

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
WATER QUALITY STANDARDS AND)
EFFLUENT LIMITATIONS FOR THE) R08-9
CHICAGO AREA WATERWAY SYSTEM) (Rulemaking - Water)
AND THE LOWER DES PLAINES RIVER:)
PROPOSED AMENDMENTS TO 35 Ill.)
Adm. Code Parts 301, 302, 303 and 304)

PRE-FILED TESTIMONY OF JENNIFER WASIK

I am Jennifer Wasik, and I have been a biologist in the Aquatic Ecology and Water Quality Section at the District for over 7 years. I have a Bachelor of Science degree in Biology from the University of Michigan and a Master of Science degree in Environmental Management from the Illinois Institute of Technology. In addition to supervising the collection of biological, habitat, and sediment samples for our Ambient Water Quality Monitoring (AWQM) Program, which began in 2001, I manage other aquatic research projects. I serve on various local water quality-related committees including the Bubbly Creek Sediment Capping Demonstration Project committee and the Illinois Nutrient Standards Workgroup. I have also been a member of the North American Benthological Society (NABS) since 2003.

In my testimony, I will discuss the District’s sediment and benthic invertebrate sample collection program and summarize the physical, chemical, and toxicological data we have collected between 2001-2007 in the CAWS. A detailed description of our collection and analytical methods for biological and sediment data is located in District R&D reports (Wasik, *et al* 2008; **Attachments 1 and 2**)

Methodology

Sampling Stations. The 59 AWQM Program sampling stations are located on natural and man-made waterways throughout the District’s service area (**Attachment 3**). Twenty eight of the stations are in the CAWS, whereas the other stations are located in the General Use, shallow-draft waterways.

The biological, sediment, and habitat monitoring portions of the AWQM Program operate on a 4-year cycle, with a primary focus each year on a different watershed area. The

waterways are divided into the northern Chicago River System, southern Chicago River System, Calumet River System, and Des Plaines River System. The Des Plaines River System consists of General Use waterways that are not relevant to this rulemaking.

Physical Characterization of Sediment. During biological collections, physical habitat is assessed at four locations at each sampling station: At the beginning and end of a sampling reach, at the side and center of the waterway. A sediment evaluation is one component of the habitat assessment process. The estimated sediment composition, color, and odor are recorded, and the presence of oil is noted. In addition, the depth of fines is measured by pushing a leveling rod through the fine deposited sediment until a hard bottom is reached. Fine-grained sediment has a large surface area to volume ratio and has a tendency to be more chemically and biologically reactive, thereby increasing the probability of contaminant absorption and desorption (Salomons et al., 1987; Burton, 1992). Thus, homogenous fine-grained sediments like silt and sand generally support tolerant organisms, such as aquatic worms from the Oligochaete taxon (Brinkhurst, R.O). On the other hand, a more complex and heterogeneous substrate, consisting of sand, gravel and cobbles, is conducive to a diverse benthic invertebrate community (Hynes, 1970). Such a balanced benthic invertebrate population would likely include more sensitive mayfly, stonefly, and caddisfly larvae known as EPT (Ephemeroptera, Plecoptera, and Trichoptera taxa.

Sediment Chemistry and Toxicity. In 2002, the District began collecting sediment for chemical and toxicity analysis at each of the AWQM stations. A ponar sampler was used to obtain sediment from the side and center of the waterway at each sampling station. A ponar is a 6" x 6" stainless steel dredge that scoops up sediment from the bottom of a waterbody. The District's Analytical Laboratory Division (ALD) analyzed sediment samples for total solids (TS), total volatile solids (TVS), ammonia nitrogen (NH₃-N), nitrate plus nitrite nitrogen (NO₂+NO₃), total Kjeldahl nitrogen (TKN), total phosphorus (TP), total cyanide (TCN), phenols, total metals, and Organic Priority Pollutants listed in **Attachment 4**. Additional sediment samples were sent on ice to a contractor laboratory for Acid Volatile Sulfide/Simultaneously Extracted Metals (AVS/SEM), TOC, and particle size determination. All constituents were analyzed using procedures established by the United States Environmental Protection Agency (USEPA) or

described in Standard Methods for the Examination of Water and Wastewater (19th edition, 1998).

Inorganic and organic sediment chemistry results for 2002-2007 are found in **Attachments 5** and **6**, respectively. **Attachment 7** is the station location key to accompany organic sediment chemistry data. AVS/SEM, TOC, and particle size reports from 2002-2007 prepared by the contracted laboratories are provided in **Attachments 8-13**.

In the absence of sediment toxicity data, the CAWS UAA report employed sediment toxicity screening levels from MacDonald, et al. 2000 in order to identify “potential problem areas and constituents.” Sediment contaminants exceeding the Threshold Effects Concentration (TEC) are considered “possibly toxic,” and those exceeding the Probable Effects Concentrations (PEC) are “presumed toxic.” Table 4-9 (page 4-12) in the UAA report lists the TEC and PEC values for 12 contaminants.

However, the District also has several years of sediment toxicity data obtained from bioassays conducted in sediment from the CAWS. Sediment samples for toxicity analysis were collected in the same manner and locations as the sediment chemistry samples. These samples were sent to a contractor for ten-day *Chironomus tentans* toxicity testing, which is a USEPA-recommended method (USEPA 2000 Test Method 100.2). **Attachment 14** exhibits sediment toxicity results between 2002-2007 in the CAWS. **Attachments 15-20** are the sediment toxicity reports prepared during 2002-2007, respectively, by ASci Corp, the District’s contracted toxicity laboratory. These reports contain a very detailed description of the test methods and results. Bioassay survival results that are significantly different than the control indicate that the sediment sample is not suitable for survival of this commonly assayed benthic invertebrate. Ash free dry weight results that are significantly different than the control suggest that the sediment is not conducive to normal growth of the organism.

Benthic Invertebrates. The District has been collecting benthic invertebrates in the CAWS as part of the AWQM Program since 2001. We collect benthic invertebrates from the center and side of the waterway at each station, using ponar grab and Hester Dendy samplers. While ponar samplers are like a small steel jaw that collects a portion of sediment from the bottom of the waterway, Hester Dendy samplers provide an artificial substrate in the water column above the sediment for colonization by benthic invertebrates. Hester Dendy data reflects

colonization potential as opposed to actual assemblage at a given location (USEPA 2006). Hester Dendy samples tend to indicate benthic invertebrate taxa that might be present at a given location if there were habitat available. Evidence of this in the CAWS is provided in **Attachment 21**.

The benthic invertebrate data from 2001-2005 is available in reports prepared by our contractor, EA Engineering, Science, and Technology (**Attachments 22, 23, and 24**). Due to the time required for identification, benthic invertebrate data is currently only available through 2005, although benthic invertebrates were also collected in 2006 and 2007, and continue to be collected. These reports also contain overall taxa richness (ie. number of species collected), EPT taxa richness (ie. number of sensitive mayfly, stonefly, and caddisfly species collected), Chironomidae (a classification of midges with an aquatic larval phase) head capsule deformity abundance, and brief interpretations of the data from each sampling station. Chironomidae head capsule deformity observations can indicate stress from sediment contaminant exposure (Merritt, et al. 2008).

Sediment Data Summary by CAWS Reach

North Shore Channel. Sand and silt dominated sediment throughout the North Shore Channel (NSC), and the depth of fines measured greater than 4 feet at two stations.

Concentrations of trace metals in NSC sediments were generally below the PEC, but most samples exhibited cadmium, copper, lead, nickel and zinc concentrations above the TEC. Total polycyclic aromatic hydrocarbon (PAH) concentrations were presumed toxic in three of the samples.

Toxicity results showed significant lethality from exposure to NSC sediments from one station.

Oligochaeta was the dominant taxon collected from the NSC. Total taxa richness from Hester Dendy samples was highest in the furthest upstream station in the North Shore Channel (31 taxa), and decreased in the downstream direction.

North Branch Chicago River. Along the North Branch Chicago River (NBCR), sediments were less dominated by fine sediments at the furthest upstream location. However, sediments taken further downstream in the NBCR were dominated by silt and sludge and contained heavy oil deposits. Depth of fines at this station was as deep as >5 feet.

Five of the six sediment samples from the NBCR during 2005 had PAH concentrations presumed toxic. Generally, trace metal concentrations in sediment samples were above either the PEC or TEC screening levels in all of these samples.

Toxicity results showed significant lethality from exposure to Diversey Parkway and Grand Avenue on the North Branch Chicago River.

Pollution tolerant aquatic worms were the dominant organisms collected from the deep draft portion of the NBCR. The lowest total taxa richness (four) was from the ponar sample at Grand Avenue in the North Branch Chicago River. Approximately 13 percent of midge specimens collected and examined from Grand Avenue in the North Branch Chicago River during 2002 exhibited head capsule deformities.

Chicago River. Fine sediments dominated the Chicago River bottom, with 1-5 feet depth of fines.

Analysis of sediments from the Chicago River (main stem) sampling stations showed presumed toxic concentrations of PAHs and polychlorinated biphenyls (PCBs) in seven out of eight samples. In addition, concentrations of cadmium, chromium, copper, lead, mercury, and zinc were always greater than either the presumed or possibly toxic screening values in the 2002 samples from the Chicago River.

A majority of benthic invertebrates collected from the Chicago River were aquatic worms. Hester Dendy samples yielded a total of 22 species from the Chicago River, while ponar samples only had 5 species, as would be expected given the high quality lake water in this reach and the poor sediment habitat quality.

South Branch Chicago River. The South Branch Chicago River (SBCR) was extensively embedded with fine sediments with depth of fines measuring 1 to >5 feet. Sediments from these stations generally exhibited an oil sheen. In the SBCR, each of the seven total sediment samples greatly exceeded the presumed toxic screening level for PAH concentration. Six of the samples also exceeded the PEC for PCBs. Sediment samples from the South Branch exceeded the PEC or TEC for cadmium chromium, copper, lead, mercury, nickel, and zinc, with very few exceptions.

Tolerant taxa dominated samples from the SBCR. Total and EPT taxa richness were considerably higher in Hester Dendy than ponar samples. Five percent of midges collected from Loomis Street on the South Branch Chicago River in 2002 exhibited head capsule deformities.

South Fork South Branch Chicago River (Bubbly Creek). In Bubbly Creek, there was only one monitoring station assessed for physical habitat. Sediment composition varied greatly between the beginning and end of the sampling reach; the former dominated by sludge deposits and the latter by gravel. Depth of fines ranged up to 4.5 feet, and the sediments had odors of asphalt or strongly septic sludge.

All four samples taken would be presumed toxic based on exceeding the PEC concentration for PCBs and lead. Every Bubbly Creek sediment sample exceeded either the PEC or TEC for PAHs, cadmium, chromium, copper, lead, mercury, nickel, and zinc.

Tolerant benthic invertebrate taxa comprised over 99 percent of the total density in Bubbly Creek samples, demonstrating a highly stressed community.

Sediment toxicity bioassays also confirmed toxicity to *Chironomus tentans* in the 2002 samples from Archer Avenue on Bubbly Creek

Chicago Sanitary and Ship Canal. The three furthest upstream stations on the Chicago Sanitary and Ship Canal (CSSC) were dominated by silt and sludge bottoms and depth of fines ranging from <1-9 feet. Oil was detected at a majority of the assessment locations. At the three stations further downstream, the channel bottom was often scoured concrete.

A majority of the 16 sediment samples taken from the CSSC exceeded the PEC screening level for cadmium, chromium, lead, nickel, zinc, PCBs, and PAHs.

One CSSC sediment sample elicited significant lethality to *Chironomus tentans*. Seventeen of the samples from this system indicated impaired organism growth.

Tolerant taxa, primarily Oligochaeta, comprised a majority of the benthic invertebrate samples from most of the stations in this system. According to reports prepared by EA Engineering, the benthic communities were generally highly stressed in the CSSC. From 2001-2005, Hester Dendy samples yielded many more total and EPT taxa than ponar samples. This is

characteristic of aquatic environments in which water quality exceeds habitat quality or availability. These data are probably reflective of the soft homogenous silt sediments present in this system.

Calumet-Sag Channel. The results from physical habitat characterizations in the Cal-Sag Channel (CSC) clearly show that the sediments lack substrate heterogeneity. Most of the sediment samples are comprised of fine particulates of silt and sludge. The depth of fine sediments often measured seven to eight feet. Several sediment samples displayed slight to heavy oil sheens and were reported to have strong petroleum odors. Aquatic vegetation was absent during the surveys, except for attached green algae.

By comparing measured concentrations to the TEC and PEC values, all of the sediment samples collected by the District from the CSC in 2003 would be presumed toxic for PCBs. Total PAH levels in all of the sediment samples from the CSC exceeded the TEC, and two exceeded the PEC. All of the sediment samples had presumed toxic lead concentrations and five of the six samples had presumed toxic zinc concentrations. One sediment sample showed chromium and cadmium concentrations greater than the PEC. In 2007, sediment with a strong petroleum odor collected from two of the locations on the CSC was discarded due to concerns over possible flammability during metals analysis. Of the remaining four sediment samples three were presumed toxic due to lead, two due to chromium, nickel, and zinc, and one due to cadmium.

The toxicity of CSC sediments was confirmed by sediment toxicity bioassays. Relative to the rest of the CAWS, sediment from the CSC exhibited elevated toxicity. Sediment samples collected during 2003 from all of the CSC stations were not conducive to the survival of *Chironomus tentans*. Generally, the survival rates for test organisms in the six sediment samples from the three locations were very low (down to zero) compared to control samples. Similar toxicity was observed in sediment samples collected during 2007, in which five of the six sediment samples caused significant organism lethality. Significant growth impairment was detected in the one sample that did not have a lethal effect on the organisms.

According to the technical report prepared by EA Engineering (**Attachment 23**) which summarized the results of field assessments conducted during 2003-2004, the "benthic

community at all three locations (in the CSC) was represented by a low number of taxa and was dominated by highly tolerant organisms. Therefore, it is reasonable to conclude that the benthic community at these locations in the Cal-Sag is highly stressed” (Page 3-21). Similar results have been obtained from samples collected during 2001, 2002, and 2005.

In 2003, total Hester Dendy taxa richness was 20, 21, and 18 species at the three Cal-Sag Channel sampling stations. Conversely, only six, three, and five total taxa were observed in ponar samples at the same stations, respectively. The discrepancy between total taxa collected in ponar versus Hester Dendy samples suggests that lack of habitat (ie. physical characteristics of the sediment) may be limiting benthic invertebrate communities.

Head capsule deformities were observed at a rate generally less than two percent, except during 2003 at Cicero Avenue on the Calumet-Sag Channel, where approximately ten percent of midge specimen collected exhibited head capsule deformities.

Little Calumet River. In the Little Calumet River, the surveys indicated a variety of sediment types ranging from silt or gravel to scoured concrete bottoms in the center of the waterway, with mostly fine sediments on the side. Light oil was detected in certain reaches and some reaches had relatively extensive decaying terrestrial vegetation on the bottom. Depth of fines had a wide range of 0 to 6.6 feet during 2007. Sediment samples from the Little Calumet River exhibited concentrations of certain contaminants above screening levels to a lesser extent than the Grand Calumet River and Cal-Sag Channel.

In the deep draft portion of the Little Calumet River, three out of five sediment stations exhibited toxicity and the other two stations showed decreased growth compared to the control during 2003. During 2007, one out of the five Little Calumet River sediment samples showed significant lethality, and there was decreased growth in two samples.

Zebra mussels were the dominant taxa from Hester Dendy samples in the Little Calumet River during most years.

Calumet River. Channel scouring was present in some reaches of the Calumet River, whereas other areas exhibited pockets of fine sediments mixed with zebra and quagga mussel shells. Oil sheens and odors were detected in the sediment at both stations.

In the Calumet River, one sample out of three was unsuitable for *Chironomus* survival in 2003 and one sample out of four was unsuitable for survival in 2007.

Zebra mussels represented 93-98 percent of the total density in the Hester Dendy samples between 2001-2005. Samples from the Calumet River differed from the rest of the system in that total taxa richness was higher in ponar than Hester Dendy samples because zebra mussels largely colonized space on the artificial substrates.

Grand Calumet River. Sediments at the one station in the Grand Calumet River were characterized by very deep fines (generally <5 feet) and extensive evidence of oil contamination.

In the Grand Calumet River, both sediment samples taken in 2003 had concentrations of cadmium, chromium, copper, lead, mercury, zinc, PCBs and PAHs above the PEC screening level, any one of which would indicate presumed toxicity. During 2007, one sample showed six heavy metal concentrations beyond presumed toxic levels, whereas the other sample had two metals beyond this threshold. One sample exhibited a presumed toxic PAH concentration

One out of two samples in the Grand Calumet River exhibited significant lethality in 2003, while both samples did in 2007.

Pollution tolerant *Oligochaeta* accounted for over 90 percent of the total density of ponar and Hester Dendy samples from the Grand Calumet River. Relatively few total species were collected in these samples and no EPT taxa were found.

Conclusion

Throughout the CAWS, homogenous fine sediments dominated and there was no quality habitat for benthic invertebrates. Many locations in the CSSC, CSC, NBCR, and SBCR emitted the odor or sheen of oil. Chemical contamination with metals, PAHs, and/or PCBs was widespread in CAWS sediments according to screening levels used in the UAA report. Toxicity analysis demonstrated that sediments were unsuitable for the survival of a relatively tolerant species of benthic invertebrate, especially in the CSC. Unsurprisingly, benthic invertebrate samples from the CAWS exhibited low total and EPT taxa richness, and tolerant species of worms and midges were ubiquitous. Finally, higher taxa richness in Hester Dendy samples than

ponar samples indicate that water quality is adequate for more sensitive species, but the habitat is limiting their colonization.

Respectfully submitted,

Jennifer Wasik

By: *Jennifer Wasik*

Testimony Attachments

1. District R&D Report No. 08-2. Ambient Water Quality Monitoring in the Chicago Area Waterway System: A Summary of Biological, Habitat, and Sediment Quality Data Between 2001 and 2004.
2. District R&D Report No. 08-33. Ambient Water Quality Monitoring in the Chicago, Calumet, and Des Plaines River Systems: A Summary of Biological, Habitat, and Sediment Quality During 2005.
3. Ambient Water Quality Monitoring Program Station Map
4. List of Organic Priority Pollutants analyzed in CAWS sediments
5. Summary of inorganic sediment chemistry in the CAWS between 2002-2007
6. Summary of organic sediment chemistry in the CAWS between 2002-2007
7. Key of sampling station identification numbers and locations
8. AVS/SEM, TOC, and particle size reports from 2002
9. AVS/SEM, TOC, and particle size reports from 2003
10. AVS/SEM, TOC, and particle size reports from 2004
11. AVS/SEM, TOC, and particle size reports from 2005
12. AVS/SEM, TOC, and particle size reports from 2006
13. AVS/SEM, TOC, and particle size reports from 2007
14. Summary of sediment toxicity results in the CAWS between 2002-2007
15. Sediment toxicity report from 2002
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18. Sediment toxicity report from 2005
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20. Sediment toxicity report from 2007
21. Comparison of benthic invertebrate species richness from Hester Dendy versus ponar grab samples at District annual sampling stations
22. Benthic invertebrate report from 2001-2002
23. Benthic invertebrate report from 2003-2004
24. Benthic invertebrate report from 2005

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- Wasik, Jennifer and Thomas Minarik, Jr. June, 2008. *Ambient Water Quality Monitoring in the Chicago, Calumet, and Des Plaines River Systems: A Summary of Biological, Habitat, and Sediment Quality During 2005*. Metropolitan Water Reclamation District of Greater Chicago Research and Development Department Report No. 08-33.

Attachment 1

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

**RESEARCH AND DEVELOPMENT
DEPARTMENT**

REPORT NO. 08-2

AMBIENT WATER QUALITY MONITORING

IN THE CHICAGO AREA WATERWAY SYSTEM:

A SUMMARY OF BIOLOGICAL, HABITAT, AND

SEDIMENT QUALITY DATA BETWEEN 2001 AND 2004

January 2008

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**AMBIENT WATER QUALITY MONITORING
IN THE CHICAGO AREA WATERWAY SYSTEM:
A SUMMARY OF BIOLOGICAL, HABITAT, AND
SEDIMENT QUALITY DATA BETWEEN 2001 AND 2004**

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January 2008

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DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

SUMMARY AND CONCLUSION

The biological portion of the Ambient Water Quality Monitoring (AWQM) Program operates on a 4-year cycle, with a primary focus each year on a different portion of the Chicago Area Waterway System (CAWS). Biological assessments were performed at each of the 59 stations within the 4-year cycle of 2001–2004. Physical habitat and sediment characterizations were added to the protocol in 2002. Fifteen of the 59 stations were monitored annually based on their proximity to Metropolitan Water Reclamation District of Greater Chicago (District) facilities and other considerations. Chlorophyll *a* was measured monthly at each of the 59 AWQM stations. The following summarizes findings for biological, physical habitat, and sediment parameters measured during 2001–2004.

Chlorophyll

Chlorophyll *a* concentrations decreased directly downstream of water treatment plants due to dilution of the waterway with effluent. In the Chicago River System, chlorophyll *a* means ranged from 1 µg/L at Touhy Avenue on the North Shore Channel to 25 µg/L at Dundee Road on the West Fork North Branch Chicago River. The highest recorded chlorophyll *a* concentration during 2001–2004 was 118 µg/L, also at Dundee Road.

Mean chlorophyll *a* values in the Calumet River System ranged from 2 µg/L (Ewing Avenue, Calumet River) to 40 µg/L (Burnham Avenue, Grand Calumet River). The maximum concentration measured 313 µg/L at Burnham Avenue.

The range of chlorophyll *a* concentrations in the Des Plaines River System was 3 µg/L (Wille Road, Higgins Creek) to 46 µg/L (Material Service Road, Des Plaines River). The maximum concentration measured in this system was 299 µg/L at Stephen Street in the Des Plaines River.

Habitat

During the biological collection events, staff biologists assessed physical habitat at the beginning and end of each sampling reach and calculated a Qualitative Habitat Evaluation Index (QHEI) score using this information. The QHEI was developed for wadeable streams and may not be appropriate for deep-draft channels in CAWS. However, no physical habitat index is currently available for such waterways. Physical habitat assessments were not performed during the first year of the 4-year biological collection cycle. Therefore, habitat data in the northern region of the Chicago River System is limited to the annually sampled stations.

The habitat ratings assigned to stations assessed in the Chicago River System during 2002–2004 ranged from very poor to poor (27–42). Negative habitat features in this system included channelization, limited flow, limited instream cover, and excess silt in sediments.

In the Calumet River System, QHEI ratings ranged from poor to fair (32–55). The limiting factors in this system appeared to be lack of instream cover, silty substrates, and channelization.

Habitat ratings ranged from very poor to good (23–64) in the Des Plaines System. Some stations in the Des Plaines River and Salt Creek had instream habitat for fish, as well as adequate canopy cover, and comparably better channel morphology and land use than found in other systems. However, stations in Higgins Creek and the Calumet-Sag Channel were limited by channelization, silt-dominated sediments, and lack of canopy or in stream cover.

Fish

Fish were collected from deep-draft waterways using boat electrofishing methods and from wadeable waterways employing a backpack electrofisher and a bag seine. Sampling length was generally 400 meters or 40 meters on each bank for deep and wadeable waterways, respectively. Fish were generally identified, weighed, measured, and checked for abnormalities in the field before being released.

A total of 56 fish species and 4 hybrids were collected from CAWS between 2001–2004. Index of Biotic Integrity (IBI) scores indicated a “fair” rating at most of the 59 stations, although a few were considered “poor.” Carp and gizzard shad were among the most frequently collected species of fish in the Chicago and Calumet River Systems, while various sunfish were most abundant in the Des Plaines River System.

Benthic Invertebrates

Benthic invertebrate samples were collected using petite ponar grab and Hester Dendy larval plate samplers. The samples yielded 193 total benthic invertebrate taxa (73 identified to species level) during 2001–2004. Comprehensive benthic invertebrate data have been published in two other Research and Development (R&D) Reports available on the District Website (www.mwrd.org) under the “Biological Reports” heading. They are entitled, R&D Report No. 04-4, “A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2001 and 2002,” and Report No. 07-47, “A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2003 and 2004.”

Sediment Chemistry

During 2002–2004, sediment samples were collected from the side and center of the waterway at 40 stations (sediment chemistry was not analyzed in 2001). Sediment samples were analyzed for 8 general chemistry constituents, 11 trace metals, and a total of 111 total organic priority pollutants. In addition, a contracted lab performed acid volatile sulfide/simultaneously extracted metals (AVS/SEM), total organic carbon (TOC), and particle size determination.

Sediment Toxicity

Ten-day toxicity tests were performed on *Chironomus tentans* in sediment samples collected from 40 stations during 2002–2004. Forty-eight percent of stations contained sediment that was not suitable for *Chironomus tentans* survival. Forty-eight percent of stations also contained sediment unsuitable for *Chironomus tentans* growth.

INTRODUCTION

The District began monitoring for the AWQM Program at 59 sampling stations on 21 waterways in 2001. While water samples were collected monthly to assess water quality, this report focus is on the biological, habitat, and sediment quality at these sampling stations from 2001–2004.

The biological monitoring portion of the AWQM Program operates on a 4-year cycle, with a primary focus each year on a different portion of the CAWS. Table 1 displays the field monitoring schedule for biological, physical habitat, and sediment quality assessments throughout the 4-year cycle. Fifteen of the 59 stations are monitored annually, based on their proximity to District water reclamation plants (WRPs) or municipal boundaries.

Characterization of physical habitat, fish, and benthic invertebrate populations, along with sediment toxicity and chemistry, are among the most crucial components for a comprehensive evaluation of a waterway. Each parameter represents a piece of the overall picture that is necessary to identify problem areas, make regulatory decisions, and determine plausible attainable uses for a waterway.

In addition to analyzing the AWQM Program data in order to assess and manage the impact of the District's WRPs, our data is often shared with other government agencies, non-governmental organizations, and academic institutions. For instance, the AWQM Program data is shared with the Illinois Environmental Protection Agency (IEPA) to support their efforts to make regulatory decisions, prepare the 305(b) reports in accordance with the Clean Water Act, and perform Use Attainability Analyses (UAA).

TABLE 1: AMBIENT WATER QUALITY PROGRAM SAMPLING STATIONS
AND BIOLOGICAL SAMPLING YEAR

| Station No. | Sampling Station | Waterway | Year Sampled |
|-------------|--------------------------|---------------------------------|--------------|
| 106 | Dundee Road | West Fork North Branch | 2001 |
| 103 | Golf Road | West Fork North Branch | 2001 |
| 31 | Lake-Cook Road | Middle Fork North Branch | 2001 |
| 32 | Lake-Cook Road | Skokie River | 2001 |
| 105 | Frontage Road | Skokie River | 2001 |
| 104 | Glenview Road | North Branch Chicago River | 2001 |
| 34 | Dempster Street | North Branch Chicago River | 2001 |
| 96 | Albany Avenue | North Branch Chicago River | Annually |
| 35 | Central Street | North Shore Channel | 2001 |
| 102 | Oakton Street | North Shore Channel | 2001 |
| 36 | Touhy Avenue | North Shore Channel | Annually |
| 101 | Foster Avenue | North Shore Channel | 2001 |
| 37 | Wilson Avenue | North Branch Chicago River | 2001 |
| 73 | Diversey Parkway | North Branch Chicago River | 2001 |
| 46 | Grand Avenue | North Branch Chicago River | Annually |
| 74 | Lake Shore Drive | Chicago River | 2002 |
| 100 | Wells Street | Chicago River | 2002 |
| 39 | Madison Street | South Branch Chicago River | 2002 |
| 108 | Loomis Street | South Branch Chicago River | 2002 |
| 99 | Archer Avenue | South Fork South Branch | 2002 |
| 40 | Damen Avenue | Chicago Sanitary and Ship Canal | 2002 |
| 75 | Cicero Avenue | Chicago Sanitary and Ship Canal | Annually |
| 41 | Harlem Avenue | Chicago Sanitary and Ship Canal | Annually |
| 42 | Route 83 | Chicago Sanitary and Ship Canal | 2002 |
| 48 | Stephen Street | Chicago Sanitary and Ship Canal | 2002 |
| 92 | Lockport | Chicago Sanitary and Ship Canal | Annually |
| 49 | Ewing Avenue | Calumet River | 2003 |
| 55 | 130 th Street | Calumet River | Annually |
| 50 | Burnham Avenue | Wolf Lake | 2003 |
| 86 | Burnham Avenue | Grand Calumet River | 2003 |
| 56 | Indiana Avenue | Little Calumet River | 2003 |
| 76 | Halsted Street | Little Calumet River | Annually |
| 52 | Wentworth Avenue | Little Calumet River | 2003 |
| 54 | Joe Orr Road | Thorn Creek | 2003 |
| 97 | 170 th Street | Thorn Creek | 2003 |

TABLE 1 (Continued): AMBIENT WATER QUALITY PROGRAM SAMPLING STATIONS
AND BIOLOGICAL SAMPLING YEAR

| Station No. | Sampling Station | Waterway | Year Sampled |
|-------------|-----------------------|--------------------------|--------------|
| 57 | Ashland Avenue | Little Calumet River | 2003 |
| 58 | Ashland Avenue | Calumet-Sag Channel | 2003 |
| 59 | Cicero Avenue | Calumet-Sag Channel | Annually |
| 43 | Route 83 | Calumet-Sag Channel | 2003 |
| 90 | Route 19 | Poplar Creek | 2004 |
| 110 | Springinsguth Road | West Branch DuPage River | 2004 |
| 89 | Walnut Lane | West Branch DuPage River | 2004 |
| 64 | Lake Avenue | West Branch DuPage River | Annually |
| 79 | Higgins Road | Salt Creek | 2004 |
| 80 | Arlington Heights Rd. | Salt Creek | 2004 |
| 18 | Devon Avenue | Salt Creek | Annually |
| 24 | Wolf Road | Salt Creek | 2004 |
| 109 | Brookfield Avenue | Salt Creek | 2004 |
| 77 | Elmhurst Road | Higgins Creek | 2004 |
| 78 | Wille Road | Higgins Creek | Annually |
| 12 | Lake-Cook Road | Buffalo Creek | 2004 |
| 13 | Lake-Cook Road | Des Plaines River | Annually |
| 17 | Oakton Street | Des Plaines River | 2004 |
| 19 | Belmont Avenue | Des Plaines River | 2004 |
| 20 | Roosevelt Road | Des Plaines River | 2004 |
| 22 | Ogden Avenue | Des Plaines River | Annually |
| 23 | Willow Springs Rd. | Des Plaines River | 2004 |
| 29 | Stephen Street | Des Plaines River | 2004 |
| 91 | Material Service Rd. | Des Plaines River | Annually |

DESCRIPTION OF THE STUDY AREA

Chicago Area Waterway System

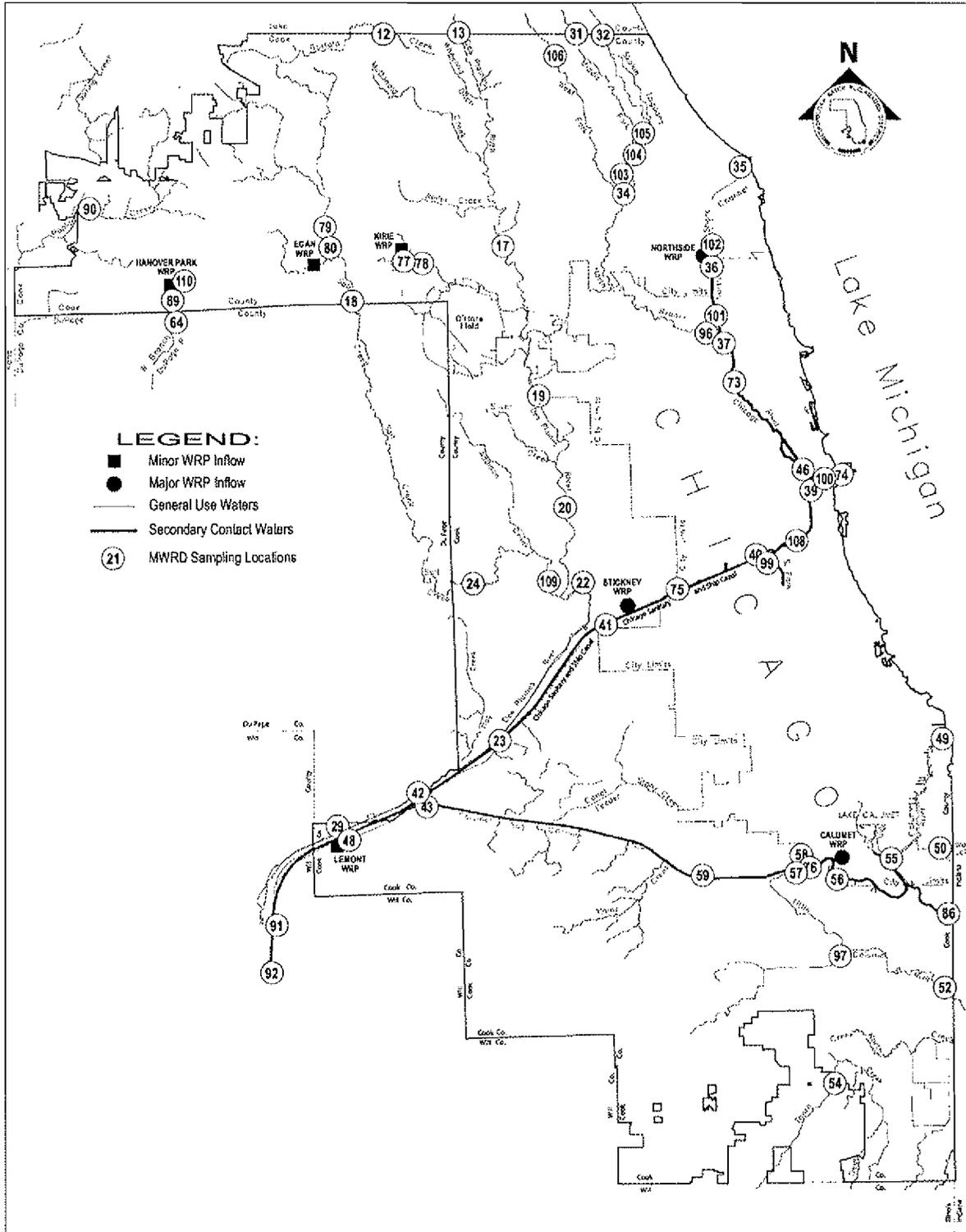
The CAWS consists of man-made canals, as well as natural streams, which have been altered to varying degrees. Some natural waterways have been deepened, straightened, and/or widened to such an extent that reversion to their natural state would be impossible. The waterways serve the Chicago area by draining urban storm water runoff and treated municipal wastewater effluent and allowing commercial navigation in the deep-draft portions.

The primary man-made waterways are the North Shore Channel, connecting Lake Michigan at Wilmette to the North Branch of the Chicago River; the Chicago Sanitary and Ship Canal (CSSC), extending from Damen Avenue to the Lockport Powerhouse; and the Calumet-Sag Channel, connecting the Little Calumet River with the CSSC. The primary natural waterways include the Chicago River System, branches flowing south from Lake County into the North Branch of the Chicago River; the Des Plaines River System, flowing south from Lake County and joining with the discharge from the CSSC downstream of the Lockport Powerhouse; and the Calumet River System, flowing south and west into the Calumet-Sag Channel.

Sampling Stations

The sampling stations for the AWQM Program are located on natural and man-made waterways throughout the District's service area. A map of the CAWS including the 59 sampling stations and the District's WRPs is shown in [Figure 1](#). Stations were primarily selected such that there was at least one monitoring station on the lower end of an IEPA 303(d) impaired waterway segment. Secondary criteria for selecting sampling locations included: (1) above and below major point sources of pollution, (2) below Lake Michigan diversion points, (3) above junction of two major waterways, (4) below county municipal boundaries, and (5) in areas of environmental concern.

FIGURE 1: AMBIENT WATER QUALITY MONITORING PROGRAM
SAMPLING STATIONS



MATERIALS AND METHODS

Chlorophyll

Sample Collection. Surface water grab samples for chlorophyll analysis were collected using a stainless steel bucket. The bucket was lowered into the waterway generally from the upstream side of the bridge at the most central location. The bucket was submerged, filled, and then raised to the top of the bridge. An aliquot was poured into an amber, plastic, one-liter bottle that was pre-preserved with 1-mg magnesium carbonate, leaving 1/2-inch airspace at the top. Samples were then placed in a cooler with ice and returned to lab for processing.

Laboratory Analysis. Filtration. Prior to filtering samples, water was mixed by rapidly inverting sample bottles 25 times before the first pour. Samples were filtered through Whatman type GF/F glass-fiber filters (0.7 micrometers) using Millipore filtration equipment and vacuum pressure. The water samples were filtered until the rate of flow decreased, but before it became clogged. Following filtration, sample filters were folded and wrapped with aluminum foil and extracted the following day.

Extraction. Filters were placed in glass extraction tubes with 5 mL of 90 percent aqueous acetone solution. Using a motorized tissue grinder set at 500 rpm and a pestle, the top layer of the filter was separated. Samples were then transferred to centrifuge tubes and additional acetone was added until the total volume equaled 10 mL. These tubes were inverted 5 times and then placed at 4°C for approximately 24 hours to steep.

Spectrophotometric Analysis. After removing samples from refrigeration, they were centrifuged for 20 minutes at 2,500 rpm. Three ml of the supernatant was transferred into a spectrophotometric cell and the absorbance read at 750, 664, 647, and 630 nm. To correct for the degradation product, pheophyton, 0.1 mL of 1 percent hydrochloric acid was added and after one minute, absorbance was read again at 750 and 665 nm. The spectrophotometer was programmed to calculate corrected chlorophyll *a*, *b*, and *c* values based on the volumes filtered and used to extract samples.

Quality Control. A reagent blank of 90 percent acetone was placed in the spectrophotometer every tenth sample and read between -0.1 and 0.1 µg/L. A method blank of distilled water was prepared for each group of samples and run through the entire laboratory procedure. One duplicate sample was chosen randomly for each group of samples and would have to be within 20 relative percent difference of the original sample. Chlorophyll *a* and *b* standards from spinach were also analyzed every 20 samples and displayed at least a 90 percent recovery.

Habitat

Data Collection. Physical habitat assessment data sheets (Figure 2) were completed by a staff biologist in the field at each station starting in 2002. Habitat evaluation had not yet been implemented in the AWQM Program during 2001 when the focus of sampling was in the North Shore Channel and the North Branch Chicago River. Assessments made in the field included weather conditions, channel morphology, bank erosion, shore cover, aquatic vegetation, man-made structures, floatable materials, riparian land use, sediment composition, sediment color and odor, depth of fines, and presence of oil in sediment. Channel width was determined using a Yardage Pro 800 rangefinder in the non-wadable waterways. A fiberglass telescoping leveling rod was used to measure water depth and depth of fines (in sediment). The smallest extension of the round leveling rod (1-inch diameter) was pushed into the sediment with reasonable force as far as possible to determine depth of fines in feet. A 6- X 6-inch petite Ponar grab sampler was used to collect sediment for analysis. Staff biologists estimated the percent composition of plant debris, clay, inorganic silt, organic sludge, sand (0.06-2 mm diameter), gravel (<2-64 mm diameter), cobble (>64-256 mm diameter), boulder (>256 mm diameter), or bedrock/concrete in the sediment. Sediment color and odor was recorded, as well as the appearance of oil in the sample.

Assessment Locations. Physical habitat was evaluated at the beginning and end of the fishing range in the center and on one side of the waterway at each station. The range was 40 meters for wadable sites, 100 meters for sites in which the small boat electrofisher was employed, and 400 meters for deep-draft waterways.

Calculating Qualitative Habitat Evaluation Index. The QHEI was created by the Ohio Environmental Protection Agency (OEPA) to determine the suitability of a stretch of waterway to fish and macroinvertebrates based on physical habitat characteristics (Rankin, 1989). The index was developed to assess wadable streams, not deep-draft channels such as CAWS. However, no appropriate index was available for these waterways. Habitat scores were calculated for each of the stations visited between 2002 and 2004 using the OEPA QHEI procedures. Stations were then classified as excellent, good, fair, poor, or very poor based on their ability to support aquatic life in reference to habitat (CDM, 2004). The classification ranges were as follows:

| | |
|-------|-----------|
| <=75 | Excellent |
| 60-74 | Good |
| 46-59 | Fair |
| 30-45 | Poor |
| <30 | Very Poor |

**FIGURE 2: METROPOLITAN WATER RECLAMATION DISTRICT OF
GREATER CHICAGO PHYSICAL HABITAT ASSESSMENT FIELD DATA SHEET**

Date _____ Time _____ Station Number _____

Station Name _____ Latitude _____

Waterbody _____ Longitude _____

Assessment Observer (s) _____

Weather Conditions SUNNY CLOUDY RAIN (circle one)

Stream Order _____ Assessment Location BEGINNING END (circle one)

Assessment Location Facing Upstream LEFT CENTER RIGHT (circle one)

Channel Habitat POOL RUN RIFFLE (circle one)

Water Depth (ft) _____ Channel Width (ft) _____

Water Level LOW NORMAL HIGH FLOODED (circle one)

Man-made Structures DAM RIPRAP BRIDGE LEVEE ISLAND
 OUTFALL SHEET PILING OTHER _____ (circle all applicable)
(Specify)

Channelization YES NO (circle one)

Bank Erosion NONE SLIGHT MODERATE SEVERE (circle one)

| | | | |
|----------------------------|---|----------------------|--|
| Floatable Materials | YES <input checked="" type="checkbox"/> | NO (circle one) | |
| | If YES, characterize (circle all applicable) | | |
| STREET LITTER | SANITARY SEWAGE | VEGETATIVE MATERIAL | |

| | | | |
|---------------------------|--|---|--|
| Aquatic Vegetation | YES <input checked="" type="checkbox"/> | NO (circle one) | |
| | If YES, is vegetation (circle all applicable) | | |
| ROOTED EMERGENT | ROOTED SUBMERGENT | ROOTED FLOATING | |
| ATTACHED ALGAE | FLOATING ALGAE | OTHER _____ <small>(Specify)</small> | |

| | | | |
|--|----------------------------------|---|------|
| Instream Cover for Fish (circle all applicable) | | | |
| AQUATIC VEGETATION | BOULDERS | BRUSH-DEBRIS JAMS | LOGS |
| SUBMERGED TREE ROOTS | SUBMERGED TERRESTRIAL VEGETATION | | |
| UNDER CUT BANK | ROCK LEDGE | OTHER _____ <small>(Specify)</small> | |

Canopy Cover OPEN PARTLY SHADED SHADED (circle one)

| Immediate Shore Cover | Riparian Land Use |
|-------------------------|---|
| DENUDED _____ % | GRASSLAND _____ % |
| GRASSES _____ % | URBAN RESIDENTIAL _____ % |
| SHRUBS _____ % | URBAN COMMERCIAL/INDUSTRIAL _____ % |
| TREES _____ % | WETLAND _____ % |
| OTHER (Specify) _____ % | FOREST _____ % |
| | ROW CROPS _____ % |
| | OTHER _____ % <small>(Specify)</small> |

(complete both sides of page)

FIGURE 2 (Continued): METROPOLITAN WATER RECLAMATION DISTRICT OF
GREATER CHICAGO PHYSICAL HABITAT ASSESSMENT FIELD DATA SHEET

Station Number _____

| | | | |
|-----------------------------|------------------------------------|-------|---|
| Sediment Composition | Plant Debris | _____ | % |
| | Clay | _____ | % |
| | Inorganic Silt | _____ | % |
| | Organic Sludge | _____ | % |
| | Sand (0.06 mm to 2 mm diameter) | _____ | % |
| | Gravel (>2 mm to 64 mm diameter) | _____ | % |
| | Cobble (>64 mm to 256 mm diameter) | _____ | % |
| | Boulder (>256 mm diameter) | _____ | % |
| | Bedrock or Concrete | _____ | % |

Sediment Color _____ **Sediment Odor** _____

Oil in Sediment NONE LIGHT MODERATE HEAVY (circle one)

Embeddedness NONE NORMAL MODERATE EXTENSIVE (circle one)

Sinuosity NONE LOW MODERATE HIGH (circle one)

Depth of Fines (In feet using 1 inch diameter probe) _____

Photo Numbers Looking Upstream _____ Looking Downstream _____

Site Location/Map (Draw a map of the site and indicate the area assessed)

Additional Remarks _____

Fish

Boatable Stream Sampling. Fish were collected at each sample station with a boat mounted electrofisher. The electrofisher was powered by a direct current (DC) generator. Stunned fish were picked out of the water with long handled dip nets by either of two netters who were positioned on the bow of the boat. In most cases, the section of canal sampled extended for 400 meters. Whenever possible, both sides of this canal section were electrofished.

Wadeable Stream Sampling. Fish were collected at each sample station using a backpack electrofisher and a bag seine. A DC backpack electrofisher was employed to electrify the water with 0.7 to 1.0 amps of current, stunning the fish. In most instances, two 40-meter long backpack electrofisher collections were conducted at each station. A 40-meter reach of the creek was electrified by moving upstream parallel to the bank. Additional personnel followed the electrofisher collecting the stunned fish with dip nets. Following the first collection, a second 40-meter electrofishing survey was conducted on the opposite bank. If the creek was less than five meters wide, electrofishing occurred only once along a 40-meter reach. The total electrofishing time during each 40-meter collection was noted.

A 15-foot bag seine with 3/16-inch mesh was also used to collect fish. Staff pulled the seine for 40 meters traveling upstream parallel to the bank. In most instances, a separate 40-meter seine collection occurred along each bank.

The total area monitored varied with the width of the creek. For example, a location 20 meters wide sampled with two 40-meter electrofisher collections and two 40-meter seine collections would equate to a monitoring area of 800 square meters. Conductivity and temperature (°C) were recorded before each sample collection.

Fish Processing. In the field, most fish were identified to species, weighed to the nearest gram or nearest 0.1 gram (depending on size), measured for standard and total length to the nearest millimeter, and examined for the incidence of disease, parasites, or other anomalies. Following processing, these fish were returned live to the river. Minnows and other small fish that were difficult to identify were preserved in 10 percent (v/v) formalin and returned to the laboratory for further analysis. These small fish were processed in a similar manner to the field-measured fish, except that they were weighed to the nearest 0.01 gram.

Index of Biotic Integrity. Biological integrity of aquatic ecosystems has been defined as the ability to support and maintain a balanced, integrated, and adaptive community having a species composition, diversity, and a functional organization comparable to that of a natural habitat (Karr et al., 1986). Karr's 1986 IBI was used to analyze fish data from 2001–2004. The limitations of using this tool, which was meant to apply to wadable streams, for some of the man-made, channelized waterways in CAWS should be recognized. Karr's IBI integrates information from 12 fish community metrics that fall into three major categories: (1) species richness and composition, (2) trophic composition, and (3) fish abundance and condition. Each metric is

scored as a 1, 3, or 5 based on whether its evaluation deviates strongly, deviates somewhat, or approximates expectations, respectively, as compared to an undisturbed site located in a similar geographical region and on a stream of comparable size. Individual metrics are added to calculate a total IBI score. A high IBI indicates high biological integrity or health and low disturbance or lack of perturbations. A low IBI indicates low biological integrity and high disturbance or degradation. Separate IBI metric scores were determined based on the relative abundance of fish collected with each fishing gear. IBI categories of good (IBI 41-60), fair (IBI 21-40), or poor (IBI <21), as derived by the IEPA (IEPA, 1996) were determined and reported.

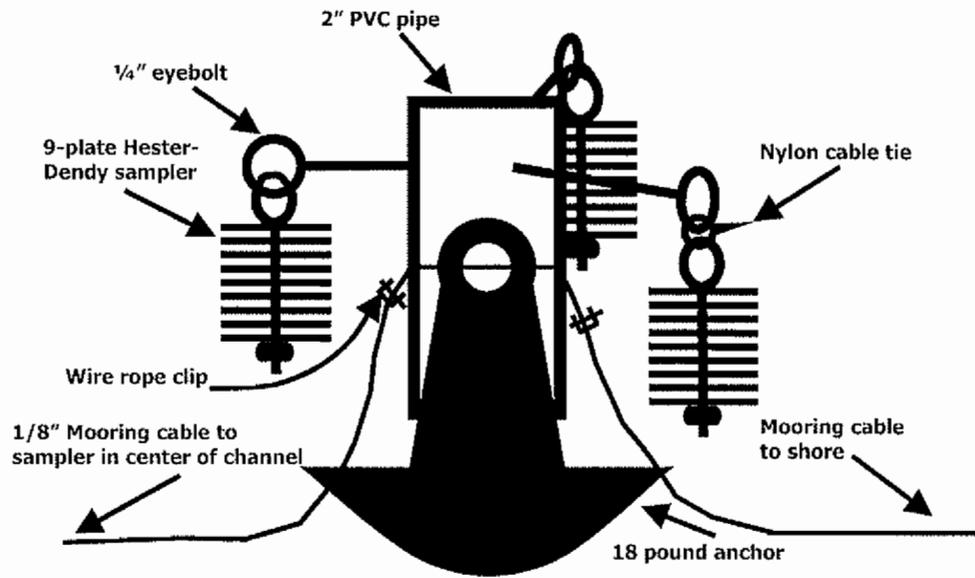
Benthic Invertebrates

Ponar Sediment Sampling. Triplicate sediment samples were collected with a petite Ponar Grab (0.023 m²) from the center and one side of the deep-draft and wadeable waterway stations. Grab samples were taken at locations upstream from any prior sampling disturbance, such as Hester Dendy retrievals (see description in next section) to avoid collecting disturbed sediment. An appropriate area for ponar sampling was chosen by a staff biologist to avoid any obvious obstructions such as large rocks or plants. The sediment samples were sieved in the field using a field sieving bucket with 250-micrometer (µm) openings. The sieved material was poured into one-gallon plastic containers, preserved to 10 percent formalin concentration, and brought back to the laboratory for analysis. All samples were stored at 4°C until processed.

Artificial Substrate Sampling. Hester Dendy artificial substrate samplers were deployed at each station between May and June. [Figure 3](#) shows a diagram of the plate configuration that was assembled prior to deployment in the waterways. In all, 27, 3- X 3-inch sampling plates were attached to 2, 18-pound river anchors, connected to an object on shore (usually a tree) by a cable, and then placed on the bottom of the waterway in the center and on one side. These substrates were left in the waterway between 7 and 14 weeks and then retrieved concurrent to other biological sampling. Hester Dendy set-ups were located and the anchors were lifted out of the waterway with a 250-micron mesh plankton net underneath to avoid organism loss. Then, plates were cut from the anchors and placed into a one-gallon bucket with a secure leak-proof lid. Invertebrates from the plankton net reservoir were also rinsed into the buckets, which were then filled with river water and brought to a 10 percent final concentration of formalin.

Benthic Invertebrate Processing. In the laboratory, the ponar sediment samples were gently washed and screened through a U.S. Standard number 60 mesh sieve (250 µm openings). The formalin mixture in which the Hester Dendy plates were immersed was also sieved through a number 60 mesh sieve, and then the sampling bucket was filled with tap water to cover the plates. Each plate was removed from the sampler and gently brushed with a paintbrush on both sides while running under a slow stream of water in order to rinse the attached invertebrates into the sieve. Rinsings from both ponar and Hester Dendy sampling containers were thoroughly sieved. The sieved material was examined in small batches under a compound microscope in a 100- X 50-mm glass crystallizing dish filled about 1 cm high. Laboratory technicians then

FIGURE 3: CONFIGURATION OF HESTER DENDY LARVAL PLATE SAMPLER



counted oligochaete worms and removed all other invertebrates from the finer residual material. In situations where large numbers of worms were encountered (>1000), estimates of their abundance were made by using a subsampling device. Invertebrates other than worms were sent to a consultant (EA Engineering) for identification to genus or species when possible.

Sediment Chemistry

Sample Collection. Prior to sample collection the Ponar grab sampler and the metal and plastic pans and scoops were cleaned with hot water and laboratory detergent, rinsed with de-ionized water and allowed to air dry. The Ponar and metal pans and scoops were then rinsed with acetone, allowed to air dry, and dried in an oven at 105°C for one hour. When dry and cool, each set was placed in a plastic bag and sealed to prevent contamination until ready for use. Sediment samples were collected from the center and side of the waterway using separate cleaned 6- X 6-inch Ponar grab samplers. The sediment samples were transferred into either plastic or metal pans and then put into the appropriate container using plastic or metal scoops. The constituents analyzed in sediment, sample containers used, and preservation methods are summarized in Table 2. Metal scoops and pans were used for samples collected in glass containers, whereas plastic scoops and pans were used for sediment collected in plastic containers. After being filled, sample containers were placed on ice until they could be refrigerated.

Sample Analyses. The sediment samples were analyzed for total solids (TS), total volatile solids (TVS), ammonia nitrogen (NH₃-N), nitrate plus nitrite nitrogen (NO₂+NO₃), total Kjeldahl nitrogen (TKN), total phosphorus (TP), total cyanide (TCN), phenols, total metals (including arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc), and Organic Priority Pollutants listed in Table 3 by the District's Analytical Laboratory Division (ALD). Sediment samples were sent on ice to a contractor laboratory for AVS/SEM, TOC, and particle size. In the laboratory, all constituents were analyzed using procedures established by the United States Environmental Protection Agency (USEPA) or described in Standard Methods for the Examination of Water and Wastewater (19th edition, 1998).

Sediment Toxicity

Sediment samples were collected using a 6- X 6-inch Ponar grab sampler from the center and side of the waterways, and scooped into 1-gallon plastic buckets (at least 1/2 full). Buckets were kept on ice until they could be refrigerated. These samples were sent in coolers on ice to a contractor for ten-day *Chironomus tentans* toxicity testing (USEPA 2000 Test Method 100.2). Tests were performed within 14 days of sediment collection.

TABLE 2: CONSTITUENTS ANALYZED, SAMPLE CONTAINERS, AND PRESERVATION METHODS FOR SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM DURING 2002–2004

| Constituents | Units of Measure ¹ | Sample Container | Preservative |
|--|-------------------------------|------------------|--------------|
| Total Solids (TS) | percent | Glass | Cool, 4°C |
| Total Volatile Solids (TVS) | percent | Glass | Cool, 4°C |
| Un-ionized Ammonia (NH ₃ -N) | mg/kg | Glass | Cool, 4°C |
| Nitrite plus Nitrate Nitrogen (NO ₂ +NO ₃) | mg/kg | Glass | Cool, 4°C |
| Total Kjeldahl Nitrogen (TKN) | mg/kg | Glass | Cool, 4°C |
| Total Phosphorus (TP) | mg/kg | Glass | Cool, 4°C |
| Phenols | mg/kg | Glass | Cool, 4°C |
| Total Cyanide (TCN) | mg/kg | Glass | Cool, 4°C |
| Acid Volatile Sulfide (AVS) | μmoles/g | Plastic | Cool, 4°C |
| Simultaneously Extracted Metal (SEM) | μmoles/g | Plastic | Cool, 4°C |
| Total Organic Carbon (TOC) | mg/kg | Glass | Cool, 4°C |
| Particle Size | percent | Plastic | Cool, 4°C |
| Toxicity (survival) | percent | Plastic | Cool, 4°C |
| Toxicity (growth) | mg/org | Plastic | Cool, 4°C |
| Total Metals: (Arsenic, Cadmium, Chromium Copper, Iron, Lead, Manganese, Mercury, Nickel, Silver, and Zinc) | mg/kg | Glass | Cool, 4°C |
| Organic Priority Pollutants: (Volatile Organic Compounds, Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls, Pesticides) | μg/kg | Glass | Cool, 4°C |

¹Expressed on a dry weight basis.

TABLE 3: LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM BETWEEN 2002–2004

| Volatile Organic Compounds | Acid Extractables | Base/Neutral Extractables | Pesticides and PCBs |
|----------------------------|-----------------------|-----------------------------|---------------------|
| Acrolein | 2-Chlorophenol | Acenaphthene | Aldrin |
| Acrylonitrile | 2,4-Dichlorophenol | Acenaphthylene | a-BHC-alpha |
| Benzene | 2,4-Dimethylphenol | Anthracene | b-BHC-beta |
| Bromoform | 4,6-Dinitro-o-cresol | Benzdine | BHC-gamma |
| Carbon tetrachloride | 2,4-Dinitrophenol | Benzo(a)anthracene | BHC-delta |
| Chlorobenzene | 2-Nitrophenol | Benzo(a)pyrene | Chlordane |
| Chlorodibromomethane | 4-Nitrophenol | 3,4-Benzofluoranthene | 4,4'-DDT |
| Chloroethane | Parachlorometacresol | Benzo(ghi)perylene | 4,4'-DDE |
| 2-Chloroethylvinyl ether | Pentachlorophenol | Benzo(k)fluoranthene | 4,4'-DDD |
| Chloroform | Phenol | Bis(2-chloroethoxy)methane | Dieldrin |
| Dichlorobromomethane | 2,4,6-Trichlorophenol | Bis(2-chloroethyl)ether | a-Endosulfan-alpha |
| 1,1-Dichloroethane | | Bis(2-chloroisopropyl)ether | b-Endosulfan-beta |
| 1,2-Dichloroethane | | Bis(2-ethylhexyl)phthalate | Endosulfan sulfate |
| 1,1-Dichloroethylene | | 4-Bromophenyl phenyl ether | Endrin |
| 1,2-Dichloropropane | | Butylbenzyl phthalate | Endrin aldehyde |
| 1,3-Dichloropropene | | 2-Chloronaphthalene | Heptachlor |
| Ethyl benzene | | 4-Chlorophenyl phenyl ether | Heptachlor epoxide |
| Methyl bromide | | Chrysene | PCB-1242 |
| Methyl chloride | | Dibenzo(a,h)anthracene | PCB-1254 |
| Methylene chloride | | 1,2-Dichlorobenzene | PCB-1221 |
| 1,1,2,2-Tetrachloroethane | | 1,3-Dichlorobenzene | PCB-1232 |
| Tetrachloroethylene | | 1,4-Dichlorobenzene | PCB-1248 |
| Toluene | | 3,3'-Dichlorobenzidine | PCB-1260 |

TABLE 3 (Continued): LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM BETWEEN 2002–2004

| Volatile Organic Compounds | Acid Extractables | Base/Neutral Extractables | Pesticides and PCBs |
|----------------------------|-------------------|---------------------------|---------------------|
| 1,2-trans-Dichloroethylene | | Diethyl phthalate | PCB-1016 |
| 1,1,1-Trichloroethane | | Dimethyl phthalate | Toxaphene |
| 1,1,2-Trichloroethane | | Di-n-butyl phthalate | |
| Trichloroethylene | | 2,4-Dinitrotoluene | |
| Vinyl chloride | | 2,6-Dinitrotoluene | |
| Trichlorofluoromethane | | Di-n-octyl phthalate | |
| | | 1,2-Diphenylhydrazine | |
| | | Fluoranthene | |
| | | Fluorene | |
| | | Hexachlorobenzene | |
| | | Hexachlorobutadiene | |
| | | Hexachlorocyclopentadiene | |
| | | Hexachloroethane | |
| | | Indeno(1,2,3-cd)pyrene | |
| | | Isophorone | |
| | | Naphthalene | |
| | | Nitrobenzene | |
| | | N-Nitrosodimethylamine | |
| | | N-Nitrosodi-n-propylamine | |
| | | N-Nitrosodiphenylamine | |
| | | Phenanthrene | |
| | | Pyrene | |
| | | 1,2,4-Trichlorobenzene | |

RESULTS AND DISCUSSION

Chlorophyll

As a photosynthetic component of all algae cells, the determination of chlorophyll *a* is an accepted way of quantifying algal biomass in lakes and streams. Chlorophyll values are of interest to regulatory agencies since it is also widely accepted that high algae concentrations may indicate nutrient impairment. The IEPA is cooperating with other state and local agencies to develop regional water quality criteria for nutrients and possibly chlorophyll. In light of this consideration, the District began monitoring chlorophyll on a monthly basis in August 2001 as part of the AWQM Program. Results are shown in [Table 4](#).

Chicago River System. During 2001–2004, the highest mean chlorophyll *a* value in the Chicago River System was at Dundee Road on the West Fork North Branch Chicago River (25 µg/L). The lowest mean chlorophyll *a* concentration throughout the system was 1 µg/L at Touhy Avenue on the North Shore Channel.

Calumet River System. Mean chlorophyll *a* concentrations ranged from 2 µg/L at Ewing Avenue on the Calumet River to 40 µg/L at Burnham Avenue on the Grand Calumet River.

Des Plaines River System. The highest mean chlorophyll concentrations in the Des Plaines River System were calculated at Stephen Street (41 µg/L) and Material Service Road (46 µg/L) on the Des Plaines River. Wille Road on Higgins Creek had the lowest mean chlorophyll *a* concentration throughout this system (3 µg/L).

Habitat

Habitat is one of the most crucial factors limiting aquatic life in urban environments such as CAWS. Channelization, limited instream and canopy cover, siltation, erosion, and lack of adequate flood plain area are some of the physical characteristics that challenge waterways in the Chicago area. The QHEI was developed by OEPA as a method to quantify and assess wadeable aquatic habitats for their ability to support aquatic life. Since this metric was designed to analyze wadeable streams, the limitations to its application in man-made channel portions of CAWS should be considered. Metrics include: substrate, instream cover, channel quality, riparian zone/erosion, pool and riffle quality, and stream gradient. Narrative designations were assigned to QHEI score ranges so that waterway reaches could be categorized as excellent, good, fair, poor, or very poor based on the ability of the habitat to support aquatic life. [Table 5](#) displays the QHEI score and rating for each of the stations assessed in 2002–2004.

Chicago River System. The habitat ratings assigned to stations assessed in the Chicago River System during 2002–2004 ranged from very poor to poor (27–42). Negative habitat

TABLE 4: RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN AUGUST 2001 AND DECEMBER 2004

| Station No. | Station Name | Waterway | N* | Mean $\mu\text{g/L}$ | Minimum $\mu\text{g/L}$ | Maximum $\mu\text{g/L}$ | Standard Deviation $\mu\text{g/L}$ |
|-------------|-----------------------------|--|----|----------------------|-------------------------|-------------------------|------------------------------------|
| 106 | Dundee Road | West Fork North Branch Chicago River | 18 | 25 | 4 | 118 | 31 |
| 103 | Golf Road | West Fork North Branch Chicago River | 34 | 18 | 2 | 96 | 18 |
| 31 | Lake-Cook Road | Middle Fork North Branch Chicago River | 33 | 9 | <1 | 35 | 8 |
| 32 | Lake-Cook Road | Skokie River | 33 | 14 | 1 | 91 | 17 |
| 105 | Frontage Road | Skokie River | 41 | 22 | 2 | 80 | 17 |
| 104 | Glenview Road | North Branch Chicago River | 29 | 18 | 1 | 47 | 12 |
| 34 | Dempster Street | North Branch Chicago River | 40 | 16 | 1 | 39 | 10 |
| 96 | Albany Avenue | North Branch Chicago River | 37 | 17 | 2 | 61 | 15 |
| 35 | Central Street | North Shore Channel | 32 | 7 | <1 | 91 | 18 |
| 102 | Oakton Street | North Shore Channel | 38 | 11 | <1 | 65 | 18 |
| 36 | Touhy Avenue | North Shore Channel | 40 | 1 | <1 | 5 | 1 |
| 101 | Foster Avenue | North Shore Channel | 40 | 3 | <1 | 31 | 5 |
| 37 | Wilson Avenue | North Branch Chicago River | 41 | 4 | <1 | 18 | 4 |
| 73 | Diversey Avenue | North Branch Chicago River | 41 | 4 | <1 | 12 | 3 |
| 46 | Grand Avenue | North Branch Chicago River | 41 | 5 | 1 | 20 | 5 |
| 74 | Lake Shore Dr. | Chicago River | 36 | 3 | 1 | 18 | 4 |
| 100 | Wells Street | Chicago River | 37 | 3 | 1 | 16 | 3 |
| 39 | Madison Street | South Branch Chicago River | 39 | 4 | 1 | 16 | 4 |
| 108 | Loomis Street | South Branch Chicago River | 41 | 5 | <1 | 26 | 6 |
| 99 | Archer Avenue | South Fork South Branch Chicago River | 41 | 15 | <1 | 90 | 20 |
| 107 | Western Avenue ¹ | Chicago Sanitary and Ship Canal | 17 | 3 | 1 | 7 | 2 |
| 40 | Damen Avenue | Chicago Sanitary and Ship Canal | 24 | 7 | 1 | 25 | 7 |
| 75 | Cicero Avenue | Chicago Sanitary and Ship Canal | 41 | 7 | 1 | 25 | 7 |
| 41 | Harlem Avenue | Chicago Sanitary and Ship Canal | 41 | 3 | 1 | 8 | 2 |
| 42 | Route 83 | Chicago Sanitary and Ship Canal | 41 | 4 | <1 | 24 | 4 |

TABLE 4 (Continued): RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN AUGUST 2001 AND DECEMBER 2004

| Station No. | Station Name | Waterway | N ^a | Mean $\mu\text{g/L}$ | Minimum $\mu\text{g/L}$ | Maximum $\mu\text{g/L}$ | Standard Deviation $\mu\text{g/L}$ |
|-------------|------------------------------|---------------------------------|----------------|----------------------|-------------------------|-------------------------|------------------------------------|
| 48 | Stephen Street | Chicago Sanitary and Ship Canal | 41 | 5 | 1 | 20 | 4 |
| 92 | Lockport | Chicago Sanitary and Ship Canal | 171 | 5 | <1 | 37 | 5 |
| 49 | Ewing Avenue | Calumet River | 38 | 2 | 1 | 5 | 1 |
| 55 | 130 th Street | Calumet River | 37 | 7 | 1 | 22 | 5 |
| 50 | Burnham Avenue | Wolf Lake | 40 | 6 | <1 | 18 | 5 |
| 86 | Burnham Avenue | Grand Calumet River | 33 | 40 | 3 | 313 | 69 |
| 56 | Indiana Avenue | Little Calumet River | 37 | 20 | 3 | 64 | 14 |
| 76 | Halsted Street | Little Calumet River | 39 | 7 | <1 | 29 | 7 |
| 52 | Wentworth Avenue | Little Calumet River | 35 | 7 | 1 | 40 | 7 |
| 54 | Joe Orr Road | Thorn Creek | 21 | 7 | 1 | 33 | 8 |
| 97 | 170 th Street | Thorn Creek | 38 | 10 | 2 | 32 | 7 |
| 57 | Ashland Avenue | Little Calumet River | 35 | 10 | 2 | 43 | 9 |
| 58 | Ashland Avenue | Calumet-Sag Channel | 41 | 10 | 1 | 35 | 10 |
| 59 | Cicero Avenue | Calumet-Sag Channel | 40 | 11 | 1 | 56 | 12 |
| 43 | Route 83 | Calumet-Sag Channel | 38 | 14 | <1 | 93 | 18 |
| 90 | Route 19 | Poplar Creek | 34 | 12 | 1 | 32 | 8 |
| 63 | Longmeadow Lane ² | West Branch DuPage River | 2 | 17 | 8 | 25 | 13 |
| 110 | Springinsguth Road | West Branch DuPage River | 10 | 11 | 1 | 23 | 7 |
| 89 | Walnut Lane | West Branch DuPage River | 38 | 6 | 1 | 31 | 7 |
| 64 | Lake Street | West Branch DuPage River | 40 | 23 | 5 | 103 | 19 |
| 79 | Higgins Road | Salt Creek | 32 | 36 | 10 | 114 | 23 |
| 80 | Arlington Hts. Road | Salt Creek | 38 | 15 | 2 | 41 | 11 |
| 18 | Devon Avenue | Salt Creek | 38 | 17 | 4 | 45 | 9 |
| 24 | Wolf Road | Salt Creek | 39 | 10 | 1 | 49 | 11 |
| 21 | First Avenue ³ | Salt Creek | 9 | 11 | 2 | 46 | 14 |
| 109 | Brookfield Avenue | Salt Creek | 25 | 13 | <1 | 50 | 14 |

TABLE 4 (Continued): RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN AUGUST 2001 AND DECEMBER 2004

| Station No. | Station Name | Waterway | N [*] | Mean µg/L | Minimum µg/L | Maximum µg/L | Standard Deviation µg/L |
|-------------|------------------------|-------------------|----------------|--------------|-----------------|-----------------|-------------------------------|
| 77 | Elmhurst Road | Higgins Creek | 22 | 12 | 4 | 23 | 5 |
| 78 | Wille Road | Higgins Creek | 40 | 3 | <1 | 15 | 3 |
| 12 | Lake-Cook Road | Buffalo Creek | 27 | 28 | 7 | 65 | 13 |
| 13 | Lake-Cook Road | Des Plaines River | 39 | 27 | 7 | 105 | 20 |
| 17 | Oakton Street | Des Plaines River | 35 | 27 | 2 | 108 | 24 |
| 19 | Belmont Avenue | Des Plaines River | 39 | 19 | <1 | 91 | 23 |
| 20 | Roosevelt Road | Des Plaines River | 34 | 15 | <1 | 81 | 19 |
| 22 | Ogden Avenue | Des Plaines River | 32 | 18 | 1 | 94 | 23 |
| 23 | Willow Springs Road | Des Plaines River | 35 | 25 | 1 | 161 | 34 |
| 29 | Stephen Street | Des Plaines River | 38 | 41 | 1 | 299 | 62 |
| 91 | Material Services Road | Des Plaines River | 39 | 46 | 3 | 214 | 51 |

*N=Number of Observations.

¹Samples were taken at Western Avenue instead of Damen Avenue during 2001–2002 due to bridge construction.

²Longmeadow Avenue Station on West Branch DuPage River was replaced by Springinsguth Road in January 2004 due to low flow.

³First Avenue Station on Salt Creek was replaced by Brookfield Avenue in July 2002 due to low flow.

TABLE 5: QUALITATIVE HABITAT EVALUATION INDEX SCORES IN THE CHICAGO AREA WATERWAY SYSTEM MEASURED BETWEEN 2002 AND 2004

| Station No. | Station Name | Waterway | QHEI* Score | Habitat Rating |
|-------------|--------------------------|---------------------------------------|-------------|----------------|
| 96 | Albany Avenue | North Branch Chicago River | 33 | Poor |
| 36 | Touhy Avenue | North Shore Channel | 40 | Poor |
| 46 | Grand Avenue | North Branch Chicago River | 29 | Very Poor |
| 74 | Lake Shore Drive | Chicago River | 29 | Very Poor |
| 100 | Wells Street | Chicago River | 28 | Very Poor |
| 39 | Madison Street | South Branch Chicago River | 27 | Very Poor |
| 108 | Loomis Street | South Branch Chicago River | 32 | Poor |
| 99 | Archer Avenue | South Fork South Branch Chicago River | 42 | Poor |
| 40 | Damen Avenue | Chicago Sanitary and Ship Canal | 34 | Poor |
| 75 | Cicero Avenue | Chicago Sanitary and Ship Canal | 32 | Poor |
| 41 | Harlem Avenue | Chicago Sanitary and Ship Canal | 35 | Poor |
| 42 | Route 83 | Chicago Sanitary and Ship Canal | 38 | Poor |
| 48 | Stephen Street | Chicago Sanitary and Ship Canal | 37 | Poor |
| 92 | Lockport | Chicago Sanitary and Ship Canal | 40 | Poor |
| 49 | Ewing Avenue | Calumet River | 32 | Poor |
| 55 | 130 th Street | Calumet River | 51 | Fair |
| 50 | Burnham Avenue | Wolf Lake Drain | 47 | Fair |
| 86 | Burnham Avenue | Grand Calumet River | 36 | Poor |
| 56 | Indiana Avenue | Little Calumet River | 47 | Fair |
| 76 | Halsted Street | Little Calumet River | 55 | Fair |
| 52 | Wentworth Avenue | Little Calumet River | 40 | Poor |
| 54 | Joe Orr Road | Thorn Creek | 55 | Fair |
| 97 | 170 th Street | Thorn Creek | 41 | Poor |
| 57 | Ashland Avenue | Little Calumet River | 51 | Fair |
| 58 | Ashland Avenue | Calumet-Sag Channel | 39 | Poor |
| 59 | Cicero Avenue | Calumet-Sag Channel | 37 | Poor |
| 43 | Route 83 | Calumet-Sag Channel | 41 | Poor |
| 90 | Route 19 | Poplar Creek | 52 | Fair |
| 110 | Springinsguth Road | West Branch DuPage River | 31 | Poor |
| 89 | Walnut Lane | West Branch DuPage River | 47 | Fair |
| 64 | Lake Street | West Branch DuPage River | 49 | Fair |
| 79 | Higgins Road | Salt Creek | 63 | Good |
| 80 | Arlington Heights Rd. | Salt Creek | 64 | Good |
| 18 | Devon Avenue | Salt Creek | 55 | Fair |
| 24 | Wolf Road | Salt Creek | 49 | Fair |
| 109 | Brookfield Avenue | Salt Creek | 47 | Fair |
| 77 | Elmhurst Road | Higgins Creek | 23 | Very Poor |

TABLE 5 (Continued): QUALITATIVE HABITAT EVALUATION INDEX SCORES IN THE CHICAGO AREA WATERWAYS MEASURED BETWEEN 2002 AND 2004

| Station No. | Station Name | Waterway | QHEI* Score | Habitat Rating |
|-------------|-----------------------|-------------------|-------------|----------------|
| 78 | Wille Road | Higgins Creek | 27 | Very Poor |
| 12 | Lake-Cook Road | Buffalo Creek | 43 | Poor |
| 13 | Lake-Cook Road | Des Plaines River | 49 | Fair |
| 17 | Oakton Street | Des Plaines River | 51 | Fair |
| 19 | Belmont Avenue | Des Plaines River | 51 | Fair |
| 20 | Roosevelt Road | Des Plaines River | 47 | Fair |
| 22 | Ogden Avenue | Des Plaines River | 53 | Fair |
| 23 | Willow Springs Rd. | Des Plaines River | 46 | Fair |
| 29 | Stephen Street | Des Plaines River | 46 | Fair |
| 91 | Material Services Rd. | Des Plaines River | 64 | Good |

*QHEI=Qualitative Habitat Evaluation Index.

features in this system included channelization throughout most of the evaluated waterways, limited flow especially in the North Shore Channel, limited instream cover, and excess silt in sediments. The highest QHEI score in the analyzed portion of this system (42) was assigned to Archer Avenue on the South Fork South Branch Chicago River, despite its extremely silty substrate. Positive attributes at Archer Avenue included moderate instream and canopy cover along the waterway reach and the lack of channel walls. It is important to note that there were stations in non-channelized portions of the Main, West, and Middle Forks of the North Branch Chicago River and Skokie River that were likely to have higher QHEI scores but were not assessed for habitat quality in 2001. These sampling stations will be evaluated for habitat in 2005 and reported upon subsequently.

Calumet River System. In the Calumet River System, QHEI ratings ranged from poor to fair (32–55). The limiting factors in this system were a lack of instream cover, silty substrates, and channelization throughout reaches of the Calumet River and the Calumet-Sag Channel. The stations with the best habitat scores were located at Halsted Street on the Little Calumet River and Joe Orr Road on Thorn Creek. These locations had more instream cover, less silt in the sediment, and better channel development than the other stations in the Calumet River System.

Des Plaines River System. Habitat varied most widely amongst waterway reaches in the Des Plaines River System, ratings ranged from very poor to good (23–64). Some stations in the Des Plaines River and Salt Creek had attractive instream habitat for fish, as well as adequate canopy cover, and comparably better channel morphology and land use than found in other systems. Arlington Heights Road and Higgins Road on Salt Creek were both located in highly forested areas which provided tree cover and good flood plain quality. However, stations on Higgins Creek and the Calumet-Sag Channel were limited by channelization, silt-dominated sediments, and lack of canopy or instream cover. Wille Road on Higgins Creek had concrete banks and an artificial streambed, while the Elmhurst Road Station on the same creek was intermittent and had sludge in the sediments.

Fish

The common and scientific names of the fishes collected in CAWS between 2001 and 2004 are listed in [Table 6](#), organized by family. The number of individuals, total species, and game species collected, as well as catch weight from each station, can be referenced in [Table 7](#). In addition, [Table 8](#) displays the calculated IBI score and descriptive category for various collection methods employed at each station. Comprehensive fish data for each station are also available on the District Website at www.mwr.org under the “Biological Data” heading.

Chicago River System. The most abundant species collected from the wadeable portion of the Chicago River System included carp, largemouth bass, green sunfish, and bluegill, while carp, gizzard shad, and largemouth bass were the most frequently collected species in the deep-draft portion. The IBI scores generally indicated fair conditions in the wadeable portion and poor to fair conditions in the deep draft.

TABLE 6: COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED
IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Common Name | Scientific Name |
|------------------------|---|
| BOWFIN FAMILY | AMIIDAE |
| Bowfin | <i>Amia calva</i> |
| HERRING FAMILY | CLUPEIDAE |
| Skipjack herring | <i>Alosa chrysochloris</i> |
| Alewife | <i>Alosa pseudoharengus</i> |
| Gizzard shad | <i>Dorosoma cepedianum</i> |
| TROUT FAMILY | SALMONIDAE |
| Chinook salmon* | <i>Oncorhynchus tshawytscha</i> |
| PIKE FAMILY | ESOCIDAE |
| Grass pickerel | <i>Esox americanus</i> |
| Northern pike* | <i>Esox lucius</i> |
| MINNOW FAMILY | CYPRINIDAE |
| Goldfish | <i>Carassius auratus</i> |
| Common carp | <i>Cyprinus carpio</i> |
| Grass carp | <i>Ctenopharyngodon idella</i> |
| Carp x Goldfish Hybrid | <i>Cyprinus carpio x Carrassius auratus</i> |
| Spotfin shiner | <i>Cyprinella spiloptera</i> |
| Hornyhead chub | <i>Nocomis biguttatus</i> |
| Golden shiner | <i>Notemigonus crysoleucas</i> |
| Emerald shiner | <i>Notropis atherinoides</i> |
| Bigmouth shiner | <i>Notropis dorsalis</i> |
| Spottail shiner | <i>Notropis hudsonius</i> |
| Ozark minnow | <i>Notropis nubilus</i> |
| Sand shiner | <i>Notropis stramineus</i> |
| Mimic shiner | <i>Notropis volucellus</i> |
| Bluntnose minnow | <i>Pimephales notatus</i> |
| Fathead minnow | <i>Pimephales promelas</i> |
| Creek chub | <i>Semotilus atromaculatus</i> |
| SUCKER FAMILY | CATOSTOMIDAE |
| Quillback | <i>Carpiodes cyprinus</i> |
| White sucker | <i>Catostomus commersonii</i> |
| Black buffalo | <i>Ictiobus niger</i> |
| Spotted sucker | <i>Minytrema melanops</i> |
| Golden redhorse | <i>Moxostoma erythrurum</i> |

TABLE 6 (Continued): COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED
IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Common Name | Scientific Name |
|------------------------------------|--------------------------------------|
| CATFISH FAMILY | ICTALURIDAE |
| Black bullhead* | <i>Ameiurus melas</i> |
| Yellow bullhead* | <i>Ameiurus natalis</i> |
| Channel catfish* | <i>Ictalurus punctatus</i> |
| Tadpole madtom | <i>Noturus gyrinus</i> |
| PIRATE PERCH FAMILY | APHREDODERIDAE |
| Pirate perch | <i>Aphredoderus sayanus</i> |
| KILLIFISH FAMILY | FUNDULIDAE |
| Blackstripe topminnow | <i>Fundulus notatus</i> |
| LIVEBEARER FAMILY | POECILIIDAE |
| Western mosquitofish | <i>Gambusia affinis</i> |
| STICKLEBACK FAMILY | GASTEROSTEIDAE |
| Brook stickleback | <i>Culaea inconstans</i> |
| TEMPERATE BASS FAMILY | MORONIDAE |
| White perch* | <i>Morone americana</i> |
| White bass* | <i>Morone chrysops</i> |
| Yellow bass* | <i>Morone mississippiensis</i> |
| GOBY FAMILY | GOBIIDAE |
| Round goby | <i>Neogobius melanostomus</i> |
| SUNFISH FAMILY | CENTRARCHIDAE |
| Rock bass* | <i>Ambloplites rupestris</i> |
| Green sunfish* | <i>Lepomis cyanellus</i> |
| Pumpkinseed* | <i>Lepomis gibbosus</i> |
| Warmouth* | <i>Lepomis gulosus</i> |
| Orangespotted sunfish* | <i>Lepomis humilis</i> |
| Bluegill | <i>Lepomis macrochirus</i> |
| Longear sunfish* | <i>Lepomis megalotis</i> |
| Green sunfish x Pumpkinseed Hybrid | <i>L. cyanellus x L. gibbosus</i> |
| Green sunfish x Bluegill Hybrid | <i>L. cyanellus x L. macrochirus</i> |
| Pumpkinseed x Bluegill Hybrid | <i>L. gibbosus x L. macrochirus</i> |

TABLE 6 (Continued): COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED
IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Common Name | Scientific Name |
|----------------------------|-------------------------------|
| SUNFISH FAMILY (Continued) | CENTRARCHIDAE |
| Smallmouth bass* | <i>Micropterus dolomieu</i> |
| Largemouth bass* | <i>Micropterus salmoides</i> |
| White crappie* | <i>Pomoxis annularis</i> |
| Black crappie* | <i>Pomoxis nigromaculatus</i> |
| PERCH FAMILY | PERCIDAE |
| Johnny darter | <i>Etheostoma nigrum</i> |
| Yellow perch | <i>Perca flavescens</i> |
| Blackside darter | <i>Percina maculata</i> |
| Sauger* | <i>Sander canadensis</i> |
| Walleye* | <i>Sander vitreus</i> |
| DRUM FAMILY | SCIAENIDAE |
| Freshwater drum | <i>Aplodinotus grunniens</i> |

*Game fish species.

TABLE 7: NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Year | Sample Gear ¹ | Number of Fish | Weight in Grams | Number of Species | | Most Abundant Species |
|--|----------------------------|------|--------------------------|----------------|-----------------|-------------------|------|-----------------------------------|
| | | | | | | Total | Game | |
| <u>West Fork North Branch Chicago River</u> | | | | | | | | |
| 106 | Dundee Road | 2001 | BP/S | 9 | 108 | 3 | 1 | Carp |
| 103 | Golf Road | 2001 | BP/S | 16 | 65 | 6 | 3 | Largemouth bass |
| <u>Middle Fork North Branch Chicago River</u> | | | | | | | | |
| 31 | Lake-Cook Road | 2001 | BP/S | 7 | 26 | 4 | 2 | Largemouth bass |
| <u>Skokie River</u> | | | | | | | | |
| 32 | Lake-Cook Road | 2001 | BP/S | 9 | 32 | 2 | 2 | Bluegill |
| 105 | Frontage Road | 2001 | BP/S | 34 | 422 | 3 | 3 | Green sunfish |
| <u>North Branch Chicago River (Wadeable Portion)</u> | | | | | | | | |
| 104 | Glenview Road | 2001 | BP | 5 | 37 | 3 | 3 | Green sunfish & Largemouth bass |
| 34 | Dempster Street | 2001 | BP/S | 5 | 57 | 3 | 2 | Bluegill |
| 96 | Albany Avenue ² | 2001 | BP | 2 | 3 | 2 | 1 | Green sunfish & Brook stickleback |
| | Albany Avenue ² | 2002 | BP | 2 | 10 | 1 | 1 | Green sunfish |
| | Albany Avenue ² | 2003 | BP | 6 | 66 | 3 | 1 | Green sunfish |
| | Albany Avenue ² | 2004 | BP | 6 | 31 | 2 | 1 | Green sunfish & White sucker |
| <u>North Shore Channel</u> | | | | | | | | |
| 35 | Central Street | 2001 | EFB-L | 132 | 3,449 | 12 | 8 | Bluegill |
| 102 | Oakton Street | 2001 | EFB-L | 2 | 4 | 2 | 1 | Golden shiner & Largemouth bass |
| 36 | Touhy Avenue ² | 2001 | EFB-L | 596 | 84,454 | 11 | 6 | Gizzard shad |
| | Touhy Avenue ² | 2002 | EFB-L | 147 | 146,480 | 12 | 8 | Gizzard shad |
| | Touhy Avenue ² | 2003 | EFB-L | 335 | 102,261 | 14 | 6 | Gizzard shad |
| | Touhy Avenue ² | 2004 | EFB-L | 249 | 141,700 | 11 | 5 | Gizzard shad |

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Year | Sample Gear ¹ | Number of Fish | Weight in Grams | Number of Species | | Most Abundant Species |
|---|----------------------------|------|--------------------------|----------------|-----------------|-------------------|------|--------------------------------|
| | | | | | | Total | Game | |
| <u>North Shore Channel (Continued)</u> | | | | | | | | |
| 101 | Foster Avenue | 2001 | EFB-L | 179 | 45,309 | 15 | 8 | Largemouth bass |
| <u>North Branch Chicago River (Deep Portion)</u> | | | | | | | | |
| 37 | Wilson Avenue | 2001 | EFB-L | 75 | 79,777 | 13 | 6 | Carp |
| 73 | Diversey Parkway | 2001 | EFB-L | 58 | 23,733 | 7 | 2 | Gizzard shad |
| 46 | Grand Avenue ² | 2001 | EFB-L | 53 | 43,553 | 9 | 6 | Carp |
| | Grand Avenue ² | 2002 | EFB-L | 28 | 22,066 | 7 | 3 | Carp |
| | Grand Avenue ² | 2003 | EFB-L | 67 | 17,359 | 8 | 4 | Gizzard shad |
| | Grand Avenue ² | 2004 | EFB-L | 88 | 19,722 | 9 | 4 | Gizzard shad |
| <u>Chicago River</u> | | | | | | | | |
| 74 | Outer Drive | 2002 | EFB-L | 22 | 11,087 | 8 | 5 | Gizzard shad & Largemouth bass |
| 100 | Wells Street | 2002 | EFB-L | 136 | 104,017 | 11 | 7 | Gizzard shad |
| <u>South Branch Chicago River</u> | | | | | | | | |
| 39 | Madison Street | 2002 | EFB-L | 138 | 25,700 | 10 | 3 | Emerald shiner |
| 108 | Loomis Street | 2002 | EFB-L | 76 | 77,763 | 10 | 5 | Carp |
| <u>Bubbly Creek (South Fork South Branch Chicago River)</u> | | | | | | | | |
| 99 | Archer Avenue | 2002 | EFB-L | 21 | 3,812 | 5 | 2 | Gizzard shad |
| <u>Chicago Sanitary and Ship Canal</u> | | | | | | | | |
| 40 | Damen Avenue | 2002 | EFB-L | 148 | 153,355 | 10 | 4 | Carp |
| 75 | Cicero Avenue ² | 2001 | EFB-L | 188 | 183,269 | 11 | 4 | Carp |
| | Cicero Avenue ² | 2002 | EFB-L | 136 | 160,509 | 10 | 3 | Carp |

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Year | Sample Gear ¹ | Number of Fish | Weight in Grams | Number of Species | | Most Abundant Species |
|--|---------------------------------------|------|--------------------------|----------------|-----------------|-------------------|------|-----------------------|
| | | | | | | Total | Game | |
| <u>Chicago Sanitary and Ship Canal (Continued)</u> | | | | | | | | |
| 75 | Cicero Avenue ² | 2003 | EFB-L | 138 | 34,260 | 9 | 3 | Gizzard shad |
| | Cicero Avenue ² | 2004 | EFB-L | 191 | 98,526 | 13 | 4 | Carp |
| 41 | Harlem Avenue ² | 2001 | EFB-L | 88 | 51,515 | 9 | 3 | Gizzard shad |
| | Harlem Avenue ² | 2002 | EFB-L | 188 | 114,024 | 11 | 3 | Gizzard shad |
| | Harlem Avenue ² | 2003 | EFB-L | 225 | 47,000 | 9 | 3 | Bluntnose minnow |
| | Harlem Avenue ² | 2004 | EFB-L | 193 | 99,601 | 13 | 3 | Gizzard shad |
| 42 | Route 83 | 2002 | EFB-L | 32 | 1,264 | 5 | 2 | Mosquitofish |
| 48 | Stephen Street | 2002 | EFB-L | 24 | 1,940 | 4 | 0 | Bluntnose minnow |
| 92 | Lockport ² | 2001 | EFB-L | 77 | 97,313 | 2 | 0 | Gizzard shad |
| | Lockport ² | 2002 | EFB-L | 67 | 41,250 | 6 | 2 | Gizzard shad |
| | Lockport ² | 2003 | EFB-L | 67 | 17,248 | 7 | 4 | Carp |
| | Lockport ² | 2004 | EFB-L | 22 | 44,259 | 4 | 2 | Carp |
| <u>Calumet River</u> | | | | | | | | |
| 49 | Ewing Avenue | 2003 | EFB-L | 13 | 4,754 | 3 | 2 | Rock bass |
| 55 | 130 th Street ² | 2001 | EFB-L | 157 | 62,258 | 13 | 6 | Gizzard shad |
| | 130 th Street ² | 2002 | EFB-L | 261 | 54,688 | 12 | 6 | Bluntnose minnow |
| | 130 th Street ² | 2003 | EFB-L | 182 | 68,404 | 8 | 3 | Gizzard shad |
| | 130 th Street ² | 2004 | EFB-L | 360 | 95,951 | 14 | 6 | Gizzard shad |
| <u>Wolf Lake Outlet</u> | | | | | | | | |
| 50 | Burnham Avenue | 2003 | BP/S | 16 | 194 | 6 | 5 | Longear sunfish |
| <u>Grand Calumet River</u> | | | | | | | | |
| 86 | Burnham Avenue | 2003 | BP | 0 | 0 | 0 | 0 | NA |

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Year | Sample Gear ¹ | Number of Fish | Weight in Grams | Number of Species | | Most Abundant Species |
|--|-----------------------------|------|--------------------------|----------------|-----------------|-------------------|------|----------------------------------|
| | | | | | | Total | Game | |
| <u>Little Calumet River (Deep Portion)</u> | | | | | | | | |
| 56 | Indiana Avenue | 2003 | EFB-L | 452 | 234,592 | 17 | 11 | Gizzard shad |
| 76 | Halsted Street ² | 2001 | EFB-L | 210 | 128,546 | 16 | 8 | Gizzard shad |
| | Halsted Street ² | 2002 | EFB-L | 163 | 106,079 | 17 | 7 | Carp |
| | Halsted Street ² | 2003 | EFB-L | 219 | 47,350 | 13 | 6 | Gizzard shad |
| | Halsted Street ² | 2004 | EFB-L | 207 | 116,705 | 17 | 9 | Largemouth bass |
| <u>Thorn Creek</u> | | | | | | | | |
| 54 | Joe Orr Road | 2003 | BP | 19 | 164 | 3 | 2 | Creek chub & Green sunfish |
| 97 | 170 th Street | 2003 | EFB-S | 5 | 1,726 | 4 | 1 | White sucker |
| <u>Little Calumet River (Wadeable Portion)</u> | | | | | | | | |
| 52 | Wentworth Avenue | 2003 | BP | 1 | 26 | 1 | 0 | Carp |
| 57 | Ashland Avenue | 2003 | EFB-S | 12 | 24,255 | 2 | 1 | Carp |
| <u>Calumet-Sag Channel</u> | | | | | | | | |
| 58 | Ashland Avenue | 2003 | EFB-L | 95 | 80,244 | 13 | 8 | Gizzard shad |
| 59 | Cicero Avenue ² | 2001 | EFB-L | 127 | 52,583 | 10 | 4 | Gizzard shad |
| | Cicero Avenue ² | 2002 | EFB-L | 174 | 47,808 | 13 | 6 | Bluntnose minnow |
| | Cicero Avenue ² | 2003 | EFB-L | 56 | 27,815 | 12 | 6 | Bluntnose minnow & Green sunfish |
| | Cicero Avenue ² | 2004 | EFB-L | 147 | 70,642 | 10 | 5 | Gizzard shad |
| 43 | Route 83 | 2003 | EFB-L | 43 | 31,450 | 7 | 3 | Carp |
| <u>Buffalo Creek</u> | | | | | | | | |
| 12 | Lake-Cook Road | 2004 | BP/S | 48 | 890 | 8 | 6 | Bluegill |

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Year | Sample Gear ¹ | Number of Fish | Weight in Grams | Number of Species | | Most Abundant Species |
|--------------------------|-------------------------------------|------|--------------------------|----------------|-----------------|-------------------|------|---|
| | | | | | | Total | Game | |
| <u>Higgins Creek</u> | | | | | | | | |
| 77 | Elmhurst Road | 2004 | NS | 0 | 0 | 0 | 0 | NA |
| 78 | Wille Road ² | 2001 | BP/S | 323 | 442 | 7 | 1 | Fathead minnow |
| | Wille Road ² | 2002 | BP | 2 | 7 | 2 | 1 | Largemouth bass & Spottfin shiner |
| | Wille Road ² | 2003 | BP | 1 | 3 | 1 | 1 | Bluegill |
| | Wille Road ² | 2004 | BP | 3 | 249 | 2 | 0 | White sucker |
| <u>Des Plaines River</u> | | | | | | | | |
| 13 | Lake-Cook Road ² | 2001 | BP/S | 67 | 742 | 4 | 3 | Spottfin shiner |
| | Lake-Cook Road ² | 2002 | BP/S | 62 | 659 | 8 | 5 | Green sunfish |
| | Lake-Cook Road ² | 2003 | BP/S | 133 | 6,994 | 13 | 8 | Green sunfish |
| | Lake-Cook Road ² | 2004 | BP/S | 165 | 4,642 | 11 | 6 | Green sunfish |
| 17 | Oakton Street | 2004 | EFB-S | 22 | 11,878 | 11 | 7 | Spotted sucker |
| 19 | Belmont Avenue | 2004 | EFB-S | 15 | 1,854 | 8 | 3 | Green sunfish |
| 20 | Roosevelt Road | 2004 | EFB-S | 12 | 8,356 | 5 | 1 | White sucker |
| 22 | Ogden Avenue ² | 2001 | BP | 112 | 196 | 13 | 4 | Spottail Shiner |
| | Ogden Avenue ² | 2002 | BP | 11 | 1,567 | 7 | 5 | Bluegill |
| | Ogden Avenue ² | 2003 | BP | 14 | 128 | 5 | 2 | Green sunfish |
| | Ogden Avenue ² | 2004 | BP | 37 | 7,623 | 12 | 6 | Bluegill, Green & Orangespotted sunfish |
| 23 | Willow Springs Road | 2004 | EFB-S | 45 | 26,385 | 14 | 9 | Carp |
| 29 | Stephen Street | 2004 | BP | 58 | 2,875 | 10 | 7 | Green sunfish |
| 91 | Material Services Road ² | 2001 | BP/S | 81 | 3,069 | 14 | 3 | Bluntnose minnow |
| | Material Services Road ² | 2002 | BP/S | 36 | 457 | 11 | 3 | Bluntnose minnow |
| | Material Services Road ² | 2003 | BP/S | 24 | 102 | 6 | 1 | Blackstripe topminnow |
| | Material Services Road ² | 2004 | BP/S | 48 | 15,036 | 9 | 3 | Green sunfish |

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Year | Sample Gear ¹ | Number of Fish | Weight in Grams | Number of Species | | Most Abundant Species |
|---------------------------------|---------------------------|------|--------------------------|----------------|-----------------|-------------------|------|-----------------------|
| | | | | | | Total | Game | |
| <u>Salt Creek</u> | | | | | | | | |
| 79 | Higgins Road | 2004 | EFB-S | 114 | 20,329 | 8 | 7 | Bluegill |
| 80 | Arlington Heights Road | 2004 | BP | 38 | 969 | 7 | 6 | Bluegill |
| 18 | Devon Avenue ² | 2001 | BP | 17 | 87 | 6 | 3 | Spotfin shiner |
| | Devon Avenue ² | 2002 | BP | 104 | 5,172 | 10 | 6 | Spotfin shiner |
| | Devon Avenue ² | 2003 | BP | 23 | 6,869 | 6 | 3 | Green sunfish |
| | Devon Avenue ² | 2004 | BP | 26 | 1,369 | 5 | 4 | Green sunfish |
| 24 | Wolf Road | 2004 | BP/S | 41 | 13,278 | 6 | 2 | Spotfin shiner |
| 109 | Brookfield Avenue | 2004 | BP/S | 35 | 757 | 9 | 3 | Creek chub |
| <u>West Branch DuPage River</u> | | | | | | | | |
| 110 | Springinsguth Road | 2004 | BP/S | 3 | 32 | 2 | 2 | Pumpkinseed sunfish |
| 89 | Walnut Lane | 2004 | BP | 14 | 295 | 4 | 3 | Green sunfish |
| 64 | Lake Street ² | 2001 | BP/S | 65 | 3,232 | 8 | 5 | Green sunfish |
| | Lake Street ² | 2002 | BP/S | 73 | 3,148 | 8 | 5 | Green sunfish |
| | Lake Street ² | 2003 | BP/S | 70 | 7,829 | 8 | 5 | Green sunfish |
| | Lake Street ² | 2004 | BP/S | 81 | 3,668 | 8 | 6 | Green sunfish |
| <u>Poplar Creek</u> | | | | | | | | |
| 90 | Route 19 | 2004 | BP/S | 38 | 549 | 8 | 2 | Green sunfish |

¹Sample Gear: BP, backpack electrofisher; BP/S, backpack electrofisher and minnow seine, EFB-L, large electrofishing boat, EFB-S, small electrofishing boat.

²Annual collections.

TABLE 8: INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Waterway | Year | Sample Gear | IBI* Score | IBI* Category |
|-------------|------------------|--|------|---------------|------------|---------------|
| 32 | Lake-Cook Road | Skokie River | 2001 | BP | 34 | Fair |
| | Lake-Cook Road | Skokie River | 2001 | Seine | 30 | Fair |
| 105 | Frontage Road | Skokie River | 2001 | BP | 32 | Fair |
| | Frontage Road | Skokie River | 2001 | Seine | 34 | Fair |
| 31 | Lake-Cook Road | Middle Fork North Branch Chicago River | 2001 | BP | 30 | Fair |
| | Lake-Cook Road | Middle Fork North Branch Chicago River | 2001 | Seine | 28 | Fair |
| 104 | Glenview Road | North Branch Chicago River | 2001 | BP | 24 | Fair |
| 106 | Dundee Road | West Fork North Branch Chicago River | 2001 | BP | 22 | Fair |
| | Dundee Road | West Fork North Branch Chicago River | 2001 | Seine | 24 | Fair |
| 103 | Golf Road | West Fork North Branch Chicago River | 2001 | BP | 32 | Fair |
| | Golf Road | West Fork North Branch Chicago River | 2001 | Seine | 28 | Fair |
| 34 | Dempster Street | North Branch Chicago River | 2001 | BP | 26 | Fair |
| | Dempster Street | North Branch Chicago River | 2001 | Seine | 28 | Fair |
| 96 | Albany Avenue | North Branch Chicago River | 2001 | BP | 24 | Fair |
| | Albany Avenue | North Branch Chicago River | 2002 | BP | 24 | Fair |
| | Albany Avenue | North Branch Chicago River | 2003 | BP | 20 | Poor |
| | Albany Avenue | North Branch Chicago River | 2004 | BP | 24 | Fair |
| 35 | Central Street | North Shore Channel | 2001 | Large EF Boat | 30 | Fair |
| 102 | Oakton Street | North Shore Channel | 2001 | Large EF Boat | 28 | Fair |
| 36 | Touhy Avenue | North Shore Channel | 2001 | Large EF Boat | 34 | Fair |
| | Touhy Avenue | North Shore Channel | 2002 | Large EF Boat | 32 | Fair |
| | Touhy Avenue | North Shore Channel | 2003 | Large EF Boat | 30 | Fair |
| | Touhy Avenue | North Shore Channel | 2004 | Large EF Boat | 30 | Fair |
| 101 | Foster Avenue | North Shore Channel | 2001 | Large EF Boat | 30 | Fair |
| 37 | Wilson Avenue | North Branch Chicago River | 2001 | Large EF Boat | 28 | Fair |
| 73 | Diversey Parkway | North Branch Chicago River | 2001 | Large EF Boat | 20 | Poor |
| 46 | Grand Avenue | North Branch Chicago River | 2001 | Large EF Boat | 30 | Fair |

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Waterway | Year | Sample Gear | IBI [*] Score | IBI [*] Category |
|-------------|--------------------------|---------------------------------------|------|---------------|------------------------|---------------------------|
| 46 | Grand Avenue | North Branch Chicago River | 2002 | Large EF Boat | 20 | Poor |
| | Grand Avenue | North Branch Chicago River | 2003 | Large EF Boat | 32 | Fair |
| | Grand Avenue | North Branch Chicago River | 2004 | Large EF Boat | 28 | Fair |
| 74 | Lake Shore Drive | Chicago River | 2002 | Large EF Boat | 30 | Fair |
| 100 | Wells Street | Chicago River | 2002 | Large EF Boat | 30 | Fair |
| 39 | Madison Street | South Branch Chicago River | 2002 | Large EF Boat | 34 | Fair |
| 108 | Loomis Street | South Branch Chicago River | 2002 | Large EF Boat | 26 | Fair |
| 99 | Archer Avenue | South Fork South Branch Chicago River | 2002 | Large EF Boat | 26 | Fair |
| 40 | Damen Avenue | Chicago Sanitary and Ship Canal | 2002 | Large EF Boat | 28 | Fair |
| 75 | Cicero Avenue | Chicago Sanitary and Ship Canal | 2001 | Large EF Boat | 20 | Poor |
| | Cicero Avenue | Chicago Sanitary and Ship Canal | 2002 | Large EF Boat | 22 | Fair |
| | Cicero Avenue | Chicago Sanitary and Ship Canal | 2003 | Large EF Boat | 22 | Fair |
| | Cicero Avenue | Chicago Sanitary and Ship Canal | 2004 | Large EF Boat | 22 | Fair |
| 41 | Harlem Avenue | Chicago Sanitary and Ship Canal | 2001 | Large EF Boat | 24 | Fair |
| | Harlem Avenue | Chicago Sanitary and Ship Canal | 2002 | Large EF Boat | 26 | Fair |
| | Harlem Avenue | Chicago Sanitary and Ship Canal | 2003 | Large EF Boat | 24 | Fair |
| | Harlem Avenue | Chicago Sanitary and Ship Canal | 2004 | Large EF Boat | 26 | Fair |
| 42 | Route 83 | Chicago Sanitary and Ship Canal | 2002 | Large EF Boat | 26 | Fair |
| 48 | Stephen Street | Chicago Sanitary and Ship Canal | 2002 | Large EF Boat | 20 | Poor |
| 92 | Lockport | Chicago Sanitary and Ship Canal | 2001 | Large EF Boat | 20 | Poor |
| | Lockport | Chicago Sanitary and Ship Canal | 2002 | Large EF Boat | 22 | Fair |
| | Lockport | Chicago Sanitary and Ship Canal | 2003 | Large EF Boat | 24 | Fair |
| | Lockport | Chicago Sanitary and Ship Canal | 2004 | Large EF Boat | 24 | Fair |
| 52 | Wentworth Avenue | Little Calumet River | 2003 | BP | 24 | Fair |
| 54 | Joe Orr Road | Thorn Creek | 2003 | BP | 32 | Fair |
| 97 | 170 th Street | Thorn Creek | 2003 | Small EF Boat | 24 | Fair |
| 57 | Ashland Avenue | Little Calumet River | 2003 | Small EF Boat | 18 | Poor |

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Waterway | Year | Sample Gear | IBI [*] Score | IBI [*] Category |
|-------------|--------------------------|----------------------|------|---------------|------------------------|---------------------------|
| 49 | Ewing Avenue | Calumet River | 2003 | Large EF Boat | 34 | Fair |
| 50 | Burnham Avenue | Wolf Lake Outlet | 2003 | BP | 32 | Fair |
| | Burnham Avenue | Wolf Lake Outlet | 2003 | Seine | 28 | Fair |
| 55 | 130 th Street | Calumet River | 2001 | Large EF Boat | 32 | Fair |
| | 130 th Street | Calumet River | 2002 | Large EF Boat | 34 | Fair |
| | 130 th Street | Calumet River | 2003 | Large EF Boat | 30 | Fair |
| | 130 th Street | Calumet River | 2004 | Large EF Boat | 36 | Fair |
| 86 | Burnham Avenue | Grand Calumet River | 2003 | BP | NA | NA |
| 56 | Indiana Avenue | Little Calumet River | 2003 | Large EF Boat | 34 | Fair |
| 76 | Halsted Street | Little Calumet River | 2001 | Large EF Boat | 34 | Fair |
| | Halsted Street | Little Calumet River | 2002 | Large EF Boat | 34 | Fair |
| | Halsted Street | Little Calumet River | 2003 | Large EF Boat | 36 | Fair |
| | Halsted Street | Little Calumet River | 2004 | Large EF Boat | 36 | Fair |
| 58 | Ashland Avenue | Calumet-Sag Channel | 2003 | Large EF Boat | 22 | Fair |
| 59 | Cicero Avenue | Calumet-Sag Channel | 2001 | Large EF Boat | 28 | Fair |
| | Cicero Avenue | Calumet-Sag Channel | 2002 | Large EF Boat | 28 | Fair |
| | Cicero Avenue | Calumet-Sag Channel | 2003 | Large EF Boat | 24 | Fair |
| | Cicero Avenue | Calumet-Sag Channel | 2004 | Large EF Boat | 28 | Fair |
| 43 | Route 83 | Calumet-Sag Channel | 2003 | Large EF Boat | 22 | Fair |
| 12 | Salt Creek | Buffalo Creek | 2004 | BP | 22 | Fair |
| | Salt Creek | Buffalo Creek | 2004 | Seine | 28 | Fair |
| 13 | Lake-Cook Road | Des Plaines River | 2001 | BP | 28 | Fair |
| | Lake-Cook Road | Des Plaines River | 2001 | Seine | 32 | Fair |
| | Lake-Cook Road | Des Plaines River | 2002 | BP | 24 | Fair |
| | Lake-Cook Road | Des Plaines River | 2002 | Seine | 34 | Fair |
| | Lake-Cook Road | Des Plaines River | 2003 | BP | 32 | Fair |
| | Lake-Cook Road | Des Plaines River | 2003 | Seine | 32 | Fair |

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Waterway | Year | Sample Gear | IBI ⁺ Score | IBI ⁺ Category |
|-------------|------------------------|-------------------|------|---------------|------------------------|---------------------------|
| 13 | Lake-Cook Road | Des Plaines River | 2004 | BP | 30 | Fair |
| | Lake-Cook Road | Des Plaines River | 2004 | Seine | 32 | Fair |
| 17 | Oakton Street | Des Plaines River | 2004 | Small EF Boat | 36 | Fair |
| 77 | Elmhurst Road | Higgins Creek | 2004 | BP/Seine | NA | NA |
| 78 | Wille Road | Higgins Creek | 2001 | BP | 28 | Fair |
| | Wille Road | Higgins Creek | 2001 | Seine | 30 | Fair |
| | Wille Road | Higgins Creek | 2002 | BP | 36 | Fair |
| | Wille Road | Higgins Creek | 2003 | BP | 30 | Fair |
| | Wille Road | Higgins Creek | 2004 | BP | 26 | Fair |
| 19 | Belmont Avenue | Des Plaines River | 2004 | Small EF Boat | 30 | Fair |
| 20 | Roosevelt Road | Des Plaines River | 2004 | Small EF Boat | 20 | Poor |
| 79 | Higgins Road | Salt Creek | 2004 | Small EF Boat | 36 | Fair |
| 80 | Arlington Heights Road | Salt Creek | 2004 | BP | 26 | Fair |
| 18 | Devon Avenue | Salt Creek | 2001 | BP | 26 | Fair |
| | Devon Avenue | Salt Creek | 2001 | Seine | 32 | Fair |
| | Devon Avenue | Salt Creek | 2002 | BP | 34 | Fair |
| | Devon Avenue | Salt Creek | 2002 | Seine | 30 | Fair |
| | Devon Avenue | Salt Creek | 2003 | BP | 22 | Fair |
| | Devon Avenue | Salt Creek | 2003 | Seine | 32 | Fair |
| | Devon Avenue | Salt Creek | 2004 | BP | 24 | Fair |
| 24 | Wolf Road | Salt Creek | 2004 | BP | 20 | Poor |
| | Wolf Road | Salt Creek | 2004 | Seine | 32 | Fair |
| 109 | Brookfield Avenue | Salt Creek | 2004 | BP | 32 | Fair |
| | Brookfield Avenue | Salt Creek | 2004 | Seine | 32 | Fair |
| 22 | Ogden Avenue | Des Plaines River | 2001 | BP | 32 | Fair |
| | Ogden Avenue | Des Plaines River | 2001 | Seine | 32 | Fair |
| | Ogden Avenue | Des Plaines River | 2002 | BP | 26 | Fair |

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY CALCULATED FOR THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Waterway | Year | Sample Gear | IBI [*] Score | IBI [*] Category |
|-------------|------------------------|--------------------------|------|---------------|------------------------|---------------------------|
| 22 | Ogden Avenue | Des Plaines River | 2003 | BP | 26 | Fair |
| | Ogden Avenue | Des Plaines River | 2004 | BP | 28 | Fair |
| 23 | Willow Springs Road | Des Plaines River | 2004 | Small EF Boat | 32 | Fair |
| 29 | Stephen Street | Des Plaines River | 2004 | BP | 28 | Fair |
| 91 | Material Services Road | Des Plaines River | 2001 | BP | 26 | Fair |
| | Material Services Road | Des Plaines River | 2001 | Seine | 24 | Fair |
| | Material Services Road | Des Plaines River | 2002 | BP | 26 | Fair |
| | Material Services Road | Des Plaines River | 2002 | Seine | 28 | Fair |
| | Material Services Road | Des Plaines River | 2003 | BP | 26 | Fair |
| | Material Services Road | Des Plaines River | 2003 | Seine | 28 | Fair |
| | Material Services Road | Des Plaines River | 2004 | BP | 24 | Fair |
| | Material Services Road | Des Plaines River | 2004 | Seine | 24 | Fair |
| 110 | Springinsguth Road | West Branch DuPage River | 2004 | BP | 28 | Fair |
| 89 | Walnut Lane | West Branch DuPage River | 2004 | BP | 22 | Fair |
| 64 | Lake Street | West Branch DuPage River | 2001 | BP | 30 | Fair |
| | Lake Street | West Branch DuPage River | 2001 | Seine | 40 | Fair |
| | Lake Street | West Branch DuPage River | 2002 | BP | 22 | Fair |
| | Lake Street | West Branch DuPage River | 2002 | Seine | 35 | Fair |
| | Lake Street | West Branch DuPage River | 2003 | BP | 28 | Fair |
| | Lake Street | West Branch DuPage River | 2003 | Seine | 34 | Fair |
| | Lake Street | West Branch DuPage River | 2004 | BP | 24 | Fair |
| | Lake Street | West Branch DuPage River | 2004 | Seine | 34 | Fair |
| 90 | Route 19 | Poplar Creek | 2004 | BP | 32 | Fair |
| | Route 19 | Poplar Creek | 2004 | Seine | 32 | Fair |

*IBI=Index of Biotic Integrity.

Calumet River System. Carp and gizzard shad were also among the most abundant species collected from the Calumet River System (deep draft and wadeable). All but one collection from this system, which was considered poor, yielded a fair IBI rating.

Des Plaines River System. Various sunfish were abundant in the Des Plaines River System, including, green sunfish, bluegill, orangespotted sunfish, and pumpkinseed sunfish. Blunt-nose minnows and spotfin shiners were also prevalent in this system. IBI scores were generally associated with fair ratings, with the exception of two stations.

Benthic Invertebrates

A list of benthic invertebrate taxa collected by the two sampling methods between 2001–2004 can be found in [Table 9](#). Research and Development Department reports regarding benthic invertebrate sampling during these years have been published separately and posted on the District Website at www.mwr.org under the “Biological Reports” heading. (R&D Report No. 04-4, “A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2001 and 2002,” and Report No. 07-47, “A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2003 and 2004”). The complete benthic invertebrate data set from 2001–2004 including number of organisms from each species collected in petite ponar samplers, as well as Hester Dendy artificial plate samplers, is available in spreadsheet form on the District Website at the following address: http://www.mwr.org/dc.dst.il.us/RD/IEPA_Reports/Waterways/Biological%20Data/Benthic%20Invertebrate%20Data%20Chicago%20Area%20Waterways%202001-2004.xls .

North Branch Chicago River System. There was considerable variability among benthic communities analyzed in the waterways within this system. Oligochaeta was the dominant taxon collected from the North Shore Channel and the deep draft portion of the North Branch Chicago River. In general, benthic communities appeared less stressed in the shallow portion of the North Branch Chicago River than in the deep draft. Benthic invertebrate assemblages in the upstream portions of the West Fork North Branch Chicago River, Skokie River, and North Branch Chicago River were more balanced and included higher species and EPT richness than downstream stations. With a few exceptions, head capsule deformities were rarely observed in the samples from this system. Approximately 13 percent of midge specimens collected and examined from Grand Avenue in the North Branch Chicago River during 2002 exhibited head capsule deformities, but 2003 and 2004 samples from this station yielded only one specimen with a similar deformity. A small number (1-2 percent) of midges collected by Hester Dendy samplers from both stations in the Skokie River during 2001 also exhibited head capsule deformities.

South Branch Chicago River System. Tolerant taxa, primarily Oligochaeta, comprised a majority of the benthic invertebrate samples from most of the stations in this system. The benthic communities ranged from moderately stressed in the South Branch Chicago River and Lockport in the CSSC, to highly stressed in the rest of the CSSC and Bubbly Creek. There were occurrences of head capsule deformities at multiple stations throughout this system, but they

TABLE 9: LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN
HESTER DENDY AND PONAR SAMPLES FROM THE CHICAGO AREA
WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Taxa | Taxa (Continued) |
|-------------------------------------|---------------------------------|
| COELENTERATA (Hydroids) | CRUSTACEA (Continued) |
| Hydra | Decapoda (Crayfish) |
| NEMATODA | <i>Cambarus bartonii</i> |
| PLATYHELMINTHES (Flat worms) | <i>Orconectes</i> |
| Turbellaria | <i>Orconectes immunis</i> |
| ENTOPROCTA (Moss Animalcules) | <i>Orconectes virilis</i> |
| <i>Urnatella gracilis</i> | ARACHNOIDEA |
| ECTOPROCTA (Bryozoans) | Hydracarina (Water Mites) |
| Plumatella | INSECTA |
| ANNELLIDA | Ephemeroptera (Mayflies) |
| Oligochaeta (Aquatic Worms) | Isonychia |
| Hirudinea (Leeches) | <i>Baetis</i> ¹ |
| Glossiphoniidae ¹ | <i>Baetis flavistriga</i> |
| Helobdella ¹ | <i>Baetis intercalaris</i> |
| <i>Helobdella papillata</i> | <i>Callibaetis</i> |
| <i>Helobdella stagnalis</i> | <i>Pseudocloeon ephippiatum</i> |
| <i>Helobdella triserialis</i> | Heptageniidae ¹ |
| Placobdella | Heptagenia |
| <i>Placobdella pediculata</i> | Leucrocua |
| <i>Erpobdella punctata punctata</i> | Stenacron |
| <i>Mooreobdella bucera</i> | Stenonema |
| <i>Mooreobdella microstoma</i> | <i>Stenonema exiguum</i> |
| CRUSTACEA | <i>Stenonema integrum</i> |
| Ostracoda (Seed Shrimp) | <i>Stenonema terminatum</i> |
| Isopoda (Sow Bugs) | Tricorythodes |
| Caecidotea | Caenis |
| Amphipoda (Side Swimmers) | <i>Anthopotamus myops</i> grp. |
| <i>Crangonyx</i> | <i>Hexagenia</i> |
| <i>Gammarus</i> ¹ | <i>Hexagenia bilineata</i> |
| <i>Gammarus fasciatus</i> | <i>Hexagenia limbata</i> |
| <i>Hyalella azteca</i> | Plecoptera |
| | <i>Perlesta</i> |

TABLE 9 (Continued): LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN
HESTER DENDY AND PONAR SAMPLES FROM THE CHICAGO AREA
WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Taxa (Continued) | Taxa (Continued) |
|---------------------------------------|------------------------------------|
| INSECTA (Continued) | INSECTA (Continued) |
| Odonata (Damselflies and Dragonflies) | Coleoptera (Beetles) |
| <i>Calopteryx</i> | <i>Macronychus glabratus</i> |
| <i>Coenagrionidae</i> | <i>Stenelmis</i> ¹ |
| <i>Argia</i> | <i>Stenelmis crenata</i> grp. |
| <i>Enallagma</i> | <i>Peltodytes</i> |
| <i>Lestes</i> | <i>Paracymus</i> |
| Libellulidae | <i>Tropisternus</i> |
| <i>Somatochlora</i> | <i>Berosus</i> |
| <i>Stylurus</i> | <i>Ectopria</i> |
| Hemiptera (True Bugs) | Diptera (True Flies) |
| <i>Trepobates</i> | <i>Chaoborus</i> |
| Corixidae | Ceratopogonidae |
| <i>Palmarcorixa</i> | <i>Atrichopogon</i> |
| Megaloptera (Dobson flies) | <i>Bezzia</i> |
| <i>Corydalus cornutus</i> | <i>Ceratopogon</i> |
| <i>Sialis</i> | <i>Culicoides</i> |
| Trichoptera (Caddisflies) | <i>Serromyia</i> |
| <i>Cyrnellus fraternus</i> | Culicidae |
| Hydropsychidae ¹ | <i>Hemerodromia</i> |
| <i>Ceratopsyche morosa</i> | <i>Rhamphomyia</i> |
| <i>Cheumatopsyche</i> | <i>Pericoma</i> |
| <i>Hydropsyche</i> | Simuliidae |
| <i>Hydropsyche betteni</i> | <i>Simulium</i> |
| <i>Hydropsych bidens</i> | Tipulidae |
| <i>Hydropsyche orris</i> | <i>Tipula</i> |
| <i>Hydropsyche simulans</i> | Chironomidae (Midges) ¹ |
| <i>Potamyia flava</i> | <i>Ablabesmyia</i> |
| <i>Hydroptila</i> | <i>Ablabesmyia mallochi</i> |
| <i>Ocecetis</i> | <i>Clinotanypus</i> |
| Lepidoptera (Aquatic Moths) | <i>Coelotanypus</i> |
| <i>Petrophila</i> | <i>Natarsia</i> sp. A |
| Coleoptera (Beetles) | <i>Nilotanypus fimbriatus</i> |
| <i>Agabus</i> | <i>Procladius (Holotanypus)</i> |
| <i>Copelatus</i> | <i>Tanypus</i> |
| <i>Laccophilus maculosus</i> | <i>Psectrotanypus dyari</i> |
| <i>Ancyronyx variegata</i> | <i>Thienemannimyia</i> grp. |
| <i>Dubiraphia</i> | |

TABLE 9 (Continued): LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN
 HESTER DENDY AND PONAR SAMPLES FROM THE CHICAGO AREA
 WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Taxa (Continued) | Taxa (Continued) |
|---|---|
| INSECTA (Continued) | INSECTA (Continued) |
| Diptera (True Flies) | Diptera (True Flies) |
| <i>Corynoneura</i> | <i>Parachironomus</i> |
| <i>Corynoneura lobata</i> | <i>Paracladopelma</i> |
| <i>Cricotopus</i> | <i>Paratendipes</i> |
| <i>Cricotopus bicinctus</i> grp. | <i>Phaenopsectra</i> |
| <i>Cricotopus sylvestris</i> grp. | <i>Phaenopsectra punctipes</i> |
| <i>Cricotopus tremulus</i> grp. | <i>Polypedilum fallax</i> grp. |
| <i>Cricotopus trifascia</i> grp. | <i>Polypedilum flavum</i> |
| <i>Cricotopus/Orthocladius</i> | <i>Polypedilum illinoense</i> |
| <i>Euryhopsis</i> | <i>Polypedilum scalanum</i> grp. |
| <i>Heterotrissocladius</i> | <i>Pseudochironomus</i> |
| <i>Nanocladius</i> ¹ | <i>Saetheria</i> |
| <i>Nanocladius crassicornus/rectinervis</i> | <i>Stenochironomus</i> |
| <i>Nanocladius distinctus</i> | <i>Stictochironomus</i> |
| <i>Orthocladius</i> | <i>Tribelos fusciorne</i> |
| <i>Parakiefferiella</i> | <i>Xenochironomus xenolabis</i> |
| <i>Rheocricotopus robacki</i> | <i>Cladotanytarus</i> ¹ |
| <i>Thienemanniella n. sp. 3</i> | <i>Cladotanytarsus mangus</i> grp. |
| <i>Thienemanniella similis</i> | <i>Cladotanytarsus vanderwulpi</i> grp. |
| <i>Thienemanniella xena</i> | <i>Paratanytarsus</i> |
| <i>Tvetenia discoloripes</i> grp. | <i>Rheotanytarsus</i> |
| Chironomini | <i>Tanytarsus</i> |
| <i>Chironomus</i> | <i>Tanytarsus glabrescens</i> grp. |
| <i>Cladopelma</i> | <i>Tanytarsus guerlus</i> grp. |
| <i>Cryptochironomus</i> | GASTROPODA (Snails) |
| <i>Cryptotendipes</i> | <i>Amnicola</i> |
| <i>Cryptotendipes sp. 15</i> | <i>Campeloma decisum</i> |
| <i>Dicrotendipes</i> ¹ | <i>Ferrissia</i> |
| <i>Dicrotendipes fumidus</i> | <i>Physa</i> |
| <i>Dicrotendipes neomodestus</i> | <i>Gyraulus</i> |
| <i>Dicrotendipes simpsoni</i> | <i>Helisoma</i> |
| <i>Endochironomus nigricans</i> | <i>Menetus dilatatus</i> |
| <i>Glyptotendipes</i> | <i>Planorbella</i> |
| <i>Harnishia</i> | <i>Pleurocera</i> |
| <i>Microchironomus</i> | <i>Valvata</i> |
| <i>Micropsectra</i> | <i>Viviparus</i> |
| <i>Microtendipes</i> | |

TABLE 9 (Continued): LIST OF BENTHIC INVERTEBRATE TAXA COLLECTED IN
 HESTER DENDY AND PONAR SAMPLES FROM THE CHICAGO AREA
 WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Taxa (Continued) | Taxa (Continued) |
|---|---|
| PELECYPODA (Mussels and Clams) ¹ | PELECYPODA (Mussels and Clams) ¹ |
| <i>Corbicula fluminea</i> | <i>Pisidium compressum</i> |
| <i>Dreissena polymorpha</i> | <i>Pisidium nitidum</i> |
| Sphaeriidae ¹ | <i>Sphaerium</i> |
| <i>Musculium</i> | <i>Sphaerium simile</i> |
| <i>Musculium transversum</i> | <i>Lasmigona complanata</i> |
| <i>Pisidium</i> | |

¹Not counted as a discreet taxon.

generally constituted a low percentage of the overall number of organisms. However, five percent of midges collected from Loomis Street on the South Branch Chicago River in 2002 exhibited deformities.

Calumet River System. The benthic samples from the Calumet River System largely consisted of tolerant taxa, indicating communities were moderately to highly stressed. EPT taxa richness was low throughout, especially in the Grand Calumet River, Calumet-Sag Channel, and the Calumet River. Head capsule deformities were observed at a rate generally less than two percent, except for at Cicero Avenue on the Calumet-Sag Channel, where approximately ten percent of midge specimen collected exhibited head capsule deformities during 2003.

Des Plaines River System. The Des Plaines River System had relatively high total benthic invertebrate and EPT richness compared to other watersheds. However, there was substantial variability between and within some of the waterways in this system. Benthic communities at sampling stations within the Des Plaines River System ranged from slightly to highly stressed, but head capsule deformities were rare. The Des Plaines River had the highest total richness value in this system overall, although total taxa and EPT richness indicated a decreasing downstream trend in benthic community quality. Based on taxa and EPT richness, Salt Creek stations ranged from slightly to moderately stressed, but no downstream trend was identified.

Sediment Chemistry

Sediment quality can considerably impact overlying water quality, benthic community structure, food chain dynamics, and other elements of freshwater ecosystems. Since sediment acts as a reservoir for persistent or bioaccumulative contaminants, sediment data reflects a long-term record of quality.

The concentrations of the eight general chemistry constituents measured in sediment at each of the 40 sampled stations are presented in [Table 10](#). The 11 measured trace metal concentrations for these stations can be found in [Table 11](#). [Table 12](#) contains the AVS, SEM, TOC, and particle size data for the 40 sampling stations. There were 111 total organic priority pollutants analyzed for each sample collected (listed in [Table 3](#)). Thirty-four out of the 111 priority pollutants were detected at least once in the samples, and 65 out of the 73 samples analyzed detected at least one of these organic priority pollutants. [Tables 13–23](#) presents the concentrations of organic priority pollutants detected at each of the sampling stations.

Sediment Toxicity

The results from the *Chironomus tentans* ten-day toxicity tests for each sediment sample collected are presented in [Table 24](#). A significant difference in *Chironomus* survival from the control indicates that the sediment is an unsuitable habitat for *Chironomus* survival. Significant differences in *Chironomus* dried weight and/or *Chironomus* ash-free dried weight compared to

TABLE 10: CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | Constituents (Expressed on a dry weight basis) | | | | | | | |
|-------------|-----------------------|--------------------|-----------------------------|------|--|---------|----------------------------|--|-------------|------------|-----------------|-------------|
| | | | | | TS (%) | TVS (%) | NH ₃ -N (mg/kg) | NO ₂ +NO ₃ (mg/kg) | TKN (mg/kg) | TP (mg/kg) | Phenols (mg/kg) | TCN (mg/kg) |
| 74 | Lake Shore Dr. | C | Chicago River | 2002 | 34.5 | 14 | 38 | <0.02 | 3,901 | 2,750 | 0.016 | 1.690 |
| | Lake Shore Dr. | S | Chicago River | 2002 | 50.2 | 15 | 8 | <0.02 | 2,279 | 1,370 | 0.008 | 0.532 |
| 100 | Wells St. | C | Chicago River | 2002 | 42.6 | 9 | 47 | <0.02 | 3,282 | 2,106 | 0.011 | 0.695 |
| | Wells St. | S | Chicago River | 2002 | 39.2 | 10 | 76 | <0.02 | 3,714 | 2,274 | 0.012 | 1.678 |
| 39 | Madison St. | C | S Branch Chicago River | 2002 | 34.0 | 14 | 35 | <0.02 | 3,231 | 3,451 | 0.029 | 1.658 |
| 108 | Loomis St. | C | S Branch Chicago River | 2002 | 56.6 | 11 | 6 | <0.02 | 1,317 | 1,383 | 0.012 | 2.988 |
| | Loomis St. | S | S Branch Chicago River | 2002 | 55.1 | 9 | 8 | <0.02 | 847 | 938 | 0.006 | 0.481 |
| 99 | Archer Ave. | C | S Fork S Branch Chgo. River | 2002 | 35.3 | 18 | 228 | ND | 4,790 | 2,636 | 0.033 | 2.704 |
| | Archer Ave. | S | S Fork S Branch Chgo. River | 2002 | 38.0 | 15 | 353 | ND | 4,151 | 2,415 | 0.022 | 1.616 |
| 40 | Damen Ave. | C | CSSC ² | 2002 | 41.1 | 15 | 96 | ND | 3,165 | 4,100 | 0.022 | 2.614 |
| | Damen Ave. | S | CSSC ² | 2002 | 40.6 | 15 | 95 | ND | 3,797 | 4,234 | 0.020 | 3.397 |
| 75 | Cicero Ave. | C | CSSC ² | 2002 | 54.4 | 14 | 13 | ND | 2,109 | 2,595 | 0.013 | 3.337 |
| | Cicero Ave. | S | CSSC ² | 2002 | 78.4 | 7 | 39 | ND | 590 | 505 | 0.007 | 0.191 |
| 41 | Harlem Ave. | C | CSSC ² | 2002 | 69.5 | 6 | 15 | ND | 638 | 675 | 0.007 | 0.906 |
| | Harlem Ave. | S | CSSC ² | 2002 | 75.8 | 4 | 6 | ND | 629 | 687 | 0.004 | 0.492 |
| 92 | Lockport Powerhouse | C | CSSC ² | 2002 | 53.9 | 10 | 4 | 0.39 | 2,421 | ND | 0.007 | 4.198 |
| | Lockport Powerhouse | S | CSSC ² | 2002 | 68.0 | 7 | 2 | 0.25 | 839 | 1,318 | 0.005 | 0.848 |
| 52 | Wentworth Ave. | S | Little Calumet River | 2003 | 45.6 | 10 | 99 | 0.88 | 3,429 | 1,920 | 1.170 | 0.272 |
| 54 | Joe Orr Rd. | C | Thorn Creek | 2003 | 88.4 | ND | 4 | 4.90 | 100 | 118 | 0.018 | 0.020 |
| | Joe Orr Rd. | S | Thorn Creek | 2003 | 76.3 | ND | 6 | 3.43 | 150 | 115 | 0.033 | 0.043 |
| 97 | 170 th St. | C | Thorn Creek | 2003 | 67.7 | 5 | 5 | 0.82 | 611 | 1,344 | 0.080 | 0.047 |
| | 170 th St. | S | Thorn Creek | 2003 | 47.7 | 8 | 13 | 0.89 | 1,857 | 1,401 | 0.130 | 0.193 |
| 57 | Ashland Ave. | S | Little Calumet River | 2003 | 27.5 | ND | 36 | 2.28 | 1,948 | 1,845 | 0.316 | 0.178 |
| 49 | Ewing Ave. | S | Calumet River | 2003 | 62.3 | 5 | 25 | 1.24 | 971 | 387 | 0.586 | 0.156 |
| 50 | Burnham Ave. | C | Wolf Lake | 2003 | 36.2 | 8 | 7 | 0.64 | 492 | 91 | 0.116 | 0.149 |
| | Burnham Ave. | S | Wolf Lake | 2003 | 67.5 | 3 | 13 | 1.28 | 1,411 | 121 | 0.033 | 0.068 |

TABLE 10 (Continued): CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | Constituents (Expressed on a dry weight basis) | | | | | | | |
|-------------|-----------------------|--------------------|----------------------|------|--|---------|----------------------------|--|-------------|------------|-----------------|-------------|
| | | | | | TS (%) | TVS (%) | NH ₃ -N (mg/kg) | NO ₂ +NO ₃ (mg/kg) | TKN (mg/kg) | TP (mg/kg) | Phenols (mg/kg) | TCN (mg/kg) |
| 55 | 130 th St. | C | Calumet River | 2003 | 45.7 | ND | 27 | 1.52 | 1,472 | 617 | 0.593 | 0.123 |
| | 130 th St. | S | Calumet River | 2003 | 65.2 | ND | 14 | 1.79 | 410 | 214 | 0.072 | 0.031 |
| 86 | Burnham Ave. | C | Grand Calumet River | 2003 | 49.6 | 10 | 142 | 8.48 | 3,507 | 3,855 | 1.911 | 0.256 |
| | Burnham Ave. | S | Grand Calumet River | 2003 | 21.9 | 24 | 84 | 4.49 | 8,494 | 5,923 | 3.342 | 0.412 |
| 56 | Indiana Ave. | C | Little Calumet River | 2003 | 44.3 | 8 | 64 | 1.15 | 2,070 | 1,796 | 0.458 | 0.120 |
| | Indiana Ave. | S | Little Calumet River | 2003 | 61.7 | 4 | 12 | 1.41 | 619 | 824 | 0.424 | 0.089 |
| 76 | Halsted St. | C | Little Calumet River | 2003 | 68.6 | 19 | 40 | 1.64 | 1,664 | 1,173 | 0.325 | 0.124 |
| | Halsted St. | S | Little Calumet River | 2003 | 78.5 | 3 | 6 | 1.28 | 250 | 561 | 0.414 | 0.043 |
| 58 | Ashland Ave. | C | Calumet-Sag Channel | 2003 | 40.7 | 10 | 210 | 1.57 | 3,476 | 3,056 | 3.331 | 0.317 |
| | Ashland Ave. | S | Calumet-Sag Channel | 2003 | 56.2 | 5 | 59 | 1.94 | 1,694 | 1,761 | 2.852 | 0.226 |
| 59 | Cicero Ave. | C | Calumet-Sag Channel | 2003 | 48.9 | 15 | 57 | 1.31 | 2,371 | 3,760 | 1.627 | 0.198 |
| | Cicero Ave. | S | Calumet-Sag Channel | 2003 | 57.5 | 7 | 30 | 0.89 | 1,599 | 5,393 | 2.168 | 0.282 |
| 43 | Route 83 | C | Calumet-Sag Channel | 2003 | 40.9 | 9 | 175 | 0.88 | 3,034 | 7,471 | 2.059 | 0.232 |
| | Route 83 | S | Calumet-Sag Channel | 2003 | 49.9 | 8 | 65 | 1.04 | 2,473 | 4,706 | 3.136 | 0.122 |
| 12 | Lake Cook Rd. | C | Buffalo Creek | 2004 | 73.9 | 3 | 21 | 2.58 | 177 | 166 | 0.046 | 0.057 |
| | Lake Cook Rd. | S | Buffalo Creek | 2004 | 74.5 | 3 | 55 | 4.54 | 548 | 234 | 0.148 | 0.066 |
| 13 | Lake Cook Rd. | C | Des Plaines River | 2004 | 78.7 | 1 | 23 | 2.32 | 133 | 191 | 0.093 | 0.008 |
| | Lake Cook Rd. | S | Des Plaines River | 2004 | 33.6 | 15 | 111 | 6.31 | 3,882 | 1,512 | 0.262 | 0.384 |
| 17 | Oakton St. | C | Des Plaines River | 2004 | 77.5 | 2 | 25 | 3.20 | 272 | 383 | 0.071 | 0.015 |
| | Oakton St. | S | Des Plaines River | 2004 | 62.6 | 5 | 54 | 4.04 | 1,174 | 945 | 0.114 | 0.114 |
| 77 | Elmhurst Rd. | C | Higgins Creek | 2004 | 70.5 | 4 | 52 | 8.38 | 1,189 | 385 | 0.074 | 0.109 |
| | Elmhurst Rd. | S | Higgins Creek | 2004 | 56.5 | 6 | 41 | 2.95 | 1,611 | 391 | 0.083 | 0.133 |
| 19 | Belmont Ave. | C | Des Plaines River | 2004 | 69.8 | 4 | 16 | 3.65 | 496 | 316 | 0.153 | 0.057 |
| | Belmont Ave. | S | Des Plaines River | 2004 | 40.0 | 10 | 131 | 6.23 | 3,840 | 1,319 | 0.317 | 0.482 |
| 20 | Roosevelt Rd. | C | Des Plaines River | 2004 | 58.0 | 13 | 16 | 2.59 | 1,133 | 551 | 0.198 | 0.059 |
| | Roosevelt Rd. | S | Des Plaines River | 2004 | 45.2 | 13 | 118 | 7.71 | 3,151 | 1,698 | 0.148 | 0.363 |

TABLE 10 (Continued): CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2001 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | Constituents (Expressed on a dry weight basis) | | | | | | | |
|-------------|--------------------|--------------------|-----------------------|------|--|---------|----------------------------|--|-------------|------------|-----------------|-------------|
| | | | | | TS (%) | TVS (%) | NH ₃ -N (mg/kg) | NO ₂ +NO ₃ (mg/kg) | TKN (mg/kg) | TP (mg/kg) | Phenols (mg/kg) | TCN (mg/kg) |
| 79 | Higgins Rd. | C | Salt Creek | 2004 | 37.7 | 9 | 77 | 0.83 | 3,274 | 841 | 0.159 | 0.324 |
| 80 | Arlington Hts. Rd. | C | Salt Creek | 2004 | 81.3 | 3 | 19 | 4.18 | 427 | 126 | 0.060 | 0.028 |
| | Arlington Hts. Rd. | S | Salt Creek | 2004 | 84.4 | 2 | 7 | 3.41 | 189 | 161 | 0.071 | 0.019 |
| 18 | Devon Ave. | C | Salt Creek | 2004 | 69.9 | 2 | 19 | 5.19 | 571 | 516 | 0.074 | 0.056 |
| | Devon Ave. | S | Salt Creek | 2004 | 73.2 | ND | 14 | 4.13 | 481 | 468 | 0.085 | 0.049 |
| 24 | Wolf Rd. | S | Salt Creek | 2004 | 44.3 | 8 | 45 | 5.13 | 2,641 | 2,114 | 0.142 | 0.275 |
| 109 | Brookfield Ave. | C | Salt Creek | 2004 | 71.3 | 2 | 3 | 2.50 | 371 | 410 | 0.000 | 0.079 |
| | Brookfield Ave. | S | Salt Creek | 2004 | 63.5 | 6 | 110 | 0.49 | 2,253 | 992 | 0.129 | 0.441 |
| 22 | Ogden Ave. | C | Des Plaines River | 2004 | 88.2 | 3 | 3 | 2.47 | 197 | 241 | 0.135 | 0.036 |
| | Ogden Ave. | S | Des Plaines River | 2004 | 33.6 | 19 | 134 | 9.45 | 4,819 | 2,878 | 0.128 | 0.602 |
| 23 | Willow Springs Rd. | C | Des Plaines River | 2004 | 42.8 | 12 | 104 | 10.10 | 1,946 | 1,946 | 0.124 | 0.367 |
| | Willow Springs Rd. | S | Des Plaines River | 2004 | 41.1 | 14 | 174 | 9.91 | 2,632 | 2,993 | 0.109 | 0.316 |
| 29 | Stephen St. | C | Des Plaines River | 2004 | 82.2 | 14 | 6 | 1.71 | 526 | 737 | 0.123 | <0.003 |
| | Stephen St. | S | Des Plaines River | 2004 | 32.4 | 18 | 174 | 10.40 | 4,314 | 2,996 | 0.377 | 0.160 |
| 110 | Springinsguth Rd. | C | W Branch DuPage River | 2004 | 71.0 | 4 | 23 | 1.33 | 764 | 162 | 0.100 | 0.082 |
| | Springinsguth Rd. | S | W Branch DuPage River | 2004 | 76.6 | 3 | 19 | 1.00 | 613 | 169 | 0.076 | 0.050 |
| 89 | Walnut Lane. | C | W Branch DuPage River | 2004 | 82.5 | 2 | 8 | 5.10 | 280 | 201 | 0.103 | 0.050 |
| | Walnut Lane | S | W Branch DuPage River | 2004 | 74.6 | 2 | 17 | 2.06 | 530 | 236 | 0.142 | 0.042 |
| 64 | Lake St. | C | W Branch DuPage River | 2004 | 81.8 | 2 | 18 | 0.82 | 376 | 405 | 0.062 | 0.016 |
| | Lake St. | S | W Branch DuPage River | 2004 | 68.4 | 3 | 37 | 2.14 | 908 | 609 | 0.094 | 0.039 |
| 90 | Route 19 | S | Poplar Creek | 2004 | 73.0 | 3 | 30 | 1.21 | 669 | 406 | 0.144 | <0.003 |

¹C=Center, S=Side.

²Chicago Sanitary and Ship Canal.

ND=No data.

TABLE 11: TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM
BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | (mg/kg dry weight) | | | | | | | | | | | |
|-------------|-----------------------|--------------------|-----------------------------|------|--------------------|------|-----|-----|--------|-----|-----|--------|----|------|-----|--|
| | | | | | As | Cd | Cr | Cu | Fe | Pb | Mn | Hg | Ni | Ag | Zn | |
| 74 | Lake Shore Dr. | C | Chicago River | 2002 | <1 | 8.3 | 105 | 247 | 22,861 | 258 | 377 | 0.5600 | 43 | 4.8 | 701 | |
| | Lake Shore Dr. | S | Chicago River | 2002 | <1 | 2.9 | 61 | 115 | 21,727 | 143 | 374 | 0.6000 | 31 | <0.1 | 345 | |
| 100 | Wells St. | C | Chicago River | 2002 | <1 | 6.5 | 99 | 284 | 33,700 | 996 | 367 | 0.9200 | 38 | 0.6 | 685 | |
| | Wells St. | S | Chicago River | 2002 | <1 | 15.4 | 177 | 233 | 27,800 | 808 | 366 | 0.9800 | 63 | 9.7 | 666 | |
| 39 | Madison St. | C | S Branch Chicago River | 2002 | <1 | 13.7 | 240 | 349 | 29,600 | 619 | 381 | 0.4500 | 99 | 5.8 | 848 | |
| 108 | Loomis St. | C | S Branch Chicago River | 2002 | <1 | 3.6 | 68 | 87 | 17,600 | 226 | 257 | 0.4300 | 34 | 3.9 | 288 | |
| | Loomis St. | S | S Branch Chicago River | 2002 | <1 | 2.5 | 61 | 88 | 20,300 | 344 | 351 | 0.2000 | 35 | <0.1 | 593 | |
| 99 | Archer Ave. | C | S Fork S Branch Chgo. River | 2002 | <1 | 4.1 | 95 | 161 | 17,000 | 419 | 248 | 0.5000 | 50 | 4.0 | 630 | |
| | Archer Ave. | S | S Fork S Branch Chgo. River | 2002 | <1 | 3.6 | 85 | 181 | 19,600 | 354 | 286 | 0.7300 | 40 | 3.3 | 665 | |
| 40 | Damen Ave. | C | CSSC ² | 2002 | <1 | 8.4 | 131 | 250 | 25,100 | 443 | 363 | 0.9900 | 58 | 3.7 | 825 | |
| | Damen Ave. | S | CSSC ² | 2002 | <1 | 10.3 | 157 | 244 | 23,700 | 439 | 346 | 0.6500 | 60 | 4.9 | 810 | |
| 75 | Cicero Ave. | C | CSSC ² | 2002 | <1 | 10.2 | 293 | 399 | 28,648 | 270 | 408 | 0.7500 | 88 | <0.1 | 926 | |
| | Cicero Ave. | S | CSSC ² | 2002 | <1 | 2.2 | 75 | 100 | 49,047 | 123 | 354 | 0.2700 | 55 | <0.1 | 215 | |
| 41 | Harlem Ave. | C | CSSC ² | 2002 | <1 | 5.8 | 92 | 123 | 20,467 | 110 | 261 | 0.3900 | 99 | <0.1 | 440 | |
| | Harlem Ave. | S | CSSC ² | 2002 | <1 | 2.4 | 46 | 54 | 18,314 | 49 | 301 | 0.1400 | 77 | <0.1 | 254 | |
| 92 | Lockport Powerhouse | C | CSSC ² | 2002 | <1 | 11.2 | 146 | 125 | 22,623 | 140 | 392 | 0.5300 | 68 | <0.1 | 615 | |
| | Lockport Powerhouse | S | CSSC ² | 2002 | <1 | 11.1 | 146 | 126 | 22,329 | 139 | 392 | 0.2500 | 68 | <0.1 | 613 | |
| 52 | Wentworth Ave. | S | Little Calumet River | 2003 | <1 | 1.1 | 79 | 58 | 22,165 | 87 | 415 | 0.2770 | 43 | 1.6 | 319 | |
| 54 | Joe Orr Rd. | C | Thorn Creek | 2003 | <1 | 0.2 | 6 | 4 | 8,178 | 14 | 209 | 0.0648 | 5 | <0.3 | 138 | |
| | Joe Orr Rd. | S | Thorn Creek | 2003 | <1 | <0.1 | 5 | 2 | 6,852 | 11 | 123 | 0.1530 | 5 | <0.3 | 313 | |
| 97 | 170 th St. | C | Thorn Creek | 2003 | <1 | 0.5 | 40 | 35 | 14,277 | 71 | 321 | 0.1730 | 22 | 0.6 | 197 | |
| | 170 th St. | S | Thorn Creek | 2003 | <1 | 0.1 | 33 | 27 | 12,335 | 33 | 340 | 0.3080 | 24 | <0.3 | 93 | |
| 57 | Ashland Ave. | S | Little Calumet River | 2003 | <1 | 0.6 | 43 | 35 | 17,100 | 62 | 433 | 0.1060 | 29 | 0.6 | 230 | |
| 49 | Ewing Ave. | S | Calumet River | 2003 | <1 | 0.9 | 36 | 64 | 51,809 | 112 | 894 | 0.0612 | 26 | 0.7 | 296 | |
| 50 | Burnham Ave. | C | Wolf Lake | 2003 | ND | ND | ND | ND | ND | ND | ND | 0.3510 | ND | ND | ND | |
| | Burnham Ave. | S | Wolf Lake | 2003 | <1 | 0.9 | 33 | 26 | 8,616 | 129 | 678 | 0.0833 | 8 | <0.3 | 258 | |

TABLE 11 (Continued): TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM
BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | (mg/kg dry weight) | | | | | | | | | | |
|-------------|-----------------------|--------------------|----------------------|------|--------------------|------|-----|-----|--------|-----|-------|----------|----|------|-------|
| | | | | | As | Cd | Cr | Cu | Fe | Pb | Mn | Hg | Ni | Ag | Zn |
| 55 | 130 th St. | C | Calumet River | 2003 | <1 | 1.5 | 61 | 61 | 32,459 | 137 | 929 | 0.0839 | 37 | 0.5 | 514 |
| | 130 th St. | S | Calumet River | 2003 | <1 | 0.3 | 15 | 12 | 12,246 | 96 | 503 | 0.0668 | 10 | 0.4 | 139 |
| 86 | Burnham Ave. | C | Grand Calumet River | 2003 | <1 | 6.1 | 116 | 224 | 16,395 | 340 | 209 | 1.0910 | 30 | 4.2 | 1,097 |
| | Burnham Ave. | S | Grand Calumet River | 2003 | <1 | 13.4 | 232 | 637 | 35,469 | 669 | 734 | 1.9070 | 49 | 10.0 | 2,427 |
| 56 | Indiana Ave. | C | Little Calumet River | 2003 | <1 | 1.7 | 58 | 96 | 25,922 | 145 | 598 | 0.6520 | 32 | 1.7 | 404 |
| | Indiana Ave. | S | Little Calumet River | 2003 | <1 | 1.5 | 49 | 53 | 34,576 | 346 | 607 | 6.3970 | 26 | 1.0 | 526 |
| 76 | Halsted St. | C | Little Calumet River | 2003 | <1 | 1.4 | 51 | 58 | 36,008 | 163 | 562 | 0.3500 | 38 | 0.8 | 372 |
| | Halsted St. | S | Little Calumet River | 2003 | <1 | 0.5 | 143 | 64 | 35,547 | 120 | 3,167 | 0.1070 | 21 | 0.5 | 265 |
| 58 | Ashland Ave. | C | Calumet-Sag Channel | 2003 | <1 | 1.6 | 49 | 71 | 22,218 | 139 | 495 | 0.2770 | 26 | 1.2 | 465 |
| | Ashland Ave. | S | Calumet-Sag Channel | 2003 | <1 | 2.3 | 61 | 67 | 21,773 | 218 | 398 | 0.4010 | 30 | 1.0 | 456 |
| 59 | Cicero Ave. | C | Calumet-Sag Channel | 2003 | <1 | 2.0 | 54 | 71 | 23,923 | 184 | 474 | 0.2120 | 23 | 1.1 | 628 |
| | Cicero Ave. | S | Calumet-Sag Channel | 2003 | <1 | 4.0 | 76 | 79 | 31,211 | 278 | 529 | 0.3300 | 28 | 1.8 | 1,322 |
| 43 | Route 83 | C | Calumet-Sag Channel | 2003 | <1 | 3.9 | 91 | 81 | 34,216 | 223 | 595 | 0.3160 | 34 | 2.3 | 785 |
| | Route 83 | S | Calumet-Sag Channel | 2003 | <1 | 5.8 | 114 | 84 | 36,406 | 337 | 509 | 0.3490 | 42 | 2.1 | 1,359 |
| 12 | Lake Cook Rd. | C | Buffalo Creek | 2004 | 11 | 0.7 | 46 | 12 | 31,010 | 15 | 5,041 | 0.1028 | 36 | <0.3 | 50 |
| | Lake Cook Rd. | S | Buffalo Creek | 2004 | 6 | 0.3 | 27 | 13 | 16,898 | 14 | 784 | 0.0636 | 18 | <0.3 | 43 |
| 13 | Lake Cook Rd. | C | Des Plaines River | 2004 | <1 | <0.1 | 34 | 3 | 7,382 | 6 | 453 | <0.00002 | 18 | <0.3 | 31 |
| | Lake Cook Rd. | S | Des Plaines River | 2004 | 1 | 0.8 | 44 | 35 | 19,627 | 26 | 625 | 0.0035 | 25 | <0.3 | 163 |
| 17 | Oakton St. | C | Des Plaines River | 2004 | <1 | 0.2 | 32 | 7 | 10,456 | 13 | 438 | <0.00002 | 21 | <0.3 | 50 |
| | Oakton St. | S | Des Plaines River | 2004 | <1 | 0.6 | 27 | 22 | 10,710 | 47 | 325 | 0.1413 | 13 | 1.2 | 94 |
| 77 | Elmhurst Rd. | C | Higgins Creek | 2004 | 6 | 1.0 | 33 | 29 | 21,388 | 62 | 413 | 0.1113 | 28 | 3.5 | 123 |
| | Elmhurst Rd. | S | Higgins Creek | 2004 | 3 | 1.9 | 79 | 45 | 15,897 | 52 | 314 | 0.0839 | 37 | 1.9 | 192 |
| 19 | Belmont Ave. | C | Des Plaines River | 2004 | <1 | 5.9 | 88 | 39 | 12,793 | 48 | 555 | 0.0693 | 48 | <0.3 | 185 |
| | Belmont Ave. | S | Des Plaines River | 2004 | 8 | 1.8 | 54 | 81 | 21,098 | 79 | 520 | 0.1630 | 45 | <0.3 | 285 |
| 20 | Roosevelt Rd. | C | Des Plaines River | 2004 | <1 | 1.2 | 93 | 51 | 19,508 | 92 | 509 | 0.6865 | 46 | 0.7 | 204 |
| | Roosevelt Rd. | S | Des Plaines River | 2004 | 4 | 3.3 | 88 | 115 | 24,957 | 120 | 554 | 0.1920 | 50 | <0.3 | 407 |

TABLE 11 (Continued): TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM
BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | (mg/kg dry weight) | | | | | | | | | | |
|-------------|--------------------|--------------------|-----------------------|------|--------------------|------|----|----|--------|-----|-----|----------|----|------|-------|
| | | | | | As | Cd | Cr | Cu | Fe | Pb | Mn | Hg | Ni | Ag | Zn |
| 79 | Higgins Rd. | C | Salt Creek | 2004 | 6 | 1.2 | 32 | 44 | 22,948 | 41 | 441 | 0.0628 | 29 | <0.3 | 184 |
| 80 | Arlington Hts. Rd. | C | Salt Creek | 2004 | 5 | 0.4 | 18 | 11 | 16,155 | 10 | 264 | 0.0194 | 16 | 3.5 | 44 |
| | Arlington Hts. Rd. | S | Salt Creek | 2004 | 2 | 0.3 | 18 | 11 | 10,548 | 9 | 400 | <0.00002 | 14 | <0.3 | 36 |
| 18 | Devon Ave. | C | Salt Creek | 2004 | 4 | 0.2 | 25 | 11 | 11,787 | 14 | 329 | 0.0556 | 17 | <0.3 | 79 |
| | Devon Ave. | S | Salt Creek | 2004 | 4 | 0.2 | 23 | 13 | 11,819 | 15 | 271 | 0.0891 | 14 | <0.3 | 66 |
| 24 | Wolf Rd. | S | Salt Creek | 2004 | 3 | 1.2 | 34 | 50 | 17,937 | 60 | 422 | 0.1164 | 22 | <0.3 | 180 |
| 109 | Brookfield Ave. | C | Salt Creek | 2004 | 3 | 0.5 | 59 | 17 | 13,821 | 31 | 434 | <0.00002 | 27 | <0.3 | 84 |
| | Brookfield Ave. | S | Salt Creek | 2004 | 5 | 10.7 | 61 | 58 | 23,093 | 99 | 434 | 0.1900 | 48 | <0.3 | 4,573 |
| 22 | Ogden Ave. | C | Des Plaines River | 2004 | <1 | 0.6 | 87 | 17 | 13,986 | 42 | 608 | <0.00002 | 51 | 1.7 | 88 |
| | Ogden Ave. | S | Des Plaines River | 2004 | 2 | 3.4 | 74 | 98 | 22,320 | 117 | 670 | 0.2316 | 31 | <0.3 | 366 |
| 23 | Willow Springs Rd. | C | Des Plaines River | 2004 | 4 | 2.4 | 64 | 71 | 24,564 | 73 | 887 | 0.2294 | 36 | <0.3 | 295 |
| | Willow Springs Rd. | S | Des Plaines River | 2004 | 4 | 2.5 | 71 | 85 | 23,362 | 81 | 704 | 0.3497 | 44 | <0.3 | 333 |
| 29 | Stephen St. | C | Des Plaines River | 2004 | <1 | 0.4 | 13 | 6 | 7,292 | 15 | 333 | 0.0240 | 8 | <0.3 | 50 |
| | Stephen St. | S | Des Plaines River | 2004 | 6 | 2.5 | 59 | 81 | 23,536 | 75 | 704 | 0.2922 | 30 | <0.3 | 333 |
| 110 | Springinsguth Rd. | C | W Branch DuPage River | 2004 | 4 | 0.6 | 28 | 27 | 17,394 | 45 | 229 | 0.0172 | 22 | <0.3 | 133 |
| | Springinsguth Rd. | S | W Branch DuPage River | 2004 | 2 | 0.4 | 23 | 23 | 15,088 | 45 | 246 | <0.00002 | 18 | 4.1 | 103 |
| 89 | Walnut Lane | C | W Branch DuPage River | 2004 | 5 | 0.4 | 21 | 10 | 15,254 | 13 | 422 | <0.00002 | 16 | <0.3 | 56 |
| | Walnut Lane | C | W Branch DuPage River | 2004 | <1 | 0.2 | 14 | 9 | 8,071 | 14 | 228 | <0.00002 | 10 | <0.3 | 46 |
| 64 | Lake St. | C | W Branch DuPage River | 2004 | 4 | 0.4 | 21 | 13 | 14,246 | 14 | 567 | 0.0185 | 15 | <0.3 | 57 |
| | Lake St. | S | W Branch DuPage River | 2004 | 12 | 0.5 | 24 | 16 | 19,665 | 19 | 472 | 0.0727 | 17 | <0.3 | 80 |
| 90 | Route 19 | S | Poplar Creek | 2004 | 2 | 0.2 | 31 | 17 | 17,842 | 13 | 487 | <0.00002 | 24 | <0.3 | 61 |

¹C=Center, S=Side.

²Chicago Sanitary and Ship Canal.

ND=No data.

TABLE 12: ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | AVS ² | SEM ³ | SEM/AVS | TOC ⁴ | Particle Size (Percent) | | | |
|-------------|-----------------------|--------------------|-----------------------------|------|------------------|------------------|---------|------------------|-------------------------|------|------|------|
| | | | | | (μmoles/g) | | | (mg/kg) | Gravel | Sand | Silt | Clay |
| 74 | Lake Shore Drive | C | Chicago River | 2002 | 7.23 | 7.70 | 1.07 | 51,800 | 1.5 | 27.4 | 38.2 | 32.8 |
| | Lake Shore Drive | S | Chicago River | 2002 | BDL | 10.66 | 2.26 | 43,000 | 6.3 | 41.7 | 26.3 | 25.7 |
| 100 | Wells St. | C | Chicago River | 2002 | 16.20 | 13.07 | 0.81 | 46,900 | 8.7 | 38.3 | 30.6 | 22.4 |
| | Wells St. | S | Chicago River | 2002 | 11.80 | 12.02 | 1.02 | 58,900 | 0.0 | 7.4 | 47.8 | 44.9 |
| 39 | Madison St. | C | S Branch Chicago River | 2002 | BDL | 9.45 | 1.40 | 63,000 | 0.9 | 32.1 | 39.0 | 28.0 |
| 108 | Loomis St. | C | S Branch Chicago River | 2002 | 9.84 | 5.35 | 0.54 | 47,200 | 35.8 | 48.5 | 8.3 | 7.4 |
| | Loomis St. | S | S Branch Chicago River | 2002 | 6.51 | 5.84 | 0.90 | 43,400 | 1.8 | 70.4 | 17.9 | 9.9 |
| 99 | Archer Ave. | C | S Fork S Branch Chgo. River | 2002 | 80.50 | 13.57 | 0.17 | 84,200 | 0.2 | 47.9 | 35.6 | 16.3 |
| | Archer Ave. | S | S Fork S Branch Chgo. River | 2002 | 124.00 | 10.41 | 0.08 | 71,700 | 0.3 | 53.4 | 31.1 | 15.3 |
| 40 | Damen Ave. | C | CSSC ⁵ | 2002 | 16.40 | 12.31 | 0.75 | 124,000 | 0.1 | 27.1 | 50.6 | 22.2 |
| | Damen Ave. | S | CSSC ⁵ | 2002 | 8.66 | 9.22 | 1.06 | 99,800 | 3.8 | 28.2 | 45.6 | 22.4 |
| 75 | Cicero Ave. | C | CSSC ⁵ | 2002 | 12.00 | 11.36 | 0.95 | 86,100 | 1.8 | 63.5 | 19.9 | 14.8 |
| | Cicero Ave. | S | CSSC ⁵ | 2002 | BDL | 3.64 | 1.22 | 43,100 | 3.1 | 80.2 | 7.8 | 8.9 |
| 41 | Harlem Ave. | C | CSSC ⁵ | 2002 | 8.23 | 3.77 | 0.46 | 36,000 | 16.5 | 74.3 | 4.9 | 4.2 |
| | Harlem Ave. | S | CSSC ⁵ | 2002 | BDL | 2.21 | 0.74 | 33,700 | 15.9 | 75.2 | 3.9 | 5.1 |
| 92 | Lockport Powerhouse | C | CSSC ⁵ | 2002 | 30.10 | 10.84 | 0.36 | 64,500 | 2.3 | 56.6 | 24.6 | 16.6 |
| | Lockport Powerhouse | S | CSSC ⁵ | 2002 | 7.11 | 3.15 | 0.44 | 40,000 | 0.7 | 85.9 | 6.5 | 7.0 |
| 52 | Wentworth Ave. | S | Little Calumet River | 2003 | 38.05 | 4.82 | 0.13 | 930 | 8.0 | 42.0 | 45.0 | 5.0 |
| 54 | Joe Orr Rd. | C | Thorn Creek | 2003 | 8.47 | 1.43 | 0.17 | 5,800 | 37.0 | 61.0 | 1.0 | 1.0 |
| | Joe Orr Rd. | S | Thorn Creek | 2003 | 33.54 | 3.23 | 0.10 | 4,200 | 0.0 | 93.0 | 6.0 | 1.0 |
| 97 | 170 th St. | C | Thorn Creek | 2003 | 0.50 | 1.29 | 2.58 | 8,900 | 3.0 | 80.0 | 12.0 | 5.0 |
| | 170 th St. | S | Thorn Creek | 2003 | 58.29 | 3.62 | 0.06 | 80,000 | 3.0 | 62.0 | 27.0 | 8.0 |
| 57 | Ashland Ave. | S | Little Calumet River | 2003 | 3.81 | 6.06 | 1.59 | 24,000 | 14.0 | 44.0 | 36.0 | 6.0 |
| 49 | Ewing Ave. | S | Calumet River | 2003 | 3.36 | 4.05 | 1.21 | 25,000 | 9.0 | 58.0 | 22.0 | 11.0 |
| 50 | Burnham Ave. | C | Wolf Lake | 2003 | 24.98 | 2.12 | 0.08 | 5,800 | 2.0 | 84.0 | 11.0 | 3.0 |
| | Burnham Ave. | S | Wolf Lake | 2003 | 12.50 | 3.48 | 0.28 | 120,000 | 10.0 | 12.0 | 75.0 | 3.0 |
| 55 | 130 th St. | C | Calumet River | 2003 | 0.24 | 5.51 | 22.96 | 33,000 | 0.0 | 40.0 | 41.0 | 19.0 |
| | 130 th St. | S | Calumet River | 2003 | BDL | 0.95 | ND | 6,100 | 1.0 | 84.0 | 12.0 | 3.0 |

TABLE 12 (Continued): ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | AVS ² | SEM ³ | SEM/AVS | TOC ⁴ | Particle Size (Percent) | | | |
|-------------|--------------------|--------------------|----------------------|------|------------------|------------------|---------|------------------|-------------------------|------|------|------|
| | | | | | | (μmoles/g) | | (mg/kg) | Gravel | Sand | Silt | Clay |
| 86 | Burnham Ave. | C | Grand Calumet River | 2003 | 55.43 | 7.84 | 0.14 | 1,000 | 0.0 | 85.0 | 12.0 | 3.0 |
| | Burnham Ave. | S | Grand Calumet River | 2003 | 273.40 | 6.27 | 0.02 | 3,900 | 0.0 | 60.0 | 37.0 | 3.0 |
| 56 | Indiana Ave. | C | Little Calumet River | 2003 | 7.31 | 4.62 | 0.63 | 24,000 | 1.0 | 26.0 | 59.0 | 14.0 |
| | Indiana Ave. | S | Little Calumet River | 2003 | 32.60 | 17.85 | 0.55 | 9,800 | 12.0 | 70.0 | 15.0 | 3.0 |
| 76 | Halsted St. | C | Little Calumet River | 2003 | 12.07 | 6.65 | 0.55 | 17,000 | 0.0 | 35.0 | 53.0 | 11.0 |
| | Halsted St. | S | Little Calumet River | 2003 | 7.67 | 4.38 | 0.57 | 7,100 | 5.0 | 85.0 | 7.0 | 3.0 |
| 58 | Ashland Ave. | C | Calumet-Sag Channel | 2003 | 27.04 | 17.02 | 0.63 | 1,300 | 0.0 | 36.0 | 55.0 | 9.0 |
| | Ashland Ave. | S | Calumet-Sag Channel | 2003 | 56.26 | 30.22 | 0.54 | 440 | 0.0 | 70.0 | 27.0 | 3.0 |
| 59 | Cicero Ave. | C | Calumet-Sag Channel | 2003 | 12.00 | 8.53 | 0.71 | 37,000 | 1.0 | 22.0 | 58.0 | 19.0 |
| | Cicero Ave. | S | Calumet-Sag Channel | 2003 | 40.80 | 25.27 | 0.62 | 23,000 | 0.0 | 51.0 | 38.0 | 11.0 |
| 43 | Route 83 | C | Calumet-Sag Channel | 2003 | 28.83 | 11.30 | 0.39 | 86,000 | 0.0 | 12.0 | 63.0 | 25.0 |
| | Route 83 | S | Calumet-Sag Channel | 2003 | 43.80 | 24.20 | 0.55 | 43,000 | 1.0 | 9.0 | 42.0 | 48.0 |
| 12 | Lake Cook Rd. | C | Buffalo Creek | 2004 | BDL | 0.39 | 4.88 | 23,200 | 55.0 | 45.0 | 0.0 | 0.0 |
| | Lake Cook Rd. | S | Buffalo Creek | 2004 | BDL | 0.48 | 6.00 | 19,000 | 28.0 | 66.0 | 4.0 | 2.0 |
| 13 | Lake Cook Rd. | C | Des Plaines River | 2004 | BDL | 0.31 | 3.88 | <1000 | 13.0 | 87.0 | 0.0 | 0.0 |
| | Lake Cook Rd. | S | Des Plaines River | 2004 | 7.48 | 2.51 | 0.34 | 65,300 | 0.0 | 26.0 | 52.0 | 22.0 |
| 17 | Oakton St. | C | Des Plaines River | 2004 | BDL | 0.55 | 6.88 | 20,500 | 12.0 | 88.0 | 0.0 | 0.0 |
| | Oakton St. | S | Des Plaines River | 2004 | 2.56 | 2.40 | 0.94 | 29,800 | 0.0 | 79.0 | 13.0 | 8.0 |
| 77 | Elmhurst Rd. | C | Higgins Creek | 2004 | 12.00 | 1.33 | 0.11 | 32,700 | 14.0 | 49.0 | 19.0 | 18.0 |
| | Elmhurst Rd. | S | Higgins Creek | 2004 | 14.00 | 3.11 | 0.22 | 47,900 | 4.0 | 30.0 | 44.0 | 22.0 |
| 19 | Belmont Ave. | C | Des Plaines River | 2004 | BDL | 1.53 | 19.13 | 29,800 | 23.0 | 75.0 | 1.0 | 1.0 |
| | Belmont Ave. | S | Des Plaines River | 2004 | 8.80 | 5.41 | 0.61 | 56,700 | 0.0 | 16.0 | 52.0 | 32.0 |
| 20 | Roosevelt Rd. | C | Des Plaines River | 2004 | 0.37 | 3.36 | 9.08 | 30,300 | 10.0 | 76.0 | 10.0 | 4.0 |
| | Roosevelt Rd. | S | Des Plaines River | 2004 | 3.18 | 7.57 | 2.38 | 65,600 | 0.0 | 22.0 | 51.0 | 27.0 |
| 79 | Higgins Rd. | C | Salt Creek | 2004 | 14.00 | 3.39 | 0.24 | 38,800 | 0.0 | 8.0 | 58.0 | 34.0 |
| 80 | Arlington Hts. Rd. | C | Salt Creek | 2004 | BDL | 0.10 | 1.25 | 34,100 | 12.0 | 88.0 | 0.0 | 0.0 |
| | Arlington Hts. Rd. | S | Salt Creek | 2004 | 0.29 | 0.23 | 0.79 | 25,500 | 40.0 | 55.0 | 3.0 | 2.0 |

TABLE 12 (Continued): ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | AVS ² | SEM ³ (μmoles/g) | SEM/AVS | TOC ⁴ (mg/kg) | Particle Size (Percent) | | | |
|-------------|--------------------|--------------------|-----------------------|------|------------------|--------------------------------|---------|-----------------------------|-------------------------|------|------|------|
| | | | | | | | | | Gravel | Sand | Silt | Clay |
| 18 | Devon Ave. | C | Salt Creek | 2004 | BDL | 0.51 | 6.38 | 9,480 | 0.0 | 99.0 | 1.0 | 0.0 |
| | Devon Ave. | S | Salt Creek | 2004 | BDL | 0.46 | 5.75 | 14,600 | 3.0 | 96.0 | 1.0 | 0.0 |
| 24 | Wolf Rd. | S | Salt Creek | 2004 | 10.50 | 5.52 | 0.53 | 48,800 | 0.0 | 23.0 | 41.0 | 36.0 |
| 109 | Brookfield Ave. | C | Salt Creek | 2004 | 0.14 | 1.20 | 8.57 | 38,600 | 11.0 | 88.0 | 1.0 | 0.0 |
| | Brookfield Ave. | S | Salt Creek | 2004 | 2.71 | 3.18 | 1.17 | 42,900 | 0.0 | 44.0 | 32.0 | 24.0 |
| 22 | Ogden Ave. | C | Des Plaines River | 2004 | 0.20 | 0.54 | 2.70 | 38,000 | 59.0 | 41.0 | 0.0 | 0.0 |
| | Ogden Ave. | S | Des Plaines River | 2004 | 1.28 | 5.79 | 4.52 | 79,400 | 0.0 | 52.0 | 37.0 | 11.0 |
| 23 | Willow Springs Rd. | C | Des Plaines River | 2004 | 1.51 | 7.59 | 5.03 | 59,700 | 0.0 | 34.0 | 45.0 | 21.0 |
| | Willow Springs Rd. | S | Des Plaines River | 2004 | 0.92 | BDL | 0.22 | 72,900 | 0.0 | 10.0 | 65.0 | 25.0 |
| 29 | Stephen St. | C | Des Plaines River | 2004 | BDL | 0.88 | 11.00 | 88,600 | 72.0 | 28.0 | 0.0 | 0.0 |
| | Stephen St. | S | Des Plaines River | 2004 | 6.60 | 7.82 | 1.18 | 91,500 | 0.0 | 18.0 | 58.0 | 24.0 |
| 110 | Springinsguth Rd. | C | W Branch DuPage River | 2004 | 27.00 | 1.47 | 0.05 | 43,400 | 5.0 | 69.0 | 17.0 | 9.0 |
| | Springinsguth Rd. | S | W Branch DuPage River | 2004 | 0.62 | 0.26 | 0.42 | 31,900 | 22.0 | 63.0 | 9.0 | 6.0 |
| 89 | Walnut Lane | C | W Branch DuPage River | 2004 | BDL | 0.10 | 1.25 | 43,600 | 42.0 | 58.0 | 0.0 | 0.0 |
| | Walnut Lane | S | W Branch DuPage River | 2004 | BDL | 0.22 | 2.75 | 35,200 | 17.0 | 82.0 | 1.0 | 0.0 |
| 64 | Lake St. | C | W Branch DuPage River | 2004 | 0.16 | 0.19 | 1.19 | 13,100 | 48.0 | 48.0 | 2.0 | 2.0 |
| | Lake St. | S | W Branch DuPage River | 2004 | BDL | 0.43 | 5.38 | 15,300 | 21.0 | 52.0 | 14.0 | 13.0 |
| 90 | Route 19 | S | Poplar Creek | 2004 | 0.51 | 0.92 | 1.80 | 31,100 | 9.0 | 27.0 | 33.0 | 31.0 |

¹C=Center, S=Side.

²Acid Volatile Sulfide.

³Simultaneously Extracted Metals.

⁴Total Organic Carbon.

⁵Chicago Sanitary and Ship Canal.

BDL=Below detection limit.

ND=No data.

TABLE 13: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO RIVER DURING 2002

| Compound ¹ | Chicago River 2002 | | | |
|----------------------------|--------------------|---------|------------|----------|
| | 74 center | 74 side | 100 center | 100 side |
| Chlorobenzene | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND |
| Acenaphthene | ND | ND | 133,636 | ND |
| Acenaphthylene | ND | ND | ND | ND |
| Anthracene | ND | ND | 197,597 | ND |
| Benzo(a)anthracene | 3,566 | 4,958 | 320,609 | 5,495 |
| Benzo(a)pyrene | ND | ND | 263,107 | ND |
| 3,4-Benzofluoranthene | 4,011 | 5,318 | 237,613 | ND |
| Benzo(ghi)perylene | 1,796 | 2,130 | 90,603 | ND |
| Benzo(k)fluoranthene | 4,850 | 5,993 | 271,756 | ND |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND |
| Chrysene | 4,570 | 5,936 | 354,511 | 6,925 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND |
| Fluoranthene | 8,117 | 10,101 | 969,568 | 11,804 |
| Fluorene | ND | ND | 142,392 | ND |
| Indeno(1,2,3-cd)pyrene | ND | 2,032 | 87,800 | ND |
| Naphthalene | ND | ND | 5,691 | ND |
| Phenanthrene | 4,490 | 4,704 | 1,005,339 | 7,621 |
| Pyrene | 7,210 | 9,167 | 701,548 | 10,164 |
| Aldrin | ND | ND | ND | ND |
| 4,4'-DDT | 31 | 36 | 29 | 63 |
| 4,4'-DDE | 52 | 41 | 59 | 49 |
| 4,4'-DDD | 75 | 68 | 75 | 79 |
| Dieldrin | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND |
| PCB-1254 | ND | ND | ND | ND |
| PCB-1232 | 1,314 | 1,388 | 1,495 | 2,166 |
| PCB-1248 | ND | ND | ND | ND |
| PCB-1260 | 372 | 497 | 534 | 1,656 |
| PCB-1016 | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 14: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE SOUTH BRANCH CHICAGO RIVER AND SOUTH FORK SOUTH BRANCH CHICAGO RIVER DURING 2002

| Compound ¹ | South Branch Chicago River 2002 | | | South Fork South Branch Chicago River 2002 | |
|----------------------------|---------------------------------|------------|----------|--|---------|
| | 39 center | 108 center | 108 side | 99 center | 99 side |
| Chlorobenzene | ND | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | 42 | ND |
| Acenaphthene | 11,541 | ND | 4,898 | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND |
| Anthracene | 16,513 | 5,386 | 12,524 | ND | ND |
| Benzo(a)anthracene | 37,272 | 12,767 | 16,187 | 3,628 | ND |
| Benzo(a)pyrene | 42,585 | 9,578 | 11,945 | ND | ND |
| 3,4-Benzofluoranthene | 35,059 | 8,448 | 9,804 | ND | ND |
| Benzo(ghi)perylene | 16,189 | ND | 5,440 | ND | ND |
| Benzo(k)fluoranthene | 47,795 | 10,599 | 14,274 | ND | ND |
| Bis(2-ethylhexyl)phthalate | 68,074 | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND |
| Chrysene | 43,896 | 13,865 | 15,433 | 4,803 | 2,097 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | ND |
| Fluoranthene | 109,024 | 33,205 | 52,652 | 8,589 | 3,974 |
| Fluorene | 13,782 | ND | 6,886 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 15,200 | ND | ND | ND | ND |
| Naphthalene | 6,620 | ND | ND | ND | ND |
| Phenanthrene | 102,265 | 24,197 | 55,045 | 7,157 | 2,598 |
| Pyrene | 90,056 | 27,357 | 38,535 | 7,058 | 3,222 |
| Aldrin | ND | ND | ND | ND | ND |
| 4,4'-DDT | ND | ND | ND | ND | 55 |
| 4,4'-DDE | 53 | 70 | 58 | 130 | 61 |
| 4,4'-DDD | 143 | 70 | 57 | 137 | 77 |
| Dieldrin | ND | ND | ND | 32 | 17 |
| Endosulfan sulfate | ND | 33 | 24 | ND | ND |
| PCB-1254 | ND | ND | ND | 1,471 | 1,015 |
| PCB-1232 | ND | ND | ND | ND | ND |
| PCB-1248 | 2,149 | 1,501 | 1,022 | 1,703 | 556 |
| PCB-1260 | 327 | 1,157 | ND | 1,319 | 1,668 |
| PCB-1016 | ND | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 15: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO SANITARY AND SHIP CANAL DURING 2002

| Compound ¹ | Chicago Sanitary and Ship Canal 2002 | | | | | | | |
|----------------------------|--------------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|
| | 40 center | 40 side | 75 center | 75 side | 41 center | 41 side | 92 center | 92 side |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | 2,359 | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | 4,182 | ND | 3,629 | 2,601 | ND | ND |
| Benzo(a)anthracene | 2,802 | ND | 14,984 | ND | 6,558 | 4,567 | 2,076 | 1,616 |
| Benzo(a)pyrene | 2,538 | ND | 14,490 | ND | 5,779 | 3,760 | 2,215 | 1,854 |
| 3,4-Benzofluoranthene | 2,701 | ND | 15,149 | ND | 5,333 | 3,499 | 2,052 | 1,711 |
| Benzo(ghi)perylene | ND | ND | 5,238 | ND | 2,679 | 1,584 | 1,155 | ND |
| Benzo(k)fluoranthene | 3,245 | ND | 18,042 | ND | 6,842 | 4,769 | 2,551 | 2,090 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | 3,654 | 3,282 | 18,657 | ND | 7,663 | 6,176 | 2,783 | 2,322 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | ND | ND | ND | ND |
| Fluoranthene | 6,769 | 6,369 | 45,788 | 1,781 | 18,790 | 14,295 | 4,176 | 3,352 |
| Fluorene | ND | ND | 2,488 | ND | 2,441 | 1,879 | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | ND | 4,820 | ND | 2,375 | 1,454 | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND |
| Phenanthrene | 3,838 | 3,409 | 29,916 | 2,050 | 15,402 | 15,893 | 2,131 | 1,501 |
| Pyrene | 5,795 | 5,529 | 37,160 | 1,533 | 14,331 | 11,857 | 4,485 | 3,824 |
| Aldrin | ND | 14 | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | 105 | 67 | ND | ND | ND | ND | 9 | 8 |
| 4,4'-DDE | 105 | 100 | ND | ND | 47 | ND | 21 | 20 |
| 4,4'-DDD | 151 | 136 | 103 | 7 | 71 | 35 | 15 | 11 |
| Dieldrin | 9 | ND | 7 | ND | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND | 7 | 9 | 8 |
| PCB-1254 | ND | ND | 3,057 | ND | 767 | 333 | ND | ND |
| PCB-1232 | ND | ND | ND | ND | ND | ND | ND | ND |
| PCB-1248 | 1,581 | 1,153 | 7,945 | 392 | 1,756 | 864 | 542 | 452 |
| PCB-1260 | 2,209 | 1,976 | 2,720 | 64 | 354 | 127 | 212 | 218 |
| PCB-1016 | ND | ND | ND | ND | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 16: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CALUMET RIVER AND THE GRAND CALUMET RIVER DURING 2003

| Compound ¹ | Calumet River 2003 | | Grand Calumet River 2003 | |
|----------------------------|--------------------|-----------|--------------------------|---------|
| | 49 side | 55 center | 86 center | 86 side |
| Chlorobenzene | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | 3,825 | 1,939 |
| Anthracene | ND | ND | 2,126 | ND |
| Benzo(a)anthracene | ND | ND | 11,459 | 5,530 |
| Benzo(a)pyrene | 1,475 | ND | 12,919 | 7,369 |
| 3,4-Benzofluoranthene | 1,346 | ND | 10,689 | 5,905 |
| Benzo(ghi)perylene | ND | ND | ND | ND |
| Benzo(k)fluoranthene | 1,245 | ND | 8,594 | 5,776 |
| Bis(2-ethylhexyl)phthalate | 36,031 | ND | 32,660 | 121,266 |
| Butylbenzyl phthalate | ND | ND | ND | 33,280 |
| Chrysene | 1,596 | ND | 15,259 | 7,434 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | 81,255 |
| Fluoranthene | 2,131 | ND | 13,383 | 9,780 |
| Fluorene | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | ND | ND | ND |
| Naphthalene | ND | ND | ND | ND |
| Phenanthrene | 2,108 | ND | 3,967 | 3,725 |
| Pyrene | 2,639 | ND | 17,855 | 13,754 |
| Aldrin | ND | ND | ND | ND |
| 4,4'-DDT | ND | 17 | 51 | 536 |
| 4,4'-DDE | ND | ND | 60 | 32 |
| 4,4'-DDD | ND | ND | 91 | 81 |
| Dieldrin | ND | ND | ND | 25 |
| Endosulfan sulfate | ND | ND | ND | ND |
| PCB-1254 | 366 | 657 | ND | 1,196 |
| PCB-1232 | ND | ND | ND | ND |
| PCB-1248 | 366 | 1,357 | ND | ND |
| PCB-1260 | ND | ND | 821 | ND |
| PCB-1016 | 296 | 1,138 | 682 | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 17: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THORN CREEK AND WOLF LAKE DURING 2003

| Compound ¹ | Thorn Creek 2003 | | | Wolf Lake 2003 | |
|----------------------------|------------------|-----------|---------|----------------|---------|
| | 54 center | 97 center | 97 side | 50 center | 50 side |
| Chlorobenzene | ND | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND |
| Anthracene | ND | 286 | ND | ND | ND |
| Benzo(a)anthracene | ND | 745 | 896 | 248 | 427 |
| Benzo(a)pyrene | ND | 597 | 977 | 201 | 394 |
| 3,4-Benzofluoranthene | ND | 803 | 1,258 | 171 | 460 |
| Benzo(ghi)perylene | ND | 222 | 463 | 95 | ND |
| Benzo(k)fluoranthene | ND | 560 | 1,119 | 224 | 362 |
| Bis(2-ethylhexyl)phthalate | ND | ND | 4,828 | 2,706 | ND |
| Butylbenzyl phthalate | 6,059 | ND | 2,278 | ND | ND |
| Chrysene | ND | 970 | 1,319 | 243 | 511 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | 10,591 | ND | ND | ND | ND |
| Fluoranthene | ND | 2,766 | 2,716 | 526 | 1,047 |
| Fluorene | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | 256 | 587 | 103 | 182 |
| Naphthalene | ND | ND | ND | ND | ND |
| Phenanthrene | ND | 1,399 | 1,240 | 318 | 483 |
| Pyrene | ND | 2,486 | 2,213 | 454 | 900 |
| Aldrin | ND | 8 | 17 | ND | ND |
| 4,4'-DDT | ND | 19 | 29 | ND | 69 |
| 4,4'-DDE | ND | ND | ND | ND | ND |
| 4,4'-DDD | ND | 63 | 32 | ND | 28 |
| Dieldrin | ND | 46 | 44 | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND |
| PCB-1254 | ND | 2,373 | 2,063 | ND | ND |
| PCB-1232 | ND | ND | ND | ND | ND |
| PCB-1248 | ND | ND | ND | ND | ND |
| PCB-1260 | ND | ND | ND | ND | ND |
| PCB-1016 | ND | 2,606 | 944 | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 18: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE LITTLE CALUMET RIVER DURING 2003

| Compound ¹ | Little Calumet River 2003 | | | | | |
|----------------------------|---------------------------|---------|-----------|--------|-----------|---------|
| | 52 side | 57 side | 56 center | 56side | 76 center | 76 side |
| Chlorobenzene | ND | ND | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | ND | ND | 2,410 | ND |
| Benzo(a)anthracene | ND | ND | ND | 3,539 | 3,312 | 1,364 |
| Benzo(a)pyrene | ND | ND | 1,444 | 2,889 | 2,485 | 1,231 |
| 3,4-Benzofluoranthene | 5,019 | ND | 1,820 | 2,959 | 2,211 | 1,469 |
| Benzo(ghi)perylene | ND | ND | ND | 1,203 | ND | ND |
| Benzo(k)fluoranthene | 5,751 | ND | 1,804 | 2,544 | 2,023 | 1,318 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND |
| Chrysene | 5,784 | ND | 1,898 | 3,924 | 3,383 | 1,534 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | 4,370 | 41,071 |
| Fluoranthene | 11,351 | 3,404 | 2,302 | 8,455 | 7,541 | 3,703 |
| Fluorene | ND | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | ND | ND | 1,347 | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | ND |
| Phenanthrene | 4,517 | ND | ND | 5,604 | 7,800 | 1,883 |
| Pyrene | 8,379 | 2,756 | 2,771 | 7,098 | 7,286 | 3,152 |
| Aldrin | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | ND | 20 | 13 | ND | ND | 8 |
| 4,4'-DDE | ND | 20 | ND | ND | ND | ND |
| 4,4'-DDD | 17 | 25 | ND | 10 | ND | ND |
| Dieldrin | ND | 19 | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND | ND |
| PCB-1254 | 405 | 618 | 416 | ND | ND | ND |
| PCB-1232 | ND | ND | ND | ND | ND | ND |
| PCB-1248 | ND | ND | ND | ND | ND | ND |
| PCB-1260 | ND | ND | ND | ND | ND | ND |
| PCB-1016 | ND | ND | 396 | ND | 232 | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 19: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CALUMET-SAG CHANNEL DURING 2003

| Compound ¹ | Calumet-Sag Channel 2003 | | | | | |
|----------------------------|--------------------------|---------|-----------|---------|-----------|---------|
| | 58 center | 58 side | 59 center | 59 side | 43 center | 43 side |
| Chlorobenzene | ND | ND | 116 | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | 2,586 | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | 1,970 | ND | ND | ND |
| Benzo(a)anthracene | 2,045 | 2,529 | 3,371 | 2,676 | ND | ND |
| Benzo(a)pyrene | ND | ND | ND | 3,117 | 1,770 | 1,646 |
| 3,4-Benzofluoranthene | ND | ND | ND | 3,529 | 2,286 | 2,109 |
| Benzo(ghi)perylene | ND | ND | ND | 1,487 | ND | ND |
| Benzo(k)fluoranthene | ND | ND | ND | 3,398 | 2,370 | 1,480 |
| Bis(2-ethylhexyl)phthalate | ND | 25,380 | 83,059 | 38,962 | 130,010 | 74,650 |
| Butylbenzyl phthalate | ND | ND | ND | 2,847 | ND | ND |
| Chrysene | 2,989 | 3,228 | 4,944 | 3,722 | 2,061 | 2,346 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | 3,088 | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | ND | ND |
| Fluoranthene | 5,492 | 5,432 | 7,144 | 5,925 | 2,994 | 3,079 |
| Fluorene | ND | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | ND | ND | 1,504 | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | ND |
| Phenanthrene | 2,162 | 2,069 | 10,655 | 2,684 | ND | ND |
| Pyrene | 4,484 | 4,821 | 8,472 | 5,565 | 3,268 | 3,935 |
| Aldrin | ND | ND | 318 | ND | ND | 15 |
| 4,4'-DDT | ND | ND | ND | 25 | ND | ND |
| 4,4'-DDE | 17 | 23 | 131 | 27 | 39 | 65 |
| 4,4'-DDD | ND | ND | 59 | 31 | 29 | 26 |
| Dieldrin | 16 | 12 | ND | 12 | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND | ND |
| PCB-1254 | 486 | 767 | 3,791 | 676 | 698 | 1,928 |
| PCB-1232 | ND | ND | ND | ND | ND | ND |
| PCB-1248 | ND | ND | 3,748 | ND | ND | ND |
| PCB-1260 | ND | ND | 1,162 | 237 | 274 | 528 |
| PCB-1016 | 390 | 668 | 2,718 | 558 | 548 | 2,192 |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 20: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM BUFFALO CREEK AND HIGGINS CREEK DURING 2004

| Compound ¹ | Buffalo Creek 2004 | Higgins Creek 2004 | |
|----------------------------|--------------------|--------------------|---------|
| | 12 side | 77 center | 77 side |
| Chlorobenzene | ND | ND | ND |
| Methylene chloride | ND | 19 | 29 |
| Toluene | ND | ND | ND |
| Acenaphthene | ND | ND | ND |
| Acenaphthylene | ND | ND | ND |
| Anthracene | ND | 1,224 | ND |
| Benzo(a)anthracene | ND | 2,696 | 2,171 |
| Benzo(a)pyrene | ND | 2,695 | 2,947 |
| 3,4-Benzofluoranthene | ND | 2,543 | 3,767 |
| Benzo(ghi)perylene | ND | 1,092 | 1,385 |
| Benzo(k)fluoranthene | ND | 3,227 | 3,914 |
| Bis(2-ethylhexyl)phthalate | ND | 9,383 | ND |
| Butylbenzyl phthalate | ND | ND | ND |
| Chrysene | ND | 3,180 | 3,609 |
| Dibenzo(a,h)anthracene | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND |
| Di-n-octyl phthalate | ND | 5,900 | ND |
| Fluoranthene | 431 | 8,893 | 7,947 |
| Fluorene | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | 1,067 | 1,563 |
| Naphthalene | ND | ND | ND |
| Phenanthrene | ND | 4,574 | 1,388 |
| Pyrene | 318 | 6,711 | 5,819 |
| Aldrin | ND | ND | ND |
| 4,4'-DDT | ND | ND | 11 |
| 4,4'-DDE | ND | 13 | 24 |
| 4,4'-DDD | ND | 16 | 21 |
| Dieldrin | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND |
| PCB-1254 | ND | ND | ND |
| PCB-1232 | ND | ND | ND |
| PCB-1248 | ND | ND | ND |
| PCB-1260 | ND | ND | ND |
| PCB-1016 | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 21: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT
COLLECTED FROM THE DES PLAINES RIVER DURING 2004

| Compound ¹ | Des Plaines River 2004 | | | | | | |
|----------------------------|------------------------|-----------|---------|-----------|---------|-----------|---------|
| | 13 side | 17 center | 17 side | 19 center | 19 side | 20 center | 20 side |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | 632 | ND | ND | ND | 3,056 |
| Benzo(a)anthracene | 2,019 | 522 | 2,927 | 371 | 2,579 | 1,352 | 3,293 |
| Benzo(a)pyrene | 2,419 | 612 | 3,310 | 365 | 3,415 | 1,647 | 4,155 |
| 3,4-Benzofluoranthene | 3,078 | 755 | 3,679 | 361 | 5,077 | 2,477 | 6,460 |
| Benzo(ghi)perylene | 1,161 | 312 | 1,612 | ND | 1,667 | 812 | 2,143 |
| Benzo(k)fluoranthene | 2,565 | 788 | 3,800 | 461 | 4,621 | 2,484 | 5,075 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND | ND | ND | 9,479 |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | 3,182 | 843 | 3,838 | 477 | 4,292 | 2,135 | 5,718 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | ND | ND | 16,158 |
| Fluoranthene | 7,494 | 1,895 | 9,034 | 1,041 | 8,389 | 4,280 | 11,537 |
| Fluorene | ND | ND | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | 1,186 | 337 | 1,626 | ND | 1,904 | 882 | 2,429 |
| Naphthalene | ND | ND | ND | ND | ND | ND | ND |
| Phenanthrene | 2,893 | 756 | 4,327 | 668 | 2,901 | 1,897 | 3,607 |
| Pyrene | 5,399 | 1,393 | 6,697 | 817 | 6,218 | 3,429 | 8,852 |
| Aldrin | ND | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | ND | ND | 34 | ND | 37 | 30 | 29 |
| 4,4'-DDE | ND | ND | 26 | ND | 39 | 36 | 37 |
| 4,4'-DDD | ND | 14 | 96 | 16 | 77 | 85 | 104 |
| Dieldrin | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND | ND | ND |
| PCB-1254 | ND | ND | ND | ND | ND | ND | ND |
| PCB-1232 | ND | ND | ND | ND | ND | ND | ND |
| PCB-1248 | ND | ND | ND | ND | ND | ND | ND |
| PCB-1260 | ND | ND | 331 | ND | ND | ND | ND |
| PCB-1016 | ND | ND | ND | ND | ND | ND | ND |

TABLE 21 (Continued): ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE DES PLAINES RIVER DURING 2004

| Compound ¹ | Des Plaines River 2004 | | | | |
|----------------------------|------------------------|---------|-----------|---------|---------|
| | 22 center | 22 side | 23 center | 23 side | 29 side |
| Chlorobenzene | ND | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | ND | ND | ND |
| Benzo(a)anthracene | ND | 4,365 | 1,112 | 2,476 | 1,765 |
| Benzo(a)pyrene | ND | 5,160 | 1,506 | 3,495 | 2,534 |
| 3,4-Benzofluoranthene | ND | 6,627 | 2,217 | 5,018 | 3,990 |
| Benzo(ghi)perylene | ND | 2,271 | 794 | 1,855 | 1,281 |
| Benzo(k)fluoranthene | ND | 6,894 | 2,181 | 4,281 | 3,529 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND |
| Chrysene | ND | 6627 | 2,027 | 4,384 | 3,215 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | ND |
| Fluoranthene | ND | 13,141 | 3,818 | 7,821 | 5,440 |
| Fluorene | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | 2,616 | 889 | 2,074 | 1,488 |
| Naphthalene | ND | ND | ND | ND | ND |
| Phenanthrene | ND | 4,243 | 1,154 | 2,282 | 1,555 |
| Pyrene | ND | 10,383 | 3,033 | 6,029 | 4,296 |
| Aldrin | ND | ND | ND | ND | ND |
| 4,4'-DDT | 7 | 108 | 14 | 30 | 20 |
| 4,4'-DDE | 11 | 113 | 81 | 51 | 61 |
| 4,4'-DDD | 41 | 296 | 158 | 80 | 98 |
| Dieldrin | ND | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND |
| PCB-1254 | ND | ND | ND | ND | ND |
| PCB-1232 | ND | ND | ND | ND | ND |
| PCB-1248 | ND | ND | ND | ND | ND |
| PCB-1260 | ND | ND | ND | ND | ND |
| PCB-1016 | ND | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 22: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT
COLLECTED FROM SALT CREEK DURING 2004

| Compound ¹ | Salt Creek 2004 | | | | | |
|----------------------------|-----------------|-----------|---------|---------|------------|----------|
| | 79 center | 18 center | 18 side | 24 side | 109 center | 109 side |
| Chlorobenzene | ND | ND | ND | ND | ND | ND |
| Methylene chloride | 47 | 20 | 22 | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND | 8,775 |
| Acenaphthylene | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | ND | ND | ND | 5,118 |
| Benzo(a)anthracene | 1,053 | 762 | 747 | 1,369 | ND | 16,179 |
| Benzo(a)pyrene | 2,107 | 1,032 | 975 | 1,953 | ND | 7,239 |
| 3,4-Benzofluoranthene | 2,516 | 679 | 709 | 2,287 | ND | 10,973 |
| Benzo(ghi)perylene | 1,040 | ND | 306 | 781 | ND | 1,855 |
| Benzo(k)fluoranthene | 2,344 | 790 | 712 | 2,218 | ND | 8,240 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND |
| Chrysene | 2,352 | 802 | 921 | 1,996 | ND | 11,988 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND | 532 |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | ND | ND |
| Fluoranthene | 4,151 | 2,263 | 2,189 | 4,219 | 447 | 94,679 |
| Fluorene | ND | ND | ND | ND | ND | 8,503 |
| Indeno(1,2,3-cd)pyrene | 988 | 292 | 293 | 916 | ND | 2,322 |
| Naphthalene | ND | ND | ND | ND | ND | 2,354 |
| Phenanthrene | 814 | 1,219 | 819 | 1,361 | ND | 62,258 |
| Pyrene | 3,017 | 1,722 | 1,650 | 3,129 | 413 | 62,892 |
| Aldrin | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | ND | ND | ND | 394 | ND | 89 |
| 4,4'-DDE | 18 | ND | ND | 43 | 27 | 96 |
| 4,4'-DDD | 18 | 10 | 9 | 97 | 126 | 326 |
| Dieldrin | ND | ND | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND | ND |
| PCB-1254 | ND | ND | ND | ND | ND | ND |
| PCB-1232 | ND | ND | ND | ND | ND | ND |
| PCB-1248 | ND | ND | ND | ND | ND | ND |
| PCB-1260 | ND | ND | ND | ND | ND | ND |
| PCB-1016 | ND | ND | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 23: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE WEST BRANCH DUPAGE RIVER DURING 2004

| Compound ¹ | West Branch DuPage River 2004 | | | | | |
|----------------------------|-------------------------------|----------|-----------|---------|-----------|---------|
| | 110 center | 110 side | 89 center | 89 side | 64 center | 64 side |
| Chlorobenzene | ND | ND | ND | ND | ND | ND |
| Methylene chloride | ND | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | ND | 457 | ND | ND |
| Benzo(a)anthracene | 928 | 835 | ND | 1,014 | ND | ND |
| Benzo(a)pyrene | 1,024 | 929 | 266 | 962 | ND | ND |
| 3,4-Benzofluoranthene | 1,363 | 991 | 359 | 1,007 | ND | ND |
| Benzo(ghi)perylene | 584 | ND | ND | 341 | ND | ND |
| Benzo(k)fluoranthene | 1,311 | 1,271 | 409 | 1,268 | ND | ND |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND |
| Chrysene | 1,251 | 1,179 | 292 | 1,128 | ND | ND |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | ND | ND |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND | ND |
| Di-n-octyl phthalate | ND | ND | ND | ND | 3,762 | ND |
| Fluoranthene | 3,079 | 3,100 | 629 | 3,027 | ND | ND |
| Fluorene | ND | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | 583 | ND | ND | 310 | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | ND |
| Phenanthrene | 1,781 | 1,804 | 342 | 2,202 | ND | ND |
| Pyrene | 2,125 | 2,245 | 487 | 2,233 | ND | ND |
| Aldrin | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | ND | ND | ND | ND | ND | 12 |
| 4,4'-DDE | ND | ND | ND | ND | ND | ND |
| 4,4'-DDD | 11 | 14 | ND | ND | ND | ND |
| Dieldrin | ND | ND | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND | 8 |
| PCB-1254 | ND | ND | ND | ND | ND | ND |
| PCB-1232 | ND | ND | ND | ND | ND | ND |
| PCB-1248 | ND | ND | ND | ND | ND | ND |
| PCB-1260 | ND | ND | ND | ND | ND | 233 |
| PCB-1016 | ND | ND | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 24: TOXICITY DATA FOR SEDIMENT COLLECTED FROM THE CHICAGO AREA
WATERWAY SYSTEM BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | <i>(Chironomus tentans</i> 10-Day Test Data) | | |
|-------------|-----------------------|--------------------|---------------------------------------|------|--|-----------------------|--------------------------------|
| | | | | | Survival (Percent) | Dried Weight (mg/org) | Ash-free Dried Weight (mg/org) |
| 74 | Lake Shore Dr. | C | Chicago River | 2002 | 94 | 1.09 | 0.79 |
| | Lake Shore Dr. | S | Chicago River | 2002 | 99 | 1.07 | 0.76 |
| 100 | Wells St. | C | Chicago River | 2002 | 94 | 0.97 | 0.67 ^a |
| | Wells St. | S | Chicago River | 2002 | 99 | 0.90 | 0.64 ^a |
| 39 | Madison St. | C | South Branch Chicago River | 2002 | 91 | 0.83 ^a | 0.62 ^a |
| 108 | Loomis St. | C | South Branch Chicago River | 2002 | 90 | 0.70 ^a | 0.53 ^c |
| | Loomis St. | S | South Branch Chicago River | 2002 | 83 | 0.86 | 0.61 ^a |
| 99 | Archer Ave. | C | South Fork South Branch Chicago River | 2002 | 14 ^c | 0.24 ^c | 0.14 ^c |
| | Archer Ave. | S | South Fork South Branch Chicago River | 2002 | 59 ^c | 0.25 ^c | 0.16 ^c |
| 40 | Damen Ave. | C | Chicago Sanitary and Ship Canal | 2002 | 76 | 0.62 ^c | 0.44 ^c |
| | Damen Ave. | S | Chicago Sanitary and Ship Canal | 2002 | 80 | 0.67 ^c | 0.48 ^c |
| 75 | Cicero Ave. | C | Chicago Sanitary and Ship Canal | 2002 | 93 | 0.64 ^c | 0.46 ^c |
| | Cicero Ave. | S | Chicago Sanitary and Ship Canal | 2002 | 93 | 1.17 ^b | 0.81 ^a |
| 41 | Harlem Ave. | C | Chicago Sanitary and Ship Canal | 2002 | 91 | 1.48 | 1.16 |
| | Harlem Ave. | S | Chicago Sanitary and Ship Canal | 2002 | 89 | 1.53 | 1.04 |
| 92 | Lockport Powerhouse | C | Chicago Sanitary and Ship Canal | 2002 | 90 | 0.58 ^c | 0.43 ^c |
| | Lockport Powerhouse | S | Chicago Sanitary and Ship Canal | 2002 | 98 | 1.28 | 0.95 ^a |
| 52 | Wentworth Ave. | S | Little Calumet River | 2003 | 40 ^a | 1.18 | 0.98 |
| 54 | Joe Orr Rd. | C | Thorn Creek | 2003 | 95 | 1.19 | 0.92 |
| | Joe Orr Rd. | S | Thorn Creek | 2003 | 94 | 0.92 | 0.63 |
| 97 | 170 th St. | C | Thorn Creek | 2003 | 40 ^a | 0.58 | 0.45 |
| | 170 th St. | S | Thorn Creek | 2003 | 18 ^a | 0.42 ^a | 0.32 ^a |
| 57 | Ashland Ave. | S | Little Calumet River | 2003 | 84 | 0.84 ^a | 0.68 ^a |
| 49 | Ewing Ave. | S | Calumet River | 2003 | 8 ^a | 0.63 | 0.36 ^a |
| 50 | Burnham Ave. | C | Wolf Lake | 2003 | 19 ^a | 0.65 | 0.55 |
| | Burnham Ave. | S | Wolf Lake | 2003 | 36 ^a | 0.45 ^a | 0.18 ^a |

TABLE 24 (Continued): TOXICITY DATA FOR SEDIMENT COLLECTED FROM THE CHICAGO AREA
WATERWAY SYSTEM BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | <i>(Chironomus tentans</i> 10-Day Test Data) | | |
|-------------|-----------------------|--------------------|----------------------|------|--|-----------------------|--------------------------------|
| | | | | | Survival (Percent) | Dried Weight (mg/org) | Ash-free Dried Weight (mg/org) |
| 55 | 130 th St. | C | Calumet River | 2003 | 95 | 1.33 | 0.99 |
| | 130 th St. | S | Calumet River | 2003 | 98 | 1.61 | 1.10 |
| 86 | Burnham Ave. | C | Grand Calumet River | 2003 | 86 | 0.51 ^a | 0.46 ^a |
| | Burnham Ave. | S | Grand Calumet River | 2003 | 25 ^a | 0.19 ^a | 0.19 ^a |
| 56 | Indiana Ave. | C | Little Calumet River | 2003 | 58 ^a | 0.38 ^a | 0.30 ^a |
| | Indiana Ave. | S | Little Calumet River | 2003 | 55 ^d | 0.29 ^a | 0.21 ^a |
| 76 | Halsted St. | C | Little Calumet River | 2003 | 3 ^a | 0.25 ^a | 0.17 ^a |
| | Halsted St. | S | Little Calumet River | 2003 | 89 | 0.34 ^a | 0.25 ^a |
| 58 | Ashland Ave. | C | Calumet-Sag Channel | 2003 | 84 | 0.54 ^a | 0.47 ^a |
| | Ashland Ave. | S | Calumet-Sag Channel | 2003 | 19 ^a | 0.14 ^a | 0.11 ^a |
| 59 | Cicero Ave. | C | Calumet-Sag Channel | 2003 | 9 ^a | 1.06 | 0.65 |
| | Cicero Ave. | S | Calumet-Sag Channel | 2003 | 0 ^a | NA | NA |
| 43 | Route 83 | C | Calumet-Sag Channel | 2003 | 11 ^a | 0.83 | 0.52 |
| | Route 83 | S | Calumet-Sag Channel | 2003 | 0 ^a | NA | NA |
| 12 | Lake Cook Rd. | C | Buffalo Creek | 2004 | 38 ^a | 1.78 | 0.95 |
| | Lake Cook Rd. | S | Buffalo Creek | 2004 | 11 ^a | 1.54 | 0.51 |
| 13 | Lake Cook Rd. | C | Des Plaines River | 2004 | 48 ^a | 1.45 | 1.03 |
| | Lake Cook Rd. | S | Des Plaines River | 2004 | 28 ^a | 0.99 | 0.58 |
| 17 | Oakton St. | C | Des Plaines River | 2004 | 70 | 1.11 | 0.75 |
| | Oakton St. | S | Des Plaines River | 2004 | 38 ^a | 1.72 | 0.88 |
| 77 | Elmhurst Rd. | C | Higgins Creek | 2004 | 85 | 1.27 | 0.80 ^a |
| | Elmhurst Rd. | S | Higgins Creek | 2004 | 88 | 0.98 ^a | 0.65 ^a |
| 19 | Belmont Ave. | C | Des Plaines River | 2004 | 73 | 0.69 ^d | 0.51 ^d |
| | Belmont Ave. | S | Des Plaines River | 2004 | 98 | 1.26 | 0.78 ^a |
| 20 | Roosevelt Rd. | C | Des Plaines River | 2004 | 96 | 1.48 | 0.88 |
| | Roosevelt Rd. | S | Des Plaines River | 2004 | 64 ^a | 0.48 ^a | 0.37 ^a |

TABLE 24 (Continued): TOXICITY DATA FOR SEDIMENT COLLECTED FROM THE CHICAGO AREA WATERWAY SYSTEM BETWEEN 2002 AND 2004

| Station No. | Station Name | Point ¹ | Waterway | Year | <i>(Chironomus tentans 10-Day Test Data)</i> | | |
|-------------|--------------------|--------------------|--------------------------|------|--|-----------------------|--------------------------------|
| | | | | | Survival (Percent) | Dried Weight (mg/org) | Ash-free Dried Weight (mg/org) |
| 79 | Higgins Rd. | C | Salt Creek | 2004 | 86 | 1.42 | 1.02 |
| 80 | Arlington Hts. Rd. | C | Salt Creek | 2004 | 86 | 1.10 | 0.75 |
| | Arlington Hts. Rd. | S | Salt Creek | 2004 | 78 | 1.38 | 0.80 |
| 18 | Devon Ave. | C | Salt Creek | 2004 | 94 | 1.27 | 0.72 ^a |
| | Devon Ave. | S | Salt Creek | 2004 | 86 | 1.14 ^a | 0.72 ^a |
| 24 | Wolf Rd. | S | Salt Creek | 2004 | 90 | 1.73 | 1.26 |
| 109 | Brookfield Ave. | C | Salt Creek | 2004 | 95 | 0.97 | 0.66 |
| | Brookfield Ave. | S | Salt Creek | 2004 | 83 | 0.82 | 0.53 |
| 22 | Ogden Ave. | C | Des Plaines River | 2004 | 40 ^a | 0.58 | 0.45 |
| | Ogden Ave. | S | Des Plaines River | 2004 | 90 | 1.17 | 0.79 |
| 23 | Willow Springs Rd. | C | Des Plaines River | 2004 | 100 | 1.38 | 0.85 |
| | Willow Springs Rd. | S | Des Plaines River | 2004 | 98 | 1.45 | 0.91 |
| 29 | Stephen St. | C | Des Plaines River | 2004 | 100 | 1.25 | 0.85 |
| | Stephen St. | S | Des Plaines River | 2004 | 100 | 1.25 | 0.79 ^a |
| 110 | Springingsuth Rd. | C | West Branch DuPage River | 2004 | 84 | 1.12 | 0.79 |
| | Springingsuth Rd. | S | West Branch DuPage River | 2004 | 44 ^a | 1.11 | 0.73 |
| 89 | Walnut Lane | C | West Branch DuPage River | 2004 | 60 ^a | 1.40 | 0.94 |
| | Walnut Lane | S | West Branch DuPage River | 2004 | 60 ^a | 1.38 | 0.92 |
| 64 | Lake St. | C | West Branch DuPage River | 2004 | 78 | 1.60 | 0.88 |
| | Lake St. | S | West Branch DuPage River | 2004 | 76 | 1.31 | 0.78 |
| 90 | Route 19 | S | Poplar Creek | 2004 | 47 ^a | 1.11 | 0.75 |

¹C=Center, S=Side.

^aSignificantly different than the West Bearskin Lake control results.

^bSignificantly different than the Negative Control-Sand control results.

^cSignificantly different than the West Bearskin Lake and Negative Control-Sand control results.

^dNot statistically different due to high variability among replicates.

NA=Not applicable as all of the organisms died.

the control sediment indicate that sediments constitute an unsuitable habitat for optimal Chironomus growth.

Chicago River System. Station 99 in the South Fork of the South Branch of the Chicago River had percent survival rates that were significantly different than the control stations indicating that the sediment was unsuitable for Chironomus survival. Seven out of the nine stations sampled showed either dried weight and or ash-free dried weight that were significantly different than control stations indicating that these sediments are unsuitable for optimal Chironomus growth.

Calumet River System. Ten out of the thirteen stations sampled had percent survival rates that were significantly different than the control stations indicating that the sediment was unsuitable for Chironomus survival. Eight out of the thirteen stations sampled showed either dried weight and or ash-free dried weight that were significantly different than control stations indicating that these sediments are unsuitable for optimal Chironomus growth.

Des Plaines River System. Eight out of the eighteen stations sampled had percent survival rates that were significantly different than the control stations indicating that the sediment was unsuitable for Chironomus survival. Five out of the eighteen stations sampled showed either dried weight and or ash-free dried weight that were significantly different than control stations indicating that these sediments are unsuitable for optimal Chironomus growth.

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Attachment 2

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO 08-33

AMBIENT WATER QUALITY MONITORING

IN THE CHICAGO, CALUMET, AND

DES PLAINES RIVER SYSTEMS:

A SUMMARY OF BIOLOGICAL, HABITAT, AND

SEDIMENT QUALITY DURING 2005

June 2008

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, IL 60611-2803 (312) 751-5600

AMBIENT WATER QUALITY MONITORING
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A SUMMARY OF BIOLOGICAL, HABITAT, AND
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DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

SUMMARY AND CONCLUSIONS

During 2005, biological and habitat monitoring focused on the northern portion of the Chicago River System, as well as the 15 annual Ambient Water Quality Monitoring (AWQM) Program stations located throughout the Chicago, Calumet, and Des Plaines River Systems. Sediment chemistry and toxicity analyses were also performed on samples from the northern Chicago River System. Chlorophyll samples were collected at each of the 59 AWQM stations monthly.

Chlorophyll

Chlorophyll *a* concentrations decreased directly downstream of water treatment plants due to dilution of the waterway with effluent. In the Chicago River System, chlorophyll *a* means ranged from 2 µg/L at Touhy and Foster Avenues on the North Shore Channel to 36 µg/L at Albany Avenue on the North Branch Chicago River. The maximum recorded chlorophyll *a* concentration in the Chicago River System during 2005 was also at Albany Avenue on the North Branch Chicago River (157 µg/L).

Mean chlorophyll *a* values in the Calumet River System ranged from 1 (Ewing Avenue, Calumet River) to 58 µg/L (Burnham Avenue, Grand Calumet River). The maximum concentration measured 207 µg/L at Burnham Avenue.

The range of mean chlorophyll *a* concentrations in the Des Plaines River System was 2 (Wille Road, Higgins Creek) to 60 µg/L (Springinsguth Road, West Branch DuPage River). The maximum concentration measured in this system was 266 µg/L also at Springinsguth Road in the West Branch DuPage River.

Habitat

During the biological collection events, staff biologists assessed physical habitat at the beginning and end of each sampling reach and completed a corresponding data sheet. Qualitative Habitat Evaluation Index (QHEI) scores were calculated using this information and assigned to each waterway reach. The QHEI was developed for wadeable streams and may not be appropriate for deep-draft channels in the Chicago and Calumet River Systems. However, no alternate physical habitat index is currently available for such waterways.

The habitat ratings assigned to stations assessed during 2005 ranged from very poor at Grand Avenue in the North Branch Chicago River and Wille Road in Higgins Creek, to good at Glenview Avenue in the North Branch Chicago River, Lake-Cook Road in the Skokie River, and Material Service Road in the Des Plaines River. QHEI scores ranged from 25 to 62 throughout all three river systems. Negative habitat features in this system included channelization, limited flow, limited instream cover, and excess silt in sediments.

Fish

A total of 4,632 fish composed of 36 species were collected from Chicago area waterways in 2005, including 14 game species. The most abundant fish species collected from the shallow portion of the Chicago River System included carp and green sunfish, while carp and gizzard shad were the most frequently collected species in the deep-draft portion.

Benthic Invertebrates

Benthic invertebrates were collected from side and center locations using two methods at 27 AWQM stations during 2005. Total species richness for ponar and Hester Dendy samplers combined was 135 species, while total Ephemeroptera, Plecoptera, and Trichoptera (EPT) richness was 23 species (EPT taxa are considered relatively sensitive to pollution). Comprehensive benthic invertebrate data have been posted on the District Website (www.mwrd.org) under the "Biological Reports" heading. The report is entitled, "A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2005."

Sediment Chemistry

During 2005, sediment samples were collected from the side and center of the waterway at 15 stations. Sediment samples were analyzed for 8 general chemistry constituents, 11 trace metals, and a total of 111 total organic priority pollutants. In addition, a contracted laboratory performed acid volatile sulfide/simultaneously extracted metals (AVS/SEM), total organic carbon (TOC), and particle size determinations.

Sediment Toxicity

Ten-day *Chironomus tentans* toxicity testing was performed using sediment from side and center locations at 15 stations. Four out of the 30 samples elicited percent survival rates that were significantly less than the control sites indicating that the sediment was unsuitable for *Chironomus* survival. Three additional sites sampled showed ash-free dried weight that was significantly less than control sites, indicating that these sediments were unsuitable for optimal *Chironomus* growth.

INTRODUCTION

The Metropolitan Water Reclamation District of Greater Chicago (District) began monitoring for the AWQM Program at 59 sampling stations on 21 waterways in 2001. While water samples were collected monthly at these stations to assess water quality, this report focuses on the biological, habitat, and sediment quality during 2005. The biological monitoring portion of the AWQM Program operates on a 4-year cycle, with a primary focus each year on a different river system in the Chicago area. Fifteen of the 59 stations located across all of the waterways are monitored annually, based on their proximity to District water reclamation plants (WRPs) or municipal boundaries. During 2005, biological monitoring focused on the northern portion of the Chicago River System.

Characterization of physical habitat, fish, and benthic invertebrate populations, along with sediment toxicity and chemistry, are among the most crucial components for a comprehensive evaluation of a waterway. Each parameter represents a piece of the overall picture that is necessary to identify problem areas, make regulatory decisions, and determine plausible attainable uses for a waterway.

In addition to analyzing the AWQM Program data in order to assess and manage the impact of the District's WRPs, our data are often shared with other government agencies, non-governmental organizations (NGOs), and academic institutions. For instance, the AWQM Program data are shared with the Illinois Environmental Protection Agency (IEPA) to support their efforts to make regulatory decisions, prepare the 305 (b) report in accordance with the Clean Water Act, and perform Use Attainability Analyses (UAA).

DESCRIPTION OF THE STUDY AREA

Chicago, Calumet, and Des Plaines River Systems

The Chicago area waterways consist of man-made canals as well as natural streams which have been altered to varying degrees. Some natural waterways have been deepened, straightened, and/or widened to such an extent that reversion to their natural state would be impossible. The waterways serve the Chicago area by draining urban storm water runoff and treated municipal wastewater effluent and allowing commercial navigation in the deep-draft portions.

The primary man-made waterways are the North Shore Channel connecting Lake Michigan at Wilmette to the North Branch Chicago River; the Chicago Sanitary and Ship Canal (CSSC) extending from Damen Avenue to the Lockport Powerhouse; and the Calumet-Sag Channel connecting the Little Calumet River with the CSSC. The primary natural waterways include the wadeable branches of the Chicago River System flowing south from Lake County into the deep-draft portion of the North Branch Chicago River, which joins the Chicago River and South Branch Chicago River; the Des Plaines River System flowing south from Lake County and joining with the discharge from the CSSC downstream of the Lockport Powerhouse; and the Calumet River System which flows south and west into the Calumet-Sag Channel.

Sampling Stations

The sampling stations for the AWQM Program are located on natural and man-made waterways throughout the District's service area. A map of the Chicago area waterways including the 59 sampling stations and the District's WRPs is shown in [Figure 1](#). Stations were primarily selected such that there was at least one monitoring station on the lower end of an IEPA 303 (d) impaired waterway segment. Secondary criteria for selecting sampling locations included: (1) above and below major point sources of pollution, (2) below Lake Michigan diversion points, (3) above junction of two major waterways, (4) below county municipal boundaries, and (5) in areas of environmental concern. Fifteen of the 59 stations were chosen for annual biological monitoring.

In addition to the 15 annual stations, biological sampling was focused in the northern portion of the Chicago River System during 2005, including the North Shore Channel, West Fork North Branch Chicago River, Middle Fork North Branch Chicago River, Skokie River, and North Branch Chicago River. [Table 1](#) displays the 2005 field monitoring schedule for biological, physical habitat, and sediment quality assessments.

TABLE 1: SCHEDULE OF AMBIENT WATER QUALITY PROGRAM STATIONS
SAMPLED DURING 2005

| Station No. | Sampling Station | Waterway | Date Sampled |
|-------------|---------------------------|-------------------------------|-------------------------------|
| 106 | Dundee Road | West Fork North Branch | 6/23/05 |
| 103 | Golf Road | West Fork North Branch | 6/28/05 |
| 31 | Lake-Cook Road | Middle Fork North Branch | 6/21/05 |
| 32 | Lake-Cook Road | Skokie River | 6/22/05 |
| 105 | Frontage Road | Skokie River | 6/29/05 |
| 104 | Glenview Road | North Branch Chicago River | 6/30/05 |
| 34 | Dempster Street | North Branch Chicago River | 7/13/05 |
| 96 | Albany Avenue* | North Branch Chicago River | 7/19/05 |
| 35 | Central Street | North Shore Channel | 7/7/05, 7/20/05 ^a |
| 102 | Oakton Street | North Shore Channel | 7/20/05 |
| 36 | Touhy Avenue* | North Shore Channel | 7/21/05 |
| 101 | Foster Avenue | North Shore Channel | 7/27/05, 9/8/05 ^b |
| 37 | Wilson Avenue | North Branch Chicago River | 7/27/05, 9/7/05 ^b |
| 73 | Diversey Parkway | North Branch Chicago River | 7/28/05, 9/6/05 ^b |
| 46 | Grand Avenue* | North Branch Chicago River | 7/18/05 |
| 75 | Cicero Avenue* | Chicago Sanitary & Ship Canal | 8/22/05 |
| 41 | Harlem Avenue* | Chicago Sanitary & Ship Canal | 8/26/05 |
| 92 | Lockport* | Chicago Sanitary & Ship Canal | 9/15/05 |
| 55 | 130 th Street* | Calumet River | 9/28/05 |
| 76 | Halsted Street* | Little Calumet River | 9/27/05 |
| 59 | Cicero Avenue* | Calumet-Sag Channel | 8/29/05, 9/29/05 ^a |
| 64 | Lake Street* | West Branch DuPage River | 7/6/05 |
| 18 | Devon Avenue* | Salt Creek | 7/15/05 |
| 78 | Wille Road* | Higgins Creek | 7/14/05 |
| 13 | Lake-Cook Road* | Des Plaines River | 6/20/05 |
| 22 | Ogden Avenue* | Des Plaines River | 7/26/05 |
| 91 | Material Service Rd.* | Des Plaines River | 8/18/05 |

*Annual sampling station.

^aElectrofishing conducted on this later date due to equipment failure.

^bElectrofishing and Habitat Assessment conducted on this later date due to equipment failure.

MATERIALS AND METHODS

Chlorophyll

Water samples for chlorophyll analysis are collected monthly at each AWQM station along with the water samples for various chemical analyses.

Sample Collection. Surface water grab samples for chlorophyll analysis were collected using a stainless steel bucket. The bucket was lowered into the waterway generally from the upstream side of the bridge at the most central location. The bucket was submerged, filled, and then raised to the top of the bridge. An aliquot was poured into an amber, plastic one-liter sample bottle containing 1-mg magnesium carbonate as preservative, and a 1/2-inch airspace was left at the top of the bottle. Samples were then placed in a cooler with ice and returned to the lab for processing.

Laboratory Analysis. Filtration. Prior to filtering samples, water was mixed by rapidly inverting sample bottles 25 times before the first pour. Samples were filtered through Whatman type GF/F glass-fiber filters (0.7 micrometers) using Millipore filtration equipment and vacuum pressure. Water samples were filtered until the rate of flow decreased, but before it became clogged. Following filtration, sample filters were folded and wrapped with aluminum foil and extracted the following day.

Extraction. Filters were placed in glass extraction tubes with 5 mL of 90 percent aqueous acetone solution. Using a motorized tissue grinder set at 500 rpm and a pestle, the top layer of the filter was separated. Samples were then transferred to centrifuge tubes and additional acetone was added until the total volume equaled 10 mL. These tubes were inverted 5 times and then placed at 4°C for approximately 24 hours to steep.

Spectrophotometric Analysis. After removing samples from refrigeration, they were centrifuged for 20 minutes at 2,500 rpm. Three mL of the supernatant was transferred into a spectrophotometric cell and the absorbance read at 750, 664, 647, and 630 nm. To correct for the degradation product, pheophyton, 0.1 mL of 1 percent hydrochloric acid was added and after one minute, absorbance was read again at 750 and 665 nm. The spectrophotometer was programmed to calculate corrected chlorophyll *a*, *b*, and *c* values based on the volumes filtered and used to extract samples.

Quality Control. A reagent blank of 90 percent acetone was placed in the spectrophotometer every tenth sample and read between -0.1 and 0.1 ug/L. A method blank of distilled water was prepared for each group of samples and run through the entire laboratory procedure. One duplicate sample was chosen randomly for each group of samples and would have to be within 20 relative percent difference of the original sample. Chlorophyll *a* and *b* standards from spinach were also analyzed every 20 samples and displayed at least a 90 percent recovery.

Habitat

Data Collection. Physical habitat assessment data sheets (Figure 2) were completed by a staff biologist in the field at each station. Assessments made in the field included weather conditions, channel morphology, bank erosion, shore cover, aquatic vegetation, man-made structures, floatable materials, riparian land-use, sediment composition, sediment color and odor, depth of fines, and presence of oil in sediment. Channel width was determined using a Yardage Pro 800 rangefinder in the non-wadable waterways. A fiberglass telescoping leveling rod was used to measure water depth and depth of fines (in sediment). The smallest extension of the round leveling rod (1" diameter) was pushed into the sediment with reasonable force as far as possible to determine depth of fines in feet. A 6- X 6-inch petite Ponar grab sampler was used to collect sediment for analysis. Staff biologists estimated the percent composition of plant debris, clay, inorganic silt, organic sludge, sand (0.06-2 mm diameter), gravel (<2-64 mm diameter), cobble (>64-256 mm diameter), boulder (>256 mm diameter), or bedrock/concrete in the sediment. Sediment color and odor were recorded, as well as the appearance of oil in the sample.

Assessment Locations. Physical habitat was evaluated at the beginning and end of the fishing range in the center and on one side of the waterway at each station. The range was 40 meters for wadeable sites, 100 meters for sites in which the small boat electrofisher was employed, and 400 meters for deep-draft waterways.

Calculating Qualitative Habitat Evaluation Index. The QHEI was created by the Ohio Environmental Protection Agency (OEPA) to determine the suitability of a stretch of waterway to fish and macroinvertebrates based on physical habitat characteristics (Rankin, 1989). The index was developed to assess wadeable streams, not deep-draft channels such as those in the Chicago area. However, no appropriate index was available for these waterways. Habitat scores were calculated for each of the stations using the Ohio QHEI procedures. Sites were then classified as excellent, good, fair, poor, or very poor based on their ability to support aquatic life in reference to habitat (Rankin, 2004). The classification ranges were as follows:

| | |
|-------|-----------|
| <=75 | Excellent |
| 60-74 | Good |
| 46-59 | Fair |
| 30-45 | Poor |
| <30 | Very Poor |

Fish

Boatable Stream Sampling. Fish were collected at each sample station using a boat mounted electrofisher. The electrofisher was powered by a direct current (dc) generator.

**FIGURE 2: METROPOLITAN WATER RECLAMATION DISTRICT OF
GREATER CHICAGO PHYSICAL HABITAT ASSESSMENT**

Date _____ Time _____ Station Number _____
 Station Name _____ Latitude _____
 Waterbody _____ Longitude _____

Assessment Observer (s) _____

Weather Conditions SUNNY CLOUDY RAIN (circle one)

Stream Order _____ Assessment Location BEGINNING END (circle one)

Assessment Location Facing Upstream LEFT CENTER RIGHT (circle one)

Channel Habitat POOL RUN RIFFLE (circle one)

Water Depth (ft) _____ Channel Width (ft) _____

Water Level LOW NORMAL HIGH FLOODED (circle one)

Man-made Structures DAM RIPRAP BRIDGE LEVEE ISLAND
 OUTFALL SHEET PILING OTHER _____ (circle all applicable)
(Specify)

Channelization YES NO (circle one)

Bank Erosion NONE SLIGHT MODERATE SEVERE (circle one)

| | | | |
|----------------------------|--|-----------------------------|--------------|
| Floatable Materials | YES <input checked="" type="checkbox"/> | NO <input type="checkbox"/> | (circle one) |
| | If YES, characterize (circle all applicable) | | |
| STREET LITTER | SANITARY SEWAGE | VEGETATIVE MATERIAL | |

| | | | |
|---------------------------|---|-----------------------------|--------------------------|
| Aquatic Vegetation | YES <input checked="" type="checkbox"/> | NO <input type="checkbox"/> | (circle one) |
| | If YES, is vegetation (circle all applicable) | | |
| ROOTED EMERGENT | ROOTED SUBMERGENT | ROOTED FLOATING | |
| ATTACHED ALGAE | FLOATING ALGAE | OTHER _____ | <small>(Specify)</small> |

| | | | |
|--------------------------------|--|-------------------|--------------------------|
| Instream Cover for Fish | <small>(circle all applicable)</small> | | |
| AQUATIC VEGETATION | BOULDERS | BRUSH-DEBRIS JAMS | LOGS |
| SUBMERGED TREE ROOTS | SUBMERGED TERRESTRIAL VEGETATION | | |
| UNDER CUT BANK | ROCK LEDGE | OTHER _____ | <small>(Specify)</small> |

Canopy Cover OPEN PARTLY SHADED SHADED (circle one)

| Immediate Shore Cover | | Riparian Land Use | |
|--------------------------------|---------|-----------------------------|---------|
| DENUDED | _____ % | GRASSLAND | _____ % |
| GRASSES | _____ % | URBAN RESIDENTIAL | _____ % |
| SHRUBS | _____ % | URBAN COMMERCIAL/INDUSTRIAL | _____ % |
| TREES | _____ % | WETLAND | _____ % |
| OTHER <small>(Specify)</small> | _____ % | FOREST | _____ % |
| | | ROW CROPS | _____ % |
| | | OTHER _____ | _____ % |
| | | <small>(Specify)</small> | |

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**FIGURE 2 (Continued): METROPOLITAN WATER RECLAMATION DISTRICT OF
GREATER CHICAGO PHYSICAL HABITAT ASSESSMENT**

Station Number _____

Sediment Composition

| | | |
|------------------------------------|-------|---|
| Plant Debris | _____ | % |
| Clay | _____ | % |
| Inorganic Silt | _____ | % |
| Organic Sludge | _____ | % |
| Sand (0.06 mm to 2 mm diameter) | _____ | % |
| Gravel (>2 mm to 64 mm diameter) | _____ | % |
| Cobble (>64 mm to 256 mm diameter) | _____ | % |
| Boulder (>256 mm diameter) | _____ | % |
| Bedrock or Concrete | _____ | % |

Sediment Color _____ **Sediment Odor** _____

Oil in Sediment NONE LIGHT MODERATE HEAVY (circle one)

Embeddedness NONE NORMAL MODERATE EXTENSIVE (circle one)

Sinuosity NONE LOW MODERATE HIGH (circle one)

Depth of Fines (In feet using 1 inch diameter probe) _____

Photo Numbers Looking Upstream _____ Looking Downstream _____

Site Location/Map (Draw a map of the site and indicate the area assessed)

Additional Remarks _____

Stunned fish were picked out of the water with long handled dip nets by either of two netters who were positioned on the bow of the boat.

In most cases, the section of canal sampled extended for 400 meters. Whenever possible, both sides of this canal section were electrofished.

Wadeable Stream Sampling. Fish were collected at each sample station using a backpack electrofisher and a bag seine. Conductivity and temperature (°C) were recorded before each sample collection. A DC backpack electrofisher was employed to electrify the water with 0.7 to 1.0 amps of current, stunning the fish. In most instances, two 40-meter long backpack electrofisher collections were conducted at each station. A 40-meter reach of the creek was electrified by moving upstream parallel to the bank. Additional personnel followed the electrofisher collecting the stunned fish with dip nets. Following the first collection, a second 40-meter electrofishing survey was conducted on the opposite bank. If the creek was less than five meters wide, electrofishing occurred only once along a 40-meter reach. The total electrofishing time during each 40-meter collection was noted.

A 15-foot bag seine with 3/16-inch mesh was also used to collect fish. Staff pulled the seine for 40 meters traveling upstream parallel to the bank. In most instances, a separate 40-meter seine collection occurred along each bank.

Fish Processing. In the field, most fish were identified to species, weighed to the nearest gram or nearest 0.1 gram (depending on size), measured for standard and total length to the nearest millimeter, and examined for the incidence of disease, parasites, or other anomalies. Following processing, these fish were returned live to the river. Minnows and other small fish that were difficult to identify were preserved in 10 percent (v/v) formalin and returned to the laboratory for further analysis. These fish were processed in a similar manner to the field-measured fish, except that they were weighed to the nearest 0.01 gram.

Index of Biotic Integrity. Biological integrity of aquatic ecosystems has been defined as the ability to support and maintain a balanced, integrated, and adaptive community having a species composition, diversity, and a functional organization comparable to that of a natural habitat (Karr et al., 1986). Karr's 1986 Index of Biotic Integrity (IBI) was used to analyze fish data from 2005.

The limitations of using this tool, which was meant to apply to wadable streams, for some of the man-made, channelized waterways in the Chicago area should be recognized.

Karr's IBI integrates information from 12 fish community metrics that fall into three major categories: (1) species richness and composition, (2) trophic composition, and (3) fish abundance and condition. Each metric is scored as a 1, 3, or 5 based on whether its evaluation deviates strongly, deviates somewhat, or approximates expectations, respectively, as compared to an undisturbed site located in a similar geographical region and on a stream of comparable size. Individual metrics are added to calculate a total IBI score. A high IBI indicates high biological

integrity or health and low disturbance or lack of perturbations. A low IBI indicates low biological integrity and high disturbance or degradation. Separate IBI metric scores were determined based on the relative abundance of fish collected with each fishing gear. IBI categories of good (IBI 41-60), fair (IBI 21-40) or poor (IBI <21), as derived by the IEPA (IEPA, 1996) were determined and reported.

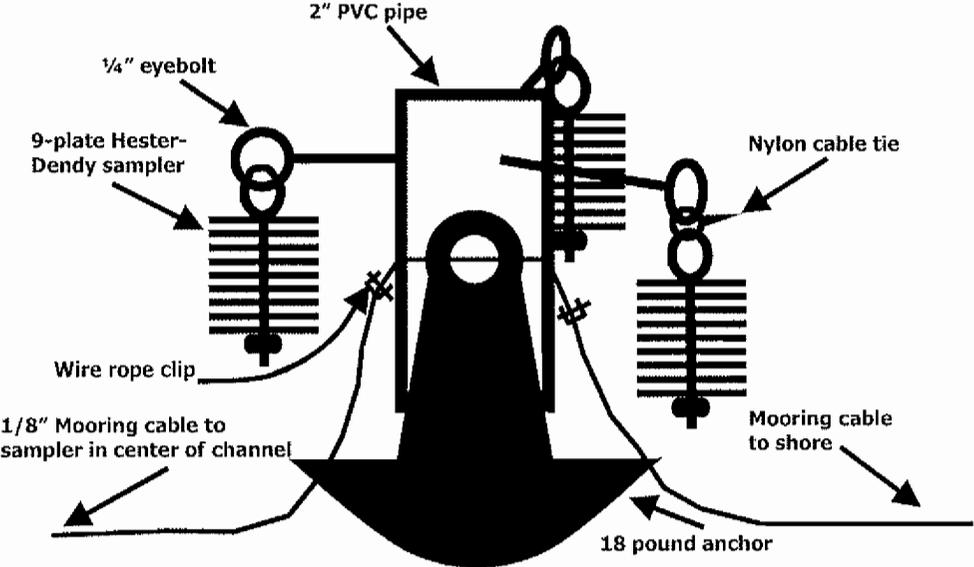
Benthic Invertebrates

Ponar Sediment Sampling. Triplicate sediment samples were collected with a petite Ponar Grab (0.023 m²) from the center and one side of the deep-draft and wadeable waterway stations. Grab samples were taken at locations upstream from any prior sampling disturbance, such as Hester Dendy retrievals (see description in next section) to avoid collecting disturbed sediment. An appropriate area for ponar sampling was chosen by a staff biologist to avoid any obvious obstructions such as large rocks or plants. The sediment samples were sieved in the field using a field sieving bucket with 250 micrometer (µm) openings. The sieved material was poured into one-gallon plastic containers, preserved to 10 percent formalin concentration, and brought back to the laboratory for analysis. All samples were stored at 4°C until processed.

Artificial Substrate Sampling. Hester Dendy artificial substrate samplers were deployed at each station between May and early June of 2005. [Figure 3](#) shows a diagram of the plate configuration that was assembled prior to deployment in the waterways. In all, 27, 3- X 3-inch sampling plates were attached to 2, 18-pound river anchors, connected to an object on shore (usually a tree) by a cable, and then placed on the bottom of the waterway in the center and on one side. These substrates were left in the waterway between 7 and 14 weeks and then retrieved concurrent to other biological sampling. Hester Dendy set-ups were located and the anchors were lifted out of the waterway with a 250 micron mesh plankton net underneath to avoid organism loss. Then, plates were cut from the anchors and placed into a one-gallon bucket with a secure leak-proof lid. Invertebrates from the plankton net reservoir were also rinsed into the buckets, which were then filled with river water and brought to a 10 percent final concentration of formalin.

Benthic Invertebrate Processing. In the laboratory, the ponar sediment samples were gently washed and screened through a U.S. Standard number 60 mesh sieve (250 µm openings). The formalin mixture in which the Hester Dendy plates were immersed was also sieved through a number 60 mesh sieve, and then the sampling bucket was filled with tap water to cover the plates. Each plate was removed from the sampler and gently brushed with a paintbrush on both sides while running under a slow stream of water in order to rinse the attached invertebrates into the sieve. Rinsings from both ponar and Hester Dendy sampling containers were thoroughly sieved. The sieved material was examined in small batches under a compound microscope in a 100- X 50-mm glass crystallizing dish filled about 1 cm high. Laboratory technicians then counted oligochaete worms and removed all other invertebrates from the finer residual material. In situations where large numbers of any one taxon (usually worms) were encountered (>3000), estimates of their abundance were made by using a sub-sampling device. Invertebrates other

FIGURE 3: CONFIGURATION OF HESTER DENDY LARVAL PLATE SAMPLER



than worms were sent to a consultant (EA Engineering) for identification to genus or species when possible.

Sediment Chemistry

Sample Collection. Prior to sample collection the Ponar grab sampler and the metal and plastic pans and scoops were cleaned with hot water and lab detergent, rinsed with de-ionized water and allowed to air dry. The ponar and metal pans and scoops were then rinsed with acetone, allowed to air dry, and dried in an oven at 105°C for one hour. When dry and cool, each set was placed in a plastic bag and sealed to prevent contamination until ready for use. Sediment samples were collected from the center and side of the waterway using separate cleaned 6- X 6-inch Ponar grab samplers. The sediment samples were either transferred into plastic or metal pans and then put into the appropriate container using plastic or metal scoops. The constituents analyzed in sediment, sample containers used, and preservation methods are summarized in Table 2. Metal scoops and pans were used for samples collected in glass containers, whereas plastic scoops and pans were used for sediment collected in plastic containers. After being filled, sample containers were placed on ice until they could be refrigerated.

Sample Analyses. The sediment samples were analyzed for total solids (TS), total volatile solids (TVS), ammonia nitrogen (NH₃-N), nitrate plus nitrite nitrogen (NO₂+NO₃), total Kjeldahl nitrogen (TKN), total phosphorus (TP), total cyanide (TCN), phenols, total metals (including arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc), and Organic Priority Pollutants (OPPs) (listed in Table 3) by the District's Analytical Laboratory Division (ALD). Sediment samples were sent on ice to a contractor laboratory for acid volatile sulfide/simultaneously extractable metals (AVS/SEM), total organic carbon (TOC), and particle size. In the laboratory, all constituents were analyzed using procedures established by the USEPA or described in Standard Methods for the Examination of Water and Wastewater (19th edition, 1998).

Sediment Toxicity

Sediment samples were collected using a 6- X 6-inch Ponar grab sampler from the center and side of the waterways, and scooped into 1-gallon plastic buckets (at least ½ full). Buckets were kept on ice until they could be refrigerated. These samples were sent in coolers on ice to a contractor for ten-day *Chironomus tentans* toxicity testing (USEPA, Test Method 100.2, 2000). Tests were performed within 14 days of sediment collection.

TABLE 2: CONSTITUENTS ANALYZED, SAMPLE CONTAINERS, AND PRESERVATION METHODS FOR SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM

| Constituents | Units of Measure ¹ | Sample Container | Preservative |
|---|-------------------------------|------------------|--------------|
| Total Solids | percent | Glass | Cool, 4°C |
| Total Volatile Solids | percent | Glass | Cool, 4°C |
| Un-ionized Ammonia | mg/kg | Glass | Cool, 4°C |
| Nitrite plus Nitrate Nitrogen | mg/kg | Glass | Cool, 4°C |
| Total Kjeldahl Nitrogen | mg/kg | Glass | Cool, 4°C |
| Total Phosphorus | mg/kg | Glass | Cool, 4°C |
| Phenols | mg/kg | Glass | Cool, 4°C |
| Total Cyanide | mg/kg | Glass | Cool, 4°C |
| Acid Volatile Sulfide | μmoles/g | Plastic | Cool, 4°C |
| Simultaneously Extracted Metal | μmoles/g | Plastic | Cool, 4°C |
| Total Organic Carbon | mg/kg | Glass | Cool, 4°C |
| Particle Size | percent | Plastic | Cool, 4°C |
| Toxicity (survival) | percent | Plastic | Cool, 4°C |
| Toxicity (growth) | mg/org ² | Plastic | Cool, 4°C |
| Total Metals (Arsenic, Cadmium, Chromium Copper, Iron, Lead, Manganese, Mercury, Nickel, Silver, and Zinc) | mg/kg | Glass | Cool, 4°C |
| Organic Priority Pollutants (Volatile Organic Compounds, Polynuclear Aromatic Hydrocarbons, Polychlorinated Biphenyls, Pesticides) | μg/kg | Glass | Cool, 4°C |

¹Expressed on a dry weight basis.

²Org = organism.

TABLE 3: LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM DURING 2005

| Volatile Organic Compounds | Acid Extractables | Base/Neutral Extractables | Pesticides and PCBs |
|----------------------------|-----------------------|-----------------------------|---------------------|
| Acrolein | 2-Chlorophenol | Acenaphthene | Aldrin |
| Acrylonitrile | 2,4-Dichlorophenol | Acenaphthylene | a-BHC-alpha |
| Benzene | 2,4-Dimethylphenol | Anthracene | b-BHC-beta |
| Bromoform | 4,6-Dinitro-o-cresol | Benzidine | BHC-gamma |
| Carbon tetrachloride | 2,4-Dinitrophenol | Benzo(a)anthracene | BHC-delta |
| Chlorobenzene | 2-Nitrophenol | Benzo(a)pyrene | Chlordane |
| Chlorodibromomethane | 4-Nitrophenol | 3,4-Benzofluoranthene | 4,4'-DDT |
| Chloroethane | Parachlorometacresol | Benzo(ghi)perylene | 4,4'-DDE |
| 2-Chloroethylvinyl ether | Pentachlorophenol | Benzo(k)fluoranthene | 4,4'-DDD |
| Chloroform | Phenol | Bis(2-chloroethoxy)methane | Dieldrin |
| Dichlorobromomethane | 2,4,6-Trichlorophenol | Bis(2-chloroethyl)ether | a-Endosulfan-alpha |
| 1,1-Dichloroethane | | Bis(2-chloroisopropyl)ether | b-Endosulfan-beta |
| 1,2-Dichloroethane | | Bis(2-ethylhexyl)phthalate | Endosulfan sulfate |
| 1,1-Dichloroethylene | | 4-Bromophenyl phenyl ether | Endrin |
| 1,2-Dichloropropane | | Butylbenzyl phthalate | Endrin aldehyde |
| 1,3-Dichloropropene | | 2-Chloronaphthalene | Heptachlor |
| Ethyl benzene | | 4-Chlorophenyl phenyl ether | Heptachlor epoxide |
| Methyl bromide | | Chrysene | PCB-1242 |
| Methyl chloride | | Dibenzo(a,h)anthracene | PCB-1254 |
| Methylene chloride | | 1,2-Dichlorobenzene | PCB-1221 |
| 1,1,2,2-Tetrachloroethane | | 1,3-Dichlorobenzene | PCB-1232 |
| Tetrachloroethylene | | 1,4-Dichlorobenzene | PCB-1248 |
| Toluene | | 3,3-Dichlorobenzidine | PCB-1260 |

TABLE 3 (Continued): LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE AMBIENT WATER QUALITY MONITORING PROGRAM DURING 2005

| Volatile Organic Compounds | Acid Extractables | Base/Neutral Extractables | Pesticides and PCBs |
|-------------------------------|----------------------|------------------------------|---------------------|
| 1,2-trans-Dichloroethylene | | Diethyl phthalate | PCB-1016 |
| 1,1,1-Trichloroethane | | Dimethyl phthalate | Toxaphene |
| 1,1,2-Trichloroethane | | Di-n-butyl phthalate | |
| Trichloroethylene | | 2,4-Dinitrotoluene | |
| Vinyl chloride | | 2,6-Dinitrotoluene | |
| Trichlorofluoromethane | | Di-n-octyl phthalate | |
| | | 1,2-Diphenylhydrazine | |
| | | Fluoranthene | |
| | | Fluorene | |
| | | Hexachlorobenzene | |
| | | Hexachlorobutadiene | |
| | | Hexachlorocyclopentadiene | |
| | | Hexachloroethane | |
| | | Indeno(1,2,3-cd)pyrene | |
| | | Isophorone | |
| | | Naphthalene | |
| | | Nitrobenzene | |
| | | N-Nitrosodimethylamine | |
| | | N-Nitrosodi-n-propylamine | |
| | | N-Nitrosodiphenylamine | |
| | | Phenanthrene | |
| | | Pyrene | |
| | | 1,2,4-Trichlorobenzene | |

RESULTS AND DISCUSSION

Chlorophyll

As a photosynthetic component of all algae cells, the determination of chlorophyll *a* is an accepted way of quantifying algal biomass in lakes and streams. Chlorophyll *a* values are of interest to regulatory agencies since it is also widely accepted that high algae concentrations may indicate nutrient impairment. The IEPA is cooperating with other state and local agencies to develop regional water quality criteria for nutrients and possibly chlorophyll. In light of this consideration, the District began monitoring chlorophyll on a monthly basis in August 2001 as part of the AWQM Program. Results from 2005 are shown in [Table 4](#).

During 2005, the highest mean chlorophyll *a* values in the Chicago area waterways were at Burnham Avenue on the Grand Calumet River (58 µg/L), and Springinsguth Road on the West Branch DuPage River (60 µg/L). The lowest mean chlorophyll *a* concentration throughout the system was 1 µg/L at Ewing Avenue on the Calumet River.

Habitat

Habitat is one of the most crucial factors limiting aquatic life in urban environments. Channelization, limited instream and canopy cover, siltation, erosion, and lack of adequate flood plain area are some of the physical characteristics that challenge waterways in the Chicago area. The QHEI was developed by OEPA as a method to quantify and assess wadeable aquatic habitats for their ability to support aquatic life. Since this metric was designed to analyze wadeable streams, the limitations to its application in man-made channel portions of the Chicago and Calumet River Systems should be considered. Metrics include: substrate, instream cover, channel quality, riparian zone/erosion, pool and riffle quality, and stream gradient. Narrative designations were assigned to QHEI score ranges so that waterway reaches could be categorized as excellent, good, fair, poor, or very poor based on the ability of the habitat to support aquatic life. [Table 5](#) displays the QHEI score and rating for each of the stations assessed in 2005.

In the northern Chicago River System, QHEI ratings ranged from very poor to good (25-62). The limiting factors in this system were a lack of in-stream cover, silty substrates, and channelization throughout reaches of the North Shore Channel and the deep-draft portion of the North Branch Chicago River. The stations with the best habitat scores were located at Lake-Cook Road on the Skokie River and Glenview Road on the North Branch Chicago River. These locations had more in-stream cover, less silt in the sediment, and better pool/run development than the other stations in the northern Chicago River System. Located in downtown Chicago in the channelized portion of the North Branch Chicago River, Grand Avenue received the lowest QHEI rating (very poor). This site had poor riparian zone habitat, low to no in-stream cover, and the sediment was embedded with oily silt.

Of the stations sampled annually, the lowest habitat rating was assigned to Wille Road on Higgins Creek. Downstream of the John C. Kirie WRP, this section of the waterway is

TABLE 4: RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS DURING 2005

| Station No. | Station Name | Waterway | N* | Mean $\mu\text{g/L}$ | Minimum $\mu\text{g/L}$ | Maximum $\mu\text{g/L}$ | Standard Deviation $\mu\text{g/L}$ |
|-------------|------------------|--|----|----------------------|-------------------------|-------------------------|------------------------------------|
| 106 | Dundee Road | W Fork N Branch Chicago River ¹ | 4 | 15 | 4 | 22 | 8 |
| 103 | Golf Road | W Fork N Branch Chicago River ¹ | 10 | 29 | 5 | 123 | 36 |
| 31 | Lake-Cook Road | M Fork N Branch Chicago River ² | 10 | 8 | 1 | 19 | 5 |
| 32 | Lake-Cook Road | Skokie River | 11 | 12 | 2 | 55 | 17 |
| 105 | Frontage Road | Skokie River | 12 | 15 | 1 | 34 | 11 |
| 104 | Glenview Road | North Branch Chicago River | 12 | 10 | 1 | 30 | 10 |
| 34 | Dempster Street | North Branch Chicago River | 11 | 24 | 3 | 96 | 27 |
| 96 | Albany Avenue | North Branch Chicago River | 11 | 36 | 3 | 157 | 47 |
| 35 | Central Street | North Shore Channel | 8 | 4 | 1 | 21 | 7 |
| 102 | Oakton Street | North Shore Channel | 12 | 8 | 1 | 40 | 12 |
| 36 | Touhy Avenue | North Shore Channel | 12 | 2 | <1 | 16 | 2 |
| 101 | Foster Avenue | North Shore Channel | 12 | 2 | <1 | 16 | 3 |
| 37 | Wilson Avenue | North Branch Chicago River | 12 | 3 | 1 | 6 | 1 |
| 73 | Diversey Avenue | North Branch Chicago River | 12 | 3 | 1 | 6 | 1 |
| 46 | Grand Avenue | North Branch Chicago River | 12 | 4 | 2 | 8 | 2 |
| 74 | Lake Shore Drive | Chicago River | 10 | 3 | <1 | 16 | 5 |
| 100 | Wells Street | Chicago River | 12 | 3 | 1 | 11 | 3 |
| 39 | Madison Street | South Branch Chicago River | 12 | 4 | 1 | 11 | 3 |
| 108 | Loomis Street | South Branch Chicago River | 10 | 5 | 1 | 13 | 4 |
| 99 | Archer Avenue | South Fork South Branch Chicago River | 11 | 21 | 2 | 130 | 37 |
| 40 | Damen Avenue | Chicago Sanitary and Ship Canal | 12 | 14 | 1 | 76 | 22 |
| 75 | Cicero Avenue | Chicago Sanitary and Ship Canal | 12 | 6 | 2 | 21 | 5 |
| 41 | Harlem Avenue | Chicago Sanitary and Ship Canal | 12 | 4 | 1 | 9 | 3 |
| 42 | Route 83 | Chicago Sanitary and Ship Canal | 11 | 6 | 1 | 20 | 7 |
| 48 | Stephen Street | Chicago Sanitary and Ship Canal | 11 | 5 | 1 | 18 | 5 |
| 92 | Lockport | Chicago Sanitary and Ship Canal | 52 | 5 | 1 | 19 | 4 |

TABLE 4 (Continued): RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS DURING 2005

| Station No. | Station Name | Waterway | N* | Mean $\mu\text{g/L}$ | Minimum $\mu\text{g/L}$ | Maximum $\mu\text{g/L}$ | Standard Deviation $\mu\text{g/L}$ |
|-------------|--------------------------|--------------------------|----|----------------------|-------------------------|-------------------------|------------------------------------|
| 49 | Ewing Avenue | Calumet River | 11 | 1 | <1 | 1 | <1 |
| 55 | 130 th Street | Calumet River | 11 | 3 | 1 | 6 | 2 |
| 50 | Burnham Avenue | Wolf Lake | 12 | 7 | 3 | 18 | 4 |
| 86 | Burnham Avenue | Grand Calumet River | 10 | 58 | 5 | 207 | 70 |
| 56 | Indiana Avenue | Little Calumet River | 9 | 16 | 2 | 38 | 12 |
| 76 | Halsted Street | Little Calumet River | 12 | 7 | <1 | 16 | 7 |
| 52 | Wentworth Avenue | Little Calumet River | 9 | 6 | 2 | 13 | 4 |
| 54 | Joe Orr Road | Thorn Creek | 8 | 12 | 2 | 59 | 19 |
| 97 | 170 th Street | Thorn Creek | 11 | 8 | 3 | 18 | 5 |
| 57 | Ashland Avenue | Little Calumet River | 11 | 9 | 4 | 20 | 6 |
| 58 | Ashland Avenue | Calumet-Sag Channel | 12 | 10 | 1 | 29 | 10 |
| 59 | Cicero Avenue | Calumet-Sag Channel | 12 | 8 | 1 | 19 | 6 |
| 43 | Route 83 | Calumet-Sag Channel | 11 | 9 | 2 | 29 | 9 |
| 90 | Route 19 | Poplar Creek | 11 | 13 | 2 | 31 | 8 |
| 110 | Springinsguth Road | West Branch DuPage River | 11 | 60 | 4 | 266 | 91 |
| 89 | Walnut Lane | West Branch DuPage River | 12 | 9 | 1 | 31 | 10 |
| 64 | Lake Street | West Branch DuPage River | 12 | 25 | 6 | 53 | 16 |
| 79 | Higgins Road | Salt Creek | 9 | 31 | 17 | 44 | 9 |
| 80 | Arlington Heights Road | Salt Creek | 12 | 12 | 2 | 34 | 10 |
| 18 | Devon Avenue | Salt Creek | 12 | 15 | 4 | 36 | 10 |
| 24 | Wolf Road | Salt Creek | 12 | 11 | 1 | 33 | 10 |
| 109 | Brookfield Avenue | Salt Creek | 12 | 11 | 1 | 31 | 10 |
| 77 | Elmhurst Road | Higgins Creek | 4 | 14 | 9 | 19 | 4 |
| 78 | Wille Road | Higgins Creek | 12 | 2 | <1 | 16 | 1 |
| 12 | Lake-Cook Road | Buffalo Creek | 7 | 31 | 15 | 51 | 14 |

TABLE 4 (Continued): RANGE AND MEAN CHLOROPHYLL *a* VALUES IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS DURING 2005

| Station No. | Station Name | Waterway | N* | Mean $\mu\text{g/L}$ | Minimum $\mu\text{g/L}$ | Maximum $\mu\text{g/L}$ | Standard Deviation $\mu\text{g/L}$ |
|-------------|------------------------|-------------------|----|----------------------|-------------------------|-------------------------|------------------------------------|
| 13 | Lake-Cook Road | Des Plaines River | 12 | 28 | 8 | 92 | 28 |
| 17 | Oakton Street | Des Plaines River | 12 | 34 | 1 | 150 | 54 |
| 19 | Belmont Avenue | Des Plaines River | 12 | 23 | 1 | 108 | 33 |
| 20 | Roosevelt Road | Des Plaines River | 12 | 23 | 2 | 99 | 36 |
| 22 | Ogden Avenue | Des Plaines River | 12 | 19 | 2 | 69 | 22 |
| 23 | Willow Springs Road | Des Plaines River | 12 | 29 | 4 | 176 | 49 |
| 29 | Stephen Street | Des Plaines River | 12 | 49 | 4 | 225 | 64 |
| 91 | Material Services Road | Des Plaines River | 12 | 35 | 6 | 164 | 43 |

*N = Number of Observations.

¹West Fork North Branch Chicago River.

²Middle Fork North Branch Chicago River.

TABLE 5: QUALITATIVE HABITAT EVALUATION INDEX SCORES IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS MEASURED DURING 2005

| Station No. | Station Name | Waterway | QHEI ¹ Score | Habitat Rating |
|-------------|---------------------------|-------------------------------|-------------------------|----------------|
| 106 | Dundee Road | West Fork North Branch | 46 | Fair |
| 103 | Golf Road | West Fork North Branch | 51 | Fair |
| 31 | Lake-Cook Road | Middle Fork North Branch | 32 | Poor |
| 32 | Lake-Cook Road | Skokie River | 62 | Good |
| 105 | Frontage Road | Skokie River | 36 | Poor |
| 104 | Glenview Road | North Branch Chicago River | 62 | Good |
| 34 | Dempster Street | North Branch Chicago River | 47 | Fair |
| 96 | Albany Avenue* | North Branch Chicago River | 33 | Poor |
| 35 | Central Street | North Shore Channel | 39 | Poor |
| 102 | Oakton Street | North Shore Channel | 39 | Poor |
| 36 | Touhy Avenue* | North Shore Channel | 44 | Poor |
| 101 | Foster Avenue | North Shore Channel | 46 | Fair |
| 37 | Wilson Avenue | North Branch Chicago River | 42 | Poor |
| 73 | Diversey Parkway | North Branch Chicago River | 30 | Poor |
| 46 | Grand Avenue* | North Branch Chicago River | 25 | Very Poor |
| 75 | Cicero Avenue* | Chicago Sanitary & Ship Canal | 32 | Poor |
| 41 | Harlem Avenue* | Chicago Sanitary & Ship Canal | 35 | Poor |
| 92 | Lockport* | Chicago Sanitary & Ship Canal | 40 | Poor |
| 55 | 130 th Street* | Calumet River | 51 | Fair |
| 76 | Halsted Street* | Little Calumet River | 55 | Fair |
| 59 | Cicero Avenue* | Calumet-Sag Channel | 37 | Poor |
| 64 | Lake Street* | West Branch DuPage River | 49 | Fair |
| 18 | Devon Avenue* | Salt Creek | 55 | Fair |
| 78 | Wille Road* | Higgins Creek | 27 | Very Poor |
| 13 | Lake-Cook Road* | Des Plaines River | 49 | Fair |
| 22 | Ogden Avenue* | Des Plaines River | 53 | Fair |
| 91 | Material Service Rd.* | Des Plaines River | 64 | Good |

¹QHEI=Qualitative Habitat Evaluation Index.

*Annual sampling station.

essentially a concrete conveyance for treated effluent. The annual station with the most favorable habitat according to the QHEI rating was Material Services Road on the Des Plaines River. The river is wide along this reach and it had development of riffle, run, and pool habitats. Embeddedness was low and there was ample in-stream cover.

Fish

Table 6 lists the common and scientific names of the fish species collected from the Chicago, Calumet, and Des Plaines River Systems during 2005. The number of individuals, total species, and game species collected, as well as catch weight from each station, can be referenced in Table 7. The most abundant fish species collected from the shallow portion of the Chicago River System included carp and green sunfish, while carp and gizzard shad were the most frequently collected species in the deep-draft portion. During 2005, 4,632 fish comprised of 36 total species, 14 game species, and 3 hybrids were collected from AWQM stations. Table 8 shows the IBI scores calculated for each station and collection method. All of the stations rated “fair” according to the IBI except for 130th Street on the Calumet River which would be considered “good.” Comprehensive fish data for each sampling station is available on the District Website at www.mwrld.org under the *Biological Data* heading.

Benthic Invertebrates

Table 9 contains a list of benthic invertebrate taxa collected by each of the two sampling methods. Taxa that are underlined in the table are considered highly tolerant based on literature sources examined by EA Engineering, Science, and Technology, the District’s consultant for benthic invertebrate identification. A report entitled, “A Study of the Benthic Macroinvertebrate Community in Selected Chicago Metropolitan Area Waterways During 2005” has been posted on the District Website at www.mwrld.org under the *Biological Reports* heading. Total species richness for ponar and Hester Dendy samplers combined was 135 species, while total Ephemeroptera, Plecoptera, and Tricoptera (EPT) richness was 23 species. These indices are both slightly higher than the 2001 collection at the same stations, which yielded 100 total species, 20 of which were EPT.

North Branch Chicago River System. In 2005, biological sampling focused on the North Branch Chicago River System, so benthic invertebrate samples were collected at 15 stations therein. Tolerant invertebrate taxa dominated Hester Dendy and ponar samples throughout this system. Total and EPT taxa richness varied considerably within each waterway. Highest total taxa richness occurred in the Hester Dendy sample from Dempster Street in the North Branch Chicago River (37 taxa), while the lowest (4) was found at Grand Avenue in the deep-draft portion of the same waterway. The Hester Dendy sample from Albany Avenue on the North Branch Chicago River contained the highest EPT taxa richness with 5 taxa, while several samples throughout the watershed contained no EPT taxa. Head capsule deformities in Chironomidae specimens occurred at a higher rate than in other Chicago area river systems during 2005, and were found in a majority of the samples. This does not necessarily indicate a more

TABLE 6: COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS DURING 2005

| Common Name | Scientific Name |
|------------------------------|--|
| HERRING FAMILY | CLUPEIDAE |
| Skipjack herring | <i>Alosa chrysochloris</i> |
| Gizzard shad | <i>Dorosoma cepedianum</i> |
| MINNOW FAMILY | CYPRINIDAE |
| Goldfish | <i>Carassius auratus</i> |
| Central mudminnow | <i>Umbra limi</i> |
| Common carp | <i>Cyprinus carpio</i> |
| Carp x Goldfish Hybrid | <i>Cyprinus carpio x Carassius auratus</i> |
| Spotfin shiner | <i>Cyprinella spiloptera</i> |
| Golden shiner | <i>Notemigonus crysoleucas</i> |
| Emerald shiner | <i>Notropis atherinoides</i> |
| Bigmouth shiner | <i>Notropis dorsalis</i> |
| Spottail shiner | <i>Notropis hudsonius</i> |
| Sand shiner | <i>Notropis stramineus</i> |
| Bluntnose minnow | <i>Pimephales notatus</i> |
| Fathead minnow | <i>Pimephales promelas</i> |
| Creek chub | <i>Semotilus atromaculatus</i> |
| SUCKER FAMILY | CATOSTOMIDAE |
| White sucker | <i>Catostomus commersonii</i> |
| Black buffalo | <i>Ictiobus niger</i> |
| CATFISH FAMILY | ICTALURIDAE |
| Black bullhead* | <i>Ameiurus melas</i> |
| Yellow bullhead* | <i>Ameiurus natalis</i> |
| Brown bullhead* | <i>Ameiurus nebulosus</i> |
| Channel catfish* | <i>Ictalurus punctatus</i> |
| KILLIFISH FAMILY | FUNDULIDAE |
| Blackstripe topminnow | <i>Fundulus notatus</i> |
| LIVEBEARER FAMILY | POECILIIDAE |
| Western mosquitofish | <i>Gambusia affinis</i> |
| TEMPERATE BASS FAMILY | MORONIDAE |
| White perch* | <i>Morone americana</i> |
| Yellow bass* | <i>Morone mississippiensis</i> |

TABLE 6 (Continued): COMMON AND SCIENTIFIC NAMES OF FISHES COLLECTED IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS DURING 2005

| Common Name | Scientific Name |
|---------------------------------|--------------------------------------|
| GOBY FAMILY | GOBIIDAE |
| Round goby | <i>Neogobius melanostomus</i> |
| SUNFISH FAMILY | CENTRARCHIDAE |
| Rock bass* | <i>Ambloplites rupestris</i> |
| Green sunfish* | <i>Lepomis cyanellus</i> |
| Pumpkinseed* | <i>Lepomis gibbosus</i> |
| Orangespotted sunfish* | <i>Lepomis humilis</i> |
| Bluegill* | <i>Lepomis macrochirus</i> |
| Green sunfish x Bluegill Hybrid | <i>L. cyanellus x L. macrochirus</i> |
| Pumpkinseed x Bluegill Hybrid | <i>L. gibbosus x L. macrochirus</i> |
| Smallmouth bass* | <i>Micropterus dolomieu</i> |
| Largemouth bass* | <i>Micropterus salmoides</i> |
| Black crappie* | <i>Pomoxis nigromaculatus</i> |
| PERCH FAMILY | PERCIDAE |
| Johnny darter | <i>Etheostoma nigrum</i> |
| Blackside darter | <i>Percina maculata</i> |
| DRUM FAMILY | SCIAENIDAE |
| Freshwater drum | <i>Aplodinotus grunniens</i> |

*Game fish species.

TABLE 7: NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS DURING 2005

| Station No. | Location | Waterway | Sample Gear | Number of Fish | Weight (grams) | Number of Species | | Most Abundant Species |
|-------------|---------------------------|--|---------------|----------------|----------------|-------------------|------|-------------------------|
| | | | | | | Total | Game | |
| 106 | Dundee Road | W Fork N Branch Chicago River ¹ | BP/Seine | 5 | 14 | 3 | 1 | Carp |
| 103 | Golf Road | W Fork N Branch Chicago River ¹ | BP/Seine | 6 | 118 | 4 | 3 | Green sunfish |
| 31 | Lake-Cook Road | M Fork N Branch Chicago River ² | BP | 14 | 260 | 4 | 2 | Green sunfish |
| 32 | Lake-Cook Road | Skokie River | BP/Seine | 34 | 5,621 | 4 | 2 | Bluegill, Green sunfish |
| 105 | Frontage Road | Skokie River | BP/Seine | 39 | 722 | 3 | 2 | Green sunfish |
| 104 | Glenview Road | North Branch Chicago River | BP | 10 | 657 | 3 | 2 | Green sunfish |
| 34 | Dempster Street | North Branch Chicago River | BP/Seine | 13 | 399 | 5 | 2 | Carp |
| 96 | Albany Avenue* | North Branch Chicago River | BP | 6 | 17 | 3 | 1 | Carp |
| 35 | Central Street | North Shore Channel | Large EF Boat | 139 | 159,512 | 10 | 5 | Carp |
| 102 | Oakton Street | North Shore Channel | Large EF Boat | 151 | 21,056 | 17 | 9 | Golden shiner |
| 36 | Touhy Avenue* | North Shore Channel | Large EF Boat | 276 | 102,744 | 9 | 4 | Gizzard shad |
| 101 | Foster Avenue | North Shore Channel | Large EF Boat | 273 | 48,926 | 16 | 7 | Gizzard shad |
| 37 | Wilson Avenue | North Branch Chicago River | Large EF Boat | 122 | 169,620 | 11 | 5 | Carp |
| 73 | Diversey Parkway | North Branch Chicago River | Large EF Boat | 164 | 70,776 | 12 | 6 | Golden shiner |
| 46 | Grand Avenue* | North Branch Chicago River | Large EF Boat | 77 | 14,020 | 5 | 3 | Gizzard shad |
| 75 | Cicero Avenue* | Chicago Sanitary & Ship Canal | Large EF Boat | 184 | 59,470 | 7 | 3 | Gizzard shad |
| 41 | Harlem Avenue* | Chicago Sanitary & Ship Canal | Large EF Boat | 758 | 96,426 | 13 | 4 | Gizzard shad |
| 92 | Lockport* | Chicago Sanitary & Ship Canal | Large EF Boat | 179 | 20,337 | 9 | 3 | Gizzard shad |
| 55 | 130 th Street* | Calumet River | Large EF Boat | 380 | 102,346 | 16 | 7 | Largemouth bass |
| 76 | Halsted Street* | Little Calumet River | Large EF Boat | 913 | 125,321 | 18 | 9 | Gizzard shad |

TABLE 7 (Continued): NUMBER, WEIGHT, AND NUMBER OF SPECIES FOR FISH COLLECTED IN THE CHICAGO, CALUMET, AND DES PLAINES RIVER SYSTEMS DURING 2005

| Station No. | Location | Waterway | Sample Gear | Number of Fish | Weight (grams) | Number of Species | | Most Abundant Species |
|-------------|------------------------|--------------------------|---------------|----------------|----------------|-------------------|------|-----------------------|
| | | | | | | Total | Game | |
| 59 | Cicero Avenue* | Calumet-Sag Channel | Large EF Boat | 453 | 85,424 | 10 | 5 | Emerald shiner |
| 64 | Lake Street* | West Branch DuPage River | BP/Seine | 64 | 1,633 | 7 | 3 | Green sunfish |
| 18 | Devon Avenue* | Salt Creek | BP/Seine | 49 | 2,985 | 8 | 4 | Green sunfish |
| 78 | Wille Road* | Higgins Creek | BP | 30 | 214 | 6 | 1 | White sucker |
| 13 | Lake-Cook Road* | Des Plaines River | BP/Seine | 125 | 2,284 | 10 | 5 | Green sunfish |
| 22 | Ogden Avenue* | Des Plaines River | BP | 39 | 1,522 | 10 | 3 | White sucker |
| 91 | Material Service Road* | Des Plaines River | BP/Seine | 129 | 454 | 12 | 3 | Bluntnose minnow |
| TOTAL | | | | 4,632 | 1,093 kg. | 36 | 14 | |

¹West Fork North Branch Chicago River.

²Middle Fork North Branch Chicago River.

*Annual sampling station.

TABLE 8: INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY BY STATION DURING 2005

| Station No. | Location | Waterway | Sample Gear | IBI* Score | IBI* Category |
|-------------|------------------|--|---------------|------------|---------------|
| 106 | Dundee Road | West Fork North Branch Chicago River | BP | 26 | Fair |
| 106 | Dundee Road | West Fork North Branch Chicago River | Seine | 24 | Fair |
| 103 | Golf Road | West Fork North Branch Chicago River | BP | 28 | Fair |
| 103 | Golf Road | West Fork North Branch Chicago River | Seine | 28 | Fair |
| 31 | Lake-Cook Road | Middle Fork North Branch Chicago River | BP | 22 | Fair |
| 31 | Lake-Cook Road | Middle Fork North Branch Chicago River | Seine | ND | ND |
| 32 | Lake-Cook Road | Skokie River | BP | 26 | Fair |
| 32 | Lake-Cook Road | Skokie River | Seine | 30 | Fair |
| 105 | Frontage Road | Skokie River | BP | 22 | Fair |
| 105 | Frontage Road | Skokie River | Seine | ND | ND |
| 104 | Glenview Road | North Branch Chicago River | BP | 22 | Fair |
| 104 | Glenview Road | North Branch Chicago River | Seine | ND | ND |
| 34 | Dempster Street | North Branch Chicago River | BP | 24 | Fair |
| 34 | Dempster Street | North Branch Chicago River | Seine | 24 | Fair |
| 96 | Albany Avenue | North Branch Chicago River | BP | 22 | Fair |
| 96 | Albany Avenue | North Branch Chicago River | Seine | ND | ND |
| 35 | Central Street | North Shore Channel | Large EF Boat | 28 | Fair |
| 102 | Oakton Street | North Shore Channel | Large EF Boat | 36 | Fair |
| 36 | Touhy Avenue | North Shore Channel | Large EF Boat | 32 | Fair |
| 101 | Foster Avenue | North Shore Channel | Large EF Boat | 32 | Fair |
| 37 | Wilson Avenue | North Branch Chicago River | Large EF Boat | 30 | Fair |
| 73 | Diversey Parkway | North Branch Chicago River | Large EF Boat | 30 | Fair |
| 46 | Grand Avenue | North Branch Chicago River | Large EF Boat | 28 | Fair |
| 75 | Cicero Avenue | Chicago Sanitary and Ship Canal | Large EF Boat | 28 | Fair |
| 41 | Harlem Avenue | Chicago Sanitary and Ship Canal | Large EF Boat | 30 | Fair |
| 92 | Lockport | Chicago Sanitary and Ship Canal | Large EF Boat | 30 | Fair |

TABLE 8 (Continued): INDEX OF BIOTIC INTEGRITY SCORE AND CATEGORY BY STATION DURING 2005

| Station No. | Location | Waterway | Sample Gear | IBI* Score | IBI* Category |
|-------------|--------------------------|--------------------------|---------------|------------|---------------|
| 55 | 130 th Street | Calumet River | Large EF Boat | 42 | Good |
| 76 | Halsted Street | Little Calumet River | Large EF Boat | 36 | Fair |
| 59 | Cicero Avenue | Calumet-Sag Channel | Large EF Boat | 36 | Fair |
| 13 | Lake-Cook Road | Des Plaines River | BP | 28 | Fair |
| 13 | Lake-Cook Road | Des Plaines River | Seine | 34 | Fair |
| 78 | Wille Road | Higgins Creek | BP | 28 | Fair |
| 78 | Wille Road | Higgins Creek | Seine | ND | ND |
| 18 | Devon Avenue | Salt Creek | BP | 24 | Fair |
| 18 | Devon Avenue | Salt Creek | Seine | 34 | Fair |
| 22 | Ogden Avenue | Des Plaines River | BP | 26 | Fair |
| 22 | Ogden Avenue | Des Plaines River | Seine | ND | ND |
| 91 | Material Services Road | Des Plaines River | BP | 28 | Fair |
| 91 | Material Services Road | Des Plaines River | Seine | 26 | Fair |
| 64 | Lake Street | West Branch DuPage River | BP | 28 | Fair |
| 64 | Lake Street | West Branch DuPage River | Seine | 32 | Fair |

*IBI = Index of Biotic Integrity.

ND = No fish were caught in the seine or conditions were unfavorable for seining.

TABLE 9: BENTHIC INVERTEBRATE TAXA COLLECTED BY PONAR AND HESTER DENDY SAMPLERS DURING 2005

| Taxa | Hester Dendy | Petite Ponar |
|-------------------------------------|----------------|--------------|
| PORIFERA (Sponges) | X | |
| COELENTERATA (Hydroids) | | |
| <i>Hydra</i> | X | X |
| PLATYHELMINTHES (Flat worms) | | |
| Turbellaria | X | X |
| ENTOPROCTA (Moss Animalcules) | | |
| <i>Urnatella gracilis</i> | X | X |
| ECTOPROCTA (Bryozoans) | | |
| <i>Plumatella</i> | X | X |
| ANNELLIDA | | |
| <u>Oligochaeta (Aquatic Worms)</u> | X | X |
| Hirudinea (Leeches) | | |
| Glossiphoniidae ¹ | | |
| <i>Desserobdella phalera</i> | X | |
| <i>Helobdella</i> ¹ | X ¹ | |
| <i>Helobdella stagnalis</i> | X | X |
| <i>Helobdella triserialis</i> | X | X |
| <i>Placobdella montifera</i> | X | |
| <i>Erpobdella punctata punctata</i> | X | X |
| <i>Mooreobdella microstoma</i> | X | X |
| CRUSTACEA | | |
| Isopoda (Sow Bugs) | | |
| <i>Caecidotea</i> | X | X |
| Amphipoda (Side Swimmers) | | |
| <i>Crangonyx</i> | X | |
| <i>Gammarus</i> ¹ | X | X |
| <i>Hyalella azteca</i> | X | X |
| Decapoda (Crayfish) | | |
| <i>Orconectes</i> ¹ | X | X |
| <i>Procambarus acutus</i> | X | |
| ARACHNOIDEA | | |
| <i>Hydracarina (Water Mites)</i> | X | X |

TABLE 9 (Continued): BENTHIC INVERTEBRATE TAXA COLLECTED BY PONAR AND HESTER DENDY SAMPLERS DURING 2005

| Taxa | Hester Dendy | Petite Ponar |
|--|-----------------|-----------------|
| INSECTA | | |
| Collembola (Springtails) | X | X |
| Ephemeroptera (Mayflies) | | |
| <i>Isonychia</i> | X | |
| <i>Baetis intercalaris</i> | X | X |
| <i>Centroptilum</i> | X | X |
| <i>Heptagenia</i> | X | |
| <i>Maccaffertium integrum</i> | X | |
| <i>Maccaffertium terminatum</i> | X | |
| <i>Stenacron</i> | X | X |
| <i>Stenonema femoratum</i> | X | |
| <i>Caenis</i> | | X |
| <i>Tricorythodes</i> | X | X |
| <i>Anthopotamus myops</i> grp. | | X |
| Odonata (Damsel­flies and Dragonflies) | | |
| Zygoptera ¹ | | X ¹ |
| Coenagrionidae ¹ | X ¹ | |
| <i>Argia</i> | X | |
| <i>Enallagma</i> | X | X |
| Hemiptera (True Bugs) | | |
| <i>Rheumatobates</i> | X | |
| Corixidae | X | |
| Neuroptera (Spongillaf­lies) | | |
| Sisyridae | X | |
| Trichoptera (Caddisflies) | | |
| <i>Cynellus fraternus</i> | X | |
| <i>Ceratopsyche morosa</i> | X | |
| <i>Cheumatopsyche</i> | X | X |
| <i>Hydropsyche</i> | X | |
| <i>Hydropsyche betteni</i> | X | |
| <i>Hydropsyche bidens</i> | X | |
| <i>Hydropsyche orris</i> | X | |
| <i>Hydropsyche simulans</i> | X | |

TABLE 9 (Continued): BENTHIC INVERTEBRATE TAXA COLLECTED BY PONAR AND HESTER DENDY SAMPLERS DURING 2005

| Taxa | Hester Dendy | Petite Ponar |
|---------------------------------------|-----------------|-----------------|
| INSECTA | | |
| Trichoptera (Caddisflies) (Continued) | | |
| <i>Hydroptila</i> | X | X |
| <i>Oxyethira</i> | | X |
| <i>Ceraclea maculata</i> | X | |
| <i>Ocecetis</i> | X | X |
| Lepidoptera (Aquatic Moths) | | |
| Noctuidae | | X |
| <i>Petrophila</i> | X | |
| Coleoptera (Beetles) | | |
| <i>Dubiraphia</i> | X | X |
| <i>Macronychus glabratus</i> | X | |
| <i>Stenelmis</i> | X | X |
| <i>Berosus</i> | | X |
| <i>Enochrus</i> | X | |
| Diptera (True Flies) | | |
| <u><i>Chaoborus</i></u> | | X |
| Ceratopogonidae | X | X |
| <i>Hemerodromia</i> | X | |
| Muscidae | | X |
| <u><i>Psychoda</i></u> | X | |
| <i>Simulium</i> | X | |
| Chironomidae (Midges) ¹ | | |
| <i>Alotanypus</i> | X | |
| <u><i>Procladius</i></u> | X | X |
| <u><i>Tanypus</i></u> | X | X |
| <u><i>Psectrotanypus</i></u> | | X |
| <i>Coelotanypus</i> | | X |
| <i>Ablabesmyia</i> | X | |
| <i>Ablabesmyia annulata</i> | X | |
| <i>Ablabesmyia janta</i> | X | X |
| <i>Ablabesmyia mallochi</i> | X | X |
| <i>Labrundinia neopilosella</i> | | X |

TABLE 9 (Continued): BENTHIC INVERTEBRATE TAXA COLLECTED BY PONAR AND HESTER DENDY SAMPLERS DURING 2005

| Taxa | Hester Dendy | Petite Ponar |
|---|-----------------|-----------------|
| INSECTA | | |
| Diptera (True Flies) (Continued) | | |
| <i>Larsia</i> | | X |
| <i>Pentaneura</i> | X | X |
| Chironomidae (Midges) ¹ | | |
| <i>Thienemannimyia</i> grp. | X | X |
| <i>Corynoneura</i> | X | |
| <u><i>Cricotopus</i></u> | | X |
| <u><i>Cricotopus bicinctus</i> grp.</u> | X | X |
| <u><i>Cricotopus sylvestris</i> grp.</u> | X | X |
| <u><i>Cricotopus tremulus</i> grp.</u> | X | X |
| <i>Cricotopus trifascia</i> grp. | | X |
| <i>Nanocladius</i> ¹ | X ¹ | |
| <i>Nanocladius crassicornus/rectinervis</i> | X | |
| <u><i>Nanocladius distinctus</i></u> | X | X |
| <i>Nanocladius spiniplenus</i> | X | |
| <i>Parakiefferiella</i> | X | X |
| <i>Psectrocladius</i> | | X |
| <i>Rheocricotopus robacki</i> | X | X |
| <i>Thienemanniella similis</i> | X | X |
| <i>Thienemanniella xena</i> | X | X |
| <u><i>Chironomus</i></u> | X | X |
| <i>Cladopelma</i> | X | X |
| <u><i>Cryptochironomus</i></u> | X | X |
| <i>Cryptotendipes</i> | X | X |
| <i>Dicrotendipes</i> ¹ | | X ¹ |
| <i>Dicrotendipes fumidus</i> | X | X |
| <i>Dicrotendipes modestus</i> | X | X |
| <i>Dicrotendipes neomodestus</i> | X | X |
| <u><i>Dicrotendipes simpsoni</i></u> | X | X |
| <i>Endochironomus nigricans</i> | X | |
| <u><i>Glyptotendipes</i></u> | X | X |

TABLE 9 (Continued): BENTHIC INVERTEBRATE TAXA COLLECTED BY PONAR AND HESTER DENDY SAMPLERS DURING 2005

| Taxa | Hester Dendy | Petite Ponar |
|--|-----------------|-----------------|
| INSECTA | | |
| Diptera (True Flies) (Continued) | | |
| <i>Harnischia</i> | X | X |
| <i>Microtendipes</i> | X | |
| <u><i>Parachironomus</i></u> | X | X |
| Chironomidae (Midges) ¹ | | |
| <i>Paralauterborniella nigrohalteralis</i> | | X |
| <i>Paratendipes</i> | X | X |
| <i>Phaenopsectra</i> | | X |
| <i>Phaenopsectra obediens</i> grp. | X | X |
| <i>Phaenopsectra punctipes</i> | X | X |
| <u><i>Polypedilum fallax</i> grp.</u> | X | |
| <i>Polypedilum flavum</i> | X | X |
| <i>Polypedilum halterale</i> grp. | X | X |
| <u><i>Polypedilum illinoense</i></u> | X | X |
| <i>Polypedilum scalaenum</i> grp. | X | X |
| <i>Pseudochironomus</i> | X | X |
| <i>Stenochironomus</i> | X | X |
| <i>Stictochironomus</i> | | X |
| <i>Xenochironomus xenolabis</i> | X | |
| <i>Cladotanytarsus mancus</i> grp. | X | X |
| <i>Cladotanytarsus vanderwulpi</i> grp. | X | X |
| <i>Paratanytarsus</i> | X | X |
| <i>Rheotanytarsus</i> | X | |
| <i>Tanytarsus</i> | X | X |
| <i>Tanytarsus glabrescens</i> grp. | X | |
| <i>Tanytarsus guerlus</i> grp. | X | X |
| GASTROPODA (Snails) | | |
| <u><i>Ferrissia</i></u> | X | X |
| <i>Bithynia tentaculata</i> | X | X |
| <i>Amnicola</i> | X | X |
| <u><i>Physa</i></u> | X | X |
| <i>Gyraulus</i> | X | |

TABLE 9 (Continued): BENTHIC INVERTEBRATE TAXA COLLECTED BY PONAR AND HESTER DENDY SAMPLERS DURING 2005

| Taxa | Hester Dendy | Petite Ponar |
|--|-----------------|-----------------|
| GASTROPODA (Snails) (Continued) | | |
| <i>Helisoma</i> | X | X |
| <u><i>Menetus dilatatus</i></u> | X | X |
| <i>Pleurocera</i> | X | X |
| PELECYPODA (Mussels and Clams) ¹ | | |
| <i>Corbicula fluminea</i> | X | X |
| <i>Dreissena polymorpha</i> | X | X |
| <i>Musculium</i> ¹ | X | X |
| <i>Pisidium</i> ¹ | X | X |
| <i>Sphaerium</i> ¹ | X | X |
| TOTAL SPECIES RICHNESS BY SAMPLE TYPE | 118 | 94 |
| EPT ² SPECIES RICHNESS BY SAMPLE TYPE | 20 | 10 |
| TOTAL SPECIES RICHNESS FOR 2005 | | 135 |
| EPT ² SPECIES RICHNESS FOR 2005 | | 23 |

Underlined taxa are considered highly tolerant.

¹Not counted as a discreet taxon.

²Ephemeroptera, Plecoptera, and Tricoptera are considered relatively sensitive taxa.

stressed benthic community than other watersheds. Sediments in other watersheds may be more toxic to these organisms, so that overall survival is lower, resulting in overall lower incidence of head capsule deformities. The greatest proportion of head capsule deformities in *Chironomus* were found in the West Fork North Branch Chicago River Hester Dendy and ponar samples (30 and 14 percent, respectively), Skokie River Hester Dendy samples (9-22 percent), and the North Branch Chicago River ponar samples (7-19 percent).

South Branch Chicago River System. During 2005, benthic samples were collected from three stations in the CSSC. Total taxa richness ranged from 11 at Cicero and Harlem Avenues to 29 at Lockport, in the Hester Dendy samples. EPT taxa richness for these samples, on the other hand, ranged from 1 at both Cicero and Harlem Avenues to 3 at Lockport. Total taxa richness from ponar samples was lower (3-5 taxa), and no EPT taxa were collected in these samples. Head capsule deformities were found in 2 Hester Dendy samples, and only constituted 1 and 5 percent of examined Chironomidae.

Calumet River System. Benthic samples were collected from single stations in the Calumet River, Little Calumet River, and Calumet-Sag Channel during 2005. The Little Calumet River station's Hester Dendy sample exhibited the highest total and EPT taxa richness (30 and 2 taxa, respectively), while the Calumet-Sag Channel ponar sample had the lowest total taxa richness (5) and no EPT taxa. In the Calumet River, zebra mussels represented 93 percent of the total density in the Hester Dendy sample. Oligochaeta and other tolerant taxa dominated all of the samples from the Calumet River System. Head capsule deformities were absent, except in the Calumet River, where they were rare.

Des Plaines River System. Benthic invertebrate samples were collected from eight AWQM stations in the Des Plaines River System during 2005. There was substantial spatial variability throughout the watershed, as well as within individual waterways. The highest total and EPT taxa richness in the Des Plaines River System occurred at the furthest upstream station in the Des Plaines River. In the Hester Dendy and ponar samples from this station, there was a combined taxa richness of 79, and an EPT taxa richness of 17. Both of these richness metrics decreased in the downstream direction. The incidence of chironomid deformities was low among stations in this system.

Sediment Chemistry

Sediment quality can considerably impact overlying water quality, benthic community structure, food chain dynamics, and other elements of freshwater ecosystems. Since sediment acts as a reservoir for persistent or bioaccumulative contaminants, sediment data reflects a long-term record of quality. It should be noted that grab sample sediment data can be difficult to interpret, as samples may reflect a "hot spot," or an area with an unusually high concentration of a specific pollutant. This can be caused by an accidental release or spill of a contaminant that

sinks down through the water column and resides in the sediment. Similarly, sediment chemistry can vary widely between side and center samples from the same station.

General Chemistry. The concentrations of the eight general chemistry constituents measured in sediment from the side and center at each of the 15 sample stations are presented in Table 10. Sediment samples from the side and center of Diversey Parkway exhibited elevated concentrations of phenols (0.700 and 0.448 mg/kg, respectively). The sediment taken from the side channel at Diversey Parkway and Grand Avenue also contained a very high concentration of total cyanide, which was more than ten times the concentration of cyanide present at other sediment sampling stations (9.665 and 9.294 mg/kg, respectively).

Trace Metals. The 11 measured trace metal concentrations for these same stations are presented in Table 11.

Acid Volatile Sulfide, Simultaneously Extracted Metals, Total Organic Carbon, and Particle Size. Table 12 presents the AVS, SEM, TOC, and particle size data for these 15 sampled sites. The ratio of SEM to AVS can affect the bioavailability of divalent metals, for which sulfide ions have a high affinity. For instance, if AVS is greater than SEM concentration, it is less likely that metals are available for biological uptake, thus rendering them less toxic to organisms. As a measure of oxidizable organic material, the TOC concentration in sediment affects nonionic organic chemical, as well as metal bioavailability. Particle size is a useful analysis since it influences chemical reactions that take place in the sediment and the type of invertebrate taxa able to colonize the substrate (USEPA, 2001).

Organic Priority Pollutants. There were 111 total organic priority pollutants analyzed for each sample collected (listed in Table 3). Tables 13-17 present the concentrations of 24 OPPs that were detected in sediment samples during 2005. The most elevated concentrations of OPPs in the wadeable portion of the northern Chicago River System were found at Lake-Cook Road on the Middle Fork North Branch Chicago River, in which 16 OPPs were detected. In the deep draft, sediment from the center of the North Branch Chicago River at Diversey Parkway had extremely high values of OPPs compared to other sampling stations. Sediment from the side at Diversey Parkway, the center and side sediment from Grand Avenue on the North Branch Chicago River, and the center of the North Shore Channel at Touhy Avenue also had relatively high OPP concentrations.

Sediment Toxicity

The toxicity data resulting from the *Chironomus tentans* 10-day toxicity tests for each sediment sample collected are presented in Table 18. Sites with a significant difference in *Chironomus* survival compared to the control sediment indicate that the sediment constitutes an unsuitable habitat for *Chironomus* survival. Sites with a significant difference in *Chironomus* dried

TABLE 10: CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED DURING 2005

| Station. No. | Location | Waterway | Segment | Constituents (Expressed on a dry weight basis) | | | | | | | |
|--------------|----------------------------|--|---------|--|---------|----------------------------|--|-------------|------------|-----------------|-------------|
| | | | | TS (%) | TVS (%) | NH ₃ -N (mg/kg) | NO ₂ +NO ₃ (mg/kg) | TKN (mg/kg) | TP (mg/kg) | Phenols (mg/kg) | TCN (mg/kg) |
| 106 | Dundee Road | W Fork N Branch Chicago River ¹ | Side | 59.9 | 5 | 37 | 7.64 | 1,100 | 769 | 0.037 | 0.017 |
| 106 | Dundee Road | W Fork N Branch Chicago River ¹ | Center | 64.9 | 3 | 19 | 3.58 | 393 | 384 | 0.039 | 0.028 |
| 103 | Golf Road | W Fork N Branch Chicago River ¹ | Side | 56.9 | 4 | 20 | 5.48 | 632 | 395 | 0.058 | 0.040 |
| 103 | Golf Road | W Fork N Branch Chicago River ¹ | Center | 34.3 | 25 | 20 | 7.93 | 1,192 | 554 | 0.128 | 0.079 |
| 31 | Lake-Cook Road | M Fork N Branch Chicago River ² | Side | 46.8 | 9 | 51 | 7.33 | 2,558 | 649 | 0.126 | 0.385 |
| 31 | Lake-Cook Road | M Fork N Branch Chicago River ² | Center | 56.4 | 4 | 30 | 7.14 | 949 | 407 | 0.066 | 0.044 |
| 32 | Lake-Cook Road | Skokie River | Side | 51.2 | 6 | 59 | 7.70 | 1,360 | 396 | 0.051 | 0.105 |
| 32 | Lake-Cook Road | Skokie River | Center | 62.3 | 2 | 15 | 4.80 | 329 | 140 | 0.067 | 0.010 |
| 105 | Frontage Road | Skokie River | Side | 54.0 | 6 | 43 | 5.99 | 910 | 916 | 0.035 | 0.061 |
| 105 | Frontage Road | Skokie River | Center | 55.7 | 6 | 18 | 4.53 | 951 | 1,798 | 0.061 | 0.083 |
| 104 | Glenview Road | North Branch Chicago River | Side | 61.8 | 4 | 25 | 6.55 | 669 | 451 | 0.015 | 0.006 |
| 104 | Glenview Road | North Branch Chicago River | Center | 80.9 | 2 | 5 | 3.15 | 300 | 344 | 0.045 | 0.015 |
| 34 | Dempster Street | North Branch Chicago River | Side | 50.2 | 4 | 35 | 6.36 | 1,881 | 942 | 0.114 | 0.126 |
| 34 | Dempster Street | North Branch Chicago River | Center | 15.3 | 20 | 43 | 20.39 | 6,373 | 1,404 | 0.150 | 0.183 |
| 96 | Albany Avenue ³ | North Branch Chicago River | Side | 63.3 | 5 | 14 | 4.10 | 847 | 148 | 0.035 | 0.014 |
| 35 | Central Street | North Shore Channel | Side | 38.7 | 7 | 21 | 4.44 | 2,044 | 425 | 0.147 | 0.145 |
| 35 | Central Street | North Shore Channel | Center | 31.7 | 9 | 21 | 6.33 | 2,523 | 572 | 0.145 | 0.117 |
| 102 | Oakton Street | North Shore Channel | Side | 32.9 | 11 | 12 | 2.89 | 422 | 159 | 0.398 | 0.040 |
| 102 | Oakton Street | North Shore Channel | Center | 41.0 | 15 | 156 | 6.66 | 1,248 | 559 | 0.120 | 0.093 |
| 36 | Touhy Avenue | North Shore Channel | Side | 76.8 | 5 | 30 | 1.88 | 642 | 381 | 0.049 | 0.022 |
| 36 | Touhy Avenue | North Shore Channel | Center | 70.0 | 7 | 37 | 1.68 | 433 | 123 | 0.051 | 0.026 |
| 101 | Foster Avenue | North Shore Channel | Side | 81.1 | 2 | 20 | 3.47 | 336 | 136 | 0.027 | <0.003 |
| 101 | Foster Avenue | North Shore Channel | Center | 65.6 | 5 | 12 | 2.60 | 981 | 514 | 0.064 | <0.003 |

TABLE 10 (Continued): CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED DURING 2005

| Station No. | Location | Waterway | Segment | Constituents (Expressed on a dry weight basis) | | | | | | | |
|-------------|------------------|----------------------------|---------|--|---------|----------------------------|--|-------------|------------|-----------------|-------------|
| | | | | TS (%) | TVS (%) | NH ₃ -N (mg/kg) | NO ₂ +NO ₃ (mg/kg) | TKN (mg/kg) | TP (mg/kg) | Phenols (mg/kg) | TCN (mg/kg) |
| 37 | Wilson Avenue | North Branch Chicago River | Side | 55.4 | 10 | 18 | 2.72 | 745 | 355 | 0.083 | 0.108 |
| 37 | Wilson Avenue | North Branch Chicago River | Center | 72.7 | 2 | 5 | 1.15 | 128 | 227 | 0.059 | 0.127 |
| 73 | Diversey Parkway | North Branch Chicago River | Side | 20.9 | 34 | 215 | 21.38 | 12,311 | 7,092 | 0.700 | 9.665 |
| 73 | Diversey Parkway | North Branch Chicago River | Center | 13.6 | 19 | 519 | 35.99 | 16,617 | 7,981 | 0.448 | 0.816 |
| 46 | Grand Avenue | North Branch Chicago River | Side | 41.2 | 13 | 186 | 11.83 | 4,021 | 4,174 | 0.129 | 9.294 |
| 46 | Grand Avenue | North Branch Chicago River | Center | 28.8 | 18 | 285 | 13.43 | 6,087 | 3,988 | 0.163 | 0.979 |

¹West Fork North Branch Chicago River.

²Middle Fork North Branch Chicago River.

³No sediment sample was taken from the center of the waterway at Albany Avenue because there is a concrete bottom throughout the sampling reach.

TABLE 11: TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO RIVER SYSTEM DURING 2005

| Station No. | Location | Waterway | Segment | (mg/kg dry weight) | | | | | | | | | | |
|-------------|--------------------------|--|---------|--------------------|------|----|-----|--------|-----|-----|----------|----|------|-----|
| | | | | As | Cd | Cr | Cu | Fe | Pb | Mn | Hg | Ni | Ag | Zn |
| 106 | Dundee Rd. | W Fork N Branch Chgo. River ¹ | Side | 2.6 | <0.1 | 12 | 13 | 15,537 | 15 | 371 | 0.0568 | 15 | <0.3 | 56 |
| 106 | Dundee Rd. | W Fork N Branch Chgo. River ¹ | Center | 1.1 | <0.1 | 6 | 8 | 9,210 | 16 | 474 | 0.0933 | 7 | <0.3 | 75 |
| 103 | Golf Rd. | W Fork N Branch Chgo. River ¹ | Side | 1.2 | 0.3 | 14 | 9 | 6,790 | 13 | 155 | 0.6923 | 7 | <0.3 | 53 |
| 103 | Golf Rd. | W Fork N Branch Chgo. River ¹ | Center | 2.6 | 0.4 | 42 | 12 | 11,982 | 15 | 468 | 0.1178 | 21 | <0.3 | 95 |
| 31 | Lake-Cook Rd. | M Fork N Branch Chgo. River ² | Side | 3.3 | <0.1 | 19 | 31 | 16,080 | 33 | 382 | 0.0987 | 17 | <0.3 | 111 |
| 31 | Lake-Cook Rd. | M Fork N Branch Chgo. River ² | Center | 5.3 | <0.1 | 11 | 11 | 17,270 | 28 | 645 | 0.0633 | 12 | <0.3 | 40 |
| 32 | Lake-Cook Rd. | Skokie River | Side | 3.4 | 0.3 | 19 | 36 | 10,964 | 86 | 296 | 0.2368 | 13 | <0.3 | 258 |
| 32 | Lake-Cook Rd. | Skokie River | Center | 3.6 | <0.1 | 3 | 6 | 3,580 | 12 | 125 | 0.1197 | 4 | <0.3 | 73 |
| 105 | Frontage Rd. | Skokie River | Side | 2.2 | 0.3 | 25 | 20 | 20,441 | 20 | 927 | 0.0445 | 20 | <0.3 | 68 |
| 105 | Frontage Rd. | Skokie River | Center | 1.5 | 0.5 | 19 | 32 | 15,870 | 63 | 432 | 0.0734 | 13 | <0.3 | 130 |
| 104 | Glenview Rd. | N Branch Chicago River ³ | Side | 3.2 | 0.5 | 25 | 20 | 21,360 | 29 | 698 | 0.0384 | 27 | <0.3 | 94 |
| 104 | Glenview Rd. | N Branch Chicago River ³ | Center | 2.5 | 0.3 | 14 | 10 | 12,742 | 25 | 564 | 0.0431 | 11 | <0.3 | 67 |
| 34 | Dempster St. | N Branch Chicago River ³ | Side | 1.6 | 0.3 | 13 | 13 | 9,810 | 16 | 427 | 0.0408 | 11 | <0.3 | 55 |
| 34 | Dempster St. | N Branch Chicago River ³ | Center | 9.8 | 2.4 | 51 | 61 | 27,237 | 158 | 306 | 0.1369 | 30 | <0.3 | 341 |
| 96 | Albany Ave. ⁴ | N Branch Chicago River ³ | Side | 7.0 | 0.3 | 15 | 22 | 13,372 | 12 | 509 | <0.00002 | 17 | <0.3 | 41 |
| 35 | Central St. | North Shore Channel | Side | 1.5 | 0.9 | 23 | 72 | 13,613 | 63 | 367 | 0.1174 | 16 | <0.3 | 188 |
| 35 | Central St. | North Shore Channel | Center | 2.8 | 1.0 | 23 | 84 | 13,828 | 66 | 364 | 0.4357 | 16 | 1.0 | 189 |
| 102 | Oakton St. | North Shore Channel | Side | 5.2 | 1.4 | 41 | 36 | 21,512 | 40 | 516 | <0.00002 | 36 | <0.3 | 224 |
| 102 | Oakton St. | North Shore Channel | Center | 2.0 | 2.4 | 42 | 120 | 16,720 | 130 | 381 | 0.5775 | 25 | 1.4 | 360 |
| 36 | Touhy Ave. | North Shore Channel | Side | 1.3 | 5.0 | 31 | 64 | 7,730 | 59 | 183 | 0.1180 | 17 | <0.3 | 212 |
| 36 | Touhy Ave. | North Shore Channel | Center | 1.7 | 5.5 | 34 | 92 | 10,915 | 80 | 273 | 0.0188 | 24 | <0.3 | 252 |

TABLE 11 (Continued): TRACE METALS IN SEDIMENT COLLECTED FROM THE CHICAGO RIVER SYSTEM DURING 2005

| Station No. | Location | Waterway | Segment | (mg/kg dry weight) | | | | | | | | | | |
|-------------|----------------|-------------------------------------|---------|--------------------|-------|-----|-----|--------|-----|-----|--------|-----|------|-------|
| | | | | As | Cd | Cr | Cu | Fe | Pb | Mn | Hg | Ni | Ag | Zn |
| 101 | Foster Ave. | North Shore Channel | Side | 10.3 | 0.3 | 26 | 37 | 21,906 | 21 | 419 | 0.0287 | 27 | <0.3 | 64 |
| 101 | Foster Ave. | North Shore Channel | Center | 6.0 | 3.4 | 23 | 66 | 10,247 | 65 | 220 | 0.0361 | 13 | <0.3 | 246 |
| 37 | Wilson Ave. | N Branch Chicago River ³ | Side | 4.6 | 1.9 | 17 | 38 | 7,580 | 48 | 191 | 0.2586 | 13 | <0.3 | 125 |
| 37 | Wilson Ave. | N Branch Chicago River ³ | Center | 4.0 | 3.3 | 20 | 143 | 4,219 | 145 | 98 | 0.1355 | 8 | 1.2 | 267 |
| 73 | Diversey Pkwy. | N Branch Chicago River ³ | Side | <0.9 | 35.6 | 117 | 234 | 13,822 | 432 | 226 | 0.5612 | 91 | 20.3 | 742 |
| 73 | Diversey Pkwy. | N Branch Chicago River ³ | Center | <0.9 | 4.7 | 64 | 195 | 17,811 | 142 | 334 | 0.7335 | 30 | 5.7 | 504 |
| 46 | Grand Ave. | N Branch Chicago River ³ | Side | 1.9 | 121.9 | 581 | 453 | 20,608 | 883 | 329 | 1.4527 | 205 | 15.6 | 2,384 |
| 46 | Grand Ave. | N Branch Chicago River ³ | Center | 1.2 | 11.2 | 118 | 261 | 20,386 | 244 | 336 | 0.7912 | 45 | 8.5 | 967 |

¹West Fork North Branch Chicago River.

²Middle Fork North Branch Chicago River.

³North Branch Chicago River.

⁴No sediment sample was taken from the center of the waterway at Albany Avenue because there is a concrete bottom throughout the sampling reach.

TABLE 12: ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO RIVER SYSTEM DURING 2005

| Station No. | Location | Waterway | Segment | AVS ¹ | SEM ² | SEM/AVS | TOC ³ (mg/kg) | Particle Size (Percent) | | | |
|-------------|--------------------------|--|---------|------------------|------------------|---------|-----------------------------|-------------------------|--------|------|------|
| | | | | | | | | (μmoles/g) | Gravel | Sand | Silt |
| 106 | Dundee Rd. | W Fork N Branch Chgo. River ⁴ | Side | 0.514 | 0.983 | 1.91 | 46,200 | 9.1 | 70.5 | 14.3 | 6.1 |
| 106 | Dundee Rd. | W Fork N Branch Chgo. River ⁴ | Center | 1.42 | 1.63 | 1.15 | 15,400 | 0.0 | 95.6 | 4.1 | 0.2 |
| 103 | Golf Rd. | W Fork N Branch Chgo. River ⁴ | Side | 5.63 | 0.598 | 0.106 | 9,740 | 0.7 | 93.3 | 6.0 | 0.0 |
| 103 | Golf Rd. | W Fork N Branch Chgo. River ⁴ | Center | 6.30 | 0.618 | 0.098 | 13,300 | 24.1 | 73.4 | 2.5 | 0.0 |
| 31 | Lake-Cook Rd. | M Fork N Branch Chgo. River ⁵ | Side | 1.67 | 2.77 | 1.66 | 32,800 | 0.0 | 80.8 | 16.1 | 3.1 |
| 31 | Lake-Cook Rd. | M Fork N Branch Chgo. River ⁵ | Center | 8.63 | 0.727 | 0.084 | 20,600 | 2.6 | 89.1 | 6.0 | 2.3 |
| 32 | Lake-Cook Rd. | Skokie River | Side | 0.527 | 2.75 | 5.22 | 46,800 | 0.4 | 79.1 | 16.2 | 4.3 |
| 32 | Lake-Cook Rd. | Skokie River | Center | 0.785 | 1.06 | 1.34 | 19,300 | 0.0 | 85.8 | 14.2 | 0.0 |
| 105 | Frontage Rd. | Skokie River | Side | 2.53 | 0.403 | 0.159 | 52,900 | 1.1 | 63.2 | 31.7 | 4.0 |
| 105 | Frontage Rd. | Skokie River | Center | 33.6 | 1.06 | 0.031 | 36,000 | 0.0 | 85.8 | 14.2 | 0.0 |
| 104 | Glenview Rd. | North Branch Chicago River | Side | 5.32 | 1.83 | 0.343 | 43,900 | 60.8 | 36.9 | 2.4 | 0.0 |
| 104 | Glenview Rd. | North Branch Chicago River | Center | 1.73 | 0.325 | 0.188 | 19,300 | 9.8 | 86.8 | 2.5 | 1.0 |
| 34 | Dempster St. | North Branch Chicago River | Side | 35.7 | 0.595 | 0.017 | 19,400 | 0.0 | 81.5 | 13.6 | 4.9 |
| 34 | Dempster St. | North Branch Chicago River | Center | 117 | 4.33 | 0.037 | 106,000 | 4.8 | 85.7 | 0.0 | 9.5 |
| 96 | Albany Ave. ⁶ | North Branch Chicago River | Side | 0.893 | 0.374 | 0.550 | 47,300 | 1.1 | 61.6 | 34.8 | 2.5 |
| 35 | Central St. | North Shore Channel | Side | 0.642 | 2.12 | 0.954 | 43,300 | 7.9 | 67.0 | 22.1 | 3.0 |
| 35 | Central St. | North Shore Channel | Center | 39.7 | 1.47 | 0.037 | 25,400 | 0.0 | 62.8 | 33.5 | 3.7 |
| 102 | Oakton St. | North Shore Channel | Side | 28.4 | 0.387 | 0.014 | 8,630 | 24.6 | 74.1 | 0.0 | 1.5 |
| 102 | Oakton St. | North Shore Channel | Center | 0.409 | 2.61 | 6.39 | 87,400 | 0.0 | 54.1 | 39.9 | 5.9 |
| 36 | Touhy Ave. | North Shore Channel | Side | 58.5 | 1.98 | 0.034 | 51,000 | 13.1 | 85.7 | 0.0 | 1.2 |
| 36 | Touhy Ave. | North Shore Channel | Center | 0.456 | 0.180 | 0.370 | 44,200 | 6.7 | 90.9 | 0.0 | 2.4 |

TABLE 12 (Continued): ACID VOLATILE SULFIDE, SIMULTANEOUSLY EXTRACTED METALS, TOTAL ORGANIC CARBON, AND PARTICLE SIZE SEDIMENT DATA FROM THE CHICAGO RIVER SYSTEM DURING 2005

| Station No. | Location | Waterway | Segment | AVS ¹ | SEM ² | SEM/AVS | TOC ³ (mg/kg) | Particle Size (Percent) | | | |
|-------------|----------------|----------------------------|---------|------------------|------------------|---------|-----------------------------|-------------------------|------|------|------|
| | | | | | | | | Gravel | Sand | Silt | Clay |
| 101 | Foster Ave. | North Shore Channel | Side | 27.7 | 1.72 | 0.062 | 34,400 | 14.6 | 78.1 | 2.7 | 4.6 |
| 101 | Foster Ave. | North Shore Channel | Center | 28.6 | 1.70 | 0.059 | 29,000 | 0.1 | 97.8 | 0.0 | 2.0 |
| 37 | Wilson Ave. | North Branch Chicago River | Side | 95.2 | 3.73 | 0.039 | 35,500 | 2.0 | 95.2 | 0.5 | 2.3 |
| 37 | Wilson Ave. | North Branch Chicago River | Center | 0.400 | 0.917 | 2.29 | 6,170 | 0.0 | 89.4 | 9.7 | 0.8 |
| 73 | Diversey Pkwy. | North Branch Chicago River | Side | 104 | 22.2 | 0.213 | 66,500 | 0.0 | 89.4 | 9.7 | 0.8 |
| 73 | Diversey Pkwy. | North Branch Chicago River | Center | 1.98 | 7.23 | 3.65 | 103,000 | 0.0 | 76.2 | 21.5 | 2.3 |
| 46 | Grand Ave. | North Branch Chicago River | Side | 6.68 | 17.4 | 2.60 | 126,000 | 1.0 | 70.6 | 22.4 | 6.0 |
| 46 | Grand Ave. | North Branch Chicago River | Center | 75.4 | 5.74 | 0.076 | 125,000 | 1.0 | 68.2 | 22.5 | 8.3 |

¹Acid Volatile Sulfide.

²Simultaneously Extracted Metals.

³Total Organic Carbon.

⁴West Fork North Branch Chicago River.

⁵Middle Fork North Branch Chicago River.

⁶No sediment sample was taken from the center of the waterway at Albany Avenue because there is a concrete bottom throughout the sampling reach.

TABLE 13: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE WEST FORK NORTH BRANCH CHICAGO RIVER DURING 2005

| Compound ¹ | West Fork North Branch Chicago River | | | |
|----------------------------|--------------------------------------|----------|------------|----------|
| | 106 center | 106 side | 103 center | 103 side |
| Methylene chloride | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND |
| Anthracene | ND | ND | ND | ND |
| Benzo(a)anthracene | 647 | 607 | ND | ND |
| Benzo(a)pyrene | 964 | 568 | ND | 271 |
| 3,4-Benzofluoranthene | 1,468 | 598 | ND | 339 |
| Benzo(ghi)perylene | 564 | ND | ND | ND |
| Benzo(k)fluoranthene | 1,356 | 555 | ND | 389 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND |
| Chrysene | 1,222 | 741 | ND | 372 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND |
| Fluoranthene | 2,680 | 2,113 | 414 | 697 |
| Fluorene | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | 488 | 281 | ND | ND |
| Naphthalene | ND | ND | ND | ND |
| Phenanthrene | 897 | 1,066 | ND | ND |
| Pyrene | 2,085 | 1,593 | 340 | 551 |
| 4,4'-DDT | 11 | ND | ND | 176 |
| 4,4'-DDE | 16 | 8 | 20 | 25 |
| 4,4'-DDD | ND | 8 | 122 | 96 |
| Endrin aldehyde | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND = Not Detectable.

TABLE 14: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE MIDDLE FORK NORTH BRANCH CHICAGO RIVER AND SKOKIE RIVER DURING 2005

| Compound ¹ | Middle Fork North Branch Chicago River | | Skokie River | | | |
|----------------------------|---|---------|--------------|---------|------------|----------|
| | 31 center | 31 side | 32 center | 32 side | 105 center | 105 side |
| Methylene chloride | 25 | 22 | ND | 27 | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | 570 | ND | ND | ND | ND |
| Benzo(a)anthracene | 1,030 | 4,057 | ND | 1,426 | 885 | 556 |
| Benzo(a)pyrene | 1,314 | 4,969 | 232 | 1,840 | 1,045 | 714 |
| 3,4-Benzofluoranthene | 1,700 | 7,536 | 356 | 2,424 | 1,402 | 987 |
| Benzo(ghi)perylene | 713 | 2,847 | ND | ND | 433 | ND |
| Benzo(k)fluoranthene | 1,437 | 6,210 | 269 | 1,871 | 1,385 | 748 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND |
| Chrysene | 1,447 | 6,258 | 361 | 2,353 | 1,327 | 901 |
| Dibenzo(a,h)anthracene | ND | 333 | ND | ND | ND | ND |
| Fluoranthene | 3,211 | 13,466 | 917 | 5,505 | 2,654 | 1,700 |
| Fluorene | ND | ND | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | 711 | 3,320 | ND | 1,115 | 461 | ND |
| Naphthalene | ND | ND | ND | ND | ND | ND |
| Phenanthrene | 932 | 3,864 | 490 | 1,899 | 756 | 488 |
| Pyrene | 2,480 | 9,895 | 672 | 4,195 | 2,068 | 1,373 |
| 4,4'-DDT | 8 | 13 | ND | 15 | 44 | 32 |
| 4,4'-DDE | 18 | 29 | 13 | 35 | 120 | 53 |
| 4,4'-DDD | 40 | 86 | 44 | 66 | 703 | 220 |
| Endrin aldehyde | ND | ND | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND = Not Detectable.

TABLE 15: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE NORTH BRANCH CHICAGO RIVER DURING 2005

| Compound ¹ | North Branch Chicago River | | | |
|----------------------------|----------------------------|----------|-----------|---------|
| | 104 center | 104 side | 34 center | 34 side |
| Methylene chloride | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND |
| Anthracene | ND | ND | ND | ND |
| Benzo(a)anthracene | 450 | 1,018 | 478 | 1,219 |
| Benzo(a)pyrene | 437 | 1,159 | 505 | 1,793 |
| 3,4-Benzofluoranthene | 476 | 1,607 | 531 | 2,799 |
| Benzo(ghi)perylene | ND | 555 | 251 | 1,006 |
| Benzo(k)fluoranthene | 508 | 1,341 | 579 | 1,975 |
| Bis(2-ethylhexyl)phthalate | ND | ND | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND |
| Chrysene | 494 | 1,389 | 617 | 2,193 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND |
| Fluoranthene | 1,358 | 3,078 | 1,456 | 4,313 |
| Fluorene | ND | ND | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | 590 | 295 | 1,138 |
| Naphthalene | ND | ND | ND | ND |
| Phenanthrene | 707 | 1,187 | 764 | 1,239 |
| Pyrene | 1,097 | 2,426 | 1,140 | 3,285 |
| 4,4'-DDT | 9 | 70 | ND | 281 |
| 4,4'-DDE | 23 | 38 | 15 | 82 |
| 4,4'-DDD | 125 | 156 | 49 | 209 |
| Endrin aldehyde | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
 ND = Not Detectable.

TABLE 16: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE NORTH SHORE CHANNEL DURING 2005

| Compound ¹ | North Shore Channel | | | | | | |
|----------------------------|---------------------|---------|------------|----------|-----------|---------|------------|
| | 35 center | 35 side | 102 center | 102 side | 36 center | 36 side | 101 center |
| Methylene chloride | ND | ND | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | 1,438 | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | 1,119 | ND | ND |
| Anthracene | ND | ND | 902 | ND | 3,562 | 417 | 497 |
| Benzo(a)anthracene | 1,446 | 677 | 3,859 | ND | 9,924 | 1,488 | 1,977 |
| Benzo(a)pyrene | 1,492 | 817 | 4,595 | 257 | 9,500 | 1,455 | 1,887 |
| 3,4-Benzofluoranthene | 1,923 | 1,115 | 6,360 | 315 | 10,066 | 1,761 | 1,936 |
| Benzo(ghi)perylene | 564 | ND | 2,347 | ND | 4,474 | 474 | 660 |
| Benzo(k)fluoranthene | 1,713 | 1,030 | 5,743 | 273 | 8,632 | 1,409 | 1,901 |
| Bis(2-ethylhexyl)phthalate | ND | ND | 15,571 | ND | 8,549 | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND | 799 |
| Chrysene | 1,873 | 1,016 | 5,503 | 394 | 10,809 | 1,663 | 2,402 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | 1,246 | ND | ND |
| Fluoranthene | 4,269 | 2,026 | 10,563 | 840 | 21,963 | 2,738 | 4,389 |
| Fluorene | ND | ND | ND | ND | 1,709 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 689 | 424 | 2,301 | ND | 4,416 | 464 | 636 |
| Naphthalene | ND | ND | ND | ND | ND | ND | ND |
| Phenanthrene | 2,057 | 777 | 4,914 | 599 | 14,871 | 1,355 | 2,136 |
| Pyrene | 3,425 | 1,637 | 8,310 | 711 | 18,566 | 2,522 | 4,282 |
| 4,4'-DDT | 36 | 23 | 46 | 12 | ND | ND | 8 |
| 4,4'-DDE | 94 | 86 | 225 | 31 | 87 | 32 | 25 |
| 4,4'-DDD | 97 | 96 | 387 | 109 | 276 | 82 | 36 |
| Endrin aldehyde | ND | ND | ND | ND | 71 | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
 ND = Not Detectable.

TABLE 17: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE NORTH BRANCH CHICAGO RIVER DURING 2005

| Compound ¹ | North Branch Chicago River | | | | | |
|----------------------------|----------------------------|---------|-----------|---------|-----------|---------|
| | 37 center | 37 side | 73 center | 73 side | 46 center | 46 side |
| Methylene chloride | ND | ND | ND | ND | ND | ND |
| Toluene | ND | 21 | ND | ND | ND | ND |
| Acenaphthene | ND | ND | 75,687 | 902 | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND |
| Anthracene | 922 | ND | 135,456 | 2,390 | 3,393 | 2,420 |
| Benzo(a)anthracene | 3,393 | 674 | 198,987 | 9,490 | 9,948 | 7,255 |
| Benzo(a)pyrene | 3,454 | 679 | 182,236 | 10,734 | 10,498 | 8,054 |
| 3,4-Benzofluoranthene | 4,456 | 992 | 197,214 | 12,884 | 10,331 | 7,936 |
| Benzo(ghi)perylene | 1,435 | ND | 58,575 | 5,025 | 7,530 | 3,353 |
| Benzo(k)fluoranthene | 3,828 | 589 | 164,255 | 9,804 | 10,328 | 9,367 |
| Bis(2-ethylhexyl)phthalate | 8,895 | ND | 31,889 | 18,549 | 73,846 | 45,886 |
| Butylbenzyl phthalate | ND | ND | ND | 4,943 | ND | ND |
| Chrysene | 4,290 | 883 | 215,557 | 12,097 | 13,129 | 9,649 |
| Dibenzo(a,h)anthracene | 328 | ND | 20,315 | 1,407 | ND | 561 |
| Fluoranthene | 10,760 | 1,924 | 632,417 | 26,705 | 17,050 | 16,124 |
| Fluorene | 555 | ND | 74,240 | 1,103 | 1,823 | 1,333 |
| Indeno(1,2,3-cd)pyrene | 1,546 | ND | 65,412 | 5,704 | 5,863 | 3,191 |
| Naphthalene | ND | ND | 48,372 | ND | ND | ND |
| Phenanthrene | 7,155 | 698 | 691,027 | 13,954 | 15,762 | 10,936 |
| Pyrene | 8,060 | 1,606 | 523,517 | 21,507 | 16,151 | 16,473 |
| 4,4'-DDT | ND | ND | ND | 58 | 95 | ND |
| 4,4'-DDE | 12 | 16 | 75 | 79 | 91 | 754 |
| 4,4'-DDD | 17 | 22 | 230 | 131 | 131 | 333 |
| Endrin aldehyde | ND | ND | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.

ND = Not Detectable.

TABLE 18: TEN-DAY *CHIRONOMUS TENTANS* TOXICITY DATA FOR SEDIMENT COLLECTED FROM THE CHICAGO RIVER SYSTEM DURING 2005

| Station No. | Location | Waterway | Segment | <i>(Chironomus tentans 10-Day Test Data)</i> | |
|-------------|----------------------------|--|---------|--|--------------------------------|
| | | | | Survival (Percent) | Ash-free Dried Weight (mg/org) |
| 106 | Dundee Road | W Fork N Branch Chicago River ¹ | Side | 90 | 0.73 ^a |
| 106 | Dundee Road | W Fork N Branch Chicago River ¹ | Center | 93 | 1.42 |
| 103 | Golf Road | W Fork N Branch Chicago River ¹ | Side | 96 | 0.19 |
| 103 | Golf Road | W Fork N Branch Chicago River ¹ | Center | 95 | 1.20 |
| 31 | Lake-Cook Road | M Fork N Branch Chicago River ² | Side | 80 | 0.96 |
| 31 | Lake-Cook Road | M Fork N Branch Chicago River ² | Center | 86 | 1.20 |
| 32 | Lake-Cook Road | Skokie River | Side | 90 | 0.72 ^a |
| 32 | Lake-Cook Road | Skokie River | Center | 93 | 1.22 |
| 105 | Frontage Road | Skokie River | Side | 96 | 1.28 |
| 105 | Frontage Road | Skokie River | Center | 99 | 1.23 |
| 104 | Glenview Road | North Branch Chicago River | Side | 97 | 1.09 |
| 104 | Glenview Road | North Branch Chicago River | Center | 94 | 1.01 |
| 34 | Dempster Street | North Branch Chicago River | Side | 95 | 0.95 ^a |
| 34 | Dempster Street | North Branch Chicago River | Center | 94 | 1.19 |
| 96 | Albany Avenue ³ | North Branch Chicago River | Side | 80 ^a | 1.08 ^b |
| 35 | Central Street | North Shore Channel | Side | 96 | 1.47 |
| 35 | Central Street | North Shore Channel | Center | 96 | 1.35 |
| 102 | Oakton Street | North Shore Channel | Side | 80 | 1.62 |
| 102 | Oakton Street | North Shore Channel | Center | 79 | 1.16 |
| 36 | Touhy Avenue | North Shore Channel | Side | 95 | 1.25 |
| 36 | Touhy Avenue | North Shore Channel | Center | 94 | 1.23 |
| 101 | Foster Avenue | North Shore Channel | Side | 51 ^a | 0.17 ^b |
| 101 | Foster Avenue | North Shore Channel | Center | 94 | 1.40 |
| 37 | Wilson Avenue | North Branch Chicago River | Side | 93 | 1.44 |
| 37 | Wilson Avenue | North Branch Chicago River | Center | 84 | 0.93 |
| 73 | Diversey Parkway | North Branch Chicago River | Side | 49 ^a | 0.43 ^b |
| 73 | Diversey Parkway | North Branch Chicago River | Center | 86 | 0.98 |
| 46 | Grand Avenue | North Branch Chicago River | Side | 13 ^a | 0.13 ^b |
| 46 | Grand Avenue | North Branch Chicago River | Center | 93 | 0.88 |

^aSignificantly different than the West Bearskin Lake control results.

^bNot formally compared since survival data were statistically different.

¹West Fork North Branch Chicago River.

²Middle Fork North Branch Chicago River.

³No sediment sample was taken from the center of the waterway at Albany Avenue because there is a concrete bottom throughout the sampling reach.

weight and or *Chironomus* ash-free dried weight compared to the control sediment indicate that those sediments constitute an unsuitable habitat for optimal *Chironomus* growth.

Four out of the 30 sites sampled (15 stations, side and center) had percent survival rates that were significantly different than the control sites indicating that the sediment was unsuitable for *Chironomus* survival. Decreased survival rates occurred in side sediments from Diversey Parkway, Grand Avenue, and Albany Avenue on the North Branch Chicago River, and Foster Avenue on the North Shore Channel. Three additional sites sampled showed ash-free dried weight that was significantly different than control sites, indicating that these sediments are unsuitable for optimal *Chironomus* growth. Notably, all sediments that elicited decreased survival or growth during 2005 were from the side channel sediments. None of the center sediment samples showed a significant difference from the control.

Sediment chemistry analysis revealed that the side samples from Grand Avenue and Diversey Avenue contained very elevated cyanide concentrations of 9.294 and 9.665 mg/kg, respectively. Both stations also exhibited high OPP concentrations. None of the other sediments which elicited *Chironomus* toxicity showed any unusual chemical characteristics.

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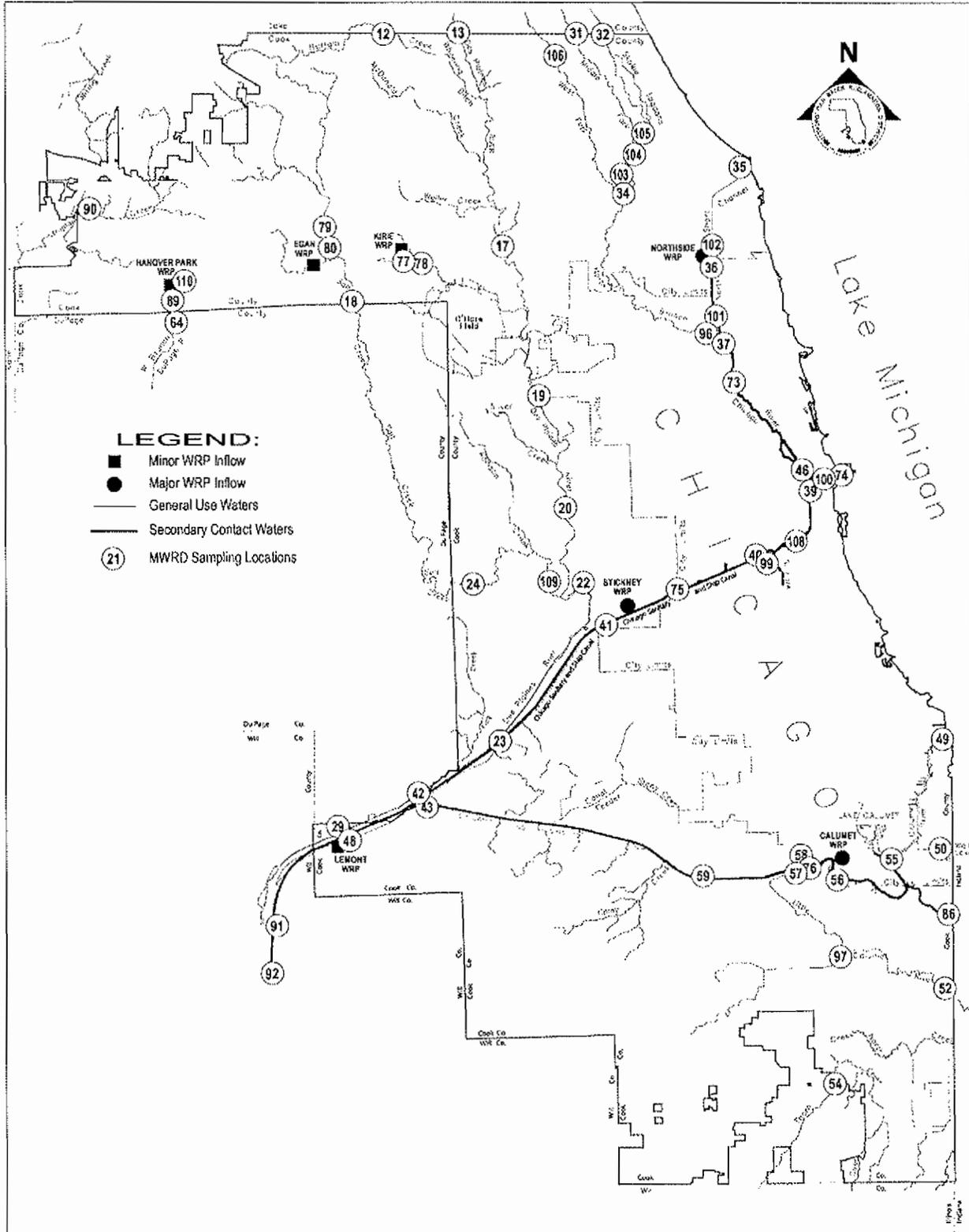
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Attachment 3

AMBIENT WATER QUALITY MONITORING PROGRAM SAMPLE STATIONS



Attachment 4

LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE
AMBIENT WATER QUALITY MONITORING PROGRAM

| Volatile Organic Compounds | Acid Extractables | Base/Neutral Extractables | Pesticides and PCBs |
|-------------------------------|-----------------------|------------------------------|---------------------|
| Acrolein | 2-Chlorophenol | Acenaphthene | Aldrin |
| Acrylonitrile | 2,4-Dichlorophenol | Acenaphthylene | a-BHC-alpha |
| Benzene | 2,4-Dimethylphenol | Anthracene | b-BHC-beta |
| Bromoform | 4,6-Dinitro-o-cresol | Benzidine | BHC-gamma |
| Carbon tetrachloride | 2,4-Dinitrophenol | Benzo(a)anthracene | BHC-delta |
| Chlorobenzene | 2-Nitrophenol | Benzo(a)pyrene | Chlordane |
| Chlorodibromomethane | 4-Nitrophenol | 3,4-Benzofluoranthene | 4,4'-DDT |
| Chloroethane | Parachlorometacresol | Benzo(ghi)perylene | 4,4'-DDE |
| 2-Chloroethylvinyl ether | Pentachlorophenol | Benzo(k)fluoranthene | 4,4'-DDD |
| Chloroform | Phenol | Bis(2-chloroethoxy)methane | Dieldrin |
| Dichlorobromomethane | 2,4,6-Trichlorophenol | Bis(2-chloroethyl)ether | a-Endosulfan-alpha |
| 1,1-Dichloroethane | | Bis(2-chloroisopropyl)ether | b-Endosulfan-beta |
| 1,2-Dichloroethane | | Bis(2-ethylhexyl)phthalate | Endosulfan sulfate |
| 1,1-Dichloroethylene | | 4-Bromophenyl phenyl ether | Endrin |
| 1,2-Dichloropropane | | Butylbenzyl phthalate | Endrin aldehyde |
| 1,3-Dichloropropene | | 2-Chloronaphthalene | Heptachlor |
| Ethyl benzene | | 4-Chlorophenyl phenyl ether | Heptachlor epoxide |
| Methyl bromide | | Chrysene | PCB-1242 |
| Methyl chloride | | Dibenzo(a,h)anthracene | PCB-1254 |
| Methylene chloride | | 1,2-Dichlorobenzene | PCB-1221 |
| 1,1,2,2-Tetrachloroethane | | 1,3-Dichlorobenzene | PCB-1232 |
| Tetrachloroethylene | | 1,4-Dichlorobenzene | PCB-1248 |
| Toluene | | 3,3'-Dichlorobenzidine | PCB-1260 |

LIST OF ORGANIC PRIORITY POLLUTANTS ANALYZED IN SEDIMENT SAMPLES COLLECTED FOR THE
 AMBIENT WATER QUALITY MONITORING PROGRAM (Continued)

| Volatile Organic Compounds | Acid Extractables | Base/Neutral Extractables | Pesticides and PCBs |
|-------------------------------|----------------------|------------------------------|---------------------|
| 1,2-trans-Dichloroethylene | | Diethyl phthalate | PCB-1016 |
| 1,1,1-Trichloroethane | | Dimethyl phthalate | Toxaphene |
| 1,1,2-Trichloroethane | | Di-n-butyl phthalate | |
| Trichloroethylene | | 2,4-Dinitrotoluene | |
| Vinyl chloride | | 2,6-Dinitrotoluene | |
| Trichlorofluoromethane | | Di-n-octyl phthalate | |
| | | 1,2-Diphenylhydrazine | |
| | | Fluoranthene | |
| | | Fluorene | |
| | | Hexachlorobenzene | |
| | | Hexachlorobutadiene | |
| | | Hexachlorocyclopentadiene | |
| | | Hexachloroethane | |
| | | Indeno(1,2,3-cd)pyrene | |
| | | Isophorone | |
| | | Naphthalene | |
| | | Nitrobenzene | |
| | | N-Nitrosodimethylamine | |
| | | N-Nitrosodi-n-propylamine | |
| | | N-Nitrosodiphenylamine | |
| | | Phenanthrene | |
| | | Pyrene | |
| | | 1,2,4-Trichlorobenzene | |

Attachment 5

2002 - 2006 Sediment Data

| Waterway | Station | | Sample | | | | | | | | | | | | | | | | | |
|---------------------------------|---------|------------------|--------|-----------------|-----------------|------------------|--------------|-------------|-----------|-----------|-----------|---------|----------|-----------------------------|---|--------------|-------------------|-----------------|-----------------|--------|
| | # | Location | Date | AVS umoles/g | SEM umoles/g | SEM/AVS ratio | TOC mg/kg | gravel % | sand % | silt % | clay % | TS % | VTS % | NH ₃ -N mg/kg | NO ₂ +NO ₃ mg/kg | TKN mg/kg | Tot Phos mg/kg | Phenol mg/kg | Tot CN mg/kg | |
| Cal-Sag Channel | 43 | Route 83 | Center | 7/30/2003 | 28.83 | 11.30 | 0.39 | 86,000 | 0.0 | 12.0 | 63.0 | 25.0 | 40.9 | 9 | 175 | 0.88 | 3,034 | 7,471 | 2,059 | 0.232 |
| Cal-Sag Channel | 43 | Route 83 | Side | 7/30/2003 | 43.80 | 24.20 | 0.55 | 43,000 | 1.0 | 9.0 | 42.0 | 48.0 | 49.9 | 8 | 65 | 1.04 | 2,473 | 4,706 | 3,136 | 0.122 |
| Cal-Sag Channel | 58 | Ashland Avenue | Center | 9/5/2003 | 27.04 | 17.02 | 0.63 | 1,300 | 0.0 | 36.0 | 55.0 | 9.0 | 40.7 | 10 | 210 | 1.57 | 3,476 | 3,056 | 3,301 | 0.317 |
| Cal-Sag Channel | 58 | Ashland Avenue | Side | 9/5/2003 | 56.26 | 30.22 | 0.54 | 440 | 0.0 | 70.0 | 27.0 | 3.0 | 56.2 | 5 | 59 | 1.94 | 1,694 | 1,761 | 2,852 | 0.226 |
| Cal-Sag Channel | 59 | Cicero Avenue | Center | 7/31/2003 | 12.00 | 8.53 | 0.71 | 37,000 | 1.0 | 22.0 | 58.0 | 19.0 | 48.9 | 15 | 57 | 1.31 | 2,371 | 3,760 | 1,627 | 0.198 |
| Cal-Sag Channel | 59 | Cicero Avenue | Side | 7/31/2003 | 40.80 | 25.27 | 0.62 | 23,000 | 0.0 | 51.0 | 38.0 | 11.0 | 57.5 | 7 | 30 | 0.89 | 1,599 | 5,393 | 2,168 | 0.282 |
| Calumet River | 49 | Ewing Avenue | Side | 8/1/2003 | 3.36 | 4.05 | 1.21 | 25,000 | 9.0 | 58.0 | 22.0 | 11.0 | 62.3 | 5 | 25 | 1.24 | 971 | 387 | 0.586 | 0.156 |
| Calumet River | 55 | 130th Street | Center | 8/8/2003 | 0.24 | 5.51 | 22.96 | 33,000 | 0.0 | 40.0 | 41.0 | 19.0 | 45.7 | NA | 27 | 1.52 | 1,472 | 617 | 0.593 | 0.123 |
| Calumet River | 55 | 130th Street | Side | 8/8/2003 | BDL | 0.95 | ND | 6,100 | 1.0 | 84.0 | 12.0 | 3.0 | 65.2 | NA | 14 | 1.79 | 410 | 214 | 0.072 | 0.031 |
| Chicago River | 74 | Lake Shore Drive | Center | 8/2/2002 | 7.23 | 7.70 | 1.07 | 51,900 | 1.5 | 27.4 | 38.2 | 32.8 | 34.5 | 14 | 38 | 0.00 | 3,901 | 2,750 | 0.016 | 1.690 |
| Chicago River | 74 | Lake Shore Drive | Side | 8/2/2002 | <4.72 | 10.66 | ND | 43,000 | 6.3 | 41.7 | 26.3 | 25.7 | 50.2 | 15 | 8 | 0.00 | 2,279 | 1,370 | 0.008 | 0.532 |
| Chicago River | 74 | Lake Shore Drive | Side | 7/26/2006 | 24.6 | 204 | 8.29 | ND | 2 | 91.5 | 3.4 | 3.1 | 43.6 | 8 | 30 | 7.23 | 1328 | 760 | 0.229 | 0.135 |
| Chicago River | 74 | Lake Shore Drive | Center | 7/26/2006 | ND | 69.2 | ND | 0 | 66.5 | 27.8 | 5.7 | 39.2 | 8 | 56 | 10.61 | 2818 | 2172 | 0.276 | 0.452 | |
| Chicago River | 100 | Wells St. | Center | 8/21/2002 | 16.20 | 13.07 | 0.81 | 46,900 | 8.7 | 38.3 | 30.6 | 22.4 | 42.6 | 9 | 47 | 0.00 | 3,282 | 2,106 | 0.011 | 0.695 |
| Chicago River | 100 | Wells St. | Side | 8/21/2002 | 11.80 | 12.02 | 1.02 | 58,900 | 0.0 | 7.4 | 47.8 | 44.9 | 39.2 | 10 | 76 | 0.00 | 3,714 | 2,274 | 0.012 | 1.678 |
| Chicago River | 100 | Wells St. | Side | 7/27/2006 | 51.8 | 395 | 7.63 | ND | 0.7 | 91.4 | 5.4 | 2.5 | 45 | 7 | 32 | 9.11 | 1520 | 2011 | 0.227 | 0.204 |
| Chicago River | 100 | Wells St. | Center | 7/27/2006 | 8.3 | 62.1 | 7.48 | ND | 0 | 73 | 19.3 | 7.7 | 30.8 | 13 | 161 | 19.26 | 4200 | 4069 | 0.39 | 1.186 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Center | 8/19/2002 | 16.40 | 12.31 | 0.75 | 124,000 | 0.1 | 27.1 | 50.6 | 23.2 | 41.1 | 15 | 96 | NA | 3,165 | 4,100 | 0.022 | 2.614 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Side | 8/19/2002 | 8.66 | 9.22 | 1.06 | 99,800 | 3.8 | 28.2 | 45.6 | 22.4 | 40.6 | 15 | 95 | NA | 3,797 | 4,234 | 0.020 | 3.397 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Side | 8/2/2006 | 1.2 | 25.3 | 21.08 | ND | 0 | 53.1 | 42.4 | 4.5 | 32.5 | 14 | 139 | 0 | 4165 | 4607 | 0.495 | 1.135 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Center | 8/2/2006 | 3.8 | 33.3 | 8.76 | ND | 0.6 | 65.4 | 30 | 4 | 28.2 | 16 | 259 | 0.86 | 5739 | 5471 | 0.482 | 1.206 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Center | 9/3/2002 | 8.23 | 3.77 | 0.46 | 36,000 | 16.5 | 74.3 | 4.9 | 4.2 | 69.5 | 6 | 15 | NA | 638 | 675 | 0.007 | 0.906 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Side | 9/3/2002 | <2.99 | 2.21 | ND | 33,700 | 15.9 | 75.2 | 3.9 | 5.1 | 75.8 | 4 | 6 | NA | 629 | 687 | 0.004 | 0.492 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Side | 8/4/2006 | 4 | 22.6 | 5.65 | ND | 0.8 | 90.3 | 7.2 | 1.7 | 65.2 | 5 | 52 | 0 | 797 | 803 | 0.167 | 3.968 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Center | 8/4/2006 | 3.4 | 29.8 | 3.55 | ND | 2 | 91.7 | 4.3 | 2 | 53.9 | 10 | 92 | 0 | 1438 | 1811 | 0.141 | 0.477 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Center | 8/29/2002 | 12.00 | 11.36 | 0.95 | 86,100 | 1.8 | 63.5 | 19.9 | 14.8 | 54.4 | 14 | 13 | NA | 2,109 | 2,595 | 0.013 | 3.337 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Side | 8/29/2002 | <2.98 | 3.64 | ND | 43,100 | 3.1 | 80.2 | 7.8 | 8.9 | 78.4 | 7 | 39 | NA | 590 | 505 | 0.007 | 0.191 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Side | 8/4/2006 | 3.6 | 19.2 | 5.33 | ND | 0.8 | 82.2 | 15.2 | 1.8 | 55.5 | 7 | 76 | 0.1 | 1203 | 1252 | 0.2 | 0.483 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Center | 8/4/2006 | 6.7 | 29.9 | 4.46 | ND | 0.1 | 70.6 | 23.5 | 5.8 | 47.1 | 12 | 65 | 0.06 | 1788 | 2047 | 0.193 | 0.545 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Center | 9/11/2002 | 30.10 | 10.94 | 0.36 | 64,500 | 2.3 | 56.6 | 24.6 | 16.6 | 53.9 | 10 | 4 | 0.39 | 2,421 | NA | 0.007 | 4.198 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Side | 9/11/2002 | 7.11 | 3.15 | 0.44 | 40,000 | 0.7 | 85.9 | 6.5 | 7.0 | 68.0 | 7 | 2 | 0.25 | 839 | 1,318 | 0.005 | 0.848 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Side | 7/25/2006 | 18.2 | 110 | 6.04 | ND | 1.9 | 92.2 | 3.8 | 2.1 | 56.2 | 13 | 19 | 2.3 | 851 | 1435 | 0.311 | 0.58 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Center | 7/25/2006 | 5.6 | 141 | 25.18 | ND | 0.3 | 81 | 15.1 | 3.6 | 26.4 | 16 | 210 | 9.97 | 4146 | 4760 | 1.069 | 8.442 |
| Grand Calumet River | 86 | Burnham Avenue | Center | 9/3/2003 | 55.43 | 7.84 | 0.14 | 1,000 | 0.0 | 85.0 | 12.0 | 3.0 | 49.6 | 10 | 142 | 8.43 | 3,507 | 3,855 | 1.911 | 0.256 |
| Grand Calumet River | 86 | Burnham Avenue | Side | 9/3/2003 | 273.40 | 6.27 | 0.02 | 3,900 | 0.0 | 60.6 | 37.0 | 3.0 | 21.9 | 24 | 84 | 4.49 | 8,494 | 5,923 | 3.342 | 0.412 |
| Higgins Creek | 77 | Elmhurst Rd. | center | 7/20/2004 | 12.00 | 1.33 | 0.11 | 32,700 | 14.0 | 49.0 | 19.0 | 18.0 | 70.5 | 4 | 52 | 8.38 | 1,189 | 385 | 0.074 | 0.109 |
| Higgins Creek | 77 | Elmhurst Rd. | side | 7/20/2004 | 14.00 | 3.11 | 0.22 | 47,900 | 4.0 | 30.0 | 44.0 | 22.0 | 56.5 | 6 | 41 | 2.95 | 1,611 | 391 | 0.083 | 0.133 |
| Little Calumet River | 52 | Wentworth Avenue | Side | 9/4/2003 | 38.05 | 4.82 | 0.13 | 930 | 8.0 | 42.0 | 45.0 | 5.0 | 45.6 | 10 | 99 | 0.88 | 3,429 | 1,920 | 1.170 | 0.272 |
| Little Calumet River | 56 | Indiana Avenue | Center | 7/14/2003 | 7.31 | 4.62 | 0.63 | 24,000 | 1.0 | 26.0 | 59.0 | 14.0 | 44.3 | 8 | 64 | 1.15 | 2,070 | 1,796 | 0.458 | 0.120 |
| Little Calumet River | 56 | Indiana Avenue | Side | 7/14/2003 | 32.60 | 17.85 | 0.55 | 9,800 | 12.0 | 70.0 | 15.0 | 3.0 | 61.7 | 4 | 12 | 1.41 | 619 | 824 | 0.424 | 0.088 |
| Little Calumet River | 57 | Ashland Avenue | Side | 8/13/2003 | 3.81 | 6.06 | 1.59 | 24,000 | 14.0 | 44.0 | 36.0 | 6.0 | 27.5 | NA | 36 | 2.28 | 1,948 | 1,845 | 0.316 | 0.178 |
| Little Calumet River | 76 | Halsted Street | Center | 7/9/2003 | 12.07 | 6.65 | 0.55 | 17,000 | 0.0 | 35.0 | 53.0 | 11.0 | 68.6 | 19 | 40 | 1.64 | 1,664 | 1,173 | 0.325 | 0.124 |
| Little Calumet River | 76 | Halsted Street | Side | 7/9/2003 | 7.67 | 4.38 | 0.57 | 7,100 | 5.0 | 85.0 | 7.0 | 3.0 | 78.5 | 3 | 6 | 1.28 | 250 | 361 | 0.414 | 0.043 |
| North Branch Chicago River | 37 | Wilson Ave. | Center | 7/27/2005 | 0.4 | 0.917 | 2.29 | 6,170 | 0 | 89.4 | 9.7 | 0.8 | 72.7 | 2 | 5 | 1.15 | 128 | 227 | 0.059 | 0.127 |
| North Branch Chicago River | 37 | Wilson Ave. | Side | 7/27/2005 | 95.2 | 3.73 | 0.04 | 35,500 | 2 | 95.2 | 0.5 | 2.3 | 55.4 | 10 | 18 | 2.72 | 745 | 355 | 0.083 | 0.108 |
| North Branch Chicago River | 46 | Grand Ave. | Center | 7/18/2005 | 75.4 | 5.74 | 0.08 | 125,000 | 1 | 68.2 | 22.5 | 8.3 | 28.8 | 18 | 285 | 13.43 | 6087 | 3988 | 0.163 | 0.979 |
| North Branch Chicago River | 46 | Grand Ave. | Side | 7/18/2005 | 6.68 | 17.4 | 2.60 | 126,000 | 1 | 70.6 | 22.4 | 6 | 41.2 | 13 | 186 | 11.83 | 4021 | 4174 | 0.129 | 9.294 |
| North Branch Chicago River | 73 | Diversey Parkway | Center | 7/28/2005 | 1.98 | 7.23 | 3.65 | 103,000 | 0 | 76.2 | 21.5 | 2.3 | 13.6 | 19 | 519 | 35.99 | 16617 | 7981 | 0.448 | 8.816 |
| North Branch Chicago River | 73 | Diversey Parkway | Side | 7/28/2005 | 104 | 22.2 | 0.21 | 66,500 | 0 | 89.4 | 9.7 | 0.8 | 20.9 | 34 | 215 | 21.38 | 12311 | 7092 | 0.700 | 9.665 |
| North Shore Channel | 35 | Central St. | Side | 7/7/2005 | 0.642 | 2.12 | 3.30 | 43,300 | 7.9 | 67 | 22.1 | 3 | 38.7 | 7 | 21 | 4.44 | 2044 | 425 | 0.147 | 0.145 |
| North Shore Channel | 35 | Central St. | Center | 7/7/2005 | 39.7 | 1.47 | 0.04 | 25,400 | 0 | 62.8 | 33.5 | 3.7 | 31.7 | 9 | 21 | 6.33 | 2523 | 572 | 0.145 | 0.117 |
| North Shore Channel | 36 | Touhy Ave. | Side | 7/21/2005 | 58.5 | 1.98 | 0.03 | 51,000 | 13.1 | 85.7 | 0 | 1.2 | 76.8 | 5 | 30 | 1.88 | 642 | 381 | 0.049 | 0.022 |
| North Shore Channel | 36 | Touhy Ave. | Center | 7/21/2005 | 0.456 | 0.18 | 0.39 | 44,200 | 6.7 | 90.9 | 0 | 2.4 | 70.0 | 7 | 37 | 1.68 | 433 | 123 | 0.051 | 0.026 |
| North Shore Channel | 101 | Foster Ave. | Center | 7/27/2005 | 28.6 | 1.7 | 0.06 | 29,000 | 0.1 | 97.3 | 0 | 2 | 65.6 | 5 | 12 | 2.60 | 981 | 514 | 0.064 | 0.000 |
| North Shore Channel | 101 | Foster Ave. | Side | 7/27/2005 | 27.7 | 1.72 | 0.06 | 34,400 | 14.6 | 78.1 | 2.7 | 4.6 | 81.1 | 2 | 20 | 3.47 | 336 | 136 | 0.027 | 0.000 |
| North Shore Channel | 102 | Oakton St. | Side | 7/20/2005 | 28.4 | 0.387 | 0.01 | 8,630 | 24.6 | 74.1 | 0 | 1.5 | 32.9 | 11 | 12 | 2.89 | 422 | 159 | 0.398 | 0.040 |
| North Shore Channel | 102 | Oakton St. | Center | 7/20/2005 | 0.409 | 2.61 | 6.38 | 37,400 | 0 | 54.1 | 39.9 | 5.9 | 41.0 | 15 | 156 | 6.66 | 1248 | 559 | 0.120 | 0.093 |
| South Branch Chicago River | 39 | Madison St. | Center | 8/27/2002 | <6.73 | 9.45 | ND | 63,000 | 0.9 | 32.1 | 39.0 | 28.0 | 34.0 | 14 | 35 | 0.00 | 3,231 | 3,451 | 0.029 | 1.658 |
| South Branch Chicago River | 39 | Madison St. | Side | 7/28/2006 | 11.6 | 1030 | 88.79 | ND | 4.9 | 79.4 | 11.5 | 4.2 | 8.2 | 23 | 227 | 0 | 5407 | 19994 | 1.213 | 2.745 |
| South Branch Chicago River | 39 | Madison St. | Center | 7/28/2006 | 68.9 | 850 | 12.34 | ND | 2.8 | 85.3 | 7.1 | 4.8 | 44 | 11 | 60 | 0 | 1213 | 7173 | 0.239 | 8.839 |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/26/2002 | 9.84 | 5.35 | 0.54 | 47,200 | 35.8 | 48.5 | 8.3 | 7.4 | 56.6 | 11 | 6 | 0.00 | 1,317 | 1,383 | 0.012 | 2.988 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/26/2002 | 6.51 | 5.84 | 0.90 | 43,400 | 1.8 | 70.4 | 17.9 | 9.9 | 55.1 | 9 | 8 | 0.00 | 847 | 938 | 0.006 | 0.481 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/2/2006 | 4.3 | 2.87 | 0.67 | ND | 1.6 | 66.1 | 25.9 | 6.4 | 59.5 | 5 | 33 | 0.51 | 1352 | 494 | 0.144 | 15.585 |

2002 - 2006 Sediment Data

| Waterway | Station | | Sample | | AVS umoles/g | SEM umoles/g | SEM/AVS ratio | TOC mg/kg | gravel % | sand % | silt % | clay % | TS % | VTS % | NH ₃ -N mg/kg | NO ₂ -NO ₃ mg/kg | TKN mg/kg | Tot Phos mg/kg | Phenol mg/kg | Tot CN mg/kg |
|---------------------------------------|---------|----------------|--------|-----------|-----------------|-----------------|------------------|--------------|-------------|-----------|-----------|-----------|---------|----------|-----------------------------|---|--------------|-------------------|-----------------|-----------------|
| | # | Location | Date | | | | | | | | | | | | | | | | | |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/2/2006 | 1.8 | 10.2 | 5.67 | ND | 14.1 | 69.5 | 13.7 | 2.7 | 53.8 | 14 | 60 | 0 | 1414 | 1639 | 0.188 | 1.871 |
| South Fork South Branch Chicago River | 99 | Archer Ave. | Center | 8/22/2002 | 80.50 | 13.57 | 0.17 | 84,200 | 0.2 | 47.9 | 35.6 | 16.3 | 35.3 | 18 | 228 | NA | 4,790 | 2,636 | 0.033 | 2.704 |
| South Fork South Branch Chicago River | 99 | Archer Ave | Side | 8/22/2002 | 124.00 | 10.41 | 0.08 | 71,700 | 0.3 | 53.4 | 31.1 | 15.3 | 38.0 | 15 | 353 | NA | 4,151 | 2,415 | 0.022 | 1.616 |
| South Fork South Branch Chicago River | 99 | Archer Ave. | Side | 8/2/2006 | 8.3 | 29.3 | 3.53 | ND | 4.9 | 73.5 | 17.8 | 3.8 | 34 | 17 | 343 | 0.51 | 3808 | 3420 | 0.367 | 0.805 |
| South Fork South Branch Chicago River | 99 | Archer Ave. | Center | 8/2/2006 | 4.6 | 65.7 | 14.28 | ND | 14.8 | 77.1 | 5.9 | 2.2 | 40.3 | 25 | 187 | 0 | 2196 | 1756 | 0.286 | 0.986 |
| Wolf Lake | 50 | Burnham Avenue | Center | 7/1/2003 | 24.98 | 2.12 | 0.08 | 5,800 | 2.0 | 84.0 | 11.0 | 3.0 | 36.2 | 8 | 7 | 0.64 | 492 | 91 | 0.116 | 0.149 |
| Wolf Lake | 50 | Burnham Avenue | Side | 7/1/2003 | 12.50 | 3.48 | 0.28 | 120,000 | 10.0 | 12.0 | 75.0 | 3.0 | 67.5 | 3 | 13 | 1.28 | 1,411 | 121 | 0.033 | 0.068 |

2002 - 2006 Sediment Data

| Waterway | Station | | Sample | | | | | | | | | | | | |
|---------------------------------|---------|------------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------|
| | # | Location | Date | As mg/kg | Cd mg/kg | Cr mg/kg | Cu mg/kg | Fe mg/kg | Pb mg/kg | Mn mg/kg | Hg mg/kg | Ni mg/kg | Ag mg/kg | Zn mg/kg | |
| Cal-Sag Channel | 43 | Route 83 | Center | 7/30/2003 | <1 | 3.9 | 91 | 81 | 34,216 | 223 | 595 | 0.3160 | 34 | 2.3 | 785 |
| Cal-Sag Channel | 43 | Route 83 | Side | 7/30/2003 | <1 | 5.8 | 114 | 84 | 36,406 | 337 | 509 | 0.3490 | 42 | 2.1 | 1,359 |
| Cal-Sag Channel | 58 | Ashland Avenue | Center | 9/5/2003 | <1 | 1.6 | 49 | 71 | 22,218 | 139 | 495 | 0.2770 | 26 | 1.2 | 465 |
| Cal-Sag Channel | 58 | Ashland Avenue | Side | 9/5/2003 | <1 | 2.3 | 61 | 67 | 21,773 | 218 | 398 | 0.4010 | 30 | 1.0 | 456 |
| Cal-Sag Channel | 59 | Cicero Avenue | Center | 7/31/2003 | <1 | 2.0 | 54 | 71 | 23,923 | 184 | 474 | 0.2120 | 23 | 1.1 | 628 |
| Cal-Sag Channel | 59 | Cicero Avenue | Side | 7/31/2003 | <1 | 4.0 | 76 | 79 | 31,211 | 278 | 529 | 0.3300 | 28 | 1.8 | 1,322 |
| Calumet River | 49 | Ewing Avenue | Side | 8/1/2003 | <1 | 0.9 | 36 | 64 | 51,809 | 112 | 894 | 0.0612 | 26 | 0.7 | 296 |
| Calumet River | 55 | 130th Street | Center | 8/8/2003 | <1 | 1.5 | 61 | 61 | 32,459 | 137 | 929 | 0.0839 | 37 | 0.5 | 514 |
| Calumet River | 55 | 130th Street | Side | 8/8/2003 | <1 | 0.3 | 15 | 12 | 12,246 | 56 | 503 | 0.0668 | 10 | 0.4 | 139 |
| Chicago River | 74 | Lake Shore Drive | Center | 8/2/2002 | <1 | 8.3 | 105 | 247 | 22,861 | 258 | 377 | 0.5600 | 43 | 4.8 | 701 |
| Chicago River | 74 | Lake Shore Drive | Side | 8/2/2002 | <1 | 2.9 | 61 | 115 | 21,727 | 143 | 374 | 0.6000 | 31 | <0.1 | 345 |
| Chicago River | 74 | Lake Shore Drive | Side | 7/26/2006 | <5 | 1.2 | 33.7 | 51 | 21,520 | 67.3 | 329.7 | 0.673 | 22.6 | < 0.2 | 184.1 |
| Chicago River | 74 | Lake Shore Drive | Center | 7/26/2006 | <5 | 3.8 | 65.1 | 136.5 | 19,489 | 209.5 | 344.2 | 3.738 | 26.9 | 1.2 | 408.1 |
| Chicago River | 100 | Wells St. | Center | 8/21/2002 | <1 | 6.5 | 99 | 284 | 33,700 | 996 | 367 | 0.9200 | 38 | 0.6 | 685 |
| Chicago River | 100 | Wells St. | Side | 8/21/2002 | <1 | 15.4 | 177 | 233 | 27,800 | 808 | 366 | 0.9800 | 63 | 9.7 | 666 |
| Chicago River | 100 | Wells St. | Side | 7/27/2006 | <5 | 1.9 | 60.5 | 103 | 26,776 | 1255 | 356.8 | 0.512 | 15.5 | < 0.2 | 416.7 |
| Chicago River | 100 | Wells St. | Center | 7/27/2006 | <5 | 8.2 | 101.7 | 237.3 | 23,916 | 272.1 | 347.6 | 2.034 | 34.7 | 6 | 691.2 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Center | 8/19/2002 | <1 | 8.4 | 131 | 250 | 25,100 | 443 | 363 | 0.9900 | 58 | 3.7 | 825 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Side | 8/19/2002 | <1 | 10.3 | 157 | 244 | 23,700 | 439 | 346 | 0.6500 | 60 | 4.9 | 810 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Side | 8/2/2006 | <5 | 9.7 | 112.2 | 255.3 | 19,759 | 393.5 | 323.6 | 2.209 | 38.4 | 6.2 | 845.6 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Center | 8/2/2006 | <5 | 9 | 115.1 | 220.7 | 21,465 | 389.7 | 324.7 | 1.619 | 42.5 | 5.3 | 757.9 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Center | 9/3/2002 | <1 | 5.8 | 92 | 123 | 20,467 | 110 | 261 | 0.3900 | 99 | <0.1 | 440 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Side | 9/3/2002 | <1 | 2.4 | 46 | 54 | 18,314 | 49 | 301 | 0.1400 | 77 | <0.1 | 254 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Side | 8/4/2006 | <5 | 9.8 | 103.7 | 125.2 | 19,196 | 264.5 | 219.9 | 0.929 | 83.2 | 0.2 | 510.3 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Center | 8/4/2006 | <5 | 6.2 | 70 | 223.1 | 19,538 | 138.2 | 218.2 | 0.749 | 71 | < 0.2 | 530.1 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Center | 8/29/2002 | <1 | 10.2 | 293 | 399 | 28,648 | 270 | 408 | 0.7500 | 88 | <0.1 | 926 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Side | 8/29/2002 | <1 | 2.2 | 75 | 100 | 49,047 | 133 | 354 | 0.2700 | 55 | <0.1 | 215 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Side | 8/4/2006 | <5 | 7.9 | 130.5 | 189 | 20,999 | 230.8 | 310.4 | 0.876 | 56.3 | 0.6 | 512.9 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Center | 8/4/2006 | <5 | 9.7 | 162.1 | 189.5 | 22,339 | 219.4 | 285.5 | 1.212 | 79.8 | 1.7 | 565.7 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Center | 9/1/2002 | <1 | 11.2 | 146 | 125 | 22,623 | 140 | 392 | 0.5300 | 68 | <0.1 | 615 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Side | 9/1/2002 | <1 | 11.1 | 146 | 126 | 22,329 | 139 | 392 | 0.2500 | 68 | <0.1 | 613 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Side | 7/25/2006 | <5 | 1.9 | 26.7 | 34.7 | 12,714 | 76 | 307.3 | 0.75 | 23.4 | < 0.2 | 216 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Center | 7/25/2006 | <5 | 9.5 | 129.2 | 143.7 | 21,000 | 174.3 | 342.5 | 3.963 | 44.8 | 0.8 | 615.4 |
| Grand Calumet River | 86 | Burnham Avenue | Center | 9/3/2003 | <1 | 6.1 | 116 | 224 | 16,395 | 340 | 209 | 1.0910 | 30 | 4.2 | 1,097 |
| Grand Calumet River | 86 | Burnham Avenue | Side | 9/3/2003 | <1 | 13.4 | 232 | 637 | 35,469 | 669 | 734 | 1.9070 | 49 | 10.0 | 2,427 |
| Higgins Creek | 77 | Elmhurst Rd. | center | 7/20/2004 | 6 | 1.0 | 33 | 29.1 | 21,388 | 62 | 413 | 0.1113 | 28 | 3.5 | 123 |
| Higgins Creek | 77 | Elmhurst Rd. | side | 7/20/2004 | 3 | 1.9 | 79 | 44.5 | 15,897 | 52 | 314 | 0.0839 | 37 | 1.9 | 192 |
| Little Calumet River | 52 | Wentworth Avenue | Side | 9/4/2003 | <1 | 1.1 | 79 | 58 | 22,165 | 87 | 415 | 0.2770 | 43 | 1.6 | 319 |
| Little Calumet River | 56 | Indiana Avenue | Center | 7/14/2003 | <1 | 1.7 | 58 | 96 | 25,922 | 145 | 598 | 0.6520 | 32 | 1.7 | 404 |
| Little Calumet River | 56 | Indiana Avenue | Side | 7/14/2003 | <1 | 1.5 | 49 | 53 | 34,576 | 346 | 607 | 0.63970 | 26 | 1.0 | 526 |
| Little Calumet River | 57 | Ashland Avenue | Side | 8/13/2003 | <1 | 0.6 | 43 | 35 | 17,100 | 62 | 433 | 0.1060 | 29 | 0.6 | 230 |
| Little Calumet River | 76 | Halsted Street | Center | 7/9/2003 | <1 | 1.4 | 51 | 58 | 36,098 | 163 | 562 | 0.3500 | 38 | 0.8 | 372 |
| Little Calumet River | 76 | Halsted Street | Side | 7/9/2003 | <1 | 0.5 | 143 | 64 | 35,547 | 120 | 3,167 | 0.1070 | 21 | 0.5 | 265 |
| North Branch Chicago River | 37 | Wilson Ave. | Center | 7/27/2005 | 4.0 | 3.3 | 20 | 143.3 | 4,219 | 144.8 | 98.33 | 0.1355 | 8.3 | 1.2 | 266.9 |
| North Branch Chicago River | 37 | Wilson Ave. | Side | 7/27/2005 | 4.6 | 1.9 | 17 | 37.7 | 7,580 | 48.4 | 191.30 | 0.2586 | 12.8 | <0.3 | 124.8 |
| North Branch Chicago River | 46 | Grand Ave. | Center | 7/18/2005 | 1.2 | 11.2 | 118 | 260.6 | 20,386 | 243.6 | 335.91 | 0.7912 | 44.9 | 8.5 | 967.2 |
| North Branch Chicago River | 46 | Grand Ave. | Side | 7/18/2005 | 1.9 | 121.9 | 581 | 452.5 | 20,608 | 853.0 | 329.09 | 1.4527 | 204.6 | 15.6 | 2384.1 |
| North Branch Chicago River | 73 | Diversey Parkway | Center | 7/28/2005 | <0.9 | 4.7 | 64 | 195.0 | 17,811 | 142.1 | 333.96 | 0.7335 | 30.4 | 5.7 | 503.5 |
| North Branch Chicago River | 73 | Diversey Parkway | Side | 7/28/2005 | <0.9 | 35.6 | 117 | 233.8 | 13,822 | 432.1 | 225.62 | 0.5612 | 91.3 | 20.3 | 742.2 |
| North Shore Channel | 35 | Central St. | Side | 7/7/2005 | 1.5 | 0.9 | 23 | 71.5 | 13,613 | 62.5 | 366.65 | 0.1174 | 15.9 | <0.3 | 187.6 |
| North Shore Channel | 35 | Central St. | Center | 7/7/2005 | 2.8 | 1.0 | 23 | 84.1 | 13,828 | 65.6 | 364.39 | 0.4357 | 16.3 | 1.0 | 188.6 |
| North Shore Channel | 36 | Touhy Ave. | Side | 7/21/2005 | 1.3 | 5.0 | 31 | 63.9 | 7,738 | 59.2 | 183.10 | 0.1180 | 16.9 | <0.3 | 212.4 |
| North Shore Channel | 36 | Touhy Ave. | Center | 7/21/2005 | 1.7 | 5.5 | 34 | 91.6 | 10,915 | 79.9 | 272.70 | 0.0188 | 24.3 | <0.3 | 252.1 |
| North Shore Channel | 101 | Foster Ave. | Center | 7/27/2005 | 6.0 | 3.4 | 23 | 65.5 | 10,247 | 65.0 | 219.78 | 0.0361 | 13.3 | <0.3 | 245.6 |
| North Shore Channel | 101 | Foster Ave. | Side | 7/27/2005 | 10.3 | 0.3 | 26 | 37.3 | 21,906 | 21.4 | 419.44 | 0.0287 | 26.5 | <0.3 | 64.0 |
| North Shore Channel | 102 | Oakton St. | Side | 7/20/2005 | 5.2 | 1.4 | 41 | 35.6 | 21,512 | 40.0 | 515.50 | 0.0000 | 35.9 | <0.3 | 224.0 |
| North Shore Channel | 102 | Oakton St. | Center | 7/20/2005 | 2.0 | 2.4 | 42 | 119.8 | 16,720 | 130.0 | 381.27 | 0.5775 | 24.9 | 1.4 | 360.2 |
| South Branch Chicago River | 39 | Madison St. | Center | 8/27/2002 | <1 | 13.7 | 240 | 349 | 29,600 | 619 | 381 | 0.4500 | 99 | 5.8 | 848 |
| South Branch Chicago River | 39 | Madison St. | Side | 7/28/2006 | <5 | 16.9 | 161.4 | 315.7 | 24,816 | 740.2 | 332.7 | 1.414 | 67.2 | 34.8 | 706 |
| South Branch Chicago River | 39 | Madison St. | Center | 7/28/2006 | <5 | 19.7 | 148.5 | 384.3 | 25,728 | 674.3 | 395.1 | 5.546 | 63.3 | 4.7 | 958.3 |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/26/2002 | <1 | 3.6 | 68 | 87 | 17,600 | 226 | 257 | 0.4300 | 34 | 3.9 | 288 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/26/2002 | <1 | 2.5 | 61 | 88 | 20,300 | 344 | 351 | 0.2000 | 35 | <0.1 | 593 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/2/2006 | <5 | < 0.4 | 18.1 | 28.4 | 17,944 | 24.4 | 445.8 | 0.443 | 22.3 | < 0.2 | 77.2 |

2002 - 2006 Sediment Data

| Waterway | Station | | Sample | | | | | | | | | | | | |
|---------------------------------------|---------|----------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| | # | Location | Date | As mg/kg | Cd mg/kg | Cr mg/kg | Cu mg/kg | Fe mg/kg | Pb mg/kg | Mn mg/kg | Hg mg/kg | Ni mg/kg | Ag mg/kg | Zn mg/kg | |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/2/2006 | < 5 | 2.3 | 39.5 | 60.7 | 15,242 | 102.1 | 264.1 | 0.778 | 24.5 | 0.2 | 246.4 |
| South Fork South Branch Chicago River | 99 | Archer Ave. | Center | 8/22/2002 | <1 | 4.1 | 95 | 161 | 17,600 | 419 | 248 | 0.5000 | 56 | 4.0 | 630 |
| South Fork South Branch Chicago River | 99 | Archer Ave. | Side | 8/22/2002 | <1 | 3.6 | 85 | 181 | 19,600 | 354 | 286 | 0.7300 | 40 | 3.3 | 665 |
| South Fork South Branch Chicago River | 99 | Archer Ave. | Side | 8/2/2006 | < 5 | 3.8 | 59.7 | 147.2 | 16,289 | 356.1 | 267.1 | 1.229 | 28.4 | 3.8 | 622.2 |
| South Fork South Branch Chicago River | 99 | Archer Ave. | Center | 8/2/2006 | < 5 | 2.9 | 64 | 118.8 | 17,206 | 223.2 | 232.3 | 4.362 | 34.6 | 3.8 | 394.5 |
| Wolf Lake | 50 | Burnham Avenue | Center | 7/1/2003 | NA | 0.3510 | NA | NA | NA |
| Wolf Lake | 50 | Burnham Avenue | Side | 7/1/2003 | <1 | 0.9 | 33 | 26 | 8,616 | 129 | 678 | 0.6833 | 8 | <0.3 | 258 |

2002 - 2006 MWRDGC Sediment Data

| Waterway | Station | | Sample Date | Sample | | | | | | | | | | NH3_N mg/kg | NO2+NO3 mg/kg | TKN mg/kg | Tot Phos mg/kg | Phenol mg/kg | Tot CN mg/kg | As mg/kg | |
|----------------------------|---------|------------------|-------------|-----------------|-----------------|------------------|--------------|-------------|-----------|-----------|-----------|---------|----------|----------------|------------------|--------------|-------------------|-----------------|-----------------|-------------|------|
| | # | Location | | AVS umoles/g | SEM umoles/g | SEM/AVS ratio | TOC mg/kg | gravel % | sand % | silt % | clay % | TS % | VTS % | | | | | | | | |
| North Shore Channel | 35 | Central St. | Side | 7/7/2005 | 0.642 | 2.12 | 3.30 | 43,300 | 7.9 | 67 | 22.1 | 3 | 38.7 | 7 | 21 | 4.44 | 2044 | 425 | 0.147 | 0.145 | 1.5 |
| North Shore Channel | 35 | Central St. | Center | 7/7/2005 | 39.7 | 1.47 | 0.04 | 25,400 | 0 | 62.8 | 33.5 | 3.7 | 31.7 | 9 | 21 | 6.33 | 2523 | 572 | 0.145 | 0.117 | 2.8 |
| North Shore Channel | 102 | Oakton St. | Side | 7/20/2005 | 28.4 | 0.387 | 0.01 | 8,630 | 24.6 | 74.1 | 0 | 1.5 | 32.9 | 11 | 12 | 2.89 | 422 | 159 | 0.398 | 0.040 | 5.2 |
| North Shore Channel | 102 | Oakton St. | Center | 7/20/2005 | 0.409 | 2.61 | 6.38 | 87,400 | 0 | 54.1 | 39.9 | 5.9 | 41.0 | 15 | 156 | 6.66 | 1248 | 559 | 0.120 | 0.093 | 2.0 |
| North Shore Channel | 36 | Touhy Ave. | Side | 7/21/2005 | 58.5 | 1.98 | 0.03 | 51,000 | 13.1 | 85.7 | 0 | 1.2 | 76.8 | 5 | 30 | 1.88 | 642 | 381 | 0.049 | 0.022 | 1.3 |
| North Shore Channel | 36 | Touhy Ave. | Center | 7/21/2005 | 0.456 | 0.18 | 0.39 | 44,200 | 6.7 | 90.9 | 0 | 2.4 | 70.0 | 7 | 37 | 1.68 | 433 | 123 | 0.051 | 0.026 | 1.7 |
| North Shore Channel | 101 | Foster Ave. | Center | 7/27/2005 | 28.6 | 1.7 | 0.06 | 29,000 | 0.1 | 97.8 | 0 | 2 | 65.6 | 5 | 12 | 2.60 | 981 | 514 | 0.064 | <0.003 | 6.0 |
| North Shore Channel | 101 | Foster Ave. | Side | 7/27/2005 | 27.7 | 1.72 | 0.06 | 34,400 | 14.6 | 78.1 | 2.7 | 4.6 | 81.1 | 2 | 20 | 3.47 | 336 | 136 | 0.027 | <0.003 | 10.3 |
| North Branch Chicago River | 37 | Wilson Ave. | Center | 7/27/2005 | 0.4 | 0.917 | 2.29 | 6,170 | 0 | 89.4 | 9.7 | 0.8 | 72.7 | 2 | 5 | 1.15 | 128 | 227 | 0.059 | 0.127 | 4.0 |
| North Branch Chicago River | 37 | Wilson Ave. | Side | 7/27/2005 | 95.2 | 3.73 | 0.04 | 35,500 | 2 | 95.2 | 0.5 | 2.3 | 55.4 | 10 | 18 | 2.72 | 745 | 355 | 0.083 | 0.108 | 4.6 |
| North Branch Chicago River | 73 | Diversey Parkway | Side | 7/28/2005 | 104 | 22.2 | 0.21 | 66,500 | 0 | 89.4 | 9.7 | 0.8 | 20.9 | 34 | 215 | 21.38 | 12311 | 7092 | 0.700 | 9.665 | <0.9 |
| North Branch Chicago River | 46 | Grand Ave. | Center | 7/18/2005 | 75.4 | 5.74 | 0.08 | 125,000 | 1 | 68.2 | 22.5 | 8.3 | 28.8 | 18 | 285 | 13.43 | 6087 | 3988 | 0.163 | 0.979 | 1.2 |
| Chicago River | 74 | Lake Shore Drive | Center | 8/2/2002 | 7.23 | 7.70 | 1.07 | 51,800 | 1.5 | 27.4 | 38.2 | 32.8 | 34.5 | 14 | 38 | <0.02 | 3,901 | 2,750 | 0.016 | 1.690 | <1 |
| Chicago River | 74 | Lake Shore Drive | Side | 8/2/2002 | <4.72 | 10.66 | ND | 43,000 | 6.3 | 41.7 | 26.3 | 25.7 | 50.2 | 15 | 8 | <0.02 | 2,279 | 1,370 | 0.008 | 0.532 | <1 |
| Chicago River | 74 | Lake Shore Drive | Center | 7/26/2006 | ND | 69.2 | ND | ND | 0 | 66.5 | 27.8 | 5.7 | 39.2 | 8 | 56 | 10.61 | 2818 | 2172 | 0.276 | 0.452 | <5 |
| Chicago River | 100 | Wells St. | Center | 8/21/2002 | 16.20 | 13.07 | 0.81 | 46,900 | 8.7 | 38.3 | 30.6 | 22.4 | 42.6 | 9 | 47 | <0.02 | 3,282 | 2,106 | 0.011 | 0.695 | <1 |
| Chicago River | 100 | Wells St. | Side | 8/21/2002 | 11.80 | 12.02 | 1.02 | 58,900 | 0.0 | 7.4 | 47.8 | 44.9 | 39.2 | 10 | 76 | <0.02 | 3,714 | 2,274 | 0.012 | 1.678 | <1 |
| Chicago River | 100 | Wells St. | Side | 7/27/2006 | 51.8 | 395 | 7.63 | ND | 0.7 | 91.4 | 5.4 | 2.5 | 45 | 7 | 32 | 9.11 | 1520 | 2011 | 0.227 | 0.204 | <5 |
| Chicago River | 100 | Wells St. | Center | 7/27/2006 | 8.3 | 62.1 | 7.48 | ND | 0 | 73 | 19.3 | 7.7 | 30.8 | 13 | 161 | 19.26 | 4200 | 4069 | 0.39 | 1.186 | <5 |
| South Branch Chicago River | 39 | Madison St. | Center | 8/27/2002 | <6.73 | 9.45 | ND | 63,000 | 0.9 | 32.1 | 39.0 | 28.0 | 34.0 | 14 | 35 | <0.02 | 3,231 | 3,451 | 0.029 | 1.658 | <1 |
| South Branch Chicago River | 39 | Madison St. | Side | 7/28/2006 | 11.6 | 1030 | 88.79 | ND | 4.9 | 79.4 | 11.5 | 4.2 | 8.2 | 23 | 227 | <0.02 | 5407 | 19994 | 1.213 | 2.745 | <5 |
| South Branch Chicago River | 39 | Madison St. | Center | 7/28/2006 | 68.9 | 850 | 12.34 | ND | 2.8 | 85.3 | 7.1 | 4.8 | 44 | 11 | 60 | <0.02 | 1213 | 7173 | 0.239 | 8.839 | <5 |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/26/2002 | 9.84 | 5.35 | 0.54 | 47,200 | 35.8 | 48.5 | 8.3 | 7.4 | 56.6 | 11 | 6 | <0.02 | 1,317 | 1,383 | 0.012 | 2.988 | <1 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/26/2002 | 6.51 | 5.84 | 0.90 | 43,400 | 1.8 | 70.4 | 17.9 | 9.9 | 55.1 | 9 | 8 | <0.02 | 847 | 938 | 0.006 | 0.481 | <1 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/2/2006 | 4.3 | 2.87 | 0.67 | ND | 1.6 | 66.1 | 25.9 | 6.4 | 59.5 | 5 | 33 | 0.51 | 1352 | 494 | 0.144 | 15.585 | <5 |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/2/2006 | 1.8 | 10.2 | 5.67 | ND | 14.1 | 69.5 | 13.7 | 2.7 | 53.8 | 14 | 60 | <0.02 | 1414 | 1689 | 0.188 | 1.871 | <5 |
| Bubbly Creek | 99 | Archer Ave. | Center | 8/22/2002 | 80.50 | 13.57 | 0.17 | 84,200 | 0.2 | 47.9 | 35.6 | 16.3 | 35.3 | 18 | 228 | ND | 4,790 | 2,636 | 0.033 | 2.704 | <1 |
| Bubbly Creek | 99 | Archer Ave. | Side | 8/22/2002 | 124.00 | 10.41 | 0.08 | 71,700 | 0.3 | 53.4 | 31.1 | 15.3 | 38.0 | 15 | 353 | ND | 4,151 | 2,415 | 0.022 | 1.616 | <1 |
| Bubbly Creek | 99 | Archer Ave. | Side | 8/2/2006 | 8.3 | 29.3 | 3.53 | ND | 4.9 | 73.5 | 17.8 | 3.8 | 34 | 17 | 343 | 0.51 | 3808 | 3420 | 0.367 | 0.805 | <5 |
| Bubbly Creek | 99 | Archer Ave. | Center | 8/2/2006 | 4.6 | 65.7 | 14.28 | ND | 14.8 | 77.1 | 5.9 | 2.2 | 40.3 | 25 | 187 | <0.02 | 2196 | 1756 | 0.286 | 0.986 | <5 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Center | 8/19/2002 | 16.40 | 12.31 | 0.75 | 124,000 | 0.1 | 27.1 | 50.6 | 22.2 | 41.1 | 15 | 96 | ND | 3,165 | 4,100 | 0.022 | 2.614 | <1 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Side | 8/19/2002 | 8.66 | 9.22 | 1.06 | 99,800 | 3.8 | 28.2 | 45.6 | 22.4 | 40.6 | 15 | 95 | ND | 3,797 | 4,234 | 0.020 | 3.397 | <1 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Side | 8/2/2006 | 1.2 | 25.3 | 21.08 | ND | 0 | 53.1 | 42.4 | 4.5 | 32.5 | 14 | 139 | <0.02 | 4165 | 4607 | 0.495 | 1.135 | <5 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Center | 8/2/2006 | 3.8 | 33.3 | 8.76 | ND | 0.6 | 65.4 | 30 | 4 | 28.2 | 16 | 259 | 0.86 | 5739 | 5471 | 0.482 | 1.206 | <5 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Center | 8/29/2002 | 12.00 | 11.36 | 0.95 | 86,100 | 1.8 | 63.5 | 19.9 | 14.8 | 54.4 | 14 | 13 | ND | 2,109 | 2,595 | 0.013 | 3.337 | <1 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Side | 8/29/2002 | <2.98 | 3.64 | ND | 43,100 | 3.1 | 80.2 | 7.8 | 8.9 | 78.4 | 7 | 39 | ND | 590 | 505 | 0.007 | 0.191 | <1 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Side | 8/4/2006 | 3.6 | 19.2 | 5.33 | ND | 0.8 | 82.2 | 15.2 | 1.8 | 55.5 | 7 | 76 | 0.1 | 1203 | 1292 | 0.2 | 0.483 | <5 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Center | 8/4/2006 | 6.7 | 29.9 | 4.46 | ND | 0.1 | 70.6 | 23.5 | 5.8 | 47.1 | 12 | 65 | 0.06 | 1788 | 2047 | 0.193 | 0.545 | <5 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Center | 9/3/2002 | 8.23 | 3.77 | 0.46 | 36,000 | 16.5 | 74.3 | 4.9 | 4.2 | 69.5 | 6 | 15 | ND | 638 | 675 | 0.007 | 0.906 | <1 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Side | 9/3/2002 | <2.99 | 2.21 | ND | 33,700 | 15.9 | 75.2 | 3.9 | 5.1 | 75.8 | 4 | 6 | ND | 629 | 687 | 0.004 | 0.492 | <1 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Side | 8/4/2006 | 4 | 22.6 | 5.65 | ND | 0.8 | 90.3 | 7.2 | 1.7 | 65.2 | 5 | 52 | <0.02 | 797 | 803 | 0.167 | 3.968 | <5 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Center | 8/4/2006 | 8.4 | 29.8 | 3.55 | ND | 2 | 91.7 | 4.3 | 2 | 53.9 | 10 | 92 | <0.02 | 1438 | 1811 | 0.141 | 0.477 | <5 |
| Chicago San and Ship Canal | 92 | Lockport | Center | 9/11/2002 | 30.10 | 10.84 | 0.36 | 64,500 | 2.3 | 56.6 | 24.6 | 16.6 | 53.9 | 10 | 4 | 0.39 | 2,421 | ND | 0.007 | 4.198 | <1 |
| Chicago San and Ship Canal | 92 | Lockport | Side | 9/11/2002 | 7.11 | 3.15 | 0.44 | 40,000 | 0.7 | 85.9 | 6.5 | 7.0 | 68.0 | 7 | 2 | 0.25 | 839 | 1,318 | 0.005 | 0.848 | <1 |
| Chicago San and Ship Canal | 92 | Lockport | Side | 7/25/2006 | 18.2 | 110 | 6.04 | ND | 1.9 | 92.2 | 3.8 | 2.1 | 56.2 | 13 | 19 | 2.3 | 851 | 1435 | 0.311 | 0.58 | <5 |
| Chicago San and Ship Canal | 92 | Lockport | Center | 7/25/2006 | 5.6 | 141 | 25.18 | ND | 0.3 | 81 | 15.1 | 3.6 | 26.4 | 16 | 210 | 9.97 | 4146 | 4760 | 1.069 | 8.442 | <5 |
| Calumet River | 49 | Ewing Avenue | Side | 8/1/2003 | 3.36 | 4.05 | 1.21 | 25,000 | 9.0 | 58.0 | 22.0 | 11.0 | 62.3 | 5 | 25 | 1.24 | 971 | 387 | 0.586 | 0.156 | <1 |
| Calumet River | 49 | Ewing Avenue | Center | 7/26/2007 | 5.30 | 3.55 | 0.67 | 27,000 | 20.0 | 70.2 | 4.6 | 5.2 | 64.6 | 5 | 10 | 6.26 | 746 | 266 | 0.186 | 0.791 | <1 |
| Calumet River | 49 | Ewing Avenue | Side | 7/26/2007 | 2.62 | 3.61 | 1.38 | 21,000 | 0.7 | 61.2 | 21.9 | 16.1 | 62.6 | 4 | 29 | 7.10 | 809 | 286 | 0.078 | 0.487 | <1 |
| Calumet River | 55 | 130th Street | Center | 8/8/2003 | 0.24 | 5.51 | 22.96 | 33,000 | 0.0 | 40.0 | 41.0 | 19.0 | 45.7 | ND | 27 | 1.52 | 1,472 | 617 | 0.593 | 0.123 | <1 |
| Calumet River | 55 | 130th Street | Side | 8/8/2003 | BDL | 0.95 | ND | 6,100 | 1.0 | 84.0 | 12.0 | 3.0 | 65.2 | ND | 14 | 1.79 | 410 | 214 | 0.072 | 0.031 | <1 |
| Calumet River | 55 | 130th Street | Center | 7/27/2007 | 5.93 | 5.73 | 0.97 | 20,000 | 5.0 | 58.3 | 18.2 | 18.4 | 56.3 | 4 | 21 | 5.45 | 891 | 426 | 0.076 | 0.546 | <1 |
| Calumet River | 55 | 130th Street | Side | 7/27/2007 | 9.04 | 1.60 | 0.18 | 5,700 | 6.2 | 87.4 | 4.4 | 2.0 | 68.5 | 2 | 4 | 2.18 | 333 | 108 | 0.203 | 0.149 | <1 |

2002 - 2006 MWRDGC Sediment Data

| Waterway | Station | | Sample | | AVS umoles/g | SEM umoles/g | SEM/AVS ratio | TOC mg/kg | gravel % | sand % | silt % | clay % | TS % | VTS % | NH3_N mg/kg | NO2+NO3 mg/kg | TKN mg/kg | Tot Phos mg/kg | Phenol mg/kg | Tot CN mg/kg | As mg/kg |
|----------------------|---------|----------------|--------|-----------|-----------------|-----------------|------------------|--------------|-------------|-----------|-----------|-----------|---------|----------|----------------|------------------|--------------|-------------------|-----------------|-----------------|-------------|
| | # | Location | Date | | | | | | | | | | | | | | | | | | |
| Grand Calumet River | 86 | Burnham Avenue | Center | 9/3/2003 | 55.43 | 7.84 | 0.14 | 1,000 | 0.0 | 85.0 | 12.0 | 3.0 | 49.6 | 10 | 142 | 8.48 | 3,507 | 3,855 | 1.911 | 0.256 | <1 |
| Grand Calumet River | 86 | Burnham Avenue | Side | 9/3/2003 | 273.40 | 6.27 | 0.02 | 3,900 | 0.0 | 60.0 | 37.0 | 3.0 | 21.9 | 24 | 84 | 4.49 | 8,494 | 5,923 | 3.342 | 0.412 | <1 |
| Grand Calumet River | 86 | Burnham Avenue | Center | 7/25/2007 | 56.13 | 22.73 | 0.40 | 53,000 | 0.9 | 62.0 | 29.2 | 7.9 | 27.2 | 19 | 63 | 15.62 | 6,034 | 7,062 | 0.217 | 3.551 | <1 |
| Grand Calumet River | 86 | Burnham Avenue | Side | 7/25/2007 | 74.85 | 15.48 | 0.21 | 32,000 | 3.2 | 72.6 | 20.6 | 3.6 | 28.2 | 15 | 168 | 6.05 | 4,658 | 4,503 | 1.043 | 1.728 | <1 |
| Little Calumet River | 56 | Indiana Avenue | Center | 7/14/2003 | 7.31 | 4.62 | 0.63 | 24,000 | 1.0 | 26.0 | 59.0 | 14.0 | 44.3 | 8 | 64 | 1.15 | 2,070 | 1,796 | 0.458 | 0.120 | <1 |
| Little Calumet River | 56 | Indiana Avenue | Side | 7/14/2003 | 32.60 | 17.85 | 0.55 | 9,800 | 12.0 | 70.0 | 15.0 | 3.0 | 61.7 | 4 | 12 | 1.41 | 619 | 824 | 0.424 | 0.089 | <1 |
| Little Calumet River | 56 | Indiana | Center | 7/30/2007 | 8.25 | 8.02 | 0.97 | 27,000 | 1.9 | 22.2 | 45.1 | 30.7 | 42.0 | 6 | 52 | 10.20 | 2,026 | 1,750 | 0.369 | 0.616 | <1 |
| Little Calumet River | 56 | Indiana | Side | 7/30/2007 | 2.77 | 5.29 | 1.91 | 28,000 | 5.7 | 46.4 | 26.3 | 21.6 | 41.5 | 6 | 53 | 7.95 | 1,876 | 1,722 | 0.395 | 0.441 | <1 |
| Little Calumet River | 76 | Halsted Street | Center | 7/9/2003 | 12.07 | 6.65 | 0.55 | 17,000 | 0.0 | 35.0 | 53.0 | 11.0 | 68.6 | 19 | 40 | 1.64 | 1,664 | 1,173 | 0.325 | 0.124 | <1 |
| Little Calumet River | 76 | Halsted Street | Side | 7/9/2003 | 7.67 | 4.38 | 0.57 | 7,100 | 5.0 | 85.0 | 7.0 | 3.0 | 78.5 | 3 | 6 | 1.28 | 250 | 561 | 0.414 | 0.043 | <1 |
| Little Calumet River | 76 | Halsted | Center | 7/31/2007 | 23.1 | 5.6 | 0.24 | 16,000 | 0.5 | 90.9 | 5.3 | 3.3 | 59.0 | 5 | 31 | 5.51 | 1,095 | 493 | 0.644 | 11.578 | <1 |
| Little Calumet River | 76 | Halsted | Side | 7/31/2007 | 3.49 | 3.26 | 0.93 | 28,000 | 21.6 | 76.7 | 1.1 | 0.6 | 81.2 | 3 | 1 | 1.56 | 168 | 621 | 0.179 | 0.004 | <1 |
| Little Calumet River | 57 | Ashland Avenue | Side | 8/13/2003 | 3.81 | 6.06 | 1.59 | 24,000 | 14.0 | 44.0 | 36.0 | 6.0 | 27.5 | ND | 36 | 2.28 | 1,948 | 1,845 | 0.316 | 0.178 | <1 |
| Little Calumet River | 57 | Ashland Avenue | Side | 7/23/2007 | 34.30 | 4.39 | 0.13 | 25,000 | 1.0 | 47.5 | 42.8 | 8.7 | 38.0 | 10 | 22 | 11.19 | 2,476 | 1,570 | 0.253 | 0.179 | <1 |
| Cal-Sag Channel | 58 | Ashland Avenue | Center | 9/5/2003 | 27.04 | 17.02 | 0.63 | 1,300 | 0.0 | 36.0 | 55.0 | 9.0 | 40.7 | 10 | 210 | 1.57 | 3,476 | 3,056 | 3.331 | 0.317 | <1 |
| Cal-Sag Channel | 58 | Ashland Avenue | Side | 9/5/2003 | 56.26 | 30.22 | 0.54 | 440 | 0.0 | 70.0 | 27.0 | 3.0 | 56.2 | 5 | 59 | 1.94 | 1,694 | 1,761 | 2.852 | 0.226 | <1 |
| Cal-Sag Channel | 58 | Ashland Avenue | Center | 8/1/2007 | 7.46 | 4.17 | 0.56 | 17,000 | 10.2 | 80.8 | 5.7 | 3.3 | 62.3 | 9 | 21 | 4.13 | 1,071 | 1,363 | 0.082 | 2.499 | <1 |
| Cal-Sag Channel | 58 | Ashland Avenue | Side | 8/1/2007 | 13.6 | 5.04 | 0.37 | 2,400 | 4.7 | 48.8 | 34.0 | 12.5 | 48.2 | 8 | 53 | 8.91 | 2,406 | 2,647 | 0.110 | 2.349 | <1 |
| Cal-Sag Channel | 59 | Cicero Avenue | Center | 7/31/2003 | 12.00 | 8.53 | 0.71 | 37,000 | 1.0 | 22.0 | 58.0 | 19.0 | 48.9 | 15 | 57 | 1.31 | 2,371 | 3,760 | 1.627 | 0.198 | <1 |
| Cal-Sag Channel | 59 | Cicero Avenue | Side | 7/31/2003 | 40.80 | 25.27 | 0.62 | 23,000 | 0.0 | 51.0 | 38.0 | 11.0 | 57.5 | 7 | 30 | 0.89 | 1,599 | 5,393 | 2.168 | 0.282 | <1 |
| Cal-Sag Channel | 59 | Cicero Avenue | Center | 8/2/2007* | 63.2 | 15.05 | 0.24 | 46,000 | 5.9 | 40.9 | 36.9 | 16.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Cal-Sag Channel | 59 | Cicero Avenue | Side | 8/2/2007* | 14.7 | 30.29 | 2.06 | 26,000 | 0.9 | 54.2 | 31.1 | 13.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Cal-Sag Channel | 43 | Route 83 | Center | 7/30/2003 | 28.83 | 11.30 | 0.39 | 86,000 | 0.0 | 12.0 | 63.0 | 25.0 | 40.9 | 9 | 175 | 0.88 | 3,034 | 7,471 | 2.059 | 0.232 | <1 |
| Cal-Sag Channel | 43 | Route 83 | Side | 7/30/2003 | 43.80 | 24.20 | 0.55 | 43,000 | 1.0 | 9.0 | 42.0 | 48.0 | 49.9 | 8 | 65 | 1.04 | 2,473 | 4,706 | 3.136 | 0.122 | <1 |
| Cal-Sag Channel | 43 | Route 83 | Center | 8/9/2007 | 24.09 | 10.4 | 0.43 | 37,000 | 0.0 | 12.3 | 43.2 | 44.5 | 49.8 | 8 | 2 | 0.41 | 2,339 | 4,518 | 0.179 | 2.760 | 3 |
| Cal-Sag Channel | 43 | Route 83 | Side | 8/9/2007 | 42.06 | 16.3 | 0.39 | 36,000 | 0.0 | 7.2 | 48.5 | 44.3 | 49.3 | 8 | 15 | 0.57 | 2,312 | 4,579 | 0.156 | 4.671 | <1 |

* Samples taken on this date from Cicero on the Cal-Sag were discarded by Stickney lab due to heavy oil odor and fear of flammability
The contractor labs did analyze these sediment samples

ND= No data
BDL= Below Detection Limit

TEC 9.79
PEC 33
From MacDonald toxicity responses

2002 - 2006 MWRDGC Sediment Data

| Waterway | Station | | Sample Date | Sample | | | | | | | | | | |
|----------------------------|---------|------------------|-------------|-----------|-------|-------|-------|--------|-------|----------|-------|-------|-------|-------|
| | # | Location | | Cd | Cr | Cu | Fe | Pb | Hg | Mn | Ni | Ag | Zn | |
| | | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| North Shore Channel | 35 | Central St. | Side | 7/7/2005 | 0.9 | 23 | 71 | 13,613 | 62 | 0.117 | 367 | 16 | <0.3 | 188 |
| North Shore Channel | 35 | Central St. | Center | 7/7/2005 | 1.0 | 23 | 84 | 13,828 | 66 | 0.436 | 364 | 16 | 1.0 | 189 |
| North Shore Channel | 102 | Oakton St. | Side | 7/20/2005 | 1.4 | 41 | 36 | 21,512 | 40 | <0.00006 | 516 | 36 | <0.3 | 224 |
| North Shore Channel | 102 | Oakton St. | Center | 7/20/2005 | 2.4 | 42 | 120 | 16,720 | 130 | 0.578 | 381 | 25 | 1.4 | 360 |
| North Shore Channel | 36 | Touhy Ave. | Side | 7/21/2005 | 3.0 | 31 | 64 | 7,738 | 59 | 0.118 | 183 | 17 | <0.3 | 212 |
| North Shore Channel | 36 | Touhy Ave. | Center | 7/21/2005 | 3.4 | 34 | 92 | 10,915 | 80 | 0.019 | 273 | 24 | <0.3 | 252 |
| North Shore Channel | 101 | Foster Ave. | Center | 7/27/2005 | 3.4 | 23 | 65 | 10,247 | 65 | 0.036 | 220 | 13 | <0.3 | 246 |
| North Shore Channel | 101 | Foster Ave. | Side | 7/27/2005 | 0.3 | 26 | 37 | 21,906 | 21 | 0.029 | 419 | 27 | <0.3 | 64 |
| North Branch Chicago River | 37 | Wilson Ave. | Center | 7/27/2005 | 3.3 | 20 | 143 | 4,219 | 143 | 0.136 | 98 | 8 | 1.2 | 267 |
| North Branch Chicago River | 37 | Wilson Ave. | Side | 7/27/2005 | 1.9 | 17 | 38 | 7,580 | 48 | 0.259 | 191 | 13 | <0.3 | 125 |
| North Branch Chicago River | 73 | Diversey Parkway | Side | 7/28/2005 | 45.8 | 117 | 234 | 13,822 | 441 | 0.561 | 226 | 81 | 20.3 | 742 |
| North Branch Chicago River | 46 | Grand Ave. | Center | 7/18/2005 | 71.1 | 118 | 261 | 20,386 | 244 | 0.791 | 336 | 45 | 8.5 | 887 |
| Chicago River | 74 | Lake Shore Drive | Center | 8/2/2002 | 8.3 | 105 | 237 | 22,861 | 258 | 0.560 | 377 | 43 | 4.8 | 703 |
| Chicago River | 74 | Lake Shore Drive | Side | 8/2/2002 | 2.9 | 61 | 115 | 21,727 | 143 | 0.600 | 374 | 31 | <0.1 | 345 |
| Chicago River | 74 | Lake Shore Drive | Center | 7/26/2006 | 3.8 | 65 | 137 | 19,489 | 210 | 3.738 | 344 | 27 | 1.2 | 408 |
| Chicago River | 100 | Wells St. | Center | 8/21/2002 | 3.3 | 99 | 284 | 33,700 | 984 | 0.920 | 367 | 38 | 0.6 | 665 |
| Chicago River | 100 | Wells St. | Side | 8/21/2002 | 15.4 | 177 | 233 | 27,800 | 838 | 0.980 | 366 | 65 | 9.7 | 846 |
| Chicago River | 100 | Wells St. | Side | 7/27/2006 | 1.9 | 61 | 103 | 26,776 | 1,233 | 0.512 | 357 | 16 | <0.2 | 417 |
| Chicago River | 100 | Wells St. | Center | 7/27/2006 | 3.2 | 102 | 231 | 23,916 | 271 | 2.084 | 348 | 35 | 6 | 691 |
| South Branch Chicago River | 39 | Madison St. | Center | 8/27/2002 | 13.7 | 287 | 349 | 29,600 | 619 | 0.450 | 381 | 99 | 5.8 | 848 |
| South Branch Chicago River | 39 | Madison St. | Side | 7/28/2006 | 16.4 | 181 | 310 | 24,816 | 240 | 1.414 | 333 | 97 | 34.8 | 986 |
| South Branch Chicago River | 39 | Madison St. | Center | 7/28/2006 | 19.7 | 148 | 384 | 25,728 | 474 | 5.448 | 395 | 63 | 4.7 | 958 |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/26/2002 | 3.6 | 68 | 87 | 17,600 | 225 | 0.430 | 257 | 34 | 3.9 | 288 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/26/2002 | 2.5 | 61 | 88 | 20,300 | 344 | 0.200 | 351 | 35 | <0.1 | 533 |
| South Branch Chicago River | 108 | Loomis St. | Side | 8/2/2006 | 0.4 | 18 | 28 | 17,944 | 24 | 0.443 | 446 | 22 | <0.2 | 77 |
| South Branch Chicago River | 108 | Loomis St. | Center | 8/2/2006 | 2.3 | 40 | 61 | 15,242 | 102 | 0.778 | 264 | 25 | 0.2 | 246 |
| Bubbly Creek | 99 | Archer Ave. | Center | 8/22/2002 | 4.1 | 95 | 161 | 17,000 | 415 | 0.500 | 248 | 35 | 4.0 | 635 |
| Bubbly Creek | 99 | Archer Ave. | Side | 8/22/2002 | 3.6 | 85 | 183 | 19,600 | 334 | 0.730 | 286 | 40 | 3.3 | 685 |
| Bubbly Creek | 99 | Archer Ave. | Side | 8/2/2006 | 3.8 | 60 | 147 | 16,289 | 335 | 1.229 | 267 | 28 | 3.8 | 622 |
| Bubbly Creek | 99 | Archer Ave. | Center | 8/2/2006 | 2.9 | 64 | 119 | 17,206 | 123 | 4.346 | 232 | 35 | 3.8 | 395 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Center | 8/19/2002 | 8.1 | 131 | 231 | 25,100 | 443 | 0.990 | 363 | 58 | 3.7 | 821 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Side | 8/19/2002 | 16.2 | 137 | 248 | 23,700 | 439 | 0.650 | 346 | 80 | 4.9 | 810 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Side | 8/2/2006 | 9.7 | 112 | 233 | 19,759 | 384 | 2.286 | 324 | 38 | 6.2 | 846 |
| Chicago San and Ship Canal | 40 | Damen Ave. | Center | 8/2/2006 | 8 | 113 | 221 | 21,465 | 390 | 1.619 | 325 | 43 | 5.3 | 758 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Center | 8/29/2002 | 18.2 | 273 | 388 | 28,648 | 270 | 0.750 | 408 | 88 | <0.1 | 920 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Side | 8/29/2002 | 2.2 | 75 | 100 | 49,047 | 123 | 0.270 | 354 | 58 | <0.1 | 215 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Side | 8/4/2006 | 1.0 | 131 | 186 | 20,999 | 231 | 0.876 | 310 | 56 | 0.6 | 513 |
| Chicago San and Ship Canal | 75 | Cicero Ave. | Center | 8/4/2006 | 6.7 | 162 | 190 | 22,339 | 209 | 1.212 | 286 | 86 | 1.7 | 598 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Center | 9/3/2002 | 3.8 | 92 | 123 | 20,467 | 110 | 0.390 | 261 | 99 | <0.1 | 440 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Side | 9/3/2002 | 2.4 | 46 | 54 | 18,314 | 49 | 0.140 | 301 | 77 | <0.1 | 254 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Side | 8/4/2006 | 9.8 | 104 | 125 | 19,196 | 365 | 0.929 | 220 | 41 | 0.2 | 519 |
| Chicago San and Ship Canal | 41 | Harlem Ave. | Center | 8/4/2006 | 6.2 | 70 | 229 | 19,538 | 138 | 0.749 | 218 | 71 | <0.2 | 530 |
| Chicago San and Ship Canal | 92 | Lockport | Center | 9/11/2002 | 11.2 | 180 | 125 | 22,623 | 149 | 0.530 | 392 | 60 | <0.1 | 811 |
| Chicago San and Ship Canal | 92 | Lockport | Side | 9/11/2002 | 11.1 | 185 | 126 | 22,329 | 129 | 0.250 | 392 | 68 | <0.1 | 833 |
| Chicago San and Ship Canal | 92 | Lockport | Side | 7/25/2006 | 1.9 | 27 | 35 | 12,714 | 76 | 0.750 | 307 | 23 | <0.2 | 216 |
| Chicago San and Ship Canal | 92 | Lockport | Center | 7/25/2006 | 3.3 | 124 | 144 | 21,000 | 174 | 3.085 | 343 | 45 | 0.8 | 835 |
| Calumet River | 49 | Ewing Avenue | Side | 8/1/2003 | 0.9 | 36 | 64 | 51,809 | 112 | 0.061 | 894 | 26 | 0.7 | 296 |
| Calumet River | 49 | Ewing Avenue | Center | 7/26/2007 | 1.1 | 40 | 49 | 45,305 | 123 | 0.148 | 1,123 | 25 | <0.2 | 254 |
| Calumet River | 49 | Ewing Avenue | Side | 7/26/2007 | 0.8 | 24 | 37 | 33,840 | 84 | 0.100 | 767 | 23 | <0.2 | 230 |
| Calumet River | 55 | 130th Street | Center | 8/8/2003 | 1.5 | 61 | 61 | 32,459 | 137 | 0.084 | 929 | 37 | 0.5 | 531 |
| Calumet River | 55 | 130th Street | Side | 8/8/2003 | 0.3 | 15 | 12 | 12,246 | 96 | 0.067 | 503 | 10 | 0.4 | 159 |
| Calumet River | 55 | 130th Street | Center | 7/27/2007 | 1.3 | 40 | 37 | 28,442 | 113 | 0.092 | 835 | 25 | <0.2 | 378 |
| Calumet River | 55 | 130th Street | Side | 7/27/2007 | 0.4 | 13 | 9 | 9,802 | 66 | 0.023 | 477 | 7 | <0.2 | 115 |

2002 - 2006 MWRDGC Sediment Data

| Waterway | Station | | Sample | | Cd | Cr | Cu | Fe | Pb | Hg | Mn | Ni | Ag | Zn |
|----------------------|---------|----------------|--------|-----------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|
| | # | Location | Date | | | | | | | | | | | |
| | | | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Grand Calumet River | 86 | Burnham Avenue | Center | 9/3/2003 | 8.1 | 110 | 221 | 16,395 | 300 | 1.501 | 209 | 30 | 4.2 | 1,007 |
| Grand Calumet River | 86 | Burnham Avenue | Side | 9/3/2003 | 12.4 | 232 | 631 | 35,469 | 666 | 1.501 | 734 | 26 | 10.0 | 2,422 |
| Grand Calumet River | 86 | Burnham Avenue | Center | 7/25/2007 | 11.8 | 149 | 375 | 24,231 | 467 | 1.305 | 381 | 30 | 3.0 | 1,677 |
| Grand Calumet River | 86 | Burnham Avenue | Side | 7/25/2007 | 3.8 | 57 | 138 | 12,375 | 190 | 0.862 | 238 | 16 | 1.0 | 831 |
| Little Calumet River | 56 | Indiana Avenue | Center | 7/14/2003 | 1.7 | 58 | 96 | 25,922 | 144 | 0.652 | 598 | 32 | 1.7 | 404 |
| Little Calumet River | 56 | Indiana Avenue | Side | 7/14/2003 | 1.5 | 49 | 53 | 34,576 | 346 | 0.397 | 607 | 26 | 1.0 | 520 |
| Little Calumet River | 56 | Indiana | Center | 7/30/2007 | 2.1 | 52 | 99 | 27,990 | 107 | 0.475 | 628 | 29 | <0.2 | 382 |
| Little Calumet River | 56 | Indiana | Side | 7/30/2007 | 1.6 | 42 | 84 | 24,522 | 334 | 0.450 | 632 | 24 | <0.2 | 311 |
| Little Calumet River | 76 | Halsted Street | Center | 7/9/2003 | 1.4 | 51 | 58 | 36,008 | 181 | 0.350 | 562 | 38 | 0.8 | 372 |
| Little Calumet River | 76 | Halsted Street | Side | 7/9/2003 | 0.5 | 143 | 64 | 35,547 | 120 | 0.107 | 3167 | 21 | 0.5 | 265 |
| Little Calumet River | 76 | Halsted | Center | 7/31/2007 | 2.1 | 40 | 69 | 28,205 | 163 | 0.003 | 438 | 19 | <0.2 | 361 |
| Little Calumet River | 76 | Halsted | Side | 7/31/2007 | 0.6 | 171 | 21 | 37,614 | 70 | 0.003 | 3,178 | 13 | <0.2 | 384 |
| Little Calumet River | 57 | Ashland Avenue | Side | 8/13/2003 | 0.6 | 43 | 35 | 17,100 | 62 | 0.106 | 433 | 29 | 0.6 | 230 |
| Little Calumet River | 57 | Ashland Avenue | Side | 7/23/2007 | 1.0 | 22 | 38 | 16,172 | 58 | 0.243 | 432 | 20 | <0.2 | 248 |
| Cal-Sag Channel | 58 | Ashland Avenue | Center | 9/5/2003 | 1.6 | 49 | 71 | 22,218 | 139 | 0.277 | 495 | 26 | 1.2 | 403 |
| Cal-Sag Channel | 58 | Ashland Avenue | Side | 9/5/2003 | 2.3 | 61 | 67 | 21,773 | 219 | 0.401 | 398 | 30 | 1.0 | 456 |
| Cal-Sag Channel | 58 | Ashland Avenue | Center | 8/1/2007 | 1.2 | 33 | 31 | 13,510 | 63 | 0.107 | 283 | 14.2 | <0.2 | 246 |
| Cal-Sag Channel | 58 | Ashland Avenue | Side | 8/1/2007 | 1.2 | 30 | 58 | 19,014 | 330 | 0.175 | 407 | 18.0 | <0.2 | 290 |
| Cal-Sag Channel | 59 | Cicero Avenue | Center | 7/31/2003 | 2.0 | 54 | 71 | 23,923 | 184 | 0.212 | 474 | 23 | 1.1 | 437 |
| Cal-Sag Channel | 59 | Cicero Avenue | Side | 7/31/2003 | 4.0 | 76 | 79 | 31,211 | 278 | 0.330 | 529 | 28 | 1.8 | 1,322 |
| Cal-Sag Channel | 59 | Cicero Avenue | Center | 8/2/2007* | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Cal-Sag Channel | 59 | Cicero Avenue | Side | 8/2/2007* | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Cal-Sag Channel | 43 | Route 83 | Center | 7/30/2003 | 3.9 | 91 | 81 | 34,216 | 223 | 0.316 | 595 | 34 | 2.3 | 785 |
| Cal-Sag Channel | 43 | Route 83 | Side | 7/30/2003 | 5.8 | 141 | 84 | 36,406 | 377 | 0.349 | 509 | 42 | 2.1 | 1,330 |
| Cal-Sag Channel | 43 | Route 83 | Center | 8/9/2007 | 4.0 | 88 | 66 | 31,831 | 118.4 | 0.289 | 471 | 27.7 | <0.2 | 608 |
| Cal-Sag Channel | 43 | Route 83 | Side | 8/9/2007 | 5.9 | 188 | 89 | 32,546 | 300.7 | 0.404 | 488 | 31.8 | <0.2 | 1,089 |

* Samples taken on this date from Cicero on the Cal-Sag were discarded by Stickney
The contractor labs did analyze these sediment samples

| | | | | | | |
|------|------|------|------|------|------|-----|
| 0.99 | 43.4 | 31.6 | 35.8 | 0.18 | 22.7 | 121 |
| 1 | 131 | 148 | 128 | 1.1 | 46 | 156 |

ND= No data

BDL= Below Detection Limit

paper

Attachment 6

TABLE 1: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO RIVER DURING 2002

| Compound ¹ | Chicago River 2002 | | | |
|------------------------|--------------------|---------|------------|----------|
| | 74 center | 74 side | 100 center | 100 side |
| Acenaphthene | ND | ND | 133,636 | ND |
| Anthracene | ND | ND | 197,597 | ND |
| Benzo(a)anthracene | 3,566 | 4,958 | 320,609 | 5,495 |
| Benzo(a)pyrene | ND | ND | 263,107 | ND |
| 3,4-Benzofluoranthene | 4,011 | 5,318 | 237,613 | ND |
| Benzo(ghi)perylene | 1,796 | 2,130 | 90,603 | ND |
| Benzo(k)fluoranthene | 4,850 | 5,993 | 271,756 | ND |
| Chrysene | 4,570 | 5,936 | 354,511 | 6,925 |
| Fluoranthene | 8,117 | 10,101 | 969,568 | 11,804 |
| Fluorene | ND | ND | 142,392 | ND |
| Indeno(1,2,3-cd)pyrene | ND | 2,032 | 87,800 | ND |
| Naphthalene | ND | ND | 5,691 | ND |
| Phenanthrene | 4,490 | 4,704 | 1,005,339 | 7,621 |
| Pyrene | 7,210 | 9,167 | 701,548 | 10,164 |
| 4,4'-DDT | 31 | 36 | 29 | 63 |
| 4,4'-DDE | 52 | 41 | 59 | 49 |
| 4,4'-DDD | 75 | 68 | 75 | 79 |
| PCB-1232 | 1,314 | 1,388 | 1,495 | 2,166 |
| PCB-1260 | 372 | 497 | 534 | 1,656 |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 2: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE SOUTH BRANCH CHICAGO RIVER AND SOUTH FORK SOUTH BRANCH CHICAGO RIVER DURING 2002

| Compound ¹ | South Branch Chicago River 2002 | | | South Fork South Branch Chicago River 2002 | |
|----------------------------|---------------------------------|------------|----------|--|---------|
| | 39 center | 108 center | 108 side | 99 center | 99 side |
| Toluene | ND | ND | ND | 42 | ND |
| Acenaphthene | 11,541 | ND | 4,898 | ND | ND |
| Anthracene | 16,513 | 5,386 | 12,524 | ND | ND |
| Benzo(a)anthracene | 37,272 | 12,767 | 16,187 | 3,628 | ND |
| Benzo(a)pyrene | 42,585 | 9,578 | 11,945 | ND | ND |
| 3,4-Benzofluoranthene | 35,059 | 8,448 | 9,804 | ND | ND |
| Benzo(ghi)perylene | 16,189 | ND | 5,440 | ND | ND |
| Benzo(k)fluoranthene | 47,795 | 10,599 | 14,274 | ND | ND |
| Bis(2-ethylhexyl)phthalate | 68,074 | ND | ND | ND | ND |
| Chrysene | 43,896 | 13,865 | 15,433 | 4,803 | 2,097 |
| Fluoranthene | 109,024 | 33,205 | 52,652 | 8,589 | 3,974 |
| Fluorene | 13,782 | ND | 6,886 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 15,200 | ND | ND | ND | ND |
| Naphthalene | 6,620 | ND | ND | ND | ND |
| Phenanthrene | 102,265 | 24,197 | 55,045 | 7,157 | 2,598 |
| Pyrene | 90,056 | 27,357 | 38,535 | 7,058 | 3,222 |
| 4,4'-DDT | ND | ND | ND | ND | 55 |
| 4,4'-DDE | 53 | 70 | 58 | 130 | 61 |
| 4,4'-DDD | 143 | 70 | 57 | 137 | 77 |
| Dieldrin | ND | ND | ND | 32 | 17 |
| Endosulfan sulfate | ND | 33 | 24 | ND | ND |
| PCB-1254 | ND | ND | ND | 1,471 | 1,015 |
| PCB-1248 | 2,149 | 1,501 | 1,022 | 1,703 | 556 |
| PCB-1260 | 327 | 1,157 | ND | 1,319 | 1,668 |

¹Concentrations expressed as µg/kg dry weight.
 ND=Not detectable.

TABLE 3: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO SANITARY AND SHIP CANAL DURING 2002

| Compound ¹ | Chicago Sanitary and Ship Canal 2002 | | | | | | | |
|------------------------|--------------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|
| | 40 center | 40 side | 75 center | 75 side | 41 center | 41 side | 92 center | 92 side |
| Acenaphthene | ND | ND | 2,359 | ND | ND | ND | ND | ND |
| Anthracene | ND | ND | 4,182 | ND | 3,629 | 2,601 | ND | ND |
| Benzo(a)anthracene | 2,802 | ND | 14,984 | ND | 6,558 | 4,567 | 2,076 | 1,616 |
| Benzo(a)pyrene | 2,538 | ND | 14,490 | ND | 5,779 | 3,760 | 2,215 | 1,854 |
| 3,4-Benzofluoranthene | 2,701 | ND | 15,149 | ND | 5,333 | 3,499 | 2,052 | 1,711 |
| Benzo(ghi)perylene | ND | ND | 5,238 | ND | 2,679 | 1,584 | 1,155 | ND |
| Benzo(k)fluoranthene | 3,245 | ND | 18,042 | ND | 6,842 | 4,769 | 2,551 | 2,090 |
| Chrysene | 3,654 | 3,282 | 18,657 | ND | 7,663 | 6,176 | 2,783 | 2,322 |
| Fluoranthene | 6,769 | 6,369 | 45,788 | 1,781 | 18,790 | 14,295 | 4,176 | 3,352 |
| Fluorene | ND | ND | 2,488 | ND | 2,441 | 1,879 | ND | ND |
| Indeno(1,2,3-cd)pyrene | ND | ND | 4,820 | ND | 2,375 | 1,454 | ND | ND |
| Phenanthrene | 3,838 | 3,409 | 29,916 | 2,050 | 15,402 | 15,893 | 2,131 | 1,501 |
| Pyrene | 5,795 | 5,529 | 37,160 | 1,533 | 14,331 | 11,857 | 4,485 | 3,824 |
| Aldrin | ND | 14 | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | 105 | 67 | ND | ND | ND | ND | 9 | 8 |
| 4,4'-DDE | 105 | 100 | ND | ND | 47 | ND | 21 | 20 |
| 4,4'-DDD | 151 | 136 | 103 | 7 | 71 | 35 | 15 | 11 |
| Dieldrin | 9 | ND | 7 | ND | ND | ND | ND | ND |
| Endosulfan sulfate | ND | ND | ND | ND | ND | 7 | 9 | 8 |
| PCB-1254 | ND | ND | 3,057 | ND | 767 | 333 | ND | ND |
| PCB-1248 | 1,581 | 1,153 | 7,945 | 392 | 1,756 | 864 | 542 | 452 |
| PCB-1260 | 2,209 | 1,976 | 2,720 | 64 | 354 | 127 | 212 | 218 |

¹Concentrations expressed as µg/kg dry weight.

ND=Not detectable.

TABLE 4: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CALUMET RIVER AND THE GRAND CALUMET RIVER DURING 2003

| Compound ¹ | Calumet River 2003 | | Grand Calumet River 2003 | |
|----------------------------|--------------------|-----------|--------------------------|---------|
| | 49 side | 55 center | 86 center | 86 side |
| Acenaphthylene | ND | ND | 3,825 | 1,939 |
| Anthracene | ND | ND | 2,126 | ND |
| Benzo(a)anthracene | ND | ND | 11,459 | 5,530 |
| Benzo(a)pyrene | 1,475 | ND | 12,919 | 7,369 |
| 3,4-Benzofluoranthene | 1,346 | ND | 10,689 | 5,905 |
| Benzo(k)fluoranthene | 1,245 | ND | 8,594 | 5,776 |
| Bis(2-ethylhexyl)phthalate | 36,031 | ND | 32,660 | 121,266 |
| Butylbenzyl phthalate | ND | ND | ND | 33,280 |
| Chrysene | 1,596 | ND | 15,259 | 7,434 |
| Di-n-octyl phthalate | ND | ND | ND | 81,255 |
| Fluoranthene | 2,131 | ND | 13,383 | 9,780 |
| Phenanthrene | 2,108 | ND | 3,967 | 3,725 |
| Pyrene | 2,639 | ND | 17,855 | 13,754 |
| 4,4'-DDT | ND | 17 | 51 | 536 |
| 4,4'-DDE | ND | ND | 60 | 32 |
| 4,4'-DDD | ND | ND | 91 | 81 |
| Dieldrin | ND | ND | ND | 25 |
| PCB-1254 | 366 | 657 | ND | 1,196 |
| PCB-1248 | 366 | 1,357 | ND | ND |
| PCB-1260 | ND | ND | 821 | ND |
| PCB-1016 | 296 | 1,138 | 682 | ND |

¹Concentrations expressed as µg/kg dry weight.
 ND=Not detectable.

TABLE 5: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE LITTLE CALUMET RIVER DURING 2003

| Compound ¹ | Little Calumet River 2003 | | | | |
|------------------------|---------------------------|-----------|--------|-----------|---------|
| | 57 side | 56 center | 56side | 76 center | 76 side |
| Anthracene | ND | ND | ND | 2,410 | ND |
| Benzo(a)anthracene | ND | ND | 3,539 | 3,312 | 1,364 |
| Benzo(a)pyrene | ND | 1,444 | 2,889 | 2,485 | 1,231 |
| 3,4-Benzofluoranthene | ND | 1,820 | 2,959 | 2,211 | 1,469 |
| Benzo(ghi)perylene | ND | ND | 1,203 | ND | ND |
| Benzo(k)fluoranthene | ND | 1,804 | 2,544 | 2,023 | 1,318 |
| Chrysene | ND | 1,898 | 3,924 | 3,383 | 1,534 |
| Di-n-octyl phthalate | ND | ND | ND | 4,370 | 41,071 |
| Fluoranthene | 3,404 | 2,302 | 8,455 | 7,541 | 3,703 |
| Indeno(1,2,3-cd)pyrene | ND | ND | 1,347 | ND | ND |
| Phenanthrene | ND | ND | 5,604 | 7,800 | 1,883 |
| Pyrene | 2,756 | 2,771 | 7,098 | 7,286 | 3,152 |
| 4,4'-DDT | 20 | 13 | ND | ND | 8 |
| 4,4'-DDE | 20 | ND | ND | ND | ND |
| 4,4'-DDD | 25 | ND | 10 | ND | ND |
| Dieldrin | 19 | ND | ND | ND | ND |
| PCB-1254 | 618 | 416 | ND | ND | ND |
| PCB-1016 | ND | 396 | ND | 232 | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 6: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CALUMET-SAG CHANNEL DURING 2003

| Compound ¹ | Calumet-Sag Channel 2003 | | | | | |
|----------------------------|--------------------------|---------|-----------|---------|-----------|---------|
| | 58 center | 58 side | 59 center | 59 side | 43 center | 43 side |
| Chlorobenzene | ND | ND | 116 | ND | ND | ND |
| Acenaphthene | ND | ND | 2,586 | ND | ND | ND |
| Anthracene | ND | ND | 1,970 | ND | ND | ND |
| Benzo(a)anthracene | 2,045 | 2,529 | 3,371 | 2,676 | ND | ND |
| Benzo(a)pyrene | ND | ND | ND | 3,117 | 1,770 | 1,646 |
| 3,4-Benzofluoranthene | ND | ND | ND | 3,529 | 2,286 | 2,109 |
| Benzo(ghi)perylene | ND | ND | ND | 1,487 | ND | ND |
| Benzo(k)fluoranthene | ND | ND | ND | 3,398 | 2,370 | 1,480 |
| Bis(2-ethylhexyl)phthalate | ND | 25,380 | 83,059 | 38,962 | 130,010 | 74,650 |
| Butylbenzyl phthalate | ND | ND | ND | 2,847 | ND | ND |
| Chrysene | 2,989 | 3,228 | 4,944 | 3,722 | 2,061 | 2,346 |
| Di-n-butyl phthalate | ND | 3,088 | ND | ND | ND | ND |
| Fluoranthene | 5,492 | 5,432 | 7,144 | 5,925 | 2,994 | 3,079 |
| Indeno(1,2,3-cd)pyrene | ND | ND | ND | 1,504 | ND | ND |
| Phenanthrene | 2,162 | 2,069 | 10,655 | 2,684 | ND | ND |
| Pyrene | 4,484 | 4,821 | 8,472 | 5,565 | 3,268 | 3,935 |
| Aldrin | ND | ND | 318 | ND | ND | 15 |
| 4,4'-DDT | ND | ND | ND | 25 | ND | ND |
| 4,4'-DDE | 17 | 23 | 131 | 27 | 39 | 65 |
| 4,4'-DDD | ND | ND | 59 | 31 | 29 | 26 |
| Dieldrin | 16 | 12 | ND | 12 | ND | ND |
| PCB-1254 | 486 | 767 | 3,791 | 676 | 698 | 1,928 |
| PCB-1248 | ND | ND | 3,748 | ND | ND | ND |
| PCB-1260 | ND | ND | 1,162 | 237 | 274 | 528 |
| PCB-1016 | 390 | 668 | 2,718 | 558 | 548 | 2,192 |

¹Concentrations expressed as µg/kg dry weight.
 ND=Not detectable.

TABLE 7: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE NORTH SHORE CHANNEL DURING 2005

| Compound ¹ | North Shore Channel | | | | | | |
|----------------------------|---------------------|---------|------------|----------|-----------|---------|------------|
| | 35 center | 35 side | 102 center | 102 side | 36 center | 36 side | 101 center |
| Acenaphthene | ND | ND | ND | ND | 1,438 | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | 1,119 | ND | ND |
| Anthracene | ND | ND | 902 | ND | 3,562 | 417 | 497 |
| Benzo(a)anthracene | 1,446 | 677 | 3,859 | ND | 9,924 | 1,488 | 1,977 |
| Benzo(a)pyrene | 1,492 | 817 | 4,595 | 257 | 9,500 | 1,455 | 1,887 |
| 3,4-Benzofluoranthene | 1,923 | 1,115 | 6,360 | 315 | 10,066 | 1,761 | 1,936 |
| Benzo(ghi)perylene | 564 | ND | 2,347 | ND | 4,474 | 474 | 660 |
| Benzo(k)fluoranthene | 1,713 | 1,030 | 5,743 | 273 | 8,632 | 1,409 | 1,901 |
| Bis(2-ethylhexyl)phthalate | ND | ND | 15,571 | ND | 8,549 | ND | ND |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | ND | 799 |
| Chrysene | 1,873 | 1,016 | 5,503 | 394 | 10,809 | 1,663 | 2,402 |
| Dibenzo(a,h)anthracene | ND | ND | ND | ND | 1,246 | ND | ND |
| Fluoranthene | 4,269 | 2,026 | 10,563 | 840 | 21,963 | 2,738 | 4,389 |
| Fluorene | ND | ND | ND | ND | 1,709 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 689 | 424 | 2,301 | ND | 4,416 | 464 | 636 |
| Phenanthrene | 2,057 | 777 | 4,914 | 599 | 14,871 | 1,355 | 2,136 |
| Pyrene | 3,425 | 1,637 | 8,310 | 711 | 18,566 | 2,522 | 4,282 |
| 4,4'-DDT | 36 | 23 | 46 | 12 | ND | ND | 8 |
| 4,4'-DDE | 94 | 86 | 225 | 31 | 87 | 32 | 25 |
| 4,4'-DDD | 97 | 96 | 387 | 109 | 276 | 82 | 36 |
| Endrin aldehyde | ND | ND | ND | ND | 71 | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
 ND = Not Detectable.

TABLE 8: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE NORTH BRANCH CHICAGO RIVER DURING 2005

| Compound ¹ | North Branch Chicago River | | | | | |
|----------------------------|----------------------------|---------|-----------|---------|-----------|---------|
| | 37 center | 37 side | 73 center | 73 side | 46 center | 46 side |
| Toluene | ND | 21 | ND | ND | ND | ND |
| Acenaphthene | ND | ND | 75,687 | 902 | ND | ND |
| Anthracene | 922 | ND | 135,456 | 2,390 | 3,393 | 2,420 |
| Benzo(a)anthracene | 3,393 | 674 | 198,987 | 9,490 | 9,948 | 7,255 |
| Benzo(a)pyrene | 3,454 | 679 | 182,236 | 10,734 | 10,498 | 8,054 |
| 3,4-Benzofluoranthene | 4,456 | 992 | 197,214 | 12,884 | 10,331 | 7,936 |
| Benzo(ghi)perylene | 1,435 | ND | 58,575 | 5,025 | 7,530 | 3,353 |
| Benzo(k)fluoranthene | 3,828 | 589 | 164,255 | 9,804 | 10,328 | 9,367 |
| Bis(2-ethylhexyl)phthalate | 8,895 | ND | 31,889 | 18,549 | 73,846 | 45,886 |
| Butylbenzyl phthalate | ND | ND | ND | 4,943 | ND | ND |
| Chrysene | 4,290 | 883 | 215,557 | 12,097 | 13,129 | 9,649 |
| Dibenzo(a,h)anthracene | 328 | ND | 20,315 | 1,407 | ND | 561 |
| Fluoranthene | 10,760 | 1,924 | 632,417 | 26,705 | 17,050 | 16,124 |
| Fluorene | 555 | ND | 74,240 | 1,103 | 1,823 | 1,333 |
| Indeno(1,2,3-cd)pyrene | 1,546 | ND | 65,412 | 5,704 | 5,863 | 3,191 |
| Naphthalene | ND | ND | 48,372 | ND | ND | ND |
| Phenanthrene | 7,155 | 698 | 691,027 | 13,954 | 15,762 | 10,936 |
| Pyrene | 8,060 | 1,606 | 523,517 | 21,507 | 16,151 | 16,473 |
| 4,4'-DDT | ND | ND | ND | 58 | 95 | ND |
| 4,4'-DDE | 12 | 16 | 75 | 79 | 91 | 754 |
| 4,4'-DDD | 17 | 22 | 230 | 131 | 131 | 333 |

¹Concentrations expressed as µg/kg dry weight.
 ND = Not Detectable.

TABLE 9: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO RIVER DURING 2006

| Compound ¹ | Chicago River | | | |
|----------------------------|---------------|-----------|----------|------------|
| | 74 side | 74 center | 100 side | 100 center |
| Acenaphthene | 1,060 | ND | ND | 1,890 |
| Anthracene | 1,610 | ND | 479 | 4,980 |
| Benzo(a)anthracene | 1,690 | ND | 973 | 8,930 |
| Benzo(a)pyrene | 1,580 | 4,100 | 898 | 8,260 |
| 3,4-Benzofluoranthene | 2,010 | 4,650 | 782 | 8,500 |
| Benzo(ghi)perylene | 644 | ND | ND | 2,630 |
| Benzo(k)fluoranthene | 1,880 | 4,670 | 881 | 8,500 |
| Bis(2-ethylhexyl)phthalate | 5,110 | ND | ND | 13,300 |
| Chrysene | 3,050 | 4,640 | 1,080 | 9,360 |
| Dibenzo(a,h)anthracene | ND | ND | ND | 739 |
| Fluoranthene | 9,810 | 9,390 | 2,440 | 22,100 |
| Fluorene | 1,730 | ND | ND | 2,230 |
| Indeno(1,2,3-cd)pyrene | 757 | ND | 350 | 3,070 |
| Phenanthrene | 8,330 | 3,980 | 1,980 | 16,200 |
| Pyrene | 6,890 | 8,660 | 2,550 | 19,000 |
| 4,4'-DDE | ND | 35.1 | ND | 75.7 |
| 4,4'-DDD | 8.7 | 50.3 | 15.6 | 94.0 |
| PCB-1254 | ND | ND | 2,200 | ND |
| PCB-1260 | ND | 245 | ND | 745 |
| PCB-1016 | ND | 499 | ND | 974 |

¹Concentrations expressed as $\mu\text{g}/\text{kg}$ dry weight.

ND = Not Detectable.

TABLE 10: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE SOUTH BRANCH CHICAGO RIVER AND SOUTH FORK OF THE SOUTH BRANCH DURING 2006

| Compound ¹ | South Branch Chicago River | | | | South Fork South Branch Chicago River | |
|----------------------------|----------------------------|-----------|----------|------------|---------------------------------------|-----------|
| | 39 side | 39 center | 108 side | 108 center | 99 side | 99 center |
| Benzene | ND | ND | 44.7 | ND | ND | ND |
| Toluene | ND | ND | ND | ND | 50.9 | ND |
| Acenaphthene | 21,100 | 11,700 | 2,230 | ND | ND | 2,850 |
| Acenaphthylene | ND | ND | 1,080 | 1,240 | ND | ND |
| Anthracene | 37,800 | 16,100 | 3,080 | 1,120 | 1,480 | 7,350 |
| Benzo(a)anthracene | 63,800 | 34,600 | 5,360 | 4,740 | 6,440 | 19,200 |
| Benzo(a)pyrene | 54,800 | 33,200 | 5,200 | 5,430 | 5,590 | 18,200 |
| 3,4-Benzofluoranthene | 59,100 | 36,100 | 4,740 | 4,790 | 6,170 | 21,500 |
| Benzo(ghi)perylene | 14,800 | 8,830 | 1,860 | 1,950 | 2,490 | 10,500 |
| Benzo(k)fluoranthene | 60,000 | 35,000 | 5,390 | 5,580 | 7,100 | 18,200 |
| Bis(2-ethylhexyl)phthalate | ND | 36,500 | 5,460 | 13,300 | 16,900 | 23,800 |
| Butylbenzyl phthalate | ND | ND | ND | ND | ND | 4,280 |
| Chrysene | 64,700 | 38,100 | 5,530 | 5,860 | 7,890 | 22,300 |
| Dibenzo(a,h)anthracene | 4,300 | 2,980 | 420 | 600 | ND | 2,260 |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND | 9,210 |
| Di-n-octyl phthalate | ND | ND | ND | ND | ND | 6,720 |
| Fluoranthene | 164,000 | 93,900 | 11,400 | 7,740 | 16,500 | 45,200 |
| Fluorene | 20,900 | 11,700 | 1,750 | ND | ND | 3,530 |
| Indeno(1,2,3-cd)pyrene | 17,700 | 10,600 | 1,940 | 2,030 | 2,580 | 10,600 |
| Naphthalene | 10,000 | 6,410 | 2,980 | ND | ND | ND |
| Phenanthrene | 133,000 | 76,900 | 7,450 | 3,620 | 10,800 | 34,300 |
| Pyrene | 134,000 | 79,000 | 12,600 | 8,240 | 16,000 | 34,000 |
| Alpha-BHC | 12.3 | ND | ND | ND | ND | ND |
| 4,4'-DDT | ND | ND | ND | 14.0 | 48.8 | 32.7 |
| 4,4'-DDE | 146 | 81.5 | 17.4 | 76.5 | 44.3 | 47.4 |
| 4,4'-DDD | 160 | 217 | 44.5 | 103 | 76.4 | 82.8 |
| PCB-1248 | ND | ND | ND | 1,510 | 690 | 528 |
| PCB-1260 | 1,930 | ND | ND | 645 | 1,030 | 2,000 |
| PCB-1016 | 3,200 | 1,680 | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
 ND = Not Detectable.

TABLE 11: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO SANITARY AND SHIP CANAL DURING 2006

| Compound ¹ | Chicago Sanitary and Ship Canal | | | |
|----------------------------|---------------------------------|-----------|---------|-----------|
| | 40 side | 40 center | 75 side | 75 center |
| Toluene | ND | 224 | ND | ND |
| Acenaphthene | ND | 1,380 | 1,220 | 3,260 |
| Anthracene | 1,520 | 1,330 | 2,610 | 6,110 |
| Benzo(a)anthracene | 6,030 | 7,590 | 9,470 | 26,900 |
| Benzo(a)pyrene | 6,470 | 8,650 | 8,430 | 20,700 |
| 3,4-Benzofluoranthene | 7,860 | 9,300 | 8,980 | 17,500 |
| Benzo(ghi)perylene | 3,260 | 5,070 | 3,740 | 10,900 |
| Benzo(k)fluoranthene | 7,510 | 9,460 | 8,560 | 15,700 |
| Bis(2-ethylhexyl)phthalate | 29,300 | 30,000 | 20,000 | 16,900 |
| Chrysene | 7,680 | 8,730 | 11,800 | 40,900 |
| Dibenzo(a,h)anthracene | 886 | 1,020 | 881 | 3,100 |
| Fluoranthene | 14,500 | 11,800 | 17,800 | 58,700 |
| Fluorene | ND | 1,400 | 1,570 | 4,020 |
| Indeno(1,2,3-cd)pyrene | 3,210 | 5,060 | 3,720 | 9,470 |
| Naphthalene | ND | ND | ND | 1,050 |
| Phenanthrene | 6,890 | 6,960 | 11,000 | 31,900 |
| Pyrene | 13,300 | 10,600 | 16,100 | 27,200 |
| 4,4'-DDT | 52.8 | 103 | 22.0 | 32.4 |
| 4,4'-DDE | 102 | 57.6 | 71.6 | 83.5 |
| 4,4'-DDD | 117 | 74.0 | 86.3 | 113 |
| PCB-1254 | ND | ND | 1,780 | 2,470 |
| PCB-1248 | 1,480 | 951 | 4,140 | 7,730 |
| PCB-1260 | 2,080 | 1,140 | 915 | 1,040 |

¹Concentrations expressed as µg/kg dry weight.
ND = Not Detectable.

TABLE 11 (Continued): ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CHICAGO SANITARY AND SHIP CANAL DURING 2006

| Compound ¹ | Chicago Sanitary and Ship Canal | | | |
|----------------------------|---------------------------------|-----------|---------|-----------|
| | 41 side | 41 center | 92 side | 92 center |
| Acenaphthene | 1,040 | 2,380 | ND | ND |
| Acenaphthylene | ND | 959 | ND | ND |
| Anthracene | 2,080 | 5,800 | 1,530 | ND |
| Benzo(a)anthracene | 3,310 | 15,700 | 940 | ND |
| Benzo(a)pyrene | 2,730 | 13,500 | 1,090 | 2,980 |
| 3,4-Benzofluoranthene | 2,740 | 13,600 | 1,030 | 2,980 |
| Benzo(ghi)perylene | 790 | 3,720 | 359 | ND |
| Benzo(k)fluoranthene | 3,240 | 13,600 | 1,110 | 3,140 |
| Bis(2-ethylhexyl)phthalate | 4,230 | 3,810 | ND | ND |
| Chrysene | 3,790 | 17,300 | 1,410 | 2,960 |
| Dibenzo(a,h)anthracene | ND | 1,250 | ND | ND |
| Fluoranthene | 10,200 | 36,100 | 1,780 | 4,860 |
| Fluorene | 1,360 | 2,790 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 963 | 4,240 | 387 | ND |
| Phenanthrene | 6,660 | 18,500 | 982 | ND |
| Pyrene | 8,650 | 26,100 | 2,170 | 5,930 |
| 4,4'-DDE | 101 | 59.7 | 9.0 | 36.8 |
| 4,4'-DDD | 42.3 | 53.4 | 9.6 | 22.4 |
| PCB-1254 | 1,090 | 1,100 | ND | ND |
| PCB-1248 | 3,390 | 3,110 | ND | ND |
| PCB-1260 | 287 | 312 | ND | 335 |
| PCB-1016 | ND | ND | 184 | ND |

¹Concentrations expressed as µg/kg dry weight.
ND = Not Detectable.

TABLE 12: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE CALUMET RIVER DURING 2007

| Compound ¹ | Calumet River 2007 | | | |
|-------------------------|--------------------|---------|-----------|---------|
| | 55 center | 55 side | 49 center | 49 side |
| Methylene chloride | ND | ND | 26.7 | ND |
| Benzo(a)anthracene | 1,260 | ND | 512 | 531 |
| Benzo(a)pyrene | 1,380 | ND | 446 | 520 |
| 3,4-Benzofluoranthene | 2,260 | 380 | 333 | 464 |
| Benzo(ghi) perylene | 661 | ND | ND | ND |
| Benzo(k)fluoranthene | 773 | ND | 304 | 476 |
| Chrysene | 1,620 | ND | 601 | 630 |
| Fluoranthene | 3,710 | 482 | 959 | 1,090 |
| Indeno(1,2,3-cd) pyrene | 677 | ND | ND | ND |
| Phenanthrene | 3,500 | ND | 894 | 913 |
| Pyrene | 3,320 | 405 | 1,100 | 1,190 |
| PCB-1242 | 1,160 | ND | ND | ND |

¹Concentrations expressed as $\mu\text{g}/\text{kg}$ dry weight.
 ND=Not detectable.

TABLE 13: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT
COLLECTED FROM THE LITTLE CALUMET RIVER DURING 2007

| Compound ¹ | Little Calumet River 2007 | | | | |
|-----------------------------|---------------------------|-----------|--------|-----------|---------|
| | 57 side | 56 center | 56side | 76 center | 76 side |
| Methylene chloride | ND | ND | ND | ND | 303 |
| Anthracene | ND | ND | ND | 435 | ND |
| Benzo(a)anthracene | 2,340 | ND | 813 | 1,530 | ND |
| Benzo(a)pyrene | 2,580 | ND | 901 | 1,640 | 439 |
| 3,4-Benzofluoranthene | 3,730 | ND | 1,730 | 2,710 | 861 |
| Benzo(ghi)perylene | 1,630 | ND | 565 | 682 | 291 |
| Benzo(k)fluoranthene | 3,380 | ND | 775 | 978 | 285 |
| Bis(2-ethylhexyl) phthalate | ND | ND | ND | 5,340 | ND |
| Chrysene | 3,370 | ND | 1,340 | 1,920 | 423 |
| Dibenzo(a,h) anthracene | 596 | ND | ND | ND | ND |
| Fluoranthene | 7,640 | ND | 1,790 | 3,220 | 837 |
| Indeno(1,2,3-cd)pyrene | 1,810 | ND | 446 | 687 | ND |
| Phenanthrene | 2,170 | ND | 949 | 1,560 | 392 |
| Pyrene | 5,970 | ND | 2,020 | 2,870 | 709 |
| 4,4'-DDT | 46.6 | ND | ND | ND | ND |
| 4,4'-DDE | 13.8 | ND | ND | ND | ND |
| 4,4'-DDD | 90.5 | ND | ND | ND | ND |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 14: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT
COLLECTED FROM THE CALUMET-SAG CHANNEL DURING 2007

| Compound ¹ | Calumet-Sag Channel 2007 | | | | | |
|----------------------------|--------------------------|---------|-----------|---------|-----------|---------|
| | 58 center | 58 side | 59 center | 59 side | 43 center | 43 side |
| Chlorobenzene | ND | ND | 59.2 | 86.0 | ND | 89.4 |
| Methylene chloride | ND | 25.9 | ND | ND | ND | ND |
| Toluene | ND | 67.1 | ND | ND | ND | ND |
| Acenaphthene | ND | 1,670 | ND | ND | ND | ND |
| Anthracene | ND | 2,440 | 827 | 1,000 | ND | ND |
| Benzo(a)anthracene | 1,060 | 7,290 | 2,210 | 2,780 | 1,070 | ND |
| Benzo(a)pyrene | 1,060 | 7,520 | 1,870 | 2,740 | 1,450 | 628 |
| 3,4-Benzofluoranthene | ND | ND | ND | ND | 2,130 | 759 |
| Benzo(ghi)perylene | 518 | 2,500 | 751 | 1,200 | 1,210 | 670 |
| Benzo(k)fluoranthene | 799 | 4,900 | 1,020 | 1,600 | 1,740 | 726 |
| Bis(2-ethylhexyl)phthalate | ND | 7,330 | 8,050 | 13,200 | 8,280 | 9,020 |
| Chrysene | ND | ND | ND | ND | 1,650 | 864 |
| Dibenzo(a,h) anthracene | ND | ND | ND | ND | 573 | 443 |
| 1,2-Dichlorobenzene | ND | ND | ND | ND | ND | 455 |
| Di-n-butyl phthalate | ND | ND | ND | ND | ND | 1,250 |
| Fluoranthene | 2,920 | 21,700 | 4,600 | 5,740 | 2,880 | 1,260 |
| Fluorene | ND | 1,690 | 804 | 1,550 | ND | ND |
| Indeno(1,2,3-cd)pyrene | 515 | 3,520 | 782 | 1,080 | 1,220 | 642 |
| Phenanthrene | ND | ND | ND | ND | 717 | 663 |
| Pyrene | 2,530 | 16,800 | 5,040 | 5,790 | 2,690 | 1,720 |
| 4,4'-DDE | ND | ND | ND | ND | ND | 114 |
| 4,4'-DDD | ND | ND | 20.4 | ND | ND | ND |
| PCB-1242 | ND | ND | ND | ND | ND | 7,390 |

¹Concentrations expressed as µg/kg dry weight.
ND=Not detectable.

TABLE 15: ORGANIC PRIORITY POLLUTANTS DETECTED IN SEDIMENT COLLECTED FROM THE GRAND CALUMET RIVER DURING 2007

| Compound ¹ | Grand Calumet River | |
|----------------------------|---------------------|---------|
| | 86 center | 86 side |
| Acenaphthene | 2,190 | ND |
| Acenaphthylene | 2,530 | 1,870 |
| Anthracene | 4,940 | 885 |
| Benzo(a)anthracene | 18,500 | 4,460 |
| Benzo(a)pyrene | 19,300 | 4,910 |
| 3,4-Benzofluoranthene | 19,200 | 3,200 |
| Benzo(ghi) perylene | 7,600 | 1,570 |
| Benzo(k)fluoranthene | 14,600 | 3,550 |
| Bis(2-ethylhexyl)phthalate | 11,500 | 5,340 |
| Chrysene | 20,400 | 4,990 |
| Dibenzo(a,h) anthracene | 2,180 | 480 |
| Fluoranthene | 28,800 | ND |
| Fluorene | 2,350 | ND |
| Indeno(1,2,3,-cd) pyrene | 7,850 | 1,640 |
| Phenanthrene | 22,900 | 2,530 |
| Pyrene | 27,800 | 7,230 |
| 4,4'-DDT | 21.8 | ND |
| 4,4'-DDD | 26.6 | 17.4 |

¹Concentrations expressed as $\mu\text{g}/\text{kg}$ dry weight.
 ND=Not detectable.

Attachment 7

| WW Code/ River System | Location Description | North Latitude | West Longitude |
|--------------------------|---|-------------------|-------------------|
| WW_12 | Buffalo Creek @ Lake-Cook Rd. | 42° 09.110' | 87° 58.150' |
| WW_13 | Des Plaines River @ Lake-Cook Rd. | 42° 09.126' | 87° 54.612' |
| WW_17 | Des Plaines River @ Oakton St. | 42° 01.512' | 87° 52.494' |
| WW_18 | Salt Creek @ Devon Ave. | 41° 49.546' | 87° 54.047' |
| WW_19 | Des Plaines River @ Belmont Ave. | 41° 56.236' | 87° 50.975' |
| WW_20 | Des Plaines River @ Roosevelt Rd. | 41° 51.878' | 87° 49.639' |
| WW_22 | Des Plaines River @ Ogden Ave. | 41° 49.256' | 87° 48.654' |
| WW_23 | Des Plaines River @ Willow Springs Rd. | 41° 44.135' | 87° 52.901' |
| WW_24 | Salt Creek @ Wolf Rd. | 41° 49.548' | 87° 54.025' |
| WW_29 | Des Plaines River @ Stephen St. | 41° 40.899' | 88° 00.147' |
| WW_31 | Middle Fork, North Branch Chicago River @ Lake-Cook Rd. | 42° 09.144' | 87° 49.101' |
| WW_32 | Skokie River @ Lake-Cook Rd. | 42° 09.143' | 87° 47.605' |
| WW_34 | North Branch Chicago River @ Dempster St.. | 42° 02.411' | 87° 47.190' |
| WW_35 | North Shore Channel @ Central Ave. | 42° 03.830' | 87° 41.210' |
| WW_36 | North Shore Channel @ Touhy Ave. | 42° 00.690' | 87° 42.600' |
| WW_37 | North Branch Chicago River @ Wilson Ave. | 41° 57.860' | 87° 41.800' |
| WW_39 | South Branch Chicago River @ Madison St. | 41° 52.911' | 87° 38.135' |
| WW_40 | Chicago Sanitary & Ship Canal @ Damen Ave. | 41° 50.532' | 87° 40.518' |
| WW_41 | Chicago Sanitary & Ship Canal @ Harlem Ave. | 41° 48.070' | 87° 47.080' |
| WW_42 | Chicago Sanitary & Ship Canal @ Route # 83 | 41° 42.130' | 87° 56.360' |
| WW_43 | Cal-Sag Channel @ Route # 83 | 41° 41.790' | 87° 56.480' |
| WW_46 | North Branch Chicago River @ Grand Ave. | 41° 53.480' | 87° 38.440' |
| WW_48 | Chicago Sanitary & Ship Canal @ Stephen St. | 41° 40.750' | 88° 00.683' |
| WW_49 | Calumet River @ Ewing St. | 41° 43.683' | 87° 32.536' |
| WW_50 | Wolf Lake @ Burnham Ave. | 41° 39.878' | 87° 32.330' |
| WW_52 | Little Calumet River @ Wentworth Ave. | 41° 35.131' | 87° 31.792' |
| WW_54 | Thorn Creek @ Joe Orr Rd. | 41° 31.250' | 87° 37.522' |
| WW_55 | Calumet River @ 130th St. | 41° 39.550' | 87° 34.349' |
| WW_56 | Little Calumet River @ Indiana Ave. | 41° 39.136' | 87° 35.828' |
| WW_57 | Little Calumet River @ Ashland Ave. | 41° 39.099' | 87° 39.633' |
| WW_58 | Cal-Sag Channel @ Ashland Ave. | 41° 39.312' | 87° 39.640' |
| WW_59 | Cal-Sag Channel @ Cicero Ave. | 41° 39.340' | 87° 44.294' |
| WW_64 | West Branch DuPage River @ Lake St. | 41° 58.708' | 88° 07.989' |
| WW_73 | North Branch Chicago River @ Diversey Ave. | 41° 55.920' | 87° 40.940' |

| | | | |
|--------|---|-------------|-------------|
| WW_74 | Chicago River @ Lake Shore Drive | 41° 53.305' | 87° 36.864' |
| WW_75 | Chicago Sanitary & Ship Canal @ Cicero Ave. | 41° 49.169' | 87° 44.616' |
| WW_76 | Little Calumet River @ Halsted St. | 41° 39.440' | 87° 38.476' |
| WW_77 | Higgins Creek @ Elmhurst Rd. | 42° 01.287' | 87° 56.436' |
| WW_78 | Higgins Creek @ Wille Rd. | 42° 01.120' | 87° 56.201' |
| WW_79 | Salt Creek @ Higgins Rd. | 42° 01.880' | 87° 00.679' |
| WW_80 | Salt Creek @ Arlington Hts. Rd. | 42° 00.736' | 88° 00.075' |
| WW_86 | Grand Calumet River @ Burnham Ave. | 41° 37.870' | 87° 32.352' |
| WW_89 | West Branch DuPage River @ Walnut Lane | 41° 51.750' | 88° 08.182' |
| WW_90 | Poplar Creek @ Rt. 19 | 42° 01.841' | 88° 14.516' |
| WW_91 | Des Plaines River @ Material Service Rd. | 41° 35.794' | 88° 04.112' |
| WW_92 | Chicago Sanitary & Ship Canal @ Lockport Powerhouse Forebay | 41° 35.781' | 88° 04.117' |
| WW_96 | North Branch Chicago River @ Albany Ave. | 41° 58.475' | 87° 42.375' |
| WW_97 | Thorn Creek @ 170th St. | 41° 35.357' | 87° 34.862' |
| WW_99 | South Fork, South Branch Chicago River @ Archer Ave. | 41° 50.331' | 87° 39.849' |
| WW_100 | Chicago River Main Stem @ Wells St. | 41° 53.259' | 87° 38.045' |
| WW_101 | North Shore Channel @ Foster Ave. | 41° 58.543' | 87° 42.277' |
| WW_102 | North Shore Channel @ Oakton Ave. | 42° 01.570' | 87° 42.580' |
| WW_103 | West Fork, North Branch Chicago River @ Golf Rd. | 42° 03.307' | 87° 46.487' |
| WW_104 | North Branch Chicago River @ Glenview Rd. | 42° 04.129' | 87° 46.466' |
| WW_105 | Skokie River @ West Frontage Rd. | 42° 05.332' | 87° 45.594' |
| WW_106 | West Fork, North Branch Chicago River @ Dundee Rd. | 42° 08.300' | 87° 50.095' |
| WW_108 | South Branch Chicago River @ Loomis St. | 41° 50.747' | 87° 39.662' |
| WW_109 | Salt Creek @ Brookfield Ave. | 41° 49.370' | 87° 50.494' |
| WW_110 | West Branch DuPage River @ Springinsguth Rd. | 42° 00.495' | 88° 07.142' |

Attachment 8

ENVIRONMENTAL
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Jennifer Wasik
Metropolitan Water Reclamation District
6001 W. Pershing
Cicero, IL 60804

January 09, 2003

RE: MWRD Sediment Sampling

Lab Orders:
02100793 02110005 02110477

Dear Ms. Wasik:

Enclosed are the analytical reports for the EMT Lab Orders listed. If you have any questions, please contact me at 847-967-6666.

Sincerely,

Handwritten signature of Charlie T. Diamos in black ink.

Charlie T. Diamos
Project Manager

Approved by,

Handwritten signature of Mitchell Ostrowski in black ink.

Mitchell Ostrowski
Laboratory Director

The Contents of this report apply to the sample(s) analyzed. No duplication is allowed except in its entirety.

State of Illinois Chemical Analysis in Drinking Water Accredited Lab No. 100256
State of Wisconsin Wastewater and Hazardous Waste No. 9396A6680

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CLIENT: Metropolitan Water Reclamation District

Date: 09-Jan-03

Project: MWRD Sediment Sampling

CASE NARRATIVE

Lab Orders: 02100793 02110008 02110477

Unless otherwise noted, samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste. Physical/Chemical Methods, SW846, 3rd Edition

Unless otherwise noted, all method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

Sample results relate only to the analytes of interest tested and to the sample received at the laboratory.

All results are reported on a wet weight basis, unless otherwise noted. Dry weight adjusted results are indicated by the notation "dry" in the Units column.

Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated. For specific information regarding EMT's scope of accreditation, please contact your EMT project manager.

The Reporting Limit listed on the Report of Laboratory Analysis is EMT's reporting limit for the analyte reported. For most test methods this reporting limit is primarily based upon the lowest point in the calibration curve.

Method References:

SW=USEPA, Test Methods for Evaluating Solid Waste, SW-846.

F=USEPA Methods for the Determination of Inorganic Substances in Environmental Samples, Methods for Chemical Analysis of Water and Wastes; Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, 40 CFR Part 136, App A; methods for the Determination of Metals in Environmental Samples; Methods for the Determination of Organic Compounds in Drinking Water.

SM= APHA, Standard Methods for the Examination of Water and Wastewater.

D=ASTM, Annual Book of Standards

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CLIENT: Metropolitan Water Reclamation District

Date: 09-Jan-63

Project: MWRD Sediment Sampling

CASE NARRATIVE

Lab Orders: 02100793 02110006 02110477

Analytical Comments for METHOD 6010B_S_LIST, LCS-R38435: LCS used was IDMP solution within 5 times MDL, all recoveries within 30%.

Analytical Comments for METHOD 6010B_S_LIST, 02100793-01A: Sample run with 1:1 dilution for 1 point MSA determination and calculated with a 25 time dilution factor for the distillation set-up prior to conversion to umoles.

Analytical Comments for METHOD 6010B_S_LIST, 02100793-02A: Sample run with 1:1 dilution for 1 point MSA determination and calculated with a 25 time dilution factor for the distillation set-up prior to conversion to umoles.

Analytical Comments for METHOD 6010B_S_LIST, 02100793-03A: Sample run with 1:1 dilution for 1 point MSA determination and calculated with a 25 time dilution factor for the distillation set-up prior to conversion to umoles.

Analytical Comments for METHOD 6010B_S_LIST, 02100793-04A: Sample run with 1:1 dilution for 1 point MSA determination and calculated with a 25 time dilution factor for the distillation set-up prior to conversion to umoles.

Analytical Comments for METHOD 6010B_S_LIST, 02100793-05A: Sample run with 1:1 dilution for 1 point MSA determination and calculated with a 25 time dilution factor for the distillation set-up prior to conversion to umoles.

Analytical Comments for METHOD 6010B_S_LIST, 02100793-06A: Sample run with 1:1 dilution for 1 point MSA determination and calculated with a 25 time dilution factor for the distillation set-up prior to conversion to umoles.

Analytical Comments for METHOD 6010B_S_LIST, 02100793-07A: Sample run with 1:1 dilution for 1 point MSA determination and calculated with a 25 time dilution factor for the distillation set-up prior to conversion to umoles.

Analytical Comments for METHOD 6010B_S_LIST, MB-R38435: Cu and Zn detected in blank greater than MDL but less than 0.02 ppm prior to conversion.

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CLIENT: Metropolitan Water Reclamation District

Date: 09-Jan-03

Project: MWRD Sediment Sampling

CASE NARRATIVE

Lab Orders: 02100793 02110006 02110477

Analytical Comments for METHOD 6010B_S_LIST, 02110006-02A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110006-01A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110006-03A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110006-04A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110006-05A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110006-06A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110006-07A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110006-08A: Samples run with a 1 to 1 dilution for a 1 point MSA.

Analytical Comments for METHOD 6010B_S_LIST, 02110477-01A: Samples run with 1 point MSA on 1:1 dilution of matrix.

Analytical Comments for METHOD 6010B_S_LIST, 02110477-02A: Samples run with 1 point MSA on 1:1 dilution of matrix.

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW74 CENTER
Lab Order: 02100793 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/25/02
Lab ID: 02100793-07 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|---------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediments | 7.23 | 5.72 | umoles/g-dry | 10/25/02 | LNS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 51600. | 797 | mg/Kg-dry | 11/1/02 | IGM |
| Percent Moisture | | | | | |
| Percent Moisture | 58.6 | 0.1 | % (Percent) | 10/25/02 | RM2 |
| ICP Metals Solids Total | | | | | |
| Cadmium | 0.047 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Copper | 1.17 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Lead | 0.727 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MC |
| Nickel | 0.231 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Zinc | 5.52 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- S - Spike Recovery outside accepted recovery limits
- E - Estimated
- R - RPD outside accepted recovery limits
- H - Holding Time Exceeded
- L - Analyte detected below quantification limits
- C - Laboratory not accredited for this parameter

environmental laboratory and testing services

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW74 SIDE
 Lab Order: 02160793 Report Date: 1/7/03
 Project: MWRD Sediment Sampling Collection Date: 10/25/02
 Lab ID: 02160793-01 Matrix: Sludge

| Analyses | Result | E.M.T. Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|------------------------------|---------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediments | < 4.72 | 4.72 | umoles/g-dry | 10/29/02 | ENS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 43000 | 657 | mg/Kg-dry | 11/1/02 | IGIA |
| Percent Moisture | | | | | |
| percent Moisture | 19.8 | 0.1 | % (Percent) | 10/29/02 | RMZ |
| ICP Metals Solids Total | | | | | |
| Cadmium | 0.027 | 0. | u moles/g dry | 10/30/02 9:43:35 AM | MG |
| Copper | 1.04 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Lead | 0.483 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Nickel | 5.03 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Zinc | 3.11 | 0. | u moles/g dry | 10/30/02 9:43:35 AM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- S - Spike Recovery outside accepted recovery limits
- E - Estimated
- R - EPD outside accepted recovery limits
- H - Holding Time Exceeded
- T - Analyte detected below quantitation limits
- C - Laboratory not accredited for this parameter

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW100 CENTER
Lab Order: 02100793 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/25/02
Lab ID: 02100793-07 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|---------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediments | 16.2 | 4.58 | umoles/g-dry | 10/29/02 | LNS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 48900 | 637 | mg/Kg-dry | 11/1/02 | IGM |
| Percent Moisture | | | | | |
| Percent Moisture | 48.2 | 0.1 | %, (Percent) | 10/29/02 | RM2 |
| ICP Metals Solids Total | | | | | |
| Cadmium | 0.063 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Copper | 2.62 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Lead | 3.39 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Nickel | 0.122 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Zinc | 6.57 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- F - Estimated
- H - Holding Time Exceeded
- C - Laboratory not accredited for this parameter
- S - Spike recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW100 SIDE
Lab Order: 02100795 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/25/02
Lab ID: 02100793-02 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|---------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediments | 11.8 | 5.66 | umoles/g-dry | 10/29/02 | LNS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 68900 | 776 | mg/Kg-dry | 11/1/02 | IGM |
| Percent Moisture | | | | | |
| Percent Moisture | 58.1 | 0.1 | % (Percent) | 10/29/02 | RM2 |
| ICP Metals Solids Total | | | | | |
| Cadmium | 0.113 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Copper | 1.16 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Lead | 1.74 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Nickel | 2.16 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Zinc | 6.66 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- E - Estimated
- F - Holding Time Exceeded
- C - Laboratory not accredited for this parameter
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW108 CENTER
Lab Order: 02100793 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/25/02
Lab ID: 02100793-05 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediments | 9.54 | 4.09 | microsiegs dry | 10/29/02 | LNS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 47200. | 565. | mg/Kg-dry | 11/1/02 | IGM |
| Percent Moisture | | | | | |
| Percent Moisture | 42. | 0.1 | % (Percent) | 10/29/02 | RM2 |
| ICP Metals Solids Total | | | | | |
| Cadmium | 0.054 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Copper | 0.009 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Lead | 0.018 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Nickel | 0.231 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Zinc | 3.60 | 0 | u moles/g dry | 10/30/02 9:43:35 AM | MG |

Qualifiers: R - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits
E - Estimated R - RPD outside accepted recovery limits
H - Holding Time Exceeded J - Analyte detected below quantitation limits
C - Laboratory not accredited for this parameter

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW108 SIDE
Lab Order: 02100793 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/25/02
Lab ID: 02100793.06 Matrix: Sludge

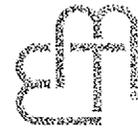
| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|---------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediments | 6.51 | 4.37 | umoles/g-dry | 10/29/02 | LNS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 43400. | 600 | mg/Kg-dry | 11/1/02 | IGM |
| Percent Moisture | | | | | |
| Percent Moisture | 45.8 | 0.1 | % (Percent) | 10/29/02 | RM2 |
| ICP Metals Solids Total | | | | | |
| Calcium | 0.041 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Copper | 0.929 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Lead | 0.567 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Nickel | 0.139 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Zinc | 4.14 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |

Qualifiers: B - Analyte detected in the associated Method Blank
E - Estimated
H - Holding Time Exceeded
C - Laboratory not accredited for this parameter
N - Spike Recovery outside accepted recovery limits
K - LOD outside accepted recovery limits
J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW39 CENTER
Lab Order: 02100793 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/25/02
Lab ID: 02100793-15 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|---------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment Method: AVS/SEM | | | | | |
| Acid Volatile Sulfide in Sediments | < 6.73 | 6.73 | u moles/g-dry | 10/29/02 | LNS |
| Organic Carbon, Total Method: SW9060 | | | | | |
| Total Organic Carbon | 63000. | 938. | mg/Kg-dry | 11/1/02 | IGM |
| Percent Moisture Method: 2540G | | | | | |
| Percent Moisture | 64.8 | 0.1 | % (Percent) | 10/29/02 | RI42 |
| ICP Metals Solids Total Method: SW6010B | | | | | |
| Chromium | 0.078 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Copper | 1.08 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Lead | 1.22 | 0 | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Nickel | 0.385 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |
| Zinc | 8.71 | 0. | u moles/g-dry | 10/30/02 9:43:35 AM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- E - Estimated
- H - Holding Time Exceeded
- C - Laboratory not accredited for this parameter
- S - Spike recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- J - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW 99 side
Lab Order: 02110006 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/29/02
Lab ID: 02110006-01 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|-------------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediments | 124 | Method: AVS/SEM 0.25 | umoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 71700 | Method: SW9060 825 | mg/Kg-dry | 11/11/02 | LP |
| Percent Moisture | | | | | |
| Percent Moisture | 62.1 | Method: 2540G 0.1 | % (Percent) | 11/5/02 | RM2 |
| ICP Metals Solids Total | | | | | |
| Calcium | 0.038 | Method: SW6010B 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 0.271 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 1.38 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 3.303 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Zinc | 8.42 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |

Qualifiers

- B - Analyte detected in the associated Method Blank
- E - Estimated
- H - Holding Time Exceeded
- C - Laboratory not accredited for this parameter

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

L - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW 99 ceme
Lab Order: 0211006 Report Date: 1/7/02
Project: MWRD Sediment Sampling Collection Date: 10/29/02
Lab ID: 0211006-02 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | Method: | AVS/SEM | | |
| Acid Volatile Sulfide in Sediments | 50.5 | 7.1 | umoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total | | Method: | SW9060 | | |
| Total Organic Carbon | 84200 | 928 | mg/Kg-dry | 11/11/02 | LP |
| Percent Moisture | | Method: | 2540G | | |
| Percent Moisture | 66.6 | 0.1 | % (Percent) | 11/3/02 | RM2 |
| ICP Metals Solids Total | | Method: | SW6010B | | |
| Cadmium | 0.045 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 0.159 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 2.57 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 0.843 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Zinc | 10.2 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- E - Estimated
- H - Holding Time Exceeded
- C - Laboratory not accredited for this parameter
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- L - Analyte detected below quantitation limits

environmental laboratory and testing services

| water | soil | air | product | waste |





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Report of Laboratory Analysis

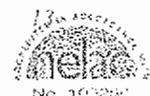
CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW 40 side
Lab Order: 02110006 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/29/02
Lab ID: 02110006-03 Matrix: Sludge

| Analyses | Result | EMI Reporting Limit | Units | Date Analyzed | Analyst |
|------------------------------------|--------|---------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | Method: | AVS/SEM | | |
| Acid Volatile Sulfide in Sediments | 8.68 | 4.95 | µmoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total | | Method: | SW9060 | | |
| Total Organic Carbon | 99800 | 640 | mg/kg-dry | 11/11/02 | LP |
| Percent Moisture | | Method: | 2540G | | |
| Percent Moisture | 52.1 | 0.1 | % (Percent) | 11/3/02 | RM2 |
| ICP Metals Solids Total | | Method: | SW6010B | | |
| Cadmium | 0.04 | 0. | µ moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 0.959 | 0. | µ moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 1.88 | 0. | µ moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 0.324 | 0. | µ moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Zinc | 6.21 | 0. | µ moles/ g-dry | 11/11/02 2:12:05 PM | MG |

Qualifiers: B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits
E - Estimated R - RPD outside accepted recovery limits
H - Holding Time Exceeded J - Analyte detected below quantitation limits
C - Laboratory not accredited for this parameter

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW 40 center
Lab Order: 02110006 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/29/02
Lab ID: 02110006-04 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|------------------------------------|---------|---------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | Method: AVS/SEM | | | |
| Acid Volatile Sulfide in Sediments | 18.4 | 5.77 | umoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total | | Method: SW9060 | | | |
| Total Organic Carbon | 124000. | 753 | mg/Kg-dry | 11/11/02 | LP |
| Percent Moisture | | Method: 2540G | | | |
| Percent Moisture | 58.9 | 0.1 | % (Percent) | 11/3/02 | RM2 |
| ICP Metals Solids Total | | Method: SW6010B | | | |
| Calcium | 0.076 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 1.19 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 1.55 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 0.399 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Zinc | 9.05 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |

Qualifiers: E - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits
F - Rejected R - RPL outside accepted recovery limits
H - Holday Time Exceeded J - Analyte detected below quantitation limits
C - Laboratory not accredited for this parameter

environmental laboratory and testing services

| water | soil | air | product | waste |





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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW 75 side
Lab Order: 02110006 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/31/02
Lab ID: 02110006-05 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|------------------------------------|--------|---------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | Method: AVS/SEM | | | |
| Acid Volatile Sulfide in Sediments | < 2.98 | 2.98 | umoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total | | Method: SW9060 | | | |
| Total Organic Carbon | 43100. | 389. | mg/kg-dry | 11/11/02 | LP |
| Percent Moisture | | Method: 2540G | | | |
| Percent Moisture | 20.4 | 0.1 | % (Percent) | 11/3/02 | RM2 |
| ICP Metals Solids Total | | Method: SW6010B | | | |
| Caesium | 0.032 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 0.042 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 0.415 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 0.216 | 0. | u moles/ g dry | 11/11/02 2:12:05 PM | MG |
| Zinc | 2.35 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |

Qualifiers: B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits
F - Estimated R - RPD outside accepted recovery limits
H - Holding Time Exceeded J - Analyte detected below quantitation limits
C - Laboratory not accredited for this parameter

environmental laboratory and testing services

water | soil | air | product | waste





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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW 75 center
Lab Order: 02110006 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/31/02
Lab ID: 02110006-06 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | | | | |
| Acid Volatile Sulfide in Sediment | 12 | 4.32 | umoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total | | | | | |
| Total Organic Carbon | 86100 | 505 | mg/Kg-dry | 11/11/02 | LP |
| Percent Moisture | | | | | |
| Percent Moisture | 45.2 | 0.1 | % (Percent) | 11/3/02 | RM2 |
| ICP Metals Solids Total | | | | | |
| Cadmium | 0.085 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 1.41 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 1.05 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 0.474 | 0. | u moles/ g dry | 11/11/02 2:12:05 PM | MG |
| Zinc | 8.34 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- E - Estimated
- H - Holding Time Exceeded
- C - Laboratory not accredited for this parameter
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- L - Analyte detected below quantitation limits

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW 41 side
Lab Order: 02110006 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/31/02
Lab ID: 02110006-07 Matrix: Sludge

| Analyses | Result | E.M.T. Reporting Limit | Units | Date Analyzed | Analyst |
|------------------------------------|--------|------------------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment | | Method: | AVS/SEM | | |
| Acid Volatile Sulfide in Sediments | < 2.96 | 2.96 | umoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total | | Method: | SW9060 | | |
| Total Organic Carbon | 33700 | 417 | mg/Kg-dry | 11/11/02 | LP |
| Percent Moisture | | Method: | 2540G | | |
| Percent Moisture | 20.6 | 0.1 | % (Percent) | 11/3/02 | RM2 |
| ICP Metals Solids Total | | Method: | SW6010B | | |
| Cadmium | 0.017 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 0.076 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 0.086 | 0 | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 0.166 | 0 | u moles/ g-dry | 11/11/02 2:12:07 PM | MG |
| Zinc | 1.66 | 0 | u moles/ g-dry | 11/11/02 2:12:06 PM | MG |

Qualifiers:

- B - Analyte detected in the associated Method Blank
- S - Spike Recovery outside accepted recovery limits
- E - Estimated
- R - RFD outside accepted recovery limits
- H - Holding Time Exceeded
- J - Analyte detected below quantitation limits
- C - Laboratory not accredited for this parameter

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Report of Laboratory Analysis

CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW #1 center
Lab Order: 02110006 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 10/31/02
Lab ID: 02110006-05 Matrix: Sludge

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|--|--------|---------------------|----------------|---------------------|---------|
| Acid Volatile Sulfide in Sediment Method: AVS/SEM | | | | | |
| Acid Volatile Sulfide in Sediments | 8.23 | 3.13 | umoles/g-dry | 11/7/02 | LNS |
| Organic Carbon, Total Method: SW9060 | | | | | |
| Total Organic Carbon | 36000 | 431 | mg/Kg-dry | 11/11/02 | LP |
| Percent Moisture Method: 2540G | | | | | |
| Percent Moisture | 24.2 | 0.1 | % (Percent) | 11/3/02 | RM2 |
| ICP Metals Solids Total Method: SW6010B | | | | | |
| Cadmium | 0.037 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Copper | 0.264 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Lead | 0.233 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |
| Nickel | 0.329 | 0 | u moles/ g dry | 11/11/02 2:12:05 PM | MG |
| Zinc | 2.91 | 0. | u moles/ g-dry | 11/11/02 2:12:05 PM | MG |

Qualifiers: B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits
F - Estimated R - RPD outside accepted recovery limits
H - Holding Time Exceeded I - Analyte detected below quantitation limit.
C - Laboratory not accredited for this parameter

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Report of Laboratory Analysis

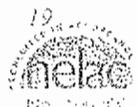
| | | | |
|------------|---|-------------------|------------|
| CLIENT: | Metropolitan Water Reclamation District | Client Sample ID: | WW92CENTER |
| Lab Order: | 02110477 | Report Date: | 11/7/02 |
| Project: | MWRD Sediment Sampling | Collection Date: | 11/14/02 |
| Lab ID: | 02110477-01 | Matrix: | Solid |

| Analyses | Result | EML Reporting Limit | Units | Date Analyzed | Analyst |
|------------------------------------|--------|---------------------|----------------|---------------|---------|
| Acid Volatile Sulfide in Sediment | | Method: | AVS/SEM | | |
| Acid Volatile Sulfide in Sediments | 30.1 | 0.81 | umoles/g-dry | 11/21/02 | LNS |
| Organic Carbon, Total | | Method: | SW9060 | | |
| Total Organic Carbon | 84500 | 779 | mg/Kg-dry | 11/20/02 | LP |
| Percent Moisture | | Method: | 2540G | | |
| Percent Moisture | 59.2 | 0.1 | % (Percent) | 11/19/02 | RM2 |
| ICP Metals Solids Total | | Method: | SW6010B | | |
| Calcium | 0.126 | 0 | u moles/ g-dry | 11/22/02 | MG |
| Copper | 0.482 | 0 | u moles/ g-dry | 11/22/02 | MG |
| Lead | 0.588 | 0 | u moles/ g-dry | 11/22/02 | MG |
| Nickel | 0.498 | 0 | u moles/ g-dry | 11/22/02 | MG |
| Zinc | 9.18 | 0 | u moles/ g-dry | 11/22/02 | MG |

Qualifiers: R - Analyte Detected in the associated Method Blank
 S - Spike Recovery outside accepted recovery limits
 E - Filtered
 R - RPD outside accepted recovery limits
 H - Holding Time Exceeded
 T - Analyte Detected below quantitation limits
 C - Laboratory not accredited for this parameter

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| water | soil | air | product | waste |





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Report of Laboratory Analysis

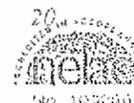
CLIENT: Metropolitan Water Reclamation District Client Sample ID: WW92SIDE
Lab Order: 02110477 Report Date: 1/7/03
Project: MWRD Sediment Sampling Collection Date: 11/14/02
Lab ID: 02110477-02 Matrix: Solid

| Analyses | Result | EMT Reporting Limit | Units | Date Analyzed | Analyst |
|------------------------------------|--------|---------------------|----------------|---------------|---------|
| Acid Volatile Sulfide in Sediment | | Method: AVS/SEM | | | |
| Acid Volatile Sulfide in Sediments | 7.11 | 3.42 | umoles/g-dry | 11/21/02 | LNS |
| Organic Carbon, Total | | Method: SW9060 | | | |
| Total Organic Carbon | 40000. | 459. | mg/Kg-dry | 11/20/02 | LP |
| Percent Moisture | | Method: 2540G | | | |
| Percent Moisture | 30.7 | 0.1 | % (Percent) | 11/19/02 | RM2 |
| ICP Metals Solids Total | | Method: SW6010B | | | |
| Cadmium | 0.013 | 0. | u moles/ g-dry | 11/22/02 | MG |
| Copper | 0.216 | 0. | u moles/ g-dry | 11/22/02 | MG |
| Lead | 0.189 | 0 | u moles/ g-dry | 11/22/02 | MG |
| Nickel | 0.136 | 0. | u moles/ g-dry | 11/22/02 | MG |
| Zinc | 2.59 | 0. | u moles/ g-dry | 11/22/02 | MG |

Qualifiers: B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits
E - Estimated R - RPD outside accepted recovery limits
H - Holding Time Exceeded J - Analyte detected below quantitation limits
C - Laboratory not accredited for this parameter

environmental laboratory and testing services

| water | soil | air | product | waste |



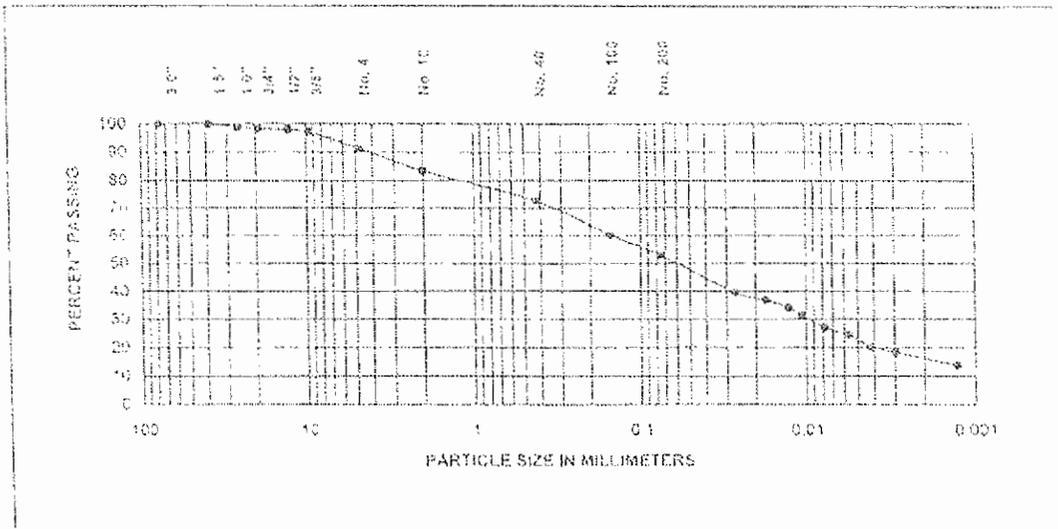


Great Lakes Soil & Environmental Consultants, Inc.
 333 Green Drive East Ridge, IL 60521 TEL: (630) 331-0944 FAX: (630) 331-0945

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | | | |
|----------|--|-----------|--------------|-------------|-----------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Melrose Grove, IL 60063 Attn: Mr. Charles Thomas | | | | | | |
| File No. | 2529 | Sample #: | WW105-Center | Date Tested | 11/5/2002 | Tested by | MA |
| | | | | | | Qc by | GAK |

| | |
|-----------------------|-----------------------|
| Date Sample Received: | 10/31/2002 |
| Sample Location: | |
| Sample Description: | Gray sandy silty clay |



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 6.7 | 38.3 | 30.6 | 22.4 |

| For coarse-grained soils with <12% Fines | D60(mm) | D30(mm) | D10(mm) | Cu | Cc |
|--|---------|---------|---------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _i | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.2" | 99.8 | | | |
| 3/4" | 98.5 | | | |
| 1/2" | 98.0 | | | |
| 3/8" | 97.4 | | | |
| No. 4 | 91.3 | | | |
| No. 10 | 83.5 | | | |
| No. 40 | 77.5 | | | |
| No. 100 | 60.2 | | | |
| No. 200 | 53.0 | | | |

| | |
|----------------------|------------|
| Soil Classification: | ML |
| Soil Description: | Sandy silt |
| System: | USCS |

Remarks

UC Atterberg Limits tests were performed.



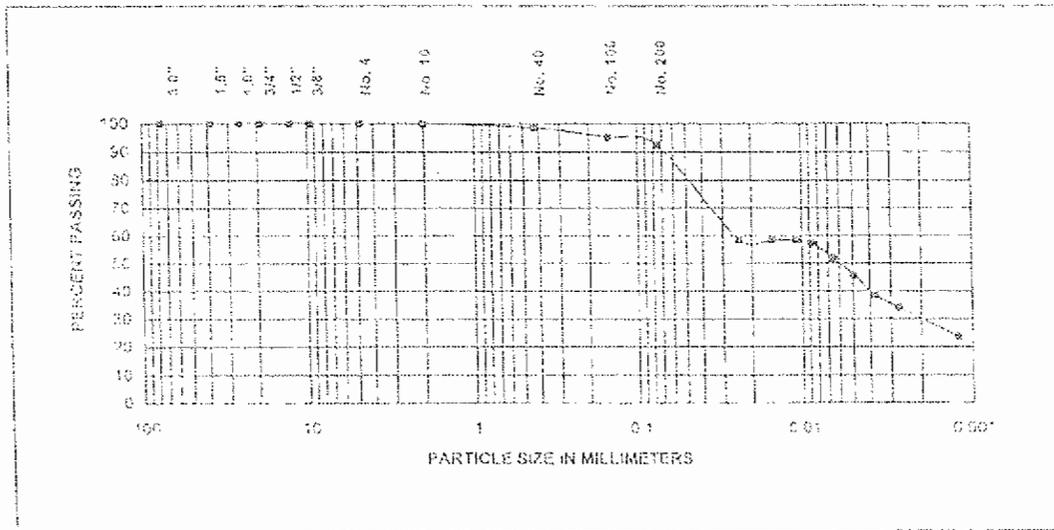
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 137 North Lake Street, Suite 1000, Chicago, IL 60610, 312-554-1344 Fax: 312-554-0940

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | | | |
|----------|---|----------|------------|-------------|-----------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 3160 North Austin Avenue, Monon Grove, IL 60053 Attn: Mr. Charlie Diambro | | | | | | |
| File No. | 2529 | Sample # | WW100-Side | Date Tested | 11/5/2002 | Tested by | MC |
| | | | | | | Qc by | GAK |

Date Sample Received: 10/11/2002

| | |
|--------------------|-----------------|
| Sample Location | |
| Sample Description | Gray silty clay |



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 0.0 | 7.4 | 47.9 | 44.9 |

| For coarse-grained soils with <12% Fines | D60(mm) | D30(mm) | D10(mm) | Cu | Cc |
|--|---------|---------|---------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _L | Plastic Limit, P _L | Plasticity Index, P _I |
|------------|-----------------|------------------------------|-------------------------------|----------------------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 100.0 | | | |
| 1/2" | 100.0 | | | |
| 3/8" | 100.0 | | | |
| No. 4 | 100.0 | | | |
| No. 10 | 99.9 | | | |
| No. 40 | 99.5 | | | |
| No. 100 | 95.4 | | | |
| No. 200 | 92.6 | | | |

| | |
|----------------------|------|
| Soil Classification: | ML |
| Soil Description: | Silt |
| System: | USCS |

Remarks

No Atterberg Limits tests were performed

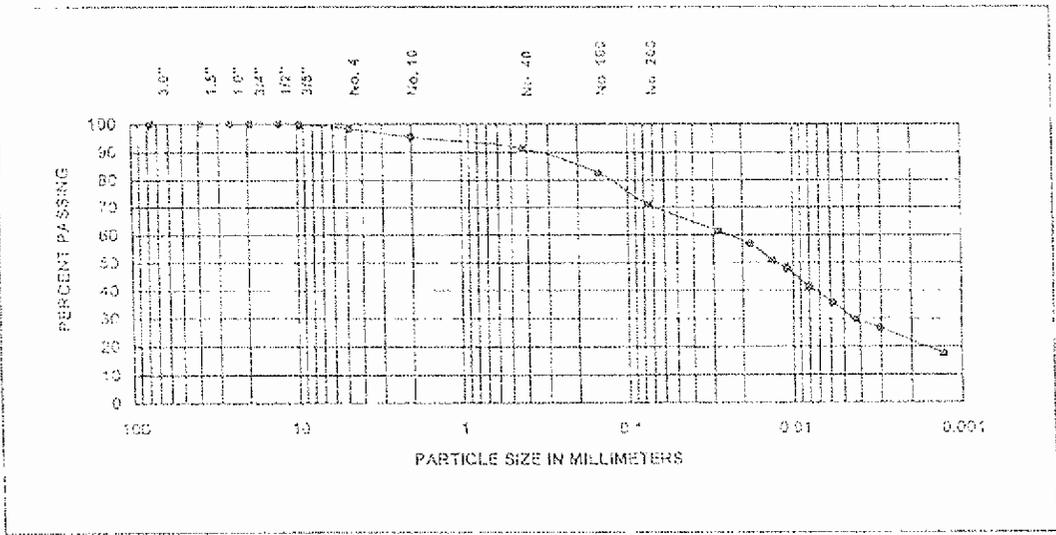


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 225 State Circle, Burlington, OH 43021 Tel: (615) 321-9544 Fax: (615) 321-9545

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | | | |
|----------|--|----------|-------------|-------------|-----------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 2100 North Austin Avenue, Monon Grove, IL 60053 Attn.: Mr. Charles Damos | | | | | | |
| File No. | 2529 | Sample # | WW74-Center | Date Tested | 11/6/2002 | Tested by | MC |
| | | | | | | Qc by | CAK |

| | |
|-----------------------|-----------------|
| Date Sample Received: | 11/21/2002 |
| Sample Location: | |
| Sample Description: | Gray silty clay |



| % > 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 1.5 | 27.4 | 38.7 | 32.8 |

| | | | | | |
|--|---------|---------|---------|----|----|
| For coarse-grained soils with <12% Fines | D60(mm) | D30(mm) | D10(mm) | Cu | Cc |
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _i | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 100.0 | | | |
| 1/2" | 100.0 | | | |
| 3/8" | 99.8 | | | |
| No. 4 | 96.7 | | | |
| No. 10 | 91.5 | | | |
| No. 40 | 81.5 | | | |
| No. 100 | 62.6 | | | |
| No. 200 | 42.8 | | | |

| | |
|----------------------|----------------|
| Soil Classification: | ML |
| Soil Description: | Silt with sand |
| System: | USCS |

Remarks:

No Atterberg Limits tests were performed



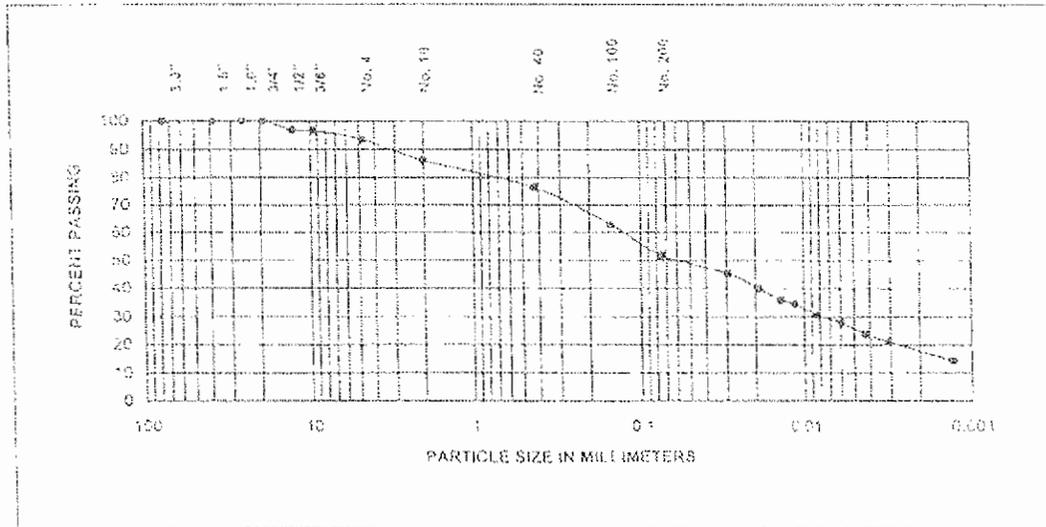
Great Lakes Soil & Environmental Consultants, Inc.
 533 Greenway Drive, Suite 100, Naperville, IL 60563
 Phone: (630) 321-0344 Fax: (630) 321-0343

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | | | |
|----------|--|----------|-----------|-------------|-----------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Morton Grove, IL 60053 Attn: Mr. Charlie Dumas | | | | | | |
| File No. | 2529 | Sample # | WW74-Side | Date Tested | 11/6/2002 | Tested by | MC |
| | | | | | | Qc by | GAK |

Date Sample Received: 10/31/2002

| | |
|--------------------|-----------------|
| Sample Location | |
| Sample Description | Gray silty clay |



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 6.3 | 41.7 | 26.3 | 25.7 |

| For coarse-grained soils with <12% Fines | D50(mm) | D30(mm) | D10(mm) | C _u | C _c |
|--|---------|---------|---------|----------------|----------------|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _l | Plastic Limit, P _l | Plasticity Index, P _I |
|------------|-----------------|------------------------------|-------------------------------|----------------------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 100.0 | | | |
| 1/2" | 97.0 | | | |
| 3/8" | 96.7 | | | |
| No. 4 | 93.7 | | | |
| No. 10 | 86.3 | | | |
| No. 40 | 76.5 | | | |
| No. 100 | 62.5 | | | |
| No. 200 | 52.5 | | | |

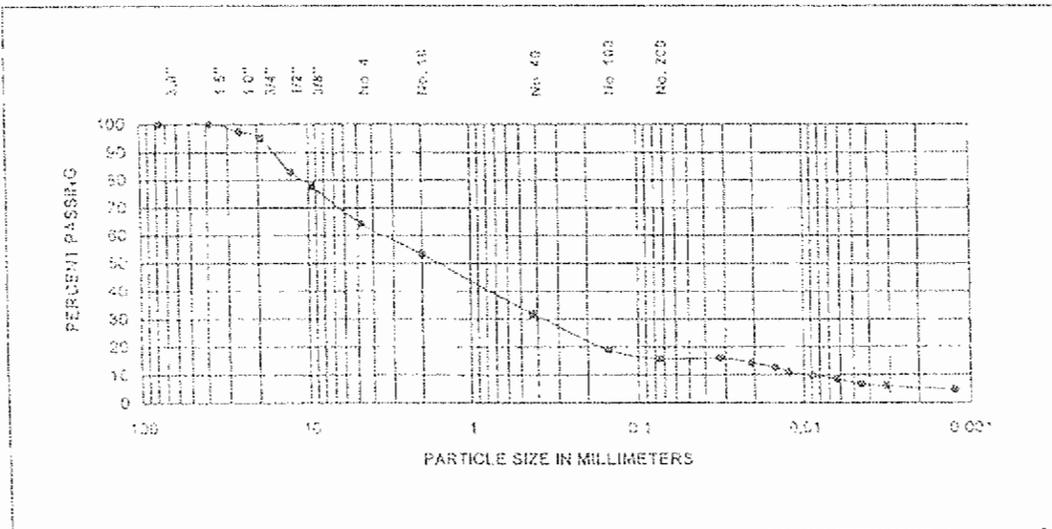
Soil Classification: ML
 Soil Description: Silty sand
 System: USCS

Remarks:
 No Atterberg limits tests were performed

| | | |
|---|---|---|
|  | Great Lakes Soil & Environmental Consultants, Inc. 5710 State Street, Suite 400, Chicago, IL 60631-1211 Tel: (847) 321-0944 Fax: (847) 321-4046 | GRAIN SIZE ANALYSIS (ASTM D422) |
| | Project: Laboratory testing services | |

| | | | | | | | |
|----------|---|-----------|--------------|--------------|-----------|------------|-----|
| Client: | Environmental Monitoring and Technology, Inc. 6130 North Aurora Avenue, Mason Grove, IL 60053 Attn: Mr. Charles DiMarco | | | | | | |
| File No: | 2529 | Sample #: | WW108-Center | Date Tested: | 11/7/2002 | Tested by: | MC |
| | | | | | | Qc by: | GAK |

| | |
|-----------------------|-----------------|
| Date Sample Received: | 10/31/2002 |
| Sample Location: | |
| Sample Description: | Gray silty sand |



| % > 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 35.3 | 48.5 | 5.3 | 7.4 |

| For coarse-grained soils with <12% Fines | D50(mm) | D30(mm) | D10(mm) | Cu | Cc |
|--|---------|---------|---------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _c | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 97.5 | | | |
| 3/4" | 95.2 | | | |
| 1/2" | 82.9 | | | |
| 3/8" | 78.0 | | | |
| No. 4 | 64.2 | | | |
| No. 10 | 53.3 | | | |
| No. 40 | 31.9 | | | |
| No. 100 | 19.0 | | | |
| No. 200 | 15.7 | | | |

Soil Classification: SM
 Soil Description: Silty sand with gravel
 System: USCS

Remarks:

No Atterberg Limits tests were performed.



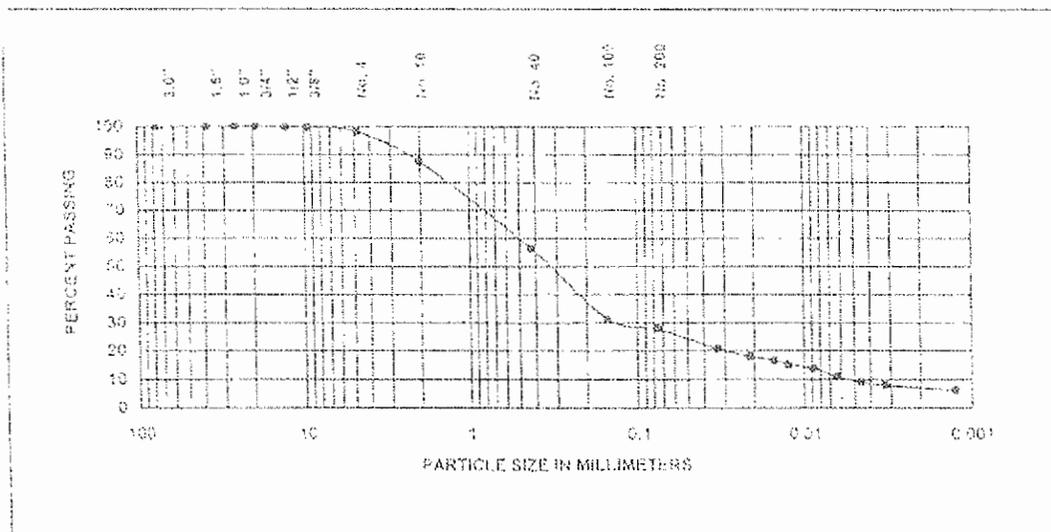
Great Lakes Soil & Environmental Consultants, Inc.
 522 Street Drive, Blue Ridge, IL 60021 PH: (815) 451-0944 Fax: (815) 451-0445

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | | | |
|----------|---|----------|------------|-------------|-----------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Morton Grove, IL 60053 Attn: Mr. Chema Dianna | | | | | | |
| File No. | 2529 | Sample # | WW105-Side | Date Tested | 11/7/2002 | Tested by | MC |
| | | | | | | Qc by | GAK |

Date Sample Received: 10/31/2002

| | |
|--------------------|-----------------|
| Sample Location | |
| Sample Description | Gray Silty Clay |



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 1.6 | 75.4 | 17.9 | 9.9 |

| For coarse-grained soils with <12% Fines | D ₆₀ (mm) | D ₃₀ (mm) | D ₁₀ (mm) | C _u | C _c |
|--|----------------------|----------------------|----------------------|----------------|----------------|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _L | Plastic Limit, P _L | Plasticity Index, P _I |
|------------|-----------------|------------------------------|-------------------------------|----------------------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 100.0 | | | |
| 1/2" | 100.0 | | | |
| 3/8" | 99.9 | | | |
| No. 4 | 99.2 | | | |
| No. 10 | 87.8 | | | |
| No. 40 | 56.4 | | | |
| No. 100 | 31.3 | | | |
| No. 200 | 27.8 | | | |
| | | Soil Classification | SM | |
| | | Soil Description | Silty sand | |
| | | System | JSCS | |

Remarks:

No Atterberg Limits tests were performed



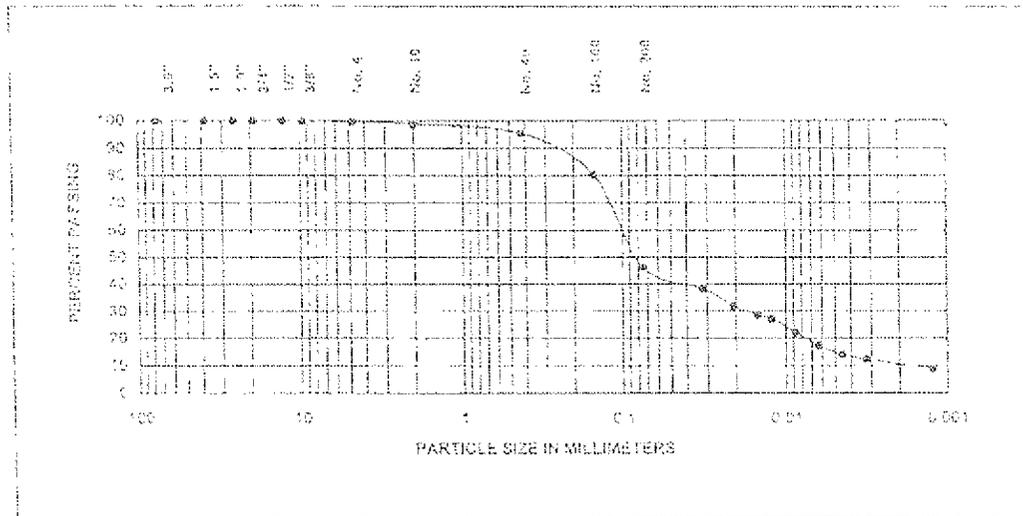
Great Lakes Soil & Environmental Consultants, Inc.
 233 Shore Road, East Troy, IL 60121 Ph: (570) 311-2644 Fax: (800) 361-6541

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | |
|----------|--|----------|------------|-------------|-----------|
| Project | Laboratory testing services | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Morton Grove, IL 60053 Attn: Mr. Charlie Deane | | | | |
| File No. | 2529 | Sample # | WAW 39 Soe | Date Tested | 11/3/2002 |
| | | | | Tested by | MC |
| | | | | Ge by | GAN |

Date Sample Received: 11/7/2002

| | |
|--------------------|--|
| Sample Location | |
| Sample Description | Black silty clayey sand with trace of gravel |



| % + 2" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 0.3 | 0.4 | 31.1 | 15.5 |

| For coarse-grained soils with <12% fines: | D60 (mm) | D30 (mm) | D10 (mm) | Cu | Cc |
|---|----------|----------|----------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, LL | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.18" | 100.0 | | | |
| 0.85" | 100.0 | | | |
| 0.60" | 100.0 | | | |
| No. 4 | 99.7 | | | |
| No. 10 | 98.7 | | | |
| No. 30 | 95.7 | | | |
| No. 100 | 86.4 | | | |
| No. 200 | 46.4 | | | |

Soil Classification: SC-SM
 Soil Description: Silty, clayey sand
 System: USCS

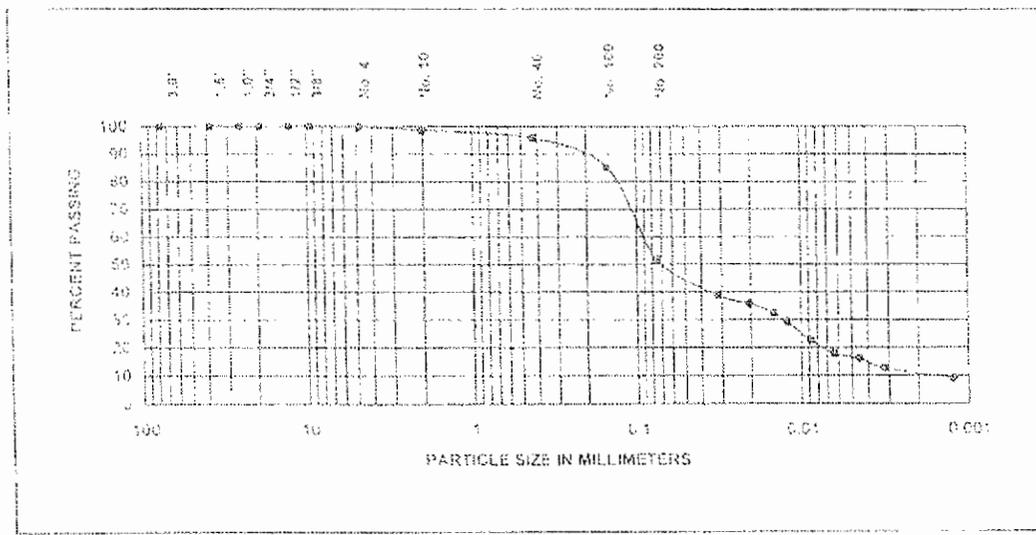
Remarks:
 No Atterberg Limits tests were performed

| | | |
|---|---|---|
|  | Great Lakes Soil & Environmental Consultants, Inc. 200 Green Drive, Burdette, WI 54821 Ph: (715) 321-0544 Fax: (715) 321-0445 | GRAIN SIZE ANALYSIS (ASTM D422) |
| | Project: Laboratory Testing Services | |

| | | | | | | | |
|-----------|---|-----------|--------------|--------------|------------|------------|----|
| Client: | Environmental Monitoring and Technology, Inc. P100 North Austin Avenue, Mentor Grove, IL 60053 Attn: Mr. Charles Djanogly | | | | | | |
| File No.: | 2529 | Sample #: | WW 99 Center | Date Tested: | 11/13/2002 | Tested by: | MC |
| | | | | | | Qc by: | SB |

Date Sample Received: 11/7/2002

| | |
|---------------------|----------------------------|
| Sample Location: | |
| Sample Description: | Black silty clay with sand |



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 0.2 | 47.9 | 35.6 | 15.3 |

| | | | | | |
|--|---------|---------|---------|----|----|
| For coarse-grained soils with <12% Fines | D60(mm) | D30(mm) | D10(mm) | Cu | Cc |
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _i | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|--------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 100.0 | | | |
| 1/2" | 100.0 | | | |
| 3/8" | 100.0 | | | |
| No. 4 | 99.8 | | | |
| No. 10 | 98.7 | | | |
| No. 40 | 95.0 | | | |
| No. 100 | 47.9 | | | |
| No. 200 | 10.0 | | | |
| | | Soil Classification: | SC-SM | |
| | | Soil Description: | silty, clayey sand | |
| | | System: | USCS | |

Remarks:

No Atterberg Limits tests were performed.

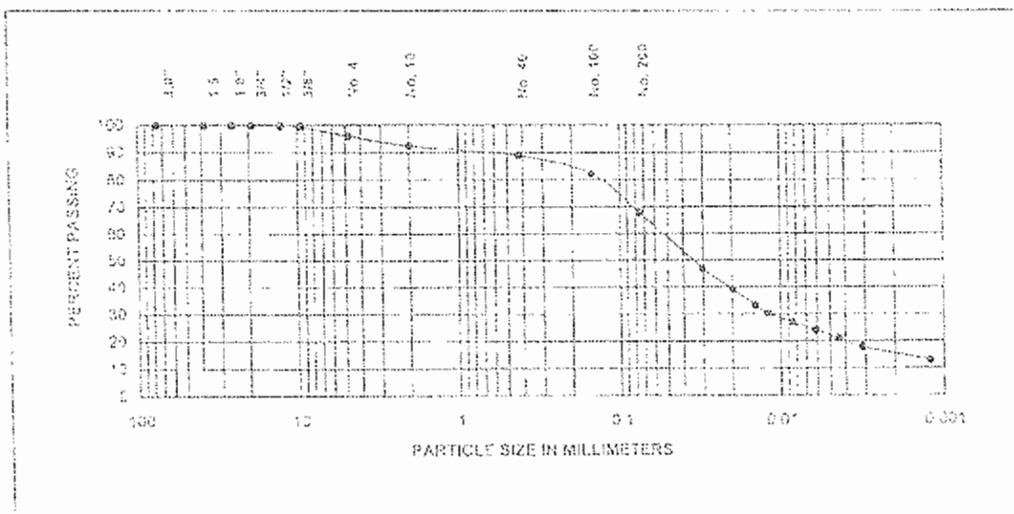


Great Lakes Soil & Environmental Consultants, Inc.
221 Shore Drive, Fair Plain, IL 60131 Ph: 630, 321-1514 Fax: 630, 321-0947

GRAIN SIZE ANALYSIS
(ASTM D422)

| | | | | | | | |
|----------|--|----------|-------------------------|-------------|------------|-----------|------|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Morton Grove, IL 60059 Attn: Mr. Charles Diarpos | | | | | | |
| File No. | 0525 | Sample # | VVV 40 Sid ₀ | Date Tested | 11/13/2002 | Tested by | MC |
| | | | | | | Go by | BAK. |

| | |
|----------------------|---|
| Date Sample Received | 11/7/2002 |
| Sample Location | |
| Sample Description | Black sandy silty clay with trace of gravel |



| % + 3" | % Gravel | % Sand | % Silt | Fines % Clay |
|--------|----------|--------|--------|-----------------|
| 0.0 | 3.8 | 28.7 | 45.5 | 22.4 |

| For coarse-grained soils with <12% Fines | D ₆₀ (mm) | D ₃₀ (mm) | D ₁₀ (mm) | C _u | C _c |
|--|----------------------|----------------------|----------------------|----------------|----------------|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _l | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 5.0" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 0.85" | 100.0 | | | |
| 0.75" | 100.0 | | | |
| 0.6" | 99.8 | | | |
| 0.425" | 99.8 | | | |
| No. 4 | 96.7 | | | |
| No. 10 | 82.3 | | | |
| No. 40 | 65.0 | | | |
| No. 100 | 65.0 | | | |
| No. 200 | 22.4 | | | |

Soil Classification: CL-M
Soil Description: Sandy silty clay
System: USCS

Remarks

No Atterberg limits tests were performed

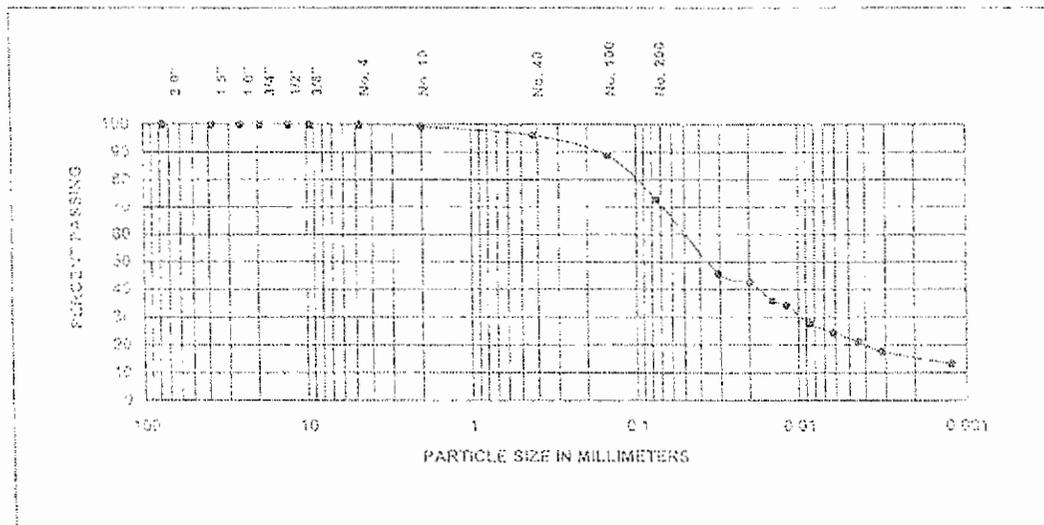


Great Lakes Soil & Environmental Consultants, Inc.
 230 Shore Drive, Sun Ridge, IL 60021 Ph: (815) 921-0944 Fax: (815) 921-0945

**GRAIN SIZE ANALYSIS
 (ASTM D422)**

| | | | | | | | |
|----------|---|----------|---------------|-------------|------------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Morton Grove, IL 60053 Attn: Mr. Charlie Diomas | | | | | | |
| File No. | 2529 | Sample # | WAY 40 Center | Date Tested | 11/13/2002 | Tested by | MC |
| | | | | | | Qc by | GAK |

| | |
|-----------------------|-----------------------------|
| Date Sample Received: | 11/2002 |
| Sample Location | |
| Sample Description | Black clayey silt with sand |



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 0.1 | 27.1 | 55.6 | 22.7 |

| For coarse-grained soils with <12% Fines | D60(mm) | D30(mm) | D10(mm) | Cu | Cc |
|--|---------|---------|---------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L ₁ | Plastic Limit, P ₁ | Plasticity Index, P _I |
|------------|-----------------|------------------------------|-------------------------------|----------------------------------|
| 3" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 100.0 | | | |
| 1/2" | 100.0 | | | |
| 3/8" | 100.0 | | | |
| No. 4 | 99.9 | | | |
| No. 10 | 99.7 | | | |
| No. 40 | 88.5 | | | |
| No. 100 | 88.5 | | | |
| No. 200 | 72.8 | | | |
| | | Soil Classification: | MI | |
| | | Soil Description: | Silt with sand | |
| | | System: | USCS | |

Remarks:

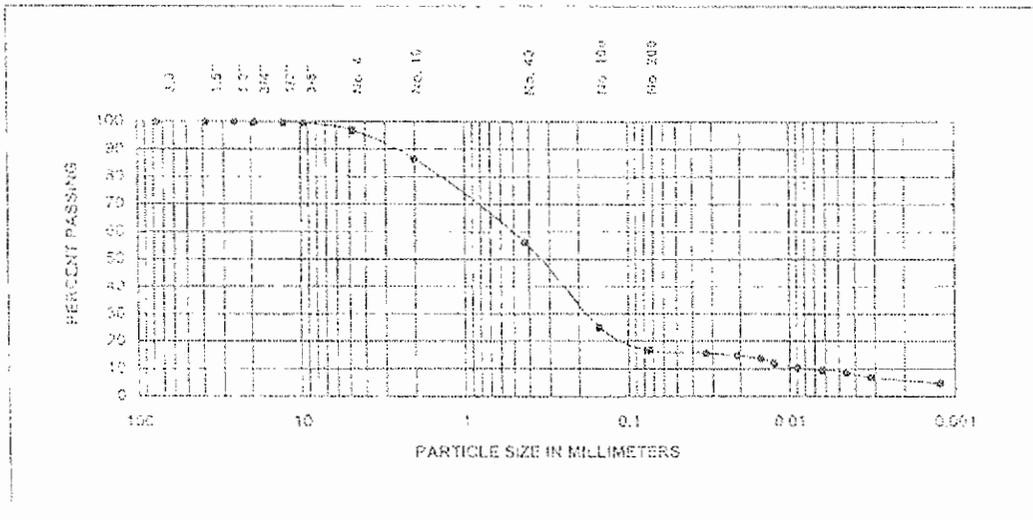
No Atterberg Limits tests were performed.



Great Lakes Soil & Environmental Consultants, Inc.
 213 Shook Drive, Bay Village, OH 44140-1100 Phone: (440) 885-1000 Fax: (440) 885-1004

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | |
|-----------------------|--|----------|------------|-------------|------------|
| Project | Laboratory testing services | | | | |
| Client | Environmental Monitoring and Technology, Inc., 8100 North Austin Avenue, Mentor Grove, IL 60053 Attn: Mr. Charles Quince | | | | |
| File No. | 2529 | Sample # | WW /S Side | Date Tested | 11/13/2002 |
| | | | | Tested by | MC |
| | | | | Qc by | GAK |
| Date Sample Received: | 11/7/2002 | | | | |
| Sample Location | | | | | |
| Sample Description | Black silty clayey sand with trace of gravel | | | | |



| % < 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 3.1 | 80.2 | 7.3 | 8.9 |

| For coarse-grained soils with <12% Fines: | D ₆₀ (mm) | D ₃₀ (mm) | D ₁₀ (mm) | C _u | C _c |
|---|----------------------|----------------------|----------------------|----------------|----------------|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _c | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 99.7 | | | |
| 2.0" | 99.7 | | | |
| 3/8" | 96.5 | | | |
| No. 4 | 96.5 | | | |
| No. 10 | 88.1 | | | |
| No. 40 | 68.1 | | | |
| No. 100 | 25.4 | | | |
| No. 200 | 16.7 | | | |

Soil Classification: SC-SM
 Soil Description: Silty, clayey sand
 System: USCS

Remarks: No Atterberg Limits tests were performed.



Great Lakes Soil & Environmental Consultants, Inc.
 132 Shore Drive, Suite 200, L. 60271, P.O. Box 501, 60241, Fax: 847 531 0545

GRAIN SIZE ANALYSIS
 (ASTM D-422)

Project: Laboratory testing services

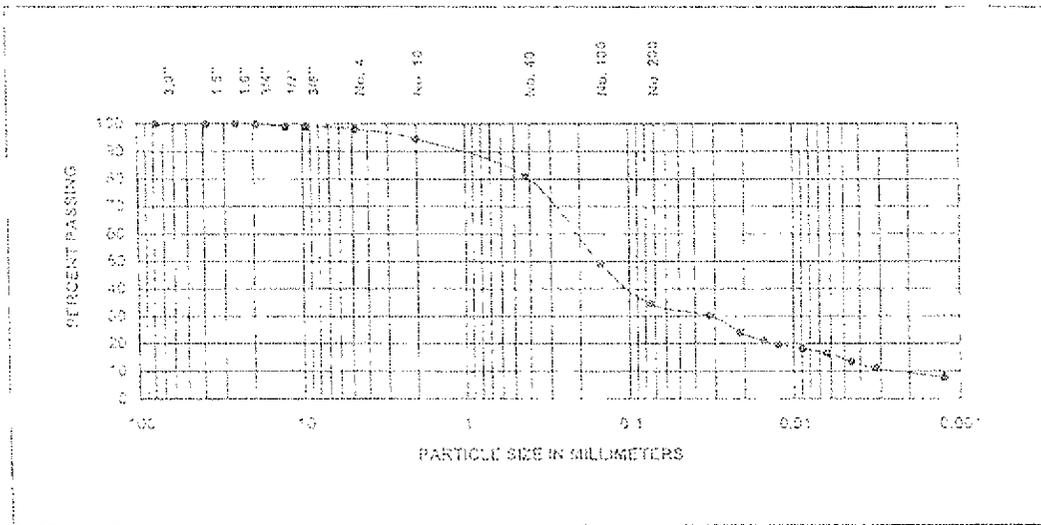
Client: Environmental Monitoring and Technology, Inc. 8190 North Austin Avenue, Motor Grove, IL 60153 Attn: Mr. Charles Diermer

File No.: 2523 Sample #: WW 75 Center Date Tested: 11/13/2002 Tested by: MC
 Cc by: GAK

Date Sample Received: 11/7/2002

Sample Location:

Sample Description: Black silty clayey sand with trace of gravel



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 1.8 | 83.5 | 19.9 | 14.8 |

| For coarse-grained soils with <12% Fines: | D50(mm) | D60(mm) | D10(mm) | Cu | Cc |
|---|---------|---------|---------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _l | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 3/2" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.2" | 100.0 | | | |
| 3/4" | 99.9 | | | |
| 1/2" | 99.0 | | | |
| 3/8" | 95.0 | | | |
| No. 4 | 98.2 | | | |
| No. 10 | 94.7 | | | |
| No. 40 | 81.0 | | | |
| No. 100 | 49.2 | | | |
| No. 200 | 32.7 | | | |

Soil Classification: SC-SM
 Soil Description: Silty clayey sand
 System: USCS

Remarks:

No Atterberg Limits tests were performed.

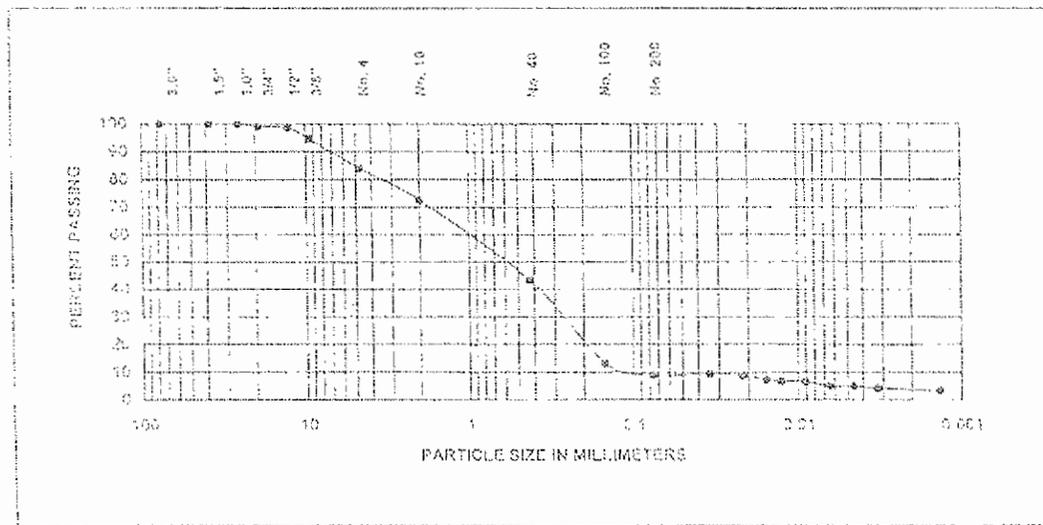


Great Lakes Soil & Environmental Consultants, Inc.
 220 Bruce Drive, Suite 100, Ridgeville, OH 44130 Phone: (440) 931-0940 Fax: (440) 931-0943

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | | | |
|----------|---|----------|------------|-------------|------------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Morton Grove, IL 60053 Attn: Mr. Graham D'Amico | | | | | | |
| File No. | 2528 | Sample # | WW 4" Side | Date Tested | 11/15/2002 | Tested by | MC |
| | | | | | | Qc by | GAK |

| | |
|----------------------|-------------------------------|
| Date Sample Received | 11-7-2002 |
| Sample Location | |
| Sample Description | Black clayey sand with gravel |



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 13.9 | 75.2 | 3.8 | 5.1 |

| For coarse-grained soils with <12% Fines | D60(mm) | D30(mm) | D10(mm) | Cu | Cc |
|--|---------|---------|---------|------|------|
| | 1.03 | 0.27 | 0.09 | 11.6 | 0.73 |

| Sieve Size | Percent Passing | Liquid Limit, LL | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 98.6 | | | |
| 1/2" | 98.6 | | | |
| 3/8" | 94.9 | | | |
| No. 4 | 84.1 | | | |
| No. 10 | 72.6 | | | |
| No. 20 | 53.1 | | | |
| No. 40 | 33.3 | | | |
| No. 100 | 13.3 | | | |
| No. 200 | 10 | | | |

| | |
|----------------------|--|
| Soil Classification: | SP-SC |
| Soil Description: | Poory graded sand with clay and gravel |
| System: | USCS |

Remarks:

No Atterberg Limits tests were performed



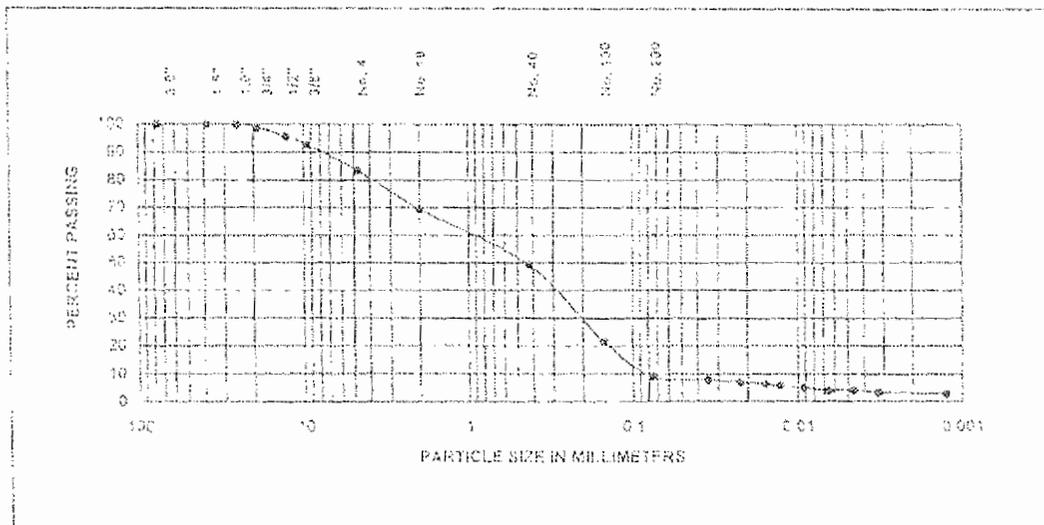
Great Lakes Soil & Environmental Consultants, Inc.
 261 South Lincoln Road, Suite 100, Oak Brook, IL 60452-1000
 Tel: (630) 571-9944 Fax: (630) 571-9948

GRAIN SIZE ANALYSIS
 (ASTM D422)

| | | | | | | | |
|----------|--|----------|--------------|-------------|------------|-----------|-----|
| Project | Laboratory testing services | | | | | | |
| Client | Environmental Monitoring and Technology, Inc. 8100 North Austin Avenue, Moline Grove, IL 60055 Attn: Mr. Charles DiMarco | | | | | | |
| File No. | 2526 | Sample # | WW 41 Corner | Date Tested | 11/13/2007 | Tested by | MA |
| | | | | | | Qc by | GAK |

Date Sample Received: 11/12/2007

| | |
|--------------------|-------------------------------|
| Sample Location | |
| Sample Description | Black clayey sand with gravel |



| | | | | |
|--------|----------|--------|--------|--------|
| % > 3" | % Gravel | % Sand | Fines | |
| 0.0 | 16.6 | 74.3 | % Silt | % Clay |
| | | | 4.9 | 4.2 |

| | | | | | |
|--|---------|---------|---------|------|------|
| For coarse-grained soils with <12% Fines | D50(mm) | D30(mm) | D10(mm) | Cu | Cc |
| | 0.96 | 0.21 | 0.08 | 12.2 | 0.96 |

| Sieve Size | Percent Passing | Liquid Limit, L _c | Plastic Limit, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 0.85" | 98.9 | | | |
| 0.75" | 98.7 | | | |
| 0.6" | 92.9 | | | |
| No. 4 | 83.5 | | | |
| No. 10 | 65.8 | | | |
| No. 40 | 49.4 | | | |
| No. 100 | 21.6 | | | |
| No. 200 | 9.1 | | | |

Soil Classification: SP-SC
 Soil Description: poorly graded sand with clay and gravel
 System: USCS

Remarks:
 No Atterberg limits tests were performed



Great Lakes Soil & Environmental Consultants, Inc.
 221 South Lake Park Road, P.O. Box 111, (609) 521-0344 Fax: (609) 521-0342

GRAIN SIZE ANALYSIS
 (ASTM D422)

Project: Laboratory testing services

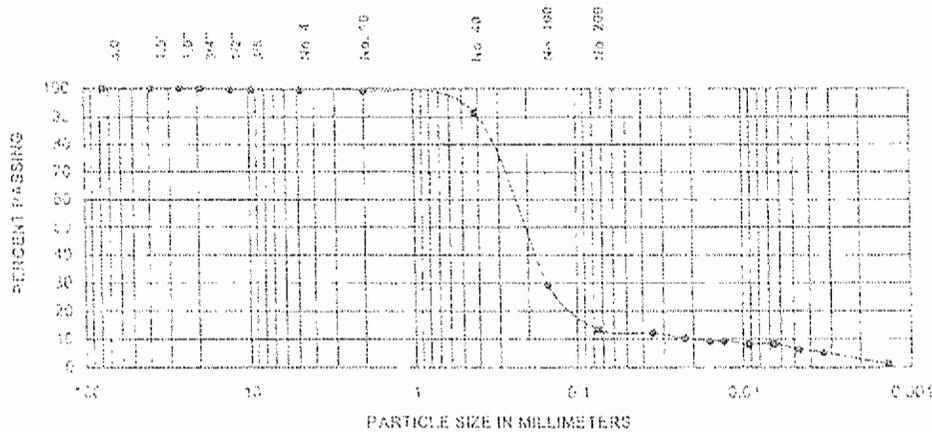
Client: Environmental Monitoring and Technology, Inc. 8120 North Austin Avenue, Morton Grove, IL 60053 Attn: Mr. Charles Dumas

File No: 2526 Sample #: WW92 Side Date Tested: 11-25-2002 Tested by: MD
 Qc by: SS

Date Sample Received: 11/19/2002

Sample Location:

Sample Description: Gray silty clayey sand



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 0.7 | 85.9 | 6.5 | 7.0 |

| For coarse-grained soils with <12% Fines | D60(mm) | D30(mm) | D10(mm) | Cu | Cc |
|--|---------|---------|---------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Lim't, L _L | Plastic Lim't, PL | Plasticity Index, PI |
|------------|-----------------|------------------------------|-------------------|----------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 3/4" | 100.0 | | | |
| 2" | 99.5 | | | |
| 3/8" | 99.5 | | | |
| No. 4 | 99.3 | | | |
| No. 10 | 99.3 | | | |
| No. 40 | 61.9 | | | |
| No. 100 | 22.3 | | | |
| No. 200 | 13.5 | | | |

Soil Classification: SO-SM
 Soil Description: silty, clayey sand
 System: USCS

Remarks:

No Atterberg limits tests were performed.



Great Lakes Soil & Environmental Consultants, Inc.
 501 Lakeshore Blvd. Suite 1000 • P.O. Box 501 • Waukegan, IL 60084

GRAIN SIZE ANALYSIS
 (ASTM D422)

Project: Laboratory testing services

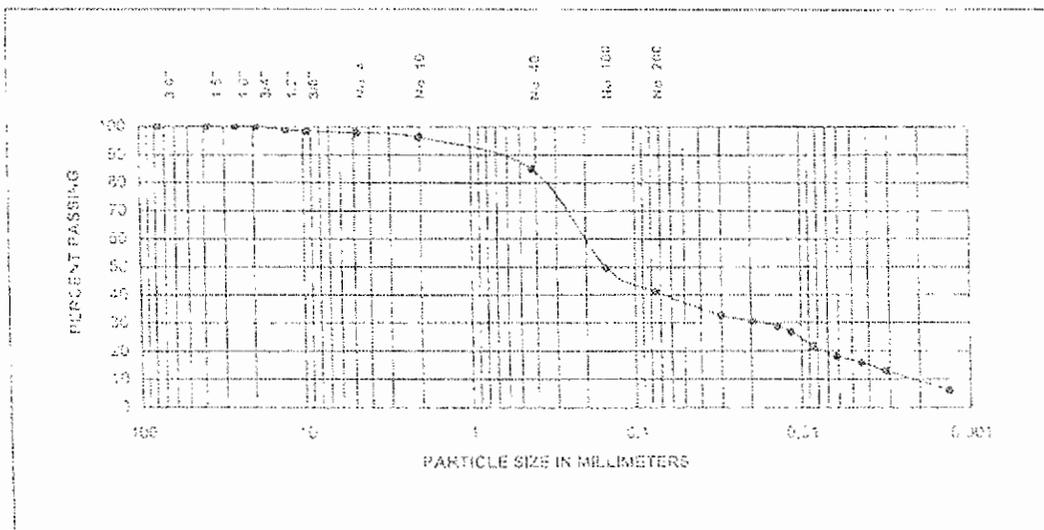
Client: Environmental Monitoring and Technology, Inc. 9151 North Lincoln Avenue, Morton Grove, IL 60053 Attn: Mr. Charles B. Jones

File No.: 2325 Sample #: WW92-Center Date Tested: 11/26/2002 Tested by: MC
 Qc by: SB

Date Sample Received: 11/9/2002

Sample Location:

Sample Description: Gray silty clayey sand



| % + 3" | % Gravel | % Sand | Fines | |
|--------|----------|--------|--------|--------|
| | | | % Silt | % Clay |
| 0.0 | 2.3 | 58.6 | 24.6 | 13.0 |

| For coarse-grained soils with <12% Fines | D60 (mm) | D30 (mm) | D10 (mm) | Cu | Cc |
|--|----------|----------|----------|----|----|
| | | | | | |

| Sieve Size | Percent Passing | Liquid Limit, L _L | Plastic Limit, P _L | Plasticity Index, P _I |
|------------|-----------------|------------------------------|-------------------------------|----------------------------------|
| 3.0" | 100.0 | | | |
| 1.5" | 100.0 | | | |
| 1.0" | 100.0 | | | |
| 0.84" | 100.0 | | | |
| 0.6" | 99.7 | | | |
| No. 4 | 96.2 | | | |
| No. 10 | 58.6 | | | |
| No. 40 | 24.6 | | | |
| No. 100 | 13.0 | | | |
| No. 200 | 13.0 | | | |

Soil Classification: SC-SM
 Soil Description: silty clayey sand
 System: USCS

Remarks:

No Atterberg Limits tests were performed

CLIENT: Metropolitan Water Reclamation District

QC SUMMARY REPORT

Project: MWRD Sediment Sampling

Method Blank

Lab Order: 02110477

| Sample ID: MB-R39430 | Batch ID: R39430 | Test Code: SW6010B | Units: mg/Kg | Analysis Date: 11/27/02 | Prep Date: | | | | | | |
|----------------------|-----------------------|--------------------|--------------|-------------------------|------------|-----------|------------|-------------|------|-----------|------|
| Client ID: | Run ID: T_ICP_021122B | SeqNo: 361854 | | | | | | | | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | Low Limit | High Limit | RPD Ref Val | %RPD | RPD Limit | Qual |
| Cadmium | < 0.58 | 0.583 | | | | | | | | | |
| Copper | < 2.6 | 2.6 | | | | | | | | | |
| Lead | < 3.5 | 3.5 | | | | | | | | | |
| Nickel | < 3.5 | 3.5 | | | | | | | | | |
| Zinc | < 2.8 | 2.83 | | | | | | | | | |

| Sample ID: MB-R39350 | Batch ID: R39350 | Test Code: AVS/SEM | Units: umoles/g | Analysis Date: 11/21/02 | Prep Date: | | | | | | |
|------------------------------------|-------------------------|--------------------|-----------------|-------------------------|------------|-----------|------------|-------------|------|-----------|------|
| Client ID: | Run ID: SULFIDE_021121H | SeqNo: 361207 | | | | | | | | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | Low Limit | High Limit | RPD Ref Val | %RPD | RPD Limit | Qual |
| Acid Volatile Sulfide in Sediments | < 2.4 | 2.37 | | | | | | | | | |

| Sample ID: MB-R39223 | Batch ID: R39223 | Test Code: 2540G | Units: % (Percent) | Analysis Date: 11/19/02 | Prep Date: | | | | | | |
|----------------------|------------------------|------------------|--------------------|-------------------------|------------|-----------|------------|-------------|------|-----------|------|
| Client ID: | Run ID: SOLIDS_021119D | SeqNo: 360115 | | | | | | | | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | Low Limit | High Limit | RPD Ref Val | %RPD | RPD Limit | Qual |
| Percent Moisture | < 0.10 | 0.1 | | | | | | | | | |

| Sample ID: MB-R39328 | Batch ID: R39328 | Test Code: SW9060 | Units: mg/Kg | Analysis Date: 11/20/02 | Prep Date: | | | | | | |
|----------------------|---------------------|-------------------|--------------|-------------------------|------------|-----------|------------|-------------|------|-----------|------|
| Client ID: | Run ID: TOC_021120A | SeqNo: 360999 | | | | | | | | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | Low Limit | High Limit | RPD Ref Val | %RPD | RPD Limit | Qual |
| Total Organic Carbon | < 300 | 300 | | | | | | | | | |

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 - Analyte detected below quantitative limit R - RPD outside accepted recovery limits

Attachment 9



Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 09/26/2003
 Log #: L80852-1

Sample Description:

Analytical Report: WW58Side
 Date Sampled: 09/08/2003
 Time Sampled: 12:15
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 11 | mg/kg (dw) | 6010B | 0.50 | 09/15 | 09/15 | SUB |
| Copper | 78 | mg/kg (dw) | 6010B | 0.50 | 09/15 | 09/15 | SUB |
| Lead | 490 | mg/kg (dw) | 6010B | 5.0 | 09/15 | 09/15 | SUB |
| Nickel | 31 | mg/kg (dw) | 6010B | 3.0 | 09/15 | 09/15 | SUB |
| Zinc | 1700 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 48 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | 4.6 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Copper | 120 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Lead | 250 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Nickel | 33 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Zinc | 540 | mg/kg (dw) | 3050/6010 | 4.2 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 1800 | mg/kg | 1991 | 190 | 09/11 | 09/11 | SUE |
| Total Organic Carbon | 440 | mg/kg (dw) | 9060 | 23 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 2 of 2
 Date: 09/26/2003
 Log #: L80852-1

Sample Description:

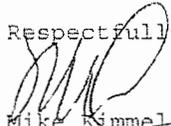
Analytical Report: WW58Side
 Date Sampled: 09/08/2003
 Time Sampled: 12:15
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. Limit | Anly. Date | Analyst |
|---|---------|-------|--------|------------------------|------------|---------|
| Subcontracted Services (continued) | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
 Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
 Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C#:-see attached USB code
 FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
 FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
 FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUE DOH# 86122,86109.E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

 Mike Kimmel
 Senior Project Manager



Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 05/20/2005
 Log #: L80852-1

Sample Description:

Analytical Report: WW58Side
 Date Sampled: 09/08/2003
 Time Sampled: 12:15
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | | Analyst |
|-------------------------------|---------|------------|-----------|------------------|-------|-------|--|---------|
| | | | | Limit | Date | Date | | |
| Metals | | | | | | | | |
| Cadmium | 11 | mg/kg (dw) | 6010B | 0.50 | 09/15 | 09/15 | | SUB |
| Copper | 78 | mg/kg (dw) | 6010B | 0.50 | 09/15 | 09/15 | | SUB |
| Lead | 490 | mg/kg (dw) | 6010B | 5.0 | 09/15 | 09/15 | | SUB |
| Nickel | 31 | mg/kg (dw) | 6010B | 3.0 | 09/15 | 09/15 | | SUB |
| Zinc | 1700 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | | SUB |
| Percent Solids | | | | | | | | |
| Percent Solid | 48 | % | SM2540E | 0.10 | 09/10 | 09/10 | | KB |
| Metals | | | | | | | | |
| Cadmium | 4.6 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | | SE |
| Copper | 120 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | | SE |
| Lead | 250 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | | SE |
| Nickel | 33 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | | SE |
| Zinc | 540 | mg/kg (dw) | 3050/6010 | 4.2 | 09/11 | 09/12 | | SE |
| General Chemistry | | | | | | | | |
| Acid Volatile Sulfide | 1800 | mg/kg | 1991 | 150 | 09/11 | 09/11 | | SUE |
| Total Organic Carbon | 440 | mg/kg (dw) | 9060 | 23 | 09/17 | 09/17 | | SUE |
| Subcontracted Services | | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | | SUB |

AMENDMENT ANALYTICAL REPORT# 0520051

Client #: CHI-96-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 05/20/2005
Log #: L60852-1

Sample Description:

Analytical Report: WW58Side
Date Sampled: 09/08/2003
Time Sampled: 12:15
Date Received: 09/09/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAP requirements
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule. ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: 3:(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail WR or WRPD; 4:matrix int 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | |
|-----------------------|---------------------------|
| FLDQH/NELAC# B86240 | KS/NELAC# E-10360 |
| NO CERT# 444 | ADEM ID# 40650 |
| SC CERT# 94031001 | TN CERT# 02985 |
| IL/NELAC CERT# 260020 | CA CERT# 517 |
| VA CERT# 30395 | USDA Soil Permits S-35040 |

Respectfully submitted,


Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C. ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3116 Project Name: Waterway Sediment Samples ProjectID: 73286
Date: 9/22/2003 Boring No. WW-58 *side* Sample No. Side Depth: 0 Test No. 23

Total Sample Wt.: 154.5

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.0 | 0.0 | 100.0 | 100.0 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 0.0 | 0.0 | 100.0 | 100.0 | 2.0000 |
| | No.20 | 0.4 | 0.8 | 99.2 | 99.2 | 0.8500 |
| | No.40 | 2.8 | 5.2 | 94.8 | 94.8 | 0.4200 |
| | No.100 | 24.1 | 44.2 | 55.8 | 55.8 | 0.1500 |
| | No.200 | 38.3 | 70.3 | 29.7 | 29.7 | 0.0750 |

Wt of Sample at Start of Hydrometer : 54.5

Temperature (C): 24.5

Temp Bath Bulb Reading: 4.0

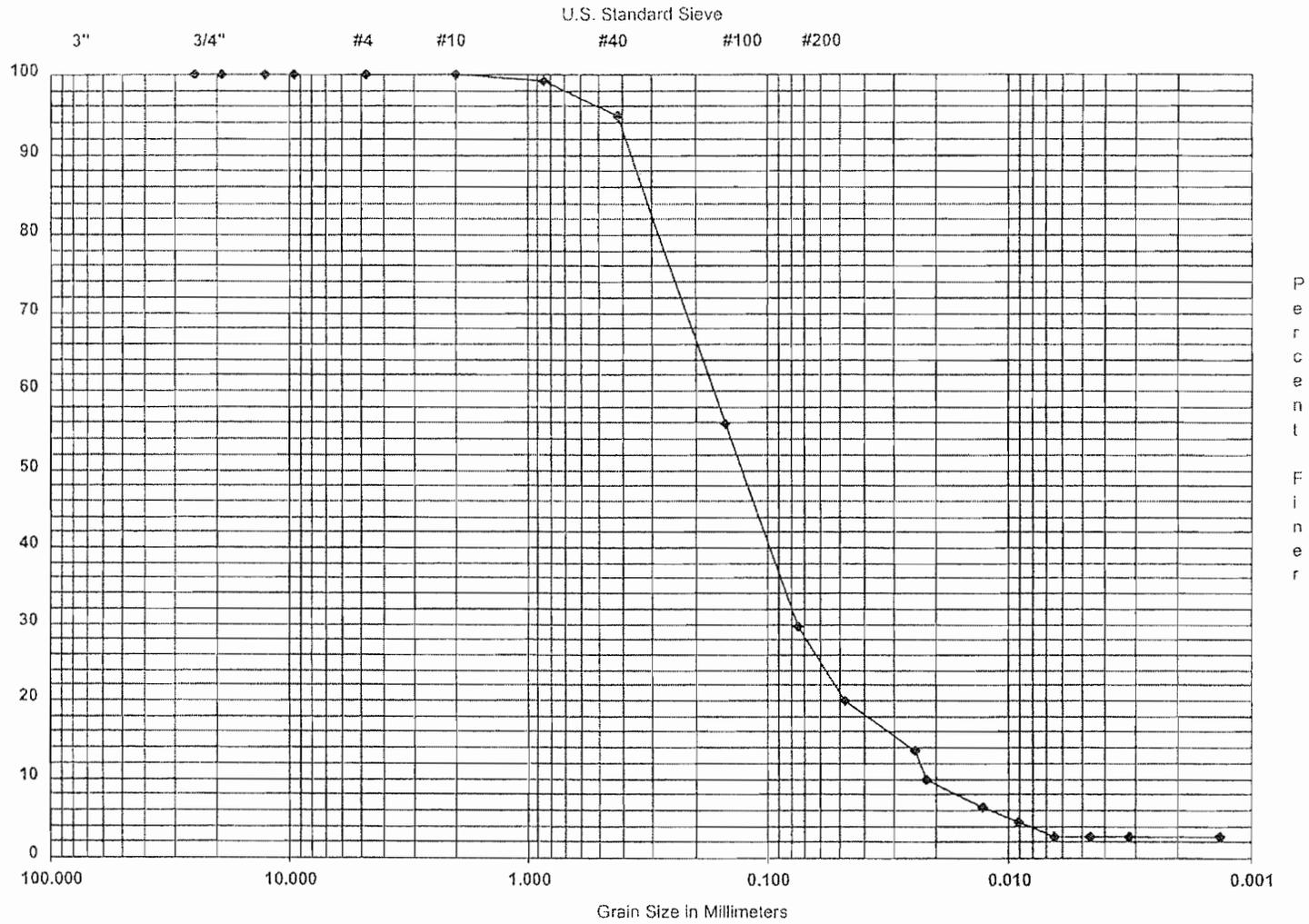
Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 14.0 | 11.0 | 20.0 | 20.0 | 0.0480 |
| | 4 | 10.5 | 7.5 | 13.6 | 13.6 | 0.0245 |
| | 5 | 8.5 | 5.5 | 10.0 | 10.0 | 0.0221 |
| | 15 | 6.5 | 3.5 | 6.4 | 6.4 | 0.0129 |
| | 30 | 5.5 | 2.5 | 4.5 | 4.5 | 0.0092 |
| | 60 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0065 |
| | 120 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0046 |
| | 250 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0032 |
| | 1440 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0013 |

LL : PL: PI : Organic : No
Gravel : 0 Sand : 70 Silt : 27 Clay : 3
Cu: 14.0 Cc: 2.5 D10: 0.0128 D30: 0.076 D60: 0.179
Unified Classification: SAND, Some Silt, SM

REPORT OF GRAIN SIZE ANALYSIS

SCHLEEDE-HAMPTON ASSOCIATES, INC.



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: WW-58 Sample No.: Side: Depth: 0 LL%: PL%: PI%:
 Gravel: 0 Sand: 70 Silt: 27 Clay: 3 Cu: 14.0 Cc: 2.5 Dia10:0.013 Dia30:0.076 Dia60:0.179

Unified Classification: SAND, Some Silt, SM

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 09/26/2003
 Log #: L80852-2

Sample Description:

Analytical Report: WW58Center
 Date Sampled: 09/08/2003
 Time Sampled: 12:30
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 10.4 5.4 | mg/kg (dw) | 6010B | 0.30 | 09/15 | 09/15 | SUB |
| Copper | 1.385 88 | mg/kg (dw) | 6010B | 0.30 | 09/15 | 09/15 | SUB |
| Lead | 1.446 300 | mg/kg (dw) | 6010B | 3.0 | 09/15 | 09/15 | SUB |
| Nickel | 0.22 13 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 13.919 910 | mg/kg (dw) | 6010B | 0.80 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 37 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Copper | 84 | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Lead | 110 | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Nickel | 27 | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Zinc | 410 | mg/kg (dw) | 3050/6010 | 5.4 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 870 | mg/kg | 1991 | 240 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 1300 | mg/kg (dw) | 9060 | 25 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
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Jennifer Wasik

Page: Page 2 of 2
Date: 09/26/2003
Log #: L80852-2

Sample Description:

Sediment Samples

Analytical Report: WW58Center
Date Sampled: 09/08/2003
Time Sampled: 12:30
Date Received: 09/09/2003
Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr fail 2:nc known QC req 3:QC fail &R or &RPD; 4:matrix int 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 980126 | DOH# E96240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & I Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 05/20/2005
 Log #: L80852-2

Sample Description:

Sediment Samples

Analytical Report: WW58Center
 Date Sampled: 09/08/2003
 Time Sampled: 12:30
 Date Received: 09/09/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 5.4 | mg/kg (dw) | 6010B | 0.30 | 09/15 | 09/15 | SUB |
| Copper | 88 | mg/kg (dw) | 6010B | 0.30 | 09/15 | 09/15 | SUB |
| Lead | 300 | mg/kg (dw) | 6010B | 3.0 | 09/15 | 09/15 | SUB |
| Nickel | 13 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 910 | mg/kg (dw) | 6010B | 0.80 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 37 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Copper | 84 | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Lead | 110 | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Nickel | 27 | mg/kg (dw) | 3050/6010 | 2.7 | 09/11 | 09/12 | SB |
| Zinc | 410 | mg/kg (dw) | 3050/6010 | 5.4 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 870 | mg/kg | 1991 | 240 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 1300 | mg/kg (dw) | 9060 | 25 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
8001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 05/20/2005
Log #: LB0852-2

Sample Description:

Analytical Report: WW58Center
Date Sampled: 09/08/2003
Time Sampled: 12:30
Date Received: 09/09/2003
Collected By: Client

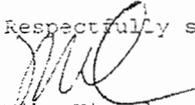
Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | Analyst |
|-----------|---------|-------|--------|------------------|------|-------|---------|
| | | | | Limit | Date | | |

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAP requirements
Flags: BDL or N-below reporting limit, DL-diluted out, ID-meat's internal lab limits, MI-matrix interference, NA not app.
Flags: CFR-Pb/Cv rule; ND-non detect; RE estimated; NFL-no free liquids; dw-dry wt; ww-wet wt. C(=) see attached USB code
PLDEP Flags: P(=) estimated 1-surr fail 2-nc known QC req. 3-QC fail 4R or WRP; 4-matrix int 5-improper fld protocol
PLDEP Flags: L-exceeds calibration, C-holding time exceeded, T-value > MDL, V-present in blank
PLDEP Flags: X-improper preservation; 3-colonies exceed range 1-result between MDL and POL

FLDOR/NELAP# E86240 KS/NELAP# E-10360
NC CERT# 444 ADEM ID# 40350
SC CERT# 96031601 TN CERT# 02985
TX/NELAP CERT# 200020 SA CERT# 917
VA CERT# 00388 USDA Soil Permit# S-35240

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3115 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 9/22/2003 Boring No. WW-58 Sample No. Center Depth: 0 Test No. 22

Total Sample Wt.: 125.0

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.0 | 0.0 | 100.0 | 100.0 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 0.0 | 0.0 | 100.0 | 100.0 | 2.0000 |
| | No.20 | 1.0 | 2.0 | 98.0 | 98.0 | 0.8500 |
| | No.40 | 2.8 | 5.5 | 94.5 | 94.5 | 0.4200 |
| | No.100 | 13.1 | 25.4 | 74.6 | 74.6 | 0.1500 |
| | No.200 | 18.4 | 35.9 | 64.1 | 64.1 | 0.0750 |

Wt of Sample at Start of Hydrometer : 51.4

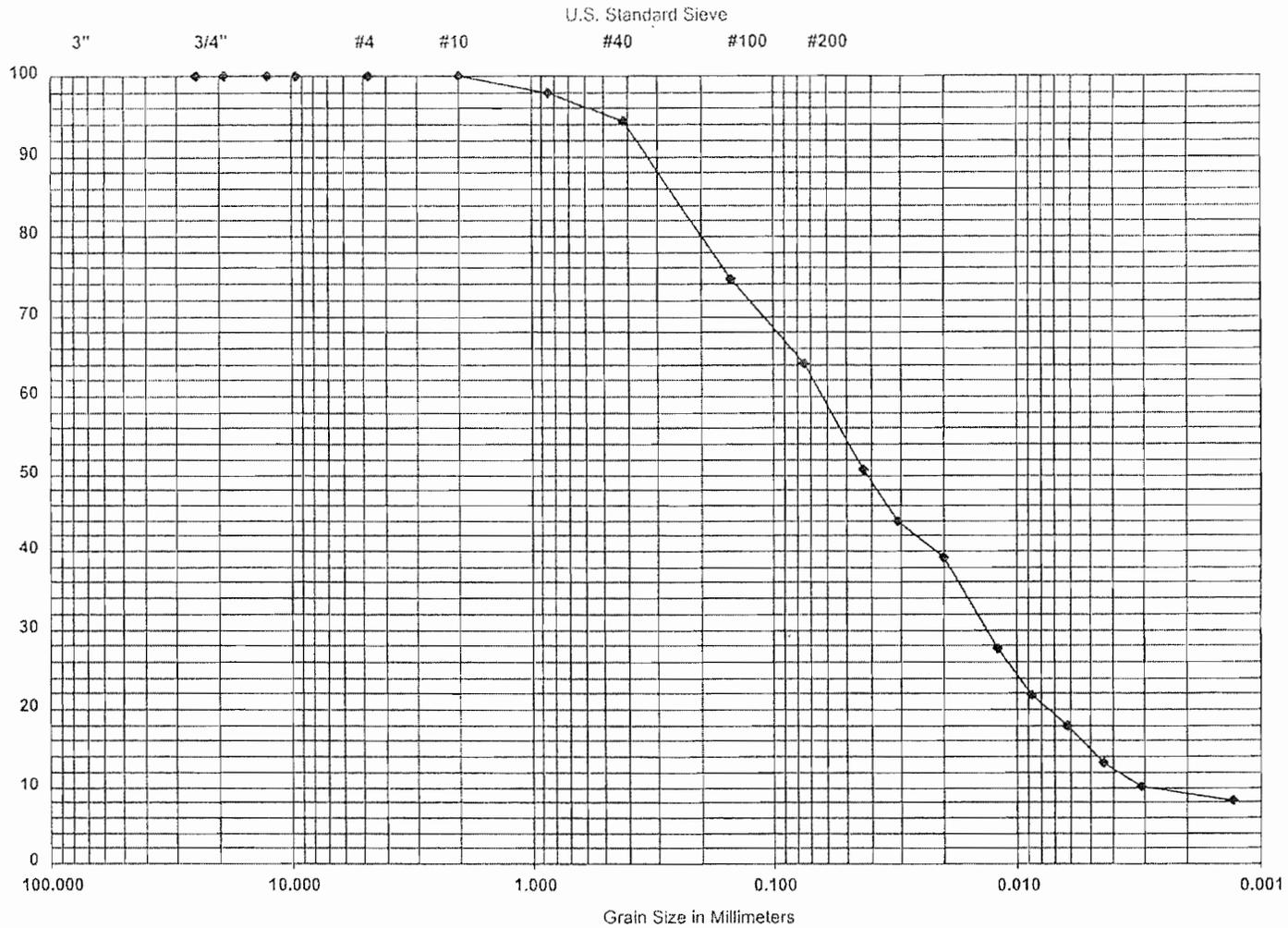
Temperature (C): 25.4

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 29.0 | 26.3 | 50.6 | 50.6 | 0.0431 |
| | 2 | 25.5 | 22.8 | 43.9 | 43.9 | 0.0312 |
| | 5 | 23.0 | 20.3 | 39.1 | 39.1 | 0.0201 |
| | 15 | 17.0 | 14.3 | 27.5 | 27.5 | 0.0120 |
| | 30 | 14.0 | 11.3 | 21.8 | 21.8 | 0.0087 |
| | 60 | 12.0 | 9.3 | 17.9 | 17.9 | 0.0062 |
| | 120 | 9.5 | 6.8 | 13.1 | 13.1 | 0.0044 |
| | 250 | 8.0 | 5.3 | 10.2 | 10.2 | 0.0031 |
| | 1440 | 7.0 | 4.3 | 8.3 | 8.3 | 0.0013 |

LL : PL: PI : Organic : No
 Gravel : 0 Sand : 36 Silt : 55 Clay : 9
 Cu: 22.4 Cc: 1.0 D10: 0.0029 D30: 0.014 D60: 0.065
 Unified Classification: SILT and SAND, ML



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: WW-58 Sample No.: Center Depth: 0 LL%: PL %: PI %:
 Gravel: 0 Sand: 36 Silt: 55 Clay: 9 Cu: 22.4 Cc: 1.0 Dia10:0.003 Dia30:0.014 Dia60:0.065
 Unified Classification: SILT and SAND, ML

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 09/26/2003
 Log #: L80852-3

Sample Description:

Analytical Report: WW86Side

Date Sampled: 09/08/2003

Time Sampled: 11:30

Sediment Samples

Date Received: 09/09/2003

Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 2.9 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Copper | 9.2 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Lead | 150 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | SUB |
| Nickel | 10 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 340 | mg/kg (dw) | 6010B | 0.60 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 21 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | 11 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Copper | 670 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Lead | 670 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Nickel | 38 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Zinc | 1900 | mg/kg (dw) | 3050/6010 | 9.5 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 2800 | mg/kg (dw) | 1991 | 520 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 3900 | mg/kg (dw) | 9060 | 53 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 09/26/2003
Log #: L80852-3

Sample Description:

Analytical Report: WW86Side
Date Sampled: 09/08/2003
Time Sampled: 11:30
Date Received: 09/09/2003
Collected By: Client

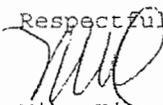
Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. Limit | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------------|------------|---------|
|-----------|---------|-------|--------|------------------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NPL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

QAP# 980126 DOH# E86240 NC CERT# 444
SUE DOH# 86122,86109,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96031061 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-35240

Respectfully submitted,

Mike Kimmel
Senior Project Manager

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 05/20/2005
 Log #: L80852-3

Sample Description:

Analytical Report: WW86S1de
 Date Sampled: 09/08/2003
 Time Sampled: 11:30
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 2.9 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Copper | 9.2 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Lead | 150 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | SUB |
| Nickel | 10 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 340 | mg/kg (dw) | 6010B | 0.60 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 21 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | 11 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Copper | 670 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Lead | 670 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Nickel | 38 | mg/kg (dw) | 3050/6010 | 4.8 | 09/11 | 09/12 | SB |
| Zinc | 1900 | mg/kg (dw) | 3050/6010 | 9.5 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 8800 | mg/kg | 1991 | 520 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 3900 | mg/kg (dw) | 9060 | 53 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | B27487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 05/20/2005
Log #: L80852-3

Sample Description:

Analytical Report: WW86Side
Date Sampled: 09/08/2003
Time Sampled: 11:30
Date Received: 09/09/2003
Collected By: Client

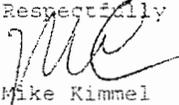
Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------|------------|---------|
| | | | | Limit | Date | | |

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements
Flags: BDL or U-below reporting limit, DL-diluted out, IL meets internal lab limits, MI matrix interference, NA not appl.
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated), NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USG code
FLDEP Flags: 3-#1-estimated 1:corr. fail 2-no known Qd req. 3:QC fail 4R or 4RPD, 4.matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; C-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | |
|-----------------------|---------------------------|
| FLDOH/NELAC# E86240 | KS/NELAC# E-19380 |
| NC CERT# 444 | ADEM ID# 40850 |
| SC CERT# 96031001 | TN CERT# 02965 |
| IL/NELAC CERT# 100020 | GA CERT# 917 |
| VA CERT# 00355 | USDA Soil Permit# S-35240 |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3111 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 9/22/2003 Boring No. WW-86 Sample No. Side Depth: 0 Test No. 19

Total Sample Wt.: 74.3

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.0 | 0.0 | 100.0 | 100.0 | 4.7500 |
| | No.10 | 0.0 | 0.0 | 100.0 | 100.0 | 2.0000 |
| - #10 Sieve Portion. | No.20 | 3.0 | 5.9 | 94.1 | 94.1 | 0.8500 |
| | No.40 | 9.9 | 19.4 | 80.6 | 80.6 | 0.4200 |
| | No.100 | 21.8 | 42.7 | 57.3 | 57.3 | 0.1500 |
| | No.200 | 30.3 | 59.5 | 40.5 | 40.5 | 0.0750 |

Wt of Sample at Start of Hydrometer : 51.0

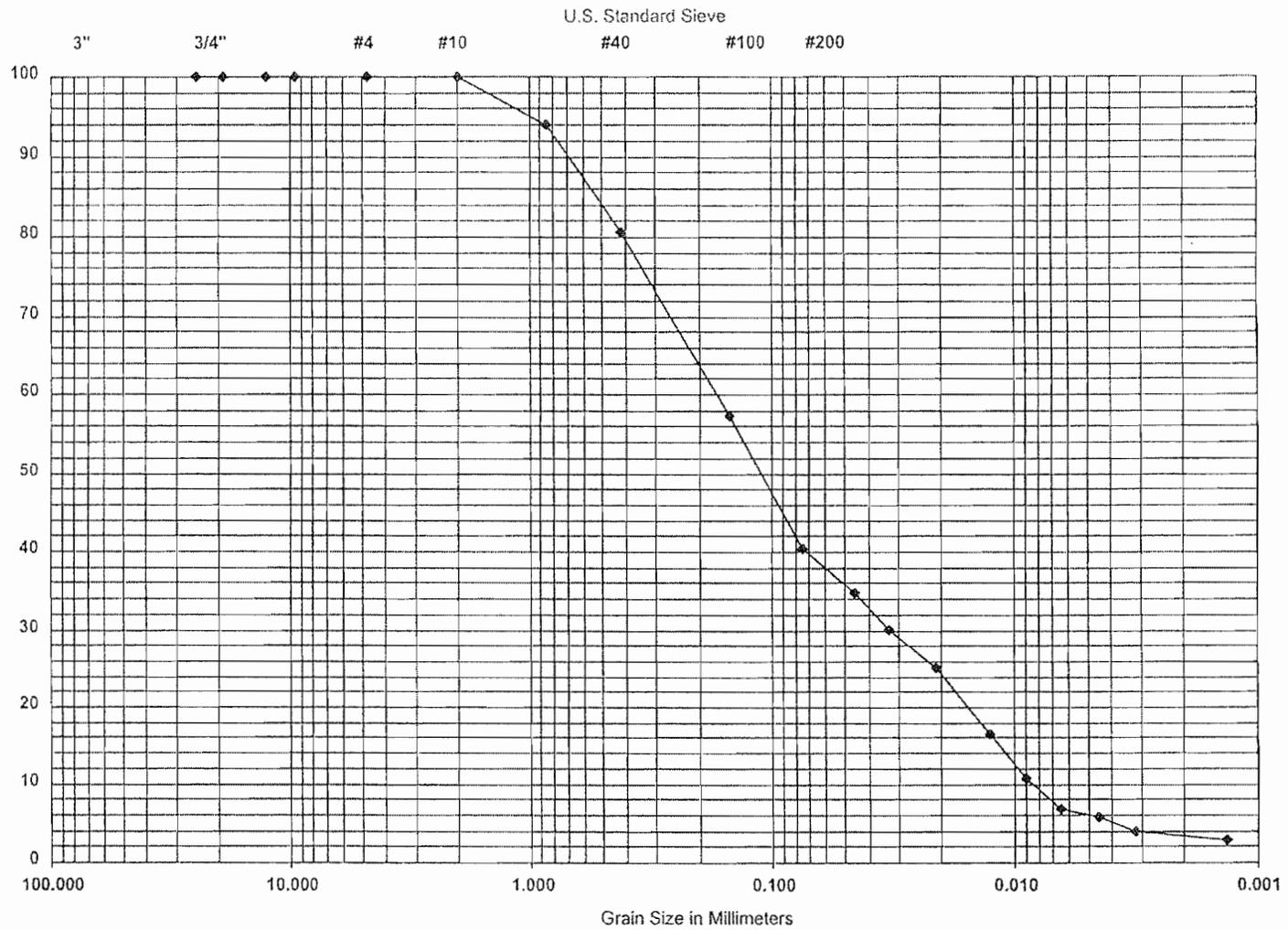
Temperature (C): 24.5

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 21.0 | 18.0 | 34.9 | 34.9 | 0.0460 |
| | 2 | 18.5 | 15.5 | 30.1 | 30.1 | 0.0330 |
| | 5 | 16.0 | 13.0 | 25.2 | 25.2 | 0.0212 |
| | 15 | 11.5 | 8.5 | 16.5 | 16.5 | 0.0126 |
| | 30 | 8.5 | 5.5 | 10.7 | 10.7 | 0.0090 |
| | 60 | 6.5 | 3.5 | 6.8 | 6.8 | 0.0065 |
| | 120 | 6.0 | 3.0 | 5.8 | 5.8 | 0.0046 |
| | 250 | 5.0 | 2.0 | 3.9 | 3.9 | 0.0032 |
| | 1440 | 4.5 | 1.5 | 2.9 | 2.9 | 0.0013 |

LL : PL: PI : Organic : No
 Gravel : 0 Sand : 60 Silt : 37 Clay : 3
 Cu: 21.1 Cc: 0.7 D10: 0.0086 D30: 0.033 D60: 0.182
 Unified Classification: Silty SAND, SM



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: WW-86 Sample No.: Side: Depth: 0 LL%: PL%: PI%:
 Gravel: 0 Sand: 60 Silt: 37 Clay: 3 Cu: 21.1 Cc: 0.7 Dia10: 0.009 Dia30: 0.033 Dia60: 0.182
 Unified Classification: Silty SAND, SM

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 09/26/2003
 Log #: L80852-4

Sample Description:

Analytical Report: WW86Center
 Date Sampled: 09/08/2003
 Time Sampled: 12:00
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|-------------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 0.7 1.9 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Copper | 787 50 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Lead | 579 120 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | SUB |
| Nickel | 147 11 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 6271 410 | mg/kg (dw) | 6010B | 0.70 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 7.411 46 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | 4.1 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Copper | 240 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Lead | 370 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Nickel | 24 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Zinc | 780 | mg/kg (dw) | 3050/6010 | 4.3 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 1800 | mg/kg | 1991 | 250 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 1000 | mg/kg (dw) | 9060 | 19 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 09/26/2003
Log #: L80852-4

Sample Description:

Analytical Report: WW86Center
Date Sampled: 09/08/2003
Time Sampled: 12:00
Date Received: 09/09/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | Analyst |
|-----------|---------|-------|--------|------------------|------|-------|---------|
| | | | | Limit | Date | Date | |

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NPL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

QAP# 980126 DOH# E86240 NC CERT# 444
SUB DOH# 86122,86109,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96031001 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-35240

Respectfully submitted,

Mike Kissel
Senior Project Manager

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60604
 Jennifer Wasik

Page: Page 1 of 2
 Date: 05/20/2005
 Log #: L80852-4

Sample Description:

Analytical Report: WW86Center
 Date Sampled: 09/08/2003
 Time Sampled: 12:00
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. Anly. | | | Analyst |
|-------------------------------|---------|------------|-----------|------------------------|-------|-------|---------|
| | | | | Limit | Date | Date | |
| Metals | | | | | | | |
| Cadmium | 1.9 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Copper | 50 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Lead | 120 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | SUB |
| Nickel | 11 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 410 | mg/kg (dw) | 6010B | 0.70 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 46 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | 4.1 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Copper | 240 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Lead | 370 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Nickel | 24 | mg/kg (dw) | 3050/6010 | 2.2 | 09/11 | 09/12 | SB |
| Zinc | 780 | mg/kg (dw) | 3050/6010 | 4.3 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 1800 | mg/kg | 1991 | 250 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 1000 | mg/kg (dw) | 9060 | 19 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & E Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 2 of 2
 Date: 05/20/2005
 Log #: L80852-4

Sample Description:

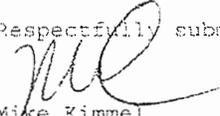
Analytical Report: WW86Center
 Date Sampled: 09/08/2003
 Time Sampled: 12:00
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | | Analyst |
|---|---------|-------|--------|------------------|------|-------|--|---------|
| | | | | Limit | Date | Date | | |
| Subcontracted Services (continued) | | | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAP requirements.
 Flags: HDL or U-below reporting limit; DL diluted out; ID-meets internal lab limits; MI-matrix interference; NA not appl.
 Flags: CFF-Ph. El. rule; ND-non detect; EL-estimated; NPL-no free liquids; dw-dry wt; ww-wet wt; CFW see attached USA code
 FLDEP Flags: J/M-estimated; SURF fail; Snd known; JC req; HQC fail; Wk or WRPD; 4-matrix int; 5-improper fld protocol
 FLDEP Flags: L-exceeds calibration; O-holding time exceeded; T-value < MDL; V-present in blank
 FLDEP Flags: 1-improper preservation; 5-colonies exceed range; 1-result between MDL and PCL

| | |
|-----------------------|---------------------------|
| FLDCH/NELAP# 896240 | NS/NELAP# E-10260 |
| NC CERT# 444 | ADEM ID# 40850 |
| SC CERT# 56021001 | TN CERT# 02995 |
| IL/NELAP CERT# 200020 | GA CERT# 917 |
| VA CERT# 00695 | USDA Soil Permit# S-35240 |

Respectfully submitted,

 Mike Kimmel
 Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3114 Project Name: Waterway Sediment Samples ProjectID: 73286
Date: 9/22/2003 Boring No. WW-86 Sample No. Center Depth: 0 Test No. 21

Total Sample Wt.: 272.7

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.0 | 0.0 | 100.0 | 100.0 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 0.0 | 0.0 | 100.0 | 100.0 | 2.0000 |
| | No.20 | 0.4 | 0.8 | 99.2 | 99.2 | 0.8500 |
| | No.40 | 1.5 | 2.7 | 97.3 | 97.3 | 0.4200 |
| | No.100 | 17.7 | 31.8 | 68.2 | 68.2 | 0.1500 |
| | No.200 | 47.3 | 84.9 | 15.1 | 15.1 | 0.0750 |

Wt of Sample at Start of Hydrometer : 55.7

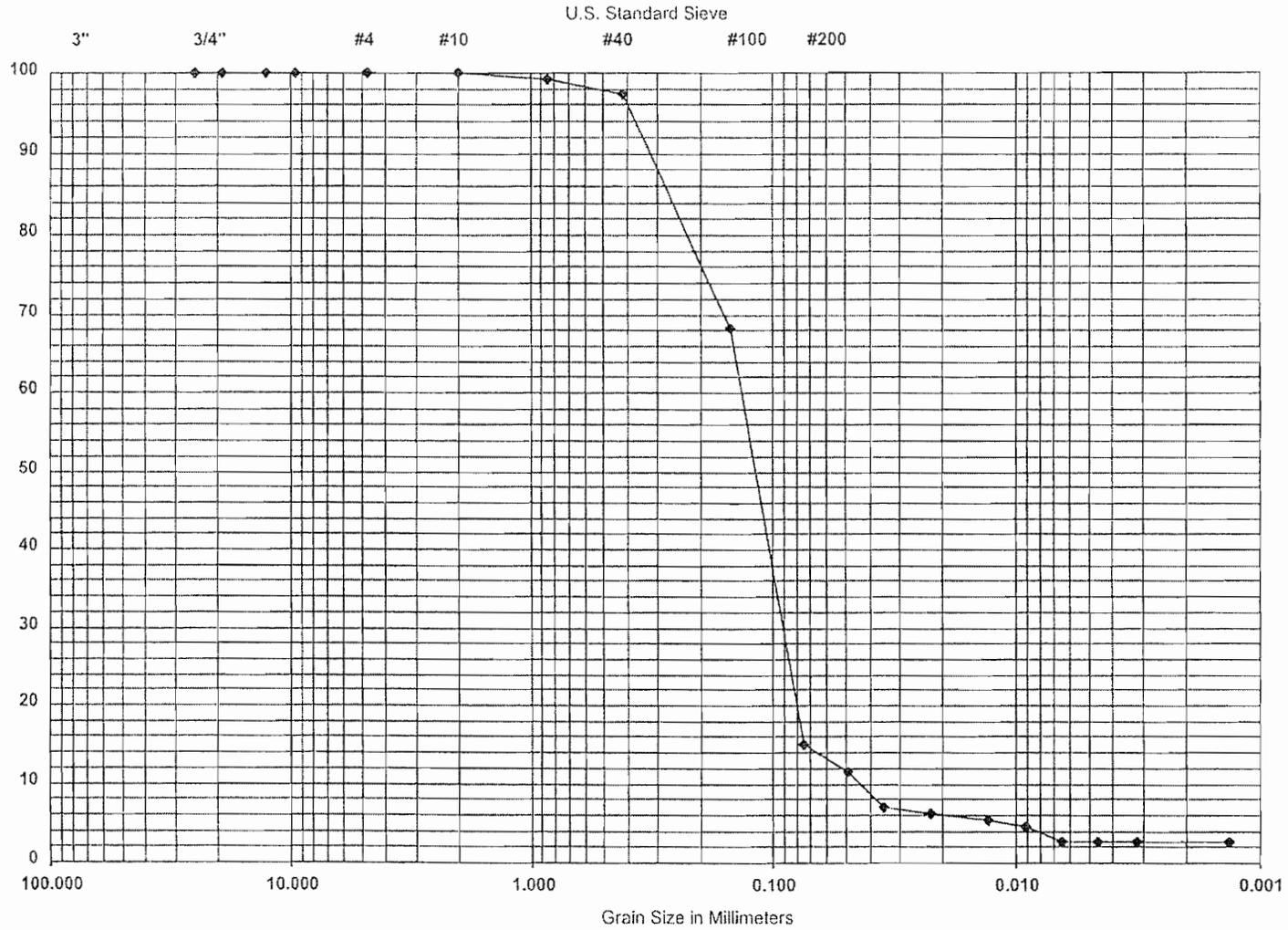
Temperature (C): 24.5

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 9.5 | 6.5 | 11.5 | 11.5 | 0.0492 |
| | 2 | 7.0 | 4.0 | 7.1 | 7.1 | 0.0353 |
| | 5 | 6.5 | 3.5 | 6.2 | 6.2 | 0.0224 |
| | 15 | 6.0 | 3.0 | 5.3 | 5.3 | 0.0130 |
| | 30 | 5.5 | 2.5 | 4.4 | 4.4 | 0.0092 |
| | 60 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0065 |
| | 120 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0046 |
| | 250 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0032 |
| | 1440 | 4.5 | 1.5 | 2.7 | 2.7 | 0.0013 |

LL : PL : PI : Organic : No
Gravel : 0 Sand : 85 Silt : 12 Clay : 3
Cu: 3.1 Cc: 1.5 D10: 0.0444 D30: 0.096 D60: 0.138
Unified Classification: SAND, Little Silt, SP-SM



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: WW-86 Sample No.: Center Depth: 0 LL%: PL %: PI %:
 Gravel: 0 Sand: 85 Silt: 12 Clay: 3 Cu: 3.1 Cc: 1.5 Dia10:0.044 Dia30:0.096 Dia60: 0.138

Unified Classification: SAND, Little Silt, SP-SM

Project Name: Waterway Sediment Samples Client: U.S.Biosystems, Inc. ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 09/26/2003
 Log #: L80852-5

Sample Description:

Analytical Report: WW52Side
 Date Sampled: 09/08/2003
 Time Sampled: 11:20
 Date Received: 09/09/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 1.1 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Copper | 37 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Lead | 77 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | SUB |
| Nickel | 20 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 230 | mg/kg (dw) | 6010B | 0.70 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 47 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Copper | 57 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Lead | 77 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Nickel | 34 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Zinc | 230 | mg/kg (dw) | 3050/6010 | 4.3 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 1200 | mg/kg | 1991 | 230 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 930 | mg/kg (dw) | 9060 | 20 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 09/26/2003
Log #: L80852-5

Sample Description:

Analytical Report: WW52Side
Date Sampled: 09/08/2003
Time Sampled: 11:20
Date Received: 09/09/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 05/20/2005
 Log #: L80852-5

Sample Description:

Sediment Samples

Analytical Report: WW52Side
 Date Sampled: 09/08/2003
 Time Sampled: 11:20
 Date Received: 09/09/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable | Extr. | Anly. | Analyst |
|-------------------------------|---------|------------|-----------|------------|-------|-------|---------|
| | | | | Limit | Date | Date | |
| Metals | | | | | | | |
| Cadmium | 1.1 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Copper | 37 | mg/kg (dw) | 6010B | 0.20 | 09/15 | 09/15 | SUB |
| Lead | 77 | mg/kg (dw) | 6010B | 2.0 | 09/15 | 09/15 | SUB |
| Nickel | 20 | mg/kg (dw) | 6010B | 1.0 | 09/15 | 09/15 | SUB |
| Zinc | 230 | mg/kg (dw) | 6010B | 0.70 | 09/15 | 09/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 47 | % | SM2540B | 0.10 | 09/10 | 09/10 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Copper | 57 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Lead | 77 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Nickel | 34 | mg/kg (dw) | 3050/6010 | 2.1 | 09/11 | 09/12 | SB |
| Zinc | 230 | mg/kg (dw) | 3050/6010 | 4.3 | 09/11 | 09/12 | SB |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 1200 | mg/kg | 1991 | 230 | 09/11 | 09/11 | SUB |
| Total Organic Carbon | 930 | mg/kg (dw) | 9060 | 20 | 09/17 | 09/17 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 1991 | | | | SUB |
| Subcontract Lab 2 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87467 | | 9060 | | | | SUB |

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 2 of 2
 Date: 05/20/2005
 Log #: L80852-5

Sample Description:

Analytical Report: WW52Side
 Date Sampled: 09/08/2003
 Time Sampled: 11:20
 Date Received: 09/09/2003
 Collected By: Client

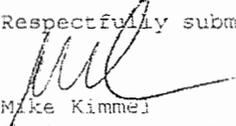
Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. Anly. | | | Analyst |
|-----------|---------|-------|--------|------------------------|------|------|---------|
| | | | | Limit | Date | Date | |

~~Subcontracted Services~~ (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAP requirements
 Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA not appl.
 Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(P)-see attached USE code
 FLDEP Flags: 0(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
 FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL, V-present in blank
 FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | |
|-----------------------|---------------------------|
| FLDOR/NELAC# E96240 | KS/NELAC# E-10360 |
| NC CERT# 444 | ADEM ID# 40850 |
| SC CERT# 96031001 | TN CERT# 02985 |
| IL/NELAC CERT# 200020 | GA CERT# 917 |
| VA CERT# 00395 | USDA Soil Permit# S-35240 |

Respectfully submitted,

 Mike Kimmel
 Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3112 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 9/22/2003 Boring No. WW-52 Sample No. Side Depth: 0 Test No. 20

Total Sample Wt.: 340.4

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|--------------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 14.4 | 4.2 | 95.8 | 95.8 | 9.5000 |
| | No.4 | 26.1 | 7.7 | 92.3 | 92.3 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 56.3 | 16.5 | 83.5 | 83.5 | 2.0000 |
| | No.20 | 5.2 | 9.6 | 90.4 | 75.5 | 0.8500 |
| | No.40 | 12.2 | 22.4 | 77.6 | 64.8 | 0.4200 |
| | No.100 | 19.6 | 36.1 | 63.9 | 53.3 | 0.1500 |
| | No.200 | 21.7 | 39.9 | 60.1 | 50.1 | 0.0750 |

Wt of Sample at Start of Hydrometer : 54.4

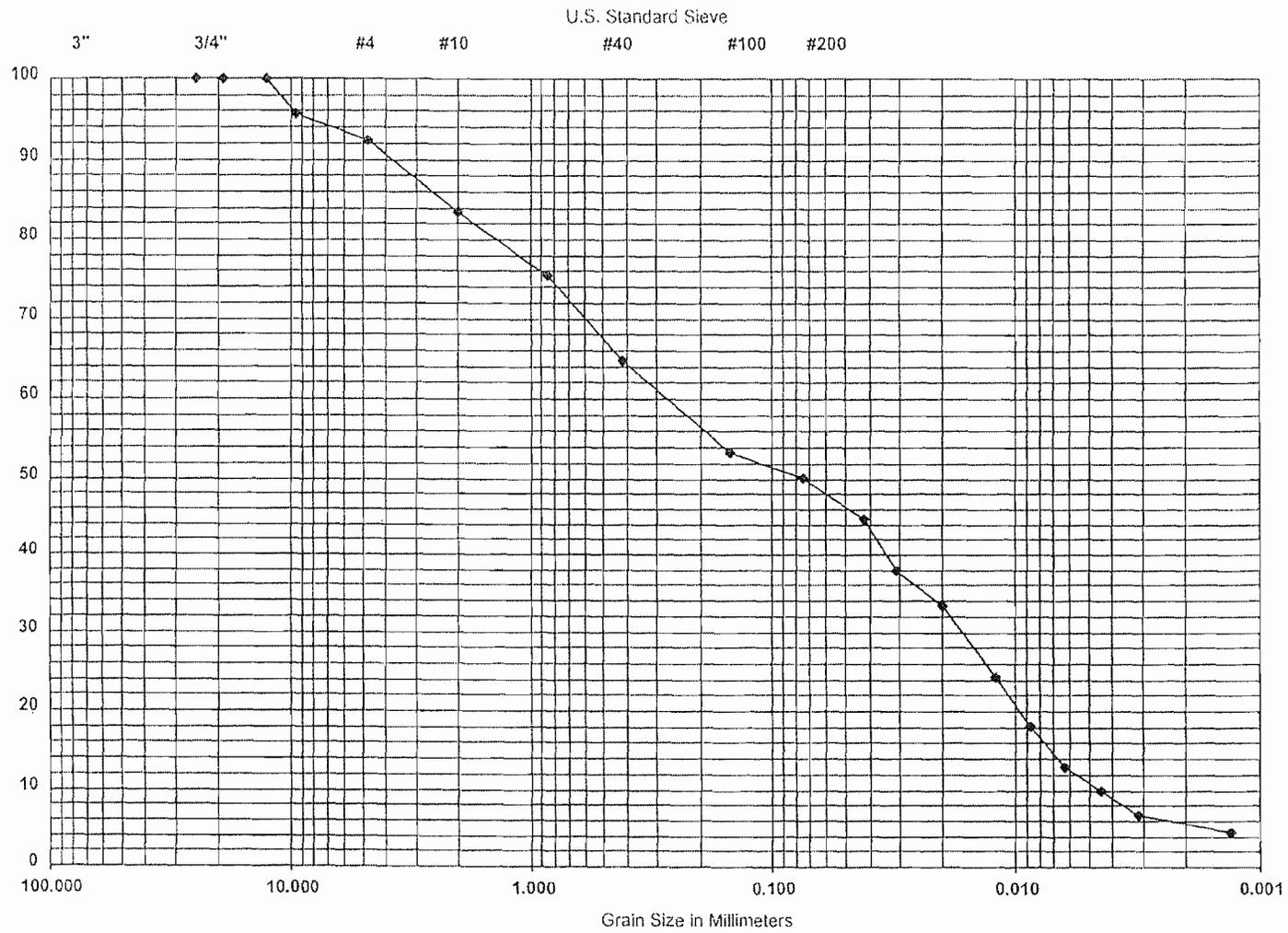
Temperature (C): 24.5

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 32.5 | 29.5 | 53.6 | 44.8 | 0.0425 |
| | 2 | 28.0 | 25.0 | 45.4 | 37.9 | 0.0310 |
| | 5 | 25.0 | 22.0 | 40.0 | 33.4 | 0.0200 |
| | 15 | 19.0 | 16.0 | 29.1 | 24.3 | 0.0120 |
| | 30 | 15.0 | 12.0 | 21.8 | 18.2 | 0.0087 |
| | 60 | 11.5 | 8.5 | 15.4 | 12.9 | 0.0063 |
| | 120 | 9.5 | 6.5 | 11.8 | 9.9 | 0.0045 |
| | 250 | 7.5 | 4.5 | 8.2 | 6.8 | 0.0031 |
| | 1440 | 6.0 | 3.0 | 5.5 | 4.6 | 0.0013 |

LL : PL : PI : Organic : No
 Gravel : 8 Sand : 42 Silt : 45 Clay : 5
 Cu: 67.1 Cc: 0.2 D10: 0.0046 D30: 0.017 D60: 0.307
 Unified Classification: SILT and SAND, Trace Gravel, ML



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: WW-52 Sample No.: Side: Depth: 0 LL%: PL%: PI%
 Gravel: 8 Sand: 42 Silt: 45 Clay: 5 Cu: 67.1 Cc: 0.2 Dia10: 0.005 Dia30: 0.017 Dia60: 0.307
 Unified Classification: SILT and SAND, Trace Gravel, ML

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286



Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/31/2003
 Log #: L78891-1

Sample Description:

Analytical Report: WW97 Side
 Date Sampled: 07/08/2003
 Time Sampled: 11:45
 Date Received: 07/15/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 1.1 | mg/kg (dw) | 6010B | 0.20 | 07/24 | 07/25 | SUB |
| Copper | 35 | mg/kg (dw) | 6010B | 0.20 | 07/24 | 07/25 | SUB |
| Lead | 57 | mg/kg (dw) | 6010B | 2.0 | 07/24 | 07/25 | SUB |
| Nickel | 11 | mg/kg (dw) | 6010B | 1.0 | 07/24 | 07/25 | SUB |
| Zinc | 170 | mg/kg (dw) | 6010B | 0.70 | 07/24 | 07/25 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 51 | % | SM2540B | 0.10 | 07/16 | 07/16 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 2.0 | 07/18 | 07/22 | LL |
| Copper | 33 | mg/kg (dw) | 3050/6010 | 2.0 | 07/18 | 07/22 | LL |
| Lead | 45 | mg/kg (dw) | 3050/6010 | 2.0 | 07/18 | 07/22 | LL |
| Nickel | 16 | mg/kg (dw) | 3050/6010 | 2.0 | 07/18 | 07/22 | LL |
| Zinc | 150 | mg/kg (dw) | 3050/6010 | 3.9 | 07/18 | 07/22 | LL |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 1900 | mg/kg (dw) | 1991 | 120 | 07/21 | 07/21 | SUB |
| Total Organic Carbon | 80000 | mg/kg | 9060 | 30 | 07/22 | 07/22 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 07/31/2003
Log #: L78891-1

Sample Description:

Sediment Samples

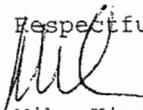
Analytical Report: WW97 Side
Date Sampled: 07/08/2003
Time Sampled: 11:45
Date Received: 07/15/2003
Collected By: Client

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | | Analyst |
|-----------|---------|-------|--------|------------------|------|-------|--|---------|
| | | | | Limit | Date | Date | | |

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3052 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 7/22/2003 Boring No. 0 Sample No. WW97 Side Depth: 0 Test No. 7

Total Sample Wt.: 169.8

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 2.2 | 1.3 | 98.7 | 98.7 | 12.5000 |
| | 3/8 | 2.7 | 1.6 | 98.4 | 98.4 | 9.5000 |
| | No.4 | 5.5 | 3.2 | 96.8 | 96.8 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 10.1 | 5.9 | 94.1 | 94.1 | 2.0000 |
| | No.20 | 2.5 | 2.5 | 97.5 | 91.7 | 0.8500 |
| | No.40 | 4.8 | 4.8 | 95.2 | 89.6 | 0.4200 |
| | No.100 | 41.3 | 41.1 | 58.9 | 55.4 | 0.1500 |
| | No.200 | 63.6 | 63.3 | 36.7 | 34.6 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.5

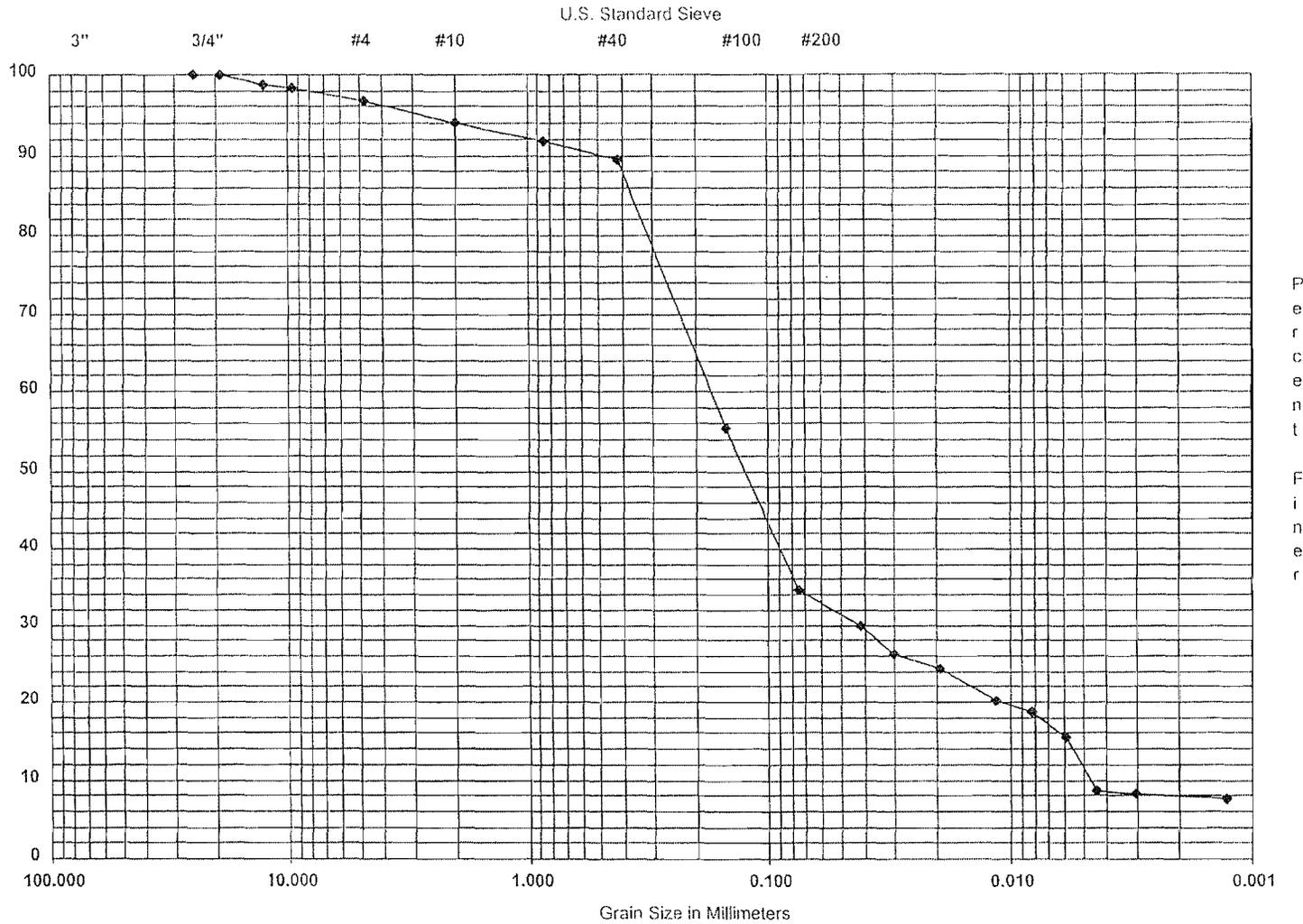
Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 34.0 | 32.3 | 31.8 | 29.9 | 0.0415 |
| | 2 | 30.0 | 28.3 | 27.8 | 26.2 | 0.0302 |
| | 5 | 28.0 | 26.3 | 25.9 | 24.3 | 0.0194 |
| | 15 | 23.5 | 21.8 | 21.5 | 20.2 | 0.0115 |
| | 30 | 22.0 | 20.3 | 20.0 | 18.8 | 0.0082 |
| | 60 | 18.5 | 16.8 | 16.5 | 15.5 | 0.0060 |
| | 120 | 11.0 | 9.3 | 9.2 | 8.6 | 0.0044 |
| | 250 | 10.5 | 8.8 | 8.7 | 8.1 | 0.0031 |
| | 1440 | 10.0 | 8.3 | 8.2 | 7.7 | 0.0013 |

LL : 0 PL : 0 PI : 0 Organic : No
 Gravel : 3 Sand : 62 Silt : 27 Clay : 8
 Cu : 39.5 Cc : 2.0 D10 : 0.0047 D30 : 0.042 D60 : 0.186
 Unified Classification: SAND, Trace Gavel, Some Silt, SM



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW97 Side Depth: 0 LL%: 0 PL %: 0 PI %: 0
 Gravel: 3 Sand: 62 Silt: 27 Clay: 8 Cu: 39.5 Cc: 2.0 Dia10:0.005 Dia30:0.042 Dia60: 0.186

Unified Classification: SAND, Trace Gavel, Some Silt, SM

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/31/2003
 Log #: L78891-2

Sample Description:

Analytical Report: WW97 Center

Sediment Samples

Date Sampled: 07/08/2003
 Time Sampled: 12:30
 Date Received: 07/15/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 0.30 | mg/kg (dw) | 6010B | 0.10 | 07/24 | 07/25 | SUB |
| Copper | 13 | mg/kg (dw) | 6010B | 0.10 | 07/24 | 07/25 | SUB |
| Lead | 25 | mg/kg (dw) | 6010B | 1.0 | 07/24 | 07/25 | SUB |
| Nickel | 6.0 | mg/kg (dw) | 6010B | 0.60 | 07/24 | 07/25 | SUB |
| Zinc | 56 | mg/kg (dw) | 6010B | 0.40 | 07/24 | 07/25 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 76 | % | SM2540B | 0.10 | 07/16 | 07/16 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Copper | 16 | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Lead | 110 | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Nickel | 16 | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Zinc | 83 | mg/kg (dw) | 3050/6010 | 2.6 | 07/18 | 07/22 | LL |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 15 | mg/kg (dw) | 1991 | 1.3 | 07/21 | 07/21 | SUB |
| Total Organic Carbon | 8900 | mg/kg | 9060 | 14 | 07/22 | 07/22 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 07/31/2003
Log #: L78891-2

Sample Description:

Analytical Report: WW97 Center
Date Sampled: 07/08/2003
Time Sampled: 12:30
Date Received: 07/15/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|---|---------|-------|--------|------------------|------------|------------|---------|
| Subcontracted Services (continued) | | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

QAP# 980126 DOH# E86240 NC CERT# 444
SUE DOH# 86122,86109,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96931001 TN CERT# 029&5
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-35240

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3053 Project Name: Waterway Sediment Samples ProjectID: 73286
Date: 7/22/2003 Boring No. 0 Sample No. WW97 Center Depth: 0 Test No. 8

Total Sample Wt.: 379.3

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 5.4 | 1.4 | 98.6 | 98.6 | 12.5000 |
| | 3/8 | 6.1 | 1.6 | 98.4 | 98.4 | 9.5000 |
| | No.4 | 12.2 | 3.2 | 96.8 | 96.8 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 50.1 | 13.2 | 86.8 | 86.8 | 2.0000 |
| | No.20 | 25.6 | 25.4 | 74.6 | 64.8 | 0.8500 |
| | No.40 | 63.2 | 62.7 | 37.3 | 32.4 | 0.4200 |
| | No.100 | 74.8 | 74.2 | 25.8 | 22.4 | 0.1500 |
| | No.200 | 81.3 | 80.7 | 19.3 | 16.6 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.7

Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

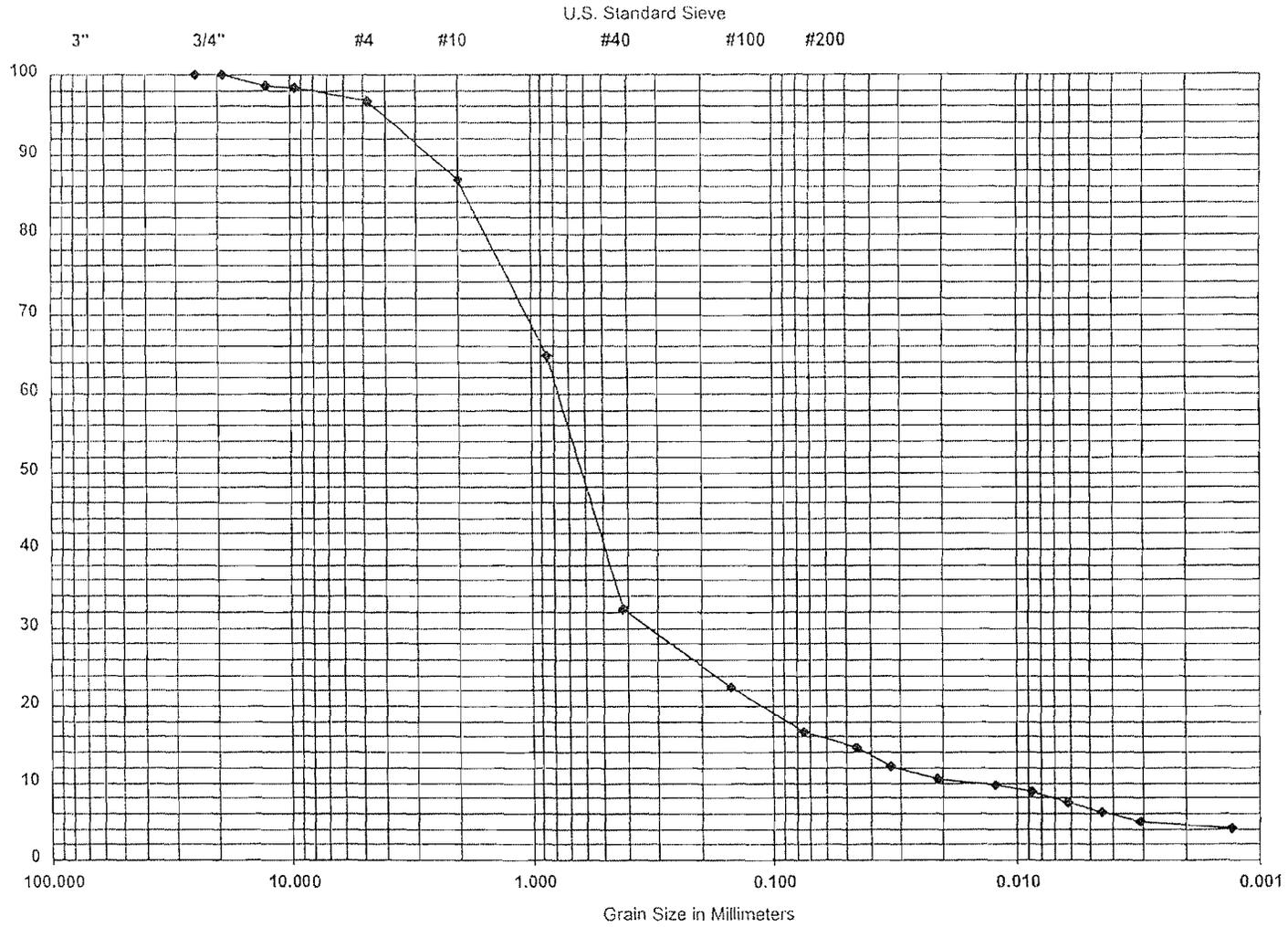
Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 19.0 | 17.3 | 17.0 | 14.7 | 0.0460 |
| | 2 | 16.0 | 14.3 | 14.0 | 12.2 | 0.0331 |
| | 5 | 14.0 | 12.3 | 12.1 | 10.5 | 0.0212 |
| | 15 | 13.0 | 11.3 | 11.1 | 9.6 | 0.0123 |
| | 30 | 12.0 | 10.3 | 10.1 | 8.8 | 0.0088 |
| | 60 | 10.5 | 8.8 | 8.6 | 7.5 | 0.0062 |
| | 120 | 9.0 | 7.3 | 7.2 | 6.2 | 0.0045 |
| | 250 | 7.5 | 5.8 | 5.7 | 4.9 | 0.0031 |
| | 1440 | 6.5 | 4.8 | 4.7 | 4.1 | 0.0013 |

LL : 0 PL : 0 PI : 0 Organic : No
Gravel : 3 Sand : 80 Silt : 12 Clay : 5
Cu : 48.6 Cc : 9.9 D10 : 0.0162 D30 : 0.356 D60 : 0.787
Unified Classification: SAND, Trace Gravel, Little Silt, SP-SM

REPORT OF GRAIN SIZE ANALYSIS

SCHLEEDE-HAMPTON ASSOCIATES, INC.



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW97 Center Depth: 0 LL%: 0 PL %: 0 PI %: 0
 Gravel: 3 Sand: 80 Silt: 12 Clay: 5 Cu: 48.6 Cc: 9.9 Dia10: 0.016 Dia30: 0.356 Dia60: 0.787
 Unified Classification: SAND, Trace Gravel, Little Silt, SP-SM

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/31/2003
 Log #: L78891-3

Sample Description:

Analytical Report: WW76 Side
 Date Sampled: 07/11/2003
 Time Sampled: 12:30
 Date Received: 07/15/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 0.80 | mg/kg (dw) | 6010B | 0.70 | 07/24 | 07/29 | SUB |
| Copper | 39 | mg/kg (dw) | 6010B | 0.70 | 07/24 | 07/29 | SUB |
| Lead | 61 | mg/kg (dw) | 6010B | 7.0 | 07/24 | 07/29 | SUB |
| Nickel | 6.0 | mg/kg (dw) | 6010B | 3.0 | 07/24 | 07/29 | SUB |
| Zinc | 220 | mg/kg (dw) | 6010B | 2.0 | 07/24 | 07/29 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 76 | % | SM2540B | 0.10 | 07/16 | 07/16 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Copper | 37 | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Lead | 79 | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Nickel | 13 | mg/kg (dw) | 3050/6010 | 1.3 | 07/18 | 07/22 | LL |
| Zinc | 240 | mg/kg (dw) | 3050/6010 | 2.6 | 07/18 | 07/22 | LL |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 250 | mg/kg (dw) | 1991 | 26 | 07/21 | 07/21 | SUB |
| Total Organic Carbon | 7100 | mg/kg | 9060 | 13 | 07/22 | 07/22 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 07/31/2003
Log #: L78891-3

Sample Description:

Analytical Report: WW76 Side
Date Sampled: 07/11/2003
Time Sampled: 12:30
Date Received: 07/15/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. Limit | Anly. Date | Analyst |
|---|---------|-------|--------|------------------------|------------|---------|
| <u>Subcontracted Services</u> (continued) | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USE code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

QAP# 980126 DOH# E86240 NC CERT# 444
SUB DOH# 86122,86169,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96031001 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-35240

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3050 Project Name: Waterway Sediment Samples ProjectID: 73286
Date: 7/22/2003 Boring No. 0 Sample No. WW76 Side Depth: 0 Test No. 5

Total Sample Wt.: 399.5

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|----------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 2.4 | 0.6 | 99.4 | 99.4 | 12.5000 |
| | 3/8 | 8.9 | 2.2 | 97.8 | 97.8 | 9.5000 |
| | No.4 | 21.0 | 5.2 | 94.8 | 94.8 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 40.2 | 10.1 | 89.9 | 89.9 | 2.0000 |
| | No.20 | 13.3 | 13.2 | 86.8 | 78.0 | 0.8500 |
| | No.40 | 38.6 | 38.3 | 61.7 | 55.5 | 0.4200 |
| | No.100 | 85.7 | 85.0 | 15.0 | 13.5 | 0.1500 |
| | No.200 | 90.5 | 89.7 | 10.3 | 9.3 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.9

Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

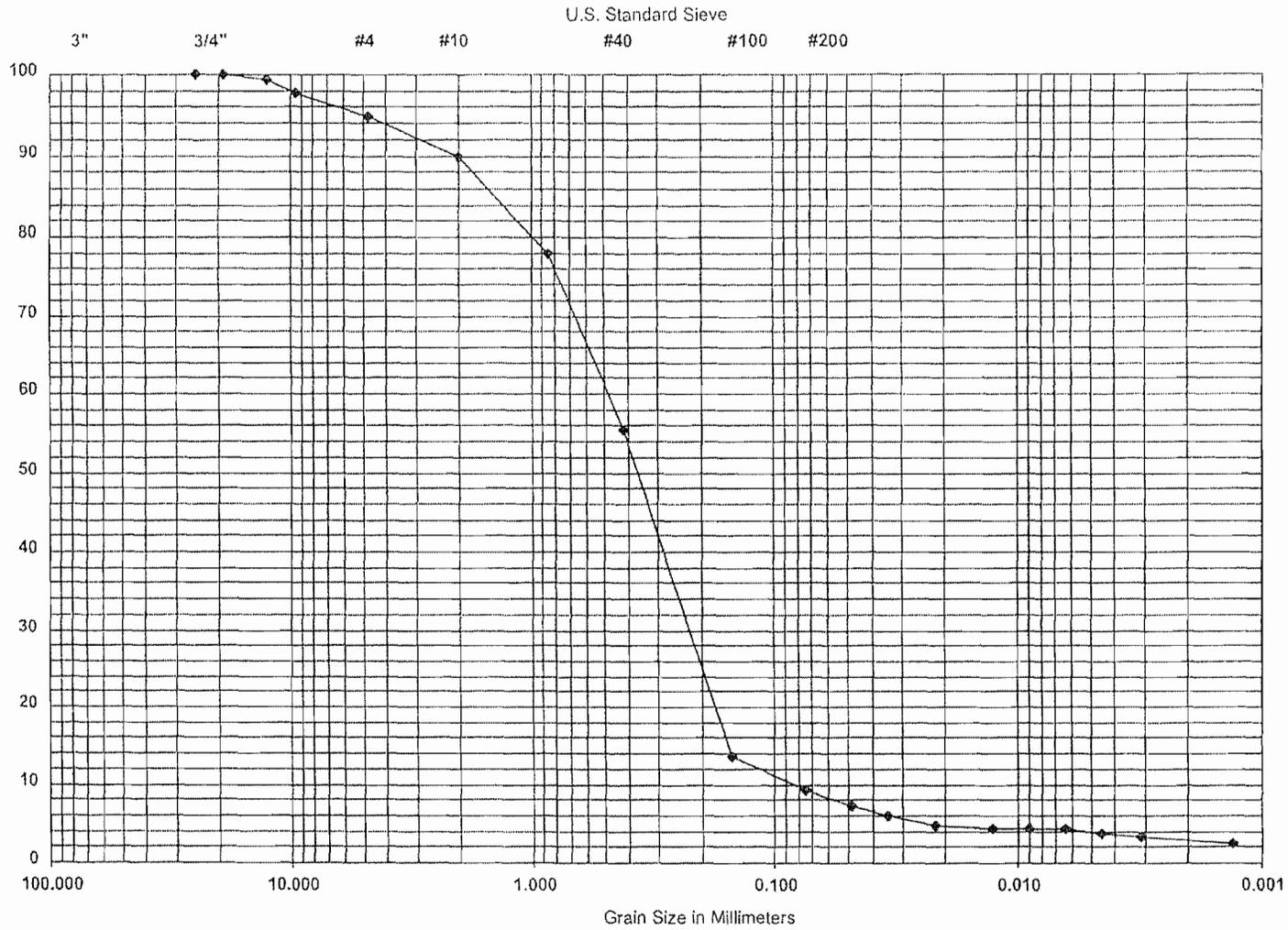
Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 10.0 | 8.3 | 8.1 | 7.3 | 0.0485 |
| | 2 | 8.5 | 6.8 | 6.7 | 6.0 | 0.0346 |
| | 5 | 7.0 | 5.3 | 5.2 | 4.7 | 0.0221 |
| | 15 | 6.5 | 4.8 | 4.7 | 4.2 | 0.0128 |
| | 30 | 6.5 | 4.8 | 4.7 | 4.2 | 0.0090 |
| | 60 | 6.5 | 4.8 | 4.7 | 4.2 | 0.0064 |
| | 120 | 6.0 | 4.3 | 4.2 | 3.8 | 0.0045 |
| | 250 | 5.5 | 3.8 | 3.7 | 3.3 | 0.0031 |
| | 1440 | 4.5 | 2.8 | 2.7 | 2.5 | 0.0013 |

LL : 0 PL : 0 PI : 0 Organic : No
Gravel : 5 Sand : 85 Silt : 7 Clay : 3
Cu : 5.8 Cc : 1.5 D10 : 0.0875 D30 : 0.256 D60 : 0.505
Unified Classification: SAND, Trace Gravel, Trace Silt, SP

REPORT OF GRAIN SIZE ANALYSIS

SCHLEEDER-RAMPTON ASSOCIATES, INC.



P
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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW76 Side Depth: 0 LL%: 0 PL %: 0 PI %: 0
 Gravel: 5 Sand: 85 Silt: 7 Clay: 3 Cu: 5.8 Cc: 1.5 Dia10:0.088 Dia30:0.256 Dia60: 0.505

Unified Classification: SAND, Trace Gravel, Trace Silt, SP

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/31/2003
 Log #: L78891-4

Sample Description:

Analytical Report: WW76 Center
 Date Sampled: 07/11/2003
 Time Sampled: 13:30
 Date Received: 07/15/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 1.2 | mg/kg (dw) | 6010B | 0.20 | 07/24 | 07/25 | SUB |
| Copper | 30 | mg/kg (dw) | 6010B | 0.20 | 07/24 | 07/25 | SUB |
| Lead | 140 | mg/kg (dw) | 6010B | 2.0 | 07/24 | 07/25 | SUB |
| Nickel | 17 | mg/kg (dw) | 6010B | 0.80 | 07/24 | 07/25 | SUB |
| Zinc | 340 | mg/kg (dw) | 6010B | 0.50 | 07/24 | 07/25 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 73 | % | SM2540B | 0.10 | 07/16 | 07/16 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Copper | 71 | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Lead | 180 | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Nickel | 23 | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Zinc | 230 | mg/kg (dw) | 3050/6010 | 2.7 | 07/18 | 07/21 | LL |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 390 | mg/kg (dw) | 1991 | 33 | 07/21 | 07/21 | SUB |
| Total Organic Carbon | 17000 | mg/kg | 9060 | 15 | 07/22 | 07/22 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 07/31/2003
Log #: L78891-4

Sample Description:

Analytical Report: WW76 Center
Date Sampled: 07/11/2003
Time Sampled: 13:30
Date Received: 07/15/2003
Collected By: Client

Sediment Samples

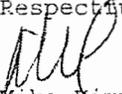
Reportable Extr. Anly.

| Parameter | Results | Units | Method | Limit | Date | Date | Analyst |
|-----------|---------|-------|--------|-------|------|------|---------|
|-----------|---------|-------|--------|-------|------|------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NPL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded, T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| CAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3051 Project Name: Waterway Sediment Samples ProjectID: 73286

Date: 7/22/2003 Boring No. 0 Sample No. WW76 Cen Depth: 0 Test No. 6

Total Sample Wt.: 236.9

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|----------------|------------|-------------|-------------|-----------|-----------------|----------|
| | + #10 | 1 | 0.0 | 0.0 | 100.0 | 25.0000 |
| Sieve Portion. | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 1.1 | 0.5 | 99.5 | 99.5 | 4.7500 |
| | No.10 | 4.6 | 1.9 | 98.1 | 98.1 | 2.0000 |
| | - #10 | No.20 | 2.2 | 4.3 | 95.7 | 0.8500 |
| Sieve Portion. | No.40 | 5.5 | 11.0 | 89.0 | 87.3 | 0.4200 |
| | No.100 | 12.7 | 25.2 | 74.8 | 73.4 | 0.1500 |
| | No.200 | 17.5 | 34.7 | 65.3 | 64.0 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.3

Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

Specific Gravity: 2.70

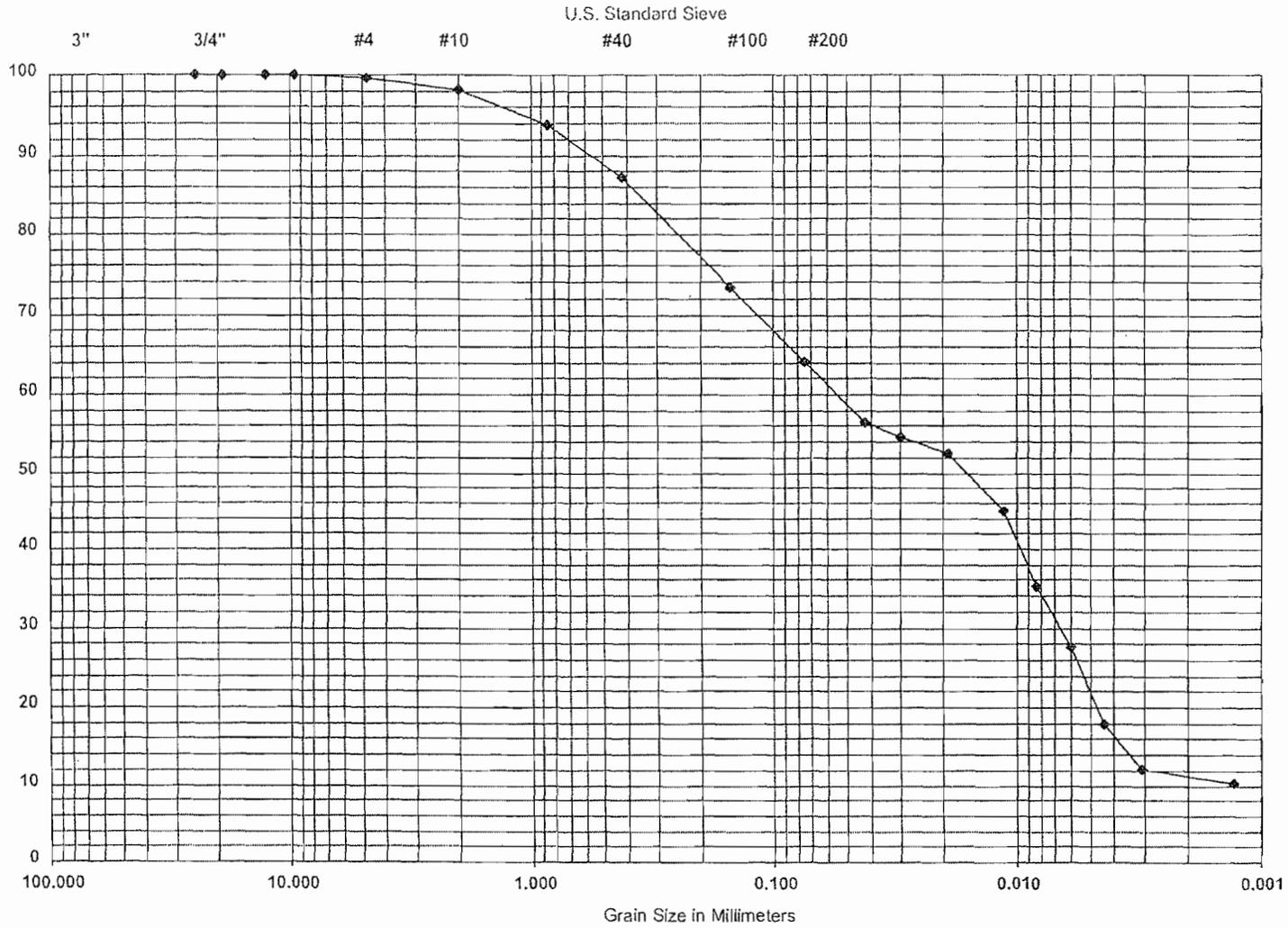
| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 31.0 | 29.3 | 57.6 | 56.5 | 0.0425 |
| | 2 | 30.0 | 28.3 | 55.6 | 54.5 | 0.0302 |
| | 5 | 29.0 | 27.3 | 53.7 | 52.6 | 0.0193 |
| | 15 | 25.0 | 23.3 | 45.8 | 44.9 | 0.0114 |
| | 30 | 20.0 | 18.3 | 36.0 | 35.3 | 0.0084 |
| | 60 | 16.0 | 14.3 | 28.1 | 27.6 | 0.0061 |
| | 120 | 11.0 | 9.3 | 18.3 | 17.9 | 0.0044 |
| | 250 | 8.0 | 6.3 | 12.4 | 12.1 | 0.0031 |
| | 1440 | 7.0 | 5.3 | 10.4 | 10.2 | 0.0013 |

LL : 0 PL : 0 PI : 0 Organic : No

Gravel : 0 Sand : 35 Silt : 53 Clay : 11

Cu : 52.4 Cc : 0.7 D10 : 0.0011 D30 : 0.007 D60 : 0.058

Unified Classification: SILT and SAND, Trace Gravel, ML



| GRAVEL | | SAND | | | SILT OR CLAY | |
|--------|------|--------|--------|------|--------------|--|
| coarse | fine | coarse | medium | fine | | |

Boring No.: 0 Sample No.: WW76 Cen Depth: 0 LL%: 0 PL%: 0 PI%: 0
 Gravel: 0 Sand: 35 Silt: 53 Clay: 11 Cu: 52.4 Cc: 0.7 Dia10: 0.001 Dia30: 0.007 Dia60: 0.058

Unified Classification: SILT and SAND, Trace Gravel, ML

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286



Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/25/2003
 Log #: L78464-1

Sample Description:

Waterway Sediment Samples

Analytical Report: WW50Side

Date Sampled: 07/01/2003

Time Sampled: 10:30

Date Received: 07/02/2003

Collected By: Client

| Parameter | Results | Units | Method | Reportable | Extr. | Anly. | Analyst |
|-------------------------------|---------------|------------|------------|------------|-------|-------|---------|
| | | | | Limit | Date | Date | |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 1991/6010B | 1.0 | 07/10 | 07/17 | SUB |
| Copper | 209 | mg/kg (dw) | 1991/6010B | 1.0 | 07/10 | 07/17 | SUB |
| Lead | 5 | mg/kg (dw) | 1991/6010B | 10 | 07/10 | 07/17 | SUB |
| Nickel | BDL | mg/kg (dw) | 1991/6010B | 7.0 | 07/10 | 07/17 | SUB |
| Zinc | 2600 | mg/kg (dw) | 1991/6010B | 4.0 | 07/10 | 07/17 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 35 | % | SM2540B | 0.10 | 07/03 | 07/03 | CP |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 2.9 | 07/10 | 07/10 | VR |
| Copper | 34 | mg/kg (dw) | 3050/6010 | 2.9 | 07/10 | 07/10 | VR |
| Lead | 120 | mg/kg (dw) | 3050/6010 | 2.9 | 07/10 | 07/10 | VR |
| Nickel | 8.3 | mg/kg (dw) | 3050/6010 | 2.9 | 07/10 | 07/10 | VR |
| Zinc | 220 | mg/kg (dw) | 3050/6010 | 5.7 | 07/10 | 07/10 | VR |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 400 | mg/kg | 1991 | 53 | 07/08 | 07/08 | SUB |
| Total Organic Carbon | 120000 | mg/kg (dw) | 9060 | 59 | 07/11 | 07/11 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | E87487 | | 9060 | | | | SUB |
| Subcontract Lab 1 | Anal. Res. In | | 1991/6010B | | | | SUB |

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 2 of 2
 Date: 07/25/2003
 Log #: L78464-1

Sample Description:
 Waterway Sediment Samples

Analytical Report: WW50Side
 Date Sampled: 07/01/2003
 Time Sampled: 10:30
 Date Received: 07/02/2003
 Collected By: Client

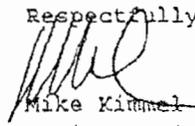
| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | | Analyst |
|-----------|---------|-------|--------|------------------|------|-------|--|---------|
| | | | | Limit | Date | Date | | |

~~Subcontracted Services~~ (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
 Flags: EDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
 Flags: CPR-Pb/Cu rule; ND-non detect (RL estimated); NPL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
 FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
 FLDEP Flags: L-exceeds calibration; O-holding time exceeded; T-value < MDL; V-present in blank
 FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 960176 | DOH# E86240 | NC CERT# 444 |
| SDE DOH# 86122,86109,E86048 | ADEN ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | SA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# E-15240 | |

Respectfully submitted,


 Mike Kimmel
 Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3043 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 7/15/2003 Boring No. 0 Sample No. WW50 Side Depth: 0 Test No. 1

Total Sample Wt.: 129.8

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|----------------|------------|-------------|-------------|-----------|-----------------|----------|
| | + #10 | 1 | 0.0 | 0.0 | 100.0 | 25.0000 |
| Sieve Portion. | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 8.9 | 6.9 | 93.1 | 93.1 | 12.5000 |
| | 3/8 | 8.9 | 6.9 | 93.1 | 93.1 | 9.5000 |
| | No.4 | 13.5 | 10.4 | 89.6 | 89.6 | 4.7500 |
| | No.10 | 15.6 | 12.1 | 87.9 | 87.9 | 2.0000 |
| | - #10 | No.20 | 0.5 | 0.5 | 99.5 | 0.8500 |
| Sieve Portion. | No.40 | 2.0 | 2.0 | 98.0 | 86.2 | 0.4200 |
| | No.100 | 8.0 | 8.0 | 92.0 | 80.9 | 0.1500 |
| | No.200 | 11.4 | 11.4 | 88.6 | 78.0 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.3

Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

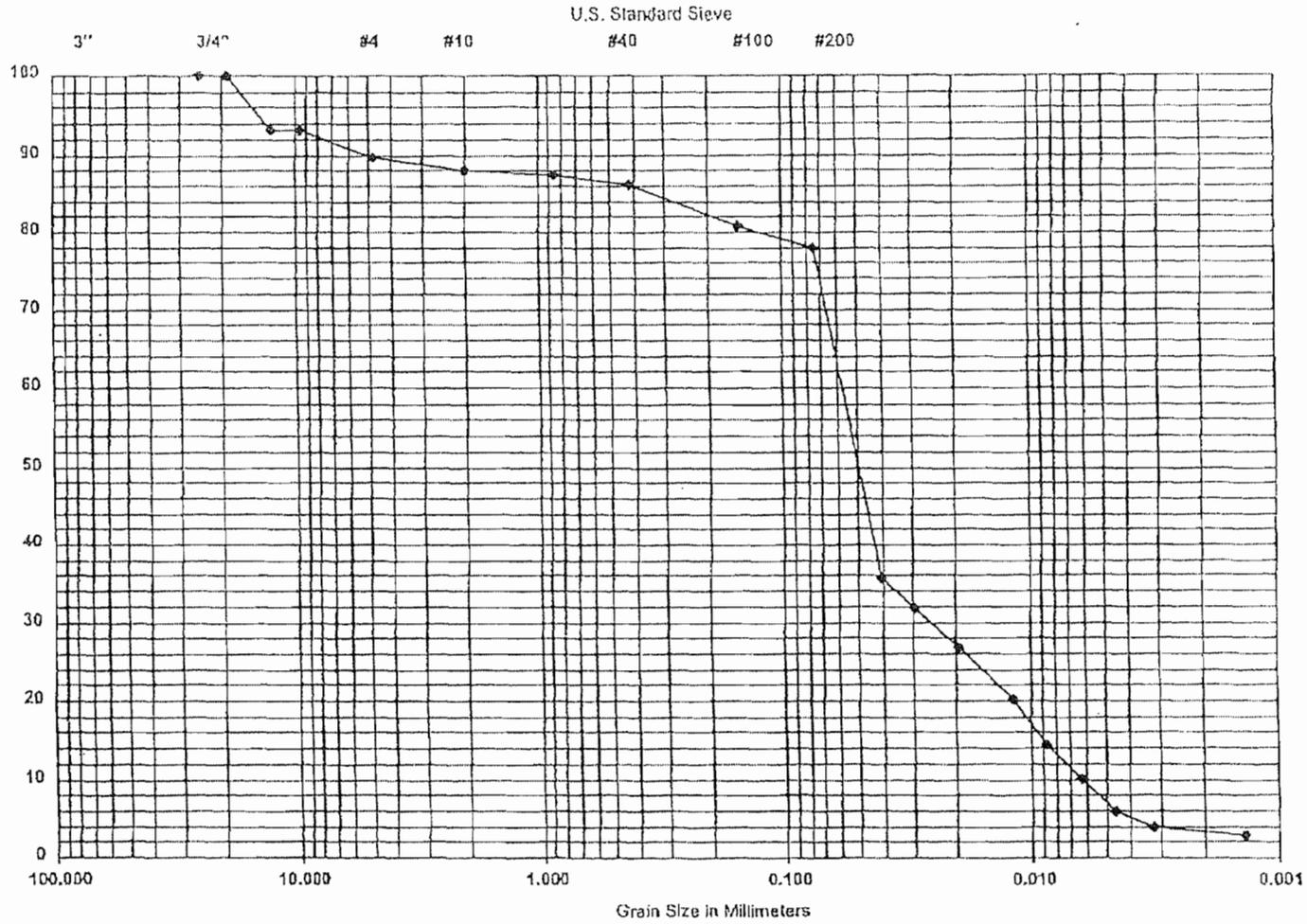
Specific Gravity: 2.60

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer | 1 | 42.0 | 40.3 | 40.7 | 35.8 | 0.0401 |
| Portion. | 2 | 37.5 | 35.8 | 36.1 | 31.8 | 0.0294 |
| | 5 | 32.0 | 30.3 | 30.6 | 26.9 | 0.0194 |
| | 15 | 24.5 | 22.8 | 23.0 | 20.2 | 0.0118 |
| | 30 | 18.0 | 16.3 | 16.4 | 14.5 | 0.0087 |
| | 60 | 13.0 | 11.3 | 11.4 | 10.0 | 0.0063 |
| | 120 | 8.5 | 6.8 | 6.9 | 6.0 | 0.0046 |
| | 250 | 6.0 | 4.3 | 4.3 | 3.8 | 0.0032 |
| | 1440 | 5.0 | 3.3 | 3.3 | 2.9 | 0.0014 |

LL : PL: PI : Organic : No
 Gravel : 10 Sand : 12 Silt : 75 Clay : 3
 Cu: 9.6 Cc: 1.9 D10: 0.0063 D30: 0.026 D60: 0.06
 Unified Classification: SILT, Little Sand, Little Gravel, ML

REPORT OF GRAIN SIZE ANALYSIS

SCHLEEDE-HAMPTON ASSOCIATES, INC.



Percent Finer

| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW50 Side Depth: 0 LL%: PL%: PI%:
 Gravel: 10 Sand: 12 Silt: 75 Clay: 3 Cu: 9.6 Cc: 1.9 Dia10: 0.006 Dia30: 0.026 Dia60: 0.060
 Unified Classification: SILT, Little Sand, Little Gravel, ML
 Project Name: Waterway Sediment Samples Client: U.S.Biosystems, Inc. ProjectID: 73286

07/25/03 FRI 10:55 FAX 561 447 6138

USBIOYSTEMS

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/25/2003
 Log #: L78464-2

Sample Description:
 Waterway Sediment Samples

Analytical Report: WW50Center
 Date Sampled: 07/01/2003
 Time Sampled: 11:00
 Date Received: 07/02/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|-------------|------------|------------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 1991/6010B | 0.70 | 07/10 | 07/17 | SUB |
| Copper | 189 | mg/kg (dw) | 1991/6010B | 0.70 | 07/10 | 07/17 | SUB |
| Lead | 179 | mg/kg (dw) | 1991/6010B | 7.0 | 07/10 | 07/17 | SUB |
| Nickel | 107 | mg/kg (dw) | 1991/6010B | 3.0 | 07/10 | 07/17 | SUB |
| Zinc | 110 | mg/kg (dw) | 1991/6010B | 2.0 | 07/10 | 07/17 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 78 | % | SM2540B | 0.10 | 07/03 | 07/03 | CP |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.3 | 07/10 | 07/10 | VR |
| Copper | 9.7 | mg/kg (dw) | 3050/6010 | 1.3 | 07/10 | 07/10 | VR |
| Lead | 29 | mg/kg (dw) | 3050/6010 | 1.3 | 07/10 | 07/10 | VR |
| Nickel | 3.5 | mg/kg (dw) | 3050/6010 | 1.3 | 07/10 | 07/10 | VR |
| Zinc | 140 | mg/kg (dw) | 3050/6010 | 2.6 | 07/10 | 07/10 | VR |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 800 | mg/kg | 1991 | 140 | 07/08 | 07/08 | SUB |
| Total Organic Carbon | 5800 | mg/kg (dw) | 9060 | 15 | 07/11 | 07/11 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | E87487 | | 9060 | | | | SUB |
| Subcontract Lab 1 | Anal.Res.In | | 1991/6010B | | | | SUB |

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 2 of 2
 Date: 07/25/2003
 Log #: L78464-2

Sample Description:
 Waterway Sediment Samples

Analytical Report: WW50Center
 Date Sampled: 07/01/2003
 Time Sampled: 11:00
 Date Received: 07/02/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Extr. Limit | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------------|------------|---------|
|-----------|---------|-------|--------|------------------------|------------|---------|

~~Subcontracted Services~~ (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAP requirements.
 Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
 Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NPL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
 FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail ±R or ±RPD; 4:matrix int. 5:improper fld. protocol
 FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
 FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 960126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,866048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| DEACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# 5-35240 | |

Respectfully submitted,


 Mike Kimmel
 Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3045 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 7/15/2003 Boring No. 0 Sample No. WW50 Cent Depth: 0 Test No. 2

Total Sample Wt.: 254.6

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 2.2 | 0.8 | 99.2 | 99.2 | 9.5000 |
| | No.4 | 6.0 | 2.4 | 97.6 | 97.6 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 10.9 | 4.3 | 95.7 | 95.7 | 2.0000 |
| | No.20 | 5.6 | 5.6 | 94.4 | 90.3 | 0.8500 |
| | No.40 | 13.3 | 13.3 | 86.7 | 83.0 | 0.4200 |
| | No.100 | 81.7 | 81.4 | 18.6 | 17.8 | 0.1500 |
| | No.200 | 86.1 | 85.8 | 14.2 | 13.6 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.3

Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

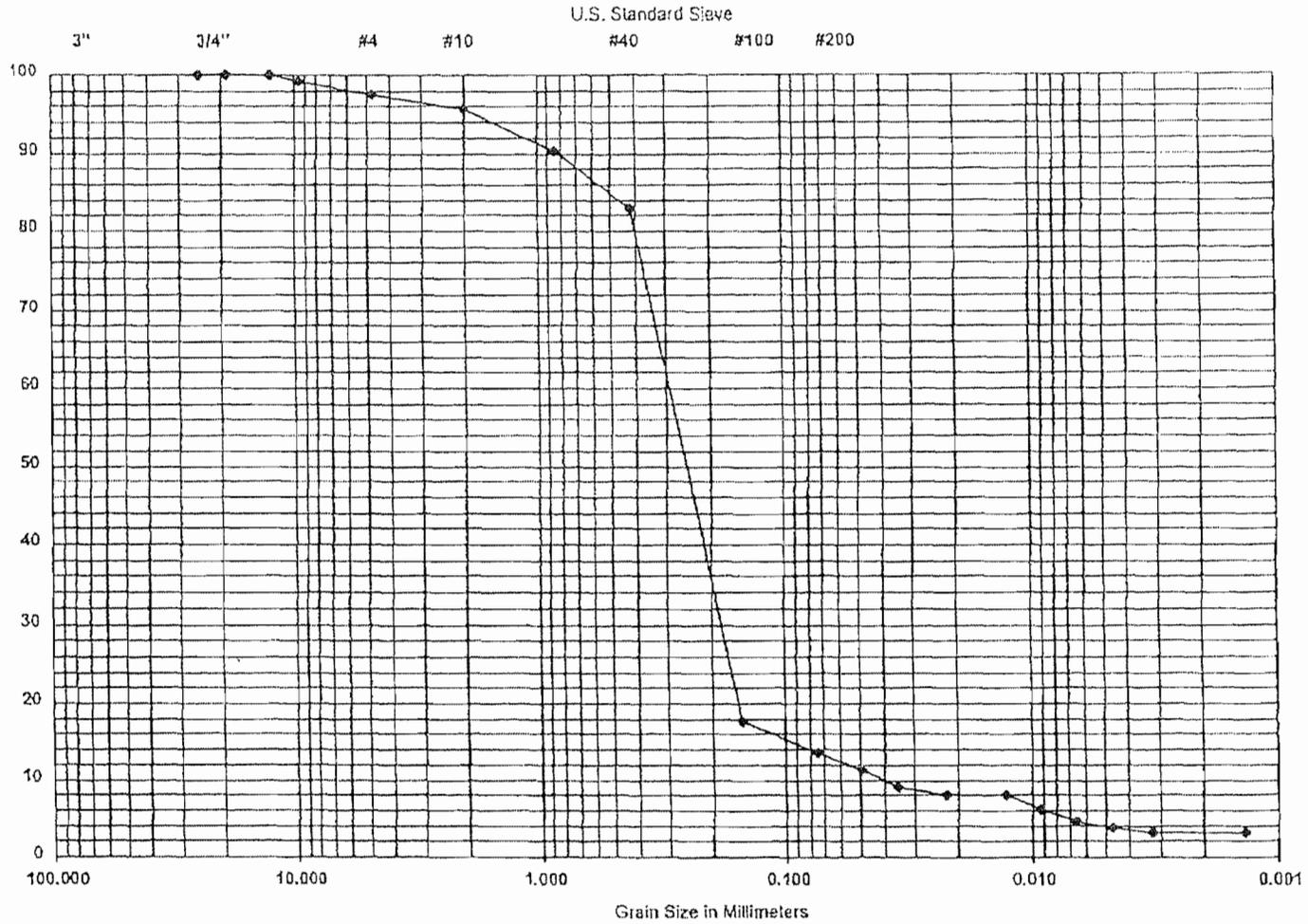
Specific Gravity: 2.60

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 13.5 | 11.8 | 11.9 | 11.4 | 0.0490 |
| | 2 | 11.0 | 9.3 | 9.4 | 9.0 | 0.0352 |
| | 5 | 10.0 | 8.3 | 8.4 | 8.0 | 0.0224 |
| | 15 | 10.0 | 8.3 | 8.4 | 8.0 | 0.0129 |
| | 30 | 8.0 | 6.3 | 6.4 | 6.1 | 0.0092 |
| | 60 | 6.5 | 4.8 | 4.8 | 4.6 | 0.0086 |
| | 120 | 5.5 | 3.8 | 3.8 | 3.7 | 0.0047 |
| | 250 | 5.0 | 3.3 | 3.3 | 3.2 | 0.0033 |
| | 1440 | 5.0 | 3.3 | 3.3 | 3.2 | 0.0014 |

LL : PL : PI : Organic : No
 Gravel : 2 Sand : 84 Silt : 11 Clay : 3
 Cu: 7.9 Cc: 3.0 D10: 0.0410 D30: 0.201 D60: 0.325
 Unified Classification: SAND, Trace Gravel, Little Silt, SP-SM

REPORT OF GRAIN SIZE ANALYSIS

SCHLEEDE-HAMPTON ASSOCIATES, INC.



P
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F
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e
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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW50 Cent Depth: 0 LL%: PL %: PI %:
 Gravel: 2 Sand: 84 Silt: 11 Clay: 3 Cu: 7.9 Cc: 3.0 Dia10: 0.041 Dia30: 0.201 Dia60: 0.325

Unified Classification: SAND, Trace Gravel, Little Silt, SP-SM

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

07/25/03 FRI 10:56 FAX 561 447 8136

USBIOSYSTEMS



Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/28/2003
 Log #: L79941-1

Sample Description:

Sediment Samples

Analytical Report: WW-55Side
 Date Sampled: 08/08/2003
 Time Sampled: 11:15
 Date Received: 08/14/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|------------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 0.20 | mg/kg (dw) | 6010B | 0.10 | 08/19 | 08/19 | SUB |
| Copper | 7.7 | mg/kg (dw) | 6010B | 0.10 | 08/19 | 08/19 | SUB |
| Lead | 19 | mg/kg (dw) | 6010B | 1.0 | 08/19 | 08/19 | SUB |
| Nickel | 2.0 | mg/kg (dw) | 6010B | 0.60 | 08/19 | 08/19 | SUB |
| Zinc | 46 | mg/kg (dw) | 6010B | 0.40 | 08/19 | 08/19 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 72 | % | SM2540B | 0.10 | 08/15 | 08/15 | KB |
| Metals | | | | | | | |
| Cadmium | BDL MI | mg/kg (dw) | 3050/6010 | 1.4 | 08/16 | 08/17 | SB |
| Copper | 15 | mg/kg (dw) | 3050/6010 | 1.4 | 08/16 | 08/17 | SB |
| Lead | 21 | mg/kg (dw) | 3050/6010 | 1.4 | 08/16 | 08/17 | SB |
| Nickel | 5.4 MI | mg/kg (dw) | 3050/6010 | 1.4 | 08/16 | 08/17 | SB |
| Zinc | 69 MI | mg/kg (dw) | 3050/6010 | 2.8 | 08/16 | 08/17 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | BDL | mg/kg (dw) | 1991 | 1.2 | 08/19 | 08/19 | SUB |
| Total Organic Carbon | 6100 | mg/kg (dw) | 9060 | 13 | 08/18 | 08/18 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | E87487 | | 9060 | | | | SUB |
| Subcontract Lab 2 | ARI | | 1991/6010B | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/28/2003
Log #: L79941-1

Sample Description:

Analytical Report: WW-55Side
Date Sampled: 08/08/2003
Time Sampled: 11:15
Date Received: 08/14/2003
Collected By: Client

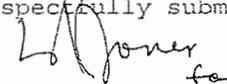
Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements
Flags: BDL or U-below reporting limit; DU-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appli
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; SW-dry wt; WW-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-------------------------------|---------------------------|-----------------|
| QAP# 960126 | DOH# E26240 | NC CERT# 444 |
| SUB DOH# E6122, E6109, E66048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3100 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 8/25/2003 Boring No. 0 Sample No. WW55-Side Depth: 0 Test No. 17

Total Sample Wt.: 300.4

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.4 | 0.1 | 99.9 | 99.9 | 9.5000 |
| | No.4 | 3.1 | 1.0 | 99.0 | 99.0 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 7.9 | 2.6 | 97.4 | 97.4 | 2.0000 |
| | No.20 | 1.3 | 2.6 | 97.4 | 94.9 | 0.8500 |
| | No.40 | 2.8 | 5.6 | 94.4 | 92.0 | 0.4200 |
| | No.100 | 30.9 | 61.8 | 38.2 | 37.2 | 0.1500 |
| | No.200 | 42.4 | 84.6 | 15.4 | 15.0 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.1

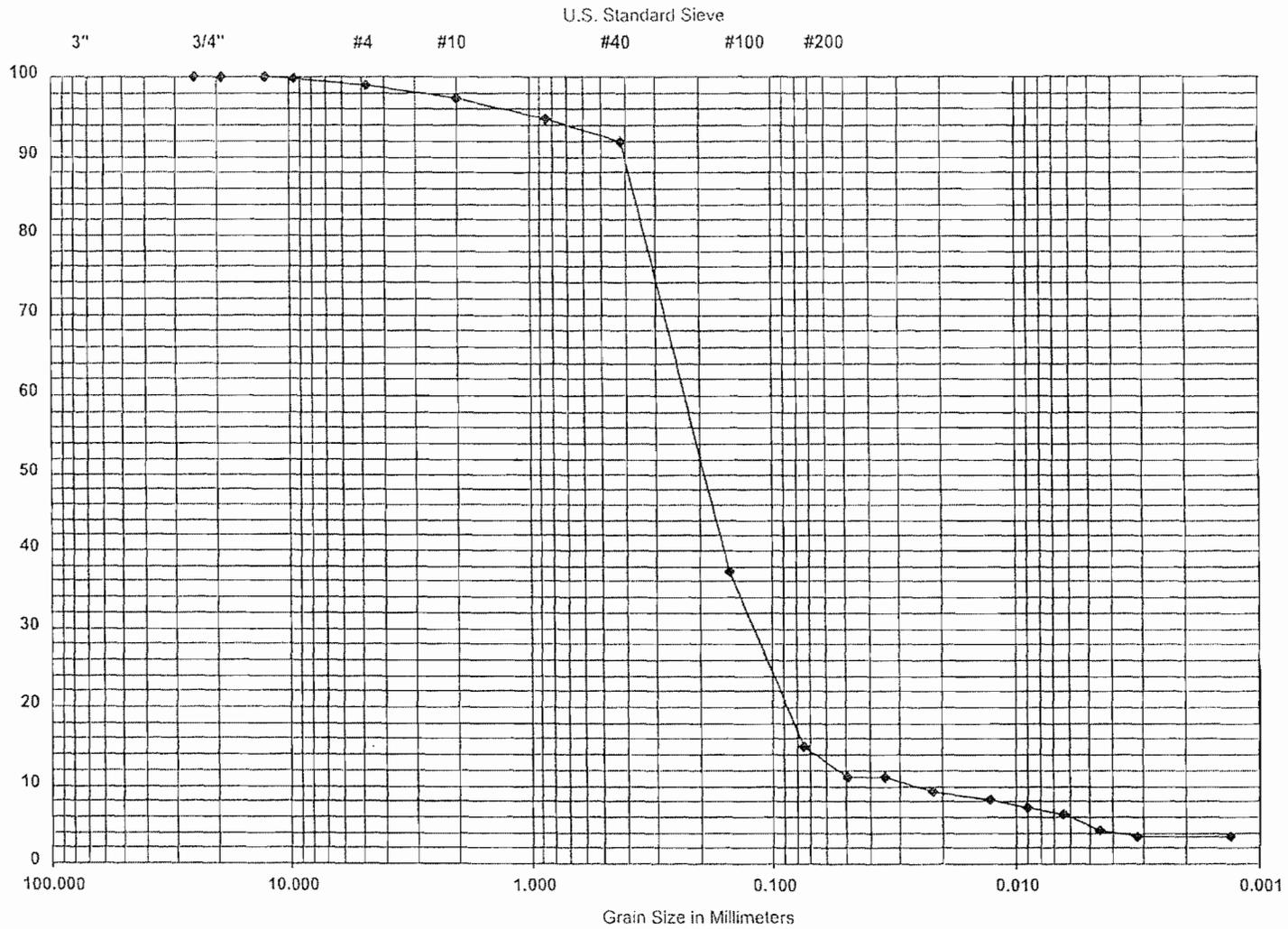
Temperature (C): 25.0

Temp Bath Bulb Reading: 3.5

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 8.0 | 5.8 | 11.5 | 11.2 | 0.0491 |
| | 2 | 8.0 | 5.8 | 11.5 | 11.2 | 0.0347 |
| | 5 | 7.0 | 4.8 | 9.5 | 9.2 | 0.0221 |
| | 15 | 6.5 | 4.3 | 8.5 | 8.3 | 0.0128 |
| | 30 | 6.0 | 3.8 | 7.5 | 7.3 | 0.0091 |
| | 60 | 5.5 | 3.3 | 6.5 | 6.3 | 0.0064 |
| | 120 | 4.5 | 2.3 | 4.5 | 4.4 | 0.0046 |
| | 250 | 4.0 | 1.8 | 3.6 | 3.5 | 0.0032 |
| | 1440 | 4.0 | 1.8 | 3.6 | 3.5 | 0.0013 |

LL : PL: PI : Organic : No
 Gravel : 1 Sand : 84 Silt : 12 Clay : 3
 Cu: 9.7 Cc: 2.2 D10: 0.0271 D30: 0.126 D60: 0.262
 Unified Classification: SAND, Trace Gravel, Little Silt, SW-SM



Percent Finer

| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW55-Side Depth: 0 LL%: PL %: PI %:
 Gravel: 1 Sand: 84 Silt: 12 Clay: 3 Cu: 9.7 Cc: 2.2 Dia10: 0.027 Dia30: 0.126 Dia60: 0.262

Unified Classification: SAND, Trace Gravel, Little Silt, SW-SM

Project Name: Waterway Sediment Samples Client: U.S.Biosystems, Inc. ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/28/2003
 Log #: L79941-2

Sample Description:

Analytical Report: WW-55Center
 Date Sampled: 08/08/2003
 Time Sampled: 12:15
 Date Received: 08/14/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|------------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 6010B | 0.60 | 08/19 | 08/19 | SUB |
| Copper | 11 | mg/kg (dw) | 6010B | 0.60 | 08/19 | 08/19 | SUB |
| Lead | 15 | mg/kg (dw) | 6010B | 6.0 | 08/19 | 08/19 | SUB |
| Nickel | 4.0 | mg/kg (dw) | 6010B | 3.0 | 08/19 | 08/19 | SUB |
| Zinc | 340 | mg/kg (dw) | 6010B | 2.0 | 08/19 | 08/19 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 54 | % | SM2540B | 0.10 | 08/15 | 08/15 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SB |
| Copper | 48 | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SB |
| Lead | 120 | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SB |
| Nickel | 24 | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SB |
| Zinc | 280 | mg/kg (dw) | 3050/6010 | 3.7 | 08/16 | 08/17 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 7.8 | mg/kg (dw) | 1991 | 1.2 | 08/19 | 08/19 | SUB |
| Total Organic Carbon | 33000 | mg/kg (dw) | 9060 | 19 | 08/18 | 08/18 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | E87487 | | 9060 | | | | SUB |
| Subcontract Lab 2 | ARI | | 1991/6010B | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/28/2003
Log #: L79941-2

Sample Description:

Analytical Report: WW-55Center
Date Sampled: 08/08/2003
Time Sampled: 12:15
Date Received: 08/14/2003
Collected By: Client

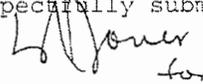
Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | |
|-----------|---------|-------|--------|------------------|------|-------|---------|
| | | | | Limit | Date | Date | Analyst |

~~Subcontracted Services~~ (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NALAC requirements.
Flags: BDL or D below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not app.
Flags: CFR-PB/Cu rule; ND-non detect (RL estimated); NFL-no free liquids, dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr fail 2:no known QC req 3-QC fail %R or %RPD; 4:matrix int 5:improper fld protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

QAP# 960126 DOH# E86240 NC CERT# 444
SUB DOH# 96123,86109,E86048 ADEM ID# 40850 IL CERT# 200026
SC CERT# 96931001 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-15240

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3101 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 8/25/2003 Boring No. 0 Sample No. WW55-Cen Depth: 0 Test No. 18

Total Sample Wt.: 190.3

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|--------------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.4 | 0.2 | 99.8 | 99.8 | 9.5000 |
| | No.4 | 0.5 | 0.3 | 99.7 | 99.7 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 3.1 | 1.6 | 98.4 | 98.4 | 2.0000 |
| | No.20 | 2.4 | 4.9 | 95.1 | 93.6 | 0.8500 |
| | No.40 | 4.7 | 9.5 | 90.5 | 89.1 | 0.4200 |
| | No.100 | 14.0 | 27.9 | 72.1 | 70.9 | 0.1500 |
| | No.200 | 19.5 | 38.9 | 61.1 | 60.2 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.1

Temperature (C): 25.0

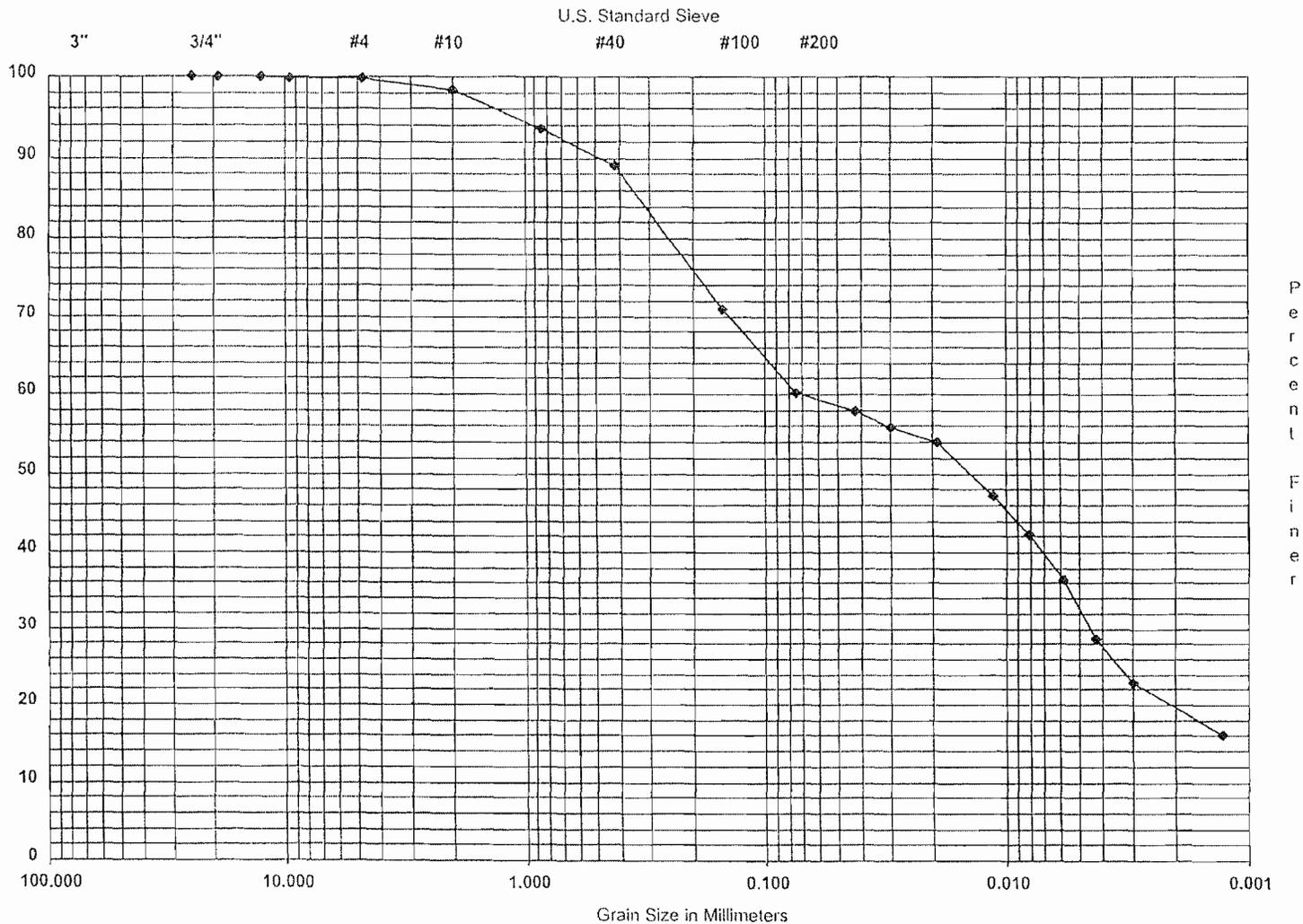
Temp Bath Bulb Reading: 3.5

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 32.0 | 29.8 | 58.8 | 57.9 | 0.0421 |
| | 2 | 31.0 | 28.8 | 56.9 | 55.9 | 0.0300 |
| | 5 | 30.0 | 27.8 | 54.9 | 54.0 | 0.0191 |
| | 15 | 26.5 | 24.3 | 48.0 | 47.2 | 0.0113 |
| | 30 | 24.0 | 21.8 | 43.0 | 42.3 | 0.0081 |
| | 60 | 21.0 | 18.8 | 37.1 | 36.5 | 0.0059 |
| | 120 | 17.0 | 14.8 | 29.2 | 28.7 | 0.0043 |
| | 250 | 14.0 | 11.8 | 23.3 | 22.9 | 0.0030 |
| | 1440 | 10.5 | 8.3 | 16.4 | 16.1 | 0.0013 |

LL : PL: PI : Organic : No
 Gravel : 0 Sand : 40 Silt : 41 Clay : 19
 Cu: 72.7 Cc: 0.3 D10: 0.001 D30: 0.005 D60: 0.073

Unified Classification: Silty CLAY and Sand, Trace Gravel, CL



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW55-Cen Depth: 0 LL%: PL %: PI %:
 Gravel: 0 Sand: 40 Silt: 41 Clay: 19 Cu: 72.7 Cc: 0.3 Dia10: 0.001 Dia30: 0.005 Dia60: 0.073
 Unified Classification: Silty CLAY and Sand, Trace Gravel, CL

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/28/2003
 Log #: L79941-3

Sample Description:

Analytical Report: WW-54Side
 Date Sampled: 08/12/2003
 Time Sampled: 11:10
 Date Received: 08/14/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|------------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 0.70 | mg/kg (dw) | 6010B | 0.60 | 08/19 | 08/19 | SUB |
| Copper | 23 | mg/kg (dw) | 6010B | 0.60 | 08/19 | 08/19 | SUB |
| Lead | 57 | mg/kg (dw) | 6010B | 6.0 | 08/19 | 08/19 | SUB |
| Nickel | 8.0 | mg/kg (dw) | 6010B | 3.0 | 08/19 | 08/19 | SUB |
| Zinc | 160 | mg/kg (dw) | 6010B | 2.0 | 08/19 | 08/19 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 80 | % | SM2540B | 0.10 | 08/15 | 08/15 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.3 | 08/16 | 08/17 | SB |
| Copper | 5.6 | mg/kg (dw) | 3050/6010 | 1.3 | 08/16 | 08/17 | SB |
| Lead | 6.5 | mg/kg (dw) | 3050/6010 | 1.3 | 08/16 | 08/17 | SB |
| Nickel | 4.3 | mg/kg (dw) | 3050/6010 | 1.3 | 08/16 | 08/17 | SB |
| Zinc | 41 | mg/kg (dw) | 3050/6010 | 2.5 | 08/16 | 08/17 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 1100 | mg/kg (dw) | 1991 | 20 | 08/19 | 08/19 | SUB |
| Total Organic Carbon | 4200 | mg/kg (dw) | 9060 | 12 | 08/18 | 08/18 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | E87487 | | 9060 | | | | SUB |
| Subcontract Lab 2 | ARI | | 1991/6010B | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/28/2003
Log #: L79941-3

Sample Description:

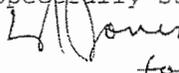
Sediment Samples

Analytical Report: WW-54Side
Date Sampled: 08/12/2003
Time Sampled: 11:10
Date Received: 08/14/2003
Collected By: Client

| Parameter | Results | Units | Method | Reportable Extr. Limit | Anly. Date | Analyst |
|---|---------|-------|--------|------------------------|------------|---------|
| Subcontracted Services (continued) | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
Flags: CFR-PE Ca rule; ND-non detect; RL-estimated; NFL-no free liquids; dw-dry wt; ww-wet wt; C(F)-see attached USB code
FLDEP Flags: 0:estimated; 1:surr fail; 2:no known QC req; 3:QC fail; 4:RPD; 5:matrix int; 6:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MEL and PQL

QAP# 980126 DOH# E86240 NC CERT# 444
SUB DOH# 86122,86109,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96031001 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-35240

Respectfully submitted,

for
Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3096 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 8/25/2003 Boring No. 0 Sample No. WW54-Side Depth: 0 Test No. 14

Total Sample Wt.: 453.6

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.7 | 0.1 | 99.9 | 99.9 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 4.0 | 0.9 | 99.1 | 99.1 | 2.0000 |
| | No.20 | 7.2 | 7.2 | 92.8 | 92.0 | 0.8500 |
| | No.40 | 30.9 | 30.9 | 69.1 | 68.5 | 0.4200 |
| | No.100 | 92.5 | 92.5 | 7.5 | 7.5 | 0.1500 |
| | No.200 | 93.7 | 93.6 | 6.4 | 6.3 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.1

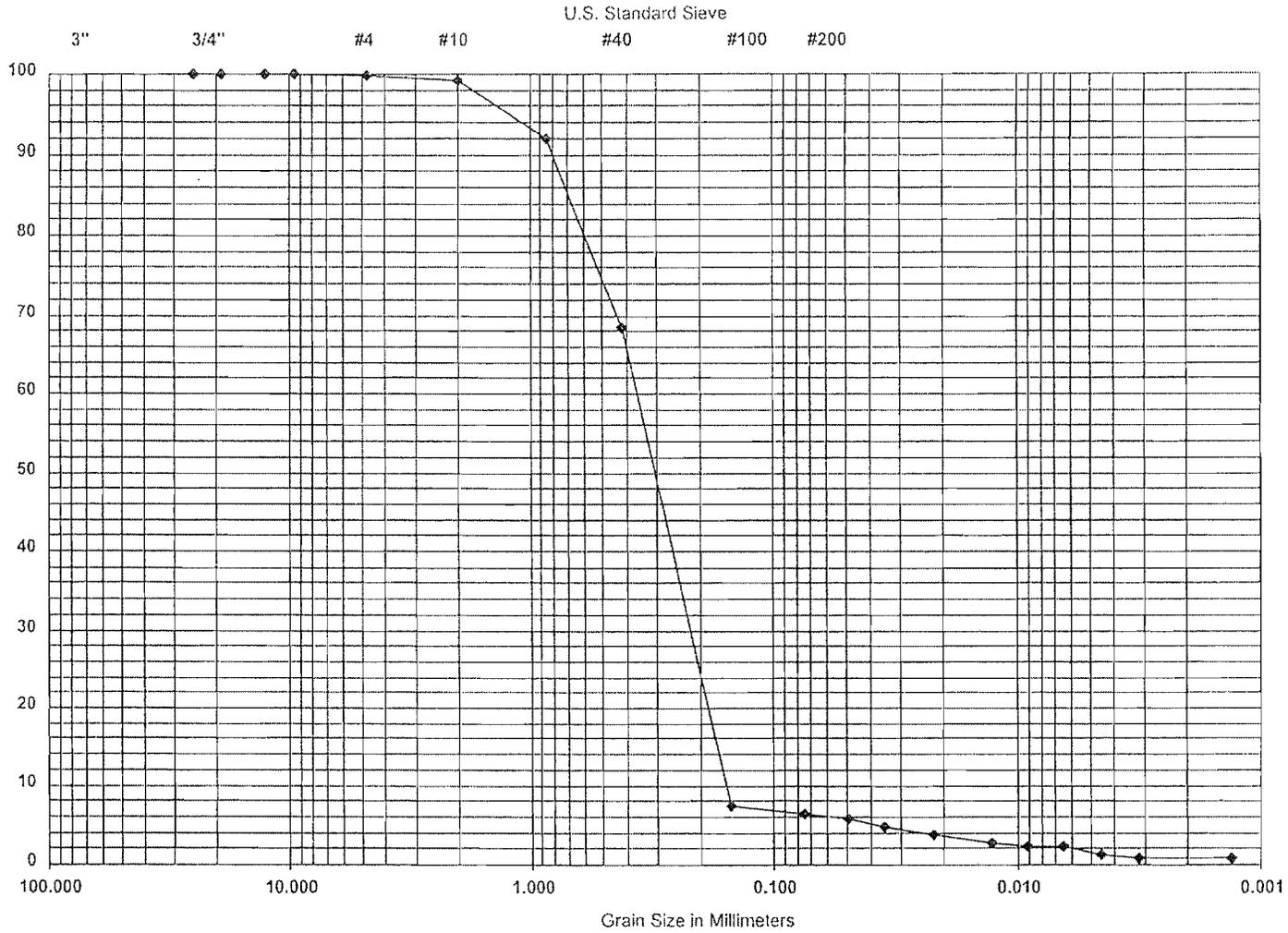
Temperature (C): 25.0

Temp Bath Bulb Reading: 3.5

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 8.0 | 5.8 | 5.7 | 5.7 | 0.0491 |
| | 2 | 7.0 | 4.8 | 4.7 | 4.7 | 0.0349 |
| | 5 | 6.0 | 3.8 | 3.8 | 3.7 | 0.0222 |
| | 15 | 5.0 | 2.8 | 2.8 | 2.7 | 0.0129 |
| | 30 | 4.5 | 2.3 | 2.3 | 2.3 | 0.0091 |
| | 60 | 4.5 | 2.3 | 2.3 | 2.3 | 0.0065 |
| | 120 | 3.5 | 1.3 | 1.3 | 1.3 | 0.0046 |
| | 250 | 3.0 | 0.8 | 0.8 | 0.8 | 0.0032 |
| | 1440 | 3.0 | 0.8 | 0.8 | 0.8 | 0.0013 |

LL : PL : PI : Organic : No
 Gravel : 0 Sand : 93 Silt : 6 Clay : 1
 Cu: 2.4 Cc: 1.0 D10: 0.1612 D30: 0.25 D60: 0.382
 Unified Classification: SAND, Trace Gravel, Trace Silt, SP



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW54-Side Depth: 0 LL%: PL %: PI %:
 Gravel: 0 Sand: 93 Silt: 6 Clay: 1 Cu: 2.4 Cc: 1.0 Dia10: 0.161 Dia30: 0.25 Dia60: 0.382
 Unified Classification: SAND, Trace Gravel, Trace Silt, SP

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/28/2003
 Log #: L79941-4

Sample Description:

Analytical Report: WW-54Center
 Date Sampled: 08/12/2003
 Time Sampled: 11:30
 Date Received: 08/14/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|------------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 0.50 | mg/kg (dw) | 6010B | 0.30 | 08/19 | 08/19 | SUB |
| Copper | 9.3 | mg/kg (dw) | 6010B | 0.30 | 08/19 | 08/19 | SUB |
| Lead | 55 | mg/kg (dw) | 6010B | 3.0 | 08/19 | 08/19 | SUB |
| Nickel | 3.0 | mg/kg (dw) | 6010B | 1.0 | 08/19 | 08/19 | SUB |
| Zinc | 63 | mg/kg (dw) | 6010B | 0.80 | 08/19 | 08/19 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 87 | % | SM2540B | 0.10 | 08/15 | 08/15 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.1 | 08/16 | 08/17 | SB |
| Copper | 13 | mg/kg (dw) | 3050/6010 | 1.1 | 08/16 | 08/17 | SB |
| Lead | 15 | mg/kg (dw) | 3050/6010 | 1.1 | 08/16 | 08/17 | SB |
| Nickel | 6.1 | mg/kg (dw) | 3050/6010 | 1.1 | 08/16 | 08/17 | SB |
| Zinc | 36 | mg/kg (dw) | 3050/6010 | 2.3 | 08/16 | 08/17 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 270 | mg/kg (dw) | 1991 | 20 | 08/19 | 08/19 | SUB |
| Total Organic Carbon | 5800 | mg/kg (dw) | 9060 | 11 | 08/18 | 08/18 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | E87487 | | 9060 | | | | SUB |
| Subcontract Lab 2 | ARI | | 1991/6010B | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/28/2003
Log #: L79941-4

Sample Description:

Analytical Report: WW-54Center
Date Sampled: 08/12/2003
Time Sampled: 11:30
Date Received: 08/14/2003
Collected By: Client

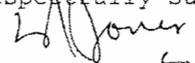
Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS or Standard Methods and certified to meet NELAP requirements
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
Flags: CPR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(*)-see attached USB code
FLDEP Flags: J(*)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; R-colonies exceed range; I-result between MDL and PQL

GAP# 980126 DOH# E86240 NC CERT# 444
SUB DOH# 86122,86169,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96031001 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00295 USDA Soil Permit# S-35240

Respectfully submitted,

for
Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3098 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 8/25/2003 Boring No. 0 Sample No. WW54-Center Depth: 0 Test No. 15

Total Sample Wt.: 393.5

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 21.2 | 5.4 | 94.6 | 94.6 | 12.5000 |
| | 3/8 | 46.0 | 11.7 | 88.3 | 88.3 | 9.5000 |
| | No.4 | 147.8 | 37.6 | 62.4 | 62.4 | 4.7500 |
| | No.10 | 265.8 | 67.6 | 32.4 | 32.4 | 2.0000 |
| - #10 Sieve Portion. | No.20 | 47.1 | 47.1 | 52.9 | 17.2 | 0.8500 |
| | No.40 | 65.8 | 65.8 | 34.2 | 11.1 | 0.4200 |
| | No.100 | 92.5 | 92.4 | 7.6 | 2.5 | 0.1500 |
| | No.200 | 95.2 | 95.1 | 4.9 | 1.6 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.0

Temperature (C): 25.0

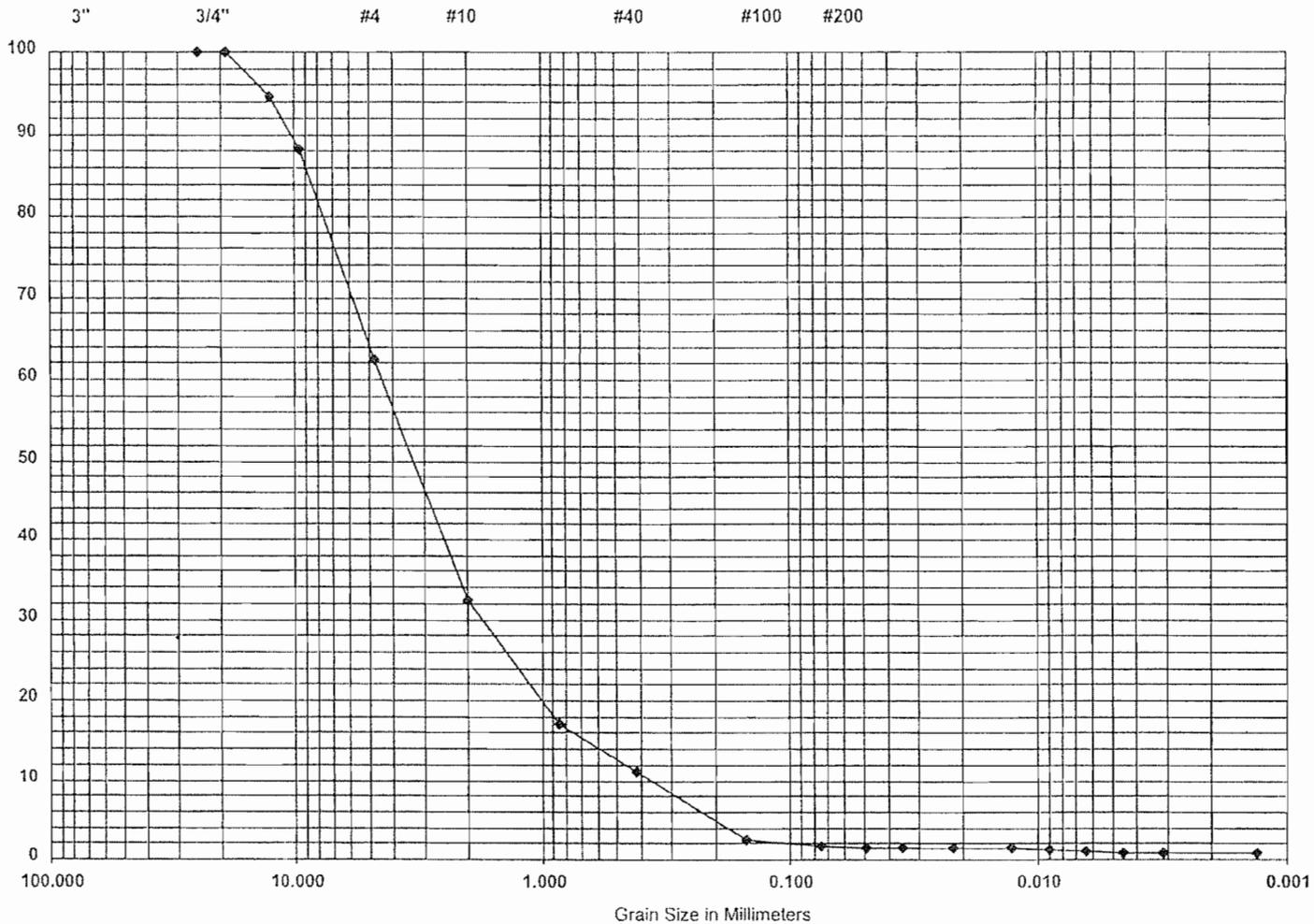
Temp Bath Bulb Reading: 3.5

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 7.0 | 4.8 | 4.7 | 1.5 | 0.0493 |
| | 2 | 6.5 | 4.3 | 4.3 | 1.4 | 0.0350 |
| | 5 | 6.5 | 4.3 | 4.3 | 1.4 | 0.0221 |
| | 15 | 6.5 | 4.3 | 4.3 | 1.4 | 0.0128 |
| | 30 | 6.0 | 3.8 | 3.8 | 1.2 | 0.0091 |
| | 60 | 5.5 | 3.3 | 3.3 | 1.1 | 0.0064 |
| | 120 | 5.0 | 2.8 | 2.8 | 0.9 | 0.0046 |
| | 250 | 4.5 | 2.3 | 2.3 | 0.7 | 0.0032 |
| | 1440 | 4.5 | 2.3 | 2.3 | 0.7 | 0.0013 |

LL : PL: PI : Organic : No
 Gravel : 37 Sand : 61 Silt : 1 Clay : 1
 Cu: 11.7 Cc: 1.9 D10: 0.3857 D30: 1.816 D60: 4.526
 Unified Classification: Gravelly SAND, Trace Silt, SW

U.S. Standard Sieve



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW54-Center Depth: 0 LL%: PL %: PI %:
 Gravel: 37 Sand: 61 Silt: 1 Clay: 1 Cu: 11.7 Cc: 1.9 Dia10: 0.386 Dia30: 1.816 Dia60: 4.526

Unified Classification: Gravelly SAND, Trace Silt, SW

Project Name: Waterway Sediment Samples Client: U.S.Biosystems, Inc. ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/28/2003
 Log #: L79941-5

Sample Description:

Analytical Report: WW-57Side
 Date Sampled: 08/13/2003
 Time Sampled: 13:00
 Date Received: 08/14/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|------------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 1.0 | mg/kg (dw) | 6010B | 0.40 | 08/19 | 08/19 | SUB |
| Copper | 31 | mg/kg (dw) | 6010B | 0.40 | 08/19 | 08/19 | SUB |
| Lead | 100 | mg/kg (dw) | 6010B | 4.0 | 08/19 | 08/19 | SUB |
| Nickel | 11 | mg/kg (dw) | 6010B | 2.0 | 08/19 | 08/19 | SUB |
| Zinc | 320 | mg/kg (dw) | 6010B | 1.0 | 08/19 | 08/19 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 52 | % | SM2540B | 0.10 | 08/15 | 08/15 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SE |
| Copper | 35 | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SE |
| Lead | 54 | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SE |
| Nickel | 15 | mg/kg (dw) | 3050/6010 | 1.9 | 08/16 | 08/17 | SE |
| Zinc | 170 | mg/kg (dw) | 3050/6010 | 3.8 | 08/16 | 08/17 | SE |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 120 | mg/kg (dw) | 1991 | 19 | 08/19 | 08/19 | SUB |
| Total Organic Carbon | 24000 | mg/kg (dw) | 9060 | 15 | 08/18 | 08/18 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | E87487 | | 9060 | | | | SUB |
| Subcontract Lab 2 | ARI | | 1991/6010B | | | | SUB |

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 2 of 2
 Date: 08/28/2003
 Log #: L79941-5

Sample Description:

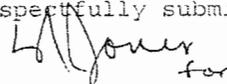
Analytical Report: WW-57Side
 Date Sampled: 08/13/2003
 Time Sampled: 13:00
 Date Received: 08/14/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable | Extr. | Anly. | Analyst |
|---|---------|-------|--------|------------|-------|-------|---------|
| | | | | Limit | Date | Date | |
| Subcontracted Services (continued) | | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements
 Flags: BDL or U below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
 Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NPL-no free liquids; dw-dry wt; ww-wet wt; C(F)-see attached USB code
 FLDEP Flags: 1: #1-estimated; 1:surr; 2: no known QC req; 3: QC fail %R or %RPD; 4: matrix int; 5: improper fld protocol
 FLDEP Flags: L-exceeds calibration; O-holding time exceeded; T-value > MDL; V-present in blank
 FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 960126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

 Mike Kimmel
 Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3099 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 8/25/2003 Boring No. 0 Sample No. WW57-Side Depth: 0 Test No. 16

Total Sample Wt.: 177.5

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 17.3 | 9.7 | 90.3 | 90.3 | 19.0000 |
| | 1/2 | 17.5 | 9.8 | 90.2 | 90.2 | 12.5000 |
| | 3/8 | 19.5 | 11.0 | 89.0 | 89.0 | 9.5000 |
| | No.4 | 25.2 | 14.2 | 85.8 | 85.8 | 4.7500 |
| | No.10 | 39.9 | 22.5 | 77.5 | 77.5 | 2.0000 |
| - #10 Sieve Portion. | No.20 | 1.7 | 3.5 | 96.5 | 74.8 | 0.8500 |
| | No.40 | 4.6 | 9.2 | 90.8 | 70.4 | 0.4200 |
| | No.100 | 15.0 | 29.9 | 70.1 | 54.4 | 0.1500 |
| | No.200 | 23.1 | 46.2 | 53.8 | 41.7 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.1

Temperature (C): 25.0

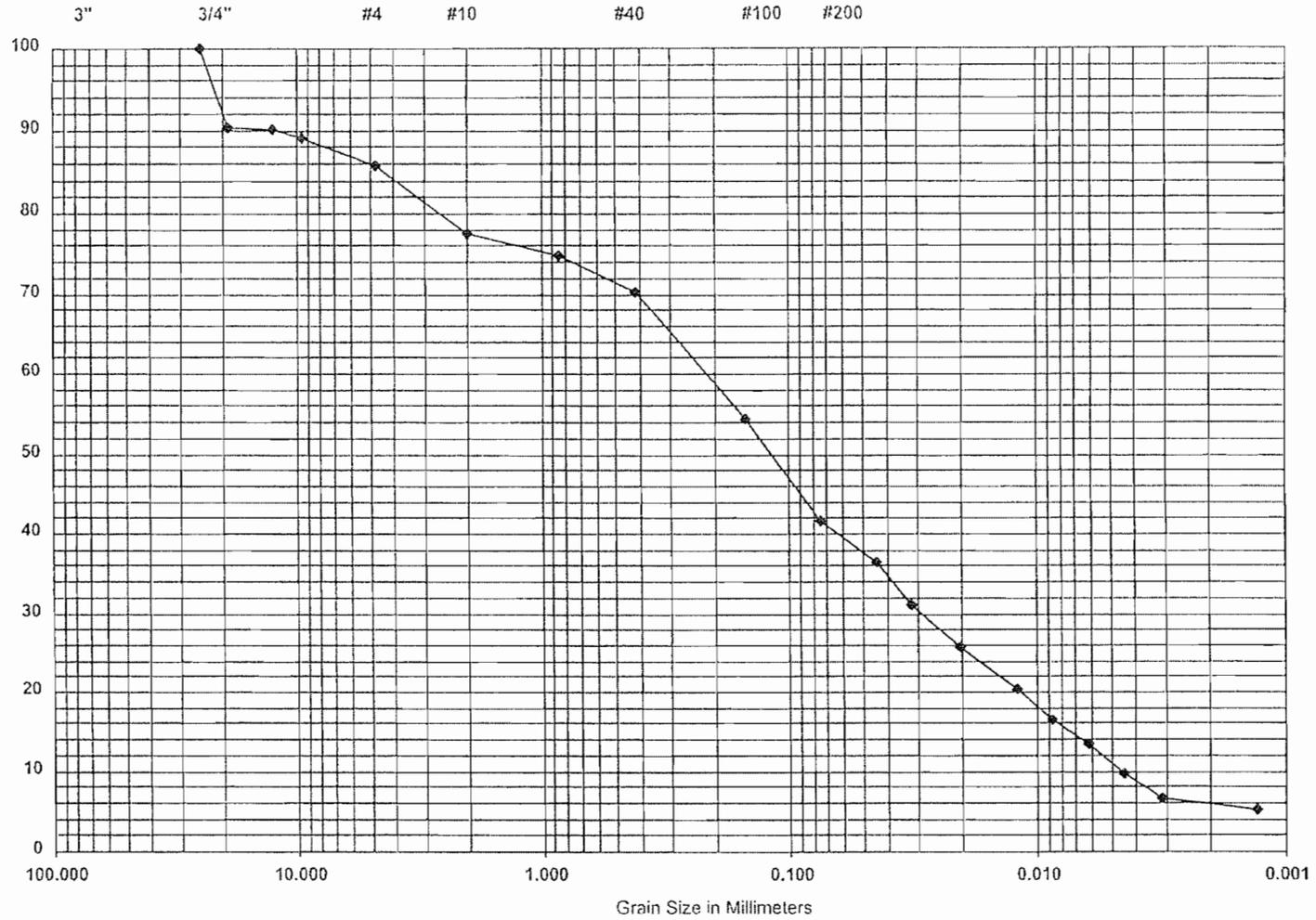
Temp Bath Bulb Reading: 3.5

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 26.0 | 23.8 | 47.0 | 36.4 | 0.0440 |
| | 2 | 22.5 | 20.3 | 40.1 | 31.1 | 0.0318 |
| | 5 | 19.0 | 16.8 | 33.2 | 25.7 | 0.0206 |
| | 15 | 15.5 | 13.3 | 26.3 | 20.4 | 0.0121 |
| | 30 | 13.0 | 10.8 | 21.3 | 16.5 | 0.0087 |
| | 60 | 11.0 | 8.8 | 17.4 | 13.5 | 0.0062 |
| | 120 | 8.5 | 6.3 | 12.4 | 9.6 | 0.0045 |
| | 250 | 6.5 | 4.3 | 8.5 | 6.6 | 0.0031 |
| | 1440 | 5.5 | 3.3 | 6.5 | 5.1 | 0.0013 |

LL : PL: PI : Organic : No
 Gravel : 14 Sand : 44 Silt : 36 Clay : 6
 Cu: 52.9 Cc: 0.8 D10: 0.0046 D30: 0.03 D60: 0.245
 Unified Classification: Silty SAND, Little Gravel, SM

U.S. Standard Sieve



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW57-Side Depth: 0 LL%: PL %: PI %:
 Gravel: 14 Sand: 44 Silt: 36 Clay: 6 Cu: 52.9 Cc: 0.8 Dia10:0.005 Dia30:0.03 Dia60:0.245
 Unified Classification: Silty SAND, Little Gravel, SM

Project Name: Waterway Sediment Samples Client: U.S.Biosystems, Inc. ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/19/2003
 Log #: L79588-5

Sample Description:

Analytical Report: WW49Side
 Date Sampled: 08/01/2003
 Time Sampled: 12:00
 Date Received: 08/04/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | | Analyst |
|-------------------------------|---------|------------|------------|------------------|-------|-------|--|---------|
| | | | | Limit | Date | Date | | |
| Metals | | | | | | | | |
| Cadmium | 0.90 | mg/kg (dw) | 6010B | 0.30 | 08/13 | 08/14 | | SUB |
| Copper | 28 | mg/kg (dw) | 6010B | 0.30 | 08/13 | 08/14 | | SUB |
| Lead | 110 | mg/kg (dw) | 6010B | 3.0 | 08/13 | 08/14 | | SUB |
| Nickel | 9.0 | mg/kg (dw) | 6010B | 2.0 | 08/13 | 08/14 | | SUB |
| Zinc | 190 | mg/kg (dw) | 6010B | 1.0 | 08/13 | 08/14 | | SUB |
| Percent Solids | | | | | | | | |
| Percent Solid | 66 | % | SM2540B | 0.10 | 08/05 | 08/05 | | KB |
| Metals | | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.5 | 08/07 | 08/08 | | SB |
| Copper | 42 | mg/kg (dw) | 3050/6010 | 1.5 | 08/07 | 08/08 | | SB |
| Lead | 77 | mg/kg (dw) | 3050/6010 | 1.5 | 08/07 | 08/08 | | SB |
| Nickel | 21 | mg/kg (dw) | 3050/6010 | 1.5 | 08/07 | 08/08 | | SB |
| Zinc | 210 | mg/kg (dw) | 3050/6010 | 3.0 | 08/07 | 08/08 | | SB |
| General Chemistry | | | | | | | | |
| Acid Insoluble Sulfide | 110 | mg/kg (dw) | 1991 | 17 | 08/12 | 08/12 | | SUB |
| Total Organic Carbon | 25000 | mg/kg (dw) | 9060 | 15 | 08/18 | 08/18 | | SUB |
| Subcontracted Services | | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B/1991 | | | | | SUB |
| Subcontract Lab 2 | E87487 | | 9060 | | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/19/2003
Log #: L79588-5

Sample Description:

Sediment Samples

Analytical Report: WW49Side
Date Sampled: 08/01/2003
Time Sampled: 12:00
Date Received: 08/04/2003
Collected By: Client

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | |
|-----------|---------|-------|--------|------------------|------|-------|---------|
| | | | | Limit | Date | Date | Analyst |

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USE code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| GAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3076 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 8/12/2003 Boring No. 0 Sample No. WW49-Side Depth: 0 Test No. 11

Total Sample Wt.: 226.6

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 3.2 | 1.4 | 98.6 | 98.6 | 9.5000 |
| | No. 4 | 21.5 | 9.5 | 90.5 | 90.5 | 4.7500 |
| - #10 Sieve Portion. | No. 10 | 29.6 | 13.1 | 86.9 | 86.9 | 2.0000 |
| | No. 20 | 3.0 | 6.1 | 93.9 | 81.7 | 0.8500 |
| | No. 40 | 7.4 | 14.8 | 85.2 | 74.1 | 0.4200 |
| | No. 100 | 23.2 | 46.4 | 53.6 | 46.6 | 0.1500 |
| | No. 200 | 31.3 | 62.7 | 37.3 | 32.5 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.0

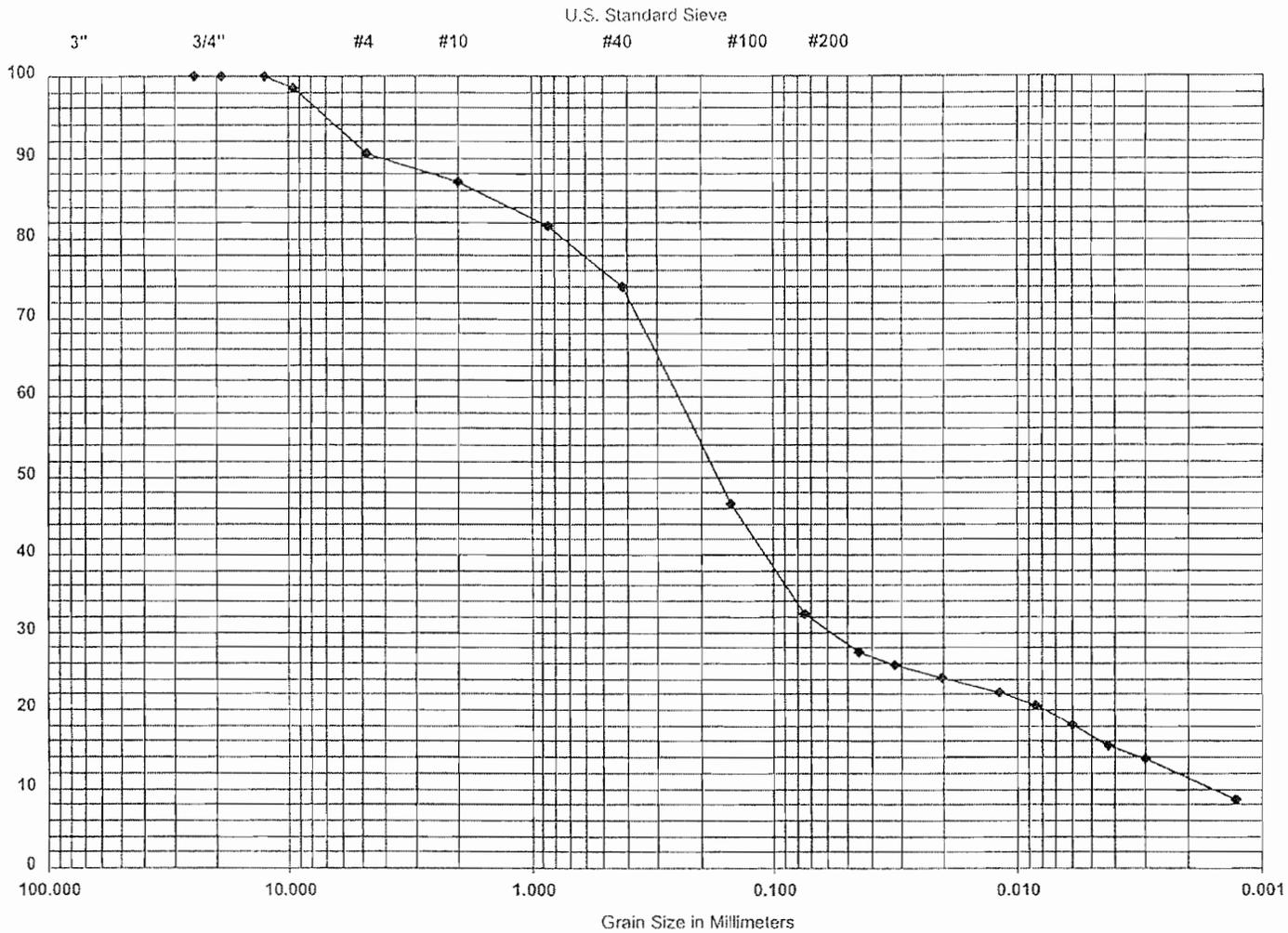
Temperature (C): 27.0

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 18.0 | 16.0 | 31.6 | 27.5 | 0.0453 |
| | 2 | 17.0 | 15.0 | 29.7 | 25.8 | 0.0322 |
| | 5 | 16.0 | 14.0 | 27.7 | 24.1 | 0.0205 |
| | 15 | 15.0 | 13.0 | 25.7 | 22.3 | 0.0119 |
| | 30 | 14.0 | 12.0 | 23.7 | 20.6 | 0.0085 |
| | 60 | 12.5 | 10.5 | 20.8 | 18.1 | 0.0060 |
| | 120 | 11.0 | 9.0 | 17.8 | 15.5 | 0.0043 |
| | 250 | 10.0 | 8.0 | 15.8 | 13.8 | 0.0030 |
| | 1440 | 7.0 | 5.0 | 9.9 | 8.6 | 0.0013 |

LL : PL: PI : Organic : No
 Gravel : 9 Sand : 58 Silt : 22 Clay : 11
 Cu: 161.7 Cc: 7.4 D10: 0.0017 D30: 0.060 D60: 0.282
 Unified Classification: SAND, Little Gravel, Some Silt, SM



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW49-Side Depth: 0 LL%: PL %: PI %:
 Gravel: 9 Sand: 58 Silt: 22 Clay: 11 Cu: 161.7 Cc: 7.4 Dia10: 0.002 Dia30: 0.060 Dia60: 0.282

Unified Classification: SAND, Little Gravel, Some Silt, SM

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/19/2003
 Log #: L79588-4

Sample Description:

Sediment Samples

Analytical Report: WW59Center

Date Sampled: 07/31/2003
 Time Sampled: 11:40
 Date Received: 08/04/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. Date | Analyst |
|-------------------------------|---------|------------|------------|------------------|-------|------------|---------|
| | | | | Limit | Date | | |
| Metals | | | | | | | |
| Cadmium | 1.7 | mg/kg (dw) | 6010B | 0.40 | 08/13 | 08/14 | SUB |
| Copper | 28 | mg/kg (dw) | 6010B | 0.40 | 08/13 | 08/14 | SUB |
| Lead | 130 | mg/kg (dw) | 6010B | 4.0 | 08/13 | 08/14 | SUB |
| Nickel | 6.0 | mg/kg (dw) | 6010B | 2.0 | 08/13 | 08/14 | SUB |
| Zinc | 480 | mg/kg (dw) | 6010B | 1.0 | 08/13 | 08/14 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 51 | % | SM2540B | 0.10 | 08/05 | 08/05 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Copper | 75 | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Lead | 120 | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Nickel | 24 | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Zinc | 550 | mg/kg (dw) | 3050/6010 | 3.9 | 08/07 | 08/08 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 390 | mg/kg (dw) | 1991 | 39 | 08/12 | 08/12 | SUB |
| Total Organic Carbon | 37000 | mg/kg (dw) | 9060 | 17 | 08/18 | 08/18 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B/1991 | | | | SUB |
| Subcontract Lab 2 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/19/2003
Log #: L79588-4

Sample Description:

Analytical Report: WW59Center
Date Sampled: 07/31/2003
Time Sampled: 11:40
Date Received: 08/04/2003
Collected By: Client

Sediment Samples

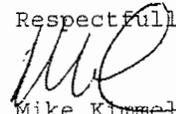
| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| GAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,


Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3078

Project Name: Waterway Sediment Samples

ProjectID: 73286

Date: 8/12/2003

Boring No. 0

Sample No. WW59-Center

Depth: 0

Test No. 13

Total Sample Wt.: 156.6

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 1.1 | 0.7 | 99.3 | 99.3 | 9.5000 |
| | No. 4 | 2.1 | 1.4 | 98.6 | 98.6 | 4.7500 |
| - #10 Sieve Portion. | No. 10 | 4.6 | 2.9 | 97.1 | 97.1 | 2.0000 |
| | No. 20 | 0.6 | 1.2 | 98.8 | 95.9 | 0.8500 |
| | No. 40 | 1.3 | 2.6 | 97.4 | 94.6 | 0.4200 |
| | No. 100 | 5.2 | 10.3 | 89.7 | 87.1 | 0.1500 |
| | No. 200 | 10.6 | 21.2 | 78.8 | 76.5 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.1

Temperature (C): 25.0

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 37.5 | 34.8 | 68.7 | 66.7 | 0.0404 |
| | 2 | 33.5 | 30.8 | 60.8 | 59.0 | 0.0295 |
| | 5 | 31.5 | 28.8 | 56.8 | 55.2 | 0.0189 |
| | 15 | 29.0 | 26.3 | 51.9 | 50.4 | 0.0111 |
| | 30 | 24.5 | 21.8 | 43.0 | 41.8 | 0.0081 |
| | 60 | 22.0 | 19.3 | 38.1 | 37.0 | 0.0058 |
| | 120 | 18.0 | 15.3 | 30.2 | 29.3 | 0.0042 |
| | 250 | 16.0 | 13.3 | 26.3 | 25.5 | 0.0030 |
| | 1440 | 10.0 | 7.3 | 14.4 | 14.0 | 0.0013 |

LL :

PL :

PI :

Organic : No

Gravel : 1

Sand : 22

Silt : 58

Clay : 19

Cu: 44.4

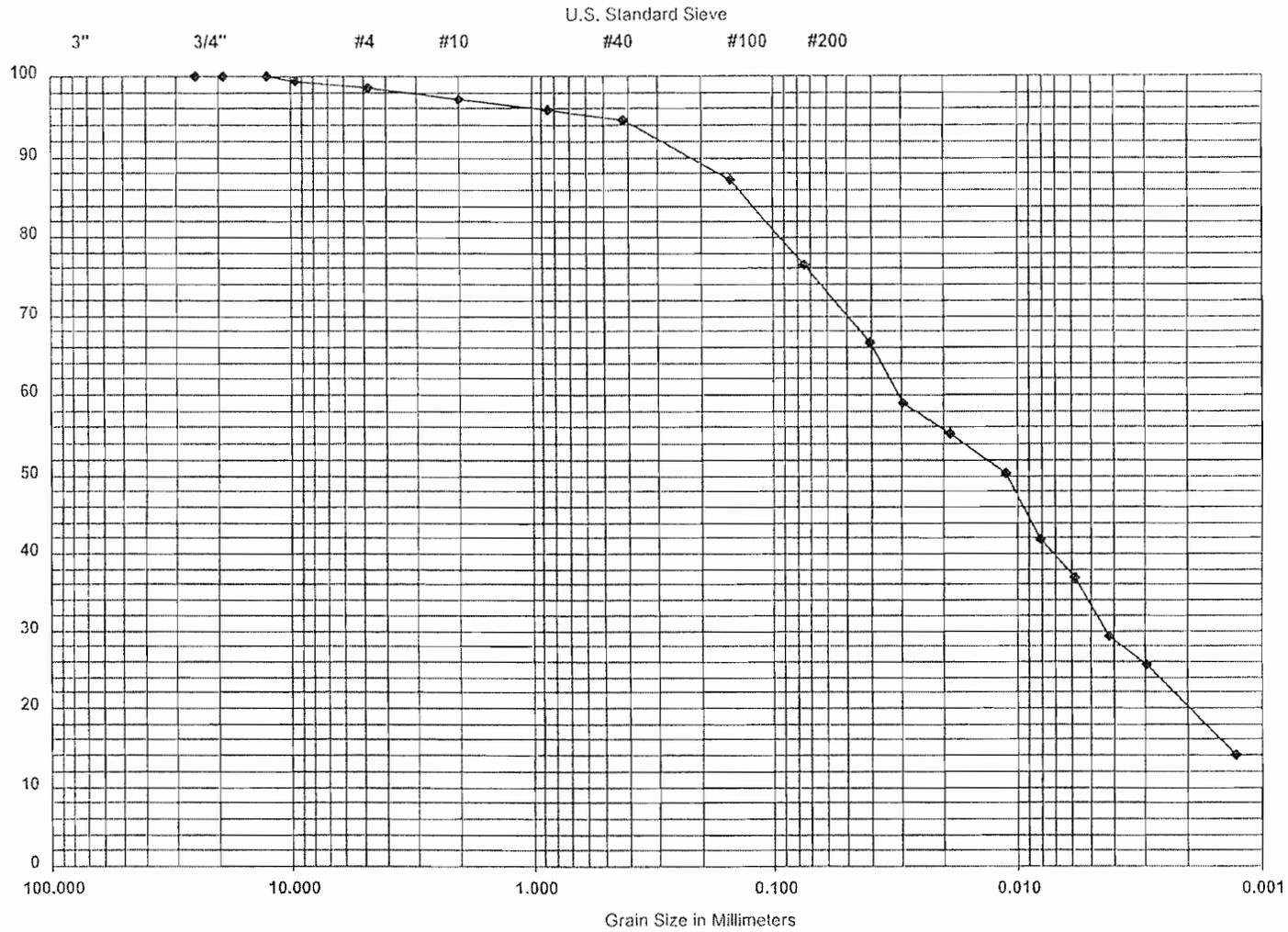
Cc: 0.9

D10: 0.0007

D30: 0.004

D60: 0.031

Unified Classification: SILT, Some Sand, Trace Gravel, ML



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW59-Center Depth: 0 LL%: PL %: PI %:
 Gravel: 1 Sand: 22 Silt: 58 Clay: 19 Cu: 44.4 Cc: 0.9 Dia10:0.0007 Dia30:0.004 Dia60:0.031

Unified Classification: SILT, Some Sand, Trace Gravel, ML

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/19/2003
 Log #: L79588-3

Sample Description:

Sediment Samples

Analytical Report: WW59Side
 Date Sampled: 07/31/2003
 Time Sampled: 12:05
 Date Received: 08/04/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | | Analyst |
|-------------------------------|---------|------------|------------|------------------|-------|-------|--|---------|
| | | | | Limit | Date | Date | | |
| Metals | | | | | | | | |
| Cadmium | 4.5 | mg/kg (dw) | 6010B | 0.30 | 08/13 | 08/14 | | SUB |
| Copper | 37 | mg/kg (dw) | 6010B | 0.30 | 08/13 | 08/14 | | SUB |
| Lead | 310 | mg/kg (dw) | 6010B | 3.0 | 08/13 | 08/14 | | SUB |
| Nickel | 12 | mg/kg (dw) | 6010B | 2.0 | 08/13 | 08/14 | | SUB |
| Zinc | 1500 | mg/kg (dw) | 6010B | 1.0 | 08/13 | 08/14 | | SUB |
| Percent Solids | | | | | | | | |
| Percent Solid | 57 | % | SM2540B | 0.10 | 08/05 | 08/05 | | KB |
| Metals | | | | | | | | |
| Cadmium | 6.3 | mg/kg (dw) | 3050/6010 | 1.8 | 08/07 | 08/08 | | SB |
| Copper | 130 | mg/kg (dw) | 3050/6010 | 1.8 | 08/07 | 08/08 | | SB |
| Lead | 440 | mg/kg (dw) | 3050/6010 | 1.8 | 08/07 | 08/08 | | SB |
| Nickel | 35 | mg/kg (dw) | 3050/6010 | 1.8 | 08/07 | 08/08 | | SB |
| Zinc | 1900 | mg/kg (dw) | 3050/6010 | 3.5 | 08/07 | 08/08 | | SB |
| General Chemistry | | | | | | | | |
| Acid Insoluble Sulfide | 1300 | mg/kg (dw) | 1991 | 82 | 08/12 | 08/12 | | SUB |
| Total Organic Carbon | 23000 | mg/kg (dw) | 9060 | 16 | 08/18 | 08/18 | | SUB |
| Subcontracted Services | | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B/1991 | | | | | SUB |
| Subcontract Lab 2 | E87487 | | 9060 | | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/19/2003
Log #: L79588-3

Sample Description:

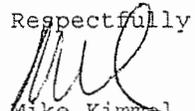
Analytical Report: WW59Side
Date Sampled: 07/31/2003
Time Sampled: 12:05
Date Received: 08/04/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | |
|---|---------|-------|--------|------------------|------|-------|---------|
| | | | | Limit | Date | Date | Analyst |
| <u>Subcontracted Services</u> (continued) | | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USE code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

QAP# 980126 DOH# E86240 NC CERT# 444
SUB DOH# 86122,86109,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96031001 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-35240

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3075 Project Name: Waterway Sediment Samples ProjectID: 73286
Date: 8/12/2003 Boring No. 0 Sample No. WW-59 Side Depth: 0 Test No. 12

Total Sample Wt.: 184.9

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.4 | 0.2 | 99.8 | 99.8 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 0.9 | 0.5 | 99.5 | 99.5 | 2.0000 |
| | No.20 | 0.6 | 1.3 | 98.7 | 98.2 | 0.8500 |
| | No.40 | 1.7 | 3.5 | 96.5 | 96.1 | 0.4200 |
| | No.100 | 12.1 | 24.1 | 75.9 | 75.5 | 0.1500 |
| | No.200 | 25.3 | 50.4 | 49.6 | 49.3 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.1

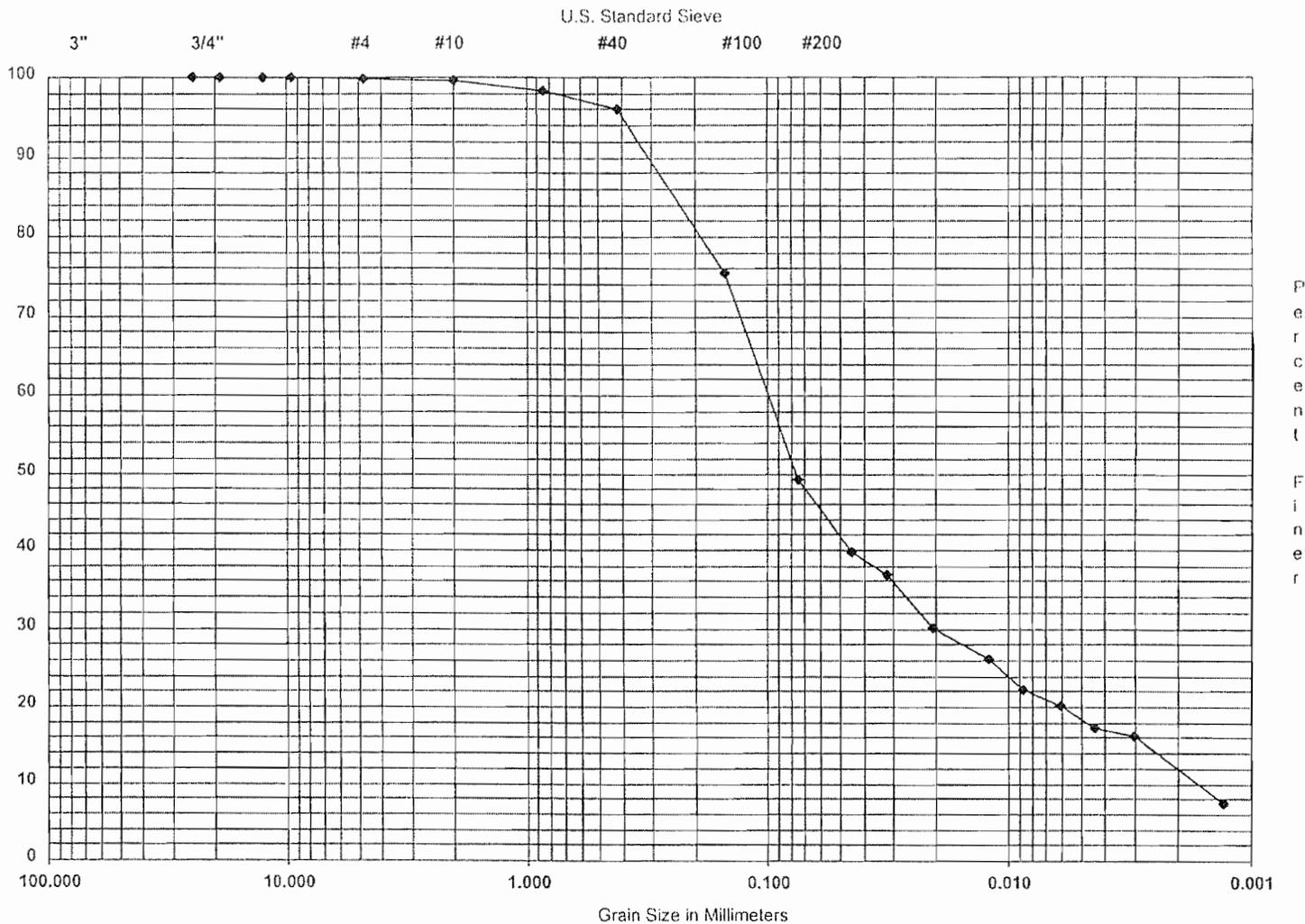
Temperature (C): 25.0

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 23.0 | 20.3 | 40.1 | 39.9 | 0.0449 |
| | 2 | 21.5 | 18.8 | 37.1 | 36.9 | 0.0320 |
| | 5 | 18.0 | 15.3 | 30.2 | 30.0 | 0.0207 |
| | 15 | 16.0 | 13.3 | 26.2 | 26.1 | 0.0121 |
| | 30 | 14.0 | 11.3 | 22.3 | 22.2 | 0.0087 |
| | 60 | 13.0 | 10.3 | 20.3 | 20.2 | 0.0062 |
| | 120 | 11.5 | 8.8 | 17.4 | 17.3 | 0.0044 |
| | 250 | 11.0 | 8.3 | 16.4 | 16.3 | 0.0031 |
| | 1440 | 6.5 | 3.8 | 7.5 | 7.5 | 0.0013 |

LL : PL: PI : Organic : No
Gravel : 0 Sand : 51 Silt : 38 Clay : 11
Cu: 58.5 Cc: 2.2 D10: 0.0018 D30: 0.021 D60: 0.106
Unified Classification: Silty SAND, Trace Gravel, SM



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW-59 Side Depth: 0 LL%: PL %: PI %:
 Gravel: 0 Sand: 51 Silt: 38 Clay: 11 Cu: 58.5 Cc: 2.2 Dia10: 0.002 Dia30: 0.021 Dia60: 0.106

Unified Classification: Silty SAND, Trace Gravel, SM

Project Name: Waterway Sediment Samples

Client: U.S. Biosystems, Inc.

ProjectID: 73286



Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/19/2003
 Log #: L79588-1

Sample Description:

Sediment Samples

Analytical Report: WW43Side
 Date Sampled: 07/30/2003
 Time Sampled: 12:00
 Date Received: 08/04/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|------------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 5.8 | mg/kg (dw) | 6010B | 0.40 | 08/13 | 08/15 | SUB |
| Copper | 46 | mg/kg (dw) | 6010B | 0.40 | 08/13 | 08/15 | SUB |
| Lead | 350 | mg/kg (dw) | 6010B | 4.0 | 08/13 | 08/15 | SUB |
| Nickel | 19 | mg/kg (dw) | 6010B | 2.0 | 08/13 | 08/15 | SUB |
| Zinc | 1400 | mg/kg (dw) | 6010B | 1.0 | 08/13 | 08/15 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 49 | % | SM2540B | 0.10 | 08/05 | 08/05 | KB |
| Metals | | | | | | | |
| Cadmium | 4.3 | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Copper | 98 | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Lead | 290 MI | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Nickel | 29 | mg/kg (dw) | 3050/6010 | 2.0 | 08/07 | 08/08 | SB |
| Zinc | 940 MI | mg/kg (dw) | 3050/6010 | 4.1 | 08/07 | 08/08 | SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | 1400 | mg/kg (dw) | 1991 | 98 | 08/12 | 08/12 | SUB |
| Total Organic Carbon | 43000 | mg/kg (dw) | 9060 | 18 | 08/18 | 08/18 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B/1991 | | | | SUB |
| Subcontract Lab 2 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/19/2003
Log #: L79588-1

Sample Description:

Analytical Report: WW43Side
Date Sampled: 07/30/2003
Time Sampled: 12:00
Date Received: 08/04/2003
Collected By: Client

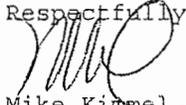
Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
Flags: CFR-Pb/Cu rule; ND-non detect (RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld protocol
FLDEP Flags: L-exceeds calibration; O-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3072 Project Name: Waterway Sediment Samples ProjectID: 73286
 Date: 8/12/2003 Boring No. 0 Sample No. WW43-Side Depth: 0 Test No. 9

Total Sample Wt.: 118.6

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.4 | 0.4 | 99.6 | 99.6 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 0.5 | 0.4 | 99.6 | 99.6 | 2.0000 |
| | No.20 | 0.3 | 0.7 | 99.3 | 98.9 | 0.8500 |
| | No.40 | 0.9 | 1.8 | 98.2 | 97.8 | 0.4200 |
| | No.100 | 2.2 | 4.4 | 95.6 | 95.2 | 0.1500 |
| | No.200 | 4.6 | 9.2 | 90.8 | 90.4 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.0

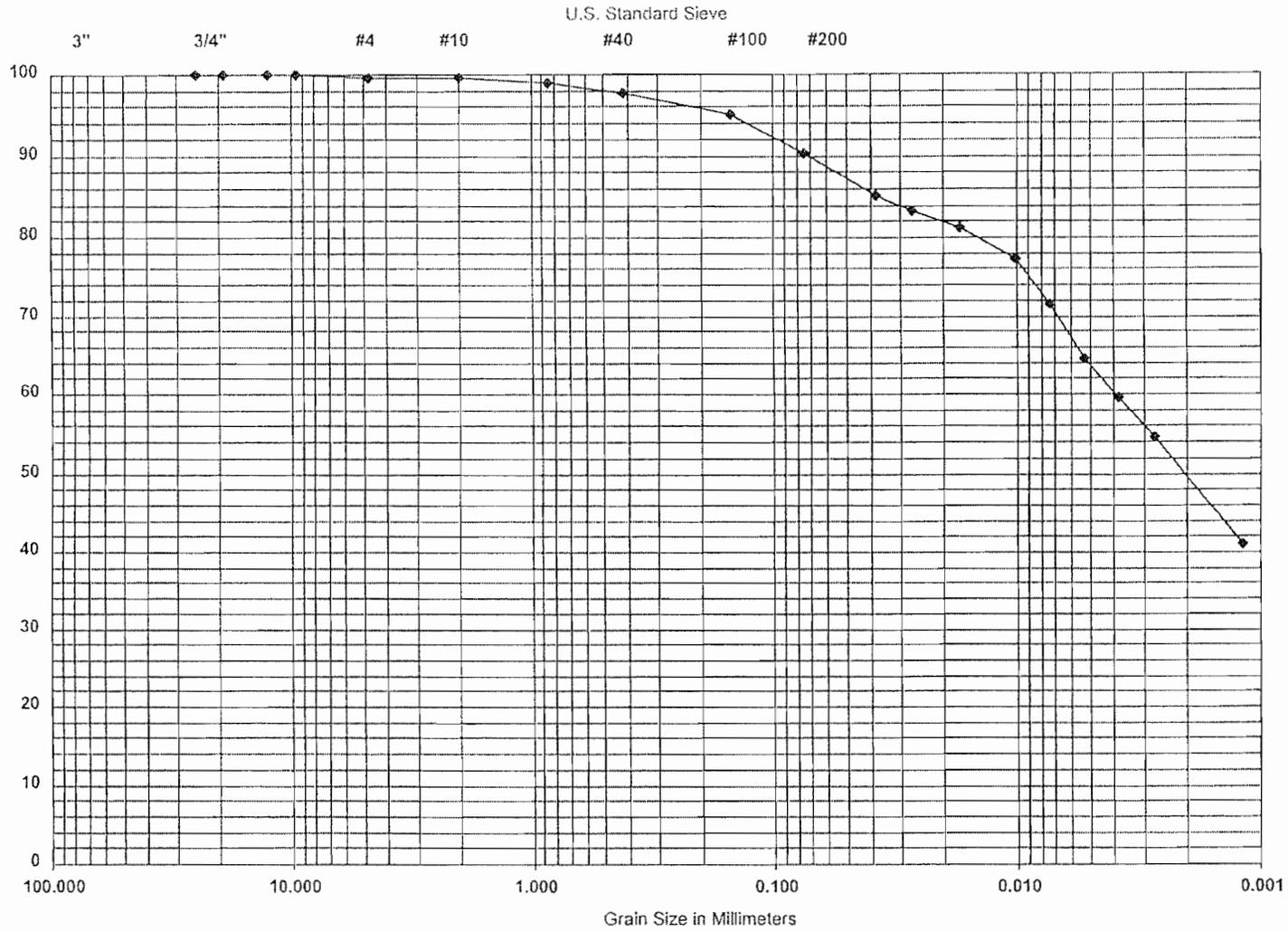
Temperature (C): 25.0

Temp Bath Bulb Reading: 3.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 45.0 | 43.3 | 85.6 | 85.2 | 0.0379 |
| | 2 | 44.0 | 42.3 | 83.6 | 83.3 | 0.0270 |
| | 5 | 43.0 | 41.3 | 81.7 | 81.3 | 0.0172 |
| | 15 | 41.0 | 39.3 | 77.7 | 77.4 | 0.0101 |
| | 30 | 38.0 | 36.3 | 71.8 | 71.5 | 0.0073 |
| | 60 | 34.5 | 32.8 | 64.9 | 64.6 | 0.0053 |
| | 120 | 32.0 | 30.3 | 59.9 | 59.6 | 0.0038 |
| | 250 | 29.5 | 27.8 | 55.0 | 54.7 | 0.0027 |
| | 1440 | 22.5 | 20.8 | 41.1 | 40.9 | 0.0012 |

LL : PL: PI : Organic : No
 Gravel : 1 Sand : 9 Silt : 42 Clay : 48
 Cu: 4.0 Cc: 0.3 D10: 0.001 D30: 0.001 D60: 0.004
 Unified Classification: SILT, Trace Sand, Trace Gravel, ML



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW43-Side Depth: 0 LL%: PL %: PI %:
 Gravel: 1 Sand: 9 Silt: 42 Clay: 48 Cu: 4.0 Cc: 0.3 Dia10: 0.001 Dia30: 0.001 Dia60: 0.004

Unified Classification: SILT, Trace Sand, Trace Gravel, ML

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/31/2003
 Log #: L78891-6

Sample Description:

Analytical Report: WW56 Center
 Date Sampled: 07/14/2003
 Time Sampled: 11:30
 Date Received: 07/15/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 1.5 | mg/kg (dw) | 6010B | 0.20 | 07/24 | 07/25 | SUB |
| Copper | 55 | mg/kg (dw) | 6010B | 0.20 | 07/24 | 07/25 | SUB |
| Lead | 81 | mg/kg (dw) | 6010B | 2.0 | 07/24 | 07/25 | SUB |
| Nickel | 8.0 | mg/kg (dw) | 6010B | 1.0 | 07/24 | 07/25 | SUB |
| Zinc | 210 | mg/kg (dw) | 6010B | 0.70 | 07/24 | 07/25 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 54 | % | SM2540B | 0.10 | 07/16 | 07/16 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.9 | 07/18 | 07/21 | LL |
| Copper | 93 | mg/kg (dw) | 3050/6010 | 1.9 | 07/18 | 07/21 | LL |
| Lead | 91 | mg/kg (dw) | 3050/6010 | 1.9 | 07/18 | 07/21 | LL |
| Nickel | 26 | mg/kg (dw) | 3050/6010 | 1.9 | 07/18 | 07/21 | LL |
| Zinc | 310 | mg/kg (dw) | 3050/6010 | 3.7 | 07/18 | 07/21 | LL |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 240 | mg/kg (dw) | 1991 | 22 | 07/21 | 07/21 | SUB |
| Total Organic Carbon | 24000 | mg/kg | 9060 | 20 | 07/22 | 07/22 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 07/31/2003
Log #: L78891-6

Sample Description:

Analytical Report: WW56 Center
Date Sampled: 07/14/2003
Time Sampled: 11:30
Date Received: 07/15/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Extr. | Anly. | Analyst |
|------------------------------------|---------|-------|--------|------------------|-------|---------|
| | | | | Limit | Date | |
| Subcontracted Services (continued) | | | | | | |

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

QAP# 980126 DOH# E86240 NC CERT# 444
SUB DOH# 86122,86109,E86048 ADEM ID# 40850 IL CERT# 200020
SC CERT# 96031001 TN CERT# 02985
USACE GA CERT# 917
VA CERT# 00395 USDA Soil Permit# S-35240

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3049 Project Name: Waterway Sediment Samples ProjectID: 73286

Date: 7/22/2003 Boring No. 0 Sample No. WW56 Center Depth: 0 Test No. 4

Total Sample Wt.: 197.4

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 2.6 | 1.3 | 98.7 | 98.7 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 8.1 | 4.1 | 95.9 | 95.9 | 2.0000 |
| | No.20 | 2.5 | 4.9 | 95.1 | 91.2 | 0.8500 |
| | No.40 | 4.2 | 8.3 | 91.7 | 87.9 | 0.4200 |
| | No.100 | 8.6 | 17.2 | 82.8 | 79.4 | 0.1500 |
| | No.200 | 12.0 | 23.7 | 76.3 | 73.1 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.4

Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

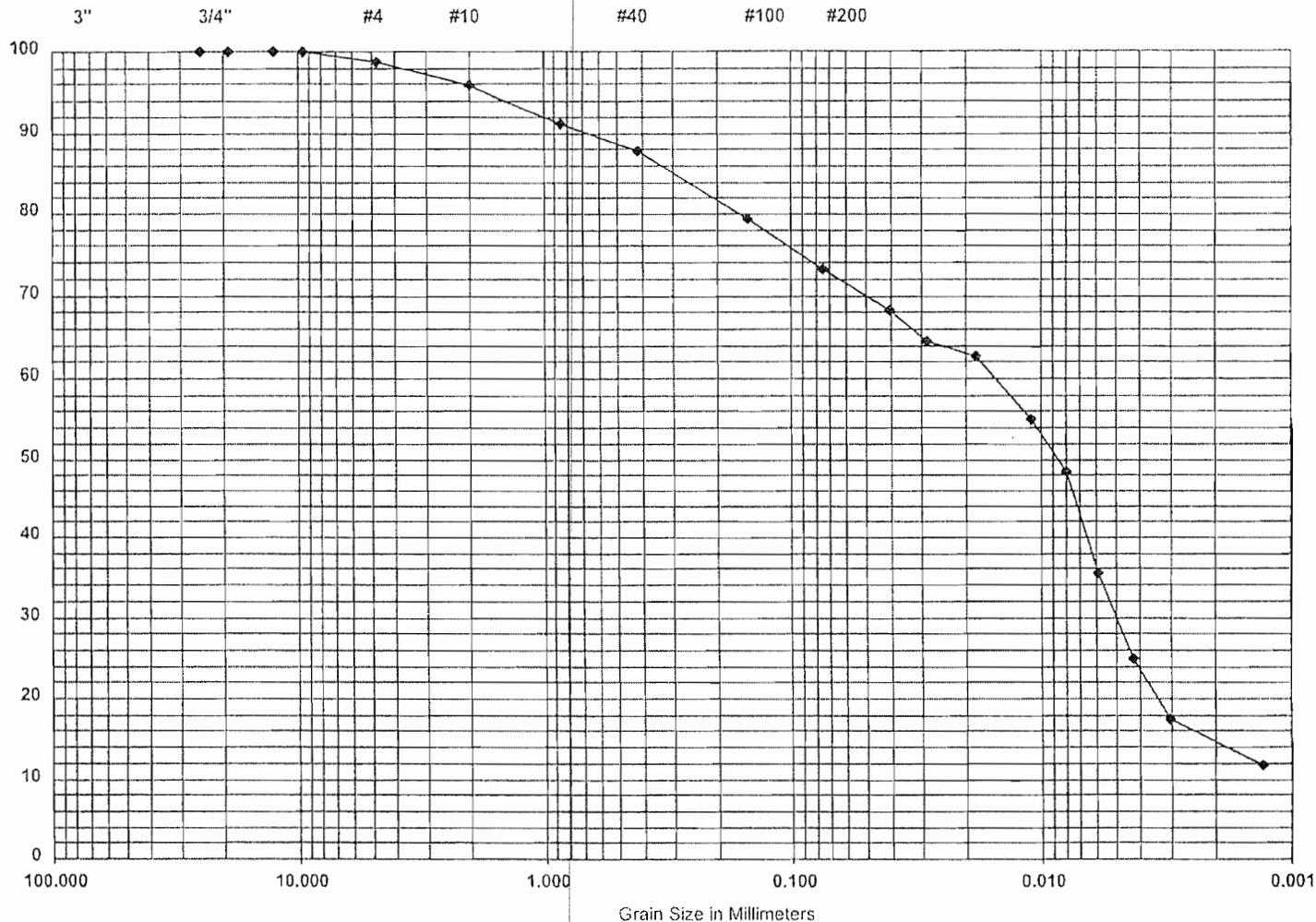
Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 38.0 | 36.3 | 71.2 | 68.3 | 0.0402 |
| | 2 | 36.0 | 34.3 | 67.3 | 64.5 | 0.0289 |
| | 5 | 35.0 | 33.3 | 65.3 | 62.6 | 0.0184 |
| | 15 | 31.0 | 29.3 | 57.5 | 55.1 | 0.0110 |
| | 30 | 27.5 | 25.8 | 50.6 | 48.5 | 0.0079 |
| | 60 | 20.5 | 18.8 | 36.9 | 35.4 | 0.0059 |
| | 120 | 15.0 | 13.3 | 26.1 | 25.0 | 0.0043 |
| | 250 | 11.0 | 9.3 | 18.2 | 17.5 | 0.0031 |
| | 1440 | 8.0 | 6.3 | 12.4 | 11.9 | 0.0013 |

LL : 0 PL : 0 PI : 0 Organic : No
 Gravel : 1 Sand : 26 Silt : 59 Clay : 14
 Cu : 22.1 Cc : 2.3 D10 : 0.0007 D30 : 0.005 D60 : 0.016

Unified Classification: SILT, Some Sand, Trace Gravel, ML

U.S. Standard Sieve



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| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW56 Center Depth: 0 LL%: 0 PL %: 0 PI %: 0
 Gravel: 1 Sand: 26 Silt: 59 Clay: 14 Cu: 22.1 Cc: 2.3 Dia10:0.0007 Dia30:0.005 Dia60:0.016

Unified Classification: SILT, Some Sand, Trace Gravel, ML

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 07/31/2003
 Log #: L78891-5

Sample Description:

Analytical Report: WW56 Side
 Date Sampled: 07/14/2003
 Time Sampled: 10:45
 Date Received: 07/15/2003
 Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|---------|------------|-----------|------------------|------------|------------|---------|
| Metals | | | | | | | |
| Cadmium | 4.1 | mg/kg (dw) | 6010B | 0.40 | 07/24 | 07/29 | SUB |
| Copper | 63 | mg/kg (dw) | 6010B | 0.40 | 07/24 | 07/29 | SUB |
| Lead | 260 | mg/kg (dw) | 6010B | 4.0 | 07/24 | 07/29 | SUB |
| Nickel | 16 | mg/kg (dw) | 6010B | 2.0 | 07/24 | 07/29 | SUB |
| Zinc | 1000 | mg/kg (dw) | 6010B | 1.0 | 07/24 | 07/29 | SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 69 | % | SM2540B | 0.10 | 07/16 | 07/16 | KB |
| Metals | | | | | | | |
| Cadmium | BDL | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Copper | 30 | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Lead | 91 | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Nickel | 14 | mg/kg (dw) | 3050/6010 | 1.4 | 07/18 | 07/21 | LL |
| Zinc | 160 | mg/kg (dw) | 3050/6010 | 2.9 | 07/18 | 07/21 | LL |
| General Chemistry | | | | | | | |
| Acid Volatile Sulfide | 1000 | mg/kg (dw) | 1991 | 88 | 07/21 | 07/21 | SUB |
| Total Organic Carbon | 9800 | mg/kg | 9060 | 14 | 07/22 | 07/22 | SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | ARI | | 6010B | | | | SUB |
| Subcontract Lab 3 | E87487 | | 9060 | | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 07/31/2003
Log #: L78891-5

Sample Description:

Analytical Report: WW56 Side
Date Sampled: 07/14/2003
Time Sampled: 10:45
Date Received: 07/15/2003
Collected By: Client

Sediment Samples

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-----------|---------|-------|--------|------------------|------------|------------|---------|
|-----------|---------|-------|--------|------------------|------------|------------|---------|

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 980126 | DCH# E86240 | NC CERT# 444 |
| SUB DCH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3047 Project Name: Waterway Sediment Samples ProjectID: 73286

Date: 7/22/2003 Boring No. 0 Sample No. WW56 Side Depth: 0 Test No. 3

Total Sample Wt.: 222.9

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 5.8 | 2.6 | 97.4 | 97.4 | 12.5000 |
| | 3/8 | 8.9 | 4.0 | 96.0 | 96.0 | 9.5000 |
| | No.4 | 26.0 | 11.7 | 88.3 | 88.3 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 57.7 | 25.9 | 74.1 | 74.1 | 2.0000 |
| | No.20 | 17.0 | 16.9 | 83.1 | 61.6 | 0.8500 |
| | No.40 | 33.2 | 33.0 | 67.0 | 49.6 | 0.4200 |
| | No.100 | 70.0 | 69.7 | 30.3 | 22.5 | 0.1500 |
| | No.200 | 75.6 | 75.2 | 24.8 | 18.4 | 0.0750 |

Wt of Sample at Start of Hydrometer : 100.5

Temperature (C): 25.9

Temp Bath Bulb Reading: 3.0

Specific Gravity: 2.70

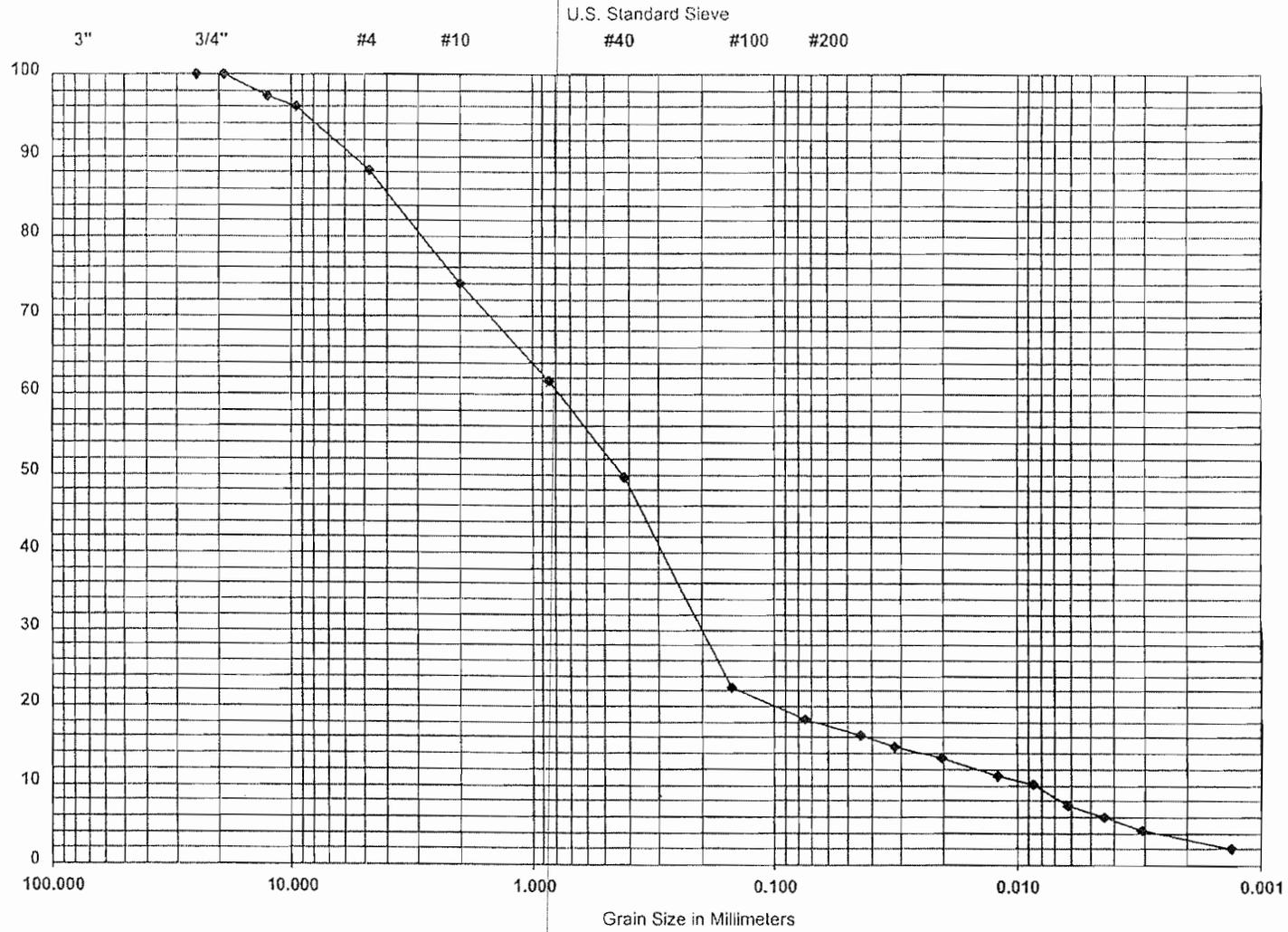
| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 24.0 | 22.3 | 21.9 | 16.3 | 0.0446 |
| | 2 | 22.0 | 20.3 | 20.0 | 14.8 | 0.0319 |
| | 5 | 20.0 | 18.3 | 18.0 | 13.3 | 0.0205 |
| | 15 | 17.0 | 15.3 | 15.1 | 11.2 | 0.0120 |
| | 30 | 15.5 | 13.8 | 13.6 | 10.1 | 0.0086 |
| | 60 | 12.0 | 10.3 | 10.1 | 7.5 | 0.0062 |
| | 120 | 10.0 | 8.3 | 8.2 | 6.1 | 0.0044 |
| | 250 | 7.5 | 5.8 | 5.7 | 4.2 | 0.0031 |
| | 1440 | 4.5 | 2.8 | 2.8 | 2.0 | 0.0013 |

LL: 0 PL: 0 PI: 0 Organic: No

Gravel: 12 Sand: 70 Silt: 15 Clay: 3

Cu: 93.0 Cc: 7.5 D10: 0.0085 D30: 0.225 D60: 0.793

Unified Classification: SAND, Little Gravel, Little Silt, SP-SM



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|--------|------|--------|--------|------|--------------|
| GRAVEL | | SAND | | | SILT OR CLAY |
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW56 Side Depth: 0 LL%: 0 PL %: 0 PI %: 0
 Gravel: 12 Sand: 70 Silt: 15 Clay: 3 Cu: 93.0 Cc: 7.5 Dia10: 0.009 Dia30: 0.225 Dia60: 0.793

Unified Classification: SAND, Little Gravel, Little Silt, SP-SM

Project Name: Waterway Sediment Samples

Client: U.S.Biosystems, Inc.

ProjectID: 73286

Client #: CHI-98-041101
 Address: Metro Water Reclamation Dist. of C
 6001 W. Pershing
 R & D Building
 Cicero, IL 60804
 Jennifer Wasik

Page: Page 1 of 2
 Date: 08/19/2003
 Log #: L79588-2

Sample Description:

Sediment Samples

Analytical Report: WW43Center
 Date Sampled: 07/30/2003
 Time Sampled: 12:15
 Date Received: 08/04/2003
 Collected By: Client

| Parameter | Results | Units | Method | Reportable Limit | Extr. Date | Anly. Date | Analyst |
|-------------------------------|----------------|--------|------------|------------------|------------|------------|-----------|
| Metals | | | | | | | |
| Cadmium | 1004/3 0.32 | 3.6 | mg/kg (dw) | 6010B | 0.20 | 08/13 | 08/14 SUB |
| Copper | 0.724 | 46 | mg/kg (dw) | 6010B | 0.20 | 08/13 | 08/14 SUB |
| Lead | 1.014 | 210 | mg/kg (dw) | 6010B | 2.0 | 08/13 | 08/14 SUB |
| Nickel | 0.204 | 12 | mg/kg (dw) | 6010B | 1.0 | 08/13 | 08/14 SUB |
| Zinc | 9330 | 610 | mg/kg (dw) | 6010B | 0.70 | 08/13 | 08/14 SUB |
| Percent Solids | | | | | | | |
| Percent Solid | 11.3011 | 34 | % | SM2540B | 0.10 | 08/05 | 08/05 KB |
| Metals | | | | | | | |
| Cadmium | | BDL | mg/kg (dw) | 3050/6010 | 2.9 | 08/07 | 08/08 SB |
| Copper | | 85 | mg/kg (dw) | 3050/6010 | 2.9 | 08/07 | 08/08 SB |
| Lead | | 170 | mg/kg (dw) | 3050/6010 | 2.9 | 08/07 | 08/08 SB |
| Nickel | | 23 | mg/kg (dw) | 3050/6010 | 2.9 | 08/07 | 08/08 SB |
| Zinc | | 590 | mg/kg (dw) | 3050/6010 | 5.9 | 08/07 | 08/08 SB |
| General Chemistry | | | | | | | |
| Acid Insoluble Sulfide | | 920 | mg/kg (dw) | 1991 | 48 | 08/12 | 08/12 SUB |
| Total Organic Carbon | | 86000 | mg/kg (dw) | 9060 | 28 | 08/18 | 08/18 SUB |
| Subcontracted Services | | | | | | | |
| Subcontract Lab 1 | | ARI | | 6010B/1991 | | | SUB |
| Subcontract Lab 2 | | E87487 | | 9060 | | | SUB |

Client #: CHI-98-041101
Address: Metro Water Reclamation Dist. of C
6001 W. Pershing
R & D Building
Cicero, IL 60804
Jennifer Wasik

Page: Page 2 of 2
Date: 08/19/2003
Log #: L79588-2

Sample Description:

Sediment Samples

Analytical Report: WW43Center
Date Sampled: 07/30/2003
Time Sampled: 12:15
Date Received: 08/04/2003
Collected By: Client

| Parameter | Results | Units | Method | Reportable Extr. | | Anly. | |
|-----------|---------|-------|--------|------------------|------|-------|---------|
| | | | | Limit | Date | Date | Analyst |

Subcontracted Services (continued)

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known OC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

| | | |
|-----------------------------|---------------------------|-----------------|
| QAP# 980126 | DOH# E86240 | NC CERT# 444 |
| SUB DOH# 86122,86109,E86048 | ADEM ID# 40850 | IL CERT# 200020 |
| SC CERT# 96031001 | TN CERT# 02985 | |
| USACE | GA CERT# 917 | |
| VA CERT# 00395 | USDA Soil Permit# S-35240 | |

Respectfully submitted,

Mike Kimmel
Senior Project Manager

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3074 Project Name: Waterway Sediment Samples ProjectID: 73286
Date: 8/12/2003 Boring No. 0 Sample No. WW43-Center Depth: 0 Test No. 10

Total Sample Wt.: 147.3

| | Sieve Size | Cum Wt. Ret | % Retaining | % Passing | Total Passing % | Dia (mm) |
|-------------------------|------------|-------------|-------------|-----------|-----------------|----------|
| + #10 Sieve Portion. | 1 | 0.0 | 0.0 | 100.0 | 100.0 | 25.0000 |
| | 3/4 | 0.0 | 0.0 | 100.0 | 100.0 | 19.0000 |
| | 1/2 | 0.0 | 0.0 | 100.0 | 100.0 | 12.5000 |
| | 3/8 | 0.0 | 0.0 | 100.0 | 100.0 | 9.5000 |
| | No.4 | 0.1 | 0.0 | 100.0 | 100.0 | 4.7500 |
| - #10 Sieve Portion. | No.10 | 0.4 | 0.3 | 99.7 | 99.7 | 2.0000 |
| | No.20 | 0.3 | 0.5 | 99.5 | 99.2 | 0.8500 |
| | No.40 | 0.8 | 1.6 | 98.4 | 98.1 | 0.4200 |
| | No.100 | 2.8 | 5.6 | 94.4 | 94.1 | 0.1500 |
| | No.200 | 5.8 | 11.6 | 88.4 | 88.1 | 0.0750 |

Wt of Sample at Start of Hydrometer : 50.0

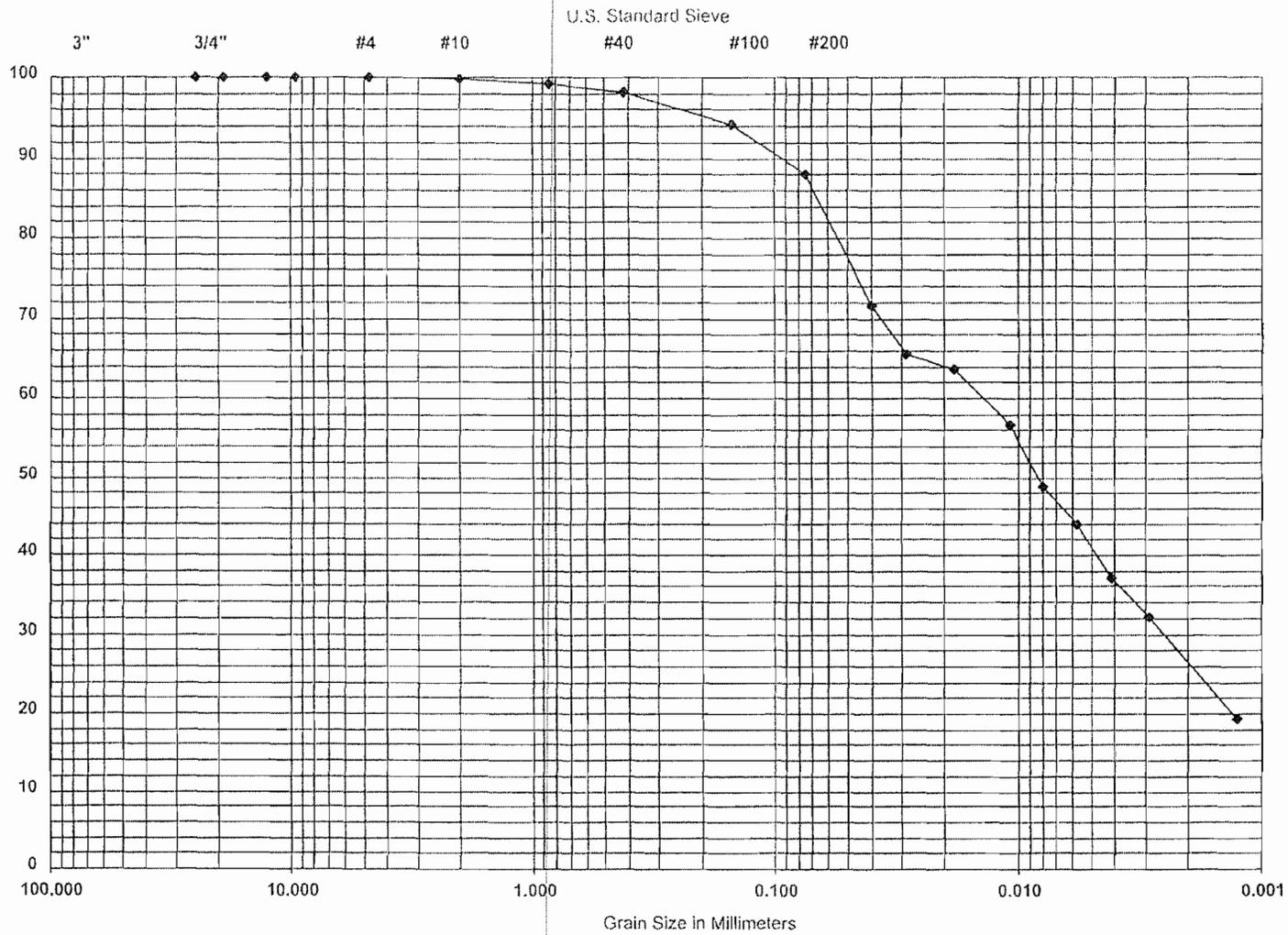
Temperature (C): 25.0

Temp Bath Bulb Reading: 4.0

Specific Gravity: 2.70

| | Elaps. Time (min) | Uncorrected | Corrected | % Passing | Total Passing % | Dia (mm) |
|------------------------|-------------------|-------------|-----------|-----------|-----------------|----------|
| Hydrometer Portion. | 1 | 39.0 | 36.3 | 71.8 | 71.6 | 0.0399 |
| | 2 | 36.0 | 33.3 | 65.8 | 65.6 | 0.0289 |
| | 5 | 35.0 | 32.3 | 63.9 | 63.7 | 0.0184 |
| | 15 | 31.5 | 28.8 | 56.9 | 56.8 | 0.0109 |
| | 30 | 27.5 | 24.8 | 49.0 | 48.9 | 0.0079 |
| | 60 | 25.0 | 22.3 | 44.1 | 44.0 | 0.0057 |
| | 120 | 21.5 | 18.8 | 37.2 | 37.1 | 0.0041 |
| | 250 | 19.0 | 16.3 | 32.2 | 32.1 | 0.0029 |
| | 1440 | 12.5 | 9.8 | 19.4 | 19.3 | 0.0013 |

LL : PL : PI : Organic : No
Gravel : 0 Sand : 12 Silt : 63 Clay : 25
Cu: 236.4 Cc: 7.9 D10: 6E-05 D30: 0.003 D60: 0.014
Unified Classification: SILT, Little Sand, Trace Gravel, ML



| GRAVEL | | SAND | | | SILT OR CLAY |
|--------|------|--------|--------|------|--------------|
| coarse | fine | coarse | medium | fine | |

Boring No.: 0 Sample No.: WW43-Center Depth: 0 LL%: PL %: PI %:
 Gravel: 0 Sand: 12 Silt: 63 Clay: 25 Cu: 236.4 Cc: 7.9 Dia10: 6E-05 Dia30: 0.003 Dia60: 0.014

Unified Classification: SILT, Little Sand, Trace Gravel, ML

Project Name: Waterway Sediment Samples

Client: U.S. Biosystems, Inc.

ProjectID: 73286

Attachment 10

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040709A
Sample Number: 31340
Sample Description: WW-12 Center

Date received: 07/09/04
Date Sampled: 07/01/04
Date Reported: 08/25/04
Lab File ID: 31340-45

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 74.73 | % | 7/22/04 | CLP |
| AVS | <0.08 | umoles/g | 7/22/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 07/27/04 | 3010A/6010B |
| Copper | 0.048 | umoles/g | 07/27/04 | 3010A/6010B |
| Lead | 0.031 | umoles/g | 07/27/04 | 3010A/6010B |
| Nickel | 0.042 | umoles/g | 07/27/04 | 3010A/6010B |
| Zinc | 0.265 | umoles/g | 07/27/04 | 3010A/6010B |
| Total SEM | 0.386 | | | |
| AVS / SEM | NA | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 23200 | mg/kg | 7/21/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040709A
Sample Number: 31341
Sample Description: WW-12 Side

Date received: 07/09/04
Date Sampled: 07/01/04
Date Reported: 08/25/04
Lab File ID: 31340-45

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 72.40 | % | 7/22/04 | CLP |
| AVS | <0.08 | umoles/g | 7/22/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 07/27/04 | 3010A/6010B |
| Copper | 0.092 | umoles/g | 07/27/04 | 3010A/6010B |
| Lead | 0.044 | umoles/g | 07/27/04 | 3010A/6010B |
| Nickel | 0.077 | umoles/g | 07/27/04 | 3010A/6010B |
| Zinc | 0.269 | umoles/g | 07/27/04 | 3010A/6010B |
| Total SEM | 0.482 | | | |
| AVS / SEM | NA | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 19000 | mg/kg | 7/21/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040709A
Sample Number: 31342
Sample Description: WW-13 Center

Date received: 07/09/04
Date Sampled: 07/06/04
Date Reported: 08/25/04
Lab File ID: 31340-45

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 77.15 | % | 7/22/04 | CLP |
| AVS | <0.08 | umoles/g | 7/22/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 07/27/04 | 3010A/6010B |
| Copper | 0.027 | umoles/g | 07/27/04 | 3010A/6010B |
| Lead | 0.014 | umoles/g | 07/27/04 | 3010A/6010B |
| Nickel | 0.036 | umoles/g | 07/27/04 | 3010A/6010B |
| Zinc | 0.233 | umoles/g | 07/27/04 | 3010A/6010B |
| Total SEM | 0.31 | | | |
| AVS / SEM | NA | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | <1000 | mg/kg | 7/21/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040709A
Sample Number: 31343
Sample Description: WW-13 Side

Date received: 07/09/04
Date Sampled: 07/06/04
Date Reported: 08/25/04
Lab File ID: 31340-45

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 36.14 | % | 7/22/04 | CLP |
| AVS | 7.48 | umoles/g | 7/22/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 07/27/04 | 3010A/6010B |
| Copper | 0.385 | umoles/g | 07/27/04 | 3010A/6010B |
| Lead | 0.125 | umoles/g | 07/27/04 | 3010A/6010B |
| Nickel | 0.159 | umoles/g | 07/27/04 | 3010A/6010B |
| Zinc | 1.84 | umoles/g | 07/27/04 | 3010A/6010B |
| Total SEM | 2.509 | | | |
| AVS / SEM | 3.0 | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 65300 | mg/kg | 7/21/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040709A
Sample Number: 31344
Sample Description: WW-17 Center

Date received: 07/09/04
Date Sampled: 07/07/04
Date Reported: 08/25/04
Lab File ID: 31340-45

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 77.45 | % | 7/22/04 | CLP |
| AVS | <0.08 | umoles/g | 7/22/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 07/27/04 | 3010A/6010B |
| Copper | 0.036 | umoles/g | 07/27/04 | 3010A/6010B |
| Lead | 0.027 | umoles/g | 07/27/04 | 3010A/6010B |
| Nickel | 0.032 | umoles/g | 07/27/04 | 3010A/6010B |
| Zinc | 0.453 | umoles/g | 07/27/04 | 3010A/6010B |
| Total SEM | 0.548 | | | |
| AVS / SEM | NA | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 20500 | mg/kg | 7/21/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040709A
Sample Number: 31345
Sample Description: WW-17 Side

Date received: 07/09/04
Date Sampled: 07/07/04
Date Reported: 08/25/04
Lab File ID: 31340-45

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 62.07 | % | 7/22/04 | CLP |
| AVS | 2.56 | umoles/g | 7/22/04 | 376.2 |
| Cadmium | 0.006 | umoles/g | 07/27/04 | 3010A/6010B |
| Copper | 0.296 | umoles/g | 07/27/04 | 3010A/6010B |
| Lead | 0.308 | umoles/g | 07/27/04 | 3010A/6010B |
| Nickel | 0.104 | umoles/g | 07/27/04 | 3010A/6010B |
| Zinc | 1.69 | umoles/g | 07/27/04 | 3010A/6010B |
| Total SEM | 2.398 | | | |
| AVS / SEM | 1.1 | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 29800 | mg/kg | 7/21/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32206
Sample Description: WW-64 Center/Lake-WB Dupage

Date received: 07/16/04
Date Sampled: 07/13/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 77.16 | % | 7/29/04 | CLP |
| AVS | 0.16 | umoles/g | 7/29/04 | 376.2 |
| Cadmium | 0.004 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.108 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.034 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.039 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | <0.005 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.185 | | | |
| AVS / SEM | 0.8 | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 13100 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32207
Sample Description: WW-64 Side/Lake-WB Dupage

Date received: 07/16/04
Date Sampled: 07/13/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 66.76 | % | 7/29/04 | CLP |
| AVS | <0.08 | umoles/g | 7/29/04 | 376.2 |
| Cadmium | 0.011 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.194 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.156 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.069 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | <0.005 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.430 | | | |
| AVS / SEM | NA | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 15300 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32208
Sample Description: WW-80 Center/Arlington Ht Rd Salt Cr

Date received: 07/16/04
Date Sampled: 07/14/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 82.41 | % | 7/29/04 | CLP |
| AVS | <0.08 | umoles/g | 7/29/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.057 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.015 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.025 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | <0.005 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.097 | | | |
| AVS / SEM | NA | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 34100 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32209
Sample Description: WW-80 Side/Arlington Ht Rd Salt Cr

Date received: 07/16/04
Date Sampled: 07/14/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 79.85 | % | 7/28/04 | CLP |
| AVS | 0.29 | umoles/g | 7/28/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.116 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.030 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.080 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | <0.005 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.226 | | | |
| AVS / SEM | 0.6 | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 25500 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32210
Sample Description: WW-89 Center/Walnut-WB DuPage

Date received: 07/16/04
Date Sampled: 07/12/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 82.23 | % | 7/28/04 | CLP |
| AVS | <0.08 | umoles/g | 7/28/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.055 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.017 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.025 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | <0.005 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.097 | | | |
| AVS / SEM | NA | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 43600 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32211
Sample Description: WW-89 Side/Walnut-WB DuPage

Date received: 07/16/04
Date Sampled: 07/12/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 79.28 | % | 7/28/04 | CLP |
| AVS | <0.08 | umoles/g | 7/28/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.110 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.056 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.053 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | <0.005 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.219 | | | |
| AVS / SEM | NA | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 35200 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32212
Sample Description: WW-90 Side/Rt 19 Poplar Cr

Date received: 07/16/04
Date Sampled: 07/08/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 67.34 | % | 7/28/04 | CLP |
| AVS | 0.51 | umoles/g | 7/28/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.250 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.050 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.210 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | 0.410 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.920 | | | |
| AVS / SEM | 0.6 | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 31100 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD

Project ID: G040716A

Sample Number: 32213

Sample Description: WW-110 Center/Springsguth-WB Dupage

Date received: 07/16/04

Date Sampled: 07/09/04

Date Reported: 08/27/04

Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|----------------|---------------|--------------|----------------------|---------------|
| Total Solids | 59.44 | % | 7/28/04 | CLP |
| AVS | 27.0 | umoles/g | 7/28/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.242 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.179 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.146 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | 0.907 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 1.474 | | | |
| AVS / SEM | 18.3 | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|----------------|---------------|--------------|----------------------|---------------|
| TOC | 43400 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040716A
Sample Number: 32214
Sample Description: WW-110 Side/Springsguth-WB Dupage

Date received: 07/16/04
Date Sampled: 07/09/04
Date Reported: 08/27/04
Lab File ID: 32206-14

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 75.44 | % | 7/28/04 | CLP |
| AVS | 0.62 | umoles/g | 7/28/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/02/04 | 3010A/6010B |
| Copper | 0.115 | umoles/g | 08/02/04 | 3010A/6010B |
| Lead | 0.069 | umoles/g | 08/02/04 | 3010A/6010B |
| Nickel | 0.075 | umoles/g | 08/02/04 | 3010A/6010B |
| Zinc | <0.005 | umoles/g | 08/02/04 | 3010A/6010B |
| Total SEM | 0.259 | | | |
| AVS / SEM | 2.4 | | | |

Note: Zinc was detected in the procedure blank and subtracted from the sample concentration.

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 31900 | mg/kg | 7/23/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040723B
Sample Number: 33538
Sample Description: WW-79 Center/Higgins Rd. Salt Cr.

Date received: 07/23/04
Date Sampled: 07/15/04
Date Reported: 08/27/04
Lab File ID: 33538-42

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 38.0 | % | 08/04/04 | CLP |
| AVS | 14.0 | umoles/g | 08/04/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/06/04 | 3010A/6010B |
| Copper | 0.635 | umoles/g | 08/06/04 | 3010A/6010B |
| Lead | 0.212 | umoles/g | 08/06/04 | 3010A/6010B |
| Nickel | 0.273 | umoles/g | 08/06/04 | 3010A/6010B |
| Zinc | 2.27 | umoles/g | 08/06/04 | 3010A/6010B |
| Total SEM | 3.390 | | | |
| AVS / SEM | 4.1 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 38800 | mg/kg | 7/27/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040723B
Sample Number: 33539
Sample Description: WW-18 Side, Devon – Salt Cr.

Date received: 07/23/04
Date Sampled: 07/19/04
Date Reported: 08/27/04
Lab File ID: 33538-42

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 73.05 | % | 08/04/04 | CLP |
| AVS | <0.08 | umoles/g | 08/04/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/06/04 | 3010A/6010B |
| Copper | 0.073 | umoles/g | 08/06/04 | 3010A/6010B |
| Lead | 0.074 | umoles/g | 08/06/04 | 3010A/6010B |
| Nickel | 0.041 | umoles/g | 08/06/04 | 3010A/6010B |
| Zinc | 0.273 | umoles/g | 08/06/04 | 3010A/6010B |
| Total SEM | 0.461 | | | |
| AVS / SEM | NA | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 14600 | mg/kg | 7/27/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040723B
Sample Number: 33540
Sample Description: WW-18 Center, Devon – Salt Cr.

Date received: 07/23/04
Date Sampled: 07/19/04
Date Reported: 08/27/04
Lab File ID: 33538-42

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 71.57 | % | 08/04/04 | CLP |
| AVS | <0.08 | umoles/g | 08/04/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/06/04 | 3010A/6010B |
| Copper | 0.075 | umoles/g | 08/06/04 | 3010A/6010B |
| Lead | 0.041 | umoles/g | 08/06/04 | 3010A/6010B |
| Nickel | 0.054 | umoles/g | 08/06/04 | 3010A/6010B |
| Zinc | 0.339 | umoles/g | 08/06/04 | 3010A/6010B |
| Total SEM | 0.509 | | | |
| AVS / SEM | NA | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 9480 | mg/kg | 7/27/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040723B
Sample Number: 33541
Sample Description: WW-77 Side, Elmhurst – Higgins Cr.

Date received: 07/23/04
Date Sampled: 07/20/04
Date Reported: 08/27/04
Lab File ID: 33538-42

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 58.31 | % | 08/04/04 | CLP |
| AVS | 14 | umoles/g | 08/04/04 | 376.2 |
| Cadmium | 0.008 | umoles/g | 08/06/04 | 3010A/6010B |
| Copper | 0.413 | umoles/g | 08/06/04 | 3010A/6010B |
| Lead | 0.215 | umoles/g | 08/06/04 | 3010A/6010B |
| Nickel | 0.175 | umoles/g | 08/06/04 | 3010A/6010B |
| Zinc | 2.31 | umoles/g | 08/06/04 | 3010A/6010B |
| Total SEM | 3.113 | | | |
| AVS / SEM | 4.5 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.
Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 47900 | mg/kg | 7/27/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040723B
Sample Number: 33542
Sample Description: WW-77 Center, Elmhurst – Higgins Cr.

Date received: 07/23/04
Date Sampled: 07/20/04
Date Reported: 08/27/04
Lab File ID: 33538-42

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 65.48 | % | 08/04/04 | CLP |
| AVS | 12 | umoles/g | 08/04/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 08/06/04 | 3010A/6010B |
| Copper | 0.217 | umoles/g | 08/06/04 | 3010A/6010B |
| Lead | 0.174 | umoles/g | 08/06/04 | 3010A/6010B |
| Nickel | 0.194 | umoles/g | 08/06/04 | 3010A/6010B |
| Zinc | 0.742 | umoles/g | 08/06/04 | 3010A/6010B |
| Total SEM | 1.327 | | | |
| AVS / SEM | 9.0 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 32700 | mg/kg | 7/27/04 | 9060M |

QUALITY CONTROL DATA

Client: MWRD
Project ID: G040709A
Sample Number: 31340
Sample Description: WW-12 Center
Date Analyzed: 07/27/2004

Date received: 07/09/04
Date Sampled: 07/01/04
Date Reported: 08/25/04
Lab File ID: 31340-45

| Element | Prep Blank | Laboratory Control Standard 1(LCS) | | | Laboratory Control Standard 2 (LCS) | | |
|---------|------------|------------------------------------|--------|-------|-------------------------------------|--------|-------|
| | | True | Found | % Rec | True | Found | % Rec |
| Cd | <0.001 | 0.2000 | 0.1783 | 89.2 | 0.2000 | 0.1955 | 97.8 |
| Cu | 0.0018 | 0.2000 | 0.0974 | 48.7 | 0.2000 | 0.0216 | 10.8 |
| Pb | <0.002 | 0.2000 | 0.1736 | 86.8 | 0.2000 | 0.1826 | 91.3 |
| Ni | <0.001 | 0.2000 | 0.1805 | 90.3 | 0.2000 | 0.1963 | 98.2 |
| Zn | 0.1356 | 0.2000 | 0.2169 | 108.5 | 0.2000 | 0.2354 | 117.7 |

QC Acceptance Ranges:
 LCS 80-120%
 PB <Reporting Limit

Explanation of QC Failures

AVS/SEM extracted LCS 1 and LCS 2 both low for copper. AVS/SEM extracted MS/MSD acceptable for copper. Post spike for Copper was acceptable.

Prep Blank (PB) : Acceptance criteria not met. Most samples had concentrations for zinc below the procedure blank. Note: the unit of measure used for this report is mg/l.

| Analyte | Date Analyzed | Method | Method QC Data | | |
|-----------------------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/L | % Recovery | % |
| Acid Volatile Sulfide | 7/22/04 | 376.2 | <0.05 | 75.2 | 80-120 |
| Acid Volatile Sulfide | 7/23/04 | 386.2 | <0.05 | 96.3 | 80-120 |

Explanation of QC Failures

LCS for 7/22/04 failed. Data is acceptable because all other QC passed and the LCS for 7/23/04 passed.

| Analyte | Date Analyzed | Method | Method QC Data | | |
|---------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/kg | % Recovery | % |
| TOC | 7/21/04 | 9060M | <1000 | 93 | 80-120 |
| TOC | 7/21/04 | 9060M | <1000 | | |

QUALITY CONTROL DATA

Client: MWRD
Project ID: G040716A
Sample Number: 32206
Sample Description: WW-64 Center/Lake-WB Dupage
Date Analyzed: 08/02/2004

Date received: 07/16/04
Date Sampled: 07/13/04
Date Reported: 08/25/04
Lab File ID: 32206-14

| Element | Prep Blank | Laboratory Control Standard 1(LCS) | | | Laboratory Control Standard 2 (LCS) | | |
|---------|------------|------------------------------------|--------|-------|-------------------------------------|--------|-------|
| | | True | Found | % Rec | True | Found | % Rec |
| Cd | <0.001 | 0.1000 | 0.1047 | 104.7 | 0.2000 | 0.1974 | 98.7 |
| Cu | <0.001 | 0.1000 | 0.1074 | 107.4 | 0.2000 | 0.0203 | 10.2 |
| Pb | <0.002 | 0.1000 | 0.1051 | 105.1 | 0.2000 | 0.1900 | 95.0 |
| Ni | <0.001 | 0.1000 | 0.1023 | 102.3 | 0.2000 | 0.1961 | 98.1 |
| Zn | <0.005 | 0.1000 | 0.1103 | 110.3 | 0.2000 | 0.2793 | 139.7 |

QC Acceptance Ranges:

LCS 80-120%

PB <Reporting Limit

Explanation of QC Failures

LCS 2 for copper was not within the acceptable limits.

Most samples had concentrations for zinc below the procedure blank. Note: the unit of measure used for this report is mg/l.

| Analyte | Date Analyzed | Method | Method QC Data | | |
|-----------------------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/L | % Recovery | % |
| Acid Volatile Sulfide | 7/28/04 | 376.2 | N/A | N/A | N/A |
| Acid Volatile Sulfide | 7/29/94 | 386.2 | <0.05 | 97.5 | 80-120 |

Explanation of QC Failures

None

| Analyte | Date Analyzed | Method | Method QC Data | | |
|---------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/kg | % Recovery | % |
| TOC | 7/23/04 | 9060M | <1000 | 99.9 | 80-120 |
| TOC | 7/23/04 | 9060M | <1000 | | |

QUALITY CONTROL DATA

Client: MWRD
Project ID: G040723B
Sample Number: 33539
Sample Description: WW-18 Side, Devon – Salt Cr.
Date Analyzed: 08/06/2004

Date received: 07/23/04
Date Sampled: 07/20/04
Date Reported: 08/25/04
Lab File ID: 33538-42

| Element | Prep Blank | Laboratory Control Standard 1(LCS) | | | Laboratory Control Standard 2 (LCS) | | |
|---------|------------|------------------------------------|--------|-------|-------------------------------------|--------|-------|
| | | True | Found | % Rec | True | Found | % Rec |
| Cd | <0.001 | 0.1000 | 0.0989 | 98.9 | 0.2000 | 0.1931 | 96.6 |
| Cu | <0.001 | 0.1000 | 0.1006 | 100.6 | 0.2000 | 0.0025 | 1.2 |
| Pb | <0.002 | 0.1000 | 0.0991 | 99.1 | 0.2000 | 0.1805 | 90.2 |
| Ni | <0.001 | 0.1000 | 0.0965 | 96.5 | 0.2000 | 0.1917 | 95.8 |
| Zn | <0.005 | 0.1000 | 0.0954 | 95.4 | 0.2000 | 0.1995 | 99.7 |

QC Acceptance Ranges:

LCS 80-120%

PB <Reporting Limit

Explanation of QC Failures

LCS 2 for Copper was not within the acceptable limits. Matrix Spike and Matrix Spike Duplicate are within acceptable limits. All external QC sample were acceptable. No further action taken.

Note: the unit of measure used for this report is mg/l.

| Analyte | Date Analyzed | Method | Method QC Data | | |
|-----------------------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/L | % Recovery | % |
| Acid Volatile Sulfide | 7/28/04 | 376.2 | N/A | N/A | N/A |
| Acid Volatile Sulfide | 7/29/04 | 386.2 | <0.05 | 97.5 | 80-120 |

Explanation of QC Failures

None

| Analyte | Date Analyzed | Method | Method QC Data | | |
|---------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/kg | % Recovery | % |
| TOC | 7/27/04 | 9060M | <1000 | 98 | 80-120 |
| TOC | 7/27/04 | 9060M | <1000 | N/A | N/A |

October 15, 2004

MWRD GC
Stickney WRP Cecil Lue-Hing R & D Com
Attn: Jennifer Wasik
6001 W. Pershing Rd.
Cicero, IL 60804

Contract #: 04-104-11

Grace Analytical Job ID: G040813A

Dear Ms. Wasik,

The above referenced project was analyzed as directed on the enclosed Chain-of-Custody record.

Analyses were performed in accordance with the following document(s): (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA, EPA 821/R-91-100; and a modified apparatus was used to perform sample preparation and Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd Edition, December 1996, The specific method references appear on the Analytical Report.

Acid volatile sulfide/simultaneously extractable metals (cadmium, copper, lead, nickel, and zinc) were performed at First Environmental Laboratories in Naperville, IL. Total organic carbon was performed at TestAmerica in Nashville, TN, and Particle size analysis was performed at Whitney and Associates in Peoria, IL.

A summary of the batch QA/QC documentation is attached. All raw data will remain on file for future reference.

Request for duplications or reproductions of these analytical reports must be made in writing to the GAL and signed by an authorized agent.

Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (708) 449-9449 X12 or e-mail sk@gracelabinc.com,

Sincerely,

Steven Kim, Ph.D.
Laboratory Director
www.gracelabinc.com

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040813A
Sample Number: 35292
Sample Description: WW- 24 Side: Wolf Rd Salt Creek

Date received: 08/13/04
Date Sampled: 08/11/04
Date Reported: 09/07/04
Lab File ID: 35292

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 47.19 | % | 08/26/04 | CLP |
| AVS | 10.5 | umoles/g | 08/26/04 | 376.2 |
| Cadmium | 0.008 | umoles/g | 08/31/04 | 3010A/6010B |
| Copper | 0.759 | umoles/g | 08/31/04 | 3010A/6010B |
| Lead | 0.536 | umoles/g | 08/31/04 | 3010A/6010B |
| Nickel | 0.328 | umoles/g | 08/31/04 | 3010A/6010B |
| Zinc | 3.890 | umoles/g | 08/31/04 | 3010A/6010B |
| Total SEM | 5.521 | | | |
| AVS / SEM | 1.9 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 48800 | mg/kg | 08/25/04 | 9060M |

QUALITY CONTROL DATA

Client: MWRD
 Project ID: G040813A
 Sample Number: 35292

Date Analyzed: 08/31/04
 Date Reported: 09/07/04
 Lab File ID: 35292

| Element | Prep Blank | Laboratory Control Standard 1(LCS) | | | Laboratory Control Standard 2 (LCS) | | |
|---------|------------|------------------------------------|--------|-------|-------------------------------------|--------|-------|
| | | True | Found | % Rec | True | Found | % Rec |
| Cd | <0.001 | 0.2000 | 0.2094 | 104.7 | 0.1000 | 0.1055 | 105.5 |
| Cu | <0.001 | 0.2000 | 0.0924 | 46.2 | 0.1000 | 0.1012 | 101.2 |
| Pb | <0.002 | 0.2000 | 0.2011 | 100.6 | 0.1000 | 0.1034 | 103.4 |
| Ni | <0.001 | 0.2000 | 0.2066 | 103.3 | 0.1000 | 0.1028 | 102.8 |
| Zn | 0.0113 | 0.2000 | 0.2363 | 118.2 | 0.1000 | 0.1044 | 104.4 |

QC Acceptance Ranges:
 LCS 80-120%
 PB <Reporting Limit

Explanation of QC Failures

AVS/SEM extracted LCS 1 low for copper. Prep Blank (PB) : Acceptance criteria not met for zinc. Note: the unit of measure used for this report is mg/l.

| Analyte | Date Analyzed | Method | Method QC Data | | |
|-----------------------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/L | % Recovery | % |
| Acid Volatile Sulfide | 8/26/04 | 376.2 | <0.05 | 82.3 | 80-120 |

Explanation of QC Failures

None

| Analyte | Date Analyzed | Method | Method QC Data | | |
|---------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/kg | % Recovery | % |
| TOC | 08/25/04 | 9060M | <1000 | 102 | 80-120 |

October 15, 2004

MWRD GC
Stickney WRP Cecil Lue-Hing R & D Com
Attn: Jennifer Wasik
6001 W. Pershing Rd.
Cicero, IL 60804

Contract #: 04-104-11

Grace Analytical Job ID: G040910A

Dear Ms. Wasik,

The above referenced project was analyzed as directed on the enclosed Chain-of-Custody record.

Analyses were performed in accordance with the following document(s): (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA, EPA 821/R-91-100; and a modified apparatus was used to perform sample preparation and Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd Edition, December 1996, The specific method references appear on the Analytical Report.

Acid volatile sulfide/simultaneously extractable metals (cadmium, copper, lead, nickel, and zinc) were performed at First Environmental Laboratories in Naperville, IL. Total organic carbon was performed at TestAmerica in Nashville, TN, and Particle size analysis was performed at Whitney and Associates in Peoria, IL.

A summary of the batch QA/QC documentation is attached. All raw data will remain on file for future reference.

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Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (708) 449-9449 X12 or e-mail sk@gracelabinc.com,

Sincerely,

Steven Kim, Ph.D.
Laboratory Director
www.gracelabinc.com

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040910A
Sample Number: 36965
Sample Description: WW-109 Side Brookfield Ave. Salt Cr.

Date received: 09/10/04
Date Sampled: 09/07/04
Date Reported: 09/22/04
Lab File ID: 36965-70

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 58.63 | % | 09/17/04 | CLP |
| AVS | 2.71 | umoles/g | 09/17/04 | 376.2 |
| Cadmium | 0.004 | umoles/g | 09/21/04 | 3010A/6010B |
| Copper | 0.432 | umoles/g | 09/21/04 | 3010A/6010B |
| Lead | 0.303 | umoles/g | 09/21/04 | 3010A/6010B |
| Nickel | 0.237 | umoles/g | 09/21/04 | 3010A/6010B |
| Zinc | 2.200 | umoles/g | 09/21/04 | 3010A/6010B |
| Total SEM | 3.176 | umoles/g | | |
| AVS / SEM | 0.8 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 42900 | mg/kg | 09/17/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040910A
Sample Number: 36966
Sample Description: WW-109 Center Brookfield Ave. Salt Cr.

Date received: 09/10/04
Date Sampled: 09/07/04
Date Reported: 09/22/04
Lab File ID: 36965-70

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 80.47 | % | 09/17/04 | CLP |
| AVS | 0.14 | umoles/g | 09/17/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 09/21/04 | 3010A/6010B |
| Copper | 0.100 | umoles/g | 09/21/04 | 3010A/6010B |
| Lead | 0.084 | umoles/g | 09/21/04 | 3010A/6010B |
| Nickel | 0.079 | umoles/g | 09/21/04 | 3010A/6010B |
| Zinc | 0.927 | umoles/g | 09/21/04 | 3010A/6010B |
| Total SEM | 1.195 | umoles/g | | |
| AVS / SEM | <0.2 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.
Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 38600 | mg/kg | 09/17/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040910A
Sample Number: 36967
Sample Description: WW-22 Side Ogden Ave. Des Plaines

Date received: 09/10/04
Date Sampled: 09/08/04
Date Reported: 09/22/04
Lab File ID: 36965-70

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 24.07 | % | 09/17/04 | CLP |
| AVS | 1.28 | umoles/g | 09/17/04 | 376.2 |
| Cadmium | 0.015 | umoles/g | 09/21/04 | 3010A/6010B |
| Copper | 0.946 | umoles/g | 09/21/04 | 3010A/6010B |
| Lead | 0.507 | umoles/g | 09/21/04 | 3010A/6010B |
| Nickel | 0.264 | umoles/g | 09/21/04 | 3010A/6010B |
| Zinc | 4.060 | umoles/g | 09/21/04 | 3010A/6010B |
| Total SEM | 5.792 | umoles/g | | |
| AVS / SEM | 0.2 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 79400 | mg/kg | 09/18/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040910A
Sample Number: 36968
Sample Description: WW-22 Center Ogden Ave. Des Plaines

Date received: 09/10/04
Date Sampled: 09/08/04
Date Reported: 09/22/04
Lab File ID: 36965-70

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 71.24 | % | 09/17/04 | CLP |
| AVS | 0.20 | umoles/g | 09/17/04 | 376.2 |
| Cadmium | 0.006 | umoles/g | 09/21/04 | 3010A/6010B |
| Copper | 0.035 | umoles/g | 09/21/04 | 3010A/6010B |
| Lead | 0.032 | umoles/g | 09/21/04 | 3010A/6010B |
| Nickel | 0.031 | umoles/g | 09/21/04 | 3010A/6010B |
| Zinc | 0.434 | umoles/g | 09/21/04 | 3010A/6010B |
| Total SEM | 0.539 | umoles/g | | |
| AVS / SEM | 0.4 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 38000 | mg/kg | 09/18/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040910A
Sample Number: 36969
Sample Description: WW-20 Side Roosevelt, Des Plaines

Date received: 09/10/04
Date Sampled: 09/09/04
Date Reported: 09/22/04
Lab File ID: 36965-70

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 43.19 | % | 09/17/04 | CLP |
| AVS | 3.18 | umoles/g | 09/17/04 | 376.2 |
| Cadmium | 0.010 | umoles/g | 09/21/04 | 3010A/6010B |
| Copper | 1.300 | umoles/g | 09/21/04 | 3010A/6010B |
| Lead | 0.585 | umoles/g | 09/21/04 | 3010A/6010B |
| Nickel | 0.372 | umoles/g | 09/21/04 | 3010A/6010B |
| Zinc | 5.300 | umoles/g | 09/21/04 | 3010A/6010B |
| Total SEM | 7.567 | umoles/g | | |
| AVS / SEM | 0.4 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 65600 | mg/kg | 09/18/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040910A
Sample Number: 36970
Sample Description: WW-20 Center Roosevelt, Des Plaines

Date received: 09/10/04
Date Sampled: 09/09/04
Date Reported: 09/22/04
Lab File ID: 36965-70

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 60.39 | % | 09/17/04 | CLP |
| AVS | 0.37 | umoles/g | 09/17/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 09/21/04 | 3010A/6010B |
| Copper | 0.926 | umoles/g | 09/21/04 | 3010A/6010B |
| Lead | 0.388 | umoles/g | 09/21/04 | 3010A/6010B |
| Nickel | 0.130 | umoles/g | 09/21/04 | 3010A/6010B |
| Zinc | 1.920 | umoles/g | 09/21/04 | 3010A/6010B |
| Total SEM | 3.364 | umoles/g | | |
| AVS / SEM | <0.2 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 30300 | mg/kg | 09/17/04 | 9060M |

QUALITY CONTROL DATA

Client: MWRD
 Project ID: G040910A
 Sample Number: 36970

Date Analyzed: 09/21/04
 Date Reported: 09/07/04
 Lab File ID: 36965-70

| Element | Prep Blank | Laboratory Control Standard 1(LCS) | | | Laboratory Control Standard 2 (LCS) | | |
|---------|------------|------------------------------------|--------|-------|-------------------------------------|--------|-------|
| | | True | Found | % Rec | True | Found | % Rec |
| Cd | <0.001 | 0.2000 | 0.1880 | 94.0 | 0.1000 | 0.0924 | 92.4 |
| Cu | <0.001 | 0.2000 | 0.1321 | 66.1 | 0.1000 | 0.0899 | 89.9 |
| Pb | <0.002 | 0.2000 | 0.1880 | 94.0 | 0.1000 | 0.0912 | 91.2 |
| Ni | <0.001 | 0.2000 | 0.1893 | 94.7 | 0.1000 | 0.0907 | 90.7 |
| Zn | <0.005 | 0.2000 | 0.1968 | 98.4 | 0.1000 | 0.0947 | 94.7 |

QC Acceptance Ranges:

LCS 80-120%
 PB <Reporting Limit

Explanation of QC Failures

AVS/SEM extracted LCS 1 low for copper. Most samples had concentrations for zinc below the procedure blank.
 Note: the unit of measure used for this report is mg/l.

| Analyte | Date Analyzed | Method | Method QC Data | | |
|-----------------------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/L | % Recovery | % |
| Acid Volatile Sulfide | 09/17/04 | 376.2 | <0.05 | 88.4 | 80-120 |

Explanation of QC Failures

None

| Analyte | Date Analyzed | Method | Method QC Data | | |
|---------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/kg | % Recovery | % |
| TOC | 09/15/04 | 9060M | <1000 | 104 | 80-120 |

October 15, 2004

MWRD GC
Stickney WRP Cecil Lue-Hing R & D Com
Attn: Jennifer Wasik
6001 W. Pershing Rd.
Cicero, IL 60804

Contract #: 04-104-11

Grace Analytical Job ID: G040923A

Dear Ms. Wasik,

The above referenced project was analyzed as directed on the enclosed Chain-of-Custody record.

Analyses were performed in accordance with the following document(s): (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA, EPA 821/R-91-100; and a modified apparatus was used to perform sample preparation and Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd Edition, December 1996, The specific method references appear on the Analytical Report.

Acid volatile sulfide/simultaneously extractable metals (cadmium, copper, lead, nickel, and zinc) were performed at First Environmental Laboratories in Naperville, IL. Total organic carbon was performed at TestAmerica in Nashville, TN, and Particle size analysis was performed at Whitney and Associates in Peoria, IL.

A summary of the batch QA/QC documentation is attached. All raw data will remain on file for future reference.

Request for duplications or reproductions of these analytical reports must be made in writing to the GAL and signed by an authorized agent.

Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (708) 449-9449 X12 or e-mail sk@gracelabinc.com,

Sincerely,

Steven Kim, Ph.D.
Laboratory Director
www.gracelabinc.com

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040923A
Sample Number: 37731
Sample Description: WW-19 Side / 11548

Date received: 09/23/04
Date Sampled: 09/20/04
Date Reported: 10/05/04
Lab File ID: 37731-36

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 47.64 | % | 09/30/04 | CLP |
| AVS | 8.8 | umoles/g | 09/30/04 | 376.2 |
| Cadmium | 0.014 | umoles/g | 10/05/04 | 3010A/6010B |
| Copper | 0.996 | umoles/g | 10/05/04 | 3010A/6010B |
| Lead | 0.462 | umoles/g | 10/05/04 | 3010A/6010B |
| Nickel | 0.300 | umoles/g | 10/05/04 | 3010A/6010B |
| Zinc | 3.640 | umoles/g | 10/05/04 | 3010A/6010B |
| Total SEM | 5.410 | umoles/g | | |
| AVS / SEM | 1.6 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 56700 | mg/kg | 10/06/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040923A
Sample Number: 37732
Sample Description: WW-19 Center / 11552

Date received: 09/23/04
Date Sampled: 09/20/04
Date Reported: 10/05/04
Lab File ID: 37731-36

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 75.44 | % | 09/30/04 | CLP |
| AVS | <0.08 | umoles/g | 09/30/04 | 376.2 |
| Cadmium | <0.002 | umoles/g | 10/05/04 | 3010A/6010B |
| Copper | 0.236 | umoles/g | 10/05/04 | 3010A/6010B |
| Lead | 0.092 | umoles/g | 10/05/04 | 3010A/6010B |
| Nickel | 0.101 | umoles/g | 10/05/04 | 3010A/6010B |
| Zinc | 1.100 | umoles/g | 10/05/04 | 3010A/6010B |
| Total SEM | 1.53 | umoles/g | | |
| AVS / SEM | <0.2 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 29800 | mg/kg | 10/06/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040923A
Sample Number: 37733
Sample Description: WW-23 Side / 11556

Date received: 09/23/04
Date Sampled: 09/21/04
Date Reported: 10/05/04
Lab File ID: 37731-36

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 38.30 | % | 09/30/04 | CLP |
| AVS | 0.92 | umoles/g | 09/30/04 | 376.2 |
| Cadmium | 0.026 | umoles/g | 10/05/04 | 3010A/6010B |
| Copper | 1.44 | umoles/g | 10/05/04 | 3010A/6010B |
| Lead | 0.474 | umoles/g | 10/05/04 | 3010A/6010B |
| Nickel | 0.351 | umoles/g | 10/05/04 | 3010A/6010B |
| Zinc | 5.550 | umoles/g | 10/05/04 | 3010A/6010B |
| Total SEM | <0.2 | umoles/g | | |
| AVS / SEM | <0.2 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 72900 | mg/kg | 10/06/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040923A
Sample Number: 37734
Sample Description: WW-23 Center / 11560

Date received: 09/23/04
Date Sampled: 09/21/04
Date Reported: 10/05/04
Lab File ID: 37731-36

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 38.25 | % | 09/30/04 | CLP |
| AVS | 1.51 | umoles/g | 09/30/04 | 376.2 |
| Cadmium | 0.021 | umoles/g | 10/05/04 | 3010A/6010B |
| Copper | 1.12 | umoles/g | 10/05/04 | 3010A/6010B |
| Lead | 0.376 | umoles/g | 10/05/04 | 3010A/6010B |
| Nickel | 0.434 | umoles/g | 10/05/04 | 3010A/6010B |
| Zinc | 5.640 | umoles/g | 10/05/04 | 3010A/6010B |
| Total SEM | 7.59 | umoles/g | | |
| AVS / SEM | 0.2 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 59700 | mg/kg | 10/06/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040923A
Sample Number: 37735
Sample Description: WW-29 Side / 11564

Date received: 09/23/04
Date Sampled: 09/22/04
Date Reported: 10/05/04
Lab File ID: 37731-36

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 30.34 | % | 09/30/04 | CLP |
| AVS | 6.6 | umoles/g | 09/30/04 | 376.2 |
| Cadmium | 0.031 | umoles/g | 10/05/04 | 3010A/6010B |
| Copper | 1.33 | umoles/g | 10/05/04 | 3010A/6010B |
| Lead | 0.469 | umoles/g | 10/05/04 | 3010A/6010B |
| Nickel | 0.462 | umoles/g | 10/05/04 | 3010A/6010B |
| Zinc | 5.530 | umoles/g | 10/05/04 | 3010A/6010B |
| Total SEM | 7.82 | umoles/g | | |
| AVS / SEM | 0.8 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 91500 | mg/kg | 10/06/04 | 9060M |

AVS / SEM ANALYTICAL REPORT

Client: MWRD
Project ID: G040923A
Sample Number: 37736
Sample Description: WW-29 Center / 11568

Date received: 09/23/04
Date Sampled: 09/22/04
Date Reported: 10/05/04
Lab File ID: 37731-36

| Analyte | Result | Units | Date Analyzed | Method |
|--------------|--------|----------|---------------|-------------|
| Total Solids | 75.97 | % | 09/30/04 | CLP |
| AVS | <0.08 | umoles/g | 09/30/04 | 376.2 |
| Cadmium | 0.003 | umoles/g | 10/05/04 | 3010A/6010B |
| Copper | 0.077 | umoles/g | 10/05/04 | 3010A/6010B |
| Lead | 0.043 | umoles/g | 10/05/04 | 3010A/6010B |
| Nickel | 0.055 | umoles/g | 10/05/04 | 3010A/6010B |
| Zinc | 0.704 | umoles/g | 10/05/04 | 3010A/6010B |
| Total SEM | 0.88 | umoles/g | | |
| AVS / SEM | <0.2 | | | |

Reference: (Draft) Determination of Acid Volatile Sulfide and Selected Simultaneously Extractable Metals in Sediment, December 1991, EPA 821/R-91-100.

Note: a modified apparatus was used to perform sample preparation.

TOC Analytical Report

| Analyte | Result | Units | Date Analyzed | Method |
|---------|--------|-------|---------------|--------|
| TOC | 88600 | mg/kg | 10/06/04 | 9060M |

QUALITY CONTROL DATA

Client: MWRD
 Project ID: G040923A
 Sample Number: 37732

Date Analyzed: 10/05/04
 Date Reported: 10/05/04
 Lab File ID: 37731-36

| Element | Prep Blank | Laboratory Control Standard 1(LCS) | | | Laboratory Control Standard 2 (LCS) | | |
|---------|------------|------------------------------------|--------|-------|-------------------------------------|--------|-------|
| | | True | Found | % Rec | True | Found | % Rec |
| Cd | <0.001 | 0.2000 | 0.2003 | 100.2 | 0.1000 | 0.0924 | 92.4 |
| Cu | 0.0036 | 0.2000 | 0.0900 | 45.0 | 0.1000 | 0.0899 | 89.9 |
| Pb | <0.002 | 0.2000 | 0.1977 | 98.9 | 0.1000 | 0.0912 | 91.2 |
| Ni | <0.001 | 0.2000 | 0.1989 | 99.5 | 0.1000 | 0.0907 | 90.7 |
| Zn | 0.0223 | 0.2000 | 0.2370 | 118.5 | 0.1000 | 0.0947 | 94.7 |

QC Acceptance Ranges:

LCS 80-120%

PB <Reporting Limit

Explanation of QC Failures

AVS/SEM extracted LCS 1 low for copper. Most samples had concentrations for zinc below the procedure blank.

Note: the unit of measure used for this report is mg/l.

| Analyte | Date Analyzed | Method | Method QC Data | | |
|-----------------------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/L | % Recovery | % |
| Acid Volatile Sulfide | 10/01/04 | 376.2 | <0.05 | 92.6 | 80-120 |

Explanation of QC Failures

None

| Analyte | Date Analyzed | Method | Method QC Data | | |
|---------|---------------|--------|----------------|----------------------|------------------|
| | | | Prep Blank | Lab Control Standard | Acceptance Limit |
| | | | mg/kg | % Recovery | % |
| TOC | 10/06/04 | 9060M | <1000 | 99 | 80-120 |

309-673-2131

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INSURANCE INVESTIGATIONS

CLIENT:

W&A FILE NO. 3707001
DATE: 08-10-04

Ms. Grace Kim
Grace Analytical Laboratory
5400-B McDermott Drive
Berkeley, Illinois 60163

PROJECT:

Metropolitan Water Reclamation
District of Greater Chicago

GRAIN SIZE ANALYSIS - HYDROMETER METHOD

| SIEVE DESIGNATION | PERCENTAGE FINER - % | |
|--------------------------------|--|--|
| | WW-13 (SIDE) 07-06-04 | WW-17 (SIDE) 07-07-04 |
| #10 | 100.0 | 100.0 |
| #20 | 99.2 | 98.3 |
| #40 | 97.2 | 97.0 |
| #60 | 93.3 | 79.4 |
| #140 | 82.1 | 26.2 |
| #200 | 73.8 | 21.4 |
| MAXIMUM DIAMETER - M.M. | | |
| .0400 | 46.4 | 16.8 |
| .0280 | 41.3 | 13.7 |
| .0150 | 34.3 | 11.6 |
| .0100 | 29.4 | 10.7 |
| .0074 | 25.2 | 9.5 |
| .0050 | 22.1 | 8.2 |
| .0036 | 20.2 | 7.1 |
| .0010 | 14.6 | 5.3 |
| SAND-% | 26 | 79 |
| SILT -% | 52 | 13 |
| CLAY-% | 22 | 8 |
| SOIL CLASSIFICATION | Organic SILTY CLAY With Fine-Grained Sand - OL | SILTY CLAYEY SAND - SC-SM Fine-Grained |

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

GRAIN SIZE ANALYSIS - SIEVE METHOD

| | | | | | |
|-----------------------|---|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-12 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 07-01-04 |
| MATERIAL TYPE: | Fine-Grained GRAVEL With Considerable Coarse-Grained Sand; Some Fine- To Medium-Grained Sand - Well-Graded - GW | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/4" | 100.0 |
| 3/8" | 84.9 |
| #4 | 44.7 |
| #10 | 20.1 |
| #20 | 11.6 |
| #40 | 7.7 |
| #60 | 2.8 |
| #140 | 0.3 |
| #200 | 0.2 |

| | | | | | |
|-----------------------|---|-------------------------|------|---------------------|----------|
| SAMPLE NUMBER: | WW-12 | SAMPLE LOCATION: | Side | SAMPLE DATE: | 07-01-04 |
| MATERIAL TYPE: | Fine- To Medium-Grained SAND With Fine-Grained Gravel; Small Amount of Coarse-Grained Sand And Silty Clay - SP-SC | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 1" | 100.0 |
| 3/4" | 94.1 |
| 3/8" | 79.4 |
| #4 | 71.6 |
| #10 | 64.5 |
| #20 | 54.0 |
| #40 | 37.1 |
| #60 | 17.2 |
| #140 | 7.3 |
| #200 | 6.3 |

| | | | | | |
|-----------------------|--|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-13 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 07-06-04 |
| MATERIAL TYPE: | Fine- To Medium-Grained SAND With Some Fine-Grained Gravel And Small Amount of Coarse-Grained Sand; Poorly Graded - SP | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|--------------------------|---------------------------------------|
| 3/4" | 100.0 |
| 3/8" | 92.4 |
| #4 | 87.1 |
| #10 | 81.3 |
| #20 | 66.1 |
| #40 | 40.2 |
| #60 | 5.2 |
| #140 | 3.0 |
| #200 | 0.2 |

| | | | | | |
|-----------------------|--|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-17 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 07-07-04 |
| MATERIAL TYPE: | Medium- To Coarse-Grained SAND With Some Fine-Grained Sand And Fine-Grained Gravel; Poorly Graded - SP | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|--------------------------|---------------------------------------|
| 3/4" | 100.0 |
| 3/8" | 98.7 |
| #4 | 88.5 |
| #10 | 61.0 |
| #20 | 34.9 |
| #40 | 16.8 |
| #60 | 1.9 |
| #140 | 0.4 |
| #200 | 0.3 |

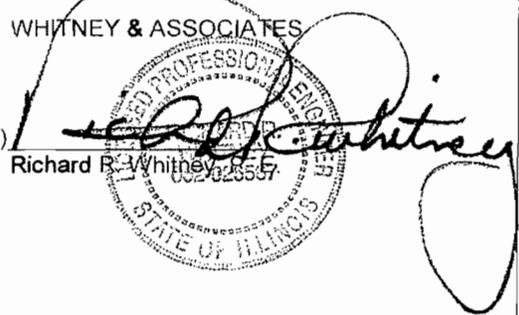
August 10, 2004

Should you have any questions or comments whatsoever in regard to these test results, or if any additional information is desired, please do not hesitate to contact me personally at your convenience.

Respectfully submitted

WHITNEY & ASSOCIATES

(By)


Richard B. Whitney, P.E.



RRW:rma

TELEPHONE
309 673-2111

TESTS
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PEORIA, ILLINOIS 61604

SPECIALISTS IN

SOILS - PORTLAND CEMENT CONCRETE
STEEL - STRUCTURAL CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - P.O.D. PAV.

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

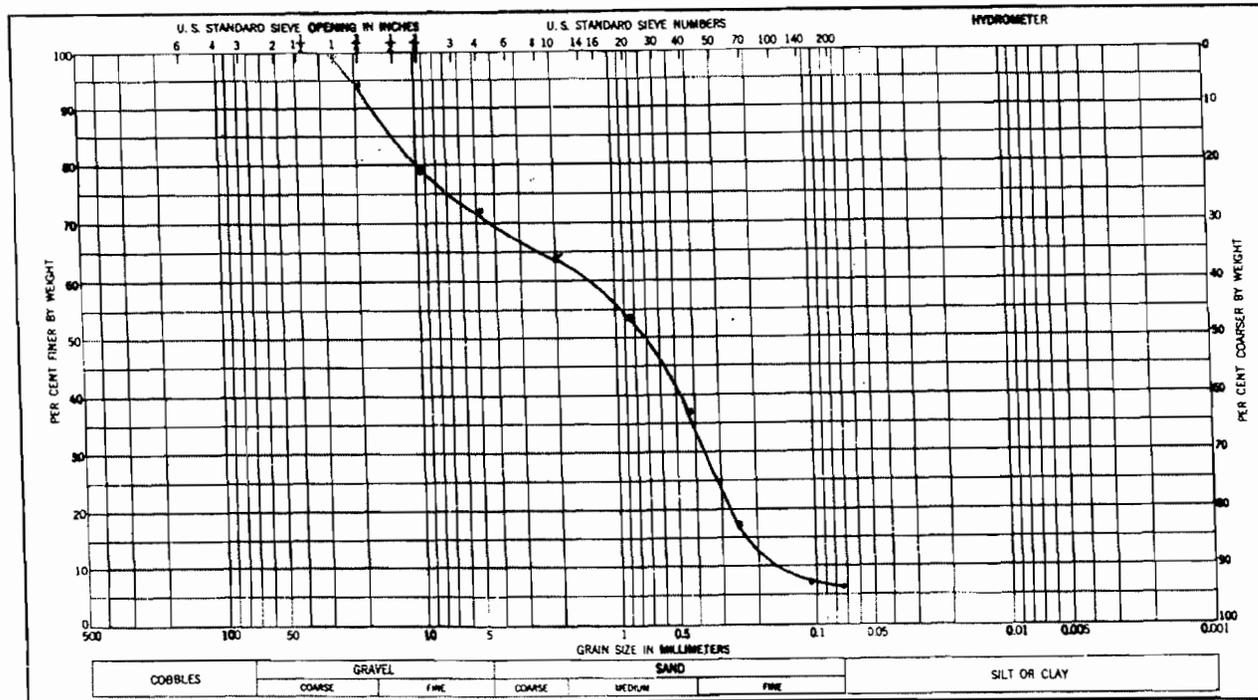
PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

W. & A. FILE NO. 3707
DATE 8-10-03

REPORT OF SOIL/AGGREGATE ANALYSIS

WW-12 Side (7-01-04)



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION: Fine- To Medium-Grained SAND With UNIFORMITY COEFFICIENT $\frac{D_{60}}{D_{10}} =$ _____ EFFECTIVE GRAIN SIZE, $D_{10} =$ _____
Fine Gravel; Small Amount Of Coarse-
Grained Sand And Silty Clay - SP-SC

TELEPHONE
309 873-2131

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CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - ROZ-OPAC

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MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

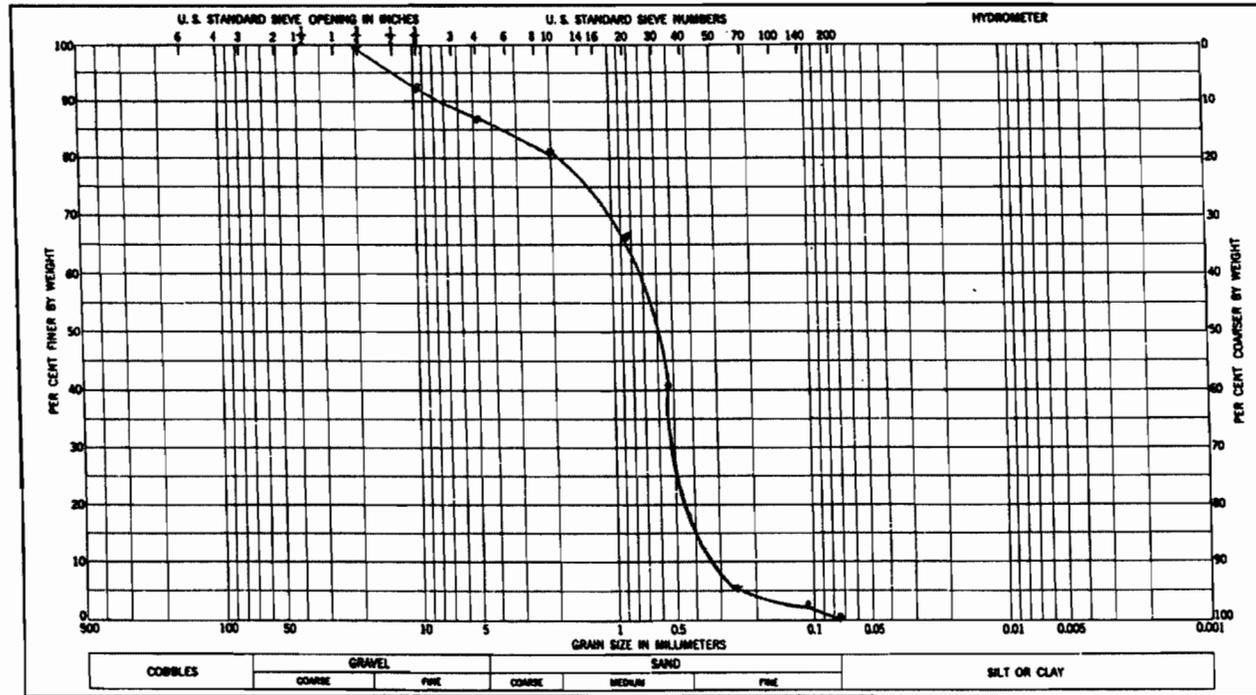
CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

W. & A. FILE NO. 3707

DATE 8-10-04

WW-13 Center (7-06-04)

REPORT OF SOIL/AGGREGATE ANALYSIS



TELEPHONE
314-2423

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INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
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FRESH CONCRETE CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZZOLANA

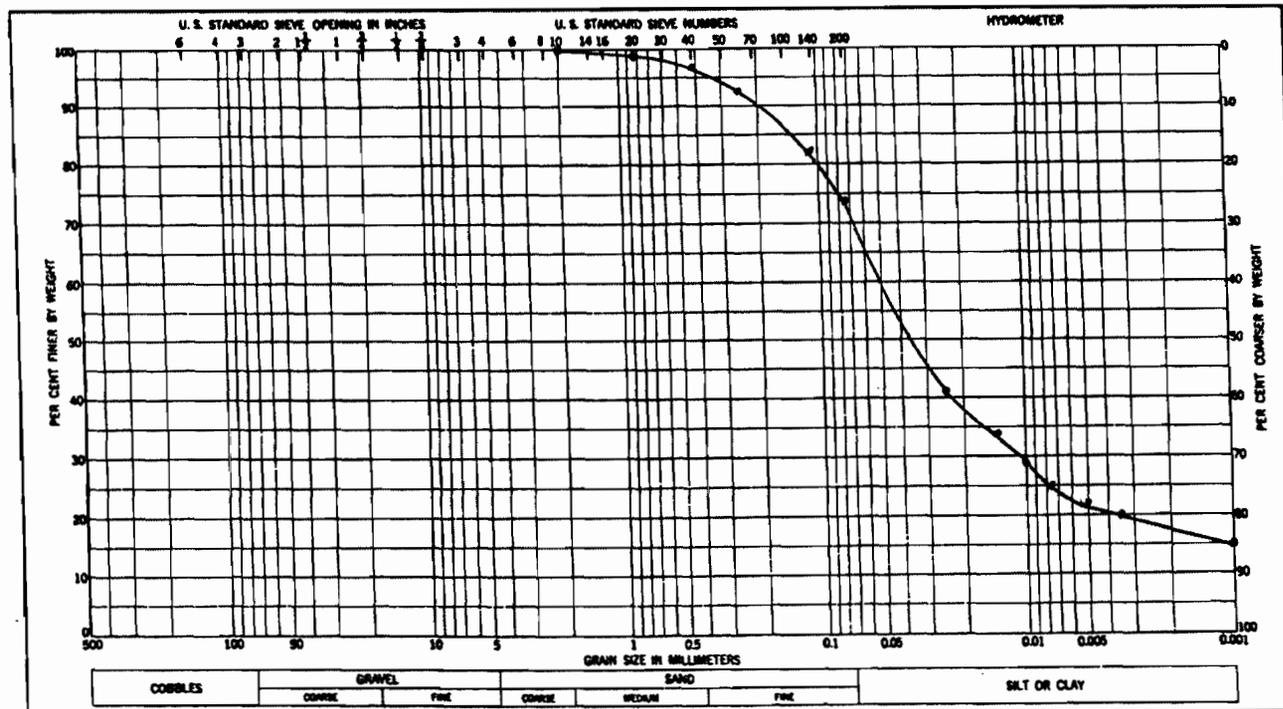
SOILS AND GRAVEL SURVEYS
WATER QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago

CLIENT Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707
DATE 8-10-04
WW-13 Side (7-06-04)



TELEPHONE
309 674-7131

TEST'S
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WHITNEY & ASSOCIATES
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SPECIALISTS IN

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STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POLY-PAD

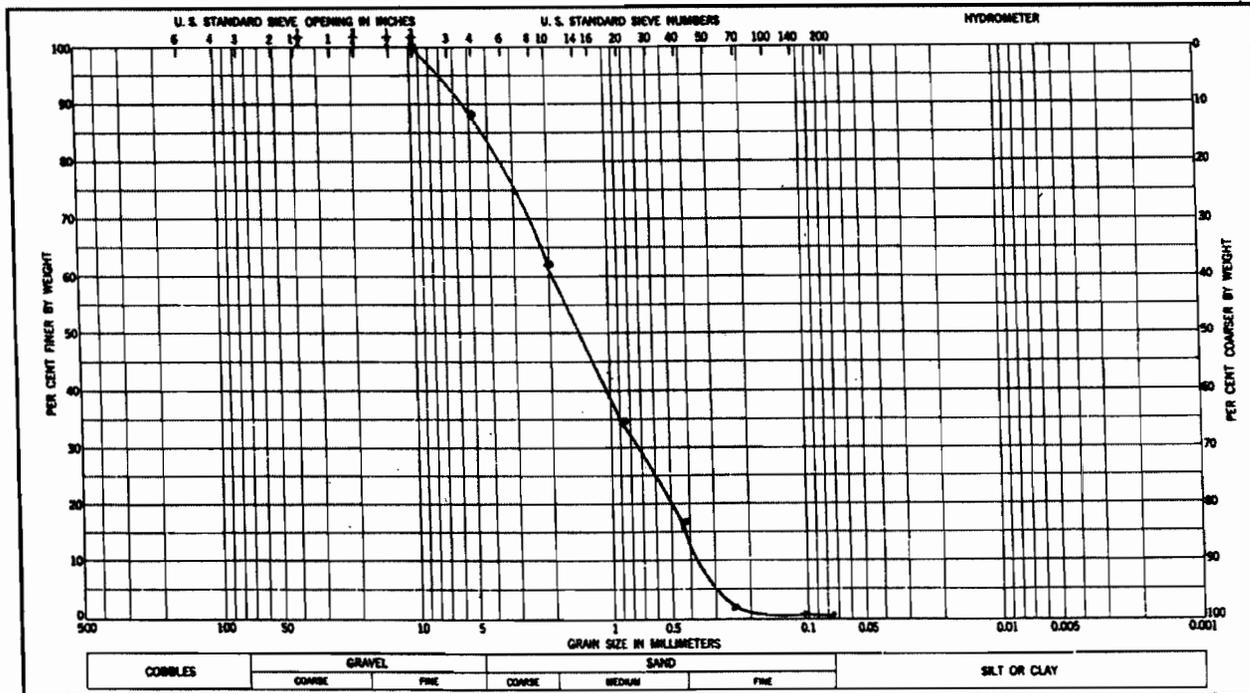
SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

W & A. FILE NO. 3707
DATE 8-10-04
WW-17 Center (7-07-04)

REPORT OF SOIL/AGGREGATE ANALYSIS



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION Medium- To Coarse-Grained SAND With UNIFORMITY COEFFICIENT, $\frac{D_{60}}{D_{10}}$: _____ EFFECTIVE GRAIN SIZE, D_{10} : _____
Some Fine-Grained Sand And Fine-
Grained Gravel - Poorly Graded - SP

TELEPHONE
309-734737

TESTS
DESIGN
REPAIRS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS



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INCORPORATED

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PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS AND SEWERS, SANITARY
STEEL, BITUMENS, CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES, ASPHALT, PAVEMENT

SOILS AND SHALES, SURVEY
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING, BORINGS, TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago

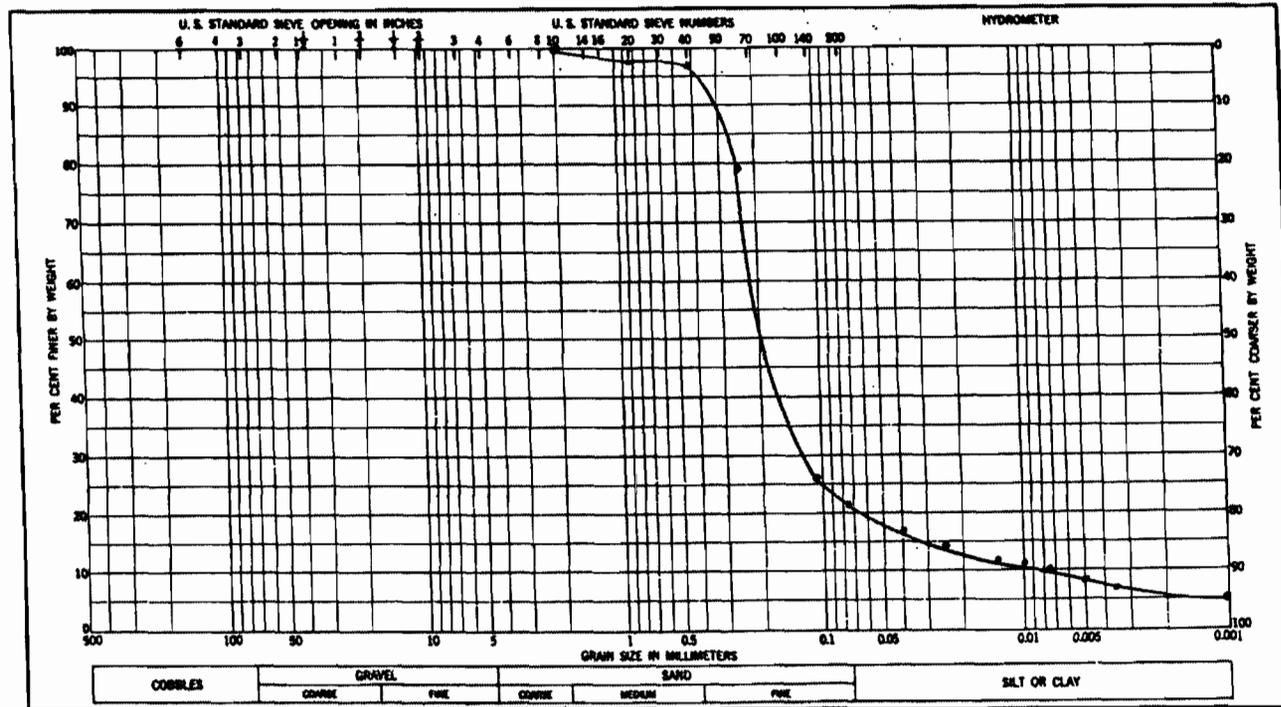
CLIENT Grace Analytical Laboratory
Berkeley, Illinois

W & A FILE NO. 3707

DATE 8-10-04

KW-17 Side (7-07-04)

REPORT OF SOIL/AGGREGATE ANALYSIS



TELEPHONE
309-673-2131

TESTS • INVESTIGATIONS
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SOILS • PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE • STEEL
ASPHALT • AGGREGATES • EMULSIONS
POZZOLANIC MATERIALS • LIME



WHITNEY & ASSOCIATES
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GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS

MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

CLIENT:

Ms. Grace Kim
Grace Analytical Laboratory
5400-B McDermott Drive
Berkeley, Illinois 60163

W&A FILE NO. 3707002
DATE: 08-13-04

PROJECT:

Metropolitan Water Reclamation
District of Greater Chicago

GRAIN SIZE ANALYSIS - HYDROMETER METHOD

| SIEVE DESIGNATION | PERCENTAGE FINER - % | |
|------------------------------------|--------------------------|--------------------------|
| | WW-64 (SIDE) 07-13-04 | WW-90 (SIDE) 07-08-04 |
| 1" | 100.0 | 100.0 |
| 3/4" | 94.4 | 100.0 |
| 3/8" | 92.6 | 96.5 |
| #4 | 79.4 | 91.3 |
| #10 | 68.1 | 87.8 |
| #20 | 58.4 | 84.5 |
| #40 | 49.3 | 81.1 |
| #60 | 36.2 | 75.9 |
| #140 | 30.6 | 67.1 |
| #200 | 27.3 | 63.7 |
| MAXIMUM DIAMETER - M.M. | | |
| .0400 | 21.7 | 55.2 |
| .0260 | 19.7 | 51.0 |
| .0150 | 17.6 | 44.1 |
| .0100 | 16.4 | 40.6 |
| .0074 | 15.1 | 36.2 |
| .0050 | 13.1 | 31.3 |
| .0036 | 11.8 | 28.1 |
| .0010 | 8.4 | 21.6 |
| GRAVEL-% | 21 | 9 |
| SAND-% | 52 | 27 |
| SILT -% | 14 | 33 |
| CLAY-% | 13 | 31 |

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

| SIEVE DESIGNATION | PERCENTAGE FINER - % | |
|------------------------------------|-----------------------------|---------------------------|
| | WW-110 (CENTER) 07-09-04 | WW-110 (SIDE) 07-09-04 |
| 3/4" | 100.0 | 100.0 |
| 3/8" | 97.3 | 89.0 |
| #4 | 94.7 | 78.1 |
| #10 | 83.4 | 67.8 |
| #20 | 62.9 | 53.5 |
| #40 | 48.3 | 40.3 |
| #60 | 35.6 | 26.0 |
| #140 | 29.7 | 16.3 |
| #200 | 26.5 | 14.9 |
| MAXIMUM DIAMETER - M.M. | | |
| .0400 | 18 | 12.3 |
| .0260 | 16 | 11.2 |
| .0150 | 13 | 9.9 |
| .0100 | 12 | 8.5 |
| .0074 | 11 | 7.6 |
| .0050 | 9 | 6.5 |
| .0036 | 8 | 5.4 |
| .0010 | 6 | 3.9 |
| GRAVEL-% | 5 | 22 |
| SAND-% | 69 | 63 |
| SILT -% | 17 | 9 |
| CLAY-% | 9 | 6 |

SOIL CLASSIFICATION

| SAMPLE NUMBER | SOIL CLASSIFICATION |
|------------------|---|
| WW-64 (Side) | SILTY CLAYEY SAND WITH GRAVEL - SC-SM; Fine- To Medium-Grained Sand And Fine-Grained Gravel, Some Coarse-Grained Sand |
| WW-90 (Side) | SANDY LEAN CLAY - CL |
| WW-110 (Center) | ORGANIC SILTY SAND - OL; Fine- To Medium-Grained, Some Coarse-Grained Sand And Trace Of Fine-Grained Gravel |
| WW-110 (Side) | ORGANIC SILTY SAND WITH GRAVEL - OL; Fine- To Medium-Grained Sand And Fine-Grained Gravel With Some Coarse-Grained Sand |

GRAIN SIZE ANALYSIS - SIEVE METHOD

| | | | | | |
|-----------------------|--|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-64 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 07-13-04 |
| MATERIAL TYPE: | Poorly Graded SAND With Gravel - SP: Fine-Grained Sand And Gravel; Some Medium-Grained Sand And Gravel, Small Amount Of Coarse-Grained Sand | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 1" | 100.0 |
| 3/4" | 88.5 |
| 3/8" | 66.0 |
| #4 | 52.3 |
| #10 | 45.5 |
| #20 | 40.1 |
| #40 | 30.1 |
| #60 | 17.4 |
| #140 | 5.1 |
| #200 | 4.1 |

| | | | | | |
|-----------------------|---|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-80 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 07-14-04 |
| MATERIAL TYPE: | Poorly Graded SAND - SP: Medium- To Coarse-Grained Sand With Some Fine-Grained Sand And Fine-Grained Gravel | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/4" | 100.0 |
| 3/8" | 97.6 |
| #4 | 87.9 |
| #10 | 66.2 |
| #20 | 40.2 |
| #40 | 15.3 |
| #60 | 1.4 |
| #140 | 0.5 |
| #200 | 0.2 |

| | | | | | |
|-----------------------|---|-------------------------|------|---------------------|----------|
| SAMPLE NUMBER: | WW-80 | SAMPLE LOCATION: | Side | SAMPLE DATE: | 07-14-04 |
| MATERIAL TYPE: | Poorly Graded SAND With Gravel - SP: Medium- To Coarse-Grained Sand And Fine-Grained Gravel; Considerable Coarse-Grained Sand | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/4" | 100.0 |
| 3/8" | 79.6 |
| #4 | 59.7 |
| #10 | 41.3 |
| #20 | 29.0 |
| #40 | 20.1 |
| #60 | 9.6 |
| #140 | 5.4 |
| #200 | 4.9 |

| | | | | | |
|-----------------------|--|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-89 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 07-12-04 |
| MATERIAL TYPE: | Poorly Graded SAND With Gravel - SP: Medium- To Coarse-Grained Sand And Fine-Grained Gravel, Trace Fine-Grained Sand | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/4" | 100.0 |
| 3/8" | 76.3 |
| #4 | 52.3 |
| #10 | 31.4 |
| #20 | 16.0 |
| #40 | 5.4 |
| #60 | 1.3 |
| #140 | 0.8 |
| #200 | 0.4 |

| | | | | | |
|-----------------------|---|-------------------------|------|---------------------|----------|
| SAMPLE NUMBER: | WW-89 | SAMPLE LOCATION: | Side | SAMPLE DATE: | 07-12-04 |
| MATERIAL TYPE: | Poorly Graded SAND With Gravel - SP: Fine- To Medium-Grained Sand With Considerable Fine-Grained Gravel And Some Coarse-Grained Sand | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|----------------------|-----------------------------------|
| 3/4" | 100.0 |
| 3/8" | 95.3 |
| #4 | 83.4 |
| #10 | 69.0 |
| #20 | 51.7 |
| #40 | 27.7 |
| #60 | 8.4 |
| #140 | 0.9 |
| #200 | 0.6 |

Should you have any questions or comments whatsoever in regard to these test results, or if any additional information is desired, please do not hesitate to contact me personally at your convenience.

Respectfully Submitted,

WHITNEY & ASSOCIATES

(By)

Richard M. Whitney, P.E.



RRW:rma

TELEPHONE
309 673-2131

TESTS
DESIGN
REPORTS
ANALYSIS
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INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN

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STEEL - REINFORCING CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - HOT-O-PAC

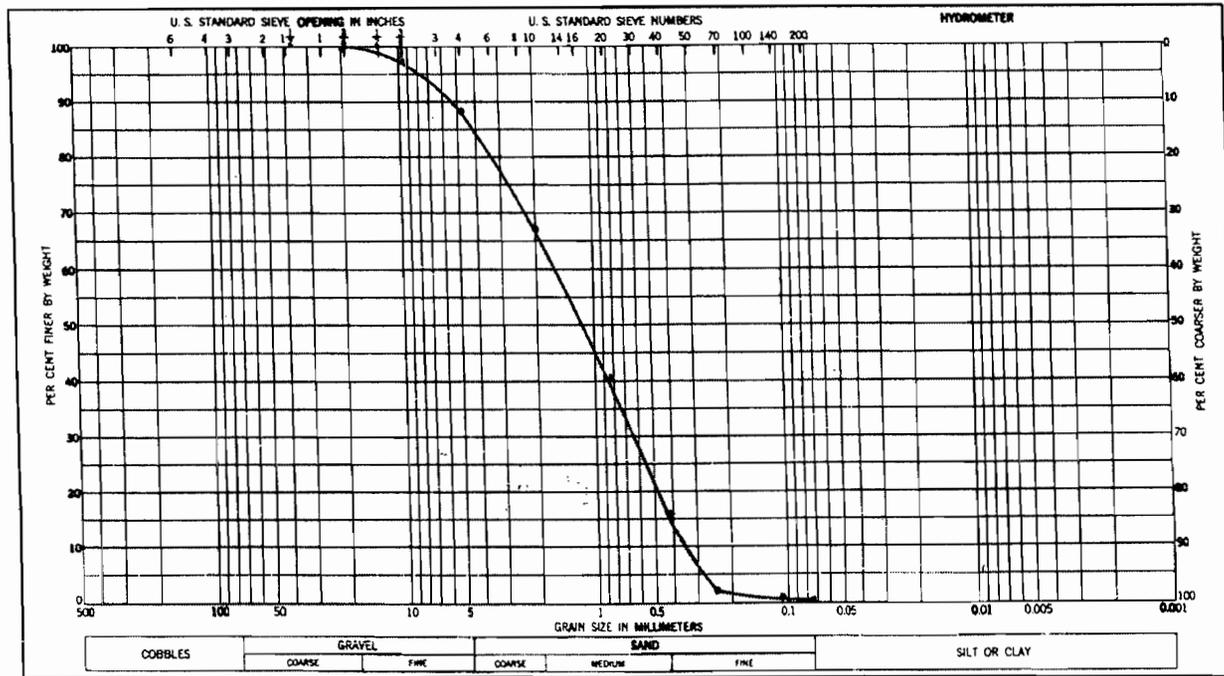
SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRAINING - COHING - TESTING

PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707
DATE 8-13-04
WW-80 Center (07-14-04)



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION Poorly Graded SAND - SP; Medium-
to Coarse-Grained sand with Some UNIFORMITY COEFFICIENT $\frac{D_{60}}{D_{10}} =$ EFFECTIVE GRAIN SIZE, $D_{10} =$
Fine-Grained Sand And Fine-Grained Gravel

TELEPHONE
309 673-2131

TESTS
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PEORIA, ILLINOIS 61604

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STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

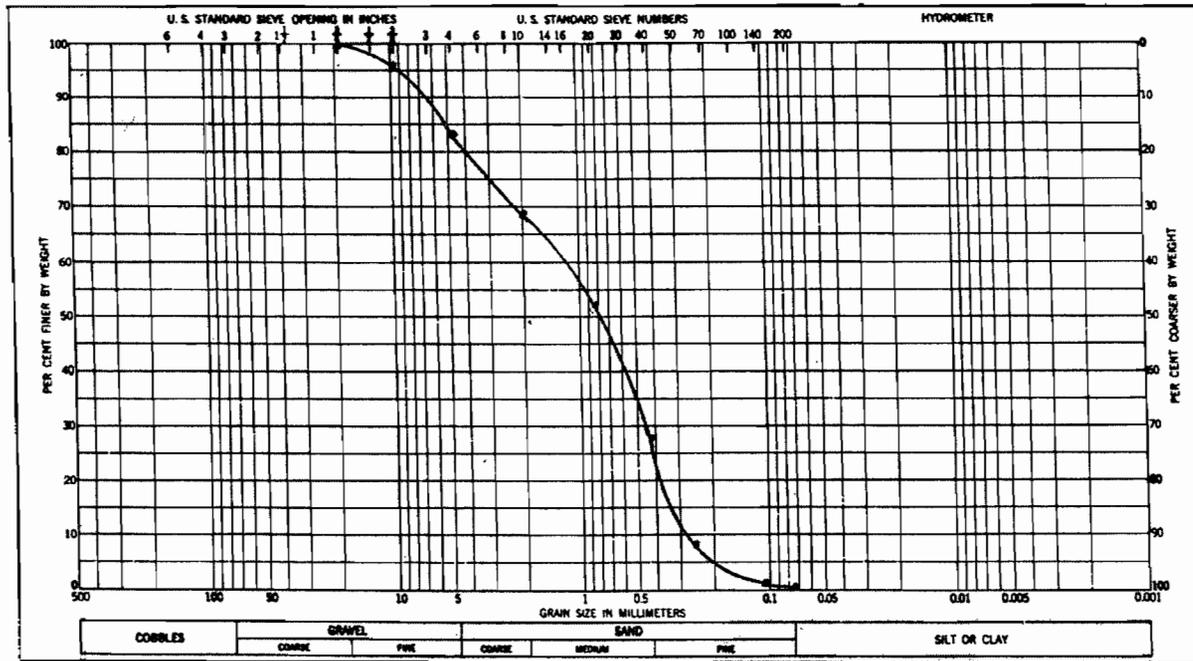
SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W. & A. FILE NO. 3707
DATE 8-13-04
WW-89 Side (07-12-04)



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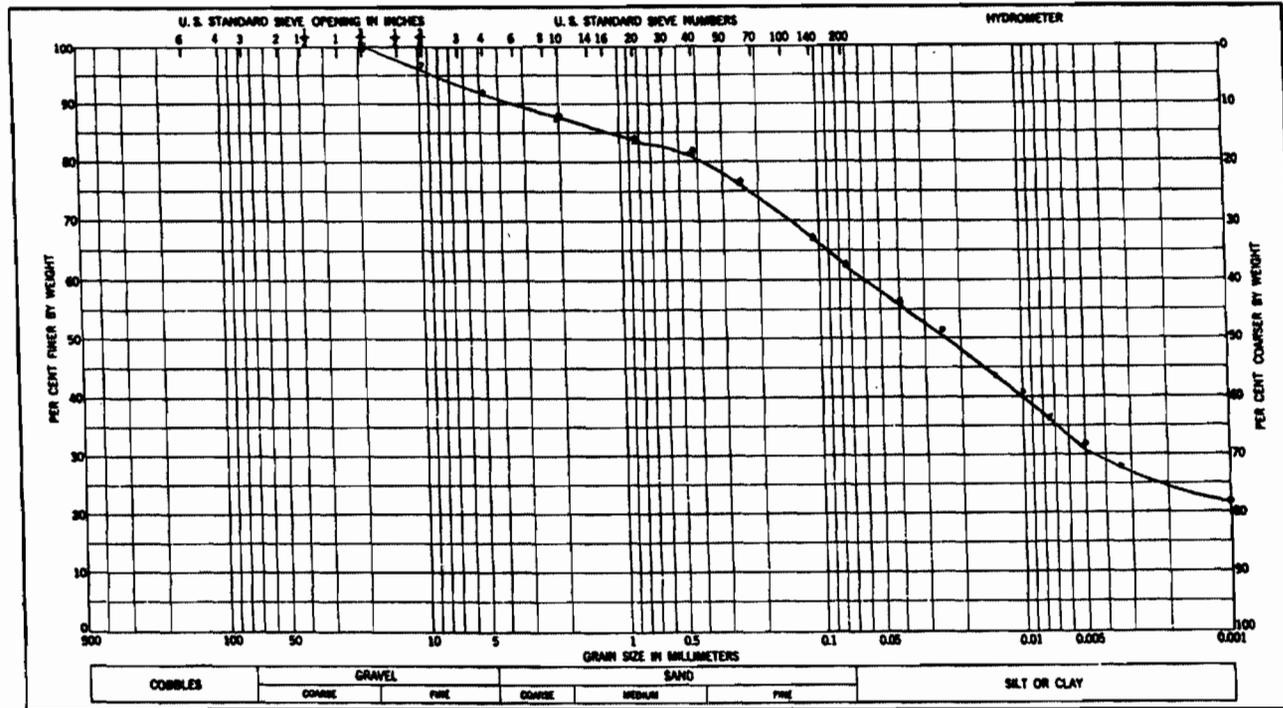
SPECIALISTS IN
SOILS, PORTLAND CEMENT, GUM-BETON,
STEEL, BITUMENOUS CONCRETE,
CONSTRUCTION MATERIALS,
AGGREGATES, ASPHALT, PROXIMAC,
SOILS AND GRAVEL SURVEYS,
MATERIALS QUALITY CONTROL,
SOIL MECHANICS AND
FOUNDATION ENGINEERING,
DRILLING, SOILING, TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago

CLIENT Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707
DATE 8-13-04
WW-90 Side (07-08-04)



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION SANDY LEAN CLAY - CL UNIFORMITY COEFFICIENT, $\frac{D_{60}}{D_{10}} =$ EFFECTIVE GRAIN SIZE, $D_{10} =$

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CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

Metropolitan Water Reclamation

PROJECT: District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

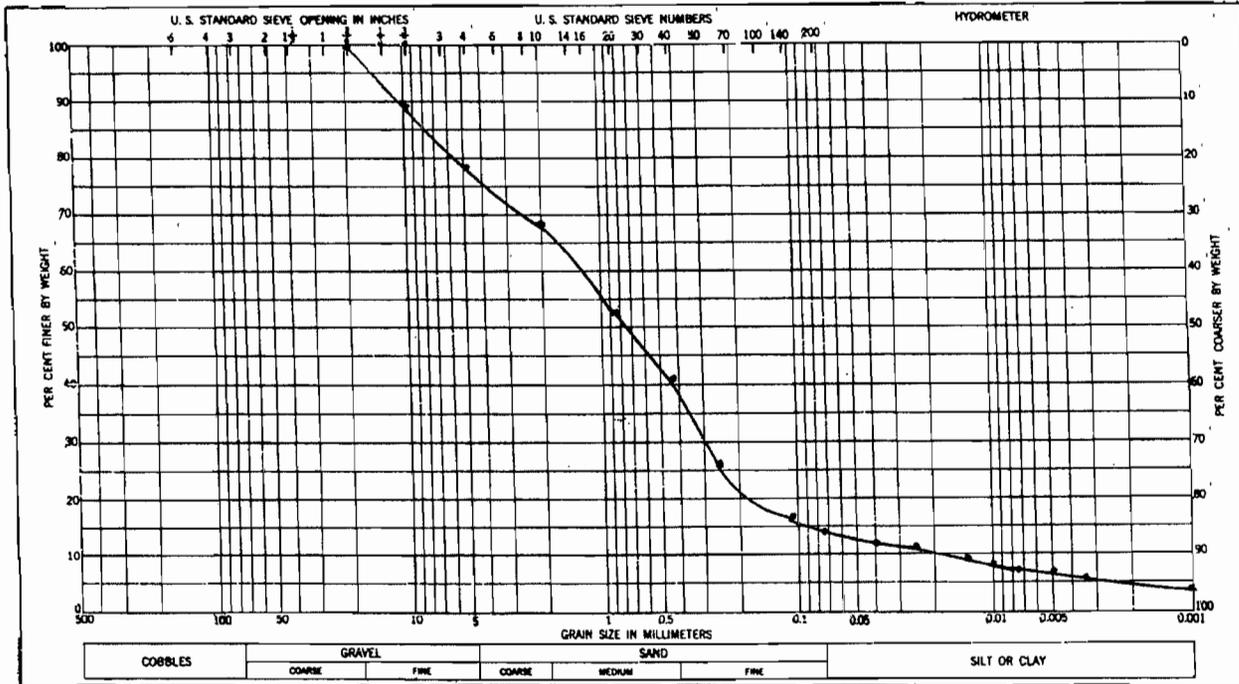
W. & A. FILE NO. 3707

DATE 8-13-04

REPORT OF SOIL/AGGREGATE ANALYSIS

WW-110 Side (07-09-04)

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS



SOIL/AGGREGATE CLASSIFICATION **ORGANIC SILTY SAND With Gravel - OL**
Fine- To Medium-Grained Sand And Fine-Grained
Gravel With Some Coarse-Grained Sand

UNIFORMITY COEFFICIENT, $\frac{D_{60}}{D_{10}} =$ _____ EFFECTIVE GRAIN SIZE, $D_{10} =$ _____

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY

SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZZOLANIC MATERIALS * LIME



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GEO-TECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS

MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

CLIENT:

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Grace Analytical Laboratory
5400-B McDermott Drive
Berkeley, Illinois 60163

W&A FILE NO. 3707003
DATE: 08-23-04

PROJECT:

Metropolitan Water Reclamation
District of Greater Chicago

GRAIN SIZE ANALYSIS - HYDROMETER METHOD

| SIEVE DESIGNATION | PERCENTAGE FINER - % | | |
|------------------------------------|----------------------------|--------------------------|----------------------------|
| | WW-79 (CENTER) 07-15-04 | WW-77 (SIDE) 07-20-04 | WW-77 (CENTER) 07-20-04 |
| 3/4" | 100.0 | 100.0 | 100.0 |
| 3/8" | 100.0 | 100.0 | 93.5 |
| #4 | 100.0 | 95.6 | 86.2 |
| #10 | 100.0 | 93.2 | 76.9 |
| #20 | 99.0 | 91.1 | 68.1 |
| #40 | 97.8 | 88.4 | 61.7 |
| #60 | 96.4 | 77.7 | 51.2 |
| #140 | 93.6 | 69.9 | 39.9 |
| #200 | 92.4 | 66.4 | 36.7 |
| MAXIMUM DIAMETER - M.M. | | | |
| .0400 | 76.2 | 50.6 | 34.7 |
| .0260 | 65.0 | 45.0 | 28.5 |
| .0150 | 55.2 | 37.4 | 24.5 |
| .0100 | 48.4 | 31.8 | 21.4 |
| .0074 | 42.2 | 26.2 | 19.7 |
| .0050 | 34.3 | 21.8 | 17.1 |
| .0036 | 29.6 | 19.2 | 15.6 |
| .0010 | 19.4 | 12.6 | 11.8 |
| GRAVEL-% | 0 | 4 | 14 |
| SAND-% | 8 | 30 | 49 |
| SILT -% | 58 | 44 | 19 |
| CLAY-% | 34 | 22 | 18 |

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL CLASSIFICATION

| SAMPLE NUMBER | SOIL CLASSIFICATION |
|----------------|---|
| WW-79 (Center) | LEAN CLAY - CL |
| WW-77 (Side) | SANDY SILTY CLAY - CL-ML |
| WW-77 (Center) | SILTY CLAYEY SAND - SC-SM; Fine-Grained With Some Medium-To Coarse-Grained Sand And Fine-Grained Gravel |

GRAIN SIZE ANALYSIS - SIEVE METHOD

| | | | | | |
|-----------------------|---|-------------------------|------|---------------------|----------|
| SAMPLE NUMBER: | WW-18 | SAMPLE LOCATION: | Side | SAMPLE DATE: | 07-19-04 |
| MATERIAL TYPE: | Poorly Graded; Fine- To Medium-Grained SAND; Some Coarse-Grained Sand And Trace of Fine-Grained Gravel - SP | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/8" | 100.0 |
| #4 | 96.8 |
| #10 | 82.0 |
| #20 | 61.6 |
| #40 | 32.9 |
| #60 | 8.3 |
| #140 | 1.5 |
| #200 | 1.1 |

| | | | | | |
|-----------------------|---|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-18 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 07-19-04 |
| MATERIAL TYPE: | Poorly Graded; Fine- To Medium-Grained SAND; Small Amount Of Coarse-Grained Sand - SP | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/8" | 100.0 |
| #4 | 99.7 |
| #10 | 93.3 |
| #20 | 65.1 |
| #40 | 27.6 |
| #60 | 3.5 |
| #140 | 1.4 |
| #200 | 1.0 |

Should you have any questions or comments whatsoever in regard to these test results, or if any additional information is desired, please do not hesitate to contact me personally at your convenience.

Respectfully submitted,

WHITNEY & ASSOCIATES

(By)

Richard R. Whitney, P. E.



RRW:ma

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399 673-2131

TESTS
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WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-G-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

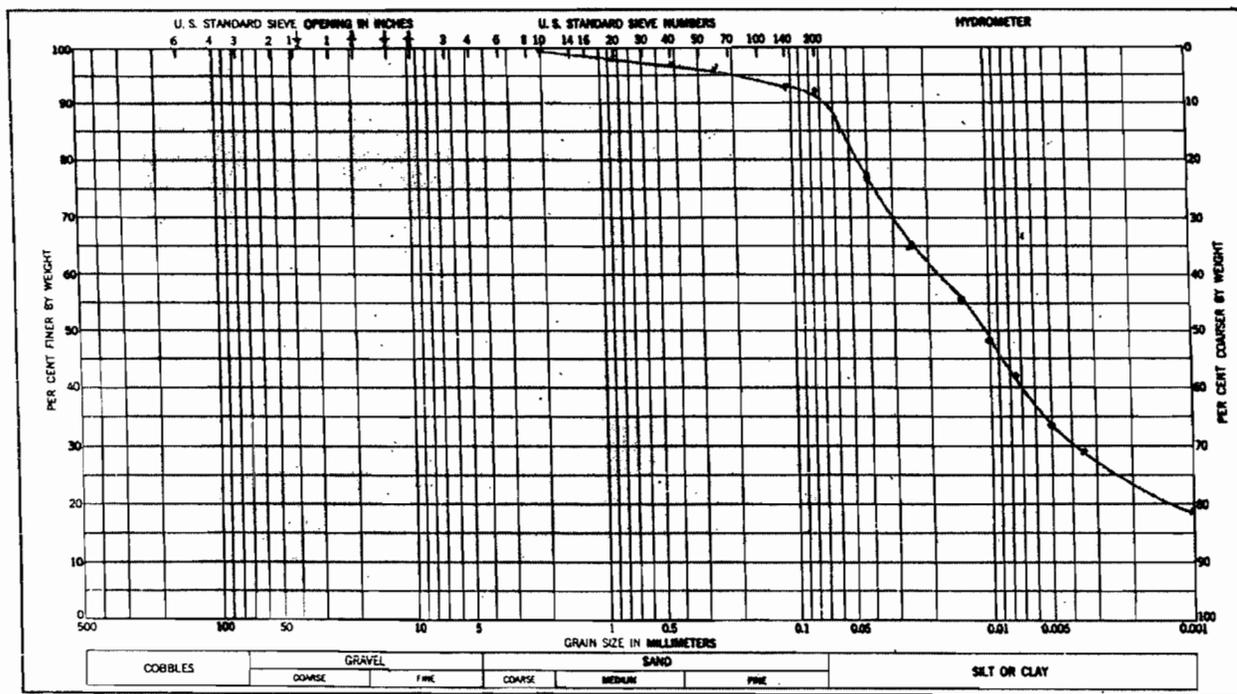
CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

W. & A. FILE NO. 3707

DATE 8-23-04

WW79 (Center)
07-15-04

REPORT OF SOIL/AGGREGATE ANALYSIS



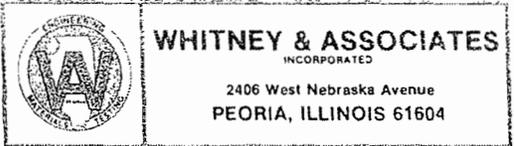
SOIL/AGGREGATE CLASSIFICATION LEAN CLAY - CL

UNIFORMITY COEFFICIENT, $\frac{D_{60}}{D_{10}} =$ _____ EFFECTIVE GRAIN SIZE, $D_{10} =$ _____

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

TELEPHONE
309 970-2131

TESTS
DESIGN
REPORTS
ANALYSIS
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SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
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AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING CORING TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago

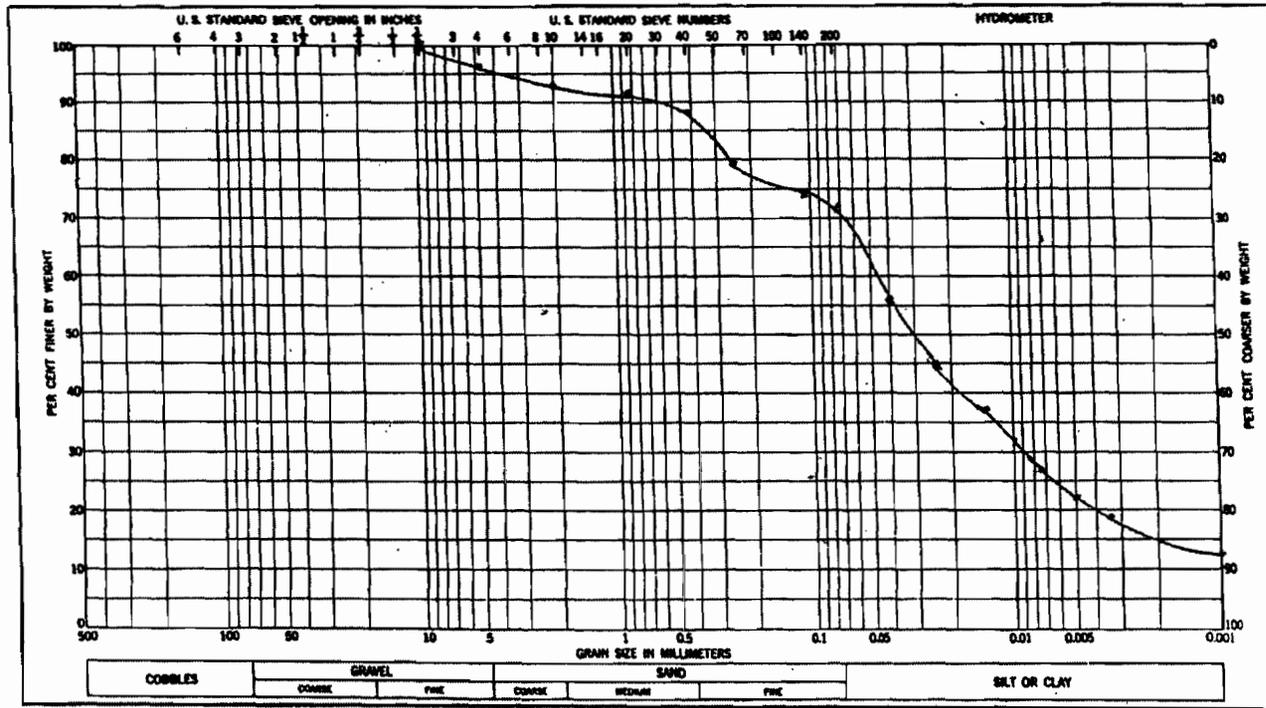
CLIENT Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707

DATE 8-23-04

WW77 (Side) 07-20-04



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309 672-2131

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WHITNEY & ASSOCIATES
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2406 West Nebraska Avenue
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SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT: Metropolitan Water Reclamation
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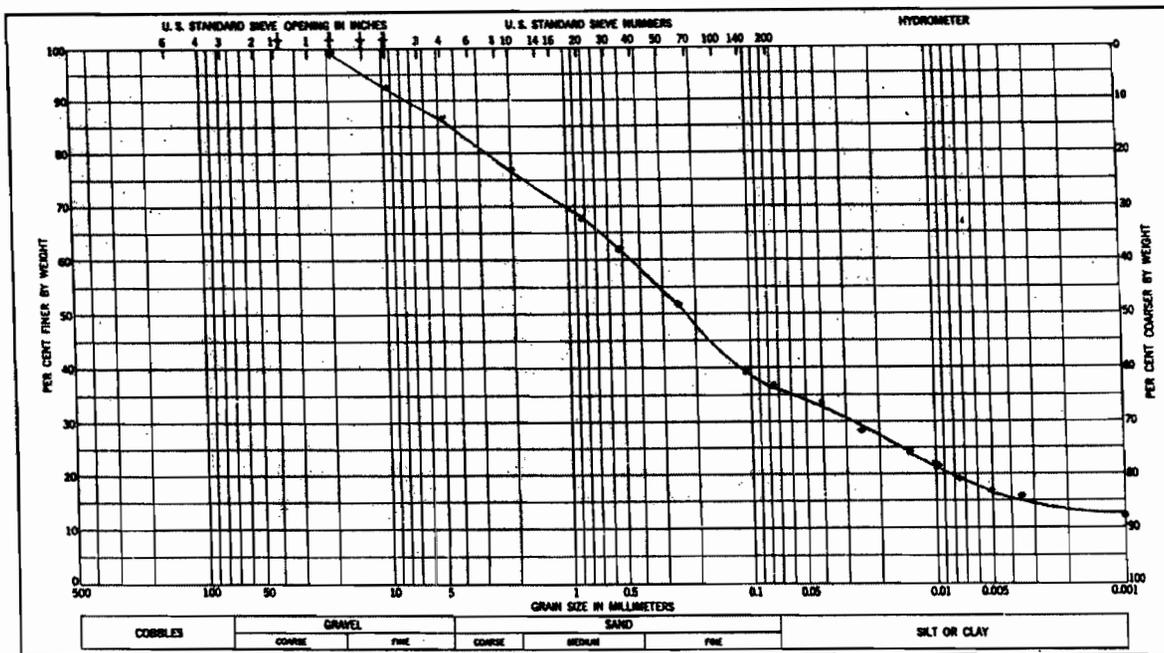
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REPORT OF SOIL/AGGREGATE ANALYSIS

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DATE 8-23-04

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PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

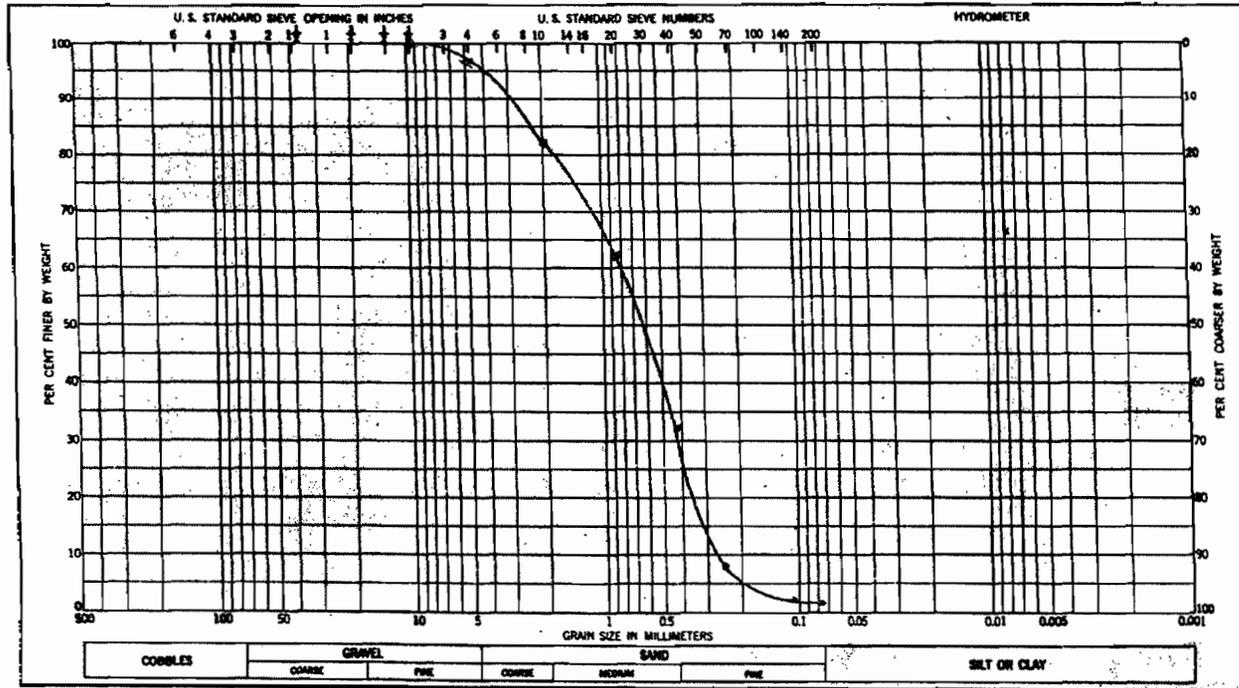
CLIENT: Grace Analytical Laboratory
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DATE 8-23-04

WW18 (Side) 07-19-04

REPORT OF SOIL/AGGREGATE ANALYSIS

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS



SOIL/AGGREGATE CLASSIFICATION Poorly Graded; Fine- To Medium-Grained SAND: Some Coarse-Grained Sand And Trace of Fine-Grained Gravel - SP UNIFORMITY COEFFICIENT, $\frac{D_{60}}{D_{10}} =$ EFFECTIVE GRAIN SIZE, $D_{10} =$

TELEPHONE
329 673 2131

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PEORIA, ILLINOIS 61604

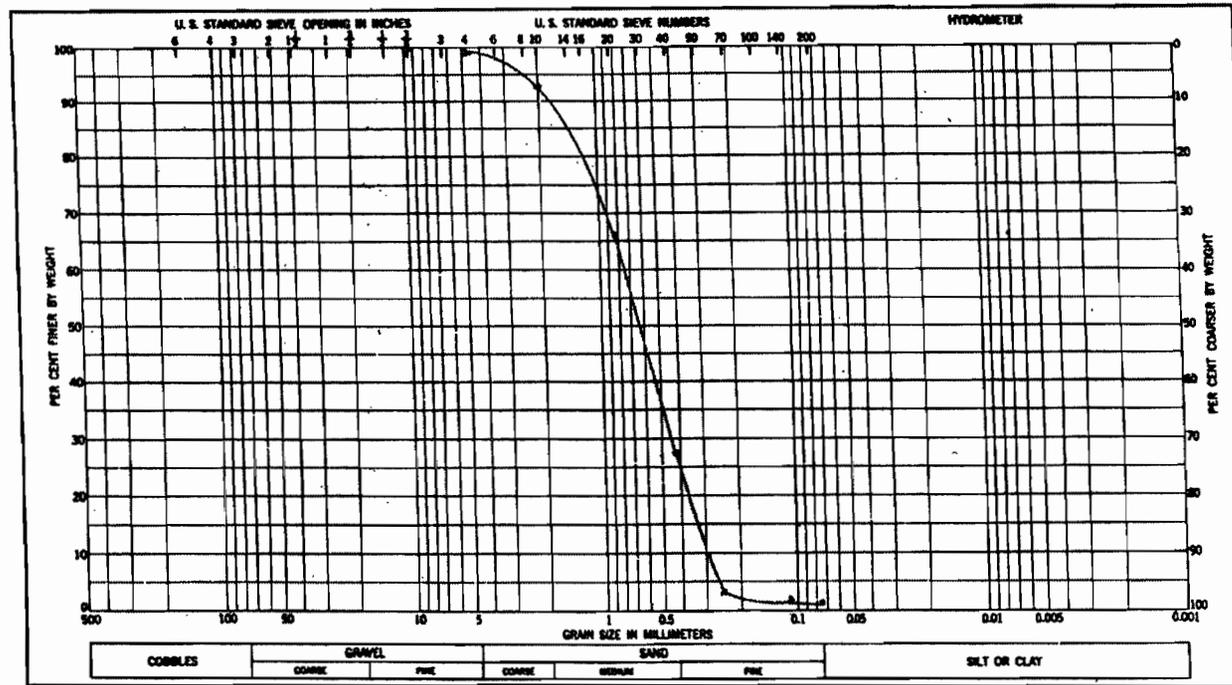
SPECIALISTS IN
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STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago
CLIENT Grace Analytical Laboratory
Berkeley, Illinois

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DATE 8-23-04
WW18 (Center) 07-19-04

REPORT OF SOIL/AGGREGATE ANALYSIS



TELEPHONE
309-673-2131

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ANALYSIS • DESIGN • EVALUATIONS
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ARBITRATION • EXPERT WITNESS TESTIMONY

SOILS • PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE • STEEL
ASPHALT • AGGREGATES • EMULSIONS
POZZOLANIC MATERIALS • LIME



WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604-3193

TELEFAX
309-673-3050

GEO TECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS

MONITORING WELL INSTALLATIONS
BUILD-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

CLIENT:

Ms. Grace Kim
Grace Analytical Laboratory
5400-B McDermott Drive
Berkeley, Illinois 60163

W&A FILE NO. 3707004
DATE: 09-24-04

PROJECT:

Metropolitan Water Reclamation
District of Greater Chicago

GRAIN SIZE ANALYSIS - HYDROMETER METHOD

| SIEVE DESIGNATION | PERCENTAGE FINER - % WW24 (SIDE) 08-11-04 |
|--------------------------------|--|
| 3/8" | 100.0 |
| #4 | 99.3 |
| #10 | 98.1 |
| #20 | 96.9 |
| #40 | 95.4 |
| #60 | 93.6 |
| #140 | 82.4 |
| #200 | 77.3 |
| MAXIMUM DIAMETER - M.M. | |
| .0400 | 64.4 |
| .0260 | 57.5 |
| .0150 | 51.6 |
| .0100 | 45.9 |
| .0074 | 41.8 |
| .0050 | 35.6 |
| .0036 | 32.0 |
| .0010 | 21.8 |
| SAND-% | 23 |
| SILT -% | 41 |
| CLAY-% | 36 |
| SOIL CLASSIFICATION | ORGANIC CLAY WITH SAND - CL |

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

Should you have any questions or comments whatsoever in regard to these test results, or if any additional information is desired, please do not hesitate to contact me personally at your convenience.

Respectfully submitted,

WHITNEY & ASSOCIATES

(By)

Richard R. Whitney, P.E.

A handwritten signature in cursive script, appearing to read "Richard R. Whitney", is written over a circular professional seal. The seal contains the text "STATE OF ILLINOIS" and "PEORIA, ILLINOIS".

RRW:ma

TELEPHONE
309 673-7131

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WHITNEY & ASSOCIATES
INCORPORATED

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PEORIA, ILLINOIS 61604

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SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

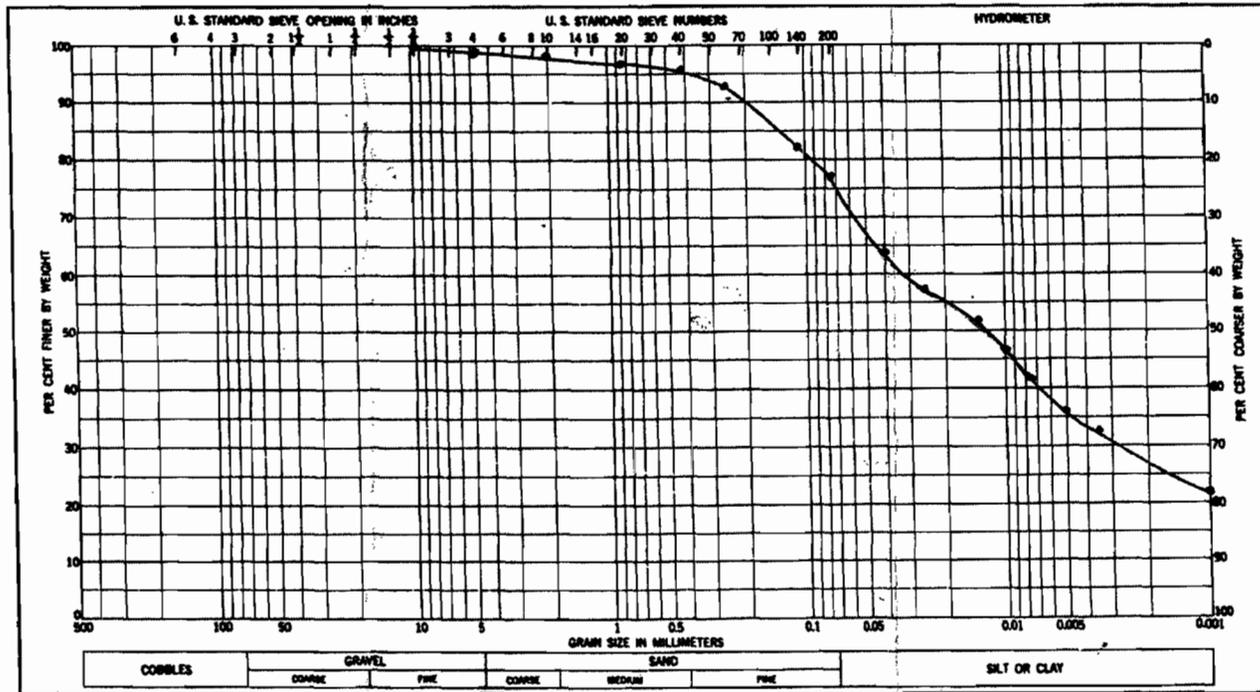
CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707

DATE 9-24-04

WW-24 (Side)
08-11-04



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION ORGANIC CLAY WITH SAND - CL UNIFORMITY COEFFICIENT, $\frac{D_{60}}{D_{10}} =$ EFFECTIVE GRAIN SIZE, $D_{10} =$

TELEPHONE
309-673-2131

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PEORIA, ILLINOIS 61604-3193

TELEFAX
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ENVIRONMENTAL INVESTIGATIONS

MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

CLIENT:

Ms. Grace Kim
Grace Analytical Laboratory
5400-B McDermott Drive
Berkeley, Illinois 60163

W&A FILE NO. 3707005
DATE: 10-25-04

PROJECT:

Metropolitan Water Reclamation
District of Greater Chicago

GRAIN SIZE ANALYSIS - HYDROMETER METHOD

| SIEVE DESIGNATION | PERCENTAGE FINER - % | | |
|------------------------------------|--------------------------|--------------------------|----------------------------|
| | WW-19 (SIDE) 09-20-04 | WW-23 (SIDE) 09-21-04 | WW-23 (CENTER) 09-21-04 |
| #4 | 100.0 | 100.0 | 100.0 |
| #10 | 99.5 | 100.0 | 98.0 |
| #20 | 99.0 | 99.2 | 95.3 |
| #40 | 98.1 | 98.2 | 90.9 |
| #60 | 96.5 | 97.4 | 81.9 |
| #140 | 87.9 | 93.5 | 69.2 |
| #200 | 84.4 | 89.6 | 65.7 |
| MAXIMUM DIAMETER - M.M. | | | |
| .0400 | 67.7 | 67.8 | 55.2 |
| .0260 | 59.7 | 53.1 | 46.1 |
| .0150 | 50.6 | 41.2 | 36.3 |
| .0100 | 44.8 | 36.9 | 30.4 |
| .0074 | 38.8 | 30.8 | 26.5 |
| .0050 | 31.6 | 24.9 | 21.3 |
| .0036 | 27.7 | 21.4 | 19.4 |
| .0010 | 17.6 | 14.5 | 12.6 |
| GRAVEL-% | 0 | 0 | 0 |
| SAND-% | 16 | 10 | 34 |
| SILT -% | 52 | 65 | 45 |
| CLAY-% | 32 | 25 | 21 |

WHITNEY & ASSOCIATES
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| SIEVE DESIGNATION | PERCENTAGE FINER - % | | |
|------------------------------------|--------------------------|---------------------------|--------------------------|
| | WW-29 (SIDE) 09-22-04 | WW-109 (SIDE) 09-06-04 | WW-22 (SIDE) 09-08-04 |
| #4 | 100.0 | 100.0 | 100.0 |
| #10 | 99.6 | 92.7 | 96.9 |
| #20 | 99.2 | 90.1 | 93.4 |
| #40 | 96.0 | 86.6 | 86.6 |
| #60 | 92.2 | 77.3 | 80.6 |
| #140 | 85.9 | 60.7 | 58.5 |
| #200 | 82.3 | 56.2 | 47.9 |
| MAXIMUM DIAMETER - M.M. | | | |
| .0400 | 65.8 | 45.6 | 30.0 |
| .0260 | 54.8 | 39.9 | 24.2 |
| .0150 | 40.9 | 34.3 | 19.6 |
| .0100 | 36.8 | 30.4 | 16.5 |
| .0074 | 30.9 | 28.6 | 14.5 |
| .0050 | 23.8 | 24.1 | 11.3 |
| .0036 | 19.7 | 20.2 | 9.5 |
| .0010 | 12.2 | 14.3 | 7.0 |
| GRAVEL-% | 0 | 0 | 0 |
| SAND-% | 18 | 44 | 52 |
| SILT -% | 58 | 32 | 37 |
| CLAY-% | 24 | 24 | 11 |

| SIEVE DESIGNATION | PERCENTAGE FINER - % | |
|------------------------------------|--------------------------|----------------------------|
| | WW-20 (SIDE) 09-09-04 | WW-20 (CENTER) 09-09-04 |
| 3/4" | 100.0 | 100.0 |
| 3/8" | 100.0 | 97.2 |
| #4 | 100.0 | 89.8 |
| #10 | 99.5 | 72.2 |
| #20 | 97.3 | 48.3 |
| #40 | 90.9 | 26.7 |
| #60 | 88.0 | 16.5 |
| #140 | 80.9 | 14.2 |
| #200 | 78.2 | 13.6 |
| MAXIMUM DIAMETER - M.M. | | |
| .0400 | 63.7 | 11.2 |
| .0260 | 54.7 | 9.7 |
| .0150 | 44.8 | 8.3 |
| .0100 | 39.8 | 6.9 |
| .0074 | 32.7 | 6.1 |
| .0050 | 27.1 | 4.4 |
| .0036 | 23.7 | 3.5 |
| .0010 | 13.1 | 2.6 |
| GRAVEL-% | 0 | 10 |
| SAND-% | 22 | 76 |
| SILT -% | 51 | 10 |
| CLAY-% | 27 | 4 |

SOIL CLASSIFICATION

| SAMPLE NUMBER | SOIL CLASSIFICATION |
|------------------|---|
| WW-19 (Side) | Organic Clay with Sand - OL |
| WW-23 (Side) | Lean Clay - CL |
| WW-23 (Center) | Sandy Silty Clay - CL-ML |
| WW-29 (Side) | Silty Clay With Sand - CL-ML |
| WW-109 (Side) | Sandy Organic Clay - OL (Sample Contained Small Amount Of Shells) |
| WW-22 (Side) | Organic, Silty Fine-Grained Sand; Small Amount Of Medium- And Coarse-Grained Sand - SM |
| WW-20 (Side) | Organic Clay With Sand - OL |
| WW-20 (Center) | Silty Medium-Grained Sand; Considerable Coarse-Grained Sand With Some Fine-Grained Sand And Fine-Grained Gravel - SML |

GRAIN SIZE ANALYSIS - SIEVE METHOD

| | | | | | |
|-----------------------|---|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-19 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 09-20-04 |
| MATERIAL TYPE: | Well-Graded Medium- To Coarse-Grained Sand With Fine-Grained Gravel; Small Amount of Fine-Grained Sand - SW (Sample Contained Numerous Shells) | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/4" | 100.0 |
| 3/8" | 91.2 |
| #4 | 77.3 |
| #10 | 43.6 |
| #20 | 18.8 |
| #40 | 8.6 |
| #60 | 4.5 |
| #140 | 3.0 |
| #200 | 2.4 |
| GRAVEL-% | 23 |
| SAND-% | 75 |
| SILT -% | 1 |
| CLAY-% | 1 |

| | | | | | |
|-----------------------|---|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-29 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 09-22-04 |
| MATERIAL TYPE: | Poorly Graded; Fine-Grained Gravel With Coarse-Grained Sand; Small Amount of Medium-Grained Sand - GP (Sample Contained Small Amount Of Shells) | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/4" | 100.0 |
| 3/8" | 75.7 |
| #4 | 28.5 |
| #10 | 7.6 |
| #20 | 2.2 |
| #40 | 0.9 |
| #60 | 0.5 |
| #140 | 0.3 |
| #200 | 0.2 |
| GRAVEL-% | 72 |
| SAND-% | 28 |
| SILT -% | 0 |
| CLAY-% | 0 |

| | | | | | |
|-----------------------|--|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-109 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 09-08-04 |
| MATERIAL TYPE: | Poorly Graded; Medium-Grained Sand; Some Fine- And Coarse-Grained Sand And Fine-Grained Gravel - SP (Sample Contained Trace Of Shells) | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 3/4" | 100.0 |
| 3/8" | 92.9 |
| #4 | 88.9 |
| #10 | 79.4 |
| #20 | 48.6 |
| #40 | 12.0 |
| #60 | 1.5 |
| #140 | 0.7 |
| #200 | 0.6 |
| GRAVEL-% | 11 |
| SAND-% | 88 |
| SILT -% | 1 |
| CLAY-% | 0 |

| | | | | | |
|-----------------------|---|-------------------------|--------|---------------------|----------|
| SAMPLE NUMBER: | WW-22 | SAMPLE LOCATION: | Center | SAMPLE DATE: | 09-08-04 |
| MATERIAL TYPE: | Poorly Graded Fine- To Coarse-Grained Gravel And Coarse-Grained Sand; Some Medium-Grained Sand; Trace Fine-Grained Sand - GP (Sample Contained Trace Of Shells) | | | | |

| SIEVE DESIGNATION | PERCENTAGE BY WEIGHT PASSING-% |
|-------------------|--------------------------------|
| 1 1/2" | 100.0 |
| 1" | 79.2 |
| 3/4" | 79.2 |
| 3/8" | 62.0 |
| #4 | 41.0 |
| #10 | 17.3 |
| #20 | 7.9 |
| #40 | 4.2 |
| #60 | 2.0 |
| #140 | 0.7 |
| #200 | 0.5 |
| GRAVEL-% | 59 |
| SAND-% | 41 |
| SILT -% | 0 |
| CLAY-% | 0 |

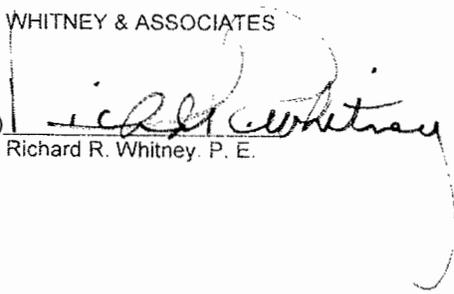
October 25, 2004

Should you have any questions or comments whatsoever in regard to these test results, or if any additional information is desired, please do not hesitate to contact me personally at your convenience.

Respectfully submitted,

WHITNEY & ASSOCIATES

(By)


Richard R. Whitney, P. E.

RRW:ma

TELEPHONE
109 670-2131

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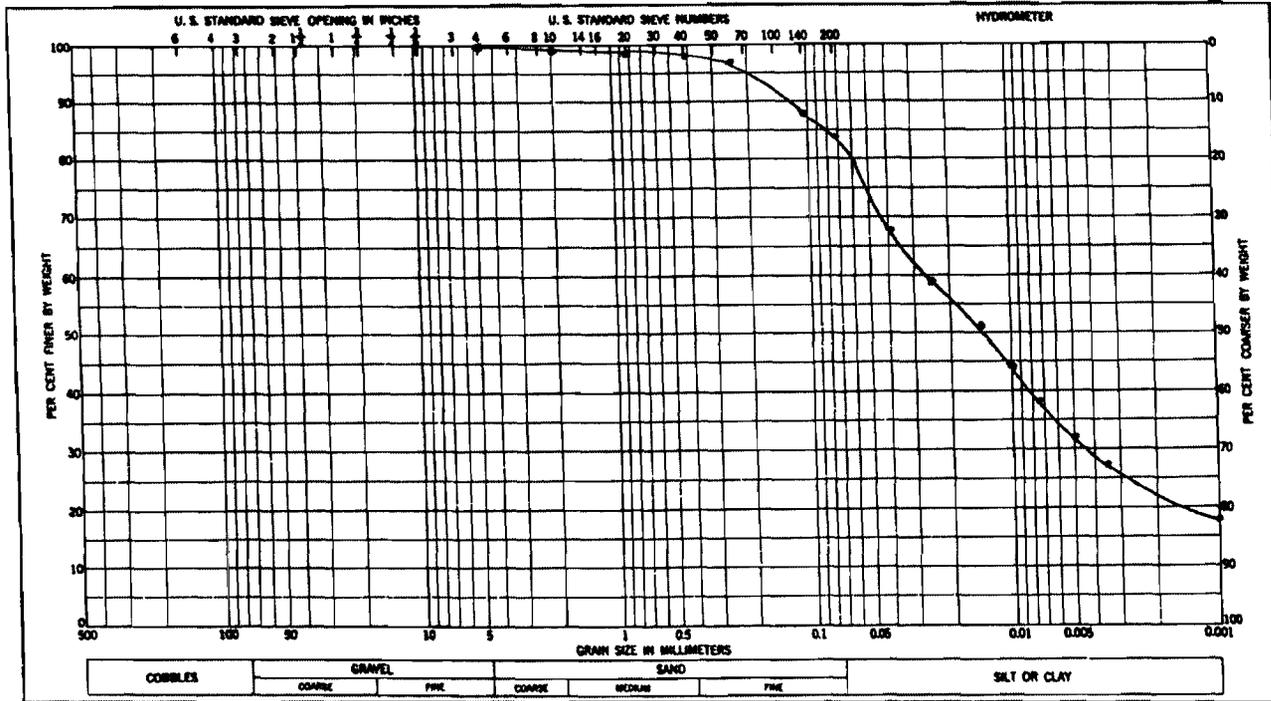
SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
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PROJECT Metropolitan Water Reclamation
District of Greater Chicago

CLIENT Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707
DATE 10-25-04
WW-19 Side (09-20-04)



TELEPHONE
309-973-2131

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PEORIA, ILLINOIS 61604

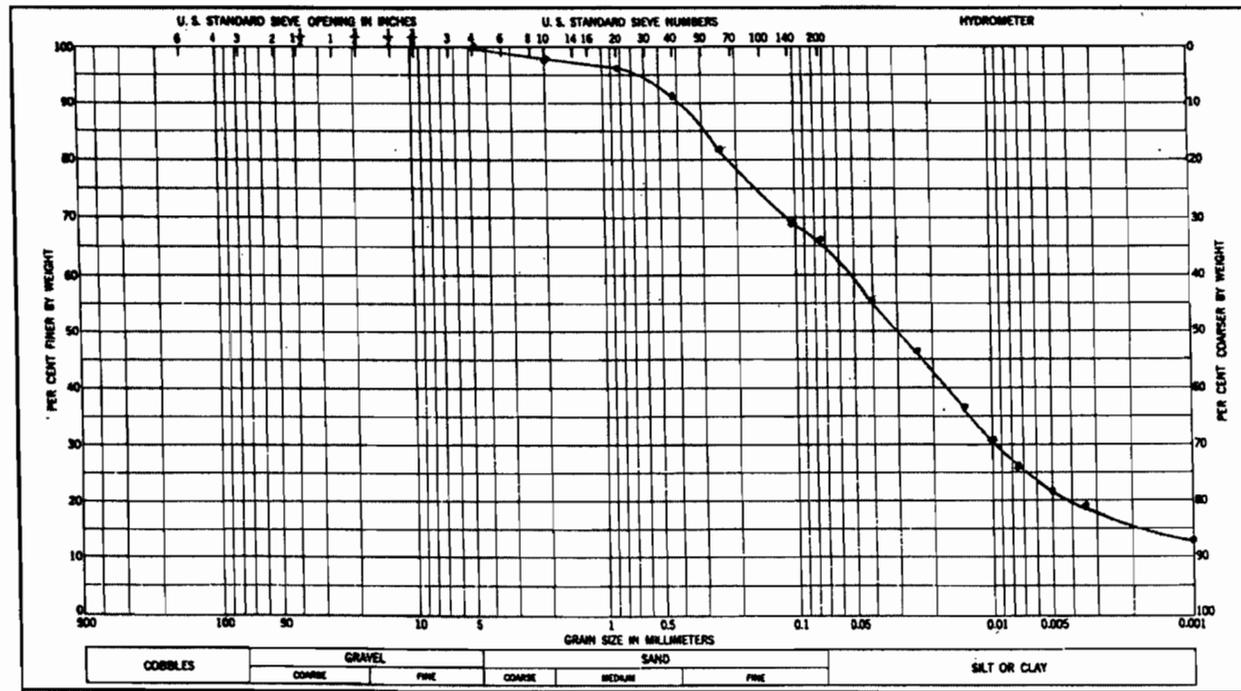
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SEAL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ G. PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago
CLIENT Grace Analytical Laboratory
Berkeley, Illinois

W & A FILE NO 3707
DATE 10-25-04
WW-23 Center (09-21-04)

REPORT OF SOIL/AGGREGATE ANALYSIS



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION SANDY SILTY CLAY - CL-ML

UNIFORMITY COEFFICIENT $\frac{D_{60}}{D_{10}}$

EFFECTIVE GRAIN SIZE, D_{10}

TELEPHONE
309-471-2151

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PEORIA, ILLINOIS 61604

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STEEL, & TUMING, GENERAL
CONSTRUCTION MATERIALS,
AGGREGATES, ASPHALT, PULVERIZED

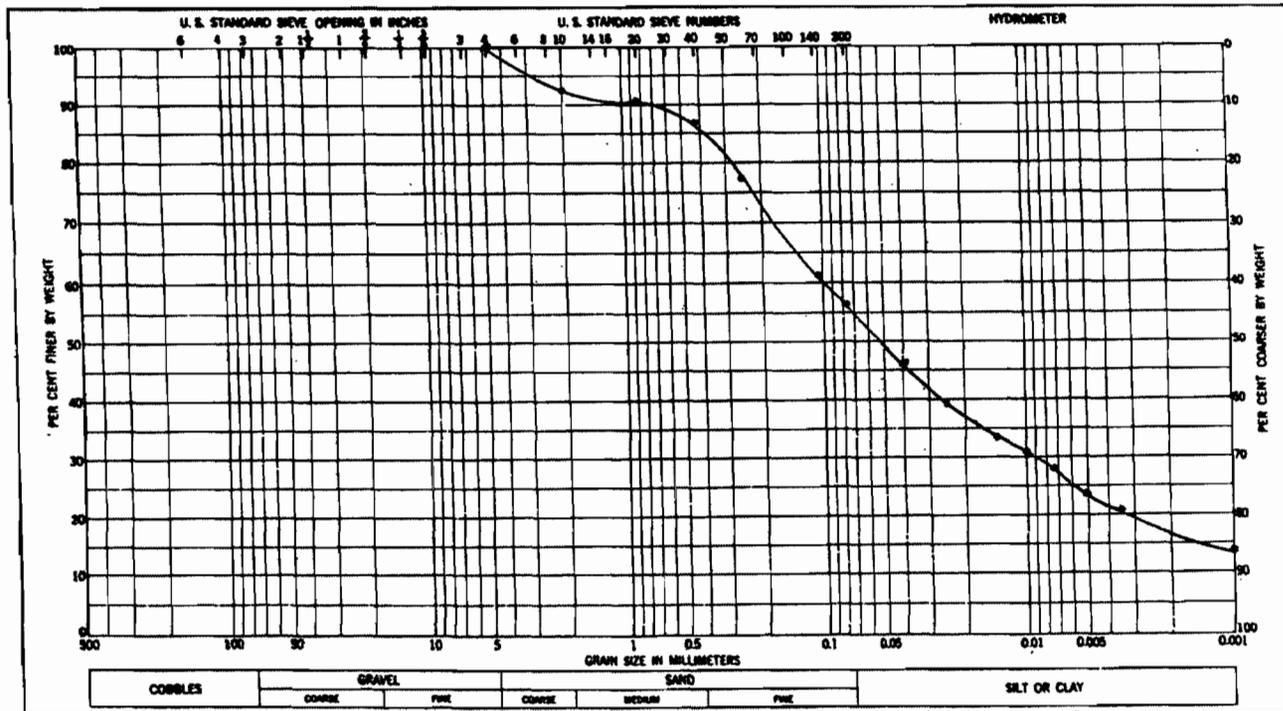
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MATERIALS QUALITY CONTROL,
SOIL MECHANICS AND
FOUNDATION ENGINEERING,
DRILLING, BORING, TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707
DATE 10-25-04
WW-109 Side (09-06-04)



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION SANDY ORGANIC CLAY - OL (Sample Contained Small Amount Of Shells) UNIFORMITY COEFFICIENT $\frac{D_{60}}{D_{10}} =$ _____ EFFECTIVE GRAIN SIZE, D₁₀: _____

TELEPHONE
325 513-2121

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WHITNEY & ASSOCIATES
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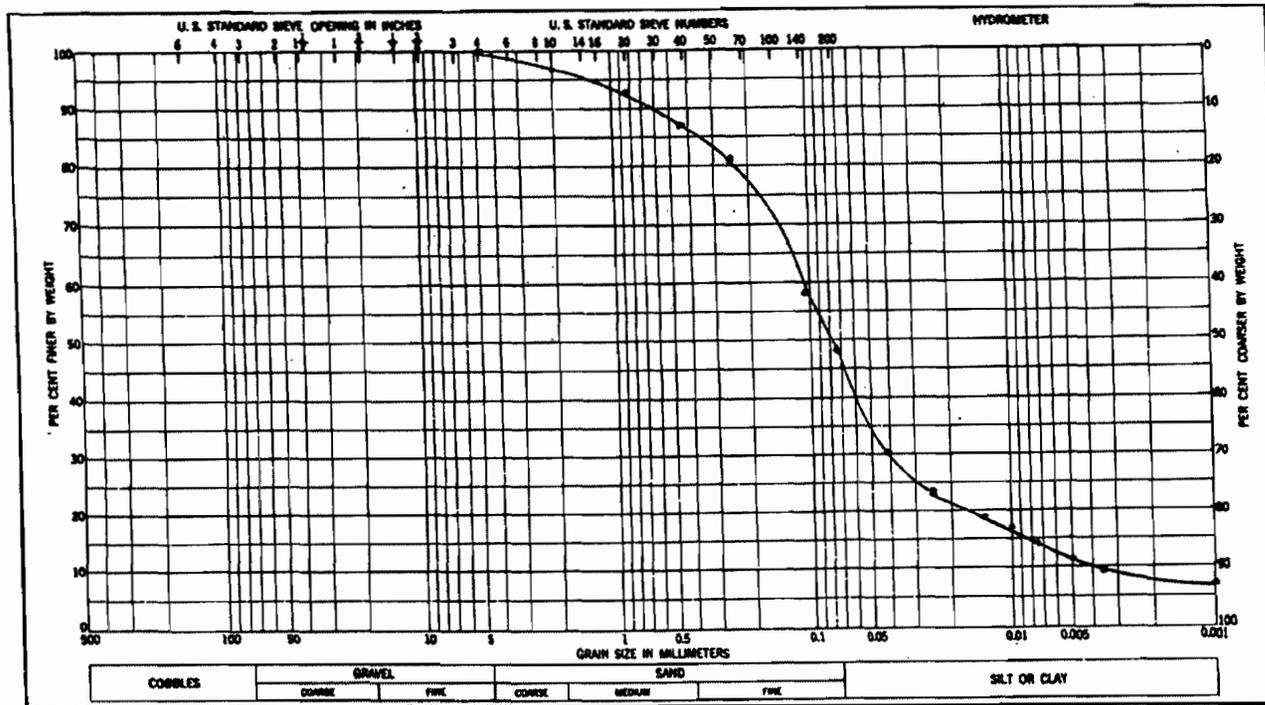
SPECIALISTS IN
PORTLAND CEMENT, PORTLAND
CEMENT, READY-MIXED CONCRETE,
CONSTRUCTION MATERIALS,
AGGREGATES, ASPHALT, ASPHALT
CONCRETE
SOILS AND GRAVEL SAMPLES
MATERIALS QUALITY CONTROL,
SOIL MECHANICS AND
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DRILLING, CORING, TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago

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REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO. 3707
DATE 10-25-04
WW-22 Side (09-08-04)



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SPECIALISTS IN
ASPHALT AND CEMENT CONCRETE
SPECIALTY MIXTURE CONCRETE
CONSULTATION MATERIALS
AGGREGATE ASPHALT PAVEMENT

SOILS AND GRAVEL SURVEYS
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SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING CORE TESTING

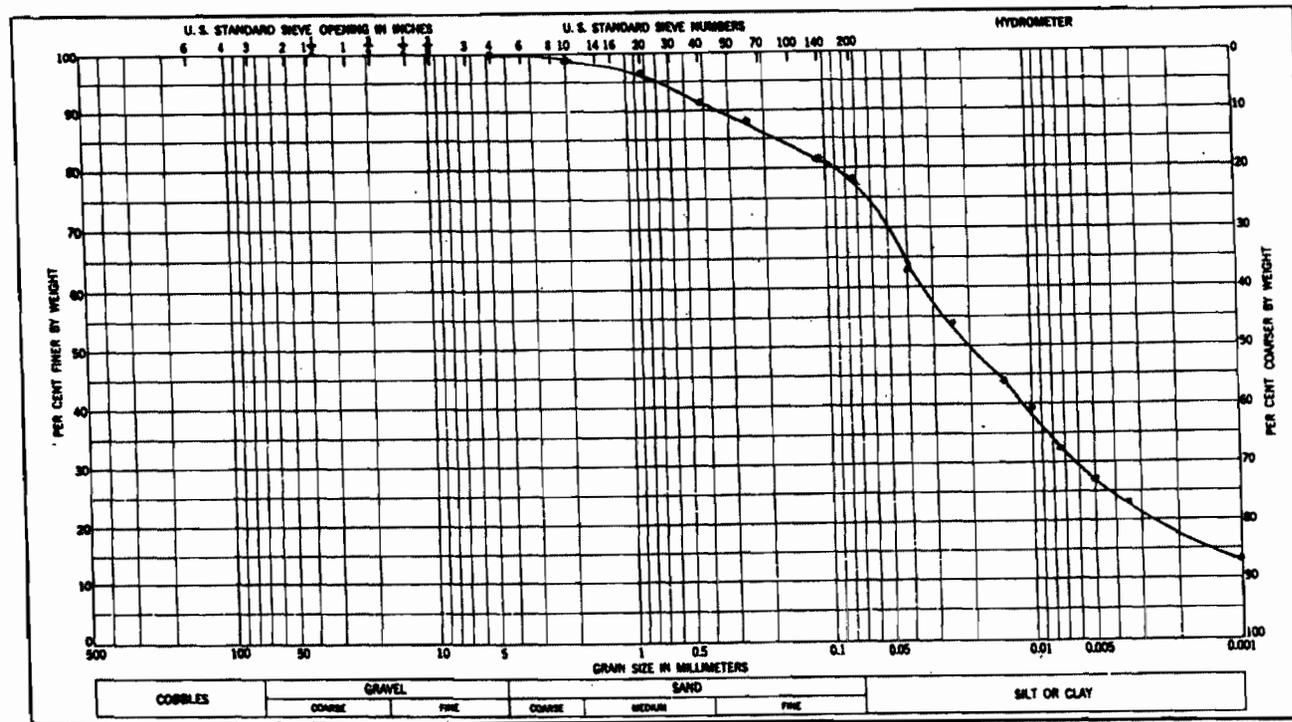
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District of Greater Chicago

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DATE 10-25-04

REPORT OF SOIL/AGGREGATE ANALYSIS

RW-20 Side (09-09-04)



TELEPHONE
309 670-2121

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS



WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - ADZ-GRAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

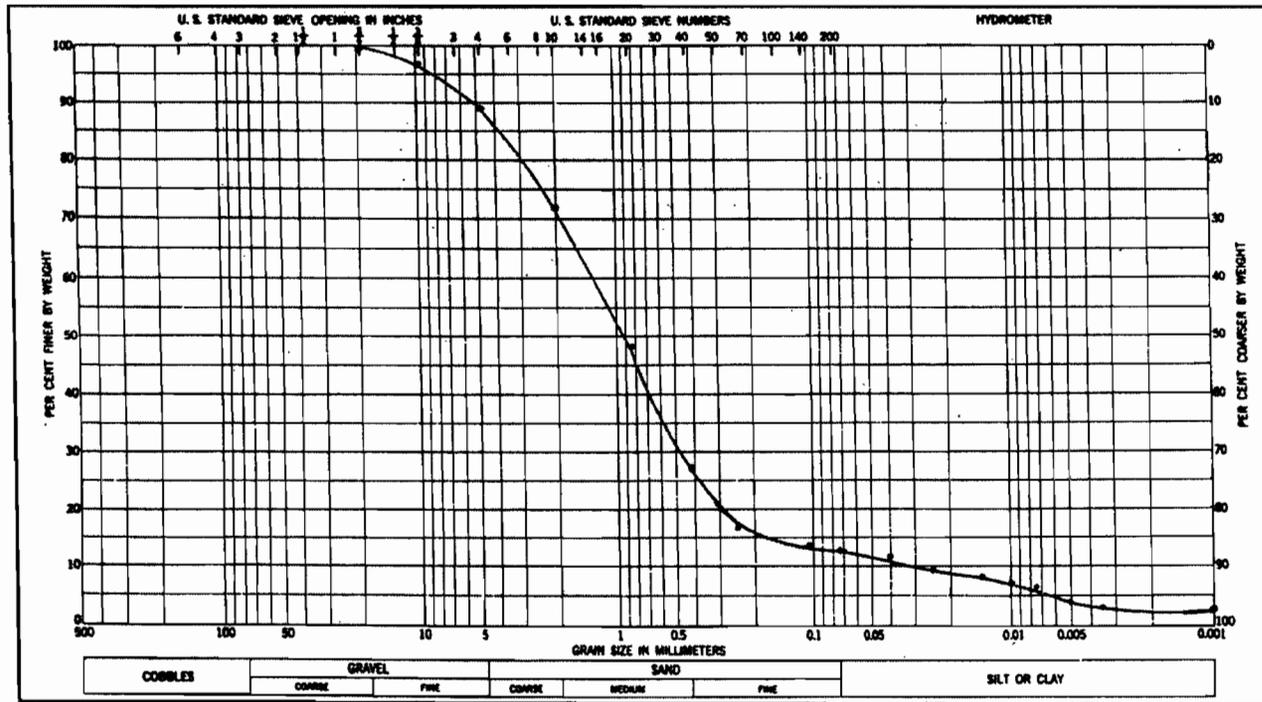
PROJECT: Metropolitan Water Reclamation
District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

W & A FILE NO. 3707
DATE 10-25-04
WW-20 Center (09-09-04)

REPORT OF SOIL/AGGREGATE ANALYSIS

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS



TELEPHONE
309 573-2137

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS



WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN

SOILS - PORTLAND CEMENT CONCRETE
STEEL & ALUMINUM CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POLYMER

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

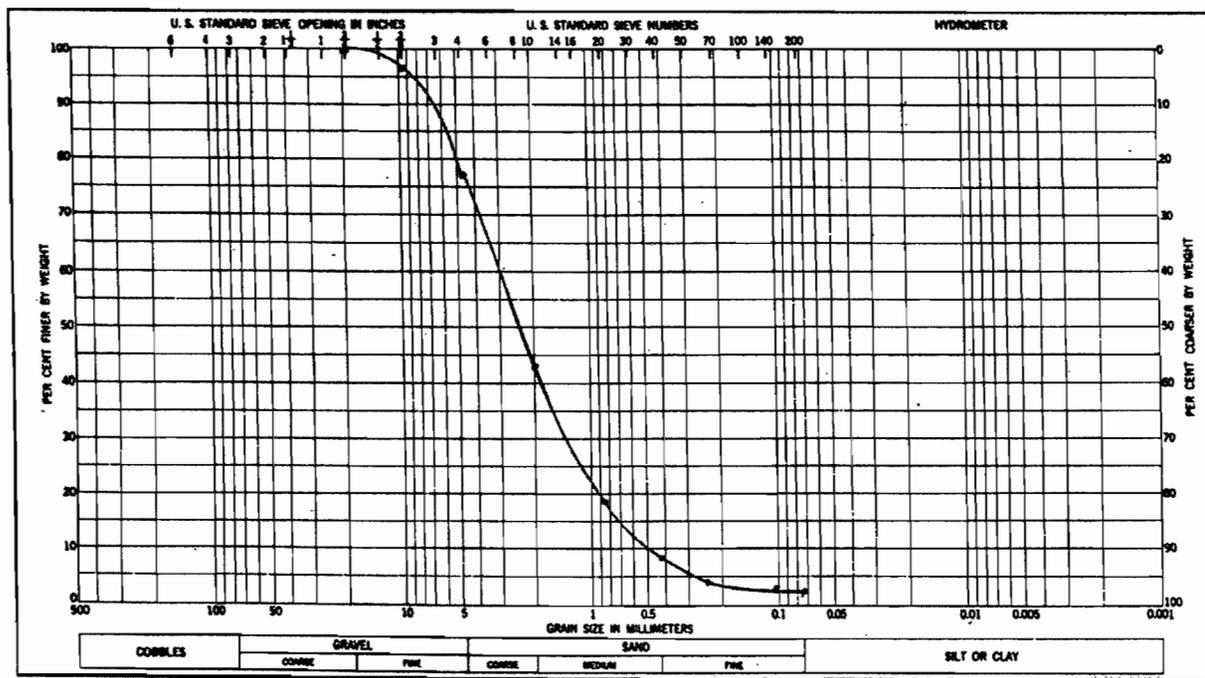
Metropolitan Water Reclamation
PROJECT: District of Greater Chicago

CLIENT: Grace Analytical Laboratory
Berkeley, Illinois

REPORT OF SOIL/AGGREGATE ANALYSIS

W & A FILE NO 3707

DATE 10-25-04
WW-19 Center (09-20-04)



WHITNEY & ASSOCIATES
Peoria, Illinois

SOIL/AGGREGATE CLASSIFICATION **WELL-GRADED, MEDIUM- To COARSE- GRAINED SAND WITH FINE-GRAINED GRAVEL.** UNIFORMITY COEFFICIENT D_{60} / D_{10} EFFECTIVE GRAIN SIZE, D_{10}
Small Amount of Fine-Grained Sand - SW (Sample Contained Numerous Shells)

TELEPHONE
309 873-2131

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTOR
CONSULTATION
INVESTIGATIONS



WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMENOLS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - PCC-UP-AC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

PROJECT Metropolitan Water Reclamation
District of Greater Chicago

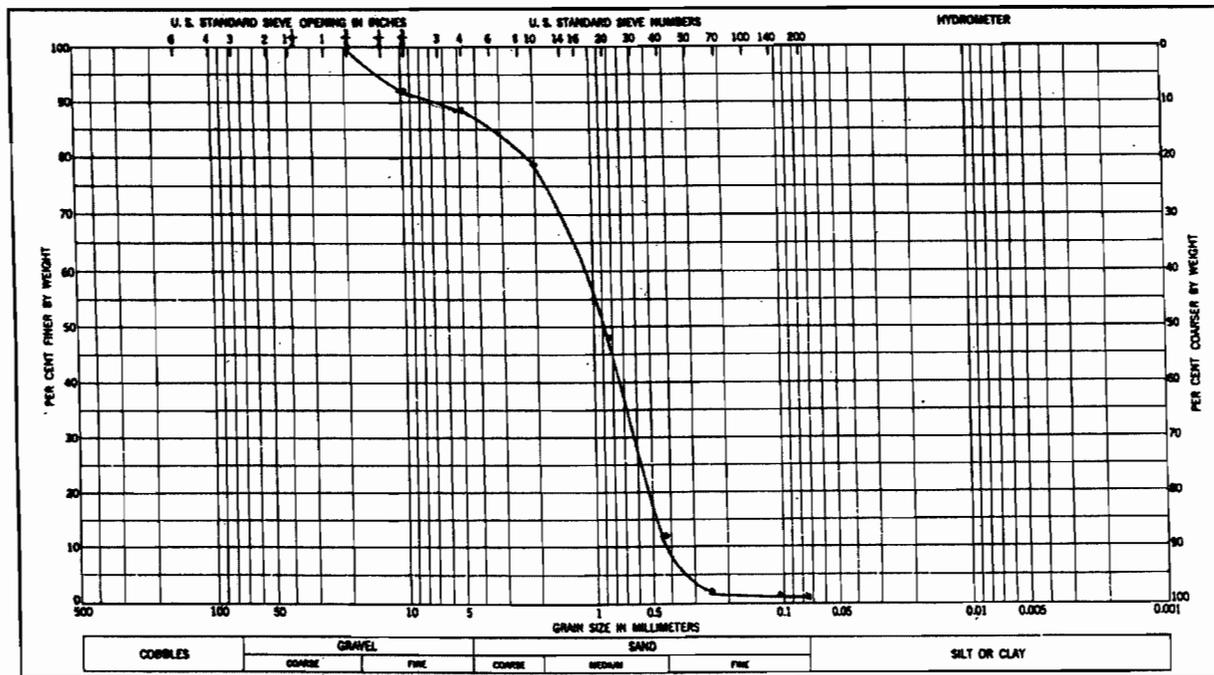
CLIENT Grace Analytical Laboratory
Berkeley, Illinois

W & A FILE NO 3707

DATE 10-25-04

REPORT OF SOIL/AGGREGATE ANALYSIS

WW-109 Center (09-06-04)



TELEPHONE
309 879-2131

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS



WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - FLUOROUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - PCC-PAV

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
GRILLING - DORING - TESTING

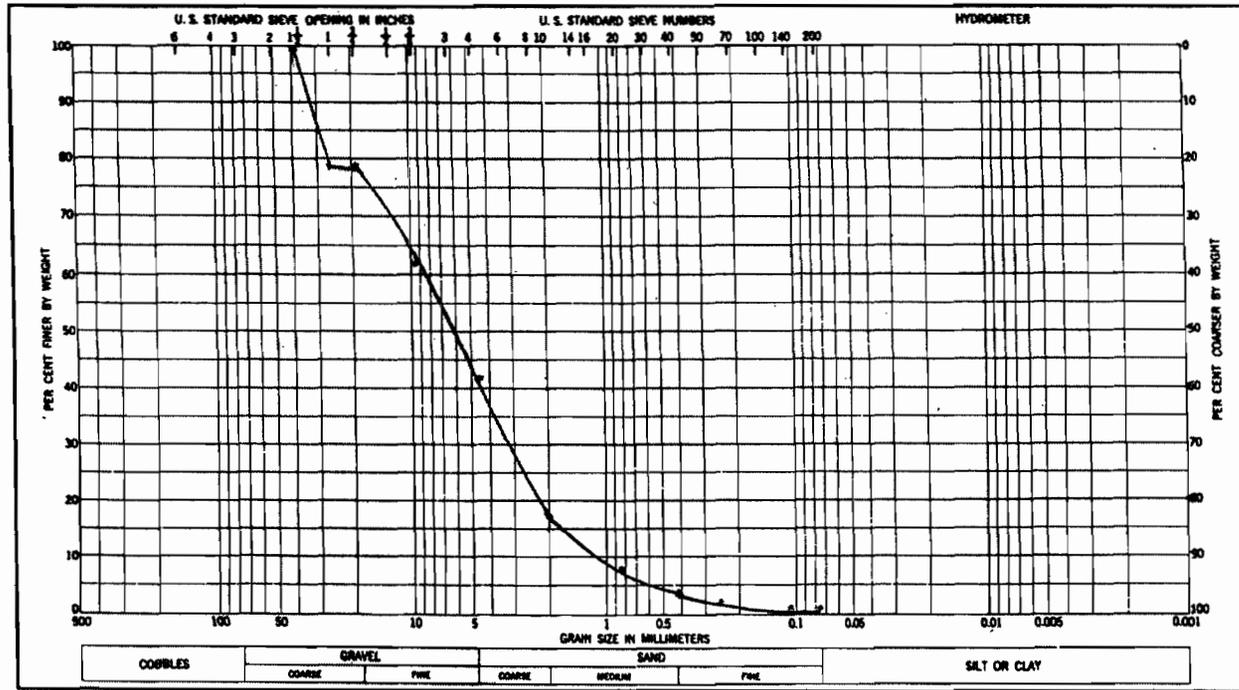
PROJECT Metropolitan Water Reclamation
District of Greater Chicago

CLIENT Grace Analytical Laboratory
Berkeley, Illinois

W & A FILE NO 3707
DATE 10-25-04

REPORT OF SOIL/AGGREGATE ANALYSIS

WW-23 Center (09-08-04)



WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

SOIL/AGGREGATE CLASSIFICATION Poorly Graded; Fine- To Coarse- UNIFORMITY COEFFICIENT $D_{60} / D_{10} =$ EFFECTIVE GRAIN SIZE, $D_{10} =$
Grained Gravel And Coarse-Grained Sand;
Some Medium-Grained Sand; Trace Fine-Grained Sand - GP
(Sample Contained Trace of Shells)

Attachment 11



SUBURBAN LABORATORIES, Inc.

4140 Litt Drive · Hillside, Illinois 60162-1183
Tel. (708) 544-3260 · Toll Free (800) 783-LABS · Fax (708) 544-8587
www.SuburbanLabs.com



August 31, 2005

Jennifer Wasik
Metropolitan Water Reclamation District of Chicago
Research and Development Dept.
6001 W. Pershing
Cicero, IL 60804-4112

Tel: (708) 588-4074
Fax: (708) 588-3807

Lab Order: **05070065**

Project Name: Contract 05-104-11 (Sediment Chemistry)

Dear Jennifer Wasik:

Suburban Laboratories, Inc. received 6 sample(s) on 7/5/05 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call your customer service representative at (708) 544-3260.

Sincerely,

Shane Clarke
Project Manager

cc: Sam Dennison



SUBURBAN LABORATORIES, Inc.

4140 Litt Drive · Hillside, Illinois 60162-1183
Tel. (708) 544-3260 · Toll Free (800) 783-LABS · Fax (708) 544-8587
www.SuburbanLabs.com



Client ID: Metropolitan Water Reclamation District of Chicago

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070065

CASE NARRATIVE

Date: August 31, 2005

Chain of Custody # 41021

PO #: 3032962

Temperature of samples upon receipt in our Lab: 2 °C

QC Level: Level I

General Comments:

- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:

- Reporting Limit: The reporting limit is designed to be the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:

For a complete list of method references please contact us.

- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater

Project Specific Comments:

TOC_S: B=The method blank contained 67.88 (MDL is 57.20).

This report supersedes the report dated 8/26/05



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070065

Client Sample ID: WW 103 Side

Matrix: SLUDGE

Lab ID: 05070065-01A

Date Received: 07/05/2005 10:40 AM

Collection Date: 06/28/2005 11:15 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.00081 | J | 0.000173 | µmoles/g-dry | 1 | 07/20/2005 11:10 AM | 16733 |
| Copper | 0.0687 | | 0.00118 | µmoles/g-dry | 1 | 07/20/2005 11:10 AM | 16733 |
| Lead | 0.0688 | | 0.000810 | µmoles/g-dry | 1 | 07/20/2005 11:10 AM | 16733 |
| Nickel | 0.0284 | | 0.00170 | µmoles/g-dry | 1 | 07/20/2005 11:10 AM | 16733 |
| Zinc | 0.431 | | 0.00573 | µmoles/g-dry | 1 | 07/20/2005 11:10 AM | 16733 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 5.63 | | 0 | µmoles/g-dry | 1 | 07/12/2005 9:00 AM | R43933 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/03/2005 12:00 AM | R44952 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/03/2005 12:00 AM | R44952 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/03/2005 12:00 AM | R44952 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/03/2005 12:00 AM | R44952 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/03/2005 12:00 AM | R44952 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 30.69 | | 0 | wt% | 1 | 07/05/2005 10:30 PM | R44426 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.106 | | 0 | | 1 | 07/12/2005 9:00 AM | R43933 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.598 | | 0 | µmoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 9740 | | 82.5 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Max | 11100 | | 82.5 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Min | 7950 | | 82.5 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070065

Client Sample ID: WW 103 Center

Matrix: SLUDGE

Lab ID: 05070065-02A

Date Received: 07/05/2005 10:40 AM

Collection Date: 06/28/2005 11:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | umoles/g-dry | 1 | 07/20/2005 11:24 AM | 16733 |
| Copper | 0.0569 | | 0.00118 | umoles/g-dry | 1 | 07/20/2005 11:24 AM | 16733 |
| Lead | 0.0670 | | 0.000810 | umoles/g-dry | 1 | 07/20/2005 11:24 AM | 16733 |
| Nickel | 0.0344 | | 0.00170 | umoles/g-dry | 1 | 07/20/2005 11:24 AM | 16733 |
| Zinc | 0.459 | | 0.00573 | umoles/g-dry | 1 | 07/20/2005 11:24 AM | 16733 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 6.30 | | 0 | µmoles/g-dry | 1 | 07/12/2005 9:00 AM | R43933 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 31.01 | | 0 | wt% | 1 | 07/05/2005 10:30 PM | R44426 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.098 | | 0 | | 1 | 07/12/2005 9:00 AM | R43933 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.618 | | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 13300 | | 82.9 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Max | 14500 | | 82.9 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Min | 11200 | | 82.9 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |

| | | |
|--|---|--|
| Qualifiers: | * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| <small>BaseReport-MDL-ContFrac2004</small> | c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| | G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| | J Analyte detected below quantitation limit (QL) | ND Not Detected at the SLI Reporting Limit |
| | Q Internal standard recovery is outside SLI in-house criteria | S Spike Recovery outside accepted recovery limits |
| | (no method specific requirements exist) | |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070065

Client Sample ID: WW 105 Side

Matrix: SLUDGE

Lab ID: 05070065-03A

Date Received: 07/05/2005 10:40 AM

Collection Date: 06/29/2005 10:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | umoles/g-dry | 1 | 07/20/2005 11:29 AM | 16733 |
| Copper | 0.0569 | | 0.00118 | umoles/g-dry | 1 | 07/20/2005 11:29 AM | 16733 |
| Lead | 0.0396 | | 0.000810 | umoles/g-dry | 1 | 07/20/2005 11:29 AM | 16733 |
| Nickel | 0.0373 | | 0.00170 | umoles/g-dry | 1 | 07/20/2005 11:29 AM | 16733 |
| Zinc | 0.269 | | 0.00573 | umoles/g-dry | 1 | 07/20/2005 11:29 AM | 16733 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 2.53 | | 0 | µmoles/g-dry | 1 | 07/12/2005 9:00 AM | R43933 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 27.22 | | 0 | wt% | 1 | 07/05/2005 10:30 PM | R44426 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.159 | | 0 | | 1 | 07/12/2005 9:00 AM | R43933 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.403 | | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 52900 | | 78.6 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Max | 62500 | | 78.6 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Min | 47200 | | 78.6 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |

Qualifiers:

BaseReport-MDL-
ConfFrac2004

- | | |
|---|--|
| * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limit (QL) | ND Not Detected at the SLI Reporting Limit |
| Q Internal standard recovery is outside SLI in-house criteria | S Spike Recovery outside accepted recovery limits |
- (no method specific requirements exist)



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070065

Client Sample ID: WW 105 Center

Matrix: SLUDGE

Lab ID: 05070065-04A

Date Received: 07/05/2005 10:40 AM

Collection Date: 06/29/2005 11:00 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | umoles/g-dry | 1 | 07/20/2005 11:33 AM | 16733 |
| Copper | 0.0834 | | 0.00118 | umoles/g-dry | 1 | 07/20/2005 11:33 AM | 16733 |
| Lead | 0.140 | | 0.000810 | umoles/g-dry | 1 | 07/20/2005 11:33 AM | 16733 |
| Nickel | 0.0260 | | 0.00170 | umoles/g-dry | 1 | 07/20/2005 11:33 AM | 16733 |
| Zinc | 0.806 | | 0.00573 | umoles/g-dry | 1 | 07/20/2005 11:33 AM | 16733 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 33.6 | | 0 | µmoles/g-dry | 1 | 07/12/2005 9:00 AM | R43933 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 40.71 | | 0 | wt% | 1 | 07/05/2005 10:30 PM | R44426 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.031 | | 0 | | 1 | 07/12/2005 9:00 AM | R43933 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.06 | | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 36000 | | 96.5 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Max | 40200 | | 96.5 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Min | 29700 | | 96.5 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070065

Client Sample ID: WW 104 Side

Matrix: SLUDGE

Lab ID: 05070065-05A

Date Received: 07/05/2005 10:40 AM

Collection Date: 06/30/2005 11:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | umoles/g-dry | 1 | 07/20/2005 11:38 AM | 16733 |
| Copper | 1.51 | | 0.00118 | umoles/g-dry | 1 | 07/20/2005 11:38 AM | 16733 |
| Lead | 0.0378 | | 0.000810 | umoles/g-dry | 1 | 07/20/2005 11:38 AM | 16733 |
| Nickel | 0.0499 | | 0.00170 | umoles/g-dry | 1 | 07/20/2005 11:38 AM | 16733 |
| Zinc | 0.226 | | 0.00573 | umoles/g-dry | 1 | 07/20/2005 11:38 AM | 16733 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 5.32 | | 0 | µmoles/g-dry | 1 | 07/12/2005 9:00 AM | R43933 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 25.36 | | 0 | wt% | 1 | 07/05/2005 10:30 PM | R44426 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.343 | | 0 | | 1 | 07/12/2005 9:00 AM | R43933 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.83 | | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 43900 | | 76.6 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Max | 63900 | | 76.6 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Min | 51300 | | 76.6 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method-specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070065

Client Sample ID: WW 104 Center

Matrix: SLUDGE

Lab ID: 05070065-06A

Date Received: 07/05/2005 10:40 AM

Collection Date: 06/30/2005 11:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | umoles/g-dry | 1 | 07/20/2005 11:42 AM | 16733 |
| Copper | 0.0264 | | 0.00118 | umoles/g-dry | 1 | 07/20/2005 11:42 AM | 16733 |
| Lead | 0.0278 | | 0.000810 | umoles/g-dry | 1 | 07/20/2005 11:42 AM | 16733 |
| Nickel | 0.0206 | | 0.00170 | umoles/g-dry | 1 | 07/20/2005 11:42 AM | 16733 |
| Zinc | 0.250 | | 0.00573 | umoles/g-dry | 1 | 07/20/2005 11:42 AM | 16733 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 1.73 | | 0 | µmoles/g-dry | 1 | 07/12/2005 9:00 AM | R43933 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/12/2005 12:00 AM | R44953 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 19.62 | | 0 | wt% | 1 | 07/05/2005 10:30 PM | R44426 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.188 | | 0 | | 1 | 07/12/2005 9:00 AM | R43933 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.325 | | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 19300 | | 71.2 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Max | 28200 | | 71.2 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |
| Total Organic Carbon - Min | 12100 | | 71.2 | mg/Kg-dry | 1 | 07/22/2005 10:15 PM | R44145 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method-specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



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SLI Work Order: 05070065
 SLI Sample ID: 05070065-01A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070065-01A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.7% |
| No. 10 | 2.00 | 2.5% |
| No. 20 | 0.85 | 7.1% |
| No. 40 | 0.420 | 22.5% |
| No. 60 | 0.250 | 36.5% |
| No. 140 | 0.106 | 16.1% |
| No. 200 | 0.075 | 8.5% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070065-01A |
| Gravel | >4.75 | 0.7% |
| Sand, Course | 4.74-2.0 | 2.5% |
| Sand, Medium | 1.99-0.420 | 29.7% |
| Sand, Fine | 0.419-0.075 | 61.1% |
| Silt | 0.074-0.005 | 6.0% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 0.0% |

Analyst: *[Signature]*

Date: 8/26/05

Reviewed: *[Signature]*

Date: 8/26/2005



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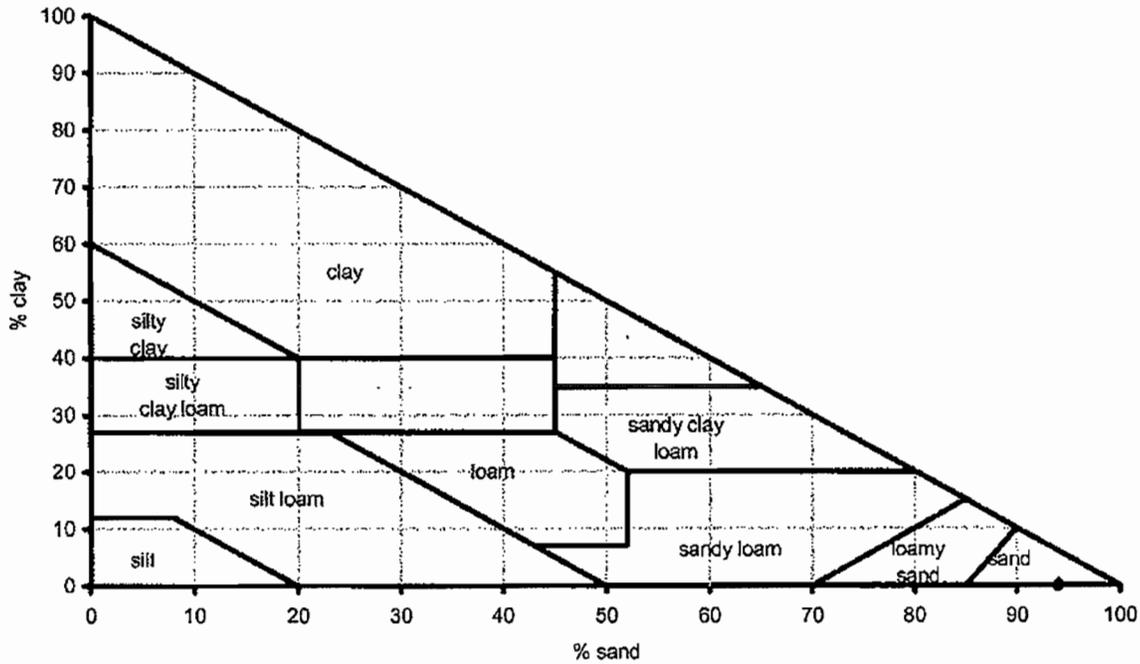


SLI Work Order: 05070065
SLI Sample ID: 05070065-01A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 94.0 | 0.0 | 5.97 |

Soil Classification: sand

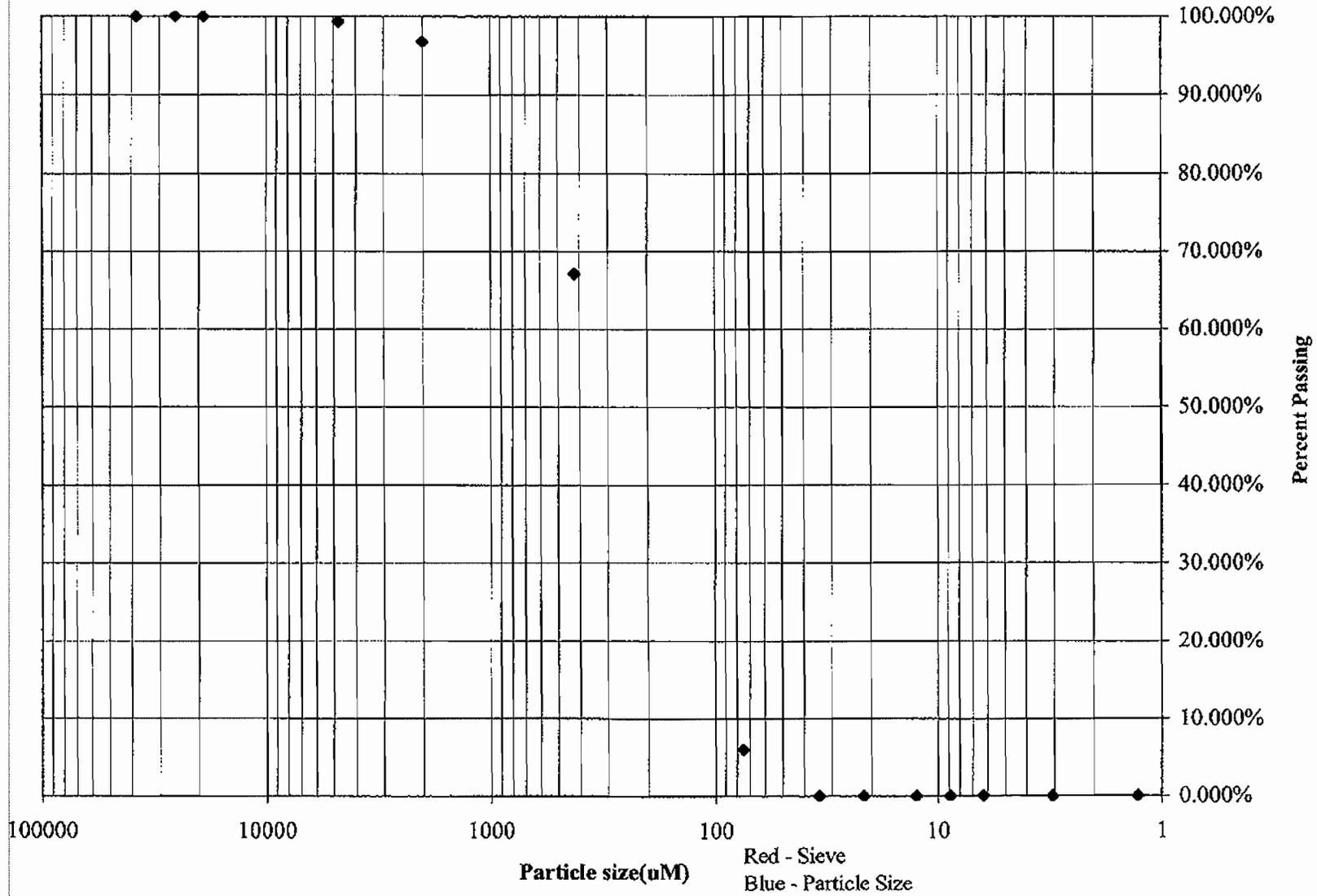


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05070065-01A





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SLI Work Order: 05070065
 SLI Sample ID: 05070065-02A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070065-02A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 24.1% |
| No. 10 | 2.00 | 13.3% |
| No. 20 | 0.85 | 12.4% |
| No. 40 | 0.420 | 16.7% |
| No. 60 | 0.250 | 20.0% |
| No. 140 | 0.106 | 9.7% |
| No. 200 | 0.075 | 1.3% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070065-02A |
| Gravel | >4.75 | 24.1% |
| Sand, Course | 4.74-2.0 | 13.3% |
| Sand, Medium | 1.99-0.420 | 29.1% |
| Sand, Fine | 0.419-0.075 | 31.0% |
| Silt | 0.074-0.005 | 2.5% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 0.0% |

Analyst: Rowe R. [Signature]

Date: 8/24/05

Reviewed: [Signature]

Date: 8/26/2005



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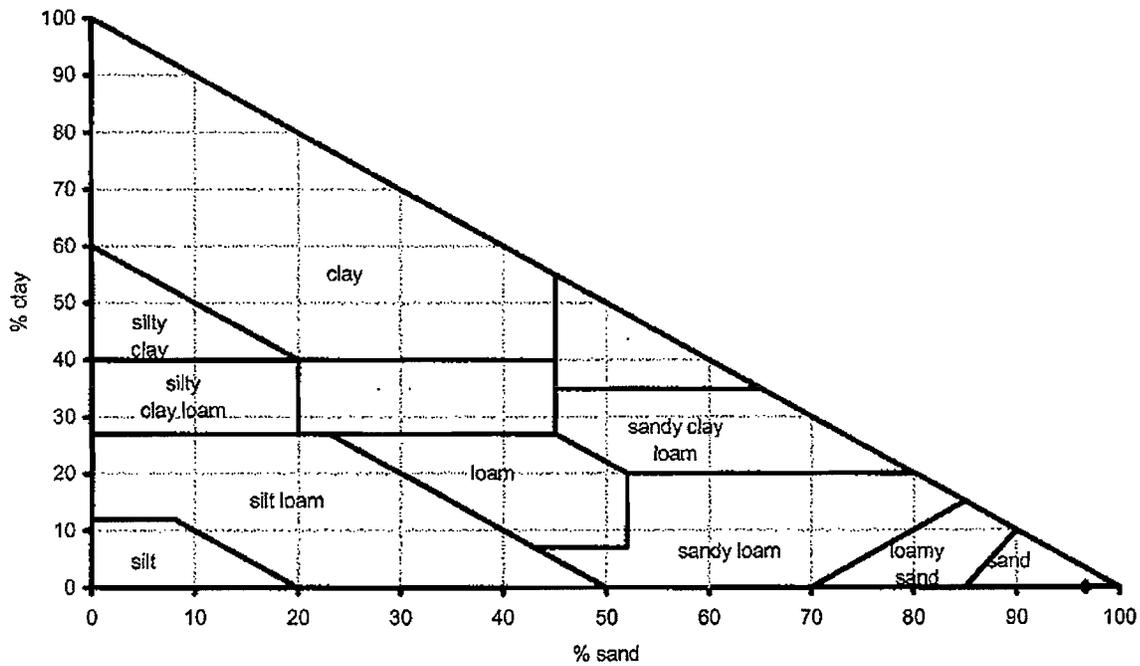


SLI Work Order: 05070065
SLI Sample ID: 05070065-02A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 96.7 | 0.0 | 2.51 |

Soil Classification: Gravelly sand

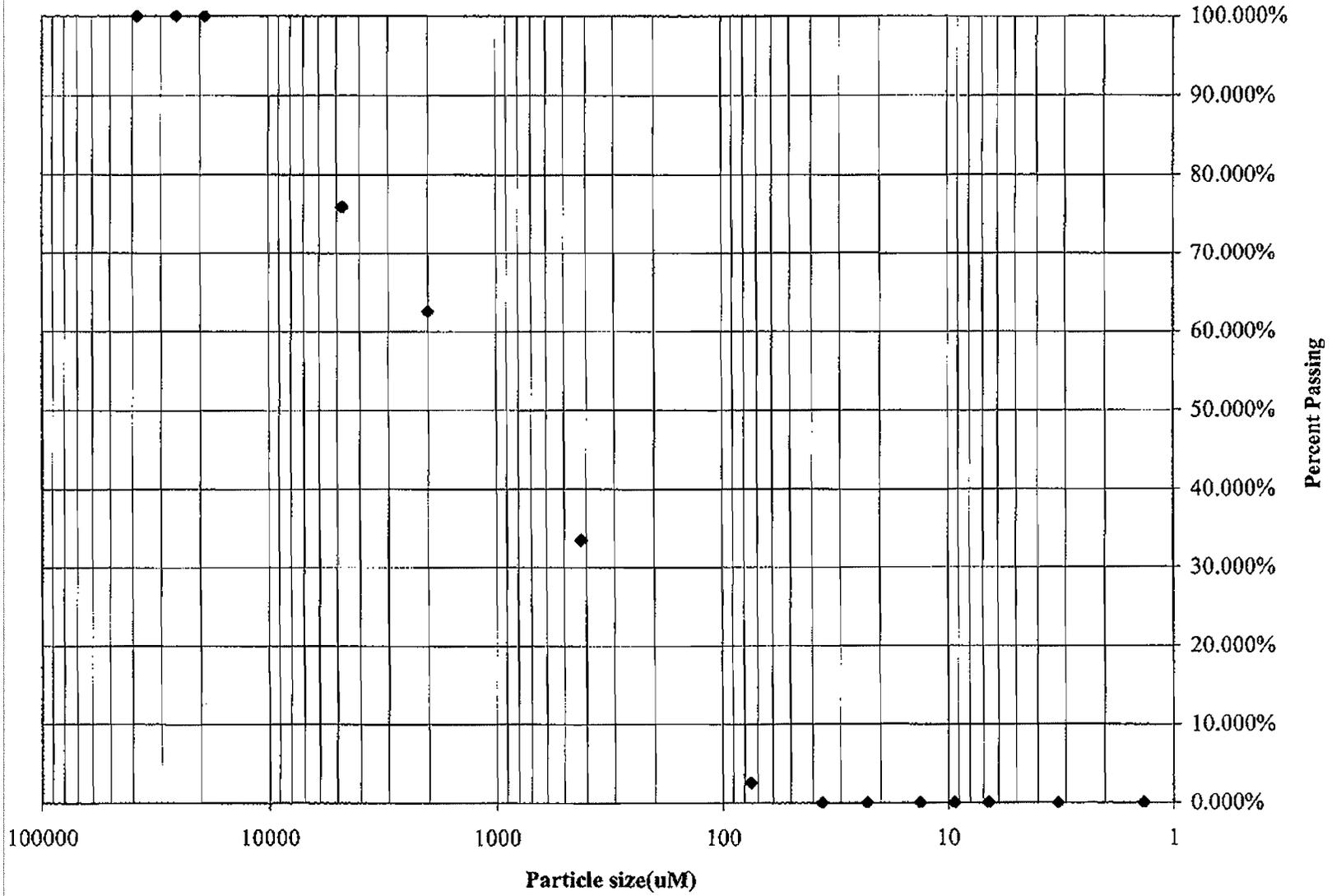


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 28 July 2000.

Particle Size Analysis

◆ 05070065-02A





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SLI Work Order: 05070065
 SLI Sample ID: 05070065-03A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 05070065-03A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 1.1% |
| No. 10 | 2.00 | 2.3% |
| No. 20 | 0.85 | 11.8% |
| No. 40 | 0.420 | 17.1% |
| No. 60 | 0.250 | 14.1% |
| No. 140 | 0.106 | 13.1% |
| No. 200 | 0.075 | 4.8% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 05070065-03A |
| Gravel | >4.75 | 1.1% |
| Sand, Course | 4.74-2.0 | 2.3% |
| Sand, Medium | 1.99-0.420 | 28.9% |
| Sand, Fine | 0.419-0.075 | 32.0% |
| Silt | 0.074-0.005 | 31.7% |
| Clay | <0.005-0.001 | 1.2% |
| Colloids | <0.001 | 2.8% |

Analyst: Renee Kald
 Reviewed: [Signature]

Date: 8/28/05
 Date: 8/26/2005



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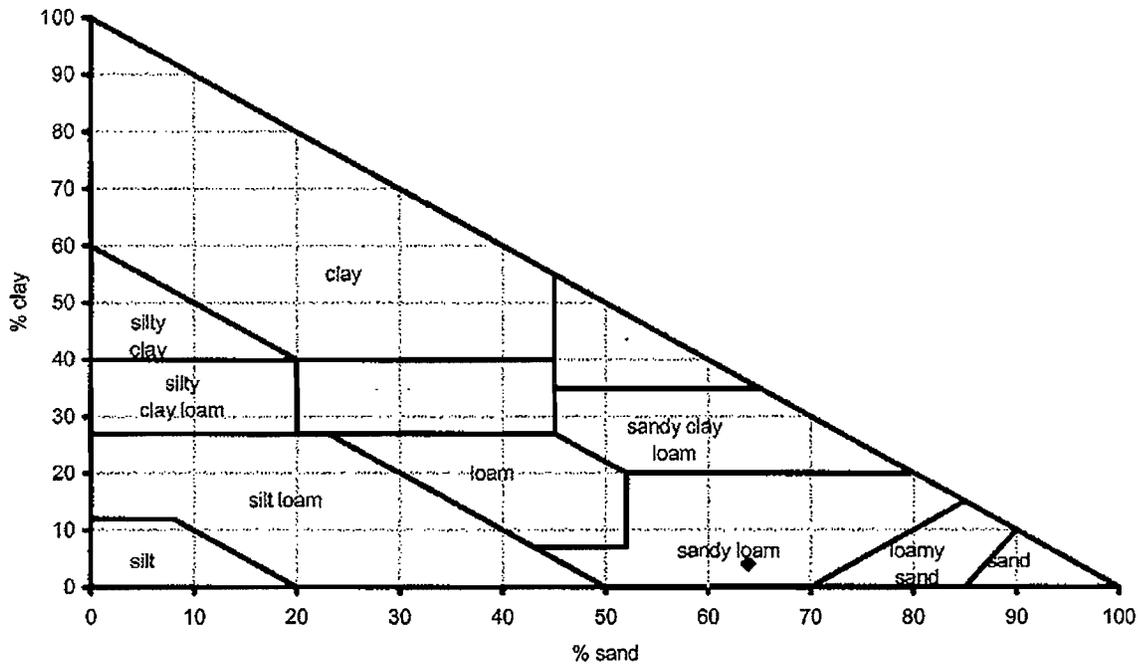


SLI Work Order: 05070065
SLI Sample ID: 05070065-03A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 63.9 | 4.0 | 31.72 |

Soil Classification: Gravelly sandy loam

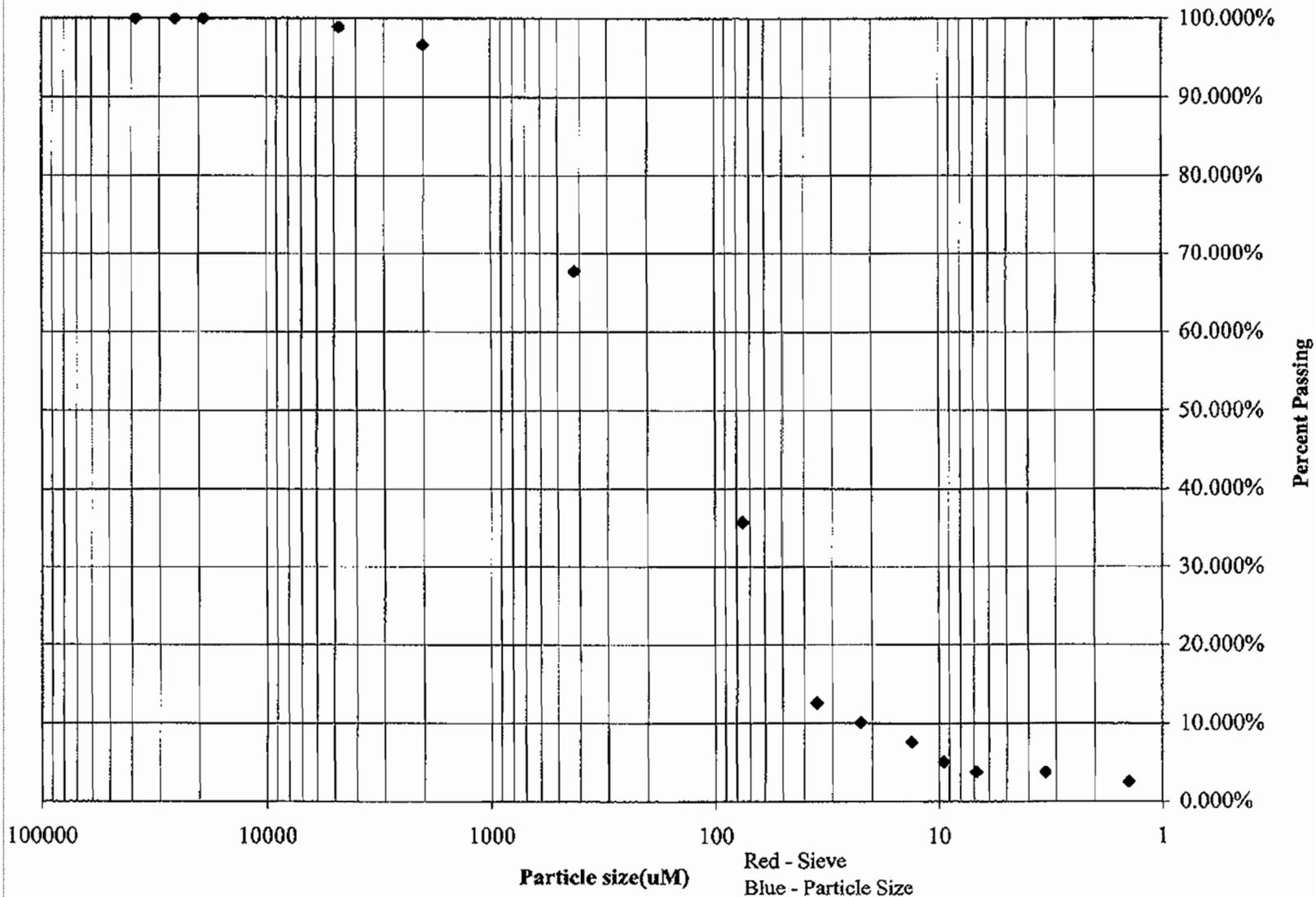


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Bear, 26 July 2000.

Particle Size Analysis

◆ 05070065-03A





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SLI Work Order: 05070065
 SLI Sample ID: 05070065-04A

Analysis Date: 8/10/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070065-04A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 1.1% |
| No. 20 | 0.85 | 6.2% |
| No. 40 | 0.420 | 11.5% |
| No. 60 | 0.250 | 22.3% |
| No. 140 | 0.106 | 37.0% |
| No. 200 | 0.075 | 7.8% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070065-04A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 1.1% |
| Sand, Medium | 1.99-0.420 | 17.6% |
| Sand, Fine | 0.419-0.075 | 67.1% |
| Silt | 0.074-0.005 | 14.2% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 0.0% |

Analyst: *[Signature]*

Date: 8/26/05

Reviewed: *[Signature]*

Date: 8/26/2005



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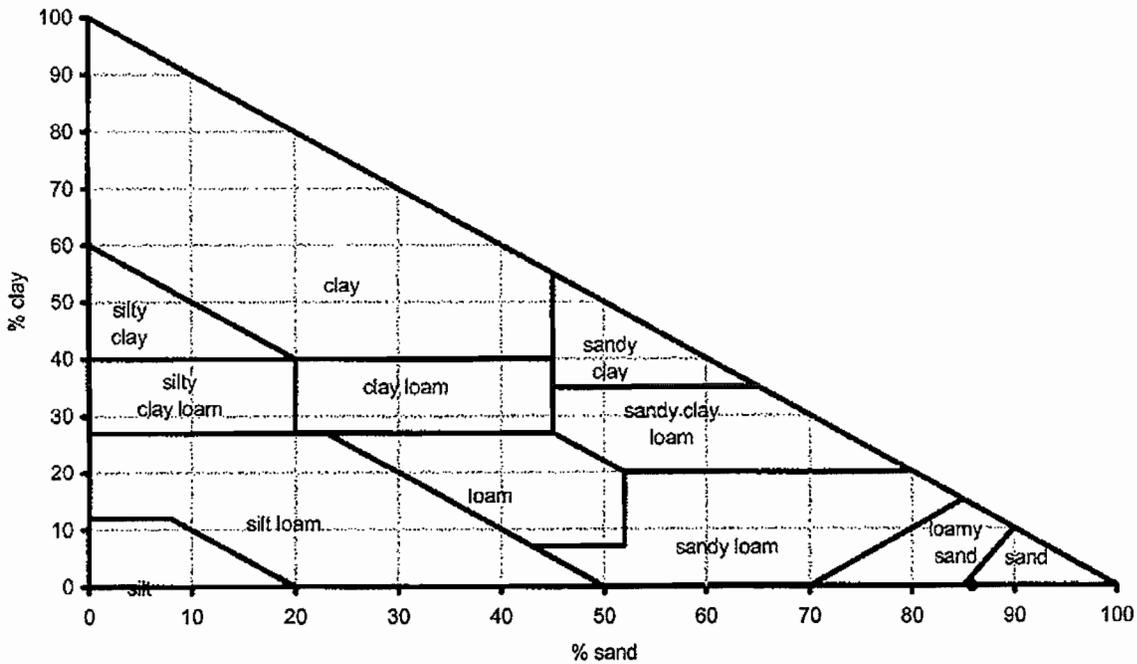


SLI Work Order: 05070065
SLI Sample ID: 05070065-04A

Analysis Date: 8/10/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 85.8 | 0.0 | 14.19 |

Soil Classification: sand

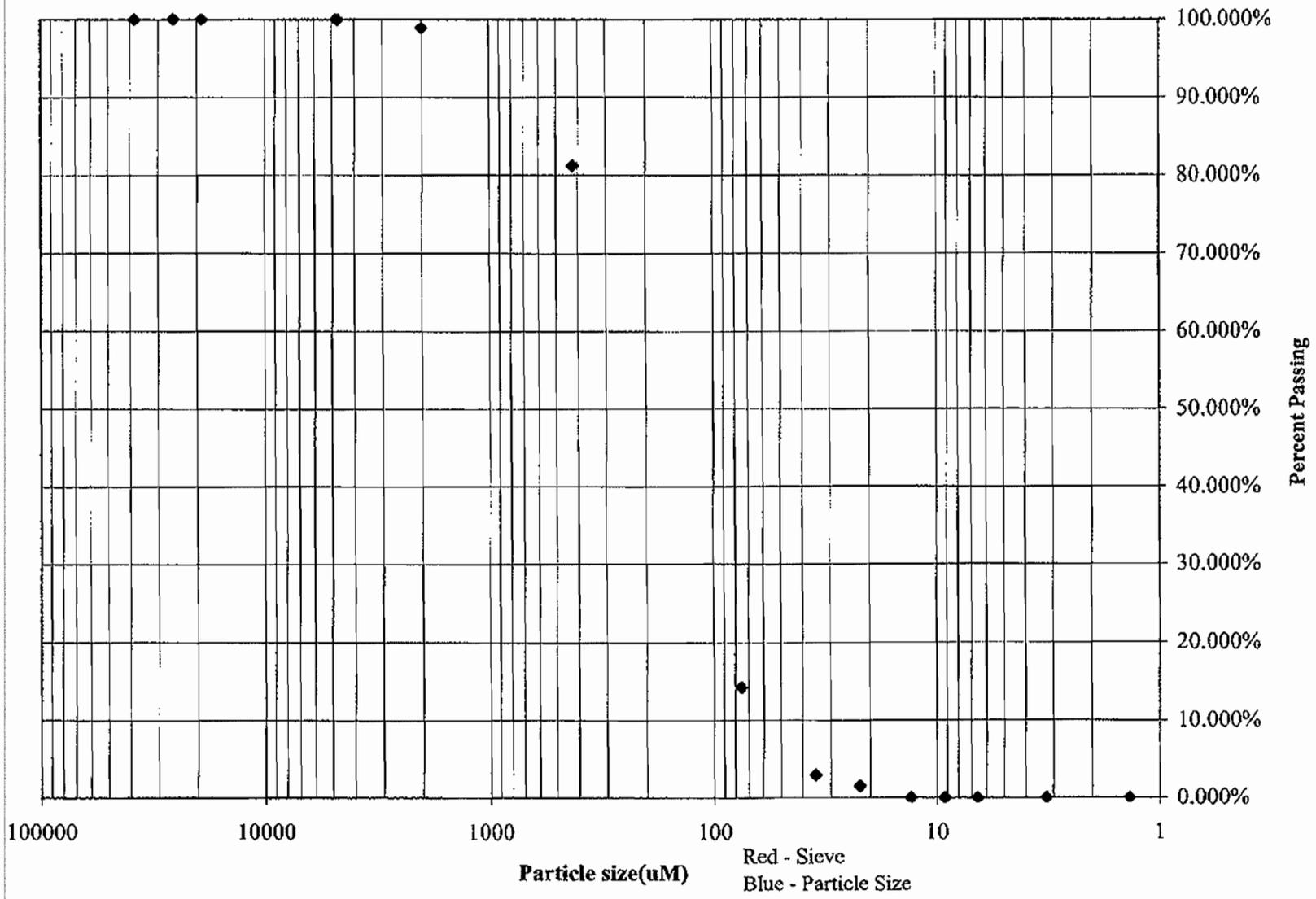


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Beer, 26 July 2000.

Particle Size Analysis

◆ 05070065-04A





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SLI Work Order: 05070065
 SLI Sample ID: 05070065-05A

Analysis Date: 8/12/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070065-05A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 60.8% |
| No. 10 | 2.00 | 8.9% |
| No. 20 | 0.85 | 10.0% |
| No. 40 | 0.420 | 8.2% |
| No. 60 | 0.250 | 5.6% |
| No. 140 | 0.106 | 3.3% |
| No. 200 | 0.075 | 0.9% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070065-05A |
| Gravel | >4.75 | 60.8% |
| Sand, Course | 4.74-2.0 | 8.9% |
| Sand, Medium | 1.99-0.420 | 18.2% |
| Sand, Fine | 0.419-0.075 | 9.8% |
| Silt | 0.074-0.005 | 2.4% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 0.0% |

Analyst: *Rene V. [Signature]*

Date: 8/26/05

Reviewed: *[Signature]*

Date: 8/26/2005



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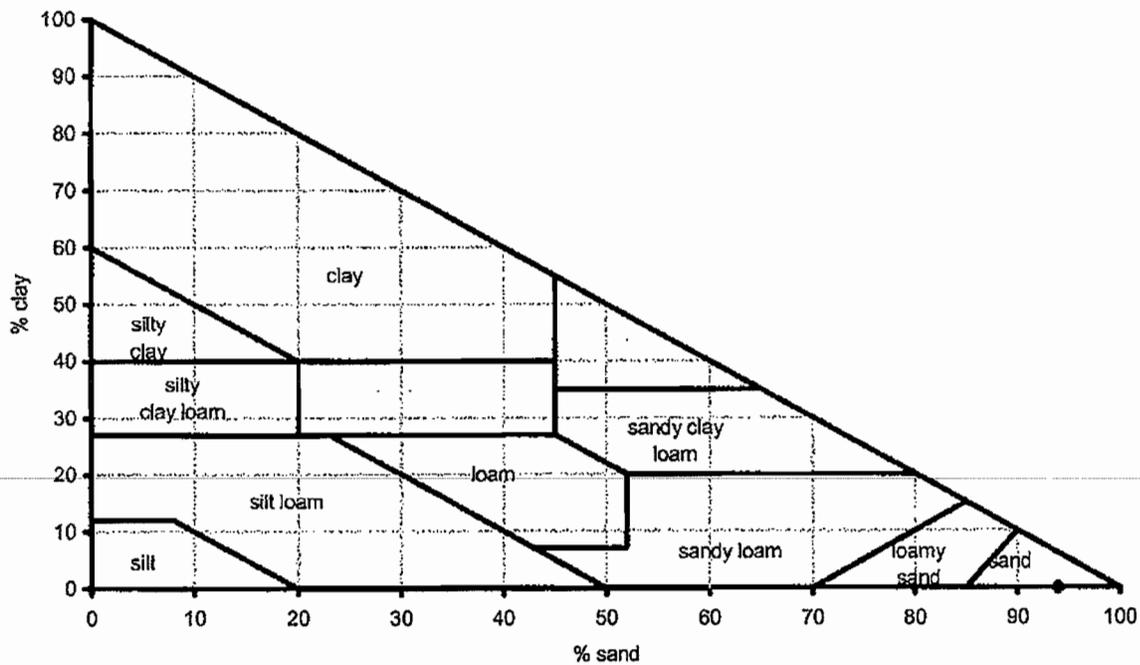


SLI Work Order: 05070065
SLI Sample ID: 05070065-05A

Analysis Date: 8/12/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 94.0 | 0.0 | 2.37 |

Soil Classification: Gravelly sand

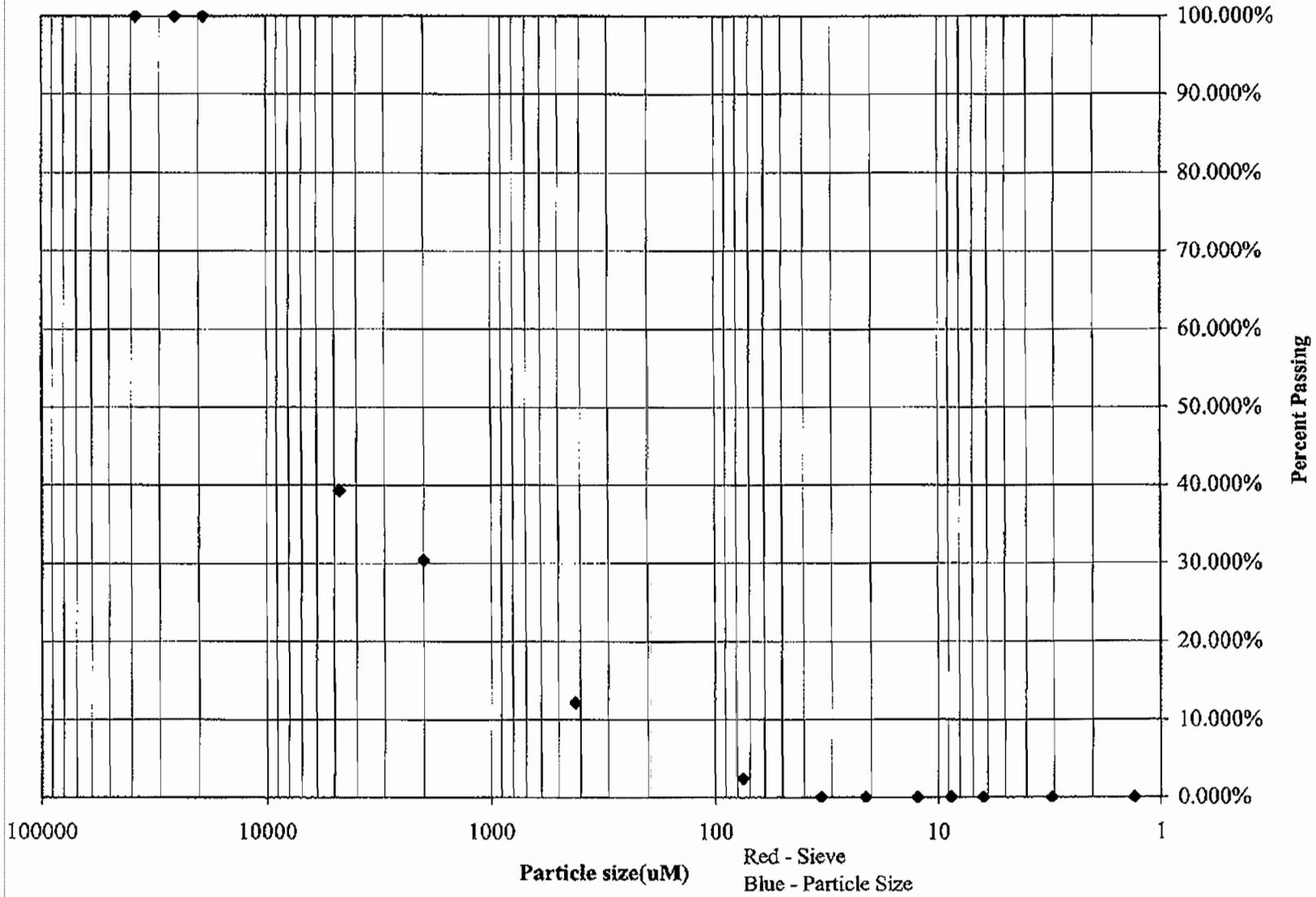


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Beer, 26 July 2000.

Particle Size Analysis

◆ 05070065-05A





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SLI Work Order: 05070065
 SLI Sample ID: 05070065-06A

Analysis Date: 8/12/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070065-06A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 9.8% |
| No. 10 | 2.00 | 19.2% |
| No. 20 | 0.85 | 21.3% |
| No. 40 | 0.420 | 20.5% |
| No. 60 | 0.250 | 17.2% |
| No. 140 | 0.106 | 6.3% |
| No. 200 | 0.075 | 2.2% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070065-06A |
| Gravel | >4.75 | 9.8% |
| Sand, Course | 4.74-2.0 | 19.2% |
| Sand, Medium | 1.99-0.420 | 41.8% |
| Sand, Fine | 0.419-0.075 | 25.8% |
| Silt | 0.074-0.005 | 2.5% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 1.0% |

Analyst: Rose Reyes
 Reviewed: [Signature]

Date: 8/26/05
 Date: 8/26/2005



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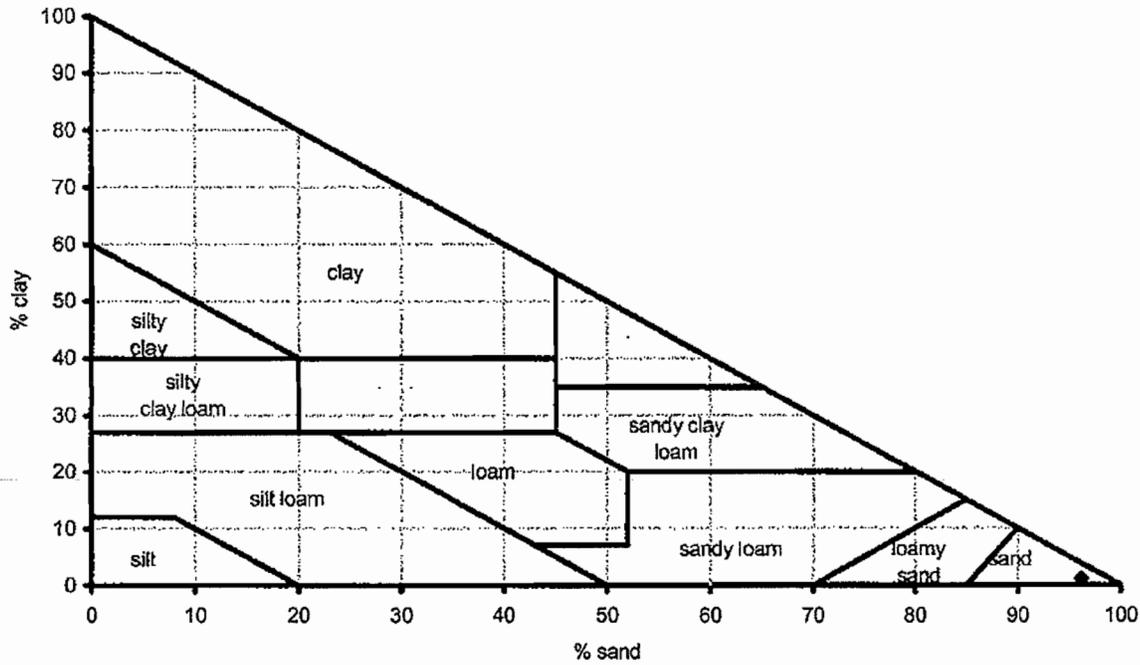


SLI Work Order: 05070065
SLI Sample ID: 05070065-06A

Analysis Date: 8/12/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 96.2 | 1.1 | 2.46 |

Soil Classification: Gravelly sand

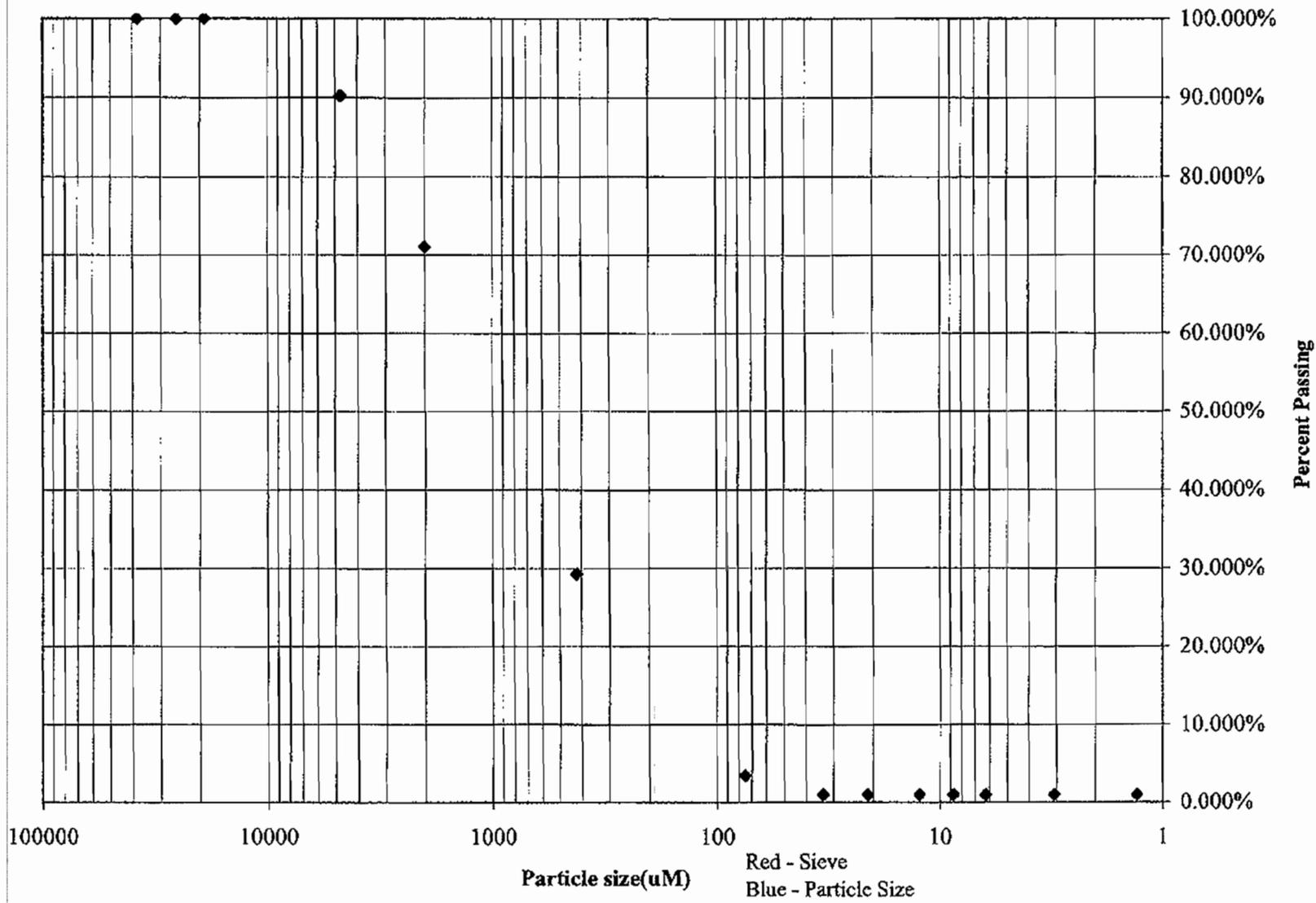


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05070065-06A





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August 31, 2005

Jennifer Wasik
Metropolitan Water Reclamation District of Chicago
Research and Development Dept.
6001 W. Pershing
Cicero, IL 60804-4112

Tel: (708) 588-4074
Fax: (708) 588-3807

Lab Order: **05060907**

Project Name: Contract 05-104-11 (Sediment Chemistry)

Dear Jennifer Wasik:

Suburban Laboratories, Inc. received 6 sample(s) on 6/27/05 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call your customer service representative at (708) 544-3260.

Sincerely,

Shane Clarke
Project Manager

cc: Sam Dennison



SUBURBAN LABORATORIES, Inc.

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Client ID: Metropolitan Water Reclamation District of Chicago

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05060907

CASE NARRATIVE

Date: August 31, 2005

Chain of Custody # 41019

PO #: 3032962

Temperature of samples upon receipt in our Lab: 3.5 °C

QC Level: Level I

General Comments:

- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:

- Reporting Limit: The reporting limit is designed to be the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:

For a complete list of method references please contact us.

- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater

Project Specific Comments: SEM Metals: The method blank for the samples contained 0.0068 umoles/gram copper, 0.0028 umole/g-dry Nickel and 0.086 umole/g-dry zinc. The blank level for the total SEM metals calculates to be 0.122 umole/gram. For samples with concentrations of the particular metal species or the total SEM metals greater than 10X the blank level, the blank contribution is generally considered insignificant. For those samples with concentrations less than 10X the blank level, the data should be used with caution. Also, the matrix spike (MS), matrix spike duplicate (MSD) had low recoveries for (respectively the MS the MSD) lead (35.6% and 40.2%), nickel (67.1% and 65.2%) and zinc (0% and 20.8%). The control criteria for the matrix spike and matrix spike duplicate recovery is 70% to 130%. The relative percent difference (RPD) between the results for zinc was 50.4%. The control criteria for the RPD is 20%. Since the laboratory control sample for the sample set was in control, the low recoveries would be indicative of the sample matrix and the high RPD for zinc would be indicative of nonhomogeneity for zinc on that particular sample.

This report supersedes the report dated 8/26/05.



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05060907

Client Sample ID: WW31 Side

Matrix: SEDIMENT

Lab ID: 05060907-01A

Date Received: 06/27/2005 1:50 PM

Collection Date: 06/21/2005 11:00 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | µmoles/g-dry | 1 | 07/20/2005 10:09 AM | 16721 |
| Copper | 0.0372 | B | 0.00118 | µmoles/g-dry | 1 | 07/20/2005 10:09 AM | 16721 |
| Lead | 0.232 | S | 0.000810 | µmoles/g-dry | 1 | 07/20/2005 10:09 AM | 16721 |
| Nickel | 0.296 | BS | 0.00170 | µmoles/g-dry | 1 | 07/20/2005 10:09 AM | 16721 |
| Zinc | 2.20 | BS | 0.00573 | µmoles/g-dry | 1 | 07/20/2005 10:09 AM | 16721 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 1.67 | | 0 | µmoles/g-dry | 1 | 07/02/2005 12:00 AM | R43365 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 50.33 | | 0 | wt% | 1 | 06/27/2005 1:00 PM | R44425 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 1.66 | | 0 | | 1 | 07/02/2005 12:00 AM | R43365 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 2.77 | B | 0 | µmoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 32800 | | 115 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |
| Total Organic Carbon - Max | 48900 | | 115 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |
| Total Organic Carbon - Min | 21500 | | 115 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |

| | | |
|-----------------------------|--|--|
| Qualifiers: | * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| BaseReport-MDL-ContFrac2004 | c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| | G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| | J Analyte detected below quantitation limit (QL) | ND Not Detected at the SLI Reporting Limit |
| | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05060907

Client Sample ID: WW31 Center

Matrix: SEDIMENT

Lab ID: 05060907-02A

Date Received: 06/27/2005 1:50 PM

Collection Date: 06/21/2005 11:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | µmoles/g-dry | 1 | 07/20/2005 10:23 AM | 16721 |
| Copper | 0.0832 | B | 0.00118 | µmoles/g-dry | 1 | 07/20/2005 10:23 AM | 16721 |
| Lead | 0.0913 | | 0.000810 | µmoles/g-dry | 1 | 07/20/2005 10:23 AM | 16721 |
| Nickel | 0.109 | B | 0.00170 | µmoles/g-dry | 1 | 07/20/2005 10:23 AM | 16721 |
| Zinc | 0.444 | B | 0.00573 | µmoles/g-dry | 1 | 07/20/2005 10:23 AM | 16721 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 8.63 | | 0 | µmoles/g-dry | 1 | 07/02/2005 12:00 AM | R43365 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 31.85 | | 0 | wt% | 1 | 06/27/2005 1:00 PM | R44425 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.084 | | 0 | | 1 | 07/02/2005 12:00 AM | R43365 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.727 | B | 0 | µmoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 20600 | | 83.9 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |
| Total Organic Carbon - Max | 24700 | | 83.9 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |
| Total Organic Carbon - Min | 17700 | | 83.9 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05060907

Client Sample ID: WW32 Side

Matrix: SEDIMENT

Lab ID: 05060907-03A

Date Received: 06/27/2005 1:50 PM

Collection Date: 06/22/2005 10:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.00094 | J | 0.000173 | µmoles/g-dry | 1 | 07/20/2005 10:28 AM | 16721 |
| Copper | 0.199 | B | 0.00118 | µmoles/g-dry | 1 | 07/20/2005 10:28 AM | 16721 |
| Lead | 0.227 | | 0.000810 | µmoles/g-dry | 1 | 07/20/2005 10:28 AM | 16721 |
| Nickel | 0.122 | B | 0.00170 | µmoles/g-dry | 1 | 07/20/2005 10:28 AM | 16721 |
| Zinc | 2.20 | B | 0.00573 | µmoles/g-dry | 1 | 07/20/2005 10:28 AM | 16721 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.527 | | 0 | µmoles/g-dry | 1 | 07/02/2005 12:00 AM | R43365 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 54.44 | | 0 | wt% | 1 | 06/27/2005 1:00 PM | R44425 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 5.22 | | 0 | | 1 | 07/02/2005 12:00 AM | R43365 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 2.75 | B | 0 | µmoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 46800 | | 126 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |
| Total Organic Carbon - Max | 57500 | | 126 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |
| Total Organic Carbon - Min | 30500 | | 126 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |

Qualifiers:

| | | | |
|---|--|----|--|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05060907

Client Sample ID: WW32 Center

Matrix: SEDIMENT

Lab ID: 05060907-04A

Date Received: 06/27/2005 1:50 PM

Collection Date: 06/22/2005 10:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | µmoles/g-dry | 1 | 07/20/2005 10:32 AM | 16721 |
| Copper | 0.119 | B | 0.00118 | µmoles/g-dry | 1 | 07/20/2005 10:32 AM | 16721 |
| Lead | 0.0928 | | 0.000810 | µmoles/g-dry | 1 | 07/20/2005 10:32 AM | 16721 |
| Nickel | 0.0577 | B | 0.00170 | µmoles/g-dry | 1 | 07/20/2005 10:32 AM | 16721 |
| Zinc | 0.786 | B | 0.00573 | µmoles/g-dry | 1 | 07/20/2005 10:32 AM | 16721 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.785 | | 0 | µmoles/g-dry | 1 | 07/02/2005 12:00 AM | R43365 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 29.95 | | 0 | wt% | 1 | 06/27/2005 1:00 PM | R44425 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 1.34 | | 0 | | 1 | 07/02/2005 12:00 AM | R43365 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.06 | B | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 19300 | | 81.7 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |
| Total Organic Carbon - Max | 24300 | | 81.7 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |
| Total Organic Carbon - Min | 13200 | | 81.7 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |

| | | | | |
|---------------------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| BaseReport-MDL- ConfFrac2004 | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05060907

Client Sample ID: WW106 Side

Matrix: SEDIMENT

Lab ID: 05060907-05A

Date Received: 06/27/2005 1:50 PM

Collection Date: 06/23/2005 11:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | umoles/g-dry | 1 | 07/20/2005 10:37 AM | 16721 |
| Copper | 0.206 | B | 0.00118 | umoles/g-dry | 1 | 07/20/2005 10:37 AM | 16721 |
| Lead | 0.0453 | | 0.000810 | umoles/g-dry | 1 | 07/20/2005 10:37 AM | 16721 |
| Nickel | 0.139 | B | 0.00170 | umoles/g-dry | 1 | 07/20/2005 10:37 AM | 16721 |
| Zinc | 0.593 | B | 0.00573 | umoles/g-dry | 1 | 07/20/2005 10:37 AM | 16721 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.514 | | 0 | umoles/g-dry | 1 | 07/02/2005 12:00 AM | R43365 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 33.86 | | 0 | wt% | 1 | 06/27/2005 1:00 PM | R44425 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 1.91 | | 0 | | 1 | 07/02/2005 12:00 AM | R43365 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.983 | B | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 46200 | | 86.5 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |
| Total Organic Carbon - Max | 51200 | | 86.5 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |
| Total Organic Carbon - Min | 36500 | | 86.5 | mg/Kg-dry | 1 | 07/18/2005 10:23 PM | R44139 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05060907

Client Sample ID: WW106 Center

Matrix: SEDIMENT

Lab ID: 05060907-06A

Date Received: 06/27/2005 1:50 PM

Collection Date: 06/23/2005 12:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000173 | umoles/g-dry | 1 | 07/20/2005 10:41 AM | 16721 |
| Copper | 0.202 | B | 0.00118 | umoles/g-dry | 1 | 07/20/2005 10:41 AM | 16721 |
| Lead | 0.0756 | | 0.000810 | umoles/g-dry | 1 | 07/20/2005 10:41 AM | 16721 |
| Nickel | 0.125 | B | 0.00170 | umoles/g-dry | 1 | 07/20/2005 10:41 AM | 16721 |
| Zinc | 0.709 | B | 0.00573 | umoles/g-dry | 1 | 07/20/2005 10:41 AM | 16721 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 1.42 | | 0 | µmoles/g-dry | 1 | 07/02/2005 12:00 AM | R43365 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/02/2005 12:00 AM | R44951 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 31.64 | | 0 | wt% | 1 | 06/27/2005 1:00 PM | R44425 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 1.15 | | 0 | | 1 | 07/02/2005 12:00 AM | R43365 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.63 | B | 0 | umoles/g-dry | 1 | 07/20/2005 12:00 AM | R43779 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 15400 | | 83.7 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |
| Total Organic Carbon - Max | 26500 | | 83.7 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |
| Total Organic Carbon - Min | 9030 | | 83.7 | mg/Kg-dry | 1 | 07/19/2005 11:44 PM | R44144 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



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SLI Work Order: 05060907
 SLI Sample ID: 05060907-01A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05060907-01A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 4.4% |
| No. 20 | 0.85 | 17.2% |
| No. 40 | 0.420 | 19.1% |
| No. 60 | 0.250 | 17.6% |
| No. 140 | 0.106 | 16.9% |
| No. 200 | 0.075 | 5.6% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05060907-01A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 4.4% |
| Sand, Medium | 1.99-0.420 | 36.3% |
| Sand, Fine | 0.419-0.075 | 40.1% |
| Silt | 0.074-0.005 | 16.1% |
| Clay | <0.005-0.001 | 0.7% |
| Colloids | <0.001 | 2.4% |

Analyst: *[Signature]*
 Reviewed: *[Signature]*

Date: 8/26/05
 Date: 8/26/2005



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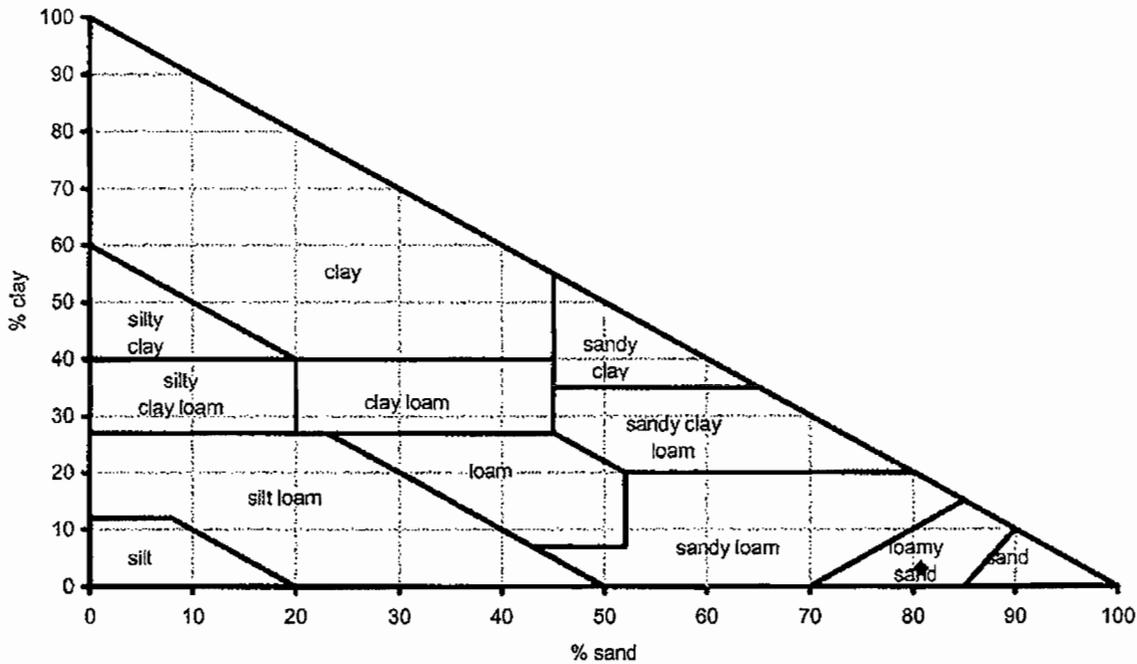


SLI Work Order: 05060907
SLI Sample ID: 05060907-01A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 80.8 | 3.1 | 16.11 |

Soil Classification: loamy sand

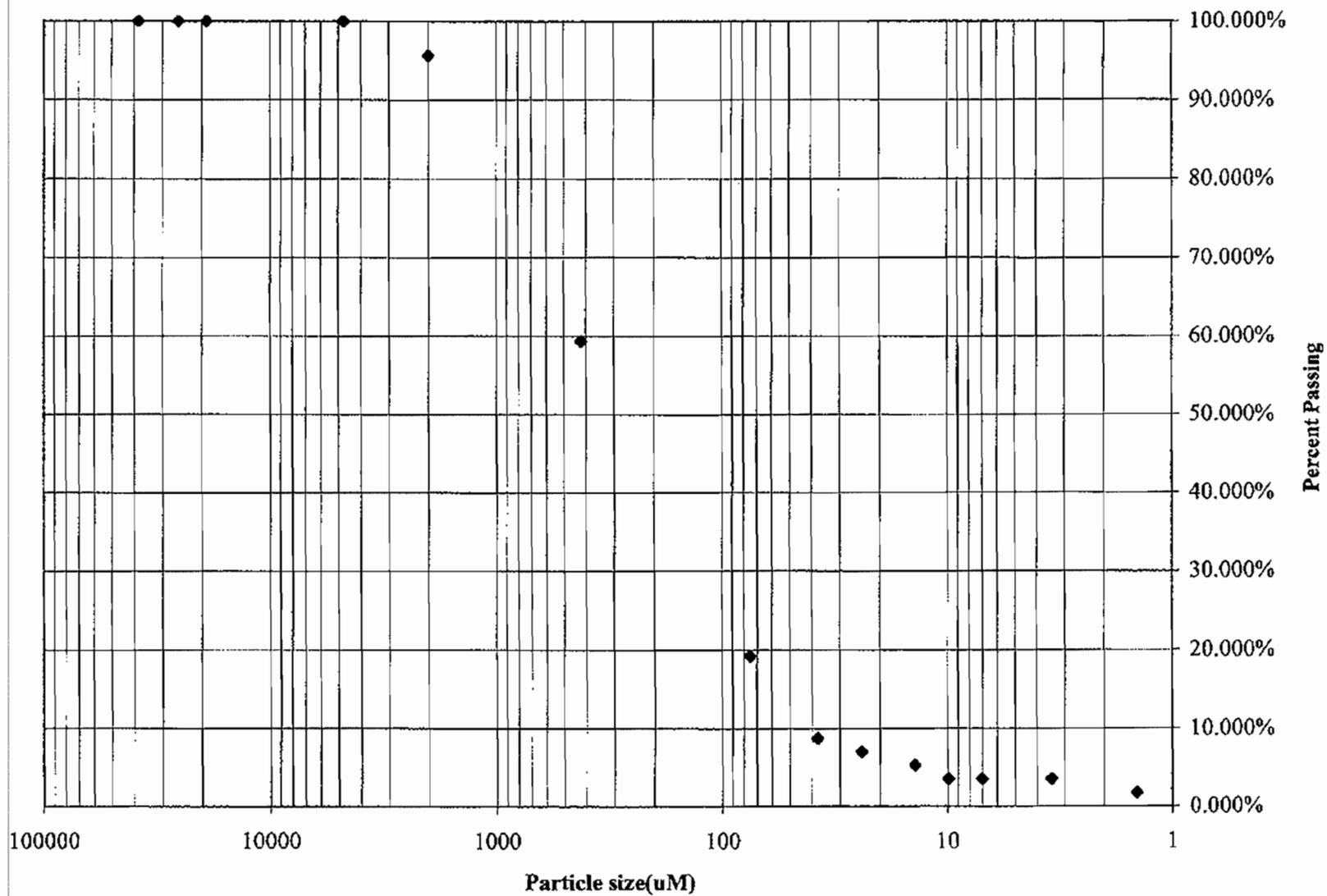


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Bear, 26 July 2000.

Particle Size Analysis

◆ 05060907-01A





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SLI Work Order: 05060907
 SLI Sample ID: 05060907-02A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05060907-02A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 2.6% |
| No. 10 | 2.00 | 3.5% |
| No. 20 | 0.85 | 17.2% |
| No. 40 | 0.420 | 25.1% |
| No. 60 | 0.250 | 25.8% |
| No. 140 | 0.106 | 13.3% |
| No. 200 | 0.075 | 4.3% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05060907-02A |
| Gravel | >4.75 | 2.6% |
| Sand, Course | 4.74-2.0 | 3.5% |
| Sand, Medium | 1.99-0.420 | 42.3% |
| Sand, Fine | 0.419-0.075 | 43.3% |
| Silt | 0.074-0.005 | 6.0% |
| Clay | <0.005-0.001 | 0.4% |
| Colloids | <0.001 | 1.9% |

Analyst: *Kenn Koh*

Date: *8/26/05*

Reviewed: *[Signature]*

Date: *8/26/2005*



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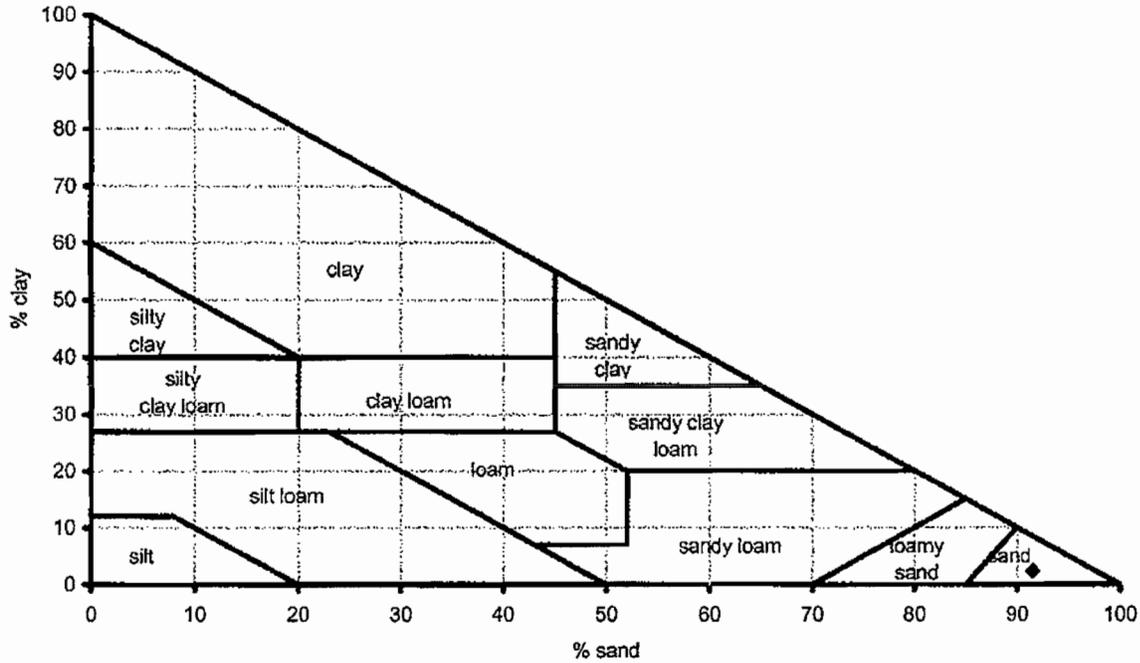


SLI Work Order: 05060907
SLI Sample ID: 05060907-02A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 91.5 | 2.3 | 5.99 |

Soil Classification: Gravelly sand

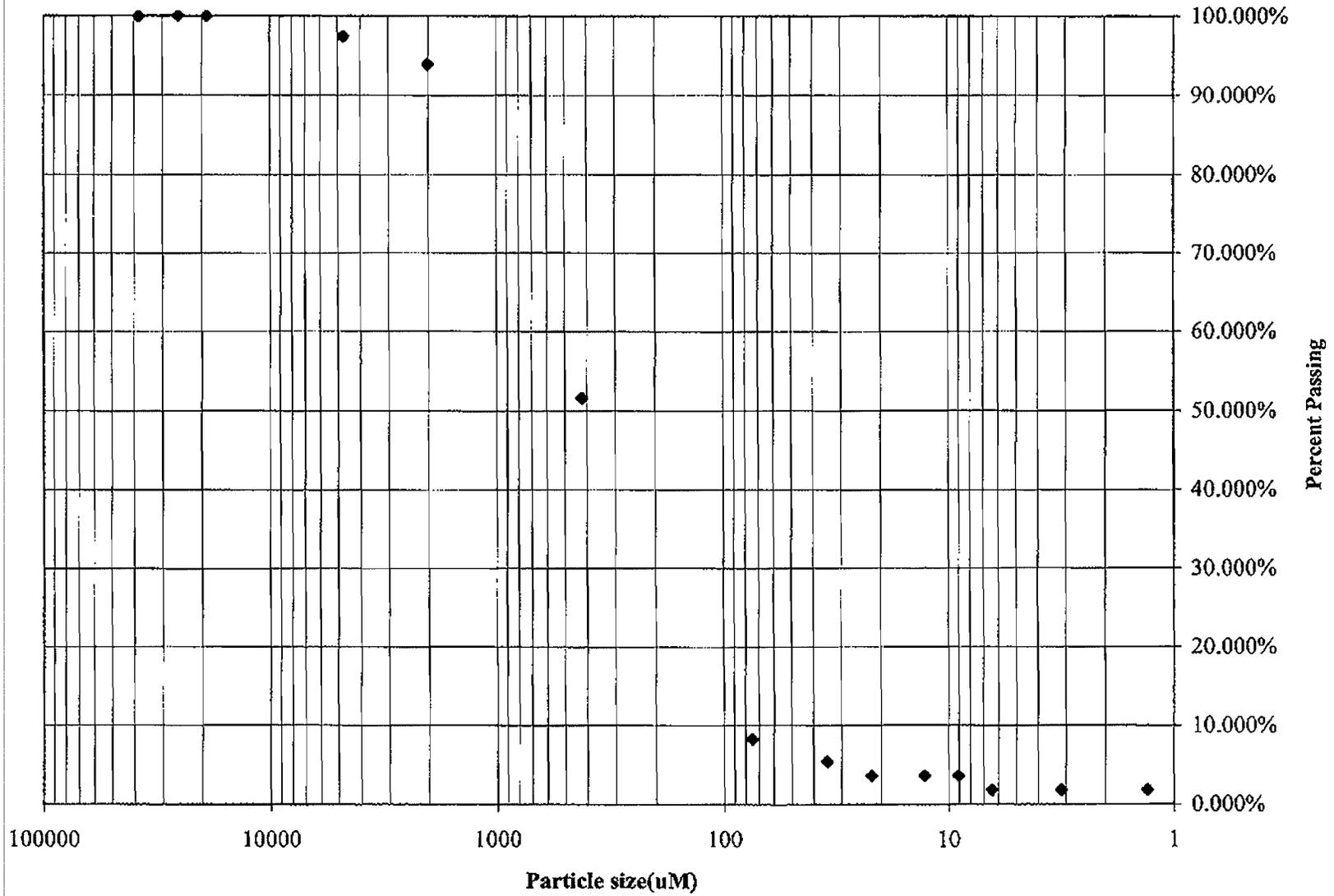


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05060907-02A





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SLI Work Order: 05060907
 SLI Sample ID: 05060907-03A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05060907-03A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.4% |
| No. 10 | 2.00 | 0.5% |
| No. 20 | 0.85 | 3.1% |
| No. 40 | 0.420 | 5.3% |
| No. 60 | 0.250 | 11.0% |
| No. 140 | 0.106 | 48.4% |
| No. 200 | 0.075 | 10.8% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05060907-03A |
| Gravel | >4.75 | 0.4% |
| Sand, Course | 4.74-2.0 | 0.5% |
| Sand, Medium | 1.99-0.420 | 8.4% |
| Sand, Fine | 0.419-0.075 | 70.2% |
| Silt | 0.074-0.005 | 16.2% |
| Clay | <0.005-0.001 | 1.1% |
| Colloids | <0.001 | 3.2% |

Analyst: *[Signature]*

Date: 8/26/04

Reviewed: *[Signature]*

Date: 8/26/04



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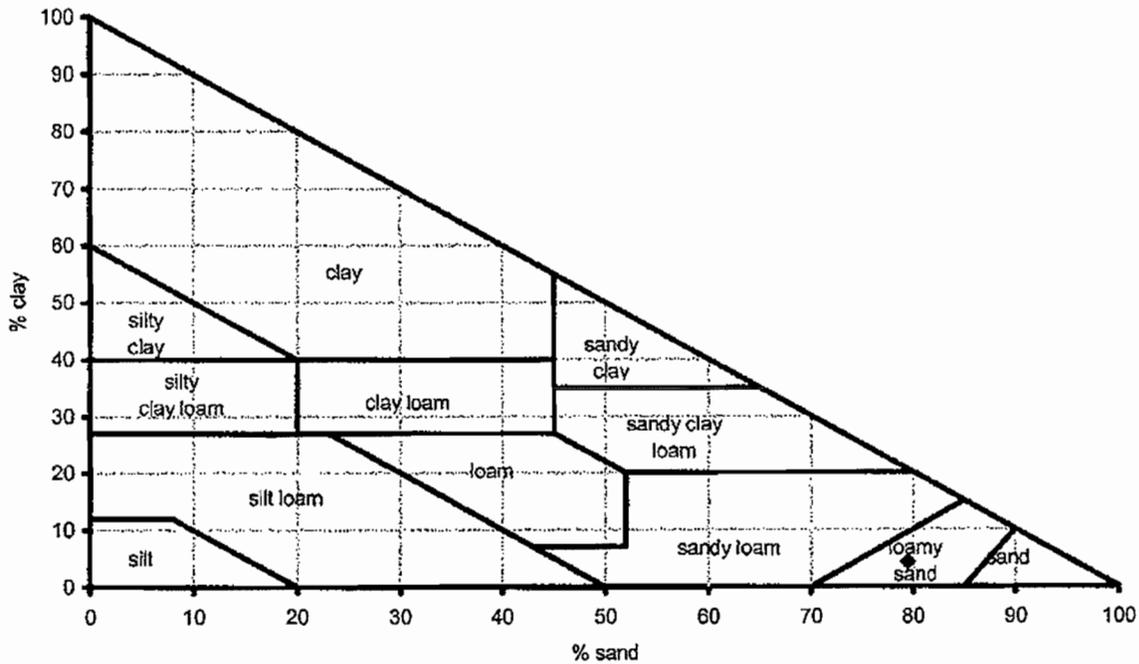


SLI Work Order: 05060907
SLI Sample ID: 05060907-03A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 79.5 | 4.3 | 16.16 |

Soil Classification: loamy sand

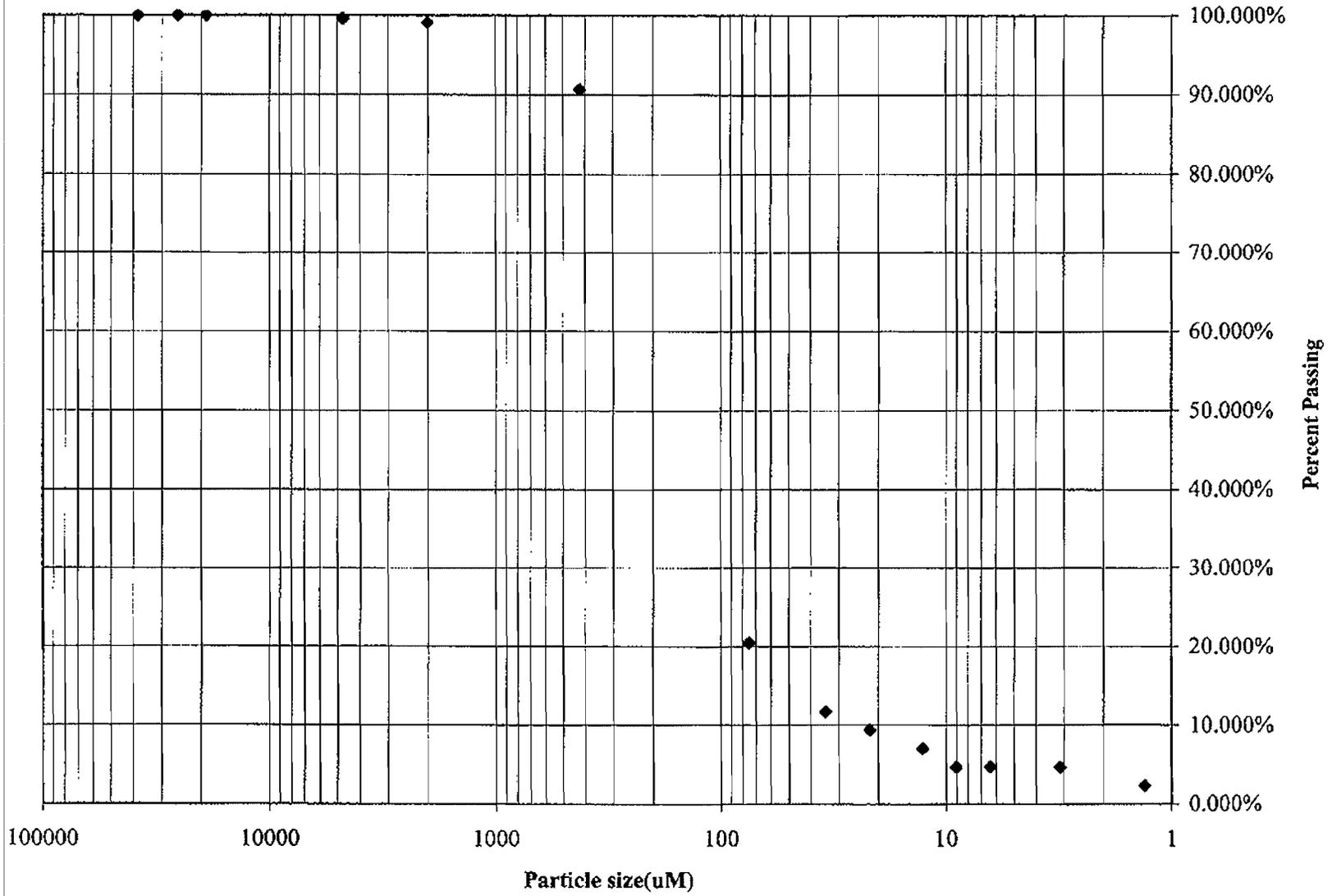


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 28 July 2000.

Particle Size Analysis

◆ 05060907-03A





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SLI Work Order: 05070065
 SLI Sample ID: 05070065-04A

Analysis Date: 8/10/2005

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 05070065-04A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 1.1% |
| No. 20 | 0.85 | 6.2% |
| No. 40 | 0.420 | 11.5% |
| No. 60 | 0.250 | 22.3% |
| No. 140 | 0.106 | 37.0% |
| No. 200 | 0.075 | 7.8% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 05070065-04A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 1.1% |
| Sand, Medium | 1.99-0.420 | 17.6% |
| Sand, Fine | 0.419-0.075 | 67.1% |
| Silt | 0.074-0.005 | 14.2% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 0.0% |

Analyst: *Ronald V. Jones*

Date: 8/26/05

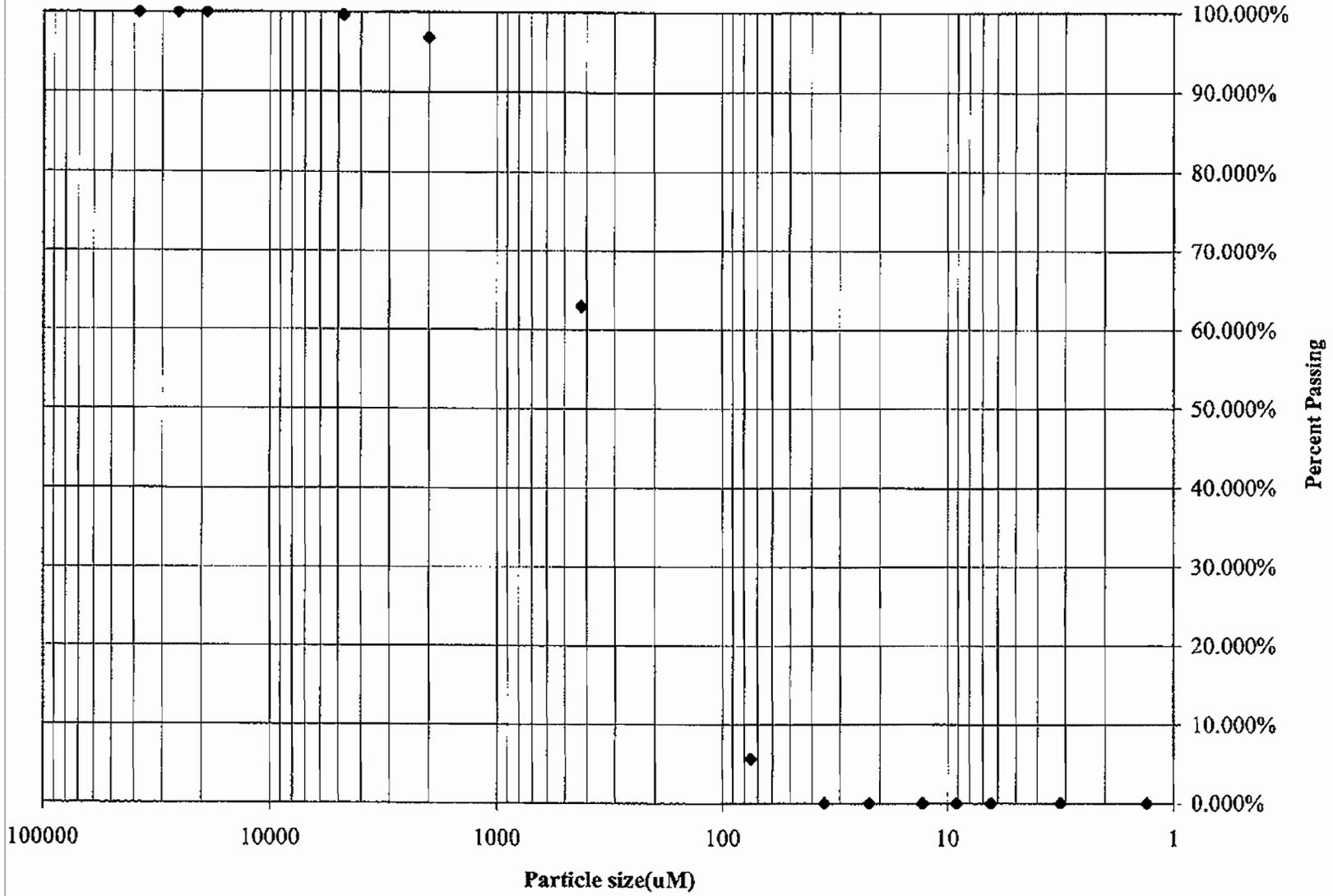
Reviewed: *[Signature]*

Date: 8/26/2005

[Signature]

Particle Size Analysis

◆ 05060907-04A





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SLI Work Order: 05060907
SLI Sample ID: 05060907-05A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05060907-05A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 9.1% |
| No. 10 | 2.00 | 2.7% |
| No. 20 | 0.85 | 11.9% |
| No. 40 | 0.420 | 15.7% |
| No. 60 | 0.250 | 12.4% |
| No. 140 | 0.106 | 15.4% |
| No. 200 | 0.075 | 13.8% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05060907-05A |
| Gravel | >4.75 | 9.1% |
| Sand, Course | 4.74-2.0 | 2.7% |
| Sand, Medium | 1.99-0.420 | 15.7% |
| Sand, Fine | 0.419-0.075 | 41.6% |
| Silt | 0.074-0.005 | 14.3% |
| Clay | <0.005-0.001 | 0.5% |
| Colloids | <0.001 | 4.3% |

Analyst: *Dave King*

Date: *8/26/05*

Reviewed: *[Signature]*

Date: *8/26/2005*



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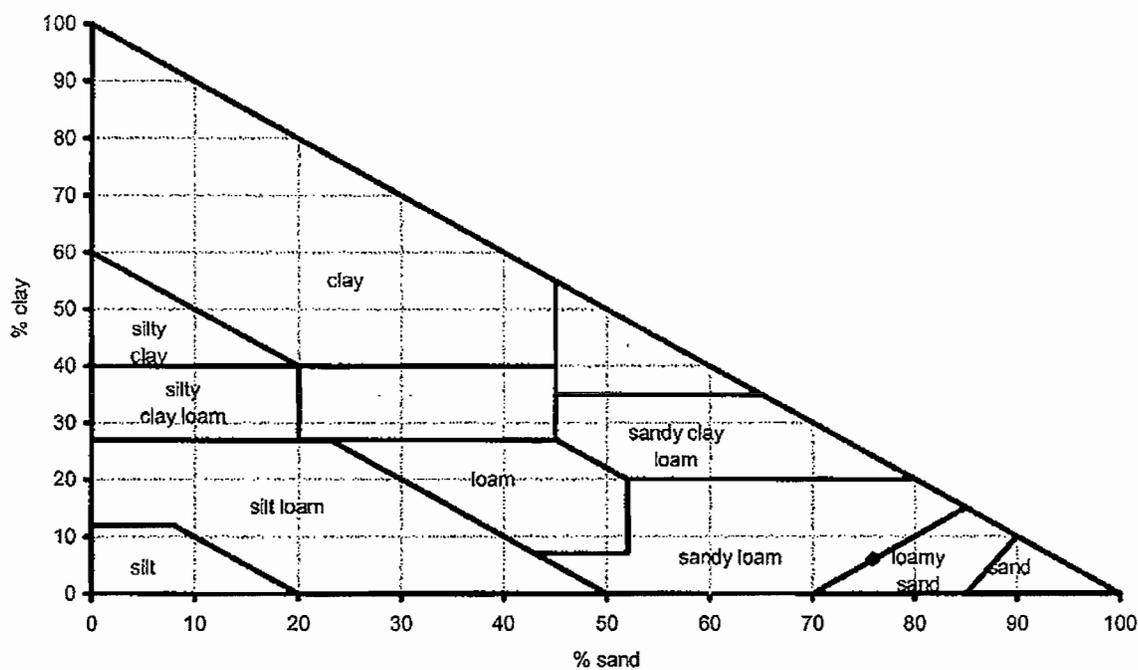


SLI Work Order: 05060907
SLI Sample ID: 05060907-05A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 75.9 | 6.1 | 14.26 |

Soil Classification: sandy loam

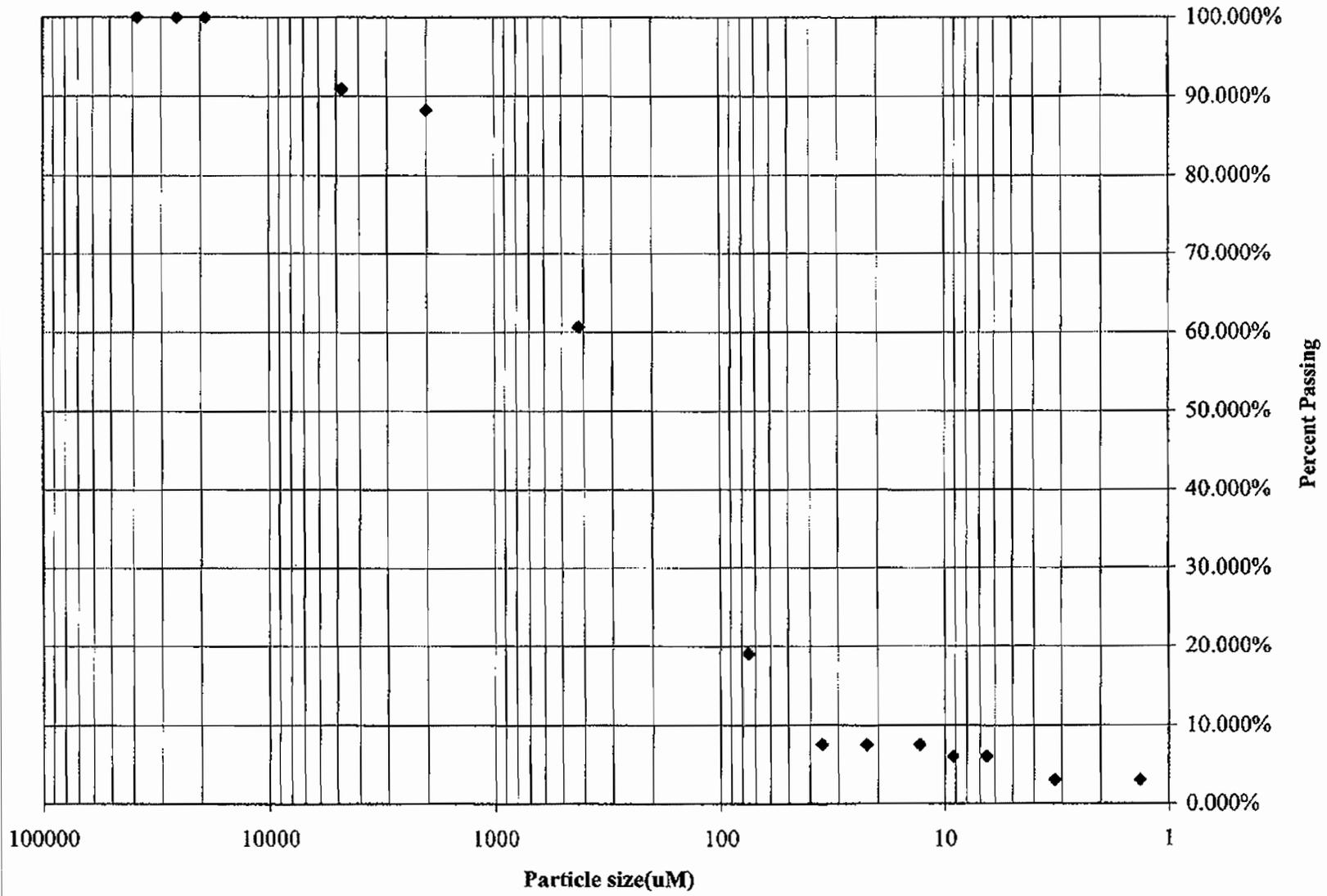


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerokis and B. Basr, 28 July 2000.

Particle Size Analysis

◆ 05060907-05A





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SLI Work Order: 05060907
 SLI Sample ID: 05060907-06A

Analysis Date: 8/2/2004

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05060907-06A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 2.6% |
| No. 20 | 0.85 | 14.5% |
| No. 40 | 0.420 | 21.6% |
| No. 60 | 0.250 | 39.1% |
| No. 140 | 0.106 | 15.8% |
| No. 200 | 0.075 | 1.9% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05060907-06A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 2.6% |
| Sand, Medium | 1.99-0.420 | 36.1% |
| Sand, Fine | 0.419-0.075 | 56.9% |
| Silt | 0.074-0.005 | 4.1% |
| Clay | <0.005-0.001 | 0.2% |
| Colloids | <0.001 | 0.0% |

Analyst: _____

Reviewed: _____

Date: 8/26/05

Date: 8/26/2005



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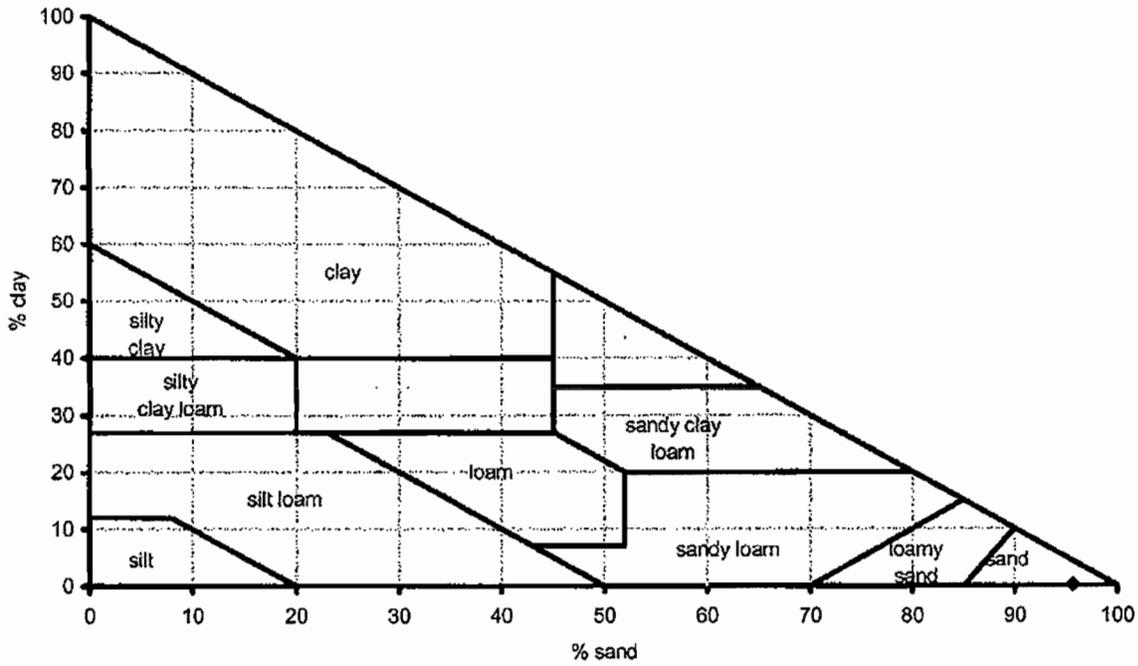


SLI Work Order: 05060907
SLI Sample ID: 05060907-06A

Analysis Date: 8/2/2004

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 95.7 | 0.2 | 4.14 |

Soil Classification: sand

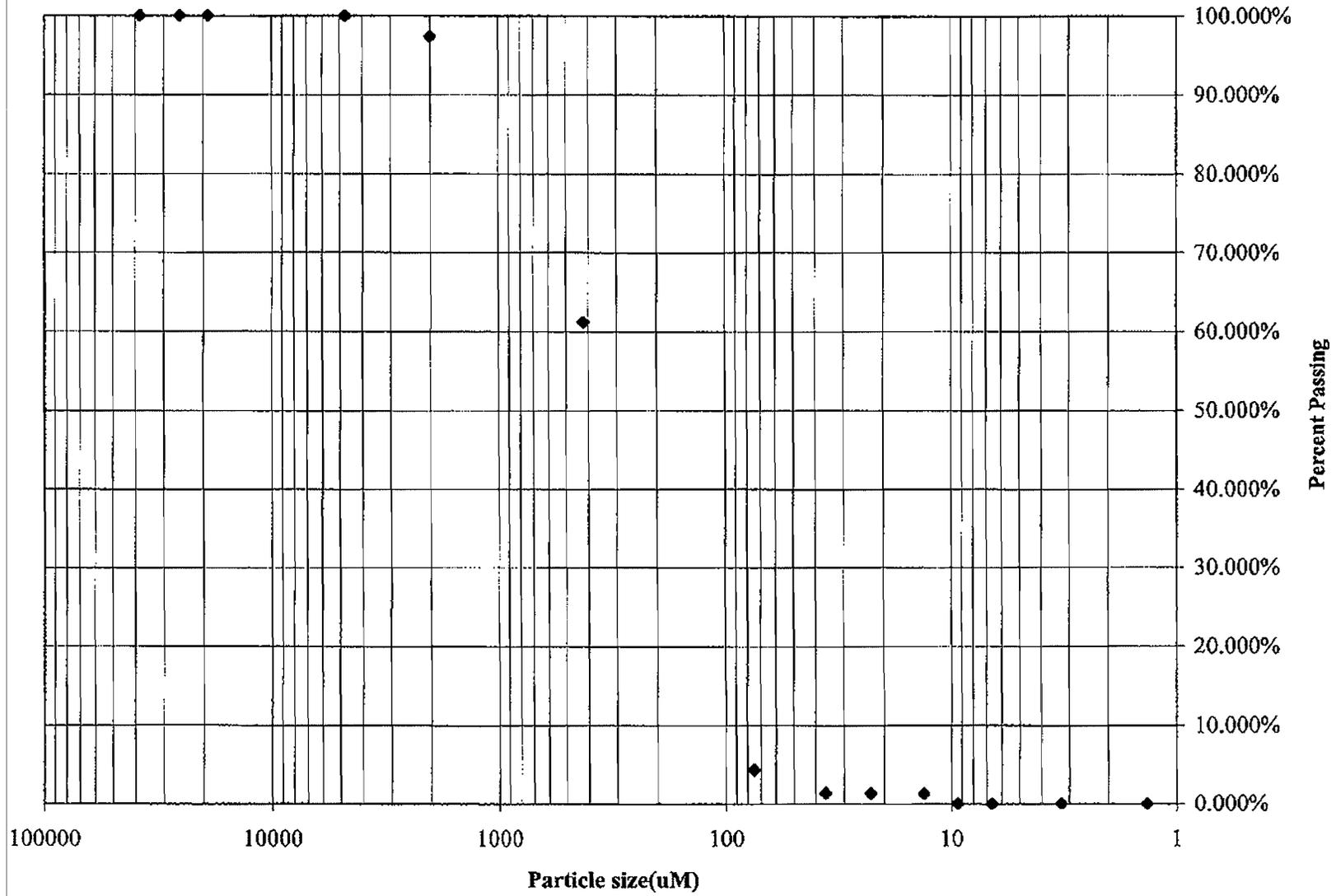


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Garakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05060907-06A





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CHAIN OF CUSTODY RECORD

41019

| | | | |
|---|---|--|---|
| Company Name MWRDGC | TURNAROUND TIME REQUESTED <input checked="" type="checkbox"/> Normal <input type="checkbox"/> RUSH* *Additional Rush Charges Approved. | ANALYSIS & METHOD REQUESTED Enter an "X" in box below for request | Page of |
| Company Address 6001 W. Pershing | | | PO No. |
| City Cicero State IL Zip 60804 | *Date & Time Needed: | Shipping Method PICK UP | Reporting Level (at additional charge) 1 2 3 4 |
| Phone (708) 588-4074 Fax Report <input type="checkbox"/> | Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply. | | LAB USE ONLY |
| Email Address jennifer.wasik@mwrdd.org Email Report <input checked="" type="checkbox"/> | Specify Regulatory Program: <input type="checkbox"/> None/Info Only (Required) | Sample containers supplied by customer? <input type="checkbox"/> Yes | |
| Project ID / Location Sediment Chem | <input type="checkbox"/> LUST <input type="checkbox"/> SRP <input type="checkbox"/> SDWA | AVS/SEM TDC Particle Size | Samples received within 6 hours of collection? <input type="checkbox"/> Yes |
| Project Manager (Report to) Jen Wasik | <input type="checkbox"/> 503 Sludge <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> MWRDGC | | R Condition Split LAB # |
| Sample Collector(s) Tom Minarik | <input type="checkbox"/> Disposal <input type="checkbox"/> Other* *Please specify in comment section below. | | |

| SAMPLE IDENTIFICATION *Use One Line Per Preservation & Container Type* | COLLECTION | | MATRIX | GRAB/ | CONTAINERS | | PRESERVATIVE | AVS/SEM | TDC | Particle Size | R | Condition | Split | LAB # |
|---|------------|-------|--------|-------|------------|-------------|--------------|-------------------------------------|-------------------------------------|-------------------------------------|---|-----------|-------|-------|
| | DATE | TIME | | COMP. | Qty | SIZE & TYPE | | | | | | | | |
| 1 WW31 side | 6/21/05 | 11:00 | Sed | G | 1 | pl. #1 L | --- | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | 01A |
| 2 WW31 center | 6/21/05 | 11:30 | Sed | G | 1 | pl. #1 L | --- | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | 02A |
| 3 WW32 side | 6/22/05 | 10:30 | Sed | G | 1 | P 1 | --- | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | 03A |
| 4 WW32 center | 6/22/05 | 10:45 | Sed | G | 1 | P 1 | --- | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | 04A |
| 5 WW106 side | 6/23/05 | 11:30 | Sed | G | 1 | P 1 | --- | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | 05A |
| 6 WW106 center | 6/23/05 | 12:00 | Sed | G | 1 | P 1 | --- | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | 06A |
| 7 | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |

| | | |
|---|---|---|
| MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water (SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H ₂ SO ₄ , HCl, HNO ₃ , Methanol (MeOH), NaOH, Sodium Bisulfate (NaB), Na ₂ SO ₃ | COMMENTS & SPECIAL INSTRUCTIONS: | CONDITION CODES 1. Improper/damaged container/cap 2. Improper preservation 3. Insufficient sample volume 4. Headspace/air bubbles for VOCs 5. Received past holding time 6. Received frozen 7. Label conflicts with COC |
|---|---|---|

| | | | | | | | |
|---|------------------------|--|------------------------|--------------------------------------|------|--------------------------------------|------|
| 1. Relinquished By <i>Jennifer Wasik</i> | Date 6/27/05 | 2. Relinquished By <i>Steve Clark</i> | Date 6/27/05 | 3. Relinquished By | Date | 4. Relinquished By | Date |
| Received By <i>Steve Clark</i> | Time 1:17 | Received By | Time 1:50 | Received By | Time | Received By | Time |
| <input checked="" type="checkbox"/> Ice present | | <input type="checkbox"/> Ice present | | <input type="checkbox"/> Ice present | | <input type="checkbox"/> Ice present | |

Submission of samples subject to Terms and Conditions on back.

Rev. 02/01/05

White - Original, Yellow - Lab Copy, Pink - Sampler Copy



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August 31, 2005

Jennifer Wasik
Metropolitan Water Reclamation District of Chicago
Research and Development Dept.
6001 W. Pershing
Cicero, IL 60804-4112

Tel: (708) 588-4074
Fax: (708) 588-3807

Lab Order: **05070516**

Project Name: Contract 05-104-11 (Sediment Chemistry)

Dear Jennifer Wasik:

Suburban Laboratories, Inc. received 4 sample(s) on 7/15/05 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call your customer service representative at (708) 544-3260.

Sincerely,

Shane Clarke
Project Manager

cc: Sam Dennison



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Client ID: Metropolitan Water Reclamation District of Chicago

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070516

Chain of Custody # 41020

Temperature of samples upon receipt in our Lab: 2 °C

CASE NARRATIVE

Date: August 31, 2005

PO #: 3032962

QC Level: Level I

General Comments:

- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:

- Reporting Limit: The reporting limit is designed to be the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:

For a complete list of method references please contact us.

- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater

Project Specific Comments:

Particle Size 05070516-04A: Due to this sample being predominately organic material (sticks and twigs) the particle size data should be used with caution. The sieve distribution would be accurate, but due to the buoyancy of the organic material, the hydrometer data (for the determination of silt, clay, and colloids) is biased high. Based upon the amount of material passing all sieves, the maximum value for the total of silt, clay, and colloids would be 4.1%, where the result from the hydrometer part of the particle size analysis totalled 9.5% (all as colloids).

SEM Metals: The method blank for the samples contained 0.0014 umoles/gram copper, 0.002 umole/g-dry Nickel and 0.41 umole/g-dry zinc. The blank level for the total SEM metals calculates to be 0.044 umole/gram-dry. For samples with concentrations of the particular metal species or the total SEM metals greater than 10X the blank level, the blank contribution is generally considered insignificant. For those samples with concentrations less than 10X the blank level, the data should be used with caution.



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070516

Client Sample ID: WW 35 Side-Central;NSC

Matrix: SEDIMENT

Lab ID: 05070516-01A

Date Received: 07/15/2005 9:47 AM

Collection Date: 07/07/2005 12:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.00065 | J | 0.000462 | umoles/g-dry | 1 | 08/10/2005 1:04 PM | 16875 |
| Copper | 0.0889 | B | 0.00315 | umoles/g-dry | 1 | 08/10/2005 1:04 PM | 16875 |
| Lead | 0.217 | | 0.00217 | umoles/g-dry | 1 | 08/10/2005 1:04 PM | 16875 |
| Nickel | 0.0759 | B | 0.00456 | umoles/g-dry | 1 | 08/10/2005 1:04 PM | 16875 |
| Zinc | 1.74 | B | 0.0153 | umoles/g-dry | 1 | 08/10/2005 1:04 PM | 16875 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.642 | | 0 | µmoles/g-dry | 1 | 07/21/2005 10:00 AM | R43934 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 62.64 | | 0 | wt% | 1 | 07/18/2005 3:00 PM | R44428 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.954 | | 0 | | 1 | 07/21/2005 10:00 AM | R43934 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 2.12 | B | 0.026 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 43300 | | 153 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Max | 53700 | | 153 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Min | 29200 | | 153 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070516

Client Sample ID: WW 35 Center-Central;NSC

Matrix: SEDIMENT

Lab ID: 05070516-02A

Date Received: 07/15/2005 9:47 AM

Collection Date: 07/07/2005 12:30 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000447 | umoles/g-dry | 1 | 08/10/2005 1:09 PM | 16875 |
| Copper | 0.163 | B | 0.00305 | umoles/g-dry | 1 | 08/10/2005 1:09 PM | 16875 |
| Lead | 0.144 | | 0.00210 | umoles/g-dry | 1 | 08/10/2005 1:09 PM | 16875 |
| Nickel | 0.0651 | B | 0.00442 | umoles/g-dry | 1 | 08/10/2005 1:09 PM | 16875 |
| Zinc | 1.10 | B | 0.0149 | umoles/g-dry | 1 | 08/10/2005 1:09 PM | 16875 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 39.7 | | 0 | umoles/g-dry | 1 | 07/21/2005 10:00 AM | R43934 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/15/2005 12:00 AM | R44954 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 61.41 | | 0 | wt% | 1 | 07/18/2005 3:00 PM | R44428 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.037 | | 0 | | 1 | 07/21/2005 10:00 AM | R43934 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.47 | B | 0.025 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 25400 | | 148 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Max | 69000 | | 148 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Min | 75500 | | 148 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |

| | | | | |
|--------------------|---|---|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070516

Client Sample ID: WW 34 Side-Dempster;NBCR

Matrix: SEDIMENT

Lab ID: 05070516-03A

Date Received: 07/15/2005 9:47 AM

Collection Date: 07/13/2005 11:00 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000309 | umoles/g-dry | 1 | 08/10/2005 1:13 PM | 16875 |
| Copper | 0.0871 | B | 0.00211 | umoles/g-dry | 1 | 08/10/2005 1:13 PM | 16875 |
| Lead | 0.0487 | | 0.00145 | umoles/g-dry | 1 | 08/10/2005 1:13 PM | 16875 |
| Nickel | 0.0481 | B | 0.00305 | umoles/g-dry | 1 | 08/10/2005 1:13 PM | 16875 |
| Zinc | 0.411 | B | 0.0103 | umoles/g-dry | 1 | 08/10/2005 1:13 PM | 16875 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 35.7 | | 0 | µmoles/g-dry | 1 | 07/21/2005 10:00 AM | R43934 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 44.12 | | 0 | wt% | 1 | 07/18/2005 3:00 PM | R44428 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.017 | | 0 | | 1 | 07/21/2005 10:00 AM | R43934 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.595 | B | 0.017 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 19400 | | 102 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Max | 24500 | | 102 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Min | 13200 | | 102 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05070516

Client Sample ID: WW 34 Center-Dempster;NBCR

Matrix: SEDIMENT

Lab ID: 05070516-04A

Date Received: 07/15/2005 9:47 AM

Collection Date: 07/13/2005 11:15 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0109 | | 0.00120 | umoles/g-dry | 1 | 08/10/2005 1:18 PM | 16875 |
| Copper | 0.0673 | B | 0.00821 | umoles/g-dry | 1 | 08/10/2005 1:18 PM | 16875 |
| Lead | 0.569 | | 0.00565 | umoles/g-dry | 1 | 08/10/2005 1:18 PM | 16875 |
| Nickel | 0.140 | B | 0.0119 | umoles/g-dry | 1 | 08/10/2005 1:18 PM | 16875 |
| Zinc | 3.54 | B | 0.0400 | umoles/g-dry | 1 | 08/10/2005 1:18 PM | 16875 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 117 | | 0 | µmoles/g-dry | 1 | 07/21/2005 10:00 AM | R43934 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | N/A | c | 0 | Date | 1 | 08/29/2005 12:00 AM | R45007 |
| Diameter of Soil Particles | N/A | c | 0 | Date | 1 | 08/29/2005 12:00 AM | R45007 |
| Hydrometer | N/A | c | 0 | Date | 1 | 08/29/2005 12:00 AM | R45007 |
| Particle Density | N/A | c | 0 | Date | 1 | 08/29/2005 12:00 AM | R45007 |
| Sieve Analysis | N/A | c | 0 | Date | 1 | 08/29/2005 12:00 AM | R45007 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 85.67 | | 0 | wt% | 1 | 07/18/2005 3:00 PM | R44428 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.037 | | 0 | | 1 | 07/21/2005 10:00 AM | R43934 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 4.33 | B | 0.067 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 106000 | | 399 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Max | 138000 | | 399 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |
| Total Organic Carbon - Min | 88000 | | 399 | mg/Kg-dry | 1 | 08/02/2005 9:15 PM | R44395 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method-specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



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SLI Work Order: 05070516
SLI Sample ID: 05070516-01A

Analysis Date: 8/15/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070516-01A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 7.9% |
| No. 10 | 2.00 | 7.3% |
| No. 20 | 0.85 | 16.5% |
| No. 40 | 0.420 | 13.7% |
| No. 60 | 0.250 | 9.5% |
| No. 140 | 0.106 | 13.2% |
| No. 200 | 0.075 | 6.7% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070516-01A |
| Gravel | >4.75 | 7.9% |
| Sand, Course | 4.74-2.0 | 15.2% |
| Sand, Medium | 1.99-0.420 | 30.2% |
| Sand, Fine | 0.419-0.075 | 29.5% |
| Silt | 0.074-0.005 | 22.1% |
| Clay | <0.005-0.001 | 1.6% |
| Colloids | <0.001 | 1.4% |

Analyst: *Renee LeMay*
Reviewed: *[Signature]*

Date: *8/30/05*
Date: *8/30/2005*



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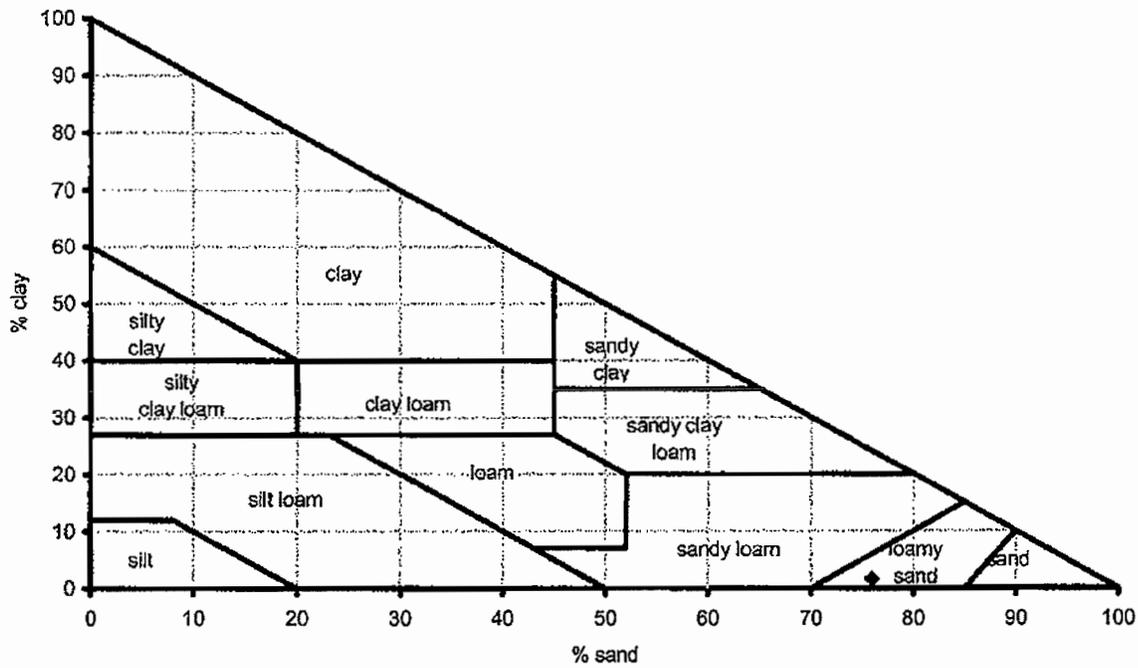


SLI Work Order: 05070516
SLI Sample ID: 05070516-01A

Analysis Date: 8/15/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 76.0 | 1.7 | 22.06 |

Soil Classification: Gravelly loamy sand

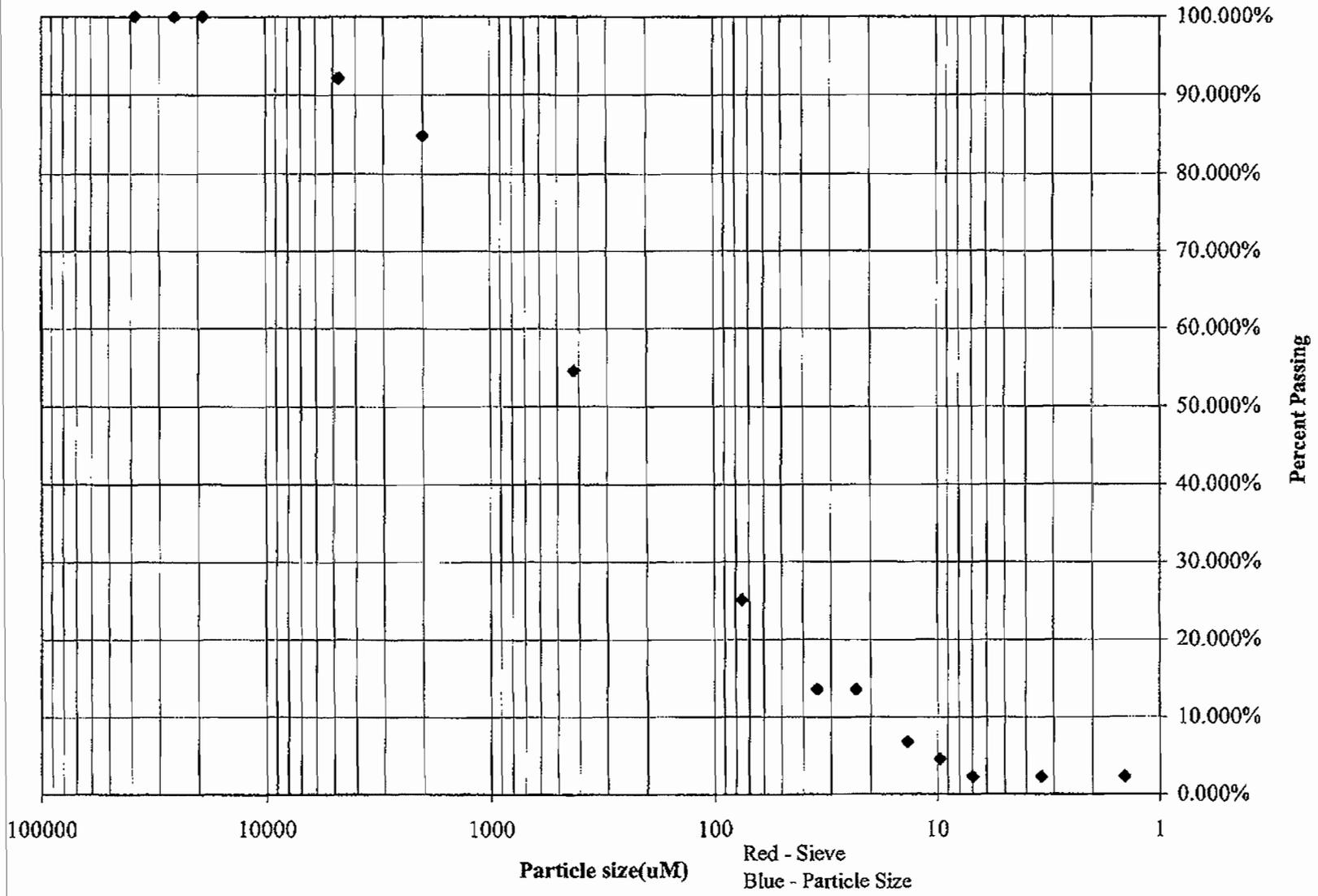


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Garbels and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05070516-01A





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SLI Work Order: 05070516
 SLI Sample ID: 05070516-02A

Analysis Date: 8/15/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070516-02A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 0.6% |
| No. 20 | 0.85 | 9.5% |
| No. 40 | 0.420 | 14.3% |
| No. 60 | 0.250 | 12.5% |
| No. 140 | 0.106 | 16.8% |
| No. 200 | 0.075 | 9.0% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070516-02A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 0.6% |
| Sand, Medium | 1.99-0.420 | 23.9% |
| Sand, Fine | 0.419-0.075 | 38.3% |
| Silt | 0.074-0.005 | 33.5% |
| Clay | <0.005-0.001 | 2.4% |
| Colloids | <0.001 | 1.3% |

Analyst: Renee Redman

Date: 8/30/05

Reviewed: [Signature]

Date: 8/30/2005



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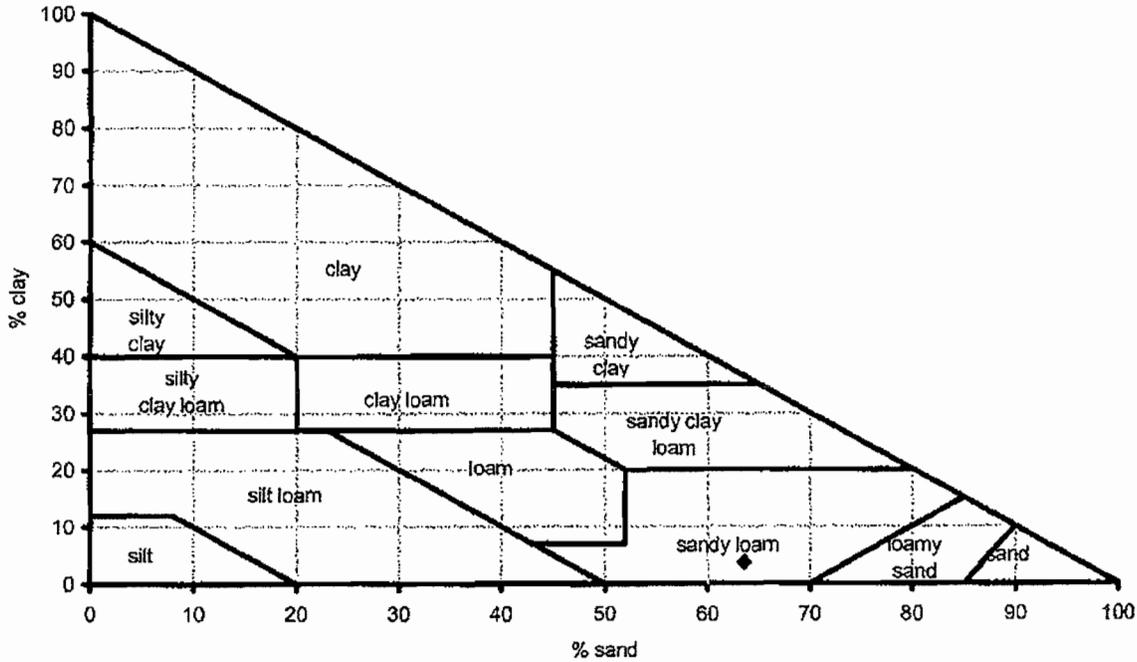


SLI Work Order: 05070516
SLI Sample ID: 05070516-02A

Analysis Date: 8/15/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 63.6 | 3.7 | 33.52 |

Soil Classification: sandy loam

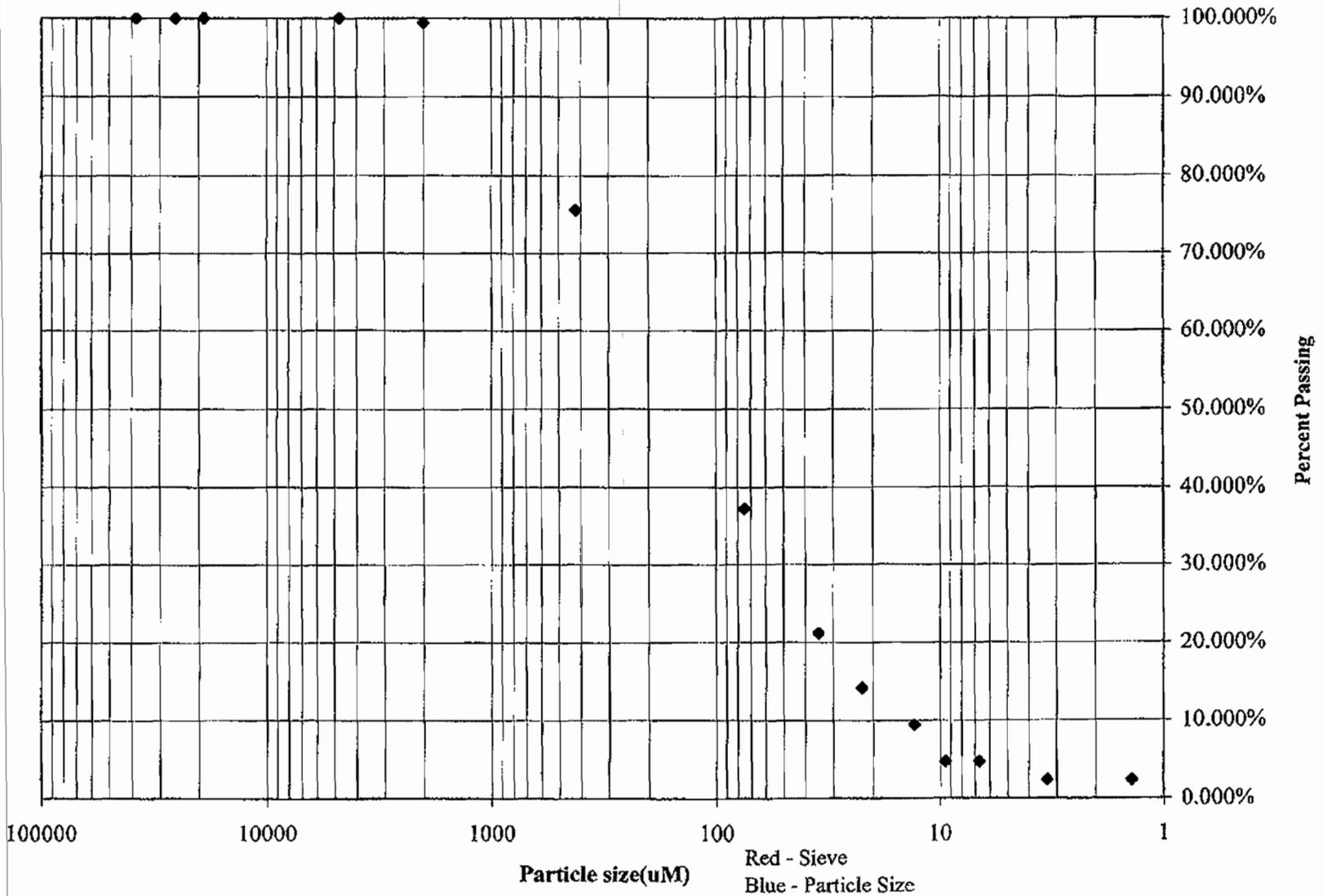


Note: For soil triangle, colloids are included as part of clay.

Texture triangle by A. Barakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05070516-02A





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SLI Work Order: 05070516
 SLI Sample ID: 05070516-03A

Analysis Date: 8/16/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070516-03A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 0.7% |
| No. 20 | 0.85 | 4.5% |
| No. 40 | 0.420 | 7.0% |
| No. 60 | 0.250 | 14.6% |
| No. 140 | 0.106 | 42.7% |
| No. 200 | 0.075 | 12.0% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070516-03A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 0.7% |
| Sand, Medium | 1.99-0.420 | 11.5% |
| Sand, Fine | 0.419-0.075 | 69.3% |
| Silt | 0.074-0.005 | 13.6% |
| Clay | <0.005-0.001 | 0.7% |
| Colloids | <0.001 | 4.2% |

Analyst: *Renee Reah*

Date: *8/30/05*

Reviewed: *[Signature]*

Date: *9/29/2005*



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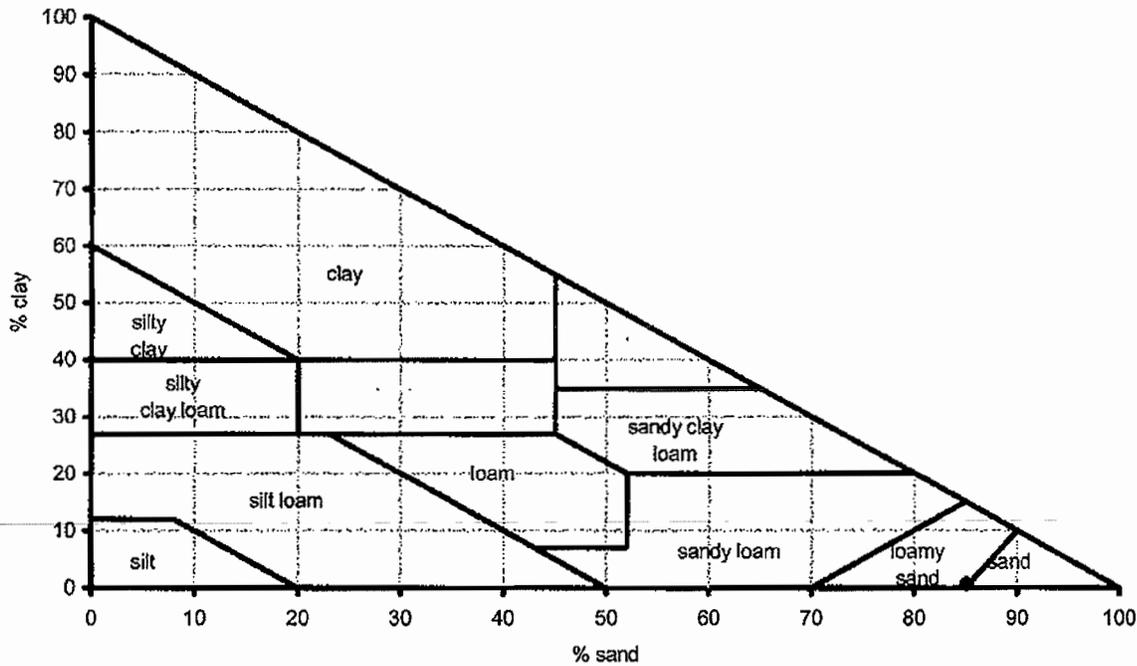


SLI Work Order: 05070516
SLI Sample ID: 05070516-03A

Analysis Date: 8/16/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 85.1 | 0.8 | 13.59 |

Soil Classification: loamy sand

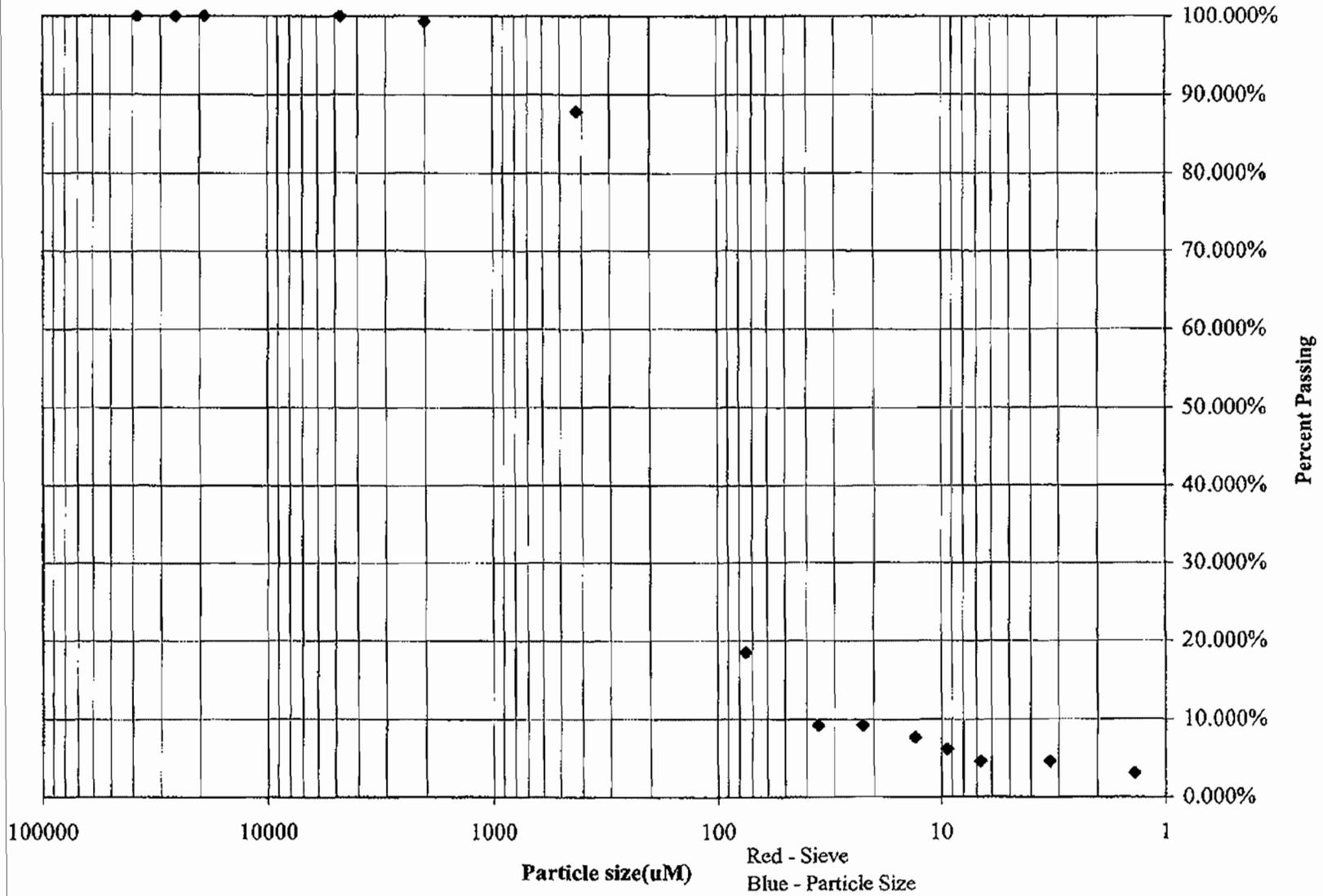


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Garak's and B. Beer, 28 July 2000.

Particle Size Analysis

◆ 05070516-03A





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SLI Work Order: 05070516
 SLI Sample ID: 05070516-04A

Analysis Date: 8/16/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05070516-04A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 4.8% |
| No. 10 | 2.00 | 3.9% |
| No. 20 | 0.85 | 19.6% |
| No. 40 | 0.420 | 20.4% |
| No. 60 | 0.250 | 20.9% |
| No. 140 | 0.106 | 17.9% |
| No. 200 | 0.075 | 3.7% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05070516-04A |
| Gravel | >4.75 | 4.8% |
| Sand, Course | 4.74-2.0 | 8.7% |
| Sand, Medium | 1.99-0.420 | 40.0% |
| Sand, Fine | 0.419-0.075 | 42.4% |
| Silt | 0.074-0.005 | 0.0% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 9.5% |

Analyst: *Renee DeLuca*
 Reviewed: *[Signature]*

Date: *8/30/05*
 Date: *8/30/2005*



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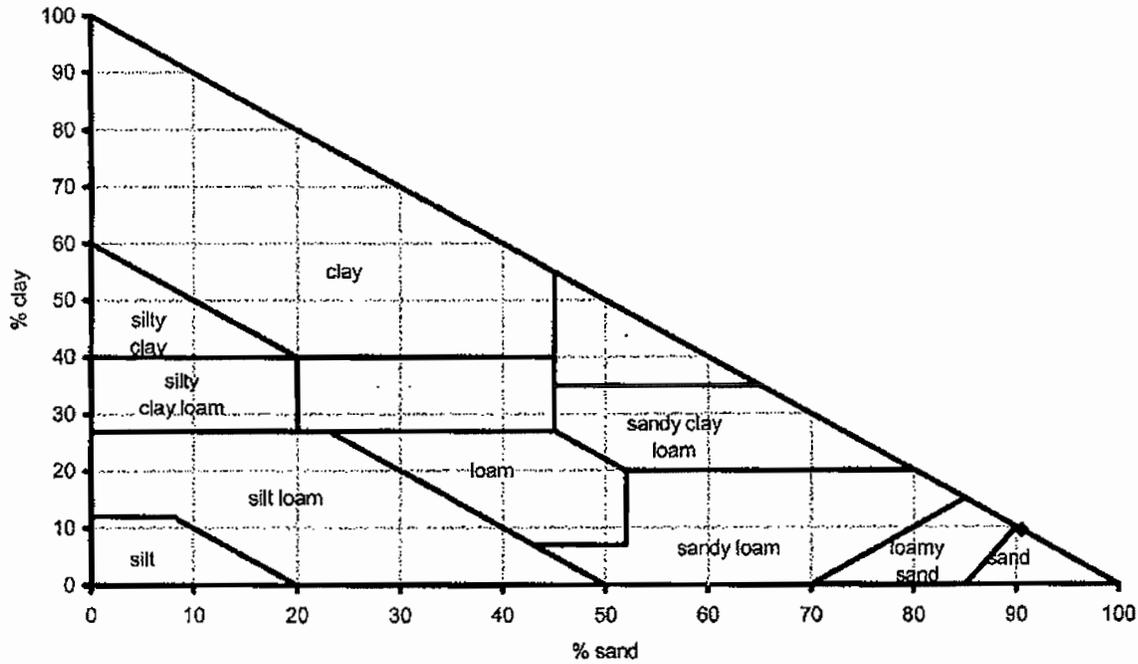


SLI Work Order: 05070516
SLI Sample ID: 05070516-04A

Analysis Date: 8/16/2005

% SAND % CLAY % SILT
90.5 9.5 0.00

Soil Classification: Gravelly sand

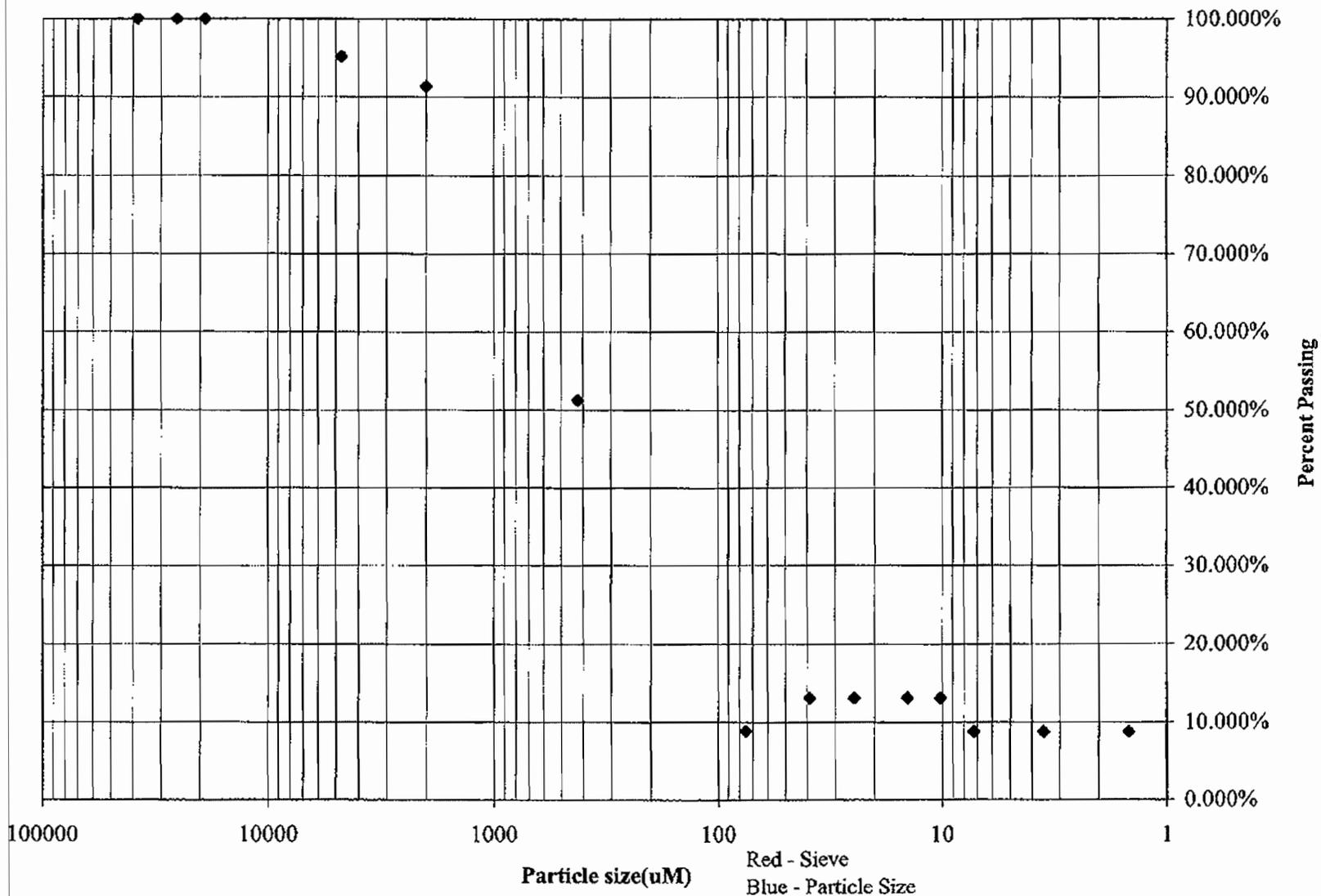


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Genskis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05070516-04A





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August 31, 2005

Jennifer Wasik
Metropolitan Water Reclamation District of Chicago
Research and Development Dept.
6001 W. Pershing
Cicero, IL 60804-4112

Tel: (708) 588-4074
Fax: (708) 588-3807

Lab Order: **05071076**

Project Name: Contract 05-104-11 (Sediment Chemistry)

Dear Jennifer Wasik:

Suburban Laboratories, Inc. received 13 sample(s) on 7/29/05 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call your customer service representative at (708) 544-3260.

Sincerely,

Shane Clarke
Project Manager

cc: Sam Dennison



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Client ID: Metropolitan Water Reclamation District of Chicago

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

CASE NARRATIVE

Date: August 31, 2005

Chain of Custody # Electronic Version

PO #: 3032962

Temperature of samples upon receipt in our Lab: 6.0 °C

QC Level: Level I

General Comments:

- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.

Abbreviations:

- Reporting Limit: The reporting limit is designed to be the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- In Laboratory: EPA recommends this analyte be analyzed "immediately" (e.g., tests that should be performed in the field within 15 minutes of collection). Analytes with "immediate" hold times are analyzed as soon as possible upon receipt by the laboratory.
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).

Method References:

For a complete list of method references please contact us.

- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater

Project Specific Comments:

05071076-01A-04A Zinc, S=The LCS percent recovery (121.59%) was outside laboratory control limits (80.0% - 120.0%). The samples run with this LCS might be slightly high biased.

SEM Metals: The method blank for the samples 01A through 04A contained 0.001 umoles/gram copper, 0.002 umole/g-dry Nickel and 0.040 umole/g-dry zinc. The blank level for the total SEM metals calculates to be 0.044 umole/gram-dry. The method blank for the samples 05A through 13A contained 0.003 umoles/gram copper, 0.003 umole/g-dry Nickel and 0.88 umole/g-dry zinc. The blank level for the total SEM metals calculates to be 0.030 umole/gram-dry. For samples with concentrations of the particular metal species or the total SEM metals greater than 10X the blank level, the blank contribution is generally considered insignificant. For those samples with concentrations less than 10X the blank level, the data should be used with caution.

Sample 04A and 13A were utilized for matrix spikes.



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 46 Side

Matrix: SEDIMENT

Lab ID: 05071076-01A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/18/2005 11:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.324 | | 0.000461 | umoles/g-dry | 1 | 08/10/2005 1:51 PM | 17021 |
| Copper | 0.758 | B | 0.00314 | umoles/g-dry | 1 | 08/10/2005 1:51 PM | 17021 |
| Lead | 1.79 | | 0.00216 | umoles/g-dry | 1 | 08/10/2005 1:51 PM | 17021 |
| Nickel | 1.15 | B | 0.00455 | umoles/g-dry | 1 | 08/10/2005 1:51 PM | 17021 |
| Zinc | 13.3 | B | 0.0153 | umoles/g-dry | 1 | 08/10/2005 1:51 PM | 17021 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 6.68 | | 0 | umoles/g-dry | 1 | 08/01/2005 2:00 PM | R44205 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 62.59 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 2.60 | | 0 | | 1 | 08/01/2005 2:00 PM | R44205 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 17.4 | B | 0.026 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 126000 | | 153 | mg/Kg-dry | 1 | 08/12/2005 11:15 PM | R44864 |
| Total Organic Carbon - Max | 145000 | | 153 | mg/Kg-dry | 1 | 08/12/2005 11:15 PM | R44864 |
| Total Organic Carbon - Min | 109000 | | 153 | mg/Kg-dry | 1 | 08/12/2005 11:15 PM | R44864 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 46 Center

Matrix: SEDIMENT

Lab ID: 05071076-02A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/18/2005 12:15 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0267 | | 0.000681 | umoles/g-dry | 1 | 08/10/2005 1:56 PM | 17021 |
| Copper | 0.273 | B | 0.00464 | umoles/g-dry | 1 | 08/10/2005 1:56 PM | 17021 |
| Lead | 0.343 | | 0.00319 | umoles/g-dry | 1 | 08/10/2005 1:56 PM | 17021 |
| Nickel | 0.154 | B | 0.00672 | umoles/g-dry | 1 | 08/10/2005 1:56 PM | 17021 |
| Zinc | 4.94 | B | 0.0226 | umoles/g-dry | 1 | 08/10/2005 1:56 PM | 17021 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 75.4 | | 0 | µmoles/g-dry | 1 | 08/01/2005 2:00 PM | R44205 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/16/2005 12:00 AM | R44955 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 74.64 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.076 | | 0 | | 1 | 08/01/2005 2:00 PM | R44205 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 5.74 | B | 0.038 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 125000 | | 226 | mg/Kg-dry | 1 | 08/12/2005 11:15 PM | R44864 |
| Total Organic Carbon - Max | 132000 | | 226 | mg/Kg-dry | 1 | 08/12/2005 11:15 PM | R44864 |
| Total Organic Carbon - Min | 116000 | | 226 | mg/Kg-dry | 1 | 08/12/2005 11:15 PM | R44864 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 96 Side

Matrix: SEDIMENT

Lab ID: 05071076-03A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/19/2005 11:00 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000280 | umoles/g-dry | 1 | 08/10/2005 2:01 PM | 17021 |
| Copper | 0.0545 | B | 0.00191 | umoles/g-dry | 1 | 08/10/2005 2:01 PM | 17021 |
| Lead | 0.0255 | | 0.00131 | umoles/g-dry | 1 | 08/10/2005 2:01 PM | 17021 |
| Nickel | 0.0846 | B | 0.00277 | umoles/g-dry | 1 | 08/10/2005 2:01 PM | 17021 |
| Zinc | 0.210 | B | 0.00931 | umoles/g-dry | 1 | 08/10/2005 2:01 PM | 17021 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.893 | | 0 | umoles/g-dry | 1 | 08/01/2005 2:00 PM | R44205 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 38.42 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.550 | | 0 | | 1 | 08/01/2005 2:00 PM | R44205 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.374 | B | 0.016 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 47300 | | 92.9 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Max | 69700 | | 92.9 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Min | 18700 | | 92.9 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |

Qualifiers:

| | | | |
|---|--|----|--|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 102 Side

Matrix: SEDIMENT

Lab ID: 05071076-04A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/20/2005 10:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | S | 0.000245 | umoles/g-dry | 1 | 08/10/2005 2:05 PM | 17021 |
| Copper | 0.0348 | SB | 0.00167 | umoles/g-dry | 1 | 08/10/2005 2:05 PM | 17021 |
| Lead | 0.0392 | S | 0.00115 | umoles/g-dry | 1 | 08/10/2005 2:05 PM | 17021 |
| Nickel | 0.0202 | SB | 0.00242 | umoles/g-dry | 1 | 08/10/2005 2:05 PM | 17021 |
| Zinc | 0.293 | SB | 0.00813 | umoles/g-dry | 1 | 08/10/2005 2:05 PM | 17021 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 28.4 | | 0 | µmoles/g-dry | 1 | 08/01/2005 2:00 PM | R44205 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 29.48 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.014 | | 0 | | 1 | 08/01/2005 2:00 PM | R44205 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.387 | B | 0.014 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 8630 | | 81.1 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Max | 11600 | | 81.1 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Min | 5160 | | 81.1 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |

| | | | | |
|--|---|---|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| <small>BaseReport-MDL-ContFrac2004</small> | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 102 Center

Matrix: SEDIMENT

Lab ID: 05071076-05A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/20/2005 10:50 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.00414 | | 0.000427 | umoles/g-dry | 1 | 08/10/2005 2:28 PM | 17039 |
| Copper | 0.137 | B | 0.00291 | umoles/g-dry | 1 | 08/10/2005 2:28 PM | 17039 |
| Lead | 0.298 | | 0.00200 | umoles/g-dry | 1 | 08/10/2005 2:28 PM | 17039 |
| Nickel | 0.0763 | B | 0.00422 | umoles/g-dry | 1 | 08/10/2005 2:28 PM | 17039 |
| Zinc | 2.09 | B | 0.0142 | umoles/g-dry | 1 | 08/10/2005 2:28 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.409 | | 0 | µmoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 59.61 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 6.39 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 2.61 | B | 0.024 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 87400 | | 142 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Max | 93700 | | 142 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Min | 79500 | | 142 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |

| | | | | |
|--------------------|---|--|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 36 Side

Matrix: SEDIMENT

Lab ID: 05071076-06A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/21/2005 10:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0217 | | 0.000507 | umoles/g-dry | 1 | 08/10/2005 2:33 PM | 17039 |
| Copper | 0.114 | B | 0.00346 | umoles/g-dry | 1 | 08/10/2005 2:33 PM | 17039 |
| Lead | 0.169 | | 0.00238 | umoles/g-dry | 1 | 08/10/2005 2:33 PM | 17039 |
| Nickel | 0.0619 | B | 0.00501 | umoles/g-dry | 1 | 08/10/2005 2:33 PM | 17039 |
| Zinc | 1.62 | B | 0.0169 | umoles/g-dry | 1 | 08/10/2005 2:33 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 58.5 | | 0 | µmoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/18/2005 12:00 AM | R44956 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 31.97 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.034 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.98 | B | 0.028 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 51000 | | 84.1 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Max | 50400 | | 84.1 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Min | 38400 | | 84.1 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |

Qualifiers:

| | | | |
|---|---|----|--|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 36 Center

Matrix: SEDIMENT

Lab ID: 05071076-07A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/21/2005 10:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000262 | umoles/g-dry | 1 | 08/10/2005 2:46 PM | 17039 |
| Copper | 0.0111 | B | 0.00179 | umoles/g-dry | 1 | 08/10/2005 2:46 PM | 17039 |
| Lead | 0.0221 | | 0.00123 | umoles/g-dry | 1 | 08/10/2005 2:46 PM | 17039 |
| Nickel | 0.0274 | B | 0.00259 | umoles/g-dry | 1 | 08/10/2005 2:46 PM | 17039 |
| Zinc | 0.108 | B | 0.00872 | umoles/g-dry | 1 | 08/10/2005 2:46 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.456 | | 0 | µmoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 34.25 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.370 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.180 | B | 0.015 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 44200 | | 87.0 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Max | 50200 | | 87.0 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Min | 41000 | | 87.0 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |

| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
|---------------------------------|---|--|----|--|
| BaseReport-MDL- ConfFrac2004 | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 101 Side

Matrix: SEDIMENT

Lab ID: 05071076-08A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/27/2005 12:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0154 | | 0.000238 | umoles/g-dry | 1 | 08/10/2005 2:51 PM | 17039 |
| Copper | ND | B | 0.00163 | umoles/g-dry | 1 | 08/10/2005 2:51 PM | 17039 |
| Lead | 0.124 | | 0.00112 | umoles/g-dry | 1 | 08/10/2005 2:51 PM | 17039 |
| Nickel | 0.0195 | B | 0.00235 | umoles/g-dry | 1 | 08/10/2005 2:51 PM | 17039 |
| Zinc | 1.56 | B | 0.00792 | umoles/g-dry | 1 | 08/10/2005 2:51 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 27.7 | | 0 | umoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 27.63 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.062 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.72 | B | 0.013 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 34400 | | 79.0 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Max | 37700 | | 79.0 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Min | 31900 | | 79.0 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |

Qualifiers:

| | |
|---|--|
| * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limit (QL) | ND Not Detected at the SLI Reporting Limit |
| Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 101 Center

Matrix: SEDIMENT

Lab ID: 05071076-09A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/27/2005 12:30 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0139 | | 0.000271 | umoles/g-dry | 1 | 08/10/2005 2:56 PM | 17039 |
| Copper | 0.00572 | B | 0.00185 | umoles/g-dry | 1 | 08/10/2005 2:56 PM | 17039 |
| Lead | 0.0763 | | 0.00127 | umoles/g-dry | 1 | 08/10/2005 2:56 PM | 17039 |
| Nickel | 0.0207 | B | 0.00268 | umoles/g-dry | 1 | 08/10/2005 2:56 PM | 17039 |
| Zinc | 1.58 | B | 0.00902 | umoles/g-dry | 1 | 08/10/2005 2:56 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 28.6 | | 0 | µmoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 36.39 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.059 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 1.70 | B | 0.015 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 29000 | | 89.9 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Max | 38700 | | 89.9 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |
| Total Organic Carbon - Min | 22300 | | 89.9 | mg/Kg-dry | 1 | 08/16/2005 11:30 PM | R44865 |

Qualifiers:

| | | | |
|---|--|----|--|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 37 Side

Matrix: SEDIMENT

Lab ID: 05071076-10A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/27/2005 10:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0268 | | 0.000968 | umoles/g-dry | 1 | 08/10/2005 3:00 PM | 17039 |
| Copper | ND | B | 0.00660 | umoles/g-dry | 1 | 08/10/2005 3:00 PM | 17039 |
| Lead | 0.256 | | 0.00454 | umoles/g-dry | 1 | 08/10/2005 3:00 PM | 17039 |
| Nickel | 0.109 | B | 0.00956 | umoles/g-dry | 1 | 08/10/2005 3:00 PM | 17039 |
| Zinc | 3.33 | B | 0.0322 | umoles/g-dry | 1 | 08/10/2005 3:00 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 95.2 | | 0 | µmoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/22/2005 12:00 AM | R44957 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 40.58 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.039 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 3.73 | B | 0.054 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 35500 | | 96.3 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Max | 51500 | | 96.3 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Min | 23600 | | 96.3 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |

| | | | | |
|--------------------|---|---|----|--|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | ND | Not Detected at the SLI Reporting Limit |
| | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S | Spike Recovery outside accepted recovery limits |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 37 Center

Matrix: SEDIMENT

Lab ID: 05071076-11A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/27/2005 11:00 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.00993 | | 0.000230 | umoles/g-dry | 1 | 08/10/2005 3:05 PM | 17039 |
| Copper | 0.00659 | B | 0.00157 | umoles/g-dry | 1 | 08/10/2005 3:05 PM | 17039 |
| Lead | 0.0550 | | 0.00108 | umoles/g-dry | 1 | 08/10/2005 3:05 PM | 17039 |
| Nickel | 0.0182 | B | 0.00227 | umoles/g-dry | 1 | 08/10/2005 3:05 PM | 17039 |
| Zinc | 0.827 | B | 0.00765 | umoles/g-dry | 1 | 08/10/2005 3:05 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 0.400 | | 0 | µmoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 25.04 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 2.29 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 0.917 | B | 0.013 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 6170 | | 76.3 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Max | 7140 | | 76.3 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Min | 5170 | | 76.3 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |

Qualifiers:

BaseReport+MDL-
ContFrac2004

- * Value exceeds Maximum Contaminant Level
 - B Analyte detected in the associated Method Blank
 - c Analyte not included in SLI scope of accreditation
 - E Estimated, analyte detected above quantitation range
 - G Refer to case narrative page for specific comments
 - H Holding times for preparation or analysis exceeded
 - J Analyte detected below quantitation limit (QL)
 - ND Not Detected at the SLI Reporting Limit
 - Q Internal standard recovery is outside SLI in-house criteria
 - S Spike Recovery outside accepted recovery limits
- (no method specific requirements exist)



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 73 Side

Matrix: SEDIMENT

Lab ID: 05071076-12A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/28/2005 11:15 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.362 | | 0.00108 | umoles/g-dry | 1 | 08/10/2005 3:10 PM | 17039 |
| Copper | ND | B | 0.00734 | umoles/g-dry | 1 | 08/10/2005 3:10 PM | 17039 |
| Lead | 2.40 | | 0.00505 | umoles/g-dry | 1 | 08/10/2005 3:10 PM | 17039 |
| Nickel | 1.97 | B | 0.0106 | umoles/g-dry | 1 | 08/10/2005 3:10 PM | 17039 |
| Zinc | 17.5 | B | 0.0358 | umoles/g-dry | 1 | 08/10/2005 3:10 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 104 | | 0 | µmoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 67.93 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 0.213 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 22.2 | | 0.060 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 66500 | | 178 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Max | 76300 | | 178 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Min | 58600 | | 178 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |

Qualifiers:

BaseReport-MDL-
ContFrac2004

- * Value exceeds Maximum Contaminant Level
- B Analyte detected in the associated Method Blank
- c Analyte not included in SLI scope of accreditation
- E Estimated, analyte detected above quantitation range
- G Refer to case narrative page for specific comments
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limit (QL)
- ND Not Detected at the SLI Reporting Limit
- Q Internal standard recovery is outside SLI in-house criteria
(no method specific requirements exist)
- S Spike Recovery outside accepted recovery limits



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: August 31, 2005

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 05071076

Client Sample ID: WW 73 Center

Matrix: SEDIMENT

Lab ID: 05071076-13A

Date Received: 07/29/2005 12:00 AM

Collection Date: 07/28/2005 11:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|--------------|-------|----------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.356 | | 0.000925 | umoles/g-dry | 1 | 08/10/2005 3:14 PM | 17039 |
| Copper | 1.06 | B | 0.00630 | umoles/g-dry | 1 | 08/10/2005 3:14 PM | 17039 |
| Lead | 5.10 | | 0.00434 | umoles/g-dry | 1 | 08/10/2005 3:14 PM | 17039 |
| Nickel | 0.529 | B | 0.00913 | umoles/g-dry | 1 | 08/10/2005 3:14 PM | 17039 |
| Zinc | 15.4 | B | 0.0307 | umoles/g-dry | 1 | 08/10/2005 3:14 PM | 17039 |
| ACID VOLATILE SULFIDE | | | Method: 821/1291/100 | | Analyst: BL | | |
| Acid Volatile Sulfide | 1.98 | | 0 | umoles/g-dry | 1 | 08/03/2005 4:30 PM | R44401 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: RR | | |
| % Soil in Suspension | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Diameter of Soil Particles | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Hydrometer | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Particle Density | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| Sieve Analysis | See Attached | c | 0 | Date | 1 | 08/24/2005 12:00 AM | R44958 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: RM | | |
| Percent Moisture | 81.34 | | 0 | wt% | 1 | 08/01/2005 7:45 PM | R44431 |
| SEM / AVS RATIO | | | Method: 821/1291/100 | | Analyst: BL | | |
| SEM / AVS Ratio | 3.65 | | 0 | | 1 | 08/03/2005 4:30 PM | R44401 |
| TOTAL SEM | | | Method: 821/1291/100 | | Analyst: RR | | |
| Total SEM | 7.23 | | 0.051 | umoles/g-dry | 1 | 08/10/2005 12:00 AM | R44476 |
| TOTAL ORGANIC CARBON | | | Method: SW9060 | | Analyst: MB | | |
| Total Organic Carbon - Average | 103000 | | 307 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Max | 107000 | | 307 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |
| Total Organic Carbon - Min | 95900 | | 307 | mg/Kg-dry | 1 | 08/19/2005 9:52 PM | R44866 |

| | | |
|-----------------------------|--|--|
| Qualifiers: | * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| BaseReport-MDL-ContFrac2014 | c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| | G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| | J Analyte detected below quantitation limit (QL) | ND Not Detected at the SLI Reporting Limit |
| | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) | S Spike Recovery outside accepted recovery limits |



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 4140 Litt Drive · Hillside, Illinois 60162-1183
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 www.suburbanlabs.com



SLI Work Order: 05071076
 SLI Sample ID: 05071076-01A

Analysis Date: 8/16/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-01A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 1.0% |
| No. 10 | 2.00 | 2.6% |
| No. 20 | 0.85 | 16.5% |
| No. 40 | 0.420 | 18.0% |
| No. 60 | 0.250 | 12.9% |
| No. 140 | 0.106 | 13.1% |
| No. 200 | 0.075 | 7.4% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-01A |
| Gravel | >4.75 | 1.0% |
| Sand, Course | 4.74-2.0 | 2.6% |
| Sand, Medium | 1.99-0.420 | 34.5% |
| Sand, Fine | 0.419-0.075 | 33.5% |
| Silt | 0.074-0.005 | 22.4% |
| Clay | <0.005-0.001 | 1.6% |
| Colloids | <0.001 | 4.4% |

Analyst: *David Newberry*

Date: 8/30/05

Reviewed: *Gregory E. Brown*

Date: 8/30/2005



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www.suburbanlabs.com

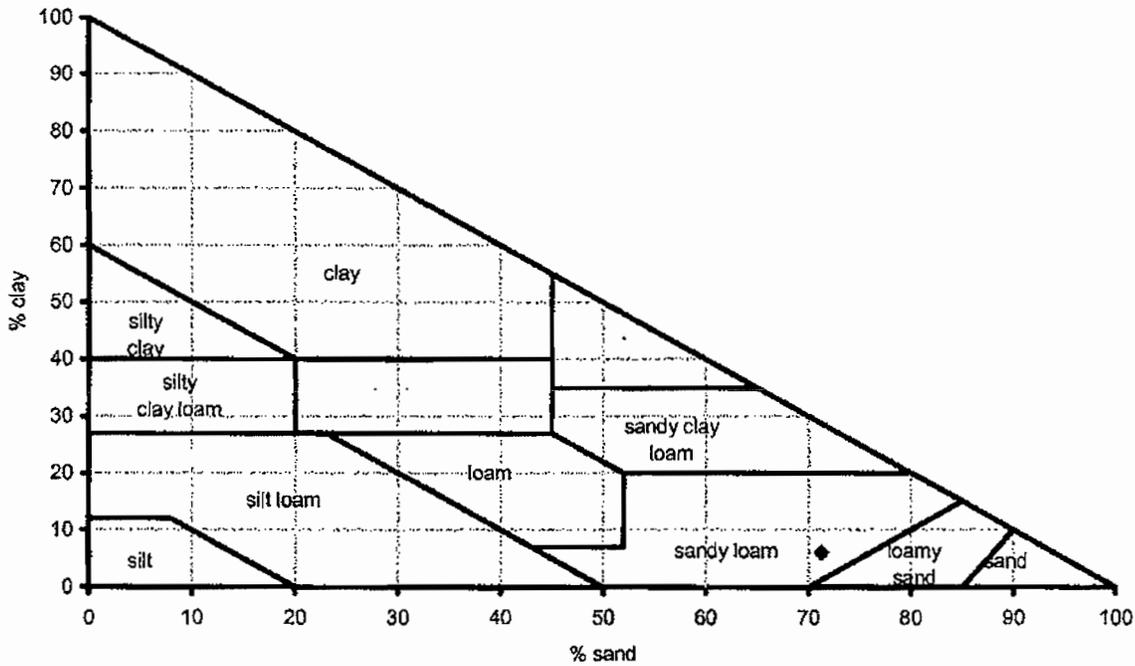


SLI Work Order: 05071076
SLI Sample ID: 05071076-01A

Analysis Date: 8/16/2005

% SAND % CLAY % SILT
71.3 6.0 22.44

Soil Classification: Gravelly sandy loam

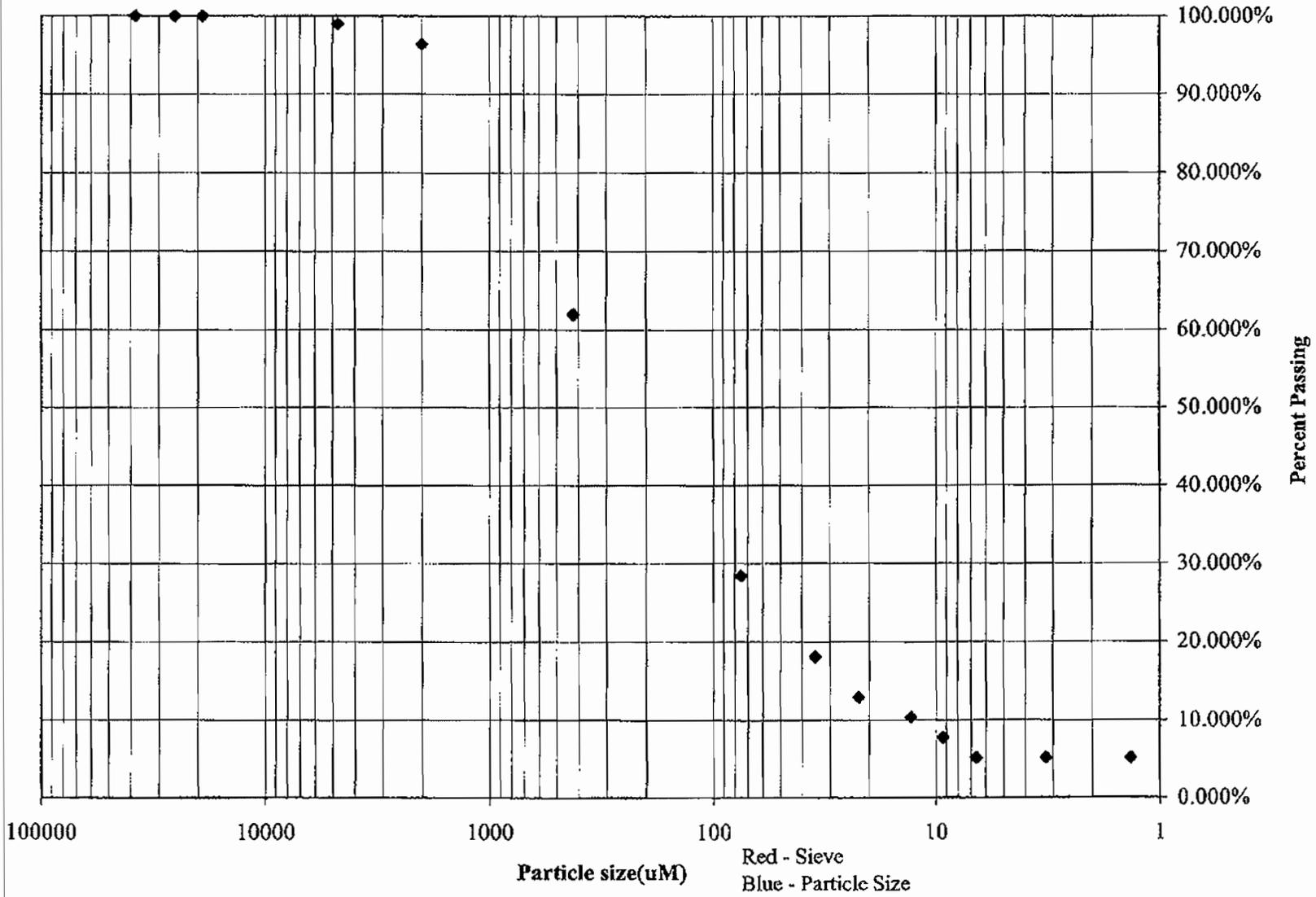


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-01A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-02A

Analysis Date: 8/16/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-02A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 1.0% |
| No. 10 | 2.00 | 1.4% |
| No. 20 | 0.85 | 19.3% |
| No. 40 | 0.420 | 18.3% |
| No. 60 | 0.250 | 11.2% |
| No. 140 | 0.106 | 12.2% |
| No. 200 | 0.075 | 5.8% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-02A |
| Gravel | >4.75 | 1.0% |
| Sand, Course | 4.74-2.0 | 1.4% |
| Sand, Medium | 1.99-0.420 | 37.6% |
| Sand, Fine | 0.419-0.075 | 29.2% |
| Silt | 0.074-0.005 | 22.5% |
| Clay | <0.005-0.001 | 2.1% |
| Colloids | <0.001 | 6.2% |

Analyst: *Renee Hedger*

Date: *8/30/05*

Reviewed: *Henry E. [Signature]*

Date: *9/2/2005*



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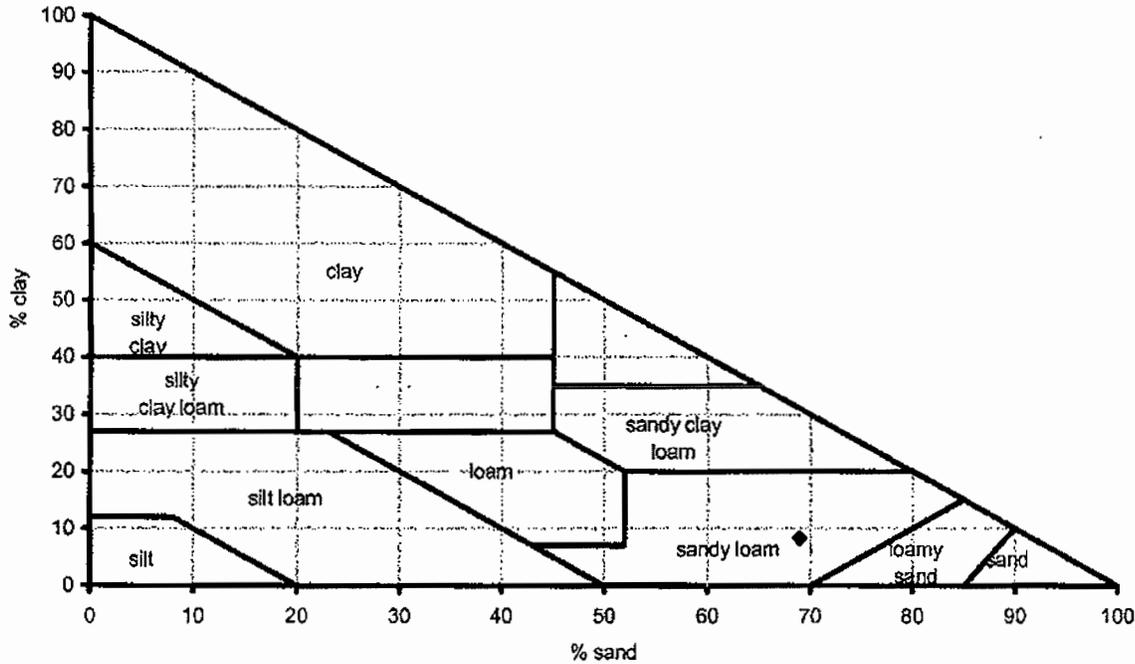


SLI Work Order: 05071076
SLI Sample ID: 05071076-02A

Analysis Date: 8/16/2005

% SAND % CLAY % SILT
69.0 8.3 22.48

Soil Classification: Gravelly sandy loam

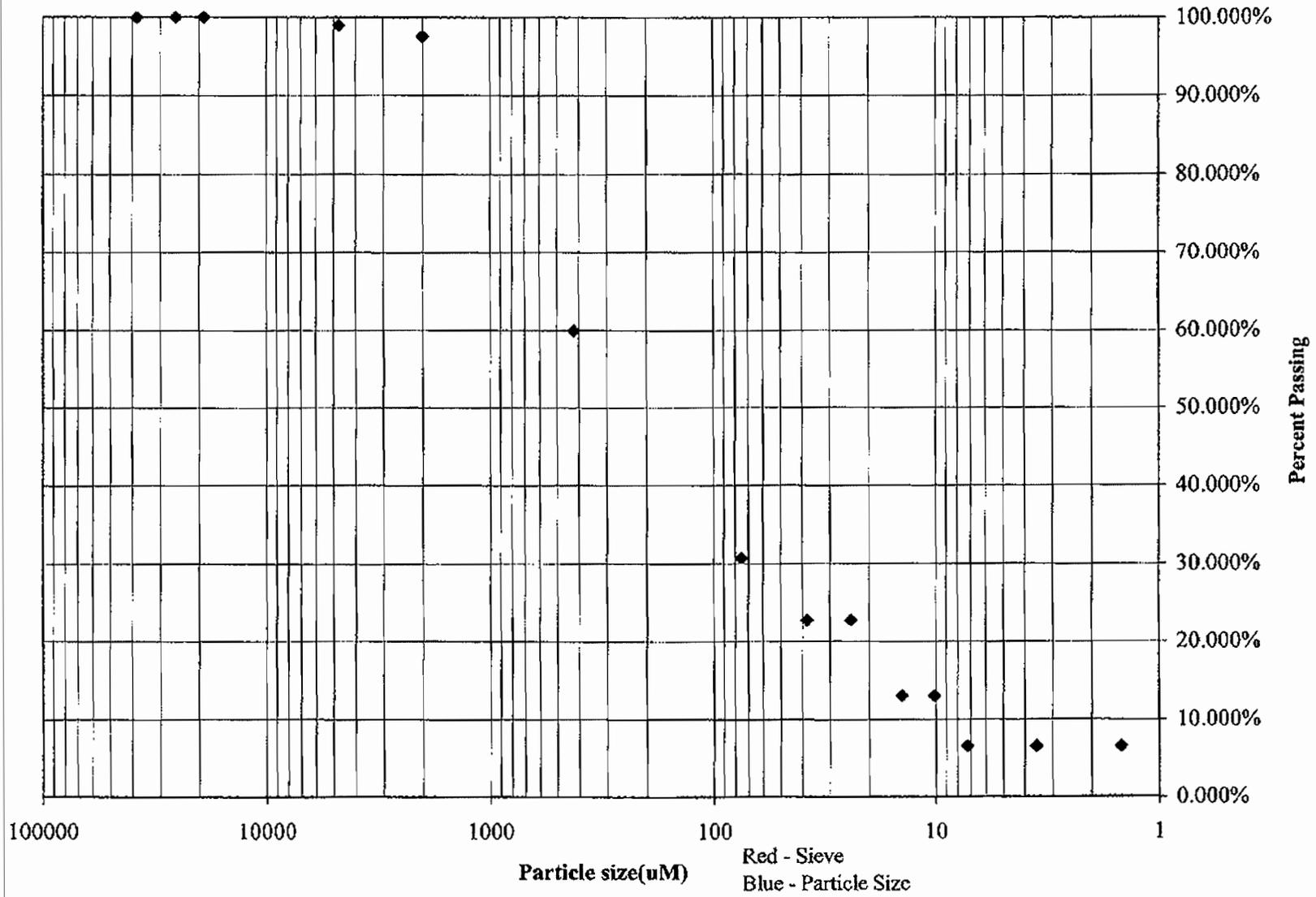


Note: For soil triangle, colloids are included as part of clay.

Texture triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-02A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-03A

Analysis Date: 8/18/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-03A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 1.1% |
| No. 10 | 2.00 | 1.6% |
| No. 20 | 0.85 | 13.7% |
| No. 40 | 0.420 | 12.0% |
| No. 60 | 0.250 | 9.4% |
| No. 140 | 0.106 | 16.9% |
| No. 200 | 0.075 | 8.2% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-03A |
| Gravel | >4.75 | 1.1% |
| Sand, Course | 4.74-2.0 | 1.6% |
| Sand, Medium | 1.99-0.420 | 25.6% |
| Sand, Fine | 0.419-0.075 | 34.4% |
| Silt | 0.074-0.005 | 34.8% |
| Clay | <0.005-0.001 | 1.2% |
| Colloids | <0.001 | 1.3% |

Analyst: *Ronald Hays 8/24*

Date: *8/30/05*

Reviewed: *[Signature]*

Date: *8/31/2005*



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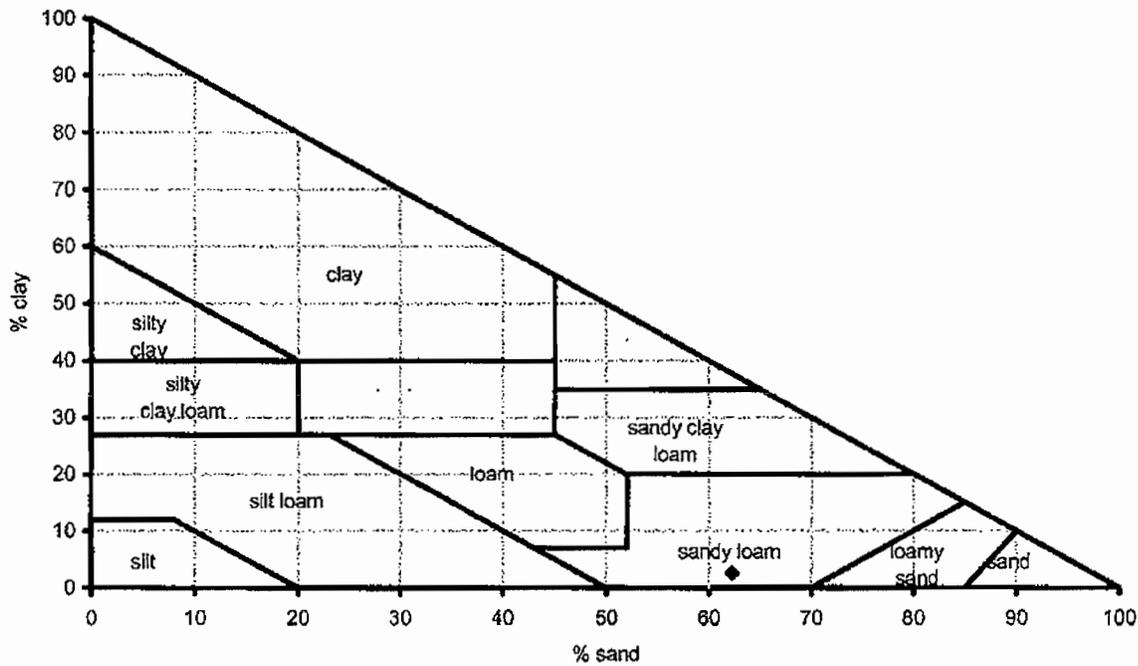


SLI Work Order: 05071076
SLI Sample ID: 05071076-03A

Analysis Date: 8/18/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 62.3 | 2.5 | 34.81 |

Soil Classification: Gravelly sandy loam

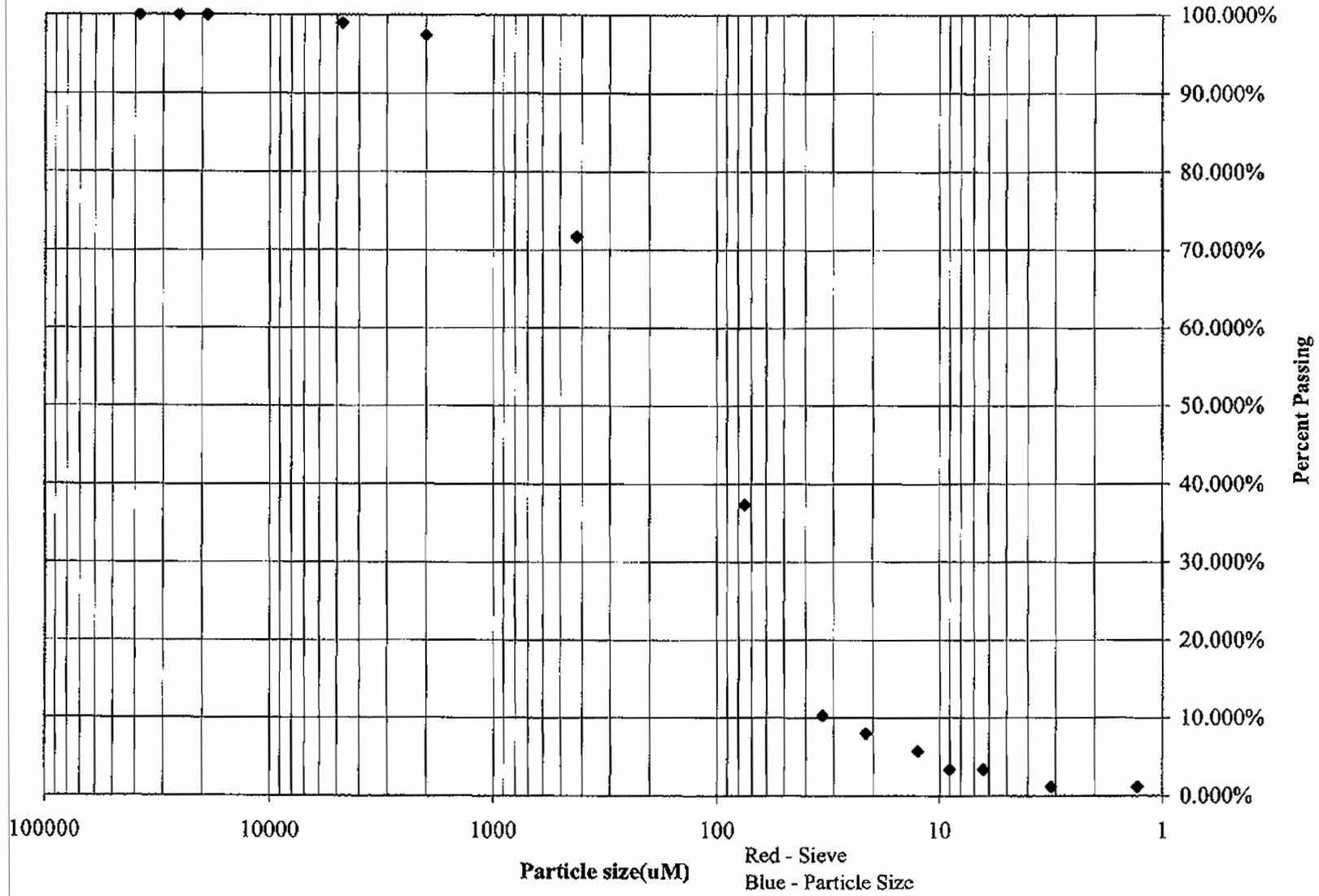


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-03A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-04A

Analysis Date: 8/18/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-04A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 24.6% |
| No. 10 | 2.00 | 22.3% |
| No. 20 | 0.85 | 24.9% |
| No. 40 | 0.420 | 12.9% |
| No. 60 | 0.250 | 7.4% |
| No. 140 | 0.106 | 5.6% |
| No. 200 | 0.075 | 1.0% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-04A |
| Gravel | >4.75 | 24.6% |
| Sand, Course | 4.74-2.0 | 22.3% |
| Sand, Medium | 1.99-0.420 | 37.8% |
| Sand, Fine | 0.419-0.075 | 14.0% |
| Silt | 0.074-0.005 | 0.0% |
| Clay | <0.005-0.001 | 0.1% |
| Colloids | <0.001 | 1.4% |

Analyst: *[Signature]*

Date: 8/30/05

Reviewed: *[Signature]*

Date: 8/30/2005



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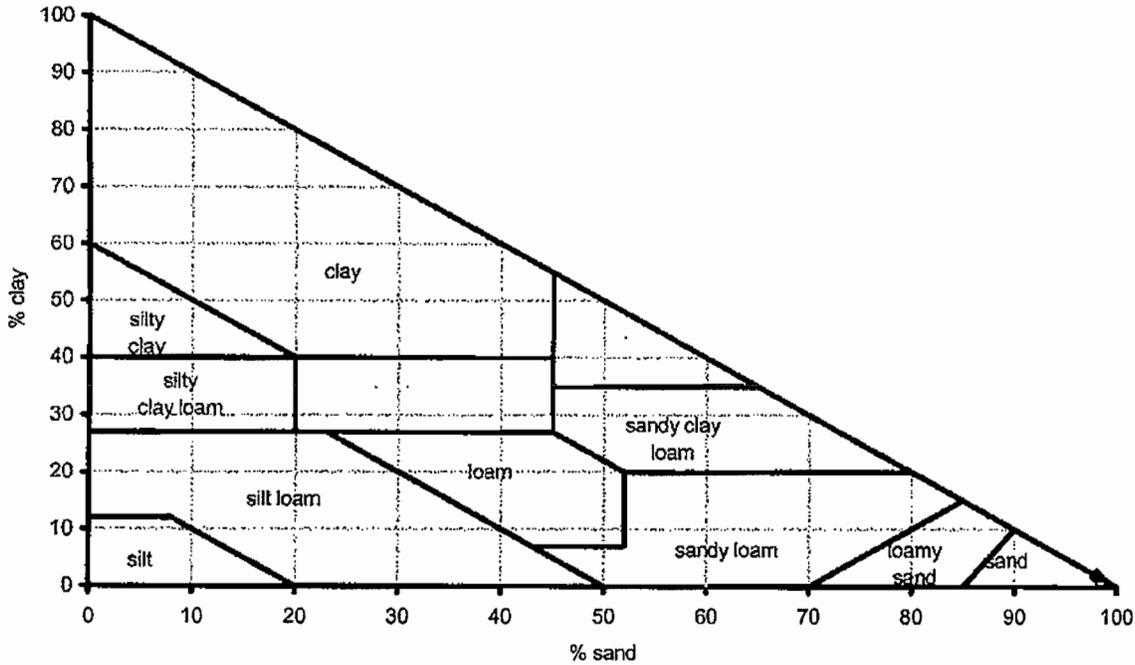


SLI Work Order: 05071076
SLI Sample ID: 05071076-04A

Analysis Date: 8/18/2005

% SAND % CLAY % SILT
98.0 2.0 0.00

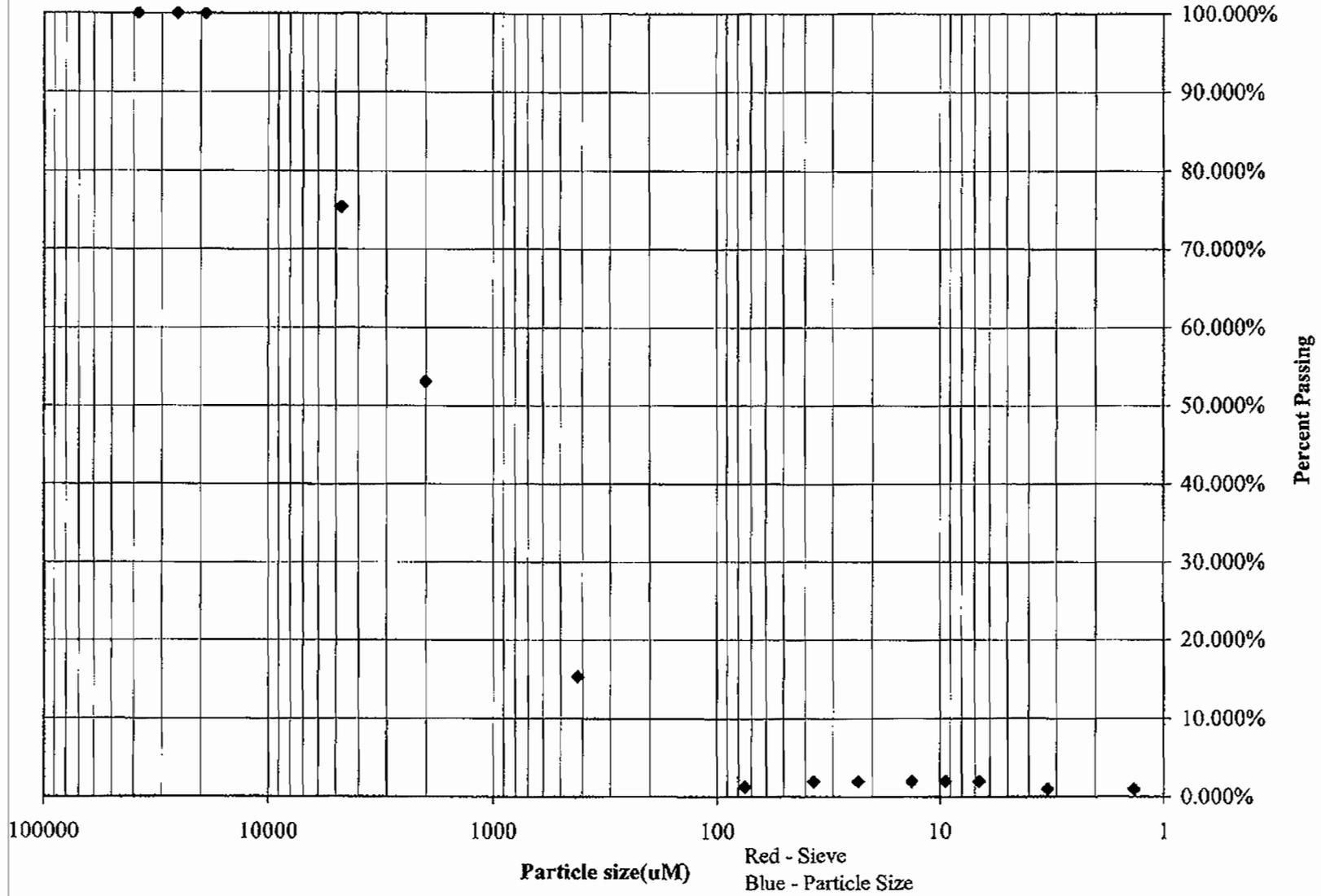
Soil Classification: Gravelly sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-04A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-05A

Analysis Date: 8/18/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-05A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 1.0% |
| No. 20 | 0.85 | 10.2% |
| No. 40 | 0.420 | 14.0% |
| No. 60 | 0.250 | 9.0% |
| No. 140 | 0.106 | 12.4% |
| No. 200 | 0.075 | 7.5% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-05A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 1.0% |
| Sand, Medium | 1.99-0.420 | 24.2% |
| Sand, Fine | 0.419-0.075 | 28.9% |
| Silt | 0.074-0.005 | 39.9% |
| Clay | <0.005-0.001 | 2.1% |
| Colloids | <0.001 | 3.8% |

Analyst: *Renee Rodgers*

Date: *8/30/05*

Reviewed: *[Signature]*

Date: *9/20/05*



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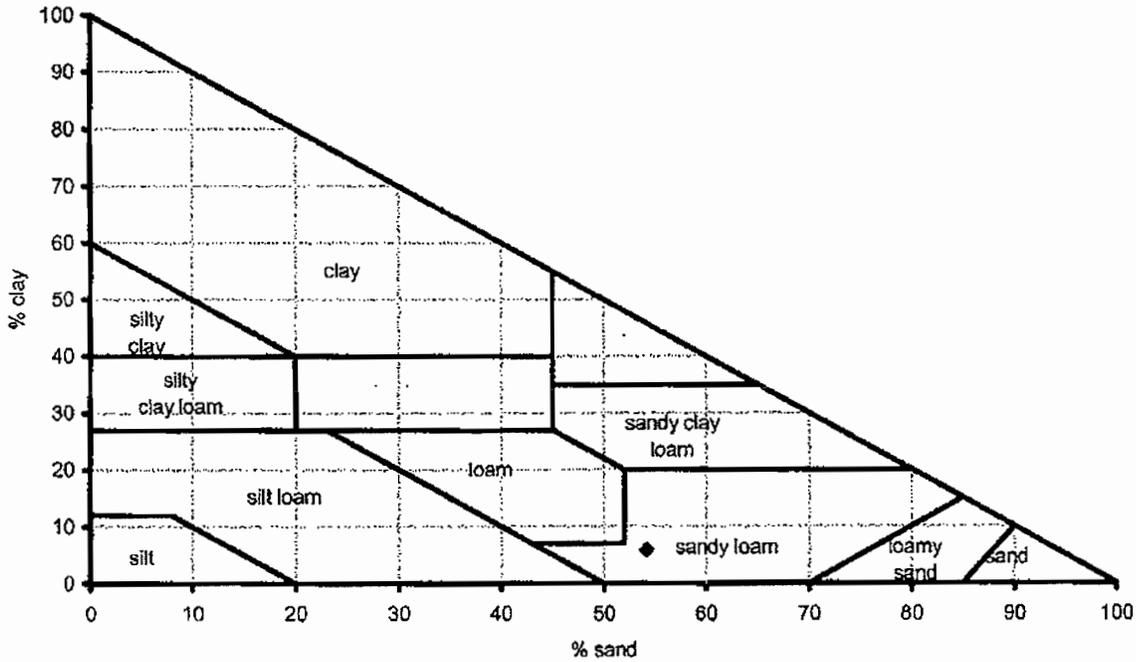


SLI Work Order: 05071076
SLI Sample ID: 05071076-05A

Analysis Date: 8/18/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 54.2 | 5.9 | 39.90 |

Soil Classification: sandy loam

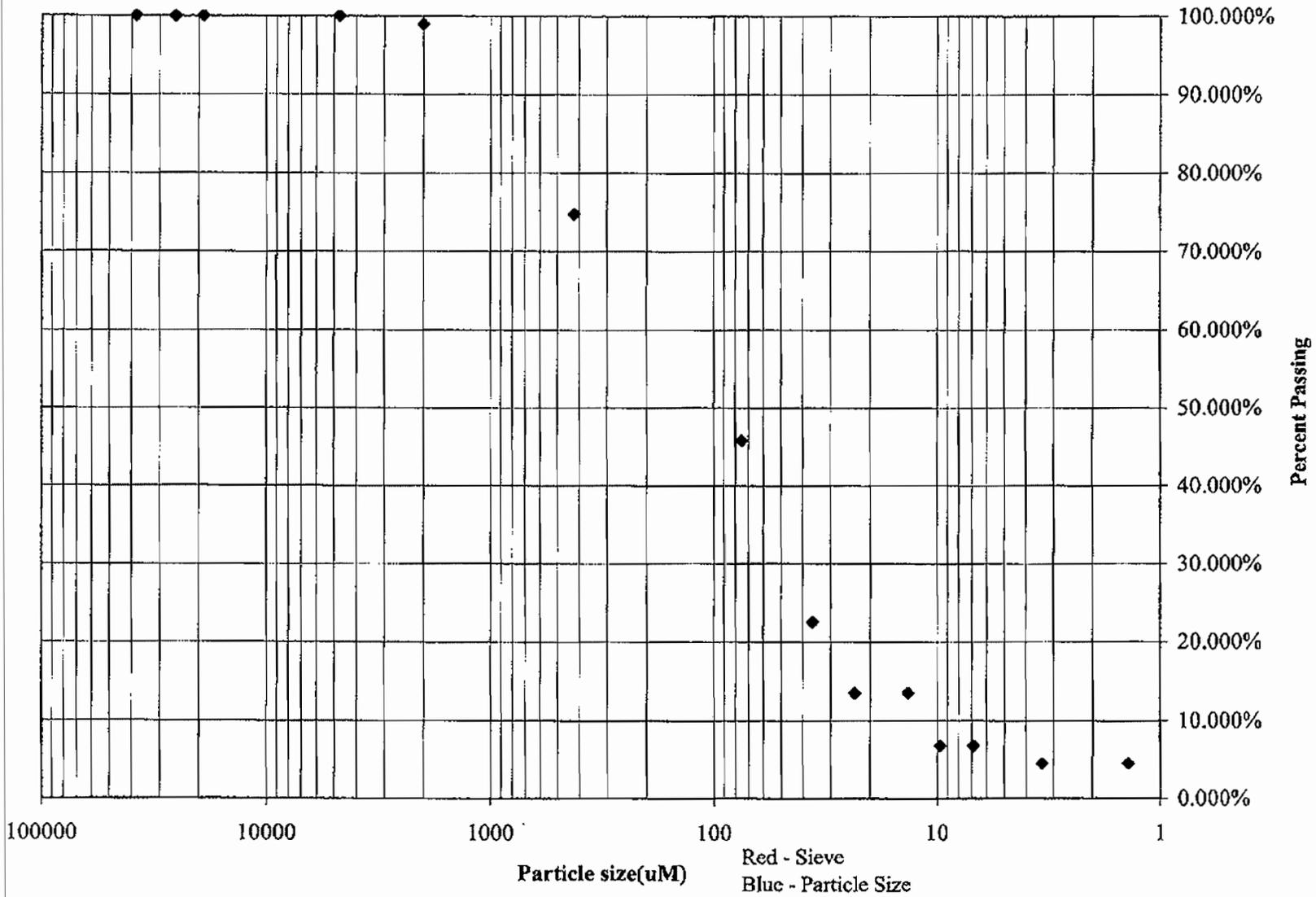


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-05A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-06A

Analysis Date: 8/18/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-06A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 13.1% |
| No. 10 | 2.00 | 11.7% |
| No. 20 | 0.85 | 10.2% |
| No. 40 | 0.420 | 9.6% |
| No. 60 | 0.250 | 14.1% |
| No. 140 | 0.106 | 39.8% |
| No. 200 | 0.075 | 1.2% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-06A |
| Gravel | >4.75 | 13.1% |
| Sand, Course | 4.74-2.0 | 11.7% |
| Sand, Medium | 1.99-0.420 | 19.8% |
| Sand, Fine | 0.419-0.075 | 55.0% |
| Silt | 0.074-0.005 | 0.0% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 1.1% |

Analyst: Levee Walker

Date: 8/30/05

Reviewed: [Signature]

Date: 8/30/2005



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SLI Work Order: 05071076

Analysis Date: 8/18/2005

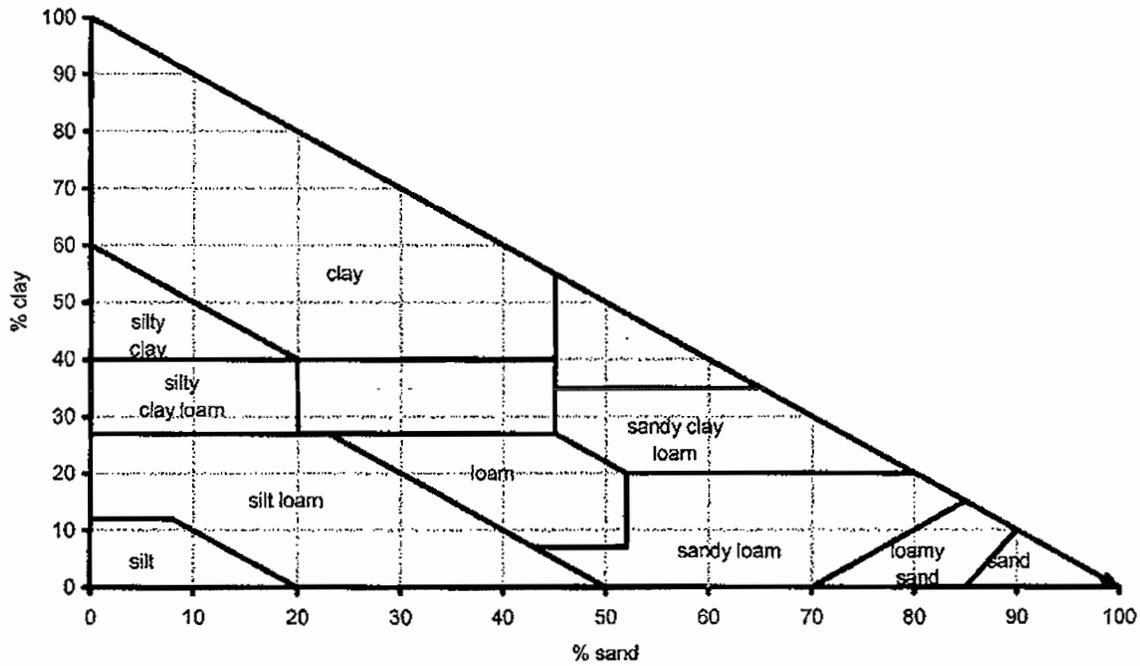
SLI Sample ID: 05071076-06A

% SAND
98.8

% CLAY
1.2

% SILT
0.00

Soil Classification: Gravelly sand

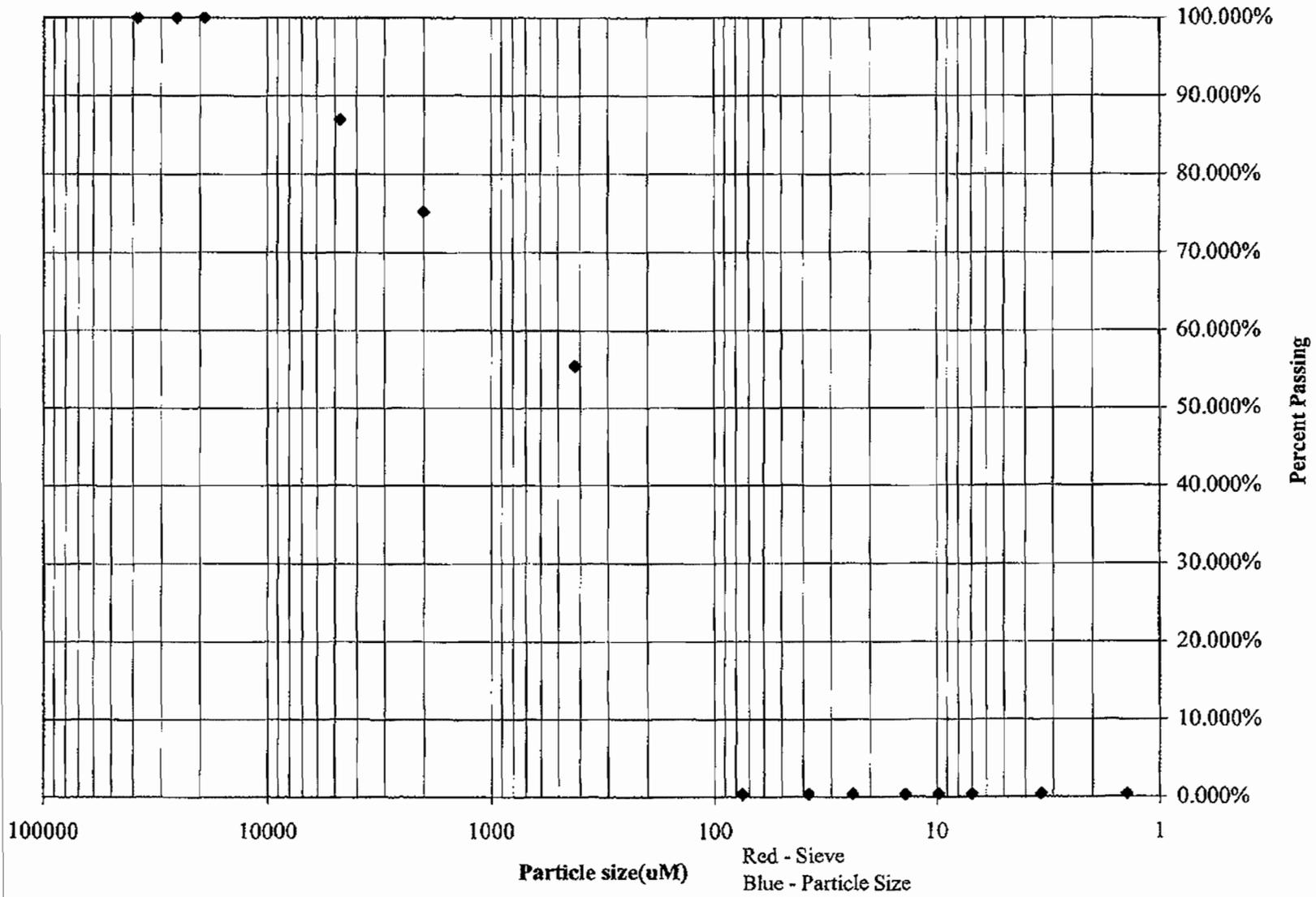


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Bazar, 28 July 2000.

Particle Size Analysis

◆ 05071076-06A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-07A

Analysis Date: 8/22/2005

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 05071076-07A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 6.7% |
| No. 10 | 2.00 | 9.4% |
| No. 20 | 0.85 | 12.2% |
| No. 40 | 0.420 | 10.2% |
| No. 60 | 0.250 | 15.0% |
| No. 140 | 0.106 | 44.0% |
| No. 200 | 0.075 | 2.0% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 05071076-07A |
| Gravel | >4.75 | 6.7% |
| Sand, Course | 4.74-2.0 | 16.1% |
| Sand, Medium | 1.99-0.420 | 10.2% |
| Sand, Fine | 0.419-0.075 | 61.1% |
| Silt | 0.074-0.005 | 0.0% |
| Clay | <0.005-0.001 | 0.0% |
| Colloids | <0.001 | 2.1% |

Analyst: *Renee Kelly*

Date: 8/20/05

Reviewed: *[Signature]*

Date: 8/24/2005



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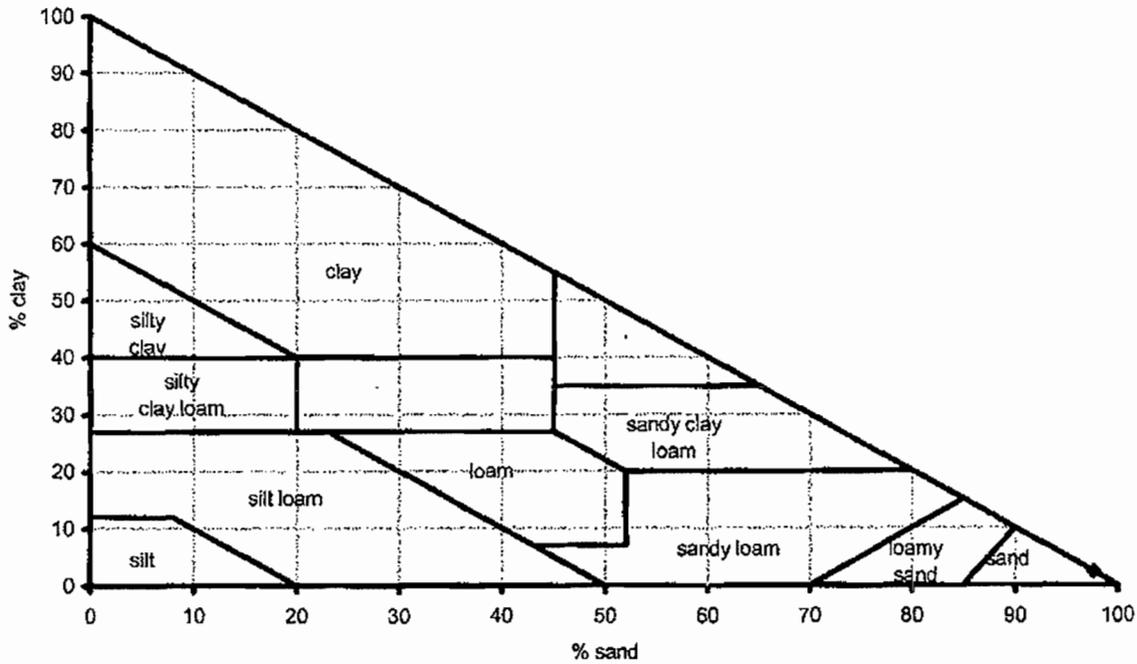


SLI Work Order: 05071076
SLI Sample ID: 05071076-07A

Analysis Date: 8/22/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 97.6 | 2.4 | 0.00 |

Soil Classification: Gravelly sand

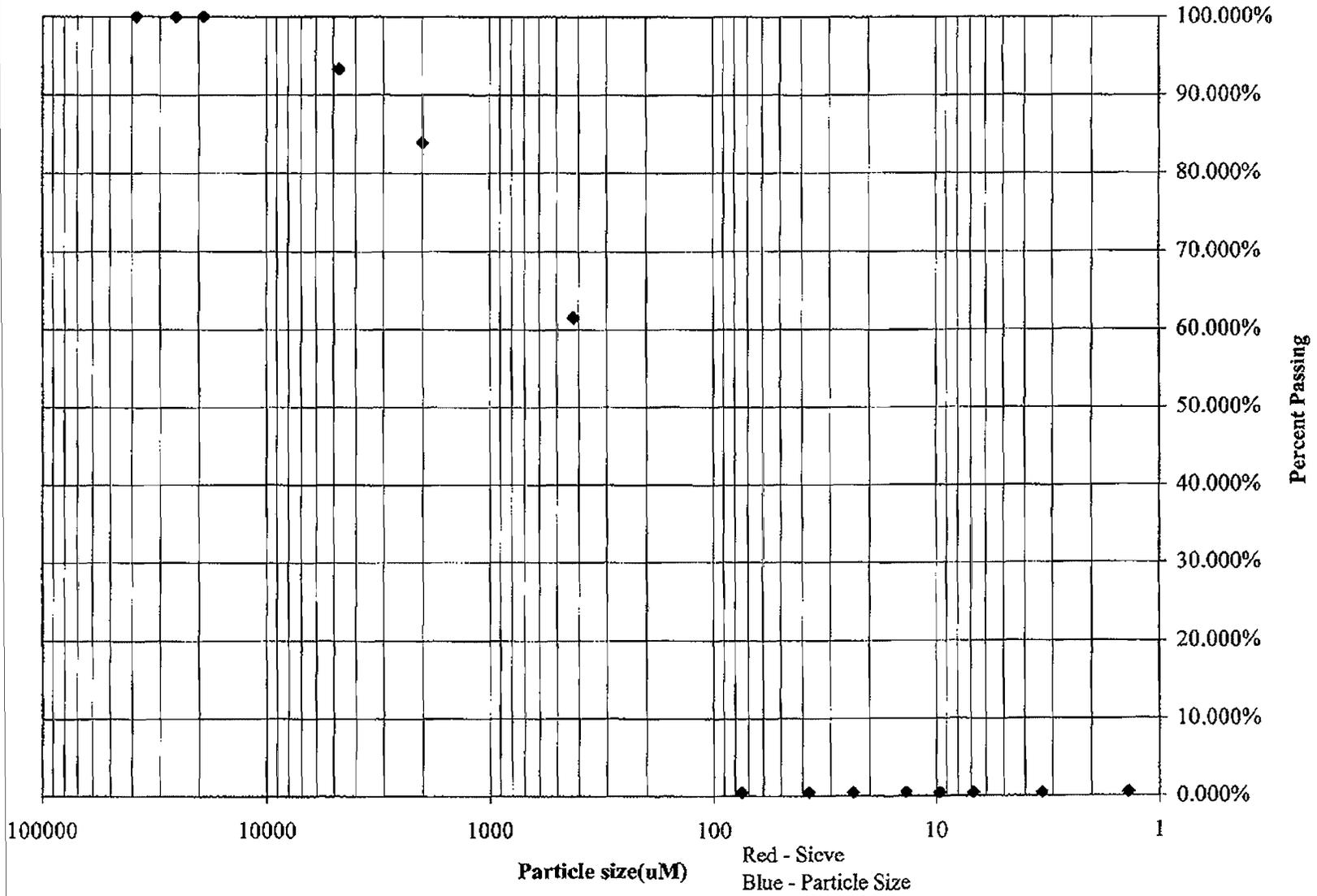


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Garakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-07A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-08A

Analysis Date: 8/22/2005

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 05071076-08A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 14.6% |
| No. 10 | 2.00 | 10.6% |
| No. 20 | 0.85 | 18.2% |
| No. 40 | 0.420 | 20.0% |
| No. 60 | 0.250 | 15.3% |
| No. 140 | 0.106 | 11.0% |
| No. 200 | 0.075 | 3.0% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 05071076-08A |
| Gravel | >4.75 | 14.6% |
| Sand, Course | 4.74-2.0 | 10.6% |
| Sand, Medium | 1.99-0.420 | 38.2% |
| Sand, Fine | 0.419-0.075 | 29.3% |
| Silt | 0.074-0.005 | 2.7% |
| Clay | <0.005-0.001 | 0.3% |
| Colloids | <0.001 | 4.3% |

Analyst: *Kenneth Kelly*
 Reviewed: *[Signature]*

Date: *8/24/05*
 Date: *8/22/2005*



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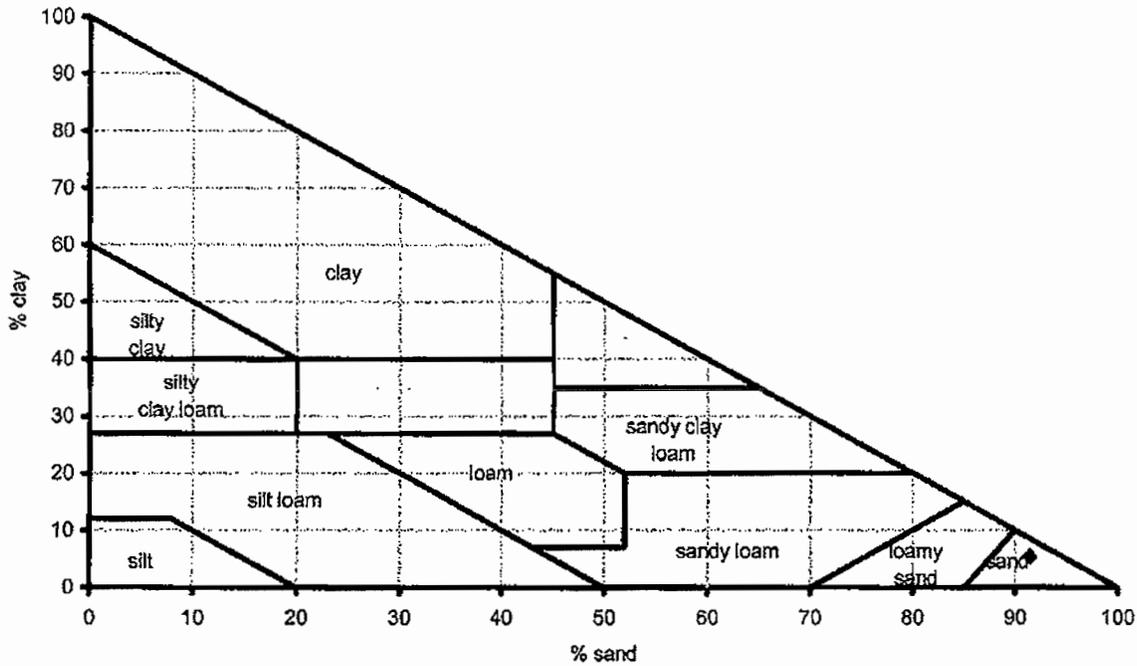


SLI Work Order: 05071076
SLI Sample ID: 05071076-08A

Analysis Date: 8/22/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 91.5 | 5.4 | 2.69 |

Soil Classification: Gravelly sand

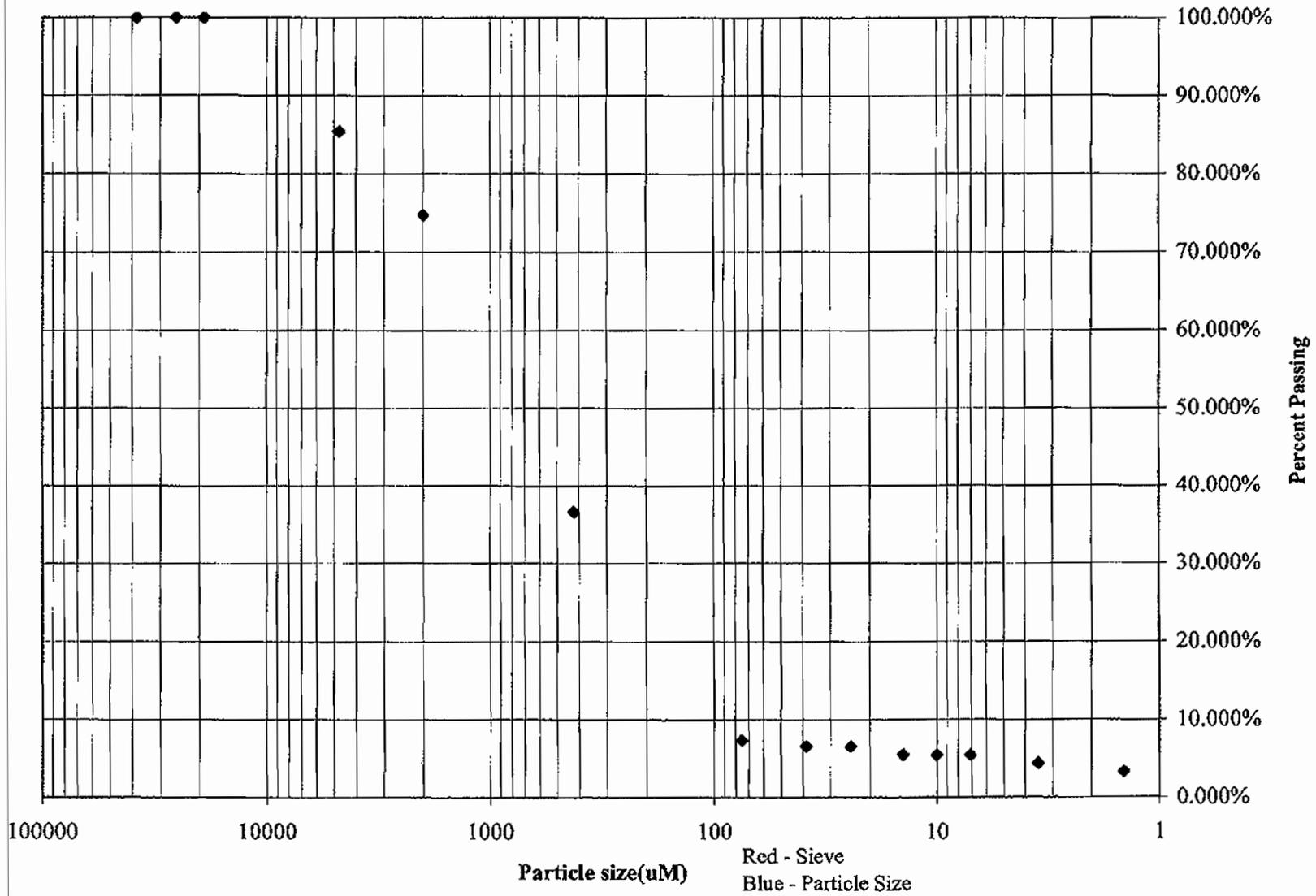


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-08A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-09A

Analysis Date: 8/22/2005

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 05071076-09A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.1% |
| No. 10 | 2.00 | 1.1% |
| No. 20 | 0.85 | 2.9% |
| No. 40 | 0.420 | 2.9% |
| No. 60 | 0.250 | 5.2% |
| No. 140 | 0.106 | 63.6% |
| No. 200 | 0.075 | 22.1% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 05071076-09A |
| Gravel | >4.75 | 0.1% |
| Sand, Course | 4.74-2.0 | 1.1% |
| Sand, Medium | 1.99-0.420 | 5.8% |
| Sand, Fine | 0.419-0.075 | 90.9% |
| Silt | 0.074-0.005 | 0.0% |
| Clay | <0.005-0.001 | 0.1% |
| Colloids | <0.001 | 1.9% |

Analyst: *Kerrie H. [Signature]*

Date: 8/22/05

Reviewed: *[Signature]*

Date: 8/30/2005



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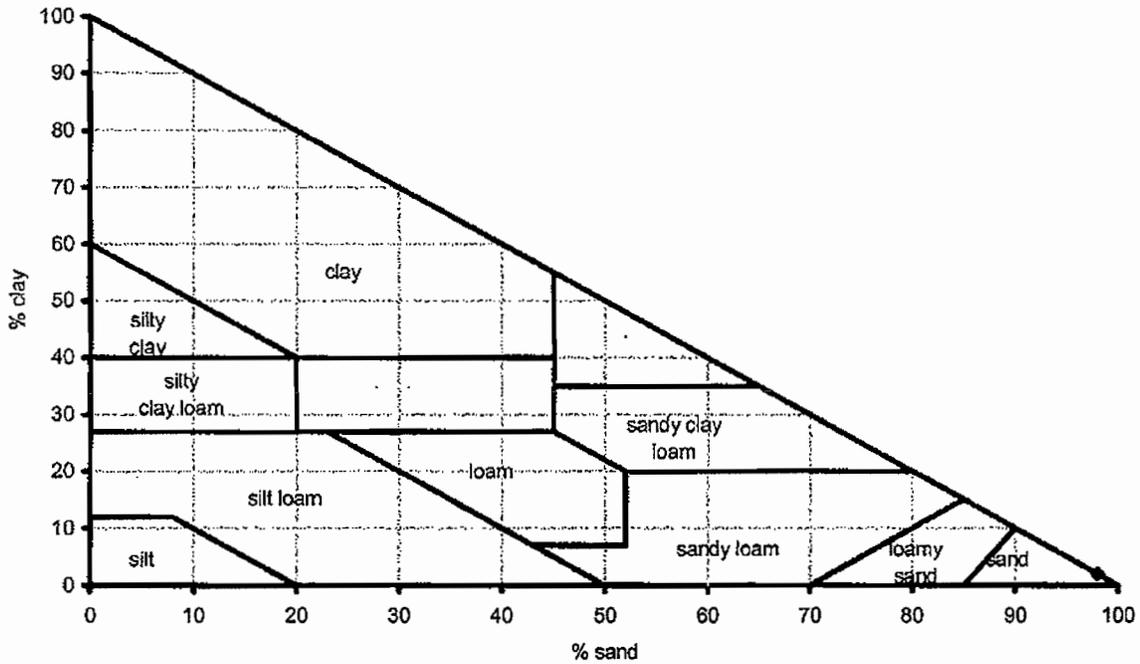


SLI Work Order: 05071076
SLI Sample ID: 05071076-09A

Analysis Date: 8/22/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 98.0 | 2.0 | 0.02 |

Soil Classification: sand

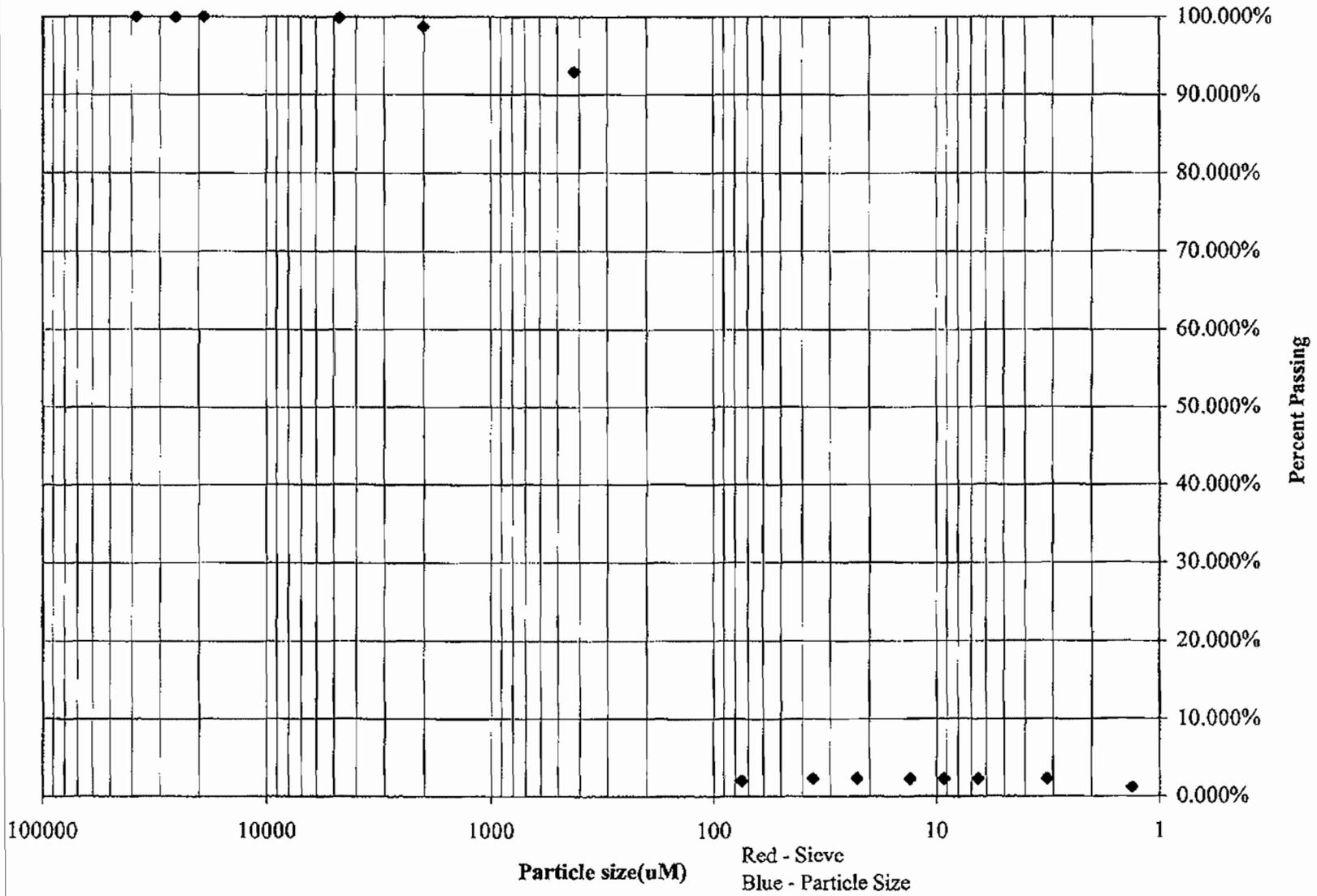


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Garakls and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-09A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-10A

Analysis Date: 8/22/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-10A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 2.0% |
| No. 10 | 2.00 | 3.7% |
| No. 20 | 0.85 | 6.5% |
| No. 40 | 0.420 | 9.3% |
| No. 60 | 0.250 | 26.7% |
| No. 140 | 0.106 | 44.2% |
| No. 200 | 0.075 | 4.9% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-10A |
| Gravel | >4.75 | 2.0% |
| Sand, Course | 4.74-2.0 | 3.7% |
| Sand, Medium | 1.99-0.420 | 15.7% |
| Sand, Fine | 0.419-0.075 | 75.8% |
| Silt | 0.074-0.005 | 0.5% |
| Clay | <0.005-0.001 | 0.1% |
| Colloids | <0.001 | 2.2% |

Analyst: *Rene Harris*

Date: *8/30/05*

Reviewed: *[Signature]*

Date: *8/30/2005*



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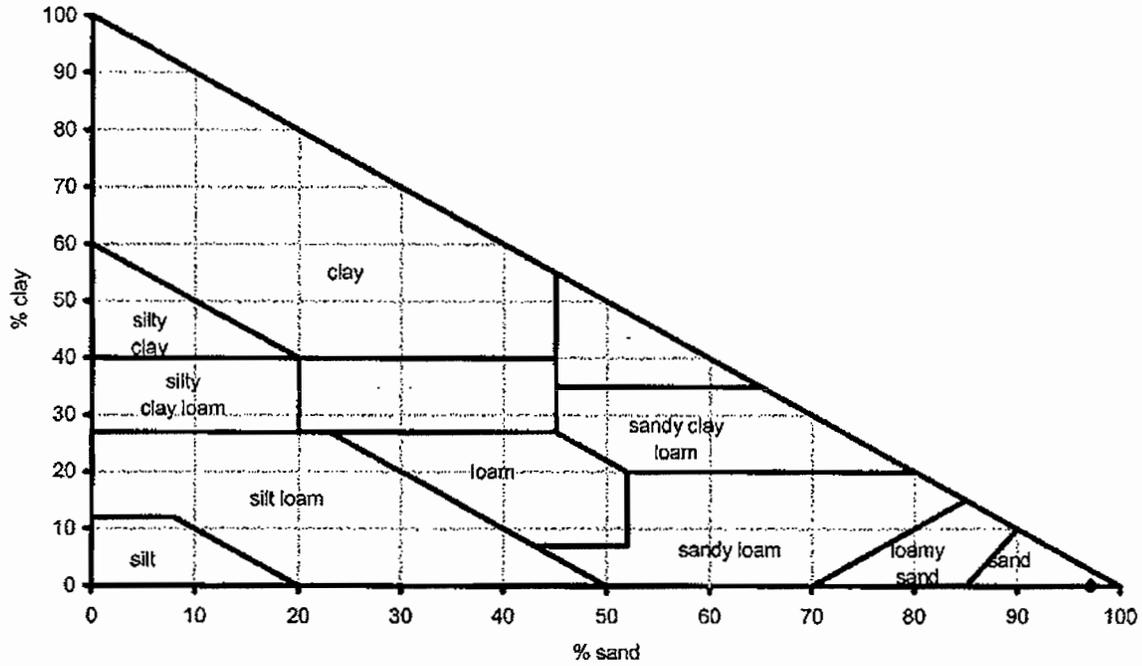


SLI Work Order: 05071076
SLI Sample ID: 05071076-10A

Analysis Date: 8/22/2005

% SAND % CLAY % SILT
97.1 0.1 0.54

Soil Classification: Gravelly sand

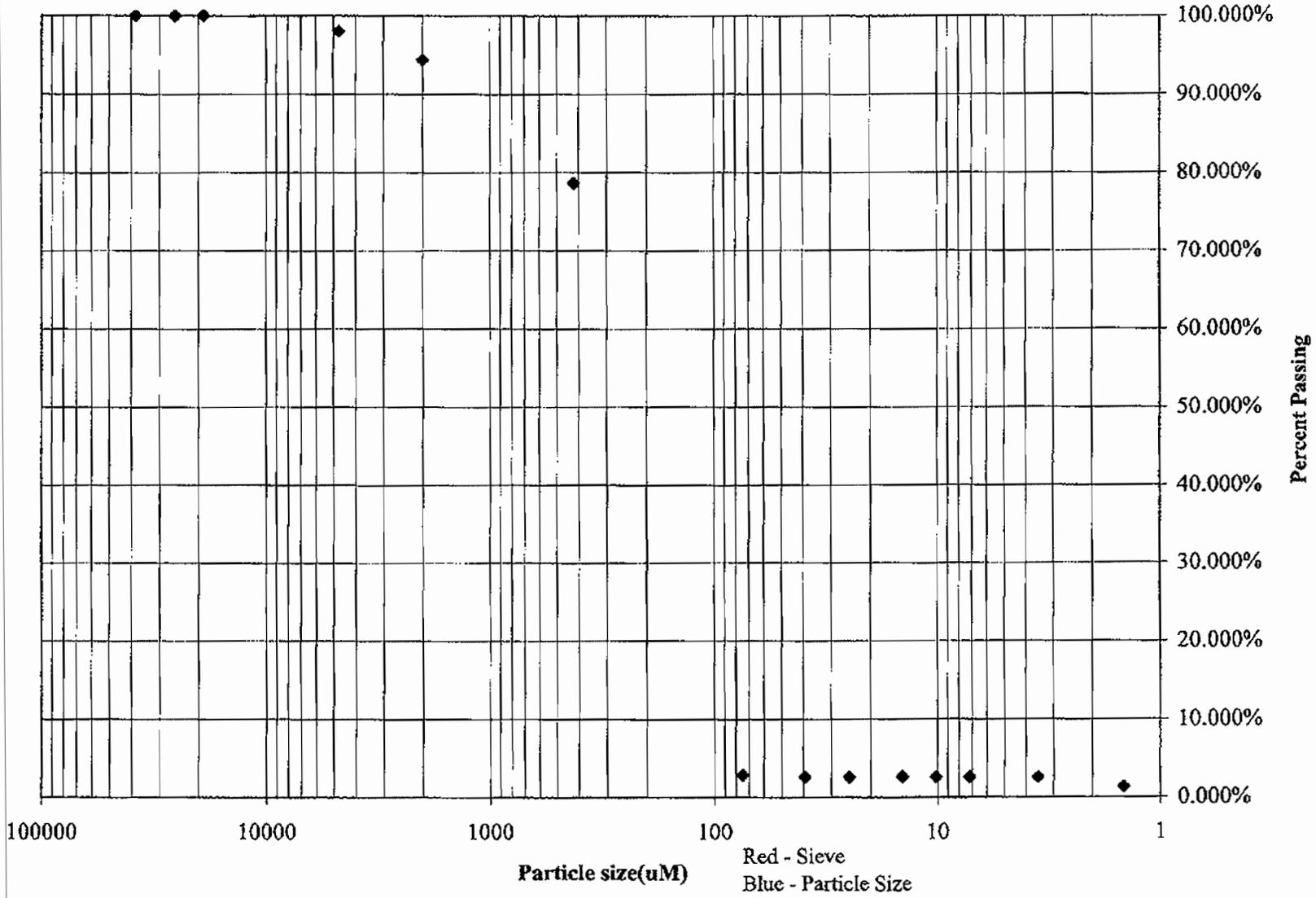


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 28 July 2000.

Particle Size Analysis

◆ 05071076-10A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-11A

Analysis Date: 8/24/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-11A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.8% |
| No. 10 | 2.00 | 2.9% |
| No. 20 | 0.85 | 7.5% |
| No. 40 | 0.420 | 19.2% |
| No. 60 | 0.250 | 41.5% |
| No. 140 | 0.106 | 27.1% |
| No. 200 | 0.075 | 0.7% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-11A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 0.8% |
| Sand, Medium | 1.99-0.420 | 10.4% |
| Sand, Fine | 0.419-0.075 | 78.2% |
| Silt | 0.074-0.005 | 9.7% |
| Clay | <0.005-0.001 | 0.4% |
| Colloids | <0.001 | 0.4% |

Analyst: *Kore Veltz*
 Reviewed: *Gregory E. Pomeroy*

Date: *8/30/05*
 Date: *8/24/2005*



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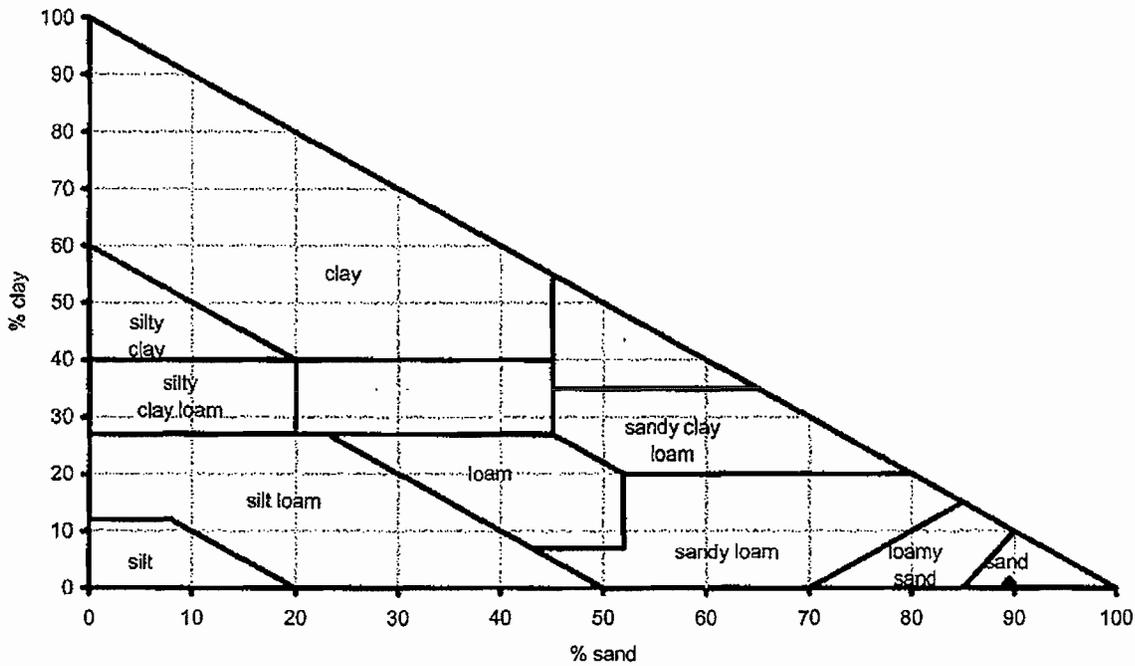


SLI Work Order: 05071076
SLI Sample ID: 05071076-11A

Analysis Date: 8/24/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 89.5 | 0.8 | 9.70 |

Soil Classification: sand

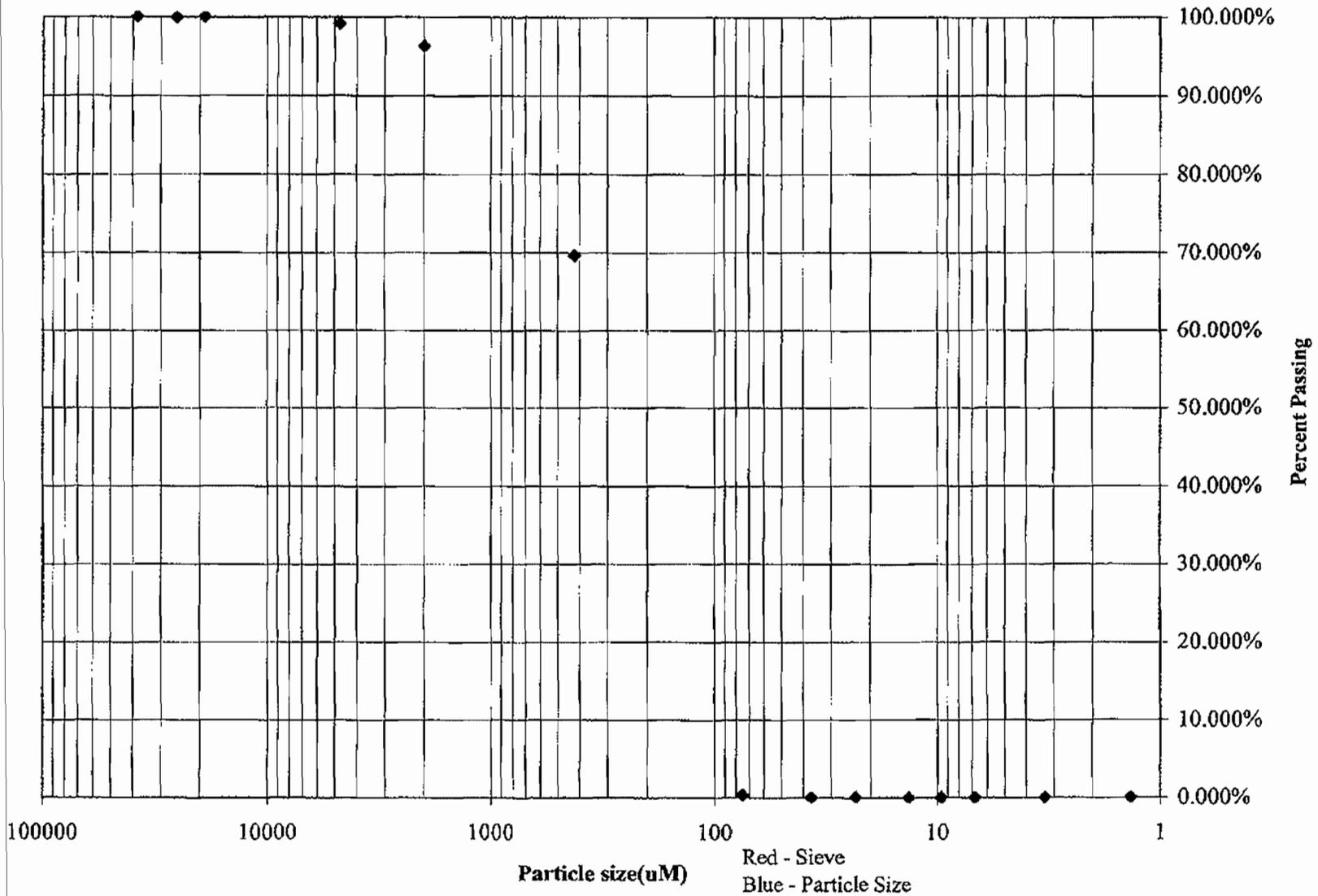


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-11A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-12A

Analysis Date: 8/24/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-12A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 0.8% |
| No. 20 | 0.85 | 4.0% |
| No. 40 | 0.420 | 6.4% |
| No. 60 | 0.250 | 9.1% |
| No. 140 | 0.106 | 49.2% |
| No. 200 | 0.075 | 19.9% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-12A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 0.8% |
| Sand, Medium | 1.99-0.420 | 10.4% |
| Sand, Fine | 0.419-0.075 | 78.2% |
| Silt | 0.074-0.005 | 9.7% |
| Clay | <0.005-0.001 | 0.4% |
| Colloids | <0.001 | 0.4% |

Analyst: *[Signature]*

Date: 8/30/05

Reviewed: *[Signature]*

Date: 8/30/2005



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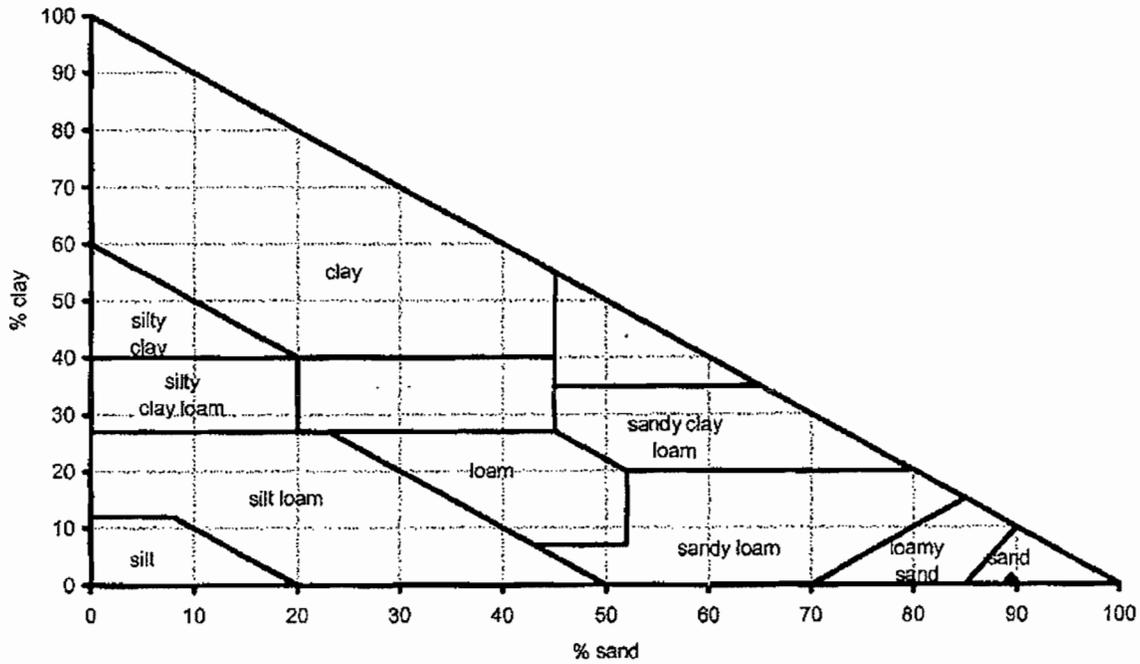


SLI Work Order: 05071076
SLI Sample ID: 05071076-12A

Analysis Date: 8/24/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 89.5 | 0.8 | 9.73 |

Soil Classification: sand

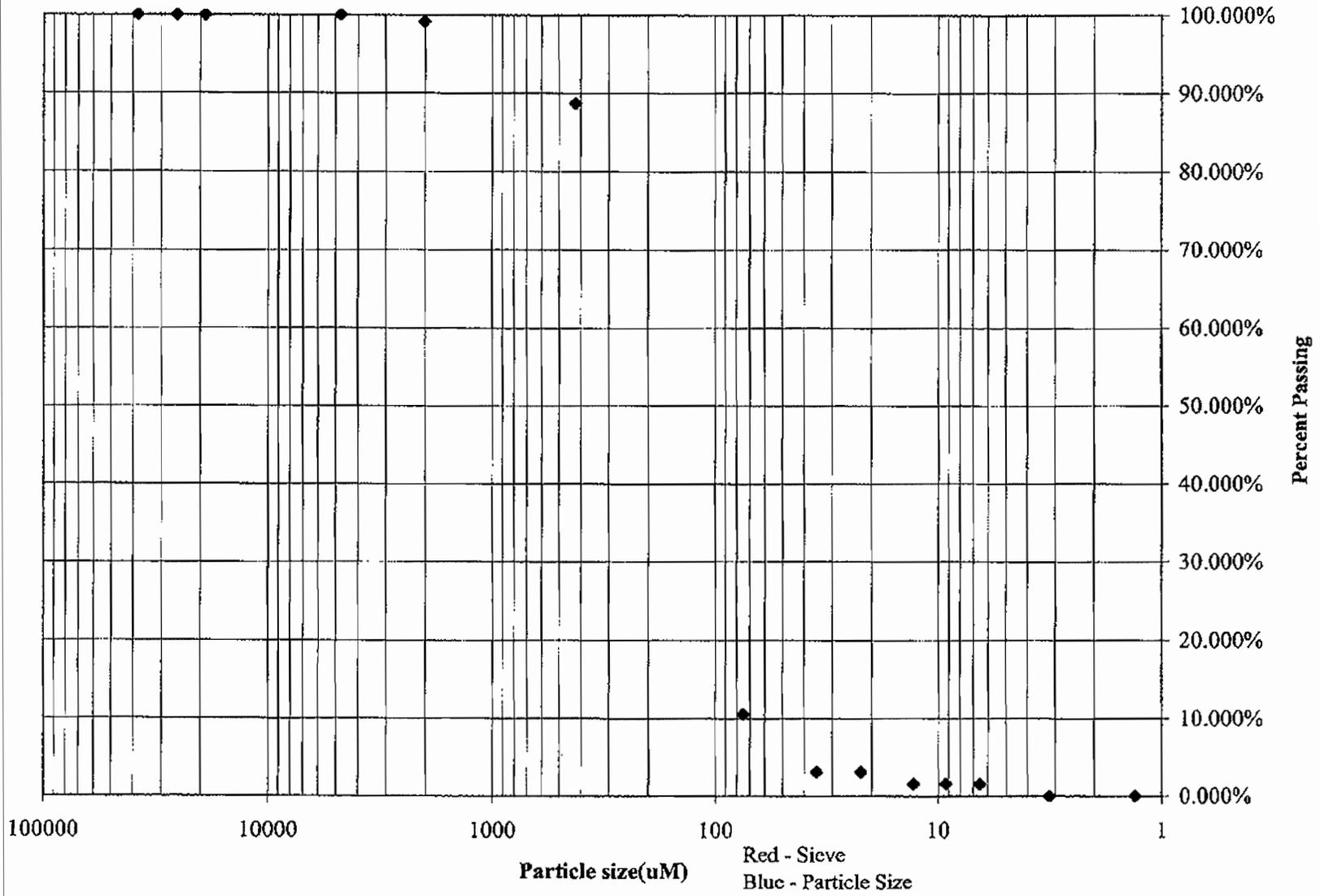


Note: For soil triangle, colloids are included as part of clay.

Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 05071076-12A





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SLI Work Order: 05071076
 SLI Sample ID: 05071076-13A

Analysis Date: 8/24/2005

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 05071076-13A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 2.8% |
| No. 20 | 0.85 | 20.2% |
| No. 40 | 0.420 | 17.7% |
| No. 60 | 0.250 | 11.5% |
| No. 140 | 0.106 | 15.2% |
| No. 200 | 0.075 | 8.9% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 05071076-13A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 2.8% |
| Sand, Medium | 1.99-0.420 | 37.9% |
| Sand, Fine | 0.419-0.075 | 35.5% |
| Silt | 0.074-0.005 | 21.5% |
| Clay | <0.005-0.001 | 1.8% |
| Colloids | <0.001 | 0.5% |

Analyst: *Renee Huber*

Date: *8/30/05*

Reviewed: *[Signature]*

Date: *8/24/2005*



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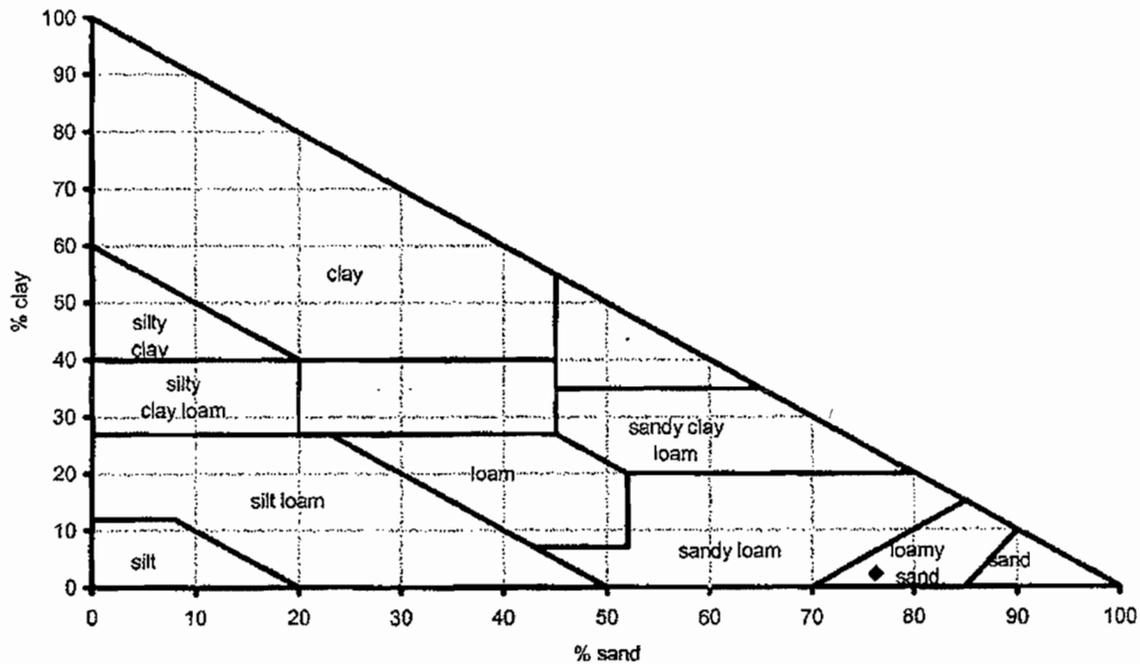


SLI Work Order: 05071076
SLI Sample ID: 05071076-13A

Analysis Date: 8/24/2005

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 76.2 | 2.3 | 21.47 |

Soil Classification: loamy sand

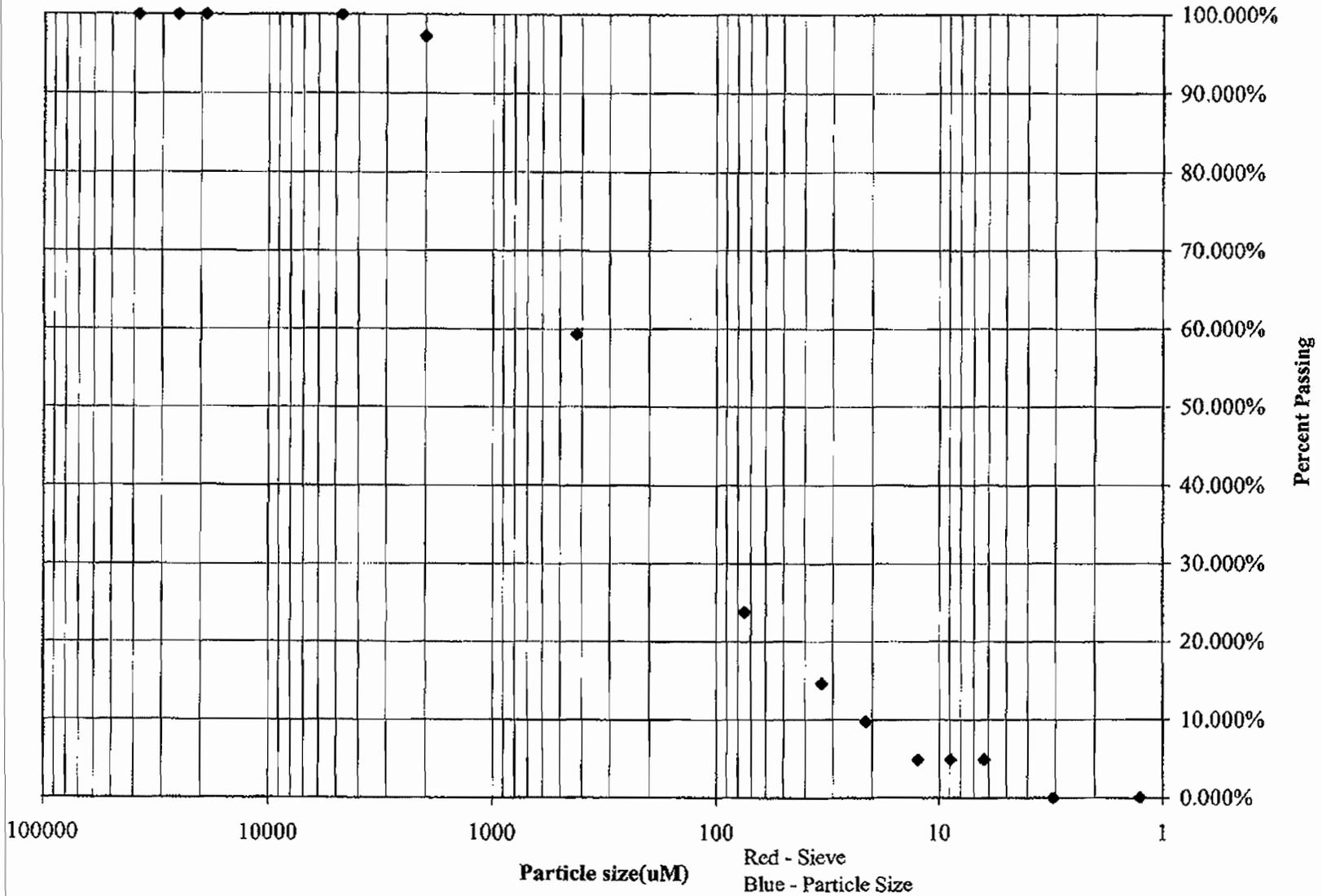


Note: For soil triangle, colloids are included as part of clay.

Texture triangle by A. Gerakis and B. Beer, 26 July 2000.

Particle Size Analysis

◆ 05071076-13A





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CHAIN OF CUSTODY RECORD

Electronic Version

Company Name: **MWRDGC**

Company Address: **6001 W. Pershing Rd**

City: **Cicero** State: **IL** Zip: **60804**

Phone: **(708) 588-4074** Fax: Fax Report

Email Address: **Jennifer.wasik@mwrdd.org** Email Report

Project ID / Location: **Sticigney**

Project Manager (Report to): **Jennifer Wasik**

Sample Collector(s): **Jennifer Wasik & Tom Minarik**

TURNAROUND TIME REQUESTED

Normal RUSH* *Additional Rush Charges Approved.

*Date & Time Needed:

Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.

Specify Regulatory Program: (Required) None/Info only

LUST SRP SDWA

503 Sludge NPDES MWRDGC

Disposal Other *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED

Enter an "X" in box below for request

*AUSSEM
TOC
particle size*

Page **1** of **1**

PO No. **3032962**

Shipping Method: **pick up**

QC Reporting Level: 1 2 3

LAB USE ONLY

SLI Order No. **1507-1076**

Sample containers supplied by customer? Yes

Temperature of Received Samples: **6** °C

Samples received within 24 hours of collection? Yes

| SAMPLE IDENTIFICATION (Please use 1 line per container type) | COLLECTION | | MATRIX | GRAB/ COMP. | CONTAINERS | | PRESERVATIVE | ANALYSIS |
|---|------------|-------|--------|----------------|------------|-------------|--------------|----------|
| | DATE | TIME | | | Qty | SIZE & TYPE | | |
| 1 WW46 side | 7/18 | 11:45 | Sed | G | 1 | PL | — | X X X |
| 2 WW46 center | 7/18 | 12:15 | Sed | G | 1 | PL | — | X X X |
| 3 WW96 side | 7/19 | 11:00 | Sed | G | 1 | PL | — | X X X |
| 4 WW102 side | 7/20 | 10:30 | Sed | G | 1 | PL | — | X X X |
| 5 WW102 center | 7/20 | 10:50 | Sed | G | 1 | PL | — | X X X |
| 6 WW136 side | 7/21 | 10:30 | Sed | G | 1 | PL | — | X X X |
| 7 WW136 center | 7/21 | 10:45 | Sed | G | 1 | PL | — | X X X |
| 8 WW101 side | 7/27 | 12:00 | Sed | G | 1 | PL | — | X X X |
| 9 WW101 center | 7/27 | 12:30 | Sed | G | 1 | PL | — | X X X |
| 10 WW37 side | 7/27 | 10:45 | Sed | G | 1 | PL | — | X X X |
| 11 WW37 center | 7/27 | 11:00 | Sed | G | 1 | PL | — | X X X |
| 12 WW73 side | 7/28 | 11:15 | Sed | G | 1 | PL | — | X X X |
| 13 WW73 center | 7/28 | 11:45 | Sed | G | 1 | PL | — | X X X |

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water (SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H₂SO₄, HCl, HNO₃, Methanol (MeOH), NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

- CONDITION CODES **-13A**
- Improper/damaged container/cap
 - Improper preservation
 - Insufficient sample volume
 - Headspace/air bubbles for VOCs
 - Received past holding time
 - Received frozen
 - Label conflicts with COC

| | | | |
|--|---|--|--|
| 1. Relinquished By: Jennifer Wasik Date: 7/29/05 | 2. Relinquished By: Tom Minarik Date: 7/29/05 | 3. Relinquished By: _____ Date: _____ | 4. Relinquished By: _____ Date: _____ |
| Received By: Tom Minarik Time: 1:11 Ice: <input checked="" type="checkbox"/> | Received By: Jennifer Wasik Time: 4:00 Ice: <input checked="" type="checkbox"/> | Received By: _____ Time: _____ Ice: <input type="checkbox"/> | Received By: _____ Time: _____ Ice: <input type="checkbox"/> |

Attachment 12



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May 02, 2007

Jennifer Wasik
Metropolitan Water Reclamation District of Chicago
Research and Development Dept.
6001 W. Pershing
Cicero, IL 60804-4112

Tel: (708) 588-4074
Fax: (708) 588-3807

Lab Order: **06080450**

Project Name: Contract 05-104-11 (Sediment Chemistry)

Dear Jennifer Wasik:

Suburban Laboratories, Inc. received 10 sample(s) on 08/09/06 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call your customer service representative at (708) 544-3260.

Sincerely,

Shane Clarke
Project Manager

cc:



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW108-Loomis St. South Branch-side

Matrix: SLUDGE

Lab ID: 06080450-01A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/02/2006 10:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | ND | | 0.000332 | umoles/g-dry | 1 | 08/24/2006 1:31 PM | 20859 |
| Copper | 0.403 | | 0.00227 | umoles/g-dry | 1 | 08/24/2006 1:31 PM | 20859 |
| Lead | 0.243 | | 0.00156 | umoles/g-dry | 1 | 08/24/2006 1:31 PM | 20859 |
| Nickel | 0.261 | | 0.00328 | umoles/g-dry | 1 | 08/24/2006 1:31 PM | 20859 |
| Zinc | 1.96 | B | 0.0110 | umoles/g-dry | 1 | 08/24/2006 1:31 PM | 20859 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 4.28 | | 0.193 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R5432 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Diameter of Soil Particles | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Hydrometer | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Particle Density | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Sieve Analysis | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 48.07 | | 0 | wt% | 1 | 08/09/2006 8:00 PM | R5400 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 0.669 | | 0 | | 1 | 08/24/2006 12:00 AM | R5456 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 2.87 | B | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R54558 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 51.9 | | 0.001 | wt% | 1 | 08/09/2006 8:00 PM | R54001 |

| | | | | |
|--------------------|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW108-Loomis St. South Branch-Cente

Matrix: SLUDGE

Lab ID: 06080450-02A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/02/2006 11:00 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0397 | | 0.000371 | umoles/g-dry | 1 | 08/24/2006 1:35 PM | 20856 |
| Copper | 2.20 | | 0.00253 | umoles/g-dry | 1 | 08/24/2006 1:35 PM | 20856 |
| Lead | 0.924 | | 0.00174 | umoles/g-dry | 1 | 08/24/2006 1:35 PM | 20856 |
| Nickel | 0.302 | | 0.00366 | umoles/g-dry | 1 | 08/24/2006 1:35 PM | 20856 |
| Zinc | 6.72 | | 0.0123 | umoles/g-dry | 1 | 08/24/2006 1:35 PM | 20856 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 1.77 | | 0.215 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R5432 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Diameter of Soil Particles | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Hydrometer | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Particle Density | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Sieve Analysis | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 53.48 | | 0 | wt% | 1 | 08/09/2006 8:00 PM | R5400 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 5.76 | | 0 | | 1 | 08/24/2006 12:00 AM | R5456 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 10.2 | | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R5456 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 46.5 | | 0.001 | wt% | 1 | 08/09/2006 8:00 PM | R5400 |

Qualifiers:

| | |
|--|---|
| * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limit (QL) | NA Not Applicable |
| ND Not Detected at the SLI Reporting Limit | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW40-Damen Av. CSSC-side

Matrix: SLUDGE

Lab ID: 06080450-03A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/02/2006 1:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.117 | | 0.000605 | umoles/g-dry | 1 | 08/24/2006 1:39 PM | 20859 |
| Copper | 5.26 | | 0.00412 | umoles/g-dry | 1 | 08/24/2006 1:39 PM | 20859 |
| Lead | 2.58 | | 0.00284 | umoles/g-dry | 1 | 08/24/2006 1:39 PM | 20859 |
| Nickel | 0.603 | | 0.00597 | umoles/g-dry | 1 | 08/24/2006 1:39 PM | 20859 |
| Zinc | 16.7 | | 0.0201 | umoles/g-dry | 1 | 08/24/2006 1:39 PM | 20859 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 1.20 | | 0.351 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R5432 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Diameter of Soil Particles | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Hydrometer | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Particle Density | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| Sieve Analysis | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R5463 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 71.47 | | 0 | wt% | 1 | 08/09/2006 8:00 PM | R5400 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 21.0 | | 0 | | 1 | 08/24/2006 12:00 AM | R5456 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 25.3 | | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R5455 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 28.5 | | 0.001 | wt% | 1 | 08/09/2006 8:00 PM | R5400 |

| | | | | |
|--------------------|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW40-Damen Av. CSSC-Center

Matrix: SLUDGE

Lab ID: 06080450-04A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/02/2006 12:30 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.106 | | 0.000727 | umoles/g-dry | 1 | 08/24/2006 1:44 PM | 20856 |
| Copper | 5.16 | | 0.00495 | umoles/g-dry | 1 | 08/24/2006 1:44 PM | 20856 |
| Lead | 6.63 | | 0.00341 | umoles/g-dry | 1 | 08/24/2006 1:44 PM | 20856 |
| Nickel | 0.741 | | 0.00718 | umoles/g-dry | 1 | 08/24/2006 1:44 PM | 20856 |
| Zinc | 20.6 | | 0.0241 | umoles/g-dry | 1 | 08/24/2006 1:44 PM | 20856 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 3.80 | | 0.421 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R5432 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Diameter of Soil Particles | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Hydrometer | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Particle Density | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Sieve Analysis | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 76.25 | | 0 | wt% | 1 | 08/09/2006 8:00 PM | R5400 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 8.75 | | 0 | | 1 | 08/24/2006 12:00 AM | R5456 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 33.3 | | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R54556 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 23.7 | | 0.001 | wt% | 1 | 08/09/2006 8:00 PM | R54001 |

| | | |
|--|--|---|
| Qualifiers: | * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| <small>BaseReport-MDL-ConfProc2004</small> | c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| | G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| | J Analyte detected below quantitation limit (QL) | NA Not Applicable |
| | ND Not Detected at the SLI Reporting Limit | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Laboratory Results

Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW99-Archer Av. BubblyCreek-side

Matrix: SLUDGE

Lab ID: 06080450-05A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/02/2006 2:30 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.0283 | | 0.000895 | umoles/g-dry | 1 | 08/24/2006 1:59 PM | 20856 |
| Copper | 4.74 | | 0.00610 | umoles/g-dry | 1 | 08/24/2006 1:59 PM | 20856 |
| Lead | 3.53 | | 0.00420 | umoles/g-dry | 1 | 08/24/2006 1:59 PM | 20856 |
| Nickel | 1.62 | | 0.00884 | umoles/g-dry | 1 | 08/24/2006 1:59 PM | 20856 |
| Zinc | 19.3 | | 0.0297 | umoles/g-dry | 1 | 08/24/2006 1:59 PM | 20856 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 8.34 | | 0.519 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R54321 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Diameter of Soil Particles | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Hydrometer | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Particle Density | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| Sieve Analysis | 8/28/06 | c | 0 | Date | 1 | 08/28/2006 12:00 AM | R54637 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 80.72 | | 0 | wt% | 1 | 08/09/2006 8:00 PM | R54001 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 3.51 | | 0 | | 1 | 08/24/2006 12:00 AM | R54561 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 29.3 | | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R54556 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 19.3 | | 0.001 | wt% | 1 | 08/09/2006 8:00 PM | R54001 |

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- c Analyte not included in SLI scope of accreditation
- G Refer to case narrative page for specific comments
- J Analyte detected below quantitation limit (QL)
- ND Not Detected at the SLI Reporting Limit
- B Analyte detected in the associated Method Blank
- E Estimated, analyte detected above quantitation range
- H Holding times for preparation or analysis exceeded
- NA Not Applicable
- Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist)



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW99-Archer Av. Bubbly Creek-Center

Matrix: SLUDGE

Lab ID: 06080450-06A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/02/2006 2:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.140 | | 0.000779 | umoles/g-dry | 1 | 08/24/2006 2:03 PM | 2085E |
| Copper | 5.48 | | 0.00531 | umoles/g-dry | 1 | 08/24/2006 2:03 PM | 2085E |
| Lead | 4.73 | | 0.00365 | umoles/g-dry | 1 | 08/24/2006 2:03 PM | 2085E |
| Nickel | 2.99 | | 0.00769 | umoles/g-dry | 1 | 08/24/2006 2:03 PM | 2085E |
| Zinc | 52.3 | | 0.0259 | umoles/g-dry | 1 | 08/24/2006 2:03 PM | 2085E |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 4.58 | | 0.451 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R54321 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469E |
| Diameter of Soil Particles | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469E |
| Hydrometer | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469E |
| Particle Density | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469E |
| Sieve Analysis | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469E |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 77.83 | | 0 | wt% | 1 | 08/09/2006 8:00 PM | R54001 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 14.3 | | 0 | | 1 | 08/24/2006 12:00 AM | R54561 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 65.7 | | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R5455E |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 22.2 | | 0.001 | wt% | 1 | 08/09/2006 8:00 PM | R54001 |

| | | | | |
|--------------------|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW41Side Harlem CSSC

Matrix: SLUDGE

Lab ID: 06080450-07A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/04/2006 11:40 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.179 | | 0.000318 | umoles/g-dry | 1 | 08/24/2006 2:07 PM | 20859 |
| Copper | 3.81 | | 0.00217 | umoles/g-dry | 1 | 08/24/2006 2:07 PM | 20859 |
| Lead | 1.75 | | 0.00149 | umoles/g-dry | 1 | 08/24/2006 2:07 PM | 20859 |
| Nickel | 2.36 | | 0.00314 | umoles/g-dry | 1 | 08/24/2006 2:07 PM | 20859 |
| Zinc | 14.5 | | 0.0106 | umoles/g-dry | 1 | 08/24/2006 2:07 PM | 20859 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 4.00 | | 0.184 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R5432 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Diameter of Soil Particles | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Hydrometer | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Particle Density | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Sieve Analysis | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 45.68 | | 0 | wt% | 1 | 08/10/2006 1:30 PM | R5402 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 5.64 | | 0 | | 1 | 08/24/2006 12:00 AM | R5456 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 22.6 | | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R5455 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 54.3 | | 0.001 | wt% | 1 | 08/10/2006 1:30 PM | R5402 |

| | | | | |
|---|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| <small>Base Report-MDL-Cont Frac 2004</small> | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080450

Client Sample ID: WW41Center Harlem-CSSC

Matrix: SLUDGE

Lab ID: 06080450-08A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/04/2006 1:30 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.135 | | 0.000610 | umoles/g-dry | 1 | 08/24/2006 2:19 PM | 20859 |
| Copper | 3.94 | | 0.00416 | umoles/g-dry | 1 | 08/24/2006 2:19 PM | 20859 |
| Lead | 1.92 | | 0.00286 | umoles/g-dry | 1 | 08/24/2006 2:19 PM | 20859 |
| Nickel | 1.58 | | 0.00602 | umoles/g-dry | 1 | 08/24/2006 2:19 PM | 20859 |
| Zinc | 22.2 | | 0.0203 | umoles/g-dry | 1 | 08/24/2006 2:19 PM | 20859 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 8.41 | | 0.353 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R5432 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Diameter of Soil Particles | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Hydrometer | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Particle Density | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| Sieve Analysis | 8/29/06 | c | 0 | Date | 1 | 08/29/2006 12:00 AM | R5469 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 71.70 | | 0 | wt% | 1 | 08/10/2006 1:30 PM | R5402 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 3.54 | | 0 | | 1 | 08/24/2006 12:00 AM | R5456 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 29.8 | | 0 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R5455 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 28.3 | | 0.001 | wt% | 1 | 08/10/2006 1:30 PM | R5402 |

| | | | | |
|--------------------|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic
Project Name: Contract 05-104-11 (Sediment Chemistry)

Report Date: May 02, 2007
Lab Order: 06080450

Client Sample ID: WW75 Side Cicero-CSSC

Matrix: SLUDGE

Lab ID: 06080450-09A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/04/2006 1:30 PM

Table with 8 columns: Parameter, Result, Qual., Report Limit, Units, Dilution Factor, Date Analyzed, Batch ID. Rows include METALS BY ICP (Cadmium, Copper, Lead, Nickel, Zinc), ACID VOLATILE SULFIDE, PARTICLE-SIZE ANALYSIS OF SOILS, PERCENT MOISTURE, SEM / AVS RATIO, DO NOT USE, and TOTAL SOLIDS.

- Qualifiers: * Value exceeds Maximum Contaminant Level, B Analyte detected in the associated Method Blank, c Analyte not included in SLI scope of accreditation, E Estimated, analyte detected above quantitation range, G Refer to case narrative page for specific comments, H Holding times for preparation or analysis exceeded, J Analyte detected below quantitation limit (QL), NA Not Applicable, ND Not Detected at the SLI Reporting Limit, Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist)



Client ID: Metropolitan Water Reclamation District of Chic
Project Name: Contract 05-104-11 (Sediment Chemistry)

Report Date: May 02, 2007
Lab Order: 06080450

Client Sample ID: WW75 Center Cicero CSSC

Matrix: SLUDGE

Lab ID: 06080450-10A

Date Received: 08/09/2006 3:00 PM

Collection Date: 08/04/2006 2:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.179 | | 0.000459 | umoles/g-dry | 1 | 08/24/2006 2:28 PM | 20859 |
| Copper | 6.89 | | 0.00313 | umoles/g-dry | 1 | 08/24/2006 2:28 PM | 20859 |
| Lead | 2.42 | | 0.00216 | umoles/g-dry | 1 | 08/24/2006 2:28 PM | 20859 |
| Nickel | 1.15 | | 0.00454 | umoles/g-dry | 1 | 08/24/2006 2:28 PM | 20859 |
| Zinc | 19.2 | | 0.0153 | umoles/g-dry | 1 | 08/24/2006 2:28 PM | 20859 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 6.66 | | 0.266 | µmoles/g-dry | 1 | 08/15/2006 12:00 AM | R5432 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5460 |
| Diameter of Soil Particles | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5460 |
| Hydrometer | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5460 |
| Particle Density | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5460 |
| Sieve Analysis | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5460 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 62.44 | | 0 | wt% | 1 | 08/10/2006 1:30 PM | R5402 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 4.48 | | 0 | | 1 | 08/24/2006 12:00 AM | R5456 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 29.9 | | 0.026 | µmoles/g-dry | 1 | 08/24/2006 12:00 AM | R5455 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 37.6 | | 0.001 | wt% | 1 | 08/10/2006 1:30 PM | R5402 |

| | | | | |
|---|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| <small>BaseReport-MDL- ConfPrac2004</small> | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



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SLI Work Order: 06080450
 SLI Sample ID: 06080450-01A

Analysis Date: 8/25/06

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 06080450-01A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 1.6% |
| No. 10 | 2.00 | 6.7% |
| No. 20 | 0.85 | 14.8% |
| No. 40 | 0.420 | 14.1% |
| No. 60 | 0.250 | 10.4% |
| No. 140 | 0.106 | 12.2% |
| No. 200 | 0.075 | 8.0% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 06080450-01A |
| Gravel | >4.75 | 1.6% |
| Sand, Course | 4.74-2.0 | 8.2% |
| Sand, Medium | 1.99-0.420 | 28.8% |
| Sand, Fine | 0.419-0.075 | 30.6% |
| Silt | 0.074-0.005 | 25.9% |
| Clay | <0.005-0.001 | 2.5% |
| Colloids | <0.001 | 3.9% |

Analyst: *Stephanopoulos*

Date: 8/28/06

Reviewed: *[Signature]*

Date: 8/28/2006



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www.suburbanlabs.com

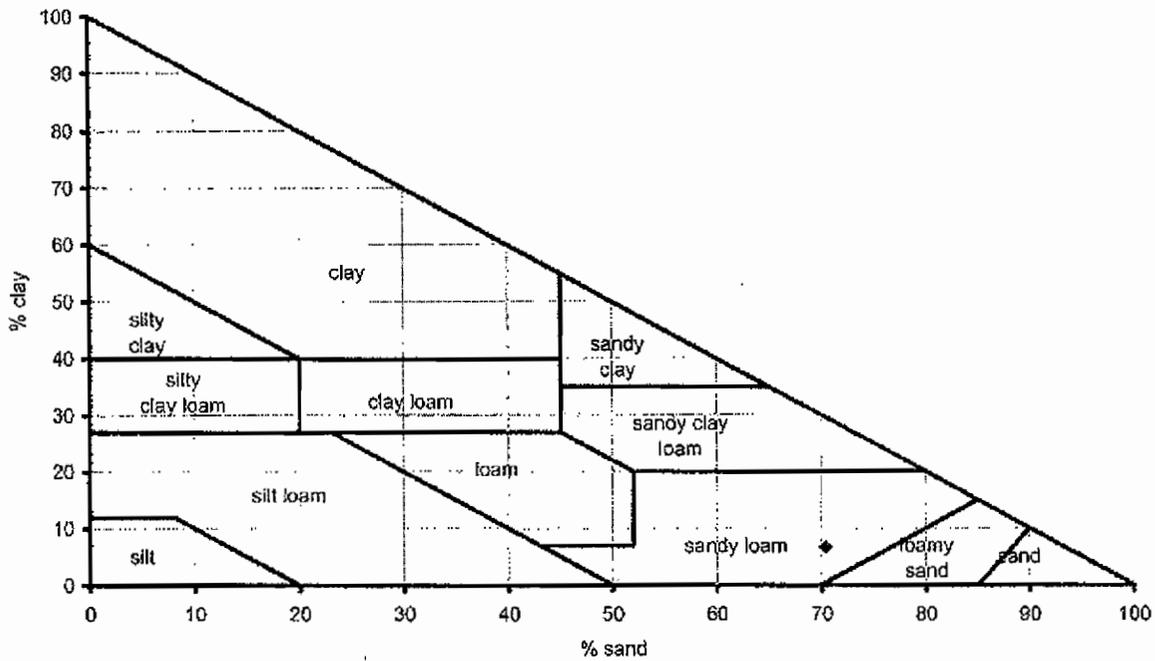


SLI Work Order: 06080450
SLI Sample ID: 06080450-01A

Analysis Date: 08/25/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 70.4 | 6.7 | 25.95 |

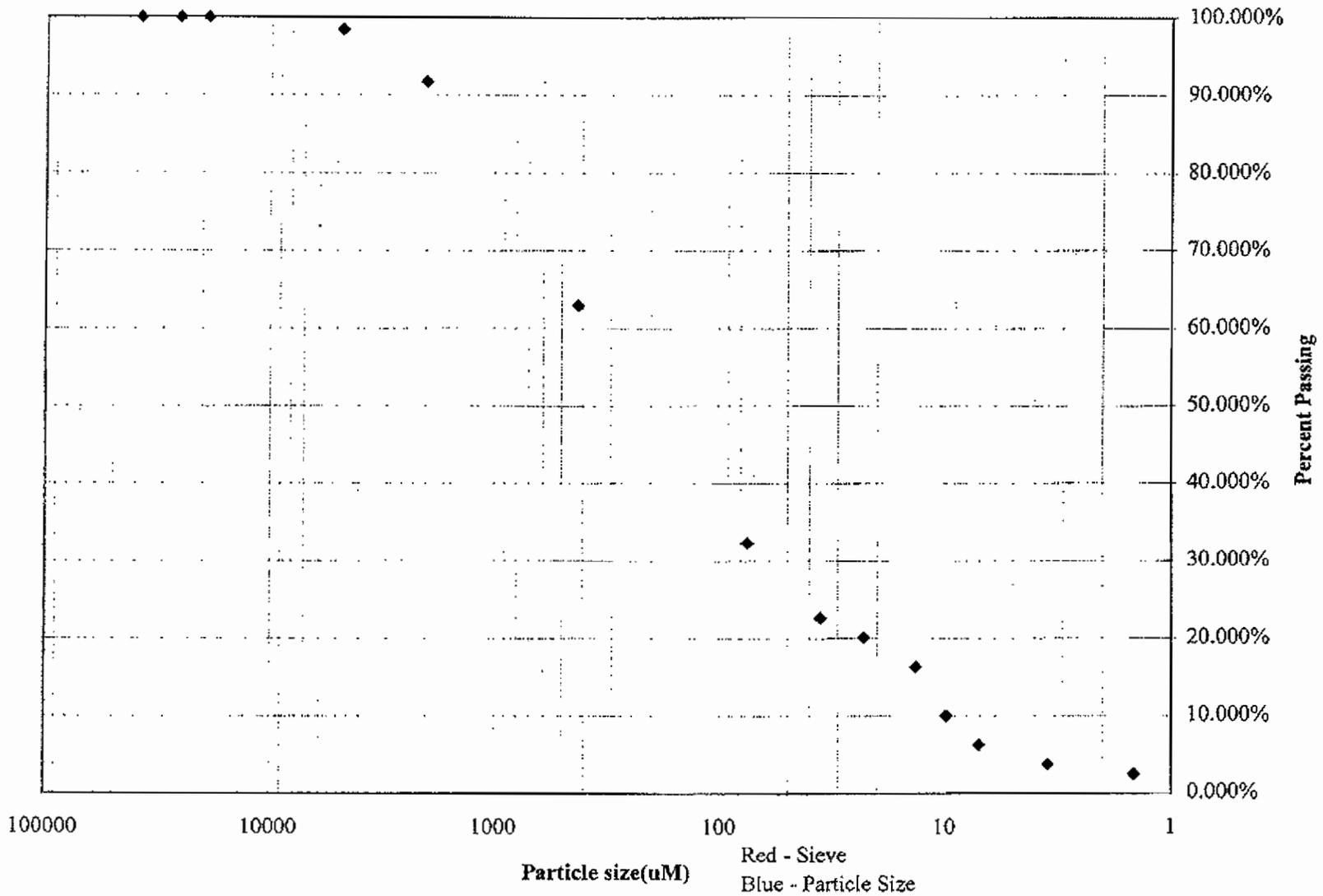
Soil Classification: Gravelly sandy loam



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-01A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-02A

Analysis Date: 8/28/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-02A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 14.1% |
| No. 10 | 2.00 | 4.3% |
| No. 20 | 0.85 | 11.0% |
| No. 40 | 0.420 | 15.7% |
| No. 60 | 0.250 | 15.4% |
| No. 140 | 0.106 | 16.8% |
| No. 200 | 0.075 | 6.4% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-02A |
| Gravel | >4.75 | 14.1% |
| Sand, Course | 4.74-2.0 | 18.4% |
| Sand, Medium | 1.99-0.420 | 26.7% |
| Sand, Fine | 0.419-0.075 | 38.6% |
| Silt | 0.074-0.005 | 13.7% |
| Clay | <0.005-0.001 | 0.3% |
| Colloids | <0.001 | 2.4% |

Analyst: Styrodada

Date: 8/29/06

Reviewed: [Signature]

Date: 8/29/06



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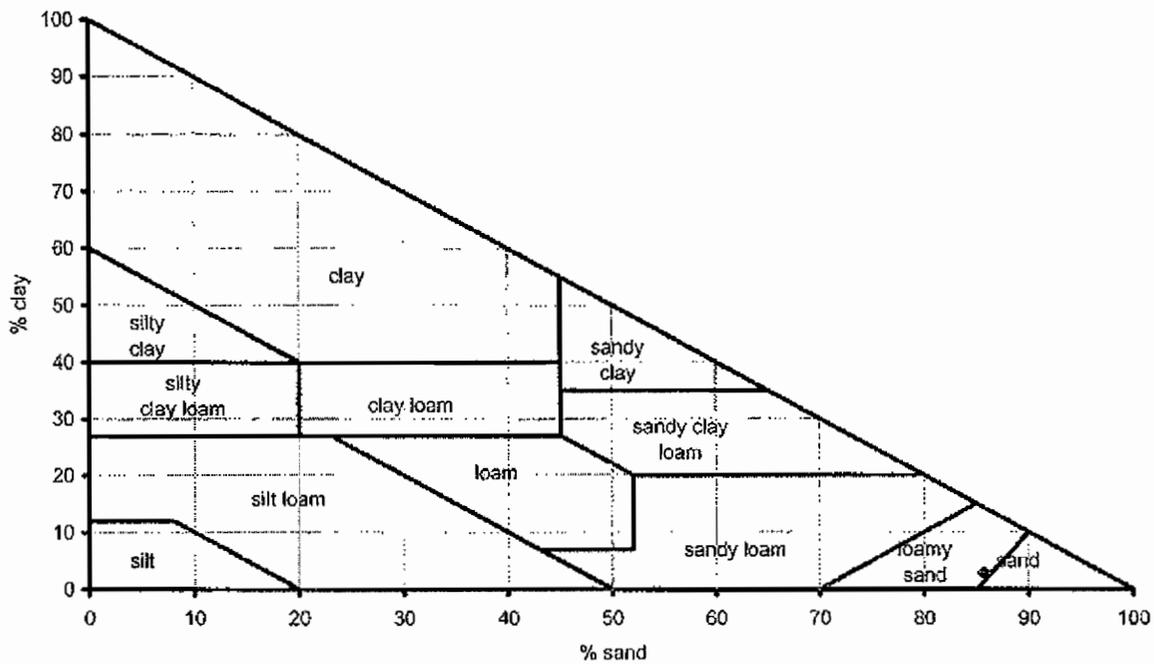


SLI Work Order: 06080450
SLI Sample ID: 06080450-02A

Analysis Date: 08/28/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 85.7 | 2.8 | 13.67 |

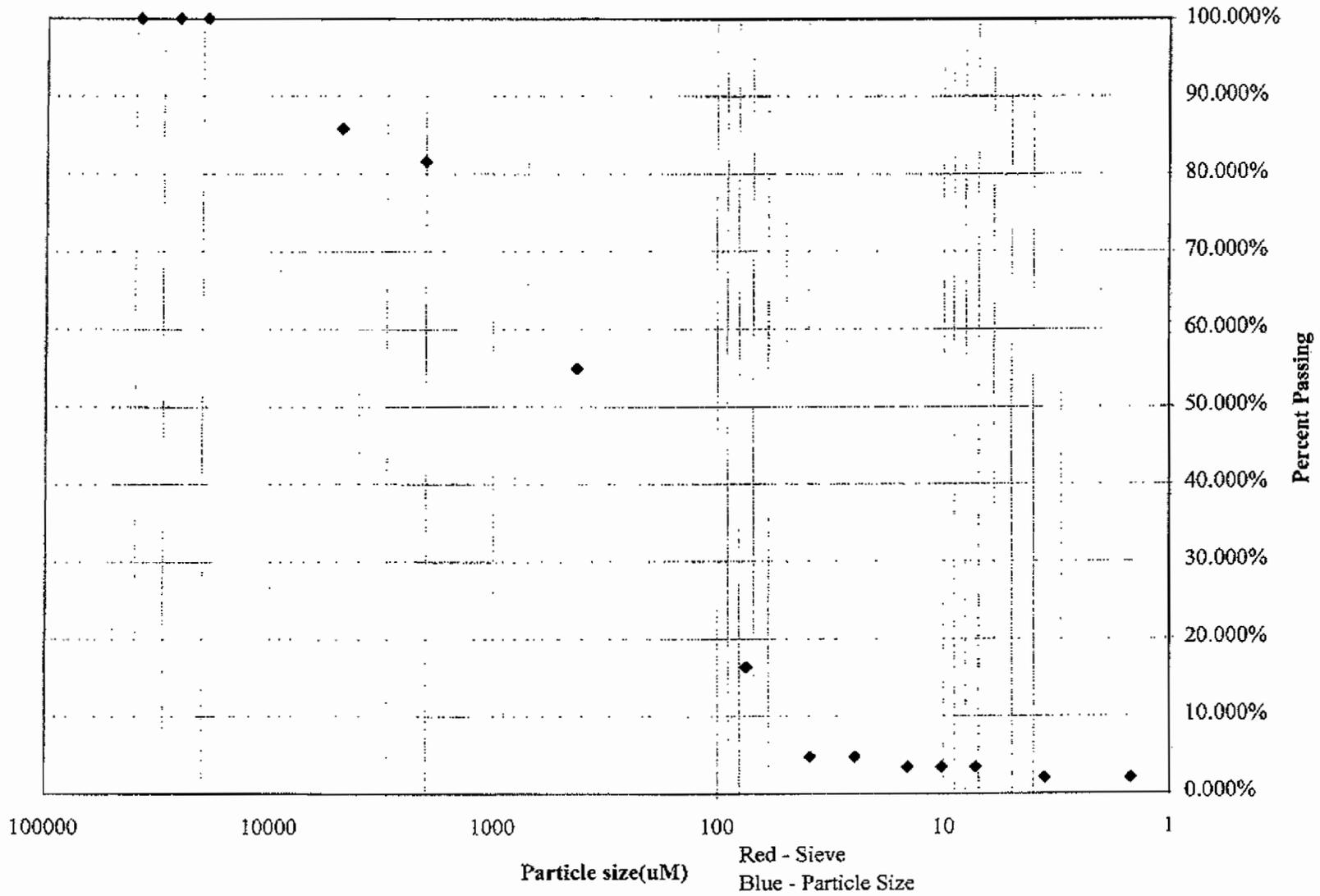
Soil Classification: Gravelly loamy sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-02A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-03A

Analysis Date: 8/28/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-03A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 1.0% |
| No. 20 | 0.85 | 9.0% |
| No. 40 | 0.420 | 10.6% |
| No. 60 | 0.250 | 7.7% |
| No. 140 | 0.106 | 13.8% |
| No. 200 | 0.075 | 11.1% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-03A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 1.0% |
| Sand, Medium | 1.99-0.420 | 19.6% |
| Sand, Fine | 0.419-0.075 | 32.5% |
| Silt | 0.074-0.005 | 42.4% |
| Clay | <0.005-0.001 | 0.5% |
| Colloids | <0.001 | 4.0% |

Analyst: Shyamadas

Date: 8/29/06

Reviewed: [Signature]

Date: 8/29/06



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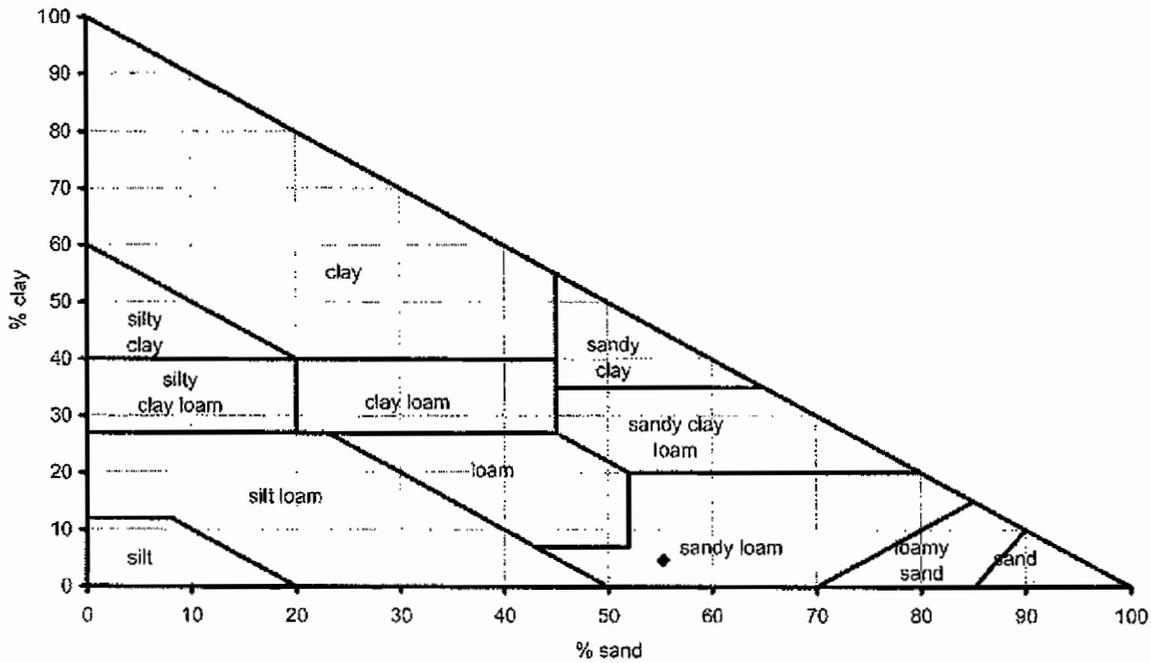


SLI Work Order: 06080450
SLI Sample ID: 06080450-03A

Analysis Date: 08/28/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 55.3 | 4.6 | 42.43 |

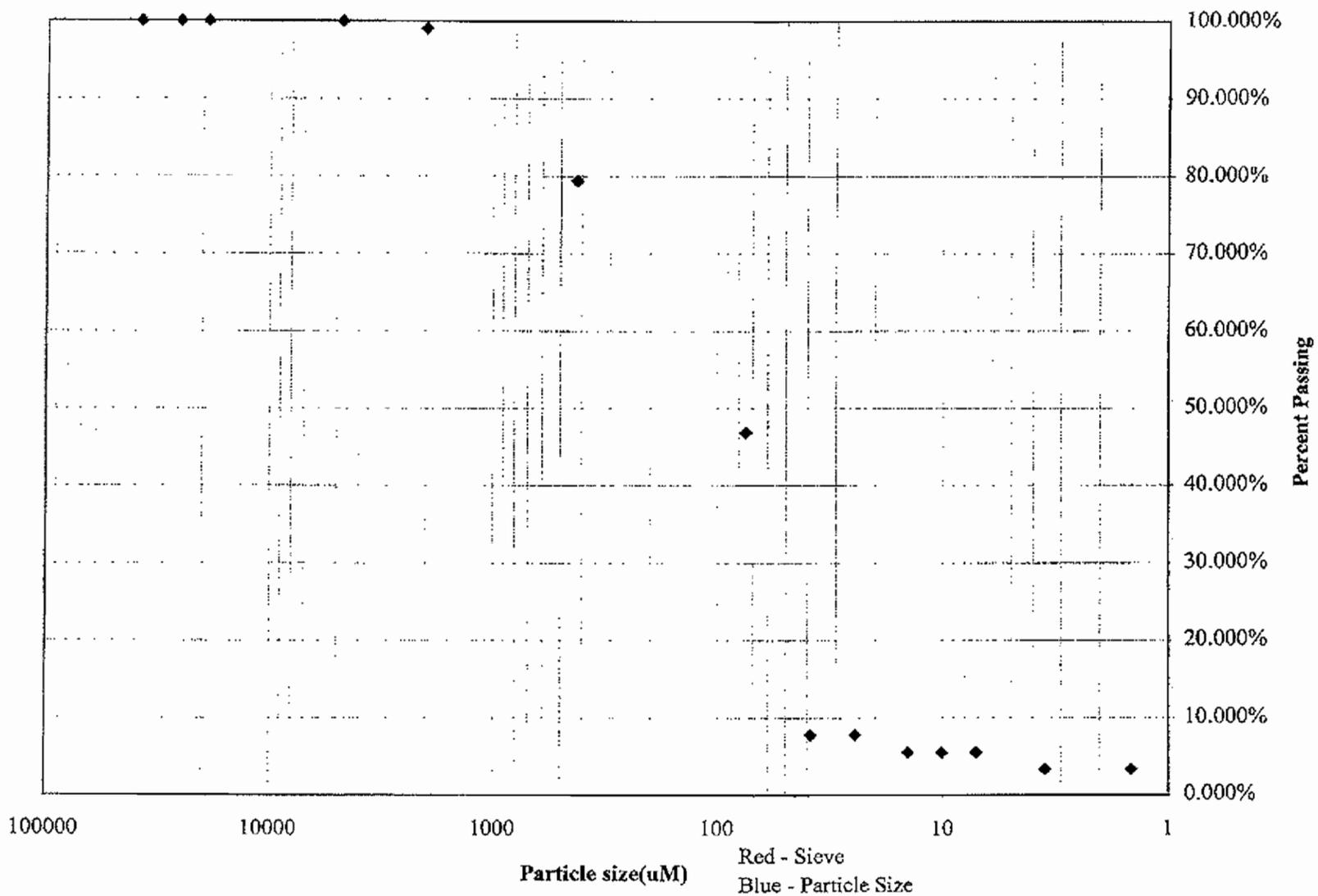
Soil Classification: sandy loam



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-03A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-04A

Analysis Date: 8/28/06

Standard Test Method for Particle-Size Analysis of Soil

| Sieve (U.S.) | Sieve Opening (mm) | Percent Retained |
|--------------|--------------------|------------------|
| | | 06080450-04A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.6% |
| No. 10 | 2.00 | 3.1% |
| No. 20 | 0.85 | 11.4% |
| No. 40 | 0.420 | 12.8% |
| No. 60 | 0.250 | 10.8% |
| No. 140 | 0.106 | 16.4% |
| No. 200 | 0.075 | 10.7% |

| Particle(s) | Particle Size (mm) | Percent Present |
|--------------|--------------------|-----------------|
| | | 06080450-04A |
| Gravel | >4.75 | 0.6% |
| Sand, Course | 4.74-2.0 | 3.7% |
| Sand, Medium | 1.99-0.420 | 24.3% |
| Sand, Fine | 0.419-0.075 | 38.0% |
| Silt | 0.074-0.005 | 30.0% |
| Clay | <0.005-0.001 | 0.7% |
| Colloids | <0.001 | 3.3% |

Analyst: Stygar, David

Date: 8/29/06

Reviewed: [Signature]

Date: 9/29/06



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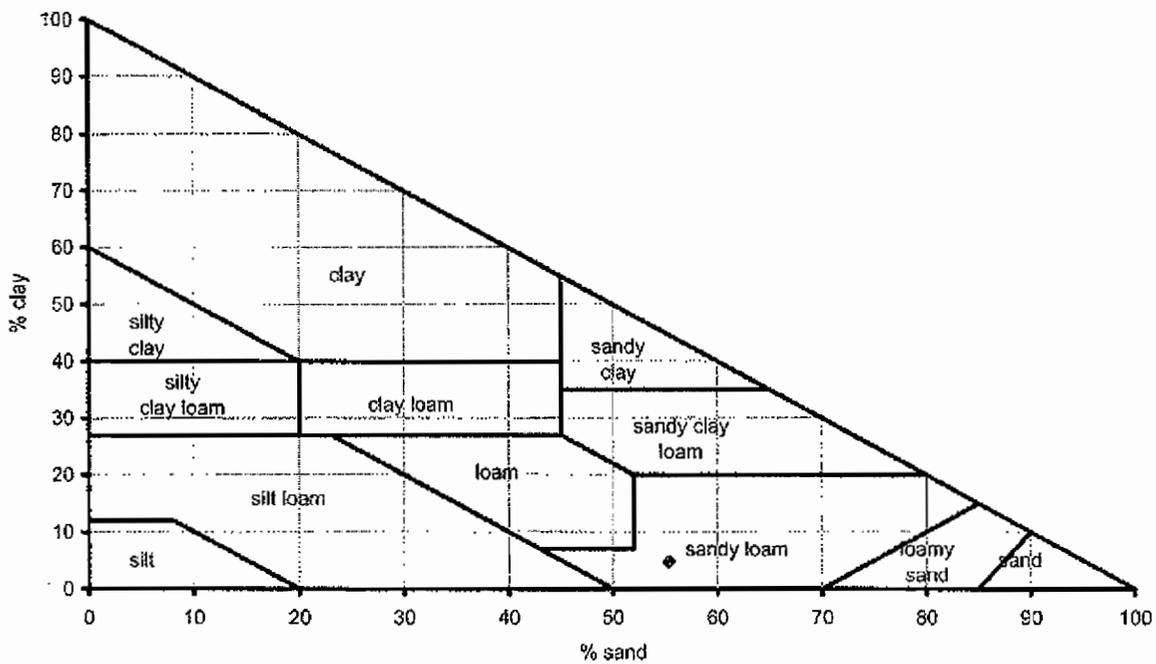


SLI Work Order: 06080450
SLI Sample ID: 06080450-04A

Analysis Date: 08/28/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 55.3 | 4.7 | 42.39 |

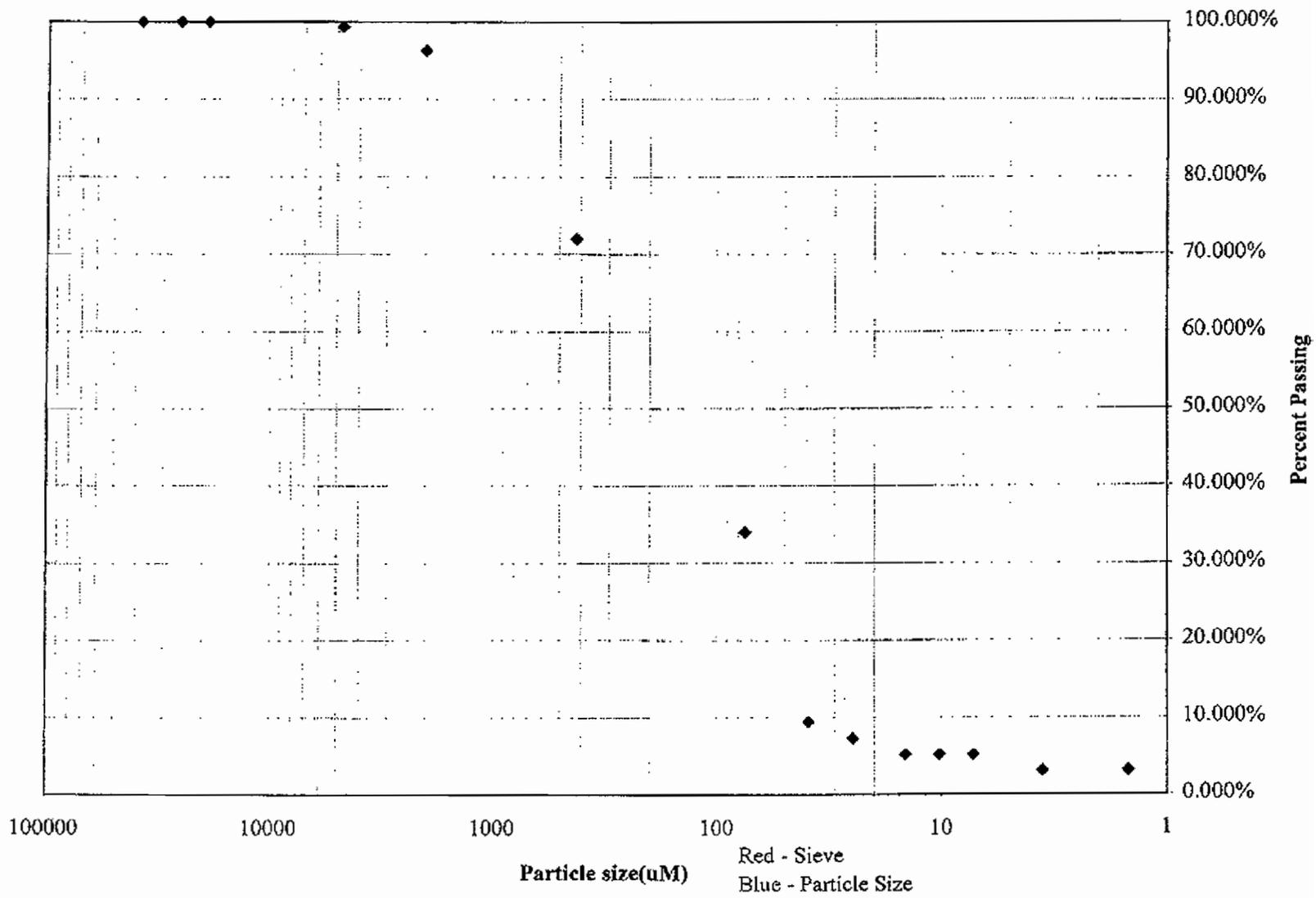
Soil Classification: sandy loam



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-04A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-05A

Analysis Date: 8/28/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-05A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 4.9% |
| No. 10 | 2.00 | 3.5% |
| No. 20 | 0.85 | 6.1% |
| No. 40 | 0.420 | 9.5% |
| No. 60 | 0.250 | 12.0% |
| No. 140 | 0.106 | 32.0% |
| No. 200 | 0.075 | 10.4% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-05A |
| Gravel | >4.75 | 4.9% |
| Sand, Course | 4.74-2.0 | 8.4% |
| Sand, Medium | 1.99-0.420 | 15.6% |
| Sand, Fine | 0.419-0.075 | 54.3% |
| Silt | 0.074-0.005 | 17.8% |
| Clay | <0.005-0.001 | 0.5% |
| Colloids | <0.001 | 3.3% |

Analyst: Shirley Adaw

Date: 8/29/06

Reviewed: [Signature]

Date: 8/29/06



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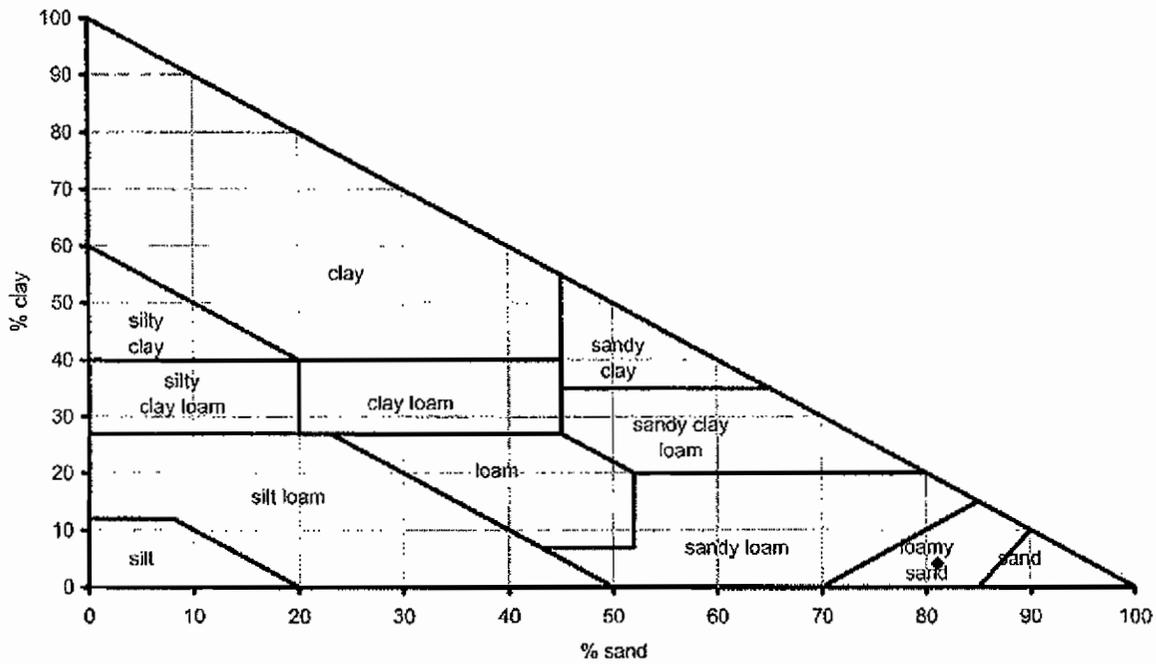


SLI Work Order: 06080450
SLI Sample ID: 06080450-05A

Analysis Date: 08/28/06

| | | |
|--------|--------|--------|
| % SAND | % CLAY | % SILT |
| 81.1 | 4.0 | 17.77 |

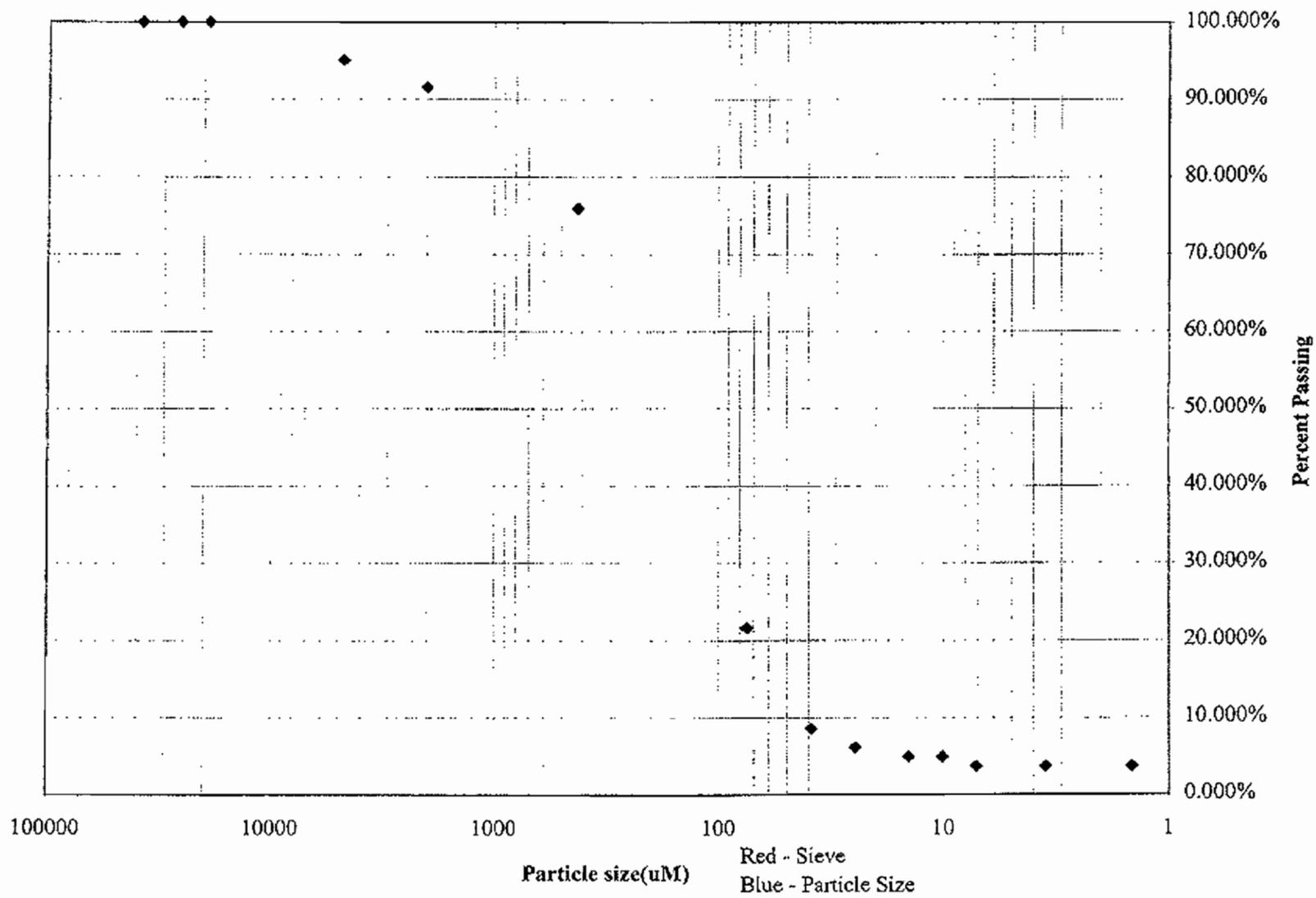
Soil Classification: Gravelly loamy sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-05A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-06A

Analysis Date: 8/29/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-06A |
| 1-1/2" | 38.1 | 0.04% |
| 1" | 25.4 | 0.04% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 14.7% |
| No. 10 | 2.00 | 11.3% |
| No. 20 | 0.85 | 8.6% |
| No. 40 | 0.420 | 10.6% |
| No. 60 | 0.250 | 12.1% |
| No. 140 | 0.106 | 29.0% |
| No. 200 | 0.075 | 5.9% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-06A |
| Gravel | >4.75 | 14.8% |
| Sand, Course | 4.74-2.0 | 26.1% |
| Sand, Medium | 1.99-0.420 | 19.2% |
| Sand, Fine | 0.419-0.075 | 47.0% |
| Silt | 0.074-0.005 | 5.9% |
| Clay | <0.005-0.001 | 0.5% |
| Colloids | <0.001 | 1.7% |

Analyst: Stavros

Date: 8/30/06

Reviewed: [Signature]

Date: 8/30/2006



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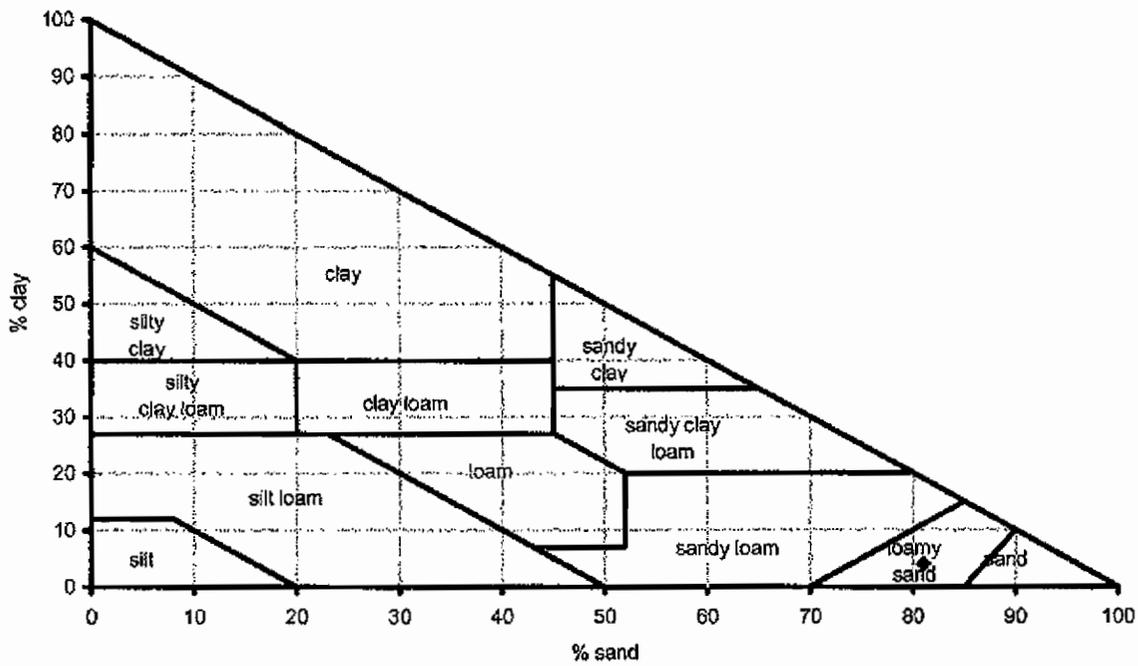


SLI Work Order: 06080450
SLI Sample ID: 06080450-06A

Analysis Date: 08/28/06

% SAND % CLAY % SILT
81.0 4.0 17.81

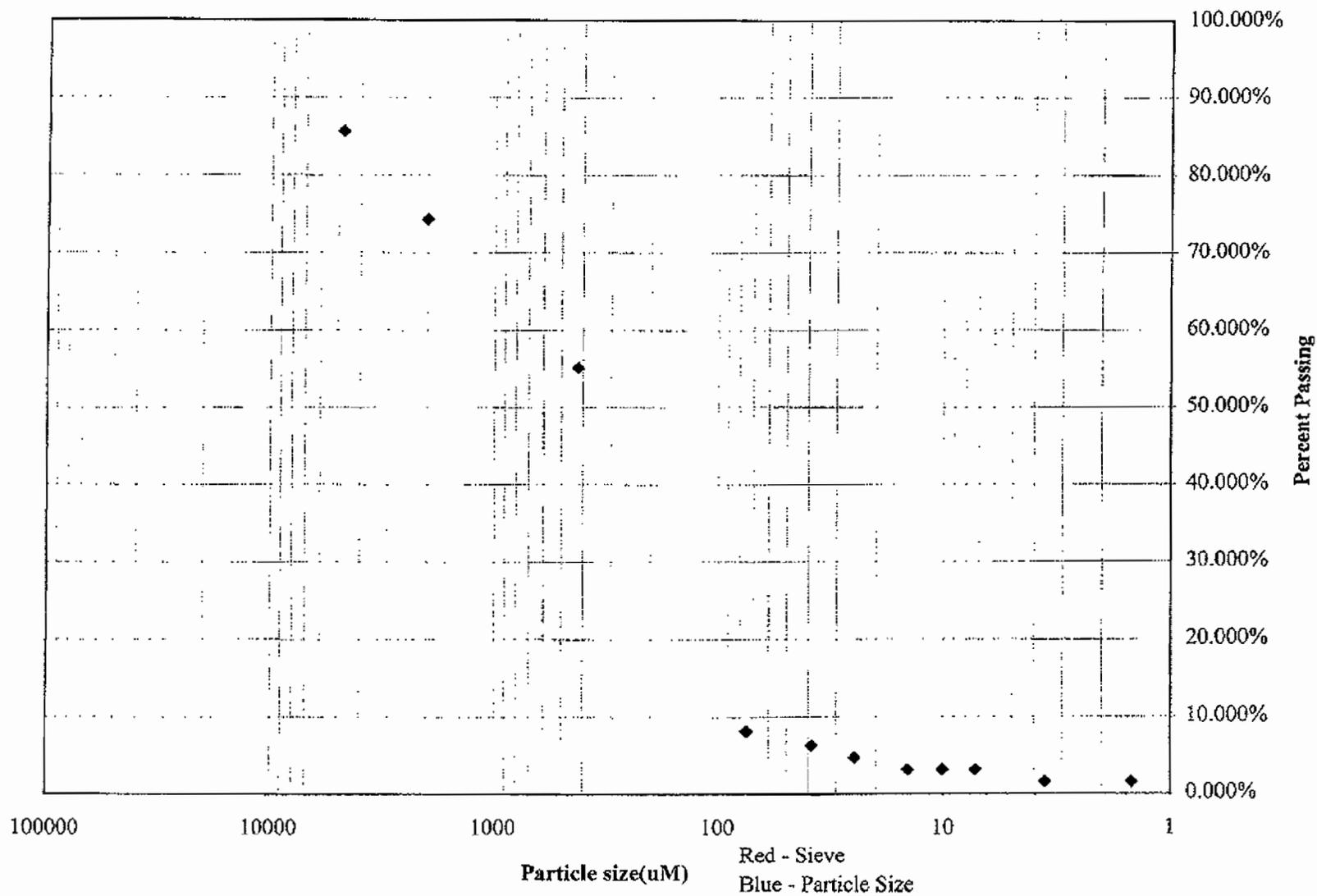
Soil Classification: Gravelly loamy sand



Textural Triangle by A. Gerekis and B. Bear, 26 July 2000.

Particle Size Analysis

◆ 06080450-06A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-07A

Analysis Date: 8/29/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-07A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.8% |
| No. 10 | 2.00 | 5.5% |
| No. 20 | 0.85 | 8.2% |
| No. 40 | 0.420 | 11.2% |
| No. 60 | 0.250 | 24.4% |
| No. 140 | 0.106 | 38.1% |
| No. 200 | 0.075 | 3.1% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-07A |
| Gravel | >4.75 | 0.8% |
| Sand, Course | 4.74-2.0 | 6.2% |
| Sand, Medium | 1.99-0.420 | 19.3% |
| Sand, Fine | 0.419-0.075 | 65.5% |
| Silt | 0.074-0.005 | 7.2% |
| Clay | <0.005-0.001 | 0.3% |
| Colloids | <0.001 | 1.4% |

Analyst: Styrodada

Date: 8/30/06

Reviewed: [Signature]

Date: 8/30/06



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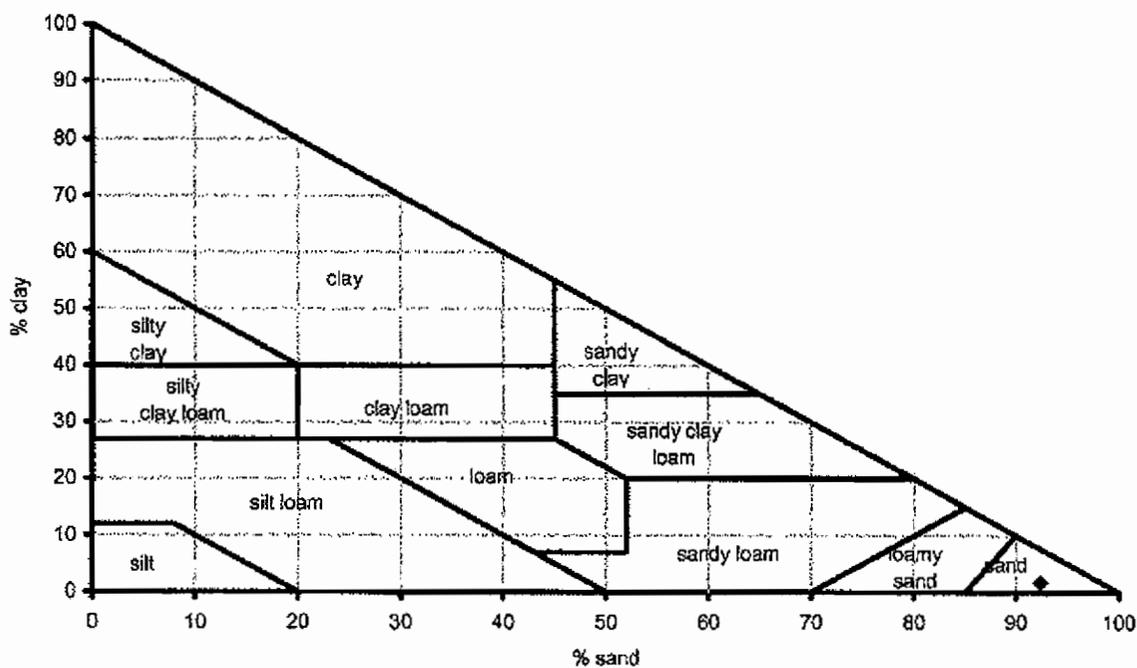


SLI Work Order: 06080450
SLI Sample ID: 06080450-07A

Analysis Date: 08/29/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 92.4 | 1.7 | 7.20 |

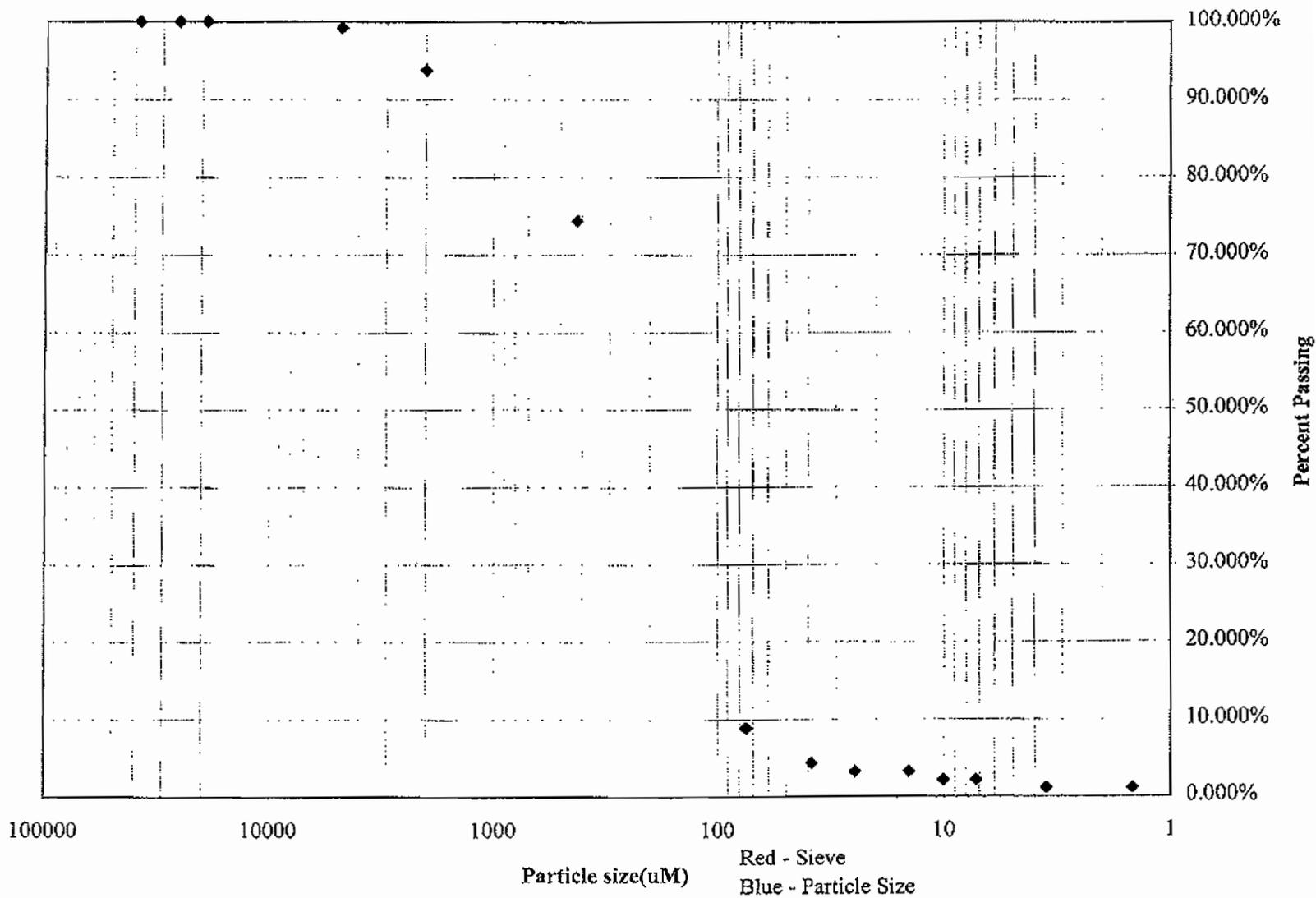
Soil Classification: sand



Textural triangle by A. Gerakis and B. Baar, 26 July 2000.

Particle Size Analysis

◆ 06080450-07A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-08A

Analysis Date: 8/29/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-08A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 2.0% |
| No. 10 | 2.00 | 5.3% |
| No. 20 | 0.85 | 8.7% |
| No. 40 | 0.420 | 11.7% |
| No. 60 | 0.250 | 23.9% |
| No. 140 | 0.106 | 29.1% |
| No. 200 | 0.075 | 12.9% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-08A |
| Gravel | >4.75 | 2.0% |
| Sand, Course | 4.74-2.0 | 7.3% |
| Sand, Medium | 1.99-0.420 | 20.4% |
| Sand, Fine | 0.419-0.075 | 66.0% |
| Silt | 0.074-0.005 | 4.3% |
| Clay | <0.005-0.001 | 0.4% |
| Colloids | <0.001 | 1.6% |

Analyst: Stephania

Date: 8/30/06

Reviewed: [Signature]

Date: 8/30/2006



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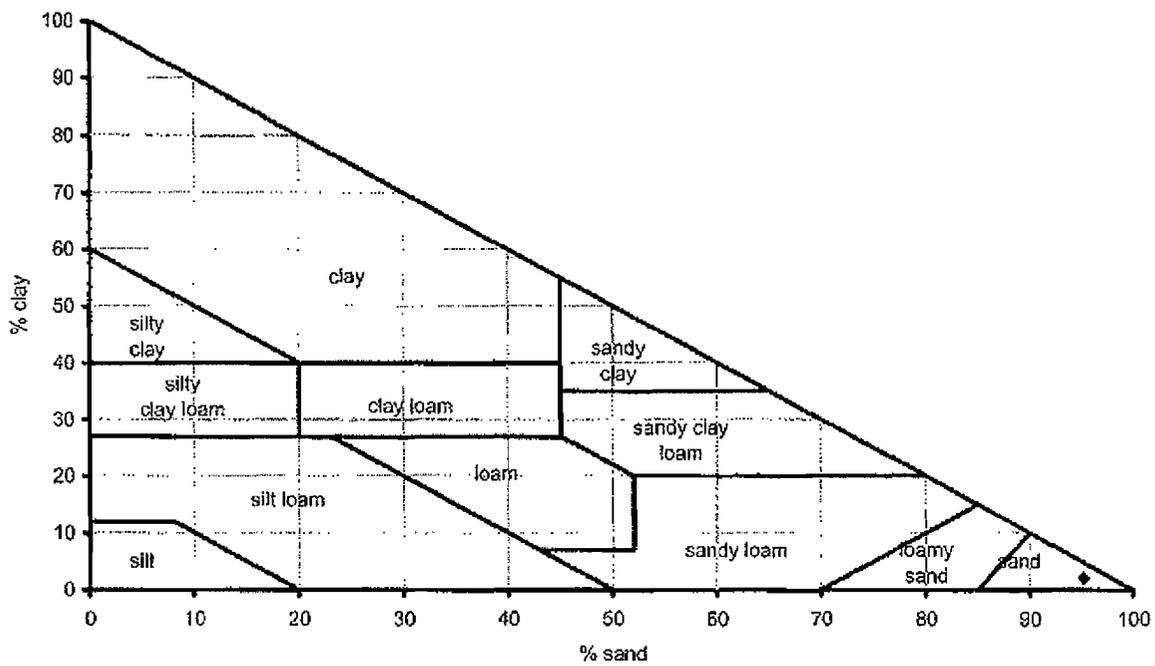


SLI Work Order: 06080450
 SLI Sample ID: 06080450-08A

Analysis Date: 08/29/06

% SAND % CLAY % SILT
 95.2 2.0 4.29

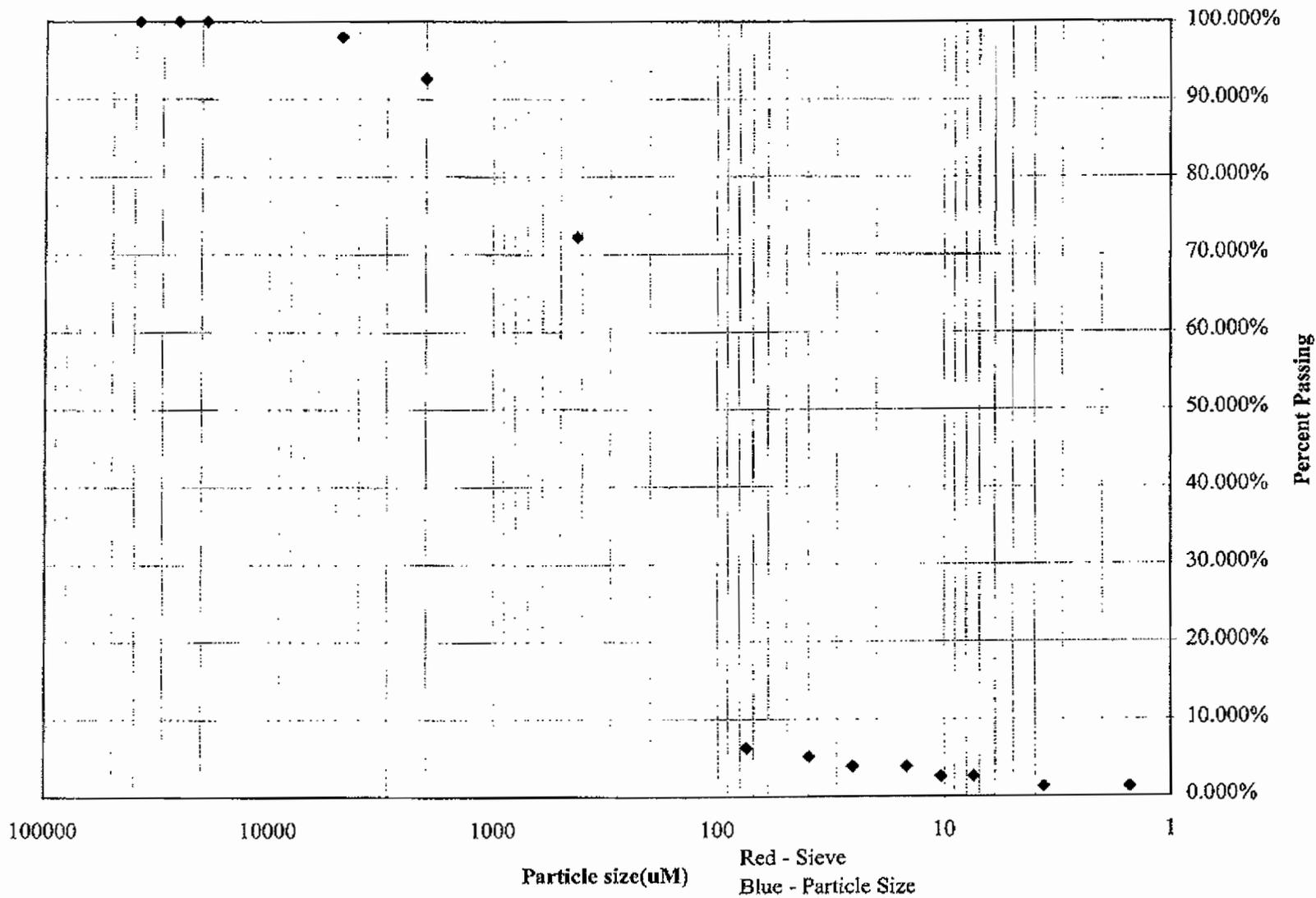
Soil Classification: Gravelly sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-08A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-09A

Analysis Date: 8/29/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-09A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.8% |
| No. 10 | 2.00 | 6.5% |
| No. 20 | 0.85 | 11.1% |
| No. 40 | 0.420 | 12.4% |
| No. 60 | 0.250 | 17.1% |
| No. 140 | 0.106 | 27.9% |
| No. 200 | 0.075 | 7.1% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-09A |
| Gravel | >4.75 | 0.8% |
| Sand, Course | 4.74-2.0 | 7.4% |
| Sand, Medium | 1.99-0.420 | 23.5% |
| Sand, Fine | 0.419-0.075 | 52.1% |
| Silt | 0.074-0.005 | 15.2% |
| Clay | <0.005-0.001 | 0.7% |
| Colloids | <0.001 | 1.1% |

Analyst: Stacy Adams

Date: 8/30/06

Reviewed: Henry E. Brown

Date: 8/30/2006



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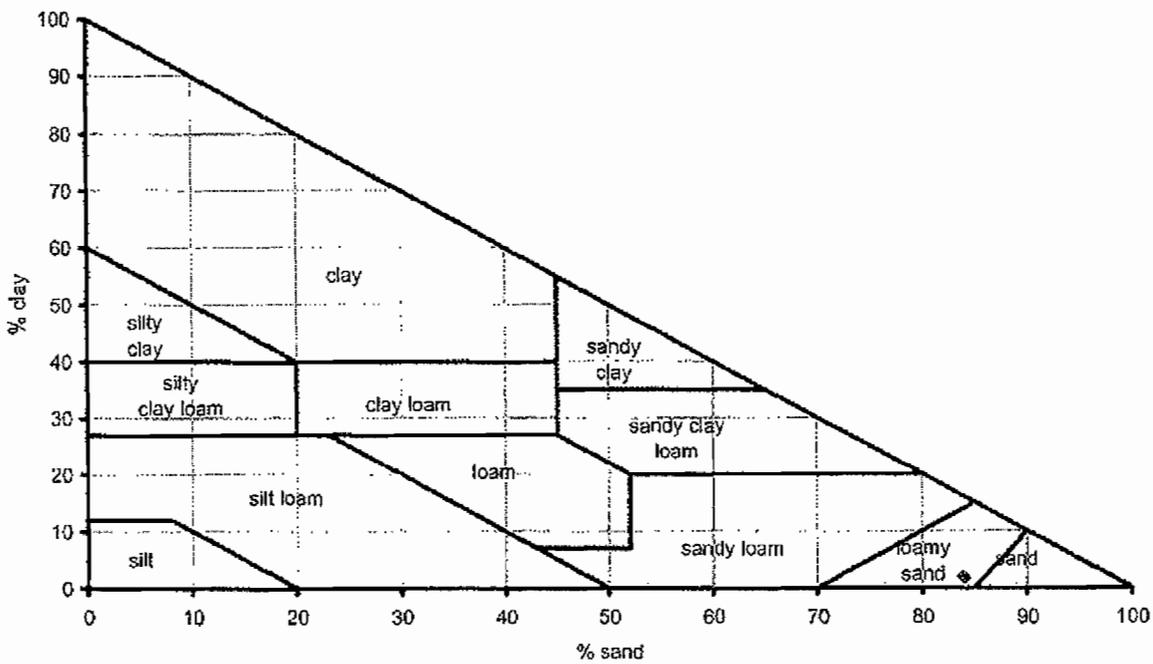


SLI Work Order: 06080450
SLI Sample ID: 06080450-09A

Analysis Date: 08/29/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 83.9 | 1.9 | 15.18 |

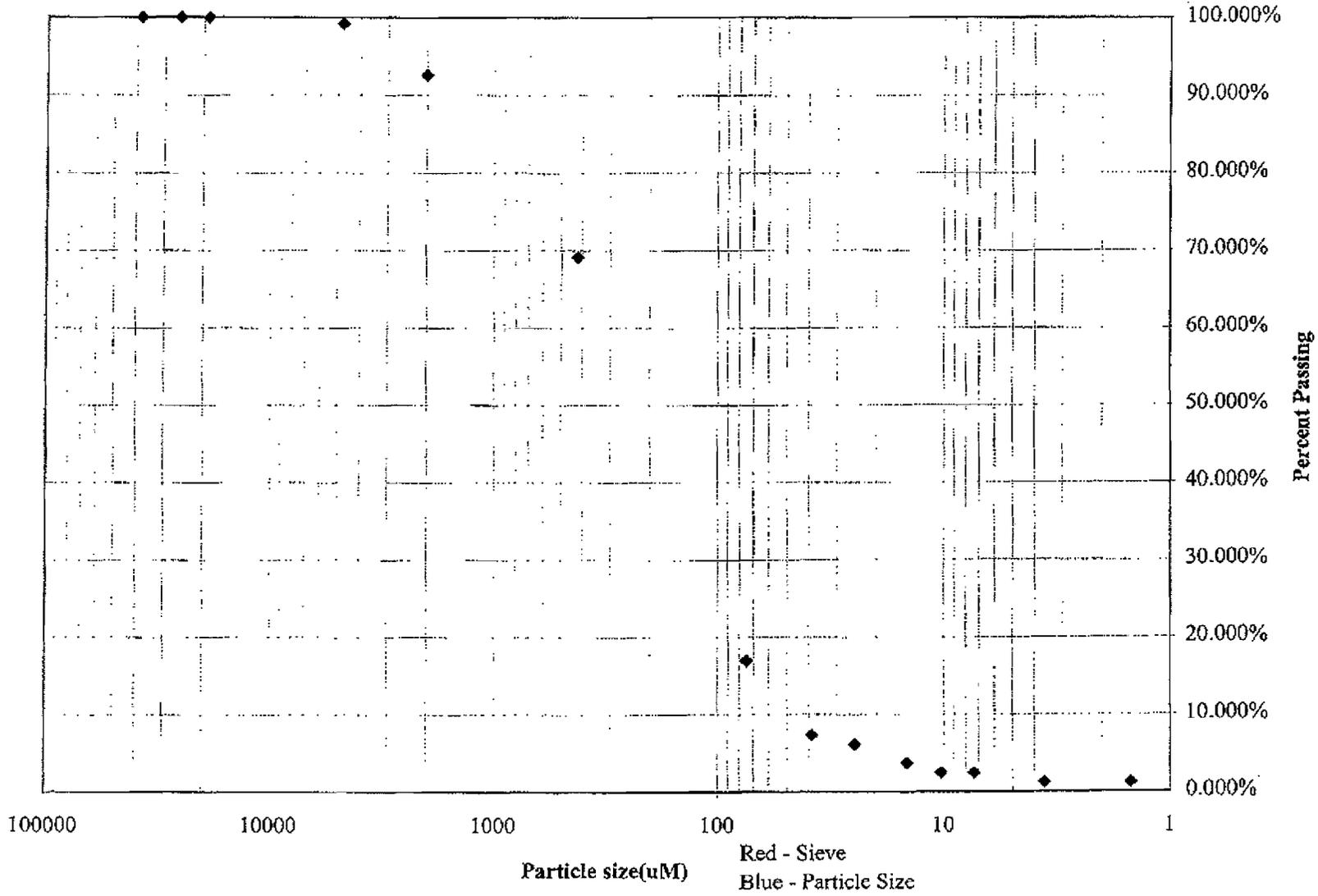
Soil Classification: loamy sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-09A





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SLI Work Order: 06080450
 SLI Sample ID: 06080450-10A

Analysis Date: 8/25/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080450-10A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.1% |
| No. 10 | 2.00 | 1.0% |
| No. 20 | 0.85 | 3.8% |
| No. 40 | 0.420 | 9.1% |
| No. 60 | 0.250 | 15.6% |
| No. 140 | 0.106 | 30.8% |
| No. 200 | 0.075 | 10.4% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080450-10A |
| Gravel | >4.75 | 0.1% |
| Sand, Course | 4.74-2.0 | 1.0% |
| Sand, Medium | 1.99-0.420 | 12.9% |
| Sand, Fine | 0.419-0.075 | 56.8% |
| Silt | 0.074-0.005 | 23.5% |
| Clay | <0.005-0.001 | 1.2% |
| Colloids | <0.001 | 4.6% |

Analyst: St. J. P. Dada

Date: 8/28/06

Reviewed: [Signature]

Date: 8/29/06



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SLI Work Order: 06080450

Analysis Date: 08/25/06

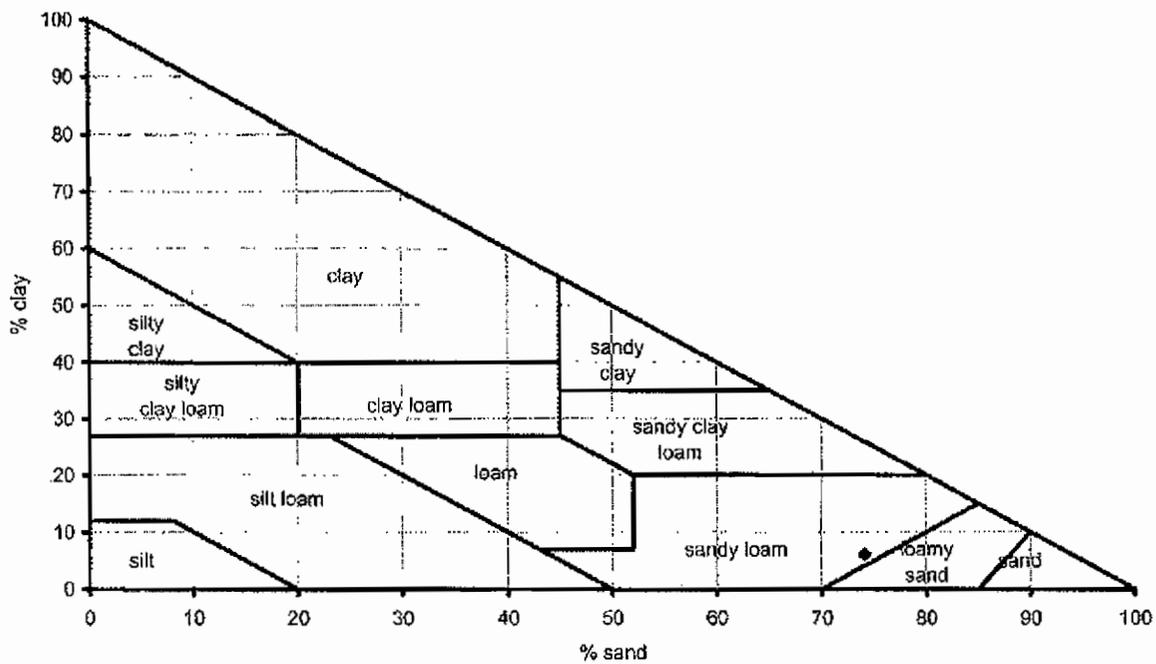
SLI Sample ID: 06080450-10A

% SAND
74.1

% CLAY
6.1

% SILT
23.46

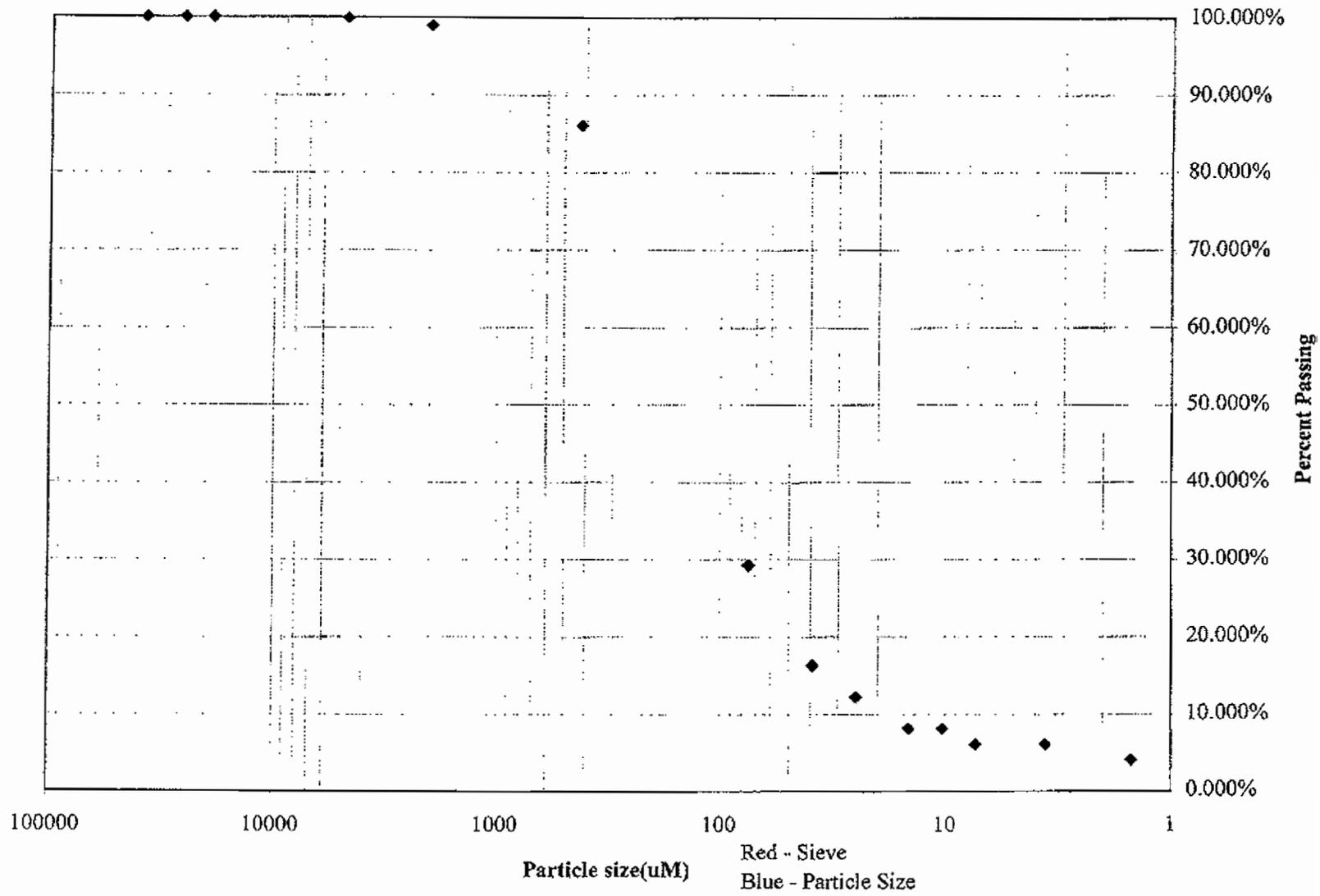
Soil Classification: sandy loam



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080450-10A



Company Name **MWRDGC**
 Company Address **6001 W. Pershing Rd.**
 City **Cicero** State **IL** Zip **60477**
 Phone **708-548-4223** Fax Fax Report
 Email Address Email Report
 Project ID / Location
 Project Manager (Report to) **Jennifer Wasik**
 Sample Collector(s) **Tom Minarik**

TURNAROUND TIME REQUESTED
 Normal **RUSH*** *Additional Rush Charges Approved.
 Date & Time Needed: _____
 Normal TAT is 5-7 work days for most work. Rush work must be pre-approved and additional charges apply.
 Specify Regulatory Program: None/Info Only (Required)
 LUST SRP SDWA
 503 Sludge NPDES **MWRDGC**
 Disposal Other* *Please specify in comment section below.

ANALYSIS & METHOD REQUESTED
 Enter an "X" in box below for request

| | | |
|---------|-----|------------|
| SEM/AVS | TOC | GRAIN SIZE |
| X | X | X |

Page _____ of _____
 PO No. **3032962**
 Shipping Method **Courier**
 Reporting Level (at additional charge) **1 2 3**
LAB USE ONLY
 S/L ORDER No. **06080450**
 Sample containers supplied by customer? Yes
 Temperature of Received Samples **5**
 Samples received within 6 hours of collection? Yes

| SAMPLE IDENTIFICATION *Use One Line Per Preservation & Container Type* | COLLECTION | | MATRIX | GRAB/COMP. | CONTAINERS | | PRESERVATIVE | SEM/AVS | TOC | GRAIN SIZE | R | Condition | Spill | LAB # |
|---|------------|-------|--------|------------|------------|-------------|--------------|---------|-----|------------|---|-----------|-------|-------|
| | DATE | TIME | | | Qty | SIZE & TYPE | | | | | | | | |
| 1 WW108-Loomis St. ^{South Branch} -side | 8/2/06 | 1030 | sed | GRAB | 1 | LP | - | X | X | X | | | | 01A |
| 2 WW108-Loomis St. ^{South Branch} -center | 8/2/06 | 1100 | | | 1 | LP | - | X | X | X | | | | 02A |
| 3 WW40-Damen Av. CSSC -side | 8/2/06 | 1300 | | | 1 | LP | - | X | X | X | | | | 03A |
| 4 WW40-Damen Av. CSSC -center | 8/2/06 | 1330 | | | 1 | LP | - | X | X | X | | | | 04A |
| 5 WW49-Archer Av. ^{Bubbly Creek} -side | 8/2/06 | 1430 | | | 1 | LP | - | X | X | X | | | | 05A |
| 6 WW49-Archer Av. ^{Bubbly Creek} -center | 8/2/06 | 1400 | | | 1 | LP | - | X | X | X | | | | 06A |
| 7 WW41 side Harlem CSSC | 8/14/06 | 1140 | | | 1 | LP | - | X | X | X | | | | 07A |
| 8 WW41 center Harlem CSSC | 8/14/06 | 12:10 | | | 1 | LP | - | X | X | X | | | | 08A |
| 9 WW75 side Cicero-CSSC | 8/14/06 | 13:30 | | | 1 | LP | - | X | X | X | | | | 09A |
| 10 WW75 center Cicero CSSC | 8/14/06 | 14:00 | | | 1 | LP | - | X | X | X | | | | 10A |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water (SW), Ground Water (GW), Solid Waste (WA), Sludge (L), Wipe (P) **CONTAINER:** 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) **PRESERVATIVE:** H₂SO₄, HCl, HNO₃, Methanol (MeOH), NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

- CONDITION CODES**
1. Improper/damaged container/cap
 2. Improper preservation
 3. Insufficient sample volume
 4. Headspace/air bubbles for VOCs
 5. Received past holding time
 6. Received frozen
 7. Label conflicts with COC

| | | | |
|---|---|---|---|
| 1. Relinquished By [Signature] Date 8/9/06 | 2. Relinquished By [Signature] Date 8/9/06 | 3. Relinquished By _____ Date _____ | 4. Relinquished By _____ Date _____ |
| Received By [Signature] Time 2:00 Ice present <input checked="" type="checkbox"/> | Received By [Signature] Time 3:00 Ice present <input checked="" type="checkbox"/> | Received By _____ Time _____ Ice present <input type="checkbox"/> | Received By _____ Time _____ Ice present <input type="checkbox"/> |



SUBURBAN LABORATORIES, Inc.

4140 Litt Drive · Hillside, Illinois 60162-1183
Tel. (708) 544-3260 · Toll Free (800) 783-LABS · Fax (708) 544-8587
www.SuburbanLabs.com



May 02, 2007

Jennifer Wasik
Metropolitan Water Reclamation District of Chicago
Research and Development Dept.
6001 W. Pershing
Cicero, IL 60804-4112

Tel: (708) 588-4074
Fax: (708) 588-3807

Lab Order: **06080011**

Project Name: Contract 05-104-11 (Sediment Chemistry)

Dear Jennifer Wasik:

Suburban Laboratories, Inc. received 8 sample(s) on 08/01/06 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call your customer service representative at (708) 544-3260.

Sincerely,

Shane Clarke
Project Manager

cc:



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080011

Client Sample ID: WW 92 Center

Matrix: SEDIMENT

Lab ID: 06080011-01A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/25/2006 1:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.915 | | 0.00238 | umoles/g-Dry | 1 | 08/16/2006 2:35 PM | 20790 |
| Copper | 25.7 | | 0.0163 | umoles/g-Dry | 1 | 08/16/2006 2:35 PM | 20790 |
| Lead | 9.62 | | 0.0112 | umoles/g-Dry | 1 | 08/16/2006 2:35 PM | 20790 |
| Nickel | 4.44 | | 0.0235 | umoles/g-Dry | 1 | 08/16/2006 2:35 PM | 20790 |
| Zinc | 100 | | 0.0792 | umoles/g-Dry | 1 | 08/16/2006 2:35 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 5.56 | | 1.38 | umoles/g-dry | 1 | 08/08/2006 12:00 AM | R5414 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Diameter of Soil Particles | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Hydrometer | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Particle Density | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Sieve Analysis | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 92.76 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R5379 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 25.4 | | 0 | | 1 | 08/16/2006 12:00 AM | R5454 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 141 | | 0.133 | umoles/g-dry | 1 | 08/16/2006 12:00 AM | R5454 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 7.25 | H | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R5379 |

| | | | | |
|-----------------------------|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| BaseReport-MDL-ContFrac2004 | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080011

Client Sample ID: WW 92 Side

Matrix: SEDIMENT

Lab ID: 06080011-02A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/25/2006 12:30 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.264 | | 0.00423 | umoles/g-Dry | 1 | 08/16/2006 2:40 PM | 20790 |
| Copper | 8.41 | | 0.0289 | umoles/g-Dry | 1 | 08/16/2006 2:40 PM | 20790 |
| Lead | 7.49 | | 0.0199 | umoles/g-Dry | 1 | 08/16/2006 2:40 PM | 20790 |
| Nickel | 5.69 | | 0.0418 | umoles/g-Dry | 1 | 08/16/2006 2:40 PM | 20790 |
| Zinc | 88.4 | | 0.141 | umoles/g-Dry | 1 | 08/16/2006 2:40 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 18.2 | | 2.45 | µmoles/g-dry | 1 | 08/08/2006 12:00 AM | R5414 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Diameter of Soil Particles | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Hydrometer | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Particle Density | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| Sieve Analysis | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R5447 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 95.92 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R5379 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 6.07 | | 0 | | 1 | 08/16/2006 12:00 AM | R5454 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 110 | | 0.235 | µmoles/g-dry | 1 | 08/16/2006 12:00 AM | R5454 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 4.08 | H | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R5379 |

| | | |
|---|--|---|
| Qualifiers: | * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| <small>Base Report-MDL-ContFrac2004</small> | c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| | G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| | J Analyte detected below quantitation limit (QL) | NA Not Applicable |
| | ND Not Detected at the SLI Reporting Limit | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic
Project Name: Contract 05-104-11 (Sediment Chemistry)

Report Date: May 02, 2007
Lab Order: 06080011

Client Sample ID: WW 74 Center

Matrix: SEDIMENT

Lab ID: 06080011-03A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/26/2006 12:00 PM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.187 | | 0.00152 | umoles/g-Dry | 1 | 08/16/2006 2:44 PM | 20790 |
| Copper | 16.1 | | 0.0104 | umoles/g-Dry | 1 | 08/16/2006 2:44 PM | 20790 |
| Lead | 9.23 | | 0.00714 | umoles/g-Dry | 1 | 08/16/2006 2:44 PM | 20790 |
| Nickel | 1.88 | | 0.0150 | umoles/g-Dry | 1 | 08/16/2006 2:44 PM | 20790 |
| Zinc | 41.9 | | 0.0506 | umoles/g-Dry | 1 | 08/16/2006 2:44 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | ND | | 0.882 | µmoles/g-dry | 1 | 08/08/2006 12:00 AM | R54142 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R54479 |
| Diameter of Soil Particles | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R54479 |
| Hydrometer | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R54479 |
| Particle Density | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R54479 |
| Sieve Analysis | 8/22/06 | c | 0 | Date | 1 | 08/22/2006 12:00 AM | R54479 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 88.66 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R53796 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 216 | | 0 | | 1 | 08/16/2006 12:00 AM | R54548 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 69.2 | | 0.085 | µmoles/g-dry | 1 | 08/16/2006 12:00 AM | R54547 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 11.3 | | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R53796 |

| | | | | |
|--------------------|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080011

Client Sample ID: WW 74 Side

Matrix: SEDIMENT

Lab ID: 06080011-04A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/26/2006 11:30 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.289 | | 0.0114 | umoles/g-Dry | 1 | 08/16/2006 2:50 PM | 20790 |
| Copper | 44.7 | | 0.0777 | umoles/g-Dry | 1 | 08/16/2006 2:50 PM | 20790 |
| Lead | 20.4 | | 0.0535 | umoles/g-Dry | 1 | 08/16/2006 2:50 PM | 20790 |
| Nickel | 7.34 | | 0.113 | umoles/g-Dry | 1 | 08/16/2006 2:50 PM | 20790 |
| Zinc | 131 | | 0.379 | umoles/g-Dry | 1 | 08/16/2006 2:50 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 24.6 | | 6.61 | µmoles/g-dry | 1 | 08/08/2006 12:00 AM | R5414 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Diameter of Soil Particles | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Hydrometer | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Particle Density | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Sieve Analysis | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 98.49 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 8.28 | | 0 | | 1 | 08/16/2006 12:00 AM | R5454 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 204 | | 0.634 | µmoles/g-dry | 1 | 08/16/2006 12:00 AM | R5454 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 1.51 | | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |

| | | |
|--|--|---|
| Qualifiers: | * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| <small>BaseReport-MDL-ContFrnc2004</small> | c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| | G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| | J Analyte detected below quantitation limit (QL) | NA Not Applicable |
| | ND Not Detected at the SLI Reporting Limit | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080011

Client Sample ID: WW 100 Center

Matrix: SEDIMENT

Lab ID: 06080011-05A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/27/2006 11:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.254 | | 0.00133 | umoles/g-Dry | 1 | 08/16/2006 2:54 PM | 20790 |
| Copper | 15.7 | | 0.00910 | umoles/g-Dry | 1 | 08/16/2006 2:54 PM | 20790 |
| Lead | 4.97 | | 0.00626 | umoles/g-Dry | 1 | 08/16/2006 2:54 PM | 20790 |
| Nickel | 1.51 | | 0.0132 | umoles/g-Dry | 1 | 08/16/2006 2:54 PM | 20790 |
| Zinc | 39.6 | | 0.0444 | umoles/g-Dry | 1 | 08/16/2006 2:54 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 8.32 | | 0.773 | µmoles/g-dry | 1 | 08/08/2006 12:00 AM | R54142 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54542 |
| Diameter of Soil Particles | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54542 |
| Hydrometer | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54542 |
| Particle Density | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54542 |
| Sieve Analysis | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54542 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 87.07 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R53796 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 7.47 | | 0 | | 1 | 08/16/2006 12:00 AM | R54542 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 62.1 | | 0.074 | µmoles/g-dry | 1 | 08/16/2006 12:00 AM | R54542 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 12.9 | | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R53796 |

| | | | | |
|--------------------|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080011

Client Sample ID: WW 100 Side

Matrix: SEDIMENT

Lab ID: 06080011-06A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/27/2006 10:45 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 0.584 | | 0.0124 | umoles/g-Dry | 1 | 08/16/2006 2:58 PM | 20790 |
| Copper | 59.4 | | 0.0844 | umoles/g-Dry | 1 | 08/16/2006 2:58 PM | 20790 |
| Lead | 81.4 | | 0.0581 | umoles/g-Dry | 1 | 08/16/2006 2:58 PM | 20790 |
| Nickel | 6.66 | | 0.122 | umoles/g-Dry | 1 | 08/16/2006 2:58 PM | 20790 |
| Zinc | 247 | | 0.411 | umoles/g-Dry | 1 | 08/16/2006 2:58 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 51.8 | | 7.17 | µmoles/g-dry | 1 | 08/08/2006 12:00 AM | R5454 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Diameter of Soil Particles | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Hydrometer | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Particle Density | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| Sieve Analysis | 8/24/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R5454 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 98.61 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 7.62 | | 0 | | 1 | 08/16/2006 12:00 AM | R5454 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 395 | | 0.689 | µmoles/g-dry | 1 | 08/16/2006 12:00 AM | R5454 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 1.39 | | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |

Qualifiers:

| | |
|--|---|
| * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limit (QL) | NA Not Applicable |
| ND Not Detected at the SLI Reporting Limit | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080011

Client Sample ID: WW 39 Side

Matrix: SEDIMENT

Lab ID: 06080011-07A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/28/2006 10:55 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 9.10 | | 0.00822 | umoles/g-Dry | 1 | 08/16/2006 3:02 PM | 20790 |
| Copper | 176 | | 0.0560 | umoles/g-Dry | 1 | 08/16/2006 3:02 PM | 20790 |
| Lead | 125 | | 0.0386 | umoles/g-Dry | 1 | 08/16/2006 3:02 PM | 20790 |
| Nickel | 29.3 | | 0.0811 | umoles/g-Dry | 1 | 08/16/2006 3:02 PM | 20790 |
| Zinc | 690 | | 0.273 | umoles/g-Dry | 1 | 08/16/2006 3:02 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 11.6 | | 4.76 | µmoles/g-dry | 1 | 08/08/2006 12:00 AM | R54140 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Diameter of Soil Particles | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Hydrometer | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Particle Density | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Sieve Analysis | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 97.90 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 88.9 | | 0 | | 1 | 08/16/2006 12:00 AM | R54540 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 1030 | | 0.457 | µmoles/g-dry | 1 | 08/16/2006 12:00 AM | R54540 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 2.10 | | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |

| | | | | |
|--|----|--|----|---|
| Qualifiers: | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| <small>BaseReport-MDL-ContFrac2004</small> | c | Analyte not included in SLI scope of accreditation | E | Estimated, analyte detected above quantitation range |
| | G | Refer to case narrative page for specific comments | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limit (QL) | NA | Not Applicable |
| | ND | Not Detected at the SLI Reporting Limit | Q | Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



Client ID: Metropolitan Water Reclamation District of Chic

Report Date: May 02, 2007

Project Name: Contract 05-104-11 (Sediment Chemistry)

Lab Order: 06080011

Client Sample ID: WW 39 Center

Matrix: SEDIMENT

Lab ID: 06080011-08A

Date Received: 08/01/2006 10:45 AM

Collection Date: 07/28/2006 10:15 AM

| Parameter | Result | Qual. | Report Limit | Units | Dilution Factor | Date Analyzed | Batch ID |
|--|---------|-------|--------------------------|--------------|-----------------|---------------------|----------|
| METALS BY ICP | | | Method: SW6010B | | Analyst: RR | | |
| Cadmium | 9.29 | | 0.0115 | umoles/g-Dry | 1 | 08/16/2006 3:07 PM | 20790 |
| Copper | 129 | | 0.0786 | umoles/g-Dry | 1 | 08/16/2006 3:07 PM | 20790 |
| Lead | 148 | | 0.0541 | umoles/g-Dry | 1 | 08/16/2006 3:07 PM | 20790 |
| Nickel | 29.9 | | 0.114 | umoles/g-Dry | 1 | 08/16/2006 3:07 PM | 20790 |
| Zinc | 534 | | 0.383 | umoles/g-Dry | 1 | 08/16/2006 3:07 PM | 20790 |
| ACID VOLATILE SULFIDE | | | Method: EPA 821/R-91-100 | | Analyst: SL | | |
| Acid Volatile Sulfide | 68.9 | | 6.68 | µmoles/g-dry | 1 | 08/08/2006 12:00 AM | R5414 |
| PARTICLE-SIZE ANALYSIS OF SOILS | | | Method: D422-63 | | Analyst: SL | | |
| % Soil in Suspension | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Diameter of Soil Particles | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Hydrometer | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Particle Density | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| Sieve Analysis | 8/25/06 | c | 0 | Date | 1 | 08/24/2006 12:00 AM | R54600 |
| PERCENT MOISTURE | | | Method: D2216 | | Analyst: VN | | |
| Percent Moisture | 98.50 | | 0 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |
| SEM / AVS RATIO | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| SEM / AVS Ratio | 12.3 | | 0 | | 1 | 08/16/2006 12:00 AM | R54540 |
| DO NOT USE | | | Method: EPA 821/R-91-100 | | Analyst: RR | | |
| Total SEM | 850 | | 0.641 | µmoles/g-dry | 1 | 08/16/2006 12:00 AM | R54540 |
| TOTAL SOLIDS | | | Method: M2540 B/D2216 | | Analyst: VN | | |
| Percent Solids | 1.50 | | 0.001 | wt% | 1 | 08/02/2006 12:45 PM | R53790 |

Qualifiers:

| | |
|--|---|
| * Value exceeds Maximum Contaminant Level | B Analyte detected in the associated Method Blank |
| c Analyte not included in SLI scope of accreditation | E Estimated, analyte detected above quantitation range |
| G Refer to case narrative page for specific comments | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limit (QL) | NA Not Applicable |
| ND Not Detected at the SLI Reporting Limit | Q Internal standard recovery is outside SLI in-house criteria (no method specific requirements exist) |



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SLI Work Order: 06080011
 SLI Sample ID: 06080011-01A

Analysis Date: 8/22/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-01A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.3% |
| No. 10 | 2.00 | 2.0% |
| No. 20 | 0.85 | 10.2% |
| No. 40 | 0.420 | 15.7% |
| No. 60 | 0.250 | 22.1% |
| No. 140 | 0.106 | 23.0% |
| No. 200 | 0.075 | 7.9% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-01A |
| Gravel | >4.75 | 0.3% |
| Sand, Course | 4.74-2.0 | 2.4% |
| Sand, Medium | 1.99-0.420 | 25.9% |
| Sand, Fine | 0.419-0.075 | 53.0% |
| Silt | 0.074-0.005 | 15.1% |
| Clay | <0.005-0.001 | 0.5% |
| Colloids | <0.001 | 3.1% |

Analyst: Stavros

Date: 8/24/06

Reviewed: [Signature]

Date: 8/24/2006



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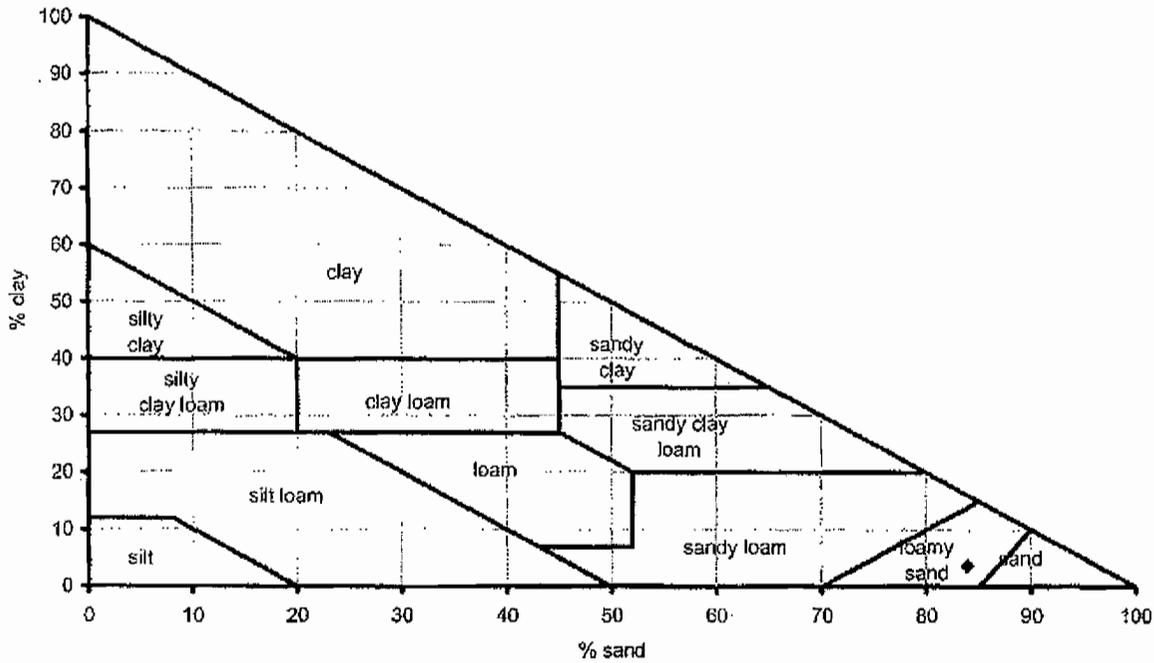


SLI Work Order: 06080011
SLI Sample ID: 06080011-01A

Analysis Date: 08/22/06

% SAND % CLAY % SILT
83.9 3.7 15.07

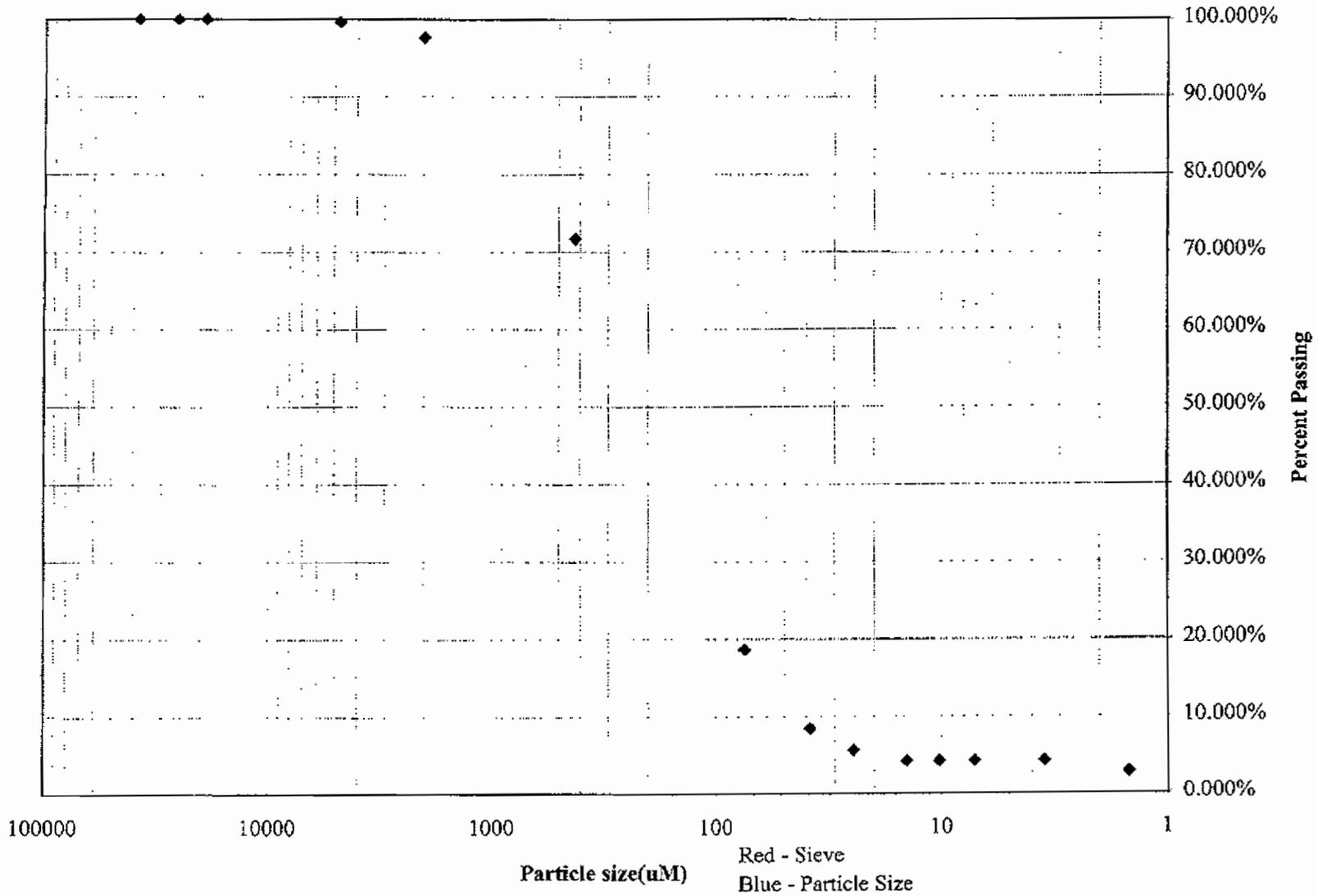
Soil Classification: loamy sand



Textural triangle by A. Gerakis and B. Beer, 26 July 2000.

Particle Size Analysis

◆ 06080011-01A





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SLI Work Order: 06080011
 SLI Sample ID: 06080011-02A

Analysis Date: 8/22/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-02A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.3% |
| No. 4 | 4.75 | 1.7% |
| No. 10 | 2.00 | 2.3% |
| No. 20 | 0.85 | 3.5% |
| No. 40 | 0.420 | 6.0% |
| No. 60 | 0.250 | 24.4% |
| No. 140 | 0.106 | 51.9% |
| No. 200 | 0.075 | 4.0% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-02A |
| Gravel | >4.75 | 1.9% |
| Sand, Course | 4.74-2.0 | 3.9% |
| Sand, Medium | 1.99-0.420 | 9.5% |
| Sand, Fine | 0.419-0.075 | 80.4% |
| Silt | 0.074-0.005 | 3.8% |
| Clay | <0.005-0.001 | 0.3% |
| Colloids | <0.001 | 1.8% |

Analyst: *Strawclada*
 Reviewed: *[Signature]*

Date: 8/24/06
 Date: 8/24/2006



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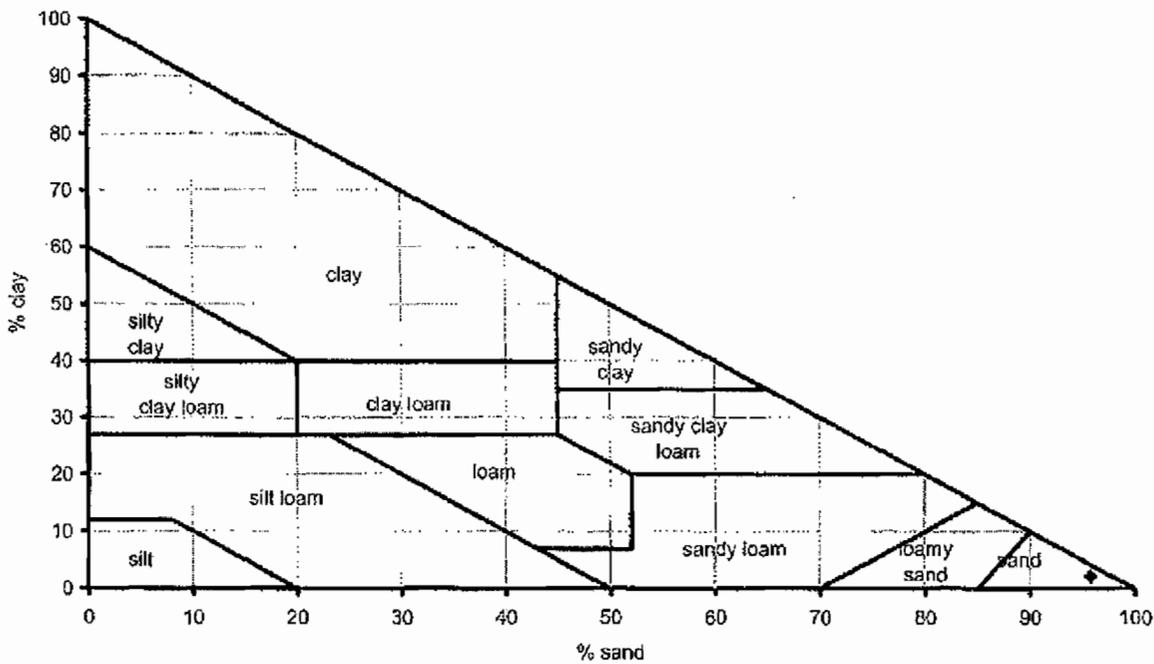


SLI Work Order: 06080011
SLI Sample ID: 06080011-02A

Analysis Date: 08/22/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 95.8 | 2.2 | 3.77 |

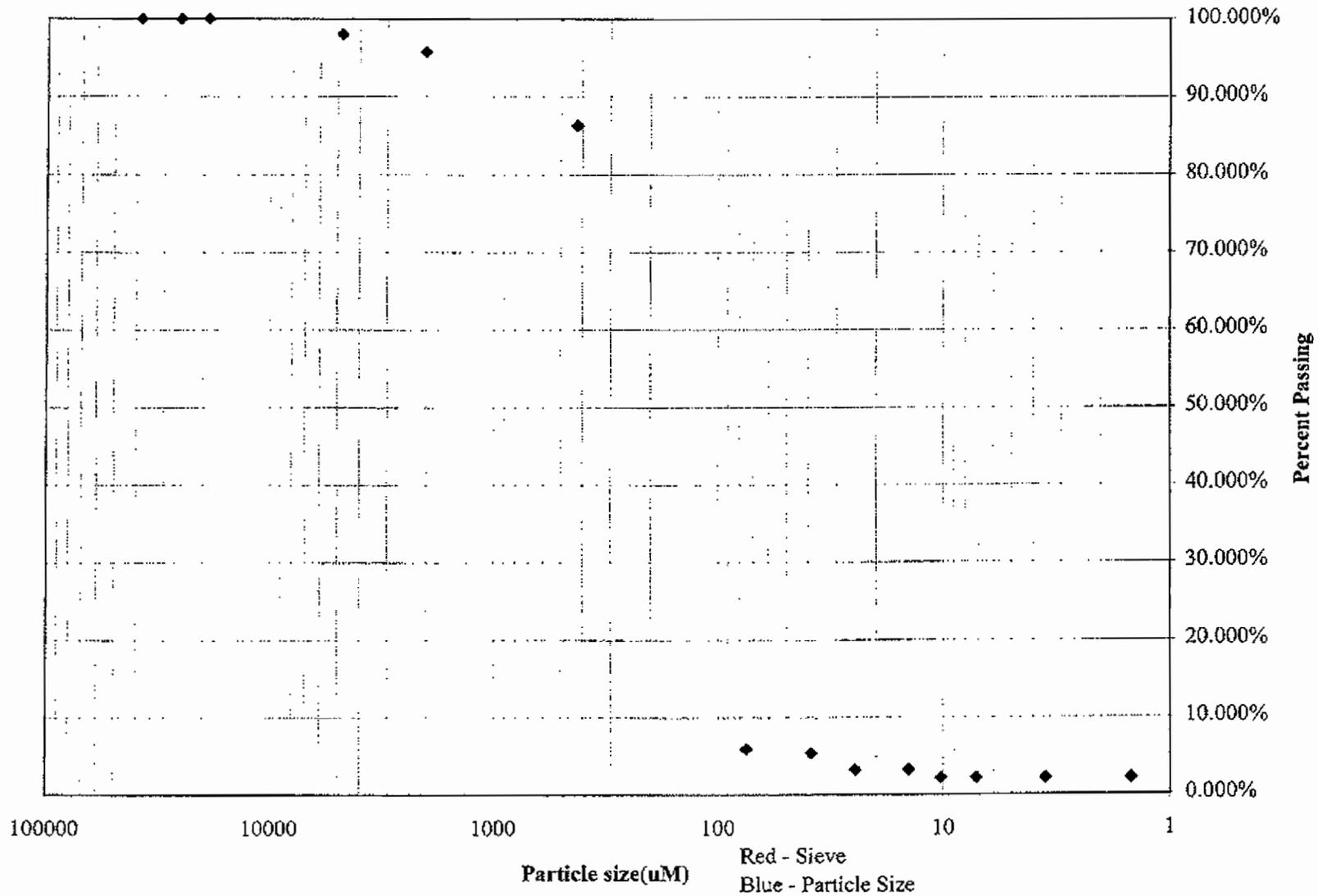
Soil Classification: Gravelly sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080011-02A





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SLI Work Order: 06080011
 SLI Sample ID: 06080011-03A

Analysis Date: 8/22/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-03A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 1.9% |
| No. 20 | 0.85 | 11.4% |
| No. 40 | 0.420 | 13.1% |
| No. 60 | 0.250 | 11.5% |
| No. 140 | 0.106 | 20.9% |
| No. 200 | 0.075 | 7.7% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-03A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 1.9% |
| Sand, Medium | 1.99-0.420 | 24.5% |
| Sand, Fine | 0.419-0.075 | 40.1% |
| Silt | 0.074-0.005 | 27.8% |
| Clay | <0.005-0.001 | 1.7% |
| Colloids | <0.001 | 4.0% |

Analyst: Stavros
 Reviewed: [Signature]

Date: 8/24/06
 Date: 8/24/2006



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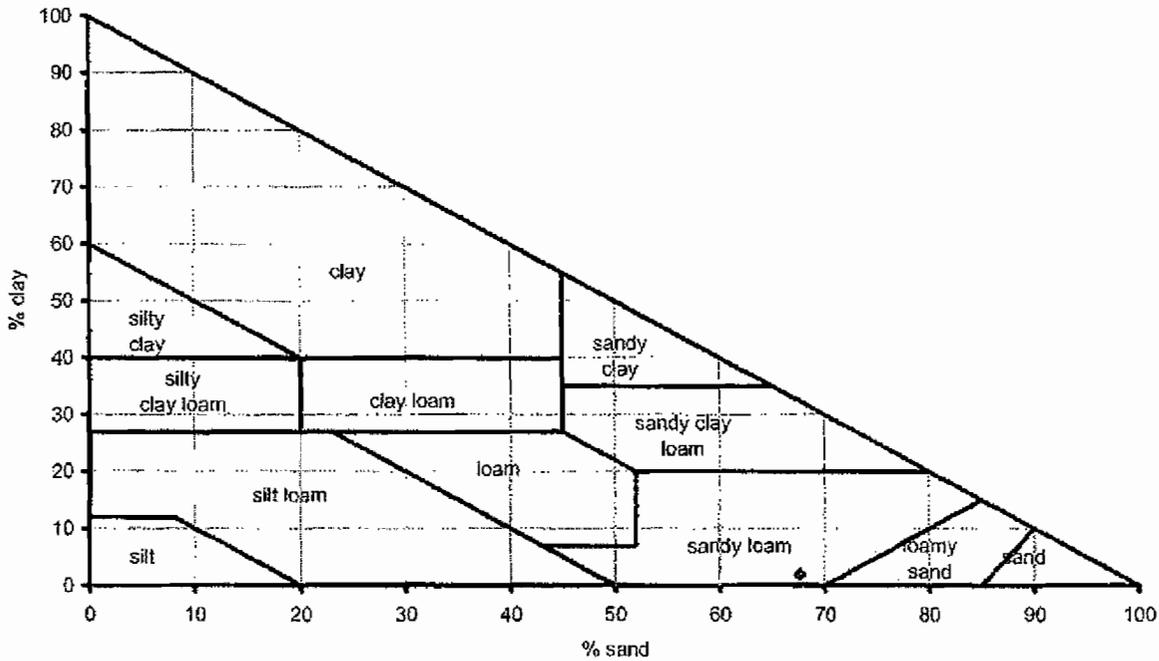


SLI Work Order: 06080011
SLI Sample ID: 06080011-03A

Analysis Date: 08/22/06

% SAND % CLAY % SILT
67.6 2.0 31.52

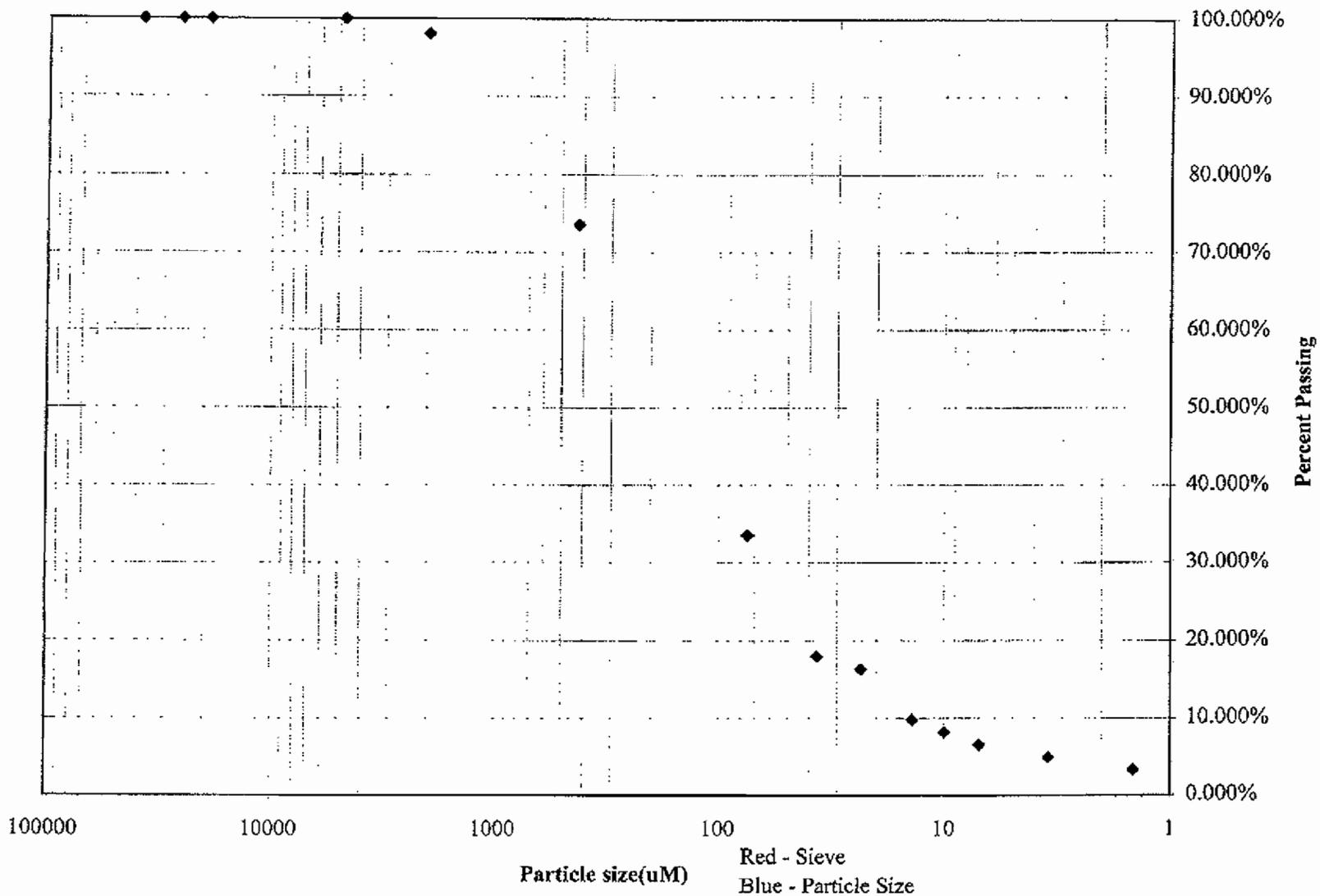
Soil Classification: sandy loam



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080011-03A





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SLI Work Order: 06080011
 SLI Sample ID: 06080011-04A

Analysis Date: 8/24/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-04A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 2.0% |
| No. 10 | 2.00 | 4.1% |
| No. 20 | 0.85 | 13.7% |
| No. 40 | 0.420 | 19.0% |
| No. 60 | 0.250 | 21.9% |
| No. 140 | 0.106 | 23.0% |
| No. 200 | 0.075 | 9.7% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-04A |
| Gravel | >4.75 | 2.0% |
| Sand, Course | 4.74-2.0 | 6.2% |
| Sand, Medium | 1.99-0.420 | 32.7% |
| Sand, Fine | 0.419-0.075 | 54.5% |
| Silt | 0.074-0.005 | 3.4% |
| Clay | <0.005-0.001 | 0.5% |
| Colloids | <0.001 | 2.6% |

Analyst: Stephanie

Date: 8/25/06

Reviewed: [Signature]

Date: 8/25/2006



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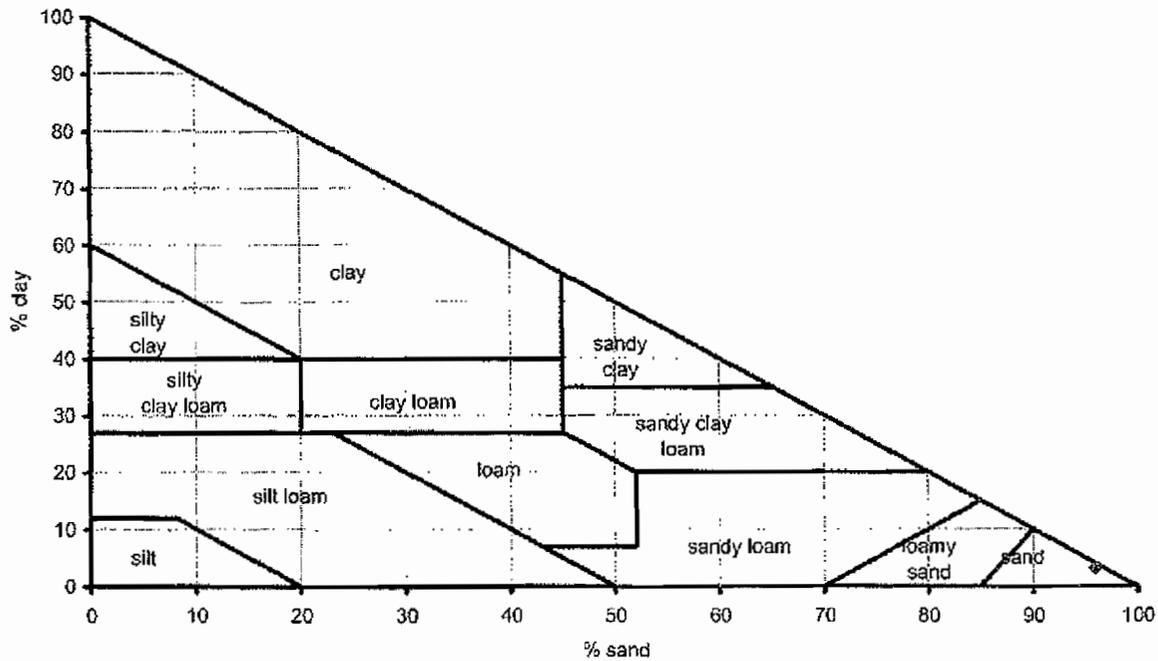


SLI Work Order: 06080011
SLI Sample ID: 06080011-04A

Analysis Date: 08/24/06

% SAND % CLAY % SILT
96.0 3.2 3.42

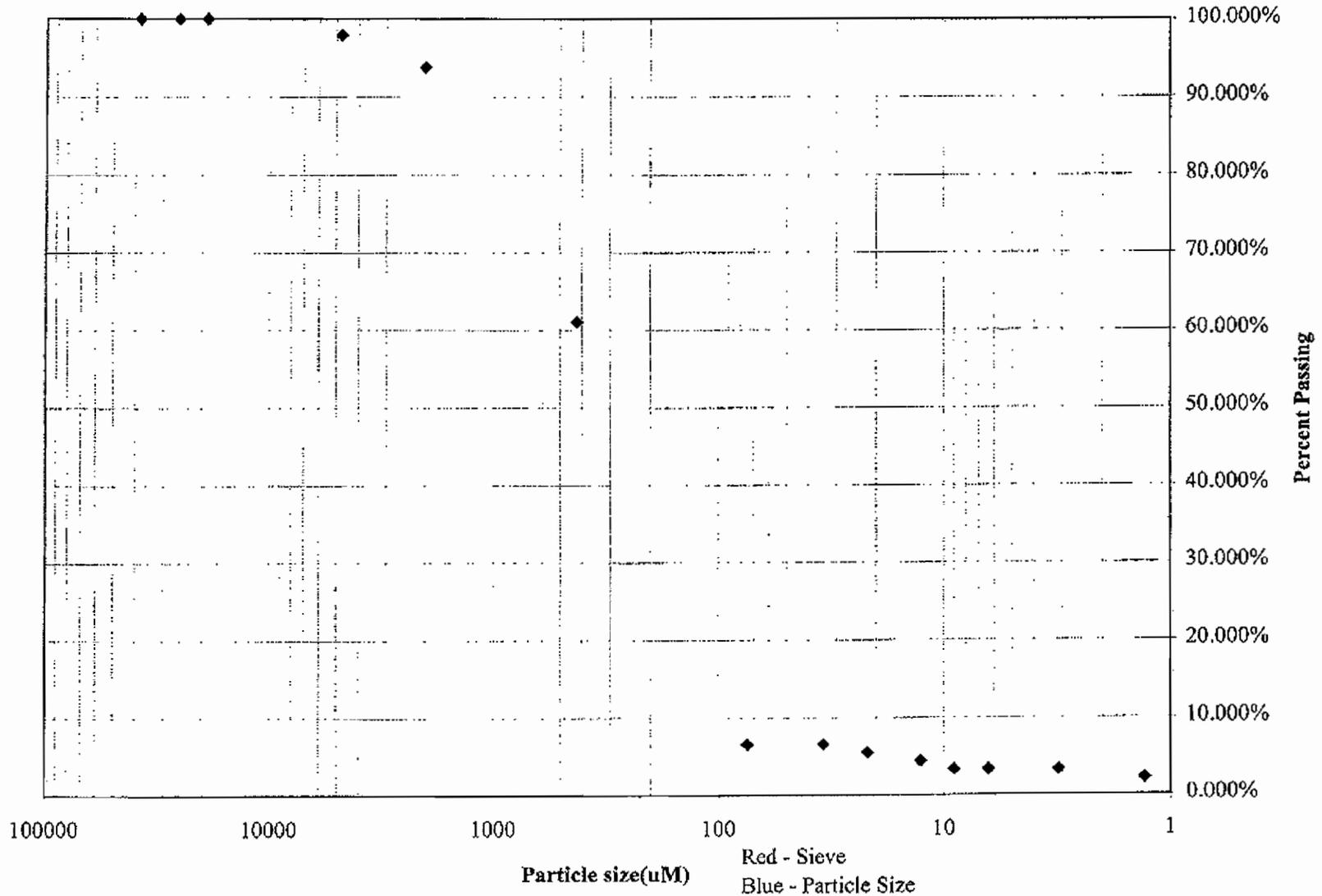
Soil Classification: Gravelly sand



Textural triangle by A. Gerakis and B. Beer, 26 July 2000.

Particle Size Analysis

◆ 06080011-04A





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SLI Work Order: 06080011
 SLI Sample ID: 06080011-05A

Analysis Date: 8/24/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-05A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.0% |
| No. 10 | 2.00 | 1.5% |
| No. 20 | 0.85 | 13.6% |
| No. 40 | 0.420 | 17.2% |
| No. 60 | 0.250 | 13.2% |
| No. 140 | 0.106 | 15.5% |
| No. 200 | 0.075 | 12.0% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-05A |
| Gravel | >4.75 | 0.0% |
| Sand, Course | 4.74-2.0 | 1.5% |
| Sand, Medium | 1.99-0.420 | 30.8% |
| Sand, Fine | 0.419-0.075 | 40.6% |
| Silt | 0.074-0.005 | 19.3% |
| Clay | <0.005-0.001 | 2.3% |
| Colloids | <0.001 | 5.4% |

Analyst: Stephanos

Date: 8/25/06

Reviewed: [Signature]

Date: 8/25/06



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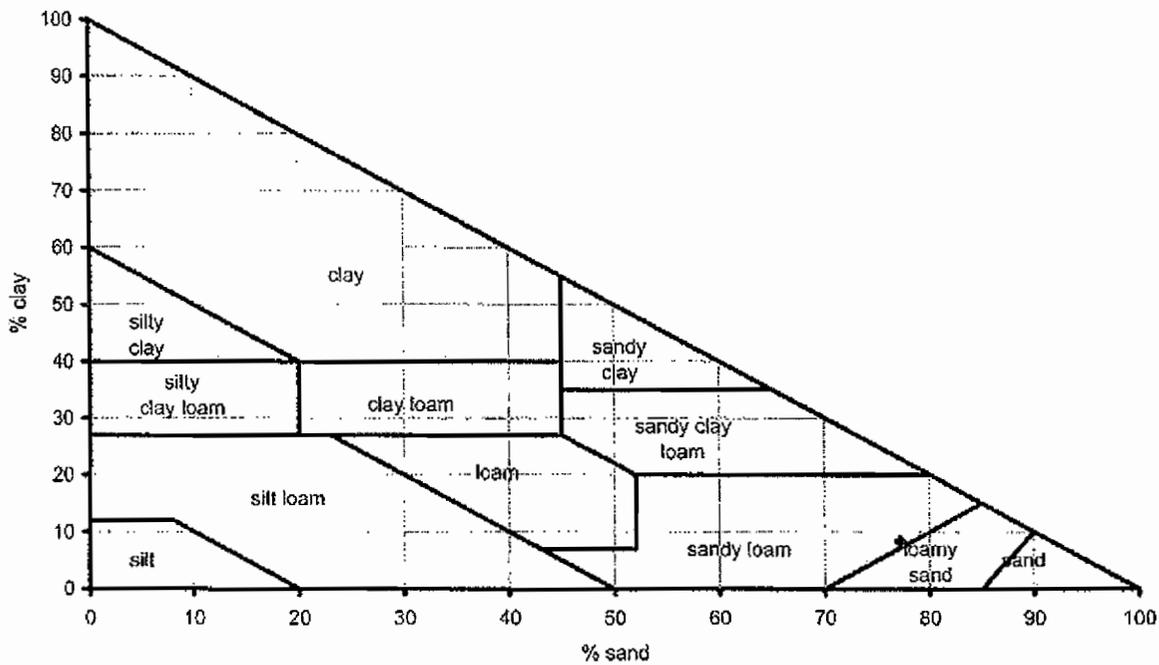


SLI Work Order: 06080011
SLI Sample ID: 06080011-05A

Analysis Date: 08/24/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 77.1 | 8.2 | 19.29 |

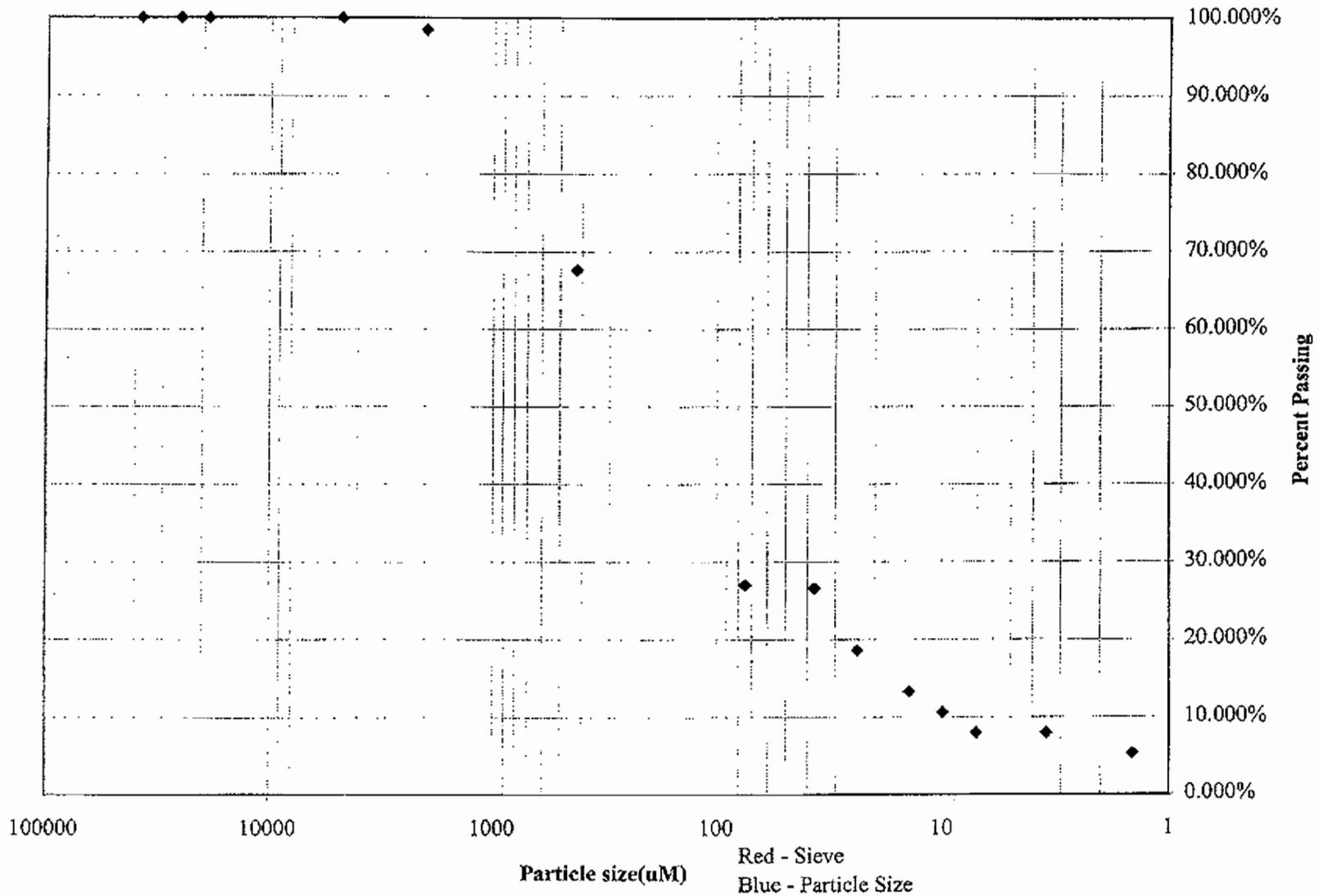
Soil Classification: sandy loam



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080011-05A





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SLI Work Order: 06080011
 SLI Sample ID: 06080011-06A

Analysis Date: 8/24/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-06A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 0.7% |
| No. 10 | 2.00 | 5.6% |
| No. 20 | 0.85 | 19.9% |
| No. 40 | 0.420 | 17.2% |
| No. 60 | 0.250 | 20.3% |
| No. 140 | 0.106 | 23.4% |
| No. 200 | 0.075 | 4.9% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-06A |
| Gravel | >4.75 | 0.7% |
| Sand, Course | 4.74-2.0 | 6.3% |
| Sand, Medium | 1.99-0.420 | 37.2% |
| Sand, Fine | 0.419-0.075 | 48.6% |
| Silt | 0.074-0.005 | 5.4% |
| Clay | <0.005-0.001 | 0.5% |
| Colloids | <0.001 | 2.0% |

Analyst: Stephanie

Date: 8/24/06

Reviewed: [Signature]

Date: 8/25/06



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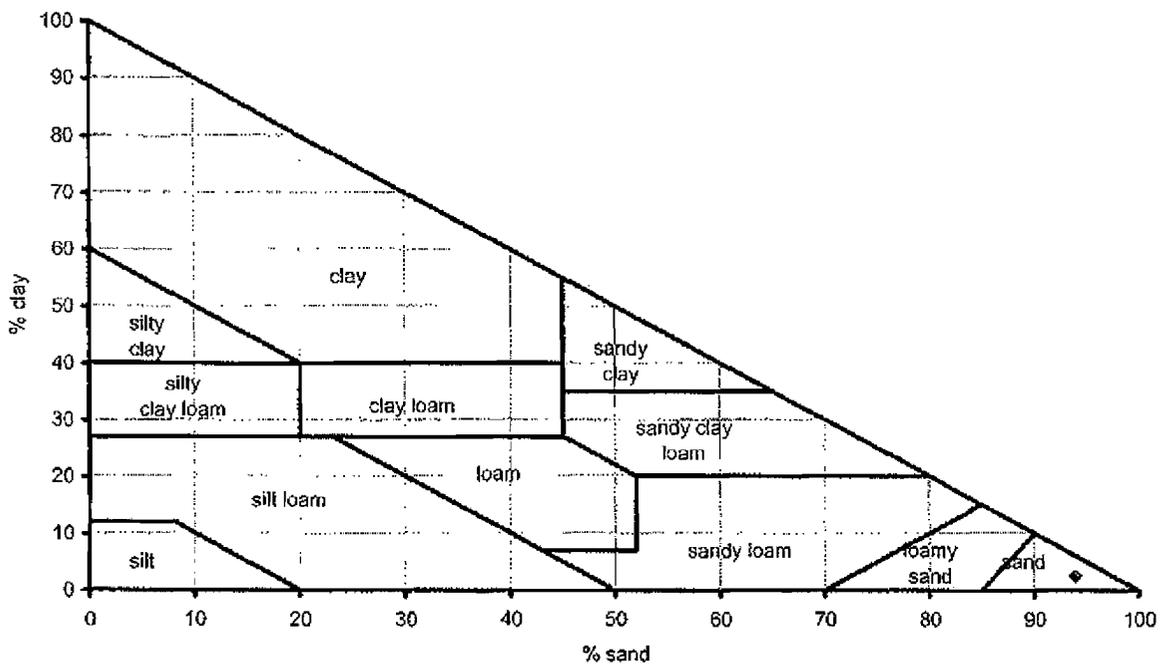


SLI Work Order: 06080011
SLI Sample ID: 06080011-06A

Analysis Date: 08/24/06

| % SAND | % CLAY | % SILT |
|--------|--------|--------|
| 94.0 | 2.5 | 5.44 |

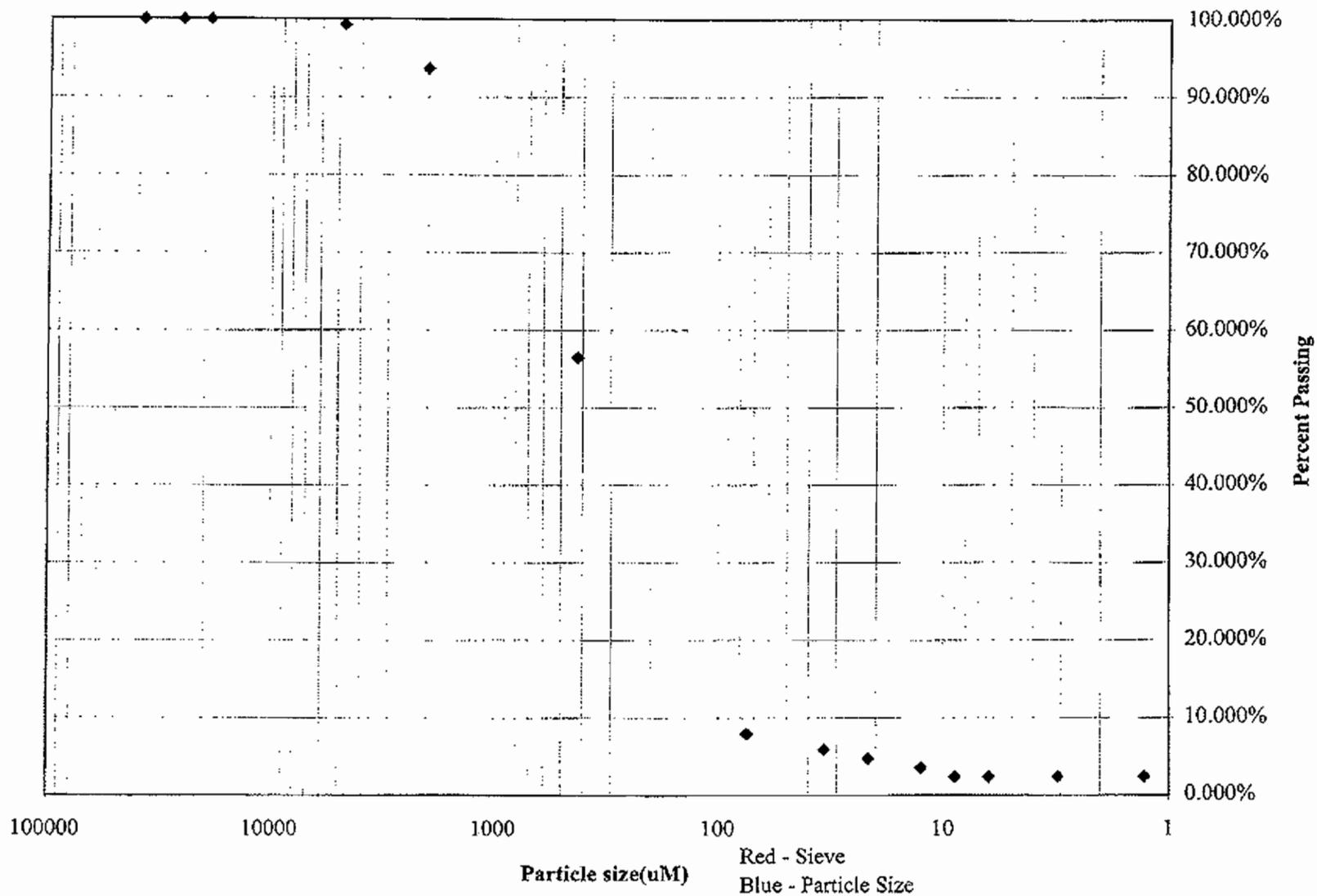
Soil Classification: sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080011-06A





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SLI Work Order: 06080011
 SLI Sample ID: 06080011-07A

Analysis Date: 8/25/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-07A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 4.9% |
| No. 10 | 2.00 | 3.6% |
| No. 20 | 0.85 | 7.4% |
| No. 40 | 0.420 | 12.0% |
| No. 60 | 0.250 | 18.3% |
| No. 140 | 0.106 | 32.8% |
| No. 200 | 0.075 | 5.3% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-07A |
| Gravel | >4.75 | 4.9% |
| Sand, Course | 4.74-2.0 | 8.5% |
| Sand, Medium | 1.99-0.420 | 19.4% |
| Sand, Fine | 0.419-0.075 | 56.4% |
| Silt | 0.074-0.005 | 11.5% |
| Clay | <0.005-0.001 | 0.6% |
| Colloids | <0.001 | 3.6% |

Analyst: Supriyada

Date: 8/28/06

Reviewed: [Signature]

Date: 8/28/2006



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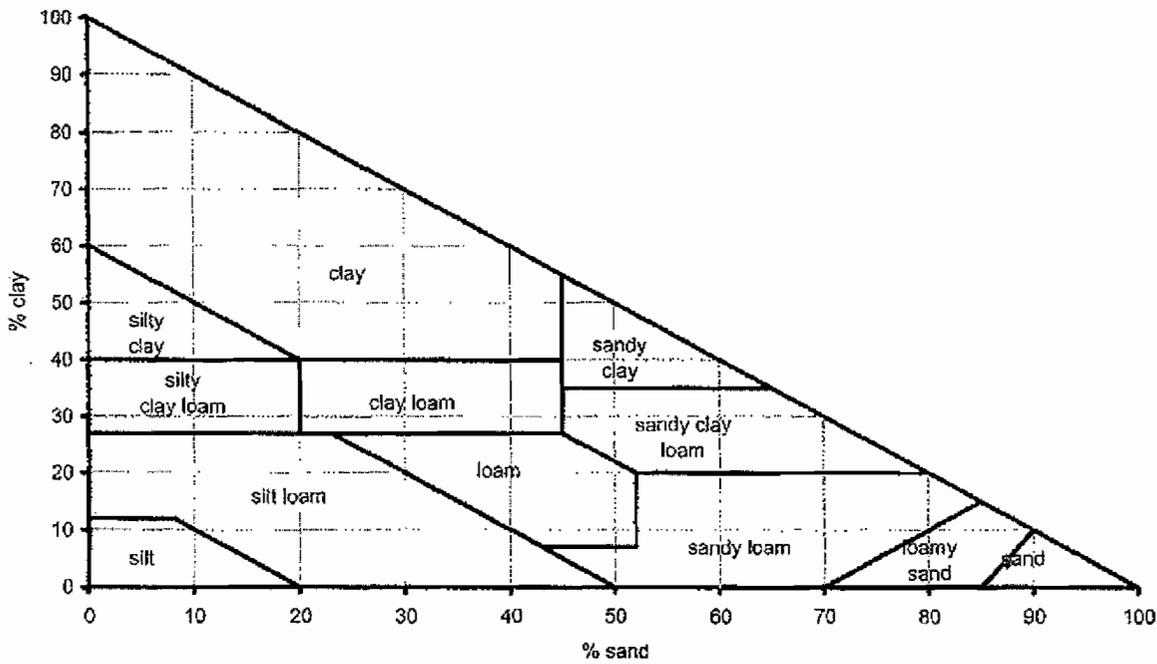


SLI Work Order: 06080011
SLI Sample ID: 06080011-07A

Analysis Date: 08/25/06

% SAND % CLAY % SILT
87.5 4.4 11.45

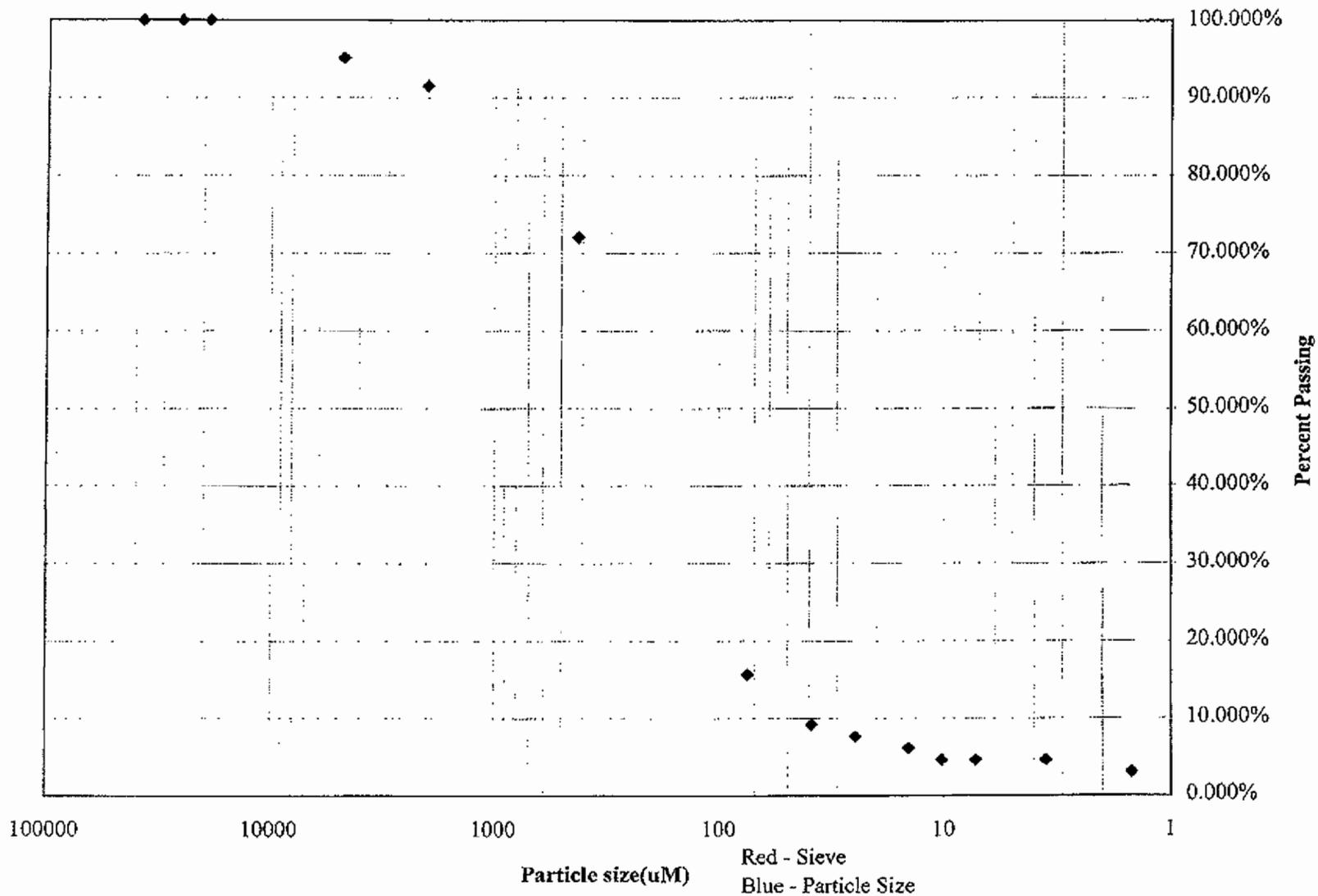
Soil Classification: Gravelly sand



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Particle Size Analysis

◆ 06080011-07A





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SLI Work Order: 06080011
 SLI Sample ID: 06080011-08A

Analysis Date: 8/25/06

Standard Test Method for Particle-Size Analysis of Soil

| | | Percent Retained |
|--------------|--------------------|------------------|
| Sieve (U.S.) | Sieve Opening (mm) | 06080011-08A |
| 1-1/2" | 38.1 | 0.00% |
| 1" | 25.4 | 0.00% |
| 0.75" | 19.1 | 0.0% |
| No. 4 | 4.75 | 2.8% |
| No. 10 | 2.00 | 2.4% |
| No. 20 | 0.85 | 4.8% |
| No. 40 | 0.420 | 8.1% |
| No. 60 | 0.250 | 15.2% |
| No. 140 | 0.106 | 48.9% |
| No. 200 | 0.075 | 5.9% |

| | | Percent Present |
|--------------|--------------------|-----------------|
| Particle(s) | Particle Size (mm) | 06080011-08A |
| Gravel | >4.75 | 2.8% |
| Sand, Course | 4.74-2.0 | 5.2% |
| Sand, Medium | 1.99-0.420 | 12.9% |
| Sand, Fine | 0.419-0.075 | 69.9% |
| Silt | 0.074-0.005 | 7.1% |
| Clay | <0.005-0.001 | 0.7% |
| Colloids | <0.001 | 4.1% |

Analyst: Stipradan

Date: 8/28/06

Reviewed: [Signature]

Date: 8/29/06



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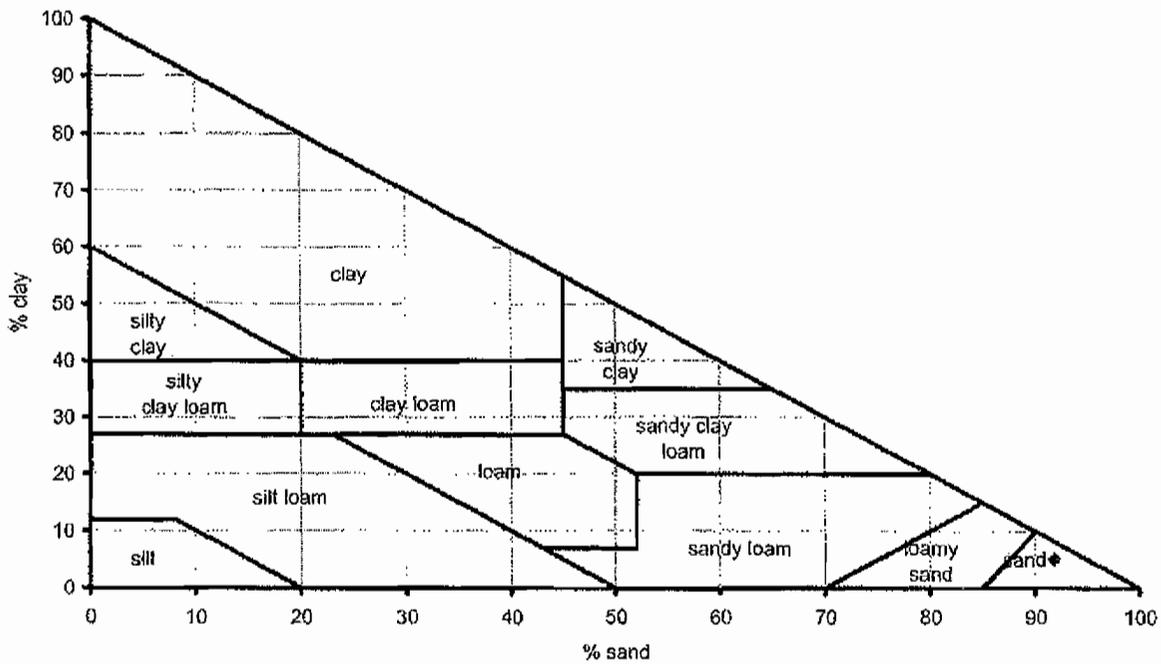


SLI Work Order: 06080011
SLI Sample ID: 06080011-08A

Analysis Date: 08/25/06

% SAND % CLAY % SILT
91.8 5.0 7.12

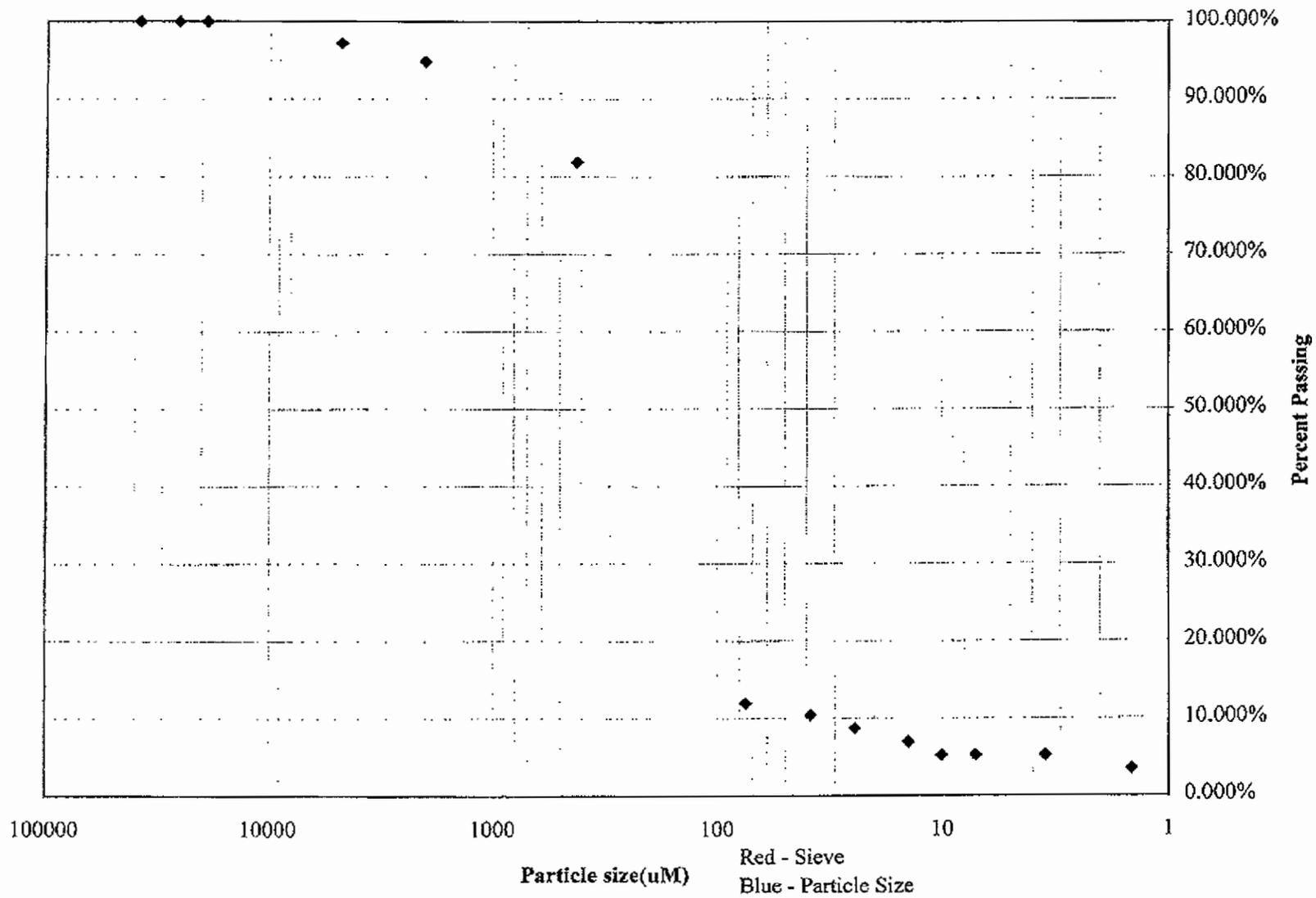
Soil Classification: Gravelly sand



Textural triangle by A. Gerakis and B. Baer, 25 July 2000.

Particle Size Analysis

◆ 06080011-08A



Attachment 13

ANALYTICAL REPORT

Job Number: 500-5632-1

Job Description: MWRD Sediment

For:

Metro Water Reclamation Dist of Chicago
6001 W. Pershing Road
Cicero, IL 60804

Attention: Jennifer Wasik



Bonnie M Stadelmann
Project Manager II
bstadelmann@stl-inc.com
09/04/2007

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the STL Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only

TestAmerica Laboratories, Inc.

TestAmerica Chicago 2417 Bond Street, University Park, IL 60466

Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com



METHOD SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

| Description | Lab Location | Method | Preparation Method |
|--|---------------------|------------------|---------------------------|
| Matrix: Solid | | | |
| Determination of Simultaneously Extracted Metals (SEM) | TAL CHI | EPA SEM | |
| Determination of AVS and SEM / Prep | TAL CHI | | EPA AVSSEM |
| Determination of Acid Volatile Sulfide (AVS) | TAL CHI | EPA AVS | |
| Acid Volatile Sulfides Prep | TAL CHI | | STL-SAV AVS Prep |
| Determination of TOC in Sediment by Lloyd Kahn Method (1988) | TAL CHI | NJDEP Lloyd Kahn | |

Lab References:

TAL CHI = TestAmerica Chicago

Method References:

EPA = US Environmental Protection Agency

NJDEP =

STL-SAV = Severn Trent Laboratories, Savannah, Facility Standard Operating Procedure.

METHOD / ANALYST SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

| Method | Analyst | Analyst ID |
|---------------------|----------------|-------------------|
| EPA SEM | Smith, Todd D | TDS |
| EPA AVS | Brogan, Mary T | MTB |
| NJDEP Lloyd Kahn | Deb, Khona | KD |
| EPA PercentMoisture | Boyd, Cheryl L | CLB |

Method: EPA SEM; Analyst: Smith, Todd D; Analyst ID: TDS; Job Number: 500-5632-1

SAMPLE SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

| Lab Sample ID | Client Sample ID | Client Matrix | Date/Time Sampled | Date/Time Received |
|----------------------|-------------------------|----------------------|------------------------------|-------------------------------|
| 500-5632-1 | WW52 center | Solid | 07/23/2007 1145 | 07/30/2007 1037 |
| 500-5632-2 | WW52 side | Solid | 07/23/2007 1120 | 07/30/2007 1037 |
| 500-5632-3 | WW57 side | Solid | 07/23/2007 1430 | 07/30/2007 1037 |
| 500-5632-4 | WW97 center | Solid | 07/24/2007 1130 | 07/30/2007 1037 |
| 500-5632-5 | WW97 side | Solid | 07/24/2007 1110 | 07/30/2007 1037 |
| 500-5632-6 | WW54 side | Solid | 07/24/2007 1320 | 07/30/2007 1037 |
| 500-5632-7 | WW54 center | Solid | 07/24/2007 1335 | 07/30/2007 1037 |
| 500-5632-8 | WW50 center | Solid | 07/25/2007 1320 | 07/30/2007 1037 |
| 500-5632-9 | WW50 side | Solid | 07/25/2007 1300 | 07/30/2007 1037 |
| 500-5632-10 | WW86 center | Solid | 07/25/2007 1100 | 07/30/2007 1037 |
| 500-5632-11 | WW86 side | Solid | 07/25/2007 1045 | 07/30/2007 1037 |
| 500-5632-12 | WW49 center | Solid | 07/26/2007 1230 | 07/30/2007 1037 |
| 500-5632-13 | WW49 side | Solid | 07/26/2007 1200 | 07/30/2007 1037 |
| 500-5632-14 | WW55 side | Solid | 07/27/2007 1150 | 07/30/2007 1037 |
| 500-5632-15 | WW55 center | Solid | 07/27/2007 1240 | 07/30/2007 1037 |

SAMPLE RESULTS

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW52 center
 Lab Sample ID: 500-5632-1

Date Sampled: 07/23/2007 1145
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|---------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1315 | |
| SEM Summary | 4.4 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.12 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0527 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 1.0 | mg/Kg | 0.30 | 1.0 |
| Copper SEM | 42 | mg/Kg | 1.5 | 1.0 |
| Nickel SEM | 24 | V mg/Kg | 1.5 | 1.0 |
| Lead SEM | 55 | V mg/Kg | 0.76 | 1.0 |
| Zinc SEM | 200 | V mg/Kg | 3.8 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1334 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 1200 | mg/Kg | 76 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/03/2007 1228 | |
| TOC Dup | 18000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 70 | % | 0.10 | 1.0 |

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 6001 W. Pershing Road
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Job Number: 500-5632-1

Client Sample ID: WW52 side
 Lab Sample ID: 500-5632-2

Date Sampled: 07/23/2007 1120
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1318 | |
| SEM Summary | 5.3 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.11 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0554 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 1.3 | mg/Kg | 0.25 | 1.0 |
| Copper SEM | 58 | mg/Kg | 1.2 | 1.0 |
| Nickel SEM | 20 | mg/Kg | 1.2 | 1.0 |
| Lead SEM | 52 | mg/Kg | 0.62 | 1.0 |
| Zinc SEM | 250 | mg/Kg | 3.1 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1341 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 1600 | mg/Kg | 62 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/03/2007 1248 | |
| TOC Dup | 24000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 61 | % | 0.10 | 1.0 |

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 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW57 side
 Lab Sample ID: 500-5632-3

Date Sampled: 07/23/2007 1430
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1321 | |
| SEM Summary | 4.4 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.13 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0600 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.94 | mg/Kg | 0.22 | 1.0 |
| Copper SEM | 36 | mg/Kg | 1.1 | 1.0 |
| Nickel SEM | 16 | mg/Kg | 1.1 | 1.0 |
| Lead SEM | 100 | mg/Kg | 0.56 | 1.0 |
| Zinc SEM | 200 | mg/Kg | 2.8 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1344 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 1100 | mg/Kg | 56 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/03/2007 1309 | |
| TOC Dup | 25000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 59 | % | 0.10 | 1.0 |

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 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW97 center
 Lab Sample ID: 500-5632-4

Date Sampled: 07/24/2007 1130
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1324 | |
| SEM Summary | 1.3 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.60 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0606 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.32 | mg/Kg | 0.13 | 1.0 |
| Copper SEM | 6.5 | mg/Kg | 0.65 | 1.0 |
| Nickel SEM | 9.1 | mg/Kg | 0.65 | 1.0 |
| Lead SEM | 42 | mg/Kg | 0.33 | 1.0 |
| Zinc SEM | 52 | mg/Kg | 1.6 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1346 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 67 | mg/Kg | 33 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/03/2007 1328 | |
| TOC Dup | 6700 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 30 | % | 0.10 | 1.0 |

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Job Number: 500-5632-1

Client Sample ID: WW97 side
 Lab Sample ID: 500-5632-5

Date Sampled: 07/24/2007 1110
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1327 | |
| SEM Summary | 2.3 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.47 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0636 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.59 | mg/Kg | 0.16 | 1.0 |
| Copper SEM | 24 | mg/Kg | 0.79 | 1.0 |
| Nickel SEM | 11 | mg/Kg | 0.79 | 1.0 |
| Lead SEM | 55 | mg/Kg | 0.39 | 1.0 |
| Zinc SEM | 98 | mg/Kg | 2.0 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1348 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 160 | mg/Kg | 39 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/03/2007 1412 | |
| TOC Dup | 15000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 39 | % | 0.10 | 1.0 |

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Job Number: 500-5632-1

Client Sample ID: WW54 side
Lab Sample ID: 500-5632-6

Date Sampled: 07/24/2007 1320
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1330 | |
| SEM Summary | 1.7 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 1.5 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0812 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | <0.68 | mg/Kg | 0.68 | 5.0 |
| Copper SEM | 12 | mg/Kg | 3.4 | 5.0 |
| Nickel SEM | 6.5 | mg/Kg | 3.4 | 5.0 |
| Lead SEM | 16 | mg/Kg | 1.7 | 5.0 |
| Zinc SEM | 85 | mg/Kg | 8.5 | 5.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1351 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 37 | mg/Kg | 34 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/03/2007 1435 | |
| TOC Dup | 6400 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 28 | % | 0.10 | 1.0 |

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 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW50 center
 Lab Sample ID: 500-5632-8

Date Sampled: 07/25/2007 1320
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1336 | |
| SEM Summary | 0.60 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.13 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0655 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.15 | mg/Kg | 0.14 | 1.0 |
| Copper SEM | 3.4 | mg/Kg | 0.69 | 1.0 |
| Nickel SEM | 2.7 | mg/Kg | 0.69 | 1.0 |
| Lead SEM | 15 | mg/Kg | 0.35 | 1.0 |
| Zinc SEM | 28 | mg/Kg | 1.7 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1356 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 150 | mg/Kg | 35 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/07/2007 0915 | |
| TOC Dup | 4700 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 29 | % | 0.10 | 1.0 |

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Job Number: 500-5632-1

Client Sample ID: WW50 side
 Lab Sample ID: 500-5632-9

Date Sampled: 07/25/2007 1300
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1339 | |
| SEM Summary | 0.58 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.080 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0703 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.14 | mg/Kg | 0.14 | 1.0 |
| Copper SEM | 1.8 | mg/Kg | 0.68 | 1.0 |
| Nickel SEM | 2.2 | mg/Kg | 0.68 | 1.0 |
| Lead SEM | 11 | mg/Kg | 0.34 | 1.0 |
| Zinc SEM | 30 | mg/Kg | 1.7 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1358 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 230 | mg/Kg | 34 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/07/2007 0941 | |
| TOC Dup | 3900 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 34 | % | 0.10 | 1.0 |

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
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 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW86 center
 Lab Sample ID: 500-5632-10

Date Sampled: 07/25/2007 1100
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|----------------|-----------------|----------|
| Method: SEM | | Date Analyzed: | 08/25/2007 1342 | |
| SEM Summary | 23 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.40 | NONE | 0.010 | 1.0 |
| Method: SEM | | Date Analyzed: | 08/25/2007 0709 | |
| Prep Method: AVSSEM | | Date Prepared: | 08/22/2007 1141 | |
| Cadmium SEM | 7.1 | mg/Kg | 0.29 | 1.0 |
| Copper SEM | 250 | mg/Kg | 1.4 | 1.0 |
| Nickel SEM | 16 | mg/Kg | 1.4 | 1.0 |
| Lead SEM | 340 | mg/Kg | 0.72 | 1.0 |
| Zinc SEM | 1100 | mg/Kg | 3.6 | 1.0 |
| Method: AVS | | Date Analyzed: | 08/03/2007 1400 | |
| Prep Method: AVS Prep | | Date Prepared: | 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 1800 | mg/Kg | 72 | 1.0 |
| Method: Lloyd Kahn | | Date Analyzed: | 08/07/2007 1018 | |
| TOC Dup | 53000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | Date Analyzed: | 08/02/2007 0116 | |
| Percent Moisture | 67 | % | 0.10 | 1.0 |

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW86 side
Lab Sample ID: 500-5632-11

Date Sampled: 07/25/2007 1045
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1345 | |
| SEM Summary | 15 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.21 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0715 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 4.7 | mg/Kg | 0.34 | 1.0 |
| Copper SEM | 160 | mg/Kg | 1.7 | 1.0 |
| Nickel SEM | 17 | mg/Kg | 1.7 | 1.0 |
| Lead SEM | 240 | mg/Kg | 0.84 | 1.0 |
| Zinc SEM | 750 | mg/Kg | 4.2 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1403 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 2400 | mg/Kg | 84 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/07/2007 1042 | |
| TOC Dup | 32000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 71 | % | 0.10 | 1.0 |

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW49 center
 Lab Sample ID: 500-5632-12

Date Sampled: 07/26/2007 1230
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1348 | |
| SEM Summary | 3.6 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.67 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0722 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.96 | mg/Kg | 0.15 | 1.0 |
| Copper SEM | 27 | mg/Kg | 0.77 | 1.0 |
| Nickel SEM | 14 | mg/Kg | 0.77 | 1.0 |
| Lead SEM | 90 | mg/Kg | 0.39 | 1.0 |
| Zinc SEM | 160 | mg/Kg | 1.9 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1405 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 170 | mg/Kg | 39 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/07/2007 1202 | |
| TOC Dup | 27000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 43 | % | 0.10 | 1.0 |

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW49 side
 Lab Sample ID: 500-5632-13

Date Sampled: 07/26/2007 1200
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1351 | |
| SEM Summary | 3.6 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 1.4 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0728 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.86 | mg/Kg | 0.15 | 1.0 |
| Copper SEM | 28 | mg/Kg | 0.75 | 1.0 |
| Nickel SEM | 15 | mg/Kg | 0.75 | 1.0 |
| Lead SEM | 64 | mg/Kg | 0.38 | 1.0 |
| Zinc SEM | 170 | mg/Kg | 1.9 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1407 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 84 | mg/Kg | 38 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/07/2007 1227 | |
| TOC Dup | 21000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 36 | % | 0.10 | 1.0 |

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5632-1

Client Sample ID: WW55 side
 Lab Sample ID: 500-5632-14

Date Sampled: 07/27/2007 1150
 Date Received: 07/30/2007 1037
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1354 | |
| SEM Summary | 1.6 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.18 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0734 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1141 | |
| Cadmium SEM | 0.33 | mg/Kg | 0.14 | 1.0 |
| Copper SEM | 10 | mg/Kg | 0.71 | 1.0 |
| Nickel SEM | 4.8 | mg/Kg | 0.71 | 1.0 |
| Lead SEM | 31 | mg/Kg | 0.36 | 1.0 |
| Zinc SEM | 79 | mg/Kg | 1.8 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/03/2007 1410 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/03/2007 0750 | |
| Acid Volatile Sulfides (AVS) | 290 | mg/Kg | 36 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/07/2007 1248 | |
| TOC Dup | 5700 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/02/2007 0116 | |
| Percent Moisture | 31 | % | 0.10 | 1.0 |

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AVS/SEM Calculation Worksheet

Job 500-5632-1

Method: AVS AVS Batch: 19904

Method: SEM ICP_6010B Batch: 21412

SEM Batch: 21461

| Element | Mol. Wt. | RL | RL |
|---------|----------|-------|-----------|
| | | mg/Kg | umoles/g |
| Cd | 112.41 | 0.10 | 0.000890 |
| Cu | 63.546 | 0.50 | 0.00787 |
| Pb | 207.2 | 0.25 | 0.00121 |
| Ni | 58.6934 | 0.50 | 0.00852 |
| Zn | 65.39 | 1.0 | 0.0153 |
| Hg | 200.59 | 0.017 | 0.0000833 |
| AVS | 32.066 | 25.0 | 0.780 |

| El | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 | Sample 9 | Sample 10 | Sample 11 | Sample 12 | Sample 13 | Sample 14 | Sample 15 |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Results calculated as mg/Kg | | | | | | | | | | | | | | | |
| Cd | 1.0 | 1.3 | 0.94 | 0.32 | 0.59 | 0 | 0 | 0.15 | 0.14 | 7.1 | 4.7 | 0.96 | 0.86 | 0.33 | 1.1 |
| Cu | 42 | 58 | 36 | 6.5 | 24 | 12 | 5.4 | 3.4 | 1.8 | 250 | 160 | 27 | 28 | 10 | 35 |
| Pb | 55 | 52 | 100 | 42 | 55 | 16 | 9.4 | 15 | 11 | 340 | 240 | 90 | 64 | 31 | 96 |
| Ni | 24 | 20 | 16 | 9.1 | 11 | 6.5 | 3.5 | 2.7 | 2.2 | 16 | 17 | 14 | 15 | 4.8 | 16 |
| Zn | 200 | 250 | 200 | 52 | 98 | 85 | 26 | 28 | 30 | 1100 | 750 | 160 | 170 | 79 | 290 |
| Hg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AVS | 1200 | 1600 | 1100 | 67 | 160 | 37 | 0 | 150 | 230 | 1800 | 2400 | 170 | 84 | 290 | 190 |

| El | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 | Sample 9 | Sample 10 | Sample 11 | Sample 12 | Sample 13 | Sample 14 | Sample 15 |
|--------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Results calculated as umoles/g | | | | | | | | | | | | | | | |
| Cd | 0.00890 | 0.01156 | 0.00836 | 0.00285 | 0.00525 | 0 | 0 | 0.00133 | 0.00125 | 0.06316 | 0.04181 | 0.00854 | 0.00765 | 0.00294 | 0.00979 |
| Cu | 0.6609 | 0.9127 | 0.5665 | 0.1023 | 0.3777 | 0.1888 | 0.0850 | 0.0535 | 0.0283 | 3.9342 | 2.5179 | 0.4249 | 0.4406 | 0.1574 | 0.5508 |
| Pb | 0.2654 | 0.2510 | 0.4826 | 0.2027 | 0.2654 | 0.0772 | 0.0454 | 0.0724 | 0.0531 | 1.6409 | 1.1583 | 0.4344 | 0.3089 | 0.1496 | 0.4633 |
| Ni | 0.4089 | 0.3408 | 0.2726 | 0.1550 | 0.1874 | 0.1107 | 0.0596 | 0.0460 | 0.0375 | 0.2726 | 0.2896 | 0.2385 | 0.2556 | 0.0818 | 0.2726 |
| Zn | 3.059 | 3.823 | 3.059 | 0.795 | 1.499 | 1.300 | 0.398 | 0.428 | 0.459 | 16.822 | 11.470 | 2.447 | 2.600 | 1.208 | 4.435 |
| Hg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AVS | 37.42 | 49.90 | 34.30 | 2.09 | 4.99 | 1.15 | 0 | 4.68 | 7.17 | 56.13 | 74.85 | 5.30 | 2.62 | 9.04 | 5.93 |
| SEM SUM | 4.403 | 5.339 | 4.389 | 1.258 | 2.334 | 1.677 | 0.588 | 0.601 | 0.579 | 22.733 | 15.477 | 3.553 | 3.613 | 1.600 | 5.731 |
| SEM/AVS Ratio | 0.12 | 0.11 | 0.13 | 0.60 | 0.47 | 1.45 | 0 | 0.13 | 0.08 | 0.40 | 0.21 | 0.67 | 1.38 | 0.18 | 0.97 |

DATA REPORTING QUALIFIERS

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

| Lab Section | Qualifier | Description |
|-------------------|-----------|---|
| Metals | | |
| | 4 | MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable. |
| | V | Serial Dilution exceeds the control limits |
| General Chemistry | | |
| | F | MS or MSD exceeds the control limits |
| | F | RPD of the MS and MSD exceeds the control limits |

QUALITY CONTROL RESULTS

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------------|--------------|---------------|--------|------------|
| Metals | | | | | |
| Prep Batch: 500-19887 | | | | | |
| LCS 500-19887/3-B | Lab Control Spike | T | Solid | AVSSEM | |
| MB 500-19887/1-B | Method Blank | T | Solid | AVSSEM | |
| Prep Batch: 500-21146 | | | | | |
| 500-5632-1 | WW52 center | T | Solid | AVSSEM | |
| 500-5632-1MS | Matrix Spike | T | Solid | AVSSEM | |
| 500-5632-1MSD | Matrix Spike Duplicate | T | Solid | AVSSEM | |
| 500-5632-2 | WW52 side | T | Solid | AVSSEM | |
| 500-5632-3 | WW57 side | T | Solid | AVSSEM | |
| 500-5632-4 | WW97 center | T | Solid | AVSSEM | |
| 500-5632-5 | WW97 side | T | Solid | AVSSEM | |
| 500-5632-6 | WW54 side | T | Solid | AVSSEM | |
| 500-5632-7 | WW54 center | T | Solid | AVSSEM | |
| 500-5632-8 | WW50 center | T | Solid | AVSSEM | |
| 500-5632-9 | WW50 side | T | Solid | AVSSEM | |
| 500-5632-10 | WW86 center | T | Solid | AVSSEM | |
| 500-5632-11 | WW86 side | T | Solid | AVSSEM | |
| 500-5632-12 | WW49 center | T | Solid | AVSSEM | |
| 500-5632-13 | WW49 side | T | Solid | AVSSEM | |
| 500-5632-14 | WW55 side | T | Solid | AVSSEM | |
| 500-5632-15 | WW55 center | T | Solid | AVSSEM | |
| Analysis Batch:500-21412 | | | | | |
| LCS 500-19887/3-B | Lab Control Spike | T | Solid | SEM | 500-19887 |
| MB 500-19887/1-B | Method Blank | T | Solid | SEM | 500-19887 |
| 500-5632-1 | WW52 center | T | Solid | SEM | 500-21146 |
| 500-5632-1MS | Matrix Spike | T | Solid | SEM | 500-21146 |
| 500-5632-1MSD | Matrix Spike Duplicate | T | Solid | SEM | 500-21146 |
| 500-5632-2 | WW52 side | T | Solid | SEM | 500-21146 |
| 500-5632-3 | WW57 side | T | Solid | SEM | 500-21146 |
| 500-5632-4 | WW97 center | T | Solid | SEM | 500-21146 |
| 500-5632-5 | WW97 side | T | Solid | SEM | 500-21146 |
| 500-5632-6 | WW54 side | T | Solid | SEM | 500-21146 |
| 500-5632-7 | WW54 center | T | Solid | SEM | 500-21146 |
| 500-5632-8 | WW50 center | T | Solid | SEM | 500-21146 |
| 500-5632-9 | WW50 side | T | Solid | SEM | 500-21146 |
| 500-5632-10 | WW86 center | T | Solid | SEM | 500-21146 |
| 500-5632-11 | WW86 side | T | Solid | SEM | 500-21146 |
| 500-5632-12 | WW49 center | T | Solid | SEM | 500-21146 |
| 500-5632-13 | WW49 side | T | Solid | SEM | 500-21146 |
| 500-5632-14 | WW55 side | T | Solid | SEM | 500-21146 |
| 500-5632-15 | WW55 center | T | Solid | SEM | 500-21146 |

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Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------|--------------|---------------|--------|------------|
| Metals | | | | | |
| Analysis Batch:500-21461 | | | | | |
| 500-5632-1 | WW52 center | T | Solid | SEM | |
| 500-5632-2 | WW52 side | T | Solid | SEM | |
| 500-5632-3 | WW57 side | T | Solid | SEM | |
| 500-5632-4 | WW97 center | T | Solid | SEM | |
| 500-5632-5 | WW97 side | T | Solid | SEM | |
| 500-5632-6 | WW54 side | T | Solid | SEM | |
| 500-5632-7 | WW54 center | T | Solid | SEM | |
| 500-5632-8 | WW50 center | T | Solid | SEM | |
| 500-5632-9 | WW50 side | T | Solid | SEM | |
| 500-5632-10 | WW86 center | T | Solid | SEM | |
| 500-5632-11 | WW86 side | T | Solid | SEM | |
| 500-5632-12 | WW49 center | T | Solid | SEM | |
| 500-5632-13 | WW49 side | T | Solid | SEM | |
| 500-5632-14 | WW55 side | T | Solid | SEM | |
| 500-5632-15 | WW55 center | T | Solid | SEM | |

Report Basis

T = Total

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------------|-----------------|---------------|-----------------|------------|
| General Chemistry | | | | | |
| Analysis Batch:500-19735 | | | | | |
| 500-5632-1 | WW52 center | T | Solid | PercentMoisture | |
| 500-5632-1DU | Duplicate | T | Solid | PercentMoisture | |
| 500-5632-2 | WW52 side | T | Solid | PercentMoisture | |
| 500-5632-3 | WW57 side | T | Solid | PercentMoisture | |
| 500-5632-4 | WW97 center | T | Solid | PercentMoisture | |
| 500-5632-5 | WW97 side | T | Solid | PercentMoisture | |
| 500-5632-6 | WW54 side | T | Solid | PercentMoisture | |
| 500-5632-7 | WW54 center | T | Solid | PercentMoisture | |
| 500-5632-8 | WW50 center | T | Solid | PercentMoisture | |
| 500-5632-9 | WW50 side | T | Solid | PercentMoisture | |
| 500-5632-10 | WW86 center | T | Solid | PercentMoisture | |
| 500-5632-11 | WW86 side | T | Solid | PercentMoisture | |
| 500-5632-12 | WW49 center | T | Solid | PercentMoisture | |
| 500-5632-13 | WW49 side | T | Solid | PercentMoisture | |
| 500-5632-14 | WW55 side | T | Solid | PercentMoisture | |
| 500-5632-15 | WW55 center | T | Solid | PercentMoisture | |
| Prep Batch: 500-19887 | | | | | |
| LCS 500-19887/2-A | Lab Control Spike | T | Solid | AVS Prep | |
| MB 500-19887/1-A | Method Blank | T | Solid | AVS Prep | |
| 500-5632-1 | WW52 center | T | Solid | AVS Prep | |
| 500-5632-1MS | Matrix Spike | T | Solid | AVS Prep | |
| 500-5632-1MSD | Matrix Spike Duplicate | T | Solid | AVS Prep | |
| 500-5632-2 | WW52 side | T | Solid | AVS Prep | |
| 500-5632-3 | WW57 side | T | Solid | AVS Prep | |
| 500-5632-4 | WW97 center | T | Solid | AVS Prep | |
| 500-5632-5 | WW97 side | T | Solid | AVS Prep | |
| 500-5632-6 | WW54 side | T | Solid | AVS Prep | |
| 500-5632-7 | WW54 center | T | Solid | AVS Prep | |
| 500-5632-8 | WW50 center | T | Solid | AVS Prep | |
| 500-5632-9 | WW50 side | T | Solid | AVS Prep | |
| 500-5632-10 | WW86 center | T | Solid | AVS Prep | |
| 500-5632-11 | WW86 side | T | Solid | AVS Prep | |
| 500-5632-12 | WW49 center | T | Solid | AVS Prep | |
| 500-5632-13 | WW49 side | T | Solid | AVS Prep | |
| 500-5632-14 | WW55 side | T | Solid | AVS Prep | |
| 500-5632-15 | WW55 center | T | Solid | AVS Prep | |

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------------|--------------|---------------|------------|------------|
| General Chemistry | | | | | |
| Analysis Batch:500-19904 | | | | | |
| LCS 500-19887/2-A | Lab Control Spike | T | Solid | AVS | 500-19887 |
| MB 500-19887/1-A | Method Blank | T | Solid | AVS | 500-19887 |
| 500-5632-1 | WW52 center | T | Solid | AVS | 500-19887 |
| 500-5632-1MS | Matrix Spike | T | Solid | AVS | 500-19887 |
| 500-5632-1MSD | Matrix Spike Duplicate | T | Solid | AVS | 500-19887 |
| 500-5632-2 | WW52 side | T | Solid | AVS | 500-19887 |
| 500-5632-3 | WW57 side | T | Solid | AVS | 500-19887 |
| 500-5632-4 | WW97 center | T | Solid | AVS | 500-19887 |
| 500-5632-5 | WW97 side | T | Solid | AVS | 500-19887 |
| 500-5632-6 | WW54 side | T | Solid | AVS | 500-19887 |
| 500-5632-7 | WW54 center | T | Solid | AVS | 500-19887 |
| 500-5632-8 | WW50 center | T | Solid | AVS | 500-19887 |
| 500-5632-9 | WW50 side | T | Solid | AVS | 500-19887 |
| 500-5632-10 | WW86 center | T | Solid | AVS | 500-19887 |
| 500-5632-11 | WW86 side | T | Solid | AVS | 500-19887 |
| 500-5632-12 | WW49 center | T | Solid | AVS | 500-19887 |
| 500-5632-13 | WW49 side | T | Solid | AVS | 500-19887 |
| 500-5632-14 | WW55 side | T | Solid | AVS | 500-19887 |
| 500-5632-15 | WW55 center | T | Solid | AVS | 500-19887 |
| Analysis Batch:500-20074 | | | | | |
| LCS 500-20074/3 | Lab Control Spike | T | Solid | Lloyd Kahn | |
| MB 500-20074/2 | Method Blank | T | Solid | Lloyd Kahn | |
| 500-5632-1 | WW52 center | T | Solid | Lloyd Kahn | |
| 500-5632-2 | WW52 side | T | Solid | Lloyd Kahn | |
| 500-5632-3 | WW57 side | T | Solid | Lloyd Kahn | |
| 500-5632-4 | WW97 center | T | Solid | Lloyd Kahn | |
| 500-5632-5 | WW97 side | T | Solid | Lloyd Kahn | |
| 500-5632-6 | WW54 side | T | Solid | Lloyd Kahn | |
| 500-5632-7 | WW54 center | T | Solid | Lloyd Kahn | |
| Analysis Batch:500-20136 | | | | | |
| LCS 500-20136/3 | Lab Control Spike | T | Solid | Lloyd Kahn | |
| MB 500-20136/2 | Method Blank | T | Solid | Lloyd Kahn | |
| 500-5632-8 | WW50 center | T | Solid | Lloyd Kahn | |
| 500-5632-9 | WW50 side | T | Solid | Lloyd Kahn | |
| 500-5632-10 | WW86 center | T | Solid | Lloyd Kahn | |
| 500-5632-11 | WW86 side | T | Solid | Lloyd Kahn | |
| 500-5632-12 | WW49 center | T | Solid | Lloyd Kahn | |
| 500-5632-13 | WW49 side | T | Solid | Lloyd Kahn | |
| 500-5632-14 | WW55 side | T | Solid | Lloyd Kahn | |
| 500-5632-14MS | Matrix Spike | T | Solid | Lloyd Kahn | |
| 500-5632-14MSD | Matrix Spike Duplicate | T | Solid | Lloyd Kahn | |
| 500-5632-15 | WW55 center | T | Solid | Lloyd Kahn | |

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Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------|------------------|--------------|---------------|--------|------------|
|---------------|------------------|--------------|---------------|--------|------------|

Report Basis

T = Total

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

Method Blank - Batch: 500-19887

Method: SEM
Preparation: AVSSEM

Lab Sample ID: MB 500-19887/1-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0514
Date Prepared: 08/03/2007 0750

Analysis Batch: 500-21412
Prep Batch: 500-19887
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Result | Qual | RL |
|-------------|--------|------|-----|
| Cadmium SEM | <1.0 | | 1.0 |
| Copper SEM | <5.0 | | 5.0 |
| Nickel SEM | <5.0 | | 5.0 |
| Lead SEM | <2.5 | | 2.5 |
| Zinc SEM | <13 | | 13 |

Lab Control Spike - Batch: 500-19887

Method: SEM
Preparation: AVSSEM

Lab Sample ID: LCS 500-19887/3-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0521
Date Prepared: 08/03/2007 0750

Analysis Batch: 500-21412
Prep Batch: 500-19887
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|-------------|--------------|--------|--------|----------|------|
| Cadmium SEM | 13.8 | 11.6 | 84 | 80 - 120 | |
| Copper SEM | 68.8 | 58.8 | 85 | 80 - 120 | |
| Nickel SEM | 138 | 116 | 84 | 80 - 120 | |
| Lead SEM | 27.5 | 24.3 | 88 | 80 - 120 | |
| Zinc SEM | 138 | 124 | 90 | 80 - 120 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-21146**

**Method: SEM
Preparation: AVSSEM**

MS Lab Sample ID: 500-5632-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0539
Date Prepared: 08/22/2007 1141

Analysis Batch: 500-21412
Prep Batch: 500-21146

Instrument ID: TJA ICAP 61E Trace
Lab File ID: P50824D
Initial Weight/Volume: 10.30 g
Final Weight/Volume: 250 mL

MSD Lab Sample ID: 500-5632-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0545
Date Prepared: 08/22/2007 1141

Analysis Batch: 500-21412
Prep Batch: 500-21146

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10.13 g
Final Weight/Volume: 250 mL

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|-------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| Cadmium SEM | 82 | 86 | 75 - 125 | 5 | 20 | | |
| Copper SEM | 86 | 106 | 75 - 125 | 7 | 20 | | |
| Nickel SEM | 85 | 104 | 75 - 125 | 14 | 20 | | |
| Lead SEM | 672 | 311 | 75 - 125 | 30 | 20 | 4 | 4 |
| Zinc SEM | 154 | 182 | 75 - 125 | 5 | 20 | 4 | 4 |

Calculations are performed before rounding to avoid round-off errors in calculated results.

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Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

Method Blank - Batch: 500-19887

**Method: AVS
Preparation: AVS Prep**

Lab Sample ID: MB 500-19887/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/03/2007 1330
Date Prepared: 08/03/2007 0750

Analysis Batch: 500-19904
Prep Batch: 500-19887
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Result | Qual | RL |
|------------------------------|--------|------|----|
| Acid Volatile Sulfides (AVS) | <25 | | 25 |

Lab Control Spike - Batch: 500-19887

**Method: AVS
Preparation: AVS Prep**

Lab Sample ID: LCS 500-19887/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/03/2007 1332
Date Prepared: 08/03/2007 0750

Analysis Batch: 500-19904
Prep Batch: 500-19887
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|------------------------------|--------------|--------|--------|----------|------|
| Acid Volatile Sulfides (AVS) | 204 | 199 | 97 | 80 - 120 | |

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-19887**

**Method: AVS
Preparation: AVS Prep**

MS Lab Sample ID: 500-5632-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/03/2007 1337
Date Prepared: 08/03/2007 0750

Analysis Batch: 500-19904
Prep Batch: 500-19887

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.39 g
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 500-5632-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/03/2007 1339
Date Prepared: 08/03/2007 0750

Analysis Batch: 500-19904
Prep Batch: 500-19887

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.97 g
Final Weight/Volume: 10 mL

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|------------------------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| Acid Volatile Sulfides (AVS) | 134 | 171 | 75 - 125 | 9 | 20 | F | F |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

Method Blank - Batch: 500-20074

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: MB 500-20074/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/03/2007 0835
Date Prepared: N/A

Analysis Batch: 500-20074
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.16 g
Final Weight/Volume: 0.16 g

| Analyte | Result | Qual | RL |
|--------------|--------|------|-----|
| TOC Result 1 | <130 | | 130 |
| TOC Result 2 | <130 | | 130 |
| TOC Dup | <130 | | 130 |

Lab Control Spike - Batch: 500-20074

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: LCS 500-20074/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/03/2007 0844
Date Prepared: N/A

Analysis Batch: 500-20074
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.01845 g
Final Weight/Volume: 0.05 g

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---------|--------------|--------|--------|----------|------|
| TOC Dup | 7480 | 8280 | 111 | 72 - 128 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

Method Blank - Batch: 500-20136

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: MB 500-20136/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/07/2007 0821
Date Prepared: N/A

Analysis Batch: 500-20136
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.16 g
Final Weight/Volume: 0.16 g

| Analyte | Result | Qual | RL |
|--------------|--------|------|-----|
| TOC Result 1 | <130 | | 130 |
| TOC Result 2 | <130 | | 130 |
| TOC Dup | <130 | | 130 |

Lab Control Spike - Batch: 500-20136

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: LCS 500-20136/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/07/2007 0853
Date Prepared: N/A

Analysis Batch: 500-20136
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.0135 g
Final Weight/Volume: 0.05 g

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---------|--------------|--------|--------|----------|------|
| TOC Dup | 7480 | 8410 | 112 | 72 - 128 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-20136**

**Method: Lloyd Kahn
Preparation: N/A**

MS Lab Sample ID: 500-5632-14
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/07/2007 1320
Date Prepared: N/A

Analysis Batch: 500-20136
Prep Batch: N/A

Instrument ID: Dohrmann Phoenix 8000
Lab File ID: N/A
Initial Weight/Volume: 0.0054 g
Final Weight/Volume: 0.0054 g

MSD Lab Sample ID: 500-5632-14
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/07/2007 1400
Date Prepared: N/A

Analysis Batch: 500-20136
Prep Batch: N/A

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.0129 g
Final Weight/Volume: 0.0129 g

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|--------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| TOC Result 1 | 116 | 108 | 72 - 128 | 62 | 30 | F | |
| TOC Result 2 | 120 | 118 | 72 - 128 | 62 | 30 | F | |
| TOC Dup | 118 | 113 | 72 - 128 | 62 | 30 | F | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

Duplicate - Batch: 500-19735

Method: PercentMoisture

Preparation: N/A

Lab Sample ID: 500-5632-1

Analysis Batch: 500-19735

Instrument ID: No Equipment Assigned

Client Matrix: Solid

Prep Batch: N/A

Lab File ID: N/A

Dilution: 1.0

Units: %

Initial Weight/Volume:

Date Analyzed: 08/02/2007 0116

Final Weight/Volume:

Date Prepared: N/A

| Analyte | Sample Result/Qual | Result | RPD | Limit | Qual |
|------------------|--------------------|--------|-----|-------|------|
| Percent Moisture | 70 | 68.5 | | | |
| Percent Solids | 30 | 31.5 | 6 | 20 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

SEVERN TREN T STL

STL Chicago
 2417 Bond Street
 University Park, IL 60466
 Phone: 708-534-5200
 Fax: 708-534-5211

Report To: _____ Bill To: _____ Shaded Areas For Internal Use Only _____ of _____

Contact: Jennifer Wasik Contact: _____
 Company: MWRDGC Company: _____
 Address: 6001 W. Pershing Rd. Address: _____
Cicero, IL 60604
 Phone: 708-586-4074 Phone: _____
 Fax: _____ Fax: _____
 E-Mail: _____ PO#: _____ Quota: _____

Lab Lot# 500-5632

| | |
|---|---|
| Package Sealed Yes No | Samples Sealed Yes No |
| Received on Ice Yes No | Samples Intact Yes No |
| Temperature °C in Cooler <u>3.0</u> | |
| Within Hold Time Yes No | Preserv. Indicated Yes No NA |
| pH Check OK Yes No NA | Res Cl ₂ Check OK Yes No NA |
| Sample Labels and COC Agree Yes No COC not present | |
| Additional Analyses / Remarks | |

| Sampler Name: <u>Tom Minarch</u> | | Signature: | | Rating # | | | | | | | | | | | | | | | | |
|---|--------|--|---------------|-----------|--------|-----------|--------|---------------|--|--|--|--|--|--|--|--|--|--|--|--|
| Project Name: <u>Chem & Phys. Analysis</u> | | Project Number: | | # / Cont. | | | | | | | | | | | | | | | | |
| Project Location: | | Date Required | | Volume | | | | | | | | | | | | | | | | |
| Lab PM: | | Hard Copy: <u> </u> / <u> </u> / <u> </u> | | Preserv | | | | | | | | | | | | | | | | |
| Laboratory ID | MS-MSD | Client Sample ID | Sampling Date | Time | Matrix | Comp/Grab | AN/SEM | Particle Size | | | | | | | | | | | | |
| 13 | | ww49 side | 7-26-07 | 1200 | SE | ✓ | ✓ | | | | | | | | | | | | | |
| 14 | | ww50 side | 7-27-07 | 1150 | SE | ✓ | ✓ | | | | | | | | | | | | | |
| 15 | | ww50 center | 7-27-07 | 1240 | SE | ✓ | ✓ | | | | | | | | | | | | | |

Page 19 of 40

| | | | | | | | |
|-------------------------------------|------------------------|----------------------|--------------------|---------------------------------|------------------------|----------------------|--------------------|
| RELINQUISHED BY: <u>[Signature]</u> | COMPANY: <u>MWRDGC</u> | DATE: <u>7-30-07</u> | TIME: <u>10:37</u> | RECEIVED BY: <u>[Signature]</u> | COMPANY: <u>STL/TA</u> | DATE: <u>7/30/07</u> | TIME: <u>10:37</u> |
|-------------------------------------|------------------------|----------------------|--------------------|---------------------------------|------------------------|----------------------|--------------------|

- | | | |
|--|--|---|
| Matrix Key WW = Wastewater W = Water S = Soil SL = Sludge MS = Miscellaneous OL = Oil A = Air SE = Sediment SO = Solid BS = Drum Solid JL = Drum Liquid L = Leachate Wl = Waste O = _____ | Container Key 1. Plastic 2. VOA Vial 3. Sterile Plastic 4. Amber Glass 5. Widesmouth Glass 6. Other | Preservative Key 1. HCl, Cool to 4° 2. H2SO4, Cool to 4° 3. HNO3, Cool to 4° 4. NaOH, Cool to 4° 5. NaOH/Zn, Cool to 4° 6. Cool to 4° 7. None |
|--|--|---|

COMMENTS

Date Received 07, 30, 07

Courier: _____ Hand Delivered X

Bill of Lading JM

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5632-1

Login Number: 5632

| Question | T/F/NA | Comment |
|--|--------|---------|
| Radioactivity either was not measured or, if measured, is at or below background | True | |
| The cooler's custody seal, if present, is intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | 3.0 |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| There are no discrepancies between the sample IDs on the containers and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter. | NA | |
| If necessary, staff have been informed of any short hold time or quick TAT needs | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |

ANALYTICAL REPORT

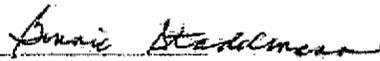
Job Number: 500-5800-1

Job Description: MWRD Sediment

For:

Metro Water Reclamation Dist of Chicago
6001 W. Pershing Road
Cicero, IL 60804

Attention: Jennifer Wasik



Bonnie M Stadelmann
Project Manager II
bstadelmann@stl-inc.com
09/10/2007

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the TestAmerica Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be

TestAmerica Laboratories, Inc.

TestAmerica Chicago 2417 Bond Street, University Park, IL 60466

Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com



Job Narrative
500-J5800-1

Comments

No additional comments.

Receipt

All samples were received in good condition within temperature requirements.

Metals

Method SEM: The serial dilution performed for the following sample(s)500-5800-1 was outside control limits: Pb

No other analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

| Lab Sample ID Analyte | Client Sample ID | Result / Qualifier | Reporting Limit | Units | Method |
|------------------------------|----------------------------|--------------------|--------------------|--------|-----------------|
| 500-5800-1 | WW56 SIDE-INDIANA | | | | |
| SEM Summary | | 5.3 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 1.5 | 0.20 | mg/Kg | SEM |
| AVS/SEM Ratio | | 1.9 | 0.010 | NONE | SEM |
| Copper SEM | | 57 | 0.98 | mg/Kg | SEM |
| Nickel SEM | | 15 | 0.98 | mg/Kg | SEM |
| Lead SEM | | 150 | 0.49 | mg/Kg | SEM |
| Zinc SEM | | 220 | 2.5 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 89 | 49 | mg/Kg | AVS |
| TOC Dup | | 28000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 51 | 0.10 | % | PercentMoisture |
| Percent Solids | | 49 | 0.10 | % | PercentMoisture |
| | | V | | | |
| 500-5800-2 | WW56 CENTER-INDIANA | | | | |
| SEM Summary | | 8.0 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 1.8 | 0.21 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.97 | 0.010 | NONE | SEM |
| Copper SEM | | 82 | 1.0 | mg/Kg | SEM |
| Nickel SEM | | 19 | 1.0 | mg/Kg | SEM |
| Lead SEM | | 470 | 0.51 | mg/Kg | SEM |
| Zinc SEM | | 270 | 2.6 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 260 | 51 | mg/Kg | AVS |
| TOC Dup | | 27000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 53 | 0.10 | % | PercentMoisture |
| Percent Solids | | 47 | 0.10 | % | PercentMoisture |
| 500-5800-3 | WW76 SIDE-HALSTED | | | | |
| SEM Summary | | 3.3 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 0.99 | 0.63 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.93 | 0.010 | NONE | SEM |
| Copper SEM | | 37 | 3.1 | mg/Kg | SEM |
| Nickel SEM | | 6.2 | 3.1 | mg/Kg | SEM |
| Lead SEM | | 53 | 1.6 | mg/Kg | SEM |
| Zinc SEM | | 150 | 7.8 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 110 | 31 | mg/Kg | AVS |
| TOC Dup | | 28000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 22 | 0.10 | % | PercentMoisture |
| Percent Solids | | 78 | 0.10 | % | PercentMoisture |

EXECUTIVE SUMMARY - Detections

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

| Lab Sample ID Analyte | Client Sample ID | Result / Qualifier | Reporting Limit | Units | Method |
|------------------------------|----------------------------|--------------------|--------------------|--------|-----------------|
| 500-5800-4 | WW76 CENTER-HALSTED | | | | |
| SEM Summary | | 5.6 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 1.7 | 0.13 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.24 | 0.010 | NONE | SEM |
| Copper SEM | | 44 | 0.67 | mg/Kg | SEM |
| Nickel SEM | | 11 | 0.67 | mg/Kg | SEM |
| Lead SEM | | 100 | 0.34 | mg/Kg | SEM |
| Zinc SEM | | 270 | 1.7 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 740 | 34 | mg/Kg | AVS |
| TOC Dup | | 16000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 32 | 0.10 | % | PercentMoisture |
| Percent Solids | | 68 | 0.10 | % | PercentMoisture |
| 500-5800-5 | WW58 SIDE-ASHLAND | | | | |
| SEM Summary | | 5.0 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 1.3 | 0.18 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.37 | 0.010 | NONE | SEM |
| Copper SEM | | 48 | 0.88 | mg/Kg | SEM |
| Nickel SEM | | 13 | 0.88 | mg/Kg | SEM |
| Lead SEM | | 91 | 0.44 | mg/Kg | SEM |
| Zinc SEM | | 240 | 2.2 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 440 | 44 | mg/Kg | AVS |
| TOC Dup | | 2400 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 45 | 0.10 | % | PercentMoisture |
| Percent Solids | | 55 | 0.10 | % | PercentMoisture |
| 500-5800-6 | WW58 CENTER-ASHLAND | | | | |
| SEM Summary | | 4.2 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 1.1 | 0.14 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.56 | 0.010 | NONE | SEM |
| Copper SEM | | 30 | 0.72 | mg/Kg | SEM |
| Nickel SEM | | 9.9 | 0.72 | mg/Kg | SEM |
| Lead SEM | | 110 | 0.36 | mg/Kg | SEM |
| Zinc SEM | | 200 | 1.8 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 240 | 36 | mg/Kg | AVS |
| TOC Dup | | 17000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 38 | 0.10 | % | PercentMoisture |
| Percent Solids | | 62 | 0.10 | % | PercentMoisture |

EXECUTIVE SUMMARY - Detections

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

| Lab Sample ID Analyte | Client Sample ID | Result / Qualifier | Reporting Limit | Units | Method |
|------------------------------|---------------------------|--------------------|--------------------|--------|-----------------|
| 500-5800-7 | WW59 CENTER-CICERO | | | | |
| SEM Summary | | 15 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 3.4 | 0.20 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.24 | 0.010 | NONE | SEM |
| Copper SEM | | 65 | 1.0 | mg/Kg | SEM |
| Nickel SEM | | 16 | 1.0 | mg/Kg | SEM |
| Lead SEM | | 200 | 0.51 | mg/Kg | SEM |
| Zinc SEM | | 830 | 2.5 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 2000 | 51 | mg/Kg | AVS |
| TOC Dup | | 46000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 51 | 0.10 | % | PercentMoisture |
| Percent Solids | | 49 | 0.10 | % | PercentMoisture |
| 500-5800-8 | WW59 SIDE-CICERO | | | | |
| SEM Summary | | 30 | 0.10 | umol/g | SEM |
| Cadmium SEM | | 5.1 | 0.17 | mg/Kg | SEM |
| AVS/SEM Ratio | | 2.1 | 0.010 | NONE | SEM |
| Copper SEM | | 88 | 0.87 | mg/Kg | SEM |
| Nickel SEM | | 28 | 0.87 | mg/Kg | SEM |
| Lead SEM | | 330 | 0.43 | mg/Kg | SEM |
| Zinc SEM | | 1800 | 22 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 470 | 43 | mg/Kg | AVS |
| TOC Dup | | 26000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 50 | 0.10 | % | PercentMoisture |
| Percent Solids | | 50 | 0.10 | % | PercentMoisture |

METHOD SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

| Description | Lab Location | Method | Preparation Method |
|--|--------------|------------------|--------------------|
| Matrix: Solid | | | |
| Determination of Simultaneously Extracted Metals (SEM) | TAL CHI | EPA SEM | |
| Determination of AVS and SEM / Prep | TAL CHI | | EPA AVSSEM |
| Determination of Acid Volatile Sulfide (AVS) | TAL CHI | EPA AVS | |
| Acid Volatile Sulfides Prep | TAL CHI | | STL-SAV AVS Prep |
| Determination of TOC in Sediment by Lloyd Kahn Method (1988) | TAL CHI | NJDEP Lloyd Kahn | |

Lab References:

TAL CHI = TestAmerica Chicago

Method References:

EPA = US Environmental Protection Agency

NJDEP =

STL-SAV = Severn Trent Laboratories, Savannah, Facility Standard Operating Procedure.

SAMPLE SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

| Lab Sample ID | Client Sample ID | Client Matrix | Date/Time Sampled | Date/Time Received |
|----------------------|-------------------------|----------------------|------------------------------|-------------------------------|
| 500-5800-1 | WW56 SIDE-INDIANA | Solid | 07/30/2007 1100 | 08/07/2007 1027 |
| 500-5800-2 | WW56 CENTER-INDIANA | Solid | 07/30/2007 1115 | 08/07/2007 1027 |
| 500-5800-3 | WW76 SIDE-HALSTED | Solid | 07/31/2007 1145 | 08/07/2007 1027 |
| 500-5800-4 | WW76 CENTER-HALSTED | Solid | 07/31/2007 1115 | 08/07/2007 1027 |
| 500-5800-5 | WW58 SIDE-ASHLAND | Solid | 08/01/2007 1230 | 08/07/2007 1027 |
| 500-5800-6 | WW58 CENTER-ASHLAND | Solid | 08/01/2007 1150 | 08/07/2007 1027 |
| 500-5800-7 | WW59 CENTER-CICERO | Solid | 08/02/2007 1210 | 08/07/2007 1027 |
| 500-5800-8 | WW59 SIDE-CICERO | Solid | 08/02/2007 1230 | 08/07/2007 1027 |

SAMPLE RESULTS

TestAmerica Chicago
 AVS/SEM Calculation Worksheet

Job: 500-5800-1
 Method: AVS AVS Batch: 20278
 Method: SEM ICP_6010B Batch: 21412
 SEM Batch: 21461

| Element | Mol. Wt. | RL | RL |
|---------|----------|-------|-----------|
| | | mg/Kg | umoles/g |
| Cd | 112.41 | 0.10 | 0.000890 |
| Cu | 63.546 | 0.50 | 0.00787 |
| Pb | 207.2 | 0.25 | 0.00121 |
| Ni | 58.6934 | 0.50 | 0.00852 |
| Zn | 65.39 | 1.0 | 0.0153 |
| Hg | 200.59 | 0.017 | 0.0000833 |
| AVS | 32.066 | 25.0 | 0.780 |

| El | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 |
|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| <u>Raw Results</u> | | | 5x | | | | | |
| Cd | 0.03139 | 0.03583 | 0.03145 | 0.05123 | 0.02918 | 0.03038 | 0.06652 | 0.11855 |
| Cu | 1.15703 | 1.59841 | 1.16985 | 1.30009 | 1.07641 | 0.82693 | 1.27828 | 2.03146 |
| Pb | 3.03435 | 9.16397 | 1.7043 | 3.1197 | 2.06713 | 2.9322 | 3.98314 | 7.66447 |
| Ni | 0.30097 | 0.37192 | 0.1962 | 0.32289 | 0.28648 | 0.27428 | 0.30645 | 0.65141 |
| Zn | 4.54437 | 5.24627 | 4.80415 | 8.14912 | 5.36485 | 5.4711 | 16.41434 | 40.3342 |
| Hg | | | | | | | | |
| AVS | 45.19 | 128.9 | 89.26 | 549.3 | 246.5 | 165.9 | 996.2 | 271.5 |

| | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|---------|--------|
| Prep Wt. (g) | 10.3412 | 10.3857 | 10.1996 | 10.8564 | 10.3565 | 11.2635 | 10.0582 | 11.498 |
| Metals Prep | | | | | | | | |
| Final Vol. (ml) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| AVS Prep | | | | | | | | |
| Final Vol. (ml) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| % Solids (dec.) | 0.492 | 0.469 | 0.781 | 0.684 | 0.546 | 0.616 | 0.489 | 0.501 |

| El | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 |
|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| <u>Results calculated as mg/Kg</u> | | | 5x | | | | | |
| Cd | 1.54 | 1.84 | 0.99 | 1.72 | 1.29 | 1.09 | 3.38 | 5.14 |
| Cu | 56.9 | 82.0 | 36.71 | 43.8 | 47.6 | 29.8 | 65.0 | 88.2 |
| Pb | 149.1 | 470.3 | 53.5 | 105.0 | 91.4 | 105.7 | 202.5 | 332.6 |
| Ni | 14.8 | 19.1 | 6.16 | 10.9 | 12.7 | 9.88 | 15.6 | 28.3 |
| Zn | 223.3 | 269.3 | 150.8 | 274.4 | 237.2 | 197.1 | 834.3 | 1750.5 |
| Hg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AVS | 88.8 | 265 | 112 | 740 | 436 | 239 | 2025 | 471 |

| El | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 |
|---------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| <u>Results calculated as umoles/g</u> | | | | | | | | |
| Cd | 0.01372 | 0.01636 | 0.00878 | 0.01534 | 0.01148 | 0.00974 | 0.03008 | 0.04577 |
| Cu | 0.8947 | 1.2910 | 0.5778 | 0.6888 | 0.7489 | 0.4689 | 1.0225 | 1.3874 |
| Pb | 0.7196 | 2.2700 | 0.2581 | 0.5069 | 0.4411 | 0.5099 | 0.9771 | 1.6054 |
| Ni | 0.2520 | 0.3252 | 0.1049 | 0.1852 | 0.2158 | 0.1684 | 0.2654 | 0.4817 |
| Zn | 3.415 | 4.118 | 2.306 | 4.196 | 3.627 | 3.015 | 12.759 | 26.770 |
| Hg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AVS | 2.77 | 8.25 | 3.49 | 23.1 | 13.6 | 7.46 | 63.2 | 14.7 |

| | | | | | | | | |
|------------------|------|------|------|------|------|------|-------|-------|
| SEM SUM | 5.29 | 8.02 | 3.26 | 5.59 | 5.04 | 4.17 | 15.05 | 30.29 |
| SEM/AVS Ratio | 1.91 | 0.97 | 0.93 | 0.24 | 0.37 | 0.56 | 0.24 | 2.06 |

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5800-1

Client Sample ID: WW56 SIDE-INDIANA
Lab Sample ID: 500-5800-1

Date Sampled: 07/30/2007 1100
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|---------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1252 | |
| SEM Summary | 5.3 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 1.9 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0921 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1152 | |
| Cadmium SEM | 1.5 | mg/Kg | 0.20 | 1.0 |
| Copper SEM | 57 | mg/Kg | 0.98 | 1.0 |
| Nickel SEM | 15 | mg/Kg | 0.98 | 1.0 |
| Lead SEM | 150 | mg/Kg | 0.49 | 1.0 |
| Zinc SEM | 220 | mg/Kg V | 2.5 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/08/2007 1515 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 89 | mg/Kg | 49 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/10/2007 1317 | |
| TOC Dup | 28000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/09/2007 0104 | |
| Percent Moisture | 51 | % | 0.10 | 1.0 |

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Job Number: 500-5800-1

Client Sample ID: WW56 CENTER-INDIANA
 Lab Sample ID: 500-5800-2

Date Sampled: 07/30/2007 1115
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1255 | |
| SEM Summary | 8.0 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.97 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 0949 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1152 | |
| Cadmium SEM | 1.8 | mg/Kg | 0.21 | 1.0 |
| Copper SEM | 82 | mg/Kg | 1.0 | 1.0 |
| Nickel SEM | 19 | mg/Kg | 1.0 | 1.0 |
| Lead SEM | 470 | mg/Kg | 0.51 | 1.0 |
| Zinc SEM | 270 | mg/Kg | 2.6 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/08/2007 1520 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 260 | mg/Kg | 51 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/10/2007 1337 | |
| TOC Dup | 27000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/09/2007 0104 | |
| Percent Moisture | 53 | % | 0.10 | 1.0 |

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Job Number: 500-5800-1

Client Sample ID: WW76 SIDE-HALSTED
 Lab Sample ID: 500-5800-3

Date Sampled: 07/31/2007 1145
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1258 | |
| SEM Summary | 3.3 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.93 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 1104 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1152 | |
| Cadmium SEM | 0.99 | mg/Kg | 0.63 | 5.0 |
| Copper SEM | 37 | mg/Kg | 3.1 | 5.0 |
| Nickel SEM | 6.2 | mg/Kg | 3.1 | 5.0 |
| Lead SEM | 53 | mg/Kg | 1.6 | 5.0 |
| Zinc SEM | 150 | mg/Kg | 7.8 | 5.0 |
| Method: AVS | | | Date Analyzed: 08/08/2007 1521 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 110 | mg/Kg | 31 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/10/2007 1417 | |
| TOC Dup | 28000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/09/2007 0104 | |
| Percent Moisture | 22 | % | 0.10 | 1.0 |

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Job Number: 500-5800-1

Client Sample ID: WW76 CENTER-HALSTED
 Lab Sample ID: 500-5800-4

Date Sampled: 07/31/2007 1115
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1301 | |
| SEM Summary | 5.6 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.24 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 1001 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1152 | |
| Cadmium SEM | 1.7 | mg/Kg | 0.13 | 1.0 |
| Copper SEM | 44 | mg/Kg | 0.67 | 1.0 |
| Nickel SEM | 11 | mg/Kg | 0.67 | 1.0 |
| Lead SEM | 100 | mg/Kg | 0.34 | 1.0 |
| Zinc SEM | 270 | mg/Kg | 1.7 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/08/2007 1522 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 740 | mg/Kg | 34 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/10/2007 1453 | |
| TOC Dup | 16000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/09/2007 0104 | |
| Percent Moisture | 32 | % | 0.10 | 1.0 |

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Job Number: 500-5800-1

Client Sample ID: **WW58 SIDE-ASHLAND**
 Lab Sample ID: **500-5800-5**

Date Sampled: 08/01/2007 1230
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1304 | |
| SEM Summary | 5.0 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.37 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 1007 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1152 | |
| Cadmium SEM | 1.3 | mg/Kg | 0.18 | 1.0 |
| Copper SEM | 48 | mg/Kg | 0.88 | 1.0 |
| Nickel SEM | 13 | mg/Kg | 0.88 | 1.0 |
| Lead SEM | 91 | mg/Kg | 0.44 | 1.0 |
| Zinc SEM | 240 | mg/Kg | 2.2 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/08/2007 1524 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 440 | mg/Kg | 44 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/10/2007 1512 | |
| TOC Dup | 2400 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/09/2007 0104 | |
| Percent Moisture | 45 | % | 0.10 | 1.0 |

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Job Number: 500-5800-1

Client Sample ID: WW58 CENTER-ASHLAND
 Lab Sample ID: 500-5800-6

Date Sampled: 08/01/2007 1150
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1307 | |
| SEM Summary | 4.2 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.56 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 1037 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1152 | |
| Cadmium SEM | 1.1 | mg/Kg | 0.14 | 1.0 |
| Copper SEM | 30 | mg/Kg | 0.72 | 1.0 |
| Nickel SEM | 9.9 | mg/Kg | 0.72 | 1.0 |
| Lead SEM | 110 | mg/Kg | 0.36 | 1.0 |
| Zinc SEM | 200 | mg/Kg | 1.8 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/08/2007 1525 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 240 | mg/Kg | 36 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/10/2007 1531 | |
| TOC Dup | 17000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/09/2007 0104 | |
| Percent Moisture | 38 | % | 0.10 | 1.0 |

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Job Number: 500-5800-1

Client Sample ID: WW59 CENTER-CICERO
 Lab Sample ID: 500-5800-7

Date Sampled: 08/02/2007 1210
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|----------------|-----------------|----------|
| Method: SEM | | Date Analyzed: | 08/25/2007 1310 | |
| SEM Summary | 15 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.24 | NONE | 0.010 | 1.0 |
| Method: SEM | | Date Analyzed: | 08/25/2007 1043 | |
| Prep Method: AVSSEM | | Date Prepared: | 08/22/2007 1152 | |
| Cadmium SEM | 3.4 | mg/Kg | 0.20 | 1.0 |
| Copper SEM | 65 | mg/Kg | 1.0 | 1.0 |
| Nickel SEM | 16 | mg/Kg | 1.0 | 1.0 |
| Lead SEM | 200 | mg/Kg | 0.51 | 1.0 |
| Zinc SEM | 830 | mg/Kg | 2.5 | 1.0 |
| Method: AVS | | Date Analyzed: | 08/08/2007 1527 | |
| Prep Method: AVS Prep | | Date Prepared: | 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 2000 | mg/Kg | 51 | 1.0 |
| Method: Lloyd Kahn | | Date Analyzed: | 08/10/2007 1557 | |
| TOC Dup | 46000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | Date Analyzed: | 08/09/2007 0104 | |
| Percent Moisture | 51 | % | 0.10 | 1.0 |

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Job Number: 500-5800-1

Client Sample ID: WW59 SIDE-CICERO
Lab Sample ID: 500-5800-8

Date Sampled: 08/02/2007 1230
 Date Received: 08/07/2007 1027
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|----------------|-----------------|----------|
| Method: SEM | | Date Analyzed: | 08/25/2007 1313 | |
| SEM Summary | 30 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 2.1 | NONE | 0.010 | 1.0 |
| Method: SEM | | Date Analyzed: | 08/25/2007 1051 | |
| Prep Method: AVSSEM | | Date Prepared: | 08/22/2007 1152 | |
| Cadmium SEM | 5.1 | mg/Kg | 0.17 | 1.0 |
| Copper SEM | 88 | mg/Kg | 0.87 | 1.0 |
| Nickel SEM | 28 | mg/Kg | 0.87 | 1.0 |
| Lead SEM | 330 | mg/Kg | 0.43 | 1.0 |
| Method: SEM | | Date Analyzed: | 08/25/2007 1058 | |
| Prep Method: AVSSEM | | Date Prepared: | 08/22/2007 1152 | |
| Zinc SEM | 1800 | mg/Kg | 22 | 10 |
| Method: AVS | | Date Analyzed: | 08/08/2007 1528 | |
| Prep Method: AVS Prep | | Date Prepared: | 08/08/2007 0915 | |
| Acid Volatile Sulfides (AVS) | 470 | mg/Kg | 43 | 1.0 |
| Method: Lloyd Kahn | | Date Analyzed: | 08/15/2007 1011 | |
| TOC Dup | 26000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | Date Analyzed: | 08/09/2007 0104 | |
| Percent Moisture | 50 | % | 0.10 | 1.0 |

QUALITY CONTROL RESULTS

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------------|--------------|---------------|--------|------------|
| Metals | | | | | |
| Prep Batch: 500-20138 | | | | | |
| LCS 500-20138/2-B | Lab Control Spike | T | Solid | AVSSEM | |
| MB 500-20138/1-B | Method Blank | T | Solid | AVSSEM | |
| Prep Batch: 500-21147 | | | | | |
| 500-5800-1 | WW56 SIDE-INDIANA | T | Solid | AVSSEM | |
| 500-5800-1MS | Matrix Spike | T | Solid | AVSSEM | |
| 500-5800-1MSD | Matrix Spike Duplicate | T | Solid | AVSSEM | |
| 500-5800-2 | WW56 CENTER-INDIANA | T | Solid | AVSSEM | |
| 500-5800-3 | WW76 SIDE-HALSTED | T | Solid | AVSSEM | |
| 500-5800-4 | WW76 CENTER-HALSTED | T | Solid | AVSSEM | |
| 500-5800-5 | WW58 SIDE-ASHLAND | T | Solid | AVSSEM | |
| 500-5800-6 | WW58 CENTER-ASHLAND | T | Solid | AVSSEM | |
| 500-5800-7 | WW59 CENTER-CICERO | T | Solid | AVSSEM | |
| 500-5800-8 | WW59 SIDE-CICERO | T | Solid | AVSSEM | |
| Analysis Batch:500-21412 | | | | | |
| LCS 500-20138/2-B | Lab Control Spike | T | Solid | SEM | 500-20138 |
| MB 500-20138/1-B | Method Blank | T | Solid | SEM | 500-20138 |
| 500-5800-1 | WW56 SIDE-INDIANA | T | Solid | SEM | 500-21147 |
| 500-5800-1MS | Matrix Spike | T | Solid | SEM | 500-21147 |
| 500-5800-1MSD | Matrix Spike Duplicate | T | Solid | SEM | 500-21147 |
| 500-5800-2 | WW56 CENTER-INDIANA | T | Solid | SEM | 500-21147 |
| 500-5800-3 | WW76 SIDE-HALSTED | T | Solid | SEM | 500-21147 |
| 500-5800-4 | WW76 CENTER-HALSTED | T | Solid | SEM | 500-21147 |
| 500-5800-5 | WW58 SIDE-ASHLAND | T | Solid | SEM | 500-21147 |
| 500-5800-6 | WW58 CENTER-ASHLAND | T | Solid | SEM | 500-21147 |
| 500-5800-7 | WW59 CENTER-CICERO | T | Solid | SEM | 500-21147 |
| 500-5800-8 | WW59 SIDE-CICERO | T | Solid | SEM | 500-21147 |
| Analysis Batch:500-21461 | | | | | |
| 500-5800-1 | WW56 SIDE-INDIANA | T | Solid | SEM | |
| 500-5800-2 | WW56 CENTER-INDIANA | T | Solid | SEM | |
| 500-5800-3 | WW76 SIDE-HALSTED | T | Solid | SEM | |
| 500-5800-4 | WW76 CENTER-HALSTED | T | Solid | SEM | |
| 500-5800-5 | WW58 SIDE-ASHLAND | T | Solid | SEM | |
| 500-5800-6 | WW58 CENTER-ASHLAND | T | Solid | SEM | |
| 500-5800-7 | WW59 CENTER-CICERO | T | Solid | SEM | |
| 500-5800-8 | WW59 SIDE-CICERO | T | Solid | SEM | |

Report Basis

T = Total

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------------|--------------|---------------|-----------------|------------|
| General Chemistry | | | | | |
| Prep Batch: 500-20138 | | | | | |
| LCS 500-20138/2-A | Lab Control Spike | T | Solid | AVS Prep | |
| MB 500-20138/1-A | Method Blank | T | Solid | AVS Prep | |
| 500-5800-1 | WW56 SIDE-INDIANA | T | Solid | AVS Prep | |
| 500-5800-1MS | Matrix Spike | T | Solid | AVS Prep | |
| 500-5800-1MSD | Matrix Spike Duplicate | T | Solid | AVS Prep | |
| 500-5800-2 | WW56 CENTER-INDIANA | T | Solid | AVS Prep | |
| 500-5800-3 | WW76 SIDE-HALSTED | T | Solid | AVS Prep | |
| 500-5800-4 | WW76 CENTER-HALSTED | T | Solid | AVS Prep | |
| 500-5800-5 | WW58 SIDE-ASHLAND | T | Solid | AVS Prep | |
| 500-5800-6 | WW58 CENTER-ASHLAND | T | Solid | AVS Prep | |
| 500-5800-7 | WW59 CENTER-CICERO | T | Solid | AVS Prep | |
| 500-5800-8 | WW59 SIDE-CICERO | T | Solid | AVS Prep | |
| Analysis Batch:500-20220 | | | | | |
| 500-5800-1 | WW56 SIDE-INDIANA | T | Solid | PercentMoisture | |
| 500-5800-2 | WW56 CENTER-INDIANA | T | Solid | PercentMoisture | |
| 500-5800-3 | WW76 SIDE-HALSTED | T | Solid | PercentMoisture | |
| 500-5800-4 | WW76 CENTER-HALSTED | T | Solid | PercentMoisture | |
| 500-5800-5 | WW58 SIDE-ASHLAND | T | Solid | PercentMoisture | |
| 500-5800-6 | WW58 CENTER-ASHLAND | T | Solid | PercentMoisture | |
| 500-5800-7 | WW59 CENTER-CICERO | T | Solid | PercentMoisture | |
| 500-5800-8 | WW59 SIDE-CICERO | T | Solid | PercentMoisture | |
| Analysis Batch:500-20278 | | | | | |
| LCS 500-20138/2-A | Lab Control Spike | T | Solid | AVS | 500-20138 |
| MB 500-20138/1-A | Method Blank | T | Solid | AVS | 500-20138 |
| 500-5800-1 | WW56 SIDE-INDIANA | T | Solid | AVS | 500-20138 |
| 500-5800-1MS | Matrix Spike | T | Solid | AVS | 500-20138 |
| 500-5800-1MSD | Matrix Spike Duplicate | T | Solid | AVS | 500-20138 |
| 500-5800-2 | WW56 CENTER-INDIANA | T | Solid | AVS | 500-20138 |
| 500-5800-3 | WW76 SIDE-HALSTED | T | Solid | AVS | 500-20138 |
| 500-5800-4 | WW76 CENTER-HALSTED | T | Solid | AVS | 500-20138 |
| 500-5800-5 | WW58 SIDE-ASHLAND | T | Solid | AVS | 500-20138 |
| 500-5800-6 | WW58 CENTER-ASHLAND | T | Solid | AVS | 500-20138 |
| 500-5800-7 | WW59 CENTER-CICERO | T | Solid | AVS | 500-20138 |
| 500-5800-8 | WW59 SIDE-CICERO | T | Solid | AVS | 500-20138 |

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|---------------------|--------------|---------------|------------|------------|
| General Chemistry | | | | | |
| Analysis Batch:500-20578 | | | | | |
| LCS 500-20578/3 | Lab Control Spike | T | Solid | Lloyd Kahn | |
| MB 500-20578/2 | Method Blank | T | Solid | Lloyd Kahn | |
| 500-5800-1 | WW56 SIDE-INDIANA | T | Solid | Lloyd Kahn | |
| 500-5800-2 | WW56 CENTER-INDIANA | T | Solid | Lloyd Kahn | |
| 500-5800-3 | WW76 SIDE-HALSTED | T | Solid | Lloyd Kahn | |
| 500-5800-4 | WW76 CENTER-HALSTED | T | Solid | Lloyd Kahn | |
| 500-5800-5 | WW58 SIDE-ASHLAND | T | Solid | Lloyd Kahn | |
| 500-5800-6 | WW58 CENTER-ASHLAND | T | Solid | Lloyd Kahn | |
| 500-5800-7 | WW59 CENTER-CICERO | T | Solid | Lloyd Kahn | |
| 500-5800-7MS | Matrix Spike | T | Solid | Lloyd Kahn | |
| Analysis Batch:500-20685 | | | | | |
| LCS 500-20685/3 | Lab Control Spike | T | Solid | Lloyd Kahn | |
| MB 500-20685/2 | Method Blank | T | Solid | Lloyd Kahn | |
| 500-5800-8 | WW59 SIDE-CICERO | T | Solid | Lloyd Kahn | |

Report Basis

T = Total

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

Method Blank - Batch: 500-20138

Method: SEM
Preparation: AVSSEM

Lab Sample ID: MB 500-20138/1-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0909
Date Prepared: 08/08/2007 0915

Analysis Batch: 500-21412
Prep Batch: 500-20138
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Result | Qual | RL |
|-------------|--------|------|------|
| Cadmium SEM | <0.10 | | 0.10 |
| Copper SEM | <0.50 | | 0.50 |
| Nickel SEM | <0.50 | | 0.50 |
| Lead SEM | <0.25 | | 0.25 |
| Zinc SEM | <1.3 | | 1.3 |

Lab Control Spike - Batch: 500-20138

Method: SEM
Preparation: AVSSEM

Lab Sample ID: LCS 500-20138/2-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0915
Date Prepared: 08/08/2007 0915

Analysis Batch: 500-21412
Prep Batch: 500-20138
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|-------------|--------------|--------|--------|----------|------|
| Cadmium SEM | 1.25 | 1.19 | 95 | 80 - 120 | |
| Copper SEM | 6.25 | 6.11 | 98 | 80 - 120 | |
| Nickel SEM | 12.5 | 12.0 | 96 | 80 - 120 | |
| Lead SEM | 2.50 | 2.55 | 102 | 80 - 120 | |
| Zinc SEM | 12.5 | 12.7 | 102 | 80 - 120 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-21147**

**Method: SEM
Preparation: AVSSEM**

MS Lab Sample ID: 500-5800-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0934
Date Prepared: 08/22/2007 1152

Analysis Batch: 500-21412
Prep Batch: 500-21147

Instrument ID: TJA ICAP 61E Trace
Lab File ID: P50824D
Initial Weight/Volume: 10.1551 g
Final Weight/Volume: 250 mL

MSD Lab Sample ID: 500-5800-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 0940
Date Prepared: 08/22/2007 1152

Analysis Batch: 500-21412
Prep Batch: 500-21147

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10.0030 g
Final Weight/Volume: 250 mL

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|-------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| Cadmium SEM | 84 | 87 | 75 - 125 | 3 | 20 | | |
| Copper SEM | 239 | 124 | 75 - 125 | 18 | 20 | 4 | 4 |
| Nickel SEM | 94 | 95 | 75 - 125 | 2 | 20 | | |
| Lead SEM | 258 | 744 | 75 - 125 | 14 | 20 | 4 | 4 |
| Zinc SEM | 83 | 109 | 75 - 125 | 3 | 20 | 4 | 4 |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

Method Blank - Batch: 500-20138

Method: AVS
Preparation: AVS Prep

Lab Sample ID: MB 500-20138/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/08/2007 1513
Date Prepared: 08/08/2007 0915

Analysis Batch: 500-20278
Prep Batch: 500-20138
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Result | Qual | RL |
|------------------------------|--------|------|----|
| Acid Volatile Sulfides (AVS) | <25 | | 25 |

Lab Control Spike - Batch: 500-20138

Method: AVS
Preparation: AVS Prep

Lab Sample ID: LCS 500-20138/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/08/2007 1514
Date Prepared: 08/08/2007 0915

Analysis Batch: 500-20278
Prep Batch: 500-20138
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|------------------------------|--------------|--------|--------|----------|------|
| Acid Volatile Sulfides (AVS) | 204 | 194 | 95 | 80 - 120 | |

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 500-20138

Method: AVS
Preparation: AVS Prep

MS Lab Sample ID: 500-5800-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/08/2007 1517
Date Prepared: 08/08/2007 0915

Analysis Batch: 500-20278
Prep Batch: 500-20138

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.0512 g
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 500-5800-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/08/2007 1518
Date Prepared: 08/08/2007 0915

Analysis Batch: 500-20278
Prep Batch: 500-20138

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.1949 g
Final Weight/Volume: 10 mL

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|------------------------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| Acid Volatile Sulfides (AVS) | 122 | 112 | 75 - 125 | 8 | 20 | | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

Method Blank - Batch: 500-20578

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: MB 500-20578/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/10/2007 0823
Date Prepared: N/A

Analysis Batch: 500-20578
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.16 g
Final Weight/Volume: 0.16 g

| Analyte | Result | Qual | RL |
|--------------|--------|------|-----|
| TOC Result 1 | <130 | | 130 |
| TOC Result 2 | <130 | | 130 |
| TOC Dup | <130 | | 130 |

Lab Control Spike - Batch: 500-20578

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: LCS 500-20578/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/10/2007 0834
Date Prepared: N/A

Analysis Batch: 500-20578
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.02195 g
Final Weight/Volume: 0.05 g

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---------|--------------|--------|--------|----------|------|
| TOC Dup | 7480 | 7830 | 105 | 72 - 128 | |

Matrix Spike - Batch: 500-20578

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: 500-5800-7
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/10/2007 1322
Date Prepared: N/A

Analysis Batch: 500-20578
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.0029 g
Final Weight/Volume: 0.0029 g

| Analyte | Sample Result/Qual | Spike Amount | Result | % Rec. | Limit | Qual |
|--------------|--------------------|--------------|--------|--------|----------|------|
| TOC Result 1 | 46000 | 34500 | 76600 | 88 | 72 - 128 | |
| TOC Result 2 | 45000 | 34500 | 76600 | 92 | 72 - 128 | |
| TOC Dup | 46000 | 34500 | 76600 | 90 | 72 - 128 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

Method Blank - Batch: 500-20685

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: MB 500-20685/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/15/2007 0920
Date Prepared: N/A

Analysis Batch: 500-20685
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.16 g
Final Weight/Volume: 0.16 g

| Analyte | Result | Qual | RL |
|--------------|--------|------|-----|
| TOC Result 1 | <130 | | 130 |
| TOC Result 2 | <130 | | 130 |
| TOC Dup | <130 | | 130 |

Lab Control Spike - Batch: 500-20685

Method: Lloyd Kahn
Preparation: N/A

Lab Sample ID: LCS 500-20685/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/15/2007 0927
Date Prepared: N/A

Analysis Batch: 500-20685
Prep Batch: N/A
Units: mg/Kg

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.0255 g
Final Weight/Volume: 0.05 g

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---------|--------------|--------|--------|----------|------|
| TOC Dup | 7480 | 8080 | 108 | 72 - 128 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.



STL Chicago
 2417 Bord Street
 University Park, IL 60465
 Phone: 708-534-5200
 Fax: 708-534-5211

Report To:

Contact: Jen Wasik
 Company: MWRDGC
 Address: 6001 W. Pershing
Cicero, IL 60804
 Phone: 708-588-4074
 Fax: _____
 E-Mail: _____

Bill To:

Contact: _____
 Company: _____
 Address: _____
 Phone: _____
 Fax: _____
 PO#: _____ Quote: _____

Shaded Areas For Internal Use Only ____ of ____

Lab Lot# 500-5800

| | |
|---|---|
| Package Sealed Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Samples Sealed Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Received on Ice Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Samples Intact Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Temperature °C of Cooler <u>3.1</u> | |
| With-Hold Time Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Preserv. Indicated Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA |
| pH Check OK Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA | Res Cl ₂ Check OK Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA |
| Sample Labels and COC Agree Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> COC not present | |
| Additional Analyses / Remarks | |

| Laboratory ID | MS-MSD | Client Sample ID | Sampling | | Matrix | Comp/Grab | Refrg # | # / Com | Volans | Preserv |
|---------------|--------|-----------------------|----------|-------|--------|-----------|---------|---------|--------|---------|
| | | | Date | Time | | | | | | |
| 1 | | WW56 side - Indiana | 7/30/07 | 11:00 | SE | G | | | | |
| 2 | | WW56 center - Indiana | 7/30/07 | 11:15 | | G | | | | |
| 1 | | WW56 side - Indiana | 7/30/07 | 11:00 | | G | | | | |
| 2 | | WW56 center - Indiana | 7/30/07 | 11:15 | | G | | | | |
| 3 | | WW76 side - Halsted | 7-31-07 | 1145 | | G | | | | |
| 1 | | WW76 side - Halsted | 7-31-07 | 1145 | | G | | | | |
| 4 | | WW76 center - Halsted | 7-31-07 | 1115 | | G | | | | |
| 1 | | WW76 center - Halsted | 7-31-07 | 1115 | | G | | | | |
| 5 | | WW58 side - Ashland | 8-1-07 | 1230 | | G | | | | |
| 6 | | WW58 center - Ashland | 8-1-07 | 1150 | | G | | | | |
| 5 | | WW58 side - Ashland | 8-1-07 | 1230 | | G | | | | |
| 6 | | WW58 center - Ashland | 8-1-07 | 1150 | V | G | | | | |

AVS/SEM/TOC
 AVS/SEM/TOC
 Particle Size
 Particle Size
 AVS/SEM/TOC
 Particle Size
 AVS/SEM/TOC
 Particle Size
 AVS/SEM/TOC
 Particle Size
 AVS/SEM/TOC
 Particle Size

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| | | | | | | |
|---|--------------------|------------------|--------------------------------|--------------------|----------------------|------------------|
| RELINQUISHED BY <u>Ten W...</u> COMPANY | DATE <u>8-7-07</u> | TIME <u>1027</u> | RECEIVED BY <u>[Signature]</u> | COMPANY <u>TAL</u> | DATE <u>08/07/07</u> | TIME <u>1027</u> |
| RELINQUISHED BY _____ COMPANY | DATE _____ | TIME _____ | RECEIVED BY _____ | COMPANY _____ | DATE _____ | TIME _____ |

- | | | |
|--|---|---|
| Matrix Key WW - Wastewater W - Water S - Soil SL - Sludge MS - Miscellaneous OL - Oil A - Air SE - Sediment SO - Solid DS - Drum Solid DL - Drum Liquid L - Leachate W - Wipe O - _____ | Container Key 1. Plastic 2. VCA Vial 3. Sterile Plastic 4. Amber Glass 5. Widemouth Glass 6. Other | Preservative Key 1. HCl, Cool to 4° 2. H2SO4, Cool to 4° 3. HNO3, Cool to 4° 4. NaOH, Cool to 4° 5. NaOH/Zn, Cool to 4° 6. Cool to 4° 7. None |
|--|---|---|

COMMENTS

Date Received 1/1

Courier TAL Hand Delivered

Bill of Lading

SEVERN TRENT STL

STL Chicago
 2417 Bonc Street
 University Park, IL 60486
 Phone: 708-534-5200
 Fax: 708-534-5211

Report to: _____ BIR to: _____ Shaded Areas For Internal Use Only _____ of _____

Contact: Sen Wasik Contact: _____
 Company: MWR DGC Company: _____
 Address: 6001 W. Pershing Rd Address: _____
Cicero, IL 60604
 Phone: 708-568-4074 Phone: _____
 Fax: _____ Fax: _____
 E-Mail: _____ PO#: _____ Quote: _____

Lab Lot# 500 - 5800

| | |
|--|---|
| Package Sealed Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Samples Sealed Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Received on Ice Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Samples Intact Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Temperature °C of Cooler <u>5</u> | |
| Within Hold Time Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Preserv. Indicated Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/> |
| pH Check OK Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/> | Res Cl. Check OK Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/> |
| Sample Labels and COC Agree Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> COC not present | |

| Laboratory ID | MS-MSD | Client Sample ID | Sampling | | Matrix | -Comp/Grab | Rating # | #1 Cool. | Volume | Preserv. | Within Hold Time | Preserv. Indicated | pH Check OK | Res Cl. Check OK | Sample Labels and COC Agree | COC not present | Additional Analyses / Remarks |
|---------------|--------|--------------------|----------|------|--------|------------|----------|----------|--------|----------|------------------|--------------------|-------------|------------------|-----------------------------|-----------------|-------------------------------|
| | | | Date | Time | | | | | | | | | | | | | |
| 7 | | WWS9 Center Cicero | 8-2-07 | 1210 | SE | ✓ | | | | | | | | | | | AVS/SEM/TOC |
| 6 | | WWS9 Side Cicero | 8-2-07 | 1230 | SE | ✓ | | | | | | | | | | | AVS/SEM/TOC |
| 7 | | WWS9 Center Cicero | 8-2-07 | 1210 | SE | ✓ | | | | | | | | | | | Particle size |
| 8 | | WWS9 Side Cicero | 8-2-07 | 1230 | SE | ✓ | | | | | | | | | | | Particle size |

| | |
|---|---|
| RELINQUISHED BY <u>To MWR</u> COMPANY _____ DATE <u>8-7-07</u> TIME <u>1027</u> | RECEIVED BY <u>[Signature]</u> COMPANY <u>TAL</u> DATE <u>08-08-07</u> TIME <u>1027</u> |
| RELINQUISHED BY _____ COMPANY _____ DATE _____ TIME _____ | RECEIVED BY _____ COMPANY _____ DATE _____ TIME _____ |

- | | | |
|---|---|---|
| Matrix Key WW = Wastewater W = Water S = Soil SL = Sludge MS = Miscellaneous OL = Oil A = Air SE = Sediment SO = Solid DS = Drum Solid DL = Drum Liquid L = Leachate VA = Vape O = _____ | Container Key 1. Plastic 2. VOA Vial 3. Sterile Plastic 4. Amber Glass 5. Widemouth Glass 6. Other | Preservative Key 1. HCl, Cool to 4° 2. H2SO4, Cool to 4° 3. HNO3, Cool to 4° 4. NaOH, Cool to 4° 5. NaOH/Zn, Cool to 4° 6. Cool to 4° 7. None |
|---|---|---|

COMMENTS _____

Date Received _____

Courier: TAL Hand Delivered _____

Bill of Lading _____

Page 30 of 31

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5800-1

Login Number: 5800

| Question | T/F/NA | Comment |
|--|--------|---------|
| Radioactivity either was not measured or, if measured, is at or below background | True | |
| The cooler's custody seal, if present, is intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | 3.1 |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| There are no discrepancies between the sample IDs on the containers and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter. | NA | |
| If necessary, staff have been informed of any short hold time or quick TAT needs | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |

ANALYTICAL REPORT

Job Number: 500-5952-1

Job Description: Chemical and Physical Analysis

For:

Metro Water Reclamation Dist of Chicago
6001 W. Pershing Road
Cicero, IL 60804

Attention: Jennifer Wasik



Bonnie M Stadelmann
Project Manager II
bstadelmann@stl-inc.com
08/31/2007

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the TestAmerica Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be

TestAmerica Laboratories, Inc.

TestAmerica Chicago 2417 Bond Street, University Park, IL 60466

Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com



Job Narrative
500-J5952-1

Comments

No additional comments.

Receipt

All samples were received in good condition within temperature requirements.

Metals

Method SEM: The serial dilution performed for the following sample(s) 500-5952-2 was outside control limits: Pb, Ni, and Zn

No other analytical or quality issues were noted.

General Chemistry

No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

| Lab Sample ID Analyte | Client Sample ID | Result / Qualifier | Reporting Limit | Units | Method |
|------------------------------|----------------------------|--------------------|--------------------|--------|-----------------|
| 500-5952-1 | WW43 SIDE RTE. 83 | | | | |
| Cadmium SEM | | 5.6 | 0.19 | mg/Kg | SEM |
| Copper SEM | | 77 | 0.95 | mg/Kg | SEM |
| SEM Summary | | 16 | 0.10 | umol/g | SEM |
| Nickel SEM | | 22 | 0.95 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.39 | 0.010 | NONE | SEM |
| Lead SEM | | 290 | 0.48 | mg/Kg | SEM |
| Zinc SEM | | 860 | 2.4 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 1300 | 48 | mg/Kg | AVS |
| TOC Dup | | 36000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 49 | 0.10 | % | PercentMoisture |
| Percent Solids | | 51 | 0.10 | % | PercentMoisture |
| 500-5952-2 | WW43 CENTER RTE. 83 | | | | |
| Cadmium SEM | | 3.9 | 0.17 | mg/Kg | SEM |
| Copper SEM | | 55 | 0.87 | mg/Kg | SEM |
| SEM Summary | | 10 | 0.10 | umol/g | SEM |
| Nickel SEM | | 19 | 0.87 | mg/Kg | SEM |
| AVS/SEM Ratio | | 0.43 | 0.010 | NONE | SEM |
| Lead SEM | | 220 | 0.43 | mg/Kg | SEM |
| Zinc SEM | | 530 | 2.2 | mg/Kg | SEM |
| Acid Volatile Sulfides (AVS) | | 770 | 43 | mg/Kg | AVS |
| TOC Dup | | 37000 | 130 | mg/Kg | Lloyd Kahn |
| Percent Moisture | | 49 | 0.10 | % | PercentMoisture |
| Percent Solids | | 51 | 0.10 | % | PercentMoisture |

METHOD SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

| Description | Lab Location | Method | Preparation Method |
|--|--------------|------------------|--------------------|
| Matrix: Solid | | | |
| Determination of Simultaneously Extracted Metals (SEM) | TAL CHI | EPA SEM | |
| Determination of AVS and SEM / Prep | TAL CHI | | EPA AVSSEM |
| Determination of Acid Volatile Sulfide (AVS) | TAL CHI | EPA AVS | |
| Acid Volatile Sulfides Prep | TAL CHI | | STL-SAV AVS Prep |
| Determination of TOC in Sediment by Lloyd Kahn Method (1988) | TAL CHI | NJDEP Lloyd Kahn | |

Lab References:

TAL CHI = TestAmerica Chicago

Method References:

EPA = US Environmental Protection Agency

NJDEP =

STL-SAV = Severn Trent Laboratories, Savannah, Facility Standard Operating Procedure.

METHOD / ANALYST SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

| Method | Analyst | Analyst ID |
|---------------------|-------------------|-------------------|
| EPA SEM | Smith, Todd D | TDS |
| EPA AVS | Brogan, Mary T | MTB |
| NJDEP Lloyd Kahn | Deb, Khona | KD |
| EPA PercentMoisture | Boyd, Cheryl L | CLB |
| EPA PercentMoisture | Kolarczyk, Paul F | PFK |

SAMPLE SUMMARY

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

| Lab Sample ID | Client Sample ID | Client Matrix | Date/Time Sampled | Date/Time Received |
|----------------------|-------------------------|----------------------|------------------------------|-------------------------------|
| 500-5952-1 | WW43 SIDE RTE. 83 | Solid | 08/09/2007 1300 | 08/13/2007 1345 |
| 500-5952-2 | WW43 CENTER RTE. 83 | Solid | 08/09/2007 1345 | 08/13/2007 1345 |

SAMPLE RESULTS

TestAmerica Chicago
 AVS/SEM Calculation Worksheet

Job: 500-5952-1
 Method: AVS AVS Batch: 20575
 Method: SEM ICP_6010B Batch: 21412
 SEM Calc. Batch: 21461

| Element | Mol. Wt. | RL mg/Kg | RL umoles/g |
|---------|----------|-------------|----------------|
| Cd | 112.41 | 0.10 | 0.000890 |
| Cu | 63.546 | 0.50 | 0.00787 |
| Pb | 207.2 | 0.25 | 0.00121 |
| Ni | 58.6934 | 0.50 | 0.00852 |
| Zn | 65.39 | 1.0 | 0.0153 |
| Hg | 200.59 | 0.017 | 0.0000833 |
| AVS | 32.066 | 25.0 | 0.780 |

| Raw Results | Sample 1 | Sample 2 |
|-------------|----------|----------|
| Cd | 0.1178 | 0.09086 |
| Cu | 1.6086 | 1.2721 |
| Pb | 6.0790 | 4.9966 |
| Ni | 0.4717 | 0.4409 |
| Zn | 18.121 | 12.294 |
| Hg | 0 | 0 |
| AVS | 706.6 | 444.45 |

| | | |
|-----------------|--------|---------|
| Prep Wt. (g) | 10.375 | 11.2176 |
| Metals Prep | | |
| Final Vol. (ml) | 250 | 250 |
| AVS Prep Final | | |
| Vol. (ml) | 10 | 10 |
| % Solids (dec.) | 0.505 | 0.513 |

| El | Sample 1 | Sample 2 |
|-----------------------------|----------|----------|
| Results calculated as mg/Kg | | |
| Cd | 5.62 | 3.95 |
| Cu | 76.8 | 55.3 |
| Pb | 290 | 217 |
| Ni | 22.5 | 19.2 |
| Zn | 865 | 534 |
| Hg | 0 | 0 |
| AVS | 1349 | 772 |

| El | Sample 1 | Sample 2 |
|--------------------------------|----------|----------|
| Results calculated as umoles/g | | |
| Cd | 0.0500 | 0.0351 |
| Cu | 1.208 | 0.870 |
| Pb | 1.400 | 1.048 |
| Ni | 0.383 | 0.326 |
| Zn | 13.223 | 8.168 |
| Hg | 0 | 0 |
| AVS | 42.06 | 24.09 |

SEM SUM 16.3 10.4

SEM/AVS
 Ratio 0.39 0.43

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5952-1

Client Sample ID: WW43 SIDE RTE. 83
Lab Sample ID: 500-5952-1

Date Sampled: 08/09/2007 1300
 Date Received: 08/13/2007 1345
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|--------|--------------------------------|----------|
| Method: SEM | | | Date Analyzed: 08/25/2007 1246 | |
| SEM Summary | 16 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.39 | NONE | 0.010 | 1.0 |
| Method: SEM | | | Date Analyzed: 08/25/2007 1130 | |
| Prep Method: AVSSEM | | | Date Prepared: 08/22/2007 1127 | |
| Cadmium SEM | 5.6 | mg/Kg | 0.19 | 1.0 |
| Copper SEM | 77 | mg/Kg | 0.95 | 1.0 |
| Nickel SEM | 22 | mg/Kg | 0.95 | 1.0 |
| Lead SEM | 290 | mg/Kg | 0.48 | 1.0 |
| Zinc SEM | 860 | mg/Kg | 2.4 | 1.0 |
| Method: AVS | | | Date Analyzed: 08/14/2007 1213 | |
| Prep Method: AVS Prep | | | Date Prepared: 08/14/2007 0925 | |
| Acid Volatile Sulfides (AVS) | 1300 | mg/Kg | 48 | 1.0 |
| Method: Lloyd Kahn | | | Date Analyzed: 08/15/2007 1028 | |
| TOC Dup | 36000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | Date Analyzed: 08/14/2007 1956 | |
| Percent Moisture | 49 | % | 0.10 | 1.0 |

Jennifer Wasik
 Metro Water Reclamation Dist of Chicago
 6001 W. Pershing Road
 Cicero, IL 60804

Job Number: 500-5952-1

Client Sample ID: WW43 CENTER RTE. 83
 Lab Sample ID: 500-5952-2

Date Sampled: 08/09/2007 1345
 Date Received: 08/13/2007 1345
 Client Matrix: Solid

| Analyte | Result/Qualifier | Unit | RL | Dilution |
|--------------------------------|------------------|---------|-------|----------|
| Method: SEM | | | | |
| SEM Summary | 10 | umol/g | 0.10 | 1.0 |
| AVS/SEM Ratio | 0.43 | NONE | 0.010 | 1.0 |
| Method: SEM | | | | |
| Prep Method: AVSSEM | | | | |
| Cadmium SEM | 3.9 | mg/Kg | 0.17 | 1.0 |
| Copper SEM | 55 | mg/Kg | 0.87 | 1.0 |
| Nickel SEM | 19 | V mg/Kg | 0.87 | 1.0 |
| Lead SEM | 220 | V mg/Kg | 0.43 | 1.0 |
| Zinc SEM | 530 | V mg/Kg | 2.2 | 1.0 |
| Method: AVS | | | | |
| Prep Method: AVS Prep | | | | |
| Acid Volatile Sulfides (AVS) | 770 | mg/Kg | 43 | 1.0 |
| Method: Lloyd Kahn | | | | |
| TOC Dup | 37000 | mg/Kg | 130 | 1.0 |
| Method: PercentMoisture | | | | |
| Percent Moisture | 49 | % | 0.10 | 1.0 |

DATA REPORTING QUALIFIERS

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

| Lab Section | Qualifier | Description |
|--------------------|------------------|---|
| Metals | | |
| | 4 | MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable. |
| | V | Serial Dilution exceeds the control limits |

QUALITY CONTROL RESULTS

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------------|--------------|---------------|--------|------------|
| Metals | | | | | |
| Prep Batch: 500-20525 | | | | | |
| LCS 500-20525/2-B | Lab Control Spike | T | Solid | AVSSEM | |
| MB 500-20525/1-B | Method Blank | T | Solid | AVSSEM | |
| Prep Batch: 500-21140 | | | | | |
| 500-5952-1 | WW43 SIDE RTE. 83 | T | Solid | AVSSEM | |
| 500-5952-2 | WW43 CENTER RTE. 83 | T | Solid | AVSSEM | |
| 500-5952-2MS | Matrix Spike | T | Solid | AVSSEM | |
| 500-5952-2MSD | Matrix Spike Duplicate | T | Solid | AVSSEM | |
| Analysis Batch:500-21412 | | | | | |
| LCS 500-20525/2-B | Lab Control Spike | T | Solid | SEM | 500-20525 |
| MB 500-20525/1-B | Method Blank | T | Solid | SEM | 500-20525 |
| 500-5952-1 | WW43 SIDE RTE. 83 | T | Solid | SEM | 500-21140 |
| 500-5952-2 | WW43 CENTER RTE. 83 | T | Solid | SEM | 500-21140 |
| 500-5952-2MS | Matrix Spike | T | Solid | SEM | 500-21140 |
| 500-5952-2MSD | Matrix Spike Duplicate | T | Solid | SEM | 500-21140 |
| Analysis Batch:500-21461 | | | | | |
| 500-5952-1 | WW43 SIDE RTE. 83 | T | Solid | SEM | |
| 500-5952-2 | WW43 CENTER RTE. 83 | T | Solid | SEM | |

Report Basis

T = Total

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

QC Association Summary

| Lab Sample ID | Client Sample ID | Report Basis | Client Matrix | Method | Prep Batch |
|---------------------------------|------------------------|-----------------|---------------|-----------------|------------|
| General Chemistry | | | | | |
| Prep Batch: 500-20525 | | | | | |
| LCS 500-20525/2-A | Lab Control Spike | T | Solid | AVS Prep | |
| MB 500-20525/1-A | Method Blank | T | Solid | AVS Prep | |
| 500-5952-1 | WW43 SIDE RTE. 83 | T | Solid | AVS Prep | |
| 500-5952-2 | WW43 CENTER RTE. 83 | T | Solid | AVS Prep | |
| 500-5952-2MS | Matrix Spike | T | Solid | AVS Prep | |
| 500-5952-2MSD | Matrix Spike Duplicate | T | Solid | AVS Prep | |
| Analysis Batch:500-20575 | | | | | |
| LCS 500-20525/2-A | Lab Control Spike | T | Solid | AVS | 500-20525 |
| MB 500-20525/1-A | Method Blank | T | Solid | AVS | 500-20525 |
| 500-5952-1 | WW43 SIDE RTE. 83 | T | Solid | AVS | 500-20525 |
| 500-5952-2 | WW43 CENTER RTE. 83 | T | Solid | AVS | 500-20525 |
| 500-5952-2MS | Matrix Spike | T | Solid | AVS | 500-20525 |
| 500-5952-2MSD | Matrix Spike Duplicate | T | Solid | AVS | 500-20525 |
| Analysis Batch:500-20636 | | | | | |
| 500-5952-1 | WW43 SIDE RTE. 83 | T | Solid | PercentMoisture | |
| Analysis Batch:500-20685 | | | | | |
| LCS 500-20685/3 | Lab Control Spike | T | Solid | Lloyd Kahn | |
| MB 500-20685/2 | Method Blank | T | Solid | Lloyd Kahn | |
| 500-5952-1 | WW43 SIDE RTE. 83 | T | Solid | Lloyd Kahn | |
| 500-5952-2 | WW43 CENTER RTE. 83 | T | Solid | Lloyd Kahn | |
| 500-5952-2MS | Matrix Spike | T | Solid | Lloyd Kahn | |
| 500-5952-2MSD | Matrix Spike Duplicate | T | Solid | Lloyd Kahn | |
| Analysis Batch:500-20723 | | | | | |
| 500-5952-2 | WW43 CENTER RTE. 83 | T | Solid | PercentMoisture | |

Report Basis

T = Total

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

Method Blank - Batch: 500-20525

Method: SEM
Preparation: AVSSEM

Lab Sample ID: MB 500-20525/1-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 1117
Date Prepared: 08/14/2007 0925

Analysis Batch: 500-21412
Prep Batch: 500-20525
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Result | Qual | RL |
|-------------|--------|------|------|
| Cadmium SEM | <0.10 | | 0.10 |
| Copper SEM | <0.50 | | 0.50 |
| Nickel SEM | <0.50 | | 0.50 |
| Lead SEM | <0.25 | | 0.25 |
| Zinc SEM | <1.3 | | 1.3 |

Lab Control Spike - Batch: 500-20525

Method: SEM
Preparation: AVSSEM

Lab Sample ID: LCS 500-20525/2-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 1123
Date Prepared: 08/14/2007 0925

Analysis Batch: 500-21412
Prep Batch: 500-20525
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|-------------|--------------|--------|--------|----------|------|
| Cadmium SEM | 1.25 | 1.16 | 93 | 80 - 120 | |
| Copper SEM | 6.25 | 6.00 | 96 | 80 - 120 | |
| Nickel SEM | 12.5 | 11.8 | 94 | 80 - 120 | |
| Lead SEM | 2.50 | 2.52 | 101 | 80 - 120 | |
| Zinc SEM | 12.5 | 12.6 | 101 | 80 - 120 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-21140**

**Method: SEM
Preparation: AVSSEM**

MS Lab Sample ID: 500-5952-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 1212
Date Prepared: 08/22/2007 1127

Analysis Batch: 500-21412
Prep Batch: 500-21140

Instrument ID: TJA ICAP 61E Trace
Lab File ID: P50824D
Initial Weight/Volume: 10.5010 g
Final Weight/Volume: 250 mL

MSD Lab Sample ID: 500-5952-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/25/2007 1218
Date Prepared: 08/22/2007 1127

Analysis Batch: 500-21412
Prep Batch: 500-21140

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50824D
Initial Weight/Volume: 10.3608 g
Final Weight/Volume: 250 mL

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|-------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| Cadmium SEM | 91 | 83 | 75 - 125 | 3 | 20 | | |
| Copper SEM | 48 | 77 | 75 - 125 | 6 | 20 | 4 | 4 |
| Nickel SEM | 90 | 86 | 75 - 125 | 2 | 20 | | |
| Lead SEM | 346 | 208 | 75 - 125 | 3 | 20 | 4 | 4 |
| Zinc SEM | 193 | 142 | 75 - 125 | 2 | 20 | 4 | 4 |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

Method Blank - Batch: 500-20525

Method: AVS
Preparation: AVS Prep

Lab Sample ID: MB 500-20525/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/14/2007 1210
Date Prepared: 08/14/2007 0925

Analysis Batch: 500-20575
Prep Batch: 500-20525
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Result | Qual | RL |
|------------------------------|--------|------|----|
| Acid Volatile Sulfides (AVS) | <25 | | 25 |

Lab Control Spike - Batch: 500-20525

Method: AVS
Preparation: AVS Prep

Lab Sample ID: LCS 500-20525/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/14/2007 1211
Date Prepared: 08/14/2007 0925

Analysis Batch: 500-20575
Prep Batch: 500-20525
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|------------------------------|--------------|--------|--------|----------|------|
| Acid Volatile Sulfides (AVS) | 204 | 193 | 95 | 80 - 120 | |

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 500-20525

Method: AVS
Preparation: AVS Prep

MS Lab Sample ID: 500-5952-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/14/2007 1216
Date Prepared: 08/14/2007 0925

Analysis Batch: 500-20575
Prep Batch: 500-20525

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.3942 g
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 500-5952-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/14/2007 1218
Date Prepared: 08/14/2007 0925

Analysis Batch: 500-20575
Prep Batch: 500-20525

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.5871 g
Final Weight/Volume: 10 mL

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|------------------------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| Acid Volatile Sulfides (AVS) | 80 | 110 | 75 - 125 | 9 | 20 | | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

Method Blank - Batch: 500-20685

Method: Lloyd Kahn

Preparation: N/A

Lab Sample ID: MB 500-20685/2

Analysis Batch: 500-20685

Instrument ID: Dohrmann Phoenix 8000 T

Client Matrix: Solid

Prep Batch: N/A

Lab File ID: N/A

Dilution: 1.0

Units: mg/Kg

Initial Weight/Volume: 0.16 g

Date Analyzed: 08/15/2007 0920

Final Weight/Volume: 0.16 g

Date Prepared: N/A

| Analyte | Result | Qual | RL |
|--------------|--------|------|-----|
| TOC Result 1 | <130 | | 130 |
| TOC Result 2 | <130 | | 130 |
| TOC Dup | <130 | | 130 |

Lab Control Spike - Batch: 500-20685

Method: Lloyd Kahn

Preparation: N/A

Lab Sample ID: LCS 500-20685/3

Analysis Batch: 500-20685

Instrument ID: Dohrmann Phoenix 8000 T

Client Matrix: Solid

Prep Batch: N/A

Lab File ID: N/A

Dilution: 1.0

Units: mg/Kg

Initial Weight/Volume: 0.0255 g

Date Analyzed: 08/15/2007 0927

Final Weight/Volume: 0.05 g

Date Prepared: N/A

| Analyte | Spike Amount | Result | % Rec. | Limit | Qual |
|---------|--------------|--------|--------|----------|------|
| TOC Dup | 7480 | 8080 | 108 | 72 - 128 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

**Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-20685**

**Method: Lloyd Kahn
Preparation: N/A**

MS Lab Sample ID: 500-5952-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/15/2007 1137
Date Prepared: N/A

Analysis Batch: 500-20685
Prep Batch: N/A

Instrument ID: Dohrmann Phoenix 8000
Lab File ID: N/A
Initial Weight/Volume: 0.0038 g
Final Weight/Volume: 0.0038 g

MSD Lab Sample ID: 500-5952-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/15/2007 1149
Date Prepared: N/A

Analysis Batch: 500-20685
Prep Batch: N/A

Instrument ID: Dohrmann Phoenix 8000 T
Lab File ID: N/A
Initial Weight/Volume: 0.0028 g
Final Weight/Volume: 0.0028 g

| Analyte | % Rec. | | Limit | RPD | RPD Limit | MS Qual | MSD Qual |
|--------------|--------|-----|----------|-----|-----------|---------|----------|
| | MS | MSD | | | | | |
| TOC Result 1 | 85 | 99 | 72 - 128 | 19 | 30 | | |
| TOC Result 2 | 107 | 115 | 72 - 128 | 19 | 30 | | |
| TOC Dup | 96 | 107 | 72 - 128 | 19 | 30 | | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Metro Water Reclamation Dist of Chicago

Job Number: 500-5952-1

Login Number: 5952

| Question | T/F/NA | Comment |
|--|--------|---------|
| Radioactivity either was not measured or, if measured, is at or below background | True | |
| The cooler's custody seal, if present, is intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | 3.0 |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| There are no discrepancies between the sample IDs on the containers and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter. | NA | |
| If necessary, staff have been informed of any short hold time or quick TAT needs | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |

ANALYTICAL REPORT

Job Number: 500-5632-2

Job Description: MWRD Sediment

For:

Metro Water Reclamation Dist of Chicago

6001 W. Pershing Road

Cicero, IL 60804

Attention: Jennifer Wasik



Bonnie M Stadelmann
Project Manager II
bstadelmann@stl-inc.com
09/04/2007

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the STL Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only

TestAmerica Laboratories, Inc.

TestAmerica Chicago 2417 Bond Street, University Park, IL 60466

Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com



STL Burlington
South Burlington, VT

Sample Data Summary
Package

SDG: 500-5632

| | |
|--|-----------|
| Case Narrative | 1 |
| Chain of Custody | 2 |
| Sample Data Summary Package - Geotechnical..... | 5 |
| Sample Handling..... | 21 |
| Last Page of this Document..... | 24 |



Case Narrative

STL

STL Burlington
30 Community Drive, Suite 11
South Burlington, VT 05403

Tel: 802 660 1990 Fax: 802 660 1919
www.stl-inc.com

September 4, 2007

Ms. Bonnie Stadelmann
TestAmerica
2417 Bond Street
University Park, IL 60466

Re: Laboratory Project No. 27002
Case: MWRDGC; SDG: 500-5632

Dear Ms. Stadelmann:

Enclosed are the analytical results for the samples that were received by STL Burlington on August 1st, 2007. Laboratory identification numbers were assigned, and designated as follows:

| <u>Lab ID</u> | <u>Client Sample ID</u> | <u>Sample Date</u> | <u>Sample Matrix</u> |
|-----------------------------------|-------------------------|--------------------|----------------------|
| Received: 08/01/07 ETR No: 121148 | | | |
| 719371 | WW52 CENTER | 07/23/07 | SOIL |
| 719372 | WW52 SIDE | 07/23/07 | SOIL |
| 719373 | WW57 SIDE | 07/23/07 | SOIL |
| 719374 | WW97 CENTER | 07/24/07 | SOIL |
| 719375 | WW97 SIDE | 07/24/07 | SOIL |
| 719376 | WW54 SIDE | 07/24/07 | SOIL |
| 719377 | WW54 CENTER | 07/24/07 | SOIL |
| 719378 | WW50 CENTER | 07/25/07 | SOIL |
| 719379 | WW50 SIDE | 07/25/07 | SOIL |
| 719380 | WW86 CENTER | 07/25/07 | SOIL |
| 719381 | WW86 SIDE | 07/25/07 | SOIL |
| 719382 | WW49 CENTER | 07/26/07 | SOIL |
| 719383 | WW49 SIDE | 07/26/07 | SOIL |
| 719384 | WW55 SIDE | 07/27/07 | SOIL |
| 719385 | WW55 CENTER | 07/27/07 | SOIL |

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

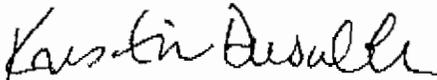
Particle Size Analysis by ASTM D422

There were no exceptions to the method quality control criteria during the analyses of these samples.

The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,



Kristine A. Dusablon
Project Manager

Enclosure



Chain of Custody



Sample Data Summary Package - Geotechnical

Particle Size of Soils by ASTM D422

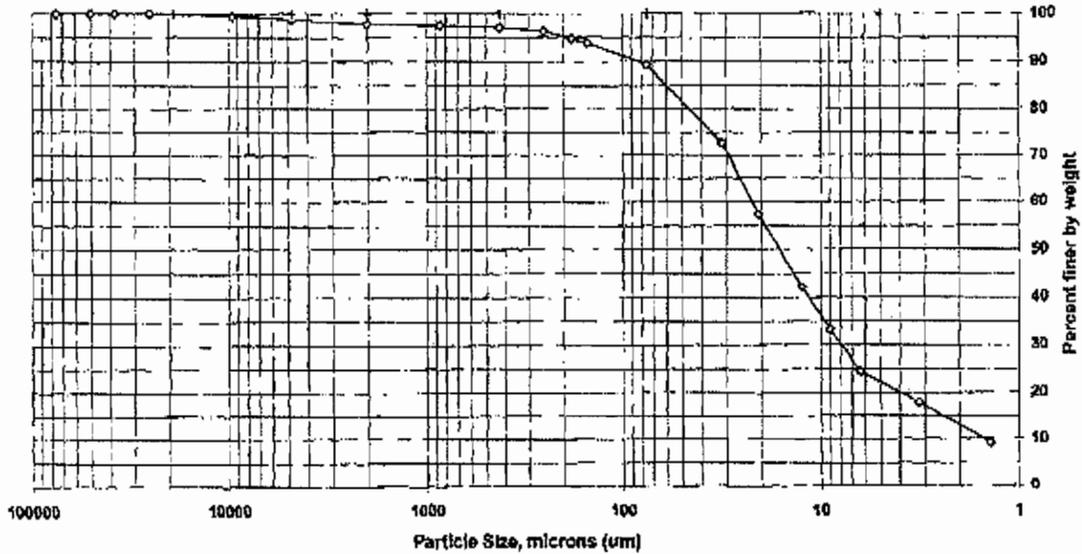
Client Code: STLILC
 Sample ID: WW52 SIDE
 Lab ID: 719372

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 8/31/2007

Percent Solids: 37.2%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: shell, plant
 Shape (> #10): n/a
 Hardness (> #10): n/a



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 99.5 | 0.5 |
| #4 | 4750 | 98.9 | 0.7 |
| #10 | 2000 | 97.9 | 1.0 |
| #20 | 850 | 97.6 | 0.3 |
| #40 | 425 | 97.1 | 0.5 |
| #80 | 250 | 96.3 | 0.8 |
| #80 | 180 | 94.7 | 1.6 |
| #100 | 150 | 94.0 | 0.7 |
| #200 | 75 | 89.4 | 4.6 |
| Hydrometer | 31.4 | 72.8 | 16.8 |
| | 20.7 | 57.4 | 15.4 |
| | 12.4 | 42.1 | 15.4 |
| | 9.0 | 33.3 | 8.8 |
| | 6.3 | 24.5 | 8.8 |
| | 3.2 | 17.9 | 6.6 |
| V | 1.4 | 9.1 | 8.8 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 1.1 |
| Sand | 9.5 |
| Coarse Sand | 1.0 |
| Medium Sand | 0.8 |
| Fine Sand | 7.6 |
| Silt | 64.9 |
| Clay | 24.5 |

Preparation Method: **D2217**
 Dispersion Device: Mechanical mixer with
 a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

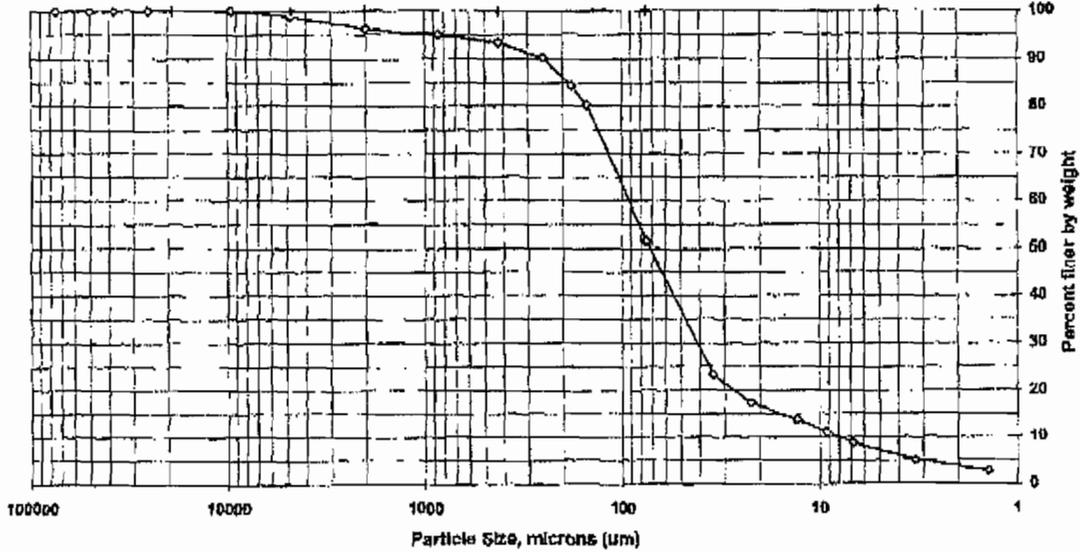
Client Code: STLILC
 Sample ID: WW57 SIDE
 Lab ID: 719373

SDG: 500-5832
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 8/31/2007

Percent Solids: 46.4%
 Specific Gravity: 2.650
 Maximum Particle Size: 9.5 mm

Non-soil material: plant
 Shape (> #10): n/a
 Hardness (> #10): n/a



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 100.0 | 0.0 |
| #4 | 4750 | 98.0 | 1.0 |
| #10 | 2000 | 96.2 | 2.8 |
| #20 | 850 | 95.1 | 1.1 |
| #40 | 425 | 93.3 | 1.8 |
| #60 | 250 | 90.3 | 3.0 |
| #80 | 180 | 84.3 | 6.0 |
| #100 | 150 | 80.2 | 4.1 |
| #200 | 75 | 51.5 | 28.7 |
| Hydrometer | 34.1 | 23.4 | 28.2 |
| | 22.1 | 17.3 | 6.1 |
| | 12.9 | 13.6 | 3.7 |
| | 9.2 | 11.2 | 2.4 |
| | 6.8 | 8.7 | 2.4 |
| | 3.3 | 5.1 | 3.7 |
| V | 1.4 | 2.6 | 2.4 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 1.0 |
| Sand | 47.5 |
| Coarse Sand | 2.8 |
| Medium Sand | 2.9 |
| Fine Sand | 41.8 |
| Silt | 42.8 |
| Clay | 8.7 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

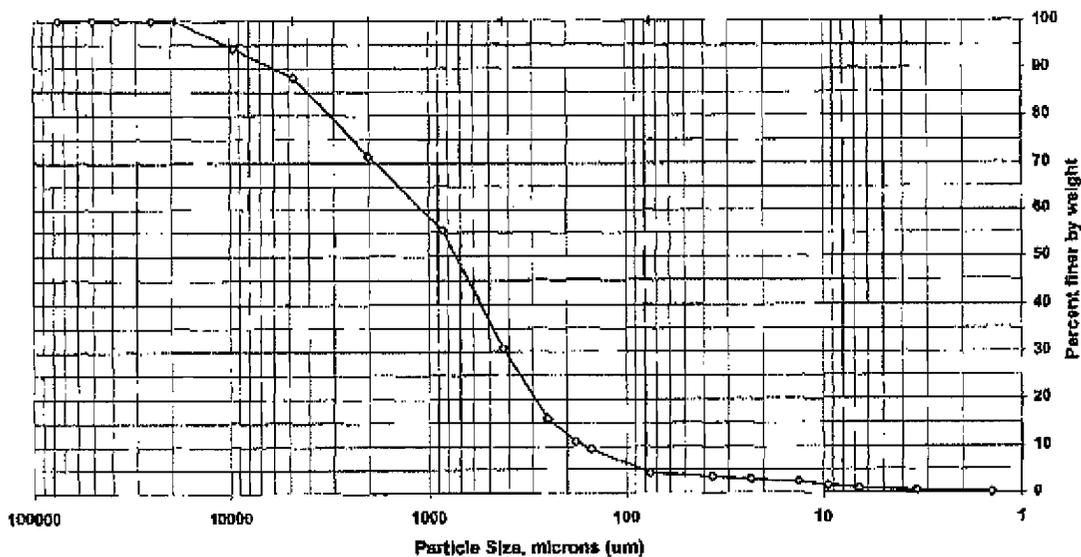
Client Code: STLILC
 Sample ID: WW97 CENTER
 Lab ID: 719374

SDG: 500-6632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 8/31/2007

Percent Solids: 80.2%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: shell, plant
 Shape (> #10): subrounded
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 94.2 | 5.6 |
| #4 | 4750 | 88.1 | 6.1 |
| #10 | 2000 | 71.6 | 16.5 |
| #20 | 850 | 55.5 | 16.0 |
| #40 | 425 | 30.9 | 24.7 |
| #60 | 250 | 15.8 | 15.0 |
| #80 | 180 | 11.1 | 4.7 |
| #100 | 150 | 9.5 | 1.7 |
| #200 | 75 | 4.3 | 5.2 |
| Hydrometer | 36.1 | 3.5 | 0.8 |
| | 23.0 | 3.0 | 0.5 |
| | 13.3 | 2.5 | 0.5 |
| | 9.5 | 1.5 | 1.0 |
| | 6.8 | 1.0 | 0.5 |
| | 3.4 | 0.6 | 0.5 |
| v | 1.4 | 0.1 | 0.5 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 11.9 |
| Sand | 83.8 |
| Coarse Sand | 16.5 |
| Medium Sand | 40.7 |
| Fine Sand | 26.6 |
| Silt | 3.2 |
| Clay | 1.0 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

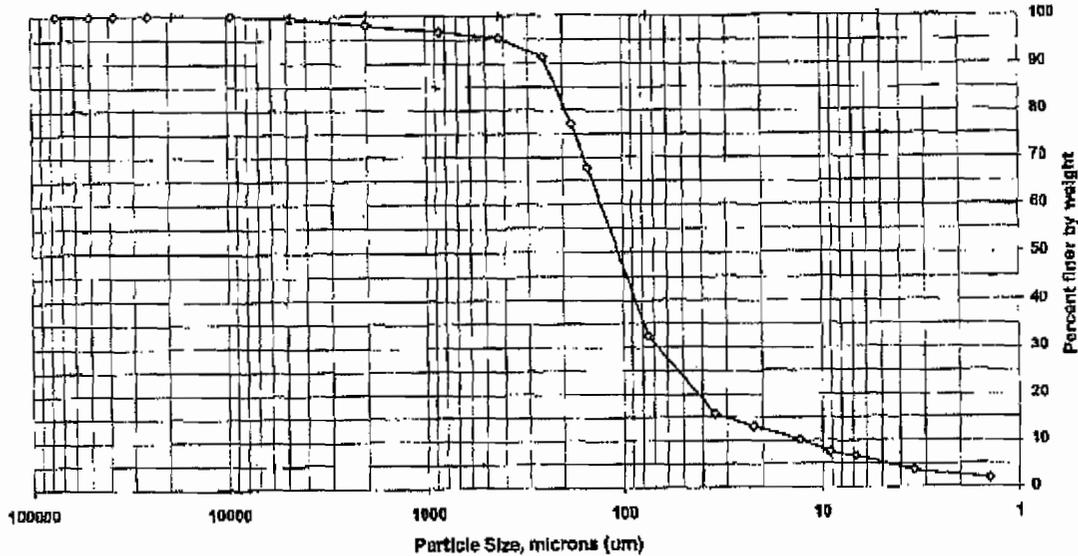
Client Code: STLILC
 Sample ID: WW97 SIDE
 Lab ID: 719375

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 8/31/2007

Percent Solids: 61.5%
 Specific Gravity: 2.650
 Maximum Particle Size: 9.5 mm

Non-soil material: plant
 Shape (> #10): subangular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 100.0 | 0.0 |
| #4 | 4750 | 98.4 | 0.6 |
| #10 | 2000 | 98.0 | 1.4 |
| #20 | 850 | 96.6 | 1.4 |
| #40 | 425 | 95.2 | 1.4 |
| #60 | 250 | 91.4 | 3.8 |
| #80 | 180 | 77.1 | 14.4 |
| #100 | 150 | 67.9 | 9.2 |
| #200 | 75 | 32.5 | 35.3 |
| Hydrometer | 34.4 | 15.8 | 16.8 |
| | 22.1 | 13.0 | 2.8 |
| | 12.9 | 10.3 | 2.8 |
| | 9.1 | 7.5 | 2.8 |
| | 6.8 | 6.6 | 0.9 |
| | 3.4 | 3.7 | 2.9 |
| V | 1.4 | 1.8 | 1.8 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.6 |
| Sand | 88.9 |
| Coarse Sand | 1.4 |
| Medium Sand | 2.8 |
| Fine Sand | 62.7 |
| Silt | 26.0 |
| Clay | 6.6 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

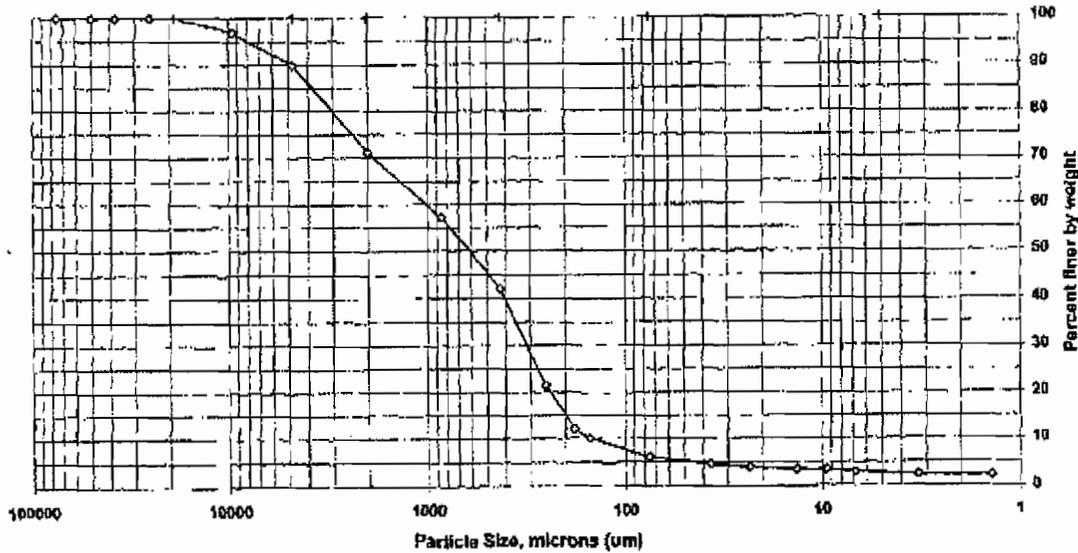
Client Code: STLILC
 Sample ID: WWS4 SIDE
 Lab ID: 719376

SDG: 500-5832
 ETR(s): 12114B

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 9/1/2007

Percent Solids: 86.4%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: shell, plant
 Shape (> #10): subrounded
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 96.9 | 3.1 |
| #4 | 4750 | 89.9 | 7.0 |
| #10 | 2000 | 71.1 | 18.7 |
| #20 | 850 | 57.2 | 13.9 |
| #40 | 425 | 42.1 | 15.1 |
| #60 | 250 | 21.5 | 20.6 |
| #80 | 180 | 12.1 | 9.4 |
| #100 | 150 | 10.1 | 2.0 |
| #200 | 75 | 8.1 | 4.0 |
| Hydrometer | 36.5 | 4.5 | 1.6 |
| | 23.2 | 4.0 | 0.6 |
| | 13.5 | 3.4 | 0.6 |
| | 9.5 | 3.4 | 0.0 |
| | 6.6 | 2.9 | 0.6 |
| | 3.3 | 2.3 | 0.7 |
| V | 1.4 | 2.2 | 0.1 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 10.1 |
| Sand | 83.6 |
| Coarse Sand | 18.7 |
| Medium Sand | 29.1 |
| Fine Sand | 35.9 |
| Silt | 3.2 |
| Clay | 2.9 |

Preparation Method: **D2217**
 Dispersion Device: Mechanical mixer with
 a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

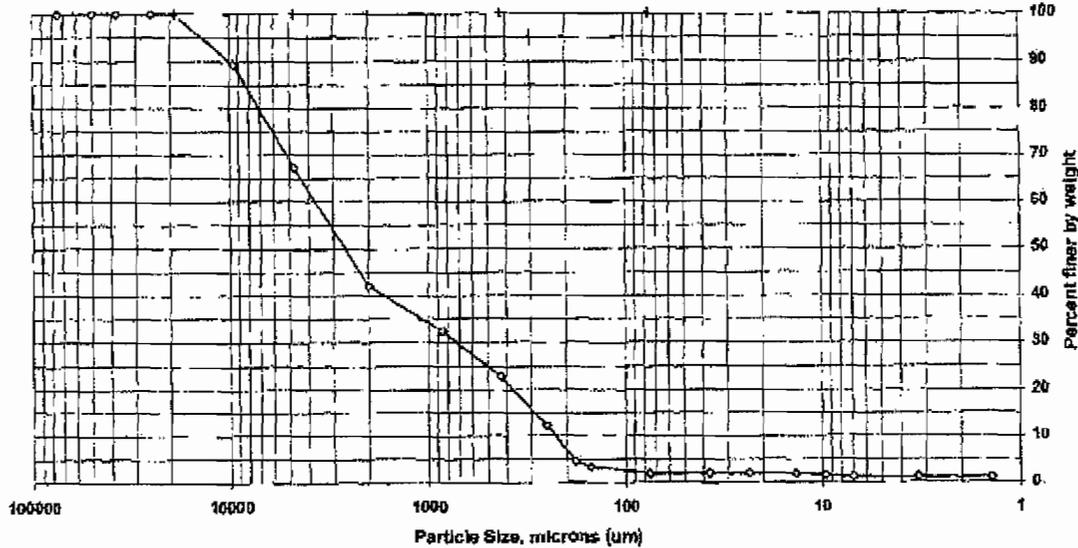
Client Code: STLILC
 Sample ID: WWS4 CENTER
 Lab ID: 719377

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 8/1/2007

Percent Solids: 84.8%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: glass
 Shape (> #10): subrounded
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 89.6 | 10.5 |
| #4 | 4750 | 67.3 | 22.1 |
| #10 | 2000 | 42.1 | 25.2 |
| #20 | 850 | 32.4 | 9.8 |
| #40 | 425 | 22.9 | 9.5 |
| #60 | 250 | 12.2 | 10.8 |
| #80 | 180 | 4.7 | 7.5 |
| #100 | 150 | 3.3 | 1.4 |
| #200 | 75 | 1.9 | 1.4 |
| Hydrometer | 37.0 | 1.9 | 0.0 |
| | 23.4 | 1.9 | 0.0 |
| | 13.5 | 1.9 | 0.0 |
| | 9.5 | 1.8 | 0.4 |
| | 6.9 | 1.2 | 0.4 |
| | 3.3 | 1.2 | 0.0 |
| V | 1.4 | 1.1 | 0.1 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 32.7 |
| Sand | 85.4 |
| Coarse Sand | 25.2 |
| Medium Sand | 19.3 |
| Fine Sand | 20.9 |
| Silt | 0.8 |
| Clay | 1.2 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

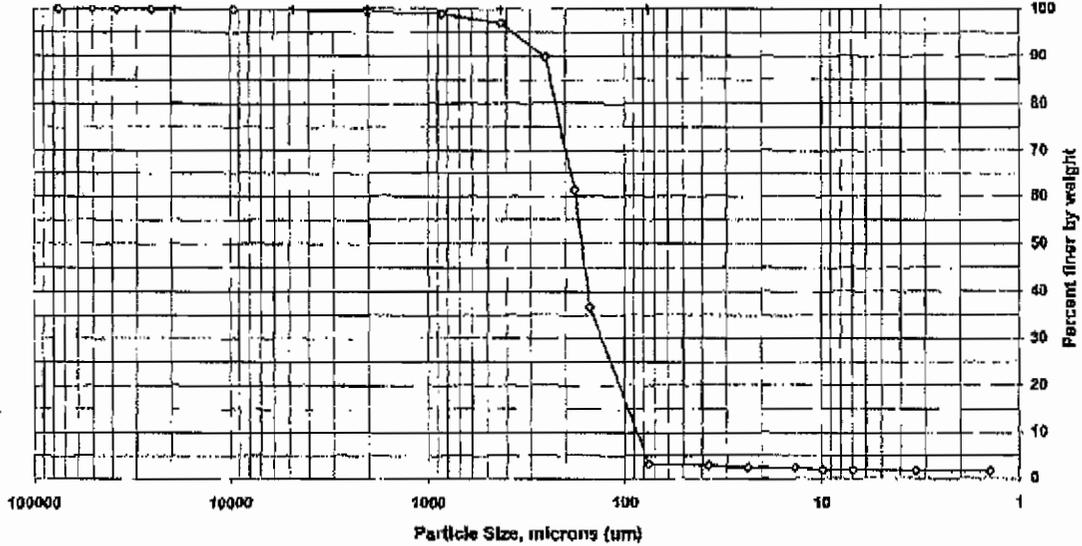
Client Code: STLILC
 Sample ID: WW50 CENTER
 Lab ID: 719378

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 9/1/2007

Percent Solids: 71.6%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: plant, shell
 Shape (> #10): angular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 99.9 | 0.1 |
| #4 | 4750 | 99.8 | 0.1 |
| #10 | 2000 | 99.5 | 0.3 |
| #20 | 850 | 98.9 | 0.5 |
| #40 | 425 | 97.0 | 1.9 |
| #60 | 250 | 89.6 | 7.2 |
| #80 | 180 | 81.4 | 28.4 |
| #100 | 150 | 36.6 | 24.8 |
| #200 | 75 | 3.1 | 33.5 |
| Hydrometer | 37.0 | 2.9 | 0.2 |
| | 23.5 | 2.3 | 0.6 |
| | 13.6 | 2.3 | 0.0 |
| | 9.8 | 1.7 | 0.6 |
| | 6.9 | 1.7 | 0.0 |
| | 3.3 | 1.7 | 0.0 |
| V | 1.4 | 1.6 | 0.1 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.2 |
| Sand | 96.7 |
| Coarse Sand | 0.3 |
| Medium Sand | 2.5 |
| Fine Sand | 93.9 |
| Silt | 1.4 |
| Clay | 1.7 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

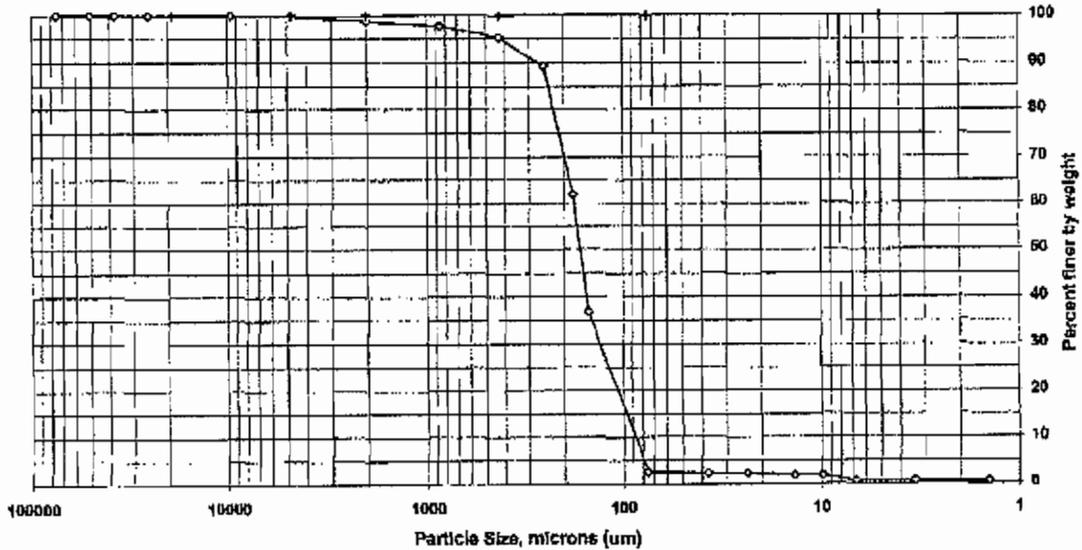
Client Code: STLJLC
 Sample ID: WW50 SIDE
 Lab ID: 719379

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 9/1/2007

Percent Solids: 69.4%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: plant, shell
 Shape (> #10): angular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 99.9 | 0.1 |
| #4 | 4750 | 99.7 | 0.2 |
| #10 | 2000 | 98.8 | 0.9 |
| #20 | 850 | 97.8 | 1.0 |
| #40 | 425 | 95.3 | 2.5 |
| #60 | 250 | 89.2 | 6.1 |
| #80 | 180 | 61.9 | 27.3 |
| #100 | 150 | 38.9 | 25.0 |
| #200 | 75 | 2.7 | 34.2 |
| Hydrometer | 37.2 | 2.4 | 0.3 |
| I | 23.5 | 2.4 | 0.0 |
| I | 13.8 | 1.8 | 0.6 |
| I | 9.8 | 1.8 | 0.0 |
| I | 6.7 | 0.6 | 1.2 |
| I | 3.4 | 0.6 | 0.0 |
| V | 1.4 | 0.5 | 0.1 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.3 |
| Sand | 97.1 |
| Coarse Sand | 0.9 |
| Medium Sand | 3.6 |
| Fine Sand | 92.6 |
| Silt | 2.1 |
| Clay | 0.6 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

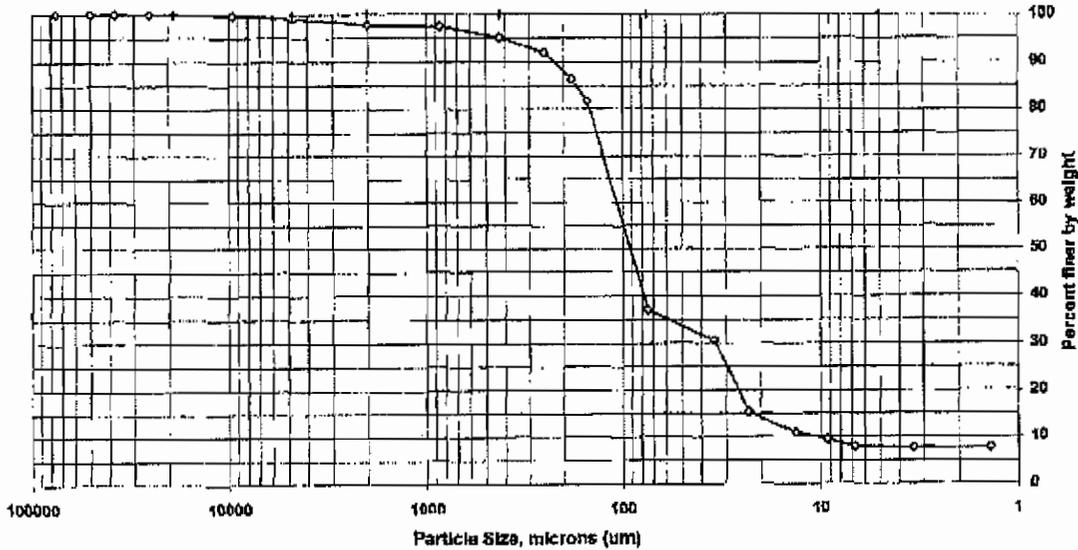
Client Code: STL/C
 Sample ID: WWBB CENTER
 Lab ID: 719380

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 9/1/2007

Percent Solids: 32.5%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: plant, shell
 Shape (> #10): n/a
 Hardness (> #10): n/a



| Sieve size | Particle size, μm | Percent finer | Incremental percent |
|------------|------------------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 99.7 | 0.3 |
| #4 | 4750 | 99.1 | 0.6 |
| #10 | 2000 | 97.7 | 1.4 |
| #20 | 850 | 97.5 | 0.3 |
| #40 | 425 | 95.2 | 2.3 |
| #60 | 250 | 92.0 | 3.2 |
| #80 | 180 | 86.5 | 5.6 |
| #100 | 150 | 81.8 | 4.7 |
| #200 | 75 | 37.1 | 44.6 |
| Hydrometer | 34.4 | 30.7 | 6.5 |
| | 22.9 | 15.3 | 15.3 |
| | 13.3 | 11.0 | 4.3 |
| | 9.3 | 9.5 | 1.5 |
| | 6.7 | 7.9 | 1.5 |
| | 3.4 | 7.7 | 0.3 |
| V | 1.4 | 7.7 | 0.0 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.9 |
| Sand | 62.0 |
| Coarse Sand | 1.4 |
| Medium Sand | 2.5 |
| Fine Sand | 58.1 |
| Silt | 29.2 |
| Clay | 7.9 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

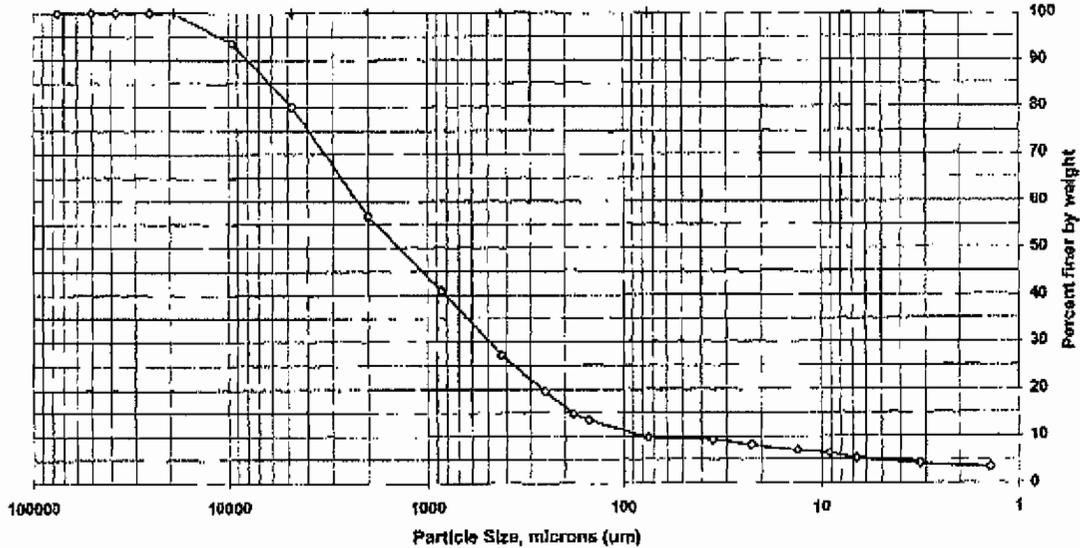
Client Code: STLJC
 Sample ID: WW48 CENTER
 Lab ID: 719382

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 9/1/2007

Percent Solids: 75.6%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: shell, plant
 Shape (> #10): angular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 93.6 | 6.4 |
| #4 | 4750 | 80.0 | 13.6 |
| #10 | 2000 | 66.8 | 23.2 |
| #20 | 850 | 40.8 | 16.0 |
| #40 | 425 | 27.3 | 13.5 |
| #60 | 250 | 19.4 | 7.9 |
| #80 | 180 | 14.7 | 4.7 |
| #100 | 150 | 13.4 | 1.3 |
| #200 | 75 | 9.8 | 3.6 |
| Hydrometer | 35.2 | 9.3 | 0.6 |
| | 22.5 | 8.1 | 1.2 |
| | 13.1 | 7.0 | 1.2 |
| | 8.1 | 6.4 | 0.8 |
| | 6.7 | 5.2 | 1.2 |
| | 3.2 | 4.1 | 1.2 |
| V | 1.4 | 3.4 | 0.7 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 20.0 |
| Sand | 70.2 |
| Coarse Sand | 23.2 |
| Medium Sand | 29.5 |
| Fine Sand | 17.5 |
| Silt | 4.6 |
| Clay | 5.2 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

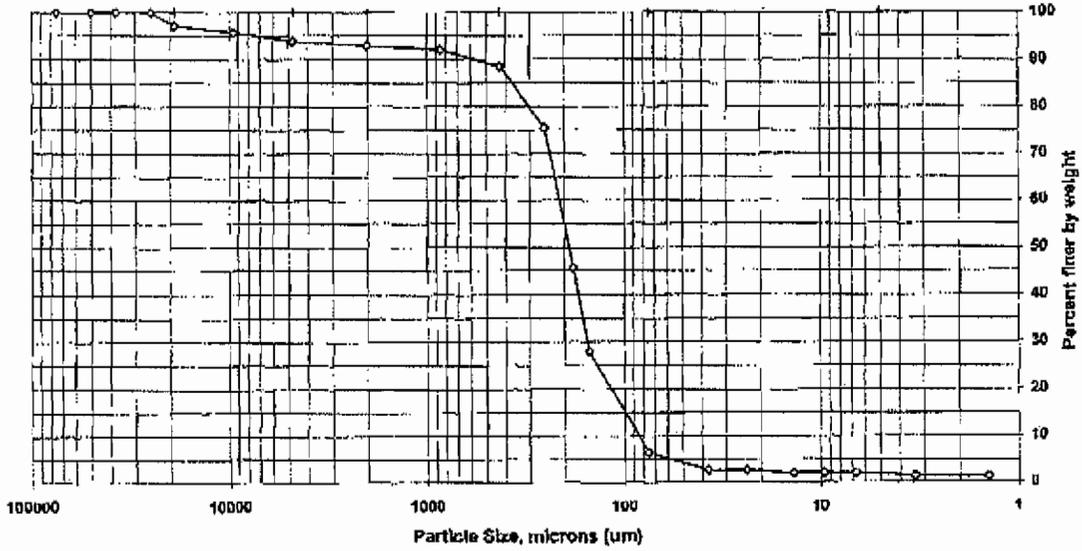
Client Code: STLILC
 Sample ID: WW55 SIDE
 Lab ID: 719384

SDG: 500-5632
 ETR(s): 121146

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 9/1/2007

Percent Solids: 73.7%
 Specific Gravity: 2.850
 Maximum Particle Size: 25 mm

Non-soil material: shell, plant
 Shape (> #10): angular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 97.1 | 2.9 |
| 3/8 inch | 9500 | 95.8 | 1.4 |
| #4 | 4750 | 83.8 | 1.9 |
| #10 | 2000 | 93.0 | 0.9 |
| #20 | 850 | 92.0 | 1.0 |
| #40 | 425 | 88.5 | 3.5 |
| #60 | 250 | 75.4 | 13.1 |
| #80 | 180 | 45.5 | 29.9 |
| #100 | 150 | 28.0 | 17.4 |
| #200 | 75 | 6.4 | 21.6 |
| Hydrometer | 37.2 | 2.5 | 3.8 |
| | 23.5 | 2.6 | 0.0 |
| | 19.6 | 2.0 | 0.7 |
| | 9.8 | 2.0 | 0.0 |
| | 6.7 | 2.0 | 0.0 |
| | 3.3 | 1.3 | 0.7 |
| V | 1.4 | 1.2 | 0.1 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 6.2 |
| Sand | 87.4 |
| Coarse Sand | 0.9 |
| Medium Sand | 4.5 |
| Fine Sand | 82.1 |
| Silt | 4.4 |
| Clay | 2.0 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

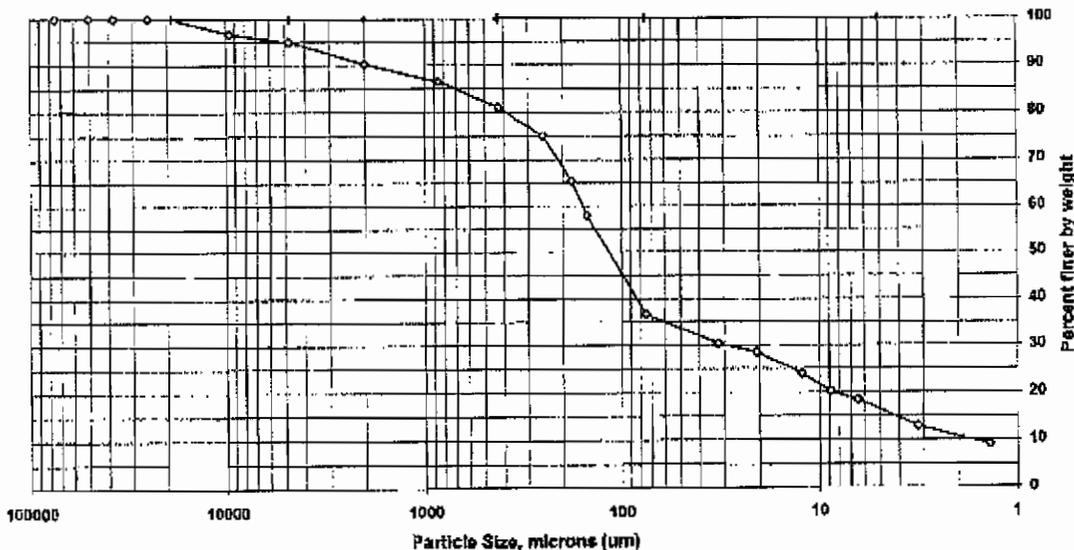
Client Code: STLILC
 Sample ID: WW55 CENTER
 Lab ID: 719385

SDG: 500-5632
 ETR(s): 121148

Date Received: 8/1/2007
 Start Date: 8/7/2007
 End Date: 9/1/2007

Percent Solids: 61.3%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: shell, plant
 Shape (> #10): angular
 Hardness (> #10): hard



| Sieve size | Particle size um | Percent finer | Incremental percent |
|------------|------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 96.7 | 3.3 |
| #4 | 4760 | 95.0 | 1.8 |
| #10 | 2000 | 90.2 | 4.8 |
| #20 | 850 | 66.5 | 3.7 |
| #40 | 425 | 61.1 | 5.4 |
| #80 | 250 | 75.0 | 6.1 |
| #80 | 180 | 65.5 | 9.5 |
| #100 | 150 | 58.0 | 7.5 |
| #200 | 75 | 36.6 | 21.3 |
| Hydrometer | 32.0 | 30.4 | 6.3 |
| | 20.5 | 26.5 | 1.8 |
| | 12.2 | 23.9 | 4.6 |
| | 8.8 | 20.2 | 3.7 |
| | 6.5 | 18.4 | 1.8 |
| | 3.2 | 12.9 | 5.5 |
| V | 1.4 | 9.0 | 3.8 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 5.0 |
| Sand | 58.3 |
| Coarse Sand | 4.6 |
| Medium Sand | 9.1 |
| Fine Sand | 44.5 |
| Silt | 18.2 |
| Clay | 18.4 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute



Sample Handling

**STL BURLINGTON
SAMPLE RECEIPT & LOG IN CHECKLIST**

| | | |
|--|-------------------------------|---------------------------------------|
| Client: <u>STLILC</u> | Date Received: <u>8/11/07</u> | Log In Date: <u>8/11/07</u> |
| ETR: <u>121148</u> | Time Received: <u>1530</u> | By: <u>JS</u> |
| SDG: <u>500-5632</u> | Received By: <u>LR</u> | Signature: <u>Jessica Burtfall</u> |
| Project: <u>27007</u> | # Coolers Received: <u>1</u> | PM Signature: <u>Jonathan Newkirk</u> |
| Samples Delivered By: <input checked="" type="checkbox"/> Shipping Service <input type="checkbox"/> Courier <input type="checkbox"/> Hand <input type="checkbox"/> Other (specify) | | Date: <u>8/11/07</u> |
| List Air bill Number(s) or Attach a photocopy of the Air Bill: | | |

| COOLER SCREEN | YES | NO | NA | COMMENTS |
|---|-------------------------------------|----|----|---------------|
| There is <i>no</i> evidence to indicate tampering | <input checked="" type="checkbox"/> | | | |
| Custody seals are present and intact | <input checked="" type="checkbox"/> | | | |
| Custody seal numbers are present | <input checked="" type="checkbox"/> | | | |
| If yes, list custody seal numbers: | | | | <u>966326</u> |

Thermal Preservation Type: Wet Ice Blue Ice None Other (specify)

IR Gun ID: 62 Correction Factor (CF) = 0 °C

| | | | |
|-------------------------|-----------|-----------|-----------|
| Cooler 1: <u>5.7</u> °C | Cooler 6 | Cooler 11 | Cooler 16 |
| Cooler 2: | Cooler 7 | Cooler 12 | Cooler 17 |
| Cooler 3: | Cooler 8 | Cooler 13 | Cooler 18 |
| Cooler 4: | Cooler 9 | Cooler 14 | Cooler 19 |
| Cooler 5 | Cooler 10 | Cooler 15 | Cooler 20 |

Unless otherwise documented, the recorded temperature readings are adjusted readings to account for the CF of the IR Gun
 EPA Criteria: 0-6°C, except for air and geo samples which should be at ambient temperature and tissue samples, which may be frozen.
 Some clients require thermal preservation criteria of 2-4°C or other such criteria. The PM must notify SM when alternate criteria is specified.

| SAMPLE CONDITION | YES | NO | NA | COMMENTS |
|---|-------------------------------------|----|----|----------|
| Sample containers were received intact | <input checked="" type="checkbox"/> | | | |
| Legible sample labels are affixed to each container | <input checked="" type="checkbox"/> | | | |

| CHAIN OF CUSTODY (COC) | YES | NO | NA | COMMENTS |
|---|-------------------------------------|-------------------------------------|-------------------------------------|----------|
| COC is present and includes the following information for each container: | | | | |
| • Sample ID / Sample Description | <input checked="" type="checkbox"/> | | | |
| • Date of Sample Collection | <input checked="" type="checkbox"/> | | | |
| • Time of Sample Collection | <input checked="" type="checkbox"/> | | | |
| • Identification of the Sampler | <input checked="" type="checkbox"/> | | | |
| • Preservation Type | | <input checked="" type="checkbox"/> | | |
| • Requested Tests Method(s) | <input checked="" type="checkbox"/> | | | |
| • Necessary Signatures | <input checked="" type="checkbox"/> | | | |
| Internal Chain of Custody (ICOC) Required | | <input checked="" type="checkbox"/> | | |
| If yes to above, ICOC Record initiated for every Worksheet | | | <input checked="" type="checkbox"/> | |

| SAMPLE INTEGRITY / USABILITY | YES | NO | NA | COMMENTS |
|---|-------------------------------------|-------------------------------------|-------------------------------------|------------------|
| The sample container matches the COC | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | <u>see below</u> |
| Appropriate sample containers were received for the tests requested | <input checked="" type="checkbox"/> | | | |
| Samples were received within holding time | <input checked="" type="checkbox"/> | | | |
| Sufficient amount of sample is provided for requested analyses | <input checked="" type="checkbox"/> | | | |
| VOA vials do not have headspace or a bubble >6mm (1/4" diameter) | | | <input checked="" type="checkbox"/> | |
| Appropriate preservatives were used for the tests requested | | | <input checked="" type="checkbox"/> | |
| pH of inorganic samples checked and is within method specification | | | <input checked="" type="checkbox"/> | |
| If no, attach Inorganic Sample pH Adjustment Form | | | | |

ANOMALY / CONC. SUMMARY

**Samples 719378 and 719379 were listed twice on the COC w/ a client ID of "WLUSS side" and "WLUSS center". The second listing of this sample was actually supposed to be "WLUSS side" and "WLUSS center" as these samples were NOT on the COC @ all. WLUSS side / WLUSS center were logged in as such w/ the lab #s 719384, 719385. as per Bonni @ STL Chicago*



Last Page of this Document

ANALYTICAL REPORT

Job Number: 500-5800-2

Job Description: MWRD Sediment

For:

Metro Water Reclamation Dist of Chicago
6001 W. Pershing Road
Cicero, IL 60804

Attention: Jennifer Wasik



Bonnie M Stadelmann
Project Manager II
bstadelmann@stl-inc.com
09/10/2007

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the TestAmerica Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be

TestAmerica Laboratories, Inc.

TestAmerica Chicago 2417 Bond Street, University Park, IL 60466

Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com



**STL Burlington
South Burlington, VT**

**Sample Data Summary
Package**

SDG: 5005800

| | |
|--|-----------|
| Case Narrative | 1 |
| Chain of Custody | 2 |
| Sample Data Summary Package - Geotechnical..... | 5 |
| Sample Handling..... | 14 |
| Last Page of this Document..... | 17 |



Case Narrative

September 10, 2007

STL

Ms. Bonnie Stadelmann
TestAmerica
2417 Bond Street
University Park, IL 60466

STL Burlington
30 Community Drive, Suite 11
South Burlington, VT 05403

Tel: 802 660 1990 Fax: 802 660 1919
www.stl-inc.com

Re: Laboratory Project No. 27002
Case: MWRDGC; SDG: 5005800

Dear Ms. Stadelmann:

Enclosed are the analytical results for the samples that were received by TestAmerica Burlington on August 9th, 2007. Laboratory identification numbers were assigned, and designated as follows:

| <u>Lab ID</u> | <u>Client Sample ID</u> | <u>Sample Date</u> | <u>Sample Matrix</u> |
|-----------------------------------|-------------------------|--------------------|----------------------|
| Received: 08/09/07 ETR No: 121281 | | | |
| 720159 | WW56 SIDE-INDIANA | 07/30/07 | SEDIMENT |
| 720160 | WW56 CENTER-INDIANA | 07/30/07 | SEDIMENT |
| 720161 | WW76 SIDE-HALSTED | 07/31/07 | SEDIMENT |
| 720162 | WW76 CENTER-HALSTED | 07/31/07 | SEDIMENT |
| 720163 | WW58 SIDE-ASHLAND | 08/01/07 | SEDIMENT |
| 720164 | WW58 CENTER-ASHLAND | 08/01/07 | SEDIMENT |
| 720165 | WW59 CENTER-CICERO | 08/02/07 | SEDIMENT |
| 720166 | WW59 SIDE-CICERO | 08/02/07 | SEDIMENT |

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

Particle Size Analysis by ASTM D422

There were no exceptions to the method quality control criteria during the analyses of these samples.

The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,



Kristine A. Dusablon
Project Manager

Enclosure



Chain of Custody



Sample Data Summary Package - Geotechnical

Particle Size of Soils by ASTM D422

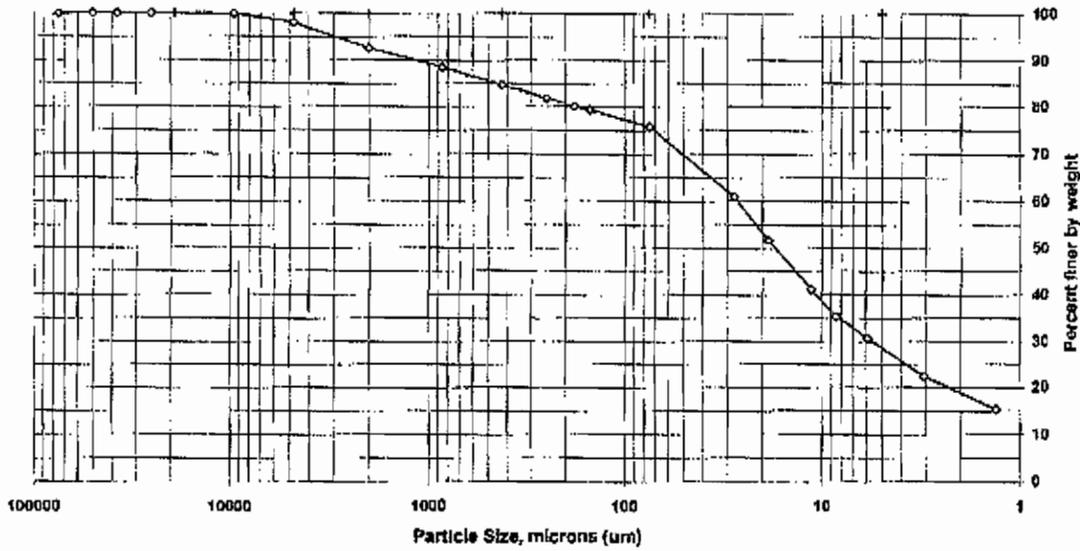
Client Code: STLJLC
 Sample ID: WW56 CENTER-INDIANA
 Lab ID: 720160

SDG: 5005800
 ETR(s): 121281

Date Received: 8/9/2007
 Start Date: 8/14/2007
 End Date: 9/7/2007

Percent Solids: 47.4%
 Specific Gravity: 2.650
 Maximum Particle Size: 9.5 mm

Non-soil material: shell, plant
 Shape (> #10): subrounded
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 100.0 | 0.0 |
| #4 | 4750 | 98.1 | 1.9 |
| #10 | 2000 | 92.6 | 5.5 |
| #20 | 850 | 88.5 | 4.2 |
| #40 | 425 | 84.6 | 3.8 |
| #60 | 250 | 82.0 | 2.7 |
| #80 | 180 | 80.2 | 1.8 |
| #100 | 150 | 79.4 | 0.8 |
| #200 | 75 | 75.8 | 3.6 |
| Hydrometer | 27.8 | 61.0 | 14.6 |
| | 18.8 | 51.7 | 9.3 |
| | 11.4 | 41.2 | 10.5 |
| | 8.5 | 35.4 | 5.8 |
| | 5.9 | 30.7 | 4.7 |
| | 3.1 | 22.5 | 8.2 |
| V | 1.3 | 15.3 | 7.2 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 1.9 |
| Sand | 22.2 |
| Coarse Sand | 5.5 |
| Medium Sand | 8.0 |
| Fine Sand | 8.8 |
| Silt | 45.1 |
| Clay | 30.7 |

Preparation Method: **D2217**
 Dispersion Device: Mechanical mixer with
 a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

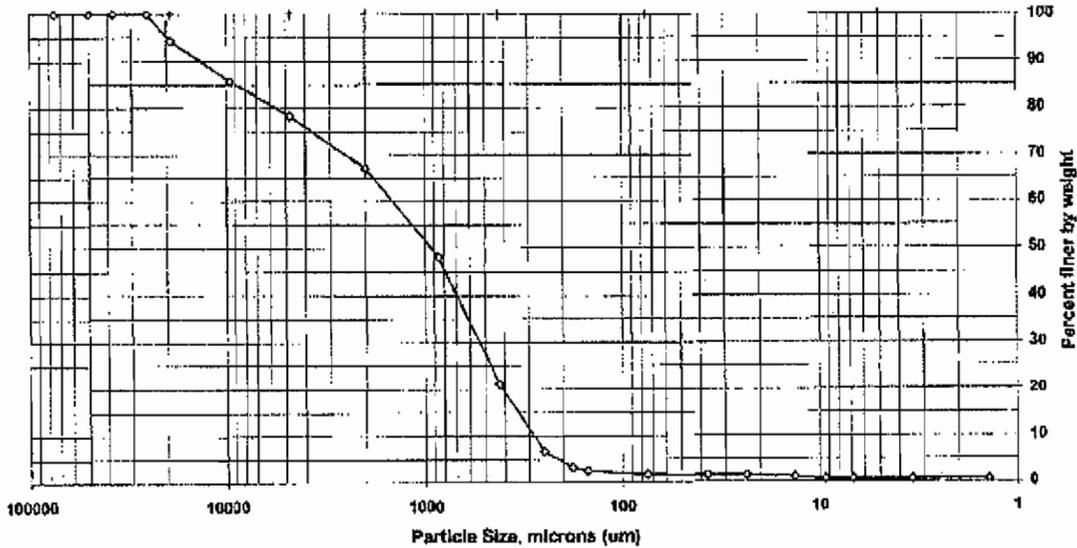
Client Code: STLILC
 Sample ID: WW76 SIDE-HALSTED
 Lab ID: 720161

SDG: 5005800
 ETR(s): 121281

Date Received: 8/8/2007
 Start Date: 8/14/2007
 End Date: 9/7/2007

Percent Solids: 79.5%
 Specific Gravity: 2.650
 Maximum Particle Size: 25 mm

Non-soil material: shell, glass
 Shape (> #10): angular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 94.3 | 5.7 |
| 3/8 inch | 9500 | 85.8 | 8.5 |
| #4 | 4750 | 78.4 | 7.4 |
| #10 | 2000 | 67.1 | 11.3 |
| #20 | 850 | 48.1 | 19.0 |
| #40 | 425 | 21.1 | 26.9 |
| #60 | 250 | 6.7 | 14.4 |
| #80 | 180 | 3.1 | 3.6 |
| #100 | 150 | 2.4 | 0.7 |
| #200 | 75 | 1.7 | 0.7 |
| Hydrometer | 36.9 | 1.5 | 0.2 |
| | 23.3 | 1.5 | 0.0 |
| | 13.5 | 1.1 | 0.5 |
| | 9.5 | 0.6 | 0.5 |
| | 6.8 | 0.6 | 0.0 |
| | 3.4 | 0.5 | 0.1 |
| V | 1.4 | 0.5 | 0.0 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 21.6 |
| Sand | 76.7 |
| Coarse Sand | 11.3 |
| Medium Sand | 45.9 |
| Fine Sand | 19.5 |
| Silt | 1.1 |
| Clay | 0.6 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

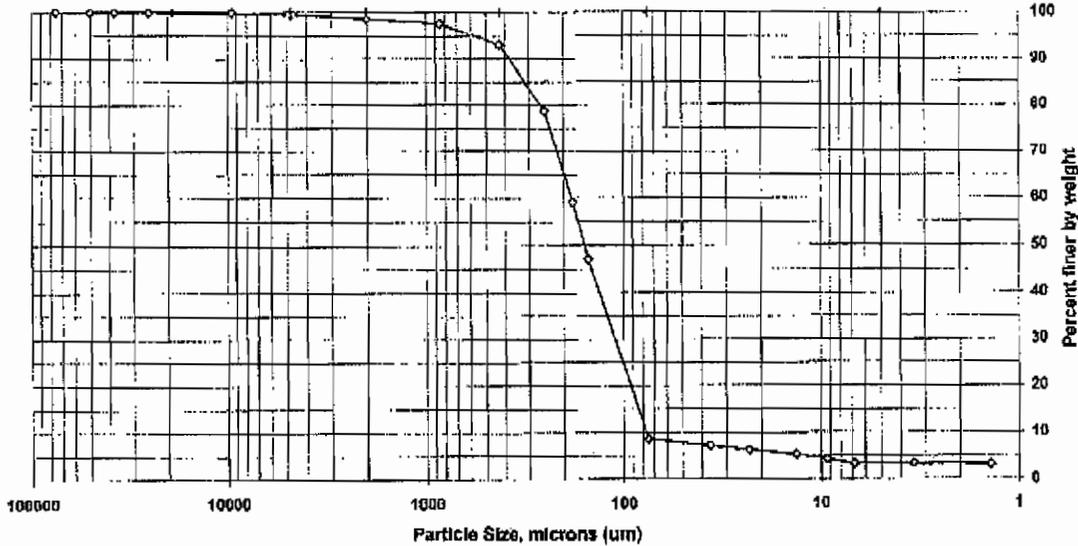
Client Code: STLILC
 Sample ID: WW76 CENTER-HALSTED
 Lab ID: 720162

SDG: 5005800
 ETR(s): 121281

Date Received: 8/9/2007
 Start Date: 8/14/2007
 End Date: 8/7/2007

Percent Solids: 64.5%
 Specific Gravity: 2.650
 Maximum Particle Size: 9.5 mm

Non-soil material: shell, plant
 Shape (> #10): subrounded
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 100.0 | 0.0 |
| #4 | 4750 | 99.5 | 0.5 |
| #10 | 2000 | 98.6 | 0.9 |
| #20 | 850 | 97.6 | 1.0 |
| #40 | 425 | 93.0 | 4.5 |
| #60 | 250 | 78.8 | 14.4 |
| #80 | 180 | 59.1 | 19.5 |
| #100 | 150 | 47.1 | 12.1 |
| #200 | 75 | 8.6 | 38.4 |
| Hydrometer | 36.2 | 7.2 | 1.4 |
| | 23.0 | 6.3 | 1.0 |
| | 13.4 | 5.3 | 1.0 |
| | 9.3 | 4.3 | 1.0 |
| | 6.8 | 3.3 | 1.0 |
| | 3.4 | 3.3 | 0.0 |
| V | 1.4 | 3.1 | 0.2 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.5 |
| Sand | 90.9 |
| Coarse Sand | 0.9 |
| Medium Sand | 5.8 |
| Fine Sand | 84.4 |
| Silt | 5.3 |
| Clay | 3.3 |

Preparation Method: **D2217**
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

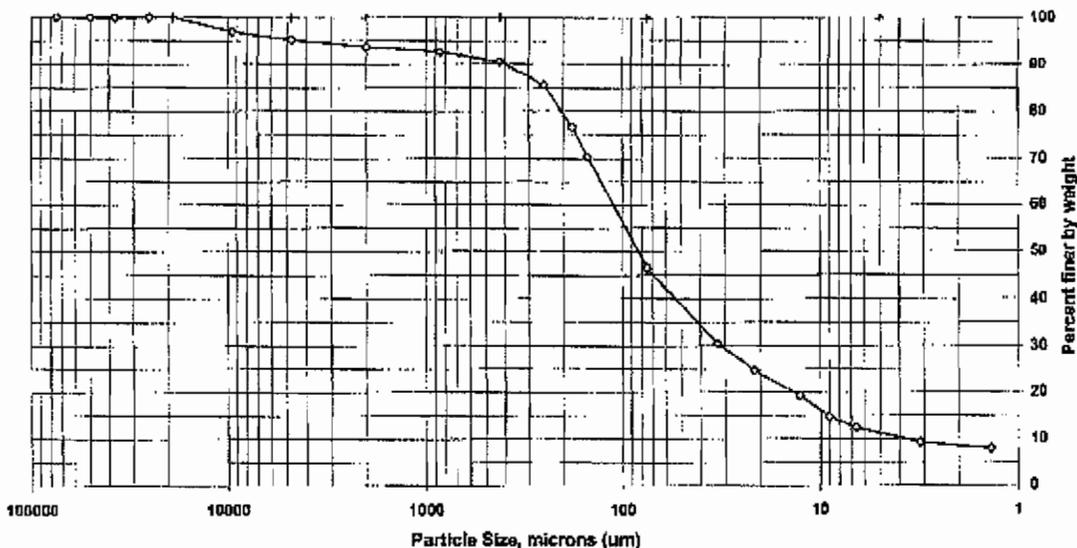
Client Code: STLILC
 Sample ID: WWS8 SIDE-ASHLAND
 Lab ID: 72D163

SDG: 5005800
 ETR(s): 121281

Date Received: 8/9/2007
 Start Date: 8/14/2007
 End Date: 9/7/2007

Percent Solids: 54.9%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-solid material: shell, plant
 Shape (> #10): subangular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 96.9 | 3.1 |
| #4 | 4750 | 95.3 | 1.6 |
| #10 | 2000 | 93.7 | 1.6 |
| #20 | 850 | 92.7 | 1.0 |
| #40 | 425 | 90.6 | 2.1 |
| #60 | 250 | 85.6 | 5.0 |
| #80 | 180 | 76.7 | 8.9 |
| #100 | 150 | 70.5 | 6.2 |
| #200 | 75 | 46.5 | 23.9 |
| Hydrometer | 32.8 | 30.5 | 16.0 |
| | 21.4 | 24.8 | 5.8 |
| | 12.7 | 19.2 | 5.6 |
| | 9.0 | 14.7 | 4.5 |
| | 6.8 | 12.5 | 2.2 |
| | 3.1 | 9.3 | 3.2 |
| V | 1.4 | 6.0 | 1.3 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 4.7 |
| Sand | 48.8 |
| Coarse Sand | 1.6 |
| Medium Sand | 3.1 |
| Fine Sand | 44.1 |
| Silt | 34.0 |
| Clay | 12.5 |

Preparation Method: **D2217**
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

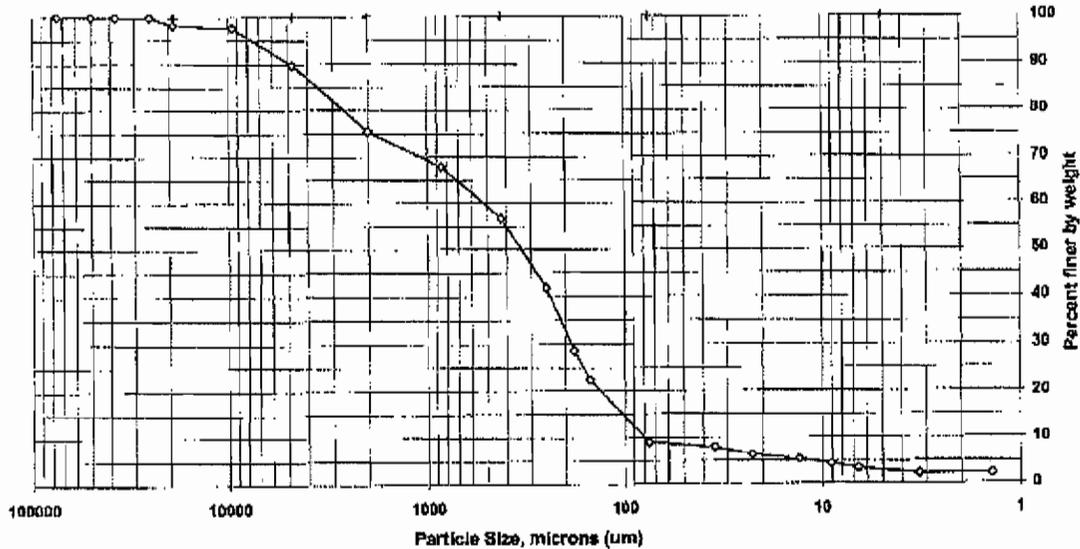
Client Code: STLJLC
 Sample ID: WW58 CENTER-ASHLAND
 Lab ID: 720164

SDG: 5005800
 ETR(s): 121281

Date Received: 8/9/2007
 Start Date: 8/14/2007
 End Date: 9/7/2007

Percent Solids: 68.2%
 Specific Gravity: 2.650
 Maximum Particle Size: 25 mm

Non-soil material: shell, plant
 Shape (> #10): subrounded
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 98.3 | 1.7 |
| 3/8 inch | 9500 | 97.7 | 0.6 |
| #4 | 4750 | 89.8 | 7.9 |
| #10 | 2000 | 75.5 | 14.3 |
| #20 | 850 | 68.0 | 7.5 |
| #40 | 425 | 56.8 | 11.2 |
| #60 | 250 | 41.8 | 15.0 |
| #80 | 180 | 28.7 | 13.1 |
| #100 | 150 | 22.5 | 6.2 |
| #200 | 75 | 8.9 | 13.5 |
| Hydrometer | 34.9 | 7.9 | 1.0 |
| | 22.4 | 6.4 | 1.6 |
| | 13.1 | 5.4 | 1.0 |
| | 9.0 | 4.3 | 1.0 |
| | 6.6 | 3.3 | 1.0 |
| | 3.2 | 2.2 | 1.1 |
| V | 1.4 | 2.2 | 0.0 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 10.2 |
| Sand | 80.8 |
| Coarse Sand | 14.3 |
| Medium Sand | 18.7 |
| Fine Sand | 47.8 |
| Silt | 5.7 |
| Clay | 3.3 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

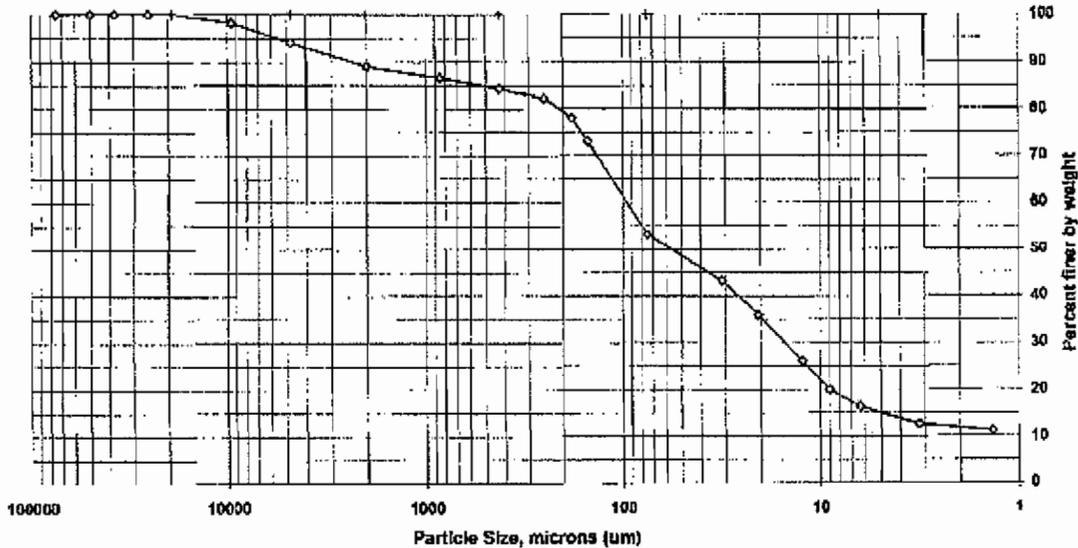
Client Code: STLILC
 Sample ID: WWS9 CENTER-CICERO
 Lab ID: 720185

SDG: 5005800
 ETR(s): 121281

Date Received: 8/8/2007
 Start Date: 8/14/2007
 End Date: 8/7/2007

Percent Solids: 49.4%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: shell, plant
 Shape (> #10): subrounded
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 98.1 | 1.9 |
| #4 | 4750 | 94.1 | 4.0 |
| #10 | 2000 | 89.1 | 5.1 |
| #20 | 850 | 86.7 | 2.3 |
| #40 | 425 | 84.5 | 2.2 |
| #60 | 250 | 82.3 | 2.2 |
| #80 | 180 | 78.0 | 4.3 |
| #100 | 150 | 73.1 | 4.9 |
| #200 | 75 | 63.2 | 19.9 |
| Hydrometer | 31.3 | 43.3 | 9.8 |
| | 20.5 | 35.9 | 7.4 |
| | 12.4 | 26.1 | 9.8 |
| | 9.0 | 20.0 | 6.1 |
| | 6.3 | 16.3 | 3.7 |
| | 3.2 | 12.7 | 3.7 |
| V | 1.4 | 11.2 | 1.4 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 5.9 |
| Sand | 40.9 |
| Coarse Sand | 5.1 |
| Medium Sand | 4.6 |
| Fine Sand | 31.3 |
| Silt | 36.9 |
| Clay | 16.3 |

Preparation Method: D2217
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

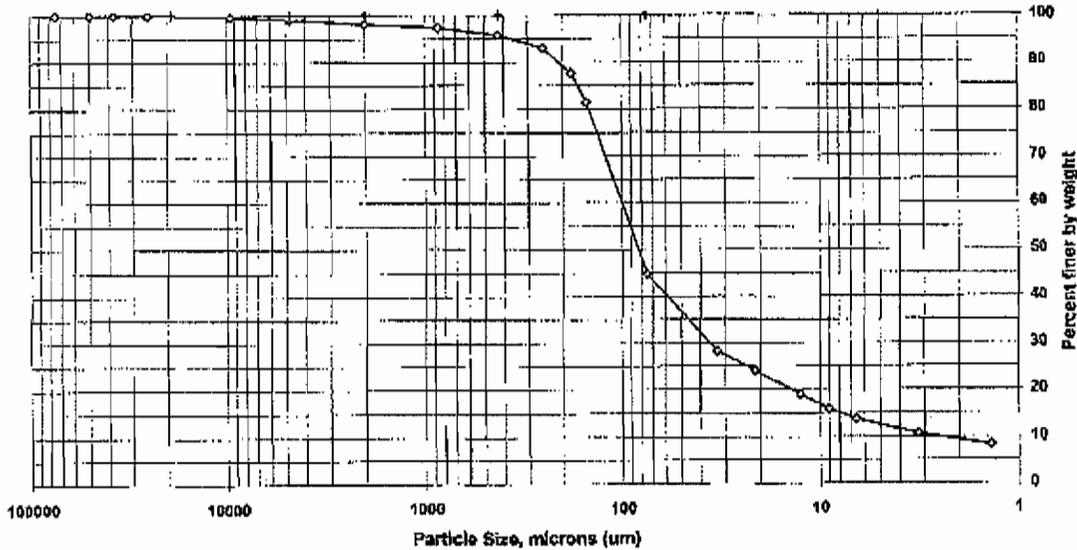
Client Code: STLILG
 Sample ID: WW59 SIDE-CICERO
 Lab ID: 720166

SDG: 5005800
 ETR(n): 121261

Date Received: 8/9/2007
 Start Date: 8/14/2007
 End Date: 9/7/2007

Percent Solids: 55.9%
 Specific Gravity: 2.650
 Maximum Particle Size: 19 mm

Non-soil material: shell, plant
 Shape (> #10): subangular
 Hardness (> #10): hard



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 18000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 99.7 | 0.3 |
| #4 | 4750 | 99.1 | 0.5 |
| #10 | 2000 | 98.2 | 1.0 |
| #20 | 850 | 97.4 | 0.8 |
| #40 | 425 | 95.8 | 1.6 |
| #60 | 250 | 93.0 | 2.8 |
| #80 | 180 | 87.5 | 5.5 |
| #100 | 150 | 81.4 | 6.1 |
| #200 | 75 | 44.9 | 36.5 |
| Hydrometer | 32.0 | 26.2 | 16.7 |
| | 21.2 | 24.1 | 4.1 |
| | 12.5 | 18.9 | 5.2 |
| | 9.0 | 15.8 | 3.1 |
| | 6.6 | 13.8 | 2.1 |
| | 3.2 | 10.7 | 3.1 |
| V | 1.4 | 8.4 | 2.2 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.9 |
| Sand | 54.2 |
| Coarse Sand | 1.0 |
| Medium Sand | 2.4 |
| Fine Sand | 50.9 |
| Silt | 31.1 |
| Clay | 13.8 |

Preparation Method: D2717
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute



Sample Handling

ORIGIN ID: JQTR (703) 534-5200
BOTTLE PREP
SEVERN TREAT SERVICES
2413 BOND ST

Ship Date: 09AUG07
Ac/Wgt: 34.8 LB WGN
System#: 0093264/CAPE2300
Account: S 137134929

UNIVERSITY PARK, IL 60466
UNITED STATES US

TO SAMPLE RECEIVING
STL BURLINGTON
30 COMMUNITY DRIVE
SUITE 11
SOUTH BURLINGTON, VT 05403

(802) 650-1990

FedEx
Express



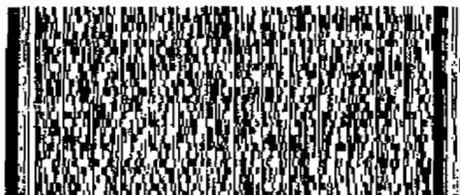
REF: 505-5680

PO:

INV:

Dept: FR

DELIVERY ADDRESS: 30 COMMUNITY DRIVE SUITE 11 SOUTH BURLINGTON VT 05403



Delivery Address
Barcode

BILL SENDER

PRIORITY OVERNIGHT

TRK# 6687 6564 4997 Form 8201

THU
Deliver By:
09AUG07

BTV AA

05403 -VT-US

XH BTVA



*5160 6016/8
8/9/07 0915
M J M*

**STL BURLINGTON
SAMPLE RECEIPT & LOG IN CHECKLIST**

| | | |
|--|-------------------------------|----------------------------------|
| Client: STL ILC | Date Received: 8/19/07 | Log In Date: 8/19/07 |
| ETR: 121281 | Time Received: 1515 | By: JEC |
| SDG: 5005800 | Received By: JEC | Signature: <i>[Signature]</i> |
| Project: 27002 | # Coolers Received: 1 | PM Signature: <i>[Signature]</i> |
| Samples Delivered By: <input checked="" type="checkbox"/> Shipping Service <input type="checkbox"/> Courier <input type="checkbox"/> Hand <input type="checkbox"/> Other (specify) | | Date: 8/12/07 |
| List Air bill Number(s) or Attach a photocopy of the Air Bill: | | |

| COOLER SCREEN | YES | NO | NA | COMMENTS |
|--|-------------------------------------|----|----|----------|
| There is no evidence to indicate tampering | <input checked="" type="checkbox"/> | | | |
| Custody seals are present and intact | <input checked="" type="checkbox"/> | | | |
| Custody seal numbers are present | <input checked="" type="checkbox"/> | | | |
| If yes, list custody seal numbers: | 9160788 | | | |

Thermal Preservation Type: Wet Ice Blue Ice None Other (specify)

IR Gun ID: **62** Correction Factor (CF) = **5** °C

| | | | |
|-------------------------|-----------|-----------|-----------|
| Cooler 1: 2.5 °C | Cooler 6 | Cooler 11 | Cooler 16 |
| Cooler 2 | Cooler 7 | Cooler 12 | Cooler 17 |
| Cooler 3 | Cooler 8 | Cooler 13 | Cooler 18 |
| Cooler 4 | Cooler 9 | Cooler 14 | Cooler 19 |
| Cooler 5 | Cooler 10 | Cooler 15 | Cooler 20 |

Unless otherwise documented, the recorded temperature readings are adjusted readings to account for the CF of the IR Gun
 EPA Criteria: 0.6°C, except for air and geo samples which should be at ambient temperature and tissue samples, which may be frozen.
 Some clients require thermal preservation criteria of 2.4°C or other such criteria. The PM must notify SM when alternate criteria is specified.

| SAMPLE CONDITION | YES | NO | NA | COMMENTS |
|---|-------------------------------------|----|----|----------|
| Sample containers were received intact | <input checked="" type="checkbox"/> | | | |
| Legible sample labels are affixed to each container | <input checked="" type="checkbox"/> | | | |

| CHAIN OF CUSTODY (COC) | YES | NO | NA | COMMENTS |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-----------|
| COC is present and includes the following information for each container: | | | | |
| • Sample ID / Sample Description | <input checked="" type="checkbox"/> | | | See below |
| • Date of Sample Collection | <input checked="" type="checkbox"/> | | | |
| • Time of Sample Collection | <input checked="" type="checkbox"/> | | | See below |
| • Identification of the Sampler | <input checked="" type="checkbox"/> | | | |
| • Preservation Type | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| • Requested Tests Method(s) | <input checked="" type="checkbox"/> | | | |
| • Necessary Signatures | <input checked="" type="checkbox"/> | | | |
| Internal Chain of Custody (ICOC) Required | | <input checked="" type="checkbox"/> | | |
| If yes to above, ICOC Record Initiated for every Worksheet | | | <input checked="" type="checkbox"/> | |

| SAMPLE INTEGRITY /USABILITY | YES | NO | NA | COMMENTS |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-----------|
| The sample container matches the COC | | <input checked="" type="checkbox"/> | | See below |
| Appropriate sample containers were received for the tests requested | <input checked="" type="checkbox"/> | | | |
| Samples were received within holding time | <input checked="" type="checkbox"/> | | | |
| Sufficient amount of sample is provided for requested analyses | <input checked="" type="checkbox"/> | | | |
| VOA vials do not have headspace or a bubble >6mm (1/4" diameter) | | | <input checked="" type="checkbox"/> | |
| Appropriate preservatives were used for the tests requested | | | <input checked="" type="checkbox"/> | |
| pH of inorganic samples checked and is within method specification | | | <input checked="" type="checkbox"/> | |
| If no, attach Inorganic Sample pH Adjustment Form | | | <input checked="" type="checkbox"/> | |

ANOMALY/NCR SUMMARY

COC not relinquished to STLVT/TAVT, COC signed by TAL on 08/07/07 @ 1027 on 1st page of COC and on 08/08/07 @ 1027 on 2nd page. Multiple inconsistencies between COC and sample container labels. Used COC at login.



Last Page of this Document

ANALYTICAL REPORT

Job Number: 500-5952-2

Job Description: Chemical and Physical Analysis

For:

Metro Water Reclamation Dist of Chicago
6001 W. Pershing Road
Cicero, IL 60804

Attention: Jennifer Wasik



Bonnie M Stadelmann
Project Manager II
bstadelmann@stl-inc.com
09/05/2007

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the TestAmerica Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be

TestAmerica Laboratories, Inc.

TestAmerica Chicago 2417 Bond Street, University Park, IL 60466
Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com



**STL Burlington
South Burlington, VT**

**Sample Data Summary
Package**

SDG: 500-5952

| | |
|---|-----------|
| Case Narrative | 1 |
| Chain of Custody | 2 |
| Sample Data Summary Package - Geotechnical | 4 |
| Sample Handling | 7 |
| Last Page of this Document..... | 10 |



Case Narrative

STL

STL Burlington
30 Community Drive, Suite 11
South Burlington, VT 05403

Tel: 802 660 1990 Fax: 802 660 1919
www.stl-inc.com

August 31, 2007

Mr. Richard Wright
TestAmerica
2417 Bond Street
University Park, IL 60466

Re: Laboratory Project No. 27002
Case: MWRDGC; SDG: 500-5952

Dear Mr. Wright:

Enclosed are the analytical results for the samples that were received by STL Burlington on August 17th, 2007. Laboratory identification numbers were assigned, and designated as follows:

| <u>Lab ID</u> | <u>Client Sample ID</u> | <u>Sample Date</u> | <u>Sample Matrix</u> |
|---------------|-----------------------------------|------------------------|--------------------------|
| | Received: 08/17/07 ETR No: 121454 | | |
| 721056 | WW43 SIDE RTE 83 | 08/09/07 | SOIL |
| 721057 | WW43 CENTER RTE 83 | 08/09/07 | SOIL |

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

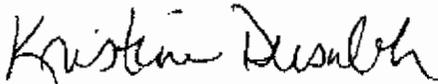
Particle Size Analysis by ASTM D422

There were no exceptions to the method quality control criteria during the analysis of this sample.

The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,



Kristine A. Dusablon
Project Manager

Enclosure



Chain of Custody

SEVERN TREN

STL

STL Chicago
2417 Bond Street
Ukrainia City Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report for **Jennifer Wasik**

Contact: **Jennifer Wasik**
Company: **MURKGC**
Address: **6001 W. Pershing Rd**
Cicero IL 60804
Phone: **708-588-4074**
Fax: **708-588-3807**
E-Mail: **jennifer.wasik@murkgc.com**

Contact: _____
Company: _____
Address: _____
Phone: _____
Fax: _____
POB: _____

Lab Lot# **500-5952**

| | | |
|--------------|-----|----|
| Preservative | Yes | No |
| Refrigerated | Yes | No |
| Temperature | Yes | No |

Signature: **Jennifer Wasik**
Project Number: **4673**
Date Required: _____
Print Name: _____
Print Title: _____

Signature: _____
Project Number: _____
Date Required: _____
Print Name: _____
Print Title: _____

Within Hold Time: **Yes** **No** **NA**
Pres. Refrigerated: **Yes** **No** **NA**
Res. CL. Check OK: **Yes** **No** **NA**
Sample Labels and COC Agree: **Yes** **No** **NA**

| Lab ID | Client Sample ID | Sampling | | Matrix | Comp/Cont | Additional Analyses / Remarks |
|--------|-----------------------|----------|------|--------|-----------|-------------------------------|
| | | Date | Time | | | |
| 1 | WW43 side - Rte. 83 | 8/10/07 | 1:00 | X | X | Particle size |
| 2 | WW43 side - Rte. 83 | 8/10/07 | 1:00 | X | X | TOC |
| 3 | WW43 Center - Rte. 83 | 8/10/07 | 1:45 | X | X | |
| 4 | WW43 Center - Rte. 83 | 8/10/07 | 1:06 | X | X | |

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Additional Analyses / Remarks

RELINQUISHED BY: **Jennifer Wasik**
DATE: **8/10/07**
TIME: **1:35**

RECEIVED BY: **Jennifer Wasik**
DATE: **8/10/07**
TIME: **1:35**

COMPANY: **MURKGC**

RECEIVED BY: **Jennifer Wasik**
DATE: **8/10/07**
TIME: **1:35**

COMPANY: **MURKGC**

RECEIVED BY: **Jennifer Wasik**
DATE: **8/10/07**
TIME: **1:35**

COMPANY: **MURKGC**

RECEIVED BY: _____
DATE: _____
TIME: _____

Matrix Key:
W - Wastewater
W - Water
S - Soil
SL - Sludge
MS - Miscellaneous
CX - Oil
A - Air

Container Mat.
1. Plastic
2. YOK Val
3. Sample Plastic
4. Amber Glass
5. Weymouth Glass
6. Other

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

RECEIVED BY: _____
DATE: _____
TIME: _____

Particle Size of Soils by ASTM D422

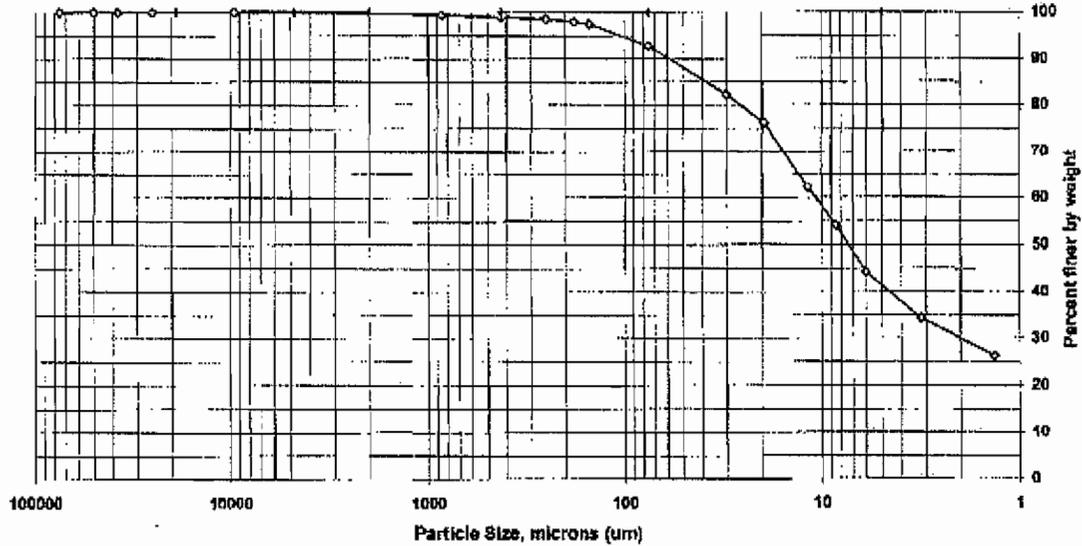
Client Code: STLILC
 Sample ID: WW43 SIDE RTE 83
 Lab ID: 721056

SDG: 500-5952
 ETR(g): 121454

Date Received: 8/17/2007
 Start Date: 8/21/2007
 End Date: 8/31/2007

Percent Solids: 50.2%
 Specific Gravity: 2.650
 Maximum Particle Size: Med sand

Non-soil material: n/a
 Shape (> #10): n/a
 Hardness (> #10): n/a



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 100.0 | 0.0 |
| #4 | 4750 | 100.0 | 0.0 |
| #10 | 2000 | 100.0 | 0.0 |
| #20 | 850 | 99.5 | 0.5 |
| #40 | 425 | 99.0 | 0.5 |
| #60 | 250 | 98.6 | 0.5 |
| #80 | 180 | 98.0 | 0.6 |
| #100 | 150 | 97.5 | 0.5 |
| #200 | 75 | 92.8 | 4.7 |
| Hydrometer | 30.3 | 82.3 | 10.5 |
| | 19.5 | 76.3 | 6.0 |
| | 11.8 | 62.3 | 14.0 |
| | 8.5 | 54.3 | 8.0 |
| | 6.0 | 44.3 | 10.0 |
| | 3.2 | 34.3 | 10.0 |
| V | 1.3 | 26.3 | 8.0 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.0 |
| Sand | 7.2 |
| Coarse Sand | 0.0 |
| Medium Sand | 1.0 |
| Fine Sand | 6.2 |
| Silt | 48.5 |
| Clay | 44.3 |

Preparation Method: **D2217**
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute

Particle Size of Soils by ASTM D422

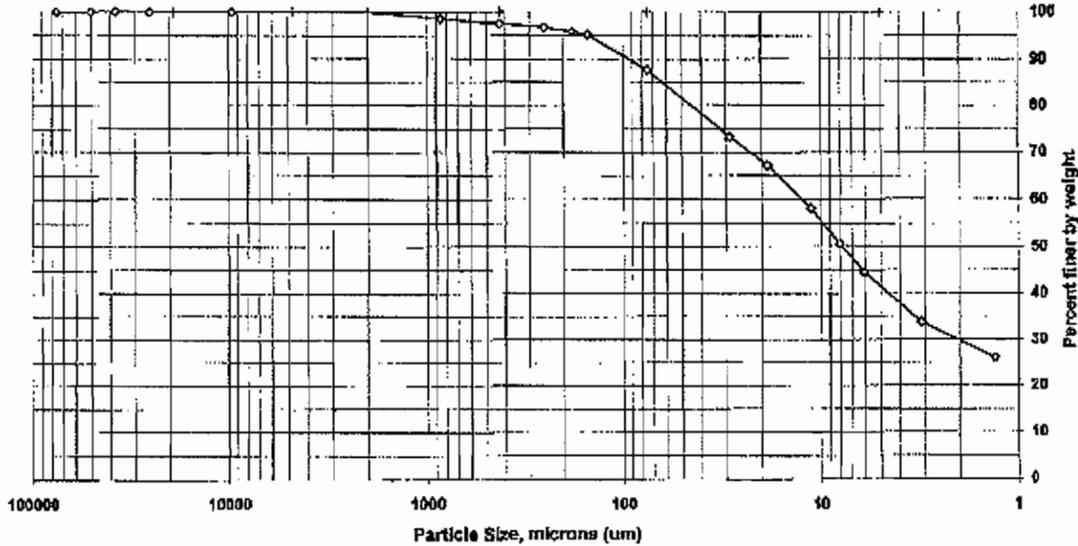
Client Code: STLILC
 Sample ID: WW43 CENTER RTE 83
 Lab ID: 721057

SDG: 500-5952
 ETR(#): 121454

Date Received: 8/17/2007
 Start Date: 8/21/2007
 End Date: 8/31/2007

Percent Solids: 49.6%
 Specific Gravity: 2.650
 Maximum Particle Size: Med sand

Non-soil material: n/a
 Shape (> #10): n/a
 Hardness (> #10): n/a



| Sieve size | Particle size, um | Percent finer | Incremental percent |
|------------|-------------------|---------------|---------------------|
| 3 inch | 75000 | 100.0 | 0.0 |
| 2 inch | 50000 | 100.0 | 0.0 |
| 1.5 inch | 37500 | 100.0 | 0.0 |
| 1 inch | 25000 | 100.0 | 0.0 |
| 3/4 inch | 19000 | 100.0 | 0.0 |
| 3/8 inch | 9500 | 100.0 | 0.0 |
| #4 | 4750 | 100.0 | 0.0 |
| #10 | 2000 | 100.0 | 0.0 |
| #20 | 850 | 98.6 | 1.4 |
| #40 | 425 | 97.5 | 1.1 |
| #60 | 250 | 96.7 | 0.8 |
| #80 | 180 | 95.9 | 0.8 |
| #100 | 150 | 95.2 | 0.7 |
| #200 | 75 | 87.7 | 7.5 |
| Hydrometer | 28.6 | 73.4 | 14.3 |
| | 18.6 | 67.3 | 6.1 |
| | 11.2 | 58.2 | 9.1 |
| | 8.0 | 50.6 | 7.6 |
| | 6.1 | 44.5 | 6.1 |
| | 3.1 | 33.8 | 10.9 |
| v | 1.3 | 26.1 | 7.6 |

| Soil Classification | Percent of Total Sample |
|---------------------|-------------------------|
| Gravel | 0.0 |
| Sand | 12.3 |
| Coarse Sand | 0.0 |
| Medium Sand | 2.5 |
| Fine Sand | 9.9 |
| Silt | 43.2 |
| Clay | 44.5 |

Preparation Method: **D2217**
 Dispersion Device: Mechanical mixer with a metal paddle.
 Dispersion Period: 1 minute



Sample Handling

0137/0007

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Handwritten: 8/17/07 0922

ORIGIN ID: JQTA (789) 534-5288
BOTTLE PREP
SEVERN TRENT SERVICES
2413 BOND ST

UNIVERSITY PARK, IL 60466
UNITED STATES US

Ship Date: 16AUG07
Actual: 26.0 LB MAX
System: 00332541CRFE2308
Account: S 137134829

TO **SAMPLE RECEIVING**
STL BURLINGTON
30 COMMUNITY DRIVE
SUITE 11
SOUTH BURLINGTON, VT 05403

(822) 658-1998

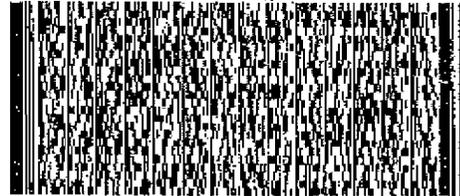
FedEx
Express



REF: 6648/5552
PO:
Inv:

Dept: PM

THE INFORMATION ON THIS LABEL IS THE PROPERTY OF FEDEX. IT IS TO BE USED ONLY FOR THE PURPOSES OF TRACKING AND DELIVERY OF THE SHIPPED ITEM.



Delivery Address:
Barcode

BILL SENDER

PRIORITY OVERNIGHT

FRI

Deliver By:
17AUG07

TRK# 6607 6564 5283 Form 0201

BTV AA

05403 -VT-US

XH BTVA



Page 2 of 4

Attachment 14

Chironomus tentans 10-Day Test

| WATERWAY | SITE # | LOCATION | YEAR | Survival (%) | Dried | Ash-free | |
|----------------------------|--------|------------------|--------|--------------|-----------------|-------------------|-------------------|
| | | | | | Weight | Dried | |
| | | | | | (mg/org) | Weight | |
| | | | | | | (mg/org) | |
| North Shore Channel | 35 | Central St. | Side | 2005 | 96 | NA | 1.47 |
| North Shore Channel | 35 | Central St. | Center | 2005 | 96 | NA | 1.35 |
| North Shore Channel | 102 | Oakton St. | Side | 2005 | 80 | NA | 1.62 |
| North Shore Channel | 102 | Oakton St. | Center | 2005 | 79 | NA | 1.16 |
| North Shore Channel | 36 | Touhy Ave. | Side | 2005 | 95 | NA | 1.25 |
| North Shore Channel | 36 | Touhy Ave. | Center | 2005 | 94 | NA | 1.23 |
| North Shore Channel | 101 | Foster Ave. | Side | 2005 | 51 ^a | NA | 0.17 ^e |
| North Shore Channel | 101 | Foster Ave. | Center | 2005 | 94 | NA | 1.4 |
| North Branch Chicago River | 37 | Wilson Ave. | Side | 2005 | 93 | NA | 1.44 |
| North Branch Chicago River | 37 | Wilson Ave. | Center | 2005 | 84 | NA | 0.93 |
| North Branch Chicago River | 73 | Diversey Parkway | Side | 2005 | 49 ^a | NA | 0.43 ^c |
| North Branch Chicago River | 73 | Diversey Parkway | Center | 2005 | 86 | NA | 0.98 |
| North Branch Chicago River | 46 | Grand Ave. | Side | 2005 | 13 ^a | NA | 0.13 ^c |
| North Branch Chicago River | 46 | Grand Ave. | Center | 2005 | 93 | NA | 0.88 |
| Chicago River | 74 | Lake Shore Drive | Side | 2002 | 99 | 1.07 | 0.76 |
| Chicago River | 74 | Lake Shore Drive | Center | 2002 | 94 | 1.09 | 0.79 |
| Chicago River | 74 | Lake Shore Dr. | Side | 2006 | ND | ND | ND |
| Chicago River | 74 | Lake Shore Dr. | Center | 2006 | 98 | NA | 0.92 |
| Chicago River | 100 | Wells St. | Side | 2002 | 99 | 0.9 | 0.64 ^a |
| Chicago River | 100 | Wells St. | Center | 2002 | 94 | 0.97 | 0.67 ^a |
| Chicago River | 100 | Wells St. | Side | 2006 | 98 | NA | 1.54 |
| Chicago River | 100 | Wells St. | Center | 2006 | 88 | NA | 1.46 |
| South Branch Chicago River | 39 | Madison St. | Center | 2002 | 91 | 0.83 ^a | 0.62 ^a |
| South Branch Chicago River | 39 | Madison St. | Side | 2006 | 80 | NA | 0.65 |

| | | | | | | | |
|---------------------------------|-----|-------------|--------|------|-----------------|-------------------|-------------------|
| South Branch Chicago River | 39 | Madison St. | Center | 2006 | 90 | NA | 1.06 |
| South Branch Chicago River | 108 | Loomis St. | Side | 2002 | 83 | 0.86 | 0.61 ^a |
| South Branch Chicago River | 108 | Loomis St. | Center | 2002 | 90 | 0.70 ^a | 0.53 ^c |
| South Branch Chicago River | 108 | Loomis St. | Side | 2006 | 95 | NA | 0.88 |
| South Branch Chicago River | 108 | Loomis St. | Center | 2006 | 98 | NA | 1.22 |
| Bubbly Creek | 99 | Archer Ave. | Side | 2002 | 59 ^c | 0.25 ^c | 0.16 ^c |
| Bubbly Creek | 99 | Archer Ave. | Center | 2002 | 14 ^c | 0.24 ^c | 0.14 ^c |
| Bubbly Creek | 99 | Archer Ave. | Side | 2006 | 75 | NA | 0.54 ^a |
| Bubbly Creek | 99 | Archer Ave. | Center | 2006 | 66 | NA | 0.52 ^a |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Side | 2002 | 80 | 0.67 ^c | 0.48 ^c |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Center | 2002 | 76 | 0.62 ^c | 0.44 ^c |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Side | 2006 | 88 | NA | 0.61 |
| Chicago Sanitary and Ship Canal | 40 | Damen Ave. | Center | 2006 | 85 | NA | 0.79 |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Side | 2002 | 93 | 1.17 ^b | 0.81 ^a |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Center | 2002 | 93 | 0.64 ^c | 0.46 ^c |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Side | 2006 | 94 | NA | 0.63 ^a |
| Chicago Sanitary and Ship Canal | 75 | Cicero Ave. | Center | 2006 | 98 | NA | 0.7 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Side | 2002 | 89 | 1.53 | 1.04 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Center | 2002 | 91 | 1.48 | 1.16 |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Side | 2006 | 90 | NA | 0.48 ^a |
| Chicago Sanitary and Ship Canal | 41 | Harlem Ave. | Center | 2006 | 93 | NA | 0.95 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Side | 2002 | 98 | 1.28 | 0.95 ^a |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Center | 2002 | 90 | 0.58 ^c | 0.43 ^c |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Side | 2006 | 93 | NA | 1.41 |
| Chicago Sanitary and Ship Canal | 92 | Lockport | Center | 2006 | 63 [*] | NA | 0.65 |
| Calumet River | 49 | Ewing Ave. | Side | 2003 | 8 ^a | 0.63 | 0.36 ^a |
| Calumet River | 49 | Ewing Ave. | Side | 2007 | 91 | 1.61 | 1.05 |
| Calumet River | 49 | Ewing Ave. | Center | 2007 | 58 ^a | 0.37 ^a | 0.27 ^a |
| Calumet River | 55 | 130th St. | Side | 2003 | 98 | 1.61 | 1.1 |
| Calumet River | 55 | 130th St. | Center | 2003 | 95 | 1.33 | 0.99 |
| Calumet River | 55 | 130th St. | Side | 2007 | 84 | 1.73 | 1.41 |
| Calumet River | 55 | 130th St. | Center | 2007 | 74 | 1.11 | 0.80 ^a |

| | | | | | | | |
|----------------------|----|--------------|--------|------|------------------|-------------------|-------------------|
| Wolf Lake | 50 | Burnham Ave. | Side | 2003 | 36 ^a | 0.45 ^a | 0.18 ^a |
| Wolf Lake | 50 | Burnham Ave. | Center | 2003 | 19 ^a | 0.65 | 0.55 |
| Wolf Lake | 50 | Burnham Ave. | Side | 2007 | 90 | 1.39 | 1.03 |
| Wolf Lake | 50 | Burnham Ave. | Center | 2007 | 79 | 2.10 | 1.53 |
| Grand Calumet River | 86 | Burnham Ave. | Side | 2003 | 25 ^a | 0.19 ^a | 0.19 ^a |
| Grand Calumet River | 86 | Burnham Ave. | Center | 2003 | 86 | 0.51 ^a | 0.46 ^a |
| Grand Calumet River | 86 | Burnham Ave. | Side | 2007 | 58 ^a | 1.07 | 0.88 |
| Grand Calumet River | 86 | Burnham Ave. | Center | 2007 | 14 ^a | 0.28 ^a | 0.22 ^a |
| Little Calumet River | 57 | Ashland Ave. | Side | 2003 | 84 | 0.84 ^a | 0.68 ^a |
| Little Calumet River | 57 | Ashland Ave. | Side | 2007 | 94 | 1.63 | 1.20 |
| Little Calumet River | 56 | Indiana Ave. | Side | 2003 | 55 ^d | 0.29 ^a | 0.21 ^a |
| Little Calumet River | 56 | Indiana Ave. | Center | 2003 | 58 ^a | 0.38 ^a | 0.30 ^a |
| Little Calumet River | 56 | Indiana Ave. | Side | 2007 | 94 | 1.64 | 1.07 |
| Little Calumet River | 56 | Indiana Ave. | Center | 2007 | 96 | 1.65 | 1.08 |
| Little Calumet River | 76 | Halsted St. | Side | 2003 | 89 | 0.34 ^a | 0.25 ^a |
| Little Calumet River | 76 | Halsted St. | Center | 2003 | 3 ^a | 0.25 ^a | 0.17 ^a |
| Little Calumet River | 76 | Halsted St. | Side | 2007 | 100 | 1.05 ^a | 0.79 ^a |
| Little Calumet River | 76 | Halsted St. | Center | 2007 | 30 ^a | 0.18 ^a | 0.17 ^a |
| Cal-Sag Channel | 58 | Ashland Ave. | Side | 2003 | 19 ^a | 0.14 ^a | 0.11 ^a |
| Cal-Sag Channel | 58 | Ashland Ave. | Center | 2003 | 84 | 0.54 ^a | 0.47 ^a |
| Cal-Sag Channel | 58 | Ashland Ave. | Side | 2007 | 90 | 0.52 ^a | 0.46 ^a |
| Cal-Sag Channel | 58 | Ashland Ave. | Center | 2007 | 73 ^a | 0.51 ^a | 0.45 ^a |
| Cal-Sag Channel | 59 | Cicero Ave. | Side | 2003 | 0 ^a | NA | NA |
| Cal-Sag Channel | 59 | Cicero Ave. | Center | 2003 | 9 ^a | 1.06 | 0.65 |
| Cal-Sag Channel | 59 | Cicero Ave. | Side | 2007 | 7.5 ^a | 0.23 ^a | 0.17 ^a |
| Cal-Sag Channel | 59 | Cicero Ave. | Center | 2007 | 2.5 ^a | 0.24 ^a | 0.21 ^a |
| Cal-Sag Channel | 43 | Route 83 | Side | 2003 | 0 ^a | NA | NA |
| Cal-Sag Channel | 43 | Route 83 | Center | 2003 | 11 ^a | 0.83 | 0.52 |
| Cal-Sag Channel | 43 | Route 83 | Side | 2007 | 43 ^a | 0.18 ^a | 0.17 ^a |
| Cal-Sag Channel | 43 | Route 83 | Center | 2007 | 33 ^a | 0.24 ^a | 0.20 ^a |

^a Significantly different than the West Bearskin Lake control results.

^b Significantly different than the Negative Control-Sand control results.

^c Significantly different than the West Bearskin Lake and Negative Control-Sand control results.

^d Not statistically different due to high variability among replicates.

^e Not formally compared since survival data were statistically different.

Attachment 15



***Results of Ten-Day
Chironomus tentans
Toxicity Test with Whole Sediment
Samples from the Metropolitan Water Reclamation
District of Greater Chicago
Received October 25-November 18, 2002***

Prepared by

***ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
Duluth, Minnesota 55811-5712***

Submitted to

***Metropolitan Water Reclamation District of Greater Chicago
6001 West Pershing
Cicero, IL 60804***

Submitted December 2002



REPORT APPROVAL

Name (signed): _____ Date: _____

Name (typed): Todd McGuire

Title: Operations Manager

* * * * *

Name (signed): _____ Date: _____

Name (typed): Kurt Anderson

Title: Senior Biologist

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TABLE 1. Flow Rates (ml/min) of Overlying Water and Daily Turnover Rates to Metropolitan Water Reclamation District of Greater Chicago Sediments Test Chambers During Ten-Day *Chironomus* Exposures

TABLE 2. Overlying Water Temperature Values (°C) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures

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- TABLE 7. Overlying Water Hardness Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 8. Overlying Water Ammonia Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 9. *Chironomus* Survival and Growth Results Following Ten-Day Exposure to Metropolitan Water Reclamation District of Greater Chicago Sediments.
- TABLE 10. Precision of *Chironomus* 96-Hour NaCl Reference Toxicant Testing

APPENDIX A -- Chain of Custody Form

APPENDIX B -- Raw Data Sheets

APPENDIX C -- Statistical Analyses

APPENDIX D -- Post-Carbon Water Analysis

APPENDIX E -- Sediment Site Designations

INTRODUCTION

At the request of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected from Chicago-area waterways. The 10-day tests were performed to measure the toxicity of selected sediment samples to larval *Chironomus tentans*. The *Chironomus* endpoints were survival and growth. Growth was defined as dried weight and ash-free dry weight (AFDW)

STUDY SUMMARY

The tables below summarize survival and growth for each Chicago-area waterways sediment and the two control sediments, Negative Control-Sand (NC-Sand) and West Bearskin (WBS). Results are grouped according to the test dates of the three separate toxicity exposures. Each toxicity test had two sets of controls for statistical comparisons.

Set # 1. Test dates November 1-11, 2002

| Endpoint | NC-Sand | WBS | WW-39 CENTER | WW-74 CENTER | WW-74 SIDE | WW-100 CENTER | WW-100 SIDE | WW-108 CENTER | WW-108 SIDE |
|---------------------------------------|---------|------|-----------------|-----------------|---------------|------------------|----------------|------------------|----------------|
| SURVIV AL (%) | 99 | 99 | 91 | 94 | 99 | 94 | 99 | 90 | 83 |
| Dried Weight (mg/org) | 0.87 | 1.06 | 0.83 WBS | 1.09 | 1.07 | 0.97 | 0.90 | 0.70 WBS | 0.86 |
| Ash-free Dry Weight (mg/org) | 0.73 | 0.88 | 0.62 WBS | 0.79 | 0.76 | 0.67 WBS | 0.64 WBS | 0.53 WBS/NCS | 0.61 WBS |

NCS Significantly different than the NC-Sand control results

WBS Significantly different than the West Bearskin control results.

WBS/NCS Significantly different than both the West Bearskin and NC-Sand control results.



Set # 2. Test dates November 8-18, 2002

| Endpoint | NC-Sand | WBS | WW-40 CENTER | WW-40 SIDE | WW-99 CENTER | WW-99 SIDE | WW-41 CENTER | WW-41 SIDE | WW-75 CENTER | WW-75 SIDE |
|------------------------------|---------|------|-------------------------|-------------------------|-------------------------|-------------------------|--------------|------------|-------------------------|---------------------|
| SURVIVAL (%) | 89 | 94 | 76 | 80 | 14 ^{WBS/NCS} | 59 ^{WBS/NCS} | 91 | 89 | 93 | 93 |
| Dried Weight (mg/org) | 1.68 | 1.38 | 0.62 ^{WBS/NCS} | 0.67 ^{WBS/NCS} | 0.24 ^{WBS/NCS} | 0.25 ^{WBS/NCS} | 1.48 | 1.53 | 0.64 ^{WBS/NCS} | 1.17 ^{NCS} |
| Ash-free Dry Weight (mg/org) | 0.78 | 1.07 | 0.44 ^{WBS/NCS} | 0.48 ^{WBS/NCS} | 0.14 ^{WBS/NCS} | 0.16 ^{WBS/NCS} | 1.16 | 1.04 | 0.46 ^{WBS/NCS} | 0.81 ^{WBS} |

Set # 3. Test dates November 22 - December 3, 2002

| Endpoint | NC-Sand | WBS | WW-92 CENTER | WW-92 SIDE |
|------------------------------|---------|------|-------------------------|---------------------|
| SURVIVAL (%) | 91 | 93 | 90 | 98 |
| Dried Weight (mg/org) | 1.18 | 1.40 | 0.58 ^{WBS/NCS} | 1.28 |
| Ash-free Dry Weight (mg/org) | 0.71 | 1.16 | 0.43 ^{WBS/NCS} | 0.95 ^{WBS} |

^{NCS} Significantly different than the NC-Sand control results

^{WBS} Significantly different than the West Bearskin control results.

^{WBS/NCS} Significantly different than both the West Bearskin and NC-Sand control results.

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from Metropolitan Water Reclamation District of Greater Chicago were performed following suggested United States Environmental Protection Agency (USEPA) methods (USEPA 2000 Test Method 100.2) Ten-day tests exposing *Chironomus* were conducted in a manner to determine the effect of each test sediment on organism survival and growth. Effect was determined by comparison to organism performance following exposure to the selected reference site sediment. Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

The toxicity tests were conducted in three separate sets, with two independent controls per test set. Set#1 was initiated on November 1, 2002, Set #2 was initiated on November 8, 2002, and Set#3 was initiated on November 22, 2002. Test methods are identical for each test set.

Test Organism Culturing, Holding, and Acclimation

Chironomus were obtained from Environmental Consulting & Testing, Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23°C.

The *Chironomus* were delivered to ASci-ETL by ASci personnel. Upon arrival at ASci-ETL, the *Chironomus* were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to

daily temperature changes greater than 3°C per day during holding. The *Chironomus* were second- to third-instar larvae (approximately 10 days-old) at test initiation.

Overlying Water Source

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds. The most recent chemical analyses of the post-carbon tap water are contained in Appendix D.

Exposure System

Sediment from each site tested included eight replicates. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Eight replicate test chambers of each sediment exposure were held in a single all glass 12-L aquarium constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each aquarium. The configuration resulted in two turnovers of overlying water

per day. Test temperature ($23^{\circ} \pm 1^{\circ}\text{C}$) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Sediments

Sediment samples were collected by MWRDGC personnel from October 22, 2002, to November 14, 2002. The samples were delivered to ASci-ETL by express courier from October 25, 2002, to November 19, 2002.

The first set of samples arrived on October 25, 2002, and included the following sediments: WW-74 Center, WW-74 Side, WW-100 Side, WW-100 Center, WW-39 Center, WW-108 Center, and WW-108 Side. WW-39 Side was not sampled due to lack of harvestable sediment.

The second set of samples arrived on November 4, 2002, and included the following sediments: WW-40 Center, WW-40 Side, WW-99 Side, WW-99 Center, WW-41 Center, WW-41 Side, WW-75 Center, and WW-75 Side.

The third set of samples arrived on November 19, 2002, and included the following sediments: WW-92 Center and WW-92 Side. Test site designations (WW-##-Center/Side) and common names are correlated in Appendix E.

The Chain of Custody forms were completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at $1-4^{\circ}\text{C}$ until use. Appendix A contains a copy of the Chain of Custody forms.

Two sets of control sediment were used for the toxicity tests. The first control sediment (NC-Sand) was VWR brand acid-washed sand, lot number 42105233. The second control sediment,

West Bearskin, was collected on December 26, 2001, from West Bearskin Lake, located in Cook County, Minnesota. The West Bearskin sediment sample (10-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample was logged-in and stored under refrigeration (1-4°C) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms.

Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water. The toxicity tests were initiated approximately 24 hours later, after the sediment and overlying water had settled.

To start the tests, ten *Chironomus* were impartially distributed to designated intermediate holding cups. The organisms were handled with a wide-bore glass pipette. The organisms were then transferred from the intermediate vessels to an assigned test replicate.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of $\pm 10\%$ from target flow were adjusted. Measurements of overlying water pH, total ammonia, conductivity, hardness, and alkalinity were performed on day 0 and day 10. The temperature and dissolved oxygen were measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic Biosystems). *Chironomus* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 10 days of exposure. Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at a constant temperature (60-90°C) for 20-24 hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus the weight of ashed larvae. This measurement accounts for gut-retained sediments in the *C. tentans* that may skew the standard dry weight results and eliminates artifactual effects of sediment grain size on growth results.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled weight of the replicate by the number of organisms exposed less the number of pupae recovered.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the two laboratory reference control sediments to measure effect. The survival data were analyzed using the TOXSTAT Version 3.5 software

package (West Inc., and University of Wyoming, Laramie, Wyoming). The survival data were arc-sine transformed before analysis then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect ($p=0.05$) as compared to the laboratory reference control results.

The growth data were not transformed before analysis. Mean dry weights and AFDW of organisms were checked for normality and equality of variance. The weight data were then analyzed for significant effect ($p=0.05$) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the two laboratory reference control results to determine effect.

Each set of test sediments were compared independently to both the Negative Control-Sand (NC-Sand) and the West Bearskin control (WBS) to measure effect.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overlying water flow rate to each of the holding tanks was maintained between 9.1 and 9.7 ml/minute. The overall mean flow rate for each of the

holding tanks during the test period averaged 9.4-9.6 ml/minute. The mean flow rate resulted in a mean daily turnover of overlying water rate of 2.0 turnovers/day.

Tables 2a, 2b, and 2c summarize the overlying water temperature values measured daily from the *Chironomus* exposure chambers. Mean test temperatures were maintained at 22.6 to 23.2°C, within the proposed range of 23°C ± 1°C.

Overlying water dissolved oxygen (DO) concentrations in the *Chironomus* test chambers are in Table 3. DO values ranged from 2.6 to 8.6 mg/L during the *Chironomus* exposure, which resulted in a range of 30 to 100% percent saturation. At no time was feeding suspended for the *Chironomus* exposures. Since the dissolved oxygen levels were all above the EPA minimum of 2.5 mg/L, aeration of the overlying water was not required.

Overlying water pHs for the *Chironomus* test chambers are in Table 4. The pH of overlying water in the *Chironomus* exposures ranged from 7.13 to 7.85. None of the pH values were outside of the organism's physiologically tolerable range.

Table 5 contains the overlying water conductivity values for the *Chironomus* exposures. The overall range of conductivity values for both exposures ranged from 112 to 393 µmhos/cm.

Table 6 contains overlying water alkalinity values for the *Chironomus* exposures. Concentrations ranged from 36 to 208 mg/L as CaCO₃.

Table 7 contains the overlying total hardness values for the exposures. Concentrations ranged from 42 to 126 mg/L as CaCO₃.

Table 8 contains the results of total ammonia measurements. Ammonia concentrations ranged from <1.0 to 23.3 mg/L. WW-99 Center had ammonia values of greater than 20 mg/L during the exposure (20.7 mg/L at test initiation and 23.3 mg/L at test termination), levels that could

have adversely affected *C. tentans* survival and growth. WW-99 Side also had moderately high levels of ammonia (11.7 mg/L at test initiation and 3.1 mg/L at test termination) throughout the toxicity test exposure.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity. Sediments from WW-99 Side and WW-99 Center contained ammonia in amounts that could have adversely affected the health (defined as survival and growth) of the *C. tentans* exposed to those sediments.

Biological Exposure Results

All organisms were observed to burrow into all test sediments. No avoidance was observed for any exposure, and normal levels of organism activity were observed. At test termination, the *Chironomus* in WW-99 Center were observed to be significantly smaller and more sluggish than the control *Chironomus*. No other significant observations were recorded throughout the test.

Chironomus tentans Survival and Growth Results -

Table 9 shows the *Chironomus* survival data. The EPA recommended minimum survival rate for control sediments is 70%. The NC-Sand control sediment supported acceptable mean percentage survival of $99 \pm 4\%$ (Set #1), $89 \pm 8\%$ (Set #2), and $91 \pm 11\%$ (Set #3). The West Bearskin control sediment supported acceptable mean percentage survival of $99 \pm 4\%$ (Set #1), $94 \pm 11\%$ (Set #2), and $93 \pm 10\%$ (Set #3). *Chironomus* survival for the test sites were all above 80%, with the following three exceptions: WW-99 Center ($14 \pm 18\%$), WW-99 Side ($59 \pm 16\%$), and WW-40 Center ($76 \pm 15\%$).

Chironomus dried weight results are also given in Table 9. The EPA control requirement for control organism dried weight is 0.60 mg/surviving organism. The NC-Sand control sediment supported acceptable mean dried weights of 0.87 mg/organism (Set #1), 1.68 mg/organism (Set #2), and 1.18 mg/organism (Set #3). The West Bearskin control sediment supported acceptable mean dried organism weights of 1.06 mg/organism (Set #1), 1.38 mg/organism (Set #2), and 1.40 mg/organism (Set #3). *Chironomus* dried weights for the test sites were all above 0.60 mg/organism, with the following exceptions: WW-99 Center (0.24 mg/organism), WW-99 Side (0.25 mg/organism), and WW-92 Center (0.58 mg/organism).

Chironomus ash-free dry weights (AFDW) results are also given in Table 9. The EPA control requirement for AFDW in control sediment organisms is 0.48 mg/organism. The NC-Sand control sediment supported acceptable mean dried weights of 0.73 mg/organism (Set #1), 0.78 mg/organism (Set #2), and 0.71 mg/organism (Set #3). The West Bearskin control sediment supported acceptable mean dried organism weights of 0.88 mg/organism (Set #1), 1.07 mg/organism (Set #2), and 1.16 mg/organism (Set #3). *Chironomus* survival for the test sites were all above 0.48 mg/organism, with the following exceptions: WW-40 Center (0.44 mg/organism), WW-99 Center (0.14 mg/organism) WW-99 Side (0.16 mg/organism), WW-75 Center (0.46 mg/organism), and WW-92 Center (0.43 mg/organism). WW-40 Side had a mean AFDW of 0.48 mg/organism.

***Chironomus tentans* Statistical Results**

The *Chironomus* survival data were grouped into the three test groups and compared independently to both the NC-Sand control and the West Bearskin control results to determine effect.

SET #1

Set #1 - Survival Data

Control Group - NC-Sand

The *Chironomus* survival data were normal and heterogeneous, therefore, Steel's was the appropriate analysis. Results of the analysis showed that none of the test sediments caused significant ($p=0.05$) organism lethality when compared to the NC-Sand control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group - West Bearskin

The *Chironomus* survival data were normal and heterogeneous, therefore, Steel's was the appropriate analysis. Results of the analysis showed that none of the test sediments caused significant ($p=0.05$) organism lethality when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

Set #1 - Dried Weight Data

Control Group - NC-Sand

The *Chironomus* dried weight data were normal and homogeneous, therefore, Dunnett's was the appropriate analysis. Results of the analysis showed that none of the test sediments caused significant ($p=0.05$) reduction in organism dried weight when compared to the NC-Sand control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group - West Bearskin

The *Chironomus* dried weight data were normal and homogeneous, therefore, Dunnett's was the appropriate analysis. Results of the analysis showed that WW-39 Center and WW-108 Center caused a significant ($p=0.05$) reduction in organism dried weight when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group – West Bearskin

The *Chironomus* survival data were non-normal and homogeneous, therefore, Steel's was the appropriate analysis. Results of the analysis showed that WW-99 Center and WW-99 Side caused significant ($p=0.05$) organism lethality when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

Set #2 – Dried Weight Data

Control Group – NC-Sand

The *Chironomus* dried weight data were normal and heterogeneous with unequal replicate numbers, therefore, Wilcoxin's was the appropriate analysis. Results of the analysis showed that WW-40 Center, WW-40 Side, WW-99 Center, WW-99 Side, WW-75 Side, and WW-75 Center caused significant ($p=0.05$) reduction in organism dried weight when compared to the NC-Sand control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group – West Bearskin

The *Chironomus* dried weight data were normal and heterogeneous with unequal replicate numbers, therefore, Wilcoxin's was the appropriate analysis. Results of the analysis showed that WW-40 Center, WW-40 Side, WW-99 Center, WW-99 Side, and WW-75 Center caused a significant ($p=0.05$) reduction in organism dried weight when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

Set #2 – Ash-free Dried Weight (AFDW) Data

Control Group – NC-Sand

The *Chironomus* AFDW data were normal and heterogeneous with unequal replicate numbers, therefore, Wilcoxin's was the appropriate analysis. Results of the analysis showed that WW-40

Center, WW-40 Side, WW-99 Center, WW-99 Side, and WW-75 Center caused significant ($p=0.05$) reduction in organism AFDW when compared to the NC-Sand control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group - West Bearskin

The *Chironomus* AFDW data were normal and homogeneous with unequal replicate numbers, therefore, Bonferroni's was the appropriate analysis. Results of the analysis showed that WW-40 Center, WW-40 Side, WW-99 Center, WW-99 Side, WW-75 Side, and WW-75 Center caused a significant ($p=0.05$) reduction in organism AFDW when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

SET #3

Set #3 - Survival Data

Control Group - NC-Sand

The *Chironomus* survival data were non-normal and homogeneous, therefore, Steel's was the appropriate analysis. Results of the analysis showed that none of the test sediments caused significant ($p=0.05$) organism lethality when compared to the NC-Sand control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group - West Bearskin

The *Chironomus* survival data were non-normal and homogeneous, therefore, Steel's was the appropriate analysis. Results of the analysis showed that none of the test sediments caused significant ($p=0.05$) organism lethality when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

Set #3 - Dried Weight Data

Control Group - NC-Sand

The *Chironomus* dried weight data were normal and homogeneous, therefore, Dunnett's was the appropriate analysis. Results of the analysis showed that WW-92 Center caused a significant ($p=0.05$) reduction in organism dried weight when compared to the NC-Sand control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group - West Bearskin

The *Chironomus* dried weight data were normal and homogeneous, therefore, Dunnett's was the appropriate analysis. Results of the analysis showed that WW-92 Center caused a significant ($p=0.05$) reduction in organism dried weight when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

Set #3 - Ash-free Dried Weight (AFDW) Data

Control Group - NC-Sand

The *Chironomus* AFDW data were normal and homogeneous, therefore, Dunnett's was the appropriate analysis. Results of the analysis showed that WW-92 Center caused significant ($p=0.05$) reduction in organism AFDW when compared to the NC-Sand control sediment results. Printouts of the analysis are contained in Appendix C.

Control Group – West Bearskin

The *Chironomus* AFDW data were normal and homogeneous, therefore, Dunnett's was the appropriate analysis. Results of the analysis showed that WW-92 Center and WW-92 Side caused a significant ($p=0.05$) reduction in organism AFDW when compared to the WBS control sediment results. Printouts of the analysis are contained in Appendix C.

CONCLUSIONS

The following conclusions can be drawn from the study results.

- Both laboratory control sediments used for this study, NC-Sand and West Bearskin, supported acceptable organism survival and growth for all three sets of toxicity tests.
- **WW-99 Side and WW-99 Center caused significant lethality to *Chironomus*** when compared to the both NC-Sand and West Bearskin results, indicating those sediments constituted an unsuitable habitat for *Chironomus* survival. No other test sediments caused a significant decrease in organism survival when compared to either of the laboratory controls.
- Test sediments that caused a **significant reduction in *Chironomus* dried weight** when compared to **both laboratory controls** included: **WW-40 Center, WW-40 Side, WW-99 Center, WW-99 Side, WW-75 Center, and WW-92 Center**, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by dried weight).

- . Test sediments that caused a **significant reduction in *Chironomus* dried weight** when compared to **West Bearskin only** included: **WW-39 Center and WW-108 Center**, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by dried weight).
- . Test sediments that caused a **significant reduction in *Chironomus* dried weight** when compared to **NC-Sand only** included: **WW-75 Side**, indicating that sediment constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by dried weight).
- . Test sediments that caused a **significant reduction in *Chironomus* AFDW** when compared to **both laboratory controls** included: **WW-108 Center, WW-40 Center, WW-40 Side, WW-99 Center, WW-99 Side, WW-75 Center, and WW-92 Center**, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by ash-free dried weight).
- . Test sediments that caused a **significant reduction in *Chironomus* AFDW** when compared to **West Bearskin only** included: **WW-108 Side, WW-100 Center, WW-39 Center, WW-100 Side, WW-75 Side, and WW-92 Side**, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by ash-free dried weight).
- . None of the test sediments caused a significant reduction in *Chironomus* AFDW when compared only to the NC-Sand reference.
- . Test sediments that had **no effect on *Chironomus* survival or growth** when compared to either of the laboratory controls include: **WW-74 Center, WW-74 Side, WW-41 Center, and WW-41 Side**. These sediments can be classified as being of a suitable quality for supporting *Chironomus* survival and growth at the same levels as the two control sediments, NC-Sand and WBS.

APPENDIX A

Chain of Custody Forms



APPENDIX B

Raw Data Sheets

APPENDIX C

Statistical Analyses



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC - 12/02
ASci-ETL Study ID #5010-214

APPENDIX D

Post-Carbon Water Analyses



APPENDIX E

Sediment Site Designations

Attachment 16



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC - 9/03
ASci-ETL Study ID #5010-214

***Results of Ten-Day
Chironomus tentans
Toxicity Test with Whole Sediment
Samples from the Metropolitan Water Reclamation
District of Greater Chicago
Received July 11 – September 11, 2003***

Prepared by

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Submitted to

***Metropolitan Water Reclamation District of Greater Chicago
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Submitted September 2003



REPORT APPROVAL

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INTRODUCTION

At the request of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected from Chicago-area waterways. The 10-day tests were performed to measure the toxicity of selected sediment samples to larval *Chironomus tentans*. The *Chironomus* endpoints were survival and growth. Growth was defined as dried weight and ash-free dry weight (AFDW)

STUDY SUMMARY

The tables below summarize survival and growth for each Chicago-area waterways sediment and the control sediment, Bearskin (WBS). Results are grouped according to the test dates of the five separate toxicity exposures. Each toxicity test used WBS as the statistical comparison reference.

| SET # 1, Test Dates 7/13-24/03 | | | |
|--------------------------------|-----------------|--------------------------|---------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 84 | 0.70 | 0.59 |
| WW-50 CENTER | 19* | 0.65 | 0.55 |
| WW-50 SIDE | 36* | 0.45* | 0.18* |
| WW-97 CENTER | 40* | 0.58 | 0.45 |
| WW-97 SIDE | 18* | 0.42* | 0.32* |

* Significantly different than the WBS control results

| SET # 2, Test Dates 7/17-28/03 | | | |
|--------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 88 | 0.73 | 0.61 |
| WW-56 CENTER | 58* | 0.38* | 0.30* |
| WW-56 SIDE | 55** | 0.29* | 0.21* |
| WW-76 CENTER | 3* | 0.25* | 0.17* |
| WW-76 SIDE | 89 | 0.34* | 0.25* |

* Significantly different than the WBS control results

** Not statistically different due to high variability among replicates

| SET # 3, Test Dates 8/7-18/03 | | | |
|-------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 96 | 1.07 | 0.89 |
| WW-43 CENTER | 11* | 0.83 | 0.52 |
| WW-43 SIDE | 0 * | NA | NA |
| WW-59 CENTER | 9* | 1.06 | 0.65 |
| WW-59 SIDE | 0 * | NA | NA |
| WW-49-SIDE | 8* | 0.63 | 0.36* |

* Significantly different than the WBS control results

| SET # 4, Test Dates 8/21-9/1/03 | | | |
|---------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 96 | 1.08 | 0.92 |
| WW-54 CENTER | 95 | 1.19 | 0.92 |
| WW-54 SIDE | 94 | 0.92 | 0.63 |
| WW-55 CENTER | 95 | 1.33 | 0.99 |
| WW-55 SIDE | 98 | 1.61 | 1.10 |
| WW-57 SIDE | 84 | 0.84* | 0.68* |

* Significantly different than the WBS control results

| SET # 5, Test Dates 9/11-22/03 | | | |
|--------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 96 | 0.75 | 0.64 |
| WW-58 CENTER | 84 | 0.54* | 0.47* |
| WW-58 SIDE | 19* | 0.14* | 0.11* |
| WW-86 CENTER | 86 | 0.51* | 0.46* |
| WW-86 SIDE | 25* | 0.19* | 0.19* |
| WW-52 SIDE | 40* | 1.18 | 0.98 |

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from Metropolitan Water Reclamation District of Greater Chicago were performed following suggested United States Environmental Protection Agency (USEPA) methods (USEPA 2000 Test Method 100.2) Ten-day tests exposing *Chironomus* were conducted in a manner to determine the effect of each test sediment on organism survival and growth. Effect was determined by comparison to organism performance following exposure to the selected reference site sediment. Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

The toxicity tests were conducted in five separate sets, with one control per test set. The test were initiated on the following days (2003): Set#1 on July 13, Set #2 on July 17, 2003, Set#3 on August 7, 2003, Set#4 on August 21, 2003, and Set#5 on September 11 2003. Test methods are identical for each test set.

Test Organism Culturing, Holding, and Acclimation

Chironomus were obtained from Environmental Consulting & Testing, Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23°C.

The *Chironomus* were delivered to ASci-ETL by ASci personnel. Upon arrival at ASci-ETL, the *Chironomus* were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to

daily temperature changes greater than 3°C per day during holding. The *Chironomus* were second- to third-instar larvae (approximately 10 days-old) at test initiation.

Overlying Water Source

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds. The most recent chemical analyses of the post-carbon tap water are contained in Appendix D.

Exposure System

Sediment from each site tested included eight replicates. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Eight replicate test chambers of each sediment exposure were held in a single all glass 12-L aquarium constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each aquarium. The configuration resulted in two turnovers of overlying water



per day. Test temperature ($23^{\circ} \pm 1^{\circ}\text{C}$) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Sediments

Sediment samples were collected by MWRDGC personnel from July 1 to September 5, 2003. The samples were delivered to ASci-ETL by express courier from July 11 to September 11, 2003.

The first set of samples arrived on July 11, 2003, and included the following sediments: WW-50 Center, WW-50 Side, WW-97 Side, and WW-97 Center.

The second set of samples arrived on July 16, 2003, and included the following sediments: WW-56 Center, WW-56 Side, WW-76 Side, and WW-76 Center.

The third set of samples arrived on August 6, 2003, and included the following sediments: WW-43 Center, WW-43 Side, WW-59 Center, WW-59 Side, and WW-49 Side.

The fourth set of samples arrived on August 19, 2003, and included the following sediments: WW-54 Center, WW-54 Side, WW-55 Side, WW-55 Center and WW-57 Side.

The fifth set of samples arrived on September 11, 2003, and included the following sediments: WW-86 Center, WW-86 Side, WW-52 Side, WW-58 Center and WW-58 Side.

The Chain of Custody forms were completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at $1-4^{\circ}\text{C}$ until use. Appendix A contains a copy of the Chain of Custody forms.

The control sediment, West Bearskin, was collected on July 7, 2003, from West Bearskin Lake, located in Cook County, Minnesota. The West Bearskin sediment sample (10-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample was logged-in and stored under refrigeration (1-4°C) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms.

Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water. The toxicity tests were initiated approximately 24 hours later, after the sediment and overlying water had settled.

To start the tests, ten *Chironomus* were impartially distributed to designated intermediate holding cups. The organisms were handled with a wide-bore glass pipette. The organisms were then transferred from the intermediate vessels to an assigned test replicate.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of $\pm 10\%$ from target flow were adjusted. Measurements of overlying water pH, total ammonia, conductivity, hardness, and alkalinity were performed on day 0 and day 10. The temperature and dissolved oxygen were measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic Biosystems). *Chironomus* test chambers received a Tetrafin® slurry.

The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 10 days of exposure. Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at a constant temperature (90-100°C) for 20-24hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus the weight of ashed larvae. This measurement accounts for gut-retained sediments in the *C. tentans* that may skew the standard dry weight results and eliminates artifactual effects of sediment grain size on growth results.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled weight of the replicate by the number of organisms exposed less the number of pupae recovered.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the laboratory reference control sediment to measure effect. The survival data were analyzed using the TOXSTAT Version 3.5 software package (West

Inc., and University of Wyoming, Laramie, Wyoming). The survival data were arc-sine transformed before analysis then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect ($p=0.05$) as compared to the laboratory reference control results.

The growth data were not transformed before analysis. Mean dry weights and AFDW of organisms were checked for normality and equality of variance. The weight data were then analyzed for significant effect ($p=0.05$) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the laboratory reference control results to determine effect.

Each set of test sediments was compared independently the West Bearskin control (WBS) to measure effect. A second control set (Negative Control – Sand) was employed for the first test set; however, after consulting with personnel at MWRDOGC it was decided one control exposure was sufficient for each set of toxicity exposures.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overlying water flow rate to each of the holding tanks was maintained between 9.1 and 9.8 ml/minute. The overall mean flow rate for each of the holding tanks during the test period averaged 9.3-9.4 ml/minute. The mean flow rate resulted in a mean daily turnover of overlying water rate of 2.0 turnovers/day.

Tables 2a-2e summarize the overlying water temperature values measured daily from the *Chironomus* exposure chambers. Mean test temperatures were maintained at 22.6 to 22.9°C, within the proposed range of 23°C ± 1°C.

Overlying water dissolved oxygen (DO) concentrations in the *Chironomus* test chambers are in Table 3. DO values ranged from 2.0 to 8.4 mg/L during the *Chironomus* exposure, which resulted in a range of 23 to 98% percent saturation. Feeding was suspended for the Set 5 *Chironomus* exposures on test day 4 when the dissolved oxygen levels dropped below the EPA minimum of 2.5 mg/L. Additionally, feeding was suspended on several occasions when the dissolved oxygen fell below 40% (3.4 mg/L), especially in those cases where a continual decline in dissolved oxygen levels was observed over the course of several days, thereby preventing the DO levels from falling to dangerously low levels. Feeding was resumed after a day of suspended feeding after DO levels rose, and no aeration of the overlaying water was required.

Overlying water pHs for the *Chironomus* test chambers are in Table 4. The pH of overlying water in the *Chironomus* exposures ranged from 7.07 to 7.96. None of the pH values were outside of the organism's physiologically tolerable range.

Table 5 contains the overlying water conductivity values for the *Chironomus* exposures. The overall range of conductivity values for both exposures ranged from 120 to 10710 µmhos/cm. The conductivity of WW-86 Side (10710 µmhos/cm) was high enough to adversely affect the *Chironomus*.

Table 6 contains overlying water alkalinity values for the *Chironomus* exposures. Concentrations ranged from 36 to 178 mg/L as CaCO₃.

Table 7 contains the overlying total hardness values for the exposures. Concentrations ranged from 46 to 594 mg/L as CaCO₃.

Table 8 contains the results of total ammonia measurements. Ammonia concentrations ranged from <1.0 to 9.5 mg/L. Ammonia levels should not have adversely affected *C. tentans* survival, however, any levels above approximately 5 mg/L could possibly affect *C. tentans* growth at the observed pH levels.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity.

Biological Exposure Results

All organisms were initially observed to burrow into all test sediments. *Chironomus* exposed to sediments in Set #3 (WW-43 Side, WW-43 Center, WW-59 Center, WW-59 Side, and WW-49 Side) exhibited signs of sediment avoidance. These sediments all exhibited uniformly poor survival at test termination, which indicated the avoidance was due to toxins in the sediment and not physical impediments. No avoidance was observed for any other exposure, and normal levels of organism activity were observed. No other significant observations were recorded throughout the test.

Chironomus tentans Survival and Growth Results -

Table 9 shows the *Chironomus* survival data. The EPA recommended minimum survival rate for control sediments is 70%. The West Bearskin control sediment supported acceptable mean

percentage survival of $84 \pm 22\%$ (Set #1), $88 \pm 15\%$ (Set #2), $96 \pm 7\%$ (Set #3), $96 \pm 7\%$ (Set #4), $96 \pm 7\%$ (Set #5). *Chironomus* survival for the test sites ranged from 0-98%.

Chironomus dried weight results are also given in Table 9. The EPA control requirement for control organism dried weight is 0.60 mg/surviving organism. The West Bearskin control sediment supported acceptable mean dried organism weights of 0.70 mg/organism (Set #1), 0.73 mg/organism (Set #2), 1.07 mg/organism (Set #3), 1.08 mg/organism (Set #4), and 0.75 mg/organism (Set #5). *Chironomus* dried weights for the test sites ranged from 0.14 to 1.61 mg/organism.

Chironomus ash-free dried weight results are also given in Table 9. The EPA control requirement for control organism ash-free dried weight is 0.48 mg/surviving organism. The West Bearskin control sediment supported acceptable mean ash-free dried organism weights of 0.59 mg/organism (Set #1), 0.61 mg/organism (Set #2), 0.89 mg/organism (Set #3), 0.92 mg/organism (Set #4), and 0.64 mg/organism (Set #5). *Chironomus* ash-free dried weights for the test sites ranged from 0.11 to 1.10 mg/organism.

***Chironomus tentans* Statistical Results**

The *Chironomus* survival data were grouped into the five test groups and compared independently to the West Bearskin control results to determine effect. Results of the analysis are contained in Appendix C. The table below summarizes the statistical analyses. An affected site is one that was statistically different than the WBS control ($p=0.05$).

| Set # 1 | | | | | |
|----------------|------------|--------------|-------------|--------------|-------------------------|
| Endpoint | Normality | Variance | Replication | Analysis | Affected Sites |
| Survival | normal | homogenous | equal | Dunnett's | 50S, 50C, 97C, 97S* |
| Dried Weight | normal | homogenous | unequal | Bonferroni's | 50S, 97S |
| AFDW | normal | homogenous | unequal | Bonferroni's | 50S, 97S |
| Set # 2 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | normal | homogenous | equal | Steel's | 56C, 76C |
| Dried Weight | normal | homogenous | unequal | Bonferroni's | 56C, 56S, 76C, 76S |
| AFDW | normal | homogenous | unequal | Bonferroni's | 56C, 56S, 76C, 76S |
| Set # 3 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | normal | heterogenous | equal | Dunnett's | 43C, 43S, 59S, 59C, 49S |
| Dried Weight | normal | homogenous | unequal | Bonferroni's | none |
| AFDW | normal | homogenous | unequal | Bonferroni's | 49S |
| Set # 4 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | normal | homogenous | equal | Steel's | None |
| Dried Weight | normal | homogenous | equal | Dunnett's | 57S |
| AFDW | non-normal | heterogenous | equal | Wilcoxin's | 57S |
| Set # 5 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | normal | homogenous | equal | Dunnett's | 58S, 86S, 52S |
| Dried Weight | non-normal | heterogenous | unequal | Wilcoxin's | 58S, 58C, 86S, 86C |
| AFDW | normal | heterogenous | unequal | Wilcoxin's | 58S, 58C, 86S, 86C |

* ABBREVIATED SITE DESIGNATIONS (97S = WW-97 Side)

CONCLUSIONS

The following conclusions can be drawn from the study results.

- The laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for all five sets of toxicity tests.
- **WW-50 SIDE, WW-50 CENTER, WW-97 SIDE, WW-97 CENTER, WW-56 CENTER, WW-76 CENTER, WW-43 CENTER, WW-59 CENTER, WW-49 SIDE, WW-50 CENTER WW-76 CENTER, WW-43 SIDE, WW-59 SIDE, WW-58 CENTER, WW-86 SIDE, and WW-52 SIDE** caused significant lethality to *Chironomus* when compared to the West Bearskin results, indicating those sediments constituted an unsuitable habitat for *Chironomus* survival. No other test sediments caused a significant decrease in organism survival when compared to either of the laboratory controls.
- Test sediments that caused a **significant reduction in *Chironomus* dried weight** when compared to the laboratory control included: **WW-50 SIDE, WW-97 SIDE, WW-56 CENTER, WW-56 SIDE, WW-76 CENTER, WW-76 SIDE, WW-57 SIDE, WW-86 SIDE, WW-86 CENTER, WW-58 CENTER, and WW-58 SIDE**, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by dried weight).
- Test sediments that caused a **significant reduction in *Chironomus* ash-free dried weight (AFDW)** when compared to the laboratory control included: **WW-50 SIDE, WW-97 SIDE, WW-56 CENTER, WW-56 SIDE, WW-76 CENTER, WW-76 SIDE, WW-49 SIDE, WW-57 SIDE, WW-86 SIDE, WW-86 CENTER, WW-58 CENTER, and WW-58 SIDE**, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by ash-free dried weight).
- WW-43 Side and WW-59 Side exhibited complete mortality at test termination, which did not allow growth analysis for those sites.
- Test sediments that had **no effect on *Chironomus* survival or growth** when compared to the laboratory controls include: **WW-54 Center, WW-54 Side, WW-55 Center, and WW-55 Side**. These sediments can be classified as being of

a suitable quality for supporting *Chironomus* survival and growth at the same levels as the control sediment, WBS.

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ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC - 9/03
ASci-ETL Study ID #5010-214

APPENDIX A

Chain of Custody Forms



APPENDIX B

Raw Data Sheets



APPENDIX C

Statistical Analyses



ASci Corporation
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Submitted to MWRDGC - 9/03
ASci-ETL Study ID #5010-214

APPENDIX D

Post-Carbon Water Analyses

Attachment 17



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC - 11/04
ASci-ETL Study ID #5010-214

***Results of Ten-Day
Chironomus tentans
Toxicity Test with Whole Sediment
Samples from the Metropolitan Water Reclamation
District of Greater Chicago
Received July 9 – September 28, 2004***

Prepared by

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Submitted to

***Metropolitan Water Reclamation District of Greater Chicago
6001 West Pershing
Cicero, IL 60804***

Submitted November 2004



REPORT APPROVAL

Name (signed): _____ Date: _____

Name (typed): Clayton Allen

Title: Biologist

* * * * *

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Title: Senior Biologist

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APPENDIX B -- Raw Data Sheets

APPENDIX C -- Statistical Analyses

INTRODUCTION

At the request of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected from Chicago-area waterways. The 10-day tests were performed to measure the toxicity of selected sediment samples to larval *Chironomus tentans*. The *Chironomus* endpoints were survival and growth. Growth was defined as dried weight and ash-free dry weight (AFDW)

STUDY SUMMARY

The tables below summarize survival and growth for each Chicago-area waterway sediment and the control sediment, West Bearskin (WBS). Results are grouped according to the test dates of the six separate toxicity exposures. Each toxicity test used WBS as the statistical comparison reference.

| SET # 1, Test Dates 7/11-22/04 | | | |
|--------------------------------|-----------------|--------------------------|---------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 79 | 1.30 | 1.02 |
| WW-13 CENTER | 48* | 1.45 | 1.03 |
| WW-17 CENTER | 70 | 1.11 | 0.75 |
| WW-13 SIDE | 28* | 0.99 | 0.58 |
| WW-12 CENTER | 38* | 1.78 | 0.95 |
| WW-17 SIDE | 38* | 1.72 | 0.88 |
| WW-12 SIDE | 11* | 1.54 | 0.51 |

* Significantly different than the WBS control results

| SET # 2, Test Dates 7/19-30/04 | | | |
|--------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 95 | 1.24 | 0.97 |
| WW-110 CENTER | 84 | 1.12 | 0.79 |
| WW-110 SIDE | 44* | 1.11 | 0.73 |
| WW-89 SIDE | 60* | 1.38 | 0.92 |
| WW-89 CENTER | 60* | 1.40 | 0.94 |
| WW-90 SIDE | 47* | 1.11 | 0.75 |

* Significantly different than the WBS control results

| SET # 3, Test Dates 7/26-8/6/04 | | | |
|---------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 94 | 1.41 | 1.13 |
| WW-79 CENTER | 86 | 1.42 | 1.02 |
| WW-18 SIDE | 86 | 1.14* | 0.72* |
| WW-77 CENTER | 85 | 1.27 | 0.80* |
| WW-77 SIDE | 88 | 0.98* | 0.65* |
| WW-18 SIDE | 94 | 1.27 | 0.72* |

• Significantly different than the WBS control results

| SET # 4, Test Dates 8/5-16/04 | | | |
|-------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 94 | 1.41 | 1.17 |
| WW-24 SIDE | 90 | 1.73 | 1.26 |

| SET # 5, Test Dates 9/16-27/04 | | | |
|--------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 95 | 0.76 | 0.58 |
| WW-109 CENTER | 95 | 0.97 | 0.66 |
| WW-109 SIDE | 83 | 0.82 | 0.53 |
| WW-22 CENTER | 40* | 0.58 | 0.45 |
| WW-22 SIDE | 90 | 1.17 | 0.79 |
| WW-20 CENTER | 96 | 1.48 | 0.88 |
| WW-20 SIDE | 64* | 0.48* | 0.37* |

* Significantly different than the WBS control results

| SET # 6, Test Dates 9/30-10/11/04 | | | |
|-----------------------------------|--------------|-----------------------|------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 98 | 1.17 | 0.91 |
| WW-19 CENTER | 73 | 0.69** | 0.51** |
| WW-19 SIDE | 98 | 1.26 | 0.78* |
| WW-23 CENTER | 100 | 1.38 | 0.85 |
| WW-23 SIDE | 98 | 1.45 | 0.91 |
| WW-29 CENTER | 100 | 1.25 | 0.85 |
| WW-29 SIDE | 100 | 1.25 | 0.79* |

* Significantly different than the WBS control results

**Not statistically different due to high variability.

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from Metropolitan Water Reclamation District of Greater Chicago were performed following suggested United States Environmental Protection Agency (USEPA) methods (USEPA 2000 Test Method 100.2) Ten-day tests exposing *Chironomus* were conducted in a manner to determine the effect of each test sediment on organism survival and growth. Effect was determined by comparison to organism performance following exposure to the selected reference site sediment. Exposure conditions were

maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

The toxicity tests were conducted in six separate sets, with one control per test set. The test were initiated on the following days (2004): Set#1 on July 12, Set #2 on July 20, Set#3 on July 27, Set#4 on August 6, Set#5 on September 17, and Set #6 on October 1. Test methods are identical for each test set.

Test Organism Culturing, Holding, and Acclimation

Chironomus were obtained from Environmental Consulting & Testing, Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23°C.

The *Chironomus* were delivered to ASci-ETL by ASci personnel. Upon arrival at ASci-ETL, the *Chironomus* were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to daily temperature changes greater than 3°C per day during holding. The *Chironomus* were second- to third-instar larvae (approximately 10 days-old) at test initiation.

Overlying Water Source

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds. The most recent chemical analyses of the post-carbon tap water are contained in Appendix D.

Exposure System

Sediment from each site tested included eight replicates. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Eight replicate test chambers of each sediment exposure were held in a single all glass 12-L aquarium constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each aquarium. The configuration resulted in two turnovers of overlying water per day. Test temperature ($23^{\circ} \pm 1^{\circ}\text{C}$) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Sediments

Sediment samples were collected by MWRDGC personnel from July 9 to September 22, 2004. The samples were delivered to ASci-ETL by express courier from July 11, 2004 to September 28, 2004.

The first set of samples arrived on July 9, 2004, and included the following sediments: WW-12 Side, WW-12 Center, WW-13 Side, WW-13 Center, WW-17 Side, and WW-17 Center.

The second set of samples arrived on July 16, 2004, and included the following sediments: WW-90 Side, WW-110 Side, WW-110 Center, WW-89 Side, WW-89 Center, WW-64 Side, WW-64 Center, WW-80 Side, WW-80 Center.

The third set of samples arrived on July 22, 2004, and included the following sediments: WW-79 Center, WW-18 Side, WW-18 Center, WW-77 Side, and WW-77 Center.

The fourth set of samples arrived on August 2, 2004, and included the following sediments: WW-24 Side.

The fifth set of samples arrived on September 13, 2004, and included the following sediments: WW-109 Center, WW-109 Side, WW-22 Side, WW-22 Center, WW-20 Center and WW-20 Side.

The sixth set of samples arrived on September 28, 2004, and included the following sediments: WW-19 Center, WW-19 Side, WW-23 Side, WW-23 Center, WW-29 Center and WW-29 Side.

The Chain of Custody forms were completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at 1-4°C until use. Appendix A contains a copy of the Chain of Custody forms.

The control sediment, West Bearskin, was collected on July 7, 2004, from West Bearskin Lake, located in Cook County, Minnesota. The West Bearskin sediment sample (10-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample was logged-in and stored under refrigeration (1-4°C) until use. Before use in the tests, the

laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms.

Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water. The toxicity tests were initiated approximately 24 hours later, after the sediment and overlying water had settled.

To start the tests, ten *Chironomus* were impartially distributed to each test replicate. The organisms were handled with a wide-bore glass pipette.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of $\pm 10\%$ from target flow were adjusted. Measurements of overlying water pH, total ammonia, conductivity, hardness, and alkalinity were performed on day 0 and day 10. The temperature and dissolved oxygen were measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic Biosystems). *Chironomus* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 10 days of exposure. Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of

live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at a constant temperature (90-100°C) for 20-24 hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus the weight of ashed larvae. This measurement accounts for gut-retained sediments in the *C. tentans* that may skew the standard dry weight results and eliminates effects of sediment grain size on growth results.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled weight of the replicate by the number of organisms exposed less the number of pupae recovered.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the laboratory reference control sediment to measure effect. The survival data were analyzed using the TOXSTAT Version 3.5 software package (West Inc., and University of Wyoming, Laramie, Wyoming). The survival data were arc-sine transformed before analysis then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect ($p=0.05$) as compared to the laboratory reference control results.

The growth data were not transformed before analysis. Mean dry weights and AFDW of organisms were checked for normality and equality of variance. The weight data were then analyzed for significant effect ($p=0.05$) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the laboratory reference control results to determine effect. Each set of test sediments was compared independently the West Bearskin control (WBS) to measure effect.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overlying water flow rate to each of the holding tanks was maintained between 9.1 and 9.6 ml/minute. The overall mean flow rate for each of the holding tanks during the test period averaged 9.3-9.5 ml/minute. The mean flow rate resulted in a mean daily turnover of overlying water rate of 2.0 turnovers/day.

Tables 2a-2c summarize the overlying water temperature values measured daily from the *Chironomus* exposure chambers. All individual and mean test temperatures were within the proposed range of $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

Overlying water dissolved oxygen (DO) concentrations in the *Chironomus* test chambers are in Table 3. DO values ranged from 1.9 to 8.3 mg/L during the *Chironomus* exposure, which resulted in a range of 22 to 97% percent saturation. Feeding was suspended for the Set #2, Set#4, Set #5, and Set #6 *Chironomus* exposures when the dissolved oxygen levels dropped below the EPA minimum of 2.5 mg/L. Feeding was resumed after DO levels increased to acceptable levels, and no aeration of the overlying water was required.

Overlying water pHs for the *Chironomus* test chambers are in Table 4. None of the pH values were outside of the organism's physiologically tolerable range.

Table 5 contains the overlying water conductivity values for the *Chironomus* exposures. None of the conductivity levels were high enough to adversely affect the *Chironomus*.

Tables 6 and 7 contain overlying water alkalinity and hardness values for the *Chironomus* exposures, respectively. All concentrations were within normal ranges

Table 8 contains the results of total ammonia measurements. Ammonia concentrations ranged from <1.0 to 5.6 mg/L. Ammonia levels should not have adversely affected *C. tentans* survival, however, any levels above approximately 5 mg/L could possibly affect *C. tentans* growth at the observed pH levels.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity.

Biological Exposure Results

All organisms were initially observed to burrow into all test sediments. Several sediments were recorded as having either dead *Chironomus* present after test initiation or *Chironomus* that appeared to be avoiding the test sediment; all observations of dead or sediment-avoiding *Chironomus* were from sediments that showed significant mortality at test termination. No other significant observations were recorded throughout the test.

Chironomus tentans Survival and Growth Results -

Table 9 shows the *Chironomus* survival data. The EPA recommended minimum survival rate for control sediments is 70%. All six West Bearskin control sediment supported acceptable mean

percentage survival of 79-98%. *Chironomus* survival for the test sediments ranged from 11-100%.

Chironomus dried weight results are also given in Table 9. The EPA control requirement for control organism dried weight is 0.60 mg/surviving organism. All six West Bearskin control sediments supported acceptable mean dried organism weights (0.76-1.41 mg/organism). *Chironomus* dried weights for the test sites ranged from 0.48 to 1.78 mg/organism.

Chironomus ash-free dried weight results are also given in Table 9. The EPA control requirement for control organism ash-free dried weight is 0.48 mg/surviving organism. All six West Bearskin control sediment supported acceptable mean ash-free dried organism weights of 0.58 -1.17 mg/organism. *Chironomus* ash-free dried weights for the test sites ranged from 0.37 to 1.26 mg/organism.

***Chironomus tentans* Statistical Results**

The *Chironomus* survival data were grouped into the six test groups and compared independently to the West Bearskin control results to determine effect. Results of the analysis are contained in Appendix C. The table below summarizes the statistical analyses. An affected site is one that was statistically different than the WBS control ($p=0.05$).

| Set # 1 | | | | | |
|----------------|---|-------------|-------------|-----------------|-------------------------|
| Endpoint | Normality | Variance | Replication | Analysis | Affected Sites* |
| Survival | normal | homogenous | unequal | Bonferroni's | 13C, 13S, 12C, 12S, 17S |
| Dried Weight | normal | homogenous | unequal | Bonferroni's | none |
| AFDW | normal | homogenous | unequal | Bonferroni's | none |
| Set # 2 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | normal | homogenous | unequal | Bonferroni's | 110S, 89S, 89C, 90S |
| Dried Weight | normal | homogenous | unequal | Bonferroni's | none |
| AFDW | normal | homogenous | unequal | Bonferroni's | none |
| Set # 3 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | non-normal | homogenous | equal | Steels | none |
| Dried Weight | normal | homogenous | equal | Dunnett's | 18S, 77S |
| AFDW | normal | homogenous | equal | Dunnett's | 18S, 18C, 77C, 77S |
| Set # 4 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | normal | homogenous | equal | 2-sample t-test | None |
| Dried Weight | Test site growth data higher than control data – not analyzed | | | | |
| AFDW | | | | | |
| Set # 5 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | non-normal | homogenous | equal | Steel's | 22C, 24S |
| Dried Weight | normal | homogenous | equal | Dunnett's | 20S |
| AFDW | normal | homogenous | equal | Dunnett's | 20S |

* ABBREVIATED SITE DESIGNATIONS (13S = WW-13 Side)

CONCLUSIONS

The following conclusions can be drawn from the study results.

- The laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for all six sets of toxicity tests.
- WW-13 CENTER, WW-13 SIDE, WW-12 SIDE, WW-12 CENTER, WW-17 SIDE, WW-110 SIDE, WW-89 SIDE, WW-89 CENTER, WW-90 SIDE, WW-22 CENTER, and WW-24 SIDE caused significant lethality to *Chironomus* when compared to the West Bearskin results, indicating those sediments constituted an unsuitable habitat for *Chironomus* survival. No other test sediments caused a significant decrease in organism survival when compared to either of the laboratory controls.
- Test sediments that caused a significant reduction in *Chironomus* dried weight when compared to the laboratory control included: WW-18 SIDE, WW-77 SIDE, and WW-20 SIDE, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by dried weight).
- Test sediments that caused a significant reduction in *Chironomus* ash-free dried weight (AFDW) when compared to the laboratory control included: WW-18 SIDE, WW-18 CENTER, WW-77 SIDE, WW-77 CENTER, WW-20 SIDE, WW-19 SIDE, and WW-29 SIDE, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by ash-free dried weight).
- Test sediments that had **no effect on *Chironomus* survival or growth** when compared to the laboratory controls include: **WW-17 Center, WW-110 Center, WW-79 Center, WW-24 Side, WW-109 Center, WW-109 Side, WW-22 Side, WW-20 Center, WW-19 Center, WW-23 Center, WW-23 Side, and WW-29 Center.** These sediments can be classified as being of a suitable quality for supporting *Chironomus* survival and growth at the same levels as the control sediment, WBS.

REFERENCES

USEPA. March 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. Second Edition. EPA/600/R-99/064.

Benoit, D.A., G. Phipps, and G.T. Ankley. 1993. A Sediment Testing Intermittent Renewal System for the Automated Renewal of Overlying Water in Toxicity Tests with Contaminated Sediments. *Water Research* 27:1403-1412.

West, Inc. and University of Wyoming. Laramie, Wyoming. 1996. Department of Zoology and Physiology. TOXSTAT software package version 3.5.



APPENDIX A

Chain of Custody Forms



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC - 11/04
ASci-ETL Study ID #5010-214

APPENDIX B

Raw Data Sheets



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC - 11/04
ASci-ETL Study ID #5010-214

APPENDIX C

Statistical Analyses



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC – 5/05
ASci-ETL Study ID #5010-214

**SUPPLEMENTAL AND AMENDED DATA FOR THE
FOLLOWING REPORT:**

**Results of Ten-Day
Chironomus tentans
Toxicity Test with Whole Sediment
Samples from the Metropolitan Water Reclamation
District of Greater Chicago
Received July 9 – September 28, 2004**

Prepared by

**ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
Duluth, Minnesota 55811-5712**

**Submitted to:
Metropolitan Water Reclamation District of Greater Chicago
6001 West Pershing
Cicero, IL 60804**

**Originally Submitted November 2004
Re-submitted May 2005**

REPORT APPROVAL

Name (signed):  Date: 5/10/05

Name (typed): Kurt Anderson

Title: Senior Biologist



| SET # 2, Test Dates 7/19-30/04 | | | |
|--------------------------------|----------|--------------|---------------------|
| SITE ID | Survival | Dried Weight | Ash-free Dry Weight |
| West Bearskin | 95 | 1.24 | 0.97 |
| WW-110 CENTER | 84 | 1.12 | 0.79 |
| WW-110 SIDE | 44* | 1.11 | 0.73 |
| WW-89 SIDE | 60* | 1.38 | 0.92 |
| WW-89 CENTER | 60* | 1.40 | 0.94 |
| WW-90 SIDE | 47* | 1.11 | 0.75 |
| WW-64 CENTER | 78 | 1.60 | 0.88 |
| WW-64 SIDE | 76 | 1.31 | 0.78 |
| WW-80 CENTER | 86 | 1.10 | 0.75 |
| WW-80 SIDE | 78 | 1.38 | 0.80 |

* Significantly different than the WBS control results

| SET # 3, Test Dates 7/26-8/6/04 | | | |
|---------------------------------|-----------------|--------------------------|---------------------------------|
| SITE ID | Survival (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 94 | 1.41 | 1.13 |
| WW-79 CENTER | 86 | 1.42 | 1.02 |
| WW-18 SIDE | 86 | 1.14* | 0.72* |
| WW-77 CENTER | 85 | 1.27 | 0.80* |
| WW-77 SIDE | 88 | 0.98* | 0.65* |
| WW-18 SIDE | 94 | 1.27 | 0.72* |

• Significantly different than the WBS control results

CONCLUSIONS

The following conclusions can be drawn from the study results.

- The laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for all six sets of toxicity tests.
- WW-13 CENTER, WW-13 SIDE, WW-12 SIDE, WW-12 CENTER, WW-17 SIDE, WW-110 SIDE, WW-89 SIDE, WW-89 CENTER, WW-90 SIDE, WW-22 CENTER, and WW-24 SIDE caused significant lethality to *Chironomus* when compared to the West Bearskin results, indicating those sediments constituted an unsuitable habitat for *Chironomus* survival. No other test sediments caused a significant decrease in organism survival when compared to either of the laboratory controls.
- Test sediments that caused a significant reduction in *Chironomus* dried weight when compared to the laboratory control included: WW-18 SIDE, WW-77 SIDE, and WW-20 SIDE, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by dried weight).
- Test sediments that caused a significant reduction in *Chironomus* ash-free dried weight (AFDW) when compared to the laboratory control included: WW-18 SIDE, WW-18 CENTER, WW-77 SIDE, WW-77 CENTER, WW-20 SIDE, WW-19 SIDE, and WW-29 SIDE, indicating those sediments constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by ash-free dried weight).
- Test sediments that had **no effect on *Chironomus* survival or growth** when compared to the laboratory controls include: **WW-17 Center, WW-110 Center, WW-79 Center, WW-24 Side, WW-109 Center, WW-109 Side, WW-64 Center, WW-64 Side, WW-80 Center, WW-80 Side, WW-22 Side, WW-20 Center, WW-19 Center, WW-23 Center, WW-23 Side, and WW-29 Center.** These sediments can be classified as being of a suitable quality for supporting *Chironomus* survival and growth at the same levels as the control sediment, WBS.

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-64 Center

| Rep. | # Organisms | | | Ashed Pan. Wt. (g) | Ashed Pan. - Dried Org. Wt. (g) | Ashed Pan. + Ashed Org. Wt. (g) | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|--------------------|------------------------------------|------------------------------------|-----------------------|-----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 8 | 2 | 8 | 1.28373 | 1.29328 | 1.28730 | 0.00955 | 0.00598 | 1.19 | 0.75 |
| B | 9 | 1 | 9 | 1.27088 | 1.28408 | 1.27624 | 0.01320 | 0.00784 | 1.47 | 0.87 |
| C | 8 | 2 | 8 | 1.26961 | 1.28250 | 1.27552 | 0.01289 | 0.00698 | 1.61 | 0.87 |
| D | 7 | 3 | 7 | 1.26784 | 1.28640 | 1.27962 | 0.01856 | 0.00678 | 2.65 | 0.97 |
| E | 8 | 2 | 8 | 1.26333 | 1.27251 | 1.26749 | 0.00918 | 0.00502 | 1.15 | 0.63 |
| F | 6 | 4 | 6 | 1.27464 | 1.28270 | 1.27792 | 0.00806 | 0.00478 | 1.34 | 0.80 |
| G | 9 | 1 | 9 | 1.28501 | 1.29785 | 1.29038 | 0.01284 | 0.00747 | 1.43 | 0.83 |
| H | 7 | 3 | 7 | 1.28574 | 1.29917 | 1.29013 | 0.01343 | 0.00904 | 1.92 | 1.29 |
| Mean | 7.8 | | | | | | | Mean | 1.60 | 0.88 |
| St.Dev | 1.0 | | | | | | | St.Dev | 0.49 | 0.19 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-64 Side

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org | Ashed Org. | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|------------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 9 | 1 | 9 | 1.29087 | 1.30484 | 1.29536 | 0.01397 | 0.00948 | 1.55 | 1.05 |
| B | 9 | 1 | 9 | 1.27781 | 1.28485 | 1.28054 | 0.00704 | 0.00431 | 0.78 | 0.48 |
| C | 9 | 1 | 9 | 1.28401 | 1.29700 | 1.28896 | 0.01299 | 0.00804 | 1.44 | 0.89 |
| D | 4 | 6 | 4 | 1.27884 | 1.28586 | 1.28239 | 0.00702 | 0.00347 | 1.76 | 0.87 |
| E | 7 | 3 | 7 | 1.26934 | 1.27904 | 1.27362 | 0.00970 | 0.00542 | 1.39 | 0.77 |
| F | 6 | 4 | 6 | 1.26340 | 1.27151 | 1.26616 | 0.00811 | 0.00535 | 1.35 | 0.89 |
| G | 8 | 2 | 8 | 1.27494 | 1.28452 | 1.27892 | 0.00958 | 0.00560 | 1.20 | 0.70 |
| H | 9 | 1 | 9 | 1.28049 | 1.28969 | 1.28446 | 0.00920 | 0.00523 | 1.02 | 0.58 |
| Mean | 7.6 | | | | | | | Mean | 1.31 | 0.78 |
| St.Dev | 1.9 | | | | | | | St.Dev | 0.31 | 0.19 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-80 Center

| Rep. | # Organisms | | | Ashed Pan. Wt. (g) | Ashed Pan. t | Ashed Pan. t | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|--------------------|--------------|--------------|--------------------|--------------------|------------------------|------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.26873 | 1.27824 | 1.27223 | 0.00951 | 0.00601 | 0.95 | 0.60 |
| B | 9 | 1 | 9 | 1.28410 | 1.29331 | 1.28651 | 0.00921 | 0.00680 | 1.02 | 0.76 |
| C | 8 | 2 | 8 | 1.27806 | 1.28647 | 1.28032 | 0.00841 | 0.00615 | 1.05 | 0.77 |
| D | 9 | 1 | 9 | 1.28418 | 1.29624 | 1.28923 | 0.01206 | 0.00701 | 1.34 | 0.78 |
| E | 9 | 1 | 9 | 1.28597 | 1.29509 | 1.28891 | 0.00912 | 0.00618 | 1.01 | 0.69 |
| F | 8 | 2 | 8 | 1.27273 | 1.28091 | 1.27523 | 0.00818 | 0.00568 | 1.02 | 0.71 |
| G | 8 | 2 | 8 | 1.27212 | 1.28318 | 1.27527 | 0.01106 | 0.00791 | 1.38 | 0.99 |
| H | 8 | 2 | 8 | 1.24777 | 1.25598 | 1.25059 | 0.00821 | 0.00539 | 1.03 | 0.67 |
| Mean | 8.6 | | | | | | | Mean | 1.10 | 0.75 |
| St.Dev | 0.7 | | | | | | | St.Dev | 0.16 | 0.12 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-80 Side

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + Dried Org. Wt. (g) | Ashed Pan + Ashed Org. Wt. (g) | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|----------|-------------------|-----------------------------------|-----------------------------------|-----------------------|-----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighted | | | | | | | |
| A | 5 | 5 | 5 | 1.27979 | 1.28857 | 1.28315 | 0.00878 | 0.00542 | 1.76 | 1.08 |
| B | 6 | 4 | 6 | 1.28398 | 1.29146 | 1.28699 | 0.00748 | 0.00447 | 1.25 | 0.74 |
| C | 9 | 1 | 9 | 1.26624 | 1.27647 | 1.27044 | 0.01023 | 0.00603 | 1.14 | 0.67 |
| D | 9 | 1 | 9 | 1.28462 | 1.29526 | 1.28912 | 0.01064 | 0.00614 | 1.18 | 0.68 |
| E | 9 | 1 | 9 | 1.28948 | 1.30072 | 1.29416 | 0.01128 | 0.00656 | 1.25 | 0.73 |
| F | 7 | 3 | 7 | 1.27976 | 1.28734 | 1.28262 | 0.00758 | 0.00452 | 1.08 | 0.65 |
| G | 8 | 2 | 8 | 1.29335 | 1.30449 | 1.29860 | 0.01114 | 0.00589 | 1.39 | 0.74 |
| H | 9 | 1 | 9 | 1.29214 | 1.30973 | 1.29954 | 0.01759 | 0.01019 | 1.95 | 1.13 |
| Mean | 7.8 | | | | | | | Mean | 1.38 | 0.80 |
| St.Dev | 1.8 | | | | | | | St.Dev | 0.31 | 0.19 |

Title: SET #2 SURVIVAL
File: SET2S

Transform: ARC SINE(SQUARE ROOT(Y))

Chi-Square Test for Normality

Actual and Expected Frequencies

| INTERVAL | <-1.5 | -1.5 to <-0.5 | -0.5 to 0.5 | >0.5 to 1.5 | >1.5 |
|----------|--------|---------------|-------------|-------------|--------|
| EXPECTED | 5.2930 | 19.1180 | 30.1780 | 19.1180 | 5.2930 |
| OBSERVED | 7 | 20 | 23 | 27 | 2 |

Chi-Square = 7.5968 (p-value = 0.1075)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: SET #2 SURVIVAL

File: SET2S

Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 18.6958

(p-value = 0.0279)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 21.6660 (alpha = 0.01, df = 9)

= 16.9190 (alpha = 0.05, df = 9)

Using Average Degrees of Freedom
(Based on average replicate size of 7.90)

Calculated B2 statistic = 16.0138

(p-value = 0.0666)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: SET #2 SURVIVAL
File: SET2S

Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA Table

| SOURCE | DF | SS | MS | F |
|----------------|----|--------|--------|--------|
| Between | 9 | 2.8851 | 0.3206 | 6.2900 |
| Within (Error) | 69 | 3.5165 | 0.0510 | |
| Total | 78 | 6.4016 | | |

(p-value = 0.0000)

Critical F = 2.6759 (alpha = 0.01, df = 9,69)
= 2.0186 (alpha = 0.05, df = 9,69)

Since $F > \text{Critical } F$ REJECT H_0 : All equal (alpha = 0.05)

Title: SET #2 SURVIVAL
File: SET2S

Transform: ARC SINE(SQUARE ROOT(Y))

Bonferroni t-Test - TABLE 1 OF 2 Ho: Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | TRANS t STAT | SIG 0.05 |
|-------|----------------|------------------|-----------------------------------|--------------|----------|
| 1 | WBS | 1.3332 | 0.9500 | | |
| 2 | WW-110 CENTER | 1.1839 | 0.8375 | 1.3220 | |
| 3 | WW-110 SIDE | 0.7071 | 0.4375 | 5.5468 | * |
| 4 | WW-89 SIDE | 0.8896 | 0.6000 | 3.9293 | * |
| 5 | WW-89 CENTER | 0.8910 | 0.6000 | 3.9172 | * |
| 6 | WW-90 SIDE | 0.7613 | 0.4714 | 4.8949 | * |
| 7 | WW-64 CENTER | 1.0860 | 0.7750 | 2.1898 | |
| 8 | WW-80CENTER | 1.1985 | 0.8625 | 1.1933 | |
| 9 | WW-64 SIDE | 1.0832 | 0.7625 | 2.2149 | |
| 10 | WW-80 SIDE | 1.0957 | 0.7750 | 2.1034 | |

Bonferroni t critical value = 2.6095 (1 Tailed, alpha = 0.05, df = 9,69)

Title: SET #2 SURVIVAL
File: SET2S

Transform: ARC SINE(SQUARE ROOT(Y))

Bonferroni t-Test - TABLE 2 OF 2 Ho: Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | MIN SIG DIFF (IN ORIG. UNITS) | % OF CONTROL | DIFFERENCE FROM CONTROL |
|-------|----------------|-------------|-------------------------------|--------------|-------------------------|
| 1 | WBS | 8 | | | |
| 2 | WW-110 CENTER | 8 | 0.2021 | 21.4 | 0.1125 |
| 3 | WW-110 SIDE | 8 | 0.2021 | 21.4 | 0.5125 |
| 4 | WW-89 SIDE | 8 | 0.2021 | 21.4 | 0.3500 |
| 5 | WW-89 CENTER | 8 | 0.2021 | 21.4 | 0.3500 |
| 6 | WW-90 SIDE | 7 | 0.2111 | 22.4 | 0.4786 |
| 7 | WW-64 CENTER | 8 | 0.2021 | 21.4 | 0.1750 |
| 8 | WW-80CENTER | 8 | 0.2021 | 21.4 | 0.0875 |
| 9 | WW-64 SIDE | 8 | 0.2021 | 21.4 | 0.1875 |
| 10 | WW-80 SIDE | 8 | 0.2021 | 21.4 | 0.1750 |

Title: SET #2 dRIED WEIGHT

File: SET2DW

Transform:

NO TRANSFORMATION

Chi-Square Test for Normality

Actual and Expected Frequencies

| INTERVAL | <-1.5 | -1.5 to <-0.5 | -0.5 to 0.5 | >0.5 to 1.5 | >1.5 |
|----------|--------|---------------|-------------|-------------|--------|
| EXPECTED | 5.1590 | 18.6340 | 29.4140 | 18.6340 | 5.1590 |
| OBSERVED | 2 | 25 | 31 | 12 | 7 |

Chi-Square = 7.2135 (p-value = 0.1250)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: SET #2 dRIED WEIGHT

File: SET2DW

Transform:

NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 9.7772 (p-value = 0.3688)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 21.6660 (alpha = 0.01, df = 9)
= 16.9190 (alpha = 0.05, df = 9)

Using Average Degrees of Freedom
(Based on average replicate size of 7.70)

Calculated B2 statistic = 8.6209 (p-value = 0.4730)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: SET #2 dRIED WEIGHT
File: SET2DW

Transform:

NO TRANSFORMATION

ANOVA Table

| SOURCE | DF | SS | MS | F |
|----------------|----|--------|--------|--------|
| Between | 9 | 1.9327 | 0.2147 | 2.2489 |
| Within (Error) | 67 | 6.3976 | 0.0955 | |
| Total | 76 | 8.3302 | | |

(p-value = 0.0290)

Critical F = 2.6843 (alpha = 0.01, df = 9,67)
 = 2.0229 (alpha = 0.05, df = 9,67)

Since $F > \text{Critical F}$ REJECT H_0 : All equal (alpha = 0.05)

Title: SET #2 dRIED WEIGHT
File: SET2DW

Transform: NO TRANSFORMATION

Bonferroni t-Test - TABLE 1 OF 2 Ho: Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | t STAT | SIG 0.05 |
|-------|----------------|---------------------|--------------------------------------|---------|-------------|
| 1 | WBS | 1.2437 | 1.2437 | | |
| 2 | WW-110 CENTER | 1.1213 | 1.1213 | 0.7929 | |
| 3 | WW-110 SIDE | 1.1071 | 1.1071 | 0.8542 | |
| 4 | WW-89 SIDE | 1.3757 | 1.3757 | -0.8252 | |
| 5 | WW-89 CENTER | 1.3950 | 1.3950 | -0.9789 | |
| 6 | WW-90 SIDE | 1.1086 | 1.1086 | 0.8453 | |
| 7 | WW-64 CENTER | 1.5958 | 1.5958 | -2.2783 | |
| 8 | WW-80 CENTER | 1.1000 | 1.1000 | 0.9304 | |
| 9 | WW-64 SIDE | 1.3113 | 1.3113 | -0.4369 | |
| 10 | WW-80 SIDE | 1.3750 | 1.3750 | -0.8495 | |

Bonferroni t critical value = 2.6116 (1 Tailed, alpha = 0.05, df = 9,67)

Title: SET #2 dRIED WEIGHT
File: SET2DW

Transform: NO TRANSFORMATION

Bonferroni t-Test - TABLE 2 OF 2 Ho: Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | MIN SIG DIFF (IN ORIG. UNITS) | % OF CONTROL | DIFFERENCE FROM CONTROL |
|-------|----------------|----------------|----------------------------------|-----------------|----------------------------|
| 1 | WBS | 8 | | | |
| 2 | WW-110 CENTER | 8 | 0.4035 | 32.4 | 0.1225 |
| 3 | WW-110 SIDE | 7 | 0.4177 | 33.6 | 0.1366 |
| 4 | WW-89 SIDE | 7 | 0.4177 | 33.6 | -0.1320 |
| 5 | WW-89 CENTER | 8 | 0.4035 | 32.4 | -0.1513 |
| 6 | WW-90 SIDE | 7 | 0.4177 | 33.6 | 0.1352 |
| 7 | WW-64 CENTER | 8 | 0.4035 | 32.4 | -0.3520 |
| 8 | WW-80 CENTER | 8 | 0.4035 | 32.4 | 0.1437 |
| 9 | WW-64 SIDE | 8 | 0.4035 | 32.4 | -0.0675 |
| 10 | WW-80 SIDE | 8 | 0.4035 | 32.4 | -0.1313 |

Title: SET #2 afdw

File: SET2AFDW

Transform:

NO TRANSFORMATION

Chi-Square Test for Normality

Actual and Expected Frequencies

| INTERVAL | <-1.5 | -1.5 to <-0.5 | -0.5 to 0.5 | >0.5 to 1.5 | >1.5 |
|----------|--------|---------------|-------------|-------------|--------|
| EXPECTED | 5.1590 | 18.6340 | 29.4140 | 18.6340 | 5.1590 |
| OBSERVED | 2 | 23 | 32 | 15 | 5 |

Chi-Square = 3.8983 (p-value = 0.4199)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: SET #2 afdw
File: SET2AFDW Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 9.6701 (p-value = 0.3778)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 21.6660 (alpha = 0.01, df = 9)
= 16.9190 (alpha = 0.05, df = 9)

Using Average Degrees of Freedom
(Based on average replicate size of 7.70)

Calculated B2 statistic = 8.8329 (p-value = 0.4528)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: SET #2 afdw

File: SET2AFDW

Transform:

NO TRANSFORMATION

ANOVA Table

| SOURCE | DF | SS | MS | F |
|----------------|----|--------|--------|--------|
| Between | 9 | 0.5423 | 0.0603 | 1.3758 |
| Within (Error) | 67 | 2.9342 | 0.0438 | |
| Total | 76 | 3.4765 | | |

(p-value = 0.2167)

Critical F = 2.6843 (alpha = 0.01, df = 9,67)
= 2.0229 (alpha = 0.05, df = 9,67)

Since $F < \text{Critical } F$ FAIL TO REJECT H_0 : All equal (alpha = 0.05)

Title: SET #2 afdw

File: SET2AFDW

Transform:

NO TRANSFORMATION

Bonferroni t-Test -

TABLE 1 OF 2

Ho: Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | t STAT | SIG 0.05 |
|-------|----------------|---------------------|--------------------------------------|--------|-------------|
| 1 | WBS | 0.9725 | 0.9725 | | |
| 2 | WW-110 CENTER | 0.7938 | 0.7938 | 1.7083 | |
| 3 | WW-110 SIDE | 0.7300 | 0.7300 | 2.2390 | |
| 4 | WW-89 SIDE | 0.9200 | 0.9200 | 0.4847 | |
| 5 | WW-89 CENTER | 0.9425 | 0.9425 | 0.2867 | |
| 6 | WW-90 SIDE | 0.7529 | 0.7529 | 2.0279 | |
| 7 | WW-64 CENTER | 0.8763 | 0.8763 | 0.9199 | |
| 8 | WW-80 CENTER | 0.7462 | 0.7462 | 2.1623 | |
| 9 | WW-64 SIDE | 0.7787 | 0.7787 | 1.8517 | |
| 10 | WW-80 SIDE | 0.8025 | 0.8025 | 1.6247 | |

Bonferroni t critical value = 2.6116 (1 Tailed, alpha = 0.05, df = 9,67)

Title: SET #2 afdw

File: SET2AFDW

Transform:

NO TRANSFORMATION

Bonferroni t-Test -

TABLE 2 OF 2

Ho: Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | MIN SIG DIFF (IN ORIG. UNITS) | % OF CONTROL | DIFFERENCE FROM CONTROL |
|-------|----------------|----------------|----------------------------------|-----------------|----------------------------|
| 1 | WBS | 8 | | | |
| 2 | WW-110 CENTER | 8 | 0.2733 | 28.1 | 0.1787 |
| 3 | WW-110 SIDE | 7 | 0.2829 | 29.1 | 0.2425 |
| 4 | WW-89 SIDE | 7 | 0.2829 | 29.1 | 0.0525 |
| 5 | WW-89 CENTER | 8 | 0.2733 | 28.1 | 0.0300 |
| 6 | WW-90 SIDE | 7 | 0.2829 | 29.1 | 0.2196 |
| 7 | WW-64 CENTER | 8 | 0.2733 | 28.1 | 0.0962 |
| 8 | WW-80 CENTER | 8 | 0.2733 | 28.1 | 0.2263 |
| 9 | WW-64 SIDE | 8 | 0.2733 | 28.1 | 0.1938 |
| 10 | WW-80 SIDE | 8 | 0.2733 | 28.1 | 0.1700 |

Attachment 18



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC – 9/05
ASci-ETL Study ID #5010-214

**Results of Ten-Day
Chironomus tentans
Toxicity Test with Whole Sediment
Samples from the Metropolitan Water Reclamation
District of Greater Chicago
Received June 29 – August 3, 2005**

Prepared by

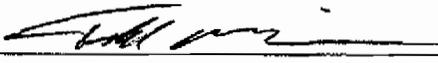
**ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
Duluth, Minnesota 55811-5712**

**Submitted to:
Metropolitan Water Reclamation District of Greater Chicago
6001 West Pershing
Cicero, IL 60804**

Submitted September 2005



REPORT APPROVAL

Name (signed):  Date: 9/2/05

Name (typed): Todd McGuire

Title: Operations Manager

Name (signed):  Date: 9/1/05

Name (typed): Kurt Anderson

Title: Senior Biologist



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INTRODUCTION

At the request of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected from Chicago-area waterways. The 10-day tests were performed to measure the toxicity of selected sediment samples to larval *Chironomus tentans*. The *Chironomus* endpoints were survival and growth. Growth was defined as ash-free dried weight (AFDW)

STUDY SUMMARY

The tables below summarize survival and growth for each Chicago-area waterway sediment and the respective control sediment, West Bearskin (WBS). Results are grouped according to the test dates of the five separate toxicity exposures. Each toxicity test used an independent WBS control as the statistical comparison reference.

| SET # 1, Test Dates 7/1-11/05 | | |
|-------------------------------|--------------|--------------------------------|
| SITE ID | Survival (%) | Ash-free Dried Weight (mg/org) |
| West Bearskin | 86 | 1.02 |
| WW-31 CENTER | 86 | 1.20 |
| WW-31 SIDE | 80 | 0.96 |
| WW-32 CENTER | 93 | 1.22 |
| WW-32 SIDE | 90 | 0.72* |
| WW-106 CENTER | 93 | 1.42 |
| WW-106 SIDE | 90 | 0.73* |

* Significantly different than the WBS control results



| SET # 2, Test Dates 7/8-18/05 | | |
|-------------------------------|--------------|------------------------------|
| SITE ID | Survival (%) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 96 | 1.18 |
| WW-103 CENTER | 95 | 1.20 |
| WW-103 SIDE | 96 | 1.19 |
| WW-104 CENTER | 94 | 1.01 |
| WW-104 SIDE | 97 | 1.09 |
| WW-105 CENTER | 99 | 1.23 |
| WW-105 SIDE | 96 | 1.28 |

- Significantly different than the WBS control results

| SET # 3, Test Dates 7/22-8/1/05 | | |
|---------------------------------|--------------|------------------------------|
| SITE ID | Survival (%) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 99 | 1.13 |
| WW-34 CENTER | 94 | 1.19 |
| WW-34 SIDE | 95 | 0.95* |
| WW-35 CENTER | 96 | 1.35 |
| WW-35 SIDE | 96 | 1.47 |

- Significantly different than the WBS control results



| SET # 4, Test Dates 7/29-8/8/05 | | |
|---------------------------------|--------------|------------------------------|
| SITE ID | Survival (%) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 96 | 1.03 |
| WW-36 CENTER | 94 | 1.23 |
| WW-36 SIDE | 95 | 1.25 |
| WW-46 CENTER | 93 | 0.88 |
| WW-46 SIDE | 13* | 0.13** |
| WW-102 CENTER | 79 | 1.16 |
| WW-102 SIDE | 80 | 1.62 |
| WW-96 SIDE | 80* | 1.08** |

- Significantly different than the WBS control results
- ** Not formally compared since survival data were statistically different.

WW-102 Side and WW-102 Center had higher variation than WW-96 Side, which accounts for the statistical anomaly that designates WW-96 Side as significantly different but not WW-102 Side or WW-102 Center.

| SET # 5, Test Dates 8/5-15/05 | | |
|-------------------------------|--------------|------------------------------|
| SITE ID | Survival (%) | Ash-free Dry Weight (mg/org) |
| West Bearskin | 96 | 0.84 |
| WW-37 CENTER | 84 | 0.93 |
| WW-37 SIDE | 93 | 1.44 |
| WW-73 CENTER | 86 | 0.98 |
| WW-73 SIDE | 49* | 0.43** |
| WW-101 CENTER | 94 | 1.40 |
| WW-101 SIDE | 51* | 0.17** |

- Significantly different than the WBS control results

** Not formally compared since survival data were statistically different.

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from Metropolitan Water Reclamation District of Greater Chicago were performed following suggested United States Environmental Protection Agency (USEPA) methods (USEPA 2000 Test Method 100.2) Ten-day tests exposing *Chironomus* were conducted in a manner to determine the effect of each test sediment on organism survival and growth. Effect was determined by comparison to organism performance following exposure to the selected reference site sediment. Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

The toxicity tests were conducted in five separate sets, with one control per test set. The test were initiated on the following days (2005): Set#1 on July 1, Set #2 on July 8, Set#3 on July 22, Set#4 on July 29, and Set #5 on August 5. Test methods are identical for each test set.

Test Organism Culturing, Holding, and Acclimation

Chironomus were obtained from Environmental Consulting & Testing, Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23°C.

The *Chironomus* were delivered to ASci-ETL by ASci personnel. Upon arrival at ASci-ETL, the *Chironomus* were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to daily temperature changes greater than 3°C per day during holding. The *Chironomus* were second- to third-instar larvae (approximately 10 days-old) at test initiation.

Overlying Water Source

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds.

Exposure System

Sediment from each site tested included eight replicates. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Eight replicate test chambers of each sediment exposure were held in a single all glass 12-L aquarium constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each aquarium. The configuration resulted in two turnovers of overlying water per day. Test temperature ($23^{\circ} \pm 1^{\circ}\text{C}$) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.



Test Sediments

Sediment samples were collected by MWRDGC personnel from June 22, 2005 to July 28, 2005. The samples were delivered to ASci-ETL by express courier from June 29 to August 3, 2005.

The first set of samples arrived on June 29, 2005, and included the following sediments: WW-31 Side, WW-31 Center, WW-32 Side, WW-32 Center, WW-106 Side, and WW-106 Center.

The second set of samples arrived on July 6, 2005, and included the following sediments: WW-103 Side, WW-103 Center, WW-104 Side, WW-104 Center, WW-105 Side, and WW-105 Center.

The third set of samples arrived on July 19, 2005, and included the following sediments: WW-34 Center, WW-34 Side, WW-35 Center, and WW-35 Side.

The fourth set of samples arrived on July 27, 2005, and included the following sediments: WW-36 Side, WW-36 Center, WW-46 Side, WW-46 Center, WW-102 Side, WW-102 Center, and WW-96 Side.

The fifth set of samples arrived on September 13, 2005, and included the following sediments: WW-37 Center, WW-37 Side, WW-73 Side, WW-73 Center, WW-101 Center and WW-101 Side.

The Chain of Custody forms were completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at 1-4°C until use. Appendix A contains a copy of the Chain of Custody forms.

The control sediment, West Bearskin, was collected on June 28, 2005, from West Bearskin Lake, located in Cook County, Minnesota. The West Bearskin sediment sample (10-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample

was logged-in and stored under refrigeration (1-4°C) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms.

Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water. The toxicity tests were initiated approximately 24 hours later, after the sediment and overlying water had settled.

To start the tests, ten *Chironomus* were impartially distributed to each test replicate. The organisms were handled with a wide-bore glass pipette.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of $\pm 10\%$ from target flow were adjusted. Measurements of overlying water pH, total ammonia, conductivity, hardness, and alkalinity were performed on day 0 and day 10. The temperature and dissolved oxygen were measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic Biosystems). *Chironomus* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 10 days of exposure. Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms



and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at a constant temperature (90-100°C) for 20-24 hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus the weight of ashed larvae. This measurement accounts for gut-retained sediments in the *C. tentans* that may skew the standard dry weight results and eliminates effects of sediment grain size on growth results.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled weight of the replicate by the number of organisms exposed less the number of pupae recovered.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the laboratory reference control sediment to measure effect. The survival data were analyzed using the TOXSTAT Version 3.5 software package (West Inc., and University of Wyoming, Laramie, Wyoming). The survival data were arc-sine transformed before analysis then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect ($p=0.05$) as compared to the laboratory reference control results.

The growth data were not transformed before analysis. Mean dry weights and AFDW of organisms were checked for normality and equality of variance. The weight data were then analyzed for significant effect ($p=0.05$) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the laboratory reference control results to determine effect. Each set of test sediments was compared independently the West Bearskin control (WBS) to measure effect.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overlying water flow rate to each of the holding tanks was maintained between 9.4 and 9.7 ml/minute. The overall mean flow rate for each of the holding tanks during the test period averaged 9.5-9.6 ml/minute. The mean flow rate resulted in a mean daily turnover of overlying water rate of 2.0 turnovers/day.

Tables 2a-2e summarize the overlying water temperature values measured daily from the *Chironomus* exposure chambers. All mean test temperatures were within the proposed range of $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$. In several instances the instantaneous temperature measured was below the minimum target values of 22°C ; however, the slight decrease in temperatures were of short duration and would not have affected the exposures.

Overlying water dissolved oxygen (DO) concentrations in the *Chironomus* test chambers are in Table 3. DO values ranged from 2.2 to 8.2 mg/L during the *Chironomus* exposure, which resulted in a range of 26 to 95% percent saturation. Feeding was suspended for the Set #1 and Set #5 *Chironomus* exposures when the dissolved oxygen levels dropped below the EPA minimum of 2.5 mg/L. Feeding was resumed after DO levels increased to acceptable levels, and no aeration of the overlying water was required.

Overlying water pHs for the *Chironomus* test chambers are in Table 4. None of the pH values were outside of the organism's physiologically tolerable range.

Table 5 contains the overlying water conductivity values for the *Chironomus* exposures. None of the conductivity levels were high enough to adversely affect the *Chironomus*.

Tables 6 and 7 contain overlying water alkalinity and hardness values for the *Chironomus* exposures, respectively. All concentrations were within normal ranges

Table 8 contains the results of total ammonia measurements. Ammonia concentrations ranged from <1.0 to 8.7 mg/L. Most of the measured ammonia levels should not have adversely affected *C. tentans* survival, however, any levels above approximately 5 mg/L could possibly affect *C. tentans* growth at the observed pH levels.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity.

Biological Exposure Results

All organisms were observed to burrow into all test sediments. During test termination, the presence of flatworms was noted for several replicates among various test sediments. In most cases, a significant decrease in *Chironomus* survival was also observed for these replicates. The assumption was made that the flatworms were adversely affecting the test organisms, either through predation and/or food competition. Therefore, any replicate containing a flatworm was excluded from the data analysis and subsequent statistical comparisons.

No other significant observations were recorded throughout the test.

No other significant observations were recorded throughout the test.

Chironomus tentans Survival and Growth Results -

Table 9 shows the *Chironomus* survival data. The EPA recommended minimum survival rate for control sediments is 70%. All five West Bearskin control sediment supported acceptable mean percentage survival of 86-99%. *Chironomus* survival for the test sediments ranged from 13-99%.

Chironomus ash-free dried weight results are also given in Table 9. The EPA control requirement for control organism ash-free dried weight is 0.48 mg/surviving organism. All five West Bearskin control sediment supported acceptable mean ash-free dried organism weights of 0.84 –1.18 mg/organism. *Chironomus* ash-free dried weights for the test sites ranged from 0.13 to 1.47 mg/organism.

Chironomus tentans Statistical Results

The *Chironomus* survival data were grouped into the five test groups and compared independently to the respective West Bearskin control results to determine effect. Results of the analysis are contained in Appendix C. The table below summarizes the statistical analyses. An affected site is one that was statistically different than the WBS control ($p=0.05$).



| Set # 1 | | | | | |
|----------|--|--------------|-------------|--------------|-----------------|
| Endpoint | Normality | Variance | Replication | Analysis | Affected Sites* |
| Survival | non-normal | homogenous | unequal | Wilcoxin's | none |
| AFDW | normal | homogenous | unequal | Bonferroni's | 32-S, 106S |
| Set # 2 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | Not analyzed due to obvious lack of effect | | | | |
| AFDW | normal | homogenous | unequal | Bonferroni's | none |
| Set # 3 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | Not analyzed due to obvious lack of effect | | | | |
| AFDW | non-normal | heterogenous | equal | Steel's | 34-S |
| Set # 4 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | normal | heterogenous | unequal | Wilcoxin's | 46-S, 96-S |
| AFDW | Non-normal | homogenous | unequal | Bonferroni's | none |
| Set # 5 | | | | | |
| Endpoint | Normality | Homogeneity | Replication | Analysis | Affected Sites |
| Survival | non-normal | homogenous | unequal | Wilcoxin's | 73-S, 101-S |
| AFDW | normal | homogenous | equal | Dunnett's | none |

* ABBREVIATED SITE DESIGNATIONS (13S = WW-13 Side)

CONCLUSIONS

The following conclusions can be drawn from the study results.

- The laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for all six sets of toxicity tests.
- WW-46 SIDE, WW-96 SIDE, WW-73 SIDE, and WW-101 SIDE caused significant lethality to *Chironomus* when compared to the West Bearskin results, indicating those sediments constituted an unsuitable habitat for *Chironomus* survival. These sites were not formally compared for growth data. No other test sediments caused a significant decrease in organism survival when compared to the laboratory control.
- Test sediments that caused a significant reduction in *Chironomus* ash-free dried weight (AFDW) when compared to the laboratory control included: WW-32 SIDE, and WW-106 SIDE, indicating those sediments had no effect on *Chironomus* survival but constituted an unsuitable habitat for optimal *Chironomus* growth (as defined by ash-free dried weight).

REFERENCES

USEPA. March 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. Second Edition. EPA/600/R-99/064.

Benoit, D.A., G. Phipps, and G.T. Ankley. 1993. A Sediment Testing Intermittent Renewal System for the Automated Renewal of Overlying Water in Toxicity Tests with Contaminated Sediments. *Water Research* 27:1403-1412.

West, Inc. and University of Wyoming. Laramie, Wyoming. 1996. Department of Zoology and Physiology. TOXSTAT software package version 3.5.

Table 2(a) Overlying Water Temperature Values (oC) for MWRDGC Set #1 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-31 CENTER | WW-31 SIDE | WW-32 CENTER | WW-32 SIDE | WW-106 CENTER | WW-106 SIDE |
|------|---------------|--------------|------------|--------------|------------|---------------|-------------|
| 0 | 23.1 | 23.2 | 23.2 | 23.2 | 23.1 | 23.1 | 23.2 |
| 1 | 22.2 | 22.3 | 22.4 | 22.3 | 22.5 | 22.5 | 22.5 |
| 2 | 22.1 | 22.1 | 22.1 | 22.2 | 22.3 | 22.2 | 22.3 |
| 3 | 21.2 | 21.2 | 21.2 | 22.0 | 22.0 | 22.2 | 22.0 |
| 4 | 22.1 | 22.1 | 22.1 | 22.1 | 22.2 | 22.2 | 22.1 |
| 5 | 22.4 | 22.4 | 22.4 | 22.6 | 22.4 | 22.6 | 22.4 |
| 6 | 22.3 | 22.3 | 22.4 | 22.3 | 22.2 | 22.4 | 22.4 |
| 7 | 22.5 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| 8 | 22.8 | 22.6 | 22.8 | 22.7 | 22.9 | 22.9 | 22.8 |
| 9 | 22.8 | 22.9 | 22.8 | 22.8 | 22.9 | 23.0 | 22.9 |
| 10 | 22.7 | 22.6 | 22.8 | 22.8 | 22.8 | 22.9 | 22.8 |
| Low | 21.2 | 21.2 | 21.2 | 22.0 | 22.0 | 22.2 | 22.0 |
| High | 23.1 | 23.2 | 23.2 | 23.2 | 23.1 | 23.1 | 23.2 |
| Mean | 22.4 | 22.4 | 22.4 | 22.5 | 22.5 | 22.6 | 22.5 |

Table 3(a) Overlying Water Dissolved Oxygen Values (mg/L) for MWRDGC Set #1 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-31 CENTER | WW-31 SIDE | WW-32 CENTER | WW-32 SIDE | WW-106 CENTER | WW-106 SIDE |
|----------------------------|---------------|--------------|------------|--------------|------------|---------------|-------------|
| 0 | 7.4 | 7.3 | 7.3 | 6.0 | 6.0 | 6.1 | 6.5 |
| 1 | 7.1 | 6.4 | 6.3 | 6.3 | 6.0 | 6.0 | 6.3 |
| 2 | 7.1 | 6.7 | 5.4 | 6.3 | 5.6 | 5.9 | 6.8 |
| 3 | 7.3 | 6.8 | 6.4 | 6.2 | 6.2 | 5.8 | 6.8 |
| 4 | 6.3 | 6.2 | 6.3 | 5.2 | 5.4 | 5.2 | 5.4 |
| 5 | 5.0 | 5.2 | 4.6 | 4.0 | 4.2 | 5.0 | 4.6 |
| 6 | 5.0 | 5.5 | 4.3 | 4.4 | 4.4 | 4.5 | 5.0 |
| 7 | 5.1 | 3.9 | 4.1 | 4.2 | 4.1 | 4.5 | 4.0 |
| 8 | 4.5 | 3.0 | 3.2 | 2.4 | 2.6 | 4.0 | 3.2 |
| 9 | 4.8 | 3.8 | 3.6 | 4.7 | 4.6 | 4.4 | 4.3 |
| 10 | 4.8 | 4.2 | 4.1 | 4.5 | 4.5 | 4.7 | 4.8 |
| Low | 4.5 | 3.0 | 3.2 | 2.4 | 2.6 | 4.0 | 3.2 |
| High | 7.4 | 7.3 | 7.3 | 6.3 | 6.2 | 6.1 | 6.8 |
| Mean | 5.9 | 5.4 | 5.1 | 4.9 | 4.9 | 5.1 | 5.2 |
| Min. DO %DO _{sat} | 52.3 | 34.9 | 37.2 | 27.9 | 30.2 | 46.5 | 37.2 |

Table 2(b) Overlying Water Temperature Values (oC) for MWRDGC Set #2 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|------|---------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 0 | 22.9 | 22.8 | 22.9 | 22.9 | 23.0 | 22.9 | 22.8 |
| 1 | 22.8 | 22.8 | 22.8 | 23.0 | 22.9 | 23.0 | 23.0 |
| 2 | 22.9 | 22.8 | 23.0 | 22.9 | 22.9 | 22.9 | 22.9 |
| 3 | 23.0 | 23.1 | 23.2 | 23.1 | 23.0 | 23.1 | 23.2 |
| 4 | 22.8 | 22.9 | 22.8 | 22.9 | 22.8 | 22.9 | 22.8 |
| 5 | 23.0 | 23.1 | 23.2 | 23.0 | 22.9 | 23.1 | 22.9 |
| 6 | 22.6 | 22.9 | 22.7 | 22.6 | 22.4 | 22.5 | 22.5 |
| 7 | 22.6 | 22.5 | 22.6 | 22.6 | 22.4 | 22.4 | 22.4 |
| 8 | 22.7 | 22.7 | 22.6 | 22.7 | 22.7 | 22.6 | 22.7 |
| 9 | 22.6 | 22.6 | 22.6 | 22.7 | 22.4 | 22.5 | 22.5 |
| 10 | 22.6 | 22.6 | 22.6 | 22.7 | 22.7 | 22.6 | 22.6 |
| Low | 22.6 | 22.5 | 22.6 | 22.6 | 22.4 | 22.4 | 22.4 |
| High | 23.0 | 23.1 | 23.2 | 23.1 | 23.0 | 23.1 | 23.2 |
| Mean | 22.8 | 22.8 | 22.8 | 22.8 | 22.7 | 22.8 | 22.8 |

Table 3(b) Overlying Water Dissolved Oxygen Values (mg/L) for MWRDGC Set #2 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|--------------|---------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 0 | 7.5 | 7.0 | 7.1 | 7.1 | 7.0 | 6.9 | 7.3 |
| 1 | 7.2 | 6.3 | 6.4 | 6.7 | 5.5 | 6.6 | 6.5 |
| 2 | 6.1 | 5.1 | 5.2 | 5.0 | 5.2 | 4.9 | 5.0 |
| 3 | 5.4 | 5.6 | 5.3 | 5.1 | 5.4 | 5.1 | 5.2 |
| 4 | 5.8 | 4.6 | 4.7 | 4.3 | 4.8 | 4.7 | 5.2 |
| 5 | 5.6 | 4.3 | 4.1 | 4.6 | 4.5 | 4.6 | 3.7 |
| 6 | 6.4 | 4.5 | 4.5 | 5.5 | 4.5 | 6.4 | 4.5 |
| 7 | 4.9 | 4.6 | 5.2 | 5.9 | 4.4 | 6.2 | 6.0 |
| 8 | 5.3 | 4.0 | 5.4 | 5.5 | 5.0 | 5.9 | 5.9 |
| 9 | 5.1 | 3.9 | 4.9 | 5.5 | 4.6 | 4.0 | 4.7 |
| 10 | 5.0 | 3.8 | 4.8 | 5.4 | 4.6 | 4.0 | 4.6 |
| Low | 4.9 | 3.8 | 4.1 | 4.3 | 4.4 | 4.0 | 3.7 |
| High | 7.5 | 7.0 | 7.1 | 7.1 | 7.0 | 6.9 | 7.3 |
| Mean | 5.8 | 4.9 | 5.2 | 5.5 | 5.0 | 5.4 | 5.3 |
| Min DO %/Sat | 57.0 | 44.2 | 47.7 | 50.0 | 51.2 | 46.5 | 43.0 |

Table 4(b) Overlying Water pH Values for MWRDGC Set#2 Sediments During 10-Day C. Exposures

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|-----|---------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 0 | 7.98 | 7.88 | 7.76 | 7.91 | 7.78 | 7.75 | 7.81 |
| 10 | 7.47 | 7.41 | 7.44 | 7.41 | 7.32 | 7.33 | 7.39 |

Table 5(b) Overlying Water Conductivity Values (umhos/cm) for MWRDGC Set#2 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|-----|---------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 0 | 120 | 266 | 240 | 187 | 402 | 231 | 330 |
| 10 | 136 | 215 | 176 | 165 | 207 | 157 | 172 |

Table 6(b) Overlying Water Alkalinity Values (mg/L) for MWRDGC Set#2 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|-----|---------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 0 | 70 | 96 | 62 | 62 | 106 | 60 | 40 |
| 10 | 44 | 86 | 62 | 60 | 82 | 56 | 62 |

Table 7(b) Overlying Water Hardness Values (mg/L) for MWRDGC Set#2 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|-----|---------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 0 | 40 | 70 | 72 | 70 | 114 | 96 | 92 |
| 10 | 46 | 76 | 64 | 64 | 76 | 54 | 62 |

Table 8(b) Overlying Water Ammonia Values (mg/L) for MWRDGC Set #2 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|-----|---------------|---------------|-------------|---------------|-------------|---------------|-------------|
| 0 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 10 | <1 | 1.4 | <1 | <1 | <1 | <1 | <1 |

Table 2(c) Overlying Water Temperature Values (oC) for MWRDGC Set #3 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-34 CENTER | WW-34 SIDE | WW-35 CENTER | WW-35 SIDE |
|------|------------------|-----------------|---------------|-----------------|---------------|
| 0 | 23.9 | 23.9 | 23.9 | 24.1 | 24.1 |
| 1 | 22.5 | 22.5 | 22.4 | 22.6 | 22.4 |
| 2 | 22.9 | 22.1 | 22.9 | 23.1 | 22.9 |
| 3 | 23.1 | 23.0 | 23.1 | 23.0 | 23.0 |
| 4 | 22.9 | 23.2 | 22.7 | 22.8 | 22.9 |
| 5 | 22.9 | 23.0 | 23.1 | 23.0 | 22.8 |
| 6 | 23.8 | 23.6 | 23.7 | 23.8 | 23.7 |
| 7 | 22.9 | 22.8 | 22.9 | 22.9 | 22.7 |
| 8 | 23.0 | 22.9 | 22.9 | 22.9 | 22.8 |
| 9 | 23.0 | 23.0 | 22.9 | 22.9 | 22.8 |
| 10 | 22.9 | 23.0 | 22.8 | 22.9 | 23.1 |
| Low | 22.5 | 22.1 | 22.4 | 22.6 | 22.4 |
| High | 23.9 | 23.9 | 23.9 | 24.1 | 24.1 |
| Mean | 23.1 | 23.0 | 23.0 | 23.1 | 23.0 |

Table 3(c) Overlying Water Dissolved Oxygen Values (mg/L) for MWRDGC Set #3 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-34 CENTER | WW-34 SIDE | WW-35 CENTER | WW-35 SIDE |
|---------------|------------------|-----------------|---------------|-----------------|---------------|
| 0 | 8.2 | 8.2 | 8.2 | 8.2 | 8.2 |
| 1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 |
| 2 | 8.2 | 8.0 | 8.0 | 7.9 | 7.5 |
| 3 | 7.7 | 6.0 | 5.6 | 5.4 | 5.2 |
| 4 | 6.0 | 5.5 | 5.6 | 5.3 | 5.5 |
| 5 | 6.8 | 4.8 | 5.2 | 5.2 | 5.2 |
| 6 | 6.6 | 5.3 | 6.6 | 5.9 | 5.9 |
| 7 | 6.9 | 5.1 | 4.7 | 5.1 | 5.2 |
| 8 | 5.3 | 4.4 | 4.3 | 4.6 | 4.3 |
| 9 | 5.1 | 4.3 | 4.3 | 4.4 | 4.4 |
| 10 | 5.0 | 4.4 | 4.6 | 4.1 | 4.3 |
| Low | 5.0 | 4.3 | 4.3 | 4.1 | 4.3 |
| High | 8.2 | 8.2 | 8.2 | 8.2 | 8.2 |
| Mean | 6.7 | 5.8 | 5.9 | 5.8 | 5.8 |
| Min DO Sat. % | 58.1 | 50.5 | 50.0 | 47.7 | 50.0 |

Table 2(d) Overlying Water Temperature Values (oC) for MWRDGC Set #4 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-36 CENTER | WW-36 SIDE | WW-46 CENTER | WW-46 SIDE | WW-102 CENTER | WW-102 SIDE | WW-96 SIDE |
|------|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|---------------|
| 0 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 |
| 1 | 22.9 | 23.0 | 23.0 | 23.0 | 23.2 | 23.1 | 23.2 | 23.2 |
| 2 | 23.1 | 23.0 | 23.1 | 23.1 | 23.2 | 23.2 | 23.1 | 23.1 |
| 3 | 23.1 | 22.9 | 23.0 | 22.8 | 23.2 | 23.1 | 23.0 | 23.1 |
| 4 | 23.6 | 23.1 | 23.2 | 23.2 | 23.0 | 23.2 | 23.1 | 23.2 |
| 5 | 23.0 | 22.5 | 23.2 | 23.1 | 23.0 | 23.2 | 23.0 | 23.1 |
| 6 | 23.9 | 23.2 | 23.5 | 23.3 | 23.7 | 23.7 | 23.2 | 23.2 |
| 7 | 22.8 | 23.0 | 23.2 | 23.1 | 23.0 | 23.1 | 22.9 | 23.1 |
| 8 | 23.0 | 23.1 | 23.5 | 23.2 | 23.1 | 23.5 | 23.3 | 23.0 |
| 9 | 23.2 | 23.2 | 23.0 | 22.9 | 22.5 | 23.0 | 22.8 | 22.8 |
| 10 | 23.1 | 23.0 | 23.1 | 23.0 | 23.1 | 23.2 | 23.1 | 23.2 |
| Low | 22.8 | 22.5 | 23.0 | 22.8 | 22.5 | 23.0 | 22.8 | 22.8 |
| High | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 |
| Mean | 23.2 | 23.1 | 23.2 | 23.1 | 23.2 | 23.3 | 23.1 | 23.2 |

Table 3(d) Overlying Water Dissolved Oxygen Values (mg/L) for MWRDGC Set #4 Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-36 CENTER | WW-36 SIDE | WW-46 CENTER | WW-46 SIDE | WW-102 CENTER | WW-102 SIDE | WW-96 SIDE |
|---------------|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|---------------|
| 0 | 8.2 | 8.0 | 7.0 | 7.6 | 7.1 | 7.1 | 7.5 | 8.0 |
| 1 | 8.0 | 8.0 | 7.9 | 7.8 | 7.8 | 7.6 | 7.5 | 7.8 |
| 2 | 8.1 | 8.0 | 7.9 | 7.9 | 7.8 | 7.8 | 7.6 | 7.7 |
| 3 | 7.8 | 7.6 | 7.4 | 6.8 | 6.5 | 7.1 | 6.8 | 6.5 |
| 4 | 7.0 | 6.8 | 6.9 | 6.4 | 6.0 | 6.0 | 5.9 | 6.2 |
| 5 | 6.5 | 6.0 | 6.0 | 5.9 | 5.9 | 5.9 | 5.7 | 5.9 |
| 6 | 6.4 | 6.2 | 6.2 | 5.2 | 5.5 | 5.5 | 5.6 | 5.8 |
| 7 | 6.3 | 5.6 | 6.0 | 5.2 | 5.5 | 5.5 | 5.5 | 5.6 |
| 8 | 6.2 | 5.4 | 6.1 | 5.0 | 5.6 | 5.6 | 5.6 | 5.5 |
| 9 | 6.1 | 5.3 | 6.0 | 5.0 | 5.4 | 5.4 | 5.4 | 5.3 |
| 10 | 6.0 | 5.9 | 5.6 | 5.0 | 5.1 | 5.6 | 5.0 | 4.8 |
| Low | 6.0 | 5.3 | 5.6 | 5.0 | 5.1 | 5.4 | 5.0 | 4.8 |
| High | 8.2 | 8.0 | 7.9 | 7.9 | 7.8 | 7.8 | 7.6 | 8.0 |
| Mean | 7.0 | 6.6 | 6.6 | 6.2 | 6.2 | 6.3 | 6.2 | 6.3 |
| Min DO 4.8 mg | 69.8 | 61.6 | 65.1 | 58.1 | 59.3 | 62.8 | 58.1 | 55.8 |

Table 2(e) Overlying Water Temperature Values (oC) for MWRDGC Set #5 Sediments During 10-Day C. tentans Exposures

| Day | West Beerskin | WW-37 CENTER | WW-37 SIDE | WW-73 CENTER | WW-73 SIDE | WW-101 CENTER | WW-101 SIDE |
|------|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|
| 0 | 23.0 | 23.5 | 23.5 | 22.8 | 22.9 | 23.1 | 22.9 |
| 1 | 23.0 | 23.1 | 23.1 | 22.9 | 23.0 | 23.1 | 23.1 |
| 2 | 22.3 | 22.3 | 22.3 | 22.1 | 22.8 | 22.2 | 22.3 |
| 3 | 22.8 | 22.8 | 22.7 | 22.7 | 22.9 | 22.7 | 22.9 |
| 4 | 22.9 | 22.9 | 22.8 | 22.8 | 22.9 | 23.0 | 23.0 |
| 5 | 21.9 | 22.2 | 22.2 | 22.1 | 22.3 | 22.1 | 22.6 |
| 6 | 22.0 | 22.1 | 22.0 | 21.8 | 22.0 | 22.1 | 22.1 |
| 7 | 22.7 | 22.8 | 22.9 | 22.7 | 22.6 | 22.8 | 22.7 |
| 8 | 22.6 | 22.7 | 22.9 | 22.8 | 22.8 | 22.7 | 22.7 |
| 9 | 22.5 | 22.6 | 22.6 | 22.5 | 22.7 | 22.6 | 22.6 |
| 10 | 22.8 | 22.8 | 22.6 | 22.5 | 22.6 | 22.5 | 22.8 |
| Low | 21.9 | 22.1 | 22.0 | 21.8 | 22.0 | 22.1 | 22.1 |
| High | 23.0 | 23.5 | 23.5 | 22.9 | 23.0 | 23.1 | 23.1 |
| Mean | 22.6 | 22.7 | 22.7 | 22.5 | 22.7 | 22.6 | 22.7 |

Table 3(e) Overlying Water Dissolved Oxygen Values (mg/L) for MWRDGC Set #5 Sediments During 10-Day C. tentans Exposures

| Day | West Beerskin | WW-37 CENTER | WW-37 SIDE | WW-73 CENTER | WW-73 SIDE | WW-101 CENTER | WW-101 SIDE |
|---------------|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|
| 0 | 7.9 | 7.7 | 7.5 | 7.7 | 6.9 | 6.6 | 7.7 |
| 1 | 8.0 | 7.3 | 7.3 | 7.2 | 6.5 | 7.0 | 7.2 |
| 2 | 7.6 | 7.2 | 7.2 | 7.1 | 6.6 | 6.9 | 7.0 |
| 3 | 7.3 | 7.1 | 7.1 | 7.0 | 6.4 | 6.2 | 6.2 |
| 4 | 6.9 | 4.9 | 3.1 | 3.7 | 2.2 | 4.8 | 6.2 |
| 5 | 7.0 | 5.0 | 3.5 | 4.0 | 2.5 | 5.0 | 6.2 |
| 6 | 6.9 | 5.2 | 3.8 | 4.1 | 2.8 | 5.0 | 6.2 |
| 7 | 6.8 | 4.8 | 4.3 | 5.2 | 3.6 | 4.8 | 4.8 |
| 8 | 6.9 | 4.9 | 4.4 | 5.3 | 3.6 | 4.9 | 4.8 |
| 9 | 6.8 | 4.8 | 4.3 | 5.2 | 3.5 | 4.8 | 4.8 |
| 10 | 6.0 | 4.1 | 4.2 | 4.9 | 3.5 | 4.1 | 4.2 |
| Low | 6.0 | 4.1 | 3.1 | 3.7 | 2.2 | 4.1 | 4.2 |
| High | 8.0 | 7.7 | 7.5 | 7.7 | 6.9 | 7.0 | 7.7 |
| Mean | 7.1 | 5.7 | 5.2 | 5.6 | 4.4 | 5.5 | 5.9 |
| Min. DO % Sat | 69.8 | 47.7 | 36.0 | 43.0 | 25.6 | 47.7 | 48.8 |

Table 9. Set #1 Chironomus tentans 10-Day Survival and Growth Data

Site ID # West Bearskin

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan # | Ashed Pan * | Dried Org Wt. (g) | Ashed Org Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-------------|-------------|-------------------|-------------------|------------------------|------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 7 | 3 | 7 | 1.22026 | | 1.23254 | 0.01228 | 0.01069 | 1.75 | 1.53 |
| B | 8 | 2 | 8 | 1.19975 | | 1.21355 | 0.01380 | 0.01164 | 1.72 | 1.45 |
| C | 7 | 3 | 7 | 1.21182 | | 1.22407 | 0.01225 | 0.00985 | 1.75 | 1.41 |
| D | 10 | 0 | 10 | 1.21880 | | 1.22923 | 0.01043 | 0.00875 | 1.04 | 0.88 |
| E | 10 | 0 | 10 | 1.21306 | | 1.22377 | 0.01071 | 0.00924 | 1.07 | 0.92 |
| F | 7 | 3 | 7 | 1.20139 | | 1.21233 | 0.01094 | 0.00932 | 1.56 | 1.33 |
| G | 10 | 0 | 10 | 1.20900 | | 1.22514 | 0.01614 | 0.01183 | 1.61 | 1.18 |
| H | 10 | 0 | 10 | 1.21570 | | 1.22756 | 0.01186 | 0.00966 | 1.19 | 0.97 |
| Mean | 8.6 | | | | | | | Mean | 1.46 | 1.21 |
| St.Dev | 1.5 | | | | | | | St.Dev | 0.31 | 0.26 |

Table 9. Set #1 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-31 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan + | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 7 | 3 | 7 | 1.20445 | 1.21990 | 1.20945 | 0.01545 | 0.01045 | 2.21 | 1.49 |
| B | 8 | 2 | 8 | 1.20928 | 1.22218 | 1.21322 | 0.01290 | 0.00896 | 1.61 | 1.12 |
| C | 8 | 2 | 8 | 1.21326 | 1.22812 | 1.21820 | 0.01486 | 0.00992 | 1.86 | 1.24 |
| D | 10 | 0 | 10 | 1.19990 | 1.21121 | 1.20327 | 0.01131 | 0.00794 | 1.13 | 0.79 |
| E | 8 | 2 | 8 | 1.20911 | 1.22530 | 1.21417 | 0.01619 | 0.01113 | 2.02 | 1.39 |
| F | 10 | 0 | 10 | 1.22560 | 1.24034 | 1.23054 | 0.01474 | 0.00980 | 1.47 | 0.98 |
| G | 8 | 2 | 8 | 1.21017 | 1.22594 | 1.21446 | 0.01577 | 0.01148 | 1.97 | 1.43 |
| H | 10 | 0 | 10 | 1.21553 | 1.23383 | 1.22226 | 0.01830 | 0.01157 | 1.83 | 1.16 |
| Mean | 8.6 | | | | | | | Mean | 1.76 | 1.20 |
| St.Dev | 1.2 | | | | | | | St.Dev | 0.34 | 0.24 |

Table 9. Set #1 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-31 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Dried Org. Wt. (g) | Ashed Pan + Ashed Org. Wt. (g) | Dried Org Wt. (g) | Ashed Org. Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|-----------------------------------|----------------------|-----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 9 | 1 | 9 | 1.20455 | 1.22069 | 1.20888 | 0.01614 | 0.01181 | 1.79 | 1.31 |
| B | 7 | 3 | 7 | 1.21600 | 1.22464 | 1.21860 | 0.00864 | 0.00604 | 1.23 | 0.86 |
| C | 9 | 1 | 9 | 1.21266 | 1.22100 | 1.21513 | 0.00834 | 0.00587 | 0.93 | 0.65 |
| D | 7 | 3 | 7 | 1.21943 | 1.22876 | 1.22169 | 0.00933 | 0.00707 | 1.33 | 1.01 |
| E | 2* | 8 | 2* | x | x | x | x | x | x | x |
| F | 0* | 10 | 0* | x | x | x | x | x | x | x |
| G | 1* | 9 | 1* | x | x | x | x | x | x | x |
| H | 1* | 9 | 1* | x | x | x | x | x | x | x |
| Mean | 8.0 | | | | | | | Mean | 1.32 | 0.96 |
| St.Dev | 1.2 | | | | | | | St.Dev | 0.36 | 0.28 |

* Flatworms present, predation of C. tentans larvae likely Not included in data analysis.

Table 9. Set #1 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-32 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org. | Ashed Org. | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|------------|------------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 10 | 0 | 10 | 1.20668 | 1.22327 | 1.21270 | 0.01659 | 0.01057 | 1.66 | 1.06 |
| B | 7 | 3 | 7 | 1.20004 | 1.21265 | 1.20323 | 0.01261 | 0.00942 | 1.80 | 1.35 |
| C | 9 | 1 | 9 | 1.19357 | 1.20980 | 1.19742 | 0.01623 | 0.01238 | 1.80 | 1.38 |
| D | 10 | 0 | 10 | 1.23234 | 1.24849 | 1.23579 | 0.01615 | 0.01270 | 1.62 | 1.27 |
| E | 9 | 1 | 9 | 1.20465 | 1.22900 | 1.21354 | 0.02435 | 0.01546 | 2.71 | 1.72 |
| F* | 10 | 0 | 10 | 1.20746 | 1.21591 | 1.20945 | 0.00845 | 0.00646 | 0.85 | 0.65 |
| G | 9 | 1 | 9 | 1.19587 | 1.21095 | 1.19910 | 0.01508 | 0.01185 | 1.68 | 1.32 |
| H | 10 | 0 | 10 | 1.20937 | 1.22220 | 1.21217 | 0.01283 | 0.01003 | 1.28 | 1.00 |
| Mean | 9.3 | | | | | | | Mean | 1.68 | 1.22 |
| St.Dev | 1.0 | | | | | | | St.Dev | 0.53 | 0.32 |

*Replicate F: C. tentans appeared smaller than other replicates.

Table 9. Set #1 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-32 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org. Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-------------|-------------|----------------------|-----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.20438 | 1.21200 | 1.20669 | 0.00762 | 0.00531 | 0.76 | 0.53 |
| B | 10 | 0 | 10 | 1.19230 | 1.20344 | 1.19643 | 0.01114 | 0.00701 | 1.11 | 0.70 |
| C | 0* | 10 | 0* | | | | 0.00000 | 0.00000 | x | x |
| D | 9 | 1 | 9 | 1.23125 | 1.24145 | 1.23496 | 0.01020 | 0.00649 | 1.13 | 0.72 |
| E | 8 | 2 | 8 | 1.20748 | 1.21860 | 1.21075 | 0.01112 | 0.00785 | 1.39 | 0.98 |
| F | 8 | 2 | 8 | 1.23078 | 1.24167 | 1.23457 | 0.01089 | 0.00710 | 1.36 | 0.89 |
| G | 9 | 1 | 9 | 1.21810 | 1.22728 | 1.22146 | 0.00918 | 0.00582 | 1.02 | 0.65 |
| H | 9 | 1 | 9 | 1.20697 | 1.21423 | 1.20892 | 0.00726 | 0.00531 | 0.81 | 0.59 |
| Mean | 9.0 | | | | | | | Mean | 1.08 | 0.72 |
| St.Dev | 0.8 | | | | | | | St.Dev | 0.24 | 0.16 |

Replicate C: Flatworm present.

Table 9. Set #1 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-106 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan # | Ashed Pan Wt. (g) | Dried Org Wt. (g) | Ashed Org Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-------------|-------------------|-------------------|-------------------|------------------------|------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.22331 | 1.23669 | 1.22748 | 0.01338 | 0.00921 | 1.34 | 0.92 |
| B | 10 | 0 | 10 | 1.22648 | 1.23728 | 1.22998 | 0.01080 | 0.00730 | 1.08 | 0.73 |
| C | 10 | 0 | 10 | 1.21602 | 1.23292 | 1.22208 | 0.01690 | 0.01084 | 1.69 | 1.08 |
| D | 8 | 2 | 8 | 1.21834 | 1.23056 | 1.22213 | 0.01222 | 0.00843 | 1.53 | 1.05 |
| E | 9 | 1 | 9 | 1.19555 | 1.20581 | 1.19961 | 0.01026 | 0.00620 | 1.14 | 0.69 |
| F | 10 | 0 | 10 | 1.21836 | 1.23808 | 1.22738 | 0.01972 | 0.01070 | 1.97 | 1.07 |
| G | 8 | 2 | 8 | 1.21654 | 1.22592 | 1.21971 | 0.00938 | 0.00621 | 1.17 | 0.78 |
| H | 1* | 9 | 1* | 1.19178 | 1.19375 | 1.19250 | 0.00197 | 0.00125 | x | x |
| Mean | 9.3 | | | | | | | Mean | 1.42 | 0.90 |
| St.Dev | 1.0 | | | | | | | St.Dev | 0.33 | 0.17 |

Replicate H: Flatworm present.

Table 9. Set #1 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-106 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan + | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org: Wt. (g) | Ashed Org: Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 3* | 7 | 3* | X | X | X | X | X | X | X |
| B | 5* | 5 | 5* | X | X | X | X | X | X | X |
| C | 7 | 3 | 7 | 1.21494 | 1.22650 | 1.21998 | 0.01156 | 0.00652 | 1.65 | 0.93 |
| D | 10 | 0 | 10 | 1.22356 | 1.23516 | 1.22799 | 0.01160 | 0.00717 | 1.16 | 0.72 |
| E | 10 | 0 | 10 | 1.22091 | 1.23188 | 1.22635 | 0.01097 | 0.00553 | 1.10 | 0.55 |
| F | 1* | 9 | 1* | X | X | X | X | X | X | X |
| G | 1* | 9 | 1* | X | X | X | X | X | X | X |
| H | 0* | 10 | 0* | X | X | X | X | X | X | X |
| Mean | 9 | | | | | | | Mean | 1.30 | 0.73 |
| St.Dev | 1.7 | | | | | | | St.Dev | 0.30 | 0.19 |

*Flatworms present

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # West Bearskin

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-------------|-------------|-------------------|-------------------|------------------------|------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.21697 | 1.23068 | 1.21974 | 0.01371 | 0.01094 | 1.37 | 1.09 |
| B | 9 | 1 | 9 | 1.21412 | 1.22718 | 1.21689 | 0.01306 | 0.01029 | 1.45 | 1.14 |
| C | 9 | 1 | 9 | 1.22034 | 1.23291 | 1.22302 | 0.01257 | 0.00989 | 1.40 | 1.10 |
| D | 10 | 0 | 10 | 1.21153 | 1.22739 | 1.21370 | 0.01586 | 0.01369 | 1.59 | 1.37 |
| E | 9 | 1 | 9 | 1.20221 | 1.21791 | 1.20682 | 0.01570 | 0.01109 | 1.74 | 1.23 |
| F | 10 | 0 | 10 | 1.22760 | 1.24269 | 1.23075 | 0.01509 | 0.01194 | 1.51 | 1.19 |
| G | 10 | 0 | 10 | 1.22785 | 1.24246 | 1.23154 | 0.01461 | 0.01092 | 1.46 | 1.09 |
| H | 10 | 0 | 10 | 1.21456 | 1.23005 | 1.21743 | 0.01549 | 0.01262 | 1.55 | 1.26 |
| Mean | 9.6 | | | | | | | Mean | 1.51 | 1.18 |
| St.Dev | 0.5 | | | | | | | St.Dev | 0.12 | 0.10 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-103 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-------------|-------------|----------------------|----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.21684 | 1.23461 | 1.22271 | 0.01777 | 0.01190 | 1.78 | 1.19 |
| B | 8 | 2 | 8 | 1.22503 | 1.23826 | 1.22942 | 0.01323 | 0.00884 | 1.65 | 1.10 |
| C | 9 | 1 | 9 | 1.19781 | 1.21344 | 1.20173 | 0.01563 | 0.01171 | 1.74 | 1.30 |
| D | 10 | 0 | 10 | 1.22450 | 1.23919 | 1.22832 | 0.01469 | 0.01087 | 1.47 | 1.09 |
| E | 10 | 0 | 10 | 1.22276 | 1.23666 | 1.22661 | 0.01390 | 0.01005 | 1.39 | 1.01 |
| F | 10 | 0 | 10 | 1.22324 | 1.24172 | 1.22887 | 0.01848 | 0.01285 | 1.85 | 1.29 |
| G | 9 | 1 | 9 | 1.22521 | 1.24218 | 1.22898 | 0.01697 | 0.01320 | 1.89 | 1.47 |
| H | 10 | 0 | 10 | 1.22722 | 1.24444 | 1.23302 | 0.01722 | 0.01142 | 1.72 | 1.14 |
| Mean | 9.5 | | | | | | | Mean | 1.69 | 1.20 |
| St.Dev | 0.8 | | | | | | | St.Dev | 0.18 | 0.15 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-103 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 10 | 0 | 10 | 1.21820 | 1.23689 | 1.22296 | 0.01869 | 0.01393 | 1.87 | 1.39 |
| B | 10 | 0 | 10 | 1.22403 | 1.24197 | 1.23358 | 0.01794 | 0.00839 | 1.79 | 0.84 |
| C | 9 | 1 | 9 | 1.22832 | 1.24406 | 1.23111 | 0.01574 | 0.01295 | 1.75 | 1.44 |
| D | 9 | 1 | 9 | 1.22984 | 1.24479 | 1.23442 | 0.01495 | 0.01037 | 1.66 | 1.15 |
| E | 10 | 0 | 10 | 1.23510 | 1.24897 | 1.23944 | 0.01387 | 0.00953 | 1.39 | 0.95 |
| F | 9 | 1 | 9 | 1.22184 | 1.23728 | 1.22611 | 0.01544 | 0.01117 | 1.72 | 1.24 |
| G | 10 | 0 | 10 | 1.21920 | 1.23436 | 1.22213 | 0.01516 | 0.01223 | 1.52 | 1.22 |
| H | 10 | 0 | 10 | 1.29859 | 1.31475 | 1.30230 | 0.01616 | 0.01245 | 1.62 | 1.25 |
| Mean | 9.6 | | | | | | | Mean | 1.67 | 1.19 |
| St.Dev | 0.5 | | | | | | | St.Dev | 0.15 | 0.20 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-104 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + Dried Org. Wt. (g) | Ashed Pan + Ashed Org. Wt. (g) | Dried Org Wt. (g) | Ashed Org Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-----------------------------------|-----------------------------------|----------------------|----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.30180 | 1.32073 | 1.30892 | 0.01893 | 0.01181 | 1.89 | 1.18 |
| B | 10 | 0 | 10 | 1.30185 | 1.31922 | 1.30962 | 0.01737 | 0.00960 | 1.74 | 0.96 |
| C | 10 | 0 | 10 | 1.30027 | 1.31505 | 1.30515 | 0.01478 | 0.00990 | 1.48 | 0.99 |
| D | 8 | 2 | 8 | 1.27104 | 1.28432 | 1.27526 | 0.01328 | 0.00906 | 1.66 | 1.13 |
| E | 9 | 1 | 9 | 1.29661 | 1.31013 | 1.30139 | 0.01352 | 0.00874 | 1.50 | 0.97 |
| F | 9 | 1 | 9 | 1.29826 | 1.31176 | 1.30349 | 0.01350 | 0.00827 | 1.50 | 0.92 |
| G | 10 | 0 | 10 | 1.30003 | 1.31795 | 1.30701 | 0.01792 | 0.01094 | 1.79 | 1.09 |
| H | 9 | 1 | 9 | 1.29820 | 1.30988 | 1.30236 | 0.01168 | 0.00752 | 1.30 | 0.84 |
| Mean | 9.4 | | | | | | | Mean | 1.61 | 1.01 |
| St.Dev | 0.7 | | | | | | | St.Dev | 0.20 | 0.11 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-104 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org Wt. (g) | Ashed Org | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|----------------------|-----------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 10 | 0 | 10 | 1.29891 | 1.31320 | 1.30269 | 0.01429 | 0.01051 | 1.43 | 1.05 |
| B | 10 | 0 | 10 | 1.29999 | 1.31696 | 1.30537 | 0.01697 | 0.01159 | 1.70 | 1.16 |
| C | 9 | 1 | 9 | 1.30398 | 1.31645 | 1.30681 | 0.01247 | 0.00964 | 1.39 | 1.07 |
| D | 10 | 0 | 10 | 1.29793 | 1.31438 | 1.30280 | 0.01645 | 0.01158 | 1.65 | 1.16 |
| E | 10 | 0 | 10 | 1.29901 | 1.31529 | 1.30333 | 0.01628 | 0.01196 | 1.63 | 1.20 |
| F | 9 | 1 | 9 | 1.29910 | 1.31480 | 1.30382 | 0.01570 | 0.01098 | 1.74 | 1.22 |
| G | 4* | 6 | 4* | 1.29245 | 1.30128 | 1.29484 | 0.00883 | 0.00644 | x | x |
| H | 10 | 0 | 10 | 1.29718 | 1.30649 | 1.29892 | 0.00931 | 0.00757 | 0.93 | 0.76 |
| Mean | 9.7 | | | | | | | Mean | 1.50 | 1.09 |
| St.Dev | 0.5 | | | | | | | St.Dev | 0.28 | 0.16 |

*Flatworm present

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-105 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org. | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-------------------|------------|------------------------|------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 10 | 0 | 10 | 1.29478 | 1.30789 | 1.29717 | 0.01311 | 0.01072 | 1.31 | 1.07 |
| B | 10 | 0 | 10 | 1.29878 | 1.31798 | 1.30453 | 0.01920 | 0.01345 | 1.92 | 1.35 |
| C | 10 | 0 | 10 | 1.30129 | 1.31856 | 1.30679 | 0.01727 | 0.01177 | 1.73 | 1.18 |
| D | 10 | 0 | 10 | 1.27196 | 1.29038 | 1.27733 | 0.01842 | 0.01305 | 1.84 | 1.31 |
| E | 9 | 1 | 9 | 1.29010 | 1.30824 | 1.29697 | 0.01814 | 0.01127 | 2.02 | 1.25 |
| F | 10 | 0 | 10 | 1.29925 | 1.31837 | 1.30531 | 0.01912 | 0.01306 | 1.91 | 1.31 |
| G | 10 | 0 | 10 | 1.30166 | 1.31973 | 1.30710 | 0.01807 | 0.01263 | 1.81 | 1.26 |
| H | 10 | 0 | 10 | 1.29483 | 1.31309 | 1.30180 | 0.01826 | 0.01129 | 1.83 | 1.13 |
| Mean | 9.9 | | | | | | | Mean | 1.80 | 1.23 |
| St.Dev | 0.4 | | | | | | | St.Dev | 0.21 | 0.10 |

Table 9. Set #2 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-105 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|----------------------|-----------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 9 | 1 | 9 | 1.30020 | 1.31976 | 1.30665 | 0.01956 | 0.01311 | 2.17 | 1.46 |
| B | 9 | 1 | 9 | 1.29380 | 1.30516 | 1.29733 | 0.01136 | 0.00783 | 1.26 | 0.87 |
| C | 10 | 0 | 10 | 1.30469 | 1.32433 | 1.31210 | 0.01964 | 0.01223 | 1.96 | 1.22 |
| D | 10 | 0 | 10 | 1.29706 | 1.31622 | 1.30283 | 0.01916 | 0.01339 | 1.92 | 1.34 |
| E | 10 | 0 | 10 | 1.29130 | 1.31307 | 1.29892 | 0.02177 | 0.01415 | 2.18 | 1.41 |
| F | 10 | 0 | 10 | 1.29470 | 1.31435 | 1.30219 | 0.01965 | 0.01216 | 1.96 | 1.22 |
| G | 9 | 1 | 9 | 1.29810 | 1.31338 | 1.30182 | 0.01528 | 0.01156 | 1.70 | 1.28 |
| H | 10 | 0 | 10 | 1.30277 | 1.32678 | 1.31244 | 0.02401 | 0.01434 | 2.40 | 1.43 |
| Mean | 9.6 | | | | | | | Mean | 1.94 | 1.28 |
| St.Dev | 0.5 | | | | | | | St.Dev | 0.35 | 0.19 |

Table 9. Set #3 Chironomus tentans 10-Day Survival and Growth Data

Site ID # West Bearskin

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-------------|-------------|----------------------|----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.29998 | 1.31207 | 1.30105 | 0.01209 | 0.01102 | 1.21 | 1.10 |
| B | 10 | 0 | 10 | 1.29469 | 1.30807 | 1.29669 | 0.01338 | 0.01138 | 1.34 | 1.14 |
| C | 10 | 0 | 10 | 1.27666 | 1.28938 | 1.27875 | 0.01272 | 0.01063 | 1.27 | 1.06 |
| D | 9 | 1 | 9 | 1.29405 | 1.30681 | 1.29585 | 0.01276 | 0.01096 | 1.42 | 1.22 |
| E | 10 | 0 | 10 | 1.29557 | 1.30882 | 1.29773 | 0.01325 | 0.01109 | 1.33 | 1.11 |
| F | 10 | 0 | 10 | 1.29976 | 1.31359 | 1.30210 | 0.01383 | 0.01149 | 1.38 | 1.15 |
| G | 10 | 0 | 10 | 1.29537 | 1.30909 | 1.29689 | 0.01372 | 0.01220 | 1.37 | 1.22 |
| H | 10 | 0 | 10 | 1.29769 | 1.31002 | 1.29958 | 0.01233 | 0.01044 | 1.23 | 1.04 |
| Mean | 9.9 | | | | | | | Mean | 1.32 | 1.13 |
| St.Dev | 0.4 | | | | | | | St.Dev | 0.07 | 0.07 |

Table 9. Set #3 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-34 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org. Wt. (g) | Ashed Org. | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|--------------------|------------|------------------------|------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 9 | 1 | 9 | 1.28714 | 1.30262 | 1.28966 | 0.01548 | 0.01296 | 1.72 | 1.44 |
| B | 8 | 2 | 8 | 1.30056 | 1.31314 | 1.30263 | 0.01258 | 0.01051 | 1.57 | 1.31 |
| C | 9 | 1 | 9 | 1.27324 | 1.28886 | 1.27682 | 0.01562 | 0.01204 | 1.74 | 1.34 |
| D | 10 | 0 | 10 | 1.29066 | 1.30156 | 1.29238 | 0.01090 | 0.00918 | 1.09 | 0.92 |
| E | 10 | 0 | 10 | 1.27514 | 1.28763 | 1.27740 | 0.01249 | 0.01023 | 1.25 | 1.02 |
| F | 10 | 0 | 10 | 1.29130 | 1.30394 | 1.29400 | 0.01264 | 0.00994 | 1.26 | 0.99 |
| G | 9 | 1 | 9 | 1.29316 | 1.30941 | 1.29722 | 0.01625 | 0.01219 | 1.81 | 1.35 |
| H | 10 | 0 | 10 | 1.28935 | 1.30381 | 1.29223 | 0.01446 | 0.01158 | 1.45 | 1.16 |
| Mean | 9.4 | | | | | | | Mean | 1.49 | 1.19 |
| St.Dev | 0.7 | | | | | | | St.Dev | 0.27 | 0.20 |

Table 9. Set #3 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-34 SIDE

| Rep. | # Organisms | | | Ashed Pan + | Ashed Pan + | Dried Org | Ashed Org | Mean Dried | Mean Ashed | |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|------------|-------------|-------------|
| | Alive | Dead | Weighed | Ashed Pan Wt. (g) | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 10 | 0 | 10 | 1.21999 | 1.23336 | 1.22312 | 0.01337 | 0.01024 | 1.34 | 1.02 |
| B | 10 | 0 | 10 | 1.29661 | 1.30800 | 1.29824 | 0.01139 | 0.00976 | 1.14 | 0.98 |
| C | 10 | 0 | 10 | 1.29251 | 1.30321 | 1.29375 | 0.01070 | 0.00946 | 1.07 | 0.95 |
| D | 10 | 0 | 10 | 1.29578 | 1.30478 | 1.29638 | 0.00900 | 0.00840 | 0.90 | 0.84 |
| E | 10 | 0 | 10 | 1.29874 | 1.31115 | 1.30111 | 0.01241 | 0.01004 | 1.24 | 1.00 |
| F* | 6 | 4 | 5 | 1.28165 | 1.28859 | 1.28292 | 0.00694 | 0.00567 | 1.39 | 1.13 |
| G | 10 | 0 | 10 | 1.28875 | 1.29858 | 1.29092 | 0.00983 | 0.00766 | 0.98 | 0.77 |
| H | 10 | 0 | 10 | 1.22395 | 1.23472 | 1.22575 | 0.01077 | 0.00897 | 1.08 | 0.90 |
| Mean | 9.5 | | | | | | | Mean | 1.14 | 0.95 |
| St.Dev | 1.4 | | | | | | | St.Dev | 0.17 | 0.11 |

*One pupae present

Table 9. Set #3 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-35 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 9 | 1 | 9 | 1.21201 | 1.22743 | 1.21537 | 0.01542 | 0.01206 | 1.71 | 1.34 |
| B | 10 | 0 | 10 | 1.20904 | 1.22732 | 1.21409 | 0.01828 | 0.01323 | 1.83 | 1.32 |
| C | 10 | 0 | 10 | 1.21849 | 1.23528 | 1.22264 | 0.01679 | 0.01264 | 1.68 | 1.26 |
| D | 10 | 0 | 10 | 1.21333 | 1.22823 | 1.21743 | 0.01490 | 0.01080 | 1.49 | 1.08 |
| E | 10 | 0 | 10 | 1.21619 | 1.23382 | 1.22097 | 0.01763 | 0.01285 | 1.76 | 1.28 |
| F | 10 | 0 | 10 | 1.21026 | 1.22974 | 1.21488 | 0.01948 | 0.01486 | 1.95 | 1.49 |
| G | 10 | 0 | 10 | 1.21246 | 1.22964 | 1.21694 | 0.01718 | 0.01270 | 1.72 | 1.27 |
| H | 8 | 2 | 8 | 1.22041 | 1.23810 | 1.22424 | 0.01769 | 0.01386 | 2.21 | 1.73 |
| Mean | 9.6 | | | | | | | Mean | 1.79 | 1.35 |
| St.Dev | 0.7 | | | | | | | St.Dev | 0.21 | 0.19 |

Table 9. Set #3 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-35 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org: | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|----------------------|------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 10 | 0 | 10 | 1.21996 | 1.24095 | 1.22537 | 0.02099 | 0.01558 | 2.10 | 1.56 |
| B | 10 | 0 | 10 | 1.22187 | 1.23983 | 1.22615 | 0.01796 | 0.01368 | 1.80 | 1.37 |
| C | 10 | 0 | 10 | 1.21901 | 1.23692 | 1.22283 | 0.01791 | 0.01409 | 1.79 | 1.41 |
| D | 10 | 0 | 10 | 1.21434 | 1.22956 | 1.21720 | 0.01522 | 0.01236 | 1.52 | 1.24 |
| E | 9 | 1 | 9 | 1.21434 | 1.23092 | 1.21760 | 0.01658 | 0.01332 | 1.84 | 1.48 |
| F | 8 | 2 | 8 | 1.22981 | 1.24928 | 1.23542 | 0.01947 | 0.01386 | 2.43 | 1.73 |
| G | 10 | 0 | 10 | 1.21554 | 1.23672 | 1.22194 | 0.02118 | 0.01478 | 2.12 | 1.48 |
| H | 10 | 0 | 10 | 1.22059 | 1.24008 | 1.22497 | 0.01949 | 0.01511 | 1.95 | 1.51 |
| Mean | 9.6 | | | | | | | Mean | 1.94 | 1.47 |
| St.Dev | 0.7 | | | | | | | St.Dev | 0.27 | 0.14 |

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # West Bearskin

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org | Ashed Org. | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|------------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 9 | 1 | 9 | 1.21891 | 1.23112 | 1.22075 | 0.01221 | 0.01037 | 1.36 | 1.15 |
| B | 9 | 1 | 9 | 1.22031 | 1.23420 | 1.22317 | 0.01389 | 0.01103 | 1.54 | 1.23 |
| C | 10 | 0 | 10 | 1.21285 | 1.22422 | 1.21473 | 0.01137 | 0.00949 | 1.14 | 0.95 |
| D | 10 | 0 | 10 | 1.22060 | 1.23170 | 1.22360 | 0.01110 | 0.00810 | 1.11 | 0.81 |
| E | 10 | 0 | 10 | 1.20983 | 1.22049 | 1.21141 | 0.01066 | 0.00908 | 1.07 | 0.91 |
| F | 9 | 1 | 9 | 1.21352 | 1.22533 | 1.21550 | 0.01181 | 0.00983 | 1.31 | 1.09 |
| G | 10 | 0 | 10 | 1.21699 | 1.23183 | 1.21929 | 0.01484 | 0.01254 | 1.48 | 1.25 |
| H | 10 | 0 | 10 | 1.21514 | 1.22588 | 1.21707 | 0.01074 | 0.00881 | 1.07 | 0.88 |
| Mean | 9.6 | | | | | | | Mean | 1.26 | 1.03 |
| St.Dev | 0.5 | | | | | | | St.Dev | 0.19 | 0.17 |

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-36 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org: Wt. (g) | Ashed Org: Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 10 | 0 | 10 | 1.20668 | 1.21805 | 1.20782 | 0.01137 | 0.01023 | 1.14 | 1.02 |
| B | 10 | 0 | 10 | 1.20634 | 1.22148 | 1.20839 | 0.01514 | 0.01309 | 1.51 | 1.31 |
| C | 9 | 1 | 9 | 1.20899 | 1.22086 | 1.21068 | 0.01187 | 0.01018 | 1.32 | 1.13 |
| D | 10 | 0 | 10 | 1.20949 | 1.22398 | 1.21120 | 0.01449 | 0.01278 | 1.45 | 1.28 |
| E | 10 | 0 | 10 | 1.21461 | 1.22747 | 1.21586 | 0.01286 | 0.01161 | 1.29 | 1.16 |
| F | 10 | 0 | 10 | 1.21817 | 1.23335 | 1.21953 | 0.01518 | 0.01382 | 1.52 | 1.38 |
| G | 10 | 0 | 10 | 1.21630 | 1.22833 | 1.21779 | 0.01203 | 0.01054 | 1.20 | 1.05 |
| H | 6 | 4 | 6 | 1.20747 | 1.21772 | 1.20854 | 0.01025 | 0.00918 | 1.71 | 1.53 |
| Mean | 9.4 | | | | | | | Mean | 1.39 | 1.23 |
| St.Dev | 1.4 | | | | | | | St.Dev | 0.19 | 0.17 |

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-36 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|----------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighted | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 10 | 0 | 10 | 1.29808 | 1.31366 | 1.30023 | 0.01558 | 0.01343 | 1.56 | 1.34 |
| B | 10 | 0 | 10 | 1.20438 | 1.21966 | 1.20716 | 0.01528 | 0.01250 | 1.53 | 1.25 |
| C | 7 | 3 | 7 | 1.20891 | 1.22141 | 1.21082 | 0.01250 | 0.01059 | 1.79 | 1.51 |
| D | 9 | 1 | 9 | 1.20743 | 1.21938 | 1.20883 | 0.01195 | 0.01055 | 1.33 | 1.17 |
| E | 10 | 0 | 10 | 1.20848 | 1.22516 | 1.21138 | 0.01668 | 0.01378 | 1.67 | 1.38 |
| F | 10 | 0 | 10 | 1.21269 | 1.22401 | 1.21453 | 0.01132 | 0.00948 | 1.13 | 0.95 |
| G | 10 | 0 | 10 | 1.21617 | 1.23064 | 1.21902 | 0.01447 | 0.01162 | 1.45 | 1.16 |
| H | 10 | 0 | 10 | 1.20441 | 1.21889 | 1.20648 | 0.01448 | 0.01241 | 1.45 | 1.24 |
| Mean | 9.5 | | | | | | | Mean | 1.49 | 1.25 |
| St.Dev | 1.1 | | | | | | | St.Dev | 0.20 | 0.17 |

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-46 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan + | Dried Org Wt. (g) | Ashed Org | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-------------------|-----------|------------------------|------------------------|
| | Alive | Dead | Weighed | | Dried Org: Wt. (g) | Ashed Org: Wt. (g) | | Wt. (g) | | |
| A | 1 | 9 | 1 | 1.21616 | 1.21637 | 1.21624 | 0.00021 | 0.00013 | 0.21 | 0.13 |
| B | 0 | 10 | 0 | X | X | X | X | X | X | X |
| C | 3 | 7 | 3 | 1.21549 | 1.21600 | 1.21555 | 0.00051 | 0.00127 | 0.17 | 0.42 |
| D | 3 | 7 | 3 | 1.21462 | 1.21520 | 1.21473 | 0.00058 | 0.00005 | 0.19 | 0.02 |
| E | 1 | 9 | 1 | 1.21505 | 1.21519 | 1.21515 | 0.00014 | 0.00004 | 0.14 | 0.04 |
| F | 0 | 10 | 0 | X | X | X | X | X | X | X |
| G | 0 | 10 | 0 | X | X | X | X | X | X | X |
| H | 2 | 8 | 2 | 1.21023 | 1.21056 | 1.21044 | 0.00033 | 0.00012 | 0.17 | 0.06 |
| Mean | 1.3 | | | | | | | Mean | 0.18 | 0.13 |
| St.Dev | 1.3 | | | | | | | St.Dev | 0.03 | 0.17 |

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-46 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|----------------------|-----------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 8 | 2 | 8 | 1.22147 | 1.23039 | 1.22325 | 0.00892 | 0.00714 | 1.12 | 0.89 |
| B | 10 | 0 | 10 | 1.21112 | 1.22489 | 1.21407 | 0.01377 | 0.01082 | 1.38 | 1.08 |
| C | 10 | 0 | 10 | 1.21840 | 1.22779 | 1.22012 | 0.00939 | 0.00767 | 0.94 | 0.77 |
| D | 9 | 1 | 9 | 1.21203 | 1.22229 | 1.21406 | 0.01026 | 0.00823 | 1.14 | 0.91 |
| E | 7 | 3 | 7 | 1.22524 | 1.23444 | 1.22686 | 0.00920 | 0.00758 | 1.31 | 1.08 |
| F | 10 | 0 | 10 | 1.21047 | 1.21963 | 1.21208 | 0.00916 | 0.00755 | 0.92 | 0.75 |
| G | 10 | 0 | 10 | 1.22285 | 1.23313 | 1.22467 | 0.01028 | 0.00846 | 1.03 | 0.85 |
| H | 10 | 0 | 10 | 1.20993 | 1.21923 | 1.21224 | 0.00930 | 0.00699 | 0.93 | 0.70 |
| Mean | 9.3 | | | | | | | Mean | 1.10 | 0.88 |
| St.Dev | 1.2 | | | | | | | St.Dev | 0.18 | 0.14 |

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-102 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan + | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 10 | 0 | 10 | 1.20659 | 1.21980 | 1.20959 | 0.01321 | 0.01021 | 1.32 | 1.02 |
| B | 3 | 7 | 3 | 1.21126 | 1.21648 | 1.21276 | 0.00522 | 0.00372 | 1.74 | 1.24 |
| C | 2 | 8 | 2 | 1.20191 | 1.20532 | 1.20279 | 0.00341 | 0.00253 | 1.70 | 1.26 |
| D | 10 | 0 | 10 | 1.21419 | 1.22908 | 1.21799 | 0.01489 | 0.01109 | 1.49 | 1.11 |
| E | 10 | 0 | 10 | 1.20250 | 1.22618 | 1.20494 | 0.02368 | 0.02124 | 2.37 | 2.12 |
| F | 10 | 0 | 10 | 1.21250 | 1.22260 | 1.21629 | 0.01010 | 0.00631 | 1.01 | 0.63 |
| G | 10 | 0 | 10 | 1.21774 | 1.22893 | 1.22122 | 0.01119 | 0.00771 | 1.12 | 0.77 |
| H | * | * | * | x | x | x | x | x | x | x |
| Mean | 7.9 | | | | | | | Mean | 1.54 | 1.16 |
| St.Dev | 3.7 | | | | | | | St.Dev | 0.46 | 0.48 |

* Beaker lost during test termination

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-102 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan + | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 7 | 3 | 7 | 1.20320 | 1.21770 | 1.20624 | 0.01450 | 0.01146 | 2.07 | 1.64 |
| B | 6 | 4 | 6 | 1.20419 | 1.22021 | 1.20845 | 0.01602 | 0.01176 | 2.67 | 1.96 |
| C | 10 | 0 | 10 | 1.21703 | 1.23929 | 1.22600 | 0.02226 | 0.01329 | 2.23 | 1.33 |
| D | 5 | 5 | 5 | 1.21522 | 1.22859 | 1.21834 | 0.01337 | 0.01025 | 2.67 | 2.05 |
| E | 7 | 3 | 7 | 1.20998 | 1.22115 | 1.21175 | 0.01117 | 0.00940 | 1.60 | 1.34 |
| F | 10 | 0 | 10 | 1.21363 | 1.23205 | 1.21727 | 0.01842 | 0.01478 | 1.84 | 1.48 |
| G | 9 | 1 | 9 | 1.20971 | 1.23106 | 1.21506 | 0.02135 | 0.01600 | 2.37 | 1.78 |
| H | 10 | 0 | 10 | 1.20744 | 1.22549 | 1.21180 | 0.01805 | 0.01369 | 1.80 | 1.37 |
| Mean | 8.0 | | | | | | | Mean | 2.16 | 1.62 |
| St.Dev | 2.0 | | | | | | | St.Dev | 0.40 | 0.29 |

Table 9. Set #4 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-96 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org Wt. (g) | Ashed Org. | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|----------------------|------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 9 | 1 | 9 | 1.20835 | 1.22010 | 1.21370 | 0.01175 | 0.00640 | 1.31 | 0.71 |
| B | 9 | 1 | 9 | 1.21148 | 1.22640 | 1.21495 | 0.01492 | 0.01145 | 1.66 | 1.27 |
| C | 6 | 4 | 6 | 1.20041 | 1.21172 | 1.20256 | 0.01131 | 0.00916 | 1.88 | 1.53 |
| D | 7 | 3 | 7 | 1.20455 | 1.21673 | 1.20878 | 0.01218 | 0.00795 | 1.74 | 1.14 |
| E | 9 | 1 | 9 | 1.21518 | 1.22880 | 1.22047 | 0.01362 | 0.00833 | 1.51 | 0.93 |
| F | 7 | 3 | 7 | 1.21200 | 1.22151 | 1.21443 | 0.00951 | 0.00708 | 1.36 | 1.01 |
| G | 9 | 1 | 9 | 1.20200 | 1.21481 | 1.20690 | 0.01281 | 0.00791 | 1.42 | 0.88 |
| H | 8 | 2 | 8 | 1.19823 | 1.21133 | 1.20221 | 0.01310 | 0.00912 | 1.64 | 1.14 |
| Mean | 8.0 | | | | | | | Mean | 1.57 | 1.08 |
| St.Dev | 1.2 | | | | | | | St.Dev | 0.20 | 0.25 |

Table 9. Set #5 Chironomus tentans 10-Day Survival and Growth Data

Site ID # West Bearskin

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org: Wt. (g) | Ashed Org: Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 10 | 0 | 10 | 1.22306 | 1.23281 | 1.22296 | 0.00975 | 0.00985 | 0.97 | 0.98 |
| B | 10 | 0 | 10 | 1.20312 | 1.21110 | 1.20482 | 0.00798 | 0.00628 | 0.80 | 0.63 |
| C | 9 | 1 | 9 | 1.19871 | 1.21019 | 1.20150 | 0.01148 | 0.00869 | 1.28 | 0.97 |
| D | 9 | 1 | 9 | 1.20091 | 1.21063 | 1.20288 | 0.00972 | 0.00775 | 1.08 | 0.86 |
| E | 10 | 0 | 10 | 1.18991 | 1.20140 | 1.19340 | 0.01149 | 0.00800 | 1.15 | 0.80 |
| F | 10 | 0 | 10 | 1.20093 | 1.20975 | 1.20307 | 0.00882 | 0.00668 | 0.88 | 0.67 |
| G | 10 | 0 | 10 | 1.21397 | 1.22473 | 1.21705 | 0.01076 | 0.00768 | 1.08 | 0.77 |
| H | 9 | 1 | 9 | 1.22169 | 1.23357 | 1.22447 | 0.01188 | 0.00910 | 1.32 | 1.01 |
| Mean | 9.6 | | | | | | | Mean | 1.07 | 0.84 |
| St.Dev | 0.5 | | | | | | | St.Dev | 0.18 | 0.14 |

Table 9. Set #5 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-37 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 7 | 3 | 7 | 1.22352 | 1.23338 | 1.22649 | 0.00986 | 0.00689 | 1.41 | 0.98 |
| B | 7 | 3 | 7 | 1.21273 | 1.22468 | 1.21663 | 0.01195 | 0.00805 | 1.71 | 1.15 |
| C | 8 | 2 | 8 | 1.21629 | 1.22739 | 1.21920 | 0.01110 | 0.00819 | 1.39 | 1.02 |
| D | 7 | 3 | 7 | 1.20011 | 1.21000 | 1.20320 | 0.00989 | 0.00680 | 1.41 | 0.97 |
| E | 10 | 0 | 10 | 1.19824 | 1.21042 | 1.20295 | 0.01218 | 0.00747 | 1.22 | 0.75 |
| F | 10 | 0 | 10 | 1.19785 | 1.21405 | 1.20507 | 0.01620 | 0.00898 | 1.62 | 0.90 |
| G | 8 | 2 | 8 | 1.19929 | 1.21179 | 1.20468 | 0.01250 | 0.00711 | 1.56 | 0.89 |
| H | 10 | 0 | 10 | 1.20650 | 1.21775 | 1.21016 | 0.01125 | 0.00759 | 1.13 | 0.76 |
| Mean | 8.4 | | | | | | | Mean | 1.43 | 0.93 |
| St.Dev | 1.4 | | | | | | | St.Dev | 0.20 | 0.13 |

Table 9. Set #5 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-37 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + Dried Org. Wt. (g) | Ashed Pan + Ashed Org. Wt. (g) | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-----------------------------------|-----------------------------------|-----------------------|-----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 9 | 1 | 9 | 1.20124 | 1.22020 | 1.20485 | 0.01896 | 0.01535 | 2.11 | 1.71 |
| B | 9 | 1 | 9 | 1.21164 | 1.22345 | 1.21382 | 0.01181 | 0.00963 | 1.31 | 1.07 |
| C | 9 | 1 | 9 | 1.20093 | 1.21600 | 1.20358 | 0.01507 | 0.01242 | 1.67 | 1.38 |
| D | 10 | 0 | 10 | 1.20576 | 1.22702 | 1.20992 | 0.02126 | 0.01710 | 2.13 | 1.71 |
| E | 9 | 1 | 9 | 1.19963 | 1.21414 | 1.20257 | 0.01451 | 0.01157 | 1.61 | 1.29 |
| F | 8 | 2 | 8 | 1.22190 | 1.23839 | 1.22600 | 0.01649 | 0.01239 | 2.06 | 1.55 |
| G | 10 | 0 | 10 | 1.20275 | 1.21896 | 1.20529 | 0.01621 | 0.01367 | 1.62 | 1.37 |
| H | 10 | 0 | 10 | 1.21540 | 1.23279 | 1.21859 | 0.01739 | 0.01420 | 1.74 | 1.42 |
| Mean | 9.3 | | | | | | | Mean | 1.78 | 1.44 |
| St.Dev | 0.7 | | | | | | | St.Dev | 0.29 | 0.22 |

Table 9. Set #5 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-73 CENTER

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + | Ashed Pan + | Dried Org Wt. (g) | Ashed Org | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|----------------------|-----------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 10 | 0 | 10 | 1.19504 | 1.20741 | 1.19807 | 0.01237 | 0.00934 | 1.24 | 0.93 |
| B | 9 | 1 | 9 | 1.19685 | 1.20750 | 1.19884 | 0.01065 | 0.00866 | 1.18 | 0.96 |
| C | 6 | 4 | 6 | 1.19936 | 1.20898 | 1.20095 | 0.00962 | 0.00803 | 1.60 | 1.34 |
| D | 10 | 0 | 10 | 1.22667 | 1.23674 | 1.22876 | 0.01007 | 0.00798 | 1.01 | 0.80 |
| E | 6 | 4 | 6 | 1.19840 | 1.20757 | 1.20004 | 0.00917 | 0.00753 | 1.53 | 1.26 |
| F | 10 | 0 | 10 | 1.20898 | 1.21969 | 1.21170 | 0.01071 | 0.00799 | 1.07 | 0.80 |
| G | 10 | 0 | 10 | 1.21717 | 1.22868 | 1.21975 | 0.01151 | 0.00893 | 1.15 | 0.89 |
| H | 8 | 2 | 8 | 1.20671 | 1.21469 | 1.20802 | 0.00798 | 0.00667 | 1.00 | 0.83 |
| Mean | 8.6 | | | | | | | Mean | 1.22 | 0.98 |
| St.Dev | 1.8 | | | | | | | St.Dev | 0.23 | 0.21 |

Table 9. Set #5 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-73 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org Wt. (g) | Ashed Org. | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|----------------------|------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | | Wt. (g) | | |
| A | 5 | 5 | 5 | 1.19359 | 1.19544 | 1.19382 | 0.00185 | 0.00162 | 0.37 | 0.32 |
| B | 7 | 3 | 7 | 1.22892 | 1.23233 | 1.22934 | 0.00341 | 0.00299 | 0.49 | 0.43 |
| C | 8 | 2 | 8 | 1.20683 | 1.21306 | 1.20798 | 0.00623 | 0.00508 | 0.78 | 0.63 |
| D | 5 | 5 | 5 | 1.21793 | 1.21900 | 1.21802 | 0.00107 | 0.00098 | 0.21 | 0.20 |
| E | 2 | 8 | 2 | 1.20210 | 1.20261 | 1.20215 | 0.00051 | 0.00046 | 0.26 | 0.23 |
| F | 4 | 6 | 4 | 1.21535 | 1.21734 | 1.21552 | 0.00199 | 0.00182 | 0.50 | 0.46 |
| G | 1 | 9 | 1 | 1.21909 | 1.22006 | 1.21924 | 0.00097 | 0.00082 | 0.97 | 0.82 |
| H | 7 | 3 | 7 | 1.19779 | 1.20065 | 1.19799 | 0.00286 | 0.00266 | 0.41 | 0.38 |
| Mean | 4.9 | | | | | | | Mean | 0.50 | 0.43 |
| St.Dev | 2.5 | | | | | | | St.Dev | 0.26 | 0.21 |

Table 9. Set #5 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-101 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan + Dried Org. Wt. (g) | Ashed Pan + Ashed Org. Wt. (g) | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Mean Dried Weight (mg) | Mean Ashed Weight (mg) |
|--------|-------------|------|---------|-------------------|-----------------------------------|-----------------------------------|-----------------------|-----------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | | | | | |
| A | 10 | 0 | 10 | 1.21390 | 1.23222 | 1.21741 | 0.01832 | 0.01481 | 1.83 | 1.48 |
| B | 10 | 0 | 10 | 1.20891 | 1.22853 | 1.21229 | 0.01962 | 0.01624 | 1.96 | 1.62 |
| C | 9 | 1 | 9 | 1.21461 | 1.22707 | 1.21737 | 0.01246 | 0.00970 | 1.38 | 1.08 |
| D | 7 | 3 | 7 | 1.20059 | 1.21331 | 1.20382 | 0.01272 | 0.00949 | 1.82 | 1.36 |
| E | 10 | 0 | 10 | 1.21014 | 1.22499 | 1.21346 | 0.01485 | 0.01153 | 1.49 | 1.15 |
| F | 10 | 0 | 10 | 1.20368 | 1.21959 | 1.20697 | 0.01591 | 0.01262 | 1.59 | 1.26 |
| G | 9 | 1 | 9 | 1.21203 | 1.23145 | 1.21721 | 0.01942 | 0.01424 | 2.16 | 1.58 |
| H | 10 | 0 | 10 | 1.20738 | 1.22914 | 1.21271 | 0.02176 | 0.01643 | 2.18 | 1.64 |
| Mean | 9.4 | | | | | | | Mean | 1.80 | 1.40 |
| St.Dev | 1.1 | | | | | | | St.Dev | 0.30 | 0.22 |

Table 9. Set #5 Chironomus tentans 10-Day Survival and Growth Data

Site ID # WW-101 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Ashed Pan * | Ashed Pan * | Dried Org | Ashed Org | Mean Dried | Mean Ashed |
|--------|-------------|------|---------|-------------------|--------------------|--------------------|-----------|-----------|-------------|-------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) | Wt. (g) | Wt. (g) | Weight (mg) | Weight (mg) |
| A | 3 | 7 | 3 | 1.20142 | 1.20245 | 1.20194 | 0.00103 | 0.00051 | 0.34 | 0.17 |
| B | 0* | 10 | 0* | x | x | x | x | x | x | x |
| C | 4 | 6 | 4 | 1.20520 | 1.20609 | 1.20584 | 0.00089 | 0.00025 | 0.22 | 0.06 |
| D | 1 | 9 | 1 | 1.21256 | 1.21274 | 1.21265 | 0.00018 | 0.00009 | 0.18 | 0.09 |
| E | 8 | 2 | 8 | 1.20165 | 1.20517 | 1.20380 | 0.00352 | 0.00137 | 0.44 | 0.17 |
| F | 7 | 3 | 7 | 1.19732 | 1.20083 | 1.19953 | 0.00351 | 0.00130 | 0.50 | 0.19 |
| G | 5 | 5 | 5 | 1.19856 | 1.20170 | 1.20019 | 0.00314 | 0.00151 | 0.63 | 0.30 |
| H | 8 | 2 | 8 | 1.20813 | 1.21149 | 1.20954 | 0.00336 | 0.00195 | 0.42 | 0.24 |
| Mean | 5.1 | | | | | | | Mean | 0.39 | 0.17 |
| St.Dev | 2.7 | | | | | | | St.Dev | 0.16 | 0.08 |

*Large flatworm present



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC -- 9/05
ASci-ETL Study ID #5010-214

APPENDIX A

Chain of Custody Forms

ASCI-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|--------------|-------------------|-------|--------|------|-------------|-----------|---------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW32 side | 6/22/05 | 10:30 | | | X | | 1/2 gal | — | 10-day Chironomid |
| WW32 center | 6/22/05 | 10:35 | | | X | | " | — | " |
| WW31 side | 6/21/05 | 11:00 | | | X | | " | — | " |
| WW31 center | 6/21/05 | 11:30 | | | X | | " | — | " |
| WW106 side | 6/23/05 | 11:30 | | | X | | 1/2 gal | — | " |
| WW106 center | 6/23/05 | 12:00 | | | X | | " | — | " |

Site: MWRD6L - WW32 - Lake Cook Rd. on Skokie R. ; WW31 - Lake Cook Rd on MFN BCR

Address: 6001 W. Pershing Rd Cicero, IL 60804

Telephone #: (708) 588-4074

Temperature of Sample During Collection: put on ice

Samples Collected by: Jennifer Wasik
 Print: Jennifer Wasik Title: BIOLOGIST II Signature: *Jennifer Wasik*

Samples Relinquished by: Jennifer Wasik
 Print: Jennifer Wasik Title: BIOLOGIST II Signature: *Jennifer Wasik*

Mode of Transportation: UPS o/n Date: 6/23/05

Received for ASCI-ETL by: Clayton Allen
 Print: Clayton Allen Signature: *Clayton Allen* Title: BIOLOGIST Date: 6/24/05 Time: 1010

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|---------------|-------------------|-------|--------|------|-------------|-----------|----------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW 103 side | 6/28/05 | 11:15 | | | X | | 1/2 gal. | — | 10 day chironomid |
| WW 103 center | " | 11:30 | | | X | | " | — | |
| WW 105 side | 6/29/05 | 10:45 | | | X | | " | — | |
| WW 105 center | " | 11:00 | | | X | | " | — | |
| WW 104 side | 6/30/05 | 11:30 | | | X | | 1/2 gal. | — | ↓ |
| WW 104 center | 6/30/05 | 11:45 | | | X | | " | — | |

Site: MW RDGC

Address: 6001 W. Pershing Cicero 60804

Telephone #: (708) 588-4074

Temperature of Sample During Collection:

Samples Collected by: Jennifer Wasik BIOLOGIST II *Jennifer Wasik*
Print Title Signature

Samples Relinquished by: " " *Jennifer Wasik*
Print Title Signature

Mode of Transportation: UPS o/n Date: 7/5/05

Received for ASci-ETL by: Genelle Lamont *Genelle Lamont* Title Biologist Date 7/6/05 Time 10:30
Print Signature

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

ASCI-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|-------------|-------------------|-------|--------|------|-------------|-----------|--------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW35 side | 7/7/05 | 12:00 | | | X | | 1/2 g | none | 10 day chironomid |
| WW35 center | " | 12:30 | | | X | | ↓ | ↓ | ↓ |
| WW34 side | 7/13/05 | 11:00 | | | X | | ↓ | ↓ | ↓ |
| WW34 center | " | 11:15 | | | X | | | | |

Site: MWRD62
 Address: 6001 W. Pershing
 Telephone #: (708) 5884674
 Temperature of Sample During Collection:

Samples Collected by: Thomas Minarik BIOLOGIST I
Print Title Signature

Samples Relinquished by: Jennifer Wasik BIOLOGIST II [Signature]
Print Title Signature

Mode of Transportation: UPS o/n Date:

Received for ASCI-ETL by: Clayton Allen [Signature] BIOLOGIST Date 7/17/05 Time 10:15
Print Signature Title Date Time

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

ASCI-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

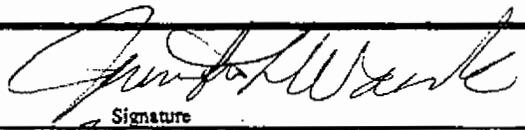
| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|---------------|-------------------|-------|--------|------|-------------|-----------|---------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW 96 side | 7/19/05 | 11:00 | | | X | | 1/2 gal | — | 10 day carbonomid |
| WW 102 side | 7/20/05 | 10:30 | | | X | | " | — | " |
| WW 102 center | 7/20/05 | 10:50 | | | X | | " | — | " |
| NW 36 side | 7/21/05 | 10:30 | | | X | | 1/2 gal | — | " |
| WW 36 center | " | 10:45 | | | X | | " | — | " |
| WW 46 side | 7/18/05 | 11:45 | | | X | | 1/2 gal | — | " |
| WW 46 center | 7/18/05 | 12:15 | | | X | | " | — | " |

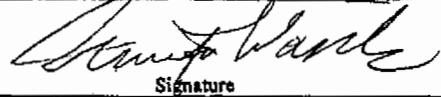
Site: MWRDGC

Address: 6001 W. Pershing Cicero, IL

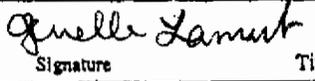
Telephone #: (708) 588-4074

Temperature of Sample During Collection:

Samples Collected by: Jennifer Wasil BIO II 
Print Title Signature

Samples Relinquished by: Jennifer Wasil BIO II 
Print Title Signature

Mode of Transportation: UPS o/n Date: July 26, 04

Received for ASCI-ETL by: Genelle Lamont  Date: 7/27/05 1350
Print Signature Title Date Time

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|-------------|-------------------|-------|--------|------|-------------|-----------|-----------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW10 side | 7/27/05 | 12:00 | | | X | | ~ 1/2 gal | — | 10-day Chironomid |
| WW10 center | " | 12:30 | | | X | | " | — | " |
| WW37 side | " | 10:45 | | | X | | " | — | " |
| WW37 center | " | 11:00 | | | X | | " | — | " |
| WW73 side | 7/28/05 | 11:15 | | | X | | " | — | " |
| WW73 center | " | 11:45 | | | X | | " | — | " |

Site: MWRD6C

Address: 6001 W. Pershing

Telephone #: (708) 588-4874

Temperature of Sample During Collection:

Samples Collected by: Tom Minarik BIOLOGIST I
Print Title Signature

Samples Relinquished by: JENNIFER WASIK BIOLOGIST II
Print Title Signature

Mode of Transportation: UPS o/n Date: 8/2/05

Received for ASci-ETL by: K. Anderson [Signature] Sen Biologist 8/3/05 1035
Print Signature Title Date Time

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC – 9/05
ASci-ETL Study ID #5010-214

APPENDIX B

Raw Data Sheets

ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC – 9/05
ASci-ETL Study ID #5010-214

CWRD Set #1
***Chironomus* Toxicity Tests**
Study LD. 5010-214
Int. 7/1/05

Exposure System Observations/Activities Sheet for Sediments Initiated 7/1/05

| Date | Day of Test | Head Flow (ml/min): | Observations |
|-----------------------------|-------------|---------------------|---|
| 6/20/05 | -1 | | SEDIMENTS LOADED. WW32-CENTER - MANY INDIGENOUS CT REMOVED. |
| 7/1/05 RE 6/28 7/1/05 | 0 | 326 | CT LOADED AND FED. |
| 7/2/05 | 1 | 320 | Looks good. Fed. |
| 7/3/05 | 2 | 328 | Looks good. Fed. |
| 7/4/05 | 3 | 324 | Looks good. Fed. |
| 7/5/05 | 4 | 322 | Looks good. Fed. |
| 7/6/05 | 5 | 328 | Looks good. Fed. |
| 7/7/05 | 6 | 324 | Arbicide visible in WW-32 side, looks good. Fed. |
| 7/8/05 | 7 | 326 | Looks okay. Fed. |
| 7/9/05 | 8 | 330 | Looks good. FEEDING SUSPENDED DUE TO LOW DO VALUES. |
| 7/10/05 | 9 | 324 | Looks good. Fed. |
| | 10 | 322 | Terminated test. Heat 5 @ 94°C for 28 hrs, cool @ 55°C for 2 hrs |

**Table 2. Overlying Water Temperature Values (oC) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-31 CENTER | WW-31 SIDE | WW-32 CENTER | WW-32 SIDE | WW-106 CENTER | WW-106 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|
| 0 | 23.1 | 23.2 | 23.2 | 23.2 | 23.1 | 23.1 | 23.2 |
| 1 | 22.2 | 22.3 | 22.4 | 22.3 | 22.5 | 22.5 | 22.5 |
| 2 | 22.1 | 22.1 | 22.1 | 22.2 | 22.3 | 22.2 | 22.3 |
| 3 | 21.2 | 21.2 | 21.2 | 22.0 | 22.0 | 22.2 | 22.2 |
| 4 | 22.1 | 22.1 | 22.1 | 22.1 | 22.2 | 22.2 | 22.1 |
| 5 | 22.4 | 22.4 | 22.4 | 22.6 | 22.4 | 22.6 | 22.4 |
| 6 | 22.3 | 22.3 | 22.3 | 22.3 | 22.2 | 22.4 | 22.4 |
| 7 | 22.5 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| 8 | 22.8 | 22.8 | 22.8 | 22.7 | 22.7 | 22.9 | 22.8 |
| 9 | 22.8 | 22.9 | 22.8 | 22.8 | 22.9 | 23.0 | 22.9 |
| 10 | 22.7 | 22.6 | 22.8 | 22.8 | 22.8 | 22.9 | 22.8 |

**Table 3. Overlying Water D.O. Values (mg/L) for CWRD
 SEDIMENTS During 10-Day *C. tentans* Exposures**

| Day | West Bearskin | WW-31 CENTER | WW-31 SIDE | WW-32 CENTER | WW-32 SIDE | WW-106 CENTER | WW-106 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|
| 0 | 7.4 | 7.3 | 7.3 | 6.0 | 6.6 | 6.1 | 6.5 |
| 1 | 7.1 | 6.4 | 6.3 | 6.3 | 6.0 | 6.0 | 6.3 |
| 2 | 7.1 | 6.7 | 5.4 | 6.3 | 5.6 | 5.9 | 6.8 |
| 3 | 7.3 | 6.8 | 6.4 | 6.2 | 6.2 | 5.8 | 6.8 |
| 4 | 6.3 | 6.2 | 6.3 | 5.2 | 5.4 | 5.2 | 5.4 |
| 5 | 5.0 | 5.2 | 4.6 | 4.0 | 4.2 | 5.0 | 4.6 |
| 6 | 5.0 | 5.5 | 4.3 | 4.4 | 4.4 | 4.5 | 5.0 |
| 7 | 5.1 | 3.9 | 4.1 | 4.2 | 4.1 | 4.5 | 4.0 |
| 8 | 4.5 | 3.0 | 3.2 | 2.4 | 2.6 | 4.0 | 3.2 |
| 9 | 4.8 | 3.8 | 3.6 | 4.7 | 4.6 | 4.4 | 4.3 |
| 10 | 4.8 | 4.2 | 4.1 | 4.5 | 4.5 | 4.7 | 4.8 |

**Table 4. Overlying Water pH Values for CWRD Sediments
 During 10-Day C. tentans Exposures**

| Day | West | WW-31 | WW-31 | WW-32 | WW-32 | WW-106 | WW-106 |
|-----|----------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 7.38 | 7.55 | 7.44 | 7.59 | 7.59 | 7.55 | 7.53 |
| 10 | 7.55 | 7.58 | 7.56 | 7.60 | 7.52 | 7.69 | 7.67 |

**Table 5. Overlying Water Cond. Values (umhos/cm) for CWRD.
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West | WW-31 | WW-31 | WW-32 | WW-32 | WW-106 | WW-106 |
|-----|----------|--------|-------|--------|--------------------------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 124 | 264 | 354 | 342 | 414 | 369 | 262 |
| 10 | 168 | 209 | 229 | 234 | 335 311/05 | 191 | 206 |

**Table 6. Overlying Water Alkalinity Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-31 | WW-31 | WW-32 | WW-32 | WW-106 | WW-106 |
|-----|----------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 38 | 70 | 76 | 86 | 92 | 88 | 68 |
| 10 | 64 | 80 | 84 | 104 | 128 | 74 | 78 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 7 | 3 | 7 | 1.22026 | 1.23254 | 1.22185 |
| B | 8 | 2 | 8 | 1.19975 | 1.21355 | 1.20191 |
| C | 7 | 3 | 7 | 1.21182 | 1.22407 | 1.21422 |
| D | 10 | 0 | 10 | 1.21880 | 1.22923 | 1.22048 |
| E | 10 | 0 | 10 | 1.21306 | 1.22377 | 1.21453 |
| F | 7 | 3 | 7 | 1.20139 | 1.21233 | 1.20301 |
| G | 10 | 0 | 10 | 1.20900 | 1.22514 | 1.21331 |
| H | 10 | 0 | 10 | 1.21570 | 1.22756 | 1.21790 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-31 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 7 | 3 | 7 | 1.20445 | 1.21990 | 1.20945 |
| B | 8 | 2 | 8 | 1.20928 | 1.22218 | 1.21322 |
| C | 8 | 2 | 8 | 1.21326 | 1.22812 | 1.21820 |
| D | 10 | 0 | 10 | 1.19990 | 1.21121 | 1.20327 |
| E | 8 | 2 | 8 | 1.20911 | 1.22530 | 1.21417 |
| F | 10 | 0 | 10 | 1.22560 | 1.24034 | 1.23054 |
| G | 8 | 2 | 8 | 1.21017 | 1.22594 | 1.21446 |
| H | 10 | 0 | 10 | 1.21553 | 1.23383 | 1.22224 |

Chironomus tentans 10-day Survival and Growth Data

Site ID #WW-31 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.20455 | 1.22069 | 1.20888 |
| B | 7 | 3 | 7 | 1.21600 | 1.22464 | 1.21860 |
| C | 9 | 1 | 9 | 1.21266 | 1.22100 | 1.21513 |
| D | 7 | 3 | 7 | 1.21943 | 1.22876 | 1.22169 |
| E | 2* | 8 | 2 | 1.19565 | 1.19844 | 1.19621 |
| F | 0* | 10 | 0 | 1.20617 | — | — |
| G | 1* | 9 | 1 | 1.19823 | 1.20056 | 1.19873 |
| H | 1* | 9 | 1 | 1.20237 | 1.20408 | 1.20278 |

* FW = Flatworm(s) present

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-32 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.20648 | 1.22327 | 1.21270 |
| B | 7 | 3 | 7 | 1.20004 | 1.21265 | 1.20323 |
| C | 9 | 1 | 9 | 1.19357 | 1.20980 | 1.19742 |
| D | 10 | 0 | 10 | 1.23234 | 1.24849 | 1.23579 |
| E | 9 | 1 | 9 | 1.20465 | 1.22900 | 1.21354 |
| F | 10* | 0 | 10 | 1.20746 | 1.21591 | 1.20945 |
| G | 9 | 1 | 9 | 1.19587 | 1.21095 | 1.19910 |
| H | 10 | 0 | 10 | 1.20937 | 1.22220 | 1.21217 |

* CT appears slightly smaller than other reps.

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-32 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 6 | 1.20438 | 1.21200 | 1.20469 |
| B | 10 | 0 | 10 | 1.19230 | 1.20344 | 1.19643 |
| C | 0* | 10 | 0 | 1.19831 | — | — |
| D | 9 | 1 | 9 | 1.23125 | 1.24145 | 1.23496 |
| E | 8 | 2 | 8 | 1.20748 | 1.21860 | 1.21075 |
| F | 8 | 2 | 8 | 1.23078 | 1.24167 | 1.23457 |
| G | 9 | 1 | 9 | 1.21810 | 1.22728 | 1.22144 |
| H | 9 | 1 | 9 | 1.20697 | 1.21423 | 1.20892 |

* FW = flatworms present

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-106 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.22331 | 1.23669 | 1.22748 |
| B | 10 | 0 | 10 | 1.22648 | 1.23728 | 1.22998 |
| C | 10 | 0 | 10 | 1.21602 | 1.23292 | 1.22208 |
| D | 8 | 2 | 8 | 1.21834 | 1.23056 | 1.22213 |
| E | 9 | 1 | 9 | 1.19555 | 1.20581 | 1.19961 |
| F | 10 | 0 | 10 | 1.21836 | 1.23808 | 1.22738 |
| G | 8 | 2 | 8 | 1.21654 | 1.22592 | 1.21971 |
| H | 1* | 9 | 1 | 1.19178 | 1.19375 | 1.19250 |

*FW

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-106 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|-------------------------------|----------------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 3* | 4 | 3 | 1.21936 | 1.22304 | 1.22089 |
| B | 5* | 5 | 5 | 1.20336 | 1.21037 | 1.20629 |
| C | 7 | 3 | 7 | 1.21494 | 1.22656 ^{CP 7/26} | 1.21998 |
| D | 10 | 0 | 10 | 1.22356 | 1.23576 | 1.22799 |
| E | 10 | 0 | 10 | 1.22091 | 1.23188 | 1.22635 |
| F | 1* | 9 | 1 | 1.23292 | 1.23332 | 1.23312 |
| G | 1* | 9 | 1 | 1.19894 | 1.20028 | 1.19932 ^{CP 7/14/97} |
| H | 0* | 10 | 0 | 1.20970 | — | — |

A Flatworms present

2025 RELEASE UNDER E.O. 14176

CWRD Set #2
***Chironomus* Toxicity Tests**
Study LD. 5010-214
Init. 7/8/05

Exposure System Observations/Activities Sheet for Sediments Initiated 7/8/05

| Date | Day of Test | Head Flow (ml/min): | Observations |
|---------|-------------|---------------------|---|
| 7/9/05 | -1 | | Homogenized & loaded cells. |
| 7/10/05 | 0 | 326 | Load 10 CF/braker. |
| 7/11/05 | 1 | 324 | Looks good. Fed. |
| 7/12/05 | 2 | 324 | No change Fed. |
| 7/13/05 | 3 | 326 | Looks good. Fed. |
| 7/14/05 | 4 | 330 | Looks good. Fed. |
| 7/15/05 | 5 | 326 | No change Fed. |
| 7/16/05 | 6 | 326 | Looks good. Fed. |
| 7/17/05 | 7 | 324 | Looks good. Fed. |
| 7/18/05 | 8 | 326 | Looks good. Fed. |
| 7/19/05 | 9 | 328 | No change. Fed. |
| 7/20/05 | 10 | 324 | Terminated test CF died @ 93°C for 26 hrs, viable @ 550°C for 2 hrs |

**Table 2. Overlying Water Temperature Values (oC) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-103 CENTER | WW-103 SIDE | WW-104 CENTER | WW-104 SIDE | WW-105 CENTER | WW-105 SIDE |
|-----|------------------|------------------|----------------|------------------|----------------|------------------|----------------|
| 0 | 22.9 | 22.8 | 22.9 | 22.9 | 23.0 | 22.9 | 22.8 |
| 1 | 22.8 | 22.8 | 22.8 | 23.0 | 22.9 | 23.0 | 23.0 |
| 2 | 22.9 | 22.8 | 23.0 | 22.9 | 22.9 | 22.9 | 22.9 |
| 3 | 23.0 | 23.1 | 23.2 | 23.1 | 23.0 | 23.1 | 23.2 |
| 4 | 22.8 | 22.9 | 22.8 | 22.9 | 22.8 | 22.9 | 22.8 |
| 5 | 23.6 | 23.1 | 23.2 | 23.0 | 22.9 | 23.1 | 22.9 |
| 6 | 22.6 | 22.7 | 22.7 | 22.6 | 22.4 | 22.5 | 22.6 |
| 7 | 22.6 | 22.5 | 22.6 | 22.6 | 22.4 | 22.4 | 22.4 |
| 8 | 22.7 | 22.7 | 22.6 | 22.7 | 22.7 | 22.6 | 22.7 |
| 9 | 22.6 | 22.6 | 22.6 | 22.7 | 22.4 | 22.5 | 22.5 |
| 10 | 22.6 | 22.6 | 22.6 | 22.7 | 22.7 | 22.6 | 22.6 |

**Table 3. Overlying Water D.O. Values (mg/L) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West | WW-103 | WW-103 | WW-104 | WW-104 | WW-105 | WW-105 |
|-----|----------|--------|--------|--------|--------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 7.5 | 7.0 | 7.1 | 7.1 | 7.0 | 6.9 | 7.3 |
| 1 | 7.2 | 6.3 | 6.4 | 6.7 | 5.5 | 6.6 | 6.5 |
| 2 | 6.1 | 5.1 | 5.2 | 5.0 | 5.2 | 4.9 | 5.0 |
| 3 | 5.4 | 5.6 | 5.3 | 5.1 | 5.4 | 5.1 | 5.2 |
| 4 | 5.8 | 4.6 | 4.7 | 4.3 | 4.8 | 4.7 | 5.2 |
| 5 | 5.6 | 4.3 | 4.1 | 4.6 | 4.5 | 4.6 | 3.7 |
| 6 | 6.4 | 4.5 | 4.5 | 5.5 | 4.5 | 6.4 | 4.5 |
| 7 | 4.9 | 4.6 | 5.2 | 5.9 | 4.4 | 6.2 | 6.0 |
| 8 | 5.3 | 4.0 | 5.4 | 5.5 | 5.0 | 5.9 | 5.9 |
| 9 | 5.1 | 3.9 | 4.9 | 5.5 | 4.6 | 4.0 | 4.7 |
| 10 | 5.0 | 3.8 | 4.8 | 5.4 | 4.6 | 4.0 | 4.6 |

**Table 4. Overlying Water pH Values for CWRD Sediments
 During 10-Day C. tentans Exposures**

| Day | West | WW-103 | WW-103 | WW-104 | WW-104 | WW-105 | WW-105 |
|-----|----------|--------|--------|--------|--------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 7.95 | 7.88 | 7.76 | 7.91 | 7.78 | 7.75 | 7.81 |
| 10 | 7.47 | 7.41 | 7.44 | 7.41 | 7.32 | 7.33 | 7.39 |

**Table 5. Overlying Water Cond. Values (umhos/cm) for CWRD.
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West | WW-103 | WW-103 | WW-104 | WW-104 | WW-105 | WW-105 |
|-----|----------|--------|--------|--------|--------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 120 | 266 | 240 | 187 | 402 | 231 | 330 |
| 10 | 136 | 215 | 176 | 165 | 207 | 157 | 172 |

**Table 6. Overlying Water Alkalinity Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-103 | WW-103 | WW-104 | WW-104 | WW-105 | WW-105 |
|-----|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------|-----------------------------|-----------------------------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 10 40 TE eq/L | 96 78 TE eq/L | 62 72 TE eq/L | 62 70 TE eq/L | 106 114 TE eq/L | 60 96 TE eq/L | 42 42 TE eq/L |
| 10 | 44 70 TE eq/L | 86 | 62 | 60 | 82 | 56 | 62 |

**Table 7. Overlying Water Hardness Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-103 | WW-103 | WW-104 | WW-104 | WW-105 | WW-105 |
|-----|----------|--------|--------|--------|--------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 40 | 70 | 72 | 70 | 114 | 96 | 92 |
| 10 | 46 | 76 | 64 | 64 | 76 | 54 | 62 |

**Table 8. Overlying Water Ammonia Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-103 | WW-103 | WW-104 | WW-104 | WW-105 | WW-105 |
|-----|----------|--------|--------|--------|--------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 10 | <1 | 1.4 | <1 | <1 | <1 | <1 | <1 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.21697 | 1.23068 | 1.21974 |
| B | 9 | 1 | 9 | 1.21412 | 1.22718 | 1.21689 |
| C | 9 | 1 | 9 | 1.22034 | 1.23291 | 1.22302 |
| D | 10 | 0 | 10 | 1.21153 | 1.22739 | 1.21370 |
| E | 9 | 1 | 9 | 1.20221 | 1.21791 ^{PE} 1.22636 ^{9/2/74} | 1.20682 |
| F | 10 | 0 | 10 | 1.22760 | 1.24269 | 1.23075 |
| G | 10 | 0 | 10 | 1.22785 | 1.24246 | 1.23154 |
| H | 10 | 0 | 10 | 1.21456 | 1.23005 | 1.21743 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-103 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.21684 | 1.23461 | 1.22271 |
| B | 8 | 2 | 8 | 1.22503 | 1.23826 | 1.22942 |
| C | 9 | 1 | 9 | 1.19781 | 1.21344 | 1.20173 |
| D | 10 | 0 | 10 | 1.22450 | 1.23919 | 1.22832 |
| E | 10 | 0 | 10 | 1.22276 | 1.23666 | 1.22661 |
| F | 10 | 0 | 10 | 1.22324 | 1.24172 | 1.22887 |
| G | 9 | 1 | 9 | 1.22521 | 1.24218 | 1.22898 |
| H | 10 | 0 | 10 | 1.22722 | 1.24444 | 1.23302 |

Chironomus tentans 10-day Survival and Growth Data

Site ID #WW-103 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.21820 | 1.23689 | 1.22296 |
| B | 10 | 0 | 10 | 1.22403 | 1.24197 | 1.23358 |
| C | 9 | 1 | 9 | 1.22832 | 1.24406 | 1.23111 |
| D | 9 | 1 | 9 | 1.22984 | 1.24479 | 1.23442 |
| E | 10 | 0 | 10 | 1.23510 | 1.24897 | 1.23944 |
| F | 9 | 1 | 9 | 1.22184 | 1.23728 | 1.22611 |
| G | 10 | 0 | 10 | 1.21920 | 1.23436 | 1.22213 |
| H | 10 | 0 | 10 | 1.29859 | 1.31475 | 1.30230 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-104 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.30180 | 1.32073 | 1.30892 |
| B | 10 | 0 | 10 | 1.30185 | 1.31922 | 1.30962 |
| C | 10 | 0 | 10 | 1.30027 | 1.31505 | 1.30515 |
| D | 8 | 2 | 8 | 1.27104 | 1.28432 | 1.27526 |
| E | 9 | 1 | 9 | 1.29661 | 1.31013 | 1.30139 |
| F | 9 | 1 | 9 | 1.29826 | 1.31176 | 1.30349 |
| G | 10 | 0 | 10 | 1.30030 | 1.31795 | 1.30701 |
| H | 9 | 1 | 9 | 1.29820 | 1.30988 | 1.30236 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-104 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|----------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.29891 | 1.31320 | 1.30269 |
| B | 10 | 0 | 10 | 1.29999 | 1.31696 | 1.30537 |
| C | 9 | 1 | 9 | 1.30398 | 1.31445 | 1.30681 |
| D | 10 | 0 | 10 | 1.29793 | 1.31438 | 1.30280 |
| E | 10 | 0 | 10 | 1.29901 | 1.31529 | 1.30333 |
| F | 9 | 1 | 9 | 1.29910 | 1.31480 | 1.30382 |
| G | 4 [*] | 6 | 4 | 1.29245 | 1.30128 | 1.29484 |
| H | 10 | 0 | 10 | 1.29718 | 1.30649 | 1.29892 |

* Flituous present

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-105 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.29478 | 1.30789 | 1.29717 |
| B | 10 | 0 | 10 | 1.29878 | 1.31798 | 1.30453 |
| C | 10 | 0 | 10 | 1.30129 | 1.31856 | 1.30679 |
| D | 10 | 0 | 10 | 1.27196 | 1.29038 | 1.27733 |
| E | 9 | 1 | 9 | 1.29010 | 1.30824 | 1.29697 |
| F | 10 | 0 | 10 | 1.29925 | 1.31837 | 1.30531 |
| G | 10 | 0 | 10 | 1.30166 | 1.31973 | 1.30710 |
| H | 10 | 0 | 10 | 1.29483 | 1.31309 | 1.30180 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-105 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.30020 | 1.31976 | 1.30665 |
| B | 9 | 1 | 9 | 1.29380 | 1.30516 | 1.29733 |
| C | 10 | 0 | 10 | 1.30469 | 1.32433 | 1.31210 |
| D | 10 | 0 | 10 | 1.29706 | 1.31622 | 1.30283 |
| E | 10 | 0 | 10 | 1.29130 | 1.31307 | 1.29892 |
| F | 10 | 0 | 10 | 1.29470 | 1.31435 | 1.30219 |
| G | 9 | 1 | 9 | 1.29810 | 1.31338 | 1.30182 |
| H | 10 | 0 | 10 | 1.30277 | 1.32678 | 1.31245 |

CWRD Set #3
Chironomus Toxicity Tests
Study I.D. 5010-214
Init. 7/22/05

Exposure System Observations/Activities Sheet for Sediments Initiated 7/22/05

| Date | Day of Test | Head Flow (ml/min): | Observations |
|---------|-------------|--------------------------------|--|
| 7/22/05 | -1 | Head Flow (ml/min): | Harmonized + loaded sed. |
| 7/23/05 | 0 | 326 | loaded OCT/leak |
| 7/24/05 | 1 | 328 | No change |
| 7/24/05 | 2 | 324 | |
| 7/25/05 | 3 | 320 | LOOKS GOOD. FED. |
| 7/26/05 | 4 | 326 | looks good. Fed. CT Burrows visible all sed. |
| 7/27/05 | 5 | 320 | looks good Fed. |
| 7/28/05 | 6 | 321 | looks good. |
| 7/29/05 | 7 | 322 | looks good. |
| 7/30/05 | 8 | 326 | looks good fed. |
| 7/31/05 | 9 | 320 | looks good. clean water. |
| 8/1/05 | 10 | 324 | Terminated test, head CT @ 97°C for 24 hrs, and @ 550°C for 2 hrs. |

**Table 2. Overlying Water Temperature Values (oC) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-34 CENTER | WW-34 SIDE | WW-35 CENTER | WW-35 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|
| 0 | 23.9 | 23.9 | 23.9 | 24.1 | 24.1 |
| 1 | 22.5 | 22.5 | 22.4 | 22.6 | 22.4 |
| 2 | 22.9 | 22.1 | 22.9 | 23.1 | 22.9 |
| 3 | 23.1 | 23.0 | 23.1 | 23.0 | 23.0 |
| 4 | 22.9 | 23.2 | 22.7 | 22.8 | 22.7 |
| 5 | 22.9 | 23.0 | 23.1 | 23.0 | 22.8 |
| 6 | 23.8 | 23.8 | 23.7 | 23.8 | 23.7 |
| 7 | 22.9 | 22.8 | 22.9 | 22.9 | 22.7 |
| 8 | 23.0 | 22.9 | 22.9 | 22.9 | 22.8 |
| 9 | 23.0 | 23.0 | 22.9 | 22.9 | 22.8 |
| 10 | 22.9 | 23.0 | 22.8 | 22.9 | 23.1 |

**Table 3. Overlying Water D.O. Values (mg/L) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-34 CENTER | WW-34 SIDE | WW-35 CENTER | WW-35 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|
| 0 | 8.2 | 8.2 | 8.2 | 8.2 | 8.2 |
| 1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 |
| 2 | 8.2 | 8.0 | 8.0 | 7.9 | 7.5 |
| 3 | 7.7 | 6.0 | 5.6 | 5.4 | 5.2 |
| 4 | 6.0 | 5.5 | 5.6 | 5.3 | 5.5 |
| 5 | 6.8 | 4.8 | 5.2 | 5.2 | 5.2 |
| 6 | 6.6 | 5.3 | 6.6 | 5.9 | 5.9 |
| 7 | 6.9 | 5.1 | 4.7 | 5.1 | 5.2 |
| 8 | 5.3 | 4.4 | 4.3 | 4.6 | 4.3 |
| 9 | 5.1 | 4.3 | 4.3 | 4.4 | 4.4 |
| 10 | 5.0 | 4.4 | 4.6 | 4.1 | 4.3 |

**Table 4. Overlying Water pH Values for CWRD Sediments
 During 10-Day C. tentans Exposures**

| Day | West | WW-34 | WW-34 | WW-35 | WW-35 |
|-----|----------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE |
| 0 | 7.87 | 7.80 | 7.72 | 7.71 | 7.64 |
| 10 | 7.44 | 7.58 | 7.67 | 7.56 | 7.48 |

**Table 5. Overlying Water Cond. Values (umhos/cm) for CWRD.
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West | WW-34 | WW-34 | WW-35 | WW-35 |
|-----|----------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE |
| 0 | 126 | 202 | 205 | 174 | 202 |
| 10 | 132 | 212 | 215 | 165 | 199 |

**Table 6. Overlying Water Alkalinity Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-34 | WW-34 | WW-35 | WW-35 |
|-----|----------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE |
| 0 | 76 | 84 | 84 | 84 | 84 |
| 10 | 40 | 48 | 56 | 48 | 46 |

Table 7. Overlying Water Hardness Values (mg/L) for CWRD Sediments During 10-Day C. tentans Exposures

| Day | West | WW-34 | WW-34 | WW-35 | WW-35 |
|-----|----------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE |
| 0 | 116 | 132 | 142 | 136 | 136 |
| 10 | 52 | 50 | 48 | 62 | 68 |

Table 8. Overlying Water Ammonia Values (mg/L) for CWRD Sediments During 10-Day C. tentans Exposures

| Day | West | WW-34 | WW-34 | WW-35 | WW-35 |
|-----|----------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE |
| 0 | <1 | <1 | <1 | <1 | <1 |
| 10 | <1 | <1 | <1 | <1 | <1 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.29998 | 1.31207 | 1.30150 |
| B | 10 | 0 | 10 | 1.29469 | 1.30807 | 1.29669 |
| C | 10 | 0 | 10 | 1.27666 | 1.28938 | 1.27875 |
| D | 9 | 1 | 9 | 1.29405 | 1.30681 | 1.29585 |
| E | 10 | 0 | 10 | 1.29557 | 1.30882 | 1.29773 |
| F | 10 | 0 | 10 | 1.29976 | 1.31359 | 1.30210 |
| G | 10 | 0 | 10 | 1.29537 | 1.30909 | 1.29689 |
| H | 10 | 0 | 10 | 1.29769 | 1.31002 | 1.29958 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-34 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.28714 | 1.30262 | 1.28966 |
| B | 8 | 2 | 8 | 1.30056 | 1.31314 | 1.30263 |
| C | 9 | 1 | 9 | 1.27324 | 1.28986 | 1.27682 |
| D | 10 | 0 | 10 | 1.29066 | 1.30156 | 1.29238 |
| E | 10 | 0 | 10 | 1.27514 | 1.28763 | 1.27740 |
| F | 10 | 0 | 10 | 1.29130 | 1.30394 | 1.29400 |
| G | 9 | 1 | 9 | 1.29316 | 1.30941 | 1.29722 |
| H | 10 | 0 | 10 | 1.28935 | 1.30381 | 1.29223 |

Chironomus tentans 10-day Survival and Growth Data

Site ID #WW-34 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|---------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.21999 | 1.23336 | 1.22312 |
| B | 10 | 0 | 10 | 1.29661 | 1.30800 | 1.29824 |
| C | 10 | 0 | 10 | 1.29215 | 1.30321 | 1.29375 |
| D | 10 | 0 | 10 | 1.29578 | 1.30478 | 1.29638 |
| E | 10 | 0 | 10 | 1.29874 | 1.31115 | 1.30111 |
| F | 6 (5+1 pupae) | 4 | 5 | 1.28165 | 1.28859 | 1.28264 |
| G | 10 | 0 | 10 | 1.28875 | 1.29858 | 1.29092 |
| H | 10 | 0 | 10 | 1.22395 | 1.23472 | 1.22575 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-35 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.21201 | 1.22743 | 1.21537 |
| B | 10 | 0 | 10 | 1.20904 | 1.22732 | 1.21409 |
| C | 10 | 0 | 10 | 1.21849 | 1.23528 | 1.22264 |
| D | 10 | 0 | 10 | 1.21333 | 1.22823 | 1.21743 |
| E | 10 | 0 | 10 | 1.21619 | 1.23382 | 1.22097 |
| F | 10 | 0 | 10 | 1.21026 | 1.22974 | 1.21488 |
| G | 10 | 0 | 10 | 1.21246 | 1.22964 | 1.21694 |
| H | 8 | 2 | 8 | 1.22041 | 1.23810 | 1.22424 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-35 SIDE

| Rep. | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|------|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.21996 | 1.24095 | 1.22537 |
| B | 10 | 0 | 10 | 1.22187 | 1.23983 | 1.22615 |
| C | 10 | 0 | 10 | 1.21901 | 1.23692 | 1.22283 |
| D | 10 | 0 | 10 | 1.21434 | 1.22956 | 1.21720 |
| E | 9 | 1 | 9 | 1.21434 | 1.23092 | 1.21760 |
| F | 8 | 2 | 8 | 1.22981 | 1.24928 | 1.23542 |
| G | 10 | 0 | 10 | 1.21554 | 1.23672 | 1.22194 |
| H | 10 | 0 | 10 | 1.22059 | 1.24008 | 1.22497 |

CWRD C. tentans Toxicity Exposure

Study I.D. 5010-214

Init. 7/29/05

SET 4

Exposure System Observations/Activities Sheet for Sediments Initiated 7/29/05

| Date | Day of Test | Head Flow (ml/min): | Observations |
|---------|-------------|---------------------|---|
| 7/28/05 | -1 | 326 | Homogenized - loaded side |
| 7/29/05 | 0 | 326 | loaded CT (w/leaks) looks good Fed CT 1.5 ml TS |
| 7/30/05 | 1 | 326 | looks good Fed CT 1.5 ml TS |
| 7/31/05 | 2 | 326 | looks good. Clear overlay. Fed CT 1.5 ml TS |
| 8/1/05 | 3 | 326 | No change Fed CT 1.5 ml TS |
| 8/2/05 | 4 | 328 | looks good Fed |
| 8/3/05 | 5 | 328 | looks good. Clear overlay. Fed CT 1.5 ml TS |
| 8/4/05 | 6 | 328 | looks good. Clear overlay. 96-S, 102-C, 46-C has a thin film on top. Fed CT 1.5 ml TS |
| 8/5/05 | 7 | 328 | looks good. Clear overlay. Thin film on top 96-S, 102-C, 46-C. Fed CT 1.5 ml TS |
| 8/6/05 | 8 | 327 | looks good. Slight film on 46-C + 102-C. 46-S is cloudy. Fed CT 1.5 ml TS |
| 8/7/05 | 9 | 326 | looks good. No change from yesterday. Fed AT 1.5 ml TS |
| 8/8/05 | 10 | 322 | Terminates test. Heat CT @ 90°C for 23 hrs, then water @ 55°C for 2 hrs |

**Table 2. Overlying Water Temperature Values (oC) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

96-5

| Day | West Bearskin | WW-36 CENTER | WW-36 SIDE | WW-46 CENTER | WW-46 SIDE | WW-102 CENTER | WW-102 SIDE | WW-102 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|----------------|
| 0 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 |
| 1 | 22.9 | 23.0 | 23.0 | 23.0 | 23.2 | 23.1 | 23.2 | 23.2 |
| 2 | 23.0 | 23.0 | 23.1 | 23.1 | 23.2 | 23.2 | 23.1 | 22.1 |
| 3 | 23.1 | 22.9 | 23.0 | 22.8 | 23.2 | 23.1 | 23.0 | 23.1 |
| 4 | 23.1 | 23.1 | 23.2 | 23.2 | 23.0 | 23.2 | 23.1 | 23.2 |
| 5 | 23.0 | 22.5 | 23.2 | 23.1 | 23.1 | 23.2 | 23.0 | 23.1 |
| 6 | 23.9 | 23.2 | 23.5 | 23.3 | 23.7 | 23.7 | 23.2 | 23.2 |
| 7 | 22.8 | 23.0 | 23.2 | 23.1 | 23.0 | 23.1 | 22.9 | 23.1 |
| 8 | 23.0 | 23.1 | 23.5 | 23.2 | 23.1 | 23.5 | 23.3 | 23.0 |
| 9 | 23.2 | 23.2 | 23.0 | 22.9 | 22.5 | 23.0 | 22.8 | 22.8 |
| 10 | 23.1 | 23.0 | 23.1 | 23.0 | 23.1 | 23.2 | 23.1 | 23.0 |

**Table 3. Overlying Water D.O. Values (mg/L) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

96-5

| Day | West Bearskin | WW-36 CENTER | WW-36 SIDE | WW-46 CENTER | WW-46 SIDE | WW-102 CENTER | WW-102 SIDE | WW-103 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|----------------|
| 0 | 8.2 | 8.0 | 7.0 | 7.6 | 7.1 | 7.1 | 7.5 | 8.0 |
| 1 | 8.0 | 8.0 | 7.9 | 7.8 | 7.8 | 7.6 | 7.5 | 7.8 |
| 2 | 8.1 | 8.0 | 7.9 | 7.9 | 7.8 | 7.8 | 7.6 | 7.7 |
| 3 | 7.8 | 7.6 | 7.4 | 6.8 | 6.5 | 7.1 | 6.8 | 6.5 |
| 4 | 7.0 | 6.8 | 6.9 | 6.4 | 6.0 | 6.0 | 5.9 | 6.2 |
| 5 | 6.5 | 6.0 | 6.0 | 5.9 | 5.9 | 5.9 | 5.7 | 5.9 |
| 6 | 6.5 | 6.2 | 6.2 | 5.2 | 5.5 | 5.5 | 5.6 | 5.8 |
| 7 | 6.3 | 5.6 | 6.0 | 5.2 | 5.5 | 5.5 | 5.5 | 5.6 |
| 8 | 6.2 | 5.4 | 6.1 | 5.0 | 5.6 | 5.6 | 5.6 | 5.5 |
| 9 | 6.1 | 5.3 | 6.0 | 5.0 | 5.4 | 5.4 | 5.4 | 5.3 |
| 10 | 6.0 | 5.9 | 5.6 | 5.0 | 5.1 | 5.6 | 5.0 | 4.8 |

**Table 4. Overlying Water pH Values for CWRD Sediments
 During 10-Day C. tentans Exposures**

| Day | West | WW-36 | WW-36 | WW-46 | WW-46 | WW-102 | WW-102 | WW-96 |
|-----|----------|--------|-------|--------|-------|--------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | SIDE |
| 0 | 8.05 | 7.40 | 7.65 | 7.53 | 7.61 | 7.54 | 7.59 | 7.55 |
| 10 | 7.65 | 7.81 | 7.80 | 7.69 | 7.73 | 7.68 | 7.63 | 7.66 |

**Table 5. Overlying Water Cond. Values (umhos/cm) for CWRD.
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West | WW-36 | WW-36 | WW-46 | WW-46 | WW-102 | WW-102 | WW-96 |
|-----|----------|--------|-------|--------|-------|--------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | SIDE |
| 0 | 129 | 218 | 200 | 247 | 187 | 249 | 191 | 276 |
| 10 | 139 | 150 | 142 | 162 | 144 | 147 | 152 | 145 |

**Table 6. Overlying Water Alkalinity Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-36 | WW-36 | WW-46 | WW-46 | WW-102 | WW-102 | WW-96 |
|-----|----------|--------|-------|--------|-------|--------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | SIDE |
| 0 | 42 | 78 | 64 | 84 | 64 | 86 | 68 | 78 |
| 10 | 46 | 50 | 46 | 56 | 52 | 64 | 52 | 50 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.21891 | 1.23112 | 1.22075 |
| B | 9 | 1 | 9 | 1.22031 | 1.23420 | 1.22317 |
| C | 10 | 0 | 10 | 1.21285 | 1.22422 | 1.21473 |
| D | 10 | 0 | 10 | 1.22060 | 1.23170 | 1.22236 |
| E | 10 | 0 | 10 | 1.20983 | 1.22049 | 1.21141 |
| F | 9 | 1 | 9 | 1.21352 | 1.22533 | 1.21550 |
| G | 10 | 0 | 10 | 1.21699 | 1.23183 | 1.21929 |
| H | 10 | 0 | 10 | 1.21514 | 1.22588 | 1.21707 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-36 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.20668 | 1.21805 | 1.20782 |
| B | 10 | 0 | 10 | 1.20634 | 1.22148 | 1.20839 |
| C | 9 | 1 | 9 | 1.20899 | 1.22086 | 1.21068 |
| D | 10 | 0 | 10 | 1.20949 | 1.22398 | 1.21129 |
| E | 10 | 0 | 10 | 1.21461 | 1.22747 | 1.21586 |
| F | 10 | 0 | 10 | 1.21817 | 1.23335 | 1.21953 |
| G | 10 | 0 | 10 | 1.21630 | 1.22833 | 1.21779 |
| H | 6 | 4 | 6 | 1.20747 | 1.21772 | 1.20864 |

Chironomus tentans 10-day Survival and Growth Data

Site ID #WW-36 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|---|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.29808 | 1.21366 | 1.20716 1.30023 25.928/05 |
| B | 10 | 0 | 10 | 1.20438 | 1.21966 | 1.20716 |
| C | 7 | 3 | 7 | 1.20891 | 1.22141 | 1.21082 |
| D | 9 | 1 | 9 | 1.20743 | 1.21938 | 1.20883 |
| E | 10 | 0 | 10 | 1.20848 | 1.22516 | 1.21138 |
| F | 10 | 0 | 10 | 1.21269 | 1.22401 | 1.21453 |
| G | 10 | 0 | 10 | 1.21617 | 1.23064 | 1.21902 |
| H | 10 | 0 | 10 | 1.20441 | 1.21889 | 1.20648 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-46 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 8 | 2 | 8 | 1.22147 | 1.23039 | 1.22325 |
| B | 10 | 0 | 10 | 1.21112 | 1.22489 | 1.21407 |
| C | 10 | 0 | 10 | 1.21840 | 1.22779 | 1.22012 |
| D | 9 | 1 | 9 | 1.21203 | 1.22229 | 1.21406 |
| E | 7 | 3 | 7 | 1.22524 | 1.23444 | 1.22686 |
| F | 10 | 0 | 10 | 1.21047 | 1.21963 | 1.21208 |
| G | 10 | 0 | 10 | 1.22285 | 1.23313 | 1.22467 |
| H | 10 | 0 | 10 | 1.20993 | 1.21923 | 1.21224 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-46 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 1 | 9 | | 1.27616 | 1.21637 | 1.21624 |
| B | 0 | 10 | | 1.20523 | ————— | ————— |
| C | 3 | 7 | | 1.21549 | 1.21600 | 1.21555 |
| D | 3 | 7 | | 1.21462 | 1.21520 | 1.21473 |
| E | 1 | 9 | | 1.21505 | 1.21519 | 1.21515 |
| F | 0 | 10 | | 1.21364 | ————— | ————— |
| G | 0 | 10 | | 1.20032 | ————— | ————— |
| H | 2 | 8 | | 1.21023 | 1.21056 | 1.21044 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-102 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.20659 | 1.21980 | 1.20959 |
| B | 3 | 7 | 3 | 1.21126 | 1.21648 | 1.21236 |
| C | 2 | 8 | 2 | 1.20191 | 1.20532 | 1.20279 |
| D | 10 | 0 | 10 | 1.21419 | 1.22968 | 1.21799 |
| E | 10 | 0 | 10 | 1.20250 | 1.22618 | 1.20494 |
| F | 10 | 0 | 10 | 1.21250 | 1.22260 | 1.21629 |
| G | 10 | 0 | 10 | 1.21774 | 1.22893 | 1.22122 |
| H | * | — | — | 1.21061 | — | — |

* = Beaker lost during test termination.

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-102 ^{SIDE} ~~SIDE~~ ~~CENTER~~ ^{REF 216105}

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|--|--------------------|--|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 67 | 3 | 3 | 1.20320 | 1.21770 | 1.21374 ^{REF 216105} 1.20634 |
| B | 56 | 4 | 4 | 1.20419 | 1.22021 | 1.20845 |
| C | 10 | 0 | 0 | 1.21703 | 1.23929 | 1.22260 |
| D | 5 | 5 | 5 | 1.21522 | 1.22859 | 1.21834 |
| E | 7 | 3 | 3 | 1.20998 | 1.22115 | 1.21175 |
| F | 10 | 0 | 0 | 1.21363 | 1.23205 | 1.21727 |
| G | 9 | 1 | 1 | 1.21774 ^{REF 216105} 1.20971 | 1.23106 | 1.21506 |
| H | 10 | 0 | 0 | 1.20744 | 1.22549 | 1.21180 |

Chironomus tentans 10-day Survival and Growth Data

96
 Site ID # WW-402 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 1 | 1.20835 | 1.22201 | 1.21370 |
| B | 9 | 1 | 1 | 1.21148 | 1.22264 | 1.21496 |
| C | 6 | 4 | 4 | 1.20041 | 1.21172 | 1.20256 |
| D | 7 | 3 | 3 | 1.20455 | 1.21673 | 1.20878 |
| E | 9 | 1 | 1 | 1.21518 | 1.22880 | 1.22047 |
| F | 7 | 3 | 3 | 1.21200 | 1.22151 | 1.21443 |
| G | 9 | 1 | 1 | 1.20200 | 1.21481 | 1.20690 |
| H | 8 | 2 | 2 | 1.19823 | 1.21133 | 1.20221 |

CWRD Sediment Toxicity

Study I.D. 5010-214

Init. 8/5/05

SET 5

Exposure System Observations/Activities Sheet for Sediments Initiated 8/5/05

| Date | Day of Test | Head Flow (ml/min): | Observations |
|---------|-------------|---------------------|--|
| 8/4/05 | -1 | ✓ | loaded + homogenized sed. |
| 8/5/05 | 0 | 328 | Sediments loaded. overlay clear, except 101-5 is cloudy. fed 1.5 mL TS |
| 8/6/05 | 1 | 327 | looks good. overlay clear, except 101-5 is still a bit cloudy. fed 1.5 mL TS |
| 8/7/05 | 2 | 326 | looks good. No change from yesterday. fed 1.5 mL TS |
| 8/8/05 | 3 | 320 | Looks good. FED |
| 8/9/05 | 4 | 320 | looks good. FEEDING SUSPENDED DUE TO LOW DO LEVELS. |
| 8/10/05 | 5 | 324 | Looks good. overlay clear except 101-5 is cloudy + slight film present on 730, 735, + 375. Feeding still suspended due to low DO levels. |
| 8/11/05 | 6 | 324 | 73-C A, B, C, F SEDIMENT SEPARATED APPROX. 70-90% floating. fed No change from yesterday. |
| 8/12/05 | 7 | 320 | No change. Fed. |
| 8/13/05 | 8 | 320 | No change. Fed 1.5 mL TS |
| 8/14/05 | 9 | 320 | No changes. fed 1.5 mL TS. |
| 8/15/05 | 10 | 326 | Temperature low. Dura etc @ 96°C for 24 hrs, and at @ 550°C for 2 hrs. |

still submerged, feeding tubes visible. Screens dead

**Table 2. Overlying Water Temperature Values (oC) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-37 CENTER | WW-37 SIDE | WW-73 CENTER | WW-73 SIDE | WW-101 CENTER | WW-101 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|
| 0 | 23.0 | 23.5 | 23.5 | 22.8 | 22.9 | 23.1 | 22.9 |
| 1 | 23.0 | 23.1 | 23.1 | 22.9 | 23.0 | 23.1 | 23.1 |
| 2 | 22.3 | 22.3 | 22.3 | 22.1 | 22.8 | 22.2 | 22.3 |
| 3 | 22.8 | 22.8 | 22.7 | 22.7 | 22.8 | 22.7 | 22.9 |
| 4 | 22.9 | 22.9 | 22.8 | 22.8 | 22.9 | 23.0 | 23.0 |
| 5 | 21.9 | 22.2 | 22.2 | 22.1 | 22.3 | 22.1 | 22.3 |
| 6 | 22.0 | 22.1 | 22.0 | 21.8 | 22.0 | 22.1 | 22.1 |
| 7 | 22.7 | 22.8 | 22.9 | 22.7 | 22.6 | 22.8 | 22.7 |
| 8 | 22.6 | 22.7 | 22.7 | 22.8 | 22.8 | 22.7 | 22.7 |
| 9 | 22.5 | 22.6 | 22.6 | 22.5 | 22.7 | 22.6 | 22.6 |
| 10 | 22.8 | 22.8 | 22.6 | 22.5 | 22.6 | 22.5 | 22.6 |

**Table 3. Overlying Water D.O. Values (mg/L) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-37 CENTER | WW-37 SIDE | WW-73 CENTER | WW-73 SIDE | WW-101 CENTER | WW-101 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|------------------|----------------|
| 0 | 7.9 | 7.7 | 7.5 | 7.7 | 6.9 | 6.6 | 7.7 |
| 1 | 8.0 | 7.3 | 7.3 | 7.2 | 6.5 | 7.0 | 7.2 |
| 2 | 7.6 | 7.2 | 7.2 | 7.1 | 6.6 | 6.9 | 7.0 |
| 3 | 7.3 | 7.1 | 7.1 | 7.0 | 6.4 | 6.2 | 6.2 |
| 4 | 6.9 | 4.9 | 3.1 | 3.7 | 2.2 | 4.8 | 6.2 |
| 5 | 7.0 | 5.0 | 3.5 | 4.0 | 2.5 | 5.0 | 6.2 |
| 6 | 6.9 | 5.2 | 3.8 | 4.1 | 2.8 | 5.0 | 6.2 |
| 7 | 6.8 | 4.8 | 4.3 | 5.2 | 3.6 | 4.8 | 4.8 |
| 8 | 6.9 | 4.9 | 4.4 | 5.3 | 3.6 | 4.9 | 4.8 |
| 9 | 6.8 | 4.8 | 4.3 | 5.2 | 3.5 | 4.8 | 4.8 |
| 10 | 6.0 | 4.1 | 4.2 | 4.9 | 3.5 | 4.1 | 4.2 |

**Table 4. Overlying Water pH Values for CWRD Sediments
 During 10-Day C. tentans Exposures**

| Day | West | WW-37 | WW-37 | WW-73 | WW-73 | WW-101 | WW-101 |
|-----|----------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 8.48 | 8.39 | 8.10 | 8.20 | 8.00 | 8.32 | 8.30 |
| 10 | 7.96 | 7.84 | 7.79 | 7.62 | 7.70 | 7.65 | 7.69 |

**Table 5. Overlying Water Cond. Values (umhos/cm) for CWRD.
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West | WW-37 | WW-37 | WW-73 | WW-73 | WW-101 | WW-101 |
|-----|----------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 129 | 175 | 407 | 318 | 531 | 184 | 330 |
| 10 | 138 | 143 | 168 | 181 | 149 | 144 | 184 |

**Table 6. Overlying Water Alkalinity Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-37 | WW-37 | WW-73 | WW-73 | WW-101 | WW-101 |
|-----|----------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 40 | 64 | 136 | 80 | 112 | 52 | 74 |
| 10 | 52 | 48 | 62 | 72 | 52 | 48 | 72 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.22036 | 1.23281 | 1.22296 |
| B | 10 | 0 | 10 | 1.20312 | 1.21110 | 1.20482 |
| C | 9 | 1 | 9 | 1.19871 | 1.21019 | 1.20150 |
| D | 9 | 1 | 9 | 1.20091 | 1.21063 | 1.20288 |
| E | 10 | 0 | 10 | 1.18991 | 1.20140 | 1.19340 |
| F | 10 | 0 | 10 | 1.20093 | 1.20975 | 1.20307 |
| G | 10 | 0 | 10 | 1.21397 | 1.22473 | 1.21705 |
| H | 9 | 1 | 9 | 1.22169 | 1.23357 | 1.22447 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-37 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 7 | 3 | 7 | 1.22352 | 1.23338 | 1.22649 |
| B | 7 | 3 | 7 | 1.21273 | 1.22468 | 1.21663 |
| C | 9 | 2 | 8 | 1.21629 | 1.22739 | 1.21920 |
| D | 7 | 3 | 7 | 1.20011 | 1.21000 | 1.20320 |
| E | 10 | 0 | 10 | 1.19824 | 1.21042 | 1.20295 |
| F | 10 | 0 | 10 | 1.19785 | 1.21405 | 1.20507 |
| G | 8 | 2 | 8 | 1.19929 | 1.21179 | 1.20468 |
| H | 10 | 0 | 10 | 1.20650 | 1.21775 | 1.21016 |

Chironomus tentans 10-day Survival and Growth Data

Site ID #WW-37 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.20124 | 1.22020 | 1.20485 |
| B | 9 | 1 | 9 | 1.21164 | 1.22345 | 1.21382 |
| C | 9 | 1 | 9 | 1.20093 | 1.21600 | 1.20358 |
| D | 10 | 0 | 10 | 1.20576 | 1.22702 | 1.20992 |
| E | 9 | 1 | 9 | 1.19963 | 1.21414 | 1.20257 |
| F | 8 | 2 | 8 | 1.22219 | 1.23839 | 1.22600 |
| G | 10 | 0 | 10 | 1.20275 | 1.21896 | 1.20529 |
| H | 10 | 0 | 10 | 1.21540 | 1.23279 | 1.21859 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-73 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.19504 | 1.20741 | 1.19807 |
| B | 9 | 1 | 1 | 1.19685 | 1.20750 | 1.19884 |
| C | 6 | 4 | 4 | 1.19936 | 1.20898 | 1.20095 |
| D | 10 | 0 | 10 | 1.22667 | 1.23674 | 1.22896 |
| E | 5/6 | 4 | 6 | 1.19840 | 1.20757 | 1.20004 |
| F | 10/10 | 0 | 0 | 1.20898 | 1.21949 | 1.21170 |
| G | 10 | 0 | 0 | 1.21717 | 1.22868 | 1.21975 |
| H | 8 | 2 | 8 | 1.20671 | 1.21469 | 1.20802 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-73 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 5 | 5 | 5 | 1.19359 | 1.19544 | 1.19382 |
| B | 7 | 3 | 7 | 1.22892 | 1.23233 | 1.22934 |
| C | 8 | 2 | 8 | 1.20683 | 1.21306 | 1.20798 |
| D | 5 | 5 | 5 | 1.21793 | 1.21900 | 1.21802 |
| E | 2 | 8 | 2 | 1.20210 | 1.20261 | 1.20215 |
| F | 4 | 6 | 4 | 1.21535 | 1.21734 | 1.21552 |
| G | 1 | 9 | 1 | 1.21909 | 1.22006 | 1.21924 |
| H | 7 | 3 | 7 | 1.19779 | 1.20065 | 1.19799 |

Not really smaller Chironomus.

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-101 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.21390 | 1.23222 | 1.21741 |
| B | 10 | 0 | 10 | 1.20891 | 1.22853 | 1.21229 |
| C | 9 | 1 | 9 | 1.21461 | 1.22707 | 1.21737 |
| D | 7 | 3 | 7 | 1.20059 | 1.21331 | ^{1.21265} 1.200 1.20382 |
| E | 10 | 0 | 10 | 1.21014 | 1.22499 | 1.21346 |
| F | 10 | 0 | 10 | 1.20368 | 1.21959 | 1.20697 |
| G | 9 | 1 | 9 | 1.21203 | 1.23145 | 1.21721 |
| H | 10 | 0 | 10 | 1.20783 | 1.22914 | 1.21271 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-101 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|----------------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 3 | 7 | 3 | 1.20142 | 1.20245 | 1.20194 |
| B | 0* | 10 | 0 | 1.22527 | — | — |
| C | 4 | 6 | 4 | 1.20520 | 1.20609 | 1.20584 |
| D | 1 | 9 | 1 | 1.21256 | 1.21274 | 1.21256 1.21268 |
| E | 8 | 2 | 8 | 1.20165 | 1.20517 | 1.20380 |
| F | 7 | 3 | 7 | 1.19732 | 1.20083 | 1.19953 |
| G | 5 | 5 | 5 | 1.19856 | 1.20170 | 1.20019 |
| H | 8 | 2 | 8 | 1.20813 | 1.21149 | 1.20954 |

* large flatworm present



ASci Corporation
Environmental Testing Laboratory
Submitted to MWRDGC – 9/05
ASci-ETL Study ID #5010-214

APPENDIX C

Statistical Analyses

Title: cwrđ set1 ct survival
File: 1CS Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 2.8025 (p-value = 0.8332)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Using Average Degrees of Freedom
(Based on average replicate size of 6.43)

Calculated B2 statistic = 3.2669 (p-value = 0.7747)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: cwrđ set1 ct survival

File: 1CS

Transform:

ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's Test for Normality

D = 1.0880

W = 0.8998

Critical W = 0.9260 (alpha = 0.01 , N = 45)

W = 0.9450 (alpha = 0.05 , N = 45)

Data FAIL normality test (alpha = 0.01). Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normality and should not be performed with this data as is.

Title: cwrđ set1 ct survival
File: 1CS

Transform: ARC SINE(SQUARE ROOT(Y))

Wilcoxon's Rank Sum Test w/ Bonferroni Adjustment Ho: Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | RANK SUM | CRIT. VALUE | REPS | SIG 0.05 |
|-------|----------------|---------------------|-------------|----------------|------|-------------|
| 1 | WBS | 1.2161 | | | | |
| 2 | 31 CENTER | 1.2070 | 69.50 | 45 | 8 | |
| 3 | 31 SIDE | 1.1201 | 21.00 | 12 | 4 | |
| 4 | 32 CENTER | 1.2983 | 73.50 | 45 | 8 | |
| 5 | 32 SIDE | 1.2551 | 59.00 | 35 | 7 | |
| 6 | 106 CENTER | 1.3016 | 63.00 | 35 | 7 | |
| 7 | 106 SIDE | 1.2717 | 19.50 | 6 | 3 | |

Critical values are 1 tailed (k = 6)

Title: SET 1 CWRD AFDW
File: 1CW

Transform:

NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

D = 2.2297

W = 0.9894

Critical W = 0.9260 (alpha = 0.01 , N = 45)

W = 0.9450 (alpha = 0.05 , N = 45)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: SET 1 CWRD AFDW
File: 1CW

Transform:

NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 4.2675 (p-value = 0.6405)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Using Average Degrees of Freedom
(Based on average replicate size of 6.43)

Calculated B2 statistic = 3.8072 (p-value = 0.7028)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: CRWS AFDW SET 3
File: 2CW

Transform:

NO TRANSFORMATION

Chi-Square Test for Normality

Actual and Expected Frequencies

| INTERVAL | <-1.5 | -1.5 to <-0.5 | -0.5 to 0.5 | >0.5 to 1.5 | >1.5 |
|----------|--------|---------------|-------------|-------------|--------|
| EXPECTED | 3.6850 | 13.3100 | 21.0100 | 13.3100 | 3.6850 |
| OBSERVED | 4 | 11 | 22 | 16 | 2 |

Chi-Square = 1.7886 (p-value = 0.7746)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: CRWS AFDW SET 3
File: 2CW

Transform:

NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 6.8932 (p-value = 0.3308)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Using Average Degrees of Freedom
(Based on average replicate size of 7.86)

Calculated B2 statistic = 5.8726 (p-value = 0.4376)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: CRWS AFDW SET 3
File: 2CW

Transform:

NO TRANSFORMATION

ANOVA Table

| SOURCE | DF | SS | MS | F |
|----------------|----|--------|--------|--------|
| Between | 6 | 0.3928 | 0.0655 | 2.9235 |
| Within (Error) | 48 | 1.0749 | 0.0224 | |
| Total | 54 | 1.4678 | | |

(p-value = 0.0164)

Critical F = 3.2036 (alpha = 0.01, df = 6,48)
= 2.2946 (alpha = 0.05, df = 6,48)

Since $F > \text{Critical F}$ REJECT H_0 : All equal (alpha = 0.05)

Title: CRWS AFDW SET 3
 File: 2CW

Transform:

NO TRANSFORMATION

Bonferroni t-Test - TABLE 1 OF 2

Ho: Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | t STAT | SIG 0.05 |
|-------|----------------|------------------|-----------------------------------|---------|----------|
| 1 | WBS | 1.1838 | 1.1838 | | |
| 2 | 103-CENTER | 1.1987 | 1.1987 | -0.2005 | |
| 3 | 103-SIDE | 1.1850 | 1.1850 | -0.0167 | |
| 4 | 104-CENTER | 1.0100 | 1.0100 | 2.3221 | |
| 5 | 104-SIDE | 1.0836 | 1.0836 | 1.2935 | |
| 6 | 105-CENTER | 1.2325 | 1.2325 | -0.6515 | |
| 7 | 105-SIDE | 1.2788 | 1.2788 | -1.2696 | |

Bonferroni t critical value = 2.4808 (1 Tailed, alpha = 0.05, df = 6,48)

Title: CRWS AFDW SET 3
 File: 2CW

Transform:

NO TRANSFORMATION

Bonferroni t-Test - TABLE 2 OF 2

Ho: Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | MIN SIG DIFF (IN ORIG. UNITS) | % OF CONTROL | DIFFERENCE FROM CONTROL |
|-------|----------------|-------------|-------------------------------|--------------|-------------------------|
| 1 | WBS | 8 | | | |
| 2 | 103-CENTER | 8 | 0.1856 | 15.7 | -0.0150 |
| 3 | 103-SIDE | 8 | 0.1856 | 15.7 | -0.0012 |
| 4 | 104-CENTER | 8 | 0.1856 | 15.7 | 0.1737 |
| 5 | 104-SIDE | 7 | 0.1921 | 16.2 | 0.1002 |
| 6 | 105-CENTER | 8 | 0.1856 | 15.7 | -0.0487 |
| 7 | 105-SIDE | 8 | 0.1856 | 15.7 | -0.0950 |

Title: SET 3 AFDW 1.

File: 3CW

Transform:

NO TRANSFORMATION

Anderson - Darling Test for Normality

A = 1.0932 (p-value = 0.0064)
A* = 1.1153

Critical A* = 1.035 (alpha = 0.01 , N = 40)
A* = 0.752 (alpha = 0.05 , N = 40)

Data FAIL normality test (alpha = 0.01). Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normality and should not be performed with this data as is.

Title: SET 3 AFDW 1.

File: 3CW

Transform:

NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 14.5616

(p-value = 0.0057)

Data FAIL B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 13.2767 (alpha = 0.01, df = 4)

= 9.4877 (alpha = 0.05, df = 4)

Title: SET 3 AFDW 1.

File: 3CW

Transform:

NO TRANSFORMATION

Steel's Many-One Rank Test

-

Ho: Control < Treatment

| GROUP | IDENTIFICATION | MEAN IN ORIGINAL UNITS | RANK SUM | CRIT. VALUE | DF | SIG 0.05 |
|-------|----------------|------------------------|----------|-------------|------|----------|
| 1 | WBS | 1.1300 | | | | |
| 2 | 34 CENTER | 1.3163 | 82.00 | 47.00 | 8.00 | |
| 3 | 34 SIDE | 0.9488 | 40.00 | 47.00 | 8.00 | * |
| 4 | 35 CENTER | 1.3462 | 94.00 | 47.00 | 8.00 | |
| 5 | 35 SIDE | 1.4762 | 100.00 | 47.00 | 8.00 | |

Critical values are 1 tailed (k = 4)

Title: SET 4 CWRD SURVIVAL
File: 4CS

Transform: ARC SINE(SQUARE ROOT(Y))

Chi-Square Test for Normality

Actual and Expected Frequencies

| INTERVAL | <-1.5 | -1.5 to <-0.5 | -0.5 to 0.5 | >0.5 to 1.5 | >1.5 |
|----------|--------|---------------|-------------|-------------|--------|
| EXPECTED | 4.2210 | 15.2460 | 24.0660 | 15.2460 | 4.2210 |
| OBSERVED | 5 | 15 | 18 | 25 | 0 |

Chi-Square = 12.1381 (p-value = 0.0164)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: SET 4 CWRD SURVIVAL

File: 4CS

Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 20.9317 (p-value = 0.0039)

Data FAIL B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 18.4753 (alpha = 0.01, df = 7)

= 14.0671 (alpha = 0.05, df = 7)

Using Average Degrees of Freedom
(Based on average replicate size of 7.88)

Calculated B2 statistic = 19.0204 (p-value = 0.0081)

Data FAIL B2 homogeneity test at 0.01 level. Try another transformation.

Title: SET 4 CWRD SURVIVAL
File: 4CS

Transform: ARC SINE(SQUARE ROOT(Y))

Wilcoxon's Rank Sum Test w/ Bonferroni Adjustment Ho: Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | RANK SUM | CRIT. VALUE | REPS | SIG 0.05 |
|-------|----------------|---------------------|-------------|----------------|------|-------------|
| 1 | WBS | 1.3509 | | | | |
| 2 | 36 CENTER | 1.3259 | 70.50 | 44 | 8 | |
| 3 | 36 SIDE | 1.3390 | 70.50 | 44 | 8 | |
| 4 | 46 CENTER | 1.3009 | 65.00 | 44 | 8 | |
| 5 | 46 SIDE | 0.3428 | 36.00 | 44 | 8 | * |
| 6 | 102 CENTER | 1.1576 | 55.50 | 35 | 7 | |
| 7 | 102 SIDE | 1.1424 | 54.00 | 44 | 8 | |
| 8 | 96 SIDE | 1.1215 | 42.00 | 44 | 8 | * |

Critical values are 1 tailed (k = 7)

Title: SET 5 SURVIVAL]
File: 5CS

Transform: ARC SINE(SQUARE ROOT(Y))

Chi-Square Test for Normality

Actual and Expected Frequencies

| INTERVAL | <-1.5 | -1.5 to <-0.5 | -0.5 to 0.5 | >0.5 to 1.5 | >1.5 |
|----------|--------|---------------|-------------|-------------|--------|
| EXPECTED | 3.6850 | 13.3100 | 21.0100 | 13.3100 | 3.6850 |
| OBSERVED | 4 | 10 | 15 | 26 | 0 |

Chi-Square = 18.3531 (p-value = 0.0011)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data FAIL normality test (alpha = 0.01). Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normality and should not be performed with this data as is.

Title: SET 5 SURVIVAL]
File: 5CS

Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 14.1954 (p-value = 0.0275)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Using Average Degrees of Freedom
(Based on average replicate size of 7.86)

Calculated B2 statistic = 12.3477 (p-value = 0.0546)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: SET 5 SURVIVAL]
File: 5CS

Transform: ARC SINE(SQUARE ROOT(Y))

Wilcoxon's Rank Sum Test w/ Bonferroni Adjustment Ho: Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | RANK SUM | CRIT. VALUE | REPS | SIG 0.05 |
|-------|----------------|---------------------|-------------|----------------|------|-------------|
| 1 | WBS | 1.3509 | | | | |
| 2 | 37 CENTER | 1.1780 | 52.50 | 45 | 8 | |
| 3 | 37 SIDE | 1.2924 | 58.50 | 45 | 8 | |
| 4 | 73 CENTER | 1.2221 | 59.50 | 45 | 8 | |
| 5 | 73 SIDE | 0.7663 | 36.00 | 45 | 8 | * |
| 6 | 101 CENTER | 1.3187 | 66.50 | 45 | 8 | |
| 7 | 101 SIDE | 0.7967 | 28.00 | 35 | 7 | * |

Critical values are 1 tailed (k = 6)

Title: CWRD SET 4 WEIGHTS

File: 4CW

Transform:

NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

D = 3.5253

W = 0.9191

Critical W = 0.9280 (alpha = 0.01 , N = 47)

W = 0.9460 (alpha = 0.05 , N = 47)

Data FAIL normality test (alpha = 0.01). Try another transformation.

Warning - The first three homogeneity tests are sensitive to non-normality and should not be performed with this data as is.

Title: CWRD SET 4 WEIGHTS

File: 4CW

Transform:

NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 12.8726 (p-value = 0.0246)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 15.0863 (alpha = 0.01, df = 5)
= 11.0705 (alpha = 0.05, df = 5)

Using Average Degrees of Freedom
(Based on average replicate size of 7.83)

Calculated B2 statistic = 11.4958 (p-value = 0.0424)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

Title: CWRD SET 4 WEIGHTS
File: 4CW

Transform:

NO TRANSFORMATION

Wilcoxon's Rank Sum Test w/ Bonferroni Adjustment

Ho: Control < Treatment

| GROUP | IDENTIFICATION | MEAN IN ORIGINAL UNITS | RANK SUM | CRIT. VALUE | REPS | SIG 0.05 |
|-------|----------------|------------------------|----------|-------------|------|----------|
| 1 | WBS | 1.0338 | | | | |
| 2 | 36 CENTER | 1.2325 | 87.00 | 45 | 8 | |
| 3 | 36 SIDE | 1.2500 | 90.00 | 45 | 8 | |
| 4 | 46 CENTER | 1.0037 | 57.50 | 45 | 8 | |
| 5 | 102 CENTER | 1.1643 | 60.00 | 35 | 7 | |
| 6 | 102 CENTER | 1.4937 | 96.00 | 45 | 8 | |

Critical values are 1 tailed (k = 5)

Title: SET 5 AFDW

File: 5CW

Transform:

NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

D = 1.2327

W = 0.9717

Critical W = 0.9190 (alpha = 0.01 , N = 40)

W = 0.9400 (alpha = 0.05 , N = 40)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: SET 5 AFDW

File: 5CW

Transform:

NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 2.8030

(p-value = 0.5913)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 13.2767 (alpha = 0.01, df = 4)

= 9.4877 (alpha = 0.05, df = 4)

Title: SET 5 AFDW

File: 5CW

Transform:

NO TRANSFORMATION

ANOVA Table

| SOURCE | DF | SS | MS | F |
|----------------|----|--------|--------|---------|
| Between | 4 | 2.5217 | 0.6304 | 17.9004 |
| Within (Error) | 35 | 1.2327 | 0.0352 | |
| Total | 39 | 3.7544 | | |

(p-value = 0.0000)

Critical F = 3.9082 (alpha = 0.01, df = 4,35)

= 2.6415 (alpha = 0.05, df = 4,35)

Since $F > \text{Critical F}$ REJECT H_0 : All equal (alpha = 0.05)

Title: SET 5 AFDW

File: 5CW

Transform:

NO TRANSFORMATION

Dunnett's Test - TABLE 1 OF 2

Ho:Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG 0.05 |
|-------|----------------|------------------|-----------------------------------|---------|----------|
| 1 | WBS | 0.8363 | 0.8363 | | |
| 2 | 37 CENTER | 0.9275 | 0.9275 | -0.9725 | |
| 3 | 37 SIDE | 1.4375 | 1.4375 | -6.4076 | |
| 4 | 73 CENTER | 0.9763 | 0.9763 | -1.4920 | |
| 5 | 101 CENTER | 1.3962 | 1.3962 | -5.9680 | |

Dunnett critical value = 2.2500 (1 Tailed, alpha = 0.05, df [used] = 4,30)
(Actual df = 4,35)

Title: SET 5 AFDW

File: 5CW

Transform:

NO TRANSFORMATION

Dunnett's Test - TABLE 2 OF 2

Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | MIN SIG DIFF (IN ORIG. UNITS) | % OF CONTROL | DIFFERENCE FROM CONTROL |
|-------|----------------|-------------|-------------------------------|--------------|-------------------------|
| 1 | WBS | 8 | | | |
| 2 | 37 CENTER | 8 | 0.2111 | 25.2 | -0.0912 |
| 3 | 37 SIDE | 8 | 0.2111 | 25.2 | -0.6012 |
| 4 | 73 CENTER | 8 | 0.2111 | 25.2 | -0.1400 |
| 5 | 101 CENTER | 8 | 0.2111 | 25.2 | -0.5600 |

Attachment 19

**Results of Ten-Day
Chironomus tentans
Toxicity Test with Whole Sediment
Samples from the Metropolitan Water Reclamation
District of Greater Chicago
Received August 2-9, 2006**

Prepared by

**ASci Corporation
Environmental Testing Laboratory
4444 Airpark Boulevard
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**Submitted to:
Metropolitan Water Reclamation District of Greater Chicago
6001 West Pershing
Cicero, IL 60804**

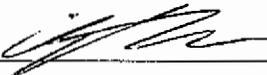
Submitted September 2006

REPORT APPROVAL

Name (signed):  Date: 9/1/06

Name (typed): Kurt Anderson

Title: Operations Manager

Name (signed):  Date: 9/11/06

Name (typed): Clayton Allen

Title: Senior Biologist

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TABLE 1. Overlying Water Flow Rate and Chemistry Ranges for Metropolitan Water Reclamation District of Greater Chicago Sediments Test Chambers During Ten-Day *Chironomus* Exposures

TABLE 2. *Chironomus* Survival, Growth, and Statistical Results Following Ten-Day Exposure to Metropolitan Water Reclamation District of Greater Chicago Sediments.

TABLE 3. Precision of *Chironomus* 96-Hour NaCl Reference Toxicant Testing

APPENDIX A -- Chain of Custody Form
APPENDIX B -- Raw Data Sheets

INTRODUCTION

At the request of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected from Chicago-area waterways. The 10-day tests were performed to measure the toxicity of selected sediment samples to larval *Chironomus tentans*. The *Chironomus* endpoints were survival and growth. Growth was defined as ash-free dried weight (AFDW)

STUDY SUMMARY

The tables below summarize survival and growth for each Chicago-area waterway sediment and the respective control sediment, West Bearskin (WBS). Results are grouped according to the test dates of the two separate toxicity exposures. Each toxicity test used an independent WBS control as the statistical comparison reference.

| SET 1 8/4-14/06 | | | SET 2 8/11-21/06 | | |
|--------------------|--------------|--------------------------------|---------------------|--------------|--------------------------------|
| SITE ID | Survival (%) | Ash-free Dried Weight (mg/org) | SITE ID | Survival (%) | Ash-free Dried Weight (mg/org) |
| West Bearskin | 93 | 0.85 | West Bearskin | 89 | 0.90 |
| WW-39 Center | 90 | 1.06 | WW-40 Center | 85 | 0.79 |
| WW-39 Side | 80 | 0.65 | WW-40 Side | 88 | 0.61 |
| WW-74 Center | 98 | 0.92 | WW-41 Center | 93 | 0.95 |
| WW-92 Center | 63* | 0.65 | WW-41 Side | 90 | 0.48* |
| WW-92 Side | 93 | 1.41 | WW-75 Center | 98 | 0.70 |
| WW-100 Center | 88 | 1.46 | WW-75 Side | 94 | 0.63* |
| WW-100 Side | 98 | 1.54 | WW-99 Center | 66 | 0.52* |
| | | | WW-99 Side | 75 | 0.54* |
| | | | WW-108 Center | 98 | 1.22 |
| | | | WW-108 Side | 95 | 0.88 |

* Significantly different than the WBS control results

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from Metropolitan Water Reclamation District of Greater Chicago were performed following suggested United States Environmental Protection Agency (USEPA) methods (USEPA 2000 Test Method 100.2) Ten-day tests exposing *Chironomus* were conducted in a manner to determine the effect of each test sediment on organism survival and growth. Effect was determined by comparison to organism performance following exposure to the selected reference site sediment. Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

The toxicity tests were conducted in two sets, with one control per test set. The tests were initiated on August 4 and August 11, 2006. Test methods are identical for each test set.

Test Organism Culturing, Holding, and Acclimation

Chironomus were obtained from Environmental Consulting & Testing, Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23°C.

The *Chironomus* were delivered to ASci-ETL by ASci personnel. Upon arrival at ASci-ETL, the *Chironomus* were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to daily temperature changes greater than 3°C per day during holding. The *Chironomus* were second- to third-instar larvae (approximately 10 days-old) at test initiation.

Overlying Water Source

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds.

Exposure System

Sediment from each site tested included eight replicates. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Eight replicate test chambers of each sediment exposure were held in a single all glass 12-L aquarium constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each aquarium. The configuration resulted in two turnovers of overlying water per day. Test temperature ($23^{\circ} \pm 1^{\circ}\text{C}$) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Sediments

Sediment samples were collected by MWRDGC personnel from July 25 to August 4, 2006. The samples were delivered to ASci-ETL by express courier from August 2-9, 2006. The first set of samples arrived on August 2, 2006, and included the following sediments: WW-39 Side, WW-39 Center, WW-74 Side, WW-74 Center, WW-92 Side, WW-92 Center, WW-100 Side, and WW-100 Center. Upon arrival, WW-74 Side was noted to have a broken lid and had been exposed to melted icewater. WW-74 Side sample was not tested due to possible shipment contamination.

The second set of samples arrived on August 9, 2006, and included the following sediments: WW-40 Side, WW-40 Center, WW-41 Side, WW-41 Center, WW-75 Side, WW-75 Center, WW-99 Side, WW-99 Center, WW-108 Side, and WW-108 Center.

The Chain of Custody forms were completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at 1-4°C until use. Appendix A contains a copy of the Chain of Custody forms.

The control sediment, West Bearskin, was collected on May 17, 2006, from West Bearskin Lake, located in Cook County, Minnesota. The West Bearskin sediment sample (10-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample was logged-in and stored under refrigeration (1-4°C) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms.

Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying water. The toxicity tests were initiated approximately 24 hours later, after the sediment and overlying water had settled.

To start the tests, ten *Chironomus* were impartially distributed to each test replicate. The organisms were handled with a wide-bore glass pipette.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of $\pm 10\%$ from target flow were adjusted. Measurements of overlying water pH, total ammonia, conductivity, hardness, and alkalinity were performed on day 0 and day 10. The temperature and dissolved oxygen were measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic Biosystems). *Chironomus* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 10 days of exposure. Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at a constant temperature (90-100°C) for 20-24 hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of dried larvae minus the weight of ashed larvae. This measurement accounts for gut-retained sediments in the *C. tentans* that may skew the standard dry weight results and eliminates effects of sediment grain size on growth results.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled weight of the replicate by the number of organisms exposed less the number of pupae recovered.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the laboratory reference control sediment to measure effect. The survival data were analyzed using the TOXCALC Version 5.0 software package. The survival data were arc-sine transformed before analysis then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect ($p=0.05$) as compared to the laboratory reference control results.

The growth data were not transformed before analysis. Mean dry weights and AFDW of organisms were checked for normality and equality of variance. The weight data were then analyzed for significant effect ($p=0.05$) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the laboratory reference control results to determine effect. Each set of test sediments was compared independently the West Bearskin control (WBS) to measure effect.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overlying water flow rate to each of the holding tanks was maintained between 9.4 and 9.6 ml/minute. The mean flow rate resulted in a mean daily turnover of overlying water rate of 2.0 turnovers/day.

Table 1 also summarizes the overlying water chemistry values measured from the *Chironomus* exposure chambers. All mean test temperatures were within the proposed range of 23°C ± 1°C. Dissolved oxygen values ranged from 3.1 to 8.2 mg/L during the *Chironomus* exposure. Feeding was suspended for the Set #2 *Chironomus* exposures on day 6 only. Feeding was resumed after DO levels increased; no aeration of the overlaying water was required.

Overlying water pH, conductivity, alkalinity, and hardness were all within normal ranges.

Table 1 contains the ranges of total ammonia measurements. Ammonia concentrations ranged from <1.0 to 7.9 mg/L. Most of the measured ammonia levels should not have adversely affected *C. tentans* survival, however, any levels above approximately 5 mg/L could possibly affect *C. tentans* growth at the observed pH levels.

Ammonia levels above 5 mg/L were recorded in Set#2 sediments WW-40 Center, WW-41 Center, and WW-99 Center. Of these sediments, only WW-99 Center had significantly reduced growth. None of the sediment had significant decreases in survival.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity.

Biological Exposure Results

All organisms were observed to burrow into all test sediments. Overlaying water remained clear throughout all exposures. During test termination a tar-like substance was detected in WW-99 Center. Predatory flatworms, observed numerous times in historical testing, were not observed in any of the waterway sediments.

No other significant observations were recorded throughout the test.

Chironomus tentans Results -

Table 2 shows the *Chironomus* survival data. The EPA recommended minimum survival rate for control sediments is 70%. Both West Bearskin control sediments supported acceptable mean percentage survival of 89-90%. *Chironomus* survival for the test sediments ranged from 63-98%.

Statistical analyses of the survival data for Set #1 indicated non-normal distribution and equal variances; results of Steel's Many-One Rank Test showed one sediment, WW-92 Center, had significantly lower survival than the control sediment, West Bearskin.

Statistical analyses of the survival data for Set #2 indicated non-normal distribution and equal variances; results of Wilcoxin's Test showed none of the test sediment had significantly lower survival than the control sediment, West Bearskin.

Chironomus ash-free dried weight results are also given in Table 2. The EPA control requirement for control organism ash-free dried weight is 0.48 mg/surviving organism. Both West Bearskin control sediments supported acceptable mean ash-free dried organism weights of 0.85-0.90 mg/organism. *Chironomus* ash-free dried weights for the test sites ranged from 0.48-1.54 mg/organism.

Statistical analyses of the survival data for Set #1 indicated normal distribution and unequal variances; results of Steel's Many-One Rank Test showed none of the sediments had significantly lower growth than the control sediment, West Bearskin.

Statistical analyses of the survival data for Set #2 indicated non-normal distribution and unequal variances; results of Wilcoxin's Test showed WW-41 Side, WW-75 Side, WW-99 Center and WW-99 Side all had significantly lower survival than the control sediment, West Bearskin.

CONCLUSIONS

The following conclusions can be drawn from the study results.

- The laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for both sets of toxicity tests.
- WW-92 Center caused significant lethality to *Chironomus* when compared to the West Bearskin results, indicating that sediment constituted an unsuitable habitat for *Chironomus* survival. No other test sediments caused a significant decrease in organism survival when compared to the laboratory control.
- Test sediments that caused a significant reduction in *Chironomus* ash-free dried weight (AFDW) when compared to the laboratory control included: WW-41 Side, WW-75 Side, WW-99 Center and WW-99 Side

REFERENCES

USEPA. March 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. Second Edition. EPA/600/R-99/064.

Benoit, D.A., G. Phipps, and G.T. Ankley. 1993. A Sediment Testing Intermittent Renewal System for the Automated Renewal of Overlying Water in Toxicity Tests with Contaminated Sediments. *Water Research* 27:1403-1412.

TOXCALC software package version 5.0.23.

TABLE 1. Flow Rates (ml/min) and Overlying Water Chemistry Ranges for MWRDGC Sediments Test Chambers During 10-Day *Chironomus* Exposures

| Set #1 | Test Day | | | | | | | | | | | | | |
|------------------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean | low | high |
| Head Flow Rate | 320 | 320 | 320 | 320 | 324 | 324 | 320 | 322 | 322 | 320 | 326 | 322 | 320 | 326 |
| Test Chamber Flow Rate | 9.4 | 9.4 | 9.4 | 9.4 | 9.5 | 9.5 | 9.4 | 9.5 | 9.5 | 9.4 | 9.6 | 9.5 | 9.4 | 9.6 |
| Volume Exchanges | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Set #2 | Test Day | | | | | | | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean | low | high |
| Head Flow Rate | 322 | 322 | 320 | 320 | 324 | 324 | 320 | 320 | 324 | 328 | 324 | 323 | 320 | 328 |
| Test Chamber Flow Rate | 9.5 | 9.5 | 9.4 | 9.4 | 9.5 | 9.5 | 9.4 | 9.4 | 9.5 | 9.6 | 9.5 | 9.5 | 9.4 | 9.6 |
| Volume Exchanges | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |

| Parameter | Water Chemistry Ranges | |
|------------------|------------------------|-----------|
| | Set #1 | Set#2 |
| Temperature | 22.8-23.7 | 23.3-23.7 |
| Dissolved Oxygen | 5.1-8.2 | 3.1-7.8 |
| pH | 6.8-7.4 | 6.5-7.2 |
| Conductivity | 136-272 | 131-428 |
| Alkalinity | 48-96 | 48-176 |
| Hardness | 48-80 | 48-122 |
| Ammonia | <1.0-2.5 | <1.0-7.9 |

TABLE 2. *Chironomus* Survival, Growth, and Statistical Results Following Ten-Day Exposure to Metropolitan Water Reclamation District of Greater Chicago Sediments.

| C. tentans 10-day survival | | | | | | | | | |
|---|-----------|-----------|----------|---------------|------------|---------|---------|----------|-------------------|
| Start Date: | 8/4/2006 | Test ID: | MWRDGC1 | Sample ID: | FIRST SET | | | | |
| End Date: | 8/14/2006 | Lab ID: | 5010 | Sample Type: | SEDIMENTS | | | | |
| Sample Date: | | Protocol: | EPA 2000 | Test Species: | C. tentans | | | | |
| Comments: | | | | | | | | | |
| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| West Bearskin | 0.8000 | 0.9000 | 0.8000 | 1.0000 | 1.0000 | 0.9000 | 1.0000 | 1.0000 | |
| V-39 CENTER | 1.0000 | 0.9000 | 0.8000 | 1.0000 | 0.8000 | 1.0000 | 1.0000 | 0.7000 | |
| WW-39 SIDE | 0.7000 | 0.8000 | 0.8000 | 0.9000 | 0.8000 | 0.7000 | 0.9000 | 0.8000 | |
| V-74 CENTER | 0.8000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | |
| V-92 CENTER | 0.3000 | 0.7000 | 0.5000 | 0.7000 | 0.7000 | 0.7000 | 0.7000 | 0.7000 | |
| WW-92 SIDE | 1.0000 | 0.8000 | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 0.8000 | 1.0000 | |
| -100 CENTER | 1.0000 | 1.0000 | 0.9000 | 1.0000 | 0.5000 | 0.9000 | 0.8000 | 0.9000 | |
| WW-100 SIDE | 1.0000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 1.0000 | |
| Transform: Arcsin Square Root | | | | | | | | | |
| Conc- | Mean | N-Mean | Mean | Min | Max | CV% | N | Rank Sum | 1-Tailed Critical |
| West Bearskin | 0.9250 | 1.0000 | 1.2951 | 1.1071 | 1.4120 | 10.505 | 8 | | |
| V-39 CENTER | 0.9000 | 0.9730 | 1.2628 | 0.9912 | 1.4120 | 13.764 | 8 | 65.00 | 45.00 |
| WW-39 SIDE | 0.8000 | 0.8649 | 1.1136 | 0.9912 | 1.2490 | 8.775 | 8 | 46.00 | 45.00 |
| V-74 CENTER | 0.9750 | 1.0541 | 1.3739 | 1.1071 | 1.4120 | 7.845 | 8 | 79.00 | 45.00 |
| V-92 CENTER | 0.6250 | 0.6757 | 0.9140 | 0.5796 | 0.9912 | 16.749 | 8 | 36.00 | 45.00 |
| WW-92 SIDE | 0.9250 | 1.0000 | 1.2951 | 1.1071 | 1.4120 | 10.505 | 8 | 68.00 | 45.00 |
| -100 CENTER | 0.8750 | 0.9459 | 1.2345 | 0.7854 | 1.4120 | 17.132 | 8 | 64.00 | 45.00 |
| WW-100 SIDE | 0.9750 | 1.0541 | 1.3713 | 1.2490 | 1.4120 | 5.501 | 8 | 78.00 | 45.00 |
| Auxiliary Tests | | | | Statistic | Critical | Skew | Kurt | | |
| Kolmogorov D Test indicates non-normal distribution (p <= 0.01) | | | | 1.41058 | 1.035 | -1.0936 | 1.07744 | | |
| Bartlett's Test indicates equal variances (p = 0.22) | | | | 9.50168 | 18.4753 | | | | |
| Hypothesis Test (1-tail, 0.05) | | | | | | | | | |
| Steel's Many-One Rank Test indicates significant differences | | | | | | | | | |
| Treatments vs West Bearskin | | | | | | | | | |

Response Plot

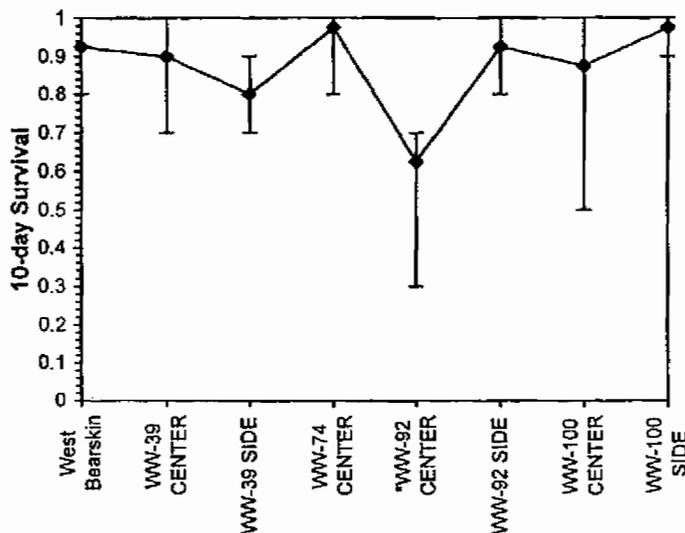


TABLE 2. *Chironomus* Survival, Growth, and Statistical Results Following Ten-Day Exposure to Metropolitan Water Reclamation District of Greater Chicago Sediments.

| C. tentans 10-day Survival | | | | | | | | | | |
|---|--------------------|---------|----------|---------------|--------------|-----------|-----------|----------|----------|---------|
| Start Date: | 8/11/2006 | 8/11/06 | Test ID: | MWRDGC1 | Sample ID: | FIRST SET | 2ND SET | | | |
| End Date: | 8/11/2006 | 8/11/06 | Lab ID: | 5010 | Sample Type: | SEDIMENTS | | | | |
| Sample Date: | Protocol: EPA 2000 | | | Test Species: | C. tentans | | | | | |
| Comments: | | | | | | | | | | |
| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| West Bearskin | 0.9000 | 0.7000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.9000 | 0.6000 | | |
| 40 CENTER | 0.9000 | 1.0000 | 0.9000 | 0.8000 | 1.0000 | 0.8000 | 0.7000 | 0.7000 | | |
| 40 SIDE | 0.6000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | | |
| 41 CENTER | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 1.0000 | 0.9000 | 0.8000 | 0.9000 | | |
| 41 SIDE | 0.8000 | 0.9000 | 1.0000 | 1.0000 | 0.8000 | 0.8000 | 0.9000 | 1.0000 | | |
| 75 CENTER | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | | |
| 75 SIDE | 0.8000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 1.0000 | | |
| 99 CENTER | 0.5000 | 0.7000 | 1.0000 | 0.3000 | 0.8000 | 0.6000 | 0.7000 | 0.7000 | | |
| 99 SIDE | 0.7000 | 0.8000 | 0.4000 | 0.9000 | 0.7000 | 0.9000 | 0.8000 | 0.8000 | | |
| 108 CENTER | 1.0000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 1.0000 | | |
| 108 SIDE | 1.0000 | 1.0000 | 1.0000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | | |
| Transform: Arcsin Square Root | | | | | | | | Rank | 1-Tailed | |
| Conc- | Mean | N-Mean | Mean | Min | Max | CV% | N | Sum | Critical | |
| West Bearskin | 0.8875 | 1.0000 | 1.2529 | 0.8861 | 1.4120 | 16.643 | 8 | | | |
| 40 CENTER | 0.8500 | 0.9577 | 1.1898 | 0.9912 | 1.4120 | 14.148 | 8 | 61.00 | 43.00 | |
| 40 SIDE | 0.8750 | 0.9859 | 1.2240 | 0.8861 | 1.4120 | 12.090 | 8 | 60.50 | 43.00 | |
| 41 CENTER | 0.9250 | 1.0423 | 1.2924 | 1.1071 | 1.4120 | 8.514 | 8 | 68.00 | 43.00 | |
| 41 SIDE | 0.9000 | 1.0141 | 1.2569 | 1.1071 | 1.4120 | 11.234 | 8 | 66.00 | 43.00 | |
| 75 CENTER | 0.9750 | 1.0986 | 1.3713 | 1.2490 | 1.4120 | 5.501 | 8 | 78.00 | 43.00 | |
| 75 SIDE | 0.9375 | 1.0563 | 1.3128 | 1.1071 | 1.4120 | 8.821 | 8 | 71.00 | 43.00 | |
| 99 CENTER | 0.6625 | 0.7465 | 0.9680 | 0.5796 | 1.4120 | 24.972 | 8 | 49.00 | 43.00 | |
| 99 SIDE | 0.7500 | 0.8451 | 1.0608 | 0.6847 | 1.2490 | 17.030 | 8 | 51.00 | 43.00 | |
| 108 CENTER | 0.9750 | 1.0986 | 1.3713 | 1.2490 | 1.4120 | 5.501 | 8 | 78.00 | 43.00 | |
| 108 SIDE | 0.9500 | 1.0704 | 1.3305 | 1.2490 | 1.4120 | 6.547 | 8 | 72.00 | 43.00 | |
| Auxiliary Tests | | | | | | | Statistic | Critical | Skew | Kurt |
| Kolmogorov D Test indicates non-normal distribution (p <= 0.01) | | | | | | | 1.36796 | 1.035 | -0.4357 | 1.24495 |
| Bartlett's Test indicates equal variances (p = 0.03) | | | | | | | 19.838 | 23.2093 | | |
| Hypothesis Test (1-tail, 0.05) | | | | | | | | | | |
| Wilcoxon Rank Sum Test indicates no significant differences | | | | | | | | | | |
| Treatments vs West Bearskin | | | | | | | | | | |

Response Plot

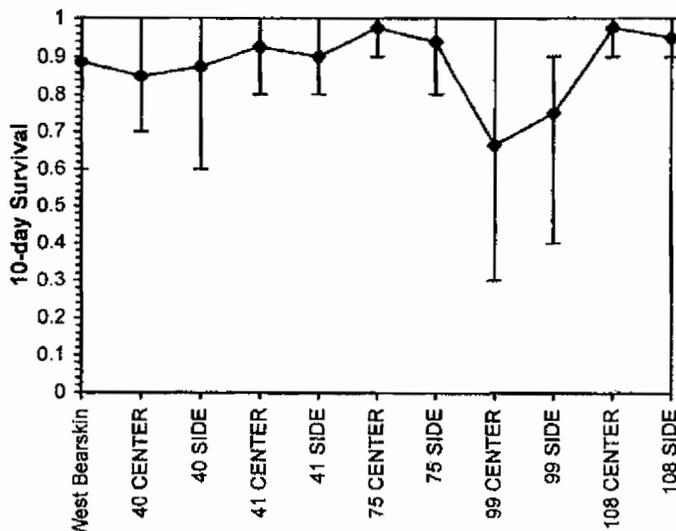


TABLE 2. *Chironomus* Survival, Growth, and Statistical Results Following Ten-Day Exposure to Metropolitan Water Reclamation District of Greater Chicago Sediments.

| C. tentans AFDW | | | | | | | | | |
|---|-----------|-----------|----------|---------------|------------|---------|---------|----------|-------------------|
| Start Date: | 8/4/2006 | Test ID: | MWRDGC1 | Sample ID: | FIRST SET | | | | |
| End Date: | 8/14/2006 | Lab ID: | 5010 | Sample Type: | SEDIMENTS | | | | |
| Sample Date: | | Protocol: | EPA 2000 | Test Species: | C. tentans | | | | |
| Comments: | | | | | | | | | |
| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| West Bearskin | 0.0010 | 0.0008 | 0.0008 | 0.0008 | 0.0007 | 0.0010 | 0.0007 | 0.0009 | |
| V-39 CENTER | 0.0010 | 0.0001 | 0.0014 | 0.0011 | 0.0008 | 0.0014 | 0.0015 | 0.0013 | |
| WW-39 SIDE | 0.0006 | 0.0007 | 0.0004 | 0.0008 | 0.0008 | 0.0004 | 0.0008 | 0.0008 | |
| V-74 CENTER | 0.0012 | 0.0009 | 0.0007 | 0.0012 | 0.0010 | 0.0008 | 0.0010 | 0.0006 | |
| V-92 CENTER | 0.0002 | 0.0004 | 0.0009 | 0.0008 | 0.0008 | 0.0009 | 0.0004 | 0.0008 | |
| WW-92 SIDE | 0.0014 | 0.0014 | 0.0014 | 0.0016 | 0.0012 | 0.0015 | 0.0015 | 0.0013 | |
| -100 CENTER | 0.0013 | 0.0011 | 0.0014 | 0.0011 | 0.0021 | 0.0015 | 0.0015 | 0.0016 | |
| NW-100 SIDE | 0.0013 | 0.0016 | 0.0013 | 0.0017 | 0.0019 | 0.0015 | 0.0015 | 0.0017 | |
| Transform: Untransformed | | | | | | | | | |
| Conc- | Mean | N-Mean | Mean | Min | Max | CV% | N | Rank Sum | 1-Tailed Critical |
| West Bearskin | 0.000849 | 1.0000 | 0.0008 | 0.0007 | 0.0010 | 14.571 | 8 | | |
| V-39 CENTER | 0.001064 | 1.2535 | 0.0011 | 0.0001 | 0.0015 | 42.411 | 8 | 86.00 | 45.00 |
| WW-39 SIDE | 0.000650 | 0.7655 | 0.0006 | 0.0004 | 0.0008 | 22.193 | 8 | 50.00 | 45.00 |
| V-74 CENTER | 0.000924 | 1.0884 | 0.0009 | 0.0006 | 0.0012 | 23.882 | 8 | 74.00 | 45.00 |
| V-92 CENTER | 0.000653 | 0.7691 | 0.0007 | 0.0002 | 0.0009 | 43.603 | 8 | 58.00 | 45.00 |
| WW-92 SIDE | 0.001412 | 1.6632 | 0.0014 | 0.0012 | 0.0016 | 9.329 | 8 | 100.00 | 45.00 |
| -100 CENTER | 0.001457 | 1.7164 | 0.0015 | 0.0011 | 0.0021 | 20.927 | 8 | 100.00 | 45.00 |
| NW-100 SIDE | 0.001540 | 1.8145 | 0.0015 | 0.0013 | 0.0019 | 12.600 | 8 | 100.00 | 45.00 |
| Auxiliary Tests | | | | Statistic | Critical | Skew | Kurt | | |
| Kolmogorov D Test indicates normal distribution (p > 0.01) | | | | 0.51595 | 1.035 | -0.8284 | 3.62387 | | |
| Bartlett's Test indicates unequal variances (p = 5.99E-03) | | | | 19.8142 | 18.4753 | | | | |
| Hypothesis Test (1-tail, 0.05) | | | | | | | | | |
| Steel's Many-One Rank Test indicates no significant differences | | | | | | | | | |
| Treatments vs West Bearskin | | | | | | | | | |

Response Plot

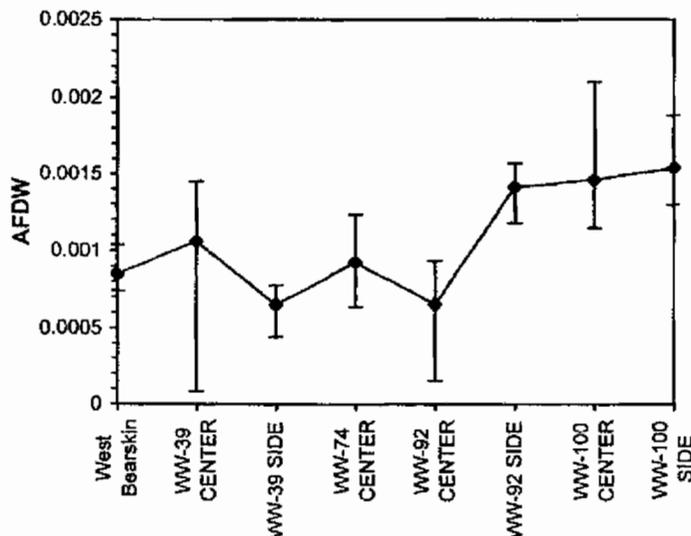


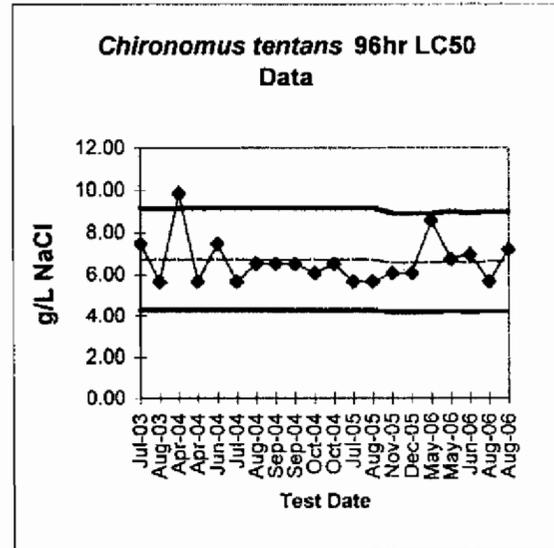
Table 3.

ASci Corporation Environmental Testing Laboratory

Precision of *Chironomus tentans* NaCl Reference Toxicant Testing

| Date | LC50 | +2SD | -2SD | MEAN |
|--------|------|------|------|------|
| Jul-03 | 7.46 | 9.15 | 4.27 | 6.71 |
| Aug-03 | 5.66 | 9.15 | 4.27 | 6.71 |
| Apr-04 | 9.85 | 9.15 | 4.27 | 6.71 |
| Apr-04 | 5.66 | 9.15 | 4.27 | 6.71 |
| Jun-04 | 7.46 | 9.15 | 4.27 | 6.71 |
| Jul-04 | 5.66 | 9.15 | 4.27 | 6.71 |
| Aug-04 | 6.50 | 9.15 | 4.27 | 6.71 |
| Sep-04 | 6.50 | 9.15 | 4.27 | 6.71 |
| Sep-04 | 6.50 | 9.15 | 4.27 | 6.71 |
| Oct-04 | 6.06 | 9.15 | 4.27 | 6.71 |
| Oct-04 | 6.50 | 9.15 | 4.27 | 6.71 |
| Jul-05 | 5.66 | 9.15 | 4.27 | 6.71 |
| Aug-05 | 5.66 | 9.15 | 4.27 | 6.71 |
| Nov-05 | 6.06 | 8.91 | 4.19 | 6.55 |
| Dec-05 | 6.06 | 8.91 | 4.19 | 6.55 |
| May-06 | 8.57 | 8.91 | 4.19 | 6.55 |
| May-06 | 6.73 | 8.99 | 4.23 | 6.61 |
| Jun-06 | 6.96 | 8.91 | 4.19 | 6.55 |
| Aug-06 | 5.66 | 8.99 | 4.23 | 6.61 |
| Aug-06 | 7.21 | 8.99 | 4.23 | 6.61 |

sd 1.09
cv 16%



APPENDIX A

Chain of Custody Forms

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested | |
|---------------------------------|-----------------------|---------|--------|------|-------------|-----------|--------|--------------|----------------------------|--|
| | Beginning | | Ending | | Grab | Composite | | | | |
| | Date | Time | Date | Time | | | | | | |
| ww92 ↓ ww74 ↓ ww100 | Lockport center | 7/25/06 | 1300 | | | ✓ | | 1/2 gal. | — | |
| | Lockport side | 7/25/06 | 1230 | | | ✓ | | 1/2 gal. | — | |
| | Lake Shore Dr. center | 7/26/06 | 1200 | | | ✓ | | 3/4 gal. | — | |
| | Lake Shore Dr. side | 7/26/06 | 1130 | | | ✓ | | 3/4 gal. | — | |
| | Wells St. Center | 7/27/06 | 1145 | | | ✓ | | 3/4 gal. | — | |

Site: MWR DGC
 Address: 6001 W. Pershing Rd., Cicero IL 60804
 Telephone #: 708-588-4223
 Temperature of Sample During Collection:

Samples Collected by: Tom Minarik (Print) Bio I (Title) Tom Wasik (Signature)
 Samples Relinquished by: Ten Wasik (Print) Bio II (Title) [Signature] (Signature)

Mode of Transportation: UPS o/n Date:

Received for ASci-ETL by: R. Brown (Print) [Signature] (Signature) Biologist (Title) 8/2/06 (Date) 1015 (Time)

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

ASCI-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|-------------------------|-------------------|-------|--------|------|-------------|-----------|----------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW100 Wells St. side | 7/27/06 | 10:15 | | | ✓ | | 3/4 gal. | — | 10-day chironomid |
| WW39 Madison side | 7/28/06 | 10:55 | | | ✓ | | 1/2 gal. | — | " |
| WW39 Madison center | 7/28/06 | 10:15 | | | ✓ | | 1/2 gal. | — | |
| | | | | | | | | | |

Site:

MW RDGC

Address:

6001 W. Pershing Rd. Cicero, IL 60804

Telephone #:

708-588-4223

Temperature of Sample During Collection:

Samples Collected by:

Tom Minorik

Bio I

Tom Minorik

Print

Title

Signature

Samples Relinquished by:

Jen Wasik

BIO II

Jen Wasik

Print

Title

Signature

Mode of Transportation:

Date:

Received for ASCI-ETL by:

K. Brown

Katie Brown

Biologist

8/2/06

10:15

Print

Signature

Title

Date

Time

Custody Seals Present?

Yes

No

If Yes, Custody Seals Intact?

Yes

No

Comments:

pg 1 of 2

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|---------------------|-------------------|------|--------|------|-------------|-----------|---------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW40-Damen-side | 8/2/06 | 1100 | | | ✓ | | 1/8 gal | | 10-day chromium |
| WW40-Damen-center | 8/2/06 | 1030 | | | ✓ | | | | |
| WW104-Leonis-side | 8/2/06 | 1300 | | | ✓ | | | | |
| WW108-Leonis-center | 8/2/06 | 1230 | | | ✓ | | | | |
| WW99-Archer side | 8/2/06 | 1430 | | | ✓ | | | | |

Site: MWR DGC
 Address: 6001 W. Pershing Rd, Cicero IL 60804
 Telephone #: 708-588-4223

Temperature of Sample During Collection:

Samples Collected by: WASIK Jennifer Print Title B.I.T.I. Signature [Signature]

Samples Relinquished by: WASIK Jennifer Print Title B.I.T.I. Signature [Signature]

Mode of Transportation: USPS Date: 8/8/06

Received for ASci-ETL by: K. Brown Print Signature [Signature] Biologist Title Date 8/9/06 Time 1000

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

pg 2 of 2

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Testing/Analysis Requested |
|----------------------|-------------------|-------|--------|------|-------------|-----------|----------|--------------|----------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| - WW99 Archer center | 8/2/06 | 1400 | | | ✓ | | 1/2 gal. | — | 10-day chironomus |
| - WW41 side Harlem | 8/4/06 | 11:40 | | | ✓ | | 1/2 gal | — | ↓ |
| - WW41 center Harlem | | 12:10 | | | ✓ | | ↓ | — | ↓ |
| - WW75 side Cicero | | 13:30 | | | ✓ | | ↓ | — | ↓ |
| - WW75 center Cicero | | 14:00 | | | ✓ | | ↓ | — | ↓ |

Site: MW RDGC

Address: 6001 W. Pershing Rd. Cicero IL 60804

Telephone #: 708-588-4223

Temperature of Sample During Collection:

Samples Collected by: WASIK / MINARIK BIO II / BIO I
Print Title Signature

Samples Relinquished by:
Print Title Signature

Mode of Transportation: UPS o/n Date:

Received for ASci-ETL by: K Brown K. Brown Biologist 8/9/06 1000
Print Signature Title Date Time

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

APPENDIX B

Raw Data Sheets

ASCI Corporation
Environmental Testing Laboratory
ASCI-ETL Study ID: #1600-006

MWRDGC Sediment Toxicity

2006

Study I.D. 5010-214

Init. 8/4/06

Exposure System Observations/Activities Sheet for Sediments Initiated 8/4/06

| Date | Day of Test | Fed 1.5 mL Slurry? | Head Flow (ml/min): | Observations |
|-----------|-------------|--------------------|---------------------|---|
| 8/3/2006 | -1 | na | 324 | Sediments loaded. |
| 8/4/2006 | 0 | ✓ | 320 | Organisms loaded. Fed 1.5 ml of 4 g/L CI slurry. |
| 8/5/2006 | 1 | ✓ | 320 | Everything looks good. Fed. |
| 8/6/2006 | 2 | ✓ | 320 | Everything looks good Fed. |
| 8/7/2006 | 3 | ✓ | 320 | Test conditions normal. Fed. |
| 8/8/2006 | 4 | ✓ | 324 | Test conditions normal. Fed. |
| 8/9/2006 | 5 | ✓ | 324 | Everything looks good Fed |
| 8/10/2006 | 6 | ✓ | 320 | Everything looks good. Fed. |
| 8/11/2006 | 7 | ✓ | 322 | Everything looks good. Fed. |
| 8/12/2006 | 8 | ✓ | 322 | Everything looks good. Fed. |
| 8/13/2006 | 9 | ✓ | 320 | Everything looks good. Fed. |
| 8/14/2006 | 10 | na | 326 | Terminated test. Incubated CI @ 48°C for 23 hours, then added @ 55°C for 2 hrs. |

**Table 2. Overlying Water Temperature Values (oC) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-39 CENTER | WW-39 SIDE | WW-74 CENTER | WW-92 CENTER | WW-92 SIDE | WW-100 CENTER | WW-100 SIDE |
|-----|------------------|-----------------|--|--|-----------------|---------------|------------------|----------------|
| 0 | 23.5 | 23.4 | 23.6 | 23.6 | 23.5 | 23.3 | 23.4 | 23.4 |
| 1 | 23.5 | 23.5 | ^{23.4} 25.4 23.5 | 23.5 | 23.5 | 23.4 | 23.4 | 23.5 |
| 2 | 23.6 | 23.5 | 23.5 | 23.5 | 23.5 | 23.6 | 23.5 | 23.5 |
| 3 | 23.2 | 23.2 | 23.1 | 23.1 | 23.2 | 23.2 | 23.2 | 23.2 |
| 4 | 23.3 | 23.2 | 23.2 | 23.2 | 23.2 | 23.2 | 23.1 | 23.1 |
| 5 | 23.5 | 23.6 | 23.6 | 23.7 | 23.5 | 23.5 | 23.6 | 23.6 |
| 6 | 22.8 | 22.8 | 22.9 | 22.8 | 22.8 | 23.0 | 22.8 | 23.0 |
| 7 | 23.3 | 23.3 | 23.4 | 23.5 | 23.3 | 23.3 | 23.3 | 23.5 |
| 8 | 23.4 | 23.5 | 23.5 | 23.4 | 23.4 | 23.4 | 23.4 | 23.5 |
| 9 | 23.7 | 23.7 | 23.5 | ^{23.5} 23.5 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| 10 | 23.6 | 23.5 | 23.4 | 23.6 | 23.5 | 23.6 | 23.5 | 23.6 |

**Table 3. Overlying Water D.O. Values (mg/L) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-39 CENTER | WW-39 SIDE | WW-74 CENTER | WW-92 CENTER | WW-92 SIDE | WW-100 CENTER | WW-100 SIDE |
|-----|------------------|-----------------|---------------|-----------------|-----------------|---------------|------------------|----------------|
| 0 | 7.8 | 7.0 | 6.6 | 7.5 | 7.1 | 6.9 | 7.1 | 7.2 |
| 1 | 8.2 | 6.5 | 7.3 | 7.1 | 6.9 | 7.1 | 6.8 | 6.8 |
| 2 | 7.1 | 6.5 | 6.5 | 5.5 | 6.2 | 5.9 | 6.4 | 5.4 |
| 3 | 6.6 | 6.2 | 6.2 | 6.9 | 6.5 | 6.4 | 6.5 | 6.0 |
| 4 | 6.2 | 6.1 | 6.0 | 6.5 | 6.5 | 6.1 | 6.0 | 5.6 |
| 5 | 10.3 | 6.5 | 5.3 | 6.5 | 6.7 | 6.7 | 5.8 | 5.8 |
| 6 | 6.9 | 5.6 | 5.8 | 5.4 | 5.5 | 5.3 | 6.4 | 5.2 |
| 7 | 5.2 | 5.1 | 5.1 | 5.2 | 5.5 | 5.3 | 5.1 | 5.1 |
| 8 | 6.7 | 7.1 | 6.2 | 6.7 | 6.5 | 6.5 | 6.1 | 5.8 |
| 9 | 7.7 | 7.1 | 7.5 | 6.5 | 6.9 | 5.8 | 6.0 | 7.1 |
| 10 | 6.8 | 7.1 | 7.0 | 6.5 | 6.0 | 5.9 | 5.6 | 6.1 |

**Table 4. Overlying Water pH Values for CWRD Sediments
 During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-39 CENTER | WW-39 SIDE | WW-74 CENTER | WW-92 CENTER | WW-92 SIDE | WW-100 CENTER | WW-100 SIDE |
|-----|------------------|-----------------|---------------|-----------------|-----------------|---------------|------------------|----------------|
| 0 | 6.81 | 6.94 | 6.99 | 7.23 | 7.02 | 7.01 | 6.94 | 7.11 |
| 10 | 7.23 | 7.11 | 7.05 | 7.36 | 7.41 | 7.02 | 7.03 | 7.40 |

**Table 5. Overlying Water Cond. Values (umhos/cm) for CWRD.
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-39 CENTER | WW-39 SIDE | WW-74 CENTER | WW-92 CENTER | WW-92 SIDE | WW-100 CENTER | WW-100 SIDE |
|-----|------------------|-----------------|---------------|-----------------|-----------------|---------------|------------------|----------------|
| 0 | 136 | 189 | 178 | 187 | 272 | 178 | 175 | 165 |
| 10 | 141 | 171 | 165 | 180 | 262 | 185 | 160 | 149 |

**Table 6. Overlying Water Alkalinity Values (mg/L) for CWRD
 Sediments During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-39 CENTER | WW-39 SIDE | WW-74 CENTER | WW-92 CENTER | WW-92 SIDE | WW-100 CENTER | WW-100 SIDE |
|-----|------------------|-----------------|---------------|-----------------|-----------------|---------------|------------------|----------------|
| 0 | 48 | 70 | 64 | 72 | 96 | 58 | 62 | 60 |
| 10 | 78 | 75 | 55 | 62 | 60 | 62 | 82 | 74 |

Table 7. Overlying Water Hardness Values (mg/L) for CWRD Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-39 CENTER | WW-39 SIDE | WW-74 CENTER | WW-92 CENTER | WW-92 SIDE | WW-100 CENTER | WW-100 SIDE |
|-----|------------------|-----------------|---------------|-----------------|-----------------|---------------|------------------|----------------|
| 0 | 48 | 74 | 68 | 72 | 80 | 60 | 60 | 60 |
| 10 | 70 | 68 | 76 | 62 | 62 | 62 | 74 | 76 |

Table 8. Overlying Water Ammonia Values (mg/L) for CWRD Sediments During 10-Day C. tentans Exposures

| Day | West Bearskin | WW-39 CENTER | WW-39 SIDE | WW-74 CENTER | WW-92 CENTER | WW-92 SIDE | WW-100 CENTER | WW-100 SIDE |
|-----|------------------|-----------------|---------------|-----------------|-----------------|---------------|------------------|----------------|
| 0 | <1 | <1 | <1 | <1 | 2.5 | <1 | <1 | <1 |
| 10 | 1.8 | 1.6 | <1 | <1 | <1 | <1 | 2.4 | <1 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 8 | 2 | 8 | 1.25757 | 1.26818 | 1.25995 |
| B | 9 | 1 | 9 | 1.25313 | 1.26132 | 1.25445 |
| C | 8 | 2 | 8 | 1.24420 | 1.25175 | 1.24562 |
| D | 10 | 0 | 10 | 1.26689 | 1.27744 | 1.26917 |
| E | 10 | 0 | 10 | 1.24168 | 1.25072 | 1.24328 |
| F | 9 | 1 | 9 | 1.24487 | 1.25654 | 1.24719 |
| G | 10 | 0 | 10 | 1.25360 | 1.26260 | 1.25520 |
| H | 10 | 0 | 10 | 1.27156 | 1.28322 | 1.27439 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-39 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.24420 | 1.26003 | 1.25011 |
| B | 9 | 1 | 9 | 1.25200 | 1.26546 | 1.25678 |
| C | 8 | 2 | 8 | 1.25157 | 1.26876 | 1.25450 |
| D | 10 | 0 | 10 | 1.24922 | 1.26303 | 1.25421 |
| E | 8 | 2 | 8 | 1.26884 | 1.28064 | 1.27239 |
| F | 10 | 0 | 10 | 1.24921 | 1.26817 | 1.25461 |
| G | 10 | 0 | 10 | 1.25225 | 1.26732 | 1.25714 |
| H | 7 | 3 | 7 | 1.25070 | 1.26330 | 1.25442 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-39 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 7 | 3 | 7 | 1.25219 | 1.25892 | 1.25420 |
| B | 8 | 2 | 8 | 1.25597 | 1.26415 | 1.25892 |
| C | 8 | 2 | 8 | 1.24999 | 1.25528 | 1.25130 |
| D | 9 | 1 | 9 | 1.25536 | 1.26445 | 1.25826 |
| E | 8 | 2 | 8 | 1.25434 | 1.26156 | 1.25630 |
| F | 7 | 3 | 7 | 1.25775 | 1.26352 | 1.25954 |
| G | 7 | 1 | 9 | 1.25170 | 1.26090 | 1.25471 |
| H | 8 | 2 | 8 | 1.25243 | 1.26081 | 1.25464 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-74 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 8 | 2 | 8 | 1.25857 | 1.27986 | 1.26788 |
| B | 10 | 0 | 10 | 1.25156 | 1.26755 | 1.25856 |
| C | 10 | 0 | 10 | 1.24722 | 1.25834 | 1.25158 |
| D | 10 | 0 | 10 | 1.24523 | 1.26595 | 1.25365 |
| E | 10 | 0 | 10 | 1.24296 | 1.25849 | 1.24898 |
| F | 10 | 0 | 10 | 1.26418 | 1.27853 | 1.27065 |
| G | 10 | 0 | 10 | 1.25666 | 1.27543 | 1.26530 |
| H | 8 | 2 | 8 | 1.25494 | 1.26420 | 1.25911 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-92 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|----------------|------|----------------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 3 | 7 | 7 3 | 1.25929 | 1,26022 | 1.25976 |
| B | 7 | 3 | 7 7 | 1.24261 | 1,24647 | 1,24374 |
| C | 5 | 5 | 5 | 1.25930 | 1,26548 | 1,26081 |
| D | 7 7 | 3 | 7 | 1.24611 | 1,25420 | 1.24830 |
| E | 7 7 | 3 | 7 | 1.24379 | 1,25131 | 1.24557 |
| F | 7 | 3 | 7 | 1.25519 | 1,26324 | 1.25710 |
| G | 7 | 3 | 7 | 1.25856 | 1,26329 | 1.26018 |
| H | 7 | 3 | 7 | 1.26093 | 1,26808 | 1.26275 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-92 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan - |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.26390 | 1.28368 | 1.26945 |
| B | 8 | 2 | 8 | 1.25650 | 1.27204 | 1.26089 |
| C | 9 | 1 | 9 | 1.26303 | 1.28123 | 1.26836 |
| D | 9 | 1 | 9 | 1.25391 | 1.27306 | 1.25892 |
| E | 10 | 0 | 10 | 1.25313 | 1.26976 | 1.25799 |
| F | 10 | 0 | 10 | 1.25644 | 1.27785 | 1.26236 |
| G | 8 | 2 | 8 | 1.25078 | 1.26699 | 1.25521 |
| H | 10 | 0 | 10 | 1.24881 | 1.26666 | 1.25387 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-100 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.25221 | 1.27199 | 1.25881 |
| B | 10 | 0 | 10 | 1.24576 | 1.28284 | 1.27143 |
| C | 9 | 1 | 9 | 1.24185 | 1.26015 | 1.24779 |
| D | 10 | 0 | 10 | 1.25683 | 1.27399 | 1.26255 |
| E | 5 | 5 | 5 | 1.26543 | 1.27973 | 1.26925 |
| F | 9 | 1 | 9 | 1.26118 | 1.28086 | 1.26733 |
| G | 8 | 2 | 8 | 1.25212 | 1.26872 | 1.25667 |
| H | 9 | 1 | 9 | 1.25845 | 1.27766 | 1.26349 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-100 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.24630 | 1.26739 | 1.25442 |
| B | 10 | 0 | 10 | 1.24115 | 1.26364 | 1.24808 |
| C | 10 | 0 | 10 | 1.24869 | 1.26763 | 1.25452 |
| D | 9 | 1 | 9 | 1.23980 | 1.26033 | 1.24545 |
| E | 9 | 1 | 9 | 1.25694 | 1.28099 | 1.26406 |
| F | 10 | 0 | 10 | 1.25276 | 1.27430 | 1.25945 |
| G | 10 | 0 | 10 | 1.25556 | 1.27760 | 1.26285 |
| H | 10 | 6 | 10 | 1.26479 | 1.29001 | 1.27337 |

MWRDGC Sediment Toxicity
2006
Study I.D. 5010-214
Init. 8/11/06

Exposure System Observations/Activities Sheet for Sediments Initiated 8/11/06

| Date | Day of Test | Fed 1.5 mL Slurry? | Head Flow (ml/min): | Observations |
|-----------|-------------|--------------------------------|---------------------|---|
| 8/10/2006 | -1 | na | — | Sediments loaded |
| 8/11/2006 | 0 | 322 Re KB 8/11/06 | 322 | Organisms loaded. |
| 8/12/2006 | 1 | Yes KB 322 Re KB 8/12/06 | 322 | Everything looks good. Fed |
| 8/13/2006 | 2 | Yes KB 320 Re KB 8/13/06 | 320 | Everything looks good. Fed. |
| 8/14/2006 | 3 | Yes CA | 320 | TEST CONDITIONS AND OBSERVATIONS NORMAL. |
| 8/15/2006 | 4 | Yes CA | 324 | TEST CONDITIONS AND OBSERVATIONS NORMAL |
| 8/16/2006 | 5 | Yes KB | 324 | Test conditions and observations normal. |
| 8/17/2006 | 6 | No | 320 | FEEDING SUSPENDED DUE TO LOW DO VALUES. |
| 8/18/2006 | 7 | Yes KB | 320 | Test Conditions and observations Normal. Fed |
| 8/19/2006 | 8 | Yes CA | 324 | Test conditions and observations normal. |
| 8/20/2006 | 9 | Yes CA | 328 | Test conditions normal. |
| 8/21/2006 | 10 | No KB | 324 | Test conditions normal. Test taken down. |

**Table 2. Overlying Water Temperature Values (oC) for CWRD
SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-40 CENTER | WW-40 SIDE | WW-41 CENTER | WW-92 WW-41 SIDE CENTER | WW-92 WW-75 CENTER SIDE | WW-100 WW-75 SIDE CENTER | WW-100 WW-99 CENTER SIDE | WW-92 WW-99 SIDE | WW-100 CENTER | WW-92 WW-100 SIDE |
|-----|------------------|-----------------|---------------|-----------------|--|----------------------------------|---|-------------------------------------|------------------------|------------------|---|
| 0 | 23.3 | 23.3 | 23.4 | 23.4 | 23.3 | 23.3 | 23.3 | 23.3 | 23.4 | 23.4 | 23.4 |
| 1 | 23.4 | 23.5 | 23.5 | 23.4 | 23.4 | 23.4 | 23.3 | 23.5 | 23.4 | 23.3 | 23.3 |
| 2 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.7 | 23.7 | 23.6 |
| 3 | 23.6 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.4 | 23.4 | 23.4 |
| 4 | 23.5 | 23.5 | 23.4 | 23.4 | 23.4 | 23.4 | 23.5 | 23.5 | 23.4 | 23.5 | 23.5 |
| 5 | 23.5 | 23.6 | 23.5 | 23.5 | 23.4 | 23.4 | 23.5 | 23.4 | 23.5 | 23.5 | 23.5 |
| 6 | 23.5 | 23.5 | 23.5 | 23.4 | 23.5 | 23.5 | 23.5 | 23.5 <i>23.5 3/17/00</i> 23.5 | 23.5 | 23.5 | 23.5 |
| 7 | 23.5 | 23.4 | 23.4 | 23.5 | 23.4 | 23.4 | 23.5 | 23.5 | 23.5 | 23.4 | 23.5 |
| 8 | 23.4 | 23.4 | 23.4 | 23.4 | 23.5 | 23.4 | 23.5 | 23.5 | 23.5 | 23.4 | 23.4 |
| 9 | 23.4 | 23.3 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.5 | 23.4 | 23.4 | 23.3 |
| 10 | 23.6 | 23.5 | 23.6 | 23.6 | 23.5 | 23.5 | 23.7 | 23.6 | 23.4 | 23.6 | 23.5 |

**Table 3. Overlying Water D.O. Values (mg/L) for CWRD
 SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West Bearskin | WW-40 CENTER | WW-40 SIDE | WW-41 CENTER | WW-41 SIDE | WW-75 CENTER | WW-75 SIDE | WW-99 CENTER | WW-99 SIDE | WW-108 CENTER | WW-108 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|------------------|----------------|
| 0 | 7.8 | 7.2 | 7.1 | 7.7 | 7.0 | 7.0 | 7.0 | 7.1 | 7.8 | 7.4 | 7.4 |
| 1 | 7.7 | 7.7 | 7.7 | 7.7 | 6.5 | 6.9 | 7.7 | 7.1 | 7.5 | 7.4 | 7.7 |
| 2 | 7.1 | 7.1 | 7.0 | 6.6 | 6.8 | 7.8 | 7.5 | 7.8 | 7.5 | 7.5 | 7.7 |
| 3 | 6.8 | 6.1 | 6.2 | 5.8 | 5.7 | 5.2 | 5.6 | 5.6 | 5.5 | 6.5 | 6.3 |
| 4 | 5.1 | 5.2 | 5.4 | 5.0 | 4.6 | 4.5 | 4.8 | 5.0 | 5.0 | 5.2 | 5.3 |
| 5 | 6.5 | 6.2 | 5.3 | 5.3 | 4.8 | 6.2 | 5.8 | 6.1 | 5.2 | 5.2 | 5.2 |
| 6 | 5.1 | 3.8 | 3.7 | 3.7 | 3.8 | 4.2 | 4.5 | 4.2 | 3.6 | 3.4 | 3.1 |
| 7 | 5.3 | 5.2 | 5.2 | 5.0 | 5.0 | 5.9 | 4.9 | 5.2 | 5.1 | 5.1 | 5.1 |
| 8 | 5.3 | 5.1 | 5.3 | 5.1 | 5.0 | 5.5 | 5.1 | 5.0 | 4.9 | 5.0 | 5.0 |
| 9 | 4.9 | 5.0 | 4.5 | 4.7 | 4.2 | 4.5 | 4.4 | 4.4 | 4.0 | 4.1 | 4.0 |
| 10 | 4.6 | 5.1 | 4.8 | 4.6 | 4.5 | 5.0 | 5.3 | 4.7 | 5.1 | 4.6 | 4.6 |

**Table 4. Overlying Water pH Values for CWRD Sediments
During 10-Day C. tentans Exposures**

| Day | West | WW-40 | WW-40 | WW-41 | WW-41 | WW-75 | WW-75 | WW-99 | WW-99 | WW-108 | WW-108 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE |
| 0 | 6.93 | 7.05 | 7.04 | 6.90 | 6.96 | 7.12 | 7.21 | 7.10 | 7.15 | 7.04 | 7.08 |
| 10 | 6.72 | 6.76 | 6.53 | 6.76 | 6.50 | 6.56 | 6.71 | 6.66 | 6.66 | 6.61 | 6.82 |

**Table 5. Overlying Water Cond. Values (umhos/cm) for CWRD.
SEDIMENTS During 10-Day C. tentans Exposures**

| Day | West | WW-40 | WW-40 | WW-41 | WW-41 | WW-75 | WW-75 | WW-99 | WW-99 | WW-108 | WW-108 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE |
| 0 | 131 | 300 | 192 | 241 | 173 | 244 | 248 | 303 | 428 | 200 | 220 |
| 10 | 157 | 176 | 178 | 193 | 166 | 152 | 232 | 171 | 168 | 171 | 211 |

**Table 6. Overlying Water Alkalinity Values (mg/L) for CWRD
Sediments During 10-Day C. tentans Exposures**

| Day | West | WW-40 | WW-40 | WW-41 | WW-41 | WW-75 | WW-75 | WW-99 | WW-99 | WW-108 | WW-108 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE |
| 0 | 48 | 118 | 76 | 84 | 66 | 94 | 94 | 116 | 176 | 80 | 82 |
| 10 | 60 | 134 | 66 | 100 | 56 | 58 | 68 | 76 | 112 | 66 | 76 |

Table 7. Overlying Water Hardness Values (mg/L) for CWRD Sediments During 10-Day C. tentans Exposures

| Day | West | WW-40 | WW-40 | WW-41 | WW-41 | WW-75 | WW-75 | WW-99 | WW-99 | WW-108 | WW-108 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE |
| 0 | 43 | 98 | 66 | 66 | 58 | 84 | 80 | 90 | 122 | 78 | 80 |
| 10 | 54 | 106 | 70 | 58 | 58 | 60 | 68 | 70 | 90 | 82 | 80 |

Table 8. Overlying Water Ammonia Values (mg/L) for CWRD Sediments During 10-Day C. tentans Exposures

| Day | West | WW-40 | WW-40 | WW-41 | WW-41 | WW-75 | WW-75 | WW-99 | WW-99 | WW-108 | WW-108 |
|-----|----------|--------|-------|--------------------|-------|--------|-------|--------|-------|--------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | <1.0 | 6.7 | 2.1 | 5.2 | 1.4 | 2.2 | 3.3 | 7.9 | 4.0 | 4.0 | 4.0 |
| 10 | 0.4 | 5.3 | 0.7 | 5.2 4.7 | 0.5 | <0.2 | 0.4 | 1.7 | 5.1 | 0.5 | 0.4 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.24825 | 1.25813 | 1.24976 |
| B | 7 | 3 | 7 | 1.24408 | 1.25322 | 1.24546 |
| C | 10 | 0 | 10 | 1.24934 | 1.26106 | 1.25143 |
| D | 10 | 0 | 10 | 1.25294 | 1.26138 | 1.25444 |
| E | 10 | 0 | 10 | 1.24851 | 1.26052 | 1.25098 |
| F | 10 | 0 | 10 | 1.24760 | 1.25499 | 1.24885 |
| G | 9 | 1 | 9 | 1.25687 | 1.26494 | 1.25801 |
| H | 6 | 4 | 6 | 1.25115 | 1.25925 | 1.25225 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-40 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.25659 | 1.26379 | 1.25828 |
| B | 10 | 0 | 10 | 1.25459 | 1.26392 | 1.25685 |
| C | 9 | 1 | 9 | 1.26182 | 1.27177 | 1.26430 |
| D | 8 | 2 | 8 | 1.24549 | 1.25572 | 1.24805 |
| E | 10 | 0 | 10 | 1.24769 | 1.25719 | 1.25010 |
| F | 8 | 2 | 8 | 1.25650 | 1.26597 | 1.25890 |
| G | 7 | 3 | 7 | 1.25911 | 1.26579 | 1.26048 |
| H | 7 | 3 | 7 | 1.24464 | 1.25079 | 1.24505 |

* C. tentans appear smaller than control - replicate A

***Chironomus tentans* 10-day Survival and Growth Data**

Site ID # WW-40 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 6 | 4 | 6 | 1.26459 | 1.27214 | 1.26672 |
| B | 9 | 1 | 9 | 1.24675 | 1.25374 | 1.24892 |
| C | 9 | 1 | 9 | 1.24921 | 1.25794 | 1.25180 |
| D | 9 | 1 | 9 | 1.25029 | 1.25998 | 1.25312 |
| E | 9 | 1 | 9 | 1.24764 | 1.25685 | 1.25025 |
| F | 10 | 0 | 10 | 1.25299 | 1.26231 | 1.25564 |
| G | 9 | 1 | 9 | 1.23876 | 1.24669 | 1.24110 |
| H | 9 | 1 | 9 | 1.24848 | 1.251069 | 1.25098 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-41 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|--------------|--------------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 9 | 1 | 9 | 1.26086 | 1.27078 | 1.26296 |
| B | 9 | 1 | 9 | 1.24393 | 1.25486 | 1.24621 |
| C | 10 | 0 | 10 | 1.26198 | 1.27289 | 1.26448 |
| D | 10 | 0 | 10 | 1.24584 | 1.25641 | 1.24813 |
| E | 10 | 0 | 10 | 1.24400 | 1.25774 | 1.24707 |
| F | 9 | 1 | 9 | 1.23888 | 1.24860 | 1.24155 |
| G | 8 | 2 | 8 | 1.25570 | 1.26747 | 1.25817 |
| H | 9 | 1 | 9 | 1.24485 | 1.25717 | 1.24742 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-41 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 8 | 2 | 8 | 1.25221 | 1.25922 | 1.25389 |
| B | 9 | 1 | 9 | 1.23804 | 1.24307 | 1.23924 |
| C | 10 | 0 | 10 | 1.26514 | 1.27062 | 1.26619 |
| D | 10 | 0 | 10 | 1.24055 | 1.24491 | 1.24158 |
| E | 8 | 2 | 8 | 1.23990 | 1.24430 | 1.24078 |
| F | 8 | 2 | 8 | 1.22553 | 1.23245 | 1.22718 |
| G | 9 | 1 | 9 | 1.24824 | 1.25390 | 1.24937 |
| H | 10 | 0 | 10 | 1.24027 | 1.24409 | 1.24125 |

8/21/06 ^{appear} C. tentans mock smaller than controls

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-75 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.25774 | 1.26862 | 1.26046 |
| B | 10 | 0 | 10 | 1.24758 | 1.25663 | 1.24966 |
| C | 9 | 1 | 9 | 1.25960 | 1.26973 | 1.26229 |
| D | 9 | 1 | 9 | 1.24140 | 1.24880 | 1.24295 |
| E | 10 | 0 | 10 | 1.25913 | 1.26574 | 1.26116 |
| F | 10 | 0 | 10 | 1.25678 | 1.26473 | 1.25878 |
| G | 10 | 0 | 10 | 1.25314 | 1.26322 | 1.25535 |
| H | 10 | 0 | 10 | 1.26253 | 1.27201 | 1.26472 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-75 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 8 | 2 | 8 | 1.25076 | 1.25941 | 1.25341 |
| B | 10 | 0 | 10 | 1.25423 | 1.26232 | 1.25665 |
| C | 10 | 0 | 10 | 1.25580 | 1.26261 | 1.25785 |
| D | 9 | 1 | 9 | 1.25010 | 1.25860 | 1.25281 |
| E | 9 | 1 | 9 | 1.24500 | 1.25585 | 1.24832 |
| F | 10 | 0 | 10 | 1.25245 | 1.26190 | 1.25521 |
| G | 9 | 1 | 9 | 1.26187 | 1.26904 | 1.26400 |
| H | 10 | 0 | 10 | 1.24810 | 1.25533 | 1.25018 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-99 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 5 | 5 | 5 | 1.25778 | 1.26195 | 1.25869 |
| B | 7 | 3 | 7 | 1.26236 | 1.26554 | 1.26306 |
| C | 10 | 0 | 10 | 1.26257 | 1.26843 | 1.26353 |
| D | 3 | 7 | 3 | 1.24760 | 1.25017 | 1.24815 |
| E | 8 | 2 | 8 | 1.24761 | 1.25149 | 1.24836 |
| F | 6 | 4 | 6 | 1.25239 | 1.25672 | 1.25322 |
| G | 7 | 3 | 7 | 1.24638 | 1.25092 | 1.24729 |
| H | 7 | 3 | 7 | 1.24793 | 1.25223 | 1.24866 |

tox present in sediment

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-99 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 7 | 3 | 7 | 1.25572 | 1.25922 | 1.25656 |
| B | 8 | 2 | 8 | 1.25622 | 1.26138 | 1.25730 |
| C | 4 | 6 | 4 | 1.24845 | 1.25159 | 1.24909 |
| D | 9 | 1 | 9 | 1.24504 | 1.24968 | 1.24596 |
| E | 7 | 3 | 7 | 1.24331 | 1.24634 | 1.24401 |
| F | 9 | 1 | 9 | 1.25167 | 1.25769 | 1.25275 |
| G | 8 | 2 | 8 | 1.24489 | 1.24999 | 1.24614 |
| H | 8 | 2 | 8 | 1.24536 | 1.25170 | 1.24649 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-108 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.24891 | 1.26351 | 1.25420 |
| B | 10 | 0 | 10 | 1.25016 | 1.25664 | 1.25240 |
| C | 10 | 0 | 10 | 1.24470 | 1.25798 | 1.24939 |
| D | 9 | 1 | 9 | 1.25725 | 1.26906 | 1.26133 |
| E | 9 | 1 | 9 | 1.24594 | 1.25947 | 1.25045 |
| F | 10 | 0 | 10 | 1.25718 | 1.26979 | 1.26165 |
| G | 10 | 0 | 10 | 1.23917 | 1.24921 | 1.24258 |
| H | 10 | 0 | 10 | 1.24326 | 1.25470 | 1.24737 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-108 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (g) | Pan + | Pan + |
|-----|-------------|------|---------|-------------------|--------------------|--------------------|
| | Alive | Dead | Weighed | | Dried Org. Wt. (g) | Ashed Org. Wt. (g) |
| A | 10 | 0 | 10 | 1.24791 | 1.26134 | 1.25315 |
| B | 10 | 0 | 10 | 1.24612 | 1.26086 | 1.25189 |
| C | 10 | 0 | 10 | 1.24938 | 1.26350 | 1.25491 |
| D | 9 | 1 | 9 | 1.25850 | 1.27107 | 1.26349 |
| E | 10 | 0 | 10 | 1.25843 | 1.27272 | 1.26406 |
| F | 9 | 1 | 9 | 1.26051 | 1.27289 | 1.26536 |
| G | 9 | 1 | 9 | 1.23143 | 1.24578 | 1.23666 |
| H | 9 | 1 | 9 | 1.25180 | 1.26491 | 1.25687 |

Attachment 20



**Results of Ten-Day *Chironomus tentans*
Toxicity Test with Whole Sediment Samples from the
Metropolitan Water Reclamation District of Greater Chicago
Received August 2, 2007 and August 8, 2007.**

Prepared by

ASci Corporation
Environmental Testing Laboratory
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Submitted to

Metropolitan Water Reclamation District of Greater Chicago
6001 West Pershing
Cicero, IL 60804

Submitted September 2007

REPORT APPROVAL

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**The following tables can be found in Appendix B-Raw Data Sheets:
Sediments Received 8/2/07**

- TABLE 1. Flow Rates (ml/min) of Overlying Water and Daily Turnover Rates to Metropolitan Water Reclamation District of Greater Chicago Sediments Test Chambers During Ten-Day *Chironomus* Exposures
- TABLE 2. Overlying Water Dissolved Oxygen Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
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- TABLE 7. Overlying Water Hardness Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 8. Overlying Water Ammonia Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 9. *Chironomus* Survival and Growth Results Following Ten-Day Exposure to Metropolitan Water Reclamation District of Greater Chicago Sediments.

**The following tables can be found in Appendix C-Raw Data Sheets:
Sediments Received 8/8/07**

- TABLE 1. Flow Rates (ml/min) of Overlying Water and Daily Turnover Rates to Metropolitan Water Reclamation District of Greater Chicago Sediments Test Chambers During Ten-Day *Chironomus* Exposures
- TABLE 2. Overlying Water Temperature Values (°C) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 3. Overlying Water Dissolved Oxygen Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 4. Overlying Water pH Values for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 5. Overlying Water Conductivity Values (µmhos/cm) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 6. Overlying Water Alkalinity Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 7. Overlying Water Hardness Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 8. Overlying Water Ammonia Values (mg/L) for Metropolitan Water Reclamation District of Greater Chicago Sediments During Ten-Day *Chironomus* Exposures
- TABLE 9. *Chironomus* Survival and Growth Results Following Ten-Day Exposure to Metropolitan Water Reclamation District of Greater Chicago Sediments.

INTRODUCTION

At the request of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), ASci-Environmental Testing Laboratory (ASci-ETL) performed toxicity tests with bulk sediment samples collected from Chicago-area waterways. The 10-day tests were performed to measure the toxicity of selected sediment samples to larval *Chironomus tentans*. The *Chironomus* endpoints were survival and growth. Growth was defined as dried weight and ash-free dry weight (AFDW).

STUDY SUMMARY

The tables below summarize survival and growth for each Chicago-area waterways sediment and the control sediment, West Bearskin (WBS). Results are grouped according to the test dates of the two separate toxicity exposures. Each toxicity test had its set of control sediments (West Bearskin) for statistical comparisons.

Set # 1. Test dates August 7-17, 2007

| Sample Site | SURVIVAL (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
|-------------|--------------|-----------------------|------------------------------|
| WBS | 94 | 1.30 | 1.03 |
| WW49C | 58* | 0.37* | 0.27* |
| WW49S | 91 | 1.61 | 1.05 |
| WW50C | 79 | 2.10 | 1.53 |
| WW50S | 90 | 1.39 | 1.03 |
| WW52C | 81 | 1.94 | 1.41 |
| WW52S | 83 | 1.97 | 1.47 |
| WW54C | 79 | 1.48 | 1.11 |
| WW54S | 93 | 1.61 | 1.06 |
| WW55C | 74 | 1.11 | 0.80* |
| WW55S | 84 | 1.73 | 1.41 |
| WW56C | 96 | 1.65 | 1.08 |
| WW56S | 94 | 1.64 | 1.07 |
| WW57S | 94 | 1.63 | 1.20 |
| WW76S | 100 | 1.05* | 0.79* |
| WW86C | 14* | 0.28* | 0.22* |
| WW86S | 58* | 1.07 | 0.88 |
| WW97C | 90 | 1.64 | 1.22 |
| WW97S | 85 | 1.48 | 1.10 |

* Significantly different than the West Bearskin control results.

Set # 2. Test dates August 14-24, 2007

| Sample Site | SURVIVAL (%) | Dried Weight (mg/org) | Ash-free Dry Weight (mg/org) |
|-------------|--------------|-----------------------|------------------------------|
| WBS | 93 | 1.13 | 1.02 |
| WW43C | 33* | 0.24* | 0.20* |
| WW43S | 43* | 0.18* | 0.17* |
| WW58C | 73* | 0.51* | 0.45* |
| WW58S | 90 | 0.52* | 0.46* |
| WW59C | 2.5* | 0.24* | 0.21* |
| WW59S | 7.5* | 0.23* | 0.17* |
| WW76C | 30* | 0.18* | 0.17* |

* Significantly different than the West Bearskin control results.

METHODS AND MATERIALS

General Test Methods

Exposures to determine the toxicity of whole sediment samples from Metropolitan Water Reclamation District of Greater Chicago were performed following suggested United States Environmental Protection Agency (USEPA) methods (USEPA 2000 Test Method 100.2). Ten-day tests exposing *Chironomus* were conducted in a manner to determine the effect of each test sediment on organism survival and growth. Effect was determined by comparison to organism performance following exposure to the selected reference site sediment. Exposure conditions were maintained using an intermittent flow system for renewal of overlying water. Following are detailed descriptions of test performance, test results, data reduction, and results interpretation.

The toxicity tests were conducted in two separate sets, with an independent control per test set. Set#1 was initiated on August 7, 2007 and Set #2 was initiated on August 14, 2007. Test methods were identical for each test set.

Test Organism Culturing, Holding, and Acclimation

Chironomus were obtained from Environmental Consulting & Testing, Superior, Wisconsin. Culture conditions were maintained according to suggested EPA methods (EPA 2000). The *Chironomus* were cultured in a recirculating system. Culture temperature is maintained near the test temperature of 23°C.

The *Chironomus* were delivered to ASci-ETL by ASci personnel. Upon arrival at ASci-ETL, the *Chironomus* were logged in and quarantined in glass containers. Diets during holding were the same as used during the toxicity exposures. The organisms were not crowded or subjected to daily temperature changes greater than 3°C per day during holding. The *Chironomus* were second- to third-instar larvae (approximately 10 days-old) at test initiation.

Overlying Water Source

Overlying water supplied to the test chambers was dechlorinated City of Duluth tap water. The City draws its water from Lake Superior. The tap water was dechlorinated and metals were removed with treatment through two, 1.5 cubic-foot activated carbon beds.

Exposure System

Sediment from each site tested included eight replicates. Exposure chambers were 300-ml Berzilius® glass beakers with 1.5 cm diameter side-wall ports screened with a stainless steel mesh. The ports were located approximately 8 cm above the base of the beaker. The screens were fixed to the beakers using aquarium-grade silicone adhesive. Eight replicate test chambers of each sediment exposure were held in a single all glass 12-L aquarium constructed with silicone adhesive. The 12-L aquaria were fitted with a self-starting siphon drain positioned 10 cm above the base of the tank and provided a water volume of 8 L.

Dechlorinated tap water was fed to a 5-gallon stainless steel headbox where the water was heated and then aerated to reduce supersaturated levels of dissolved gasses. The water was gravity fed to an intermediate polyethylene delivery tank. The intermediate tank contained a submersible pump controlled by a timer. The timer was set to activate the pump at 4-hour intervals (6 times per day). The pump was activated for 5 minutes to deliver an appropriate volume of overlying water to the test system. This volume was rapidly pumped to splitter tubes that delivered fresh overlying water to each aquarium. The configuration resulted in two turnovers of

overlying water per day. Test temperature ($23^{\circ} \pm 1^{\circ}\text{C}$) was maintained using a constant temperature water bath. Test photoperiod was maintained at 16 hours light and 8 hours darkness per day. Light was supplied by cool-white fluorescent bulbs at an intensity of 50 to 100 ft-candles.

Test Performance

Sediment samples were collected by MWRDGC personnel during the first week of August, 2007. The samples were delivered to ASci-ETL by express courier on August 2, 2007, and August 8, 2007.

The first set of samples arrived on August 2, 2007, and included the following sediments: WW-49 Center, WW-49 Side, WW-50 Center, WW-50 Side, WW-52 Center, WW-52 Side, WW-54 Center, WW-54 Side, WW-55 Center, WW-55 Side, WW-56 Center, WW-56 Side, WW-57 Side, WW-76 Side, WW-86 Center, WW-86 Side, WW-97 Center and WW-97 Side.

The second set of samples arrived on August 8, 2007, and included the following sediments: WW-43 Center, WW-43 Side, WW-58 Center, WW-58 Side, WW-59 Center, WW-59 Side and WW-76 Center.

The Chain of Custody forms were completed upon the samples' arrival. Sample log-in included visual inspection of the shipping coolers, sample container integrity, sediment temperature and appearance. Following log-in procedures, the samples were stored in darkness at $1-4^{\circ}\text{C}$ until use. Appendix A contains a copy of the Chain of Custody forms.

Two sets of control sediment were used for the toxicity tests. The control sediment, West Bearskin, was collected on June 23, 2007, from West Bearskin Lake, located in Cook County, Minnesota. The West Bearskin sediment sample (5-gallon) was placed in two new polyethylene containers and cooled immediately. Upon arrival at the laboratory, the sample was logged-in and stored under refrigeration ($1-4^{\circ}\text{C}$) until use. Before use in the tests, the laboratory control sediment was thoroughly homogenized, then sieved through a 2-mm screen to remove indigenous organisms. A second control sediment of sand was not used due to availability.

Twenty-four hours before toxicity test initiation each sample was thoroughly homogenized with a stainless steel auger, and 100-ml portions were transferred to each of the eight designated replicate exposure chambers. Each set of replicate test chambers were then placed into an assigned 12-L holding chamber containing 8 L of overlying

water. The toxicity tests were initiated approximately 24 hours later, after the sediment and overlying water had settled.

To start the tests, ten *Chironomus* were impartially distributed to designated intermediate holding cups. The organisms were handled with a wide-bore glass pipette. The organisms were then transferred from the intermediate vessels to an assigned test replicate.

At test initiation and each daily observation, head flow rate was measured, and any flows found to be outside the range of $\pm 10\%$ from target flow were adjusted. Measurements of overlying water pH, total ammonia, conductivity, hardness, and alkalinity were performed on day 0 and day 10. The temperature and dissolved oxygen were measured daily. The total residual chlorine concentration of the post-carbon water was measured periodically during the test to check for breakthrough.

The test organisms were fed a diet based on EPA methods and recommendations from the culturing laboratory (Aquatic Biosystems). *Chironomus* test chambers received a Tetrafin® slurry. The slurry was prepared to contain 4 g/L total solids. Each test replicate received 1.5 ml of the respective dietary component daily.

The tests were terminated following 10 days of exposure. Any organisms in the overlying water were removed first. The sediments were then removed from the test chambers in a layered fashion using a gentle stream of post-carbon treated water. The sediments were collected in a US Standard #40 sieve. The contents retained on the sieve were rinsed into a white polyethylene pan, placed on a light source, and the sieved contents were searched for test organisms. Numbers of live organisms and dead organisms found were counted and recorded. Organisms not found were recorded as dead. These organisms were assumed to have died early in the exposures and the remains had decayed.

The live *Chironomus* from each replicate were pooled, rinsed, and placed in pre-ashed, pre-weighed aluminum weigh boats. The organisms pooled from each individual test replicate were then dried at a constant temperature (60-90°C) for 20-24 hours. The dried, pooled organisms were then weighed to the nearest 0.01 mg to determine mean dried weights. Organisms were then ashed at 550°C for two hours, and then weighed to determine ash-free dry weight (AFDW). AFDW equals the weight of ashed larvae minus the weight of ashed pan. This measurement accounts for gut-retained sediments in the *C. tentans* that may skew the standard dry weight results and eliminates artifactual effects of sediment grain size on growth results.

Any pupae that were recovered were included in survival measurements but not growth measurements. For replicates found to contain pupae, the mean weight was calculated by dividing the pooled weight of the replicate by the number of organisms exposed less the number of pupae recovered.

Treatment of Results

The cumulative number of surviving organisms for each test sediment exposure was compared to cumulative survival of organisms exposed to the laboratory reference control sediment to measure effect. The survival data were analyzed using the TOXCALC Version 5.0 software package. The survival data were arc-sine transformed before analysis then checked for normality and equality of variance. The appropriate parametric or non-parametric test was then performed to determine significant effect ($p=0.05$) as compared to the laboratory reference control results.

The growth data were not transformed before analysis. Mean dry weights and AFDW of organisms were checked for normality and equality of variance. The weight data were then analyzed for significant effect ($p=0.05$) using the appropriate parametric or non-parametric test. Mean growth at each test site was compared to the laboratory reference control results to determine effect. Each set of test sediments was compared independently to the West Bearskin control (WBS) to measure effect.

One test replicate from sediment sample WW-58C was omitted from the statistical analysis due to abnormally low survival numbers in the presence of an indigenous leech in the sediment. It is believed that the leech interfered with the survival and/or growth of the *Chironomus* via predation or competition.

RESULTS

Overlying Water Characteristics

Headbox flow rates were measured daily. The daily values, calculated test chamber flow rates, and volume exchanges are in Table 1. The overlying water flow rate to each of the holding tanks was maintained between 9.4 and 9.6 ml/minute. The mean flow rate resulted in a mean daily turnover of overlying water rate of 2.0 turnovers/day.

Table 1 also summarizes the overlying water chemistry values measured from the *Chironomus* exposure chambers. All mean test temperatures were within the proposed range of 23°C ± 1°C. Dissolved oxygen values ranged from 2.7 to 7.2 mg/L during the *Chironomus* exposure. Overlying water pH, conductivity, alkalinity, and hardness were all within normal ranges.

Table 1 contains the ranges of total ammonia measurements. Ammonia concentrations ranged from <0.2 to 6.4 mg/L. Most of the measured ammonia levels should not have adversely affected *C. tentans* survival, however, any levels above approximately 5 mg/L could possibly affect *C. tentans* growth at the observed pH levels.

Ammonia levels above 5 mg/L were recorded in Set#1 sediments WW-76 Side and WW-86 Side. Of these sediments, only WW-76 Side had significantly reduced growth. None of the WW-76S replicates had significant decreases in survival.

The routine chemistry values indicated the test system maintained suitable water quality to allow assessment of sediment toxicity.

Biological Exposure Results

All organisms were observed to burrow into all test sediments. Overlying water remained clear throughout all exposures, although a film was noticed on the surface of some replicates.

No other significant observations were recorded throughout the test.

***Chironomus tentans* Results –**

The table in the study summary shows the *Chironomus* survival data. The EPA recommended minimum survival rate for control sediments is 70%. Both West Bearskin control sediments supported acceptable mean percentage survival of 93-94%. *Chironomus* survival for the test sediments ranged from 2.5-100%.

Statistical analyses of the survival data for Set #1 indicated three sediments, WW-49 Center, WW-86 Center and WW-86 Side had significantly lower survival than the control sediment, West Bearskin.

Statistical analyses of the survival data for Set #2 indicated six of the seven test sediments had significantly lower survival than the control sediment. WW-58 Side had a mean survival of 90%, and was therefore not significantly different from the control, West Bearskin.

Chironomus ash-free dried weight results are also given in the study summary. The EPA control requirement for control organism ash-free dried weight is 0.48 mg/surviving organism. Both West Bearskin control sediments supported acceptable mean ash-free dried organism weights of 1.02-1.03 mg/organism. *Chironomus* ash-free dried weights for the test sites ranged from 0.17-1.53 mg/organism.

Statistical analyses of the ash-free dried weight data for Set #1 indicated four of the sediments (WW-49 Center, WW-55 Center, WW-76 Side and WW-86 Center) had significantly lower growth than the control sediment, West Bearskin.

Statistical analyses of the ash-free dried weight data for Set #2 indicated all of the test sediments had significantly lower survival than the control sediment, West Bearskin.

CONCLUSIONS

The following conclusions can be drawn from the study results.

- The laboratory control sediment used for this study, West Bearskin, supported acceptable organism survival and growth for both sets of toxicity tests.
- Nine of the test sediments caused significant lethality to *Chironomus* when compared to the West Bearskin results, indicating that these sediments constituted unsuitable habitat for *Chironomus* survival. These sediments are as follows:

1. WW-43C
2. WW-43S
3. WW-49C
4. WW-58C
5. WW-59C
6. WW-59S
7. WW-76C
8. WW-86C
9. WW-86S

No other test sediments caused a significant decrease in organism survival when compared to the laboratory control.

- Eleven of the test sediments caused a significant reduction in *Chironomus* ash-free dried weight (AFDW) when compared to the laboratory control. These sediments are as follows:

1. WW-43C
2. WW-43S
3. WW-49C
4. WW-55C
5. WW-58C
6. WW-58S
7. WW-59C
8. WW-59S
9. WW-76C
10. WW-76S
11. WW-86C

REFERENCES

USEPA. March 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. Second Edition. EPA/600/R-99/064.

Benoit, D.A., G. Phipps, and G.T. Ankley. 1993. A Sediment Testing Intermittent Renewal System for the Automated Renewal of Overlying Water in Toxicity Tests with Contaminated Sediments. Water Research 27:1403-1412.

TOXCALC software package version 5.0.23.

APPENDIX A

Chain of Custody Forms

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temp during Collection |
|---|-------------------|------|--------|------|-------------|-----------|---------|--------------|----------------------------------|
| | Swimming | | Bottom | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| NW56-Indiana | 7/30/07 | | | | | X | 1/2 gal | - | |
| NW76-HaHed | 7/31/07 | | | | | X | " | - | |
| | | | | | | | | | |
| Site: MWRD6C | | | | | | | | | |
| Address: 6001 W. Pershing Rd. Cicero IL 60804 | | | | | | | | | |
| Telephone #: 708-588-4074 | | | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> C. dubia <input type="checkbox"/> FHM <input type="checkbox"/> S. capricornutum <input type="checkbox"/> D. magna <input type="checkbox"/> D. pulex <input type="checkbox"/> 10-day chronic med. Mysids <input type="checkbox"/> Menidia <input type="checkbox"/> C. variegatus <input type="checkbox"/> Other (list) <input checked="" type="checkbox"/> | | | | | | | | | |
| Samples Collected by: Tom Minarik B10 I <small>Print Title Signature</small> | | | | | | | | | |
| Samples Relinquished by: JEN WASIK B10 II <small>Print Title Signature</small> | | | | | | | | | |
| Mode of Transportation: UPS s/n Date: 8/1/07 | | | | | | | | | |
| Received by: C. Brown K. Brown Biology 8/2/07 1130 <small>Print Signature Title Date Time</small> | | | | | | | | | |
| Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No | | | | | | | | | |
| Comments: | | | | | | | | | |

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Submitted to MWRD6C
 ASci-ETL study ID# 5010-214

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temperature/Collection |
|---------------------------|-------------------|------|--------|------|-------------|-----------|---------|--------------|----------------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW55-130 th St | 7/27/07 | | | | X | | 1/2 gal | — | |
| WW55-130 th St | 7/27/07 | | | | X | | " | — | |
| WW49-Ewing | 7/26/07 | | | | X | | " | — | |
| WW56-Indiana | 7/30/07 | | | | X | | " | — | |

Site: MWRDGC
 Address: 6001 W. Pershing, Cicero IL 60864
 Telephone #: 708 588 4674

Testing Required (Check all that apply): Acute Chronic C. dubia FHM S. capricornutum D. magna D. pulex
 10-day chronomid Mysis Menidia C. variegatus Other (list)

Samples Collected by: Tom Minarek BIO I
Print Title Signature

Samples Relinquished by: Jen Wasilk BIO II
Print Title Signature

Mode of Transportation: UPS s/n Date: 8/1/07

Received by: Bob St
Print Signature Title Date Time

Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No

Comments:

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Submitted to MWRDGC
 ASci-ETL study ID# 5010-214

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temp/air in Collection |
|---|-------------------|------|--------|------|-------------|-----------|--------|--------------|----------------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW54 center | 7-24-07 | 1335 | | | | | | None | |
| WW50 center | 7-25-07 | 1320 | | | | | | ↓ | |
| WW50 side | 7-25-07 | 1300 | | | | | | | |
| WW56 center | 7-25-07 | 1100 | | | | | | | |
| Site: MWRDGC Tom Minarick | | | | | | | | | |
| Address: 6001 W. Pershing Rd. Cicero IL 60804 | | | | | | | | | |
| Telephone #: 708-568-4223 | | | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> <i>C. dubia</i> <input type="checkbox"/> FHM <input type="checkbox"/> <i>S. capricornutum</i> <input type="checkbox"/> <i>D. magna</i> <input type="checkbox"/> <i>D. pulex</i> <input type="checkbox"/> | | | | | | | | | |
| 10 day Chironomid <input checked="" type="checkbox"/> <i>Mysids</i> <input type="checkbox"/> <i>Menidia</i> <input type="checkbox"/> <i>C. variegatus</i> <input type="checkbox"/> Other (list) <input type="checkbox"/> | | | | | | | | | |
| Samples Collected by: Tom Minarick Biologist Tom Minarick | | | | | | | | | |
| Samples Relinquished by: | | | | | | | | | |
| Mode of Transportation: UPS Date: 7-30-07 | | | | | | | | | |
| Received by: | | | | | | | | | |
| Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No | | | | | | | | | |
| Comments: | | | | | | | | | |

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Submitted to MWRDGC
 ASci-ETL study ID# 5010-214

ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temp. during Collection |
|--|-------------------|------|--------|------|-------------|-----------|--------|--------------|-----------------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW46 side | 7-25-07 | 1045 | | | | | | None | |
| WW49 center | 7-26-07 | 1230 | | | | | | | |
| | | | | | | | | | |
| Site: MWRDGC Tom Minarik | | | | | | | | | |
| Address: 6001 W. Pershing Rd. Cicero IL 60804 | | | | | | | | | |
| Telephone #: 708-548-4223 | | | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> <i>C. dubia</i> <input type="checkbox"/> FHM <input type="checkbox"/> <i>S. capricornutum</i> <input type="checkbox"/> <i>D. magna</i> <input type="checkbox"/> <i>D. pulex</i> <input type="checkbox"/> 10 day Chromomid <input checked="" type="checkbox"/> <i>Mysids</i> <input type="checkbox"/> <i>Menidia</i> <input type="checkbox"/> <i>C. variegatus</i> <input type="checkbox"/> Other (list) <input type="checkbox"/> _____ | | | | | | | | | |
| Samples Collected by: Tom Minarik (Print) Biologist (Title) Tom Minarik (Signature) | | | | | | | | | |
| Samples Relinquished by: _____ (Print) _____ (Title) _____ (Signature) | | | | | | | | | |
| Mode of Transportation: UPS Date: 7-30-07 | | | | | | | | | |
| Received by: _____ (Print) _____ (Signature) _____ (Title) _____ (Date) _____ (Time) | | | | | | | | | |
| Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No | | | | | | | | | |
| Comments: | | | | | | | | | |

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ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Collection Date | | Sample Type | | Name | Preservation | Ambient Temp (duddy) Collection |
|---|-----------------|-------------|-------------|-------------------------------|------|--------------|------------------------------------|
| | Begin | End | GRB | Composite | | | |
| WV52 center | 7-23-07 | 1145 | | | | None | |
| WV52 side | 7-23-07 | 1120 | | | | ↓ | |
| WV57 side | 7-23-07 | 1430 | | | | | |
| WV97 center | 7-24-07 | 1130 | | | | | |
| Site: MWRDGC Tom Minarik | | | | | | | |
| Address: 6001 W. Pershing Rd. Cicero IL 60804 | | | | | | | |
| Telephone #: 708-568-4223 | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> <i>C. dubia</i> <input type="checkbox"/> FHM <input type="checkbox"/> <i>S. capricornutum</i> <input type="checkbox"/> <i>D. magna</i> <input type="checkbox"/> <i>D. pulex</i> <input type="checkbox"/> | | | | | | | |
| 10 day Chironomid <input checked="" type="checkbox"/> <i>Mysids</i> <input type="checkbox"/> <i>Menidia</i> <input type="checkbox"/> <i>C. variegatus</i> <input type="checkbox"/> Other (list) <input type="checkbox"/> | | | | | | | |
| Samples Collected by: | | Tom Minarik | | Biologist | | Tom Minarik | |
| | | Print | | Title | | Signature | |
| Samples Relinquished by: | | | | | | | |
| | | Print | | Title | | Signature | |
| Mode of Transportation: UPS | | | | Date: 7-30-07 | | | |
| Received by: | | | | | | | |
| | | Print | | Signature | | Title | |
| Custody Seals Present? | | Yes No | | If Yes, Custody Seals Intact? | | Yes No | |
| Comments: | | | | | | | |

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ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temp. during Collection |
|--|-------------------|------|------|------|---------------|-----------|--------|--------------|-----------------------------------|
| | Begin | | End | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW97 side | 7-24-07 | 1110 | | | | | | None | |
| WW54 side | 7-24-07 | 1320 | | | | | | ↓ | |
| | | | | | | | | ↓ | |
| Site: MWRDGC Tom Minarik | | | | | | | | | |
| Address: 6001 W. Pershing Rd. Cicero IL 60804 | | | | | | | | | |
| Telephone #: 708-568-4223 | | | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> C. dubia <input type="checkbox"/> FHM <input type="checkbox"/> S. capricornutum <input type="checkbox"/> D. magna <input type="checkbox"/> D. pulex <input type="checkbox"/> 10 day Chironomid <input checked="" type="checkbox"/> Mysids <input type="checkbox"/> Menidia <input type="checkbox"/> C. variegatus <input type="checkbox"/> Other (list) <input type="checkbox"/> | | | | | | | | | |
| Samples Collected by: Tom Minarik Biologist Tom Minarik <small>Print Title Signature</small> | | | | | | | | | |
| Samples Relinquished by: <small>Print Title Signature</small> | | | | | | | | | |
| Mode of Transportation: UPS | | | | | Date: 7-30-07 | | | | |
| Received by: <small>Print Signature Title Date Time</small> | | | | | | | | | |
| Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No | | | | | | | | | |
| Comments: | | | | | | | | | |

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ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temp. during Collection |
|---|-------------------|------|--------|------|-----------------------------------|-----------|--------|--------------|-----------------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW76 Center | 7-31-07 | 1115 | | | | | | | |
| WW58 Center | 8-1-07 | 1150 | | | | | | | |
| ww58 side | 8-1-07 | 1230 | | | | | | | |
| WW59 side | 8-2-07 | 1230 | | | | | | | |
| Site: MWRDGC | | | | | | | | | |
| Address: 6001 W. Pershing Rd. Cicero IL 60804 | | | | | | | | | |
| Telephone #: 708-588-4223 | | | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> <i>C. dubia</i> <input type="checkbox"/> FHM <input type="checkbox"/> <i>S. capricornutum</i> <input type="checkbox"/> <i>D. magna</i> <input type="checkbox"/> <i>D. pulex</i> <input type="checkbox"/> 10 day chironomid <input checked="" type="checkbox"/> <i>Mysids</i> <input type="checkbox"/> <i>Menidia</i> <input type="checkbox"/> <i>C. variegatus</i> <input type="checkbox"/> Other (list) <input type="checkbox"/> _____ | | | | | | | | | |
| Samples Collected by: MWRDGC Tom Minarik Biologist Tom Minarik <small>Print Title Signature</small> | | | | | | | | | |
| Samples Relinquished by: Tom Minarik Biologist Tom Minarik <small>Print Title Signature</small> | | | | | | | | | |
| Mode of Transportation: UPS | | | | | Date: 8-7-07 | | | | |
| Received by: K. Brown K. Brown Biologist 8/8/07 1030 <small>Print Signature Title Date Time</small> | | | | | | | | | |
| Custody Seals Present? Yes | | | | | If Yes, Custody Seals Intact? Yes | | | | |
| Comments: | | | | | | | | | |

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ASci-ETL CHAIN OF CUSTODY FORM

NPDES Permit #:

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temp. during Collection |
|---|-------------------|------|--------|------|--------------|-----------|--------|--------------|-----------------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW59 center | 8-2-07 | 1210 | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Site: MWRDGC | | | | | | | | | |
| Address: 6001 W. Pershins Rd. Cicero IL 60804 | | | | | | | | | |
| Telephone #: 708-588-4223 | | | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> <i>C. dubia</i> <input type="checkbox"/> FHM <input type="checkbox"/> <i>S. capricornutum</i> <input type="checkbox"/> <i>D. magna</i> <input type="checkbox"/> <i>D. pulex</i> <input type="checkbox"/> 10-day chironomid <input checked="" type="checkbox"/> <i>Mysids</i> <input type="checkbox"/> <i>Menidia</i> <input type="checkbox"/> <i>C. variegatus</i> <input type="checkbox"/> Other (list) <input type="checkbox"/> _____ | | | | | | | | | |
| Samples Collected by: MWRDGC Tom Minarik Biologist Tom Minarik <small>Print Title Signature</small> | | | | | | | | | |
| Samples Relinquished by: Tom Minarik Biologist Tom Minarik <small>Print Title Signature</small> | | | | | | | | | |
| Mode of Transportation: UPS | | | | | Date: 8-2-07 | | | | |
| Received by: K. Brown K. Brown Biologist 8/8/07 1030 <small>Print Signature Title Date Time</small> | | | | | | | | | |
| Custody Seals Present? Yes No If Yes, Custody Seals Intact? Yes No | | | | | | | | | |
| Comments: | | | | | | | | | |

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Submitted to MWRDGC
 ASci-ETL study ID# 5010-214

NPDES Permit #: _____

ASci-ETL CHAIN OF CUSTODY FORM

| Sample ID | Sample Collection | | | | Sample Type | | Volume | Preservation | Sample pH/Temp. during Collection |
|--|-------------------|------|--------|------|-------------|-----------|---------|--------------|-----------------------------------|
| | Beginning | | Ending | | Grab | Composite | | | |
| | Date | Time | Date | Time | | | | | |
| WW43 side | 8/9/07 | 1:00 | | | | X | 1/2 gal | — | |
| WW43 center | 8/9/07 | 1:45 | | | | X | 1/2 gal | — | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Site: <u>MWRDGC</u> | | | | | | | | | |
| Address: _____ | | | | | | | | | |
| Telephone #: <u>708 588 4074</u> | | | | | | | | | |
| Testing Required (Check all that apply): Acute <input type="checkbox"/> Chronic <input type="checkbox"/> C. dubia <input type="checkbox"/> Fathead Minnow <input type="checkbox"/> S. capricornutum <input type="checkbox"/> D. magna <input type="checkbox"/> D. pulex <input type="checkbox"/> C. tentans <input type="checkbox"/> H. azteca <input type="checkbox"/> Mysids <input type="checkbox"/> Menidia <input type="checkbox"/> C. variegates <input type="checkbox"/> Other (list) <u>10-day chironomid</u> | | | | | | | | | |
| Samples Collected by: <u>Jennifer Wasik</u> <u>BIO II</u> <u>[Signature]</u> | | | | | | | | | |
| Samples Relinquished by: <u>Jennifer Wasik</u> <u>BIO II</u> <u>[Signature]</u> | | | | | | | | | |
| Mode of Transportation: <u>UPS/AM</u> | | | | | Date: _____ | | | | |
| Received by: <u>K. Brown</u> <u>[Signature]</u> <u>Biologist</u> <u>8/11/07</u> <u>0850</u> | | | | | | | | | |
| Custody Seals Present? <u>Yes</u> No If Yes, Custody Seals Intact? <u>Yes</u> No | | | | | | | | | |
| Comments: _____ | | | | | | | | | |

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APPENDIX B

Raw Data Sheets: Sediments Received August 2, 2007

TABLE 1. Flow Rates (ml/min) and Overlying Water Chemistry Ranges for MWRDGC Sediments Test Chambers During 10-Day *Chironomus* Exposures

| Set #1 | Test Day | | | | | | | | | | | | | |
|------------------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean | low | high |
| Head Flow Rate | 320 | 322 | 324 | 326 | 324 | 324 | 326 | 322 | 324 | 326 | 324 | 324 | 320 | 326 |
| Test Chamber Flow Rate | 9.4 | 9.5 | 9.5 | 9.6 | 9.5 | 9.5 | 9.6 | 9.5 | 9.5 | 9.6 | 9.5 | 9.5 | 9.4 | 9.6 |
| Volume Exchanges | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |

| Set #2 | Test Day | | | | | | | | | | | | | |
|------------------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean | low | high |
| Head Flow Rate | 324 | 324 | 324 | 324 | 324 | 320 | 322 | 322 | 322 | 324 | 322 | 323 | 320 | 324 |
| Test Chamber Flow Rate | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 9.4 | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 9.4 | 9.5 |
| Volume Exchanges | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |

| Water Chemistry Ranges | | |
|------------------------|-----------|-----------|
| Parameter | Set #1 | Set#2 |
| Temperature | 22.0-23.7 | 22.0-22.7 |
| Dissolved Oxygen | 2.7-6.8 | 3.4-7.2 |
| pH | 6.83-8.68 | 6.90-7.17 |
| Conductivity | 113-4820 | 128-584 |
| Alkalinity | 40-184 | 40-210 |
| Hardness | 53-156 | 44-190 |
| Ammonia | 0.2-6.4 | 0.4-4.6 |

MWRDGC

TEST INITIATED 8/7/2007

10-DAY CHIRONOMUS SEDIMENT TOXICITY TEST

AUGUST 2007

STUDY ID 5010-214

TEST INITIATED 8/7/2007

Exposure System Observations/Activities Sheet for Sediments Initiated 8/7/2007

| Date | Day of Test | CT Fed 1.5 mL Slurry? | Head Flow (ml/min) | Observations |
|-----------|-------------|-----------------------|--------------------|---|
| 8/6/2007 | -1 | NA | 320 | Sediment for each site poured out |
| 8/7/2007 | 0 | yes | 320 | C. tentans loaded into sediment + |
| 8/8/2007 | 1 | yes | 322 | Sites appeared normal |
| 8/9/2007 | 2 | yes | 324 | 86C + 86S Both sites have many dead Chironomids 49C-E → one Chironomidae dead |
| 8/10/2007 | 3 | yes | 326 | Sites appear normal |
| 8/11/2007 | 4 | yes | 324 | Sites normal |
| 8/12/2007 | 5 | yes | 324 | Sites normal |
| 8/13/2007 | 6 | yes | 326 | appears normal, screens brushed |
| 8/14/2007 | 7 | yes | 322 | 56-Center all beakers have film on top of PC water all others appear normal |
| 8/15/2007 | 8 | yes | 324 | Test conditions appear normal |
| 8/16/2007 | 9 | yes | 326 | Heavy thick film on 56C slight film on 55S, 55C, 49S, 50C mold in beake 55C-f -All others normal |
| 8/17/2007 | 10 | - | 324 | CT removed from beakers. Survival determined. |

D.O. Values (mg/L)

Table 2. Overlying Water ~~Temperature Values (°C)~~ ^{D.O. Values (mg/L)} for MWRDGC SEDIMENTS During 10-Day *C. tentans* Exposures

| Day | West | WW-49 | WW-49 | WW-50 | WW-50 | WW-52 | WW-52 | WW-54 | WW-54 | WW-55 | WW-55 | WW-56 | WW-56 | WW-57 | WW-76 | WW-86 | WW-88 | WW-97 | WW-97 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|-------------------|------------------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 5.6 | 5.6 | 5.6 | 5.7 | 5.6 | 5.2 | 5.0 | 5.1 | 5.1 | 5.2 | 5.0 | 5.4 | 5.4 | 5.8 | 5.5 | 5.5 | 5.0 | 4.9 | 5.3 |
| 1 | 5.4 | 5.6 | 5.6 | 4.5 | 4.9 | 4.6 | 4.8 | 4.6 | 4.5 | 4.6 | 4.7 | 4.5 | 4.6 | 4.8 | 4.9 | 4.9 | 4.5 | 4.8 | 5.4 |
| 2 | 5.6 | 5.4 | 5.5 | 4.6 | 5.3 | 4.3 | 4.4 | 4.6 | 4.4 | 4.7 | 4.8 | 4.6 | 4.5 | 5.6 | 5.0 | 4.4 | 3.9 | 4.4 | 5.1 |
| 3 | 4.8 | 4.7 | 4.6 | 4.2 | 4.8 | 4.3 | 4.8 | 5.0 | 5.0 | 4.6 | 4.6 | 4.6 | 4.0 | 3.8 | 3.7 | 3.7 | 3.5 | 3.7 | 4.6 |
| 4 | 4.9 | 4.8 | 4.9 | 5.1 | 5.0 | 4.5 | 4.3 | 4.6 | 4.6 | 4.7 | 4.5 | 4.3 | 4.4 | 4.2 | 4.4 | 4.6 | 4.3 | 4.3 | 4.5 |
| 5 | 4.8 | 4.8 | 4.6 | 4.6 | 4.9 | 4.5 | 4.5 | 4.3 | 4.8 | 4.5 | 4.9 | 4.5 | 4.4 | 4.3 | 4.5 | 4.4 | 4.5 | 4.2 | 4.5 |
| 6 | 4.6 | 4.3 | 4.3 | 3.8 | 3.5 | 3.3 | 3.5 | 3.6 | 3.7 | 3.7 | 3.9 | 2.9 | 3.3 | 3.3 | 3.3 | 3.3 | 2.9 | 3.5 | 3.7 |
| 7 | 6.1 | 6.0 | 4.8 | 4.2 | 4.1 | 4.0 | 4.0 | 4.4 | 4.9 | 5.1 | 4.5 | 3.9 | 3.6 | 4.2 | 3.8 | 3.8 | 3.5 | 4.1 | 4.6 |
| 8 | 4.1 | 4.9 | 4.2 | 4.5 | 4.9 | 4.5 | 4.4 | 4.3 | 4.6 | 4.3 | 4.0 | 4.4 | 4.4 | 3.9 | 3.4 | 3.6 | 2.7 | 5.4 | 5.5 |
| 9 | 5.4 | 5.4 | 4.9 | 4.9 | 4.9 | 4.4 | 4.5 | 4.4 | 4.7 | 4.4 | 4.4 | 5.0 | 4.4 | 4.1 | 4.5 | 3.9 | 4.0 | 5.1 | 5.0 |
| 10 | 6.6 | 6.8 | 6.5 | 6.0 | 6.2 | 6.1 | 6.0 | 6.3 | 6.8 | 6.5 | 6.0 | 6.0 | 5.1 | 6.0 | 5.0 | 6.7 | 5.9 | 5.9 | 6.3 |

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Temperature Values (°C)

Table 3. Overlying Water ~~B.O. Values (mg/L)~~ for MWRDGC Sediments During 10-Day *C. tentans* Exposures

| Day | West Bearskin | WW-49 CENTER | WW-49 SIDE | WW-50 CENTER | WW-50 SIDE | WW-52 CENTER | WW-52 SIDE | WW-54 CENTER | WW-54 SIDE | WW-55 CENTER | WW-55 SIDE | WW-56 CENTER | WW-56 SIDE | WW-57 Side CENTER | WW-76 Side SIDE | WW-86 CENTER | WW-86 SIDE | WW-97 CENTER | WW-97 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-------------------------|----------------------------------|-----------------|---------------|-----------------|---------------|
| 0 | 22.5 | 23.4 | 23.2 | 23.3 | 23.4 | 23.5 | 23.3 | 22.8 | 22.8 | 22.9 | 22.8 | 23.0 | 23.1 | 23.2 | 23.1 | 23.4 | 23.1 | 23.4 | 23.3 |
| 1 | 22.6 | 23.3 | 23.4 | 23.2 | 23.3 | 23.4 | 23.2 | 23.1 | 22.9 | 23.0 | 22.6 | 22.9 | 23.1 | 23.2 | 23.2 | 23.3 | 23.3 | 23.3 | 23.3 |
| 2 | 22.0 | 23.2 | 23.2 | 23.1 | 23.3 | 23.5 | 23.2 | 22.9 | 22.8 | 22.9 | 22.7 | 23.0 | 23.0 | 23.4 | 23.3 | 23.4 | 23.1 | 23.3 | 23.4 |
| 3 | 22.5 | 23.5 | 23.3 | 23.2 | 23.3 | 23.5 | 23.3 | 23.0 | 22.8 | 22.8 | 22.8 | 23.0 | 23.2 | 23.2 | 23.3 | 23.3 | 23.3 | 23.4 | 23.4 |
| 4 | 22.6 | 23.3 | 23.3 | 23.2 | 23.4 | 23.5 | 23.2 | 23.2 | 23.0 | 22.8 | 22.8 | 23.1 | 23.0 | 23.3 | 23.2 | 23.3 | 23.3 | 23.0 | 23.2 |
| 5 | 22.5 | 23.4 | 23.3 | 23.3 | 23.4 | 23.4 | 23.4 | 23.3 | 22.9 | 22.9 | 22.9 | 22.8 | 22.9 | 23.2 | 23.1 | 23.3 | 23.1 | 23.2 | 23.3 |
| 6 | 22.5 | 23.3 | 23.3 | 23.4 | 23.6 | 23.5 | 23.2 | 22.9 | 22.9 | 22.9 | 22.6 | 23.0 | 23.0 | 23.2 | 23.2 | 23.3 | 23.2 | 23.4 | 23.3 |
| 7 | 22.4 | 22.4 | 23.4 | 23.6 | 23.7 | 23.7 | 23.3 | 23.0 | 23.1 | 23.0 | 22.8 | 22.9 | 22.9 | 23.1 | 23.1 | 23.3 | 23.2 | 23.3 | 23.2 |
| 8 | 22.4 | 22.3 | 23.3 | 23.1 | 23.2 | 23.3 | 23.6 | 23.9 | 23.2 | 23.1 | 22.9 | 22.9 | 22.8 | 23.3 | 23.0 | 23.3 | 23.3 | 23.2 | 23.4 |
| 9 | 22.5 | 23.2 | 23.2 | 23.1 | 23.2 | 23.4 | 23.1 | 22.9 | 22.8 | 22.9 | 22.9 | 23.1 | 23.2 | 23.1 | 23.1 | 23.2 | 23.2 | 23.3 | 23.3 |
| 10 | 22.4 | 23.2 | 23.0 | 22.8 | 22.9 | 23.0 | 23.0 | 22.7 | 22.8 | 22.7 | 22.8 | 22.8 | 22.8 | 22.9 | 23.0 | 23.1 | 23.0 | 22.9 | 22.8 |

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Table 4. Overlying Water pH Values for MWRDGC Sediments During 10-Day *C. tentans* Exposures

| Day | West | WW-49 | WW-49 | WW-50 | WW-50 | WW-52 | WW-52 | WW-54 | WW-54 | WW-55 | WW-55 | WW-56 | WW-56 | WW-57 | WW-76 | WW-86 | WW-86 | WW-97 | WW-97 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|------------------------|-------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | SIDE CENTER SIDE | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 7.61 | 7.60 | 7.52 | 8.08 | 7.95 | 7.63 | 7.70 | 7.70 | 7.43 | 7.75 | 7.81 | 7.49 | 7.50 | 7.56 | 7.40 | 7.53 | 7.57 | 7.69 | 7.60 |
| 10 | 7.63 | 7.32 | 7.33 | 7.53 | 7.51 | 7.22 | 7.10 | 7.10 | 7.11 | 7.25 | 7.30 | 7.27 | 7.28 | 7.07 | 7.21 | 7.39 | 7.08 | 7.10 | 7.21 |

Revised 8/17/07

Table 5. Overlying Water Cond. Values (umhos/cm) for MWRDGC. Sediments During 10-Day *C. tentans* Exposures.

| Day | West | WW-49 | WW-49 | WW-50 | WW-50 | WW-52 | WW-52 | WW-54 | WW-54 | WW-55 | WW-55 | WW-56 | WW-56 | WW-57 | WW-76 | WW-86 | WW-86 | WW-97 | WW-97 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|------------------------|-------|--------|-------|--------|-------|
| | Bearskin | CENTER | SIDE | SIDE CENTER SIDE | SIDE | CENTER | SIDE | CENTER | SIDE |
| 0 | 113 | 287 | 172 | 199 | 190 | 293 | 315 | 469 | 209 | 186 | 251 | 223 | 225 | 257 | 172 | 4750 | 4820 | 228 | 254 |
| 10 | 141 | 291 | 258 | 195 | 178 | 259 | 192 | 190 | 206 | 213 | 206 | 263 | 259 | 183 | 196 | 1824 | 227 | 160 | 284 |

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Table 6. Overlying Water Alkalinity Values (mg/L) for MWRDGC Sediments During 10-Day *C. tentans* Exposures.

| Day | West Bearskin | WW-49 CENTER | WW-49 SIDE | WW-50 CENTER | WW-50 SIDE | WW-52 CENTER | WW-52 SIDE | WW-54 CENTER | WW-54 SIDE | WW-55 CENTER | WW-55 SIDE | WW-56 CENTER | WW-56 SIDE | WW-57 SIDE CENTER SE KL 8/14/07 | WW-76 SIDE | WW-86 CENTER | WW-86 SIDE | WW-97 CENTER | WW-97 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|--|---------------|-----------------|---------------|-----------------|---------------|
| 0 | 40.0 | 82.0 | 68.0 | 92.0 | 74.0 | 74.0 | 86.0 | 72.0 | 86.0 | 66.0 | 90.0 | 83.0 | 76.0 | 76.0 | 58.0 | 133.0 | 122.0 | 54.0 | 64.3 |
| 10 | 57.2 | 72.2 | 105.0 | 100.0 | 74.0 | 113.6 | 66.0 | 72.2 | 73.0 | 89.0 | 82.2 | 114.0 | 110.4 | 74.0 | 72.0 | 190.0 | 96.2 | 184.0 | 64.0 |

REF
9/4

Table 7. Overlying Water Hardness Values (mg/L) for MWRDGC Sediments During 10-Day *C. tentans* Exposures.

| Day | West Bearskin | WW-49 CENTER | WW-49 SIDE | WW-50 CENTER | WW-50 SIDE | WW-52 CENTER | WW-52 SIDE | WW-54 CENTER | WW-54 SIDE | WW-55 CENTER | WW-55 SIDE | WW-56 CENTER | WW-56 SIDE | WW-57 SIDE CENTER SE KL 8/14/07 | WW-76 SIDE | WW-86 CENTER | WW-86 SIDE | WW-97 CENTER | WW-97 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|--|---------------|-----------------|---------------|-----------------|---------------|
| 0 | 58.0 | 80.2 | 83.0 | 62.0 | 60.0 | 105.0 | 105.0 | 96.0 | 96.0 | 79.0 | 115.0 | 88.0 | 90.0 | 87.0 | 84.0 | 142.0 | 122.0 | 82.0 | 88.2 |
| 10 | 53.0 | 69.0 | 104.0 | 92.0 | 71.0 | 104.0 | 72.0 | 83.0 | 84.0 | 71.0 | 70.0 | 102.0 | 105.0 | 75.0 | 58.0 | 156.0 | 70.0 | 67.0 | 62.0 |

Table 8. Overlying Water Ammonia Values (mg/L) for MWRDGC Sediments During 10-Day *C. tentans* Exposures.

| Day | West Bearskin | WW-49 CENTER | WW-49 SIDE | WW-50 CENTER | WW-50 SIDE | WW-52 CENTER | WW-52 SIDE | WW-54 CENTER | WW-54 SIDE | WW-55 CENTER | WW-55 SIDE | WW-56 CENTER | WW-56 SIDE | WW-57 SIDE CENTER SE KL 8/14/07 | WW-76 SIDE | WW-86 CENTER | WW-86 SIDE | WW-97 CENTER | WW-97 SIDE |
|-----|------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|--|---------------|-----------------|---------------|-----------------|---------------|
| 0 | 40.2 | 40.2 | 1.10 | 2.0 | 0.8 | 0.3 | 3.2 | 40.2 | 40.2 | 0.5 | 0.8 | 1.1 | 1.4 | 0.3 | <0.2 | 2.3 | 6.4 | <0.2 | 0.2 |
| 10 | 0.74 | 0.59 | 2.41 | 1.49 | 0.69 | 1.67 | 1.95 | 0.97 | 1.36 | 1.25 | 1.21 | 3.01 | 2.31 | 0.97 | 6.26 | 2.78 | 2.84 | 0.68 | 0.26 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|------------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 8 | 2 | 8 | 1269.32 | 1283.36 | 1271.97 |
| B | 10 | 0 | 10 | 1271.19 | 1279.08 | 1272.23 |
| C | 10 | 0 | 10 | 1274.02 | 1286.70 | 1276.82 |
| D | 9 | 1 | 9 | 1276.79 | 1289.86 | 1279.56 |
| E | 10 | 0 | 10 | 1273.78 | 1287.16 | 1276.95 |
| F | 10 | 0 | 10 | 1280.76 | 1293.77 | 1283.80 |
| G | 8 | 2 | 8 | 1289.32 | PEWL 8/24/07 121300.17 | 1291.35 |
| H | 10 | 0 | 10 | 1272.50 | 1283.93 | 1275.41 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-49 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 7 | 3 | 7 | 1269.66 | 1274.20 | 1270.84 |
| B | 8 | 2 | 8 | 1283.30 | 1286.02 | 1283.58 |
| C | 4 | 0 | 4 | 1286.31 | 1286.97 | 1286.43 |
| D | 7 | 3 | 7 | 1274.91 | 1276.84 | 1275.26 |
| E | 4 | 0 | 4 | 1274.33 | 1275.13 | 1274.43 |
| F | 4 | 0 | 4 | 1272.06 | 1274.06 | 1272.02 |
| G | 5 | 5 | 5 | 1282.10 | 1284.59 | 1283.41 |
| H | 7 | 3 | 7 | 1284.31 | 1286.37 | 1284.71 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-49 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|----------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 9 | 1 | 9 | 1278.67 | 1292.78 | 1283.30 |
| B | 10 | 0 | 10 | 1284.49 | 1300.54 | 1290.47 |
| C | 8 | 2 | 8 | 1277.54 | 1290.72 | 1281.78 |
| D | 9 | 1 | 9 | 1284.31 | 1300.05 | 1289.83 |
| E | 10 | 0 | 10 | 1288.88 | 1301.06 | 1292.75 |
| F | 9 | 1 | 9 | 1282.02 | 1297.55 | 1287.77 |
| G | 9 | 1 | 9 | 1276.55 | 1292.72 | 1281.84 |
| H | 9 | 1 | 9 | 1280.11 | RE PL 2/3/07 1294.24 | 1285.89 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-50 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 8 | 2 | 8 | 1277.45 | 1293.39 | 1281.59 |
| B | 10 | 0 | 10 | 1282.52 | 1299.52 | 1287.63 |
| C | 8 | 2 | 8 | 1281.98 | 1297.11 | 1285.94 |
| D | 4 | 4 | 6 | 1277.43 | 1293.03 | 1282.17 |
| E | 8 | 2 | 8 | 1281.12 | 1297.46 | 1285.76 |
| F | - | - | - | 1277.96 | - | - |
| G | 7 | 3 | 7 | 1279.62 | 1297.42 | 1284.78 |
| H | 8 | 2 | 8 | 1275.21 | 1290.48 | 1278.01 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-50 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 8 | 2 | 8 | 1278.02 | 1289.91 | 1281.11 |
| B | 8 | 2 | 8 | 1280.77 | 1291.60 | 1283.45 |
| C | 10 | 0 | 10 | 1266.04 | 1281.58 | 1271.32 |
| D | 10 | 0 | 10 | 1282.06 | 1295.64 | 1285.41 |
| E | 8 | 2 | 8 | 1279.51 | 1289.93 | 1282.22 |
| F | 10 | 0 | 10 | 1287.47 | 1300.21 | 1290.88 |
| G | 9 | 1 | 9 | 1266.43 | 1278.78 | 1267.81 |
| H | 9 | 1 | 9 | 1278.80 | 1291.59 | 1282.89 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-52 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|----------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 9 | 1 | 9 | 1272.55 | 1290.84 | 1277.30 |
| B | 7 | 3 | 7 | 1266.72 | 1279.29 | 1269.92 |
| C | 10 | 0 | 10 | 1283.55 | 1280.43 1300.43 | 1288.49 |
| D | 10 | 0 | 10 | 1276.37 | 1289.44 | 1279.96 |
| E | 4 | 6 | 4 | 1262.61 | 1273.27 | 1265.01 |
| F | 9 | 1 | 9 | 1280.04 | 1297.60 | 1285.25 |
| G | 10 | 0 | 10 | 1274.26 | 1293.99 | 1281.50 |
| H | 6 | 4 | 6 | 1288.67 | 1301.34 | 1291.58 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-52 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 9 | 1 | 9 | 1272.37 | 1292.13 | 1278.44 |
| B | 8 | 2 | 8 | 1276.58 | 1289.67 | 1279.54 |
| C | 8 | 2 | 8 | 1281.26 | 1296.30 | 1284.39 |
| D | 10 | 0 | 10 | 1279.25 | 1297.85 | 1283.80 |
| E | 8 | 2 | 8 | 1275.00 | 1288.50 | 1277.64 |
| F | 10 | 0 | 10 | 1279.77 | 1296.44 | 1284.22 |
| G | 6 | 4 | 6 | 1278.75 | 1295.15 | 1283.73 |
| H | 7 | 3 | 7 | 1275.45 | 1290.25 | 1279.33 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-54 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 9 | 1 | 9 | 1263.56 | 1276.75 | 1266.30 |
| B | 10 | 0 | 10 | 1280.88 | 1295.05 | 1284.77 |
| C | 9 | 1 | 9 | 1275.78 | 1288.83 | 1278.45 |
| D | 10 | 0 | 10 | 1282.54 | 1295.67 | 1284.79 |
| E | 10 | 0 | 10 | 1282.27 | 1296.50 | 1285.57 |
| F | 0 | 10 | 0 | 1278.20 | - | - |
| G | 8 | 2 | 8 | 1280.53 | 1292.02 | 1283.64 |
| H | 7 | 3 | 7 | 1281.82 | 1294.94 | 1286.54 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-54 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 9 | 1 | 9 | 1276.31 | 1290.22 | 1281.32 |
| B | 7 | 3 | 7 | 1284.36 | 1300.56 | 1290.35 |
| C | 10 | 0 | 10 | 1275.85 | 1287.61 | 1279.99 |
| D | 10 | 0 | 10 | 1274.92 | 1292.13 | 1280.71 |
| E | 10 | 0 | 10 | 1281.84 | 1295.17 | 1286.57 |
| F | 10 | 0 | 10 | 1271.07 | 1285.83 | 1276.30 |
| G | 8 | 2 | 8 | 1275.74 | 1289.42 | 1280.00 |
| H | 10 | 0 | 10 | 1280.33 | 1296.06 | 1285.15 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-55 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 7 | 3 | 7 | 1274.81 | 1284.57 | 1277.63 |
| B | 6 | 4 | 6 | 1275.17 | 1281.03 | 1276.25 |
| C | 10 | 0 | 10 | 1283.97 | 1294.36 | 1287.14 |
| D | 9 | 1 | 9 | 1283.03 | 1294.38 | 1286.43 |
| E | 7 | 3 | 7 | 1284.43 | 1293.38 | 1287.16 |
| F | 1 | 9 | 1 | 1280.48 | 1281.49 | 1280.72 |
| G | 9 | 1 | 9 | 1282.42 | 1290.11 | 1284.45 |
| H | 10 | 0 | 10 | 1275.42 | 1285.86 | 1278.68 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-55 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 7 | 3 | 7 | 1280.39 | 1296.78 | 1284.19 |
| B | 10 | 0 | 10 | 1283.23 | 1296.21 | 1285.18 |
| C | 7 | 3 | 7 | 1268.43 | 1278.87 | 1269.12 |
| D | 10 | 0 | 10 | 1271.86 | 1289.18 | 1275.76 |
| E | 7 | 3 | 7 | 1276.60 | 1286.18 | 1277.85 |
| F | 9 | 1 | 9 | 1277.70 | 1289.85 | 1279.53 |
| G | 10 | 0 | 10 | 1273.29 | 1292.83 | 1277.52 |
| H | 7 | 3 | 7 | 1269.09 | 1285.20 | 1272.86 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-56 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 10 | 0 | 10 | 1268.61 | 1282.30 | 1272.33 |
| B | 9 | 1 | 9 | 1274.82 | 1290.99 | 1280.09 |
| C | 10 | 0 | 10 | 1274.82 | 1290.71 | 1280.28 |
| D | 8 | 2 | 8 | 1270.75 | 1287.26 | 1276.99 |
| E | 10 | 0 | 10 | 1271.81 | 1286.93 | 1276.82 |
| F | 10 | 0 | 10 | 1273.74 | 1291.80 | 1280.00 |
| G | 10 | 0 | 10 | 1272.14 | 1287.09 | 1277.75 |
| H | 10 | 0 | 10 | 1266.67 | 1282.45 | 1272.42 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-56 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|-----------------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 10 | 0 | 10 | 1267.25 | 1281.69 | 1271.94 |
| B | 10 | 0 | 10 | 1272.66 | 1288.58 | 1277.42 |
| C | 8 | 2 | 8 10 | 1270.63 | 1284.51 | 1274.63 |
| D | 8 | 2 | 8 | 1278.74 | 1291.32 | 1283.49 |
| E | 10 | 0 | 10 | 1278.26 | 1295.53 | 1285.02 |
| F | 10 | 0 | 10 | 1267.93 | 1283.98 | 1274.27 |
| G | 10 | 0 | 10 | 1275.20 | 1290.66 | 1280.69 |
| H | 9 | 1 | 9 | 1270.65 | 1287.42 | 1276.47 |

*1 small

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-57 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 9 | 1 | 9 | 1277.35 | 1290.88 | 1280.94 |
| B | 10 | 0 | 10 | 1270.13 | 1286.14 | 1274.46 |
| C | 7 | 3 | 7 | 1270.72 | 1284.41 | 1274.45 |
| D | 10 | 0 | 10 | 1275.04 | 1292.81 | 1280.15 |
| E | 10 | 0 | 10 | 1275.89 | 1289.76 | 1279.41 |
| F | 10 | 0 | 10 | 1274.26 | 1286.28 | 1277.35 |
| G | 9 | 1 | 9 | 1268.10 | 1285.09 | 1271.55 |
| H | 10 | 0 | 10 | 1270.38 | 1287.60 | 1275.25 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-76 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 10 | 0 | 10 | 1267.88 | 1279.70 | 1271.34 |
| B | 10 | 0 | 10 | 1270.04 | 1279.75 | 1272.71 |
| C | 10 | 0 | 10 | 1273.54 | 1285.93 | 1276.63 |
| D | 10 | 0 | 10 | 1270.58 | 1282.63 | 1273.25 |
| E | 10 | 0 | 10 | 1272.16 | 1282.10 | 1274.85 |
| F | 10 | 0 | 10 | 1265.68 | 1274.90 | 1267.49 |
| G | 10 | 0 | 10 | 1278.99 | 1281.54 | 1275.17 |
| H | 10 | 0 | 10 | 1264.86 | 1275.39 | 1266.93 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-97 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 8 | 2 | 8 | 1277.55 | 1292.25 | 1281.61 |
| B | 9 | 1 | 9 | 1271.71 | 1279.50 | 1272.68 |
| C | 8 | 2 | 8 | 1274.21 | 1289.63 | 1278.76 |
| D | 8 | 2 | 8 | 1282.99 | 1296.20 | 1286.31 |
| E | 10 | 0 | 10 | 1280.47 | 1297.83 | 1284.74 |
| F | 10 | 0 | 10 | 1275.45 | 1291.88 | 1279.59 |
| G | 9 | 1 | 9 | 1277.48 | 1293.13 | 1281.41 |
| H | 10 | 0 | 10 | 1281.36 | 1298.67 | 1285.55 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-97 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 6 | 4 | 6 | 1276.94 | 1287.00 | 1279.08 |
| B | 7 | 3 | 7 | 1277.54 | 1290.45 | 1280.94 |
| C | 8 | 2 | 8 | 1279.36 | 1291.17 | 1282.49 |
| D | 10 | 0 | 10 | 1276.99 | 1290.99 | 1280.90 |
| E | 9 | 1 | 9 | 1277.86 | 1290.22 | 1280.85 |
| F | 9 | 1 | 9 | 1266.02 | 1278.86 | 1269.82 |
| G | 9 | 1 | 9 | 1274.03 | 1286.45 | 1276.69 |
| H | 10 | 0 | 10 | 1272.36 | 1284.71 | 1275.99 |

APPENDIX C

Raw Data Sheets: Sediments Received August 8, 2007

TABLE 1. Flow Rates (ml/min) and Overlying Water Chemistry Ranges for MWRDGC Sediments Test Chambers During 10-Day *Chironomus* Exposures

| Set #1 | Test Day | | | | | | | | | | | | | |
|------------------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean | low | high |
| Head Flow Rate | 320 | 322 | 324 | 326 | 324 | 324 | 326 | 322 | 324 | 326 | 324 | 324 | 320 | 326 |
| Test Chamber Flow Rate | 9.4 | 9.5 | 9.5 | 9.6 | 9.5 | 9.5 | 9.6 | 9.5 | 9.5 | 9.6 | 9.5 | 9.5 | 9.4 | 9.6 |
| Volume Exchanges | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Set #2 | Test Day | | | | | | | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Mean | low | high |
| Head Flow Rate | 324 | 324 | 324 | 324 | 324 | 320 | 322 | 322 | 322 | 324 | 322 | 323 | 320 | 324 |
| Test Chamber Flow Rate | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 9.4 | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 9.5 | 9.4 | 9.5 |
| Volume Exchanges | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |

| Water Chemistry Ranges | | |
|------------------------|-----------|-----------|
| Parameter | Set #1 | Set#2 |
| Temperature | 22.0-23.7 | 22.0-22.7 |
| Dissolved Oxygen | 2.7-6.8 | 3.4-7.2 |
| pH | 6.83-8.68 | 6.90-7.17 |
| Conductivity | 113-4820 | 128-584 |
| Alkalinity | 40-184 | 40-210 |
| Hardness | 53-156 | 44-190 |
| Ammonia | 0.2-6.4 | 0.4-4.6 |

MWRDGC
10-DAY CHIRONOMUS SEDIMENT TOXICITY TEST
AUGUST 2007
STUDY ID 5010-214
TEST INITIATED 8/14/2007

Exposure System Observations/Activities Sheet for Sediments Initiated 8/14/2007

| Date | Day of Test | CT Fed 1.5 mL Slurry? | Head Flow (ml/min): | Observations |
|-----------|-------------|-----------------------|---------------------|--|
| 8/13/2007 | -1 | NA | 322 | Filled 500 ⁴³⁰ Beakers with 100mLs of Sediment |
| 8/14/2007 | 0 | yes | 324 | Loaded Chironomidae into beakers |
| 8/15/2007 | 1 | yes | 324 | Test conditions appeared normal |
| 8/16/2007 | 2 | yes | 324 | Slight film on top 43C, 43S, 58C, 58S Slight film + many dead Chiros in 59C + 59S. |
| 8/17/2007 | 3 | yes | 324 | Test conditions appear normal - KR |
| 8/18/2007 | 4 | yes | 324 | Test conditions appear normal - KL |
| 8/19/2007 | 5 | YES | 320 | TEST COND LOOK GOOD. |
| 8/20/2007 | 6 | yes | 322 | Test conditions normal. |
| 8/21/2007 | 7 | yes | 322 | HEAVY film across top of water in beakers on 43C, 43S, 59C, 59S Chiros on top of sediment in beakers in 76C, 59S, 59C, 58C, 43S, + 43C |
| 8/22/2007 | 8 | YES | 322 | Test conditions appear normal - KR |
| 8/23/2007 | 9 | YES | 324 | Film on same beakers as day 7 Chiros on top of sed. in 43C, 43S, + 76C |
| 8/24/2007 | 10 | NO | 322 | Chiros removed from sediment + test terminated |

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ASci-ETL study ID# 5010-214

Table 2. Overlying Water Temperature Values (°C) for MWRDGC SEDIMENTS During 10-Day *C. tentans* Exposures

| Day | West | WW-43 | WW-43 | WW-58 | WW-58 | WW-59 | WW-59 | WW-76 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER |
| 0 | 22.1 | 22.3 | 22.4 | 22.5 | 22.5 | 22.4 | 22.3 | 22.3 |
| 1 | 22.2 | 22.4 | 22.4 | 22.5 | 22.6 | 22.3 | 22.3 | 22.2 |
| 2 | 22.6 | 22.7 | 22.7 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| 3 | 22.5 | 22.4 | 22.5 | 22.5 | 22.6 | 22.4 | 22.5 | 22.5 |
| 4 | 22.3 | 22.3 | 22.3 | 22.4 | 22.4 | 22.5 | 22.4 | 22.5 |
| 5 | 22.6 | 22.5 | 22.6 | 22.5 | 22.4 | 22.5 | 22.5 | 22.4 |
| 6 | 22.4 | 22.4 | 22.3 | 22.3 | 22.4 | 22.4 | 22.4 | 22.3 |
| 7 | 22.2 | 22.6 | 22.5 | 22.5 | 22.5 | 22.6 | 22.5 | 22.5 |
| 8 | 22.5 | 22.3 | 22.4 | 22.5 | 22.5 | 22.4 | 22.4 | 22.3 |
| 9 | 22.0 | 22.0 | 22.1 | 22.0 | 22.1 | 22.0 | 22.1 | 22.1 |
| 10 | 22.2 | 22.2 | 22.3 | 22.3 | 22.3 | 22.2 | 22.2 | 22.2 |

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Table 3. Overlying Water D.O.Values (mg/L) for MWRDGC Sediments During 10-Day *C. tentans* Exposures

| Day | West | WW-43 | WW-43 | WW-58 | WW-58 | WW-59 | WW-59 | WW-76 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER |
| 0 | 7.2 | 4.8 | 4.7 | 4.3 | 4.2 | 3.4 | 4.8 | 4.1 |
| 1 | 4.7 | 4.8 | 4.7 | 4.6 | 4.5 | 5.0 | 4.9 | 4.8 |
| 2 | 5.2 | 6.1 | 6.2 | 4.9 | 5.8 | 5.4 | 5.5 | 5.4 |
| 3 | 4.7 | 5.7 | 6.0 | 6.1 | 5.3 | 5.3 | 5.7 | 5.8 |
| 4 | 4.8 | 5.5 | 5.8 | 6.0 | 5.4 | 5.3 | 5.5 | 5.6 |
| 5 | 5.0 | 5.2 | 5.6 | 6.0 | 5.6 | 5.2 | 5.6 | 5.5 |
| 6 | 4.9 | 5.4 | 5.4 | 5.8 | 5.6 | 5.0 | 5.6 | 5.4 |
| 7 | 4.8 | 4.1 | 4.7 | 4.1 | 3.9 | 4.2 | 4.3 | 3.9 |
| 8 | 4.2 | 5.2 | 5.1 | 4.7 | 4.3 | 3.8 | 4.1 | 4.1 |
| 9 | 4.0 | 4.4 | 5.3 | 4.9 | 4.0 | 4.2 | 5.0 | 4.0 |
| 10 | 4.2 | 4.6 | 4.8 | 4.8 | 4.1 | 4.1 | 4.8 | 4.0 |

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Table 4. Overlying Water pH Values for MWRDGC Sediments During 10-Day *C. tentans* Exposures

| Day | West Bearskin | WW-43 CENTER | WW-43 SIDE | WW-58 CENTER | WW-58 SIDE | WW-59 CENTER | WW-59 SIDE | WW-76 CENTER |
|-----|------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
| 0 | 6.90 | 7.14 | 7.26 | 7.17 | 7.19 | 6.96 | 7.10 | 6.98 |
| 10 | 6.92 | 7.03 | 7.23 | 6.99 | 7.02 | 7.01 | 7.09 | 7.06 |

Table 5. Overlying Water Cond. Values (umhos/cm) for MWRDGC. Sediments During 10-Day *C. tentans* Exposures.

| Day | West Bearskin | WW-43 CENTER | WW-43 SIDE | WW-58 CENTER | WW-58 SIDE | WW-59 CENTER | WW-59 SIDE | WW-76 CENTER |
|-----|------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
| 0 | 128 | 261 | 256 | 322 | 584 | 274 | 331 | 257 |
| 10 | 189 | 266 | 347 | 262 | 351 | 259 | 304 | 253 |

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Table 6. Overlying Water Alkalinity Values (mg/L) for MWRDGC Sediments During 10-Day *C. tentans* Exposures.

| Day | West | WW-43 | WW-43 | WW-58 | WW-58 | WW-59 | WW-59 | WW-76 |
|-----|---------------------|---------------------|----------------------|--------|-------|--------|-------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER |
| 0 | 40 | 87 | 74 | 98 | 138 | 80 | 98 | 88 |
| 10 | 35 37 | 85 90 | 72 125 | 98 | 120 | 82 | 118 | 210 |

Table 7. Overlying Water Hardness Values (mg/L) for MWRDGC Sediments During 10-Day *C. tentans* Exposures.

| Day | West | WW-43 | WW-43 | WW-58 | WW-58 | WW-59 | WW-59 | WW-76 |
|-----|----------|--------|-------|--------|-------|--------|-------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER |
| 0 | 44 | 170 | 70 | 75 | 134 | 82 | 97 | 74 |
| 10 | 72 | 70 | 116 | 100 | 100 | 75 | 108 | 190 |

Table 8. Overlying Water Ammonia Values (mg/L) for MWRDGC Sediments During 10-Day *C. tentans* Exposures.

| Day | West | WW-43 | WW-43 | WW-58 | WW-58 | WW-59 | WW-59 | WW-76 |
|-----|----------|-------------------------|-------|--------|-------|-------------------------|-------|--------|
| | Bearskin | CENTER | SIDE | CENTER | SIDE | CENTER | SIDE | CENTER |
| 0 | 0.371 | 3.60 | 3.67 | 2.54 | 4.57 | 2.57 | 3.27 | 2.95 |
| 10 | 2.29 | 2.75 1.86 | 3.02 | 1.20 | 4.17 | 1.20 1.39 | 1.92 | 2.45 |

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Chironomus tentans 10-day Survival and Growth Data

Site ID # WEST BEARSKIN

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|-----------------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 10 | 0 | 10 | 1284.63 | 1293.92 | 1285.51 |
| B | 10 | 0 | 10 | 1277.36 | 1288.11 | 1278.31 |
| C | 10 | 0 | 10 9 | 1260.40 | 1268.69 | 1261.35 |
| D | 9 | 1 | 9 | 1272.46 | 1281.83 | 1273.25 |
| E | 9 | 1 | 9 | 1273.34 | 1284.84 | 1274.53 |
| F | 10 | 0 | 10 | 1268.55 | 1281.38 | 1270.12 |
| G | 9 | 1 | 9 | 1276.50 | 1289.97 | 1277.69 |
| H | 8 | 3 | 7 | 1269.74 | 1277.55 | 1270.65 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW43 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 1 | 9 | 1 | 1273.58 | 1273.68 | 1273.61 |
| B | 1 | 9 | 1 | 1276.95 | 1277.20 | 1276.99 |
| C | 0 | 10 | 0 | — | — | — |
| D | 5 | 5 | 5 | 1271.95 | 1274.38 | 1272.14 |
| E | 4 | 6 | 4 | 1264.68 | 1265.93 | 1264.74 |
| F | 6 | 4 | 6 | 1279.41 | 1280.60 | 1279.46 |
| G | 4 | 6 | 4 | 1270.11 | 1270.64 | 1270.59 |
| H | 5 | 5 | 5 | 1275.49 | 1276.57 | 1275.54 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-43 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 4 | 6 | 4 | 1279.73 | 1280.60 | 1279.78 |
| B | 4 | 6 | 4 | 1278.50 | 1278.98 | 1278.58 |
| C | 4 | 6 | 4 | 1286.17 | 1287.08 | 1286.21 |
| D | 4 | 6 | 4 | 1270.08 | 1270.84 | 1270.10 |
| E | 3 | 7 | 3 | 1273.00 | 1273.22 | 1273.03 |
| F | 5 | 5 | 5 | 1277.72 | 1278.43 | 1277.76 |
| G | 5 | 5 | 5 | 1274.44 | 1275.83 | 1274.65 |
| H | 5 | 5 | 5 | 1271.40 | 1272.43 | 1271.41 |

#435+ting chiros

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-58 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|----------------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 8 | 2 | 8 | 1265.60 | 1270.70 | 1266.23 |
| B | 8 | 2 | 8 | 1274.11 | 1277.22 | 1274.80 |
| * C | 1 | 9 | 8 1 | 1274.95 | 1275.98 | 1274.99 |
| D | 7 | 3 | 7 | 1278.35 | 1282.28 | 1278.90 |
| E | 8 | 2 | 8 | 1279.11 | 1284.36 | 1279.90 |
| F | 7 | 3 | 7 | 1284.75 | 1288.89 | 1285.00 |
| G | 8 | 2 | 8 | 1267.67 | 1271.76 | 1268.13 |
| H | 5 | 5 | 5 | 1276.92 | 1278.21 | 1276.97 |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-58 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 10 | 0 | 10 | 1273.98 | 1279.78 | 1274.77 |
| B | 8 | 2 | 8 | 1274.36 | 1279.65 | 1274.95 |
| C | 7 | 3 | 7 | 1280.25 | 1285.07 | 1280.76 |
| D | 10 | 0 | 10 | 1275.25 | 1280.30 | 1275.94 |
| E | 9 | 1 | 9 | 1268.95 | 1273.53 | 1269.47 |
| F | 10 | 0 | 10 | 1269.06 | 1274.29 | 1269.76 |
| G | 9 | 1 | 9 | 1273.73 | 1278.06 | 1274.26 |
| H | 9 | 1 | 9 | 1285.97 | 1288.25 | 1286.27 |

* leach found in sediment (58-C-C)

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-59 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 0 | 10 | 0 | — | — | — |
| B | 0 | 10 | 0 | — | — | — |
| C | 0 | 10 | 0 | — | — | — |
| D | 0 | 10 | 0 | — | — | — |
| E | 1 | 9 | 1 | 1266.70 | 1266.86 | 1266.72 |
| F | 0 | 10 | 0 | — | — | — |
| G | 1 | 9 | 1 | 1268.10 | 1268.41 | 1268.14 |
| H | 0 | 10 | 0 | — | — | — |

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-59 SIDE

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|--------------------------------|
| | Alive | Dead | Weighed | | | |
| A | 3 | 7 | 3 | 1271.92 | 1272.73 | 1271.99 1272.04 (X) |
| B | 0 | 10 | 0 | 1269.81 | — | — |
| C | 2 | 8 | 2 | 1275.11 | 1275.46 | 1275.20 1275.05 (X) |
| D | 1 | 9 | 1 | 1274.20 | 1274.45 | 1274.22 1274.07 (X) |
| E | 0 | 10 | 0 | — | — | — |
| F | 0 | 10 | 0 | — | — | — |
| G | 0 | 10 | 0 | — | — | — |
| H | 0 | 10 | 0 | — | — | — |

* Small Chironomids
* Scale wasn't zeroed

Chironomus tentans 10-day Survival and Growth Data

Site ID # WW-76 CENTER

| Rep | # Organisms | | | Ashed Pan Wt. (mg) | Pan + Dried Org. Wt. (mg) | Pan + Ashed Org. Wt. (mg) |
|-----|-------------|------|---------|--------------------|---------------------------|---------------------------|
| | Alive | Dead | Weighed | | | |
| A | 5 | 5 | 5 | 1274.61 | 1275.49 | 1274.66 |
| B | 5 | 7 | 3 | 1268.28 | 1268.76 | 1268.30 |
| C | 2 | 8 | 2 | 1271.40 | 1271.78 | 1271.42 |
| D | 4 | 6 | 4 | 1277.20 | 1277.82 | 1277.23 |
| E | 2 | 8 | 2 | 1286.50 | 1286.84 | 1286.52 |
| F | 3 | 7 | 3 | 1282.08 | 1282.50 | 1282.11 |
| G | 5 | 5 | 5 | 1283.43 | 1284.81 | 1283.47 |
| H | 0 | 10 | 0 | — | — | — |

Chironomus Survival and Growth-10d-Ashfree Wt

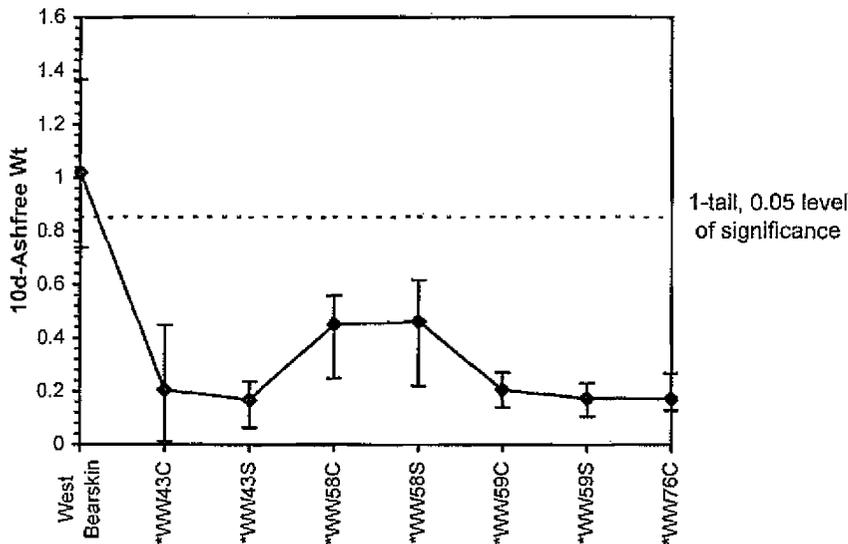
Start Date: 8/14/2007 Test ID: MWRDC2 Sample ID: CHICAGO
 End Date: 8/24/2007 Lab ID: 5010 Sample Type: SEDIMENT
 Sample Date: Protocol: -EPA 2000 Test Species: CT-Chironomus tentans
 Comments:

| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| West Bearskin | 0.8410 | 0.9800 | 0.7340 | 0.9533 | 1.1456 | 1.1260 | 1.3644 | 0.9857 |
| WW43C | 0.0700 | 0.2100 | 0.4480 | 0.2975 | 0.1900 | 0.0125 | 0.2060 | |
| WW43S | 0.2050 | 0.1000 | 0.2175 | 0.1850 | 0.0633 | 0.1340 | 0.2360 | 0.2040 |
| WW58C | 0.5588 | 0.3025 | 0.4829 | 0.5575 | 0.5557 | 0.4537 | 0.2480 | |
| WW58S | 0.5010 | 0.5875 | 0.6157 | 0.4360 | 0.4511 | 0.4530 | 0.4222 | 0.2200 |
| WW59C | 0.1400 | 0.2700 | | | | | | |
| WW59S | 0.2300 | 0.1050 | 0.1800 | | | | | |
| WW76C | 0.1660 | 0.1533 | 0.1800 | 0.1475 | 0.1600 | 0.1300 | 0.2680 | |

| Conc- | Mean | N-Mean | Transform: Untransformed | | | | N | t-Stat | 1-Tailed | |
|---------------|--------|--------|--------------------------|--------|--------|--------|---|--------|----------|--------|
| | | | Mean | Min | Max | CV% | | | Critical | MSD |
| West Bearskin | 1.0163 | 1.0000 | 1.0163 | 0.7340 | 1.3644 | 19.203 | 8 | | | |
| *WW43C | 0.2049 | 0.2016 | 0.2049 | 0.0125 | 0.4480 | 69.931 | 7 | 12.650 | 2.556 | 0.1640 |
| *WW43S | 0.1681 | 0.1654 | 0.1681 | 0.0633 | 0.2360 | 36.783 | 8 | 13.687 | 2.556 | 0.1584 |
| *WW58C | 0.4513 | 0.4441 | 0.4513 | 0.2480 | 0.5588 | 28.348 | 7 | 8.808 | 2.556 | 0.1640 |
| *WW58S | 0.4608 | 0.4534 | 0.4608 | 0.2200 | 0.6157 | 26.184 | 8 | 8.963 | 2.556 | 0.1584 |
| *WW59C | 0.2050 | 0.2017 | 0.2050 | 0.1400 | 0.2700 | 44.841 | 2 | 8.280 | 2.556 | 0.2505 |
| *WW59S | 0.1717 | 0.1689 | 0.1717 | 0.1050 | 0.2300 | 36.650 | 3 | 10.066 | 2.556 | 0.2145 |
| *WW76C | 0.1721 | 0.1694 | 0.1721 | 0.1300 | 0.2680 | 26.169 | 7 | 13.160 | 2.556 | 0.1640 |

| Auxiliary Tests | Statistic | Critical | Skew | Kurt | | |
|--|-----------|----------|---------|---------|---------|-------|
| Shapiro-Wilk's Test indicates normal distribution (p > 0.01) | 0.96909 | 0.93 | 0.09145 | 1.43942 | | |
| Bartlett's Test indicates equal variances (p = 0.03) | 15.3346 | 18.4753 | | | | |
| Hypothesis Test (1-tail, 0.05) | MSDu | MSDp | MSB | MSE | F-Prob | df |
| Bonferroni t Test indicates significant differences Treatments vs West Bearskin | 0.16397 | 0.16135 | 0.62552 | 0.01536 | 1.0E-16 | 7, 42 |

Dose-Response Plot



Chironomus Survival and Growth-10 Day Survival

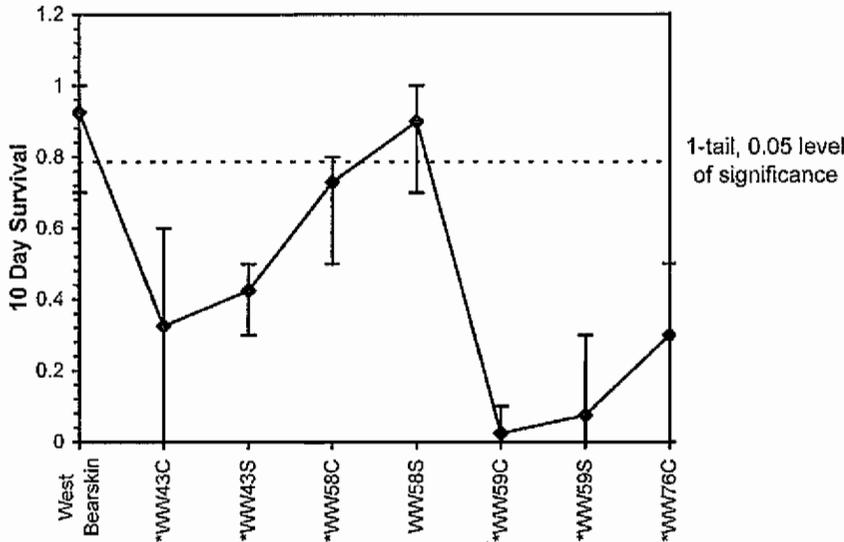
Start Date: 8/14/2007 Test ID: MWRDGC2 Sample ID: CHICAGO
 End Date: 8/24/2007 Lab ID: 5010 Sample Type: SEDIMENT
 Sample Date: Protocol: -EPA 2000 Test Species: CT-Chironomus tentans
 Comments:

| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| West Bearskin | 1.0000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.7000 |
| WW43C | 0.1000 | 0.1000 | 0.0000 | 0.5000 | 0.4000 | 0.6000 | 0.4000 | 0.5000 |
| WW43S | 0.4000 | 0.4000 | 0.4000 | 0.4000 | 0.3000 | 0.5000 | 0.5000 | 0.5000 |
| WW58C | 0.8000 | 0.8000 | 0.7000 | 0.8000 | 0.7000 | 0.8000 | 0.5000 | |
| WW58S | 1.0000 | 0.8000 | 0.7000 | 1.0000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 |
| WW59C | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1000 | 0.0000 | 0.1000 | 0.0000 |
| WW59S | 0.3000 | 0.0000 | 0.2000 | 0.1000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| WW76C | 0.5000 | 0.3000 | 0.2000 | 0.4000 | 0.2000 | 0.3000 | 0.5000 | 0.0000 |

| Conc- | Mean | N-Mean | Transform: Arcsin Square Root | | | | | 1-Tailed | | |
|---------------|--------|--------|-------------------------------|--------|--------|--------|---|----------|----------|--------|
| | | | Mean | Min | Max | CV% | N | t-Stat | Critical | MSD |
| West Bearskin | 0.9250 | 1.0000 | 1.2983 | 0.9912 | 1.4120 | 11.400 | 8 | | | |
| *WW43C | 0.3250 | 0.3514 | 0.5786 | 0.1588 | 0.8861 | 46.689 | 8 | 8.752 | 2.530 | 0.2081 |
| *WW43S | 0.4250 | 0.4595 | 0.7093 | 0.5796 | 0.7854 | 10.194 | 8 | 7.162 | 2.530 | 0.2081 |
| *WW58C | 0.7286 | 0.7876 | 1.0280 | 0.7854 | 1.1071 | 11.688 | 7 | 3.175 | 2.530 | 0.2154 |
| WW58S | 0.9000 | 0.9730 | 1.2602 | 0.9912 | 1.4120 | 12.195 | 8 | 0.463 | 2.530 | 0.2081 |
| *WW59C | 0.0250 | 0.0270 | 0.1995 | 0.1588 | 0.3218 | 37.811 | 8 | 13.361 | 2.530 | 0.2081 |
| *WW59S | 0.0750 | 0.0811 | 0.2699 | 0.1588 | 0.5796 | 62.306 | 8 | 12.506 | 2.530 | 0.2081 |
| *WW76C | 0.3000 | 0.3243 | 0.5626 | 0.1588 | 0.7854 | 36.638 | 8 | 8.946 | 2.530 | 0.2081 |

| Auxiliary Tests | Statistic | Critical | Skew | Kurt | | |
|--|-------------|-------------|------------|------------|---------------|-----------|
| Kolmogorov D Test indicates normal distribution (p > 0.01) | 0.97461 | 1.035 | -0.5303 | 0.47069 | | |
| Bartlett's Test indicates equal variances (p = 0.02) | 17.2525 | 18.4753 | | | | |
| Hypothesis Test (1-tail, 0.05) | MSDu | MSDp | MSB | MSE | F-Prob | df |
| Bonferroni t Test indicates significant differences Treatments vs West Bearskin | 0.14129 | 0.15232 | 1.40135 | 0.02705 | 6.1E-22 | 7, 55 |

Dose-Response Plot



Chironomus Survival and Growth-10-day DW

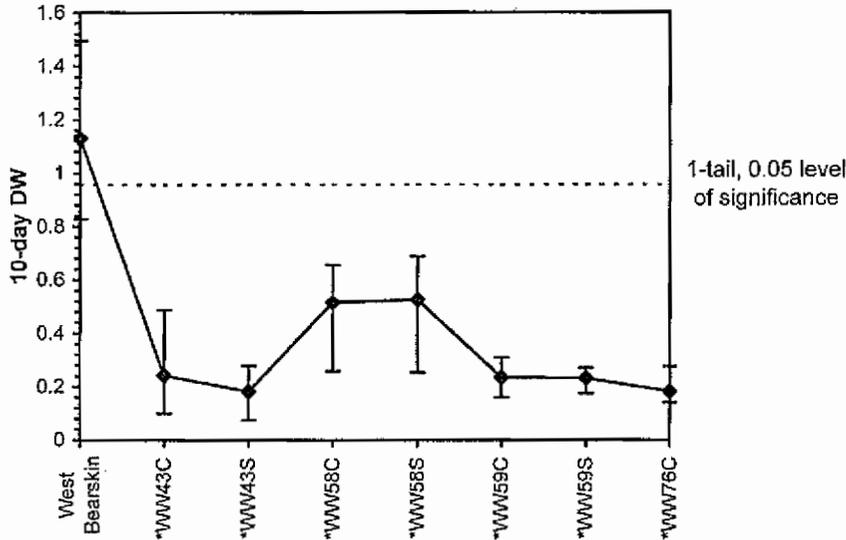
Start Date: 8/14/2007 Test ID: MWRDC2 Sample ID: CHICAGO
 End Date: 8/24/2007 Lab ID: 5010 Sample Type: SEDIMENT
 Sample Date: Protocol: -EPA 2000 Test Species: CT-Chironomus tentans
 Comments:

| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| West Bearskin | 0.9290 | 1.0750 | 0.8290 | 1.0411 | 1.2778 | 1.2830 | 1.4987 | 1.1157 |
| WW43C | 0.1000 | 0.2500 | 0.4860 | 0.3125 | 0.1983 | 0.1325 | 0.2160 | |
| WW43S | 0.2175 | 0.1200 | 0.2275 | 0.1900 | 0.0733 | 0.1420 | 0.2780 | 0.2060 |
| WW58C | 0.6375 | 0.3888 | 0.5614 | 0.6563 | 0.5914 | 0.5112 | 0.2580 | |
| WW58S | 0.5800 | 0.6613 | 0.6886 | 0.5050 | 0.5089 | 0.5230 | 0.4811 | 0.2533 |
| WW59C | 0.1600 | 0.3100 | | | | | | |
| WW59S | 0.2700 | 0.1750 | 0.2500 | | | | | |
| WW76C | 0.1760 | 0.1600 | 0.1900 | 0.1550 | 0.1700 | 0.1400 | 0.2760 | |

| Conc- | Mean | N-Mean | Transform: Untransformed | | | | N | t-Stat | 1-Tailed Critical | MSD |
|---------------|--------|--------|--------------------------|--------|--------|--------|---|--------|-------------------|--------|
| | | | Mean | Min | Max | CV% | | | | |
| West Bearskin | 1.1309 | 1.0000 | 1.1309 | 0.8290 | 1.4967 | 18.960 | 8 | | | |
| *WW43C | 0.2422 | 0.2142 | 0.2422 | 0.1000 | 0.4860 | 53.120 | 7 | 13.029 | 2.556 | 0.1744 |
| *WW43S | 0.1818 | 0.1607 | 0.1818 | 0.0733 | 0.2780 | 36.273 | 8 | 14.403 | 2.556 | 0.1685 |
| *WW58C | 0.5149 | 0.4553 | 0.5149 | 0.2580 | 0.6563 | 28.025 | 7 | 9.030 | 2.556 | 0.1744 |
| *WW58S | 0.5251 | 0.4644 | 0.5251 | 0.2533 | 0.6886 | 25.420 | 8 | 9.192 | 2.556 | 0.1685 |
| *WW59C | 0.2350 | 0.2078 | 0.2350 | 0.1600 | 0.3100 | 45.134 | 2 | 8.598 | 2.556 | 0.2664 |
| *WW59S | 0.2317 | 0.2049 | 0.2317 | 0.1750 | 0.2700 | 21.619 | 3 | 10.078 | 2.556 | 0.2281 |
| *WW76C | 0.1810 | 0.1600 | 0.1810 | 0.1400 | 0.2760 | 24.759 | 7 | 13.926 | 2.556 | 0.1744 |

| Auxiliary Tests | Statistic | Critical | Skew | Kurt | | |
|--|-----------|----------|---------|---------|---------|-------|
| Shapiro-Wilk's Test indicates normal distribution (p > 0.01) | 0.9688 | 0.93 | 0.03195 | 1.51765 | | |
| Bartlett's Test indicates equal variances (p = 0.02) | 17.1865 | 18.4753 | | | | |
| Hypothesis Test (1-tail, 0.05) | MSDu | MSDp | MSB | MSE | F-Prob | df |
| Bonferroni t Test indicates significant differences Treatments vs West Bearskin | 0.17437 | 0.15419 | 0.77192 | 0.01737 | 2.1E-17 | 7, 42 |

Dose-Response Plot



Chironomus Survival and Growth-10 Day Survival

| | | |
|----------------------|---------------------|-------------------------------------|
| Start Date: 8/7/2007 | Test ID: MWRDC | Sample ID: CHICAGO SE |
| End Date: 8/17/2007 | Lab ID: 5010 | Sample Type: SEDIMENT |
| Sample Date: | Protocol: -EPA 2000 | Test Species: CT-Chironomus tentans |
| Comments: | | |

| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| West Bearskin | 0.8000 | 1.0000 | 1.0000 | 0.9000 | 1.0000 | 1.0000 | 0.8000 | 1.0000 |
| WW49C | 0.7000 | 0.8000 | 0.4000 | 0.7000 | 0.4000 | 0.4000 | 0.5000 | 0.7000 |
| WW49S | 0.9000 | 1.0000 | 0.8000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 |
| WW50C | 0.8000 | 1.0000 | 0.8000 | 0.6000 | 0.8000 | 0.7000 | 0.8000 | |
| WW50S | 0.8000 | 0.8000 | 1.0000 | 1.0000 | 0.8000 | 1.0000 | 0.9000 | 0.9000 |
| WW52C | 0.9000 | 0.7000 | 1.0000 | 1.0000 | 0.4000 | 0.9000 | 1.0000 | 0.6000 |
| WW52S | 0.9000 | 0.8000 | 0.8000 | 1.0000 | 0.8000 | 1.0000 | 0.6000 | 0.7000 |
| WW54C | 0.9000 | 1.0000 | 0.9000 | 1.0000 | 1.0000 | 0.0000 | 0.8000 | 0.7000 |
| WW54S | 0.9000 | 0.7000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 0.8000 | 1.0000 |
| WW55C | 0.7000 | 0.6000 | 1.0000 | 0.9000 | 0.7000 | 0.1000 | 0.9000 | 1.0000 |
| WW55S | 0.7000 | 1.0000 | 0.7000 | 1.0000 | 0.7000 | 0.9000 | 1.0000 | 0.7000 |
| WW56C | 1.0000 | 0.9000 | 1.0000 | 0.8000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| WW56S | 1.0000 | 1.0000 | 0.8000 | 0.8000 | 1.0000 | 1.0000 | 1.0000 | 0.9000 |
| WW57S | 0.9000 | 1.0000 | 0.7000 | 1.0000 | 1.0000 | 1.0000 | 0.9000 | 1.0000 |
| WW76S | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| WW86C | 0.0000 | 0.7000 | 0.1000 | 0.1000 | 0.1000 | 0.0000 | 0.1000 | 0.0000 |
| WW86S | 0.8000 | 0.2000 | 0.5000 | 0.6000 | 0.6000 | 0.8000 | 0.4000 | 0.7000 |
| WW97C | 0.8000 | 0.9000 | 0.8000 | 0.8000 | 1.0000 | 1.0000 | 0.9000 | 1.0000 |
| WW97S | 0.6000 | 0.7000 | 0.8000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 |

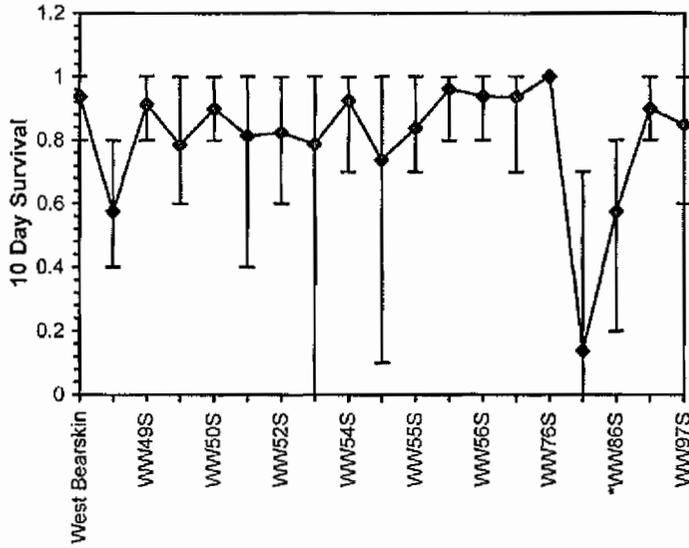
| Conc- | Transform: Arcsin Square Root | | | | | | | Rank Sum | 1-Tailed Critical |
|---------------|-------------------------------|--------|--------|--------|--------|--------|---|----------|-------------------|
| | Mean | N-Mean | Mean | Min | Max | CV% | N | | |
| West Bearskin | 0.9375 | 1.0000 | 1.3154 | 1.1071 | 1.4120 | 10.667 | 8 | | |
| *WW49C | 0.5750 | 0.6133 | 0.8650 | 0.6847 | 1.1071 | 20.034 | 8 | 37.00 | 47.00 |
| WW49S | 0.9125 | 0.9733 | 1.2721 | 1.1071 | 1.4120 | 7.806 | 8 | 60.50 | 47.00 |
| WW50C | 0.7857 | 0.8381 | 1.1025 | 0.8861 | 1.4120 | 14.584 | 7 | 37.50 | 37.00 |
| WW50S | 0.9000 | 0.9600 | 1.2569 | 1.1071 | 1.4120 | 11.234 | 8 | 60.50 | 47.00 |
| WW52C | 0.8125 | 0.8667 | 1.1620 | 0.6847 | 1.4120 | 23.809 | 8 | 57.50 | 47.00 |
| WW52S | 0.8250 | 0.8800 | 1.1590 | 0.8861 | 1.4120 | 16.204 | 8 | 52.50 | 47.00 |
| WW54C | 0.7875 | 0.8400 | 1.1239 | 0.1588 | 1.4120 | 37.293 | 8 | 58.50 | 47.00 |
| WW54S | 0.9250 | 0.9867 | 1.3009 | 0.9912 | 1.4120 | 12.925 | 8 | 67.00 | 47.00 |
| WW55C | 0.7375 | 0.7867 | 1.0640 | 0.3218 | 1.4120 | 33.772 | 8 | 52.00 | 47.00 |
| WW55S | 0.8375 | 0.8933 | 1.1812 | 0.9912 | 1.4120 | 17.784 | 8 | 55.00 | 47.00 |
| WW56C | 0.9625 | 1.0267 | 1.3535 | 1.1071 | 1.4120 | 8.476 | 8 | 72.50 | 47.00 |
| WW56S | 0.9375 | 1.0000 | 1.3154 | 1.1071 | 1.4120 | 10.667 | 8 | 68.00 | 47.00 |
| WW57S | 0.9375 | 1.0000 | 1.3187 | 0.9912 | 1.4120 | 11.484 | 8 | 68.50 | 47.00 |
| WW76S | 1.0000 | 1.0667 | 1.4120 | 1.4120 | 1.4120 | 0.000 | 8 | 80.00 | 47.00 |
| *WW86C | 0.1375 | 0.1467 | 0.3443 | 0.1588 | 0.9912 | 79.441 | 8 | 36.00 | 47.00 |
| *WW86S | 0.5750 | 0.6133 | 0.8639 | 0.4636 | 1.1071 | 25.284 | 8 | 38.00 | 47.00 |
| WW97C | 0.9000 | 0.9600 | 1.2569 | 1.1071 | 1.4120 | 11.234 | 8 | 60.50 | 47.00 |
| WW97S | 0.8500 | 0.9067 | 1.1944 | 0.8861 | 1.4120 | 15.747 | 8 | 55.50 | 47.00 |

| Auxiliary Tests | Statistic | Critical | Skew | Kurt |
|---|-----------|----------|---------|---------|
| Kolmogorov D Test indicates non-normal distribution (p <= 0.01) | 1.18161 | 1.035 | -0.9849 | 4.51004 |
| Equality of variance cannot be confirmed | | | | |
| Hypothesis Test (1-tail, 0.05) | | | | |
| Wilcoxon Rank Sum Test indicates no significant differences | | | | |
| Treatments vs West Bearskin | | | | |

Chironomus Survival and Growth-10 Day Survival

| | | |
|----------------------|---------------------|-------------------------------------|
| Start Date: 8/7/2007 | Test ID: MWRDC | Sample ID: CHICAGO SE |
| End Date: 8/17/2007 | Lab ID: 5010 | Sample Type: SEDIMENT |
| Sample Date: | Protocol: -EPA 2000 | Test Species: CT-Chironomus tentans |
| Comments: | | |

Dose-Response Plot



Chironomus Survival and Growth-10-day DW

Start Date: 8/7/2007 Test ID: MWRDC Sample ID: CHICAGO SE
 End Date: 8/17/2007 Lab ID: 5010 Sample Type: SEDIMENT
 Sample Date: Protocol: -EPA 2000 Test Species: CT-Chironomus tentans
 Comments:

| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| West Bearskin | 1.7550 | 0.7890 | 1.2680 | 1.4522 | 1.3380 | 1.3010 | 1.3563 | 1.1430 |
| WW49C | 0.6486 | 0.3400 | 0.1650 | 0.2757 | 0.2000 | 0.5150 | 0.4980 | 0.2943 |
| WW49S | 1.5678 | 1.6050 | 1.6475 | 1.7489 | 1.2180 | 1.7256 | 1.7967 | 1.5700 |
| WW50C | 1.9925 | 1.7000 | 1.8912 | 2.6000 | 2.0425 | 2.5429 | 1.9088 | |
| WW50S | 1.4863 | 1.3537 | 1.5540 | 1.3580 | 1.3025 | 1.2740 | 1.3722 | 1.4211 |
| WW52C | 2.0322 | 1.7957 | 1.6880 | 1.3070 | 2.6650 | 1.9511 | 1.9730 | 2.1117 |
| WW52S | 2.1956 | 1.6363 | 1.8800 | 1.8600 | 1.6875 | 1.6670 | 2.7333 | 2.1143 |
| WW54C | 1.4656 | 1.4170 | 1.4500 | 1.3130 | 1.4230 | 1.4363 | 1.8743 | |
| WW54S | 1.5456 | 2.3143 | 1.1760 | 1.7510 | 1.3330 | 1.4760 | 1.7100 | 1.5730 |
| WW55C | 1.3943 | 0.9767 | 1.0390 | 1.2611 | 1.2786 | 1.0100 | 0.8544 | 1.0440 |
| WW55S | 2.3414 | 1.2980 | 1.4914 | 1.7320 | 1.3686 | 1.3500 | 1.9540 | 2.3014 |
| WW56C | 1.3690 | 1.7967 | 1.5890 | 2.0638 | 1.5120 | 1.8060 | 1.4950 | 1.5780 |
| WW56S | 1.4440 | 1.5920 | 1.7350 | 1.5725 | 1.7270 | 1.6050 | 1.5460 | 1.8633 |
| WW57S | 1.5033 | 1.6010 | 1.9557 | 1.7770 | 1.3870 | 1.2020 | 1.8878 | 1.7220 |
| WW76S | 1.1820 | 0.9710 | 1.2390 | 1.2050 | 0.9940 | 0.9220 | 0.8550 | 1.0530 |
| WW86C | 0.3643 | 0.4200 | 0.2300 | 0.2600 | 0.1400 | | | |
| WW86S | 1.0825 | 0.6250 | 1.3660 | 0.6367 | 1.3083 | 0.8863 | 1.6700 | 1.0014 |
| WW97C | 1.8375 | 0.8656 | 1.9275 | 1.6513 | 1.7360 | 1.5930 | 1.7389 | 1.7310 |
| WW97S | 1.6767 | 1.8443 | 1.4763 | 1.4000 | 1.3733 | 1.4267 | 1.3800 | 1.2350 |

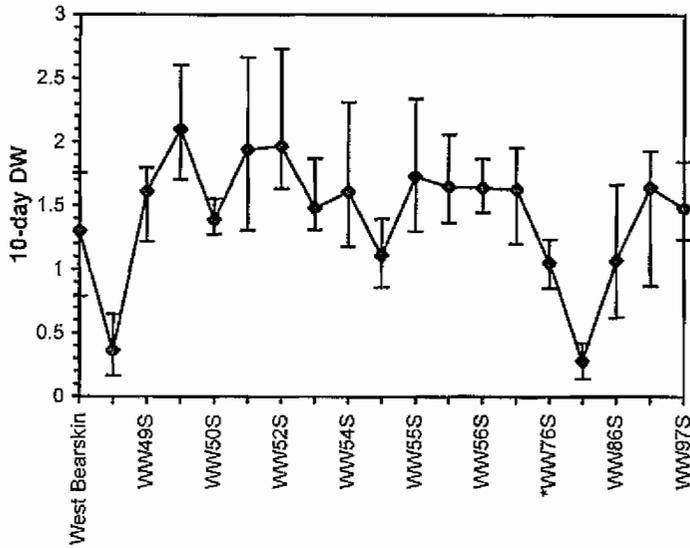
| Conc- | Mean | N-Mean | Transform: Untransformed | | | | Rank Sum | 1-Tailed Critical |
|---------------|--------|--------|--------------------------|--------|--------|--------|----------|-------------------|
| | | | Mean | Min | Max | CV% | | |
| West Bearskin | 1.3003 | 1.0000 | 1.3003 | 0.7890 | 1.7550 | 20.993 | 8 | |
| *WW49C | 0.3671 | 0.2823 | 0.3671 | 0.1650 | 0.6486 | 46.208 | 8 | 36.00 47.00 |
| WW49S | 1.6099 | 1.2381 | 1.6099 | 1.2180 | 1.7967 | 11.160 | 8 | 88.00 47.00 |
| WW50C | 2.0968 | 1.6126 | 2.0968 | 1.7000 | 2.6000 | 16.302 | 7 | 83.00 37.00 |
| WW50S | 1.3902 | 1.0692 | 1.3902 | 1.2740 | 1.5540 | 6.709 | 8 | 80.00 47.00 |
| WW52C | 1.9405 | 1.4923 | 1.9405 | 1.3070 | 2.6650 | 19.957 | 8 | 95.00 47.00 |
| WW52S | 1.9717 | 1.5164 | 1.9717 | 1.6363 | 2.7333 | 18.758 | 8 | 97.00 47.00 |
| WW54C | 1.4827 | 1.1403 | 1.4827 | 1.3130 | 1.8743 | 12.113 | 7 | 71.00 37.00 |
| WW54S | 1.6099 | 1.2381 | 1.6099 | 1.1760 | 2.3143 | 21.188 | 8 | 85.00 47.00 |
| WW55C | 1.1073 | 0.8515 | 1.1073 | 0.8544 | 1.3943 | 16.530 | 8 | 52.00 47.00 |
| WW55S | 1.7296 | 1.3302 | 1.7296 | 1.2980 | 2.3414 | 24.618 | 8 | 88.00 47.00 |
| WW56C | 1.6512 | 1.2698 | 1.6512 | 1.3690 | 2.0638 | 13.503 | 8 | 94.00 47.00 |
| WW56S | 1.6356 | 1.2579 | 1.6356 | 1.4440 | 1.8633 | 8.060 | 8 | 92.00 47.00 |
| WW57S | 1.6295 | 1.2531 | 1.6295 | 1.2020 | 1.9557 | 15.761 | 8 | 89.00 47.00 |
| *WW76S | 1.0526 | 0.8095 | 1.0526 | 0.8550 | 1.2390 | 13.479 | 8 | 47.00 47.00 |
| *WW86C | 0.2829 | 0.2175 | 0.2829 | 0.1400 | 0.4200 | 39.194 | 5 | 15.00 19.00 |
| WW86S | 1.0720 | 0.8244 | 1.0720 | 0.6250 | 1.6700 | 33.979 | 8 | 56.00 47.00 |
| WW97C | 1.6351 | 1.2575 | 1.6351 | 0.8656 | 1.9275 | 20.030 | 8 | 88.00 47.00 |
| WW97S | 1.4765 | 1.1355 | 1.4765 | 1.2350 | 1.8443 | 13.101 | 8 | 84.00 47.00 |

| Auxiliary Tests | Statistic | Critical | Skew | Kurt |
|---|-----------|----------|---------|---------|
| Kolmogorov D Test indicates normal distribution (p > 0.01) | 0.9968 | 1.035 | 0.34571 | 1.23355 |
| Bartlett's Test indicates unequal variances (p = 2.08E-03) | 40.01 | 34.8052 | | |
| Hypothesis Test (1-tail, 0.05) | | | | |
| Wilcoxon Rank Sum Test indicates no significant differences | | | | |
| Treatments vs West Bearskin | | | | |

Chironomus Survival and Growth-10-day DW

| | | |
|----------------------|---------------------|-------------------------------------|
| Start Date: 8/7/2007 | Test ID: MWRDC | Sample ID: CHICAGO SE |
| End Date: 8/17/2007 | Lab ID: 5010 | Sample Type: SEDIMENT |
| Sample Date: | Protocol: -EPA 2000 | Test Species: CT-Chironomus tentans |
| Comments: | | |

Dose-Response Plot



Chironomus Survival and Growth-10d-Ashfree Wt

Start Date: 8/7/2007 Test ID: MWRDC Sample ID: CHICAGO SE
 End Date: 8/17/2007 Lab ID: 5010 Sample Type: SEDIMENT
 Sample Date: Protocol: -EPA 2000 Test Species: CT-Chironomus tentans
 Comments:

| Conc- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| West Bearskin | 1.4237 | 0.6850 | 0.9880 | 1.1444 | 1.0410 | 0.9970 | 1.1025 | 0.8520 |
| WW49C | 0.4800 | 0.3050 | 0.1350 | 0.2257 | 0.1750 | 0.3600 | 0.2360 | 0.2371 |
| WW49S | 1.0533 | 1.0070 | 1.1175 | 1.1356 | 0.8310 | 1.0867 | 1.2089 | 0.9833 |
| WW50C | 1.4750 | 1.1890 | 1.3962 | 1.8100 | 1.4625 | 1.8057 | 1.5588 | |
| WW50S | 1.1000 | 1.0187 | 1.0260 | 1.0230 | 0.9638 | 0.9330 | 1.2189 | 0.9667 |
| WW52C | 1.5044 | 1.3386 | 1.1940 | 0.9480 | 2.0650 | 1.3722 | 1.2490 | 1.6267 |
| WW52S | 1.5211 | 1.2663 | 1.4887 | 1.4050 | 1.3575 | 1.2220 | 1.9033 | 1.5600 |
| WW54C | 1.1611 | 1.0280 | 1.1533 | 1.0880 | 1.0930 | 1.0475 | 1.2000 | |
| WW54S | 0.9889 | 1.4586 | 0.7620 | 1.1720 | 0.8600 | 0.9530 | 1.1775 | 1.0910 |
| WW55C | 0.9914 | 0.7967 | 0.7220 | 0.8833 | 0.8886 | 0.7700 | 0.6289 | 0.7180 |
| WW55S | 1.7986 | 1.1030 | 1.3929 | 1.3420 | 1.1900 | 1.1467 | 1.5310 | 1.7629 |
| WW56C | 0.9970 | 1.2111 | 1.0430 | 1.2838 | 1.0110 | 1.1800 | 0.9340 | 1.0030 |
| WW56S | 0.9750 | 1.1160 | 1.2350 | 0.9787 | 1.0510 | 0.9710 | 0.9970 | 1.2167 |
| WW57S | 1.1044 | 1.1680 | 1.4229 | 1.2660 | 1.0350 | 0.8930 | 1.5044 | 1.2350 |
| WW76S | 0.8360 | 0.7040 | 0.9300 | 0.9380 | 0.7250 | 0.7410 | 0.6370 | 0.8460 |
| WW86C | 0.4171 | 0.4300 | 0.1800 | 0.0600 | 0.0000 | | | |
| WW86S | 0.9025 | 0.5350 | 1.2100 | 0.5450 | 1.1650 | 0.4275 | 1.4625 | 0.7971 |
| WW97C | 1.3300 | 0.7578 | 1.3588 | 1.2363 | 1.3090 | 1.1790 | 1.3022 | 1.3120 |
| WW97S | 1.3200 | 1.3586 | 1.0850 | 1.0090 | 1.0411 | 1.0044 | 1.0844 | 0.8720 |

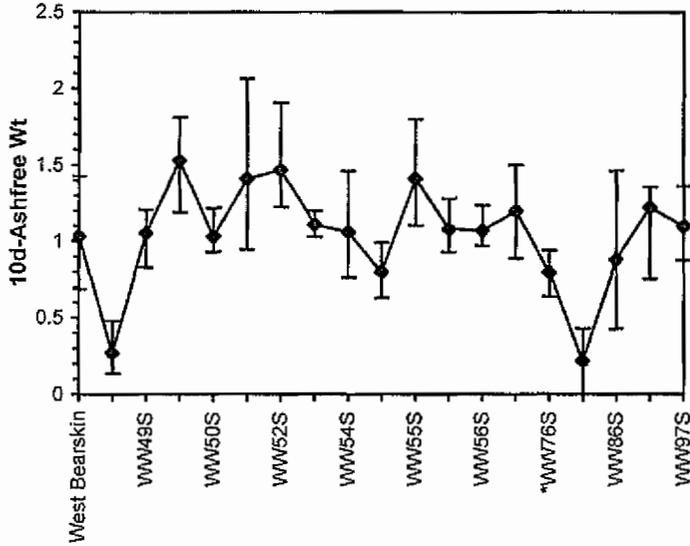
| Conc- | Transform: Untransformed | | | | | | Rank Sum | 1-Tailed Critical |
|---------------|--------------------------|--------|--------|--------|--------|--------|----------|-------------------|
| | Mean | N-Mean | Mean | Min | Max | CV% | | |
| West Bearskin | 1.0292 | 1.0000 | 1.0292 | 0.6850 | 1.4237 | 21.002 | 8 | |
| *WW49C | 0.2692 | 0.2616 | 0.2692 | 0.1350 | 0.4800 | 40.897 | 8 | 36.00 47.00 |
| WW49S | 1.0529 | 1.0230 | 1.0529 | 0.8310 | 1.2089 | 10.927 | 8 | 72.00 47.00 |
| WW50C | 1.5282 | 1.4848 | 1.5282 | 1.1890 | 1.8100 | 14.558 | 7 | 82.00 37.00 |
| WW50S | 1.0313 | 1.0020 | 1.0313 | 0.9330 | 1.2189 | 8.870 | 8 | 66.00 47.00 |
| WW52C | 1.4122 | 1.3722 | 1.4122 | 0.9480 | 2.0650 | 23.597 | 8 | 90.00 47.00 |
| WW52S | 1.4655 | 1.4239 | 1.4655 | 1.2220 | 1.9033 | 14.557 | 8 | 96.00 47.00 |
| WW54C | 1.1101 | 1.0786 | 1.1101 | 1.0280 | 1.2000 | 5.696 | 7 | 68.00 37.00 |
| WW54S | 1.0579 | 1.0278 | 1.0579 | 0.7620 | 1.4586 | 20.569 | 8 | 71.00 47.00 |
| *WW55C | 0.7999 | 0.7772 | 0.7999 | 0.6289 | 0.9914 | 14.521 | 8 | 47.00 47.00 |
| WW55S | 1.4084 | 1.3684 | 1.4084 | 1.1030 | 1.7986 | 19.110 | 8 | 94.00 47.00 |
| WW56C | 1.0829 | 1.0521 | 1.0829 | 0.9340 | 1.2838 | 11.519 | 8 | 75.50 47.00 |
| WW56S | 1.0676 | 1.0373 | 1.0676 | 0.9710 | 1.2350 | 10.240 | 8 | 70.50 47.00 |
| WW57S | 1.2036 | 1.1694 | 1.2036 | 0.8930 | 1.5044 | 16.601 | 8 | 84.00 47.00 |
| *WW76S | 0.7946 | 0.7721 | 0.7946 | 0.6370 | 0.9380 | 13.787 | 8 | 45.00 47.00 |
| *WW86C | 0.2174 | 0.2113 | 0.2174 | 0.0000 | 0.4300 | 91.561 | 5 | 15.00 19.00 |
| WW86S | 0.8806 | 0.8556 | 0.8806 | 0.4275 | 1.4625 | 42.335 | 8 | 61.00 47.00 |
| WW97C | 1.2231 | 1.1884 | 1.2231 | 0.7578 | 1.3588 | 16.057 | 8 | 86.00 47.00 |
| WW97S | 1.0968 | 1.0657 | 1.0968 | 0.8720 | 1.3586 | 14.962 | 8 | 75.00 47.00 |

| Auxiliary Tests | Statistic | Critical | Skew | Kurt |
|---|-----------|----------|---------|---------|
| Kolmogorov D Test indicates non-normal distribution (p <= 0.01) | 1.13387 | 1.035 | 0.39209 | 1.29305 |
| Bartlett's Test indicates unequal variances (p = 2.45E-04) | 46.5664 | 34.8052 | | |
| Hypothesis Test (1-tail, 0.05) | | | | |
| Wilcoxon Rank Sum Test indicates no significant differences | | | | |
| Treatments vs West Bearskin | | | | |

Chironomus Survival and Growth-10d-Ashfree Wt

| | | |
|----------------------|---------------------|-------------------------------------|
| Start Date: 8/7/2007 | Test ID: MWRDC | Sample ID: CHICAGO SE |
| End Date: 8/17/2007 | Lab ID: 5010 | Sample Type: SEDIMENT |
| Sample Date: | Protocol: -EPA 2000 | Test Species: CT-Chironomus tentans |
| Comments: | | |

Dose-Response Plot

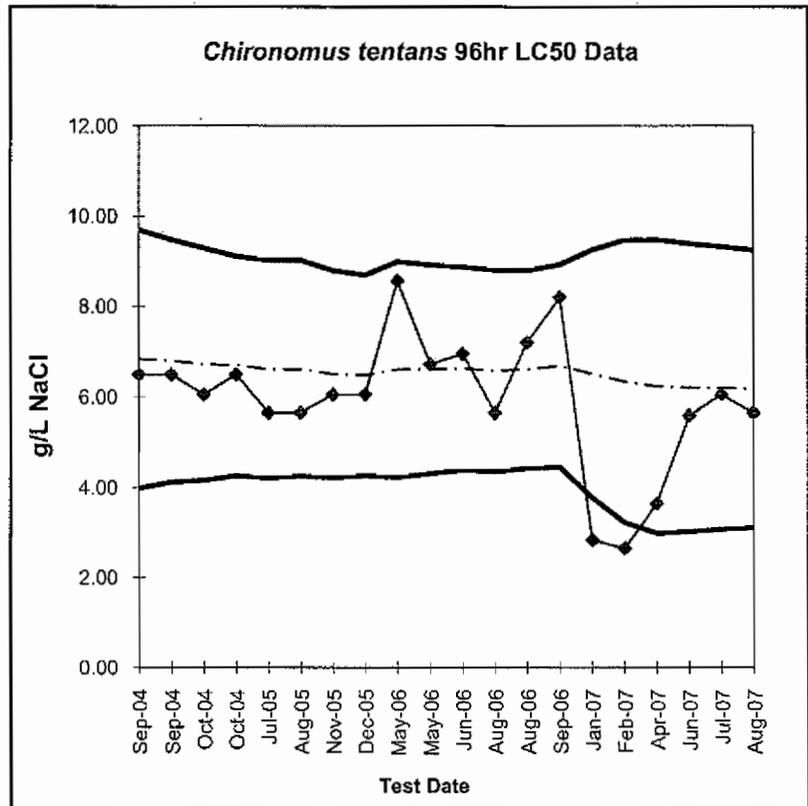


APPENDIX E

Precision of NaCl Reference Toxicant Testing

ASci Corporation Environmental Testing Laboratory
Precision of *Chironomus tentans* NaCl Reference Toxicant Testing

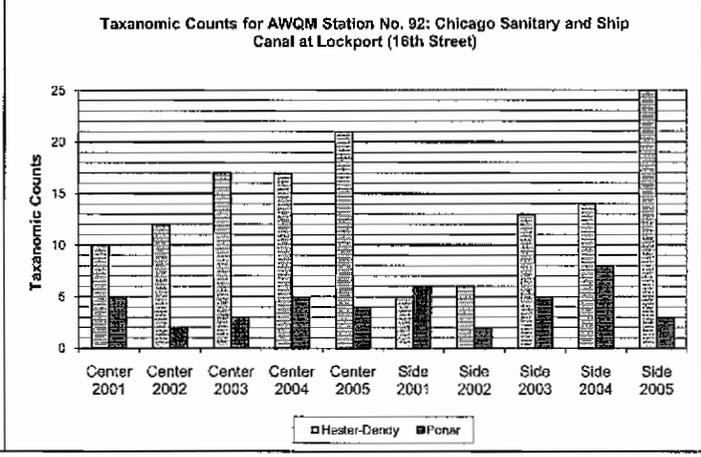
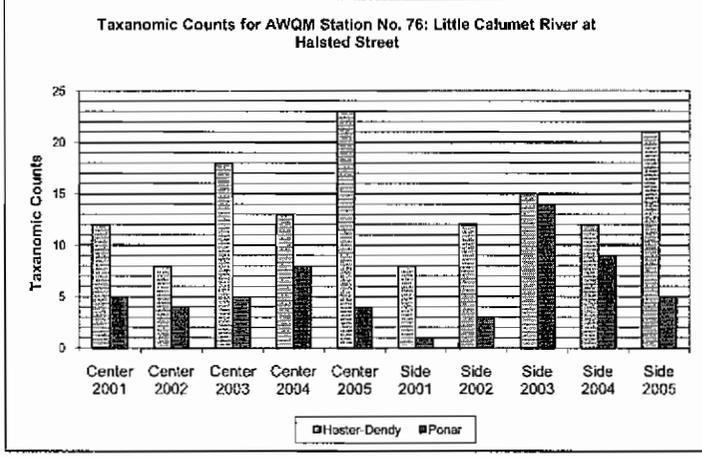
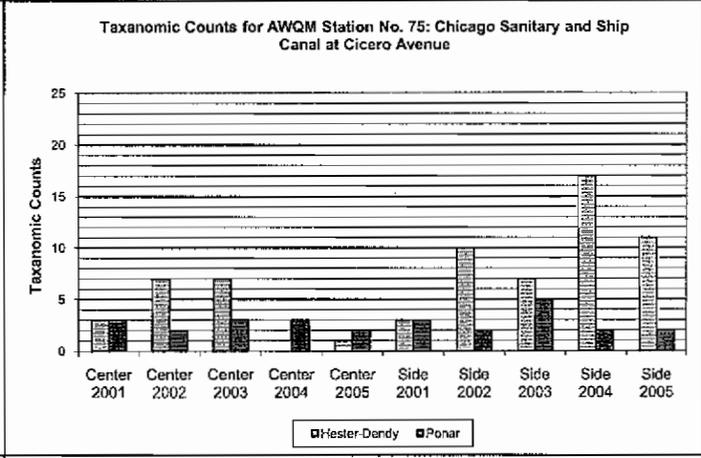
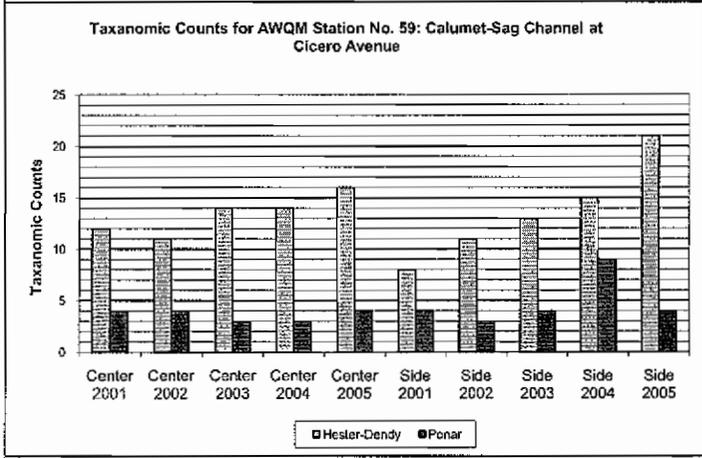
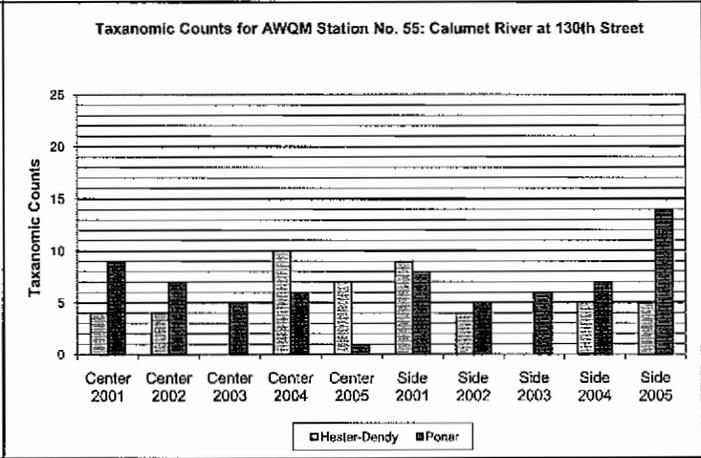
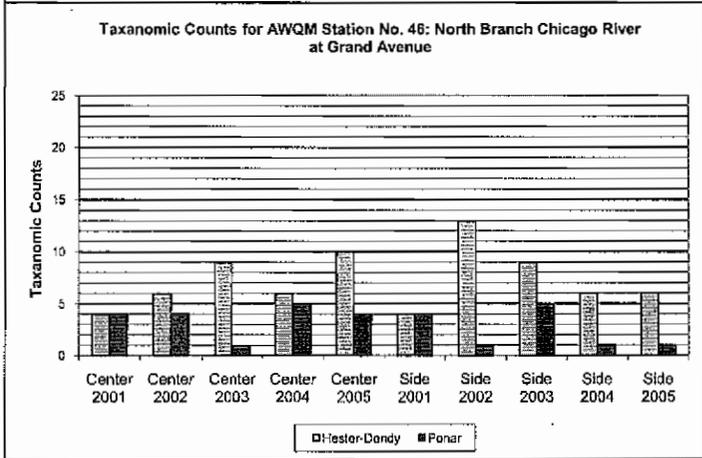
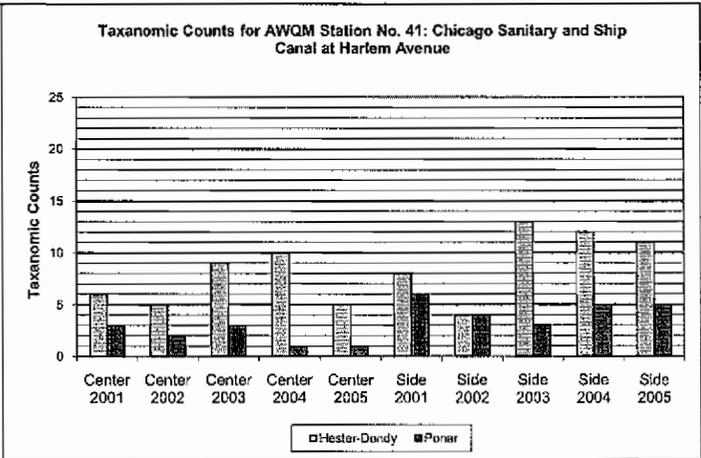
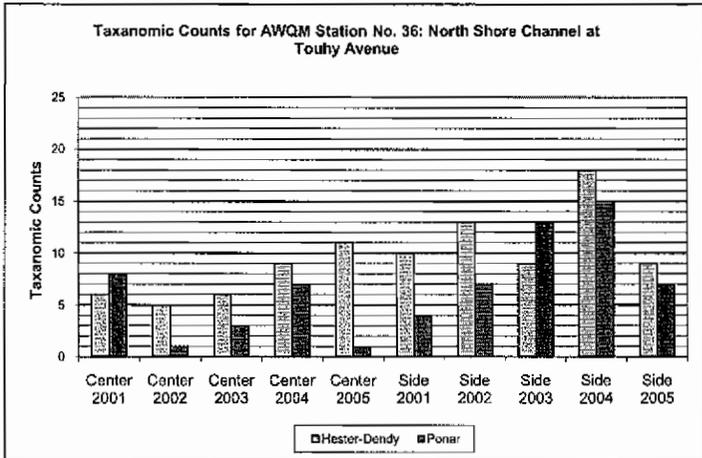
| Date | LC50 | +2SD | -2SD | MEAN |
|--------|------|-------|------|------|
| Jul-03 | 7.46 | 9.15 | 4.31 | 6.71 |
| Aug-03 | 5.66 | 9.15 | 3.64 | 6.71 |
| Apr-04 | 9.85 | 9.06 | 4.22 | 6.62 |
| Apr-04 | 5.66 | 10.22 | 4.75 | 7.16 |
| Jun-04 | 7.46 | 9.64 | 3.51 | 6.96 |
| Jul-04 | 5.66 | 10.30 | 3.62 | 6.96 |
| Aug-04 | 6.50 | 9.78 | 3.64 | 6.71 |
| Sep-04 | 6.50 | 9.70 | 3.99 | 6.84 |
| Sep-04 | 6.50 | 9.48 | 4.13 | 6.81 |
| Oct-04 | 6.06 | 9.30 | 4.16 | 6.73 |
| Oct-04 | 6.50 | 9.11 | 4.27 | 6.71 |
| Jul-05 | 5.66 | 9.03 | 4.22 | 6.62 |
| Aug-05 | 5.66 | 9.03 | 4.26 | 6.62 |
| Nov-05 | 6.06 | 8.80 | 4.23 | 6.51 |
| Dec-05 | 6.06 | 8.70 | 4.27 | 6.48 |
| May-06 | 8.57 | 8.99 | 4.23 | 6.61 |
| May-06 | 6.73 | 8.93 | 4.31 | 6.62 |
| Jun-06 | 6.96 | 8.88 | 4.40 | 6.64 |
| Aug-06 | 5.66 | 8.81 | 4.36 | 6.59 |
| Aug-06 | 7.21 | 8.80 | 4.44 | 6.62 |
| Sep-06 | 8.21 | 8.93 | 4.46 | 6.69 |
| Jan-07 | 2.83 | 9.26 | 3.78 | 6.52 |
| Feb-07 | 2.65 | 9.47 | 3.23 | 6.35 |
| Apr-07 | 3.65 | 9.49 | 2.99 | 6.24 |
| Jun-07 | 5.60 | 9.40 | 3.02 | 6.21 |
| Jul-07 | 6.06 | 9.33 | 3.08 | 6.21 |
| Aug-07 | 5.66 | 9.26 | 3.11 | 6.19 |



sd 1.54
 cv 25%

Attachment 21

Macroinvertebrate Taxonomic Counts Summary for Method Collection between Hester-Dendy and Ponar for Annual CAWS Stations



Attachment 22

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 04-4

A STUDY OF THE BENTHIC MACROINVERTEBRATE COMMUNITY

IN SELECTED CHICAGO METROPOLITAN AREA WATERWAYS

DURING 2001 AND 2002

Prepared By

EA Engineering, Science, and Technology, Inc.

March 2004

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, IL 60611-2803 (312) 751-5600

**A STUDY OF THE BENTHIC MACROINVERTEBRATE COMMUNITY
IN SELECTED CHICAGO METROPOLITAN AREA WATERWAYS
DURING 2001 AND 2002**

Prepared By

EA Engineering, Science, and Technology, Inc.

January 2004

**Research and Development Department
Richard Lanyon, Director**

March 2004

**A STUDY OF THE
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Prepared for:

Metropolitan Water Reclamation District of Greater Chicago
Research and Development Department

Prepared by:

EA Engineering, Science, and Technology, Inc.
444 Lake Cook Road, Suite 18
Deerfield, IL 60015

January 2004

EA Project 61755.01

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1. INTRODUCTION

The Upper Illinois River watershed consists of several natural, constructed, and altered waterways and their tributaries. The major waterways of the Chicago Metropolitan Area within the Upper Illinois River watershed include, in part, the Calumet River, Calumet-Saginaw Channel, North Branch of the Chicago River, South Branch of the Chicago River, Chicago Sanitary and Ship Canal, and Des Plaines River. Through their comprehensive ambient water quality program (AWQM), the Metropolitan Water Reclamation District of Greater Chicago (District) has collected a substantial amount of physicochemical and biological data describing the condition of these waterways since 1972. These data serve to provide the Illinois Environmental protection Agency (IEPA) with current information to assess the quality of the waterways within the District's service area as well as offering the unique opportunity to examine trends via the District's long-term database.

In an effort to support and strengthen their AWQM program, the District has implemented an accessory monitoring program to evaluate the biological resources, sediment quality, and habitat condition on waterways within their service area. As part of this initiative, a benthic macroinvertebrate sampling program began in 2001 to collect samples at established stations in four watersheds: North Branch Chicago River, South Branch Chicago River and Chicago Sanitary and Ship Canal, Calumet River, and Des Plaines River. Each of these watersheds will be sampled on a four-year rotation. The first two watersheds sampled were the North Branch Chicago River (2001) and the South Branch Chicago River and Chicago Sanitary and Ship Canal (2002). In addition to the target watersheds, a core group of stations throughout the District's service area will be evaluated annually. This report presents the study design and benthic macroinvertebrate data for the initial two years of the program.

2. METHODS

During 2001 and 2002, benthic macroinvertebrates were monitored at 35 stations in the Chicago Metropolitan Area waterways. Of these stations, 15 were sampled during both years. In 2001, Benthic macroinvertebrate samples were collected at 27 stations in the Calumet River, Calumet-Saginaw Channel, North Branch of the Chicago River, Chicago Sanitary and Ship Canal, and Des Plaines River waterways (Table 2-1). During 2002, benthic macroinvertebrates were monitored at 23 stations in the Calumet River, Calumet-Saginaw Channel, North Branch of the Chicago River, South Branch of the Chicago River (SBCR), Chicago Sanitary and Ship Canal (CSSC), and Des Plaines River waterways (Table 2-2). Figure 2-1 presents the benthic macroinvertebrate sampling locations for the District's ambient water quality program.

Field sampling was conducted by District personnel using a combination of Hester-Dendy (HD) artificial substrates and Ponar grabs. Each HD sampler consisted of nine, three-inch square plates with uniform spacing. The total surface area of one HD sampler, excluding the bolt and spacers was 0.031 m². At each location, a group of three HD samplers (sampler array) were deployed near shore in the littoral zone and an additional group of three samplers were deployed mid-channel of the waterway. Each HD sampler array was constructed of a 10-16" length of 2" diameter transparent, schedule 80 PVC pipe secured to the top of an 18 pound river anchor by placing a ¼" stainless steel bolt through the anchor eye and two holes drilled in the pipe. Three-inch stainless steel eyebolts are located radially, approximately 120 degrees apart, through holes drilled one-inch from the top of the PVC pipe. The HD arrays were suspended from the eyebolts approximately 12-18" off the bottom using nylon cable ties (Figure 2-2). One cable was used to anchor both arrays to a structure on shore.

The two HD sampler arrays at each station were retrieved by using the shore-attachment cable to lift the samplers into a custom-made dipnet with an attached plankton bucket. The mesh size of both the dipnet and plankton bucket was Standard Testing No. 60 (250 μ) mesh (Figure 2-3). The cable tie connecting each H-D sampler to the anchoring system was cut and each sampler was placed, fully assembled into a one-gallon plastic sample pail. The dipnet was thoroughly rinsed with river water and contents of the plankton bucket were transferred to the sample pail. The contents of each sample pail were fixed with approximately 5% formalin before the lid was attached. Deployment and retrieval dates for the HD samples in each watershed were as follows:

| 2001 | | |
|----------------------------|-------------------|-------------------------|
| <u>Watershed</u> | <u>Deployed</u> | <u>Retrieved</u> |
| Calumet | 21-22 June | 24-27 August |
| North Branch Chicago River | 25 June – 12 July | 10-28 August |
| SBCR and CSSC | 18-19 June | 30 July – 1 August |
| Des Plaines River | 11-14 June | 23-27 August |
| 2002 | | |
| <u>Watershed</u> | <u>Deployed</u> | <u>Retrieved</u> |
| Calumet | 9-19 July | 5-16 September |
| North Branch Chicago River | 10-18 June | 29 July – 1 August |
| SBCR and CSSC | 10 June – 15 July | 2 August – 11 September |
| Des Plaines River | 12-19 June | 22-30 July |

Table 2-1. Description of benthic macroinvertebrate monitoring stations sampled during 2001. Stations arranged by major watershed, upstream to downstream within each waterway.

| Watershed | Sampling Station | | Waterway | Lat./Lon. | Location Description |
|----------------------------|------------------|----------------------------|----------------------------------|------------------------------------|--|
| Calumet | 55- | 130th St. ⁽²⁾ | Calumet River | 41° 39' 33.9"N 87° 34' 20.1"W | 50' upstream of 130th St. (40' from east bank and center channel) |
| | 76- | Halsted St. ⁽²⁾ | Little Calumet River | 41° 39' 25.9"N 87° 38' 27.3"W | 20' upstream of Halsted St. (20' from south bank and center channel) |
| | 59- | Cicero Ave. ⁽²⁾ | Calumet-Sag Channel | 41° 35' 19.4"N 87° 44' 15.6"W | 150' upstream of Cicero Ave. (30' from north bank and center channel) |
| North Branch Chicago River | 106- | Dundee Rd. | W. Fork N. Branch Chicago R. | 42° 08' 19.03"N 87° 50' 5.07"W | 0.1 mile downstream of Dundee Rd. (5' from west bank and center channel) |
| | 103- | Golf Rd. | W. Fork N. Branch Chicago R. | 42° 03' 19.21"N 87° 46' 54.99"W | 20' upstream of Golf Rd. (5' from east bank and center channel) |
| | 31- | Lake-Cook Rd. | Middle Fork N. Branch Chicago R. | 42° 08' 56.5"N 87° 48' 51.0"W | 900' above I-94, 75' below diversion channel to Middle Fork Reservoir (5' from west bank and center channel) |
| | 32- | Lake-Cook Rd. | Skokie River | 42° 09' 9.7"N 87° 47' 38.0"W | 10' upstream of Lake-Cook Rd. (10' from east bank and center channel) |
| | 105- | Frontage Rd. | Skokie River | 42° 05' 16.1"N 87° 45' 38.2"W | 100' downstream of Frontage Rd. (10' from south bank and center channel) |
| | 35- | Central Rd. | N. Shore Channel | 42° 3' 52.93"N 87° 41' 13.97"W | 30' feet upstream of Central St. (15' from east bank and center channel) |
| | 102- | Oakton St. | N. Shore Channel | 42° 01' 35.50"N 87° 42' 35.96"W | 75' upstream of Oakton St. (15' from east bank and center channel) |
| | 36- | Touhy Ave. ⁽²⁾ | N. Shore Channel | 42° 00' 43.7"N 87° 42' 37.2"W | 10' upstream of Touhy Ave. (15' from east bank and center channel) |
| | 101- | Foster Ave. | N. Shore Channel | 41° 58' 32.59"N 87° 42' 16.61"W | 50' upstream of Foster Ave. (10' from west bank and center channel) |

(1) SBCR = South Branch of Chicago River, CSSC = Chicago Sanitary and Ship Canal

(2) Stations were sampled during both 2001 and 2002.

Table 2-1 - Continued

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description | |
|------------------------------|------------------|------------------------------------|---------------------------------|-------------------------------------|---|
| North Branch Chicago River | 104- | Glenview Rd. | N. Branch Chicago R. | 42° 04' 8.33"N 87° 46' 27.47"W | 100' upstream of Glenview Rd. (5' from east bank and center channel) |
| | 34- | Dempster St. | N. Branch Chicago R. | 42° 02' 30.9"N 87° 47' 16.9"W | 500' upstream of Dempster St. (5' from east bank and center channel) |
| | 96- | Albany Ave. ⁽²⁾ | N. Branch Chicago R. | 41° 58' 21.7"N 87° 42' 44.3"W | 250' downstream of Kimball Ave. (5' from south bank and center channel) |
| | 37- | Wilson Ave. | N. Branch Chicago R. | 41° 57' 52.66"N 87° 41' 50.50"W | 10' upstream of Wilson Ave. (10' from west bank and center channel) |
| | 73- | Diversey Pkwy. | N. Branch Chicago R. | 41° 55' 55.79"N 87° 40' 56.89"W | 50' upstream of Diversey Ave. (30' from east bank and center channel) |
| | 46- | Grand Ave. ⁽²⁾ | N. Branch Chicago R. | 41° 53' 29.16" N 87° 38' 9.29" W | 50' upstream of Grand Ave. (40' from east bank and center channel) |
| SBCR and CSSC ⁽¹⁾ | 75- | Cicero Ave. ⁽²⁾ | Chicago Sanitary and Ship Canal | 41° 49' 11.4"N 87° 44' 35.7"W | 20' upstream of Cicero Ave. (70' from north bank and center channel) |
| | 41- | Harlem Ave. ⁽²⁾ | Chicago Sanitary and Ship Canal | 41° 48' 4.01"N 87° 48' 5.64"W | 50' upstream of Harlem Ave. (50' from south bank and center channel) |
| | 92- | Lockport (16th St.) ⁽²⁾ | Chicago Sanitary and Ship Canal | 41° 34' 58"N 88° 04' 09.4"W | 75' upstream of former Division St. bridge location (20' from west bank and center channel) |
| Des Plaines River | 78- | Wille Road ⁽²⁾ | Higgins Cr. | 42° 01' 7.24"N 87° 56' 12.03"W | 200' downstream of Wille Rd., inside entrance to culvert (5' from west bank and center channel) |
| | 18- | Devon Ave. ⁽²⁾ | Salt Cr. | 41° 59'34.6"N 87° 59' 42.9"W | 150' feet upstream of Devon Ave. (10' from west bank and center channel) |
| | 64- | Lake St. ⁽²⁾ | W Branch Du Page R. | 41° 58'43.1"N 88° 07' 59.4"W | 75' upstream of Lake St. (5' from west bank and center channel) |

(1) SBCR = South Branch of Chicago River, CSSC = Chicago Sanitary and Ship Canal

(2) Stations were sampled during both 2001 and 2002.

Table 2-1 - Continued

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description | |
|----------------------------------|-------------------------|---|-----------------------|--|---|
| Des Plaines River | 13- | Lake-Cook Rd.⁽²⁾ | Des Plaines R. | 42° 09' 9.8"N 87° 54' 36.2"W | 20' downstream of Lake-Cook Rd. (20' from west bank and center channel) |
| | 22- | Ogden Ave.⁽²⁾ | Des Plaines R. | 41° 49' 14.4"N 87° 48' 38.2"W | 50' upstream of Ogden Ave. (20' from east bank and center channel) |
| | 91- | Material Service Rd.⁽²⁾ | Des Plaines R. | 41° 35' 29.3"N 88° 4' 8.30"W | 20' upstream of Material Service Rd. (20' from east bank and center channel) |

(1) SBCR = South Branch of Chicago River, CSSC = Chicago Sanitary and Ship Canal

(2) Stations were sampled during both 2001 and 2002.

Table 2-2. Description of benthic macroinvertebrate monitoring stations sampled during 2002. Stations arranged by major watershed, upstream to downstream within each waterway.

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description |
|------------------------------|----------------------------------|---------------------------------|------------------------------------|--|
| Calumet | 55- 130th St. ⁽²⁾ | Calumet River | 41° 39' 33.9"N 87° 34' 20.1"W | 50' upstream of 130th St. (40' from east bank and at center channel) |
| | 76- Halsted St. ⁽²⁾ | Little Calumet River | 41° 39' 25.9"N 87° 38' 27.3"W | 75' upstream of Halsted St. (15' from south bank and at center channel) |
| | 59- Cicero Ave. ⁽²⁾ | Calumet-Sag Channel | 41° 59' 19.4"N 87° 44' 15.6"W | 75' upstream of Cicero Ave. (20' from north bank and at center channel) |
| North Branch Chicago River | 36- Touhy Ave. ⁽²⁾ | N. Shore Channel | 42° 00' 43.7"N 87° 42' 37.2"W | 40' upstream of Touhy Ave. (15' from east bank and at center channel) |
| | 96- Albany Ave. ⁽²⁾ | N. Branch Chicago R. | 41° 58' 21.7"N 87° 42' 44.3"W | 250' downstream of Kimball Ave. (5' from south bank and at center channel) |
| | 46- Grand Ave. ⁽²⁾ | N. Branch Chicago R. | 41° 53' 29.16"N 87° 38' 29.29"W | 25' upstream of Grand Ave. (40' from east bank and at center channel) |
| SBCR and CSSC ⁽¹⁾ | 74- Lake Shore Dr. (Outer Drive) | Chicago R. | 41° 53' 19.9"N 87° 36' 48.6"W | 50' upstream of Lake Shore Dr. (5' from north bank and at center channel) |
| | 100- Wells St. | Chicago R. | 41° 53' 16"N 87° 38' 1.2"W | 40' upstream of Wells St. (30' from south bank and at center channel) |
| | 39- Madison St. | S. Branch Chicago R. | 41° 52' 55.4"N 87° 38' 18.7"W | 40' upstream of Madison St. (30' from west bank and at center channel) |
| | 108- Loomis St. | S. Branch Chicago R. | 41° 50' 47.3"N 87° 39' 37.1"W | 50' upstream of Loomis St. (10' from north bank and at center channel) |
| | 99- Archer Ave. | S. Fork S. Branch Chicago River | 41° 50' 18.4"N 87° 39' 50.5"W | 30' upstream of Archer Ave. (20' from west bank and at center channel) |

(1) SBCR = South Branch of Chicago River, CSSC = Chicago Sanitary and Ship Canal

(2) Stations were sampled during both 2001 and 2002.

Table 2-2 - Continued

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description | |
|------------------------------|------------------|-------------------------------------|---------------------------------|-----------------------------------|--|
| SBCR and CSSC ⁽¹⁾ | 40- | Damen Ave. | Chicago Sanitary and Ship Canal | 41° 50' 31.9"N 87° 40' 31.1"W | 40' upstream of Damen Ave. (40' from north bank and at center channel) |
| | 75- | Cicero Ave. ⁽²⁾ | Chicago Sanitary and Ship Canal | 41° 49' 11.4"N 87° 44' 35.7"W | 20' upstream of Cicero Ave. (70' from north bank and at center channel) |
| | 41- | Harlem Ave. ⁽²⁾ | Chicago Sanitary and Ship Canal | 41° 48' 4.01"N 87° 48' 5.64"W | 50' upstream of Harlem Ave. (50' from south bank and at center channel) |
| | 42- | Rt. 83 | Chicago Sanitary and Ship Canal | 41° 42' 29.5"N 87° 55' 38.6"W | 4000' upstream of Rt. 83 (5' from south bank and at center channel) |
| | 48- | Stephen St. | Chicago Sanitary and Ship Canal | 41° 41.127"N 87° 58.862"W | 1.1 miles upstream of Stephen St. (10' from west bank and at center channel) |
| | 92- | Lockport (16th St.) ⁽²⁾ | Chicago Sanitary and Ship Canal | 41° 34' 59.2"N 88° 04' 8.7"W | 75' upstream of former Division St. bridge location (20' from west bank and at center channel) |
| Des Plaines River | 78- | Wille Road ⁽²⁾ | Higgins Cr. | 42° 01' 7.24"N 87° 56' 12.03"W | 200' downstream of Wille Rd., inside entrance to culvert (5' from west bank and at center channel) |
| | 18- | Devon Ave. ⁽²⁾ | Salt Cr. | 41° 59' 34.6"N 87° 59' 42.9"W | 200' feet upstream of Devon Ave. (10' from west bank and at center channel) |
| | 64- | Lake St. ⁽²⁾ | W Branch Du Page R. | 41° 58' 43.1"N 88° 07' 59.4"W | 125' upstream of Lake St. (5' from west bank and at center channel) |
| | 13- | Lake-Cook Rd. ⁽²⁾ | Des Plaines R. | 42° 09' 9.8"N 87° 54' 36.2"W | 20' downstream of Lake-Cook Rd. (20' from west bank and at center channel) |
| | 22- | Ogden Ave. ⁽²⁾ | Des Plaines R. | 41° 49' 14.4"N 87° 48' 38.2"W | 200' upstream of Ogden Ave. (15' from east bank and at center channel) |
| | 91- | Material Service Rd. ⁽²⁾ | Des Plaines R. | 41° 35' 29.3"N 88° 4' 8.30"W | 20-30' downstream of Material Service Rd. (20' from east bank and at center channel) |

(1) SBCR = South Branch of Chicago River, CSSC = Chicago Sanitary and Ship Canal

(2) Stations were sampled during both 2001 and 2002.

Figure 2-1: Sampling stations for the MWRDGC benthic macroinvertebrate program.

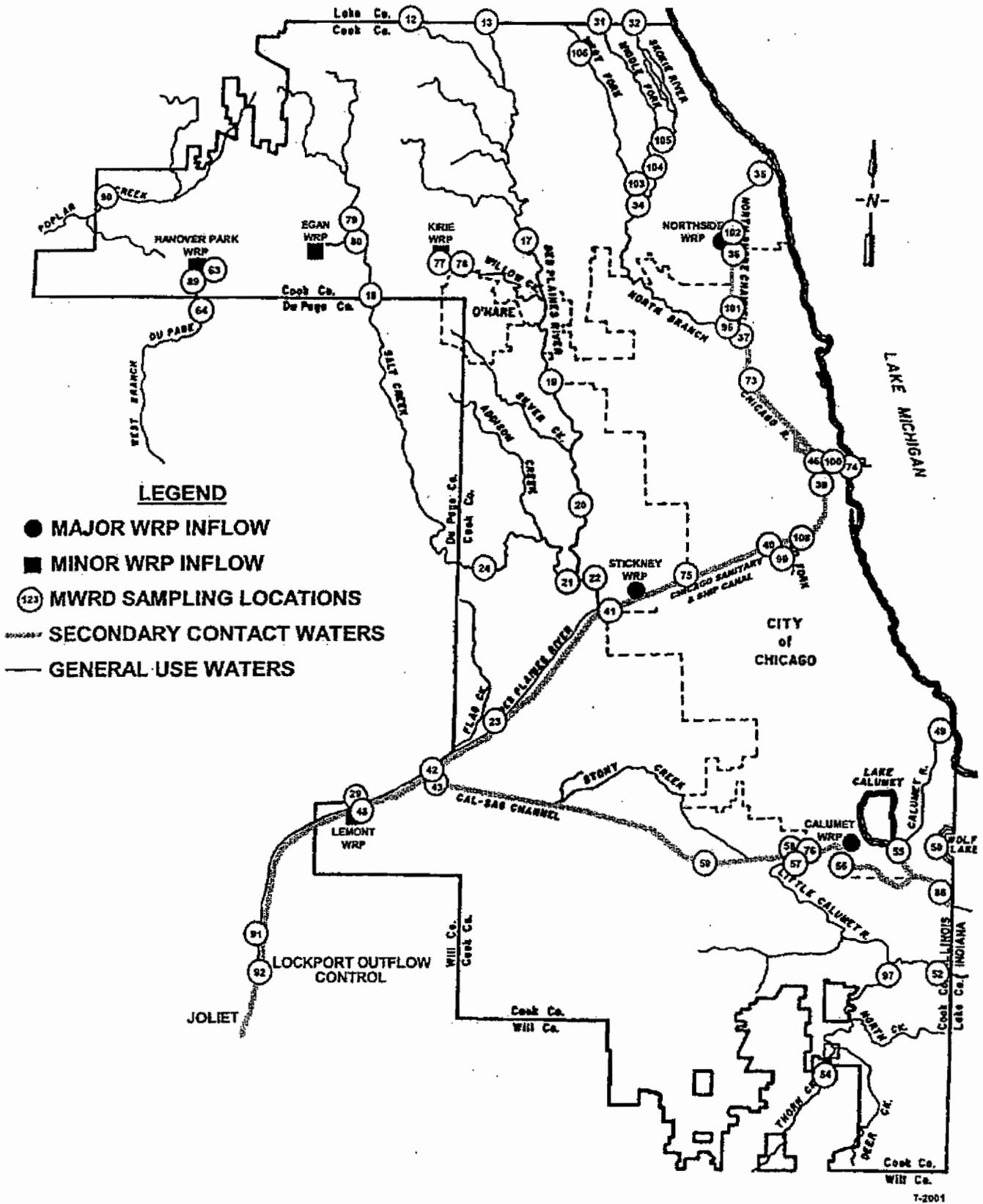


Figure 2-2. Hester-Dendy sampling array.

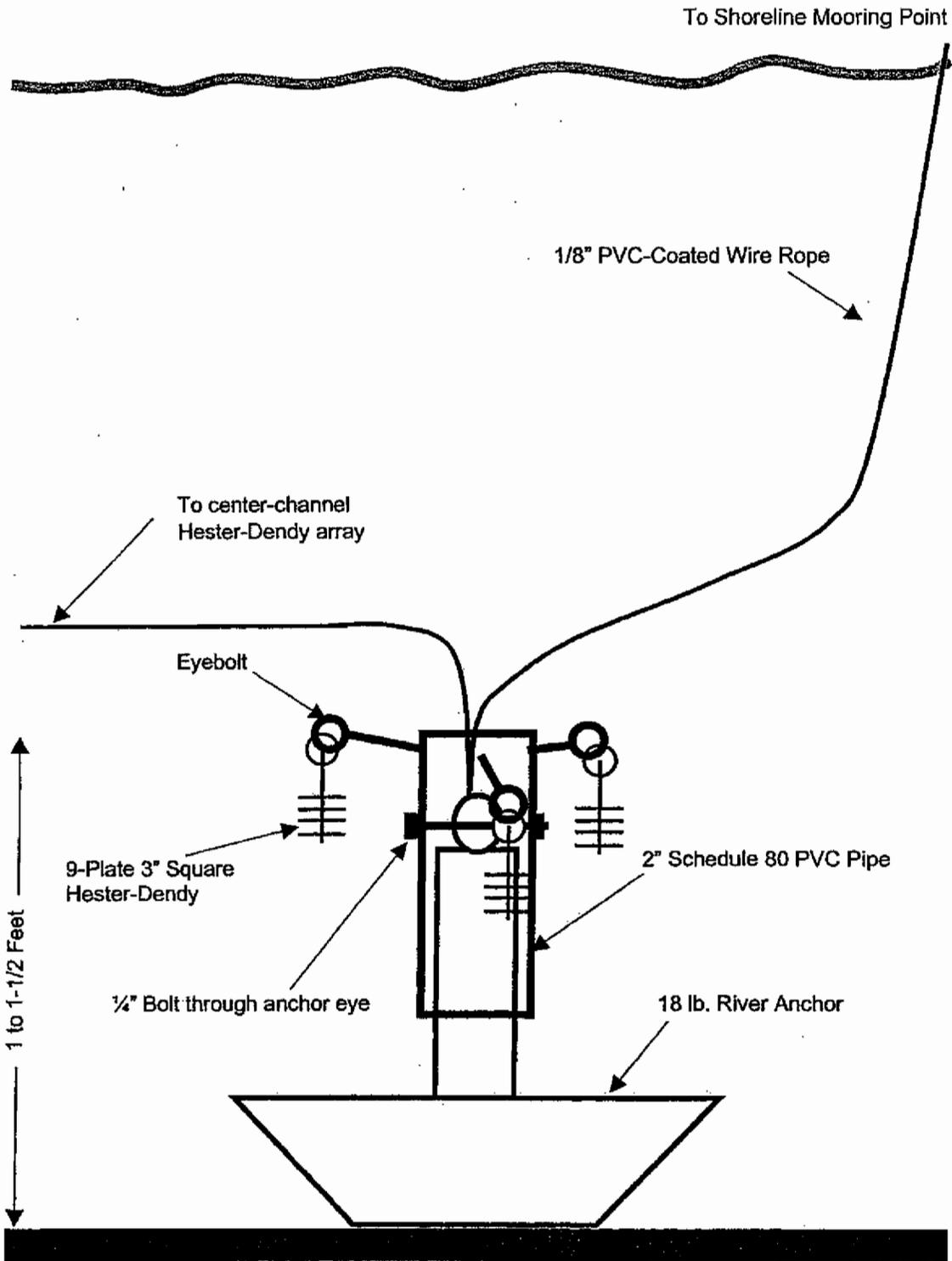
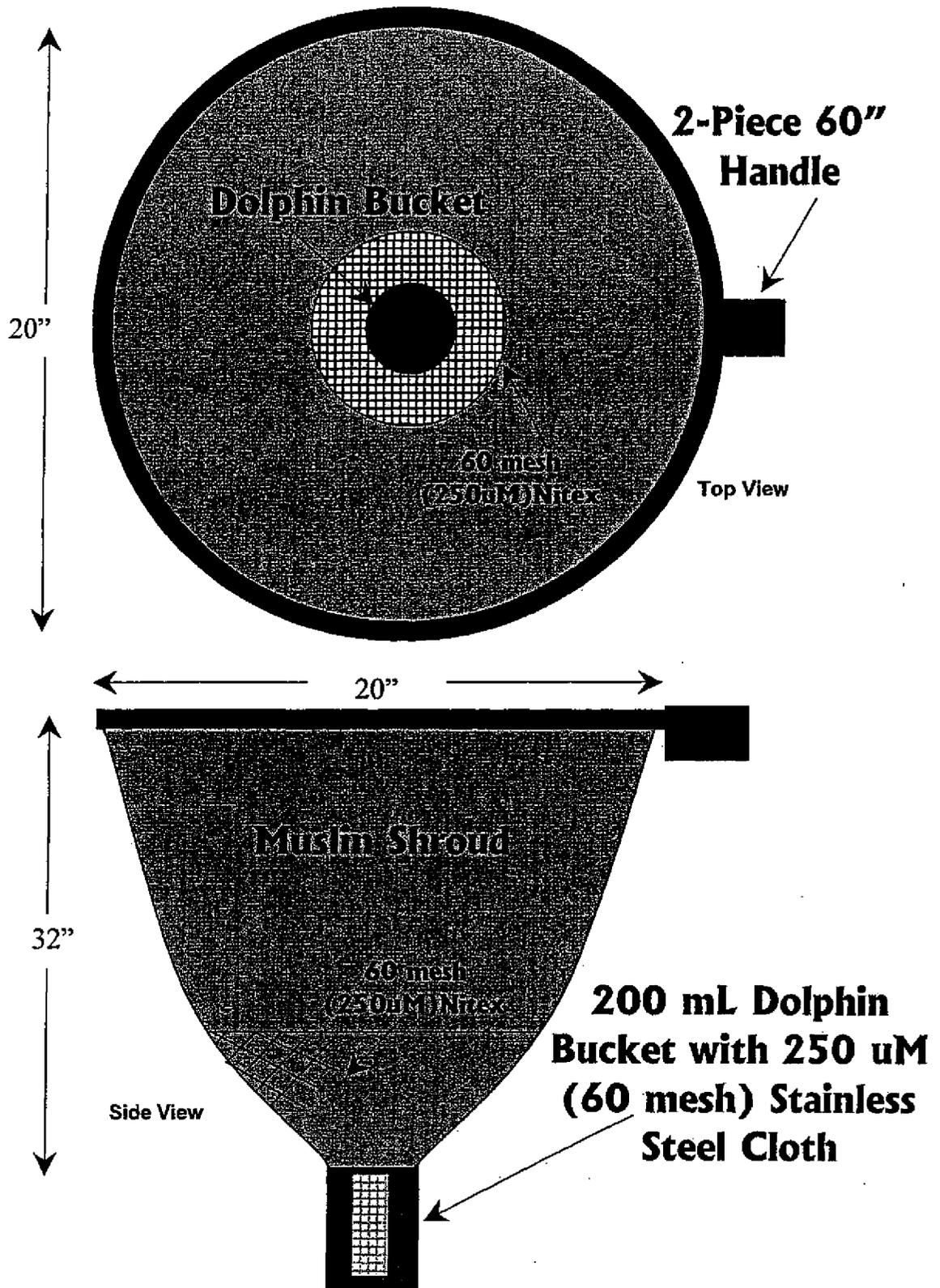


Figure 2-3. Dipnet for Hester-Dendy sampler retrieval.



HD samples were collected from the near-shore area and mid-channel at all 27 sample stations in 2001. However, during 2002, HD samples could not be collected from either the near shore area or mid-channel of the Chicago Sanitary and Ship Canal (CSSC) at Route 83 or Stephens Street (Stations 42 and 48, respectively).

Ponar grab samples were collected at each station in conjunction with the HD retrieval. The grab samples were collected using a 6" X 6" Petite-Ponar sampler. As with the HD sampling, two Ponar samples were collected at each station; one from a near shore area and one from mid-channel. Each Ponar sample consisted of three grabs. All Ponar samples were collected within 30 to 50 feet of the HD samples. All three grabs for each sample were combined in the field and washed in a No. 60 (250 μ) mesh sieving bucket to remove most of the fine sediment. The sample was then transferred to a one-gallon bottle and preserved with 5% formalin. Ponar samples could not be collected from the mid-channel location of the Des Plaines River at Material Service Road (Station 91) in 2001 and during both years from the mid-channel of the North Branch of the Chicago River (NBCR) at Albany Avenue (Station 96).

In the laboratory, each sample was processed by first pouring the contents of the sample bottle into a No. 60 mesh sieve where it could be rinsed. Under a stream of water, the individual HD plates and hardware were scrubbed with a 2-inch paintbrush into the sieve. The sample was then rinsed from the sieve into a white plastic tray partially filled with water. Sample aliquots were removed from the tray and placed in a small petri dish for counting under a dissecting microscope with 15X to 40X magnification. Following counting, the samples were preserved with 70% isopropanol solution. The subject samples were delivered to EA Engineering, Science, and Technology, Inc. (EA) in Deerfield, Illinois for further processing and taxonomic identification.

Upon arrival at EA's laboratory, the samples were logged in. Except for Oligochaeta, macroinvertebrate identifications were made to the lowest practical taxonomic level using the most current literature available (see Section 5). If necessary, Chironomidae larvae were subsampled. Chironomid larvae were placed in a grided petri dish. Squares were randomly chosen until at least 100 larvae were removed. Chironomid larvae were then cleared in 10% potassium hydroxide and permanently mounted in CMC-10. All specimens were identified, enumerated, and coded on EA's standard laboratory bench sheet for data processing.

Each slide-mounted chironomid specimen was examined for a variety of head capsule deformities. For Orthoclaadiinae, Chironomini, and Tanytarsini specimens, the structures examined for deformities included the mentum, mandibles, premandibles, and pecten epipharyngis (Sæther 1980). Tanypodinae structures included the ligula, dorsomentum, mandibles, paraligula, and pecten hypopharyngis (Sæther 1980). Guidance as to what constituted a deformity as well as descriptions of deformities for the structures and taxa listed above was derived from a variety of sources, most notably Dermott (1991), Dickman et al. (1992), Groenendijk et al. (1998), Hudson and Ciborowski (1996a), Warwick (1985 and 1991), and Warwick and Tisdale (1988), among others. A conservative approach was used to distinguish deformities or malformations from broken or severely worn larval structures. In general, deformities and malformations were easily distinguished from worn or damaged structures for the specimens examined during this study. However, if any suspicion existed as to the cause of an irregular structure, that irregularity was not counted as a deformity. Due to the

condition of the Chironomidae specimens in several samples, particularly from 2001, identification down to genus or species level and examination of deformities was problematic. This likely resulted in both lower taxa richness and, possibly, low-biased the percent occurrence of deformities at these stations in 2001.

Whenever possible, for the waterways with multiple sampling stations, comparisons were made longitudinally between monitoring stations. Temporal comparisons also were made for those stations that were sampled during both years. Metrics used included density, relative abundance (percent), total taxa richness, number of Ephemeroptera+Plecoptera+Trichoptera (EPT) taxa, dominant taxa composition, and percent Chironomidae head capsule deformities. In some instances, notable differences in the benthic macroinvertebrate community were observed among the stations. These differences could be the result of differences in water or sediment quality related to point and non-point sources, differences in habitat quality, or natural variability within the benthic community. However, since it was unclear what factors may have affected the sample results, the differences were described in varying degrees of "stress", which is intended to encompass all potential impact types. For the purpose of summarizing and discussing the 2001 and 2002 results, the center and near shore samples were combined for each site by sample type. The center and near shore data are presented separately for each station and sample type in Appendices A and B.

3. RESULTS AND DISCUSSION

3.1 2001 Benthic Macroinvertebrate Results

During 2001, 54 HD samples and 52 Ponar samples were collected from 27 stations in 13 different waterways (Table 2-1). Combined, these samples yielded 101 total taxa and 20 relatively pollution sensitive EPT taxa (Table 3-1). Chironomidae was the most taxa rich group with 40 taxa followed by Ephemeroptera and Trichoptera with 11 and 10 taxa, respectively. The taxa that are underlined in Table 3-1 represent those that are considered highly tolerant of pollution caused stressors. For the purposes of this study, several literature sources were considered to determine the tolerance of any particular taxon including Barbour et al. (1999), Illinois Environmental Protection Agency (IEPA) (1987), Ohio Environmental Protection Agency (OEPA) (1988), and Simpson and Bode (1980). Taxa were regarded as highly tolerant if they were listed as such in the literature and/or their assigned tolerance values from various regions in the U.S. averaged eight or greater on a zero to ten or eleven scale with ten/eleven being the most tolerant.

3.1.1 Calumet Watershed

Three stations were sampled in the Calumet watershed during 2001: one station in the Calumet River, one station in the Little Calumet River, and one station in the Calumet-Saginaw Channel (Cal-Sag) (Table 2-1).

Overall, the HD samples from the Calumet watershed were either dominated by zebra mussels or Oligochaeta whereas all of the Ponar samples were dominated by Oligochaeta. Although no chironomid deformities were observed, the benthic community in the Calumet watershed largely consisted of tolerant taxa.

3.1.1.1 Calumet River

Combined, the HD and Ponar samples from the single station in the Calumet River (Station 55) yielded 18 total taxa and one EPT taxon (Tables 3-2 and 3-3). Ten total taxa and one EPT taxon were observed in the HD samples while 12 total taxa were present in the Ponar samples. Total density in the HD samples was nearly ten times higher than in the Ponar samples. The higher density in the HD samples was almost exclusively due to the abundance of zebra mussels (*Dreissena polymorpha*), which prefer hard surfaces, like the HD samplers for attachment (Table 3-2). Zebra mussel was the most dominant HD taxon, representing over 94 percent of the total density. Except for the side swimmer *Gammarus fasciatus* and Oligochaeta, the remaining taxa observed in the HD samples were individually represented by less than one percent of the total density. In contrast to the HD samples, Oligochaeta was the most dominant taxon by percent in the Ponars (Table 3-3). With the exception of *D. polymorpha*, *G. fasciatus*, and the midge *Procladius (Holotanypus)*, none of the other taxa collected in the Ponar samples was represented by more than one percent of the total density.

No Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, the benthic community represented in both the HD and Ponar samples largely

Table 3-1. List of benthic macroinvertebrate taxa collected in Hester-Dendy and Ponar samples from several Chicago Metropolitan Area waterways. Underlined taxa are those considered to be highly tolerant based on literature sources.

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 |
|--|-------------------|------------|-------------------|------------|
| COELENTERATA (Hydroids) | | | | |
| <i>Hydra</i> | X | X | X | X |
| PLATYHELMINTHES (Flat worms) | | | | |
| Turbellaria | X | X | X | X |
| ENTOPROCTA (Moss Animalcules) | | | | |
| <i>Urnatella gracilis</i> | | X | | |
| ECTOPROCTA (Bryozoans) | | | | |
| <i>Plumatella</i> | X | X | X | X |
| ANNELLIDA | | | | |
| <u>Oligochaeta (Aquatic Worms)</u> | X | X | X | X |
| Hirudinea (Leeches) | | | | |
| Glossiphoniidae ¹ | | | X | X |
| <i>Helobdella</i> ¹ | X | | | |
| <i>Helobdella stagnalis</i> | X | X | X | X |
| <u><i>Helobdella triserialis</i></u> | X | X | X | |
| <i>Placobdella</i> | | | X | |
| <u><i>Erpobdella punctata punctata</i></u> | X | X | | X |
| <u><i>Mooreobdella microstoma</i></u> | X | X | X | X |
| CRUSTACEA | | | | |
| Ostracoda (Seed Shrimp) | | X | | |
| Isopoda (Sow Bugs) | | | | |
| <i>Caecidotea</i> | X | X | X | X |
| Amphipoda (Side Swimmers) | | | | |
| <i>Gammarus</i> ¹ | | | | X |
| <i>Gammarus fasciatus</i> | X | X | X | X |
| Decapoda (Crayfish) | | | | |
| <i>Orconectes immunis</i> | | X | | |
| <i>Orconectes virilis</i> | X | | | X |
| ARACHNOIDEA | | | | |
| Hydracarina (Water Mites) | X | X | | |

Table 3-1 (cont.)

| Taxa | Hester- Dendy 2001 | Ponar 2001 | Hester- Dendy 2002 | Ponar 2002 |
|---------------------------------------|--------------------------|---------------|--------------------------|---------------|
| INSECTA | | | | |
| Ephemeroptera (Mayflies) | | | | |
| <i>Isonychia</i> | X | | X | |
| <i>Baetis intercalaris</i> | X | X | X | X |
| <i>Pseudocloeon ephippiatum</i> | X | | | |
| Heptageniidae ¹ | X | X | | |
| <i>Heptagenia</i> | X | | X | |
| <i>Leucrocuta</i> | X | | X | |
| <i>Stenacron</i> | X | | X | |
| <i>Stenonema</i> | X ¹ | X | | |
| <i>Stenonema integrum</i> | X | | X | |
| <i>Stenonema terminatum</i> | X | | X | |
| <i>Tricorythodes</i> | X | X | X | X |
| <i>Caenis</i> | | X | | |
| <i>Hexagenia bilineata</i> | | | | X |
| Odonata (Damselflies and Dragonflies) | | | | |
| <i>Calopteryx</i> | X | | | |
| <i>Argia</i> | X | | X | |
| <u><i>Enallagma</i></u> | X | X | X | |
| <i>Somatochlora</i> | | | X | |
| <i>Stylurus</i> | | X | | |
| Hemiptera (True Bugs) | | | | |
| <i>Trepobates</i> | | | X | |
| Corixidae | | | X | X |
| <i>Palmarcorixa</i> | | X | | |
| Trichoptera (Caddisflies) | | | | |
| <i>Cyrnellus fraternus</i> | X | X | X | |
| Hydropsychidae ¹ | | | | X |
| <i>Ceratopsyche morosa</i> | X | | X | |
| <i>Cheumatopsyche</i> | X | X | X | X |
| <i>Hydropsyche</i> | X | | X | |
| <i>Hydropsyche betteni</i> | X | X | X | |
| <i>Hydropsyche orris</i> | X | | X | |

Table 3-1 (cont.)

| Taxa | Hester- Dendy 2001 | Ponar 2001 | Hester- Dendy 2002 | Ponar 2002 |
|---|--------------------------|---------------|--------------------------|---------------|
| Trichoptera (cont.) | | | | |
| <i>Hydropsyche simulans</i> | X | | X | |
| <i>Hydropsyche bidens</i> | X | | X | |
| <i>Potamyia flava</i> | X | X | X | X |
| <i>Hydroptila</i> | X | | X | |
| Lepidoptera (Aquatic Moths) | | | | |
| <i>Petrophila</i> | X | | X | |
| Coleoptera (Beetles) | | | | |
| <i>Copelatus</i> | | | X | |
| <i>Laccophilus maculosus</i> | | | X | |
| <i>Dubiraphia</i> | X | X | | X |
| <i>Macronychus glabratus</i> | X | X | X | |
| <i>Stenelmis</i> ¹ | X | X | | X |
| <i>Stenelmis crenata</i> grp. | X | X | X | X |
| <u><i>Tropisternus</i></u> | | | X | |
| <i>Berosus</i> | X | X | | |
| Diptera (True Flies) | | | | |
| <i>Bezzia</i> | | X | | |
| <u><i>Chaoborus</i></u> | X | X | | |
| <i>Hemerodromia</i> | X | | | |
| <i>Simulium</i> | X | X | | |
| <i>Tipula</i> | | | X | |
| Chironomidae (Midges) ¹ | X | X | X | X |
| <i>Ablabesmyia janta</i> | X | | X | X |
| <i>Ablabesmyia mallochi</i> | X | X | X | X |
| <i>Clinotanypus</i> | | X | | |
| <i>Coelotanypus</i> | | | | X |
| <u><i>Natarsia</i> sp. A</u> | | X | | |
| <i>Nilotanypus fimbriatus</i> | X | | X | |
| <u><i>Procladius</i> (<i>Holotanypus</i>)</u> | X | X | X | X |
| <u><i>Tanypus</i></u> | | X | | |
| <i>Thienemannimyia</i> grp. | X | X | X | X |
| <i>Corynoneura</i> | X | X | | |
| <u><i>Cricotopus tremulus</i> grp.</u> | X | | X | X |
| <u><i>Cricotopus bicinctus</i> grp.</u> | X | X | X | X |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 |
|---|----------------------|---------------|----------------------|---------------|
| Chironomidae (cont.) | | | | |
| <i>Cricotopus trifascia</i> grp. | | | X | X |
| <u><i>Cricotopus sylvestris</i> grp.</u> | X | X | X | X |
| <i>Heterotrissocladius</i> | | | X | |
| <i>Nanocladius</i> ¹ | | X | | |
| <u><i>Nanocladius distinctus</i></u> | X | X | X | X |
| <i>Nanocladius crassicornus/rectinervis</i> | X | X | X | |
| <i>Rheocricotopus robacki</i> | X | | X | |
| <i>Thienemanniella xena</i> | X | | X | |
| <i>Thienemanniella similis</i> | X | X | | |
| <u><i>Chironomus</i></u> | X | X | X | X |
| <i>Cladopelma</i> | | X | X | |
| <u><i>Cryptochironomus</i></u> | X | X | X | X |
| <i>Dicrotendipes neomodestus</i> | X | X | X | X |
| <u><i>Dicrotendipes simpsoni</i></u> | X | X | X | X |
| <i>Endochironomus nigricans</i> | X | | | |
| <u><i>Glyptotendipes</i></u> | X | X | X | X |
| <i>Microchironomus</i> | | X | X | |
| <i>Microtendipes</i> | | X | | X |
| <u><i>Parachironomus</i></u> | X | X | X | X |
| <i>Paracladopelma</i> | X | X | | X |
| <i>Phaenopsectra</i> | X | | | |
| <u><i>Polypedilum fallax</i> grp.</u> | X | X | X | |
| <i>Polypedilum flavum</i> | X | X | X | X |
| <i>Polypedilum halterale</i> grp. | X | X | X | X |
| <u><i>Polypedilum illinoense</i></u> | X | X | X | X |
| <i>Polypedilum scalaenum</i> grp. | X | X | X | X |
| <i>Stenochironomus</i> | X | X | X | |
| <i>Xenochironomus xenolabis</i> | | | X | |
| <i>Cladotanytarsus mancus</i> grp. | | X | X | X |
| <i>Cladotanytarsus vanderwulpi</i> grp. | | X | | |
| <i>Micropsectra</i> | | | X | |
| <i>Paratanytarsus</i> | X | | X | X |
| <i>Rheotanytarsus</i> | X | X | X | |
| <i>Tanytarsus</i> | | | X | X |

Table 3-1 (cont.)

| Taxa | Hester- Dendy 2001 | Ponar 2001 | Hester- Dendy 2002 | Ponar 2002 |
|---|--------------------------|----------------|--------------------------|---------------|
| Chironomidae (cont.) | | | | |
| <i>Tanytarsus glabrescens</i> grp. | | | | X |
| <i>Tanytarsus guerhus</i> grp. | X | X | X | |
| GASTROPODA (Snails) | | | | |
| <i>Amnicola</i> | | X | | X |
| Pleuroceridae | X | X | | |
| <u><i>Ferrissia</i></u> | X | | X | X |
| <u><i>Menetus dilatatus</i></u> | X | X | X | |
| <u><i>Physella</i></u> | X | X | X | |
| PELECYPODA (Mussels and Clams)¹ | X | | | |
| <i>Corbicula fluminea</i> | X | X | X | X |
| <i>Musculium</i> | | X ¹ | X | |
| <i>Musculium transversum</i> | X | X | | X |
| <i>Pisidium</i> | X | X ¹ | | |
| <i>Pisidium compressum</i> | | X | | |
| <i>Pisidium nitidum</i> | | | | X |
| <i>Sphaerium simile</i> | | X | | |
| <i>Lasmigona complanata</i> | | X | | |
| <i>Dreissena polymorpha</i> | X | X | X | X |
| TOTAL RICHNESS BY SAMPLE TYPE | 83 | 74 | 81 | 50 |
| EPT RICHNESS BY SAMPLE TYPE | 19 | 8 | 18 | 5 |
| TOTAL RICHNESS BY YEAR | 101 | | 90 | |
| EPT RICHNESS BY YEAR | 20 | | 19 | |

¹Not counted as a discreet taxa.

TABLE 3-2. HESTER-DENDY DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, AUGUST 2001.

| TAXA | 55 | |
|------------------------|-----------|--------|
| | 130TH ST. | |
| | #/m2 | % |
| Plumatella | 1.8 | 0.00 |
| Oligochaeta | 556.2 | 1.44 |
| Gammarus fasciatus | 1,273.8 | 3.30 |
| Cyrmellus fraternus | 35.9 | 0.09 |
| Ablabesmyia mallochii | 17.9 | 0.05 |
| Nanocladius distinctus | 17.9 | 0.05 |
| Chironomus | 179.4 | 0.47 |
| Dicrotendipes simpsoni | 143.5 | 0.37 |
| Glyptotendipes | 35.9 | 0.09 |
| Dreissena polymorpha | 36,311.4 | 94.14 |
| TOTAL BENTHOS | 38,573.7 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-3. PETITE PONAR DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, AUGUST 2001.

| TAXA | 55 | |
|----------------------------|-----------|--------|
| | 130TH ST. | |
| | #/m2 | % |
| Hydra | 7.2 | 0.18 |
| Turbellaria | 7.2 | 0.18 |
| Oligochaeta | 3,674.4 | 92.25 |
| Gammarus fasciatus | 57.4 | 1.44 |
| Procladius (Holotanypus) | 50.2 | 1.26 |
| Clinotanypus | 7.2 | 0.18 |
| Chironomus | 7.2 | 0.18 |
| Cryptochironomus | 28.7 | 0.72 |
| Microchironomus | 7.2 | 0.18 |
| Polypedilum scalaenum grp. | 21.5 | 0.54 |
| Pisidium compressum | 14.4 | 0.36 |
| Dreissena polymorpha | 100.5 | 2.52 |
| TOTAL BENTHOS | 3,983.0 | 100.00 |
| TOTAL TAXA RICHNESS | 12 | |
| EPT TAXA RICHNESS | 0 | |

consisted of taxa that are considered moderately to extremely tolerant of pollution. Of the 18 taxa, seven are typically classified as tolerant suggesting some degree and type of environmental stress is affecting the benthic community at Station 55 (Table 3-1).

3.1.1.2 Little Calumet River

Combined, the HD and Ponar samples from the single station in the Little Calumet River (Station 76) yielded 14 total taxa (Tables 3-4 and 3-5). Total taxa richness ranged from 13 taxa in the HD samples to five taxa in the Ponar samples. No EPT taxa were observed in either sample type. Total Ponar density was slightly greater than half of that observed in the HDs. Again, zebra mussel was the most dominant taxon by percent in the HD samples, accounting for over half of the total density (Table 3-4). However, unlike the HD sample from the Calumet River, eight of the 13 taxa were individually represented by more than one percent of the total density. In contrast to the HD samples, the Ponar samples from the Little Calumet were dominated by Oligochaeta, which comprised nearly 97 percent of the total density (Table 3-5). With the exception of the flatworm *Turbellaria*, none of the other taxa collected in the Ponar samples achieved one percent of the total density.

As with the Calumet River samples, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, over half of the taxa represented in the HD and Ponar samples combined are considered highly tolerant of pollution indicating a stressed environment (Table 3-1).

3.1.1.3 Calumet-Saginaw Channel

Combined, the HD and Ponar samples from the single station in the Cal-Sag (Station 59) yielded 16 total taxa (Tables 3-6 and 3-7). Fourteen total taxa were observed in the HD samples while six total taxa were present in the Ponar samples. Total density was approximately three times greater in the Ponar samples compared to the HDs. This difference was almost exclusively due to the abundance of Oligochaeta in the Ponars. The most dominant taxa by percent in the HD samples were the midge *Dicrotendipes simpsoni* and Oligochaeta (Table 3-6), which represented over half the total density. Oligochaeta also was the most dominant taxon by percent in the Ponar samples (Table 3-7). With the exception of the midge *Procladius (Holotanypus)* and the Asiatic mussel *Corbicula fluminea*, none of the other taxa collected in the Ponar samples was represented by more than one percent of the total density.

Like the other two stations in the watershed, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, tolerant taxa continued to comprise the majority of the total density, which suggests the benthic community is moderately to highly stressed (Table 3-1).

3.1.2 North Branch Chicago River Watershed

Sampling was conducted at 15 stations in the North Branch of the Chicago River watershed during 2001: two stations in the West Fork of the North Branch of the Chicago River (WFNBRCR), one station in the Middle Fork of the North Branch of the Chicago River

TABLE 3-4. HESTER-DENDY DENSITIES AT SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER, AUGUST 2001.

| TAXA | 76 | |
|-------------------------|-------------|--------|
| | HALSTED ST. | |
| | #/m2 | % |
| Hydra | 1,435.2 | 6.79 |
| Turbellaria | 2,350.2 | 11.11 |
| Oligochaeta | 1,650.5 | 7.80 |
| Mooreobdella microstoma | 17.9 | 0.08 |
| Caecidotea | 35.9 | 0.17 |
| Gammarus fasciatus | 1,650.5 | 7.80 |
| Nanocladius distinctus | 233.2 | 1.10 |
| Dicrotendipes simpsoni | 950.8 | 4.50 |
| Glyptotendipes | 71.8 | 0.34 |
| Physella | 17.9 | 0.08 |
| Menetus dilatatus | 717.6 | 3.39 |
| Ferrissia | 53.8 | 0.25 |
| Dreissena polymorpha | 11,966.3 | 56.57 |
| TOTAL BENTHOS | 21,151.8 | 100.00 |
| TOTAL TAXA RICHNESS | 13 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-5. PETITE PONAR DENSITIES AT SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER, AUGUST 2001.

| TAXA | 76 | |
|----------------------|-------------|--------|
| | HALSTED ST. | |
| | #/m2 | % |
| Turbellaria | 279.9 | 2.29 |
| Oligochaeta | 11,855.8 | 96.95 |
| Gammarus fasciatus | 28.7 | 0.23 |
| Pisidium compressum | 50.2 | 0.41 |
| Dreissena polymorpha | 14.4 | 0.12 |
| TOTAL BENTHOS | 12,229.0 | 100.00 |
| TOTAL TAXA RICHNESS | 5 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-6. HESTER-DENDY DENSITIES AT SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL, AUGUST 2001.

| TAXA | 59 CICERO AVE. | |
|---------------------------|-------------------|--------|
| | #/m ² | % |
| Hydra | 1,883.7 | 15.81 |
| Turbellaria | 161.5 | 1.36 |
| Oligochaeta | 2,924.3 | 24.55 |
| Caecidotea | 17.9 | 0.15 |
| Gammarus fasciatus | 1,776.1 | 14.91 |
| Argia | 17.9 | 0.15 |
| Ablabesmyia mallochi | 35.9 | 0.30 |
| Nanocladius distinctus | 197.3 | 1.66 |
| Dicrotendipes neomodestus | 17.9 | 0.15 |
| Dicrotendipes simpsoni | 3,480.4 | 29.22 |
| Glyptotendipes | 17.9 | 0.15 |
| Menetus dilatatus | 35.9 | 0.30 |
| Ferrissia | 53.8 | 0.45 |
| Dreissena polymorpha | 1,291.7 | 10.84 |
| TOTAL BENTHOS | 11,912.5 | 100.00 |
| TOTAL TAXA RICHNESS | 14 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-7. PETITE PONAR DENSITIES AT SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL, AUGUST 2001.

| TAXA | 59 CICERO AVE. | |
|--------------------------|-------------------|--------|
| | #/m ² | % |
| Oligochaeta | 32,495.8 | 96.01 |
| Gammarus fasciatus | 71.8 | 0.21 |
| Procladius (Holotanypus) | 868.4 | 2.57 |
| Dicrotendipes simpsoni | 21.5 | 0.06 |
| Corbicula fluminea | 358.8 | 1.06 |
| Dreissena polymorpha | 28.7 | 0.08 |
| TOTAL BENTHOS | 33,845.0 | 100.00 |
| TOTAL TAXA RICHNESS | 6 | |
| EPT TAXA RICHNESS | 0 | |

(MFNBCR), two stations in the Skokie River, four stations in the North Shore Channel (NSC), and six stations in the North Branch of the Chicago River (NBCR) (Table 2-1).

In the majority of HD samples collected from the North Branch Chicago River watershed, the dominant taxon was either Oligochaeta or the sow bug *Caecidotea*. Likewise, Oligochaeta was the dominant taxon in the Ponar samples at all but one of the stations. The incidence of Chironomidae deformities was generally low in the watershed. Based on the dominance of a single taxon, dominance by tolerant taxa, taxa richness, and EPT richness, several stations in the watershed exhibited varying degrees of stress. However, by these same measures, a few, primarily upstream or "headwater" stations exhibited relatively more balanced benthic assemblages.

3.1.2.1 West Fork of the North Branch of the Chicago River

Together, the HD and Ponar samples from the two WFNBCR stations (Stations 106 and 103) yielded 31 total taxa and two EPT taxa (Tables 3-8 and 3-9). HD total taxa richness was similar between the two stations with 18 and 14 taxa being collected at Stations 106 and 103, respectively (Table 3-8). The only two EPT taxa observed in the WFNBCR samples were collected in the HD samples from Station 103 (Table 3-8). Total density was nearly three times higher at Station 103 compared to Station 106. This difference was primarily due to noticeably higher numbers of Turbellaria, Oligochaeta, *Caecidotea*, and *Dicrotendipes simpsoni*. The dominant taxon at Station 106 was the midge *Dicrotendipes neomodestus* while at Station 103 Oligochaeta and *Caecidotea* were the dominants.

Ponar total taxa richness was noticeably higher at Station 106 with 17 taxa than at Station 103 with nine taxa (Table 3-9). As with the HD samples, total density was substantially higher downstream at Station 103 compared to Station 106. This difference was primarily due to higher numbers of Oligochaeta and *Glyptotendipes*. The dominant taxon at both Ponar stations was Oligochaeta. However, the fingernail clam *Musculium transversum* also was relatively abundant at Station 106.

The incidence of chironomid head capsule deformities in the WFNBCR was restricted to a single taxon from the Station 106 HD samples. Of the 90 *Dicrotendipes neomodestus* examined, 2.2 percent or 1.1 percent of all midges examined were deformed (Table 3-10). All observed deformities were expressed on the mentum (teeth). This taxon was also observed in the HD samples from Station 103 and the Ponar samples from Station 106; however, none of these specimens or any other taxon observed in the WFNBCR exhibited a deformity.

Although the benthic community at both stations could be characterized as relatively pollution tolerant based on composition and relative abundance of tolerant taxa (Table 3-1), the substantially higher abundance of tolerant taxa such as Oligochaeta, *Dicrotendipes simpsoni*, and *Glyptotendipes* suggests the benthic community at the downstream Station 103 is relatively more stressed compared to Station 106.

TABLE 3-8. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE WEST FORK NORTH BRANCH CHICAGO RIVER, AUGUST 2001.

| TAXA | 106 DUNDEE RD. | | 103 GOLF RD. | |
|--------------------------------------|-------------------|--------|-----------------|--------|
| | #/m2 | % | #/m2 | % |
| Turbellaria | 156.1 | 7.61 | 1,112.3 | 18.16 |
| Oligochaeta | 256.5 | 12.51 | 1,444.2 | 23.57 |
| Helobdella stagnalis | 12.6 | 0.61 | -- | -- |
| Mooreobdella microstoma | 5.4 | 0.26 | -- | -- |
| Caecidotea | 398.3 | 19.42 | 1,300.7 | 21.23 |
| Stenacron | -- | -- | 9.0 | 0.15 |
| Argia | 5.4 | 0.26 | 62.8 | 1.02 |
| Enallagma | 43.1 | 2.10 | -- | -- |
| Cheumatopsyche | -- | -- | 26.9 | 0.44 |
| Berosus | 14.4 | 0.70 | -- | -- |
| Procladius (Holotanypus) | 19.7 | 0.96 | 26.9 | 0.44 |
| Ablabesmyia mallochii | 12.6 | 0.61 | -- | -- |
| Thienemanniya grp. | 109.4 | 5.34 | 35.9 | 0.59 |
| Cricotopus sylvestris grp. | 10.8 | 0.52 | -- | -- |
| Nanocladius crassicornus/rectinervis | 5.4 | 0.26 | -- | -- |
| Dicrotendipes neomodestus | 566.9 | 27.65 | 170.4 | 2.78 |
| Dicrotendipes simpsoni | 17.9 | 0.87 | 1,112.3 | 18.16 |
| Glyptotendipes | -- | -- | 538.2 | 8.78 |
| Polypedilum flavum | 30.5 | 1.49 | 80.7 | 1.32 |
| Polypedilum illinoense | 378.5 | 18.46 | 197.3 | 3.22 |
| Polypedilum scalaenum grp. | -- | -- | 9.0 | 0.15 |
| Paratanytarsus | 7.2 | 0.35 | -- | -- |
| TOTAL BENTHOS | 2,050.6 | 100.00 | 6,126.7 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | | 14 | |
| EPT TAXA RICHNESS | 0 | | 2 | |

TABLE 3-9. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE WEST FORK NORTH BRANCH CHICAGO RIVER, AUGUST 2001.

| TAXA | 106 DUNDEE RD. | | 103 GOLF RD. | |
|------------------------------|-------------------|--------|-----------------|--------|
| | #/m2 | % | #/m2 | % |
| Turbellaria | 21.5 | 0.12 | 71.8 | 0.21 |
| Oligochaeta | 7,334.5 | 40.35 | 32,459.9 | 93.24 |
| Helobdella stagnalis | 21.5 | 0.12 | -- | -- |
| Erpobdella punctata punctata | 21.5 | 0.12 | -- | -- |
| Mooreobdella microstoma | 624.4 | 3.43 | -- | -- |
| Caecidotea | 416.2 | 2.29 | -- | -- |
| Procladius (Holotanypus) | 21.5 | 0.12 | 57.4 | 0.16 |
| Thienemanniya grp. | 21.5 | 0.12 | -- | -- |
| Cricotopus bicinctus grp. | 14.4 | 0.08 | -- | -- |
| Chironomus | -- | -- | 14.4 | 0.04 |
| Cryptochironomus | 35.9 | 0.20 | -- | -- |
| Dicrotendipes neomodestus | 50.2 | 0.28 | -- | -- |
| Glyptotendipes | -- | -- | 1,076.5 | 3.09 |
| Polypedilum illinoense | 14.4 | 0.08 | -- | -- |
| Polypedilum scalaenum grp. | 1,205.7 | 6.63 | 1,004.7 | 2.89 |
| Amnicola | -- | -- | 50.2 | 0.14 |
| Physella | 28.7 | 0.16 | -- | -- |
| Menetus dilatatus | 14.4 | 0.08 | -- | -- |
| Musculium | -- | -- | 71.8 | 0.21 |
| Musculium transversum | 6,229.3 | 34.27 | -- | -- |
| Pisidium compressum | 2,102.8 | 11.57 | 7.2 | 0.02 |
| TOTAL BENTHOS | 18,178.4 | 100.00 | 34,813.9 | 100.00 |
| TOTAL TAXA RICHNESS | 17 | | 9 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

Table 3-10. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the North Branch of the Chicago River watershed, August 2001.

| Taxa | Hester Dendy Samples | | | | Ponar Sample |
|-----------------------------------|----------------------|------------------------|------------------------|-----------------------|-----------------------|
| | W.F.N.B.C.R. | Skokie R. | Skokie R. | N.B.C.R. | N.B.C.R. |
| | @ Dundee Sta. 106 | @ Lake Cook Sta. 32 | @ Frontage Sta. 105 | @ Dempster Sta. 34 | @ Dempster Sta. 34 |
| <i>Procladius (Holotanypus)</i> | | | | | |
| Number Examined | 3 | 2 | 16 | 3 | 65 |
| Percent Deformed | 0.0 | 0.0 | 6.3 | 33.0 | 0.0 |
| <i>Chironomus</i> | | | | | |
| Number Examined | -- | -- | 1 | -- | 6 |
| Percent Deformed | -- | -- | 0.0 | -- | 33.3 |
| <i>Dicrotendipes neomodestus</i> | | | | | |
| Number Examined | 90 | 21 | 9 | 10 | 3 |
| Percent Deformed | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| <i>Dicrotendipes simpsoni</i> | | | | | |
| Number Examined | 3 | 54 | 28 | 20 | 2 |
| Percent Deformed | 0.0 | 1.8 | 3.6 | 0.0 | 0.0 |
| <i>Polypedilum halterale</i> grp. | | | | | |
| Number Examined | -- | -- | 1 | -- | -- |
| Percent Deformed | -- | -- | 100.0 | -- | -- |
| <i>Polypedilum illinoense</i> | | | | | |
| Number Examined | 61 | 2 | 6 | 3 | 1 |
| Percent Deformed | 0.0 | 0.0 | 16.7 | 0.0 | 0.0 |
| TOTAL SAMPLE | | | | | |
| Total Midges Examined | 186 | 81 | 191 | 187 | 132 |
| Percent Deformed | 1.1 | 1.2 | 2.1 | 0.5 | 1.5 |

3.1.2.2 Middle Fork of the North Branch of the Chicago River

Combined, the HD and Ponar samples from the single station in the MFNBCR (Station 31) yielded 20 total taxa (Tables 3-11 and 3-12). Eighteen total taxa were observed in the HD samples while 10 total taxa were present in the Ponar samples. Total density in the Ponar samples was approximately three times higher than in the HD samples primarily due to the abundance of *Oligochaeta*, which comprised 94 percent of the total density in the Ponar samples but only three percent in the HDs. The dominant taxon in the HD samples was *Caecidotea*. However, several other taxa in the HD samples were represented by more than five percent of the total density including *Turbellaria*, *Nanocladius crassicornus/rectinervis*, *Dicrotendipes simpsoni*, and *Polypedilum illinoense*. In contrast, no taxon besides *Oligochaeta* achieved more than five percent in the Ponar samples.

No Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, several of the benthic taxa represented in both the HD and Ponar samples are considered moderately to extremely tolerant of pollution. Of the 20 taxa, seven are typically classified as tolerant (Table 3-1). As such, it is reasonable to consider the benthic community at Station 31 as moderately stressed.

3.1.2.3 Skokie River

Combined, the HD and Ponar samples from the two Skokie River stations (Stations 32 and 105) yielded 43 total taxa and seven EPT taxa (Tables 3-13 and 3-14). HD total taxa richness was nearly three times greater at the downstream Station 105 (32 taxa) compared to Station 32 (13 taxa) (Table 3-13). In addition, EPT richness was zero at Station 32 while six EPT taxa were observed in the Station 105 HDs. Total density was approximately double at Station 32 compared to Station 105. This was primarily due to noticeably higher numbers of *Turbellaria*, and the tolerant taxa *Oligochaeta* and *Dicrotendipes simpsoni* at Station 32. The dominant taxa at both stations were *Turbellaria* and *Oligochaeta*.

Ponar total taxa richness was noticeably higher at Station 105 with 13 taxa than at Station 32 with six taxa (Table 3-14). As with the HD samples, no EPT were observed at Station 32 compared to two EPT taxa at Station 105. *Oligochaeta* was clearly the dominant taxon at both stations. However, the abundance of *Oligochaeta* was substantially greater at Station 32 relative to Station 105. This resulted in nearly a five-fold difference in total density between the two stations.

Chironomid head capsule deformities were observed only in the HD samples but from both stations (Table 3-10). At Station 32, 1.8 percent (n=54) of the *Dicrotendipes simpsoni* examined, or 1.2 percent (n=81) of all midges examined were deformed (Table 3-10). The incidence of deformities at Station 105 was 2.1 percent (n=191) of the total number examined (Table 3-10). Four separate taxa in the Station 105 HD samples exhibited head capsule deformities including *Dicrotendipes simpsoni*. Of those taxa at Station 105 that were represented by more than one specimen, the percent incidence of deformity was greatest for *Polypedilum illinoense* with 16.7 percent (n=6). However, for all species only a single specimen exhibited a deformity. All of the deformities appeared to be restricted to the mentum or ligula and

TABLE 3-11. HESTER-DENDY DENSITIES AT SAMPLING STATION 31 WITHIN THE MIDDLE FORK NORTH BRANCH CHICAGO RIVER, AUGUST 2001.

| TAXA | 31 | |
|--------------------------------------|------------------|--------|
| | LAKE COOK RD. | |
| | #/m ² | % |
| Hydra | 5.4 | 0.29 |
| Turbellaria | 192.0 | 10.35 |
| Oligochaeta | 52.0 | 2.80 |
| Caecidotea | 988.5 | 53.29 |
| Ablabesmyia mallochii | 7.2 | 0.39 |
| Thienemannimyia grp. | 16.1 | 0.87 |
| Corynoneura | 3.6 | 0.19 |
| Nanocladius distinctus | 64.6 | 3.48 |
| Nanocladius crassicornus/rectinervis | 125.6 | 6.77 |
| Rheocricotopus robacki | 3.6 | 0.19 |
| Cryptochironomus | 3.6 | 0.19 |
| Dicrotendipes neomodestus | 82.5 | 4.45 |
| Dicrotendipes simpsoni | 166.8 | 8.99 |
| Polypedilum flavum | 3.6 | 0.19 |
| Polypedilum illinoense | 98.7 | 5.32 |
| Polypedilum scalaenum grp. | 35.9 | 1.93 |
| Physella | 1.8 | 0.10 |
| Pelecypoda | 3.6 | 0.19 |
| TOTAL BENTHOS | 1,855.0 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-12. PETITE PONAR DENSITIES AT SAMPLING STATION 31 WITHIN THE MIDDLE FORK NORTH BRANCH CHICAGO RIVER, AUGUST 2001.

| TAXA | 31 | |
|----------------------------|------------------|--------|
| | LAKE COOK RD. | |
| | #/m ² | % |
| Turbellaria | 78.9 | 1.22 |
| Oligochaeta | 6,049.9 | 93.88 |
| Caecidotea | 64.6 | 1.00 |
| Procladius (Holotanypus) | 21.5 | 0.33 |
| Cryptochironomus | 14.4 | 0.22 |
| Dicrotendipes simpsoni | 21.5 | 0.33 |
| Polypedilum illinoense | 35.9 | 0.56 |
| Polypedilum scalaenum grp. | 14.4 | 0.22 |
| Sphaerium simile | 136.4 | 2.12 |
| Musculium | 7.2 | 0.11 |
| TOTAL BENTHOS | 6,444.6 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-13. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE SKOKIE RIVER, AUGUST 2001.

| TAXA | 32 | | 105 | |
|--------------------------------------|---------------|--------|--------------|--------|
| | LAKE COOK RD. | | FRONTAGE RD. | |
| | #/m2 | % | #/m2 | % |
| Hydra | --- | --- | 43.1 | 1.98 |
| Turbellaria | 1,686.4 | 38.20 | 308.6 | 14.17 |
| Oligochaeta | 1,340.2 | 30.35 | 446.7 | 20.51 |
| Helobdella stagnalis | 77.1 | 1.75 | --- | --- |
| Helobdella triserialis | --- | --- | 1.8 | 0.08 |
| Mooreobdella microstoma | 5.4 | 0.12 | --- | --- |
| Caecidotea | 387.5 | 8.78 | 34.1 | 1.57 |
| Hydracarina | 5.4 | 0.12 | --- | --- |
| Stenacron | --- | --- | 61.0 | 2.80 |
| Stenonema | --- | --- | 23.3 | 1.07 |
| Argia | 48.4 | 1.10 | 23.3 | 1.07 |
| Enallagma | --- | --- | 7.2 | 0.33 |
| Cyrnellus fraternus | --- | --- | 109.4 | 5.02 |
| Cheumatopsyche | --- | --- | 222.5 | 10.21 |
| Hydropsyche betteni | --- | --- | 1.8 | 0.08 |
| Hydroptila | --- | --- | 39.5 | 1.81 |
| Procladius (Holotanypus) | 25.1 | 0.57 | 70.0 | 3.21 |
| Ablabesmyia janta | --- | --- | 26.9 | 1.24 |
| Thienemannimyia grp. | --- | --- | 12.6 | 0.58 |
| Cricotopus bicinctus grp. | --- | --- | 5.4 | 0.25 |
| Nanocladius distinctus | --- | --- | 12.6 | 0.58 |
| Nanocladius crassicornus/rectinervis | --- | --- | 1.8 | 0.08 |
| Chironomus | --- | --- | 1.8 | 0.08 |
| Cryptochironomus | --- | --- | 1.8 | 0.08 |
| Dicrotendipes neomodestus | 245.8 | 5.57 | 26.9 | 1.24 |
| Dicrotendipes simpsoni | 543.6 | 12.31 | 150.7 | 6.92 |
| Endochironomus nigricans | 12.6 | 0.28 | 102.3 | 4.70 |
| Glyptotendipes | --- | --- | 247.6 | 11.37 |
| Phaenopsectra | 12.6 | 0.28 | --- | --- |
| Polypedilum flavum | --- | --- | 73.6 | 3.38 |
| Polypedilum halterale grp. | --- | --- | 1.8 | 0.08 |
| Polypedilum illinoense | 25.1 | 0.57 | 26.9 | 1.24 |
| Polypedilum scalaenum grp. | --- | --- | 25.1 | 1.15 |
| Stenochironomus | --- | --- | 59.2 | 2.72 |
| Rheotanytarsus | --- | --- | 5.4 | 0.25 |
| Ferrissia | --- | --- | 3.6 | 0.16 |
| TOTAL BENTHOS | 4,415.1 | 100.00 | 2,178.0 | 100.00 |
| TOTAL TAXA RICHNESS | 13 | | 32 | |
| EPT TAXA RICHNESS | 0 | | 6 | |

TABLE 3-14. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE SKOKIE RIVER, AUGUST 2001.

| TAXA | 32 | | 105 | |
|--------------------------|---------------|--------|--------------|--------|
| | LAKE COOK RD. | | FRONTAGE RD. | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | — | — | 14.4 | 0.27 |
| Oligochaeta | 23,460.4 | 93.69 | 4,478.2 | 83.98 |
| Caecidotea | 35.9 | 0.14 | 7.2 | 0.13 |
| Gammarus fasciatus | — | — | 7.2 | 0.13 |
| Caenis | — | — | 50.2 | 0.94 |
| Cheumatopsyche | — | — | 7.2 | 0.13 |
| Dubiraphia | — | — | 50.2 | 0.94 |
| Chironomidae | 71.8 | 0.29 | 301.4 | 5.65 |
| Procladius (Holotanypus) | 107.6 | 0.43 | 294.2 | 5.52 |
| Cryptochironomus | — | — | 21.5 | 0.40 |
| Dicrotendipes simpsoni | — | — | 50.2 | 0.94 |
| Polypedilum flavum | — | — | 21.5 | 0.40 |
| Polypedilum illinoense | — | — | 21.5 | 0.40 |
| Physella | 143.5 | 0.57 | — | — |
| Musculium transversum | 430.6 | 1.72 | — | — |
| Pisidium compressum | 789.4 | 3.15 | — | — |
| Lasmigona complanata | — | — | 7.2 | 0.13 |
| TOTAL BENTHOS | 25,039.3 | 100.00 | 5,332.2 | 100.00 |
| TOTAL TAXA RICHNESS | 6 | | 13 | |
| EPT TAXA RICHNESS | 0 | | 2 | |

mandibles and involved larger-than normal gaps between teeth (Köhn gaps), extra teeth, or missing teeth. Deformities of this nature have been linked to elevated levels of organochlorines, polynuclear aromatic hydrocarbons, and heavy metals (Bisthoven and Ollevier 1998, Bisthoven et al. 1998, Dermont 1991, Doherty et al. *in prep.*, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Swansburg et al. 2002). A study of deformity levels at various reference sites throughout the Great Lakes found that background levels were 2.27 percent for *Procladius (Holotanypus)* and 1.38 percent for *Polypedilum* (Burt 1998). Hudson and Ciborowski (1996a) and Dermont (1991) suggest that an incidence of three percent is typical of reference conditions. Since deformity reference levels have not been defined for the waterways of the Chicago Metropolitan Area and given the relatively small sample size of target taxa, it is difficult to determine whether these levels represent an impact or background conditions.

The benthic community at both stations could be characterized as relatively pollution tolerant based on composition, relative abundance of tolerant taxa, and incidence of chironomid deformities (Tables 3-1 and 3-10). However, based on the substantially higher abundance of tolerant taxa such as *Oligochaeta* and *Dicrotendipes simpsoni* combined with the noticeably lower taxa richness and lack of EPT taxa, it appears that the benthic community at the upstream Station 32 is relatively more stressed compared to Station 105.

3.1.2.4 North Shore Channel

HD and Ponar samples from the four NSC stations (Stations 35, 102, 36, and 101) yielded a combined 20 total taxa (Tables 3-15 and 3-16). EPT taxa were absent from both the HD and Ponar Samples. HD total taxa richness was similar among Stations 35, 36, and 101 (9-11 taxa) but noticeably lower at Station 102 with only two taxa (Table 3-15). Total density was highest at Station 36 and lowest at Station 35 but varied considerably among the four stations largely depending on the abundance of Turbellaria, *Oligochaeta*, and *Dicrotendipes simpsoni*. *Oligochaeta* clearly was the dominant taxon at all the stations.

Like the HDs, Ponar total taxa richness was fairly similar among Stations 35, 36, and 101 ranging from five to nine taxa while Station 102 was represented by one midge taxon and *Oligochaeta* (Table 3-16). Total HD density was relatively similar between Stations 35 and 101 but substantially higher at Stations 102 and 36. This difference was almost exclusively due to variations in the abundance of *Oligochaeta* among the stations, which was the dominant taxon accounting for greater than 90 percent of the total density at all four stations.

No chironomid head capsule deformities were observed out of the more than 600 chironomids examined from the NSC samples. Nonetheless, the benthic community of the NSC could be characterized as moderately to highly stressed. This assertion is supported by the fact that of the 20 total taxa observed 11 are considered highly tolerant and tolerant taxa comprised between 82 and 100 percent of the benthic community at each station regardless of sample type (Table 3-1). However, based on the relatively low taxa richness combined with the relatively higher contribution of tolerant taxa, it appears the benthic community at Station 102 is more stressed compared to the three remaining stations sampled in the NSC.

TABLE 3-15. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH SHORE CHANNEL, AUGUST 2001.

| TAXA | 35 | | 102 | | 36 | | 101 | |
|--------------------------------------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|
| | CENTRAL RD. | | OAKTON ST. | | TOUHY AVE. | | FOSTER AVE. | |
| | #/m ² | % |
| Turbellaria | -- | -- | -- | -- | 4,485.1 | 9.18 | 4,126.3 | 16.44 |
| Oligochaeta | 999.3 | 67.76 | 16,128.5 | 91.45 | 31,341.9 | 64.16 | 16,684.6 | 66.48 |
| Helobdella | -- | -- | -- | -- | -- | -- | 17.9 | 0.07 |
| Helobdella stagnalis | 17.9 | 1.22 | -- | -- | -- | -- | -- | -- |
| Caecidotea | 102.3 | 6.93 | -- | -- | 17.9 | 0.04 | 71.8 | 0.29 |
| Gammarus fasciatus | 93.3 | 6.33 | -- | -- | 143.5 | 0.29 | 340.9 | 1.36 |
| Chironomidae | -- | -- | 17.9 | 0.10 | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | 484.4 | 0.99 | -- | -- |
| Nanocladius distinctus | -- | -- | -- | -- | 1,489.1 | 3.05 | 215.3 | 0.86 |
| Nanocladius crassicornus/rectinervis | 3.6 | 0.24 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 213.5 | 14.48 | 1,489.1 | 8.44 | 9,759.6 | 19.98 | 3,516.3 | 14.01 |
| Glyptotendipes | -- | -- | -- | -- | 376.7 | 0.77 | 35.9 | 0.14 |
| Parachironomus | 3.6 | 0.24 | -- | -- | 610.0 | 1.25 | -- | -- |
| Polypedilum flavum | 3.6 | 0.24 | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | -- | -- | 71.8 | 0.15 | -- | -- |
| Paratanytarsus | 32.3 | 2.19 | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | -- | -- | 71.8 | 0.15 | -- | -- |
| Ferrissia | -- | -- | -- | -- | -- | -- | 89.7 | 0.36 |
| Dreissena polymorpha | 5.4 | 0.36 | -- | -- | -- | -- | -- | -- |
| TOTAL BENTHOS | 1,474.7 | 100.00 | 17,635.5 | 100.00 | 48,851.8 | 100.00 | 25,098.7 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | | 2 | | 11 | | 9 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | |

TABLE 3-16. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH SHORE CHANNEL, AUGUST 2001.

| TAXA | 35 | | 102 | | 36 | | 101 | |
|----------------------------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|
| | CENTRAL RD. | | OAKTON ST. | | TOUHY AVE. | | FOSTER AVE. | |
| | #/m ² | % |
| Turbellaria | -- | -- | -- | -- | 1,837.2 | 2.08 | 179.4 | 0.68 |
| Oligochaeta | 37,957.2 | 99.75 | 149,274.0 | 99.81 | 79,875.9 | 90.61 | 25,656.5 | 97.28 |
| Helobdella stagnalis | 7.2 | 0.02 | -- | -- | -- | -- | -- | -- |
| Caecidotea | 14.4 | 0.04 | -- | -- | 7.2 | 0.01 | -- | -- |
| Gammarus fasciatus | 7.2 | 0.02 | -- | -- | 71.8 | 0.08 | 143.5 | 0.54 |
| Chironomidae | -- | -- | -- | -- | 5,310.7 | 6.02 | 358.8 | 1.36 |
| Procladius (Holotanypus) | 7.2 | 0.02 | 287.1 | 0.19 | -- | -- | -- | -- |
| Ablabesmyia mallochii | 7.2 | 0.02 | -- | -- | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | 114.8 | 0.13 | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 28.7 | 0.03 | -- | -- |
| Nanocladius distinctus | -- | -- | -- | -- | 43.1 | 0.05 | -- | -- |
| Dicrotendipes simpsoni | -- | -- | -- | -- | 251.2 | 0.28 | -- | -- |
| Parachironomus | -- | -- | -- | -- | 617.2 | 0.70 | -- | -- |
| Dreissena polymorpha | 50.2 | 0.13 | -- | -- | -- | -- | 35.9 | 0.14 |
| TOTAL BENTHOS | 38,050.5 | 100.00 | 149,561.1 | 100.00 | 88,157.8 | 100.00 | 26,374.1 | 100.00 |
| TOTAL TAXA RICHNESS | 7 | | 2 | | 9 | | 5 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | |

3.1.2.5 North Branch of the Chicago River

The combined number of taxa collected in the HD and Ponar samples from the six NBCR stations (Stations 104, 34, 96, 37, 73, and 46) was 43 total taxa and four EPT taxa (Tables 3-17 and 3-18). HD total taxa richness was similar between the two upstream stations (Stations 104 and 34) with 23 to 26 taxa and substantially lower at the remaining four downstream stations (Stations 96, 37, 73, and 46) with five to 11 taxa (Table 3-17). Likewise, EPT taxa richness also decreased longitudinally from upstream than downstream. As with total and EPT taxa richness, total density was similar between Stations 104 and 34. However, density at the four downstream stations ranged from twice to four times as high compared to upstream. At Station 96, the higher density was primarily due to greater numbers of *Caecidotea* whereas higher numbers of *Oligochaeta* increased the density at the three remaining stations. Dominance was rather variable among the upstream NBCR stations. The midge *Polypedium flavum*, Turbellaria, and *Caecidotea* were the dominant taxa at Stations 104, 34, and 96, respectively while the more tolerant *Oligochaeta* was the dominant taxa among the three downstream stations, which are in the section of the NCBR with a Secondary Contact use classification.

Ponar total taxa richness followed a trend similar to what was observed in the HD samples. Among the three upstream stations, total richness similar ranging from 15 to 19 taxa while the three downstream stations had between three and six total taxa (Table 3-18). Three EPT taxa were collected in the NBCR Ponars however; all were collected at the most upstream Station 104. *Oligochaeta* was the dominant taxon at all stations except for Station 96 where *Musculium transversum* was dominant. Total density was lowest at Station 96 and nearly 35 times greater at Station 73. As was the case at most of the stations sampled during 2001, density was largely dependent upon the abundance of *Oligochaeta*.

Chironomid head capsule deformities were observed only at Station 34 in both the HD and Ponar samples (Table 3-10). However, deformity analysis in the NBCR was problematic since all or most of the Chironomidae specimens in five of the 12 samples could not be accurately identified or completely examined due to their poor condition. Regardless, the incidence of deformity was fairly low for both sample types. In the Station 34 HD samples, one out of 187 chironomids examined was deformed while in the Ponar samples two specimens exhibited deformities out of 132 chironomids examined. The levels of total deformity incidence observed in the NBCR were both below background levels observed in the Great Lakes region (Burt 1998, Hudson and Ciborowski 1996a). That combined with the small sample size suggests that the deformity levels observed at Station 34 were insignificant.

Overall, the dominant taxon in three of the six HD samples and five of the six Ponar samples were tolerant (Table 3-1). In addition, 16 of the 43 taxa observed in the NBCR samples are considered highly tolerant. In both the HD and Ponar samples the quality of the macroinvertebrate community declined sequentially from upstream to downstream between Stations 104 and 96. However, based on the parameters analyzed, it appears that the benthic community at Stations 37, 73, and 46 are subject to greater stress than the three upstream stations.

TABLE 3-17. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, AUGUST 2001.

| TAXA | 104 | | 34 | | 96 | | 37 | | 73 | | 46 | |
|--------------------------------------|--------------|--------|--------------|--------|-------------|--------|-------------|--------|----------------|--------|------------|--------|
| | GLENVIEW RD. | | DEMPSTER ST. | | ALBANY AVE. | | WILSON AVE. | | DIVERSEY PKWY. | | GRAND AVE. | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 1,026.2 | 17.32 | -- | -- | -- | -- | 53.8 | 0.51 | -- | -- |
| Turbellaria | 1,370.6 | 21.72 | 1,279.2 | 21.59 | 206.3 | 2.00 | 2,296.4 | 11.71 | 915.0 | 8.59 | 89.7 | 0.36 |
| Oligochaeta | 192.0 | 3.04 | 979.5 | 16.53 | 98.7 | 0.96 | 16,424.5 | 83.72 | 8,442.8 | 79.28 | 23,896.7 | 94.87 |
| Helobdella | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.17 | -- | -- |
| Helobdella triserialis | -- | -- | 25.1 | 0.42 | -- | -- | -- | -- | -- | -- | -- | -- |
| Erpobdella punctata punctata | -- | -- | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | -- | -- | -- | -- | -- | -- | 35.9 | 0.34 | -- | -- |
| Caecidotea | 84.3 | 1.34 | 1,115.9 | 18.83 | 9,714.7 | 94.17 | 376.7 | 1.92 | 287.0 | 2.70 | 17.9 | 0.07 |
| Gammarus fasciatus | -- | -- | -- | -- | -- | -- | -- | -- | 53.8 | 0.51 | 179.4 | 0.71 |
| Heptageniidae | 59.2 | 0.94 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenacron | 17.9 | 0.28 | 19.7 | 0.33 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenonema | 89.7 | 1.42 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calopteryx | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Argia | 48.4 | 0.77 | 105.8 | 1.79 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 1,489.1 | 23.59 | 236.8 | 4.00 | 9.0 | 0.09 | -- | -- | -- | -- | -- | -- |
| Hydropsyche betteni | 17.9 | 0.28 | 1.8 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenelmis | 17.9 | 0.28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenelmis crenata grp. | -- | -- | 10.8 | 0.18 | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomidae | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,004.7 | 3.99 |
| Procladius (Holotanypus) | -- | -- | 19.7 | 0.33 | -- | -- | -- | -- | -- | -- | -- | -- |
| Thienemannimyia grp. | 120.2 | 1.90 | -- | -- | 107.6 | 1.04 | -- | -- | -- | -- | -- | -- |
| Corynoneura | 17.9 | 0.28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | 7.2 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Nanocladius distinctus | 17.9 | 0.28 | 44.9 | 0.76 | 35.9 | 0.35 | -- | -- | 17.9 | 0.17 | -- | -- |
| Nanocladius crassicornus/rectinervis | 35.9 | 0.57 | 25.1 | 0.42 | 17.9 | 0.17 | -- | -- | -- | -- | -- | -- |
| Rheocricotopus robacki | 35.9 | 0.57 | -- | -- | 17.9 | 0.17 | -- | -- | -- | -- | -- | -- |
| Cryptochironomus | -- | -- | 12.6 | 0.21 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes neomodestus | 17.9 | 0.28 | 57.4 | 0.97 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 17.9 | 0.28 | 107.6 | 1.82 | -- | -- | 484.4 | 2.47 | 753.5 | 7.08 | -- | -- |
| Endochironomus nigricans | 17.9 | 0.28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Glyptotendipes | -- | -- | 10.8 | 0.18 | -- | -- | -- | -- | 53.8 | 0.51 | -- | -- |
| Paracladopelma | -- | -- | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | 2,357.4 | 37.35 | 93.3 | 1.57 | 44.9 | 0.43 | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | 17.9 | 0.28 | 17.9 | 0.30 | 62.8 | 0.61 | -- | -- | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | 238.6 | 3.78 | 705.1 | 11.90 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenochironomus | 17.9 | 0.28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tanytarsus guerlus grp. | -- | -- | 7.2 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | -- | -- | 35.9 | 0.18 | 17.9 | 0.17 | -- | -- |
| Pelecypoda | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Musculium transversum | -- | -- | 1.8 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Pisidium | -- | -- | 3.6 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| TOTAL BENTHOS | 6,311.4 | 100.00 | 5,925.7 | 100.00 | 10,315.8 | 100.00 | 19,617.9 | 100.00 | 10,649.4 | 100.00 | 25,188.4 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | | 26 | | 10 | | 5 | | 11 | | 5 | |
| EPT TAXA RICHNESS | 4 | | 3 | | 1 | | 0 | | 0 | | 0 | |

TABLE 3-18. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, AUGUST 2001.

| TAXA | 104 | | 34 | | 96 | | 37 | | 73 | | 46 | |
|----------------------------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|
| | GLENVIEW RD. | | DEMPSTER ST. | | ALBANY AVE. | | WILSON AVE. | | DIVERSEY PKWY. | | GRAND AVE. | |
| | #/m ² | % |
| Turbellaria | 208.1 | 4.94 | -- | -- | 14.4 | 0.40 | 215.3 | 0.59 | -- | -- | 7.2 | 0.06 |
| Plumatella | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.06 |
| Oligochaeta | 1,758.3 | 41.74 | 10,729.1 | 60.14 | 387.5 | 10.84 | 36,026.7 | 98.82 | 124,371.1 | 99.48 | 12,049.6 | 98.36 |
| Helobdella triserialis | -- | -- | -- | -- | 28.7 | 0.80 | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | 14.4 | 0.34 | -- | -- | 14.4 | 0.40 | -- | -- | 71.8 | 0.06 | -- | -- |
| Caecidotea | 7.2 | 0.17 | 50.2 | 0.28 | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Heptageniidae | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 445.0 | 10.56 | -- | -- | 28.7 | 0.80 | -- | -- | -- | -- | -- | -- |
| Hydropsyche betteni | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Macronychus glabratus | 14.4 | 0.34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenelmis | -- | -- | 35.9 | 0.20 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenelmis crenata grp. | 129.2 | 3.07 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomidae | -- | -- | -- | -- | -- | -- | 215.3 | 0.59 | 574.1 | 0.46 | 114.8 | 0.94 |
| Procladius (Holotanypus) | 122.0 | 2.90 | 839.7 | 4.71 | -- | -- | -- | -- | -- | -- | 50.2 | 0.41 |
| Thienemanniya grp. | -- | -- | 86.1 | 0.48 | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Chironomus | 7.2 | 0.17 | 78.9 | 0.44 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cryptochironomus | 21.5 | 0.51 | 28.7 | 0.16 | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes neomodestus | 86.1 | 2.04 | 251.2 | 1.41 | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 21.5 | 0.51 | 172.2 | 0.97 | -- | -- | -- | -- | -- | -- | -- | -- |
| Glyptotendipes | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.12 |
| Polypedilum flavum | 983.2 | 23.34 | 86.1 | 0.48 | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | 14.4 | 0.34 | 14.4 | 0.08 | 57.4 | 1.61 | -- | -- | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | 165.1 | 3.92 | 5,246.1 | 29.40 | 244.0 | 6.83 | -- | -- | -- | -- | -- | -- |
| Stenochironomus | -- | -- | 14.4 | 0.08 | -- | -- | -- | -- | -- | -- | -- | -- |
| Physella | -- | -- | -- | -- | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Monetus dilatatus | -- | -- | -- | -- | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Corbicula fluminea | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.06 |
| Musculium transversum | 193.8 | 4.60 | 136.4 | 0.76 | 2,382.6 | 66.67 | -- | -- | -- | -- | -- | -- |
| Pisidium | 7.2 | 0.17 | -- | -- | 28.7 | 0.80 | -- | -- | -- | -- | -- | -- |
| Pisidium compressum | -- | -- | 71.8 | 0.40 | 287.1 | 8.03 | -- | -- | -- | -- | -- | -- |
| TOTAL BENTHOS | 4,212.7 | 100.00 | 17,841.1 | 100.00 | 3,574.0 | 100.00 | 36,457.3 | 100.00 | 125,017.0 | 100.00 | 12,250.5 | 100.00 |
| TOTAL TAXA RICHNESS | 19 | | 15 | | 16 | | 3 | | 3 | | 6 | |
| EPT TAXA RICHNESS | 3 | | 0 | | 1 | | 0 | | 0 | | 0 | |

3.1.3 South Branch Chicago River and Chicago Sanitary and Ship Canal Watershed

Benthic macroinvertebrate sampling was conducted at three stations all within the Chicago Sanitary and Ship Canal (CSSC) (Table 2-1).

3.1.3.1 Chicago Sanitary and Ship Canal

Together, the HD and Ponar samples from the three CSSC stations (Stations 75, 41, and 92) yielded 19 total taxa and three EPT taxa (Tables 3-19 and 3-20). HD total taxa richness was similar between the two downstream stations (41 and 92) with 9 and 11 taxa and somewhat lower upstream (Station 75) with four taxa (Table 3-19). The two EPT taxa observed in the HD samples were both collected at Station 92. Total density was similar between Stations 75 and 92 but three to four times higher at Station 41. Density among the three stations primarily was driven by the abundance of Turbellaria, Oligochaeta, and *Dicrotendipes simpsoni*. However, Oligochaeta was the dominant taxon at all three stations accounting for 65 to 95 percent of the total density.

Ponar total taxa richness was identical between Stations 41 and 92 with 7 taxa (Table 3-20). Taxa richness in the Station 75 Ponars was equal to total HD taxa richness for that station. As with the HD samples, the only EPT taxon in the Ponars was observed at Station 92. Total density varied greatly among the three stations. However, Ponar density was again highest at Station 41. Oligochaeta was the dominant taxon and the difference in density among the three locations was almost exclusively dependent upon Oligochaeta abundance. Chironomid head capsule deformities were observed in the HD samples at two stations in the CSSC (Table 3-21). In both cases, *Dicrotendipes simpsoni* was the taxon exhibiting the deformities. In addition, at both stations the head capsule deformities only were observed in one or two specimens.

Given the relatively small sample size at Station 75 and the low number or lack of deformed specimens observed in the CSSC, it is very likely that these incidence levels are insignificant. The tolerant taxon Oligochaeta was dominant at all three stations for both sample types (Table 3-1). However, the density of Oligochaeta in the HD samples and total taxa richness for both sample types increased from upstream to downstream. Therefore, it appears that the upstream Station 75 is more stressed compared to Stations 41 and 92.

3.1.4 Des Plaines River Watershed

Sampling was conducted at six stations in the Des Plaines River watershed during 2001: one station in Higgins Creek, one station in Salt Creek, one station in the West Branch of the DuPage River (WB DuPage River), and three stations in the Des Plaines River (Table 2-1).

The benthic community in the Des Plaines River watershed exhibited a substantial amount of variability. The dominant taxon in the HD samples was different for nearly all of the waterways sampled. However, Oligochaeta was the dominant taxon in the majority of Ponar samples from the watershed. The incidence of chironomid deformities was generally low among stations in the Des Plaines watershed. However, the highest number of deformed specimens in 2001 was

TABLE 3-19. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, JULY-AUGUST 2001.

| TAXA | 75 | | 41 | | 92 | |
|----------------------------|-------------|--------|-------------|--------|----------|--------|
| | CICERO AVE. | | HARLEM AVE. | | LOCKPORT | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | -- | -- | 861.1 | 5.08 |
| Turbellaria | -- | -- | 2,260.5 | 4.41 | 1,130.2 | 6.67 |
| Plumatella | -- | -- | 1.8 | 0.00 | -- | -- |
| Oligochaeta | 11,130.2 | 94.80 | 43,164.7 | 84.27 | 11,042.3 | 65.20 |
| Helobdella | -- | -- | -- | -- | 35.9 | 0.21 |
| Caecidotea | -- | -- | 35.9 | 0.07 | -- | -- |
| Gammarus fasciatus | -- | -- | 215.3 | 0.42 | 1,193.0 | 7.04 |
| Cyrrnellus fraternus | -- | -- | -- | -- | 17.9 | 0.11 |
| Hydropsyche | -- | -- | -- | -- | 9.0 | 0.05 |
| Ablabesmyia janta | -- | -- | -- | -- | 179.4 | 1.06 |
| Cricotopus sylvestris grp. | -- | -- | 53.8 | 0.11 | -- | -- |
| Nanocladius distinctus | 71.8 | 0.61 | 89.7 | 0.18 | 340.9 | 2.01 |
| Dicrotendipes simpsoni | 520.3 | 4.43 | 5,346.3 | 10.44 | 1,838.9 | 10.86 |
| Parachironomus | -- | -- | 53.8 | 0.11 | -- | -- |
| Corbicula fluminea | 17.9 | 0.15 | -- | -- | 287.0 | 1.69 |
| TOTAL BENTHOS | 11,740.2 | 100.00 | 51,221.7 | 100.00 | 16,935.8 | 100.00 |
| TOTAL TAXA RICHNESS | 4 | | 9 | | 11 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 2 | |

TABLE 3-20. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, JULY-AUGUST 2001.

| TAXA | 75 | | 41 | | 92 | |
|--------------------------|-------------|--------|-------------|--------|----------|--------|
| | CICERO AVE. | | HARLEM AVE. | | LOCKPORT | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | -- | -- | 861.2 | 1.36 | -- | -- |
| Plumatella | -- | -- | 7.2 | 0.01 | -- | -- |
| Oligochaeta | 2,626.6 | 97.34 | 61,719.1 | 97.38 | 28,670.7 | 93.41 |
| Gammarus fasciatus | -- | -- | 215.3 | 0.34 | 114.8 | 0.37 |
| Cheumatopsyche | -- | -- | -- | -- | 71.8 | 0.23 |
| Procladius (Holotanypus) | 43.1 | 1.60 | -- | -- | 968.8 | 3.16 |
| Nanocladius distinctus | -- | -- | -- | -- | 466.5 | 1.52 |
| Chironomus | 7.2 | 0.27 | 71.8 | 0.11 | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 358.8 | 0.57 | 322.9 | 1.05 |
| Polypedilum illinoense | -- | -- | 143.5 | 0.23 | -- | -- |
| Corbicula fluminea | 21.5 | 0.80 | -- | -- | 78.9 | 0.26 |
| TOTAL BENTHOS | 2,698.4 | 100.00 | 63,376.9 | 100.00 | 30,694.5 | 100.00 |
| TOTAL TAXA RICHNESS | 4 | | 7 | | 7 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 1 | |

Table 3-21. Chironomidae head capsule deformities observed in Hester-Dendy samples from the Chicago Sanitary and Ship Canal, July 2001.

| Taxa | Hester-Dendy Sample | |
|-------------------------------|--------------------------------|-----------------------------------|
| | C.S.S.C @ Cicero Sta. 75 | C.S.S.C. @ Lockport Sta. 92 |
| <i>Dicrotendipes simpsoni</i> | | |
| Number Examined | 29 | 84 |
| Percent Deformed | 6.9 | 1.2 |
| TOTAL SAMPLE | | |
| Total Midges Examined | 33 | 104 |
| Percent Deformed | 6.1 | 1.0 |

observed in Salt Creek. In addition, the highest total richness and highest EPT richness for any station were observed in the Des Plaines River watershed.

3.1.4.1 Higgins Creek

Combined, the HD and Ponar samples from the single station in Higgins Creek (Station 78) yielded 21 total taxa (Tables 3-22 and 3-23). Nine total taxa were observed in the HD samples while 18 taxa were present in the Ponar samples. Turbellaria was the dominant taxon in the HD samples while *Caecidotea* was the dominant in the Ponars. However, both taxa were abundant in each sample type. Total density was higher in the Ponar samples compared to the HDs but not dramatically.

No chironomid head capsule deformities were observed in Higgins Creek. Although highly tolerant taxa comprised one-third of the combined total taxa, these taxa represented less than ten percent of the total density for each sample type (Table 3-1). This suggests that despite the low richness in the HD samples, pollution type stress may be relatively low in Higgins Creek.

3.1.4.2 Salt Creek

HD and Ponar samples from the single station in Salt Creek (Station 18) yielded 38 total taxa and three EPT taxa (Tables 3-24 and 3-25). Total taxa richness ranged from 31 taxa in the HD samples to 20 taxa in the Ponar samples. EPT taxa were observed in both sample types with three and two EPT taxa being represented in the HD and Ponar samples, respectively. *Polypedilum flavum* was the dominant taxon in the HD samples whereas *Oligochaeta* was the dominant in the Ponars. Total density was very similar between the two sample types. Higher numbers of Turbellaria, *Cheumatopsyche*, *Polypedilum flavum*, and *Polypedilum illinoense* produced a greater density in the HD samples compared to the Ponars.

Chironomid head capsule deformities only were observed in the Ponar samples (Table 3-26). With seven malformed specimens, Salt Creek had the highest number of chironomids that exhibited deformities during 2001. In addition, missing or extra teeth were the most common deformities observed. All but one of the deformed specimens (11.3 percent) was *Procladius (Holotanypus)*, a highly tolerant taxa that has been studied extensively for deformity investigations (Burt 1998, Dorherty et al. *in prep.*, Warwick 1991, Warwick and Tisdale 1988). These studies found that background levels of incidence consistently ranged from 2.27 to 3.9 percent (Burt 1998, Dorherty et al. *in prep.*, Warwick 1991, Warwick and Tisdale 1988). Although reference levels are lacking for the waterways of the Chicago Metropolitan Area, percent incidence as described in the literature suggest that the deformity levels observed for *Procladius (Holotanypus)* in Salt Creek are above expected background conditions.

Results from the 2001 sampling of Salt Creek were mixed. Tolerant taxa comprised approximately 25 and 75 percent of the HD and Ponar total density (Table 3-1). This combined with the elevated incidence of deformity for *Procladius (Holotanypus)* as well as the high density of *Oligochaeta* in the Ponars suggests that the Salt Creek benthic community is moderately stressed. In contrast, the presence of perturbation sensitive EPT and Tanytarsini

TABLE 3-22. HESTER-DENDY DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JULY 2001.

| TAXA | 78 | |
|--------------------------------------|------------------|--------|
| | WILLE RD. | |
| | #/m ² | % |
| Turbellaria | 14,036.6 | 80.72 |
| Oligochaeta | 986.7 | 5.67 |
| Mooreobdella microstoma | 35.9 | 0.21 |
| Caecidotea | 1,828.1 | 10.51 |
| Orconectes virilis | 17.9 | 0.10 |
| Cricotopus sylvestris grp. | 197.3 | 1.13 |
| Nanocladius crassicornus/rectinervis | 35.9 | 0.21 |
| Dicrotendipes neomodestus | 233.2 | 1.34 |
| Paratanytarsus | 17.9 | 0.10 |
| TOTAL BENTHOS | 17,389.7 | 100.00 |
| TOTAL TAXA RICHNESS | 9 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-23. PETITE PONAR DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JULY 2001.

| TAXA | 78 | |
|------------------------------|------------------|--------|
| | WILLE RD. | |
| | #/m ² | % |
| Turbellaria | 6,825.0 | 23.17 |
| Oligochaeta | 1,822.9 | 6.19 |
| Erpobdella punctata punctata | 7.2 | 0.02 |
| Mooreobdella microstoma | 466.5 | 1.58 |
| Ostracoda | 3,602.7 | 12.23 |
| Caecidotea | 16,197.7 | 54.98 |
| Orconectes immunis | 7.2 | 0.02 |
| Enallagma | 7.2 | 0.02 |
| Bezzia | 7.2 | 0.02 |
| Tanytus | 7.2 | 0.02 |
| Thienemannimyia grp. | 35.9 | 0.12 |
| Cricotopus bicinctus grp. | 114.8 | 0.39 |
| Cricotopus sylvestris grp. | 179.4 | 0.61 |
| Chironomus | 14.4 | 0.05 |
| Cryptochironomus | 14.4 | 0.05 |
| Dicrotendipes neomodestus | 35.9 | 0.12 |
| Musculium transversum | 35.9 | 0.12 |
| Pisidium | 78.9 | 0.27 |
| TOTAL BENTHOS | 29,460.1 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-24. HESTER-DENDY DENSITIES AT SAMPLING STATION 18 WITHIN SALT CREEK, JULY 2001.

| TAXA | 18 | |
|--------------------------------------|------------------|--------|
| | DEVON AVE. | |
| | #/m ² | % |
| Turbellaria | 1,130.2 | 7.07 |
| Oligochaeta | 1,148.2 | 7.18 |
| Caecidotea | 35.9 | 0.22 |
| Hydracarina | 17.9 | 0.11 |
| Tricorythodes | 35.9 | 0.22 |
| Enallagma | 17.9 | 0.11 |
| Cheumatopsyche | 2,942.2 | 18.41 |
| Hydroptila | 53.8 | 0.34 |
| Chaoborus | 17.9 | 0.11 |
| Procladius (Holotanypus) | 107.6 | 0.67 |
| Ablabesmyia janta | 340.9 | 2.13 |
| Ablabesmyia mallochi | 125.6 | 0.79 |
| Thienemannimyia grp. | 879.1 | 5.50 |
| Thienemanniella xena | 394.7 | 2.47 |
| Cricotopus tremulus grp. | 179.4 | 1.12 |
| Cricotopus bicinctus grp. | 269.1 | 1.68 |
| Cricotopus sylvestris grp. | 35.9 | 0.22 |
| Nanocladius distinctus | 125.6 | 0.79 |
| Nanocladius crassicornus/rectinervis | 466.5 | 2.92 |
| Dicrotendipes neomodestus | 71.8 | 0.45 |
| Dicrotendipes simpsoni | 107.6 | 0.67 |
| Endochironomus nigricans | 161.5 | 1.01 |
| Polypedilum flavum | 4,395.4 | 27.50 |
| Polypedilum illinoense | 2,134.9 | 13.36 |
| Polypedilum scalaenum grp. | 179.4 | 1.12 |
| Stenochironomus | 71.8 | 0.45 |
| Paratanytarsus | 71.8 | 0.45 |
| Tanytarsus guerlus grp. | 394.7 | 2.47 |
| Hemerodromia | 17.9 | 0.11 |
| Physella | 17.9 | 0.11 |
| Menetus dilatatus | 35.9 | 0.22 |
| TOTAL BENTHOS | 15,984.9 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | |
| EPT TAXA RICHNESS | 3 | |

TABLE 3-25. PETITE PONAR DENSITIES AT SAMPLING STATION 18 WITHIN SALT CREEK, JULY 2001.

| TAXA | 18 | |
|-----------------------------|------------------|--------|
| | DEVON AVE. | |
| | #/m ² | % |
| Turbellaria | 7.2 | 0.05 |
| Oligochaeta | 8,899.0 | 65.30 |
| Hydracarina | 7.2 | 0.05 |
| Tricorythodes | 7.2 | 0.05 |
| Cheumatopsyche | 64.6 | 0.47 |
| Dubiraphia | 64.6 | 0.47 |
| Chaoborus | 437.8 | 3.21 |
| Procladius (Holotanypus) | 516.7 | 3.79 |
| Chironomus | 64.6 | 0.47 |
| Cladopelma | 35.9 | 0.26 |
| Cryptochironomus | 308.6 | 2.26 |
| Dicrotendipes neomodestus | 208.1 | 1.53 |
| Paracladopelma | 57.4 | 0.42 |
| Polypedilum halterale grp. | 258.4 | 1.90 |
| Polypedilum illinoense | 28.7 | 0.21 |
| Polypedilum scalaenum grp. | 538.2 | 3.95 |
| Cladotanytarsus mancus grp. | 1,557.3 | 11.43 |
| Tanytarsus guerius grp. | 301.4 | 2.21 |
| Menetus dilatatus | 14.4 | 0.11 |
| Corbicula fluminea | 251.2 | 1.84 |
| TOTAL BENTHOS | 13,628.4 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | |
| EPT TAXA RICHNESS | 2 | |

Table 3-26. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the Des Plaines River watershed, July 2001.

| Taxa | Hester-Dendy Sample | Ponar Samples | |
|----------------------------------|---|--------------------------------|--------------------------------------|
| | Des Plaines R. @ Material Service Rd. Sta. 91 | Salt Cr. @ Devon Sta. 18 | Des Plaines R. @ Ogden Sta. 22 |
| <i>Procladius (Holotanypus)</i> | | | |
| Number Examined | -- | 53 | 5 |
| Percent Deformed | -- | 11.3 | 0.0 |
| <i>Chironomus</i> | | | |
| Number Examined | -- | 3 | 7 |
| Percent Deformed | -- | 0.0 | 14.2 |
| <i>Dicrotendipes neomodestus</i> | | | |
| Number Examined | -- | 7 | 1 |
| Percent Deformed | -- | 14.2 | 0.0 |
| <i>Polypedilum flavum</i> | | | |
| Number Examined | 177 | -- | 2 |
| Percent Deformed | 0.6 | -- | 0.0 |
| TOTAL SAMPLE | | | |
| Total Midges Examined | 187 | 196 | 157 |
| Percent Deformed | 0.5 | 3.6 | 0.6 |

midge taxa as well as the relatively high taxa richness observed in both the HDs and Ponars indicates a healthier benthic assemblage compared to several of the stations surveyed in 2001.

3.1.4.3 West Branch of the DuPage River

The benthic macroinvertebrate community in the WB DuPage River at Station 64 was represented by 31 total taxa and three EPT taxa in the HD and Ponar samples (Tables 3-27 and 3-28). The HD and Ponar samples yielded similar numbers of total taxa with 26 and 21 taxa, respectively. EPT taxa richness was slightly higher in the HD samples with three taxa while a single EPT taxon was observed in the Ponars. The dominant taxa in the HD samples were the highly tolerant taxon *Glyptotendipes*, the relatively pollution sensitive *Cheumatopsyche*, and the facultative Turbellaria. In the Ponar samples, the highly tolerant taxon *Oligochaeta* was clearly the dominant. Total density was higher in the Ponar samples compared to the HDs primarily due to the elevated abundance of *Oligochaeta*.

No chironomid head capsule deformities were observed in the WB DuPage River. However, tolerant taxa comprised 42 and 91 percent of the total density in the HDs and Ponars, respectively (Table 3-1). Despite the relatively high taxa richness in each sample type and the presence of some EPT taxa, based on the richness and relative abundance of tolerant taxa in the samples, it is reasonable to characterize the WB DuPage River benthic community as slightly to moderately stressed.

3.1.4.4 Des Plaines River

Combined, the HD and Ponar samples from the three Des Plaines River stations (Stations 13, 22, and 91) yielded 73 total taxa and 17 EPT taxa (Tables 3-29 and 3-30). These were the highest richness values observed among all the waterways sampled in 2001. HD total taxa richness decreased longitudinally upstream to downstream among the three stations from 39 taxa at Station 13 to 16 taxa at Station 91 (Table 3-29). Likewise, EPT taxa richness was highest at the upstream Station 13 with 15 taxa compared to eight EPT taxa at both downstream Stations 22 and 91. The HD richness values observed at Station 13 were highest observed among all the stations sampled during 2001. The dominant taxon at Station 13 was the relatively pollution sensitive midge *Rheotanytarsus*. The pollution sensitive EPT taxon *Cheumatopsyche* was relatively common at all three stations and was the dominant taxon at Stations 22 and 91. Total density was nearly identical at Stations 13 and 91 but over seven times lower at Station 22. The cause for decline in density at Station 22 was attributable to lower abundance of Turbellaria, *Cheumatopsyche*, *Polypedium flavum*, and/or *Rheotanytarsus*.

Ponar total taxa richness was similar at Stations 13 and 22 with 27 and 32 taxa, respectively and slightly lower at Station 91 with 21 taxa (Table 3-30). EPT taxa richness decreased upstream to downstream with six EPT at Station 13 and one EPT taxon at Station 91. The dominant taxon at Station 13 was *Caecidotea* while *Oligochaeta* was the dominant taxon at Stations 22 and 91. The tolerant taxa *Oligochaeta* and *Cryptochironomus* as well as the relatively pollution sensitive *Tanytarsus guerlus* grp. also were well represented at Station 13. In addition, *Cryptochironomus* and *Polypedium scalaenum* grp. also were noticeably common at Station 22. However, except for *Oligochaeta*, no other taxon was represented by more than three percent at Station 91. Total

TABLE 3-27. HESTER-DENDY DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2001.

| TAXA | 64 LAKE ST. | |
|--------------------------------------|------------------|--------|
| | #/m ² | % |
| Turbellaria | 2,565.5 | 19.07 |
| Plumatella | 3.6 | 0.03 |
| Oligochaeta | 855.8 | 6.36 |
| Baetis intercalaris | 39.5 | 0.29 |
| Argia | 17.9 | 0.13 |
| Enallagma | 1.8 | 0.01 |
| Cheumatopsyche | 3,143.2 | 23.36 |
| Hydroptila | 93.3 | 0.69 |
| Procladius (Holotanypus) | 21.5 | 0.16 |
| Thienemannimyia grp. | 773.2 | 5.75 |
| Thienemanniella xena | 89.7 | 0.67 |
| Cricotopus bicinctus grp. | 143.5 | 1.07 |
| Cricotopus sylvestris grp. | 21.5 | 0.16 |
| Nanocladius distinctus | 143.5 | 1.07 |
| Nanocladius crassicornus/rectinervis | 389.3 | 2.89 |
| Cryptochironomus | 53.8 | 0.40 |
| Dicrotendipes neomodestus | 200.9 | 1.49 |
| Dicrotendipes simpsoni | 265.5 | 1.97 |
| Endochironomus nigricans | 111.2 | 0.83 |
| Glyptotendipes | 3,335.1 | 24.79 |
| Polypedilum flavum | 177.6 | 1.32 |
| Polypedilum illinoense | 742.7 | 5.52 |
| Polypedilum scalaenum grp. | 165.1 | 1.23 |
| Simulium | 62.8 | 0.47 |
| Hemerodromia | 17.9 | 0.13 |
| Menetus dilatatus | 17.9 | 0.13 |
| TOTAL BENTHOS | 13,453.5 | 100.00 |
| TOTAL TAXA RICHNESS | 26 | |
| EPT TAXA RICHNESS | 3 | |

TABLE 3-28. PETITE PONAR DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2001.

| TAXA | 64 LAKE ST. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Turbellaria | 258.4 | 1.28 |
| Oligochaeta | 16,893.8 | 83.39 |
| Mooreobdella microstoma | 21.5 | 0.11 |
| Cheumatopsyche | 93.3 | 0.46 |
| Berosus | 7.2 | 0.04 |
| Procladius (Holotanypus) | 14.4 | 0.07 |
| Thienemannimyia grp. | 50.2 | 0.25 |
| Cricotopus bicinctus grp. | 28.7 | 0.14 |
| Cricotopus sylvestris grp. | 107.6 | 0.53 |
| Nanocladius distinctus | 43.1 | 0.21 |
| Cryptochironomus | 538.2 | 2.66 |
| Dicrotendipes neomodestus | 14.4 | 0.07 |
| Dicrotendipes simpsoni | 64.6 | 0.32 |
| Glyptotendipes | 473.7 | 2.34 |
| Paracladopelma | 28.7 | 0.14 |
| Polypedilum flavum | 308.6 | 1.52 |
| Polypedilum illinoense | 258.4 | 1.28 |
| Polypedilum scalaenum grp. | 724.8 | 3.58 |
| Simulium | 150.7 | 0.74 |
| Corbicula fluminea | 107.6 | 0.53 |
| Musculium transversum | 71.8 | 0.35 |
| TOTAL BENTHOS | 20,259.6 | 100.00 |
| TOTAL TAXA RICHNESS | 21 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-29. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JULY 2001.

| TAXA | 13 | | 22 | | 91 | |
|--------------------------------------|------------------|--------|------------------|--------|----------------------|--------|
| | LAKE COOK RD. | | OGDEN AVE. | | MATERIAL SERVICE RD. | |
| | #/m ² | % | #/m ² | % | #/m ² | % |
| Hydra | 3.6 | 0.02 | — | — | — | — |
| Turbellaria | 428.8 | 2.87 | 19.7 | 1.15 | 3,310.0 | 21.34 |
| Plumatella | 1.8 | 0.01 | — | — | — | — |
| Oligochaeta | 50.2 | 0.34 | 220.7 | 12.81 | 358.8 | 2.31 |
| Caecidotea | — | — | 5.4 | 0.31 | — | — |
| Gammarus fasciatus | 3.6 | 0.02 | — | — | — | — |
| Hydracarina | 5.4 | 0.04 | — | — | — | — |
| Isonychia | 35.9 | 0.24 | — | — | — | — |
| Baetis intercalaris | 663.8 | 4.44 | 30.5 | 1.77 | 44.9 | 0.29 |
| Pseudocloeon ephippiatum | 1.8 | 0.01 | — | — | — | — |
| Leucrocuta | 57.4 | 0.38 | 35.9 | 2.08 | — | — |
| Heptagenia | 28.7 | 0.19 | — | — | — | — |
| Stenacron | 78.9 | 0.53 | 104.1 | 6.04 | 9.0 | 0.06 |
| Stenonema | — | — | 30.5 | 1.77 | — | — |
| Stenonema integrum | 220.7 | 1.47 | — | — | — | — |
| Stenonema terminatum | 543.6 | 3.63 | — | — | — | — |
| Tricorythodes | 188.4 | 1.26 | 17.9 | 1.04 | 26.9 | 0.17 |
| Argia | — | — | 3.6 | 0.21 | — | — |
| Cynnellus fraternus | 3.6 | 0.02 | — | — | — | — |
| Cheumatopsyche | 2,865.1 | 19.15 | 495.2 | 28.75 | 5,660.2 | 36.50 |
| Hydropsyche betteni | — | — | 7.2 | 0.42 | 9.0 | 0.06 |
| Hydropsyche orris | — | — | — | — | 349.8 | 2.26 |
| Hydropsyche simulans | 272.7 | 1.82 | — | — | 26.9 | 0.17 |
| Hydropsyche bidens | 615.4 | 4.11 | — | — | — | — |
| Ceratopsyche morosa | 253.0 | 1.69 | 25.1 | 1.46 | 9.0 | 0.06 |
| Potamyia flava | 71.8 | 0.48 | — | — | — | — |
| Petrophila | — | — | — | — | 17.9 | 0.12 |
| Dubiraphia | 3.6 | 0.02 | — | — | — | — |
| Macronychus glabratus | 55.6 | 0.37 | 7.2 | 0.42 | — | — |
| Stenelmis crenata grp. | 16.1 | 0.11 | 1.8 | 0.10 | 17.9 | 0.12 |
| Procladius (Holotanypus) | 21.5 | 0.14 | 1.8 | 0.10 | — | — |
| Ablabesmyia janta | 21.5 | 0.14 | — | — | — | — |
| Ablabesmyia mallochii | — | — | 1.8 | 0.10 | — | — |
| Nilotanypus fimbriatus | 21.5 | 0.14 | 19.7 | 1.15 | — | — |
| Thienemanniella grp. | 192.0 | 1.28 | 70.0 | 4.06 | — | — |
| Corynoneura | — | — | 10.8 | 0.63 | — | — |
| Thienemanniella xena | 64.6 | 0.43 | 5.4 | 0.31 | — | — |
| Thienemanniella similis | — | — | 5.4 | 0.31 | — | — |
| Cricotopus sylvestris grp. | 86.1 | 0.58 | — | — | — | — |
| Nanocladius distinctus | — | — | 41.3 | 2.40 | 134.6 | 0.87 |
| Nanocladius crassicornus/rectinervis | 64.6 | 0.43 | — | — | 125.6 | 0.81 |
| Rheocricotopus robacki | 64.6 | 0.43 | 14.4 | 0.83 | — | — |
| Chironomus | 21.5 | 0.14 | — | — | — | — |
| Cryptochironomus | — | — | 5.4 | 0.31 | — | — |
| Dicrotendipes neomodestus | 21.5 | 0.14 | — | — | — | — |
| Endochironomus nigricans | 86.1 | 0.58 | — | — | — | — |
| Glyptotendipes | 193.8 | 1.30 | — | — | 35.9 | 0.23 |
| Paracladopelma | — | — | 5.4 | 0.31 | — | — |
| Polypedilum fallax grp. | — | — | 16.1 | 0.94 | — | — |
| Polypedilum flavum | 1,980.6 | 13.24 | 235.0 | 13.65 | 5,373.2 | 34.64 |
| Polypedilum illinoense | — | — | 1.8 | 0.10 | — | — |
| Polypedilum scalaenum grp. | — | — | 84.3 | 4.90 | — | — |
| Rheotanytarsus | 5,649.4 | 37.76 | 86.1 | 5.00 | — | — |
| Simulium | 1.8 | 0.01 | — | — | — | — |
| Pleuroceridae | — | — | 1.8 | 0.10 | — | — |
| Ferrissia | — | — | 111.2 | 6.46 | — | — |
| TOTAL BENTHOS | 14,960.5 | 100.00 | 1,722.3 | 100.00 | 15,509.5 | 100.00 |
| TOTAL TAXA RICHNESS | 39 | | 32 | | 16 | |
| EPT TAXA RICHNESS | 15 | | 8 | | 8 | |

TABLE 3-30. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JULY 2001.

| TAXA | 13 | | 22 | | 91 | |
|--------------------------------------|---------------|--------|------------|--------|----------------------|--------|
| | LAKE COOK RD. | | OGDEN AVE. | | MATERIAL SERVICE RD. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | 86.1 | 2.06 | 258.4 | 3.86 | 86.1 | 1.03 |
| Urnatella gracilis | 7.2 | 0.17 | — | — | — | — |
| Oligochaeta | 732.0 | 17.53 | 2,985.5 | 44.59 | 7,191.0 | 86.38 |
| Helobdella stagnalis | — | — | 7.2 | 0.11 | 57.4 | 0.69 |
| Helobdella triserialis | — | — | 7.2 | 0.11 | — | — |
| Mooreobdella microstoma | — | — | 7.2 | 0.11 | 14.4 | 0.17 |
| Ostracoda | 64.6 | 1.55 | — | — | — | — |
| Caecidotea | 868.4 | 20.79 | 100.5 | 1.50 | 28.7 | 0.34 |
| Gammarus fasciatus | — | — | 14.4 | 0.21 | 258.4 | 3.10 |
| Baetis intercalaris | 7.2 | 0.17 | 35.9 | 0.54 | — | — |
| Stenonema | 35.9 | 0.86 | — | — | — | — |
| Tricorythodes | 43.1 | 1.03 | 236.8 | 3.54 | — | — |
| Stylurus | 7.2 | 0.17 | — | — | — | — |
| Palmaeorixa | — | — | — | — | 57.4 | 0.69 |
| Cyrrnellus fraternus | 7.2 | 0.17 | — | — | — | — |
| Cheumatopsyche | 251.2 | 6.01 | 107.6 | 1.61 | 71.8 | 0.86 |
| Potamyia flava | 28.7 | 0.69 | — | — | — | — |
| Dubiraphia | 78.9 | 1.89 | — | — | — | — |
| Macronychus glabratus | — | — | 7.2 | 0.11 | — | — |
| Stenelmis crenata grp. | — | — | 78.9 | 1.18 | 86.1 | 1.03 |
| Natarsia sp. A | — | — | — | — | 14.4 | 0.17 |
| Procladius (Holotanypus) | — | — | 43.1 | 0.64 | 114.8 | 1.38 |
| Ablabesmyia mallochii | — | — | 28.7 | 0.43 | — | — |
| Thienemanniya grp. | 43.1 | 1.03 | 172.2 | 2.57 | — | — |
| Corynoneura | — | — | 7.2 | 0.11 | — | — |
| Thienemanniella similis | — | — | 7.2 | 0.11 | — | — |
| Nanocladius | — | — | 7.2 | 0.11 | — | — |
| Nanocladius crassicornus/rectinervis | 100.5 | 2.41 | — | — | — | — |
| Chironomus | — | — | 57.4 | 0.86 | 14.4 | 0.17 |
| Cladopelma | 35.9 | 0.86 | — | — | — | — |
| Cryptochironomus | 660.3 | 15.81 | 488.0 | 7.29 | 14.4 | 0.17 |
| Dicrotendipes neomodestus | 28.7 | 0.69 | 7.2 | 0.11 | 14.4 | 0.17 |
| Dicrotendipes simpsoni | 64.6 | 1.55 | — | — | — | — |
| Glyptotendipes | 28.7 | 0.69 | — | — | 14.4 | 0.17 |
| Microtendipes | 129.2 | 3.09 | — | — | — | — |
| Paracladopelma | 229.7 | 5.50 | 14.4 | 0.21 | — | — |
| Polypedilum fallax grp. | — | — | 14.4 | 0.21 | — | — |
| Polypedilum flavum | — | — | 35.9 | 0.54 | 14.4 | 0.17 |
| Polypedilum halterale grp. | — | — | 143.5 | 2.14 | — | — |
| Polypedilum illinoense | 100.5 | 2.41 | — | — | — | — |
| Polypedilum scalaenum grp. | 64.6 | 1.55 | 1,550.2 | 23.15 | 186.6 | 2.24 |
| Cladotanytarsus vanderwulpi grp. | — | — | 28.7 | 0.43 | — | — |
| Rheotanytarsus | — | — | 21.5 | 0.32 | — | — |
| Tanytarsus guerlus grp. | 380.4 | 9.11 | — | — | — | — |
| Amnicola | — | — | — | — | 14.4 | 0.17 |
| Pleuroceridae | — | — | 14.4 | 0.21 | 28.7 | 0.34 |
| Corbicula fluminea | 28.7 | 0.69 | 7.2 | 0.11 | 28.7 | 0.34 |
| Musculium | — | — | 21.5 | 0.32 | — | — |
| Musculium transversum | — | — | — | — | 14.4 | 0.17 |
| Pisidium | 64.6 | 1.55 | 179.4 | 2.68 | — | — |
| TOTAL BENTHOS | 4,176.8 | 100.00 | 6,695.8 | 100.00 | 8,324.9 | 100.00 |
| TOTAL TAXA RICHNESS | 27 | | 32 | | 21 | |
| EPT TAXA RICHNESS | 6 | | 3 | | 1 | |

density was lowest at Station 13 and increased longitudinally to Station 91. Elevated numbers of *Oligochaeta* and/or *Polypedilum scalaenum* grp. contributed the most to the higher densities observed at Stations 22 and 91.

Chironomid head capsule deformities were observed in the HD sample from Station 91 and in the Ponar sample from Station 22. However, in both cases, only one specimen exhibited a deformity. Therefore, the percent incidence of deformity observed in these two samples is likely insignificant.

Based on relative abundance, tolerant taxa were a relatively minor component in the HD samples from Stations 13 and 91 accounting for 2.5 and 3.4 percent of the total density at those stations compared to 23.1 percent at Station 22 (Table 3-1). In contrast, tolerant taxa were a relatively more important component in the Ponar samples at all three stations. However, tolerant taxa relative abundance in the Ponars increased sequentially in a longitudinal manner from 38 percent at Station 13 to 88.6 percent at Station 91. This combined with the upstream to downstream decline of HD total taxa richness and EPT richness for both sample types suggests that benthic community quality and decreases and environmental stress increases in a downstream manner between Station 13 and Station 91.

3.2 2002 Benthic Macroinvertebrate Results

During 2002, 42 HD samples and 45 Ponar samples were collected from 23 stations in 13 different waterways (Table 2-2). Combined, these samples yielded similar results compared to 2001 with 90 total taxa and 19 EPT taxa (Table 3-1). As in 2001, Chironomidae was the most taxa rich group with 39 taxa followed by Trichoptera and Ephemeroptera with 10 and 9 taxa, respectively.

3.2.1 Calumet Watershed

The same three stations in the Calumet watershed that were surveyed during 2001 were sampled again during 2002: one station in the Calumet River, one station in the Little Calumet River, and one station in the Cal-Sag (Table 2-2).

As in 2001, zebra mussel was the dominant taxon in the 2002 HD samples while *Oligochaeta* was the dominant taxon in the 2002 Ponar samples from the Calumet watershed. In addition, Chironomidae head capsule deformities again were absent in the 2002 collections. However, contrary to 2001, tolerant taxa were generally not as common in 2002 representing 50 percent or less of the taxa richness at each station.

3.2.1.1 Calumet River

Combined, the HD and Ponar samples from the single station in the Calumet River (Station 55) yielded 12 total taxa and one EPT taxon (Tables 3-31 and 3-32). Six total taxa and one EPT taxon were observed in the HD samples while nine total taxa were present in the Ponar samples. Total density in the HD samples was nearly considerably higher than in the Ponar samples due to the extreme abundance of zebra mussels (*Dreissena polymorpha*) (Table 3-31). Zebra mussel

TABLE 3-31. HESTER-DENDY DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, SEPTEMBER 2002.

| TAXA | 55 | |
|------------------------|-----------|--------|
| | 130TH ST. | |
| | #/m2 | % |
| Hydra | 179.4 | 0.12 |
| Oligochaeta | 1,435.2 | 0.98 |
| Cyrenellus fraternus | 1.8 | 0.00 |
| Ablabesmyia janta | 179.4 | 0.12 |
| Dicrotendipes simpsoni | 538.2 | 0.37 |
| Dreissena polymorpha | 143,882.3 | 98.40 |
| TOTAL BENTHOS | 146,216.4 | 100.00 |
| TOTAL TAXA RICHNESS | 6 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-32. PETITE PONAR DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, SEPTEMBER 2002.

| TAXA | 55 | |
|------------------------------|-----------|--------|
| | 130TH ST. | |
| | #/m2 | % |
| Oligochaeta | 811.0 | 61.75 |
| Caecidotea | 114.8 | 8.74 |
| Procladius (Holotanypus) | 14.4 | 1.09 |
| Coelotanypus | 21.5 | 1.64 |
| Ablabesmyia janta | 7.2 | 0.55 |
| Cryptochironomus | 14.4 | 1.09 |
| Polypedilum halterale grp. | 7.2 | 0.55 |
| Aamnicola | 7.2 | 0.55 |
| Dreissena polymorpha | 315.8 | 24.04 |
| TOTAL BENTHOS | 1,313.3 | 100.00 |
| TOTAL TAXA RICHNESS RICHNESS | 9 | |
| EPT TAXA RICHNESS | 0 | |

was the most dominant HD taxon, representing over 98 percent of the total density. All the remaining taxa observed in the HD samples were individually represented by less than one percent of the total density. In contrast to the HD samples, Oligochaeta was the most dominant taxon by percent in the Ponars (Table 3-32). However, *Caecidotea* and *D. polymorpha* also were well represented in the Ponar samples.

No Chironomidae head capsule deformities were observed in either the HD or Ponar samples. Based on the relatively low taxa richness in both sample types, the fact that tolerant taxa comprised greater than 60 percent of the total density in the Ponars (Table 3-1), and tolerant taxa comprised a third of the total richness, it reasonable to characterize the benthic community at Station 55 in the Calumet River as moderately to highly stressed.

3.2.1.2 Little Calumet River

The HD and Ponar samples from the single station in the Little Calumet River (Station 76) yielded 13 total taxa and one EPT taxon (Tables 3-33 and 3-34). Total taxa richness in the HD samples was three times higher compared to the Ponars with 12 and 4 taxa being collected, respectively. The single EPT taxon *Cyrnellus fraternus* was observed in the HD samples. As was the case for the Calumet River, zebra mussel was the dominant taxon in the HD samples while Oligochaeta was the dominant in the Ponars. In addition, the tolerant taxon *Dicrotendipes simpsoni* also was common in both sample types. Again, primarily due to the abundance of *Dreissena polymorpha*, HD total density was several orders of magnitude higher than the total Ponar density.

As with the Calumet River samples, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, nearly half of the taxa represented in the HD and Ponar samples combined are considered highly tolerant of pollution indicating a moderately to highly stressed benthic assemblage (Table 3-1).

3.2.1.3 Calumet-Saginaw Channel

Together, the HD and Ponar samples from the single station in the Cal-Sag (Station 59) combined to yield 15 total taxa and one EPT taxon (Tables 3-35 and 3-36). All 15 total taxa and the one EPT taxon were observed in the HD samples compared to six total taxa and no EPT taxa in the Ponar samples. Zebra mussel and Oligochaeta were, again the two dominant taxa in the HD and Ponar samples, respectively. Likewise, HD total density was considerably higher compared to Ponar total density. However, although the difference between the two sample types was largely driven by *Dreissena polymorpha* abundance in the HDs, the tolerant taxa Oligochaeta and *Dicrotendipes simpsoni* also were relatively common in the HD samples.

Like the other two stations in the watershed, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples. The abundance of tolerant taxa combined in both sample types together with the low density of pollution sensitive taxa (i.e., EPT) suggests that the benthic community at Station 59 in the Cal-Sag is moderately stressed (Table 3-1).

TABLE 3-33. HESTER-DENDY DENSITIES AT SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER, SEPTEMBER 2002.

| TAXA | 76 | |
|------------------------|------------------|--------|
| | HALSTED ST. | |
| | #/m ² | % |
| Turbellaria | 358.8 | 1.34 |
| Oligochaeta | 125.6 | 0.47 |
| Gammarus fasciatus | 520.3 | 1.94 |
| Argia | 35.9 | 0.13 |
| Cyrnellus fraternus | 35.9 | 0.13 |
| Ablabesmyia janta | 89.7 | 0.33 |
| Nanocladius distinctus | 53.8 | 0.20 |
| Dicrotendipes simpsoni | 1,560.8 | 5.82 |
| Glyptotendipes | 35.9 | 0.13 |
| Menetus dilatatus | 358.8 | 1.34 |
| Ferrissia | 143.5 | 0.53 |
| Dreissena polymorpha | 23,519.9 | 87.63 |
| TOTAL BENTHOS | 26,838.9 | 100.00 |
| TOTAL TAXA RICHNESS | 12 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-34. PETITE PONAR DENSITIES AT SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER, SEPTEMBER 2002.

| TAXA | 76 | |
|------------------------------|------------------|--------|
| | HALSTED ST. | |
| | #/m ² | % |
| Oligochaeta | 602.8 | 88.42 |
| Gammarus fasciatus | 7.2 | 1.05 |
| Chironomidae | 7.2 | 1.05 |
| Dicrotendipes simpsoni | 21.5 | 3.16 |
| Corbicula fluminea | 43.1 | 6.32 |
| TOTAL BENTHOS | 681.8 | 100.00 |
| TOTAL TAXA RICHNESS RICHNESS | 4 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-35. HESTER-DENDY DENSITIES AT SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL, SEPTEMBER 2002.

| TAXA | 59 | |
|---------------------------|------------------|--------|
| | CICERO AVE. | |
| | #/m ² | % |
| Hydra | 17.9 | 0.15 |
| Turbellaria | 17.9 | 0.15 |
| Oligochaeta | 1,444.2 | 11.90 |
| Caecidotea | 9.0 | 0.07 |
| Gammarus fasciatus | 53.8 | 0.44 |
| Argia | 9.0 | 0.07 |
| Cyrnellus fraternus | 35.9 | 0.30 |
| Ablabesmyia janta | 7.2 | 0.06 |
| Ablabesmyia mallochi | 53.8 | 0.44 |
| Nanocladius distinctus | 491.6 | 4.05 |
| Dicrotendipes neomodestus | 14.4 | 0.12 |
| Dicrotendipes simpsoni | 2,335.8 | 19.24 |
| Glyptotendipes | 50.2 | 0.41 |
| Corbicula fluminea | 17.9 | 0.15 |
| Dreissena polymorpha | 7,579.8 | 62.44 |
| TOTAL BENTHOS | 12,138.5 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-36. PETITE PONAR DENSITIES AT SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL, SEPTEMBER 2002.

| TAXA | 59 | |
|------------------------------|------------------|--------|
| | CICERO AVE. | |
| | #/m ² | % |
| Hydra | 7.2 | 0.71 |
| Oligochaeta | 846.8 | 83.69 |
| Gammarus fasciatus | 7.2 | 0.71 |
| Nanocladius distinctus | 35.9 | 3.55 |
| Corbicula fluminea | 21.5 | 2.13 |
| Dreissena polymorpha | 93.3 | 9.22 |
| TOTAL BENTHOS | 1,011.9 | 100.00 |
| TOTAL TAXA RICHNESS RICHNESS | 6 | |
| EPT TAXA RICHNESS | 0 | |

3.2.2 North Branch Chicago River Watershed

Sampling was conducted at three stations in the North Branch Chicago River watershed during 2002: one station in the NSC and two stations in the NBCR (Table 2-2).

Contrary to 2001, dominance in the 2002 HD samples varied by station. However, *Oligochaeta* was the dominant taxon in the Ponar samples at two of the three stations in 2002. Although chironomid head capsule deformities were observed only at one station in the watershed, the level of incidence was the highest observed among any station sampled in either 2001 or 2002.

3.2.2.1 North Shore Channel

The HD and Ponar samples from the single station in the NSC (Station 36) yielded 15 total taxa and two EPT taxa combined (Tables 3-37 and 3-38). All 15 total taxa including the two EPT taxa were observed in the HD samples compared to seven total taxa and no EPT taxa in the Ponars. *Turbellaria* was the dominant taxon in the HD samples and *Oligochaeta* was the dominant taxon in Ponar samples. Total density in the Ponar samples was considerably higher than in the HD samples exclusively due to the abundance of *Oligochaeta*, which comprised over 99 percent of the total density in the Ponar samples compared to 30 percent in the HDs.

No Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, over half of the total taxa collected in the HD samples and all but one of the taxa observed in the Ponars were highly tolerant taxa. In addition, based on density, tolerant taxa were a major component of the benthos in the HDs and the dominant component of the benthos in the Ponars (Table 3-1). As such, it appears the benthic community at Station 36 in the NSC is moderately stressed.

3.2.2.2 North Branch of the Chicago River

The combined number of taxa collected in the HD and Ponar samples from the two NBCR stations (Stations 96 and 46) was 39 total taxa and four EPT taxa (Tables 3-39 and 3-40). HD total taxa richness was twice as high at the upstream Station 96 (26 taxa) compared to the 13 taxa observed at Station 46 (Table 3-39). In addition, the four EPT taxa observed in the NBCR only were collected at Station 96. *Turbellaria* and *Caecidotea* were the dominant taxa at Station 96 representing 47 and 42 percent of the total density. In contrast, the highly tolerant taxon *Oligochaeta* clearly was the dominant taxon at Station 46 representing 83 percent of the total density. Due to the higher abundance of *Oligochaeta*, total density was over three times higher at Station 46 compared to Station 96.

As with the HD samples, Ponar total taxa richness was four times higher at Station 96 compared to Station 46 with 16 and four total taxa, respectively (Table 3-40). No EPT taxa were collected in the Ponar samples at either station. The fingernail clam *Musculium transversum* was dominant taxon at Station 96 whereas *Oligochaeta* comprised nearly 100 percent of the total benthos at Station 46. The relationship between the two stations for Ponar total density was

TABLE 3-37. HESTER-DENDY DENSITIES AT SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL, JULY 2002.

| TAXA | 36 | |
|----------------------------|------------------|--------|
| | TOUHY AVE. | |
| | #/m ² | % |
| Turbellaria | 8,076.8 | 65.86 |
| Oligochaeta | 3,674.2 | 29.96 |
| Caecidotea | 35.9 | 0.29 |
| Cyrenellus fraternus | 17.9 | 0.15 |
| Cheumatopsyche | 3.6 | 0.03 |
| Thienemannimyia grp. | 3.6 | 0.03 |
| Cricotopus bicinctus grp. | 10.8 | 0.09 |
| Cricotopus sylvestris grp. | 21.5 | 0.18 |
| Nanocladius distinctus | 32.3 | 0.26 |
| Dicrotendipes neomodestus | 3.6 | 0.03 |
| Dicrotendipes simpsoni | 258.3 | 2.11 |
| Glyptotendipes | 14.4 | 0.12 |
| Parachironomus | 89.7 | 0.73 |
| Polypedilum flavum | 3.6 | 0.03 |
| Menetus dilatatus | 17.9 | 0.15 |
| TOTAL BENTHOS | 12,264.1 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | |
| EPT TAXA RICHNESS | 2 | |

TABLE 3-38. PETITE PONAR DENSITIES AT SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL, JULY 2002.

| TAXA | 36 | |
|------------------------------|------------------|--------|
| | TOUHY AVE. | |
| | #/m ² | % |
| Turbellaria | 1,263.1 | 0.31 |
| Oligochaeta | 401,511.2 | 99.42 |
| Cricotopus bicinctus grp. | 14.4 | 0.00 |
| Cricotopus sylvestris grp. | 21.5 | 0.01 |
| Nanocladius distinctus | 50.2 | 0.01 |
| Dicrotendipes simpsoni | 71.8 | 0.02 |
| Parachironomus | 940.1 | 0.23 |
| TOTAL BENTHOS | 403,872.3 | 100.00 |
| TOTAL TAXA RICHNESS RICHNESS | 7 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-39. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, JULY-AUGUST 2002.

| TAXA | 96 | | 46 | |
|----------------------------|------------------|--------|------------------|--------|
| | ALBANY AVE. | | GRAND AVE. | |
| | #/m ² | % | #/m ² | % |
| Hydra | 1.8 | 0.04 | 1.8 | 0.01 |
| Turbellaria | 2,348.4 | 47.00 | 961.6 | 6.83 |
| Oligochaeta | 34.1 | 0.68 | 11,645.1 | 82.77 |
| Helobdella stagnalis | 3.6 | 0.07 | 1.8 | 0.01 |
| Placobdella | 1.8 | 0.04 | — | — |
| Mooreobdella microstoma | 3.6 | 0.07 | — | — |
| Caecidotea | 2,122.4 | 42.48 | 73.6 | 0.52 |
| Gammarus fasciatus | — | — | 52.0 | 0.37 |
| Stenacron | 145.3 | 2.91 | — | — |
| Corixidae | 1.8 | 0.04 | — | — |
| Cheumatopsyche | 14.4 | 0.29 | — | — |
| Hydropsyche betteni | 10.8 | 0.22 | — | — |
| Hydroptila | 14.4 | 0.29 | — | — |
| Procladius (Holotanypus) | 1.8 | 0.04 | — | — |
| Thienemanniya grp. | 26.9 | 0.54 | — | — |
| Thienemanniella xena | 1.8 | 0.04 | — | — |
| Cricotopus bicinctus grp. | 10.8 | 0.22 | — | — |
| Cricotopus sylvestris grp. | — | — | 9.0 | 0.06 |
| Nanocladius distinctus | 3.6 | 0.07 | 9.0 | 0.06 |
| Rheocricotopus robacki | 14.4 | 0.29 | — | — |
| Chironomus | — | — | 159.7 | 1.13 |
| Dicrotendipes neomodestus | 44.9 | 0.90 | — | — |
| Dicrotendipes simpsoni | 1.8 | 0.04 | 1,099.7 | 7.82 |
| Glyptotendipes | 1.8 | 0.04 | 9.0 | 0.06 |
| Parachironomus | — | — | 34.1 | 0.24 |
| Polypedilum fallax grp. | 1.8 | 0.04 | — | — |
| Polypedilum flavum | 46.6 | 0.93 | — | — |
| Polypedilum illinoense | 21.5 | 0.43 | — | — |
| Polypedilum scalaenum grp. | 114.8 | 2.30 | — | — |
| Micropsectra | 1.8 | 0.04 | — | — |
| Menetus dilatatus | — | — | 12.6 | 0.09 |
| TOTAL BENTHOS | 4,996.4 | 100.00 | 14,068.9 | 100.00 |
| TOTAL TAXA RICHNESS | 26 | | 13 | |
| EPT TAXA RICHNESS | 4 | | 0 | |

TABLE 3-40. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, JULY-AUGUST 2002.

| TAXA | 96 | | 46 | |
|------------------------------|-------------|--------|------------|--------|
| | ALBANY AVE. | | GRAND AVE. | |
| | #/m2 | % | #/m2 | % |
| Oligochaeta | 301.4 | 2.82 | 46,023.8 | 99.89 |
| Helobdella stagnalis | 114.8 | 1.07 | -- | -- |
| Erpobdella punctata punctata | 129.2 | 1.21 | -- | -- |
| Mooreobdella microstoma | 1,435.3 | 13.42 | -- | -- |
| Caecidotea | 1,105.2 | 10.34 | -- | -- |
| Stenelmis | 14.4 | 0.13 | -- | -- |
| Procladius (Holotanypus) | -- | -- | 14.4 | 0.03 |
| Cricotopus bicinctus grp. | 43.1 | 0.40 | -- | -- |
| Cryptochironomus | 14.4 | 0.13 | -- | -- |
| Dicrotendipes neomodestus | 229.7 | 2.15 | -- | -- |
| Parachironomus | -- | -- | 7.2 | 0.02 |
| Polypedilum flavum | 14.4 | 0.13 | -- | -- |
| Polypedilum scalaenum grp. | 100.5 | 0.94 | -- | -- |
| Paratanytarsus | 14.4 | 0.13 | -- | -- |
| Tanytarsus glabrescens grp. | 14.4 | 0.13 | -- | -- |
| Amnicola | 43.1 | 0.40 | -- | -- |
| Musculium transversum | 7,076.2 | 66.17 | 28.7 | 0.06 |
| Pisidium nitidum | 43.1 | 0.40 | -- | -- |
| TOTAL BENTHOS | 10,693.2 | 100.00 | 46,074.0 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | | 4 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

nearly identical to that of the HD samples with density being four times higher downstream at Station 46 largely due to the abundance of *Oligochaeta* at that station.

Chironomid head capsule deformities were observed only in the HD samples at Station 46 (Table 3-41). Of the 117 midge specimens examined from Station 46, 15 or 12.8 percent exhibited deformities. This was the highest number of deformed specimens observed at any station in either year. The two taxa with malformed specimens were *Chironomus* and *Dicrotendipes simpsoni*. As with *Procladius*, several studies involving chironomid deformity analysis have included *Chironomus* (Bisthoven et al. 1998, Bisthoven and Ollevier 1998, Dermot 1991, Groenenduk et al. 1998, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Lenat 1993, and Warwick 1985, among others). Just over half of the 19 *Chironomus* examined from Station 46 were deformed. Although many researches advocate the need for 100 specimens or more of a particular target taxon in order to define statistical significance with deformity analysis (Hudson and Ciborowski 1996a), Lenat (1993) found that a minimum of 15 specimens was adequate for his analysis of *Chironomus* deformities in impacted and unimpacted streams of North Carolina. Lenat (1993) indicates that typically less than five percent of *Chironomus* from non-toxic sites exhibited deformities while toxic sites were generally double that incidence level. Regardless of how many specimens were examined in these studies, the 53 percent incidence of deformity for *Chironomus* collected in the HD samples from Station 46 is substantially higher than background levels in literature for this taxon (Bisthoven et al. 1998, Bisthoven and Ollevier 1998, Dermot 1991, Groenenduk et al. 1998, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Lenat 1993, and Warwick 1985). Although the typical reference deformity level for *Dicrotendipes simpsoni* is not known, the sample size was fairly large (n=92) and the number of deformed specimens (n=5) at Station 46 was one of the highest observed during the 2001 and 2002 studies.

Table 3-41. Chironomidae head capsule deformities observed in Hester-Dendy samples from the North Branch Chicago River watershed, August 2002.

| Taxa | Hester-Dendy Sample N.B.C.R. @ Grand Sta. 46 |
|-------------------------------|---|
| <i>Chironomus</i> | |
| Number Examined | 19 |
| Percent Deformed | 52.6 |
| <i>Dicrotendipes simpsoni</i> | |
| Number Examined | 92 |
| Percent Deformed | 5.4 |
| TOTAL SAMPLE | |
| Total Midges Examined | 117 |
| Percent Deformed | 12.8 |

Overall, based on the higher taxa richness and presence of EPT taxa at Station 96, combined with the relatively high density of tolerant taxa (Table 3-1) and incidence of chironomid deformity at Station 46, it appears the benthic community at Station 46 is considerably more stressed than at Station 96.

3.2.3 South Branch Chicago River and Chicago Sanitary and Ship Canal Watershed

Benthic macroinvertebrate sampling was conducted at 12 stations within the CSSC watershed: two stations in the Chicago River, two stations in the South Branch of the Chicago River (SBCR), one station in the South Fork of the South Branch of the Chicago River (SFSBCR), and six stations in the CSSC (Table 2-2).

Tolerant taxa were dominant at eight of the nine HD sampling stations and nine of 11 Ponar sampling stations in the SBCR and CSSC watershed during 2002. In all but one of these instances, the tolerant taxon was *Oligochaeta*. The incidence of chironomid head capsule deformities was generally low at the majority of the stations with the watershed but somewhat elevated at three of the HD sampling stations.

3.2.3.1 Chicago River

Together, the HD and Ponar samples from the two Chicago River stations (Stations 100 and 74) yielded 22 total taxa and two EPT taxa (Tables 3-42 and 3-43). HD total taxa richness was slightly higher at the upstream Station 74 with 18 total taxa and two EPT taxa compared to 12 total taxa and no EPT at Station 100 (Table 3-42). Total density was over twice as high at Station 100 compared to Station 74 primarily due to the elevated abundance of *Oligochaeta*, which was the dominant taxon at that station and comprised 92 percent of the total density. *Gammarus fasciatus* was the dominant taxon at Station 74. However, *Oligochaeta* also was fairly abundant.

Ponar total taxa richness was relatively low at both stations with five and two taxa at Stations 74 and 100, respectively (Table 3-43). No EPT taxa were collected in the Ponars from either station. *Oligochaeta* was the dominant taxon in the Chicago River Ponar samples representing over 98 percent of the total density at both stations. However, *Oligochaeta* was three times more abundant at Station 74, which partly resulted in a four-fold difference in total density between the two stations.

Chironomid head capsule deformities were observed at both stations in the HD samples and at Station 74 in the Ponar samples (Table 3-44). *Chironomus* exhibited deformities on all three occasions whereas the single specimen of *Xenochironomus xenolabis* only was observed in the HD samples from Station 100. The percentages of deformed specimens observed at both stations are misleading since the taxa exhibiting deformities were present in relatively low numbers (one to five specimens). With the small sample sizes, it is problematic to speculate as to what these levels of incidence represent.

TABLE 3-42. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO RIVER, AUGUST 2002.

| TAXA | 74 | | 100 | |
|----------------------------|------------------|--------|------------------|--------|
| | LAKE SHORE DR. | | WELLS ST. | |
| | #/m ² | % | #/m ² | % |
| Hydra | 3.6 | 0.40 | -- | --- |
| Plumatella | 1.8 | 0.20 | -- | --- |
| Oligochaeta | 256.5 | 28.43 | 2,086.5 | 92.16 |
| Gammarus fasciatus | 502.3 | 55.67 | 95.1 | 4.20 |
| Cheumatopsyche | 1.8 | 0.20 | -- | --- |
| Hydroptila | 1.8 | 0.20 | -- | --- |
| Ablabesmyia mallochi | -- | -- | 3.6 | 0.16 |
| Cricotopus bicinctus grp. | 19.7 | 2.19 | -- | --- |
| Cricotopus sylvestris grp. | 5.4 | 0.60 | -- | --- |
| Heterotrissociadius | 1.8 | 0.20 | -- | --- |
| Nanocladius distinctus | -- | -- | 1.8 | 0.08 |
| Chironomus | 9.0 | 0.99 | 10.8 | 0.48 |
| Cladopelma | 9.0 | 0.99 | -- | --- |
| Cryptochironomus | 1.8 | 0.20 | -- | --- |
| Dicrotendipes neomodestus | 3.6 | 0.40 | 1.8 | 0.08 |
| Dicrotendipes simpsoni | 9.0 | 0.99 | 43.1 | 1.90 |
| Glyptotendipes | 7.2 | 0.80 | 1.8 | 0.08 |
| Microchironomus | -- | -- | 1.8 | 0.08 |
| Parachironomus | 16.1 | 1.79 | 10.8 | 0.48 |
| Polypedilum halterale grp. | 32.3 | 3.58 | 5.4 | 0.24 |
| Xenochironomus xenolabis | -- | -- | 1.8 | 0.08 |
| Dreissena polymorpha | 19.7 | 2.19 | -- | --- |
| TOTAL BENTHOS | 902.4 | 100.00 | 2,264.1 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | | 12 | |
| EPT TAXA RICHNESS | 2 | | 0 | |

TABLE 3-43. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO RIVER, AUGUST 2002.

| TAXA | 74 | | 100 | |
|------------------------------|------------------|--------|------------------|--------|
| | LAKE SHORE DR. | | WELLS ST. | |
| | #/m ² | % | #/m ² | % |
| Oligochaeta | 7,951.7 | 98.40 | 2,504.6 | 99.71 |
| Nanocladius distinctus | 7.2 | 0.09 | -- | --- |
| Chironomus | 7.2 | 0.09 | -- | --- |
| Polypedilum halterale grp. | 21.5 | 0.27 | -- | --- |
| Dreissena polymorpha | 93.3 | 1.15 | 7.2 | 0.29 |
| TOTAL BENTHOS | 8,080.9 | 100.00 | 2,511.8 | 100.00 |
| TOTAL TAXA RICHNESS RICHNESS | 5 | | 2 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

Table 3-44. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the South Branch Chicago River and Chicago Sanitary and Ship Canal watershed, August and September 2002.

| Taxa | Hester Dendy Samples | | | | |
|--|---------------------------------------|-----------------------------------|----------------------------------|----------------------------------|-------------------------------------|
| | Chicago R. @ Lake Shore Sta. 74 | Chicago R. @ Wells Sta. 100 | S.B.C.R. @ Madison Sta. 39 | S.B.C.R. @ Loomis Sta. 108 | S.F.S.B.C.R. @ Archer Sta. 99 |
| <i>Chironomus</i> | | | | | |
| Number Examined | 4 | 5 | -- | -- | -- |
| Percent Deformed | 25.0 | 40.0 | -- | -- | -- |
| <i>Dicrotendipes simpsoni</i> | | | | | |
| Number Examined | 4 | 21 | 158 | 184 | 182 |
| Percent Deformed | 0.0 | 0.0 | 0.6 | 4.9 | 1.6 |
| <i>Xenochironomus xenolabis</i> | | | | | |
| Number Examined | -- | 1 | -- | -- | -- |
| Percent Deformed | -- | 100.0 | -- | -- | -- |
| TOTAL SAMPLE | | | | | |
| Total Midges Examined | 51 | 41 | 166 | 187 | 185 |
| Percent Deformed | 2.0 | 7.3 | 0.6 | 4.8 | 1.6 |

| Taxa | Hester Dendy Samples | | | Ponar Sample |
|--------------------------------------|--------------------------------|---------------------------------|-----------------------------------|---------------------------------------|
| | C.S.S.C. @ Damen Sta. 40 | C.S.S.C. @ Harlem Sta. 41 | C.S.S.C. @ Lockport Sta. 92 | Chicago R. @ Lake Shore Sta. 74 |
| <i>Chironomus</i> | | | | |
| Number Examined | -- | -- | -- | 1 |
| Percent Deformed | -- | -- | -- | 100.0 |
| <i>Dicrotendipes simpsoni</i> | | | | |
| Number Examined | 178 | 47 | 12 | -- |
| Percent Deformed | 3.9 | 10.6 | 16.7 | -- |
| TOTAL SAMPLE | | | | |
| Total Midges Examined | 180 | 49 | 24 | 5 |
| Percent Deformed | 3.9 | 10.2 | 8.3 | 20.0 |

Based on the slightly lower taxa richness and lack of EPT in both the HD and Ponar samples as well as the higher relative abundance of tolerant taxa in the HD samples (Table 3-1), it appears the benthic community at the downstream Station 100 is more stressed compared to the community observed at Station 74.

3.2.3.2 South Branch of the Chicago River

The HD and Ponar samples from the two SBCR stations (Stations 39 and 108) yielded 23 combined total taxa and two EPT taxa (Tables 3-45 and 3-46). HD total taxa richness was very similar between the two stations with 15 taxa at Station 39 and 13 taxa at Station 108 (Table 3-45). Although EPT richness was identical between the two stations with one taxon at each station, the caddisfly *Potamyia flava* was collected at Station 39 while the mayfly *Stenacron* was collected at Station 108. The dominant taxa at Station 39 were the tolerant taxa *Dicrotendipes simpsoni* and *Oligochaeta*. *Oligochaeta* was the dominant taxon at Station 108. However, *Turbellaria* and *Dicrotendipes simpsoni* also were relatively abundant. HD total density also was similar between the two stations. The slightly higher density observed at Station 39 was primarily due to higher numbers of *Caecidotea* and *Dicrotendipes simpsoni* compared to Station 108.

Ponar total taxa richness was somewhat higher at Station 39 with 10 taxa compared to Station 108 with six taxa (Table 3-46). No EPT taxa were observed at either station. Total density was nearly identical at the two stations. However, density was primarily dictated by different taxa at each station. Zebra mussel and *Oligochaeta* were the dominant taxa at Station 39 while *Oligochaeta* was the sole dominant taxon at Station 108 accounting for 95 percent of the total density.

Chironomid head capsule deformities were observed at both stations but only in the HD samples (Table 3-44). At both Station 39 and Station 108, *Dicrotendipes simpsoni* was the species that exhibited the deformities. However, the incidence of deformity was noticeably higher at Station 108 with 4.8 percent compared to 0.6 percent at Station 39.

The benthic community at both stations could be characterized as relatively pollution tolerant based on community composition and relative abundance of tolerant taxa. The incidence of chironomid deformity and relative abundance of tolerant taxa in the Ponars was noticeably higher downstream at Station 108 compared to upstream (Tables 3-1). However, the number and relative abundance of tolerant taxa in the HD samples was higher upstream at Station 39 compared to downstream. Therefore, it appears that the benthic community at each station is equally and moderately stressed.

3.2.3.3 South Fork of the South Branch of the Chicago River

The benthic macroinvertebrate community in the SFSBCR at Station 99 was represented by 10 total taxa in the HD and Ponar samples (Tables 3-47 and 3-48). Eight total taxa were observed in the HD samples while three taxa were in the Ponars. No EPT taxa were observed in the SFSBCR samples. *Oligochaeta* was the dominant taxa for both sample types. However, another tolerant taxon *Dicrotendipes simpsoni* also was well represented in the HD samples. Due to the

TABLE 3-45. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE SOUTH BRANCH CHICAGO RIVER, AUGUST 2002.

| TAXA | 39 | | 108 | |
|----------------------------|-------------|--------|------------|--------|
| | MADISON ST. | | LOONIS ST. | |
| | #/m2 | % | #/m2 | % |
| Hydra | 7.2 | 0.12 | 1.8 | 0.04 |
| Turbellaria | 638.7 | 10.35 | 1,289.9 | 27.22 |
| Oligochaeta | 2,073.9 | 33.59 | 2,036.2 | 42.98 |
| Helobdella stagnalis | — | — | 1.8 | 0.04 |
| Helobdella triserialis | 17.9 | 0.29 | 9.0 | 0.19 |
| Caecidotea | 504.1 | 8.17 | 134.6 | 2.84 |
| Gammarus fasciatus | 134.6 | 2.18 | 80.7 | 1.70 |
| Stenacron | 1.8 | 0.03 | — | — |
| Argia | — | — | 5.4 | 0.11 |
| Potamyia flava | — | — | 5.4 | 0.11 |
| Nanocladius distinctus | 78.9 | 1.28 | — | — |
| Dicrotendipes simpsoni | 2,544.0 | 41.21 | 1,153.6 | 24.35 |
| Glyptotendipes | 17.9 | 0.29 | 5.4 | 0.11 |
| Polypedilum halterale grp. | 17.9 | 0.29 | — | — |
| Polypedilum illinoense | 17.9 | 0.29 | 12.6 | 0.27 |
| Polypedilum scalaenum grp. | 14.4 | 0.23 | — | — |
| Menetus dilatatus | 71.8 | 1.16 | — | — |
| Dreissena polymorpha | 32.3 | 0.52 | 1.8 | 0.04 |
| TOTAL BENTHOS | 6,173.3 | 100.00 | 4,738.1 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | | 13 | |
| EPT TAXA RICHNESS | 1 | | 1 | |

TABLE 3-46. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE SOUTH BRANCH CHICAGO RIVER, AUGUST 2002.

| TAXA | 39 | | 108 | |
|---------------------------|-------------|--------|------------|--------|
| | MADISON ST. | | LOONIS ST. | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 57.4 | 1.52 | — | — |
| Oligochaeta | 1,586.0 | 41.94 | 2,913.7 | 94.64 |
| Caecidotea | 7.2 | 0.19 | — | — |
| Procladius (Holotanypus) | 7.2 | 0.19 | 43.1 | 1.40 |
| Dicrotendipes neomodestus | 14.4 | 0.38 | — | — |
| Dicrotendipes simpsoni | 21.5 | 0.57 | 7.2 | 0.23 |
| Polypedilum illinoense | 7.2 | 0.19 | 7.2 | 0.23 |
| Corbicula fluminea | — | — | 71.8 | 2.33 |
| Musculium transversum | 7.2 | 0.19 | — | — |
| Pisidium nitidum | 7.2 | 0.19 | — | — |
| Dreissena polymorpha | 2,066.9 | 54.65 | 35.9 | 1.17 |
| TOTAL BENTHOS | 3,782.1 | 100.00 | 3,078.8 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | | 6 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

TABLE 3-47. HESTER-DENDY DENSITIES AT SAMPLING STATION 99 WITHIN THE SOUTH FORK SOUTH BRANCH CHICAGO RIVER, AUGUST 2002.

| TAXA | 99 | |
|------------------------|------------------|--------|
| | ARCHER AVE. | |
| | #/m ² | % |
| Hydra | 19.7 | 0.17 |
| Oligochaeta | 7,578.0 | 63.44 |
| Helobdella triserialis | 3.6 | 0.03 |
| Thienemannimyia grp. | 35.9 | 0.30 |
| Dicrotendipes simpsoni | 4,282.4 | 35.85 |
| Glyptotendipes | 3.6 | 0.03 |
| Parachironomus | 3.6 | 0.03 |
| Physella | 17.9 | 0.15 |
| TOTAL BENTHOS | 11,944.7 | 100.00 |
| TOTAL TAXA RICHNESS | 8 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-48. PETITE PONAR DENSITIES AT SAMPLING STATION 99 WITHIN THE SOUTH FORK SOUTH BRANCH CHICAGO RIVER, AUGUST 2002.

| TAXA | 99 | |
|--------------------------|------------------|--------|
| | ARCHER AVE. | |
| | #/m ² | % |
| Turbellaria | 7.2 | 0.25 |
| Oligochaeta | 2,813.2 | 98.74 |
| Procladius (Holotanypus) | 28.7 | 1.01 |
| TOTAL BENTHOS | 2,849.1 | 100.00 |
| TOTAL TAXA RICHNESS | 3 | |
| EPT TAXA RICHNESS | 0 | |

higher density of Oligochaeta, total density was nearly six times higher in the HD samples compared to the Ponars.

Chironomid head capsule deformities only were exhibited by *Dicrotendipes simpsoni* in the HD samples from Station 99 (Table 3-44). Of the 182 midges examined, three were malformed. As stated above, reference incidence levels are not available for this species. However, the 1.6 percent incidence level observed at Station 99 is below the published background levels for other chironomid species (Bisthoven and Ollevier 1998, Bisthoven et al. 1998, Dermont 1991, Doherty et al. *in prep.*, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Lenat 1993, Swansburg et al. 2002). Nonetheless, based on the relatively low taxa richness, lack of EPT taxa, and the fact that tolerant taxa comprised over 99 percent of the total density in both the HDs and Ponars (Table 3-1), these data clearly indicate that the benthic community at Station 99 in the SFSBCR is highly stressed.

3.2.3.4 Chicago Sanitary and Ship Canal

During 2002, HD samples were collected at four stations in the CSSC (Stations 40, 75, 41, and 92). However, Ponar samples were collected at these four stations plus two additional stations at Route 83 and Stephen Street (Stations 42 and 48) (Table 2-2).

The HD samples from the four CSSC stations and Ponar samples from the six CSSC stations combined yielded 25 total taxa and no EPT taxa (Tables 3-49 and 3-50). HD total taxa richness ranged from 13 taxa at Station 92 to five taxa at Station 41 (Table 3-49). Total richness was similar among Stations 40, 75, and 92 but noticeably lower at Station 41. Oligochaeta was the dominant taxon at all four stations. However, Turbellaria and/or *Dicrotendipes simpsoni* also were fairly common. Total density was nearly identical between the furthest upstream and downstream Stations 40 and 92 but three or more times higher at Stations 75 and 41. Density among the four stations was largely driven by the abundance of Oligochaeta, which represented between 71 and 91 percent of the total density at the four stations.

Ponar total taxa richness was similarly low at all six sampling stations ranging from three taxa at Stations 75 and 92 to six taxa at Stations 40 and 48 (Table 3-50). Oligochaeta was the dominant taxon at five of the six stations representing between 87 and 99 percent of the total density. Although Oligochaeta remained relatively common, Turbellaria was the dominant taxon at Station 48. Total density varied greatly among the six stations. Ponar density was similarly low at Stations 75, 42, and 48 and considerably higher at Stations 40 and 92. The total density observed at Station 92 was nearly 2.5 times greater compared to Station 40. However, total density among the six stations was exclusively dictated by the abundance of Oligochaeta in the samples.

Chironomid head capsule deformities only were observed in the HD samples at three of the four stations sampled in the CSSC (Table 3-44). In all cases, *Dicrotendipes simpsoni* was the taxon exhibiting the deformities. The number of specimens with deformities at each station ranged from two at Station 92 to seven at Station 40 and appeared to be directly related to sample size. Despite the smaller sample size at Station 92, incidence levels and/or number of deformed

TABLE 3-49. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, AUGUST-SEPTEMBER 2002.

| TAXA | 40 DAMEN AVE. | | 75 CICERO AVE. | | 41 HARLEM AVE. | | 92 LOCKPORT | |
|--------------------------|------------------|--------|-------------------|--------|-------------------|--------|----------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| | | | | | | | | |
| Hydra | 1.8 | 0.03 | — | — | 17.9 | 0.08 | 1.8 | 0.03 |
| Turbellaria | 830.6 | 12.17 | 317.5 | 1.86 | 3,695.7 | 17.31 | 737.4 | 10.71 |
| Oligochaeta | 4,861.9 | 71.24 | 15,536.4 | 91.19 | 17,348.4 | 81.26 | 5,760.7 | 83.64 |
| Glossiphoniidae | — | — | — | — | — | — | 17.9 | 0.26 |
| Helobdella stagnalis | — | — | — | — | — | — | 17.9 | 0.26 |
| Helobdella triserialis | 1.8 | 0.03 | — | — | — | — | — | — |
| Mooreobdella microstoma | — | — | — | — | — | — | 1.8 | 0.03 |
| Caecidotea | 7.2 | 0.11 | — | — | — | — | — | — |
| Gammarus fasciatus | 91.5 | 1.34 | — | — | — | — | 86.1 | 1.25 |
| Somatochlora | 1.8 | 0.03 | — | — | — | — | — | — |
| Procladius (Holotanypus) | 3.6 | 0.05 | — | — | — | — | — | — |
| Ablabesmyia janta | — | — | 35.9 | 0.21 | 21.5 | 0.10 | — | — |
| Ablabesmyia mallochii | — | — | — | — | — | — | 14.4 | 0.21 |
| Thienemannimyia grp. | — | — | 17.9 | 0.11 | — | — | — | — |
| Nanocladius distinctus | — | — | 107.6 | 0.63 | — | — | 107.6 | 1.56 |
| Dicrotendipes simpsoni | 1,024.4 | 15.01 | 861.1 | 5.05 | 265.5 | 1.24 | 123.8 | 1.80 |
| Parachironomus | — | — | 89.7 | 0.53 | — | — | — | — |
| Polypedilum flavum | — | — | 17.9 | 0.11 | — | — | 1.8 | 0.03 |
| Physella | — | — | 17.9 | 0.11 | — | — | — | — |
| Menetus dilatatus | — | — | 23.3 | 0.14 | — | — | — | — |
| Ferrissia | — | — | — | — | — | — | 9.0 | 0.13 |
| Corbicula fluminea | — | — | 12.6 | 0.07 | — | — | 5.4 | 0.08 |
| Dreissena polymorpha | — | — | — | — | — | — | 1.8 | 0.03 |
| TOTAL BENTHOS | 6,824.5 | 100.00 | 17,038.0 | 100.00 | 21,349.1 | 100.00 | 6,887.3 | 100.00 |
| TOTAL TAXA RICHNESS | 9 | | 11 | | 5 | | 13 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | |

TABLE 3-50. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, AUGUST-SEPTEMBER 2002.

| TAXA | 40 | | 75 | | 41 | | 42 | | 48 | | 92 | |
|------------------------------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|------------------|--------|
| | DANEN AVE. | | CICERO AVE. | | HARLEM AVE. | | ROUTE 83 | | STEPHEN ST. | | LOCKPORT | |
| | #/m ² | % |
| Turbellaria | 7.2 | 0.03 | -- | -- | 229.7 | 5.85 | 14.4 | 3.23 | 50.2 | 30.43 | 21.5 | 0.03 |
| Oligochaeta | 26,338.2 | 99.38 | 660.3 | 95.83 | 3,437.6 | 87.57 | 416.2 | 93.55 | 21.5 | 13.04 | 63,549.1 | 99.85 |
| Glossiphoniidae | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 8.70 | -- | -- |
| Caecidotea | -- | -- | -- | -- | -- | -- | 7.2 | 1.61 | -- | -- | -- | -- |
| Procladius (Holotanypus) | 7.2 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Ablabesmyia mallochi | -- | -- | -- | -- | -- | -- | 7.2 | 1.61 | -- | -- | -- | -- |
| Cryptochironomus | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 8.70 | -- | -- |
| Glyptotendipes | 71.8 | 0.27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Parachironomus | 7.2 | 0.03 | 14.4 | 2.08 | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | -- | -- | -- | -- | 14.4 | 0.37 | -- | -- | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | 244.0 | 6.22 | -- | -- | -- | -- | -- | -- |
| Corbicula fluminea | 71.8 | 0.27 | 14.4 | 2.08 | -- | -- | -- | -- | 7.2 | 4.35 | 71.8 | 0.11 |
| Dreissena polymorpha | -- | -- | -- | -- | -- | -- | -- | -- | 57.4 | 34.78 | -- | -- |
| TOTAL BENTHOS | 26,503.3 | 100.00 | 689.0 | 100.00 | 3,925.6 | 100.00 | 445.0 | 100.00 | 165.1 | 100.00 | 63,642.4 | 100.00 |
| TOTAL TAXA RICHNESS RICHNESS | 6 | | 3 | | 4 | | 4 | | 6 | | 3 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |

specimens were relatively high at all three stations compared to several other stations sampled in 2002.

In terms of relative abundance and regardless of sample type, highly tolerant taxa dominated the benthic community at all sampling stations in the CSSC (Table 3-1). This combined with the lack of EPT taxa and low total taxa richness in the majority of samples suggests that the benthic community in the CSSC is moderately to highly stressed.

3.2.4 Des Plaines River Watershed

The same six stations in the Des Plaines River watershed that were surveyed during 2001 were sampled again during 2002: one station in Higgins Creek, one station in Salt Creek, one station in the West Branch of the DuPage River, and three stations in the Des Plaines River (Table 2-2).

As in 2001, Oligochaeta was the dominant taxon at the majority of the Ponar sampling stations in 2002. However, contrary to 2001, tolerant taxa were dominant at half of the HD sampling stations in 2002. Despite this apparent shift, chironomidae capsule deformities remained relatively rare in the watershed while taxa richness and EPT richness remained relatively high compared to the other watersheds sampled in 2002.

3.2.4.1 Higgins Creek

Combined, the HD and Ponar samples from the single station in Higgins Creek (Station 78) yielded 20 total taxa (Tables 3-51 and 3-52). Sixteen total taxa were observed in the HD samples while 12 taxa were present in the Ponar samples. *Caecidotea* was the dominant taxon in the HD samples while the tolerant taxa Oligochaeta, *Cricotopus bicinctus*, and *C. sylvestris* were the dominants in the Ponars. Total density was very similar between the HD and Ponar samples.

No chironomid head capsule deformities were observed in Higgins Creek. However, the lack of EPT taxa and the fact that tolerant taxa comprised 32 and 84 percent of the total density in the HD and Ponar samples, respectively (Table 3-1) indicates a stressed benthic community exists in Higgins Creek.

3.2.4.2 Salt Creek

HD and Ponar samples from the single station in Salt Creek (Station 18) yielded 31 total taxa and three EPT taxa (Tables 3-53 and 3-54). The HD samples produced 27 total taxa and three EPT taxa whereas the Ponar samples 10 total taxa and no EPT. Although dominant taxa differed between the HD and Ponar samples, total density was nearly identical. The caddisfly *Cheumatopsyche* was the dominant taxon in the HD samples. However, Turbellaria and the tolerant taxon *Glyptotendipes* also were well represented in the HD samples. In contrast, Oligochaeta was clearly the dominant taxon in the Ponar samples.

No chironomid head capsule deformities were observed in the HD and Ponar samples. As in 2001, results from the 2002 sampling of Salt Creek were mixed. Tolerant taxa comprised approximately 34 and 94 percent of the HD and Ponar total density (Table 3-1), which suggests

TABLE 3-51. HESTER-DENDY DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JULY 2002.

| TAXA | 78 WILLE RD. | |
|----------------------------|-----------------|--------|
| | #/m2 | % |
| Turbellaria | 272.7 | 13.52 |
| Oligochaeta | 57.4 | 2.85 |
| Mooreobdella microstoma | 5.4 | 0.27 |
| Caecidotea | 1,010.0 | 50.09 |
| Copelatus | 1.8 | 0.09 |
| Laccophilus maculosus | 1.8 | 0.09 |
| Tropisternus | 1.8 | 0.09 |
| Thienemannimyia grp. | 21.5 | 1.07 |
| Cricotopus tremulus grp. | 98.7 | 4.89 |
| Cricotopus bicinctus grp. | 279.9 | 13.88 |
| Cricotopus trifascia grp. | 48.4 | 2.40 |
| Cricotopus sylvestris grp. | 208.1 | 10.32 |
| Dicrotendipes neomodestus | 1.8 | 0.09 |
| Polypedilum illinoense | 3.6 | 0.18 |
| Tipula | 1.8 | 0.09 |
| Ferrissia | 1.8 | 0.09 |
| TOTAL BENTHOS | 2,016.5 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-52. PETITE PONAR DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JULY 2002.

| TAXA | 78 WILLE RD. | |
|----------------------------|-----------------|--------|
| | #/m2 | % |
| Turbellaria | 35.9 | 1.52 |
| Oligochaeta | 617.2 | 26.06 |
| Caecidotea | 143.5 | 6.06 |
| Cricotopus tremulus grp. | 107.6 | 4.55 |
| Cricotopus bicinctus grp. | 595.7 | 25.15 |
| Cricotopus trifascia grp. | 14.4 | 0.61 |
| Cricotopus sylvestris grp. | 617.2 | 26.06 |
| Chironomus | 14.4 | 0.61 |
| Dicrotendipes neomodestus | 157.9 | 6.67 |
| Glyptotendipes | 35.9 | 1.52 |
| Microtendipes | 14.4 | 0.61 |
| Tanytarsus | 14.4 | 0.61 |
| TOTAL BENTHOS | 2,368.3 | 100.00 |
| TOTAL TAXA RICHNESS | 12 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-53. HESTER-DENDY DENSITIES AT SAMPLING STATION 18 WITHIN SALT CREEK, JULY 2002.

| TAXA | 18 DEVON AVE. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Turbellaria | 593.8 | 18.09 |
| Oligochaeta | 123.8 | 3.77 |
| Caecidotea | 16.1 | 0.49 |
| Stenacron | 7.2 | 0.22 |
| Tricorythodes | 43.1 | 1.31 |
| Argia | 1.8 | 0.05 |
| Cheumatopsyche | 823.5 | 25.08 |
| Ablabesmyia mallochi | 17.9 | 0.55 |
| Thienemannimyia grp. | 21.5 | 0.66 |
| Thienemanniella xena | 3.6 | 0.11 |
| Cricotopus tremulus grp. | 30.5 | 0.93 |
| Cricotopus bicinctus grp. | 3.6 | 0.11 |
| Cricotopus sylvestris grp. | 12.6 | 0.38 |
| Nanocladius distinctus | 39.5 | 1.20 |
| Chironomus | 14.4 | 0.44 |
| Cryptochironomus | 14.4 | 0.44 |
| Dicrotendipes neomodestus | 100.5 | 3.06 |
| Dicrotendipes simpsoni | 114.8 | 3.50 |
| Glyptotendipes | 371.4 | 11.31 |
| Polypedilum flavum | 278.1 | 8.47 |
| Polypedilum illinoense | 303.2 | 9.23 |
| Polypedilum scalaenum grp. | 125.6 | 3.83 |
| Paratanytarsus | 70.0 | 2.13 |
| Tanytarsus | 26.9 | 0.82 |
| Tanytarsus guerlus grp. | 48.4 | 1.48 |
| Menetus dilatatus | 70.0 | 2.13 |
| Ferrissia | 7.2 | 0.22 |
| TOTAL BENTHOS | 3,283.1 | 100.00 |
| TOTAL TAXA RICHNESS | 27 | |
| EPT TAXA RICHNESS | 3 | |

TABLE 3-54. PETITE PONAR DENSITIES AT SAMPLING STATION 18 WITHIN SALT CREEK, JULY 2002.

| TAXA | 18 DEVON AVE. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Plumatella | 7.2 | 0.22 |
| Oligochaeta | 2,533.4 | 76.08 |
| Dubiraphia | 21.5 | 0.65 |
| Procladius (Holotanypus) | 208.1 | 6.25 |
| Cricotopus sylvestris grp. | 136.4 | 4.09 |
| Chironomus | 71.8 | 2.16 |
| Cryptochironomus | 136.4 | 4.09 |
| Dicrotendipes simpsoni | 35.9 | 1.08 |
| Polypedilum flavum | 136.4 | 4.09 |
| Corbicula fluminea | 43.1 | 1.29 |
| TOTAL BENTHOS | 3,330.0 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 0 | |

some degree of environmental stress is affecting the benthic community. However, the abundance of EPT taxa in the HD samples, presence of environmentally sensitive Tanytarsini midge taxa, and the relatively high taxa richness observed in HD samples indicates a healthier benthic assemblage compared to many of the stations surveyed in 2002.

3.2.4.3 West Branch of the DuPage River

The benthic macroinvertebrate community in the WB DuPage River at Station 64 was represented by 19 total taxa and three EPT taxa in the HD and Ponar samples combined (Tables 3-55 and 3-56). Total taxa richness was considerably higher in the HD samples with 19 taxa compared to the three total taxa in the Ponar samples. However, comparison of the total richness values is problematic since the condition of the Chironomidae specimens in the Ponar samples precluded their identification below the family level. Since Chironomidae accounted for 12 of the 19 taxa observed in the HD samples, it is reasonable to suspect that the Ponar total richness would have been higher had the specimens been in better condition. EPT taxa richness was slightly higher in the HD samples with three taxa while a single EPT taxon was observed in the Ponars. The dominant taxa in the HD samples were the highly tolerant taxa *Nanocladius distinctus* and *Polypedilum illinoense*. In the Ponar samples, Chironomidae was the dominant taxon though the highly tolerant taxon Oligochaeta also was relatively abundant. Total density was slightly higher in the HD samples but very similar compared to the total density observed in the Ponars.

Again, deformity analysis of the WB DuPage River chironomids was complicated by the poor condition of the Ponar midge specimens. Chironomid head capsule deformities only were observed in the HD samples at Station 64 (Table 3-57). A single specimen of *Polypedilum illinoense* or 0.8 percent of all midges examined in the HD samples was deformed. Given the low number of deformed specimens observed, it is very likely that the incidence level is insignificant. However, based solely on the HD results, tolerant taxa accounted for half of the total taxa richness and 80 percent of the total density at Station 64. As such, it is reasonable to characterize the benthic community at Station 64 as moderately stressed.

3.2.4.4 Des Plaines River

Combined, the HD and Ponar samples from the three Des Plaines River stations (Stations 13, 22, and 91) yielded 60 total taxa and 18 EPT taxa (Tables 3-58 and 3-59). These were the highest richness values observed among all the waterways sampled in 2002. In addition, the EPT richness from the Des Plaines River in 2002 was the highest observed for any station during 2001 and 2002. HD total taxa richness decreased longitudinally upstream to downstream among the three stations from 34 taxa at Station 13 to 19 taxa at Station 91 (Table 3-58). Likewise, EPT taxa richness was highest at the upstream Station 13 with 14 taxa compared to seven and eight EPT taxa at the two downstream Stations 22 and 91, respectively. The HD richness values observed at Station 13 were the highest observed among all the stations sampled during 2002. The highly tolerant midge *Glyptotendipes* was clearly the dominant taxon at Station 13. No other taxa collected in the HD samples from Station 13 achieved more than four percent of the total density. In contrast, the facultative chironomid *Polypedilum flavum* was the dominant taxon at both Stations 22 and 91. In addition, the tolerant taxa Oligochaeta and *Cricotopus*

TABLE 3-55. HESTER-DENDY DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2002.

| TAXA | 64 | |
|----------------------------|------------------|--------|
| | LAKE ST. | |
| | #/m ² | % |
| Turbellaria | 251.2 | 1.45 |
| Plumatella | 3.6 | 0.02 |
| Oligochaeta | 732.0 | 4.22 |
| Argia | 12.6 | 0.07 |
| Cheumatopsyche | 1,566.2 | 9.04 |
| Hydropsyche betteni | 66.4 | 0.38 |
| Hydropsyche bidens | 5.4 | 0.03 |
| Thienemanniya grp. | 855.8 | 4.94 |
| Thienemanniella xena | 179.4 | 1.04 |
| Cricotopus tremulus grp. | 179.4 | 1.04 |
| Cricotopus bicinctus grp. | 1,422.7 | 8.21 |
| Cricotopus sylvestris grp. | 394.7 | 2.28 |
| Nanocladius distinctus | 4,413.3 | 25.46 |
| Dicrotendipes neomodestus | 53.8 | 0.31 |
| Dicrotendipes simpsoni | 879.1 | 5.07 |
| Glyptotendipes | 915.0 | 5.28 |
| Parachironomus | 102.3 | 0.59 |
| Polypedilum flavum | 497.0 | 2.87 |
| Polypedilum illinoense | 4,802.7 | 27.71 |
| TOTAL BENTHOS | 17,332.3 | 100.00 |
| TOTAL TAXA RICHNESS | 19 | |
| EPT TAXA RICHNESS | 3 | |

TABLE 3-56. PETITE PONAR DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2002.

| TAXA | 64 | |
|---------------------|------------------|--------|
| | LAKE ST. | |
| | #/m ² | % |
| Oligochaeta | 4,664.8 | 29.00 |
| Hydropsychidae | 215.3 | 1.34 |
| Cheumatopsyche | 7.2 | 0.04 |
| Chironomidae | 11,195.5 | 69.61 |
| TOTAL BENTHOS | 16,082.8 | 100.00 |
| TOTAL TAXA RICHNESS | 3 | |
| EPT TAXA RICHNESS | 1 | |

Table 3-57. Chironomidae head capsule deformities observed in Hester-Dendy samples from the Des Plaines River watershed, July 2002.

| Taxa | Hester-Dendy Samples | |
|-------------------------------|--------------------------------------|--|
| | W.B. Du Page R. @ Lake Sta. 64 | Des Plaines R. @ Lake Cook Sta. 13 |
| <i>Glyptotendipes</i> | | |
| Number Examined | 6 | 102 |
| Percent Deformed | 0.0 | 1.0 |
| <i>Polypedilum illinoense</i> | | |
| Number Examined | 41 | -- |
| Percent Deformed | 2.4 | -- |
| TOTAL SAMPLE | | |
| Total Midges Examined | 131 | 198 |
| Percent Deformed | 0.8 | 0.5 |

TABLE 3-58. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JULY 2002.

| TAXA | 13 | | 22 | | 91. | |
|--------------------------------------|---------------|--------|------------|--------|----------------------|--------|
| | LAKE COOK RD. | | OGDEN AVE. | | MATERIAL SERVICE RD. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 17.9 | 0.05 | — | — | — | — |
| Turbellaria | 35.9 | 0.10 | 64.6 | 3.55 | 2,875.9 | 18.67 |
| Plumatella | — | — | — | — | 1.8 | 0.01 |
| Oligochaeta | 233.2 | 0.65 | 290.6 | 15.98 | 9.0 | 0.06 |
| Caecidotea | — | — | 1.8 | 0.10 | — | — |
| Gammarus fasciatus | 1,298.9 | 3.62 | — | — | — | — |
| Isonychia | 43.1 | 0.12 | — | — | — | — |
| Baetis intercalaris | 89.7 | 0.25 | 46.6 | 2.56 | 333.7 | 2.17 |
| Leucrocuta | 16.1 | 0.05 | 32.3 | 1.78 | — | — |
| Heptagenia | 19.7 | 0.06 | — | — | — | — |
| Stenacron | 136.3 | 0.38 | — | — | — | — |
| Stenonema integrum | 231.4 | 0.65 | — | — | — | — |
| Stenonema terminatum | 497.0 | 1.39 | 25.1 | 1.38 | — | — |
| Tricorythodes | 642.3 | 1.79 | 25.1 | 1.38 | 30.5 | 0.20 |
| Enallagma | 17.9 | 0.05 | — | — | — | — |
| Trepobates | — | — | — | — | 1.8 | 0.01 |
| Cyrnellus fraternus | 82.5 | 0.23 | — | — | — | — |
| Cheumatopsyche | 988.5 | 2.76 | 200.9 | 11.05 | 2,768.2 | 17.97 |
| Hydropsyche | — | — | — | — | 1.8 | 0.01 |
| Hydropsyche betteni | — | — | 10.8 | 0.59 | — | — |
| Hydropsyche orris | — | — | — | — | 254.8 | 1.65 |
| Hydropsyche simulans | 62.8 | 0.18 | — | — | 7.2 | 0.05 |
| Hydropsyche bidens | 84.3 | 0.24 | — | — | 19.7 | 0.13 |
| Ceratopsyche morosa | 7.2 | 0.02 | 17.9 | 0.99 | 37.7 | 0.24 |
| Potamyia flava | 68.2 | 0.19 | — | — | — | — |
| Petrophila | — | — | — | — | 16.1 | 0.10 |
| Laccophilus maculosus | 73.6 | 0.21 | — | — | — | — |
| Macronychus glabratus | 39.5 | 0.11 | — | — | — | — |
| Stenelmis crenata grp. | 222.5 | 0.62 | 5.4 | 0.30 | 9.0 | 0.06 |
| Chironomidae | — | — | 7.2 | 0.39 | — | — |
| Ablabesmyia janta | 14.4 | 0.04 | — | — | — | — |
| Ablabesmyia mallochi | — | — | 10.8 | 0.59 | — | — |
| Nilotanytus fimbriatus | 14.4 | 0.04 | 10.8 | 0.59 | — | — |
| Thienemanniya grp. | 98.7 | 0.28 | 71.8 | 3.94 | — | — |
| Thienemanniella xena | — | — | 10.8 | 0.59 | — | — |
| Cricotopus tremulus grp. | 14.4 | 0.04 | 10.8 | 0.59 | — | — |
| Cricotopus bicinctus grp. | 84.3 | 0.24 | 236.8 | 13.02 | — | — |
| Nanocladius distinctus | — | — | 46.6 | 2.56 | 34.1 | 0.22 |
| Nanocladius crassicornus/rectinervis | 41.3 | 0.12 | — | — | — | — |
| Dicrotendipes neomodestus | 41.3 | 0.12 | 10.8 | 0.59 | 34.1 | 0.22 |
| Glyptotendipes | 29,307.5 | 81.78 | 25.1 | 1.38 | 68.2 | 0.44 |
| Polypedilum flavum | 154.3 | 0.43 | 545.4 | 29.98 | 8,880.5 | 57.66 |
| Polypedilum illinoense | — | — | 25.1 | 1.38 | — | — |
| Polypedilum scalaenum grp. | 315.8 | 0.88 | 35.9 | 1.97 | — | — |
| Stenochironomus | — | — | 25.1 | 1.38 | — | — |
| Cladotanytarsus mancus grp. | 28.7 | 0.08 | — | — | — | — |
| Rheotanytarsus | 814.5 | 2.27 | 25.1 | 1.38 | — | — |
| Musculium | — | — | — | — | 17.9 | 0.12 |
| TOTAL BENTHOS | 35,837.8 | 100.00 | 1,819.2 | 100.00 | 15,401.9 | 100.00 |
| TOTAL TAXA RICHNESS | 34 | | 25 | | 19 | |
| EPT TAXA RICHNESS | 14 | | 7 | | 8 | |

TABLE 3-59. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JULY AND SEPTEMBER 2002.

| TAXA | 13 | | 22 | | 91 | |
|-----------------------------|---------------|--------|------------|--------|----------------------|--------|
| | LAKE COOK RD. | | OGDEN AVE. | | MATERIAL SERVICE RD. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Oligochaeta | 4,664.8 | 16.86 | 2,612.3 | 72.80 | 5,418.4 | 92.52 |
| Helobdella stagnalis | -- | -- | -- | -- | 21.5 | 0.37 |
| Mooreobdella microstoma | -- | -- | 7.2 | 0.20 | 57.4 | 0.98 |
| Gammarus fasciatus | 129.2 | 0.47 | -- | -- | 7.2 | 0.12 |
| Orconectes virilis | -- | -- | -- | -- | 7.2 | 0.12 |
| Baetis intercalaris | -- | -- | -- | -- | 7.2 | 0.12 |
| Tricorythodes | 143.5 | 0.52 | 7.2 | 0.20 | 7.2 | 0.12 |
| Hexagenia bilineata | 7.2 | 0.03 | -- | -- | -- | -- |
| Corixidae | -- | -- | -- | -- | 86.1 | 1.47 |
| Cheumatopsyche | -- | -- | 7.2 | 0.20 | 7.2 | 0.12 |
| Potamyia flava | 21.5 | 0.08 | 7.2 | 0.20 | -- | -- |
| Dubiraphia | 129.2 | 0.47 | -- | -- | -- | -- |
| Stenelmis | -- | -- | 35.9 | 1.00 | -- | -- |
| Stenelmis crenata grp. | 215.3 | 0.78 | -- | -- | -- | -- |
| Procladius (Holotanypus) | 358.8 | 1.30 | 64.6 | 1.80 | 35.9 | 0.61 |
| Ablabesmyia mallochi | -- | -- | 14.4 | 0.40 | -- | -- |
| Thienemannimyia grp. | 1,076.5 | 3.89 | -- | -- | -- | -- |
| Chironomus | 1,076.5 | 3.89 | -- | -- | -- | -- |
| Cryptochironomus | 760.7 | 2.75 | -- | -- | 14.4 | 0.25 |
| Dicrotendipes neomodestus | 2,511.8 | 9.08 | -- | -- | -- | -- |
| Glyptotendipes | 445.0 | 1.61 | 21.5 | 0.60 | -- | -- |
| Paracladopelma | 358.8 | 1.30 | -- | -- | -- | -- |
| Polypedilum flavum | 358.8 | 1.30 | -- | -- | 7.2 | 0.12 |
| Polypedilum scalaenum grp. | 3,229.5 | 11.67 | 315.8 | 8.80 | 64.6 | 1.10 |
| Cladotanytarsus mancus grp. | 358.8 | 1.30 | 7.2 | 0.20 | -- | -- |
| Tanytarsus | 11,317.6 | 40.90 | -- | -- | -- | -- |
| Corbicula fluminea | 509.5 | 1.84 | 488.0 | 13.60 | 107.6 | 1.84 |
| Musculium transversum | -- | -- | -- | -- | 7.2 | 0.12 |
| TOTAL BENTHOS | 27,673.1 | 100.00 | 3,588.3 | 100.00 | 5,856.1 | 100.00 |
| TOTAL TAXA RICHNESS | 19 | | 12 | | 15 | |
| EPT TAXA RICHNESS | 3 | | 3 | | 3 | |

bicinctus and the EPT taxon *Cheumatopsyche* also were relatively abundant at Station 22 while Turbellaria and *Cheumatopsyche* were fairly well represented at Station 91. Total density varied greatly among the three stations being lowest at Station 22, more than seven times higher at Station 91, and nearly twenty times higher at Station 13. The noticeably higher densities at Stations 13 and 91 were primarily due to the elevated abundance of dominant taxa at both stations.

Ponar total taxa richness was slightly higher at Station 13 compared to Stations 22 and 91, which were similar (Table 3-59). However, EPT taxa richness was identical among the three stations. The dominant taxon at Station 13 was *Tanytarsus*. Ohio EPA (1988) found that Tanytarsini midges often are absent from stations with even slight disturbance indicating their low threshold for environmental perturbation. At Stations 22 and 91, Oligochaeta was the dominant taxon. The tolerant taxa Oligochaeta and facultative taxa *Dicrotendipes neomodestus* and *Polypedilum scalaenum* also were well represented at Station 13. In addition, the Asiatic clam *Corbicula fluminea* was relatively common at Station 22. However, except for Oligochaeta, no other taxon was represented by more than two percent at Station 91. As with the HD samples, Ponar total density was highest at Station 13 but nearly eight and five times lower at Stations 22 and 91, respectively. Elevated numbers of several chironomid taxa contributed to the higher density observed at Station 13.

A single *Glyptotendipes* specimen in the HD sample from Station 13 exhibited a head capsule deformity (Table 3-57). This specimen comprised one percent of the *Glyptotendipes* and half a percent of all the chironomids examined in the HD samples from Station 13. Therefore, the percent incidence of deformity observed in these samples is likely insignificant.

Results of the Des Plaines River benthic macroinvertebrate sampling were mixed. Station 13 had the highest total richness in both the HD and Ponar samples and the highest EPT richness in the HD samples. In addition, the Station 13 Ponars had the lowest percentage of tolerant taxa among the stations and were dominated by a relatively pollution sensitive Tanytarsini midge taxon (OEPA 1988). In contrast, the Station 13 HD samples had the highest number and percentage of tolerant taxa (Table 3-1). Overall, it appears that the benthic community at all three stations is affected by environmental perturbation in varying degrees of severity and/or types of disturbance. However, based on the collection of positive community attributes expressed at Station 13, it appears that the benthic community at the two downstream Stations 22 and 91 is generally more stressed compared to Station 13.

3.3 Inter-Year Comparisons: 2001 vs. 2002

Of the 35 stations sampled in 2001 and 2002, 15 stations in 10 different waterways were sampled during both years (Tables 2-1 and 2-2). In an effort to analyze for trends and gauge variability within these systems, comparisons between the two years by sample type and total station are summarized in the following sections. Differences between years could be the result of changes in meteorological conditions, changes in the amount and type of stressors, or natural variability. However, for the purposes of these studies, no attempt was made to ascertain a specific cause.

3.3.1 Calumet Watershed

The same three stations in the Calumet watershed were surveyed during 2001 and 2002: Station 55 in the Calumet River, Station 76 in the Little Calumet River, and Station 59 in the Cal-Sag (Tables 2-1 and 2-2).

3.3.1.1 Calumet River

The HD results from Station 55 were largely similar between the two years (Table 3-60). Total taxa richness was somewhat higher in 2001 compared to 2002. One taxon absent from the 2002 samples was *Gammarus fasciatus*, which was fairly common in 2001. The remaining three taxa that were absent from the 2002 samples were all represented by less than one percent in the 2001 samples. EPT richness was identical between the two years. Although zebra mussel was the dominant taxon in both years representing greater than 90 percent of the total density each year, zebra mussel density was nearly four times higher in 2002 compared to 2001. As a result of the increased abundance of zebra mussels, total density was considerably higher in 2002.

As with the HD samples, Ponar results from 2001 and 2002 were comparable (Table 3-61). Like the HDs, total taxa richness was slightly higher in 2001 relative to 2002. In addition, no EPT taxa were observed in the Ponars during either year. Total density was slightly higher in 2001 compared to 2002 largely due to increased Oligochaeta abundance. Although Oligochaeta was the dominant taxon in both years, due to a combined decrease in Oligochaeta density and an increase in zebra mussel abundance, the relative abundance of Oligochaeta decreased from 92 percent in 2001 to 62 percent in 2002.

Overall, 18 total taxa and one EPT taxon were collected in the 2001 HD and Ponar samples from Station 55 compared to 12 total taxa and one EPT in 2002 (Tables 3-60 and 3-61). In general, the taxa absent in the 2002 samples were collected in fairly low densities during 2001. Chironomid head capsule deformities were not observed in either year. However, in terms of density, relative abundance and richness, tolerant taxa decreased in 2002 compared to 2001 (Table 3-1). Although the cause of these differences is not completely clear, the fact that the 2001 samples were collected a month earlier than the 2002 samples may have been a contributing factor.

3.3.1.2 Little Calumet River

Results from the HD sampling at Station 76 were very similar over the two years (Table 3-62). Total taxa richness was nearly identical between the years. One EPT taxon was collected in 2002 compared to zero in 2001. However, EPT taxon *Cyrenellus fraternus* was relatively rare in the 2002 samples accounting for only 0.13 percent of the total density. Zebra mussel was the dominant taxon during both years. Despite the fact that zebra mussel density nearly doubled between 2001 and 2002, a combined decrease in the density of *Hydra*, Turbellaria, Oligochaeta, and *Gammarus fasciatus* resulted in total density being only slightly higher in 2002.

Ponar results from 2001 and 2002 also were comparable (Table 3-63). Total taxa richness differed by one taxon and EPT richness was identical between the two years. Oligochaeta was

TABLE 3-60. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN AUGUST 2001 AND SEPTEMBER 2002 FOR SAMPLING STATION 55 WITHIN THE CALUMET RIVER.

| | | 55 130TH ST. | | | |
|------------------------|----------|-----------------|-----------|--------|--|
| TAXA | 2001 | | 2002 | | |
| | #/m2 | % | #/m2 | % | |
| Hydra | — | — | 179.4 | 0.12 | |
| Plumatella | 1.8 | 0.00 | — | — | |
| Oligochaeta | 556.2 | 1.44 | 1,435.2 | 0.98 | |
| Gammarus fasciatus | 1,273.8 | 3.30 | — | — | |
| Cyrenellus fraternus | 35.9 | 0.09 | 1.8 | 0.00 | |
| Ablabesmyia janta | — | — | 179.4 | 0.12 | |
| Ablabesmyia mallochi | 17.9 | 0.05 | — | — | |
| Nanocladius distinctus | 17.9 | 0.05 | — | — | |
| Chironomus | 179.4 | 0.47 | — | — | |
| Dicrotendipes simpsoni | 143.5 | 0.37 | 538.2 | 0.37 | |
| Glyptotendipes | 35.9 | 0.09 | — | — | |
| Dreissena polymorpha | 36,311.4 | 94.14 | 143,882.3 | 98.40 | |
| TOTAL BENTHOS | 38,573.7 | 100.00 | 146,216.4 | 100.00 | |
| TOTAL TAXA RICHNESS | 10 | | 6 | | |
| EPT TAXA RICHNESS | 1 | | 1 | | |

TABLE 3-61. COMPARISON OF PETITE PONAR DENSITIES BETWEEN AUGUST 2001 AND SEPTEMBER 2002 FOR SAMPLING STATION 55 WITHIN THE CALUMET RIVER.

| | | 55 130TH ST. | | | |
|----------------------------|---------|-----------------|---------|--------|--|
| TAXA | 2001 | | 2002 | | |
| | #/m2 | % | #/m2 | % | |
| Hydra | 7.2 | 0.18 | — | — | |
| Turbellaria | 7.2 | 0.18 | — | — | |
| Oligochaeta | 3,674.4 | 92.25 | 811.0 | 61.75 | |
| Caecidotea | — | — | 114.8 | 8.74 | |
| Gammarus fasciatus | 57.4 | 1.44 | — | — | |
| Procladius (Holotanypus) | 50.2 | 1.26 | 14.4 | 1.09 | |
| Clinotanypus | 7.2 | 0.18 | — | — | |
| Coelotanypus | — | — | 21.5 | 1.64 | |
| Ablabesmyia janta | — | — | 7.2 | 0.55 | |
| Chironomus | 7.2 | 0.18 | — | — | |
| Cryptochironomus | 28.7 | 0.72 | 14.4 | 1.09 | |
| Microchironomus | 7.2 | 0.18 | — | — | |
| Polypedilum halterale grp. | — | — | 7.2 | 0.55 | |
| Polypedilum scalaenum grp. | 21.5 | 0.54 | — | — | |
| Amnicola | — | — | 7.2 | 0.55 | |
| Pisidium compressum | 14.4 | 0.36 | — | — | |
| Dreissena polymorpha | 100.5 | 2.52 | 315.8 | 24.04 | |
| TOTAL BENTHOS | 3,983.0 | 100.00 | 1,313.3 | 100.00 | |
| TOTAL TAXA RICHNESS | 12 | | 9 | | |
| EPT TAXA RICHNESS | 0 | | 0 | | |

TABLE 3-62. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN AUGUST 2001 AND SEPTEMBER 2002 FOR SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER.

| TAXA | 76 HALSTED ST. | | | |
|-------------------------|-------------------|--------|------------------|--------|
| | 2001 | | 2002 | |
| | #/m ² | % | #/m ² | % |
| Hydra | 1,435.2 | 6.79 | — | — |
| Turbellaria | 2,350.2 | 11.11 | 358.8 | 1.34 |
| Oligochaeta | 1,650.5 | 7.80 | 125.6 | 0.47 |
| Mooreobdella microstoma | 17.9 | 0.08 | — | — |
| Caecidotea | 35.9 | 0.17 | — | — |
| Gammarus fasciatus | 1,650.5 | 7.80 | 520.3 | 1.94 |
| Argia | — | — | 35.9 | 0.13 |
| Cyrnellus fraternus | — | — | 35.9 | 0.13 |
| Ablabesmyia janta | — | — | 89.7 | 0.33 |
| Nanocladius distinctus | 233.2 | 1.10 | 53.8 | 0.20 |
| Dicrotendipes simpsoni | 950.8 | 4.50 | 1,560.8 | 5.82 |
| Glyptotendipes | 71.8 | 0.34 | 35.9 | 0.13 |
| Physella | 17.9 | 0.08 | — | — |
| Menetus dilatatus | 717.6 | 3.39 | 358.8 | 1.34 |
| Ferrissia | 53.8 | 0.25 | 143.5 | 0.53 |
| Dreissena polymorpha | 11,966.3 | 56.57 | 23,519.9 | 87.63 |
| TOTAL BENTHOS | 21,151.8 | 100.00 | 26,838.9 | 100.00 |
| TOTAL TAXA RICHNESS | 13 | | 12 | |
| EPT TAXA RICHNESS | 0 | | 1 | |

TABLE 3-63. COMPARISON OF PETITE PONAR DENSITIES BETWEEN AUGUST 2001 AND SEPTEMBER 2002 FOR SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER.

| TAXA | 76 HALSTED ST. | | | |
|------------------------|-------------------|--------|------------------|--------|
| | 2001 | | 2002 | |
| | #/m ² | % | #/m ² | % |
| Turbellaria | 279.9 | 2.29 | — | — |
| Oligochaeta | 11,855.8 | 96.95 | 602.8 | 88.42 |
| Gammarus fasciatus | 28.7 | 0.23 | 7.2 | 1.05 |
| Chironomidae | — | — | 7.2 | 1.05 |
| Dicrotendipes simpsoni | — | — | 21.5 | 3.16 |
| Corbicula fluminea | — | — | 43.1 | 6.32 |
| Pisidium compressum | 50.2 | 0.41 | — | — |
| Dreissena polymorpha | 14.4 | 0.12 | — | — |
| TOTAL BENTHOS | 12,229.0 | 100.00 | 681.8 | 100.00 |
| TOTAL TAXA RICHNESS | 5 | | 4 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

the dominant taxon in both years. However, the higher numbers of Oligochaeta in 2001 produced a considerable difference in total density between years.

In 2001, 14 total taxa and no EPT taxa were collected in HD and Ponar samples from Station 76 compared to 13 total taxa and one EPT in 2002 (Tables 3-62 and 3-63). As with the Calumet River, no chironomid deformities were observed in either year at Station 76. Although tolerant taxa decreased the most in terms of richness and density (Table 3-1); this appeared to produce only minor differences with respect to community composition, as the dominant taxa remained unchanged between the years.

3.3.1.3 Calumet-Saginaw Channel

The benthic community in the HD samples exhibited only minor changes between 2001 and 2002 (Table 3-64). Total taxa and EPT richness both increased by one taxon from 2001 to 2002. All differences in richness between the two years involved taxa that comprised a small fraction of the total density. Total density was nearly identical between the two years. However, there were notable changes in composition. With the exception of zebra mussel, all of the major taxa observed in 2001 decreased in 2002. In contrast, zebra mussel exhibited nearly a six-fold increase in density between 2001 and 2002. As result, *Dicrotendipes simpsoni*, which was the dominant taxon in 2001, became the second most abundant organism in 2002 after zebra mussel.

The Station 59 Ponar data were very similar between 2001 and 2002 (Table 3-65). Total taxa and EPT richness was identical between the two years. In addition, Oligochaeta was the dominant taxon both years. However, substantially lower numbers of Oligochaeta in 2002 resulted in a 33-fold decrease in total density between years.

Based on the HD and Ponar data combined, there were relatively few differences in the benthic community at Station 59 between 2001 and 2002. Total taxa and EPT richness differed by a single taxon with 16 total taxa and no EPT being observed in 2001 and 15 total taxa and one EPT in 2002 (Tables 3-64 and 3-65). Chironomidae deformities were not observed in either sample type during 2001 and 2002. Composition in terms of relative abundance and density changed somewhat between the two years and as with the previous stations, tolerant taxa decreased in abundance and richness in 2002 (Table 3-1). However, these differences do not appear to have changed the overall quality of the benthic community at Station 59.

3.3.2 North Branch Chicago River Watershed

Of the 15 stations sampled in the NBCR Watershed during 2001 and 2002, three were sampled during both years: Station 36 in the NSC and Stations 96 and 46 in the NBCR (Tables 2-1 and 2-2).

3.3.2.1 North Shore Channel

HD results from Station 36 were slightly different in 2001 and 2002 (Table 3-66). Total taxa richness was slightly higher in 2002 with 15 taxa compared to 11 taxa in 2001. Most notable of the additions to the 2002 taxa list were the two EPT taxa *Cyrtellus fraternus* and

TABLE 3-64. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN AUGUST 2001 AND SEPTEMBER 2002 FOR SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL.

| | | 59 CICERO AVE. | | | |
|---------------------------|----------|-------------------|----------|--------|--|
| TAXA | 2001 | | 2002 | | |
| | #/m2 | % | #/m2 | % | |
| Hydra | 1,883.7 | 15.81 | 17.9 | 0.15 | |
| Turbellaria | 161.5 | 1.36 | 17.9 | 0.15 | |
| Oligochaeta | 2,924.3 | 24.55 | 1,444.2 | 11.90 | |
| Caecidotea | 17.9 | 0.15 | 9.0 | 0.07 | |
| Gammarus fasciatus | 1,776.1 | 14.91 | 53.8 | 0.44 | |
| Argia | 17.9 | 0.15 | 9.0 | 0.07 | |
| Cyrenellus fraternus | — | — | 35.9 | 0.30 | |
| Ablabesmyia janta | — | — | 7.2 | 0.06 | |
| Ablabesmyia mallochi | 35.9 | 0.30 | 53.8 | 0.44 | |
| Nanocladius distinctus | 197.3 | 1.66 | 491.6 | 4.05 | |
| Dicrotendipes neomodestus | 17.9 | 0.15 | 14.4 | 0.12 | |
| Dicrotendipes simpsoni | 3,480.4 | 29.22 | 2,335.8 | 19.24 | |
| Glyptotendipes | 17.9 | 0.15 | 50.2 | 0.41 | |
| Menetus dilatatus | 35.9 | 0.30 | — | — | |
| Ferrissia | 53.8 | 0.45 | — | — | |
| Corbicula fluminea | — | — | 17.9 | 0.15 | |
| Dreissena polymorpha | 1,291.7 | 10.84 | 7,579.8 | 62.44 | |
| TOTAL BENTHOS | 11,912.5 | 100.00 | 12,138.5 | 100.00 | |
| TOTAL TAXA RICHNESS | 14 | | 15 | | |
| EPT TAXA RICHNESS | 0 | | 1 | | |

TABLE 3-65. COMPARISON OF PETITE PONAR DENSITIES BETWEEN AUGUST 2001 AND SEPTEMBER 2002 FOR SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL.

| | | 59 CICERO AVE. | | | |
|--------------------------|----------|-------------------|---------|--------|--|
| TAXA | 2001 | | 2002 | | |
| | #/m2 | % | #/m2 | % | |
| Hydra | — | — | 7.2 | 0.71 | |
| Oligochaeta | 32,495.8 | 96.01 | 846.8 | 83.69 | |
| Gammarus fasciatus | 71.8 | 0.21 | 7.2 | 0.71 | |
| Procladius (Holotanypus) | 868.4 | 2.57 | — | — | |
| Nanocladius distinctus | — | — | 35.9 | 3.55 | |
| Dicrotendipes simpsoni | 21.5 | 0.06 | — | — | |
| Corbicula fluminea | 358.8 | 1.06 | 21.5 | 2.13 | |
| Dreissena polymorpha | 28.7 | 0.08 | 93.3 | 9.22 | |
| TOTAL BENTHOS | 33,845.0 | 100.00 | 1,011.9 | 100.00 | |
| TOTAL TAXA RICHNESS | 6 | | 6 | | |
| EPT TAXA RICHNESS | 0 | | 0 | | |

TABLE 3-66. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN AUGUST 2001 AND JULY 2002 FOR SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL.

| TAXA | 36 | | | |
|----------------------------|------------|--------|----------|--------|
| | TOUHY AVE. | | | |
| | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 4,485.1 | 9.18 | 8,076.8 | 65.86 |
| Oligochaeta | 31,341.9 | 64.16 | 3,674.2 | 29.96 |
| Caecidotea | 17.9 | 0.04 | 35.9 | 0.29 |
| Gammarus fasciatus | 143.5 | 0.29 | — | — |
| Cyrenellus fraternus | — | — | 17.9 | 0.15 |
| Cheumatopsyche | — | — | 3.6 | 0.03 |
| Thienemannimyia grp. | — | — | 3.6 | 0.03 |
| Cricotopus bicinctus grp. | 484.4 | 0.99 | 10.8 | 0.09 |
| Cricotopus sylvestris grp. | — | — | 21.5 | 0.18 |
| Nanocladius distinctus | 1,489.1 | 3.05 | 32.3 | 0.26 |
| Dicrotendipes neomodestus | — | — | 3.6 | 0.03 |
| Dicrotendipes simpsoni | 9,759.6 | 19.98 | 258.3 | 2.11 |
| Glyptotendipes | 376.7 | 0.77 | 14.4 | 0.12 |
| Parachironomus | 610.0 | 1.25 | 89.7 | 0.73 |
| Polypedilum flavum | — | — | 3.6 | 0.03 |
| Polypedilum illinoense | 71.8 | 0.15 | — | — |
| Menetus dilatatus | 71.8 | 0.15 | 17.9 | 0.15 |
| TOTAL BENTHOS | 48,851.8 | 100.00 | 12,264.1 | 100.00 |
| TOTAL TAXA RICHNESS | 11 | | 15 | |
| EPT TAXA RICHNESS | 0 | | 2 | |

TABLE 3-67. COMPARISON OF PETITE PONAR DENSITIES BETWEEN AUGUST 2001 AND JULY 2002 FOR SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL.

| TAXA | 36 | | | |
|----------------------------|------------|--------|-----------|--------|
| | TOUHY AVE. | | | |
| | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 1,837.2 | 2.08 | 1,263.1 | 0.31 |
| Oligochaeta | 79,875.9 | 90.61 | 401,511.2 | 99.42 |
| Caecidotea | 7.2 | 0.01 | — | — |
| Gammarus fasciatus | 71.8 | 0.08 | — | — |
| Chironomidae | 5,310.7 | 6.02 | — | — |
| Cricotopus bicinctus grp. | 114.8 | 0.13 | 14.4 | 0.00 |
| Cricotopus sylvestris grp. | 28.7 | 0.03 | 21.5 | 0.01 |
| Nanocladius distinctus | 43.1 | 0.05 | 50.2 | 0.01 |
| Dicrotendipes simpsoni | 251.2 | 0.28 | 71.8 | 0.02 |
| Parachironomus | 617.2 | 0.70 | 940.1 | 0.23 |
| TOTAL BENTHOS | 88,157.8 | 100.00 | 403,872.3 | 100.00 |
| TOTAL TAXA RICHNESS | 9 | | 7 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

Cheumatopsyche. In addition, dominance and total density differed noticeably between the two years. In 2001, the benthic community in the HD samples was dominated by two tolerant taxa *Oligochaeta* and *Dicrotendipes simpsoni*. In 2002, although *Oligochaeta* remained relatively abundant, both it and *D. simpsoni* decreased considerably in abundance and total density falling by 75 percent. In contrast, *Turbellaria* nearly doubled in density and became the dominant taxon in 2002.

The results from the Ponar sampling were generally more similar between years than the HD samples (Table 3-67). Total and EPT richness varied little if any between 2001 and 2002. In addition, despite a five-fold increase in *Oligochaeta* density between 2001 and 2002, community composition changed very little. *Oligochaeta* was the dominant taxon followed by *Turbellaria* in both years.

Overall, the benthic macroinvertebrate community was represented by 12 total taxa in 2001 compared to 15 total taxa and two EPT taxa in 2002 (Tables 3-66 and 3-67). Chironomid head capsule deformities were not observed in either year at Station 36. *Oligochaeta* density decreased in the HD samples between 2001 and 2002, however, *Oligochaeta* increased dramatically between years in the Ponar samples. Despite these differences between sample types, with nine taxa in 2001 and eight taxa in 2002 tolerant organisms represented over half the total richness observed in each year.

3.3.2.2 North Branch of the Chicago River

The HD results from both Station 96 and Station 46 exhibited noticeable differences between the two study years (Table 3-68). Total taxa richness at each of the respective stations more than doubled between 2001 and 2002. However, richness values from Station 46 in 2001 may be artificially low due to the fact that midges in those samples could not be identified beyond Chironomidae. Although EPT taxa were lacking at Station 46 during both years, EPT richness increased from one taxon in 2001 to four taxa in 2002 at Station 96. *Caecidotea* was clearly the dominant taxon at Station 96 in 2001 whereas *Turbellaria* was slightly more abundant and the dominant taxon in 2002. Compositional differences were not evident at Station 46 with *Oligochaeta* being the dominant taxon by a substantial margin each year. Total density was nearly twice as high in 2001 compared to 2002 at Stations 96 and 46. At both stations, the decline in density observed in 2002 was almost exclusively due to the lower abundance of the 2001 dominant taxa.

The 2001 and 2002 Ponar results were generally more similar at the two stations compared to the HD results (Table 3-69). Total taxa and EPT richness was either identical or very similar between the two years at both Station 96 and Station 46. In addition, the dominant taxon at each respective station was the same during both years attaining a similar level of relative abundance in each year. In contrast to the HD results, total density was higher at both stations in 2002. Although the difference in density between the two years was noticeably greater at Station 96, at both stations, the higher density was primarily due to the increased abundance of the dominant taxa.

TABLE 3-68. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN AUGUST 2001 AND JULY/AUGUST 2002 FOR SAMPLING STATIONS WITHIN THE NORTH BRANCH CHICAGO RIVER.

| TAXA | 96 ALBANY AVE. | | | | 46 GRAND AVE. | | | |
|--------------------------------------|-------------------|--------|---------|--------|------------------|--------|----------|--------|
| | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 1.8 | 0.04 | -- | -- | 1.8 | 0.01 |
| Turbellaria | 206.3 | 2.00 | 2,348.4 | 47.00 | 89.7 | 0.36 | 961.6 | 6.83 |
| Oligochaeta | 98.7 | 0.96 | 34.1 | 0.68 | 23,896.7 | 94.87 | 11,645.1 | 82.77 |
| Helobdella stagnalis | -- | -- | 3.6 | 0.07 | -- | -- | 1.8 | 0.01 |
| Placobdella | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | 3.6 | 0.07 | -- | -- | -- | -- |
| Caecidotea | 9,714.7 | 94.17 | 2,122.4 | 42.48 | 17.9 | 0.07 | 73.6 | 0.52 |
| Gammarus fasciatus | -- | -- | -- | -- | 179.4 | 0.71 | 52.0 | 0.37 |
| Stenacron | -- | -- | 145.3 | 2.91 | -- | -- | -- | -- |
| Corixidae | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Cheumatopsyche | 9.0 | 0.09 | 14.4 | 0.29 | -- | -- | -- | -- |
| Hydropsyche betteni | -- | -- | 10.8 | 0.22 | -- | -- | -- | -- |
| Hydroptila | -- | -- | 14.4 | 0.29 | -- | -- | -- | -- |
| Chironomidae | -- | -- | -- | -- | 1,004.7 | 3.99 | -- | -- |
| Procladius (Holotanypus) | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Thienemanniya grp. | 107.6 | 1.04 | 26.9 | 0.54 | -- | -- | -- | -- |
| Thienemanniella xena | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | 10.8 | 0.22 | -- | -- | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | -- | -- | 9.0 | 0.06 |
| Nanocladius distinctus | 35.9 | 0.35 | 3.6 | 0.07 | -- | -- | 9.0 | 0.06 |
| Nanocladius crassicornus/rectinervis | 17.9 | 0.17 | -- | -- | -- | -- | -- | -- |
| Rheocricotopus robacki | 17.9 | 0.17 | 14.4 | 0.29 | -- | -- | -- | -- |
| Chironomus | -- | -- | -- | -- | -- | -- | 159.7 | 1.13 |
| Dicrotendipes neomodestus | -- | -- | 44.9 | 0.90 | -- | -- | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 1.8 | 0.04 | -- | -- | 1,099.7 | 7.82 |
| Glyptotendipes | -- | -- | 1.8 | 0.04 | -- | -- | 9.0 | 0.06 |
| Parachironomus | -- | -- | -- | -- | -- | -- | 34.1 | 0.24 |
| Polypedilum fallax grp. | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Polypedilum flavum | 44.9 | 0.43 | 46.6 | 0.93 | -- | -- | -- | -- |
| Polypedilum illinoense | 62.8 | 0.61 | 21.5 | 0.43 | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | -- | -- | 114.8 | 2.30 | -- | -- | -- | -- |
| Micropsectra | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | -- | -- | -- | -- | 12.6 | 0.09 |
| TOTAL BENTHOS | 10,315.8 | 100.00 | 4,996.4 | 100.00 | 25,188.4 | 100.00 | 14,068.9 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | | 26 | | 5 | | 13 | |
| EPT TAXA RICHNESS | 1 | | 4 | | 0 | | 0 | |

TABLE 3-69. COMPARISON OF PETITE PONAR DENSITIES BETWEEN AUGUST 2001 AND JULY/AUGUST 2002 FOR SAMPLING STATIONS WITHIN THE NORTH BRANCH CHICAGO RIVER.

| TAXA | 96 ALBANY AVE. | | | | 46 GRAND AVE. | | | |
|------------------------------|-------------------|--------|------------------|--------|------------------|--------|------------------|--------|
| | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % |
| Turbellaria | 14.4 | 0.40 | -- | -- | 7.2 | 0.06 | -- | -- |
| Plumatella | -- | -- | -- | -- | 7.2 | 0.06 | -- | -- |
| Oligochaeta | 387.5 | 10.84 | 301.4 | 2.82 | 12,049.6 | 98.36 | 46,023.8 | 99.89 |
| Helobdella stagnalis | -- | -- | 114.8 | 1.07 | -- | -- | -- | -- |
| Helobdella triserialis | 28.7 | 0.80 | -- | -- | -- | -- | -- | -- |
| Erpobdella punctata punctata | -- | -- | 129.2 | 1.21 | -- | -- | -- | -- |
| Mooreobdella microstoma | 14.4 | 0.40 | 1,435.3 | 13.42 | -- | -- | -- | -- |
| Caecidotea | 14.4 | 0.40 | 1,105.2 | 10.34 | -- | -- | -- | -- |
| Cheumatopsyche | 28.7 | 0.80 | -- | -- | -- | -- | -- | -- |
| Stenelmis | -- | -- | 14.4 | 0.13 | -- | -- | -- | -- |
| Chironomidae | -- | -- | -- | -- | 114.8 | 0.94 | -- | -- |
| Procladius (Holotanypus) | -- | -- | -- | -- | 50.2 | 0.41 | 14.4 | 0.03 |
| Thienemannimyia grp. | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | 14.4 | 0.40 | 43.1 | 0.40 | -- | -- | -- | -- |
| Cryptochironomus | 14.4 | 0.40 | 14.4 | 0.13 | -- | -- | -- | -- |
| Dicrotendipes neomodestus | 14.4 | 0.40 | 229.7 | 2.15 | -- | -- | -- | -- |
| Glyptotendipes | -- | -- | -- | -- | 14.4 | 0.12 | -- | -- |
| Parachironomus | -- | -- | -- | -- | -- | -- | 7.2 | 0.02 |
| Polypedilum flavum | -- | -- | 14.4 | 0.13 | -- | -- | -- | -- |
| Polypedilum illinoense | 57.4 | 1.61 | -- | -- | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | 244.0 | 6.83 | 100.5 | 0.94 | -- | -- | -- | -- |
| Paratanytarsus | -- | -- | 14.4 | 0.13 | -- | -- | -- | -- |
| Tanytarsus glabrescens grp. | -- | -- | 14.4 | 0.13 | -- | -- | -- | -- |
| Amnicola | -- | -- | 43.1 | 0.40 | -- | -- | -- | -- |
| Physella | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- |
| Corbicula fluminea | -- | -- | -- | -- | 7.2 | 0.06 | -- | -- |
| Musculium transversum | 2,382.6 | 66.67 | 7,076.2 | 66.17 | -- | -- | 28.7 | 0.06 |
| Pisidium | 28.7 | 0.80 | -- | -- | -- | -- | -- | -- |
| Pisidium compressum | 287.1 | 8.03 | -- | -- | -- | -- | -- | -- |
| Pisidium nitidum | -- | -- | 43.1 | 0.40 | -- | -- | -- | -- |
| TOTAL BENTHOS | 3,574.0 | 100.00 | 10,693.2 | 100.00 | 12,250.5 | 100.00 | 46,074.0 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | | 16 | | 6 | | 4 | |
| EPT TAXA RICHNESS | 1 | | 0 | | 0 | | 0 | |

Chironomid head capsule deformities only were observed at the Station 46 HD samples in 2002 (Table 3-41). However, comparison of deformity incidence between years is problematic since all of the chironomids in the 2001 HD samples and over half of the specimens in the 2001 Ponars from Station 46 were not in adequate condition for deformities to be determined.

Based on the combined results of the HD and Ponar samples, richness increased at Station 96 from 21 total taxa and one EPT in 2001 to 34 total taxa and 4 EPT in 2002 (Tables 3-68 and 3-69). Similarly, total taxa richness at Station 46 increased from eight taxa in 2001 to 15 taxa in 2002. Tolerant taxa richness and density at Station 96 was slightly higher in 2002 compared to 2001. In contrast, tolerant taxa density was similar in both years at Station 46.

3.3.3 South Branch Chicago River and Chicago Sanitary and Ship Canal Watershed

Of the 11 stations sampled in the SBCR and CSSC watershed in 2001 and 2002, three were sampled during both years: Stations 75, 41, and 92 in the CSSC.

The HD sampling at the three CSSC stations exhibited some differences between the two years. However, few consistent trends were evident among all three stations. Total taxa richness showed a notable increase at Station 75 and a slight decrease at Station 41 (Table 3-70). Total taxa richness at Station 92 was similar both years. However, the only EPT taxa collected among the three HD stations in either year were at Station 92 in 2001. The higher taxa richness at Station 75 in 2002 was exclusively due to increased numbers of Chironomidae taxa whereas the decrease observed at Station 41 was due to the loss of chironomid and crustacean taxa. At Station 75, total density increased slightly between 2001 and 2002. In contrast, density decreased in 2002 at Stations 41 and 92. Although temporal variability differed somewhat by station, the magnitude and direction of change was strongly related to the abundance of Oligochaeta, which was the dominant taxon at all three stations each year.

The Ponar data collected from the three CSSC stations in 2001 and 2002 exhibited a lesser degree of variability compared to the HD data. Total richness was relatively similar between years at each station, albeit slightly higher in 2001 at Stations 41 and 92 (Table 3-71). Again, the only EPT taxon collected in the Ponars among the three stations was observed at Station 92 in 2001. At Stations 75 and 41, 2001 total density was four and 16 times higher, respectively compared to 2002. In contrast, total density more than doubled in 2002 at Station 92. As with the HD data, the differences in total density observed between years at each station was primarily attributable to changes in Oligochaeta density.

Chironomidae head capsule deformities were observed in the HD samples at Station 75 in 2001, Station 41 in 2002, and Station 92 during both years (Tables 3-21 and 3-44). Deformities were also observed at Station 40, however that station was not sampled in during both years (Table 3-44). In all cases, the deformities were exhibited by only one or two specimens, except Station 41 (five specimens). In addition, at Station 92 in 2002, the sample size was relatively small (n=12). Nonetheless, the occurrence of deformities at multiple stations and in two consecutive years is suggestive of potential toxic conditions.

TABLE 3-70. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2001 AND AUGUST/SEPTEMBER 2002 FOR SAMPLING STATIONS WITHIN THE CHICAGO SANITARY AND SHIP CANAL.

| TAXA | 75 CICERO AVE. | | | | 41 HARLEM AVE. | | | | 92 LOCKPORT | | | |
|----------------------------|-------------------|--------|----------|--------|-------------------|--------|----------|--------|----------------|--------|---------|--------|
| | 2001 | | 2002 | | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | -- | -- | -- | -- | 17.9 | 0.08 | 861.1 | 5.08 | 1.8 | 0.03 |
| Turbellaria | -- | -- | 317.5 | 1.86 | 2,260.5 | 4.41 | 3,695.7 | 17.31 | 1,130.2 | 6.67 | 737.4 | 10.71 |
| Plumatella | -- | -- | -- | -- | 1.8 | 0.00 | -- | -- | -- | -- | -- | -- |
| Oligochaeta | 11,130.2 | 94.80 | 15,536.4 | 91.19 | 43,164.7 | 84.27 | 17,348.4 | 81.26 | 11,042.3 | 65.20 | 5,760.7 | 83.64 |
| Glossiphoniidae | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.26 |
| Helobdella stagnalis | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.26 |
| Mooreobdella microstoma | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.03 |
| Caecidotea | -- | -- | -- | -- | 35.9 | 0.07 | -- | -- | -- | -- | -- | -- |
| Gammarus fasciatus | -- | -- | -- | -- | 215.3 | 0.42 | -- | -- | 1,193.0 | 7.04 | 86.1 | 1.25 |
| Cyrrnellus fraternus | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.11 | -- | -- |
| Hydropsyche | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | 0.05 | -- | -- |
| Ablabesmyia janta | -- | -- | 35.9 | 0.21 | -- | -- | 21.5 | 0.10 | 179.4 | 1.06 | -- | -- |
| Ablabesmyia mallochi | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.21 |
| Thienemannimyia grp. | -- | -- | 17.9 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 53.8 | 0.11 | -- | -- | -- | -- | -- | -- |
| Nanocladius distinctus | 71.8 | 0.61 | 107.6 | 0.63 | 89.7 | 0.18 | -- | -- | 340.9 | 2.01 | 107.6 | 1.56 |
| Dicortendipes simpsoni | 520.3 | 4.43 | 861.1 | 5.05 | 5,346.3 | 10.44 | 265.5 | 1.24 | 1,838.9 | 10.86 | 123.8 | 1.80 |
| Parachironomus | -- | -- | 89.7 | 0.53 | 53.8 | 0.11 | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | -- | -- | 17.9 | 0.11 | -- | -- | -- | -- | -- | -- | 1.8 | 0.03 |
| Physella | -- | -- | 17.9 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | 23.3 | 0.14 | -- | -- | -- | -- | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | 0.13 |
| Corbicula fluminea | 17.9 | 0.15 | 12.6 | 0.07 | -- | -- | -- | -- | 287.0 | 1.69 | 5.4 | 0.08 |
| Dreissena polymorpha | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.03 |
| TOTAL BENTHOS | 11,740.2 | 100.00 | 17,038.0 | 100.00 | 51,221.7 | 100.00 | 21,349.1 | 100.00 | 16,935.8 | 100.00 | 6,887.3 | 100.00 |
| TOTAL TAXA RICHNESS | 4 | | 11 | | 9 | | 5 | | 11 | | 13 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | | 2 | | 0 | |

TABLE 3-71. COMPARISON OF HESLER-DENDY DENSITIES BETWEEN JULY 2001 AND AUGUST/SEPTEMBER 2002 FOR SAMPLING STATIONS WITHIN THE CHICAGO SANITARY AND SHIP CANAL.

| TAXA | 75 CICERO AVE. | | | | 41 HARLEM AVE. | | | | 92 LOCKPORT | | | |
|----------------------------|-------------------|--------|-------|--------|-------------------|--------|---------|--------|----------------|--------|----------|--------|
| | 2001 | | 2002 | | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | -- | -- | -- | -- | 861.2 | 1.36 | 229.7 | 5.85 | -- | -- | 21.5 | 0.03 |
| Plumatella | -- | -- | -- | -- | 7.2 | 0.01 | -- | -- | -- | -- | -- | -- |
| Oligochaeta | 2,626.6 | 97.34 | 660.3 | 95.83 | 61,719.1 | 97.38 | 3,437.6 | 87.57 | 28,670.7 | 93.41 | 63,549.1 | 99.85 |
| Gammarus fasciatus | -- | -- | -- | -- | 215.3 | 0.34 | -- | -- | 114.8 | 0.37 | -- | -- |
| Cheumatopsyche | -- | -- | -- | -- | -- | -- | -- | -- | 71.8 | 0.23 | -- | -- |
| Procladius (Holotanypus) | 43.1 | 1.60 | -- | -- | -- | -- | -- | -- | 968.8 | 3.16 | -- | -- |
| Nanocladius distinctus | -- | -- | -- | -- | -- | -- | -- | -- | 466.5 | 1.52 | -- | -- |
| Chironomus | 7.2 | 0.27 | -- | -- | 71.8 | 0.11 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | -- | -- | -- | -- | 358.8 | 0.57 | -- | -- | 322.9 | 1.05 | -- | -- |
| Parachironomus | -- | -- | 14.4 | 2.08 | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | -- | -- | 143.5 | 0.23 | -- | -- | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | -- | -- | -- | -- | -- | -- | 14.4 | 0.37 | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | -- | -- | 244.0 | 6.22 | -- | -- | -- | -- |
| Corbicula fluminea | 21.5 | 0.80 | 14.4 | 2.08 | -- | -- | -- | -- | 78.9 | 0.26 | 71.8 | 0.11 |
| TOTAL BENTHOS | 2,698.4 | 100.00 | 689.0 | 100.00 | 63,376.9 | 100.00 | 3,925.6 | 100.00 | 30,694.5 | 100.00 | 63,642.4 | 100.00 |
| TOTAL TAXA RICHNESS | 4 | | 3 | | 7 | | 4 | | 7 | | 3 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | | 1 | | 0 | |

Based on the HD and Ponar data combined, total richness at Station 75 increased from six taxa in 2001 to 11 taxa in 2002 but decreased from 11 taxa in 2001 to seven taxa in 2002 at Station 41 (Tables 3-70 and 3-71). In contrast, total richness remained unchanged at Station 92 with 13 taxa each year, however EPT richness decreased from three taxa in 2001 to zero in 2002. Community composition changed relatively little at each site between years. Although the presence and densities of individual taxa at each station may have differed somewhat year to year, overall the benthic community at each station was dominated by tolerant taxa during both 2001 and 2002 (Table 3-1).

3.3.4 Des Plaines River Watershed

The same six stations in the Des Plaines River watershed were sampled during both 2001 and 2002: Station 78 in Higgins Creek, Station 18 in Salt Creek, Station 64 in the West Branch of the DuPage River, and Stations 13, 22, and 91 in the Des Plaines River (Tables 2-1 and 2-2).

3.3.4.1 Higgins Creek

Results from the HD sampling at Station 78 were noticeably different over the two years (Table 3-72). Total taxa richness was nearly twice as high in 2002 compared to 2001. EPT taxa were not collected from Higgins Creek during either year. Turbellaria was the dominant taxon in 2001 but declined substantially in 2002. *Caecidotea* was the dominant taxon in 2002 despite having similar densities in both years. Due to the elevated abundance of Turbellaria, total density was substantially higher in 2001.

Ponar results also were somewhat different between years (Table 3-73). In contrast to the HD results, total taxa richness was slightly higher in 2002. *Caecidotea* was the dominant taxon in 2001 while the more tolerant *Oligochaeta* and *Cricotopus sylvestris* were dominant in 2002. As in the HD results, total density decreased considerably between 2001 and 2002. Several taxa collected in 2001 experienced sharp declines in 2002, however the largest decrease was for the taxon *Caecidotea*.

Based on the combined HD and Ponar data by year, total taxa richness was relatively similar with 21 taxa in 2001 and 19 taxa in 2002 (Tables 3-72 and 3-73). In 2001 the majority of the taxa observed at the station were collected in the Ponar samples. However, in 2002 more taxa were collected in the HD samples than in the Ponar samples. No chironomid deformities were observed in either year at Station 78. Despite the differences exhibited by the individual sample types in each year, collectively the Higgins Creek benthic community was relatively similar in 2001 and 2002.

3.3.4.2 Salt Creek

The HD results from Station 18 were fairly similar between 2001 and 2002 (Table 3-74). Total taxa richness was slightly higher in 2001 but EPT richness was identical between years. *Polypedilum flavum* was the dominant taxon in 2001 while *Cheumatopsyche* was the dominant taxon in 2002. By comparison, *Cheumatopsyche* was relatively abundant both years and actually

TABLE 3-72. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATION 78 WITHIN HIGGINS CREEK.

| 78 | | | | |
|--------------------------------------|------------------|--------|------------------|--------|
| WILLE RD. | | | | |
| TAXA | 2001 | | 2002 | |
| | #/m ² | % | #/m ² | % |
| Turbellaria | 14,036.6 | 80.72 | 272.7 | 13.52 |
| Oligochaeta | 986.7 | 5.67 | 57.4 | 2.85 |
| Mooreobdella microstoma | 35.9 | 0.21 | 5.4 | 0.27 |
| Caecidotea | 1,828.1 | 10.51 | 1,010.0 | 50.09 |
| Orconectes virilis | 17.9 | 0.10 | — | — |
| Copelatus | — | — | 1.8 | 0.09 |
| Laccophilus maculosus | — | — | 1.8 | 0.09 |
| Tropisternus | — | — | 1.8 | 0.09 |
| Thienemannimyia grp. | — | — | 21.5 | 1.07 |
| Cricotopus tremulus grp. | — | — | 98.7 | 4.89 |
| Cricotopus bicinctus grp. | — | — | 279.9 | 13.88 |
| Cricotopus trifascia grp. | — | — | 48.4 | 2.40 |
| Cricotopus sylvestris grp. | 197.3 | 1.13 | 208.1 | 10.32 |
| Nanocladius crassicornus/rectinervis | 35.9 | 0.21 | — | — |
| Dicrotendipes neomodestus | 233.2 | 1.34 | 1.8 | 0.09 |
| Polypedilum illinoense | — | — | 3.6 | 0.18 |
| Paratanytarsus | 17.9 | 0.10 | — | — |
| Tipula | — | — | 1.8 | 0.09 |
| Ferrissia | — | — | 1.8 | 0.09 |
| TOTAL BENTHOS | 17,389.7 | 100.00 | 2,016.5 | 100.00 |
| TOTAL TAXA RICHNESS | 9 | | 16 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

TABLE 3-73. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATION 78 WITHIN HIGGINS CREEK.

| TAXA | 78 | | | |
|------------------------------|------------------|--------|------------------|--------|
| | WILLE RD. | | | |
| | 2001 | | 2002 | |
| | #/m ² | % | #/m ² | % |
| Turbellaria | 6,825.0 | 23.17 | 35.9 | 1.52 |
| Oligochaeta | 1,822.9 | 6.19 | 617.2 | 26.06 |
| Erpobdella punctata punctata | 7.2 | 0.02 | -- | -- |
| Mooreobdella microstoma | 466.5 | 1.58 | -- | -- |
| Ostracoda | 3,602.7 | 12.23 | -- | -- |
| Caecidotea | 16,197.7 | 54.98 | 143.5 | 6.06 |
| Orconectes immunis | 7.2 | 0.02 | -- | -- |
| Enallagma | 7.2 | 0.02 | -- | -- |
| Bezzia | 7.2 | 0.02 | -- | -- |
| Tanytus | 7.2 | 0.02 | -- | -- |
| Thienemanniya grp. | 35.9 | 0.12 | -- | -- |
| Cricotopus tremulus grp. | -- | -- | 107.6 | 4.55 |
| Cricotopus bicinctus grp. | 114.8 | 0.39 | 595.7 | 25.15 |
| Cricotopus trifascia grp. | -- | -- | 14.4 | 0.61 |
| Cricotopus sylvestris grp. | 179.4 | 0.61 | 617.2 | 26.06 |
| Chironomus | 14.4 | 0.05 | 14.4 | 0.61 |
| Cryptochironomus | 14.4 | 0.05 | -- | -- |
| Dicrotendipes neomodestus | 35.9 | 0.12 | 157.9 | 6.67 |
| Glyptotendipes | -- | -- | 35.9 | 1.52 |
| Microtendipes | -- | -- | 14.4 | 0.61 |
| Tanytarsus | -- | -- | 14.4 | 0.61 |
| Musculium transversum | 35.9 | 0.12 | -- | -- |
| Pisidium | 78.9 | 0.27 | -- | -- |
| TOTAL BENTHOS | 29,460.1 | 100.00 | 2,368.3 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | | 12 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

TABLE 3-74. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATION 18 WITHIN SALT CREEK.

| 18 | | | | |
|--------------------------------------|------------------|--------|------------------|--------|
| DEVON AVE. | | | | |
| TAXA | 2001 | | 2002 | |
| | #/m ² | % | #/m ² | % |
| Turbellaria | 1,130.2 | 7.07 | 593.8 | 18.09 |
| Oligochaeta | 1,148.2 | 7.18 | 123.8 | 3.77 |
| Caecidotea | 35.9 | 0.22 | 16.1 | 0.49 |
| Hydracarina | 17.9 | 0.11 | — | — |
| Stenacron | — | — | 7.2 | 0.22 |
| Tricorythodes | 35.9 | 0.22 | 43.1 | 1.31 |
| Argia | — | — | 1.8 | 0.05 |
| Enallagma | 17.9 | 0.11 | — | — |
| Cheumatopsyche | 2,942.2 | 18.41 | 823.5 | 25.08 |
| Hydroptila | 53.8 | 0.34 | — | — |
| Chaoborus | 17.9 | 0.11 | — | — |
| Procladius (Holotanypus) | 107.6 | 0.67 | — | — |
| Ablabesmyia janta | 340.9 | 2.13 | — | — |
| Ablabesmyia mallochi | 125.6 | 0.79 | 17.9 | 0.55 |
| Thienemanniayia grp. | 879.1 | 5.50 | 21.5 | 0.66 |
| Thienemanniella xena | 394.7 | 2.47 | 3.6 | 0.11 |
| Cricotopus tremulus grp. | 179.4 | 1.12 | 30.5 | 0.93 |
| Cricotopus bicinctus grp. | 269.1 | 1.68 | 3.6 | 0.11 |
| Cricotopus sylvestris grp. | 35.9 | 0.22 | 12.6 | 0.38 |
| Nanocladius distinctus | 125.6 | 0.79 | 39.5 | 1.20 |
| Nanocladius crassicornus/rectinervis | 466.5 | 2.92 | — | — |
| Chironomus | — | — | 14.4 | 0.44 |
| Cryptochironomus | — | — | 14.4 | 0.44 |
| Dicrotendipes neomodestus | 71.8 | 0.45 | 100.5 | 3.06 |
| Dicrotendipes simpsoni | 107.6 | 0.67 | 114.8 | 3.50 |
| Endochironomus nigricans | 161.5 | 1.01 | — | — |
| Glyptotendipes | — | — | 371.4 | 11.31 |
| Polypedilum flavum | 4,395.4 | 27.50 | 278.1 | 8.47 |
| Polypedilum illinoense | 2,134.9 | 13.36 | 303.2 | 9.23 |
| Polypedilum scalaenum grp. | 179.4 | 1.12 | 125.6 | 3.83 |
| Stenochironomus | 71.8 | 0.45 | — | — |
| Paratanytarsus | 71.8 | 0.45 | 70.0 | 2.13 |
| Tanytarsus | — | — | 26.9 | 0.82 |
| Tanytarsus guerlus grp. | 394.7 | 2.47 | 48.4 | 1.48 |
| Hemerodromia | 17.9 | 0.11 | — | — |
| Physella | 17.9 | 0.11 | — | — |
| Menetus dilatatus | 35.9 | 0.22 | 70.0 | 2.13 |
| Ferrissia | — | — | 7.2 | 0.22 |
| TOTAL BENTHOS | 15,984.9 | 100.00 | 3,283.1 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | | 27 | |
| EPT TAXA RICHNESS | 3 | | 3 | |

achieved a higher density in 2001. Due to the elevated abundance of several taxa, total density was approximately five times higher in 2001 compared to 2002.

Seven chironomid specimens representing two taxa in the 2001 Ponar samples exhibited head capsule deformities (Table 3-26). Of these, six were *Procladius (Holotanypus)*. Despite the absence of deformities in the 2002 samples, the incidence level of 11.3 percent for *Procladius (Holotanypus)* is well above the expected background level for this taxon and may be indicative of an intermittent adverse condition in Salt Creek.

In contrast to the HD data, results from the Ponar sampling were noticeably different between years (Table 3-75). Total richness was twice as high in 2001 primarily due to six more chironomid taxa compared to 2002. In addition, two EPT taxa were collected in 2001 compared to zero in 2002. Oligochaeta was the dominant taxon both years despite the fact that it experienced a 3.5-fold decrease in density between 2001 and 2002. As with the HD results, Ponar total density was over four times higher in 2001. Elevated densities of several taxa contributed to this difference. However, most notably among those taxa was the Tanytarsini midge *Cladotanytarsus mancus*, which represented 11 percent of the total density in 2001 but was absent in the 2002 collections.

Based on the HD and Ponar results combined, total richness was very similar between years with 38 total taxa and 3 EPT taxa in 2001 and 31 total taxa and three EPT taxa in 2002 (Tables 3-75 and 3-76). Total density decreased substantially from 2001 to 2002 for both sample types. However, it appears the overall quality of the benthic community in Salt Creek was relatively stable.

3.3.4.3 West Branch of the DuPage River

As with Salt Creek, the HD results from Station 64 were generally similar between years (Table 3-76). Total richness was slightly higher in 2001 while EPT richness was the same both years. *Glyptotendipes* was the dominant taxon in 2001 whereas *Polypedilum illinoense* was the dominant taxon in 2002. Both are considered highly tolerant (Table 3-1). EPT density decreased in 2002 largely due to the lower abundance of *Cheumatopsyche*. In contrast, the density of several tolerant taxa increased in 2002. Despite these changes, total density was similar between years though slightly higher in 2002.

In contrast, the Ponar results were somewhat different between years (Table 3-77). Total taxa richness was seven times higher in 2001. However, the total richness value for 2002 is likely artificially low due to the fact that the midges in those samples could not be identified beyond Chironomidae. Ponar EPT richness was the same for both study years being represented by the same taxon *Cheumatopsyche* each year. Oligochaeta was the dominant taxa in 2001 whereas Chironomidae was dominant in 2002. Again, this is likely artificial based on the number of midge taxa observed in 2001. Nonetheless, Oligochaeta abundance decreased in 2002 by nearly four-fold while chironomid density increased by the same margin.

Chironomid head capsule deformities were restricted to a single specimen collected in the 2002 HD sample. Despite the lack of deformity information from the 2001 Ponars, based on the lack

TABLE 3-75. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATION 18 WITHIN SALT CREEK.

| TAXA | 18 | | | |
|-----------------------------|------------|--------|---------|--------|
| | DEVON AVE. | | | |
| | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 7.2 | 0.05 | -- | -- |
| Plumatella | -- | -- | 7.2 | 0.22 |
| Oligochaeta | 8,899.0 | 65.30 | 2,533.4 | 76.08 |
| Hydracarina | 7.2 | 0.05 | -- | -- |
| Tricorythodes | 7.2 | 0.05 | -- | -- |
| Cheumatopsyche | 64.6 | 0.47 | -- | -- |
| Dubiraphia | 64.6 | 0.47 | 21.5 | 0.65 |
| Chaoborus | 437.8 | 3.21 | -- | -- |
| Procladius (Holotanypus) | 516.7 | 3.79 | 208.1 | 6.25 |
| Cricotopus sylvestris grp. | -- | -- | 136.4 | 4.09 |
| Chironomus | 64.6 | 0.47 | 71.8 | 2.16 |
| Cladopelma | 35.9 | 0.26 | -- | -- |
| Cryptochironomus | 308.6 | 2.26 | 136.4 | 4.09 |
| Dicrotendipes neomodestus | 208.1 | 1.53 | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 35.9 | 1.08 |
| Paracladopelma | 57.4 | 0.42 | -- | -- |
| Polypedilum flavum | -- | -- | 136.4 | 4.09 |
| Polypedilum halterale grp. | 258.4 | 1.90 | -- | -- |
| Polypedilum illinoense | 28.7 | 0.21 | -- | -- |
| Polypedilum scalaenum grp. | 538.2 | 3.95 | -- | -- |
| Cladotanytarsus mancus grp. | 1,557.3 | 11.43 | -- | -- |
| Tanytarsus guerlus grp. | 301.4 | 2.21 | -- | -- |
| Menetus dilatatus | 14.4 | 0.11 | -- | -- |
| Corbicula fluminea | 251.2 | 1.84 | 43.1 | 1.29 |
| TOTAL BENTHOS | 13,628.4 | 100.00 | 3,330.0 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | | 10 | |
| EPT TAXA RICHNESS | 2 | | 0 | |

TABLE 3-76. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER.

| TAXA | 64 | | | |
|--------------------------------------|----------|--------|----------|--------|
| | LAKE ST. | | | |
| | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 2,565.5 | 19.07 | 251.2 | 1.45 |
| Plumatella | 3.6 | 0.03 | 3.6 | 0.02 |
| Oligochaeta | 855.8 | 6.36 | 732.0 | 4.22 |
| Baetis intercalaris | 39.5 | 0.29 | — | — |
| Argia | 17.9 | 0.13 | 12.6 | 0.07 |
| Enallagma | 1.8 | 0.01 | — | — |
| Cheumatopsyche | 3,143.2 | 23.36 | 1,566.2 | 9.04 |
| Hydropsyche betteni | — | — | 66.4 | 0.38 |
| Hydropsyche bidens | — | — | 5.4 | 0.03 |
| Hydroptila | 93.3 | 0.69 | — | — |
| Procladius (Holotanypus) | 21.5 | 0.16 | — | — |
| Thienemanniomyia grp. | 773.2 | 5.75 | 855.8 | 4.94 |
| Thienemanniella xena | 89.7 | 0.67 | 179.4 | 1.04 |
| Cricotopus tremulus grp. | — | — | 179.4 | 1.04 |
| Cricotopus bicinctus grp. | 143.5 | 1.07 | 1,422.7 | 8.21 |
| Cricotopus sylvestris grp. | 21.5 | 0.16 | 394.7 | 2.28 |
| Nanocladius distinctus | 143.5 | 1.07 | 4,413.3 | 25.46 |
| Nanocladius crassicornus/rectinervis | 389.3 | 2.89 | — | — |
| Cryptochironomus | 53.8 | 0.40 | — | — |
| Dicrotendipes neomodestus | 200.9 | 1.49 | 53.8 | 0.31 |
| Dicrotendipes simpsoni | 265.5 | 1.97 | 879.1 | 5.07 |
| Endochironomus nigricans | 111.2 | 0.83 | — | — |
| Glyptotendipes | 3,335.1 | 24.79 | 915.0 | 5.28 |
| Parachironomus | — | — | 102.3 | 0.59 |
| Polypedilum flavum | 177.6 | 1.32 | 497.0 | 2.87 |
| Polypedilum illinoense | 742.7 | 5.52 | 4,802.7 | 27.71 |
| Polypedilum scalaenum grp. | 165.1 | 1.23 | — | — |
| Simulium | 62.8 | 0.47 | — | — |
| Hemerodromia | 17.9 | 0.13 | — | — |
| Menetus dilatatus | 17.9 | 0.13 | — | — |
| TOTAL BENTHOS | 13,453.5 | 100.00 | 17,332.3 | 100.00 |
| TOTAL TAXA RICHNESS | 26 | | 19 | |
| EPT TAXA RICHNESS | 3 | | 3 | |

TABLE 3-77. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER.

| TAXA | 64 LAKE ST. | | | |
|----------------------------|----------------|--------|----------|--------|
| | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 258.4 | 1.28 | -- | -- |
| Oligochaeta | 16,893.8 | 83.39 | 4,664.8 | 29.00 |
| Mooreobdella microstoma | 21.5 | 0.11 | -- | -- |
| Hydropsychidae | -- | -- | 215.3 | 1.34 |
| Cheumatopsyche | 93.3 | 0.46 | 7.2 | 0.04 |
| Berosus | 7.2 | 0.04 | -- | -- |
| Chironomidae | -- | -- | 11,195.5 | 69.61 |
| Procladius (Holotanypus) | 14.4 | 0.07 | -- | -- |
| Thienemannimyia grp. | 50.2 | 0.25 | -- | -- |
| Cricotopus bicinctus grp. | 28.7 | 0.14 | -- | -- |
| Cricotopus sylvestris grp. | 107.6 | 0.53 | -- | -- |
| Nanocladius distinctus | 43.1 | 0.21 | -- | -- |
| Cryptochironomus | 538.2 | 2.66 | -- | -- |
| Dicrotendipes neomodestus | 14.4 | 0.07 | -- | -- |
| Dicrotendipes simpsoni | 64.6 | 0.32 | -- | -- |
| Glyptotendipes | 473.7 | 2.34 | -- | -- |
| Paracladopelma | 28.7 | 0.14 | -- | -- |
| Polypedilum flavum | 308.6 | 1.52 | -- | -- |
| Polypedilum illinoense | 258.4 | 1.28 | -- | -- |
| Polypedilum scalaenum grp. | 724.8 | 3.58 | -- | -- |
| Simulium | 150.7 | 0.74 | -- | -- |
| Corbicula fluminea | 107.6 | 0.53 | -- | -- |
| Musculium transversum | 71.8 | 0.35 | -- | -- |
| TOTAL BENTHOS | 20,259.6 | 100.00 | 16,082.8 | 100.00 |
| TOTAL TAXA RICHNESS | 21 | | 3 | |
| EPT TAXA RICHNESS | 1 | | 1 | |

of deformities observed in the 2001 HD and Ponar samples, it is likely the 2002 HD incidence level is insignificant.

Comparisons of the combined HD and Ponar data are problematic given the lack of chironomid data from the 2002 Ponars. However, based on the HD samples, there appeared to be a noticeable increase in pollution tolerant taxa and a decrease in pollution sensitive taxa from 2001 to 2002 (Tables 3-1 and 3-76).

3.3.4.4 Des Plaines River

The HD results from the three Des Plaines River stations generally exhibited a fair amount of agreement between the two years (Table 3-78). For example, total taxa richness was relatively similar at all stations differing in three to seven taxa between 2001 and 2002. In addition, EPT richness was the same in both years or differed by a single taxon depending on the station. However, there were notable differences with regard to dominant taxa among the stations. In 2001, the benthic community at all three stations was dominated by relatively pollution sensitive taxa such as *Rheotanytarsus* (Station 13) or *Cheumatopsyche* (Stations 22 and 91). In 2002, the dominant taxa were the highly tolerant *Glyptotendipes* (Station 13) and the facultative taxon *Polypedilum flavum* (Stations 22 and 91). Although some EPT taxa (e.g., *Baetis intercalaris*, *Stenonema integrum*, and *Tricorythodes*) actually increased in density at Station 13 in 2002, due to the extreme abundance of *Glyptotendipes* the relative abundance of these EPT taxa was minimized. This was not as evident at the two downstream stations, which exhibited more modest shifts in composition. Total density was very similar between years at Stations 22 and 91 but increased considerably in 2002 at Station 13 in response to the elevated abundance of *Glyptotendipes*.

There was generally less agreement in the Ponar data between years compared to the HD data. Total taxa richness decreased from 2001 to 2002 at each of the three stations (Table 3-79). The difference in EPT richness varied by station. EPT richness decreased in 2002 at Station 13, remained the same at Station 22, and increased at Station 91. Dominance based on relative abundance remained unchanged at Stations 22 and 91 with *Oligochaeta* representing greater than 44 percent at each station in both years. However, at Station 13, *Caecidotea* was the dominant taxon in 2001 but was absent in 2002 and *Tanytarsus* became the dominant taxon. Contrary to the Station 13 HD results, the Station 13 Ponars results exhibited a general decline in EPT richness and density while more pollution tolerant taxa increased. As with the HD total density, Ponar total density remained relatively similar in 2002 at Stations 22 and 91 but increased substantially at Station 13 when compared to 2001.

Chironomidae head capsule deformities were observed at all three stations over the two study years though never at the same station in both years (Tables 3-26 and 3-57). In all cases, a single specimen exhibited a deformity. Based on literature accounts, these incidence levels are likely below expected background levels (Bisthoven et al. 1998, Bisthoven and Ollevier 1998, Dermot 1991, Groenenduk et al. 1998, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Lenat 1993, and Warwick 1985).

TABLE 3-78. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATIONS WITHIN THE DES PLAINES RIVER.

| TAXA | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|--------------------------|---------------------|-------|---------|------|------------------|-------|-------|-------|----------------------------|-------|---------|-------|
| | 2001 | | 2002 | | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 3.6 | 0.02 | 17.9 | 0.05 | -- | -- | -- | -- | -- | -- | -- | -- |
| Turbellaria | 428.8 | 2.87 | 35.9 | 0.10 | 19.7 | 1.15 | 64.6 | 3.55 | 3,310.0 | 21.34 | 2,875.9 | 18.67 |
| Plumatella | 1.8 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.01 |
| Oligochaeta | 50.2 | 0.34 | 233.2 | 0.65 | 220.7 | 12.81 | 290.6 | 15.98 | 358.8 | 2.31 | 9.0 | 0.06 |
| Caecidotea | -- | -- | -- | -- | 5.4 | 0.31 | 1.8 | 0.10 | -- | -- | -- | -- |
| Gammarus fasciatus | 3.6 | 0.02 | 1,298.9 | 3.62 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydracarina | 5.4 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Isonychia | 35.9 | 0.24 | 43.1 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Baetis intercalaris | 663.8 | 4.44 | 89.7 | 0.25 | 30.5 | 1.77 | 46.6 | 2.56 | 44.9 | 0.29 | 333.7 | 2.17 |
| Pseudocloeon ephippiatum | 1.8 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Leucrocota | 57.4 | 0.38 | 16.1 | 0.05 | 35.9 | 2.08 | 32.3 | 1.78 | -- | -- | -- | -- |
| Heptagenia | 28.7 | 0.19 | 19.7 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenacron | 78.9 | 0.53 | 136.3 | 0.38 | 104.1 | 6.04 | -- | -- | 9.0 | 0.06 | -- | -- |
| Stenonema | -- | -- | -- | -- | 30.5 | 1.77 | -- | -- | -- | -- | -- | -- |
| Stenonema integrum | 220.7 | 1.47 | 231.4 | 0.65 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenonema terminatum | 543.6 | 3.63 | 497.0 | 1.39 | -- | -- | 25.1 | 1.38 | -- | -- | -- | -- |
| Tricorythodes | 188.4 | 1.26 | 642.3 | 1.79 | 17.9 | 1.04 | 25.1 | 1.38 | 26.9 | 0.17 | 30.5 | 0.20 |
| Argia | -- | -- | -- | -- | 3.6 | 0.21 | -- | -- | -- | -- | -- | -- |
| Enallagma | -- | -- | 17.9 | 0.05 | -- | -- | -- | -- | -- | -- | -- | -- |
| Trepobates | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.01 |
| Cynellus fraternus | 3.6 | 0.02 | 82.5 | 0.23 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 2,865.1 | 19.15 | 988.5 | 2.76 | 495.2 | 28.75 | 200.9 | 11.05 | 5,660.2 | 36.50 | 2,768.2 | 17.97 |
| Hydropsyche | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.01 |
| Hydropsyche betteni | -- | -- | -- | -- | 7.2 | 0.42 | 10.8 | 0.59 | 9.0 | 0.06 | -- | -- |
| Hydropsyche orris | -- | -- | -- | -- | -- | -- | -- | -- | 349.8 | 2.26 | 254.8 | 1.65 |
| Hydropsyche simulans | 272.7 | 1.82 | 62.8 | 0.18 | -- | -- | -- | -- | 26.9 | 0.17 | 7.2 | 0.05 |
| Hydropsyche bidens | 615.4 | 4.11 | 84.3 | 0.24 | -- | -- | -- | -- | -- | -- | 19.7 | 0.13 |
| Ceratopsyche morosa | 253.0 | 1.69 | 7.2 | 0.02 | 25.1 | 1.46 | 17.9 | 0.99 | 9.0 | 0.06 | 37.7 | 0.24 |
| Potamyia flava | 71.8 | 0.48 | 68.2 | 0.19 | -- | -- | -- | -- | -- | -- | -- | -- |
| Petrophila | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.12 | 16.1 | 0.10 |
| Laccophilus maculosus | -- | -- | 73.6 | 0.21 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dubiraphia | 3.6 | 0.02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Macronychus glabratus | 55.6 | 0.37 | 39.5 | 0.11 | 7.2 | 0.42 | -- | -- | -- | -- | -- | -- |
| Stenelmis crenata grp. | 16.1 | 0.11 | 222.5 | 0.62 | 1.8 | 0.10 | 5.4 | 0.30 | 17.9 | 0.12 | 9.0 | 0.06 |
| Chironomidae | -- | -- | -- | -- | -- | -- | 7.2 | 0.39 | -- | -- | -- | -- |
| Procladius (Holotanypus) | 21.5 | 0.14 | -- | -- | 1.8 | 0.10 | -- | -- | -- | -- | -- | -- |
| Ablabesmyia janta | 21.5 | 0.14 | 14.4 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- |
| Ablabesmyia mallochi | -- | -- | -- | -- | 1.8 | 0.10 | 10.8 | 0.59 | -- | -- | -- | -- |

TABLE 3-78 (cont.)

| TAXA | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|---|---------------------|--------|----------|--------|------------------|--------|---------|--------|----------------------------|--------|----------|--------|
| | 2001 | | 2002 | | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| <i>Nilotanypus fimbriatus</i> | 21.5 | 0.14 | 14.4 | 0.04 | 19.7 | 1.15 | 10.8 | 0.59 | -- | -- | -- | -- |
| <i>Thienemanniya</i> grp. | 192.0 | 1.28 | 98.7 | 0.28 | 70.0 | 4.06 | 71.8 | 3.94 | -- | -- | -- | -- |
| <i>Corynoneura</i> | -- | -- | -- | -- | 10.8 | 0.63 | -- | -- | -- | -- | -- | -- |
| <i>Thienemanniella xena</i> | 64.6 | 0.43 | -- | -- | 5.4 | 0.31 | 10.8 | 0.59 | -- | -- | -- | -- |
| <i>Thienemanniella similis</i> | -- | -- | -- | -- | 5.4 | 0.31 | -- | -- | -- | -- | -- | -- |
| <i>Cricotopus tremulus</i> grp. | -- | -- | 14.4 | 0.04 | -- | -- | 10.8 | 0.59 | -- | -- | -- | -- |
| <i>Cricotopus bicinctus</i> grp. | -- | -- | 84.3 | 0.24 | -- | -- | 236.8 | 13.02 | -- | -- | -- | -- |
| <i>Cricotopus sylvestris</i> grp. | 86.1 | 0.58 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Nanocladius distinctus</i> | -- | -- | -- | -- | 41.3 | 2.40 | 46.6 | 2.56 | 134.6 | 0.87 | 34.1 | 0.22 |
| <i>Nanocladius crassicornus/rectinervis</i> | 64.6 | 0.43 | 41.3 | 0.12 | -- | -- | -- | -- | 125.6 | 0.81 | -- | -- |
| <i>Rheocricotopus robacki</i> | 64.6 | 0.43 | -- | -- | 14.4 | 0.83 | -- | -- | -- | -- | -- | -- |
| <i>Chironomus</i> | 21.5 | 0.14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Cryptochironomus</i> | -- | -- | -- | -- | 5.4 | 0.31 | -- | -- | -- | -- | -- | -- |
| <i>Dicrotendipes neomodestus</i> | 21.5 | 0.14 | 41.3 | 0.12 | -- | -- | 10.8 | 0.59 | -- | -- | 34.1 | 0.22 |
| <i>Endochironomus nigricans</i> | 86.1 | 0.58 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Glyptotendipes</i> | 193.8 | 1.30 | 29,307.5 | 81.78 | -- | -- | 25.1 | 1.38 | 35.9 | 0.23 | 68.2 | 0.44 |
| <i>Paracladopelma</i> | -- | -- | -- | -- | 5.4 | 0.31 | -- | -- | -- | -- | -- | -- |
| <i>Polypedilum fallax</i> grp. | -- | -- | -- | -- | 16.1 | 0.94 | -- | -- | -- | -- | -- | -- |
| <i>Polypedilum flavum</i> | 1,980.6 | 13.24 | 154.3 | 0.43 | 235.0 | 13.65 | 545.4 | 29.98 | 5,373.2 | 34.64 | 8,880.5 | 57.66 |
| <i>Polypedilum illinoense</i> | -- | -- | -- | -- | 1.8 | 0.10 | 25.1 | 1.38 | -- | -- | -- | -- |
| <i>Polypedilum scalaenum</i> grp. | -- | -- | 315.8 | 0.88 | 84.3 | 4.90 | 35.9 | 1.97 | -- | -- | -- | -- |
| <i>Stenochironomus</i> | -- | -- | -- | -- | -- | -- | 25.1 | 1.38 | -- | -- | -- | -- |
| <i>Cladotanytarsus mancus</i> grp. | -- | -- | 28.7 | 0.08 | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Rheotanytarsus</i> | 5,649.4 | 37.76 | 814.5 | 2.27 | 86.1 | 5.00 | 25.1 | 1.38 | -- | -- | -- | -- |
| <i>Simulium</i> | 1.8 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Pleuroceridae | -- | -- | -- | -- | 1.8 | 0.10 | -- | -- | -- | -- | -- | -- |
| <i>Ferrissia</i> | -- | -- | -- | -- | 111.2 | 6.46 | -- | -- | -- | -- | -- | -- |
| <i>Musculium</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.12 |
| TOTAL BENTHOS | 14,960.5 | 100.00 | 35,837.8 | 100.00 | 1,722.3 | 100.00 | 1,819.2 | 100.00 | 15,509.5 | 100.00 | 15,401.9 | 100.00 |
| TOTAL TAXA RICHNESS | 39 | | 34 | | 32 | | 25 | | 16 | | 19 | |
| EPT TAXA RICHNESS | 15 | | 14 | | 8 | | 7 | | 8 | | 8 | |

TABLE 3-79. COMPARISON OF PETITE POMAR DENSITIES BETWEEN JULY 2001 AND JULY 2002 FOR SAMPLING STATIONS WITHIN THE DES PLAINES RIVER.

| TAXA | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|--------------------------------------|---------------------|-------|---------|-------|------------------|-------|---------|-------|----------------------------|-------|---------|-------|
| | 2001 | | 2002 | | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | 86.1 | 2.06 | -- | -- | 258.4 | 3.86 | -- | -- | 86.1 | 1.03 | -- | -- |
| Urnatella gracilis | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oligochaeta | 732.0 | 17.53 | 4,664.8 | 16.86 | 2,985.5 | 44.59 | 2,612.3 | 72.80 | 7,191.0 | 86.38 | 5,418.4 | 92.52 |
| Helobdella stagnalis | -- | -- | -- | -- | 7.2 | 0.11 | -- | -- | 57.4 | 0.69 | 21.5 | 0.37 |
| Helobdella triserialis | -- | -- | -- | -- | 7.2 | 0.11 | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | -- | -- | 7.2 | 0.11 | 7.2 | 0.20 | 14.4 | 0.17 | 57.4 | 0.98 |
| Ostracoda | 64.6 | 1.55 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Caecidotea | 868.4 | 20.79 | -- | -- | 100.5 | 1.50 | -- | -- | 28.7 | 0.34 | -- | -- |
| Gammarus | -- | -- | 129.2 | 0.47 | -- | -- | -- | -- | -- | -- | -- | -- |
| Gammarus fasciatus | -- | -- | -- | -- | 14.4 | 0.21 | -- | -- | 258.4 | 3.10 | 7.2 | 0.12 |
| Orconectes virilis | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 |
| Baetis intercalaris | 7.2 | 0.17 | -- | -- | 35.9 | 0.54 | -- | -- | -- | -- | 7.2 | 0.12 |
| Stenonema | 35.9 | 0.86 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricorythodes | 43.1 | 1.03 | 143.5 | 0.52 | 236.8 | 3.54 | 7.2 | 0.20 | -- | -- | 7.2 | 0.12 |
| Hexagenia bilineata | -- | -- | 7.2 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stylurus | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Corixidae | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 86.1 | 1.47 |
| Palmarcorixa | -- | -- | -- | -- | -- | -- | -- | -- | 57.4 | 0.69 | -- | -- |
| Cynellus fraternus | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 251.2 | 6.01 | -- | -- | 107.6 | 1.61 | 7.2 | 0.20 | 71.8 | 0.86 | 7.2 | 0.12 |
| Potamyia flava | 28.7 | 0.69 | 21.5 | 0.08 | -- | -- | 7.2 | 0.20 | -- | -- | -- | -- |
| Dubiraphia | 78.9 | 1.89 | 129.2 | 0.47 | -- | -- | -- | -- | -- | -- | -- | -- |
| Macronychus glabratus | -- | -- | -- | -- | 7.2 | 0.11 | -- | -- | -- | -- | -- | -- |
| Stenelmis | -- | -- | -- | -- | -- | -- | 35.9 | 1.00 | -- | -- | -- | -- |
| Stenelmis crenata grp. | -- | -- | 215.3 | 0.78 | 78.9 | 1.18 | -- | -- | 86.1 | 1.03 | -- | -- |
| Natarsia sp. A | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.17 | -- | -- |
| Procladius (Holtanypus) | -- | -- | 358.8 | 1.30 | 43.1 | 0.64 | 64.6 | 1.80 | 114.8 | 1.38 | 35.9 | 0.61 |
| Ablabesmyia mallochi | -- | -- | -- | -- | 28.7 | 0.43 | 14.4 | 0.40 | -- | -- | -- | -- |
| Thienemanniya grp. | 43.1 | 1.03 | 1,076.5 | 3.89 | 172.2 | 2.57 | -- | -- | -- | -- | -- | -- |
| Corynoneura | -- | -- | -- | -- | 7.2 | 0.11 | -- | -- | -- | -- | -- | -- |
| Thienemanniella similis | -- | -- | -- | -- | 7.2 | 0.11 | -- | -- | -- | -- | -- | -- |
| Nanocladius | -- | -- | -- | -- | 7.2 | 0.11 | -- | -- | -- | -- | -- | -- |
| Nanocladius crassicornus/rectinervis | 100.5 | 2.41 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomus | -- | -- | 1,076.5 | 3.89 | 57.4 | 0.86 | -- | -- | 14.4 | 0.17 | -- | -- |
| Cladopelma | 35.9 | 0.86 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cryptochironomus | 660.3 | 15.81 | 760.7 | 2.75 | 488.0 | 7.29 | -- | -- | 14.4 | 0.17 | 14.4 | 0.25 |
| Dicrotendipes neomodestus | 28.7 | 0.69 | 2,511.8 | 9.08 | 7.2 | 0.11 | -- | -- | 14.4 | 0.17 | -- | -- |
| Dicrotendipes simpsoni | 64.6 | 1.55 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

TABLE 3-79 (cont.)

| TAXA | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|----------------------------------|---------------------|--------|------------------|--------|------------------|--------|------------------|--------|----------------------------|--------|------------------|--------|
| | 2001 | | 2002 | | 2001 | | 2002 | | 2001 | | 2002 | |
| | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % |
| Glyptotendipes | 28.7 | 0.69 | 445.0 | 1.61 | -- | -- | 21.5 | 0.60 | 14.4 | 0.17 | -- | -- |
| Microtendipes | 129.2 | 3.09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Paracladopelma | 229.7 | 5.50 | 358.8 | 1.30 | 14.4 | 0.21 | -- | -- | -- | -- | -- | -- |
| Polypedilum fallax grp. | -- | -- | -- | -- | 14.4 | 0.21 | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | -- | -- | 358.8 | 1.30 | 35.9 | 0.54 | -- | -- | 14.4 | 0.17 | 7.2 | 0.12 |
| Polypedilum halterale grp. | -- | -- | -- | -- | 143.5 | 2.14 | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | 100.5 | 2.41 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | 64.6 | 1.55 | 3,229.5 | 11.67 | 1,550.2 | 23.15 | 315.8 | 8.80 | 186.6 | 2.24 | 64.6 | 1.10 |
| Cladotanytarsus mancus grp. | -- | -- | 358.8 | 1.30 | -- | -- | 7.2 | 0.20 | -- | -- | -- | -- |
| Cladotanytarsus vanderwulpi grp. | -- | -- | -- | -- | 28.7 | 0.43 | -- | -- | -- | -- | -- | -- |
| Rheotanytarsus | -- | -- | -- | -- | 21.5 | 0.32 | -- | -- | -- | -- | -- | -- |
| Tanytarsus | -- | -- | 11,317.6 | 40.90 | -- | -- | -- | -- | -- | -- | -- | -- |
| Tanytarsus guerlus grp. | 380.4 | 9.11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Amnicola | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.17 | -- | -- |
| Pleuroceridae | -- | -- | -- | -- | 14.4 | 0.21 | -- | -- | 28.7 | 0.34 | -- | -- |
| Corbicula fluminea | 28.7 | 0.69 | 509.5 | 1.84 | 7.2 | 0.11 | 488.0 | 13.60 | 28.7 | 0.34 | 107.6 | 1.84 |
| Musculium | -- | -- | -- | -- | 21.5 | 0.32 | -- | -- | -- | -- | -- | -- |
| Musculium transversum | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.17 | 7.2 | 0.12 |
| Pisidium | 64.6 | 1.55 | -- | -- | 179.4 | 2.68 | -- | -- | -- | -- | -- | -- |
| TOTAL BENTHOS | 4,176.8 | 100.00 | 27,673.1 | 100.00 | 6,695.8 | 100.00 | 3,588.3 | 100.00 | 8,324.9 | 100.00 | 5,856.1 | 100.00 |
| TOTAL TAXA RICHNESS | 27 | | 19 | | 32 | | 12 | | 21 | | 15 | |
| EPT TAXA RICHNESS | 6 | | 3 | | 3 | | 3 | | 1 | | 3 | |

Based on the HD and Ponar data combined, total richness decreased at Station 13 from 53 to 42 taxa in 2002, decreased from 42 to 29 taxa at Station 22, and decreased from 30 to 28 taxa at Station 91 (Tables 3-78 and 3-79). EPT richness was the same between years at Station 13 (15 taxa) and Station 22 (eight taxa) but increased from eight to nine taxa at Station 91 in 2002. However, in each year and for each sample type total and EPT taxa richness was generally higher upstream at Station 13 and decreased in a downstream direction. This suggests that the benthic community among these three locations becomes increasingly impaired from upstream to downstream.

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APPENDIX A

2001 CENTER AND NEAR SHORE HD AND PONAR DATA

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= CAL-SAG CHANNEL,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 24AUG01

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1,050 | 3,767.5 | 26.45 | 0 | 0.0 | 0.00 |
| Turbellaria | 10 | 35.9 | 0.25 | 80 | 287.0 | 3.00 |
| Oligochaeta | 1,080 | 3,875.1 | 27.20 | 550 | 1,973.4 | 20.60 |
| Caecidotea | 10 | 35.9 | 0.25 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 460 | 1,650.5 | 11.59 | 530 | 1,901.7 | 19.85 |
| Argia | 10 | 35.9 | 0.25 | 0 | 0.0 | 0.00 |
| Ablabesmyia mallochii | 20 | 71.8 | 0.50 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 70 | 251.2 | 1.76 | 40 | 143.5 | 1.50 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.37 |
| Dicrotendipes simpsoni | 650 | 2,332.3 | 16.37 | 1,290 | 4,628.6 | 48.31 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.37 |
| Menetus dilatatus | 20 | 71.8 | 0.50 | 0 | 0.0 | 0.00 |
| Ferrissia | 30 | 107.6 | 0.76 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 560 | 2,009.3 | 14.11 | 160 | 574.1 | 5.99 |
| TOTAL BENTHOS | 3,970 | 14,244.7 | 100.00 | 2,670 | 9,580.2 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 30JUL01

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 2,734 | 9,809.8 | 96.13 | 3,470 | 12,450.7 | 93.78 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 40 | 143.5 | 1.08 |
| Dicrotendipes simpsoni | 100 | 358.8 | 3.52 | 190 | 681.7 | 5.14 |
| Corbicula fluminea | 10 | 35.9 | 0.35 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 2,844 | 10,204.5 | 100.00 | 3,700 | 13,275.9 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 30JUL01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|--------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 380 | 1,363.5 | 2.48 | 880 | 3,157.5 | 6.65 |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.01 |
| Oligochaeta | 13,770 | 49,408.0 | 89.94 | 10,290 | 36,921.4 | 77.71 |
| Caecidotea | 10 | 35.9 | 0.07 | 10 | 35.9 | 0.08 |
| Gammarus fasciatus | 120 | 430.6 | 0.78 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.23 |
| Nanocladius distinctus | 20 | 71.8 | 0.13 | 30 | 107.6 | 0.23 |
| Dicrotendipes simpsoni | 1,010 | 3,624.0 | 6.60 | 1,970 | 7,068.5 | 14.88 |
| Parachironomus | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.23 |
| TOTAL BENTHOS | 15,310 | 54,933.6 | 100.00 | 13,241 | 47,509.9 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 01AUG01

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 480 | 1,722.3 | 5.85 | 0 | 0.0 | 0.00 |
| Turbellaria | 630 | 2,260.5 | 7.67 | 0 | 0.0 | 0.00 |
| Oligochaeta | 5,440 | 19,519.2 | 66.26 | 715 | 2,565.5 | 58.13 |
| Helobdella | 20 | 71.8 | 0.24 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 380 | 1,363.5 | 4.63 | 285 | 1,022.6 | 23.17 |
| Cyrenellus fraternus | 10 | 35.9 | 0.12 | 0 | 0.0 | 0.00 |
| Hydropsyche | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.41 |
| Ablabesmyia janta | 100 | 358.8 | 1.22 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 120 | 430.6 | 1.46 | 70 | 251.2 | 5.69 |
| Dicrotendipes simpsoni | 870 | 3,121.6 | 10.60 | 155 | 556.2 | 12.60 |
| Corbicula fluminea | 160 | 574.1 | 1.95 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 8,210 | 29,458.2 | 100.00 | 1,230 | 4,413.3 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 24AUG01

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.01 |
| Oligochaeta | 200 | 717.6 | 1.52 | 110 | 394.7 | 1.33 |
| Gammarus fasciatus | 400 | 1,435.2 | 3.03 | 310 | 1,112.3 | 3.73 |
| Cyrenellus fraternus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.24 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Chironomus | 100 | 358.8 | 0.76 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 80 | 287.0 | 0.96 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.24 |
| Dreissena polymorpha | 12,500 | 44,851.1 | 94.70 | 7,740 | 27,771.8 | 93.24 |
| TOTAL BENTHOS | 13,200 | 47,362.8 | 100.00 | 8,301 | 29,784.7 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13, and DATE= 25JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|-------|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.10 |
| Turbellaria | 224 | 803.7 | 3.57 | 15 | 53.8 | 0.73 |
| Plumatella | 1 | 3.6 | 0.02 | 0 | 0.0 | 0.00 |
| Oligochaeta | 26 | 93.3 | 0.41 | 2 | 7.2 | 0.10 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.10 |
| Hydracarina | 3 | 10.8 | 0.05 | 0 | 0.0 | 0.00 |
| Isonychia | 17 | 61.0 | 0.27 | 3 | 10.8 | 0.15 |
| Baetis intercalaris | 342 | 1,227.1 | 5.45 | 28 | 100.5 | 1.36 |
| Pseudocloeon ephippiatum | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.05 |
| Leucrocota | 2 | 7.2 | 0.03 | 30 | 107.6 | 1.46 |
| Heptagenia | 5 | 17.9 | 0.08 | 11 | 39.5 | 0.53 |
| Stenacron | 13 | 46.6 | 0.21 | 31 | 111.2 | 1.51 |
| Stenonema integrum | 78 | 279.9 | 1.24 | 45 | 161.5 | 2.19 |
| Stenonema terminatum | 195 | 699.7 | 3.11 | 108 | 387.5 | 5.25 |
| Tricorythodes | 56 | 200.9 | 0.89 | 49 | 175.8 | 2.38 |
| Cyrenellus fraternus | 2 | 7.2 | 0.03 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 1,167 | 4,187.3 | 18.58 | 430 | 1,542.9 | 20.88 |
| Hydropsyche simulans | 136 | 488.0 | 2.17 | 16 | 57.4 | 0.78 |
| Hydropsyche bidens | 311 | 1,115.9 | 4.95 | 32 | 114.8 | 1.55 |
| Ceratopsyche morosa | 117 | 419.8 | 1.86 | 24 | 86.1 | 1.17 |
| Potamyia flava | 0 | 0.0 | 0.00 | 40 | 143.5 | 1.94 |
| Dubiraphia | 1 | 3.6 | 0.02 | 1 | 3.6 | 0.05 |
| Macronychus glabratus | 19 | 68.2 | 0.30 | 12 | 43.1 | 0.58 |
| Stenelmis crenata grp. | 7 | 25.1 | 0.11 | 2 | 7.2 | 0.10 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.58 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13 (cont.),
 and DATE= 25JUL01

| TAXA (cont.) | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.58 |
| Nilotanypus fimbriatus | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.58 |
| Thienemanniya grp. | 71 | 254.8 | 1.13 | 36 | 129.2 | 1.75 |
| Thienemanniella xena | 36 | 129.2 | 0.57 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 36 | 129.2 | 0.57 | 12 | 43.1 | 0.58 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 36 | 129.2 | 1.75 |
| Rheocricotopus robacki | 36 | 129.2 | 0.57 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.58 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.58 |
| Endochironomus nigricans | 36 | 129.2 | 0.57 | 12 | 43.1 | 0.58 |
| Glyptotendipes | 36 | 129.2 | 0.57 | 72 | 258.3 | 3.50 |
| Polypedilum flavum | 924 | 3,315.4 | 14.71 | 180 | 645.9 | 8.74 |
| Rheotanytarsus | 2,382 | 8,546.8 | 37.93 | 767 | 2,752.1 | 37.25 |
| Simulium | 1 | 3.6 | 0.02 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 6,280 | 22,533.2 | 100.00 | 2,059 | 7,387.9 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 26JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1,690 | 6,063.9 | 29.60 | 155 | 556.2 | 5.28 |
| Oligochaeta | 70 | 251.2 | 1.23 | 130 | 466.5 | 4.43 |
| Baetis intercalaris | 10 | 35.9 | 0.18 | 15 | 53.8 | 0.51 |
| Stenacron | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.17 |
| Tricorythodes | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.51 |
| Cheumatopsyche | 2,510 | 9,006.1 | 43.96 | 645 | 2,314.3 | 21.98 |
| Hydropsyche betteni | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.17 |
| Hydropsyche orris | 170 | 610.0 | 2.98 | 25 | 89.7 | 0.85 |
| Hydropsyche simulans | 10 | 35.9 | 0.18 | 5 | 17.9 | 0.17 |
| Ceratopsyche morosa | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.17 |
| Petrophila | 10 | 35.9 | 0.18 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 10 | 35.9 | 0.18 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 75 | 269.1 | 2.56 |
| Nanocladius crassicornus/rectinervis | 10 | 35.9 | 0.18 | 60 | 215.3 | 2.04 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.68 |
| Polypedilum flavum | 1,220 | 4,377.5 | 21.37 | 1,775 | 6,368.9 | 60.48 |
| TOTAL BENTHOS | 5,710 | 20,488.0 | 100.00 | 2,935 | 10,531.0 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22, and DATE= 26JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|-------|-------|------|-------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 2 | 7.2 | 0.28 | 9 | 32.3 | 3.78 |
| Oligochaeta | 97 | 348.0 | 13.43 | 26 | 93.3 | 10.92 |
| Caecidotea | 0 | 0.0 | 0.00 | 3 | 10.8 | 1.26 |
| Baetis intercalaris | 16 | 57.4 | 2.22 | 1 | 3.6 | 0.42 |
| Leucocuta | 20 | 71.8 | 2.77 | 0 | 0.0 | 0.00 |
| Stenacron | 3 | 10.8 | 0.42 | 55 | 197.3 | 23.11 |
| Stenonema | 17 | 61.0 | 2.35 | 0 | 0.0 | 0.00 |
| Tricorythodes | 10 | 35.9 | 1.39 | 0 | 0.0 | 0.00 |
| Argia | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.84 |
| Cheumatopsyche | 268 | 961.6 | 37.12 | 8 | 28.7 | 3.36 |
| Hydropsyche betteni | 4 | 14.4 | 0.55 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 14 | 50.2 | 1.94 | 0 | 0.0 | 0.00 |
| Macronychus glabratus | 3 | 10.8 | 0.42 | 1 | 3.6 | 0.42 |
| Stenelmis crenata grp. | 1 | 3.6 | 0.14 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Nilotanypus fimbriatus | 11 | 39.5 | 1.52 | 0 | 0.0 | 0.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22 (cont.),
 and DATE= 26JUL01

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Thienemanniya grp. | 36 | 129.2 | 4.99 | 3 | 10.8 | 1.26 |
| Corynoneura | 0 | 0.0 | 0.00 | 6 | 21.5 | 2.52 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 3 | 10.8 | 1.26 |
| Thienemanniella similis | 3 | 10.8 | 0.42 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 22 | 78.9 | 3.05 | 1 | 3.6 | 0.42 |
| Rheocricotopus robacki | 8 | 28.7 | 1.11 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 3 | 10.8 | 0.42 | 0 | 0.0 | 0.00 |
| Paracladopelma | 3 | 10.8 | 0.42 | 0 | 0.0 | 0.00 |
| Polypedilum fallax grp. | 3 | 10.8 | 0.42 | 6 | 21.5 | 2.52 |
| Polypedilum flavum | 115 | 412.6 | 15.93 | 16 | 57.4 | 6.72 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Polypedilum scalaenum grp. | 22 | 78.9 | 3.05 | 25 | 89.7 | 10.50 |
| Rheotanytarsus | 41 | 147.1 | 5.68 | 7 | 25.1 | 2.94 |
| Pleuroceridae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Ferrissia | 0 | 0.0 | 0.00 | 62 | 222.5 | 26.05 |
| TOTAL BENTHOS | 722 | 2,590.6 | 100.00 | 238 | 854.0 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 23JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 3,780 | 13,563.0 | 87.30 | 4,044 | 14,510.2 | 75.41 |
| Oligochaeta | 10 | 35.9 | 0.23 | 540 | 1,937.6 | 10.07 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.37 |
| Caecidotea | 450 | 1,614.6 | 10.39 | 569 | 2,041.6 | 10.61 |
| Orconectes virilis | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.19 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 110 | 394.7 | 2.05 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.37 |
| Dicrotendipes neomodestus | 90 | 322.9 | 2.08 | 40 | 143.5 | 0.75 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.19 |
| TOTAL BENTHOS | 4,330 | 15,536.4 | 100.00 | 5,363 | 19,242.9 | 100.00 |

WATERWAY= LITTLE CALUMET R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 24AUG01

| TAXA | CENTER | | | SIDE | | |
|-------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 760 | 2,726.9 | 10.12 | 40 | 143.5 | 0.93 |
| Turbellaria | 1,310 | 4,700.4 | 17.44 | 0 | 0.0 | 0.00 |
| Oligochaeta | 460 | 1,650.5 | 6.13 | 460 | 1,650.5 | 10.75 |
| Mooreobdella microstoma | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Caecidotea | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.47 |
| Gammarus fasciatus | 640 | 2,296.4 | 8.52 | 280 | 1,004.7 | 6.54 |
| Nanocladius distinctus | 90 | 322.9 | 1.20 | 40 | 143.5 | 0.93 |
| Dicrotendipes simpsoni | 150 | 538.2 | 2.00 | 380 | 1,363.5 | 8.88 |
| Glyptotendipes | 40 | 143.5 | 0.53 | 0 | 0.0 | 0.00 |
| Physella | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 400 | 1,435.2 | 5.33 | 0 | 0.0 | 0.00 |
| Ferrissia | 20 | 71.8 | 0.27 | 10 | 35.9 | 0.23 |
| Dreissena polymorpha | 3,620 | 12,988.9 | 48.20 | 3,050 | 10,943.7 | 71.26 |
| TOTAL BENTHOS | 7,510 | 26,946.5 | 100.00 | 4,280 | 15,357.0 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= MIDDLE FORK NORTH BRANCH CHICAGO R.
 LOCATION= LAKE COOK RD.,
 STATION= 31,
 and DATE= 13AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 3 | 10.8 | 0.51 | 0 | 0.0 | 0.00 |
| Turbellaria | 75 | 269.1 | 12.78 | 32 | 114.8 | 7.16 |
| Oligochaeta | 6 | 21.5 | 1.02 | 23 | 82.5 | 5.15 |
| Caecidotea | 361 | 1,295.3 | 61.50 | 190 | 681.7 | 42.51 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.89 |
| Thienemannimyia grp. | 9 | 32.3 | 1.53 | 0 | 0.0 | 0.00 |
| Corynoneura | 2 | 7.2 | 0.34 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 4 | 14.4 | 0.68 | 32 | 114.8 | 7.16 |
| Nanocladius crassicornus/rectinervis | 54 | 193.8 | 9.20 | 16 | 57.4 | 3.58 |
| Rheocricotopus robacki | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.45 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.45 |
| Dicrotendipes neomodestus | 4 | 14.4 | 0.68 | 42 | 150.7 | 9.40 |
| Dicrotendipes simpsoni | 41 | 147.1 | 6.98 | 52 | 186.6 | 11.63 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.45 |
| Polypedilum illinoense | 25 | 89.7 | 4.26 | 30 | 107.6 | 6.71 |
| Polypedilum scalaenum grp. | 2 | 7.2 | 0.34 | 18 | 64.6 | 4.03 |
| Physella | 1 | 3.6 | 0.17 | 0 | 0.0 | 0.00 |
| Pelecypoda | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.45 |
| TOTAL BENTHOS | 587 | 2,106.2 | 100.00 | 447 | 1,603.9 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 21AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 70 | 251.2 | 1.53 | 45 | 161.5 | 3.81 |
| Oligochaeta | 10 | 35.9 | 0.22 | 45 | 161.5 | 3.81 |
| Caecidotea | 4,480 | 16,074.6 | 98.03 | 935 | 3,354.9 | 79.24 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.42 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 60 | 215.3 | 5.08 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 20 | 71.8 | 1.69 |
| Nanocladius crassicornus/rectinervis | 10 | 35.9 | 0.22 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.85 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 25 | 89.7 | 2.12 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 35 | 125.6 | 2.97 |
| TOTAL BENTHOS | 4,570 | 16,397.6 | 100.00 | 1,180 | 4,233.9 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= DEMPSTER ST.,
 STATION= 34, and DATE= 20AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|-------|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 114 | 409.0 | 7.52 | 458 | 1,643.3 | 25.62 |
| Turbellaria | 566 | 2,030.9 | 37.36 | 147 | 527.4 | 8.22 |
| Oligochaeta | 172 | 617.2 | 11.35 | 374 | 1,341.9 | 20.92 |
| Helobdella triserialis | 2 | 7.2 | 0.13 | 12 | 43.1 | 0.67 |
| Erpobdella punctata punctata | 1 | 3.6 | 0.07 | 2 | 7.2 | 0.11 |
| Caecidotea | 202 | 724.8 | 13.33 | 420 | 1,507.0 | 23.49 |
| Stenacron | 5 | 17.9 | 0.33 | 6 | 21.5 | 0.34 |
| Argia | 19 | 68.2 | 1.25 | 40 | 143.5 | 2.24 |
| Cheumatopsyche | 84 | 301.4 | 5.54 | 48 | 172.2 | 2.68 |
| Hydropsyche betteni | 1 | 3.6 | 0.07 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 2 | 7.2 | 0.13 | 4 | 14.4 | 0.22 |
| Procladius (Holotanypus) | 11 | 39.5 | 0.73 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 4 | 14.4 | 0.26 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 4 | 14.4 | 0.26 | 21 | 75.3 | 1.17 |
| Nanocladius crassicornus/rectinervis | 11 | 39.5 | 0.73 | 3 | 10.8 | 0.17 |
| Cryptochironomus | 7 | 25.1 | 0.46 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 11 | 39.5 | 0.73 | 21 | 75.3 | 1.17 |
| Dicrotendipes simpsoni | 4 | 14.4 | 0.26 | 56 | 200.9 | 3.13 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.34 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= DEMPSTER ST.,
 STATION= 34 (cont.),
 and DATE= 20AUG01

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|--------------|----------------|---------------|--------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Paracladopelma | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.17 |
| Polypedilum flavum | 40 | 143.5 | 2.64 | 12 | 43.1 | 0.67 |
| Polypedilum illinoense | 7 | 25.1 | 0.46 | 3 | 10.8 | 0.17 |
| Polypedilum scalaenum grp. | 244 | 875.5 | 16.11 | 149 | 534.6 | 8.33 |
| Tanytarsus guerlus grp. | 4 | 14.4 | 0.26 | 0 | 0.0 | 0.00 |
| Musculium transversum | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Pisidium | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.11 |
| TOTAL BENTHOS | 1,515 | 5,436.0 | 100.00 | 1,788 | 6,415.5 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= DIVERSEY PKWY.,
 STATION= 73,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|-------------------------|-----------|-------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.51 |
| Turbellaria | 0 | 0.0 | 0.00 | 510 | 1,829.9 | 8.61 |
| Oligochaeta | 16 | 57.4 | 100.00 | 4,690 | 16,828.1 | 79.22 |
| Helobdella | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.17 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.34 |
| Caecidotea | 0 | 0.0 | 0.00 | 160 | 574.1 | 2.70 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.51 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.17 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 420 | 1,507.0 | 7.09 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.51 |
| Ferrissia | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.17 |
| TOTAL BENTHOS | 16 | 57.4 | 100.00 | 5,920 | 21,241.5 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= GLENVIEW RD.,
 STATION= 104,
 and DATE= 15AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------------|----------------|---------------|--------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 627 | 2,249.7 | 32.04 | 137 | 491.6 | 8.78 |
| Oligochaeta | 67 | 240.4 | 3.42 | 40 | 143.5 | 2.56 |
| Caecidotea | 40 | 143.5 | 2.04 | 7 | 25.1 | 0.45 |
| Heptageniidae | 33 | 118.4 | 1.69 | 0 | 0.0 | 0.00 |
| Stenacron | 3 | 10.8 | 0.15 | 7 | 25.1 | 0.45 |
| Stenonema | 17 | 61.0 | 0.87 | 33 | 118.4 | 2.11 |
| Calopteryx | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Argia | 17 | 61.0 | 0.87 | 10 | 35.9 | 0.64 |
| Cheumatopsyche | 333 | 1,194.8 | 17.02 | 497 | 1,783.3 | 31.84 |
| Hydropsyche betteni | 7 | 25.1 | 0.36 | 3 | 10.8 | 0.19 |
| Stenelmis | 10 | 35.9 | 0.51 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 20 | 71.8 | 1.02 | 47 | 168.6 | 3.01 |
| Corynoneura | 10 | 35.9 | 0.51 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.64 |
| Nanocladius crassicornus/rectinervis | 10 | 35.9 | 0.51 | 10 | 35.9 | 0.64 |
| Rheocricotopus robacki | 10 | 35.9 | 0.51 | 10 | 35.9 | 0.64 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.64 |
| Dicrotendipes simpsoni | 10 | 35.9 | 0.51 | 0 | 0.0 | 0.00 |
| Endochironomus nigricans | 10 | 35.9 | 0.51 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 627 | 2,249.7 | 32.04 | 687 | 2,465.0 | 44.01 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.64 |
| Polypedilum scalaenum grp. | 93 | 333.7 | 4.75 | 40 | 143.5 | 2.56 |
| Stenochironomus | 10 | 35.9 | 0.51 | 0 | 0.0 | 0.00 |
| Pelecypoda | 3 | 10.8 | 0.15 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,957 | 7,021.9 | 100.00 | 1,561 | 5,601.0 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 50 | 179.4 | 0.87 | 0 | 0.0 | 0.00 |
| Oligochaeta | 5,270 | 18,909.2 | 91.65 | 8,050 | 28,884.1 | 97.10 |
| Caecidotea | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Gammarus fasciatus | 80 | 287.0 | 1.39 | 20 | 71.8 | 0.24 |
| Chironomidae | 350 | 1,255.8 | 6.09 | 210 | 753.5 | 2.53 |
| TOTAL BENTHOS | 5,750 | 20,631.5 | 100.00 | 8,290 | 29,745.2 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= WILSON AVE.,
 STATION= 37,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 480 | 1,722.3 | 16.81 | 800 | 2,870.5 | 9.90 |
| Oligochaeta | 2,195 | 7,875.9 | 76.88 | 6,960 | 24,973.1 | 86.14 |
| Caecidotea | 100 | 358.8 | 3.50 | 110 | 394.7 | 1.36 |
| Dicrotendipes simpsoni | 70 | 251.2 | 2.45 | 200 | 717.6 | 2.48 |
| Ferrissia | 10 | 35.9 | 0.35 | 10 | 35.9 | 0.12 |
| TOTAL BENTHOS | 2,855 | 10,244.0 | 100.00 | 8,080 | 28,991.7 | 100.00 |

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= CENTRAL RD.,
 STATION= 35,
 and DATE= 28AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 293 | 1,051.3 | 73.43 | 264 | 947.3 | 62.41 |
| Helobdella stagnalis | 10 | 35.9 | 2.51 | 0 | 0.0 | 0.00 |
| Caecidotea | 2 | 7.2 | 0.50 | 55 | 197.3 | 13.00 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 52 | 186.6 | 12.29 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.47 |
| Dicrotendipes simpsoni | 92 | 330.1 | 23.06 | 27 | 96.9 | 6.38 |
| Parachironomus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.47 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.47 |
| Paratanytarsus | 2 | 7.2 | 0.50 | 16 | 57.4 | 3.78 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.71 |
| TOTAL BENTHOS | 399 | 1,431.6 | 100.00 | 423 | 1,517.8 | 100.00 |

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= FOSTER AVE.,
 STATION= 101,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1,720 | 6,171.5 | 27.97 | 580 | 2,081.1 | 7.40 |
| Oligochaeta | 3,630 | 13,024.8 | 59.02 | 5,670 | 20,344.5 | 72.32 |
| Helobdella | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.13 |
| Caecidotea | 0 | 0.0 | 0.00 | 40 | 143.5 | 0.51 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 190 | 681.7 | 2.42 |
| Nanocladius distinctus | 50 | 179.4 | 0.81 | 70 | 251.2 | 0.89 |
| Dicrotendipes simpsoni | 750 | 2,691.1 | 12.20 | 1,210 | 4,341.6 | 15.43 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.26 |
| Ferrissia | 0 | 0.0 | 0.00 | 50 | 179.4 | 0.64 |
| TOTAL BENTHOS | 6,150 | 22,066.7 | 100.00 | 7,840 | 28,130.6 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= OAKTON ST.,
 STATION= 102,
 and DATE= 28AUG01

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 3,110 | 11,159.0 | 99.68 | 5,880 | 21,098.0 | 87.63 |
| Chironomidae | 10 | 35.9 | 0.32 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 830 | 2,978.1 | 12.37 |
| TOTAL BENTHOS | 3,120 | 11,194.8 | 100.00 | 6,710 | 24,076.1 | 100.00 |

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 28AUG01

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|----------|--------|--------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1,770 | 6,350.9 | 12.11 | 730 | 2,619.3 | 5.78 |
| Oligochaeta | 10,150 | 36,419.1 | 69.47 | 7,320 | 26,264.8 | 58.00 |
| Caecidotea | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.08 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 80 | 287.0 | 0.63 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 270 | 968.8 | 2.14 |
| Nanocladius distinctus | 430 | 1,542.9 | 2.94 | 400 | 1,435.2 | 3.17 |
| Dicrotendipes simpsoni | 2,140 | 7,678.5 | 14.65 | 3,300 | 11,840.7 | 26.15 |
| Glyptotendipes | 80 | 287.0 | 0.55 | 130 | 466.5 | 1.03 |
| Parachironomus | 0 | 0.0 | 0.00 | 340 | 1,219.9 | 2.69 |
| Polypedilum illinoense | 40 | 143.5 | 0.27 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 40 | 143.5 | 0.32 |
| TOTAL BENTHOS | 14,610 | 52,422.0 | 100.00 | 12,620 | 45,281.7 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 24JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 90 | 322.9 | 1.75 | 540 | 1,937.6 | 14.36 |
| Oligochaeta | 330 | 1,184.1 | 6.41 | 310 | 1,112.3 | 8.24 |
| Caecidotea | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.53 |
| Hydracarina | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Tricorythodes | 20 | 71.8 | 0.39 | 0 | 0.0 | 0.00 |
| Enallagma | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 1,070 | 3,839.3 | 20.78 | 570 | 2,045.2 | 15.16 |
| Hydroptila | 20 | 71.8 | 0.39 | 10 | 35.9 | 0.27 |
| Chaoborus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.27 |
| Procladius (Holotanypus) | 40 | 143.5 | 0.78 | 20 | 71.8 | 0.53 |
| Ablabesmyia janta | 170 | 610.0 | 3.30 | 20 | 71.8 | 0.53 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 70 | 251.2 | 1.86 |
| Thienemannimyia grp. | 370 | 1,327.6 | 7.18 | 120 | 430.6 | 3.19 |
| Thienemanniella xena | 170 | 610.0 | 3.30 | 50 | 179.4 | 1.33 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 100 | 358.8 | 2.66 |
| Cricotopus bicinctus grp. | 80 | 287.0 | 1.55 | 70 | 251.2 | 1.86 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.53 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 70 | 251.2 | 1.86 |
| Nanocladius crassicornus/rectinervis | 120 | 430.6 | 2.33 | 140 | 502.3 | 3.72 |
| Dicrotendipes neomodestus | 40 | 143.5 | 0.78 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 40 | 143.5 | 0.78 | 20 | 71.8 | 0.53 |
| Endochironomus nigricans | 40 | 143.5 | 0.78 | 50 | 179.4 | 1.33 |
| Polypedilum flavum | 1,450 | 5,202.7 | 28.16 | 1,000 | 3,588.1 | 26.60 |
| Polypedilum illinoense | 790 | 2,834.6 | 15.34 | 400 | 1,435.2 | 10.64 |
| Polypedilum scalaenum grp. | 50 | 179.4 | 0.97 | 50 | 179.4 | 1.33 |
| Stenochironomus | 40 | 143.5 | 0.78 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 40 | 143.5 | 0.78 | 0 | 0.0 | 0.00 |
| Tanytarsus guerlus grp. | 120 | 430.6 | 2.33 | 100 | 358.8 | 2.66 |
| Hemerodromia | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Physella | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 20 | 71.8 | 0.39 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 5,150 | 18,478.7 | 100.00 | 3,760 | 13,491.2 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SKOKIE R.,
 LOCATION= FRONTAGE RD.,
 STATION= 105,
 and DATE= 14AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 6 | 21.5 | 1.38 | 18 | 64.6 | 2.31 |
| Turbellaria | 50 | 179.4 | 11.49 | 122 | 437.7 | 15.66 |
| Oligochaeta | 163 | 584.9 | 37.47 | 86 | 308.6 | 11.04 |
| Helobdella triserialis | 1 | 3.6 | 0.23 | 0 | 0.0 | 0.00 |
| Caecidotea | 8 | 28.7 | 1.84 | 11 | 39.5 | 1.41 |
| Stenacron | 14 | 50.2 | 3.22 | 20 | 71.8 | 2.57 |
| Stenonema | 13 | 46.6 | 2.99 | 0 | 0.0 | 0.00 |
| Argia | 7 | 25.1 | 1.61 | 6 | 21.5 | 0.77 |
| Enallagma | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.51 |
| Cynellus fraternus | 32 | 114.8 | 7.36 | 29 | 104.1 | 3.72 |
| Cheumatopsyche | 4 | 14.4 | 0.92 | 120 | 430.6 | 15.40 |
| Hydropsyche betteni | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.13 |
| Hydroptila | 12 | 43.1 | 2.76 | 10 | 35.9 | 1.28 |
| Procladius (Holotanypus) | 11 | 39.5 | 2.53 | 28 | 100.5 | 3.59 |
| Ablabesmyia janta | 8 | 28.7 | 1.84 | 7 | 25.1 | 0.90 |
| Thienemannimyia grp. | 7 | 25.1 | 1.61 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 3 | 10.8 | 0.69 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 3 | 10.8 | 0.69 | 4 | 14.4 | 0.51 |
| Nanocladius crassicornus/rectinervis | 1 | 3.6 | 0.23 | 0 | 0.0 | 0.00 |
| Chironomus | 1 | 3.6 | 0.23 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 1 | 3.6 | 0.23 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 11 | 39.5 | 2.53 | 4 | 14.4 | 0.51 |
| Dicrotendipes simpsoni | 9 | 32.3 | 2.07 | 75 | 269.1 | 9.63 |
| Endochironomus nigricans | 4 | 14.4 | 0.92 | 53 | 190.2 | 6.80 |
| Glyptotendipes | 24 | 86.1 | 5.52 | 114 | 409.0 | 14.63 |
| Polypedilum flavum | 23 | 82.5 | 5.29 | 18 | 64.6 | 2.31 |
| Polypedilum halterale grp. | 1 | 3.6 | 0.23 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 4 | 14.4 | 0.92 | 11 | 39.5 | 1.41 |
| Polypedilum scalaenum grp. | 3 | 10.8 | 0.69 | 11 | 39.5 | 1.41 |
| Stenochironomus | 8 | 28.7 | 1.84 | 25 | 89.7 | 3.21 |
| Rheotanytarsus | 3 | 10.8 | 0.69 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.26 |
| TOTAL BENTHOS | 435 | 1,560.8 | 100.00 | 779 | 2,795.1 | 100.00 |

WATERWAY= SKOKIE R.,
 LOCATION= LAKE COOK RD.,
 STATION= 32,
 and DATE= 13AUG01

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 530 | 1,901.7 | 38.29 | 410 | 1,471.1 | 38.07 |
| Oligochaeta | 447 | 1,603.9 | 32.30 | 300 | 1,076.4 | 27.86 |
| Helobdella stagnalis | 20 | 71.8 | 1.45 | 23 | 82.5 | 2.14 |
| Mooreobdella microstoma | 3 | 10.8 | 0.22 | 0 | 0.0 | 0.00 |
| Caecidotea | 153 | 549.0 | 11.05 | 63 | 226.0 | 5.85 |
| Hydracarina | 3 | 10.8 | 0.22 | 0 | 0.0 | 0.00 |
| Argia | 20 | 71.8 | 1.45 | 7 | 25.1 | 0.65 |
| Procladius (Holotanypus) | 7 | 25.1 | 0.51 | 7 | 25.1 | 0.65 |
| Dicrotendipes neomodestus | 87 | 312.2 | 6.29 | 50 | 179.4 | 4.64 |
| Dicrotendipes simpsoni | 93 | 333.7 | 6.72 | 210 | 753.5 | 19.50 |
| Endochironomus nigricans | 7 | 25.1 | 0.51 | 0 | 0.0 | 0.00 |
| Phaenopsectra | 7 | 25.1 | 0.51 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 7 | 25.1 | 0.51 | 7 | 25.1 | 0.65 |
| TOTAL BENTHOS | 1,384 | 4,965.9 | 100.00 | 1,077 | 3,864.4 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 24JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1,280 | 4,592.8 | 21.84 | 150 | 538.2 | 9.16 |
| Plumatella | 1 | 3.6 | 0.02 | 1 | 3.6 | 0.06 |
| Oligochaeta | 390 | 1,399.4 | 6.65 | 87 | 312.2 | 5.31 |
| Baetis intercalaris | 20 | 71.8 | 0.34 | 2 | 7.2 | 0.12 |
| Argia | 10 | 35.9 | 0.17 | 0 | 0.0 | 0.00 |
| Enallagma | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Cheumatopsyche | 1,600 | 5,740.9 | 27.30 | 152 | 545.4 | 9.28 |
| Hydroptila | 40 | 143.5 | 0.68 | 12 | 43.1 | 0.73 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.73 |
| Thienemanniya grp. | 320 | 1,148.2 | 5.46 | 111 | 398.3 | 6.78 |
| Thienemanniella xena | 50 | 179.4 | 0.85 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 80 | 287.0 | 1.36 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.73 |
| Nanocladius distinctus | 80 | 287.0 | 1.36 | 0 | 0.0 | 0.00 |
| Nanocladius crassicornus/rectinervis | 180 | 645.9 | 3.07 | 37 | 132.8 | 2.26 |
| Cryptochironomus | 30 | 107.6 | 0.51 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 100 | 358.8 | 1.71 | 12 | 43.1 | 0.73 |
| Dicrotendipes simpsoni | 50 | 179.4 | 0.85 | 98 | 351.6 | 5.98 |
| Endochironomus nigricans | 50 | 179.4 | 0.85 | 12 | 43.1 | 0.73 |
| Glyptotendipes | 1,060 | 3,803.4 | 18.09 | 799 | 2,866.9 | 48.78 |
| Polypedilum flavum | 50 | 179.4 | 0.85 | 49 | 175.8 | 2.99 |
| Polypedilum illinoense | 340 | 1,219.9 | 5.80 | 74 | 265.5 | 4.52 |
| Polypedilum scalaenum grp. | 80 | 287.0 | 1.36 | 12 | 43.1 | 0.73 |
| Simulium | 30 | 107.6 | 0.51 | 5 | 17.9 | 0.31 |
| Hemerodromia | 10 | 35.9 | 0.17 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 10 | 35.9 | 0.17 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 5,861 | 21,029.8 | 100.00 | 1,638 | 5,877.3 | 100.00 |

WATERWAY= WEST FORK NORTH BRANCH CHICAGO R.,
 LOCATION= DUNDEE RD.,
 STATION= 106,
 and DATE= 10AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 35 | 125.6 | 8.06 | 52 | 186.6 | 7.33 |
| Oligochaeta | 8 | 28.7 | 1.84 | 135 | 484.4 | 19.04 |
| Melobdella stagnalis | 2 | 7.2 | 0.46 | 5 | 17.9 | 0.71 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.42 |
| Caecidotea | 97 | 348.0 | 22.35 | 125 | 448.5 | 17.63 |
| Argia | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.42 |
| Enallagma | 6 | 21.5 | 1.38 | 18 | 64.6 | 2.54 |
| Berosus | 2 | 7.2 | 0.46 | 6 | 21.5 | 0.85 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 11 | 39.5 | 1.55 |
| Ablabesayia mallochii | 3 | 10.8 | 0.69 | 4 | 14.4 | 0.56 |
| Thienemanniya grp. | 35 | 125.6 | 8.06 | 26 | 93.3 | 3.67 |
| Cricotopus sylvestris grp. | 6 | 21.5 | 1.38 | 0 | 0.0 | 0.00 |
| Nanocladius crassicornus/rectinervis | 3 | 10.8 | 0.69 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 127 | 455.7 | 29.26 | 189 | 678.1 | 26.66 |
| Dicrotendipes simpsoni | 6 | 21.5 | 1.38 | 4 | 14.4 | 0.56 |
| Polypedilum flavum | 6 | 21.5 | 1.38 | 11 | 39.5 | 1.55 |
| Polypedilum illinoense | 98 | 351.6 | 22.58 | 113 | 405.5 | 15.94 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.56 |
| TOTAL BENTHOS | 434 | 1,557.2 | 100.00 | 709 | 2,544.0 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= WEST FORK NORTH BRANCH CHICAGO R.,
 LOCATION= GOLF RD.,
 STATION= 103,
 and DATE= 17AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 545 | 1,955.5 | 30.19 | 75 | 269.1 | 4.66 |
| Oligochaeta | 365 | 1,309.7 | 20.22 | 440 | 1,578.8 | 27.33 |
| Caecidotea | 500 | 1,794.0 | 27.70 | 225 | 807.3 | 13.98 |
| Stenacron | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.31 |
| Argia | 20 | 71.8 | 1.11 | 15 | 53.8 | 0.93 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.93 |
| Procladius (Holotanypus) | 10 | 35.9 | 0.55 | 5 | 17.9 | 0.31 |
| Thienemanniya grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 1.24 |
| Dicrotendipes neomodestus | 40 | 143.5 | 2.22 | 55 | 197.3 | 3.42 |
| Dicrotendipes simpsoni | 175 | 627.9 | 9.70 | 445 | 1,596.7 | 27.64 |
| Glyptotendipes | 100 | 358.8 | 5.54 | 200 | 717.6 | 12.42 |
| Polypedilum flavum | 20 | 71.8 | 1.11 | 25 | 89.7 | 1.55 |
| Polypedilum illinoense | 30 | 107.6 | 1.66 | 80 | 287.0 | 4.97 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.31 |
| TOTAL BENTHOS | 1,805 | 6,476.5 | 100.00 | 1,610 | 5,776.8 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= CAL-SAG CHANNEL.,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 24AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 588 | 8,439.7 | 97.03 | 3,940 | 56,551.9 | 95.86 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.24 |
| Procladius (Holotanypus) | 11 | 157.9 | 1.82 | 110 | 1,578.9 | 2.68 |
| Dicrotendipes simpsoni | 3 | 43.1 | 0.50 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 50 | 717.7 | 1.22 |
| Dreissena polymorpha | 4 | 57.4 | 0.66 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 606 | 8,698.1 | 100.00 | 4,110 | 58,991.9 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 30JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 156 | 2,239.1 | 97.50 | 210 | 3,014.2 | 97.22 |
| Procladius (Holotanypus) | 3 | 43.1 | 1.88 | 3 | 43.1 | 1.39 |
| Chironomus | 1 | 14.4 | 0.63 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 43.1 | 1.39 |
| TOTAL BENTHOS | 160 | 2,296.5 | 100.00 | 216 | 3,100.3 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 30JUL01

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 120 | 1,722.4 | 2.90 |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.02 |
| Oligochaeta | 4,680 | 67,173.3 | 99.57 | 3,920 | 56,264.8 | 94.89 |
| Gammarus fasciatus | 10 | 143.5 | 0.21 | 20 | 287.1 | 0.48 |
| Chironomus | 10 | 143.5 | 0.21 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 50 | 717.7 | 1.21 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 20 | 287.1 | 0.48 |
| TOTAL BENTHOS | 4,700 | 67,460.4 | 100.00 | 4,131 | 59,293.4 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 01AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 2,140 | 30,716.0 | 93.04 | 1,855 | 26,625.3 | 93.83 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 16 | 229.7 | 0.81 |
| Cheumatopsyche | 10 | 143.5 | 0.43 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 130 | 1,865.9 | 5.65 | 5 | 71.8 | 0.25 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 65 | 933.0 | 3.29 |
| Dicrotendipes simpsoni | 10 | 143.5 | 0.43 | 35 | 502.4 | 1.77 |
| Corbicula fluminea | 10 | 143.5 | 0.43 | 1 | 14.4 | 0.05 |
| TOTAL BENTHOS | 2,300 | 33,012.5 | 100.00 | 1,977 | 28,376.4 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= CALUMET R.,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 24AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.76 |
| Turbellaria | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.76 |
| Oligochaeta | 405 | 5,813.1 | 95.52 | 107 | 1,535.8 | 81.68 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 8 | 114.8 | 6.11 |
| Procladius (Holotanypus) | 6 | 86.1 | 1.42 | 1 | 14.4 | 0.76 |
| Clinotanypus | 1 | 14.4 | 0.24 | 0 | 0.0 | 0.00 |
| Chironomus | 1 | 14.4 | 0.24 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 3 | 43.1 | 0.71 | 1 | 14.4 | 0.76 |
| Microchironomus | 1 | 14.4 | 0.24 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 1 | 14.4 | 0.24 | 2 | 28.7 | 1.53 |
| Pisidium compressum | 2 | 28.7 | 0.47 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 4 | 57.4 | 0.94 | 10 | 143.5 | 7.63 |
| TOTAL BENTHOS | 424 | 6,085.8 | 100.00 | 131 | 1,880.3 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13,
 and DATE= 25JUL01

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 12 | 172.2 | 4.07 | 0 | 0.0 | 0.00 |
| Urnatella gracilis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Oligochaeta | 23 | 330.1 | 7.80 | 79 | 1,133.9 | 27.53 |
| Ostracoda | 1 | 14.4 | 0.34 | 8 | 114.8 | 2.79 |
| Caecidotea | 121 | 1,736.7 | 41.02 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 1 | 14.4 | 0.34 | 0 | 0.0 | 0.00 |
| Stenonema | 5 | 71.8 | 1.69 | 0 | 0.0 | 0.00 |
| Tricorythodes | 6 | 86.1 | 2.03 | 0 | 0.0 | 0.00 |
| Stylurus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Cyrnellus fraternus | 1 | 14.4 | 0.34 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 34 | 488.0 | 11.53 | 1 | 14.4 | 0.35 |
| Potamyia flava | 4 | 57.4 | 1.36 | 0 | 0.0 | 0.00 |
| Dubiraphia | 0 | 0.0 | 0.00 | 11 | 157.9 | 3.83 |
| Thienemannimyia grp. | 4 | 57.4 | 1.36 | 2 | 28.7 | 0.70 |
| Nanocladius crassicornus/rectinervis | 14 | 200.9 | 4.75 | 0 | 0.0 | 0.00 |
| Cladopelma | 0 | 0.0 | 0.00 | 5 | 71.8 | 1.74 |
| Cryptochironomus | 4 | 57.4 | 1.36 | 88 | 1,263.1 | 30.66 |
| Dicrotendipes neomodestus | 4 | 57.4 | 1.36 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 9 | 129.2 | 3.05 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 4 | 57.4 | 1.36 | 0 | 0.0 | 0.00 |
| Microtendipes | 18 | 258.4 | 6.10 | 0 | 0.0 | 0.00 |
| Paracladopelma | 0 | 0.0 | 0.00 | 32 | 459.3 | 11.15 |
| Polypedilum illinoense | 14 | 200.9 | 4.75 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 9 | 129.2 | 3.14 |
| Tanytarsus guerlus grp. | 14 | 200.9 | 4.75 | 39 | 559.8 | 13.59 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 4 | 57.4 | 1.39 |
| Pisidium | 2 | 28.7 | 0.68 | 7 | 100.5 | 2.44 |
| TOTAL BENTHOS | 295 | 4,234.2 | 100.00 | 287 | 4,119.4 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91, and DATE= 26JUL01

| TAXA | CENTER | | | SIDE | | |
|-------------------------|--------|------|----|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | -- | -- | -- | 6 | 86.1 | 1.03 |
| Oligochaeta | -- | -- | -- | 501 | 7,191.0 | 86.38 |
| Helobdella stagnalis | -- | -- | -- | 4 | 57.4 | 0.69 |
| Mooreobdella microstoma | -- | -- | -- | 1 | 14.4 | 0.17 |
| Caecidotea | -- | -- | -- | 2 | 28.7 | 0.34 |
| Gammarus fasciatus | -- | -- | -- | 18 | 258.4 | 3.10 |
| Palmacorixa | -- | -- | -- | 4 | 57.4 | 0.69 |
| Cheumatopsyche | -- | -- | -- | 5 | 71.8 | 0.86 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91 (cont.),
 and DATE= 26JUL01

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|--------|------|----|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Stenelmis crenata grp. | -- | -- | -- | 6 | 86.1 | 1.03 |
| Natarsia sp. A | -- | -- | -- | 1 | 14.4 | 0.17 |
| Procladius (Holotanypus) | -- | -- | -- | 8 | 114.8 | 1.38 |
| Chironomus | -- | -- | -- | 1 | 14.4 | 0.17 |
| Cryptochironomus | -- | -- | -- | 1 | 14.4 | 0.17 |
| Dicrotendipes neomodestus | -- | -- | -- | 1 | 14.4 | 0.17 |
| Glyptotendipes | -- | -- | -- | 1 | 14.4 | 0.17 |
| Polypedilum flavum | -- | -- | -- | 1 | 14.4 | 0.17 |
| Polypedilum scalaenum grp. | -- | -- | -- | 13 | 186.6 | 2.24 |
| Ammicula | -- | -- | -- | 1 | 14.4 | 0.17 |
| Pleuroceridae | -- | -- | -- | 2 | 28.7 | 0.34 |
| Corbicula fluminea | -- | -- | -- | 2 | 28.7 | 0.34 |
| Musculium transversum | -- | -- | -- | 1 | 14.4 | 0.17 |
| TOTAL BENTHOS | -- | -- | -- | 580 | 8,324.9 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 26JUL01

| TAXA | CENTER | | | SIDE | | |
|----------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 35 | 502.4 | 6.11 | 1 | 14.4 | 0.28 |
| Oligochaeta | 143 | 2,052.5 | 24.96 | 273 | 3,918.4 | 75.83 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Helobdella triserialis | 1 | 14.4 | 0.17 | 0 | 0.0 | 0.00 |
| Mooreobdella microstoma | 1 | 14.4 | 0.17 | 0 | 0.0 | 0.00 |
| Caecidotea | 7 | 100.5 | 1.22 | 7 | 100.5 | 1.94 |
| Gammarus fasciatus | 1 | 14.4 | 0.17 | 1 | 14.4 | 0.28 |
| Baetis intercalaris | 4 | 57.4 | 0.70 | 1 | 14.4 | 0.28 |
| Tricorythodes | 33 | 473.7 | 5.76 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 14 | 200.9 | 2.44 | 1 | 14.4 | 0.28 |
| Macronychus glabratus | 1 | 14.4 | 0.17 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 11 | 157.9 | 1.92 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 6 | 86.1 | 1.67 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 4 | 57.4 | 1.11 |
| Thienemanniomyia grp. | 24 | 344.5 | 4.19 | 0 | 0.0 | 0.00 |
| Corynoneura | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Thienemanniella similis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Nanocladius | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Chironomus | 0 | 0.0 | 0.00 | 8 | 114.8 | 2.22 |
| Cryptochironomus | 64 | 918.6 | 11.17 | 4 | 57.4 | 1.11 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Paracladopelma | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.56 |
| Polypedilum fallax grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.56 |
| Polypedilum flavum | 5 | 71.8 | 0.87 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 16 | 229.7 | 2.79 | 4 | 57.4 | 1.11 |
| Polypedilum scalaenum grp. | 176 | 2,526.2 | 30.72 | 40 | 574.1 | 11.11 |
| Cladotanytarsus vanderwulpi grp. | 3 | 43.1 | 0.52 | 1 | 14.4 | 0.28 |
| Rheotanytarsus | 3 | 43.1 | 0.52 | 0 | 0.0 | 0.00 |
| Pleuroceridae | 2 | 28.7 | 0.35 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 1 | 14.4 | 0.17 | 0 | 0.0 | 0.00 |
| Musculium | 3 | 43.1 | 0.52 | 0 | 0.0 | 0.00 |
| Pisidium | 25 | 358.8 | 4.36 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 573 | 8,224.4 | 100.00 | 360 | 5,167.2 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 23JUL01

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 334 | 4,794.0 | 31.16 | 617 | 8,856.0 | 20.34 |
| Oligochaeta | 30 | 430.6 | 2.80 | 224 | 3,215.1 | 7.39 |
| Erpobdella punctata punctata | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.03 |
| Mooreobdella microstoma | 27 | 387.5 | 2.52 | 38 | 545.4 | 1.25 |
| Ostracoda | 5 | 71.8 | 0.47 | 497 | 7,133.6 | 16.39 |
| Caecidotea | 655 | 9,401.4 | 61.10 | 1,602 | 22,993.9 | 52.82 |
| Orconectes immunis | 1 | 14.4 | 0.09 | 0 | 0.0 | 0.00 |
| Enallagma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.03 |
| Bezzia | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.03 |
| Tanytus | 1 | 14.4 | 0.09 | 0 | 0.0 | 0.00 |
| Thienemanniomyia grp. | 3 | 43.1 | 0.28 | 2 | 28.7 | 0.07 |
| Cricotopus bicinctus grp. | 6 | 86.1 | 0.56 | 10 | 143.5 | 0.33 |
| Cricotopus sylvestris grp. | 6 | 86.1 | 0.56 | 19 | 272.7 | 0.63 |
| Chironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.07 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.07 |
| Dicrotendipes neomodestus | 1 | 14.4 | 0.09 | 4 | 57.4 | 0.13 |
| Musculium transversum | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.16 |
| Pisidium | 3 | 43.1 | 0.28 | 8 | 114.8 | 0.26 |
| TOTAL BENTHOS | 1,072 | 15,386.7 | 100.00 | 3,033 | 43,533.5 | 100.00 |

WATERWAY= LITTLE CALUMET R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 24AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 39 | 559.8 | 20.10 | 0 | 0.0 | 0.00 |
| Oligochaeta | 142 | 2,038.2 | 73.20 | 1,510 | 21,673.4 | 100.00 |
| Gammarus fasciatus | 4 | 57.4 | 2.06 | 0 | 0.0 | 0.00 |
| Pisidium compressum | 7 | 100.5 | 3.61 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 2 | 28.7 | 1.03 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 194 | 2,784.5 | 100.00 | 1,510 | 21,673.4 | 100.00 |

WATERWAY= MIDDLE FORK NORTH BRANCH CHICAGO R.,
 LOCATION= LAKE COOK RD.,
 STATION= 31,
 and DATE= 13AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 11 | 157.9 | 1.51 |
| Oligochaeta | 156 | 2,239.1 | 92.31 | 687 | 9,860.7 | 94.24 |
| Caecidotea | 0 | 0.0 | 0.00 | 9 | 129.2 | 1.23 |
| Procladius (Holotanytus) | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.41 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.27 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.41 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.69 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.27 |
| Sphaerium simile | 13 | 186.6 | 7.69 | 6 | 86.1 | 0.82 |
| Musculium | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.14 |
| TOTAL BENTHOS | 169 | 2,425.7 | 100.00 | 729 | 10,463.5 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 21AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|------|----|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | -- | -- | -- | 1 | 14.4 | 0.40 |
| Oligochaeta | -- | -- | -- | 27 | 387.5 | 10.84 |
| Helobdella triserialis | -- | -- | -- | 2 | 28.7 | 0.80 |
| Mooreobdella microstoma | -- | -- | -- | 1 | 14.4 | 0.40 |
| Caecidotea | -- | -- | -- | 1 | 14.4 | 0.40 |
| Cheumatopsyche | -- | -- | -- | 2 | 28.7 | 0.80 |
| Thienemannimyia grp. | -- | -- | -- | 1 | 14.4 | 0.40 |
| Cricotopus bicinctus grp. | -- | -- | -- | 1 | 14.4 | 0.40 |
| Cryptochironomus | -- | -- | -- | 1 | 14.4 | 0.40 |
| Dicrotendipes neomodestus | -- | -- | -- | 1 | 14.4 | 0.40 |
| Polypedilum illinoense | -- | -- | -- | 4 | 57.4 | 1.61 |
| Polypedilum scalaenum grp. | -- | -- | -- | 17 | 244.0 | 6.83 |
| Physella | -- | -- | -- | 1 | 14.4 | 0.40 |
| Menetus dilatatus | -- | -- | -- | 1 | 14.4 | 0.40 |
| Musculium transversum | -- | -- | -- | 166 | 2,382.6 | 66.67 |
| Pisidium | -- | -- | -- | 2 | 28.7 | 0.80 |
| Pisidium compressum | -- | -- | -- | 20 | 287.1 | 8.03 |
| TOTAL BENTHOS | -- | -- | -- | 249 | 3,574.0 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= DEMPSTER ST.,
 STATION= 34,
 and DATE= 20AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 442 | 6,344.1 | 48.79 | 1,053 | 15,114.0 | 66.65 |
| Caecidotea | 3 | 43.1 | 0.33 | 4 | 57.4 | 0.25 |
| Stenelmis | 5 | 71.8 | 0.55 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 117 | 1,679.3 | 7.41 |
| Thienemannimyia grp. | 12 | 172.2 | 1.32 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 11 | 157.9 | 0.70 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.25 |
| Dicrotendipes neomodestus | 35 | 502.4 | 3.86 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 24 | 344.5 | 2.65 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 12 | 172.2 | 1.32 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.13 |
| Polypedilum scalaenum grp. | 353 | 5,066.7 | 38.96 | 378 | 5,425.5 | 23.92 |
| Stenochironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.13 |
| Musculium transversum | 10 | 143.5 | 1.10 | 9 | 129.2 | 0.57 |
| Pisidium compressum | 10 | 143.5 | 1.10 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 906 | 13,004.1 | 100.00 | 1,580 | 22,678.2 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= DIVERSEY PKWY.,
 STATION= 73,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|-------------------------|--------|----------|--------|--------|-----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 5,320 | 76,359.4 | 99.44 | 12,010 | 172,382.8 | 99.50 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.08 |
| Chironomidae | 30 | 430.6 | 0.56 | 50 | 717.7 | 0.41 |
| TOTAL BENTHOS | 5,350 | 76,790.0 | 100.00 | 12,070 | 173,244.0 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= GLENVIEW RD.,
 STATION= 104, and DATE= 15AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 27 | 387.5 | 6.78 | 2 | 28.7 | 1.06 |
| Oligochaeta | 109 | 1,564.5 | 27.39 | 136 | 1,952.0 | 71.96 |
| Mooreobdella microstoma | 2 | 28.7 | 0.50 | 0 | 0.0 | 0.00 |
| Caecidotea | 1 | 14.4 | 0.25 | 0 | 0.0 | 0.00 |
| Heptageniidae | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.53 |
| Cheumatopsyche | 53 | 760.7 | 13.32 | 9 | 129.2 | 4.76 |
| Hydropsyche betteni | 1 | 14.4 | 0.25 | 0 | 0.0 | 0.00 |
| Macronychus glabratus | 2 | 28.7 | 0.50 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 18 | 258.4 | 4.52 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 17 | 244.0 | 8.99 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.53 |
| Cryptochironomus | 3 | 43.1 | 0.75 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 12 | 172.2 | 3.02 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 3 | 43.1 | 0.75 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 136 | 1,952.0 | 34.17 | 1 | 14.4 | 0.53 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 2 | 28.7 | 1.06 |
| Polypedilum scalaenum grp. | 18 | 258.4 | 4.52 | 5 | 71.8 | 2.65 |
| Musculium transversum | 13 | 186.6 | 3.27 | 14 | 200.9 | 7.41 |
| Pisidium | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.53 |
| TOTAL BENTHOS | 398 | 5,712.6 | 100.00 | 189 | 2,712.8 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.09 | 0 | 0.0 | 0.00 |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| Oligochaeta | 1,138 | 16,334.0 | 99.13 | 541 | 7,765.1 | 96.78 |
| Chironomidae | 0 | 0.0 | 0.00 | 16 | 229.7 | 2.86 |
| Procladius (Holotanypus) | 7 | 100.5 | 0.61 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 2 | 28.7 | 0.17 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| TOTAL BENTHOS | 1,148 | 16,477.6 | 100.00 | 559 | 8,023.5 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= WILSON AVE.,
 STATION= 37,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|---------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 30 | 430.6 | 1.23 |
| Oligochaeta | 2,650 | 38,036.2 | 100.00 | 2,370 | 34,017.2 | 97.53 |
| Chironomidae | 0 | 0.0 | 0.00 | 30 | 430.6 | 1.23 |
| TOTAL BENTHOS | 2,650 | 38,036.2 | 100.00 | 2,430 | 34,878.4 | 100.00 |

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= CENTRAL RD.,
 STATION= 35, and DATE= 28AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 4,590 | 65,881.5 | 100.00 | 699 | 10,032.9 | 98.17 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.14 |
| Caecidotea | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.28 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.14 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.14 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.14 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 7 | 100.5 | 0.98 |
| TOTAL BENTHOS | 4,590 | 65,881.5 | 100.00 | 712 | 10,219.5 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= FOSTER AVE.,
 STATION= 101,
 and DATE= 27AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 25 | 358.8 | 1.56 |
| Oligochaeta | 2,060 | 29,567.7 | 99.52 | 1,515 | 21,745.2 | 94.39 |
| Gammarus fasciatus | 10 | 143.5 | 0.48 | 10 | 143.5 | 0.62 |
| Chironomidae | 0 | 0.0 | 0.00 | 50 | 717.7 | 3.12 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.31 |
| TOTAL BENTHOS | 2,070 | 29,711.3 | 100.00 | 1,605 | 23,037.0 | 100.00 |

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= OAKTON ST.,
 STATION= 102, and DATE= 28AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|-----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 17,710 | 254,196.4 | 99.83 | 3,090 | 44,351.6 | 99.68 |
| Procladius (Holotanypus) | 30 | 430.6 | 0.17 | 10 | 143.5 | 0.32 |
| TOTAL BENTHOS | 17,740 | 254,627.0 | 100.00 | 3,100 | 44,495.1 | 100.00 |

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= TOUHY AVE.,
 STATION= 36, and DATE= 28AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|--------|-----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 136 | 1,952.0 | 10.27 | 120 | 1,722.4 | 1.09 |
| Oligochaeta | 1,040 | 14,927.4 | 78.55 | 10,090 | 144,824.5 | 92.06 |
| Caecidotea | 1 | 14.4 | 0.08 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.09 |
| Chironomidae | 0 | 0.0 | 0.00 | 740 | 10,621.4 | 6.75 |
| Cricotopus bicinctus grp. | 16 | 229.7 | 1.21 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 4 | 57.4 | 0.30 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 6 | 86.1 | 0.45 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 35 | 502.4 | 2.64 | 0 | 0.0 | 0.00 |
| Parachironomus | 86 | 1,234.4 | 6.50 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,324 | 19,003.7 | 100.00 | 10,960 | 157,311.8 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18, and DATE= 24JUL01

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.13 | 0 | 0.0 | 0.00 |
| Oligochaeta | 303 | 4,349.0 | 40.40 | 937 | 13,449.0 | 81.55 |
| Hydracarina | 1 | 14.4 | 0.13 | 0 | 0.0 | 0.00 |
| Tricorythodes | 1 | 14.4 | 0.13 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 9 | 129.2 | 1.20 | 0 | 0.0 | 0.00 |
| Dubiraphia | 1 | 14.4 | 0.13 | 8 | 114.8 | 0.70 |
| Chaoborus | 0 | 0.0 | 0.00 | 61 | 875.5 | 5.31 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 72 | 1,033.4 | 6.27 |
| Chironomus | 8 | 114.8 | 1.07 | 1 | 14.4 | 0.09 |
| Cladopelma | 4 | 57.4 | 0.53 | 1 | 14.4 | 0.09 |
| Cryptochironomus | 17 | 244.0 | 2.27 | 26 | 373.2 | 2.26 |
| Dicrotendipes neomodestus | 29 | 416.2 | 3.87 | 0 | 0.0 | 0.00 |
| Paracladopelma | 4 | 57.4 | 0.53 | 4 | 57.4 | 0.35 |
| Polypedilum halterale grp. | 21 | 301.4 | 2.80 | 15 | 215.3 | 1.31 |
| Polypedilum illinoense | 4 | 57.4 | 0.53 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 63 | 904.3 | 8.40 | 12 | 172.2 | 1.04 |
| Cladotanytarsus mancus grp. | 214 | 3,071.6 | 28.53 | 3 | 43.1 | 0.26 |
| Tanytarsus guerlus grp. | 42 | 602.8 | 5.60 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 2 | 28.7 | 0.27 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 26 | 373.2 | 3.47 | 9 | 129.2 | 0.78 |
| TOTAL BENTHOS | 750 | 10,765.0 | 100.00 | 1,149 | 16,491.9 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= SKOKIE R.,
 LOCATION= FRONTAGE RD.,
 STATION= 105,
 and DATE= 14AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.51 |
| Oligochaeta | 298 | 4,277.3 | 84.90 | 326 | 4,679.2 | 83.16 |
| Caecidotea | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.26 |
| Gammarus fasciatus | 1 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| Caenis | 5 | 71.8 | 1.42 | 2 | 28.7 | 0.51 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.26 |
| Dubiraphia | 4 | 57.4 | 1.14 | 3 | 43.1 | 0.77 |
| Chironomidae | 42 | 602.8 | 11.97 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 41 | 588.5 | 10.46 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.77 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 7 | 100.5 | 1.79 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.77 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.77 |
| Lasmeigona complanata | 1 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 351 | 5,038.0 | 100.00 | 392 | 5,626.5 | 100.00 |

WATERWAY= SKOKIE R.,
 LOCATION= LAKE COOK RD.,
 STATION= 32,
 and DATE= 13AUG01

| TAXA | CENTER | | | SIDE | | |
|--------------------------|------------|----------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 329 | 4,722.2 | 97.05 | 2,940 | 42,198.6 | 93.33 |
| Caecidotea | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.16 |
| Chironomidae | 10 | 143.5 | 2.95 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 15 | 215.3 | 0.48 |
| Physella | 0 | 0.0 | 0.00 | 20 | 287.1 | 0.63 |
| Musculium transversum | 0 | 0.0 | 0.00 | 60 | 861.2 | 1.90 |
| Pisidium compressum | 0 | 0.0 | 0.00 | 110 | 1,578.9 | 3.49 |
| TOTAL BENTHOS | 339 | 4,865.8 | 100.00 | 3,150 | 45,212.8 | 100.00 |

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 24JUL01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------------|-----------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 36 | 516.7 | 3.43 |
| Oligochaeta | 1,510 | 21,673.4 | 85.17 | 844 | 12,114.2 | 80.38 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.29 |
| Cheumatopsyche | 6 | 86.1 | 0.34 | 7 | 100.5 | 0.67 |
| Berosus | 1 | 14.4 | 0.06 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.19 |
| Thienemannimyia grp. | 2 | 28.7 | 0.11 | 5 | 71.8 | 0.48 |
| Cricotopus bicinctus grp. | 2 | 28.7 | 0.11 | 2 | 28.7 | 0.19 |
| Cricotopus sylvestris grp. | 15 | 215.3 | 0.85 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 4 | 57.4 | 0.23 | 2 | 28.7 | 0.19 |
| Cryptochironomus | 61 | 875.5 | 3.44 | 14 | 200.9 | 1.33 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.19 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 9 | 129.2 | 0.86 |
| Glyptotendipes | 15 | 215.3 | 0.85 | 51 | 732.0 | 4.86 |
| Paracladopelma | 2 | 28.7 | 0.11 | 2 | 28.7 | 0.19 |
| Polypedilum flavum | 15 | 215.3 | 0.85 | 28 | 401.9 | 2.67 |
| Polypedilum illinoense | 4 | 57.4 | 0.23 | 32 | 459.3 | 3.05 |
| Polypedilum scalaenum grp. | 92 | 1,320.5 | 5.19 | 9 | 129.2 | 0.86 |
| Simulium | 19 | 272.7 | 1.07 | 2 | 28.7 | 0.19 |
| Corbicula fluminea | 15 | 215.3 | 0.85 | 0 | 0.0 | 0.00 |
| Musculium transversum | 10 | 143.5 | 0.56 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,773 | 25,448.3 | 100.00 | 1,050 | 15,070.9 | 100.00 |

APPENDIX A - 2001 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= WEST FORK NORTH BRANCH CHICAGO R.,
 LOCATION= DUNDEE RD.,
 STATION= 106,
 and DATE= 10AUG01

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 3 | 43.1 | 0.14 | 0 | 0.0 | 0.00 |
| Oligochaeta | 883 | 12,673.9 | 42.45 | 139 | 1,995.1 | 30.68 |
| Helobdella stagnalis | 3 | 43.1 | 0.14 | 0 | 0.0 | 0.00 |
| Erpobdella punctata punctata | 3 | 43.1 | 0.14 | 0 | 0.0 | 0.00 |
| Mooreobdella microstoma | 87 | 1,248.7 | 4.18 | 0 | 0.0 | 0.00 |
| Caecidotea | 57 | 818.1 | 2.74 | 1 | 14.4 | 0.22 |
| Procladius (Holotanypus) | 3 | 43.1 | 0.14 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 3 | 43.1 | 0.14 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.44 |
| Cryptochironomus | 3 | 43.1 | 0.14 | 2 | 28.7 | 0.44 |
| Dicrortendipes neomodestus | 3 | 43.1 | 0.14 | 4 | 57.4 | 0.88 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.44 |
| Polypedilum scalaenum grp. | 23 | 330.1 | 1.11 | 145 | 2,081.2 | 32.01 |
| Physella | 3 | 43.1 | 0.14 | 1 | 14.4 | 0.22 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.44 |
| Musculium transversum | 713 | 10,233.9 | 34.28 | 155 | 2,224.8 | 34.22 |
| Pisidium compressum | 293 | 4,205.5 | 14.09 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 2,080 | 29,854.8 | 100.00 | 453 | 6,502.0 | 100.00 |

WATERWAY= WEST FORK NORTH BRANCH CHICAGO R.,
 LOCATION= GOLF RD.,
 STATION= 103,
 and DATE= 17AUG01

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 10 | 143.5 | 0.22 | 0 | 0.0 | 0.00 |
| Oligochaeta | 4,320 | 62,006.1 | 93.51 | 203 | 2,913.7 | 87.88 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 8 | 114.8 | 3.46 |
| Chironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.87 |
| Glyptotendipes | 150 | 2,153.0 | 3.25 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 140 | 2,009.5 | 3.03 | 0 | 0.0 | 0.00 |
| Amnicola | 0 | 0.0 | 0.00 | 7 | 100.5 | 3.03 |
| Musculium | 0 | 0.0 | 0.00 | 10 | 143.5 | 4.33 |
| Pisidium compressum | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.43 |
| TOTAL BENTHOS | 4,620 | 66,312.1 | 100.00 | 231 | 3,315.6 | 100.00 |

APPENDIX B

2002 CENTER AND NEAR SHORE HD AND PONAR DATA

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= CAL-SAG CHANNEL,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 05SEP02

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 5 | 17.9 | 0.16 | 5 | 17.9 | 0.14 |
| Turbellaria | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.28 |
| Oligochaeta | 165 | 592.0 | 5.13 | 640 | 2,296.4 | 18.02 |
| Caecidotea | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.14 |
| Gammarus fasciatus | 20 | 71.8 | 0.62 | 10 | 35.9 | 0.28 |
| Argia | 5 | 17.9 | 0.16 | 0 | 0.0 | 0.00 |
| Cyrtellus fraternus | 20 | 71.8 | 0.62 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.11 |
| Ablabesmyia mallochi | 30 | 107.6 | 0.93 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 260 | 932.9 | 8.09 | 14 | 50.2 | 0.39 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.23 |
| Dicrotendipes simpsoni | 1,050 | 3,767.5 | 32.66 | 252 | 904.2 | 7.10 |
| Glyptotendipes | 20 | 71.8 | 0.62 | 8 | 28.7 | 0.23 |
| Corbicula fluminea | 10 | 35.9 | 0.31 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 1,630 | 5,848.6 | 50.70 | 2,595 | 9,311.1 | 73.08 |
| TOTAL BENTHOS | 3,215 | 11,535.7 | 100.00 | 3,551 | 12,741.3 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 29AUG02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 47 | 168.6 | 3.99 | 130 | 466.5 | 1.56 |
| Oligochaeta | 1,050 | 3,767.5 | 89.21 | 7,610 | 27,305.3 | 91.47 |
| Ablabesmyia janta | 10 | 35.9 | 0.85 | 10 | 35.9 | 0.12 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Nanocladius distinctus | 10 | 35.9 | 0.85 | 50 | 179.4 | 0.60 |
| Dicrotendipes simpsoni | 50 | 179.4 | 4.25 | 430 | 1,542.9 | 5.17 |
| Parachironomus | 0 | 0.0 | 0.00 | 50 | 179.4 | 0.60 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Physella | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Menetus dilatatus | 3 | 10.8 | 0.25 | 10 | 35.9 | 0.12 |
| Corbicula fluminea | 7 | 25.1 | 0.59 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,177 | 4,223.2 | 100.00 | 8,320 | 29,852.9 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= DAMEN AVE.,
 STATION= 40,
 and DATE= 18AUG02

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1 | 3.6 | 0.04 | 0 | 0.0 | 0.00 |
| Turbellaria | 363 | 1,302.5 | 13.31 | 100 | 358.8 | 9.29 |
| Oligochaeta | 1,879 | 6,742.0 | 68.90 | 831 | 2,981.7 | 77.16 |
| Helobdella triserialis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.09 |
| Caecidotea | 1 | 3.6 | 0.04 | 3 | 10.8 | 0.28 |
| Gammarus fasciatus | 5 | 17.9 | 0.18 | 46 | 165.1 | 4.27 |
| Somatochlora | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.09 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.19 |
| Dicrotendipes simpsoni | 478 | 1,715.1 | 17.53 | 93 | 333.7 | 8.64 |
| TOTAL BENTHOS | 2,727 | 9,784.7 | 100.00 | 1,077 | 3,864.4 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 03SEP02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 35.9 | 0.11 | 0 | 0.0 | 0.00 |
| Turbellaria | 1,550 | 5,561.5 | 16.28 | 510 | 1,829.9 | 21.43 |
| Oligochaeta | 7,890 | 28,310.0 | 82.88 | 1,780 | 6,386.8 | 74.79 |
| Ablabesmyia janta | 10 | 35.9 | 0.11 | 2 | 7.2 | 0.08 |
| Dicratendipes simpsoni | 60 | 215.3 | 0.63 | 88 | 315.8 | 3.70 |
| TOTAL BENTHOS | 9,520 | 34,158.6 | 100.00 | 2,380 | 8,539.6 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 11SEP02

| TAXA | CENTER | | | SIDE | | |
|-------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1 | 3.6 | 0.21 | 0 | 0.0 | 0.00 |
| Turbellaria | 321 | 1,151.8 | 67.01 | 90 | 322.9 | 2.68 |
| Oligochaeta | 111 | 398.3 | 23.17 | 3,100 | 11,123.1 | 92.26 |
| Glossiphoniidae | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.30 |
| Helobdella stagnalis | 10 | 35.9 | 2.09 | 0 | 0.0 | 0.00 |
| Mooreobdella microstoma | 1 | 3.6 | 0.21 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 8 | 28.7 | 1.67 | 40 | 143.5 | 1.19 |
| Ablabesmyia mallochi | 8 | 28.7 | 1.67 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 60 | 215.3 | 1.79 |
| Dicratendipes simpsoni | 9 | 32.3 | 1.88 | 60 | 215.3 | 1.79 |
| Polypedilum flavum | 1 | 3.6 | 0.21 | 0 | 0.0 | 0.00 |
| Ferrissia | 5 | 17.9 | 1.04 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 3 | 10.8 | 0.63 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 1 | 3.6 | 0.21 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 479 | 1,718.7 | 100.00 | 3,360 | 12,056.0 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 03SEP02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|-----------|--------|--------|-----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 100 | 358.8 | 0.20 | 0 | 0.0 | 0.00 |
| Oligochaeta | 400 | 1,435.2 | 0.81 | 400 | 1,435.2 | 1.25 |
| Cyrrnellus fraternus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.00 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 100 | 358.8 | 0.31 |
| Dicratendipes simpsoni | 300 | 1,076.4 | 0.60 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 48,800 | 175,098.7 | 98.39 | 31,400 | 112,665.9 | 98.43 |
| TOTAL BENTHOS | 49,600 | 177,969.1 | 100.00 | 31,901 | 114,463.6 | 100.00 |

WATERWAY= CHICAGO R.,
 LOCATION= LAKE SHORE DR.,
 STATION= 74,
 and DATE= 02AUG02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|-------|-------|------|-------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1 | 3.6 | 0.26 | 1 | 3.6 | 0.84 |
| Planatella | 1 | 3.6 | 0.26 | 0 | 0.0 | 0.00 |
| Oligochaeta | 138 | 495.2 | 35.94 | 5 | 17.9 | 4.20 |
| Gammarus fasciatus | 191 | 685.3 | 49.74 | 89 | 319.3 | 74.79 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.84 |
| Hydroptila | 1 | 3.6 | 0.26 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 11 | 39.5 | 2.86 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 3 | 10.8 | 0.78 | 0 | 0.0 | 0.00 |
| Heterotrissociadius | 1 | 3.6 | 0.26 | 0 | 0.0 | 0.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= CHICAGO R.,
LOCATION= LAKE SHORE DR.,
STATION= 74 (cont.),
and DATE= 02AUG02

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|------------|----------------|---------------|------------|--------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Chironomus | 4 | 14.4 | 1.04 | 1 | 3.6 | 0.84 |
| Cladopelma | 4 | 14.4 | 1.04 | 1 | 3.6 | 0.84 |
| Cryptochironomus | 1 | 3.6 | 0.26 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.68 |
| Dicrotendipes simpsoni | 5 | 17.9 | 1.30 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 4 | 14.4 | 1.04 | 0 | 0.0 | 0.00 |
| Parachironomus | 7 | 25.1 | 1.82 | 2 | 7.2 | 1.68 |
| Polypedilum halterale grp. | 12 | 43.1 | 3.13 | 6 | 21.5 | 5.04 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 11 | 39.5 | 9.24 |
| TOTAL BENTHOS | 384 | 1,377.8 | 100.00 | 119 | 427.0 | 100.00 |

WATERWAY= CHICAGO R.,
LOCATION= WELLS ST.,
STATION= 100,
and DATE= 21AUG02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 889 | 3,189.8 | 93.88 | 274 | 983.1 | 86.98 |
| Gammarus fasciatus | 21 | 75.3 | 2.22 | 32 | 114.8 | 10.16 |
| Ablabesmyia mallochii | 2 | 7.2 | 0.21 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1 | 3.6 | 0.11 | 0 | 0.0 | 0.00 |
| Chironomus | 5 | 17.9 | 0.53 | 1 | 3.6 | 0.32 |
| Dicrotendipes neomodestus | 1 | 3.6 | 0.11 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 19 | 68.2 | 2.01 | 5 | 17.9 | 1.59 |
| Glyptotendipes | 1 | 3.6 | 0.11 | 0 | 0.0 | 0.00 |
| Microchironomus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.32 |
| Parachironomus | 6 | 21.5 | 0.63 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 1 | 3.6 | 0.11 | 2 | 7.2 | 0.63 |
| Xenochironomus xenolabis | 1 | 3.6 | 0.11 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 947 | 3,397.9 | 100.00 | 315 | 1,130.2 | 100.00 |

WATERWAY= DES PLAINES R.,
LOCATION= LAKE COOK RD.,
STATION= 13,
and DATE= 25JUL02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|---------|-------|------|---------|------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.06 |
| Turbellaria | 10 | 35.9 | 0.46 | 10 | 35.9 | 0.06 |
| Oligochaeta | 20 | 71.8 | 0.92 | 110 | 394.7 | 0.62 |
| Gammarus fasciatus | 44 | 157.9 | 2.02 | 680 | 2,439.9 | 3.82 |
| Isonychia | 24 | 86.1 | 1.10 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 50 | 179.4 | 2.30 | 0 | 0.0 | 0.00 |
| Leucrocota | 9 | 32.3 | 0.41 | 0 | 0.0 | 0.00 |
| Heptagenia | 1 | 3.6 | 0.05 | 10 | 35.9 | 0.06 |
| Stenacron | 36 | 129.2 | 1.65 | 40 | 143.5 | 0.22 |
| Stenonema integrum | 69 | 247.6 | 3.17 | 60 | 215.3 | 0.34 |
| Stenonema terminatum | 217 | 778.6 | 9.97 | 60 | 215.3 | 0.34 |
| Tricorythodes | 258 | 925.7 | 11.86 | 100 | 358.8 | 0.56 |
| Enallagma | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.06 |
| Cynnellus fraternus | 6 | 21.5 | 0.28 | 40 | 143.5 | 0.22 |
| Cheumatopsyche | 531 | 1,905.3 | 24.40 | 20 | 71.8 | 0.11 |
| Hydropsyche simulans | 35 | 125.6 | 1.61 | 0 | 0.0 | 0.00 |
| Hydropsyche bidens | 47 | 168.6 | 2.16 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 4 | 14.4 | 0.18 | 0 | 0.0 | 0.00 |
| Potamyia flava | 38 | 136.3 | 1.75 | 0 | 0.0 | 0.00 |
| Laccophilus maculosus | 1 | 3.6 | 0.05 | 40 | 143.5 | 0.22 |
| Macronychus glabratus | 2 | 7.2 | 0.09 | 20 | 71.8 | 0.11 |
| Stenelmis crenata grp. | 14 | 50.2 | 0.64 | 110 | 394.7 | 0.62 |
| Ablabesmyia janta | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| Nilotanypus fimbriatus | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13 (cont.),
 and DATE= 25JUL02

| TAXA (cont.) | CENTER | | | SIDE | | |
|--------------------------------------|--------------|----------------|---------------|---------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Thienemannimyia grp. | 55 | 197.3 | 2.53 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 47 | 168.6 | 2.16 | 0 | 0.0 | 0.00 |
| Nanocladius crassicornus/rectinervis | 23 | 82.5 | 1.06 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 23 | 82.5 | 1.06 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 16 | 57.4 | 0.74 | 16,320 | 58,557.6 | 91.69 |
| Polypedilum flavum | 86 | 308.6 | 3.95 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 16 | 57.4 | 0.74 | 160 | 574.1 | 0.90 |
| Cladotanytarsus mancus grp. | 16 | 57.4 | 0.74 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 454 | 1,629.0 | 20.86 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 2,176 | 7,807.7 | 100.00 | 17,800 | 63,868.0 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 30JUL02

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------------|-----------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1,130 | 4,054.5 | 21.52 | 473 | 1,697.2 | 14.18 |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.03 |
| Oligochaeta | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.15 |
| Baetis intercalaris | 70 | 251.2 | 1.33 | 116 | 416.2 | 3.48 |
| Tricorythodes | 10 | 35.9 | 0.19 | 7 | 25.1 | 0.21 |
| Trepobates | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.03 |
| Cheumatopsyche | 810 | 2,906.4 | 15.43 | 733 | 2,630.1 | 21.98 |
| Hydropsyche | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.03 |
| Hydropsyche orris | 90 | 322.9 | 1.71 | 52 | 186.6 | 1.56 |
| Hydropsyche simulans | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.12 |
| Hydropsyche bidens | 10 | 35.9 | 0.19 | 1 | 3.6 | 0.03 |
| Ceratopsyche morosa | 10 | 35.9 | 0.19 | 11 | 39.5 | 0.33 |
| Petrophila | 0 | 0.0 | 0.00 | 9 | 32.3 | 0.27 |
| Stenelmis crenata grp. | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.15 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 19 | 68.2 | 0.57 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 19 | 68.2 | 0.57 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 38 | 136.3 | 1.14 |
| Polypedilum flavum | 3,110 | 11,159.0 | 59.24 | 1,840 | 6,602.1 | 55.17 |
| Musculium | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 5,250 | 18,837.5 | 100.00 | 3,335 | 11,966.3 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 26JUL02

| TAXA | CENTER | | | SIDE | | |
|-------------------------|--------|-------|-------|------|-------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 36 | 129.2 | 4.05 | 0 | 0.0 | 0.00 |
| Oligochaeta | 42 | 150.7 | 4.73 | 120 | 430.6 | 95.24 |
| Caecidotea | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.79 |
| Baetis intercalaris | 26 | 93.3 | 2.93 | 0 | 0.0 | 0.00 |
| Leucrocota | 18 | 64.6 | 2.03 | 0 | 0.0 | 0.00 |
| Stenonema terminatum | 14 | 50.2 | 1.58 | 0 | 0.0 | 0.00 |
| Tricorythodes | 14 | 50.2 | 1.58 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 112 | 401.9 | 12.61 | 0 | 0.0 | 0.00 |
| Hydropsyche betteni | 6 | 21.5 | 0.68 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 10 | 35.9 | 1.13 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 2 | 7.2 | 0.23 | 1 | 3.6 | 0.79 |
| Chironomidae | 0 | 0.0 | 0.00 | 4 | 14.4 | 3.17 |
| Ablabesmyia mallochii | 6 | 21.5 | 0.68 | 0 | 0.0 | 0.00 |
| Nilotanyptus fimbriatus | 6 | 21.5 | 0.68 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 40 | 143.5 | 4.50 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 6 | 21.5 | 0.68 | 0 | 0.0 | 0.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22 (cont.),
 and DATE= 26JUL02

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Cricotopus tremulus grp. | 6 | 21.5 | 0.68 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 132 | 473.6 | 14.86 | 0 | 0.0 | 0.00 |
| Nanocladus distinctus | 26 | 93.3 | 2.93 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 6 | 21.5 | 0.68 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 14 | 50.2 | 1.58 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 304 | 1,090.8 | 34.23 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 14 | 50.2 | 1.58 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 20 | 71.8 | 2.25 | 0 | 0.0 | 0.00 |
| Stenochironomus | 14 | 50.2 | 1.58 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 14 | 50.2 | 1.58 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 888 | 3,186.2 | 100.00 | 126 | 452.1 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 22JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 114 | 409.0 | 11.00 | 38 | 136.3 | 43.18 |
| Oligochaeta | 23 | 82.5 | 2.22 | 9 | 32.3 | 10.23 |
| Mooreobdella microstoma | 2 | 7.2 | 0.19 | 1 | 3.6 | 1.14 |
| Caecidotea | 540 | 1,937.6 | 52.12 | 23 | 82.5 | 26.14 |
| Copelatus | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.14 |
| Laccophilus maculosus | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.14 |
| Tropisternus | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.14 |
| Thienemannimyia grp. | 12 | 43.1 | 1.16 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 50 | 179.4 | 4.83 | 5 | 17.9 | 5.68 |
| Cricotopus bicinctus grp. | 155 | 556.2 | 14.96 | 1 | 3.6 | 1.14 |
| Cricotopus trifascia grp. | 27 | 96.9 | 2.61 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 112 | 401.9 | 10.81 | 4 | 14.4 | 4.55 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.14 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 2 | 7.2 | 2.27 |
| Tipula | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.14 |
| Ferrissia | 1 | 3.6 | 0.10 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,036 | 3,717.3 | 100.00 | 88 | 315.8 | 100.00 |

WATERWAY= LITTLE CALUMET R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 16SEP02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 60 | 215.3 | 0.63 | 140 | 502.3 | 2.59 |
| Oligochaeta | 50 | 179.4 | 0.52 | 20 | 71.8 | 0.37 |
| Gammarus fasciatus | 160 | 574.1 | 1.67 | 130 | 466.5 | 2.41 |
| Argia | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.37 |
| Cyrrnellus fraternus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.37 |
| Ablabesmyia janta | 10 | 35.9 | 0.10 | 40 | 143.5 | 0.74 |
| Nanocladus distinctus | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.56 |
| Dicrotendipes simpsoni | 400 | 1,435.2 | 4.18 | 470 | 1,686.4 | 8.70 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.37 |
| Menetus dilatatus | 170 | 610.0 | 1.78 | 30 | 107.6 | 0.56 |
| Ferrissia | 70 | 251.2 | 0.73 | 10 | 35.9 | 0.19 |
| Dreissena polymorpha | 8,640 | 31,001.1 | 90.38 | 4,470 | 16,038.8 | 82.78 |
| TOTAL BENTHOS | 9,560 | 34,302.1 | 100.00 | 5,400 | 19,375.7 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 29JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Turbellaria | 696 | 2,497.3 | 38.47 | 613 | 2,199.5 | 62.81 |
| Oligochaeta | 5 | 17.9 | 0.28 | 14 | 50.2 | 1.43 |
| Helobdella stagnalis | 1 | 3.6 | 0.06 | 1 | 3.6 | 0.10 |
| Placobdella | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Mooreobdella microstoma | 1 | 3.6 | 0.06 | 1 | 3.6 | 0.10 |
| Caecidotea | 970 | 3,480.4 | 53.62 | 213 | 764.3 | 21.82 |
| Stenacron | 34 | 122.0 | 1.88 | 47 | 168.6 | 4.82 |
| Corixidae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Cheumatopsyche | 8 | 28.7 | 0.44 | 0 | 0.0 | 0.00 |
| Hydropsyche betteni | 6 | 21.5 | 0.33 | 0 | 0.0 | 0.00 |
| Hydroptila | 8 | 28.7 | 0.44 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Thienemanniya grp. | 13 | 46.6 | 0.72 | 2 | 7.2 | 0.20 |
| Thienemanniella xena | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 5 | 17.9 | 0.28 | 1 | 3.6 | 0.10 |
| Nanocladius distinctus | 2 | 7.2 | 0.11 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 8 | 28.7 | 0.44 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 12 | 43.1 | 0.66 | 13 | 46.6 | 1.33 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Glyptotendipes | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Polypedilum fallax grp. | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 26 | 93.3 | 1.44 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 2 | 7.2 | 0.11 | 10 | 35.9 | 1.02 |
| Polypedilum scalaenum grp. | 8 | 28.7 | 0.44 | 56 | 200.9 | 5.74 |
| Microsectra | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| TOTAL BENTHOS | 1,809 | 6,490.9 | 100.00 | 976 | 3,502.0 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 01AUG02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Turbellaria | 510 | 1,829.9 | 9.96 | 26 | 93.3 | 0.96 |
| Oligochaeta | 4,280 | 15,357.0 | 83.59 | 2,211 | 7,933.3 | 81.23 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Caecidotea | 30 | 107.6 | 0.59 | 11 | 39.5 | 0.40 |
| Gammarus fasciatus | 20 | 71.8 | 0.39 | 9 | 32.3 | 0.33 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.18 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.18 |
| Chironomus | 0 | 0.0 | 0.00 | 89 | 319.3 | 3.27 |
| Dicrotendipes simpsoni | 270 | 968.8 | 5.27 | 343 | 1,230.7 | 12.60 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.18 |
| Parachironomus | 10 | 35.9 | 0.20 | 9 | 32.3 | 0.33 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.26 |
| TOTAL BENTHOS | 5,120 | 18,371.0 | 100.00 | 2,722 | 9,766.8 | 100.00 |

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 31JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------|--------|----------|-------|-------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 3,420 | 12,271.3 | 66.41 | 1,082 | 3,882.3 | 64.18 |
| Oligochaeta | 1,680 | 6,028.0 | 32.62 | 368 | 1,320.4 | 21.83 |
| Caecidotea | 20 | 71.8 | 0.39 | 0 | 0.0 | 0.00 |
| Cyrrnellus fraternus | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |
| Thienemanniya grp. | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= TOUHY AVE.,
 STATION= 36 (cont.),
 and DATE= 31JUL02

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.36 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.71 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 18 | 64.6 | 1.07 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |
| Dicrotendipes simpsoni | 20 | 71.8 | 0.39 | 124 | 444.9 | 7.35 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.47 |
| Parachironomus | 0 | 0.0 | 0.00 | 50 | 179.4 | 2.97 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.59 |
| TOTAL BENTHOS | 5,150 | 18,478.7 | 100.00 | 1,686 | 6,049.5 | 100.00 |

WATERWAY= SOUTH BRANCH CHICAGO R.,
 LOCATION= LOOMIS ST.,
 STATION= 108,
 and DATE= 21AUG02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1 | 3.6 | 0.08 | 0 | 0.0 | 0.00 |
| Turbellaria | 621 | 2,228.2 | 51.41 | 98 | 351.6 | 6.84 |
| Oligochaeta | 160 | 574.1 | 13.25 | 975 | 3,498.4 | 68.04 |
| Helobdella stagnalis | 1 | 3.6 | 0.08 | 0 | 0.0 | 0.00 |
| Helobdella triserialis | 5 | 17.9 | 0.41 | 0 | 0.0 | 0.00 |
| Caecidotea | 72 | 258.3 | 5.96 | 3 | 10.8 | 0.21 |
| Gammarus fasciatus | 20 | 71.8 | 1.66 | 25 | 89.7 | 1.74 |
| Argia | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.21 |
| Potamya flava | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.21 |
| Dicrotendipes simpsoni | 324 | 1,162.5 | 26.82 | 319 | 1,144.6 | 22.26 |
| Glyptotendipes | 3 | 10.8 | 0.25 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.49 |
| Dreissena polymorpha | 1 | 3.6 | 0.08 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,208 | 4,334.4 | 100.00 | 1,433 | 5,141.7 | 100.00 |

WATERWAY= SOUTH BRANCH CHICAGO R.,
 LOCATION= MADISON ST.,
 STATION= 39,
 and DATE= 27AUG02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 3 | 10.8 | 0.11 | 1 | 3.6 | 0.16 |
| Turbellaria | 317 | 1,137.4 | 11.28 | 39 | 139.9 | 6.18 |
| Oligochaeta | 1,050 | 3,767.5 | 37.37 | 106 | 380.3 | 16.80 |
| Helobdella triserialis | 10 | 35.9 | 0.36 | 0 | 0.0 | 0.00 |
| Caecidotea | 247 | 886.3 | 8.79 | 34 | 122.0 | 5.39 |
| Gammarus fasciatus | 3 | 10.8 | 0.11 | 72 | 258.3 | 11.41 |
| Stenacron | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.16 |
| Nanocladius distinctus | 40 | 143.5 | 1.42 | 4 | 14.4 | 0.63 |
| Dicrotendipes simpsoni | 1,110 | 3,982.8 | 39.50 | 308 | 1,105.1 | 48.81 |
| Glyptotendipes | 10 | 35.9 | 0.36 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 10 | 35.9 | 0.36 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 10 | 35.9 | 0.36 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 8 | 28.7 | 1.27 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 40 | 143.5 | 6.34 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 18 | 64.6 | 2.85 |
| TOTAL BENTHOS | 2,810 | 10,082.5 | 100.00 | 631 | 2,264.1 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SOUTH FORK SOUTH BRANCH CHICAGO R.,
 LOCATION= ARCHER AVE.,
 STATION= 99,
 and DATE= 22AUG02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 35.9 | 0.18 | 1 | 3.6 | 0.10 |
| Oligochaeta | 3,430 | 12,307.1 | 61.03 | 794 | 2,848.9 | 76.49 |
| Helobdella triserialis | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.19 |
| Thienemanniomyia grp. | 20 | 71.8 | 0.36 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 2,150 | 7,714.4 | 38.26 | 237 | 850.4 | 22.83 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.19 |
| Parachironomus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.19 |
| Physella | 10 | 35.9 | 0.18 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 5,620 | 20,165.1 | 100.00 | 1,038 | 3,724.4 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 23JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 10 | 35.9 | 1.59 | 321 | 1,151.8 | 26.71 |
| Oligochaeta | 17 | 61.0 | 2.71 | 52 | 186.6 | 4.33 |
| Caecidotea | 0 | 0.0 | 0.00 | 9 | 32.3 | 0.75 |
| Stenacron | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.33 |
| Tricorythodes | 23 | 82.5 | 3.66 | 1 | 3.6 | 0.08 |
| Argia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.08 |
| Cheumatopsyche | 427 | 1,532.1 | 67.99 | 32 | 114.8 | 2.66 |
| Ablabesmyia mallochii | 2 | 7.2 | 0.32 | 8 | 28.7 | 0.67 |
| Thienemanniomyia grp. | 4 | 14.4 | 0.64 | 8 | 28.7 | 0.67 |
| Thienemanniella xena | 2 | 7.2 | 0.32 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 9 | 32.3 | 1.43 | 8 | 28.7 | 0.67 |
| Cricotopus bicinctus grp. | 2 | 7.2 | 0.32 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 7 | 25.1 | 1.11 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 7 | 25.1 | 1.11 | 15 | 53.8 | 1.25 |
| Chironomus | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.67 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.67 |
| Dicrotendipes neomodestus | 2 | 7.2 | 0.32 | 54 | 193.8 | 4.49 |
| Dicrotendipes simpsoni | 2 | 7.2 | 0.32 | 62 | 222.5 | 5.16 |
| Glyptotendipes | 4 | 14.4 | 0.64 | 203 | 728.4 | 16.89 |
| Polypedilum flavum | 85 | 305.0 | 13.54 | 70 | 251.2 | 5.82 |
| Polypedilum illinoense | 21 | 75.3 | 3.34 | 148 | 531.0 | 12.31 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 70 | 251.2 | 5.82 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 39 | 139.9 | 3.24 |
| Tanytarsus | 0 | 0.0 | 0.00 | 15 | 53.8 | 1.25 |
| Tanytarsus guerlus grp. | 4 | 14.4 | 0.64 | 23 | 82.5 | 1.91 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 39 | 139.9 | 3.24 |
| Ferrissia | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.33 |
| TOTAL BENTHOS | 628 | 2,253.3 | 100.00 | 1,202 | 4,312.9 | 100.00 |

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 24JUL02

| TAXA | CENTER | | | SIDE | | |
|-----------------------|--------|---------|------|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 90 | 322.9 | 1.28 | 50 | 179.4 | 1.92 |
| Plumatella | 1 | 3.6 | 0.01 | 1 | 3.6 | 0.04 |
| Oligochaeta | 118 | 423.4 | 1.67 | 290 | 1,040.5 | 11.13 |
| Argia | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.27 |
| Cheumatopsyche | 533 | 1,912.5 | 7.55 | 340 | 1,219.9 | 13.05 |
| Hydropsyche betteni | 20 | 71.8 | 0.28 | 17 | 61.0 | 0.65 |
| Hydropsyche bidens | 3 | 10.8 | 0.04 | 0 | 0.0 | 0.00 |
| Thienemanniomyia grp. | 390 | 1,399.4 | 5.53 | 87 | 312.2 | 3.34 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64 (cont.),
 and DATE= 24JUL02

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Thienemanniella xena | 100 | 358.8 | 1.42 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 100 | 358.8 | 1.42 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 680 | 2,439.9 | 9.64 | 113 | 405.5 | 4.34 |
| Cricotopus sylvestris grp. | 190 | 681.7 | 2.69 | 30 | 107.6 | 1.15 |
| Nanocladius distinctus | 1,740 | 6,243.3 | 24.66 | 720 | 2,583.4 | 27.63 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 30 | 107.6 | 1.15 |
| Dicrotendipes simpsoni | 290 | 1,040.5 | 4.11 | 200 | 717.6 | 7.67 |
| Glyptotendipes | 480 | 1,722.3 | 6.80 | 30 | 107.6 | 1.15 |
| Parachironomus | 0 | 0.0 | 0.00 | 57 | 204.5 | 2.19 |
| Polypedilum flavum | 190 | 681.7 | 2.69 | 87 | 312.2 | 3.34 |
| Polypedilum illinoense | 2,130 | 7,642.6 | 30.19 | 547 | 1,962.7 | 20.99 |
| TOTAL BENTHOS | 7,055 | 25,314.0 | 100.00 | 2,606 | 9,350.6 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= CAL-SAG CHANNEL,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 05SEP02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|-------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1 | 14.4 | 12.50 | 0 | 0.0 | 0.00 |
| Oligochaeta | 0 | 0.0 | 0.00 | 118 | 1,693.7 | 88.72 |
| Gammarus fasciatus | 1 | 14.4 | 12.50 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 5 | 71.8 | 62.50 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 43.1 | 2.26 |
| Dreissena polymorpha | 1 | 14.4 | 12.50 | 12 | 172.2 | 9.02 |
| TOTAL BENTHOS | 8 | 114.8 | 100.00 | 133 | 1,909.0 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 29AUG02

| TAXA | CENTER | | | SIDE | | |
|--------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 67 | 961.7 | 97.10 | 25 | 358.8 | 92.59 |
| Parachironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 7.41 |
| Corbicula fluminea | 2 | 28.7 | 2.90 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 69 | 990.4 | 100.00 | 27 | 387.5 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= DAMEN AVE.,
 STATION= 40,
 and DATE= 18AUG02

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.26 |
| Oligochaeta | 3,290 | 47,222.3 | 99.40 | 380 | 5,454.2 | 99.22 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.26 |
| Glyptotendipes | 10 | 143.5 | 0.30 | 0 | 0.0 | 0.00 |
| Parachironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.26 |
| Corbicula fluminea | 10 | 143.5 | 0.30 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 3,310 | 47,509.3 | 100.00 | 383 | 5,497.3 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 03SEP02

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.32 | 31 | 445.0 | 13.48 |
| Oligochaeta | 316 | 4,535.6 | 99.68 | 163 | 2,339.6 | 70.87 |
| Polypedilum scalænum grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.87 |
| Ferrissia | 0 | 0.0 | 0.00 | 34 | 488.0 | 14.78 |
| TOTAL BENTHOS | 317 | 4,550.0 | 100.00 | 230 | 3,301.3 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= LOCKPORT,
 STATION= 92, and DATE= 11SEP02

| TAXA | CENTER | | | SIDE | | |
|--------------------|--------|-----------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 3 | 43.1 | 10.71 |
| Oligochaeta | 8,830 | 126,739.4 | 99.89 | 25 | 358.8 | 89.29 |
| Corbicula fluminea | 10 | 143.5 | 0.11 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 8,840 | 126,882.9 | 100.00 | 28 | 401.9 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= ROUTE 83,
 STATION= 42, and DATE= 03SEP02

| TAXA | CENTER | | | SIDE | | |
|----------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 2 | 28.7 | 4.88 | 0 | 0.0 | 0.00 |
| Oligochaeta | 37 | 531.1 | 90.24 | 21 | 301.4 | 100.00 |
| Caecidotea | 1 | 14.4 | 2.44 | 0 | 0.0 | 0.00 |
| Ablabesmyia mallochi | 1 | 14.4 | 2.44 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 41 | 588.5 | 100.00 | 21 | 301.4 | 100.00 |

WATERWAY= CHICAGO SANITARY AND SHIP CANAL,
 LOCATION= STEPHEN ST.,
 STATION= 48, and DATE= 11SEP02

| TAXA | CENTER | | | SIDE | | |
|----------------------|--------|------|---|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | — | 7 | 100.5 | 30.43 |
| Oligochaeta | 0 | 0.0 | — | 3 | 43.1 | 13.04 |
| Glossiphoniidae | 0 | 0.0 | — | 2 | 28.7 | 8.70 |
| Cryptochironomus | 0 | 0.0 | — | 2 | 28.7 | 8.70 |
| Corbicula fluminea | 0 | 0.0 | — | 1 | 14.4 | 4.35 |
| Dreissena polymorpha | 0 | 0.0 | — | 8 | 114.8 | 34.78 |
| TOTAL BENTHOS | 0 | 0.0 | — | 23 | 330.1 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= 130TH ST.,
 STATION= 55, and DATE= 03SEP02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 96 | 1,377.9 | 80.67 | 17 | 244.0 | 26.56 |
| Caecidotea | 0 | 0.0 | 0.00 | 16 | 229.7 | 25.00 |
| Procladius (Holotanypus) | 2 | 28.7 | 1.68 | 0 | 0.0 | 0.00 |
| Coelotanypus | 3 | 43.1 | 2.52 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 1 | 14.4 | 0.84 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 1 | 14.4 | 0.84 | 1 | 14.4 | 1.56 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.56 |
| Ammicula | 1 | 14.4 | 0.84 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 15 | 215.3 | 12.61 | 29 | 416.2 | 45.31 |
| TOTAL BENTHOS | 119 | 1,708.0 | 100.00 | 64 | 918.6 | 100.00 |

WATERWAY= CHICAGO R.,
 LOCATION= LAKE SHORE DR.,
 STATION= 74, and DATE= 02AUG02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 885 | 12,702.6 | 100.00 | 223 | 3,200.8 | 92.53 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.41 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.41 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 3 | 43.1 | 1.24 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 13 | 186.6 | 5.39 |
| TOTAL BENTHOS | 885 | 12,702.6 | 100.00 | 241 | 3,459.1 | 100.00 |

WATERWAY= CHICAGO R.,
 LOCATION= WELLS ST.,
 STATION= 100, and DATE= 21AUG02

| TAXA | CENTER | | | SIDE | | |
|----------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 169 | 2,425.7 | 100.00 | 180 | 2,583.6 | 99.45 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.55 |
| TOTAL BENTHOS | 169 | 2,425.7 | 100.00 | 181 | 2,597.9 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13, and DATE= 25JUL02

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------------|-----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 60 | 861.2 | 1.88 | 590 | 8,468.4 | 88.19 |
| Gammarus | 17 | 244.0 | 0.53 | 1 | 14.4 | 0.15 |
| Tricorythodes | 20 | 287.1 | 0.63 | 0 | 0.0 | 0.00 |
| Hexagenia bilineata | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Potamyia flava | 3 | 43.1 | 0.09 | 0 | 0.0 | 0.00 |
| Dubiraphia | 17 | 244.0 | 0.53 | 1 | 14.4 | 0.15 |
| Stenelmis crenata grp. | 23 | 330.1 | 0.72 | 7 | 100.5 | 1.05 |
| Procladius (Holotanypus) | 50 | 717.7 | 1.57 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 150 | 2,153.0 | 4.71 | 0 | 0.0 | 0.00 |
| Chironomus | 150 | 2,153.0 | 4.71 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 100 | 1,435.3 | 3.14 | 6 | 86.1 | 0.90 |
| Dicrotendipes neomodestus | 350 | 5,023.6 | 10.98 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 50 | 717.7 | 1.57 | 12 | 172.2 | 1.79 |
| Paracladopelma | 50 | 717.7 | 1.57 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 50 | 717.7 | 1.57 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 450 | 6,459.0 | 14.12 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 50 | 717.7 | 1.57 | 0 | 0.0 | 0.00 |
| Tanytarsus | 1,540 | 22,104.0 | 48.32 | 37 | 531.1 | 5.53 |
| Corbicula fluminea | 57 | 818.1 | 1.79 | 14 | 200.9 | 2.09 |
| TOTAL BENTHOS | 3,187 | 45,743.9 | 100.00 | 669 | 9,602.3 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91, and DATE= 30JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 294 | 4,219.9 | 90.74 | 461 | 6,616.9 | 93.70 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.61 |
| Mooreobdella microstoma | 1 | 14.4 | 0.31 | 7 | 100.5 | 1.42 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Orconectes virilis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Baetis intercalaris | 1 | 14.4 | 0.31 | 0 | 0.0 | 0.00 |
| Tricorythodes | 1 | 14.4 | 0.31 | 0 | 0.0 | 0.00 |
| Corixidae | 9 | 129.2 | 2.78 | 3 | 43.1 | 0.61 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 5 | 71.8 | 1.02 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.41 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Polypedilum scalaenum grp. | 6 | 86.1 | 1.85 | 3 | 43.1 | 0.61 |
| Corbicula fluminea | 12 | 172.2 | 3.70 | 3 | 43.1 | 0.61 |
| Musculium transversum | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| TOTAL BENTHOS | 324 | 4,650.5 | 100.00 | 492 | 7,061.8 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22, and DATE= 26JUL02

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 93 | 1,334.9 | 43.26 | 271 | 3,889.7 | 95.09 |
| Mooreobdella microstoma | 1 | 14.4 | 0.47 | 0 | 0.0 | 0.00 |
| Tricorythodes | 1 | 14.4 | 0.47 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Potamyia flava | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Stenelmis | 5 | 71.8 | 2.33 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 9 | 129.2 | 3.16 |
| Ablabesmyia mallochi | 2 | 28.7 | 0.93 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 3 | 43.1 | 1.05 |
| Polypedilum scalaenum grp. | 44 | 631.5 | 20.47 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 1 | 14.4 | 0.47 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 68 | 976.0 | 31.63 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 215 | 3,086.0 | 100.00 | 285 | 4,090.7 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78, and DATE= 22JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 5 | 71.8 | 3.52 | 0 | 0.0 | 0.00 |
| Oligochaeta | 30 | 430.6 | 21.13 | 56 | 803.8 | 29.79 |
| Caecidotea | 18 | 258.4 | 12.68 | 2 | 28.7 | 1.06 |
| Cricotopus tremulus grp. | 5 | 71.8 | 3.52 | 10 | 143.5 | 5.32 |
| Cricotopus bicinctus grp. | 19 | 272.7 | 13.38 | 64 | 918.6 | 34.04 |
| Cricotopus trifascia grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 1.06 |
| Cricotopus sylvestris grp. | 40 | 574.1 | 28.17 | 46 | 660.3 | 24.47 |
| Chironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 1.06 |
| Dicrotendipes neomodestus | 16 | 229.7 | 11.27 | 6 | 86.1 | 3.19 |
| Glyptotendipes | 5 | 71.8 | 3.52 | 0 | 0.0 | 0.00 |
| Microtendipes | 2 | 28.7 | 1.41 | 0 | 0.0 | 0.00 |
| Tanytarsus | 2 | 28.7 | 1.41 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 142 | 2,038.2 | 100.00 | 188 | 2,698.4 | 100.00 |

WATERWAY= LITTLE CALUMET R.,
 LOCATION= HALSTED ST.,
 STATION= 76, and DATE= 16SEP02

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 27 | 387.5 | 90.00 | 57 | 818.1 | 87.69 |
| Gammarus fasciatus | 1 | 14.4 | 3.33 | 0 | 0.0 | 0.00 |
| Chironomidae | 1 | 14.4 | 3.33 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 3 | 43.1 | 4.62 |
| Corbicula fluminea | 1 | 14.4 | 3.33 | 5 | 71.8 | 7.69 |
| TOTAL BENTHOS | 30 | 430.6 | 100.00 | 65 | 933.0 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= ALBANY AVE.,
 STATION= 96, and DATE= 29JUL02

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|------|----|------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | -- | -- | -- | 21 | 301.4 | 2.82 |
| Helobdella stagnalis | -- | -- | -- | 8 | 114.8 | 1.07 |
| Erpobdella punctata punctata | -- | -- | -- | 9 | 129.2 | 1.21 |
| Mooreobdella microstoma | -- | -- | -- | 100 | 1,435.3 | 13.42 |
| Caecidotea | -- | -- | -- | 77 | 1,105.2 | 10.34 |
| Stenelmis | -- | -- | -- | 1 | 14.4 | 0.13 |
| Cricotopus bicinctus grp. | -- | -- | -- | 3 | 43.1 | 0.40 |
| Cryptochironomus | -- | -- | -- | 1 | 14.4 | 0.13 |
| Dicrotendipes neomodestus | -- | -- | -- | 16 | 229.7 | 2.15 |
| Polypedilum flavum | -- | -- | -- | 1 | 14.4 | 0.13 |
| Polypedilum scalaenum grp. | -- | -- | -- | 7 | 100.5 | 0.94 |
| Paratanytarsus | -- | -- | -- | 1 | 14.4 | 0.13 |
| Tanytarsus glabrescens grp. | -- | -- | -- | 1 | 14.4 | 0.13 |
| Amnicola | -- | -- | -- | 3 | 43.1 | 0.40 |
| Musculium transversum | -- | -- | -- | 493 | 7,076.2 | 66.17 |
| Pisidium nitidum | -- | -- | -- | 3 | 43.1 | 0.40 |
| TOTAL BENTHOS | -- | -- | -- | 745 | 10,693.2 | 100.00 |

WATERWAY= NORTH BRANCH CHICAGO R.,
 LOCATION= GRAND AVE., STATION= 46, and DATE= 01AUG02

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 983 | 14,109.3 | 99.29 | 5,430 | 77,938.3 | 100.00 |
| Procladius (Holotanypus) | 2 | 28.7 | 0.20 | 0 | 0.0 | 0.00 |
| Parachironomus | 1 | 14.4 | 0.10 | 0 | 0.0 | 0.00 |
| Musculium transversum | 4 | 57.4 | 0.40 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 990 | 14,209.7 | 100.00 | 5,430 | 77,938.3 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= NORTH SHORE CHANNEL,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 31JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|-----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 176 | 2,526.2 | 36.97 |
| Oligochaeta | 55,800 | 800,912.4 | 100.00 | 147 | 2,109.9 | 30.88 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.42 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.63 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 7 | 100.5 | 1.47 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 10 | 143.5 | 2.10 |
| Parachironomus | 0 | 0.0 | 0.00 | 131 | 1,880.3 | 27.52 |
| TOTAL BENTHOS | 55,800 | 800,912.4 | 100.00 | 476 | 6,832.2 | 100.00 |

WATERWAY= SOUTH BRANCH CHICAGO R.,
 LOCATION= LOOMIS ST.,
 STATION= 108,
 and DATE= 21AUG02

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|-------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 64 | 918.6 | 96.97 | 342 | 4,908.8 | 94.21 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 6 | 86.1 | 1.65 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Corbicula fluminea | 2 | 28.7 | 3.03 | 8 | 114.8 | 2.20 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 5 | 71.8 | 1.38 |
| TOTAL BENTHOS | 66 | 947.3 | 100.00 | 363 | 5,210.2 | 100.00 |

WATERWAY= SOUTH BRANCH CHICAGO R.,
 LOCATION= MADISON ST.,
 STATION= 39,
 and DATE= 27AUG02

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 8 | 114.8 | 2.57 |
| Oligochaeta | 212 | 3,042.9 | 98.15 | 9 | 129.2 | 2.89 |
| Caecidotea | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.32 |
| Procladius (Holotanypus) | 1 | 14.4 | 0.46 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.64 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.96 |
| Polypedilum illinoense | 1 | 14.4 | 0.46 | 0 | 0.0 | 0.00 |
| Musculium transversum | 1 | 14.4 | 0.46 | 0 | 0.0 | 0.00 |
| Pisidium nitidum | 1 | 14.4 | 0.46 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 288 | 4,133.7 | 92.60 |
| TOTAL BENTHOS | 216 | 3,100.3 | 100.00 | 311 | 4,463.9 | 100.00 |

WATERWAY= SOUTH FORK SOUTH BRANCH CHICAGO R.,
 LOCATION= ARCHER AVE.,
 STATION= 99,
 and DATE= 22AUG02

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.68 | 0 | 0.0 | 0.00 |
| Oligochaeta | 142 | 2,038.2 | 96.60 | 250 | 3,588.3 | 100.00 |
| Procladius (Holotanypus) | 4 | 57.4 | 2.72 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 147 | 2,109.9 | 100.00 | 250 | 3,588.3 | 100.00 |

APPENDIX B - 2002 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 23JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Oligochaeta | 43 | 617.2 | 40.57 | 310 | 4,449.5 | 86.59 |
| Dubiraphia | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.84 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 29 | 416.2 | 8.10 |
| Cricotopus sylvestris grp. | 19 | 272.7 | 17.92 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 10 | 143.5 | 2.79 |
| Cryptochironomus | 19 | 272.7 | 17.92 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 5 | 71.8 | 1.40 |
| Polypedilum flavum | 19 | 272.7 | 17.92 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 6 | 86.1 | 5.66 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 106 | 1,521.4 | 100.00 | 358 | 5,138.5 | 100.00 |

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 24JUL02

| TAXA | CENTER | | | SIDE | | |
|----------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 420 | 6,028.4 | 21.00 | 230 | 3,301.3 | 95.44 |
| Hydropsychidae | 30 | 430.6 | 1.50 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.41 |
| Chironomidae | 1,550 | 22,247.6 | 77.50 | 10 | 143.5 | 4.15 |
| TOTAL BENTHOS | 2,000 | 28,706.5 | 100.00 | 241 | 3,459.1 | 100.00 |

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 07-47

*A STUDY OF THE BENTHIC MACROINVERTEBRATE COMMUNITY
IN SELECTED CHICAGO METROPOLITAN AREA WATERWAYS*

DURING 2003 AND 2004

Prepared By

EA Engineering, Science, and Technology, Inc.

JULY 2007

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-2803 (312) 751-5600

**A STUDY OF THE BENTHIC MACROINVERTEBRATE COMMUNITY
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June 2006

**Research and Development Department
Louis Kollias, Director**

July 2007



**A STUDY OF THE
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Prepared for:

Metropolitan Water Reclamation District of Greater Chicago
Research and Development Department

Prepared by:

EA Engineering, Science, and Technology, Inc.
444 Lake Cook Road, Suite 18
Deerfield, IL 60015

June 2006

EA-Project 61755-01

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EA Project 61755.01

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1. INTRODUCTION

The Upper Illinois River watershed consists of several natural, constructed, and altered waterways and their tributaries. The major waterways of the Chicago Metropolitan Area within the Upper Illinois River watershed include, in part, the Calumet River, Calumet-Sag Channel, North Branch of the Chicago River, South Branch of the Chicago River, Chicago Sanitary and Ship Canal, and Des Plaines River. Through their comprehensive ambient water quality monitoring program (AWQM), the Metropolitan Water Reclamation District of Greater Chicago (District) has collected a substantial amount of physicochemical and biological data describing the condition of these waterways since 1972. These data provide the Illinois Environmental Protection Agency (IEPA) with current information to assess the quality of the waterways within the District's service area as well as offering the unique opportunity to examine trends via the District's long-term database.

In an effort to support and strengthen their AWQM program, the District has implemented an ancillary monitoring program to evaluate the biological resources, sediment quality, and habitat condition on waterways within their service area. As part of this initiative, a benthic macroinvertebrate sampling program began in 2001 to collect samples at established stations in five watersheds: North Branch Chicago River, South Branch Chicago River and Chicago Sanitary and Ship Canal, Calumet River, Fox River, and Des Plaines River. Each of these watersheds will be sampled on a four-year rotation. In addition to the target watersheds, a core group of stations throughout the District's service area will be evaluated annually. The first two primary watersheds sampled were the North Branch Chicago River (2001) and the South Branch Chicago River and Chicago Sanitary and Ship Canal (2002) (EA 2004). This report presents the study design and benthic macroinvertebrate data for the 2003 and 2004 program years.

2. METHODS

For the 2003 and 2004 studies, benthic macroinvertebrates were monitored at 24 and 32 stations respectively in the Chicago Metropolitan Area waterways. Of these stations, 15 were sampled during both years. In 2003, benthic macroinvertebrate samples were collected at 24 stations in the Calumet River, Grand Calumet River, Little Calumet River, Calumet-Sag Channel, North Branch of the Chicago River, Chicago Sanitary and Ship Canal, Des Plaines River, West Branch of the DuPage River, Higgins Creek, North Shore Channel, Salt Creek, Thorn Creek, and Wolf Lake Drainage Channel waterways (Table 2-1). During 2004, benthic macroinvertebrates were monitored at 32 stations in the aforementioned 2003 waterways (excluding the Wolf Lake Drainage Channel) as well as in the Buffalo Creek and Poplar Creek waterways (Table 2-2). Figure 2-1 presents the benthic macroinvertebrate sampling locations for the District's ambient water quality program.

Field sampling was conducted by District personnel using a combination of Hester-Dendy (HD) artificial substrates and Ponar grabs. Each HD sampler consisted of nine, three-inch square plates with uniform spacing. The total surface area of one HD sampler, excluding the bolt and spacers was 0.031 m². At each location, a group of three HD samplers (sampler array) were deployed near shore in the littoral zone and an additional group of three samplers was deployed mid-channel of the waterway. Each HD sampler array was constructed of a 10-16" length of 2" diameter transparent, schedule 80 PVC pipe secured to the top of an 18 pound river anchor by placing a ¼" stainless steel bolt through the anchor eye and two holes drilled in the pipe (Figure 2-2). Three-inch stainless steel eyebolts are located radially, approximately 120 degrees apart, through holes drilled one-inch from the top of the PVC pipe. The HD arrays were suspended from the eyebolts approximately 12-18" off the bottom using nylon cable ties. One cable was used to anchor both arrays to a structure on shore.

The two HD sampler arrays at each station were retrieved by using the shore-attachment cable to lift the samplers into a custom-made dipnet with an attached plankton bucket. The mesh size of both the dipnet and plankton bucket was Standard Testing No. 60 (250 µ) mesh (Figure 2-3). The cable tie connecting each H-D sampler to the anchoring system was cut and each sampler was placed, fully assembled into a one-gallon plastic sample pail. The dipnet was thoroughly rinsed with river water and contents of the plankton bucket were transferred to the sample pail. The contents of each sample pail were fixed with approximately 5% formalin before the lid was attached. Deployment and retrieval dates for the HD samples in each watershed were as follows:

| <u>Watershed</u> | <u>2003</u> | |
|----------------------------|-------------------|----------------------|
| | <u>Deployed</u> | <u>Retrieved</u> |
| Calumet River | 16 May – 6 June | 1 July - 8 September |
| North Branch Chicago River | 20-27 May | 23 July – 6 August |
| CSSC | 21-22 May | 18-29 July |
| Des Plaines River | 29 April – 19 May | 9-27 June |

Table 2-1. Description of benthic macroinvertebrate monitoring stations sampled during 2003. Stations arranged by major watershed, upstream to downstream within each waterway. Highlighted stations were sampled every year during the 2001-2004 study period

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description |
|---------------|--------------------|----------------------------|---------------------------------|---|
| Calumet River | 49- Ewing Ave. | Calumet River | 41° 43.683' N 87° 32.536' W | 50' upstream of Ewing Ave. (30' from east bank and center channel) |
| | 55- 130th St. | Calumet River | 41° 39' 33.9" N 87° 34' 20.1" W | 50' upstream of 130th St. (40' from east bank and center channel) |
| | 50- 126th St. | Wolf Lake Drainage Channel | 41° 39.878' N 87° 32.330' W | 100' upstream of 126th St. (10' from east bank and center channel) |
| | 86- Burnham Ave. | Grand Calumet River | 41° 37.870' N 87° 32.352' W | 200' west of Norfolk & Western Railroad bridge (10' from south bank and center channel) |
| | 54- Joe Orr Rd. | Thorn Creek | 41° 32.250' N 87° 37.522' W | 200' upstream of Joe Orr Rd. (5' from east bank and center channel) |
| | 97- 170th St. | Thorn Creek | 41° 31.250' N 87° 37.522' W | 150' upstream of 170th St. (10' from east bank and center channel) |
| | 52- Wentworth Ave. | Little Calumet River | 41° 35.131' N 87° 31.792' W | 150' upstream of Wentworth Ave. (5' from north bank and center channel) |
| | 57- Ashland Ave. | Little Calumet River | 41° 39.099' N 87° 39.633' W | 400' upstream of Ashland Ave. (15' from south bank and center channel) |
| | 76- Halsfed St. | Little Calumet River | 41° 39' 25.9" N 87° 38' 27.3" W | 20' upstream of Halsfed St. (20' from south bank and center channel) |
| | 56- Indiana Ave. | Little Calumet River | 41° 39.136' N 87° 35.828' W | 30' upstream of Indiana Ave. (20' from north bank and center channel) |
| | 58- Ashland Ave. | Calumet-Sag Channel | 41° 39.312' N 87° 39.640' W | 200' upstream of Ashland Ave. (15' from south bank and center channel) |
| | 59- Cicero Ave. | Calumet-Sag Channel | 41° 35' 19.4" N 87° 44' 15.6" W | 150' upstream of Cicero Ave. (30' from north bank and center channel) |
| | 43- Route 83 | Calumet-Sag Channel | 41° 41.790' N 87° 56.480' W | 1000' upstream of Route 83 (20' from south bank and center channel) |

2-2

(1) CSSC= Chicago Sanitary and Ship Canal

Table 2-1 - Continued

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description |
|----------------------------|--------------------------|---------------------------------|-------------------------------|---|
| North Branch Chicago River | 36- Touhy Ave. | N. Shore Channel | 42°00'43.7"N 87°42'37.2"W | 10' upstream of Touhy Ave. (15' from east bank and center channel) |
| | 96- Albany Ave. | N. Branch Chicago R. | 41°58'21.7"N 87°42'44.3"W | 250' downstream of Kimball Ave. (5' from south bank and center channel) |
| | 46- Grand Ave. | N. Branch Chicago R. | 41°53'29.16"N 87°38'9.29"W | 50' upstream of Grand Ave. (40' from east bank and center channel) |
| SBCR CSSC (1) | 75- Cicero Ave. | Chicago Sanitary and Ship Canal | 41°49'41.4"N 87°44'35.7"W | 20' upstream of Cicero Ave. (70' from north bank and center channel) |
| | 41- Harlem Ave. | Chicago Sanitary and Ship Canal | 41°48'40.1"N 87°48'5.64"W | 50' upstream of Harlem Ave. (50' from south bank and center channel) |
| | 92- Lockport (16th St.) | Chicago Sanitary and Ship Canal | 41°34'58"N 88°04'09.4"W | 75' upstream of former Division St. bridge location (20' from west bank and center channel) |
| Des Plaines River | 64- Lake St. | W Branch DuPage R. | 41°58'43.1"N 88°07'59.4"W | 75' upstream of Lake St. (5' from west bank and center channel) |
| | 18- Devon Ave. | Salt Cr. | 41°59'34.6"N 87°59'42.9"W | 150' upstream of Devon Ave. (40' from west bank and center channel) |
| | 78- Wille Road | Higgins Cr. | 42°01'7.24"N 87°56'12.03"W | 200' downstream of Wille Rd., inside entrance to culvert (5' from west bank and center channel) |
| | 13- Lake Cook Rd. | Des Plaines R. | 42°09'9.8"N 87°54'36.2"W | 20' downstream of Lake Cook Rd. (20' from west bank and center channel) |
| | 22- Ogden Ave. | Des Plaines R. | 41°49'14.4"N 87°48'38.2"W | 50' upstream of Ogden Ave. (20' from east bank and center channel) |
| | 91- Material Service Rd. | Des Plaines R. | 41°35'29.3"N 88°4'8.30"W | 20' upstream of Material Service Rd. (20' from east bank and center channel) |

(1) CSSC= Chicago Sanitary and Ship Canal

Table 2-2. Description of benthic macroinvertebrate monitoring stations sampled during 2004. Stations arranged by major watershed, upstream to downstream within each waterway. Highlighted stations were sampled every year during the 2001-2004 study period.

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description |
|------------------------------|-------------------------|---------------------------------|-------------------------------------|---|
| Calumet River | 55- 130th St. | Calumet River | 41° 39' 33.9" N 87° 54' 20.1" W | 50' upstream of 130th St. (40' from east bank and center channel) |
| | 76- Halsted St | Little Calumet River | 41° 39' 25.9" N 87° 38' 27.3" W | 20' upstream of Halsted St. (20' from south bank and center channel) |
| | 59- Cicero Ave. | Calumet-Sag Channel | 41° 35' 19.4" N 87° 44' 15.6" W | 150' upstream of Cicero Ave. (30' from north bank and center channel) |
| North Branch Chicago River | 36- Touhy Ave. | N. Shore Channel | 42° 00' 43.7" N 87° 42' 37.2" W | 10' upstream of Touhy Ave. (15' from east bank and center channel) |
| | 96- Albany Ave. | N. Branch Chicago R. | 41° 58' 21.7" N 87° 42' 44.3" W | 250' downstream of Kimball Ave. (5' from south bank and center channel) |
| | CFAR Fullerton Ave. | N. Branch Chicago R. | | |
| | 46- Grand Ave. | N. Branch Chicago R. | 41° 53' 29.16" N 87° 38' 9.29" W | 50' upstream of Grand Ave. (40' from east bank and center channel) |
| SBCR and CSSC ⁽¹⁾ | 75- Cicero Ave. | Chicago Sanitary and Ship Canal | 41° 49' 11.4" N 87° 44' 35.7" W | 20' upstream of Cicero Ave. (70' from north bank and center channel) |
| | 41- Harlem Ave. | Chicago Sanitary and Ship Canal | 41° 48' 40.1" N 87° 48' 5.64" W | 50' upstream of Harlem Ave. (50' from south bank and center channel) |
| | 92- Lockport (16th St.) | Chicago Sanitary and Ship Canal | 41° 34' 58" N 88° 04' 09.4" W | 75' upstream of former Division St. bridge location (20' from west bank and center channel) |
| Fox River | 90- Route 19 | Poplar Cr. | 42° 01.841 N 88° 14.516' W | 5' upstream of Route 19 (3' from east bank and center channel) |

(1) CSSC= Chicago Sanitary and Ship Canal

Table 2-2 - Continued

| | Sampling Station | Waterway | Lat./Lon. | Location Description |
|-------------------|---------------------------|-----------------------------|---|---|
| Des Plaines River | 110 Springinsguth Rd. | W. Branch Du Page R. | 42° 00.496' N 88° 07.145' W | At upstream side of Springinsguth Rd. (2' from south bank and center channel) |
| | 89- Walnut Ln. | W. Branch Du Page R. | 41° 59.745' N 88° 08.179' W | 100' upstream of Walnut Ln. (5' from east bank and center channel) |
| | 64- Lake St. | W. Branch Du Page R. | 41° 58.431' N 88° 07.594' W | 75' upstream of Lake St. (5' from west bank and center channel) |
| | 12- Lake-Cook Rd. | Buffalo Cr. | 42° 09.110' N 87° 58.150' W | 50' upstream of Lake -Cook Rd. (15' from east bank and center channel) |
| | 79- Higgins Rd. | Salt Cr. | 42° 01.880' N 88° 00.679' W | 200' upstream of Higgins Rd. (15' from east bank and center channel) |
| | 80- Arlington Heights Rd. | Salt Cr. | 42° 00.736' N 88° 00.075' W | 1200' upstream of Arlington Heights Rd. (10' from west bank and center channel) |
| | CFAR J.F. Kennedy Blvd. | Salt Cr. | | |
| | 18- Devon Ave. | Salt Cr. | 41° 59.346' N 87° 59.429' W | 150' upstream of Devon Ave. (10' from west bank and center channel) |
| | 24- Wolf Rd. | Salt Cr. | 41° 49.548' N 87° 54.025' W | 150' upstream of Wolf Rd. (10' from north bank and center channel) |
| | 109- Brookfield Ave. | Salt Cr. | 41° 49.370' N 87° 50.494' W | 200' downstream of Brookfield Ave. (5' from east bank and center channel) |
| 77- Elmhurst Rd. | Higgins Cr. | 42° 01.287' N 87° 56.436' W | 30' upstream of Elmhurst Rd. (10' from south bank and center channel) | |

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(1) CSSC= Chicago Sanitary and Ship Canal

Table 2-2 - Continued

| | Sampling Station | Waterway | Lat./Lon. | Location Description |
|-------------------|--------------------------|----------------|-----------------------------------|---|
| Des Plaines River | 78- Wille Road | Higgins Cr. | 42° 01' 7.24"N 87° 56' 12.03"W | 200' downstream of Wille Rd., inside entrance to culvert (5' from west bank and center channel) |
| | 13- Lake-Cook Rd. | Des Plaines R. | 42° 09' 9.8"N 87° 54' 36.2"W | 20' downstream of Lake-Cook Rd. (20' from west bank and center channel) |
| | 17- Oakton St. | Des Plaines R. | 42° 01.512'N 87° 52.494'W | 100' downstream of Oakton St. (15' from west bank and center channel) |
| | CFAR Irving Park Road | Des Plaines R. | | |
| | 19- Belmont Ave. | Des Plaines R. | 41° 56.236'N 87° 50.975'W | 200' downstream of Belmont Ave. (15' from west bank and center channel) |
| | 20- Roosevelt Rd. | Des Plaines R. | 41° 51.878'N 87° 49.639'W | 200' upstream of Roosevelt Rd. (10' from east bank and center channel) |
| | 22- Ogden Ave. | Des Plaines R. | 41° 49' 14.4"N 87° 48' 38.2"W | 50' upstream of Ogden Ave. (20' from east bank and center channel) |
| | 23- Willow Springs Rd. | Des Plaines R. | 41° 44.135'N 87° 52.901'W | 300' upstream of Willow Springs Rd. (20' from west bank and center channel) |
| | 29- Stephen St. | Des Plaines R. | 41° 40.899' N 88° 00.147' W | 70' upstream of Stephen St. (15' from east bank and center channel) |
| | 91- Material Service Rd. | Des Plaines R. | 41° 35' 29.3"N 88° 4' 8.30"W | 20' upstream of Material Service Rd. (20' from east bank and center channel) |

2-6

(1) CSSC= Chicago Sanitary and Ship Canal

Figure 2-1: Sampling stations for the MWRDGC benthic macroinvertebrate program

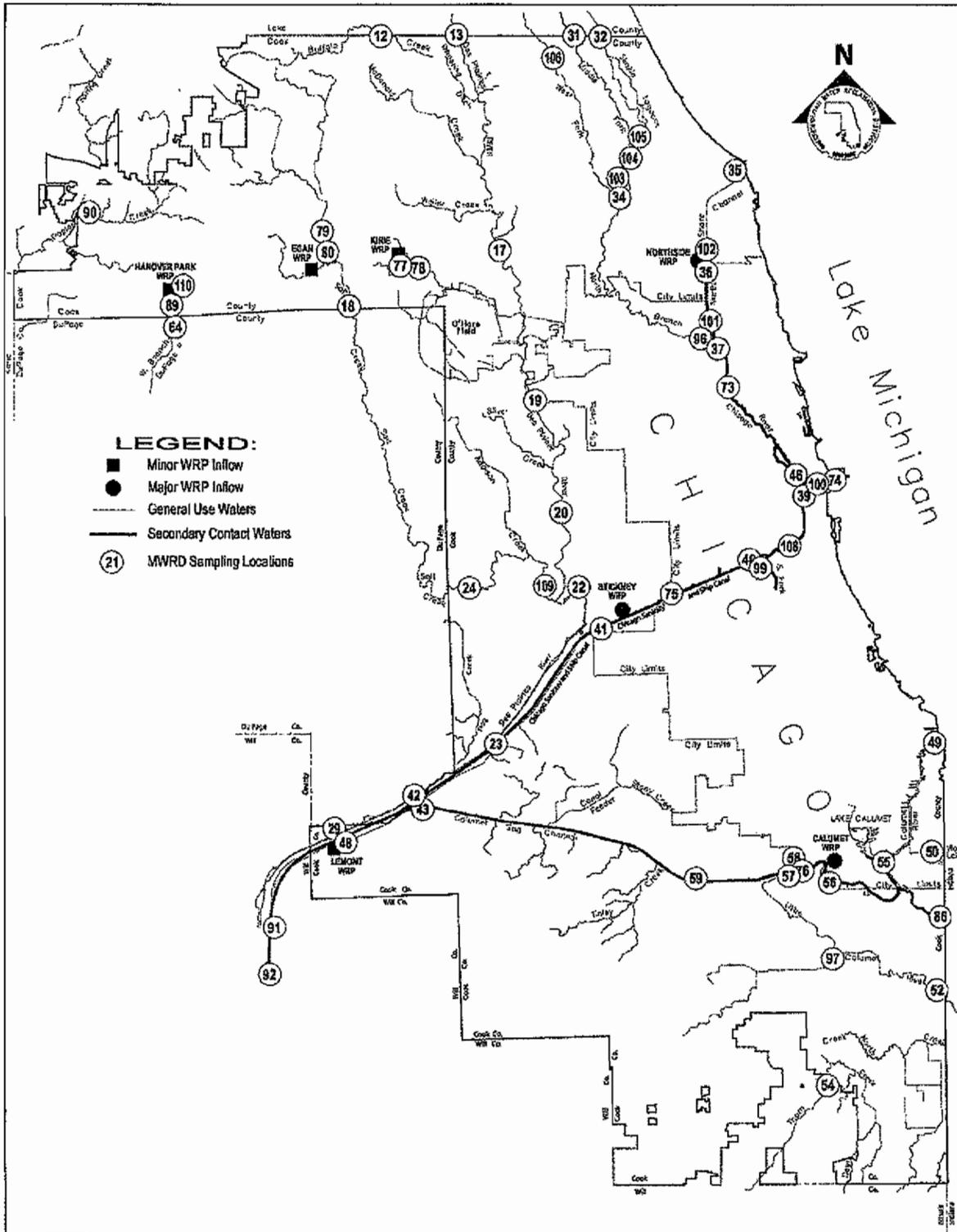


Figure 2-2. Hester-Dendy sampling array.

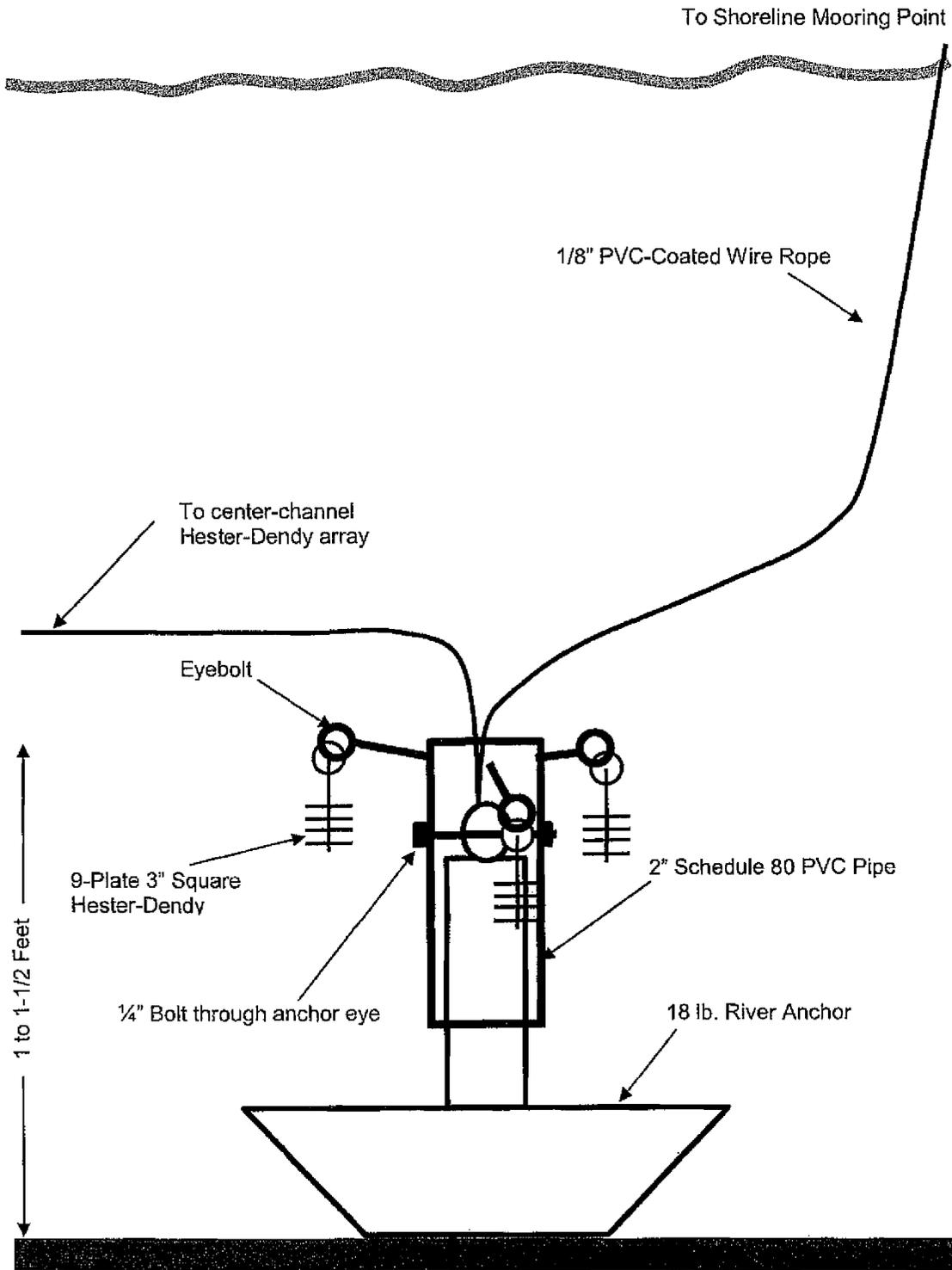
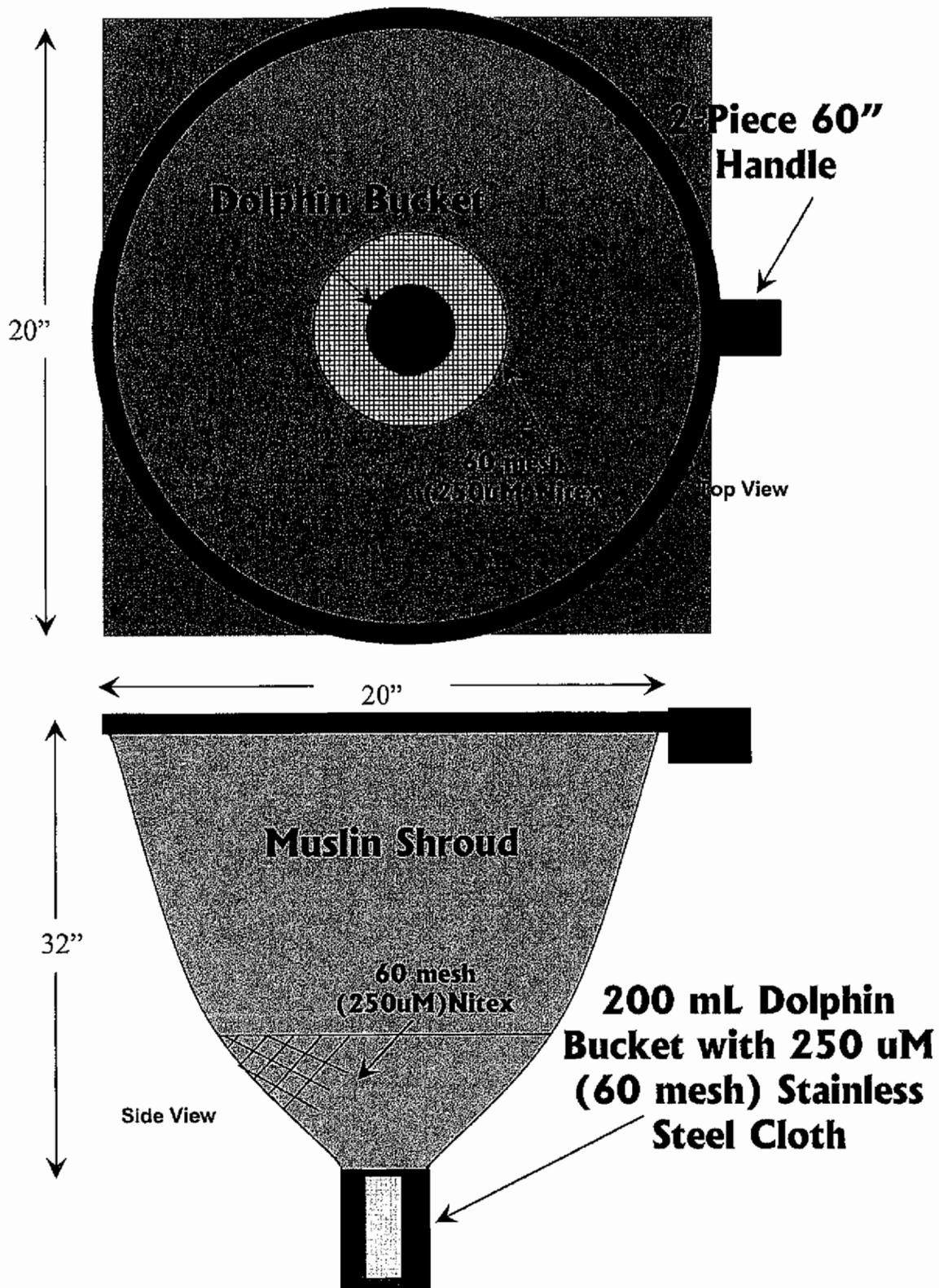


Figure 2-3. Dipnet for Hester-Dendy sampler retrieval.



2004

| <u>Watershed</u> | <u>Deployed</u> | <u>Retrieved</u> |
|----------------------------|-----------------|--------------------------|
| Calumet River | 15-17 June | 31 August - 30 September |
| North Branch Chicago River | 1-21 June | 10 August - 29 September |
| CSSC | 3-16 June | 23-30 August |
| Fox River | 6 May | 8 July |
| Des Plaines River | 4 May - 29 June | 1 July - 22 September |

HD samples were collected at 22 of the 24 sites in 2003 and 28 out of 32 sites in 2004.

Ponar grab samples were collected at each station in conjunction with the HD retrieval. The grab samples were collected using a 6" X 6" Petite-Ponar sampler. As with the HD sampling, Ponar samples were collected from two areas at each station; one from a near shore area and one from mid-channel. Each Ponar sample consisted of three grabs. All Ponar samples were collected within 30 to 50 feet of the HD samplers. All three grabs for each sample were combined in the field and washed in a No. 60 (250 μ) mesh sieving bucket to remove most of the fine sediment. The sample was then transferred to a one-gallon bottle and preserved with 5% formalin. Mid-channel Ponar samples could not be collected from the North Branch of the Chicago River at Albany Avenue (Station 96) from 2001-2003 (EA 2004), however, a sample was collected in 2004. In 2004, there were three sites from which a Ponar was collected but not an HD.

In the laboratory, each sample was processed by first pouring the contents of the sample bottle into a No. 60 mesh sieve where it could be rinsed. Under a stream of water, the individual HD plates and hardware were scrubbed with a 2-inch paintbrush into the sieve. The sample was then rinsed from the sieve into a white plastic tray partially filled with water. Sample aliquots were removed from the tray and placed in a small petri dish for counting under a dissecting microscope with 15X to 40X magnification. Following counting, the samples were preserved with 70% isopropanol solution. The subject samples were delivered to EA Engineering, Science, and Technology, Inc. (EA) in Deerfield, Illinois for further processing and taxonomic identification.

Upon arrival at EA's laboratory, the samples were logged in. Except for Oligochaeta, macroinvertebrate identifications were made to the lowest practical taxonomic level using the most current literature available (see Section 5). If necessary, Chironomidae larvae were subsampled by placing them in a grided petri dish. Squares were randomly chosen until at least 100 larvae were removed. Chironomid larvae were then cleared in 10% potassium hydroxide and permanently mounted in CMC-10. All specimens were identified, enumerated, and coded on EA's standard laboratory bench sheet for data processing.

Each slide-mounted chironomid specimen was examined for a variety of head capsule deformities. For Orthocladinae, Chironomini, and Tanytarsini specimens, the structures examined for deformities included the mentum, mandibles, premandibles, and pecten epipharyngis (Sæther 1980). Tanypodinae structures included the ligula, dorsomentum, mandibles, paraligula, and pecten hypopharyngis (Sæther 1980). Guidance as to what constituted a deformity as well as descriptions of deformities for the structures and taxa listed

above was derived from a variety of sources, most notably Dermott (1991), Dickman et al. (1992), Groenendijk et al. (1998), Hudson and Ciborowski (1996a), Warwick (1985 and 1991), and Warwick and Tisdale (1988), among others. A conservative approach was used to distinguish deformities or malformations from broken or severely worn larval structures. In general, deformities and malformations were easily distinguished from worn or damaged structures for the specimens examined during this study. However, if any suspicion existed as to the cause of an irregular structure, that irregularity was not counted as a deformity.

Whenever possible, for the waterways with multiple sampling stations, comparisons were made longitudinally among monitoring stations. Temporal comparisons also were made for those stations that were sampled during both years. Metrics compared included density, relative abundance (percent), total taxa richness, number of Ephemeroptera+Plecoptera+Trichoptera (EPT) taxa, dominant taxa composition, and percent Chironomidae head capsule deformities. In some instances, notable differences in the benthic macroinvertebrate community were observed among the stations. These differences could be the result of differences in water or sediment quality related to point and non-point sources, differences in habitat quality, or natural variability within the benthic community. However, since it was unclear what factors may have affected the results, the differences were described in varying degrees of "stress", which is intended to encompass all potential impact types. For the purpose of summarizing and discussing the results, the center and near shore samples were combined for each site by sample type. However, the center and near shore data are presented separately for each station and sample type in Appendices A and B.

3. RESULTS AND DISCUSSION

3.1 2003 Benthic Macroinvertebrate Results

During 2003, 45 HD samples and 50 Ponar samples were collected from 25 stations in 13 different waterways (Table 2-1). Combined, these samples yielded 108 total taxa and 20 relatively pollution sensitive EPT taxa (Table 3-1). Chironomidae was the most taxa rich group with 47 taxa. Among the EPT, Trichoptera was the most speciose group with 11 taxa, followed by Ephemeroptera with 8 taxa, and Plecoptera with only a single taxon. The taxa that are underlined in Table 3-1 represent those that are considered highly tolerant of pollution caused stressors. For the purposes of this study, several literature sources were considered to determine the tolerance of any particular taxon including Barbour et al. (1999), Illinois Environmental Protection Agency (IEPA) (1987), Ohio Environmental Protection Agency (OEPA) (1988), and Simpson and Bode (1980). Taxa were regarded as highly tolerant if they were listed as such in the literature and/or their assigned tolerance values from various regions in the U.S. averaged eight or greater on a zero to ten or eleven scale with ten/eleven being the most tolerant.

3.1.1 Calumet Watershed

Thirteen stations (including the three core stations sampled in 2001-2002) were sampled in the Calumet watershed during 2003: two stations in the Calumet River, one station in the Wolf Lake Drainage Channel, one station in the Grand Calumet River, two stations in Thorn Creek, four stations in the Little Calumet River, and three stations in the Calumet-Sag Channel (Cal-Sag) (Table 2-1).

Out of 12 HD samples from the Calumet watershed, more than half were dominated by Oligochaeta whereas the remaining samples varied in taxonomic dominance. The Ponar samples were dominated by Oligochaeta at all stations. The benthic community in the Calumet watershed largely consisted of tolerant taxa.

Of the waterways sampled in the Calumet watershed, chironomid deformities were observed only in Thorn Creek and the Little Calumet River.

3.1.1.1 Calumet River

The samples from Station 49 and 55 combined yielded 28 taxa and two EPT taxa from the Calumet River (Table 3-2 and 3-3). Seventeen total taxa and two EPT Taxa were observed in the single HD sample from Station 49, while the Ponar samples from stations 49 and 55 resulted in 12 and 8 total taxa, respectively. *Hydra* was the most dominant HD taxon, representing over 92 percent of the total density. Except for Oligochaeta (3 percent), the remaining taxa observed in the HD samples were individually represented by less than one percent of the total density.

Table 3-1. List of benthic macroinvertebrate taxa collected in Hester-Dendy and Ponar samples from several Chicago Metropolitan Area waterways. Underlined taxa are those considered to be highly tolerant based on literature sources.

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|--|----------------------|---------------|----------------------|---------------|----------------------|---------------|----------------------|---------------|
| COELENTERATA (Hydroids) | | | | | | | | |
| <i>Hydra</i> | X | X | X | X | X | X | X | X |
| NEMATODA | | | | | | | X | X |
| PLATYHELMINTHES (Flat worms) | | | | | | | | |
| Turbellaria | X | X | X | X | X | X | X | X |
| ENTOPROCTA (Moss Animalcules) | | | | | | | | |
| <i>Urnatella gracilis</i> | | X | | | | | X | X |
| ECTOPROCTA (Bryozoans) | | | | | | | | |
| <i>Plumatella</i> | X | X | X | X | X | | X | X |
| ANNELLIDA | | | | | | | | |
| <u>Oligochaeta (Aquatic Worms)</u> | X | X | X | X | X | X | X | X |
| Hirudinea (Leeches) | | | | | | | | |
| Glossiphoniidae ¹ | | | X | X | | | | |
| <i>Helobdella</i> ¹ | X | | | | | | X | X |
| <i>Helobdella papillata</i> | | | | | | | X | |
| <i>Helobdella stagnalis</i> | X | X | X | X | X | X | X | X |
| <u><i>Helobdella triserialis</i></u> | X | X | X | | X | X | | |
| <i>Placobdella</i> | | | X | | | | | |
| <i>Placobdella pediculata</i> | | | | | | | X | X |
| <u><i>Erpobdella punctata punctata</i></u> | X | X | | X | X | X | X | X |
| <u><i>Mooreobdella buccera</i></u> | | | | | | | | X |
| <u><i>Mooreobdella microstoma</i></u> | X | X | X | X | X | X | X | X |
| CRUSTACEA | | | | | | | | |
| Ostracoda (Seed Shrimp) | | X | | | | | X | X |
| Isopoda (Sow Bugs) | | | | | | | | |
| <i>Caecidotea</i> | X | X | X | X | X | X | X | X |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|---------------------------------|----------------------|---------------|----------------------|---------------|----------------------|---------------|----------------------|---------------|
| Crustacea (cont.) | | | | | | | | |
| Amphipoda (Side Swimmers) | | | | | | | | |
| <i>Crangonyx</i> | | | | | | | X | |
| <i>Gammarus</i> ¹ | | | | X | X | X | | |
| <i>Gammarus fasciatus</i> | X | X | X | X | X | X | X | X |
| <i>Hyaella azteca</i> | | | | | | | X | X |
| Decapoda (Crayfish) | | | | | | | | |
| <i>Cambarus bartonii</i> | | | | | | | X | |
| <i>Orconectes</i> | | | | | X ¹ | X | | |
| <i>Orconectes immunis</i> | | X | | | | | | |
| <i>Orconectes virilis</i> | X | | | X | X | | | |
| ARACHNOIDEA | | | | | | | | |
| Hydracarina (Water Mites) | X | X | | | | | X | |
| INSECTA | | | | | | | | |
| Ephemeroptera (Mayflies) | | | | | | | | |
| <i>Isonychia</i> | X | | X | | | | | |
| <i>Baetis</i> ¹ | | | | | | | X | |
| <i>Baetis flavistriga</i> | | | | | | | X | X |
| <i>Baetis intercalaris</i> | X | X | X | X | X | X | X | X |
| <i>Callibaetis</i> | | | | | | | X | |
| <i>Pseudocloeon ephippiatum</i> | X | | | | | | | |
| Heptageniidae ¹ | X | X | | | | | | |
| <i>Heptagenia</i> | X | | X | | | | | |
| <i>Leucrocuta</i> | X | | X | | | | | |
| <i>Stenacron</i> | X | | X | | X | | X | X |
| <i>Stenonema</i> | X ¹ | X | | | | | | |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|---------------------------------------|-------------------|------------|-------------------|------------|-------------------|----------------|-------------------|------------|
| Ephemeroptera (cont.) | | | | | | | | |
| <i>Stenonema exiguum</i> | | | | | X | | | |
| <i>Stenonema integrum</i> | X | | X | | X | | X | |
| <i>Stenonema terminatum</i> | X | | X | | | | X | X |
| <i>Caenis</i> | | X | | | X | X | X | X |
| <i>Tricorythodes</i> | X | X | X | X | X | X | X | X |
| <i>Anthopotamus myops grp.</i> | | | | | X | | X | X |
| <i>Hexagenia</i> | | | | | X | X ¹ | | |
| <i>Hexagenia bilineata</i> | | | | X | | | | |
| <i>Hexagenia limbata</i> | | | | | | X | | |
| Plecoptera | | | | | | | | |
| <i>Perlesta</i> | | | | | X | | | |
| Odonata (Damselflies and Dragonflies) | | | | | | | | |
| <i>Calopteryx</i> | X | | | | | | | |
| Coenagrionidae | | | | | | X | X | |
| <i>Argia</i> | X | | X | | X | | X | |
| <i>Enallagma</i> | X | X | X | | X | X | X | |
| <i>Lestes</i> | | | | | | X | | |
| Libellulidae | | | | | | | | X |
| <i>Somatochlora</i> | | | X | | | | X | |
| <i>Stylurus</i> | | X | | | | | | X |
| Hemiptera (True Bugs) | | | | | | | | |
| <i>Trepobates</i> | | | X | | | | X | |
| Corixidae | | | X | X | | X | X | X |
| <i>Palmarcorixa</i> | | X | | | | | | |
| Megaloptera (Dobson flies) | | | | | | | | |
| <i>Corydalus cornutus</i> | | | | | | X | | |
| <i>Sialis</i> | | | | | | | X | |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|-------------------------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|------------|
| Trichoptera (Caddisflies) | | | | | | | | |
| <i>Cyrnellus fraternus</i> | X | X | X | | X | | X | |
| Hydropsychidae ¹ | | | | X | | | | X |
| <i>Ceratopsyche morosa</i> | X | | X | | X | | X | X |
| <i>Cheumatopsyche</i> | X | X | X | X | X | X | X | X |
| <i>Hydropsyche</i> | X | | X | | X | | X | |
| <i>Hydropsyche betteni</i> | X | X | X | | X | | X | |
| <i>Hydropsyche bidens</i> | X | | X | | X | | X | |
| <i>Hydropsyche orris</i> | X | | X | | X | | X | |
| <i>Hydropsyche simulans</i> | X | | X | | X | | X | |
| <i>Potamyia flava</i> | X | X | X | X | X | | | |
| <i>Hydroptila</i> | X | | X | X | X | X | X | X |
| <i>Ocecetis</i> | | | | | | X | X | X |
| Lepidoptera (Aquatic Moths) | | | | | | | | |
| <i>Petrophila</i> | X | | X | | | | X | |
| Coleoptera (Beetles) | | | | | | | | |
| <i>Agabus</i> | | | | | | | X | |
| <i>Copelatus</i> | | | X | | | | | |
| <i>Laccophilus maculosus</i> | | | X | | | | X | |
| <i>Ancyronyx variegata</i> | | | | | X | | X | |
| <i>Dubiraphia</i> | X | X | | X | | X | X | X |
| <i>Macronychus glabratus</i> | X | X | X | | X | X | X | X |
| <i>Stenelmis</i> | X ¹ | X ¹ | | X ¹ | X ¹ | X ¹ | X ¹ | X |
| <i>Stenelmis crenata grp.</i> | X | X | X | X | X | X | X | |
| <i>Peltodytes</i> | | | | | | | | X |
| <i>Berosus</i> | X | X | | | X | | | |
| <i>Paracymus</i> | | | | | X | | | |
| <i>Tropisternus</i> | | | X | | | | X | |
| <i>Ectopria</i> | | | | | | | | X |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|---|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
| Diptera (True Flies) | | | | | | | | |
| <i>Chaoborus</i> | X | X | | | | | | |
| Ceratopogonidae | | | | | X | X | | |
| <i>Atrichopogon</i> | | | | | X | | | |
| <i>Bezzia</i> | | X | | | | | X | X |
| <i>Ceratopogon</i> | | | | | | | X | X |
| <i>Culicoides</i> | | | | | | | X | X |
| <i>Serromyia</i> | | | | | | | X | |
| <u>Culicidae</u> | | | | | X | | | |
| <i>Hemerodromia</i> | X | | | | | X | X | X |
| <i>Rhamphomyia</i> | | | | | | | X | |
| <i>Pericoma</i> | | | | | | | | X |
| Simuliidae | | | | | | | | |
| <i>Simulium</i> | X | X | | | X | X | X | X |
| Tipulidae | | | | | | X | | |
| <i>Tipula</i> | | | X | | X | | | |
| Chironomidae (Midges) ¹ | X | X | X | X | X | X | | |
| <i>Ablabesmyia</i> | | | | | | | X | |
| <i>Ablabesmyia janta</i> | X | | X | X | X | X | X | |
| <i>Ablabesmyia mallochi</i> | X | X | X | X | X | X | X | X |
| <i>Clinotanypus</i> | | X | | | | | | |
| <i>Coelotanypus</i> | | | | X | | X | | X |
| <u><i>Natarsia</i> sp. A</u> | | X | | | | | | X |
| <i>Nilotanypus fimbriatus</i> | X | | X | | | | X | |
| <u><i>Procladius</i> (<i>Holotanypus</i>)</u> | X | X | X | X | X | X | X | X |
| <u><i>Tanypus</i></u> | | X | | | X | X | X | X |
| <i>Psectrotanypus dyari</i> | | | | | | | | X |
| <i>Thienemannimyia</i> grp. | X | X | X | X | X | X | X | X |
| <i>Corynoneura</i> | X | X | | | X | | X | |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|---|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
| Chironomidae (cont.) | | | | | | | | |
| <i>Corynoneura lobata</i> | | | | | | | X | X |
| <u><i>Cricotopus</i></u> | | | | | | | X | X |
| <u><i>Cricotopus bicinctus grp.</i></u> | X | X | X | X | X | X | X | X |
| <u><i>Cricotopus sylvestris grp.</i></u> | X | X | X | X | X | X | X | X |
| <u><i>Cricotopus tremulus grp.</i></u> | X | | X | X | X | X | X | X |
| <i>Cricotopus trifascia grp.</i> | | | X | X | | X | | X |
| <i>Cricotopus/Orthocladius</i> | | | | | | | X | X |
| <i>Euryhapsis</i> | | | | | X | | | |
| <i>Heterotrissocladius</i> | | | X | | | | | |
| <i>Nanocladius</i> ¹ | | X | | | | | X | |
| <i>Nanocladius crassicornus/rectinervis</i> | X | X | X | | X | | X | X |
| <u><i>Nanocladius distinctus</i></u> | X | X | X | X | X | X | X | X |
| <i>Orthocladius</i> | | | | | | | X | X |
| <i>Parakiefferiella</i> | | | | | | | X | X |
| <i>Rheocricotopus robacki</i> | X | | X | | X | X | X | X |
| <i>Thienemanniella n. sp. 3</i> | | | | | | | | X |
| <i>Thienemanniella similis</i> | X | X | | | X | X | | |
| <i>Thienemanniella xena</i> | X | | X | | X | X | X | X |
| <i>Tvetenia discoloripes grp.</i> | | | | | | | X | |
| Chironomini | | | | | | | X ¹ | |
| <u><i>Chironomus</i></u> | X | X | X | X | X | X | X | X |
| <i>Cladopelma</i> | | X | X | | | X | X | X |
| <u><i>Cryptochironomus</i></u> | X | X | X | X | X | X | X | X |
| <i>Cryptotendipes</i> | | | | | | | | X |
| <i>Cryptotendipes sp. 15</i> | | | | | | X | | |
| <i>Dicrotendipes</i> ¹ | | | | | X | X | X | X |
| <i>Dicrotendipes fumidus</i> | | | | | X | X | | |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|---|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
| Chironomidae (cont.) | | | | | | | | |
| <i>Dicrotendipes neomodestus</i> | X | X | X | X | X | X | X | X |
| <i>Dicrotendipes simpsoni</i> | X | X | X | X | X | X | X | X |
| <i>Endochironomus nigricans</i> | X | | | | X | X | X | X |
| <i>Glyptotendipes</i> | X | X | X | X | X | X | X | X |
| <i>Harnischia</i> | | | | | | | X | X |
| <i>Microchironomus</i> | | X | X | | | X | | |
| <i>Micropsectra</i> | | | X | | | | X | X |
| <i>Microtendipes</i> | | X | | X | | X | | |
| <i>Parachironomus</i> | X | X | X | X | X | X | X | X |
| <i>Paracladopelma</i> | X | X | | X | X | X | | X |
| <i>Paratendipes</i> | | | | | | | X | X |
| <i>Phaenopsectra</i> | X | | | | | | | |
| <i>Phaenopsectra punctipes</i> | | | | | X | | | |
| <i>Polypedilum fallax</i> grp. | X | X | X | | X | X | X | |
| <i>Polypedilum flavum</i> | X | X | X | X | X | X | X | X |
| <i>Polypedilum halterale</i> grp. | X | X | X | X | | X | X | X |
| <i>Polypedilum illinoense</i> | X | X | X | X | X | X | X | X |
| <i>Polypedilum scalaenum</i> grp. | X | X | X | X | X | X | X | X |
| <i>Pseudochironomus</i> | | | | | | | X | X |
| <i>Saetheria</i> | | | | | | X | | X |
| <i>Stenochironomus</i> | X | X | X | | X | | X | X |
| <i>Stictochironomus</i> | | | | | | X | X | X |
| <i>Tribelos fusciorne</i> | | | | | X | X | X | X |
| <i>Xenochironomus xenolabis</i> | | | X | | X | X | X | |
| <i>Cladotanytarsus</i> ¹ | | | | | | X | | |
| <i>Cladotanytarsus mancus</i> grp. | | X | X | X | X | X | X | X |
| <i>Cladotanytarsus vanderwulpi</i> grp. | | X | | | | X | | X |
| <i>Paratanytarsus</i> | X | | X | X | X | X | X | X |

Table 3-1 (cont.)

| Taxa | Hester-Dendy 2001 | Ponar 2001 | Hester-Dendy 2002 | Ponar 2002 | Hester-Dendy 2003 | Ponar 2003 | Hester-Dendy 2004 | Ponar 2004 |
|---|-------------------|----------------|-------------------|------------|-------------------|------------|-------------------|----------------|
| Chironomidae (cont.) | | | | | | | | |
| <i>Rheotanytarsus</i> | X | X | X | | X | X | X | X |
| <i>Tanytarsus</i> | | | X | X | X | X | X | X |
| <i>Tanytarsus glabrescens</i> grp. | | | | X | X | | | |
| <i>Tanytarsus guerlus</i> grp. | X | X | X | | | X | | |
| GASTROPODA (Snails) | | | | | | | | |
| <i>Amnicola</i> | | X | | X | X | X | X | X |
| <i>Campeloma decisum</i> | | | | | | | | X |
| <i>Ferrissia</i> | X | | X | X | X | X | X | X |
| <i>Physa</i> | X | X | X | | X | X | X | X |
| <i>Gyraulus</i> | | | | | | | X | X |
| <i>Helisoma</i> | | | | | X | X | X | X |
| <i>Menetus dilatatus</i> | X | X | X | | | | X | X |
| <i>Planorbella</i> | | | | | | | X | |
| <i>Pleurocera</i> | X | X | | | X | X | X | X |
| <i>Valvata</i> | | | | | | X | X | X |
| <i>Viviparus</i> | | | | | | | X | X |
| PELECYPODA (Mussels and Clams)¹ | | | | | | | | |
| <i>Corbicula fluminea</i> | X | X | X | X | X | X | X | X |
| <i>Dreissena polymorpha</i> | X | X | X | X | X | X | X | X |
| Sphaeriidae¹ | | | | | | | | |
| <i>Musculium</i> | | X ¹ | X | | X | X | X ¹ | X ¹ |
| <i>Musculium transversum</i> | X | X | | X | | | X | X |
| <i>Pisidium</i> | X | X ¹ | | | X | X | | X |
| <i>Pisidium compressum</i> | | X | | | | | | |
| <i>Pisidium nitidum</i> | | | | X | | | | |
| <i>Sphaerium</i> | | | | | | | X | X ¹ |
| <i>Sphaerium simile</i> | | X | | | | | | X |

Table 3-1 (cont.)

| | Hester- Dendy 2001 | Ponar 2001 | Hester- Dendy 2002 | Ponar 2002 | Hester- Dendy 2003 | Ponar 2003 | Hester- Dendy 2004 | Ponar 2004 |
|--------------------------------------|--------------------------|---------------|--------------------------|---------------|--------------------------|---------------|--------------------------|---------------|
| PELECYPODA (cont.) | | | | | | | | |
| <i>Lasmigona complanata</i> | | X | | | | | | X |
| TOTAL RICHNESS BY SAMPLE TYPE | 83 | 74 | 81 | 50 | 88 | 81 | 119 | 104 |
| EPT RICHNESS BY SAMPLE TYPE | 19 | 8 | 18 | 5 | 19 | 7 | 19 | 10 |
| TOTAL RICHNESS BY YEAR | 101 | | 90 | | 108 | | 137 | |
| EPT RICHNESS BY YEAR | 20 | | 19 | | 20 | | 19 | |

¹Not counted as a discreet taxa.

TABLE 3-2. HESTER-DENDY DENSITIES AT SAMPLING STATION 49 WITHIN THE CALUMET RIVER, AUGUST 2003.

| TAXA | 49 EWING AVE. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Hydra | 11,781.5 | 92.30 |
| Oligochaeta | 441.3 | 3.46 |
| Caecidotea | 59.2 | 0.46 |
| Gammarus fasciatus | 80.7 | 0.63 |
| Hydropsyche | 1.8 | 0.01 |
| Hydropsyche orris | 17.9 | 0.14 |
| Chironomidae | 5.4 | 0.04 |
| Procladius (Holotanypus) | 1.8 | 0.01 |
| Ablabesmyia mallochii | 1.8 | 0.01 |
| Cricotopus bicinctus grp. | 48.4 | 0.38 |
| Cricotopus sylvestris grp. | 7.2 | 0.06 |
| Nanocladius distinctus | 5.4 | 0.04 |
| Dicrotendipes simpsoni | 53.8 | 0.42 |
| Glyptotendipes | 23.3 | 0.18 |
| Parachironomus | 21.5 | 0.17 |
| Polypedilum flavum | 89.7 | 0.70 |
| Rheotanytarsus | 17.9 | 0.14 |
| Dreissena polymorpha | 105.8 | 0.83 |
| TOTAL BENTHOS | 12,764.6 | 100.00 |
| TOTAL TAXA RICHNESS | 17 | |
| EPT TAXA RICHNESS | 2 | |

TABLE 3-3. PETITE PONAR DENSITIES AT SAMPLING STATIONS 55 AND 49 WITHING THE CALUMET RIVER, AUGUST 2003.

| TAXA | 49 EWING AVE. | | 55 130TH ST. | |
|----------------------------|------------------|--------|------------------|--------|
| | #/m ² | % | #/m ² | % |
| Oligochaeta | 1,471.2 | 91.52 | 1,284.6 | 91.79 |
| Gammarus fasciatus | -- | -- | 7.2 | 0.51 |
| Chironomidae | -- | -- | 7.2 | 0.51 |
| Procladius (Holotanypus) | 7.2 | 0.45 | 14.4 | 1.03 |
| Coelotanypus | -- | -- | 28.7 | 2.05 |
| Thienemanniya grp. | 14.4 | 0.89 | -- | -- |
| Thienemanniella xena | 21.5 | 1.34 | -- | -- |
| Nanocladius distinctus | 7.2 | 0.45 | -- | -- |
| Rheocricotopus robacki | 7.2 | 0.45 | -- | -- |
| Chironomus | -- | -- | 7.2 | 0.51 |
| Cryptochironomus | -- | -- | 7.2 | 0.51 |
| Dicrotendipes neomodestus | 7.2 | 0.45 | -- | -- |
| Microchironomus | -- | -- | 7.2 | 0.51 |
| Polypedilum flavum | 14.4 | 0.89 | -- | -- |
| Polypedilum illinoense | 7.2 | 0.45 | -- | -- |
| Polypedilum scalaenum grp. | 7.2 | 0.45 | 35.9 | 2.56 |
| Xenochironomus xenolabis | 7.2 | 0.45 | -- | -- |
| Dreissena polymorpha | 35.9 | 2.23 | -- | -- |
| TOTAL BENTHOS | 1,607.6 | 100.00 | 1,399.4 | 100.00 |
| TOTAL TAXA RICHNESS | 12 | | 8 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

In contrast to the HD samples, Oligochaeta was the most dominant taxon (92 percent at both stations) in the Ponar samples (Table 3-3). With the exception of zebra mussels *D. polymorpha*, and the midges *Coelotanytus*, *Polypedium scalaenum* grp., *Procladius* (*Holotanytus*), and *Thienemanniella xena*, none of the other taxa collected in the Ponar samples was represented by more than one percent of the total density.

No Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, the benthic community represented in both the HD and Ponar samples largely consisted of taxa that are considered moderately to extremely tolerant of pollution. The highly tolerant taxon, Oligochaeta, dominated the Ponar collections at both locations. In addition, of the 28 taxa, eleven are typically classified as tolerant suggesting some degree and type of environmental stress is affecting the benthic community at Stations 49 and 55 (Tables 3-2 and 3-3).

3.1.1.2 Wolf Lake Drainage Channel

The benthic macroinvertebrate community in the Wolf Lake Drainage Channel at Station 50 was represented by 30 total taxa, including four EPT taxa from the Ponar samples (Table 3-4). Only Ponar samples were collected from this site since HD's were not retrievable. Oligochaeta was the dominant taxon at nearly half the total density. Aside from the midges *Chironomus*, *Cladopelma*, and the sideswimmer *Gammarus fasciatus*, none of other taxa collected in the Ponars were represented by more than one percent of the total density.

Overall, the community was dominated by tolerant organisms but head capsule deformities were not observed. Nonetheless, given the number and density of tolerant taxa, it appears the benthic community at Station 50 is moderately stressed.

3.1.1.3 Grand Calumet River

Combined, the HD and Ponar samples from the single station (Station 86) in the Grand Calumet River yielded only 12 total taxa (Tables 3-5 and 3-6) and no EPT taxa. Total taxa richness ranged from 10 taxa in the HD samples to six taxa in the Ponar samples. Oligochaeta was clearly the most dominant taxon, accounting for over 90 percent of the total density in both the HD and Ponar samples. A majority of the HD taxa were individually represented by less than one percent of the total density (Table 3-5). With the exception of the midges *Cricotopus bicinctus* grp., *C. sylvestris* grp., and *Tanytus*, none of the other taxa collected in either samples achieved more than one percent of the total density.

As with the Calumet River samples, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, two thirds of the taxa represented in the HD and Ponar samples combined are considered highly tolerant of pollution indicating a stressed environment (Table 3-1).

TABLE 3-4. PETITE PONAR DENSITIES AT SAMPLING STATION 50 WITHIN THE WOLF LAKE DRAINAGE CHANNEL, JULY 2003.

| TAXA | 50 BURNHAM AVE. | |
|-----------------------------|--------------------|--------|
| | #/m ² | % |
| Turbellaria | 7.2 | 0.18 |
| Oligochaeta | 1,830.0 | 46.62 |
| Helobdella stagnalis | 7.2 | 0.18 |
| Gammarus fasciatus | 244.0 | 6.22 |
| Caenis | 107.6 | 2.74 |
| Hexagenia limbata | 35.9 | 0.91 |
| Lestes | 7.2 | 0.18 |
| Corixidae | 14.4 | 0.37 |
| Corydalus cornutus | 7.2 | 0.18 |
| Cheumatopsyche | 93.3 | 2.38 |
| Oecetis | 14.4 | 0.37 |
| Ceratopogonidae | 7.2 | 0.18 |
| Chironomidae | 64.6 | 1.65 |
| Tanypus | 7.2 | 0.18 |
| Procladius (Holotanypus) | 71.8 | 1.83 |
| Ablabesmyia janta | 28.7 | 0.73 |
| Cricotopus bicinctus grp. | 14.4 | 0.37 |
| Cricotopus sylvestris grp. | 28.7 | 0.73 |
| Chironomus | 509.5 | 12.98 |
| Cladopelma | 258.4 | 6.58 |
| Cryptochironomus | 122.0 | 3.11 |
| Cryptotendipes sp. 15 | 14.4 | 0.37 |
| Dicrotendipes neomodestus | 14.4 | 0.37 |
| Dicrotendipes simpsoni | 14.4 | 0.37 |
| Polypedilum halterale grp. | 193.8 | 4.94 |
| Polypedilum scalaenum grp. | 93.3 | 2.38 |
| Cladotanytarsus mancus grp. | 7.2 | 0.18 |
| Paratanytarsus | 7.2 | 0.18 |
| Rheotanytarsus | 14.4 | 0.37 |
| Tanytarsus guerlus grp. | 78.9 | 2.01 |
| Hemerodromia | 7.2 | 0.18 |
| TOTAL BENTHOS | 3,925.6 | 100.00 |
| TOTAL TAXA RICHNESS | 30 | |
| EPT TAXA RICHNESS | 4 | |

TABLE 3-5. HESTER DENDY DENSITIES AT SAMPLING STATION 86 WITHIN THE GRAND CALUMET RIVER, SEPTEMBER 2003.

| TAXA | 86 BURNHAM AVE. | |
|------------------------------|--------------------|--------|
| | #/m2 | % |
| Oligochaeta | 495.2 | 90.49 |
| Helobdella stagnalis | 1.8 | 0.33 |
| Erpobdella punctata punctata | 3.6 | 0.66 |
| Mooreobdella microstoma | 1.8 | 0.33 |
| Chironomidae | 1.8 | 0.33 |
| Tanypus | 1.8 | 0.33 |
| Ablabesmyia janta | 1.8 | 0.33 |
| Cricotopus bicinctus grp. | 1.8 | 0.33 |
| Cricotopus sylvestris grp. | 17.9 | 3.28 |
| Parachironomus | 16.1 | 2.95 |
| Helisoma | 3.6 | 0.66 |
| TOTAL BENTHOS | 547.2 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-6. PETITE PONAR DENSITIES AT SAMPLING STATION 86 WITHIN THE GRAND CALUMET RIVER, SEPTEMBER 2003.

| TAXA | 86 BURNHAM AVE. | |
|----------------------------|--------------------|--------|
| | #/m2 | % |
| Oligochaeta | 5,590.6 | 94.20 |
| Enallagma | 7.2 | 0.12 |
| Chironomidae | 7.2 | 0.12 |
| Tanypus | 222.5 | 3.75 |
| Cricotopus sylvestris grp. | 50.2 | 0.85 |
| Dicrotendipes neomodestus | 7.2 | 0.12 |
| Parachironomus | 50.2 | 0.85 |
| TOTAL BENTHOS | 5,935.1 | 100.00 |
| TOTAL TAXA RICHNESS | 6 | |
| EPT TAXA RICHNESS | 0 | |

3.1.1.4 Thorn Creek

Together, the HD and Ponar samples from the two Thorn Creek stations (Stations 54 and 97) yielded 43 total taxa and four EPT taxa (Tables 3-7 and 3-8.). HD total taxa richness between the two Stations 54 and 97 was slightly varied at 24 and 35 taxa, respectively. Two to four EPT taxa were observed in the HD samples, while only one EPT taxon was observed in the two Ponar samples. HD total densities observed between the two stations were fairly similar. At Station 97, *Oligochaeta* was the dominant taxon (52 percent) in the HD sample. *Cheumatopsyche* was also observed in substantial numbers (22 percent) (Table 3-7). Although *Oligochaeta* was the dominant taxon at Station 54, it comprised only slightly more than 32 percent, while the midge *Polypedilum illinoense* comprised just over 25 percent of the total HD sample.

The Ponar samples were similar in total taxa richness at Stations 54 and 97, with 11 and 14 taxa, respectively (Tables 3-8). Station 97 had nearly four times the total density of Station 54 due to much higher *Oligochaeta* density at Station 97. *Oligochaeta* was the dominant taxon at both Stations 54 and 97 at just under 64 and 80 percent, respectively. Both the HD and Ponar samples at Thorn Creek were dominated by highly tolerant taxa (Table 3-1).

The incidence of chironomid head capsule deformities in the Thorn Creek was restricted to *Chironomus* from Ponar samples at Stations 54 and 97. Of the 59 *Chironomus* examined, 31 (59 percent) were deformed (Table 3-9). This represents 23% of all the midges examined at the two Thorn Creek stations. Several studies involving chironomid deformity analysis have included *Chironomus* (Bisthoven et al. 1998, Bisthoven and Ollevier 1998, Dermot 1991, Groenenduk et al. 1998, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Lenat 1993, and Warwick 1985, among others). Over half of the 52 *Chironomus* examined from Station 97 were deformed while over a quarter of the *Chironomus* examined from Station 54 exhibited mentum deformities. Although many researches advocate the need for 100 specimens or more of a particular target taxon in order to define statistical significance with deformity analysis (Hudson and Ciborowski 1996a), Lenat (1993) found that a minimum of 15 specimens was adequate for his analysis of *Chironomus* deformities in impacted and unimpacted streams of North Carolina. Lenat (1993) indicates that typically less than five percent of *Chironomus* from non-toxic sites exhibited deformities while toxic sites were generally double that incidence level. Regardless of how many specimens were examined in these studies, the 59 percent incidence of deformity for *Chironomus* collected in the Ponar samples from Thorn Creek is substantially higher than background levels in literature for this taxon (Bisthoven et al. 1998, Bisthoven and Ollevier 1998, Dermot 1991, Groenenduk et al. 1998, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Lenat 1993, and Warwick 1985).

Based on the number and density of tolerant taxa in both the HD and Ponar samples combined with the relatively high incidence of mentum deformities in the Ponar samples, it appears the benthic community at both Stations 54 and 97 is moderately stressed.

3.1.1.5 Little Calumet River

HD and Ponar samples from the four L.C.R. stations (Stations 52, 56, 57, and 76) yielded a combined 52 total taxa (Tables 3-10 and 3-11). Six EPT taxa were present in the HD samples

TABLE 3-7. HESTER-DENDY DENSITIES AT SAMPLING STATIONS 54 AND 97 WITHIN THORN CREEK, JULY-AUGUST 2003.

| TAXA | 54 JOE ORR RD. | | 97 170TH ST. | |
|--------------------------------------|-------------------|--------|-----------------|--------|
| | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 139.9 | 4.29 |
| Turbellaria | 34.1 | 0.59 | 1.8 | 0.05 |
| Oligochaeta | 1,844.3 | 32.02 | 1,684.6 | 51.59 |
| Helobdella stagnalis | -- | -- | 1.8 | 0.05 |
| Caecidotea | 105.8 | 1.84 | 222.5 | 6.81 |
| Stenacron | -- | -- | 1.8 | 0.05 |
| Argia | -- | -- | 5.4 | 0.16 |
| Perlesta | -- | -- | 1.8 | 0.05 |
| Cheumatopsyche | 68.2 | 1.18 | 717.6 | 21.98 |
| Hydropsyche betteni | 66.4 | 1.15 | 14.4 | 0.44 |
| Ancyronyx variegata | -- | -- | 1.8 | 0.05 |
| Paracymus | -- | -- | 1.8 | 0.05 |
| Atrichopogon | -- | -- | 1.8 | 0.05 |
| Chironomidae | 208.1 | 3.61 | 34.1 | 1.04 |
| Ablabesmyia mallochi | 17.9 | 0.31 | 7.2 | 0.22 |
| Thienemannimyia grp. | 96.9 | 1.68 | 12.6 | 0.38 |
| Corynoneura | 102.3 | 1.78 | 9.0 | 0.27 |
| Thienemanniella xena | 491.6 | 8.54 | 32.3 | 0.99 |
| Cricotopus bicinctus grp. | 48.4 | 0.84 | -- | -- |
| Cricotopus sylvestris grp. | 35.9 | 0.62 | -- | -- |
| Euryhopsis | -- | -- | 7.2 | 0.22 |
| Nanocladius distinctus | 17.9 | 0.31 | 5.4 | 0.16 |
| Nanocladius crassicornus/rectinervis | -- | -- | 1.8 | 0.05 |
| Rheocricotopus robacki | 84.3 | 1.46 | 118.4 | 3.63 |
| Chironomus | 269.1 | 4.67 | 35.9 | 1.10 |
| Cryptochironomus | 17.9 | 0.31 | 5.4 | 0.16 |
| Dicrotendipes neomodestus | 48.4 | 0.84 | 5.4 | 0.16 |
| Dicrotendipes simpsoni | 17.9 | 0.31 | -- | -- |
| Polypedilum fallax grp. | -- | -- | 17.9 | 0.55 |
| Polypedilum flavum | 17.9 | 0.31 | -- | -- |
| Polypedilum illinoense | 1,483.7 | 25.76 | 23.3 | 0.71 |
| Polypedilum scalaenum grp. | 17.9 | 0.31 | 28.7 | 0.88 |
| Paratanytarsus | 192.0 | 3.33 | 10.8 | 0.33 |
| Tanytarsus | -- | -- | 1.8 | 0.05 |
| Culicidae | -- | -- | 1.8 | 0.05 |
| Simulium | 59.2 | 1.03 | 1.8 | 0.05 |
| Tipula | -- | -- | 1.8 | 0.05 |
| Physsa | 30.5 | 0.53 | 21.5 | 0.66 |
| Ferrissia | 382.1 | 6.64 | 78.9 | 2.42 |
| Corbicula fluminea | -- | -- | 5.4 | 0.16 |
| TOTAL BENTHOS | 5,758.9 | 100.00 | 3,265.2 | 100.00 |
| TOTAL TAXA RICHNESS | 24 | | 35 | |
| EPT TAXA RICHNESS | 2 | | 4 | |

TABLE 3-8. PETITE PONAR DENSITIES AT SAMPLING STATIONS 54 AND 97 WITHIN THORN CREEK, JULY-AUGUST 2003.

| TAXA | 54 JOE ORR RD. | | 97 170TH ST. | |
|----------------------------|-------------------|--------|-----------------|--------|
| | #/m2 | % | #/m2 | % |
| Oligochaeta | 875.5 | 63.87 | 4,176.8 | 79.95 |
| Mooreobdella microstoma | -- | -- | 14.4 | 0.27 |
| Caecidotea | -- | -- | 35.9 | 0.69 |
| Cheumatopsyche | -- | -- | 7.2 | 0.14 |
| Stenelmis | -- | -- | 7.2 | 0.14 |
| Chironomidae | 14.4 | 1.05 | 43.1 | 0.82 |
| Thienemanimyia grp. | -- | -- | 7.2 | 0.14 |
| Thienemanniella xena | 28.7 | 2.09 | -- | -- |
| Cricotopus tremulus grp. | 7.2 | 0.52 | -- | -- |
| Cricotopus bicinctus grp. | 14.4 | 1.05 | -- | -- |
| Rheocricotopus robacki | 7.2 | 0.52 | -- | -- |
| Chironomus | 50.2 | 3.66 | 373.2 | 7.14 |
| Cryptochironomus | -- | -- | 100.5 | 1.92 |
| Dicrotendipes neomodestus | -- | -- | 7.2 | 0.14 |
| Polypedilum fallax grp. | -- | -- | 7.2 | 0.14 |
| Polypedilum halterale grp. | -- | -- | 7.2 | 0.14 |
| Polypedilum illinoense | 294.2 | 21.47 | 14.4 | 0.27 |
| Polypedilum scalaenum grp. | 28.7 | 2.09 | 64.6 | 1.24 |
| Paratanytarsus | 7.2 | 0.52 | -- | -- |
| Simulium | 14.4 | 1.05 | -- | -- |
| Corbicula fluminea | 28.7 | 2.09 | 358.8 | 6.87 |
| TOTAL BENTHOS | 1,370.7 | 100.00 | 5,224.6 | 100.00 |
| TOTAL TAXA RICHNESS | 11 | | 14 | |
| EPT TAXA RICHNESS | 0 | | 1 | |

Table 3-9. Chironomidae head capsule deformities observed in Ponar samples from Thorn Creek of the Calumet watershed, June-August 2003.

| Taxa | Ponar Samples | |
|-----------------------|---------------------------------------|-------------------------------------|
| | Thorn Creek @ 170th St. Sta. 97 | Thorn Creek @ Joe Orr Sta. 54 |
| <i>Chironomus sp</i> | | |
| Number Examined | 52 | 7 |
| Percent Deformed | 55.8 | 28.6 |
| TOTAL SAMPLE | | |
| Total Midges Examined | 77 | 61 |
| Percent Deformed | 37.7 | 3.3 |

TABLE 3-10. HESTER-DENDY DENSITIES AT SAMPLING STATIONS 52, 56, 57, AND 76 WITHIN THE LITTLE CALUMET RIVER, JULY-SEPTEMBER 2003.

| TAXA | 52 WENTWORTH AVE. | | 56 INDIANA AVE. | | 57 AHSLAND AVE. | | 76 HALSTED ST. | |
|--------------------------------------|----------------------|--------|--------------------|--------|--------------------|--------|-------------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 17.9 | 0.29 | 2,160.0 | 36.09 | 1,126.7 | 20.62 | 3,948.7 | 40.73 |
| Turbellaria | 4,605.3 | 73.43 | 57.4 | 0.96 | 17.9 | 0.33 | 9.0 | 0.09 |
| Plumatella | -- | -- | -- | -- | -- | -- | 1.8 | 0.02 |
| Oligochaeta | 932.9 | 14.87 | 2,283.8 | 38.16 | 1,252.2 | 22.92 | 4,029.4 | 41.56 |
| Helobdella triserialis | 10.8 | 0.17 | -- | -- | 64.6 | 1.18 | -- | -- |
| Mooreobdella microstoma | 5.4 | 0.09 | 3.6 | 0.06 | -- | -- | 17.9 | 0.19 |
| Caecidotea | 113.0 | 1.80 | -- | -- | 211.7 | 3.88 | 9.0 | 0.09 |
| Gammarus | 53.8 | 0.86 | 37.7 | 0.63 | 10.8 | 0.20 | -- | -- |
| Gammarus fasciatus | -- | -- | -- | -- | -- | -- | 193.8 | 2.00 |
| Stenacron | -- | -- | -- | -- | 7.2 | 0.13 | -- | -- |
| Caenis | -- | -- | 3.6 | 0.06 | -- | -- | -- | -- |
| Argia | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- |
| Enallagma | -- | -- | -- | -- | 1.8 | 0.03 | -- | -- |
| Cynellus fraternus | -- | -- | 141.7 | 2.37 | -- | -- | -- | -- |
| Cheumatopsyche | -- | -- | -- | -- | 14.4 | 0.26 | 1.8 | 0.02 |
| Hydropsyche betteni | -- | -- | -- | -- | 5.4 | 0.10 | -- | -- |
| Potamyia flava | -- | -- | 3.6 | 0.06 | -- | -- | -- | -- |
| Chironomidae | -- | -- | 68.2 | 1.14 | 1.8 | 0.03 | 48.4 | 0.50 |
| Procladius (Holotanypus) | -- | -- | 32.3 | 0.54 | -- | -- | -- | -- |
| Ablabesmyia janta | 23.3 | 0.37 | -- | -- | 7.2 | 0.13 | -- | -- |
| Thienemannimyia grp. | 17.9 | 0.29 | -- | -- | 57.4 | 1.05 | -- | -- |
| Corynoneura | -- | -- | -- | -- | 5.4 | 0.10 | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | -- | -- | 68.2 | 0.70 |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 1.8 | 0.03 | 179.4 | 1.85 |
| Nanocladius distinctus | 12.6 | 0.20 | 70.0 | 1.17 | 14.4 | 0.26 | 161.5 | 1.67 |
| Nanocladius crassicornus/rectinervis | -- | -- | -- | -- | 10.8 | 0.20 | -- | -- |
| Rheocricotopus robacki | 5.4 | 0.09 | -- | -- | 3.6 | 0.07 | -- | -- |
| Chironomus | -- | -- | 80.7 | 1.35 | 1.8 | 0.03 | 26.9 | 0.28 |
| Cryptochironomus | -- | -- | -- | -- | 10.8 | 0.20 | -- | -- |
| Dicrotendipes neomolestus | -- | -- | 26.9 | 0.45 | 9.0 | 0.16 | -- | -- |
| Dicrotendipes simpsoni | 41.3 | 0.66 | 274.5 | 4.59 | 118.4 | 2.17 | 733.8 | 7.57 |
| Glyptotendipes | -- | -- | 638.7 | 10.67 | 3.6 | 0.07 | 43.1 | 0.44 |
| Parachironomus | -- | -- | 17.9 | 0.30 | 5.4 | 0.10 | 25.1 | 0.26 |
| Polypedilum fallax grp. | -- | -- | -- | -- | 12.6 | 0.23 | -- | -- |
| Polypedilum flavum | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | -- | -- | 82.5 | 1.51 | 9.0 | 0.09 |
| Polypedilum scalaenum grp. | 333.7 | 5.32 | 5.4 | 0.09 | 34.1 | 0.62 | 9.0 | 0.09 |
| Paratanytarsus | 5.4 | 0.09 | -- | -- | 19.7 | 0.36 | 25.1 | 0.26 |
| Tanytarsus | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- |
| Amnicola | -- | -- | -- | -- | -- | -- | 9.0 | 0.09 |
| Physa | 12.6 | 0.20 | -- | -- | 43.1 | 0.79 | 145.3 | 1.50 |
| Helisoma | 41.3 | 0.66 | -- | -- | 39.5 | 0.72 | -- | -- |
| Ferrissia | 17.9 | 0.29 | -- | -- | 2,267.7 | 41.51 | -- | -- |
| Pisidium | 5.4 | 0.09 | -- | -- | -- | -- | -- | -- |
| Dreissena polymorpha | -- | -- | 78.9 | 1.32 | -- | -- | -- | -- |
| TOTAL BENTHOS | 6,272.0 | 100.00 | 5,984.9 | 100.00 | 5,462.9 | 100.00 | 9,695.0 | 100.00 |
| TOTAL TAXA RICHNESS | 21 | | 17 | | 30 | | 20 | |
| EPT TAXA RICHNESS | 0 | | 3 | | 3 | | 1 | |

TABLE 3-11. PETITE PONAR DENSITIES AT SAMPLING STATIONS 52,56,57, AND 76 WITHIN THE LITTLE CALUMET RIVER, JULY-SEPTEMBER 2003.

| TAXA | 52 WENTWORTH AVE. | | 56 INDIANA AVE. | | 57 AHSLAND AVE. | | 76 HALSTED ST. | |
|------------------------------|----------------------|--------|--------------------|--------|--------------------|--------|-------------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | 495.2 | 3.04 | -- | -- | -- | -- | -- | -- |
| Oligochaeta | 10,076.0 | 61.90 | 2,124.3 | 90.52 | 27,443.5 | 98.66 | 26,158.8 | 95.95 |
| Helobdella stagnalis | -- | -- | -- | -- | 7.2 | 0.03 | -- | -- |
| Helobdella triserialis | -- | -- | -- | -- | 7.2 | 0.03 | -- | -- |
| Erpobdella punctata punctata | 559.8 | 3.44 | -- | -- | -- | -- | -- | -- |
| Caecidotea | 14.4 | 0.09 | -- | -- | -- | -- | 7.2 | 0.03 |
| Gammarus | 7.2 | 0.04 | -- | -- | -- | -- | 122.0 | 0.45 |
| Chironomidae | -- | -- | -- | -- | -- | -- | 28.7 | 0.11 |
| Procladius (Holotanypus) | 7.2 | 0.04 | 93.3 | 3.98 | -- | -- | 71.8 | 0.26 |
| Coelotanypus | -- | -- | 7.2 | 0.31 | -- | -- | -- | -- |
| Ablabesmyia mallochi | -- | -- | -- | -- | -- | -- | 7.2 | 0.03 |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | -- | -- | 100.5 | 0.37 |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | -- | -- | 315.8 | 1.16 |
| Nanocladius distinctus | -- | -- | -- | -- | 7.2 | 0.03 | -- | -- |
| Chironomus | -- | -- | 35.9 | 1.53 | 21.5 | 0.08 | 57.4 | 0.21 |
| Cryptochironomus | 14.4 | 0.09 | 35.9 | 1.53 | 50.2 | 0.18 | 71.8 | 0.26 |
| Dicrotendipes simpsoni | -- | -- | -- | -- | 14.4 | 0.05 | 7.2 | 0.03 |
| Microchironomus | -- | -- | 14.4 | 0.61 | -- | -- | -- | -- |
| Parachironomus | -- | -- | -- | -- | -- | -- | 50.2 | 0.18 |
| Polypedilum halterale grp. | -- | -- | 28.7 | 1.22 | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | -- | -- | 114.8 | 0.41 | -- | -- |
| Polypedilum scalaenum grp. | 28.7 | 0.18 | -- | -- | 28.7 | 0.10 | -- | -- |
| Paratanytarsus | -- | -- | -- | -- | -- | -- | 28.7 | 0.11 |
| Valvata | 186.6 | 1.15 | -- | -- | -- | -- | -- | -- |
| Amnicola | -- | -- | -- | -- | -- | -- | 71.8 | 0.26 |
| Physa | 14.4 | 0.09 | -- | -- | -- | -- | -- | -- |
| Helisoma | 35.9 | 0.22 | -- | -- | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | 122.0 | 0.44 | -- | -- |
| Corbicula fluminea | -- | -- | -- | -- | -- | -- | 93.3 | 0.34 |
| Musculium | 4,054.8 | 24.91 | -- | -- | -- | -- | -- | -- |
| Pisidium | 782.3 | 4.81 | -- | -- | -- | -- | -- | -- |
| Dreissena polymorpha | -- | -- | 7.2 | 0.31 | -- | -- | 71.8 | 0.26 |
| TOTAL BENTHOS | 16,276.6 | 100.00 | 2,346.8 | 100.00 | 27,816.6 | 100.00 | 27,264.0 | 100.00 |
| TOTAL TAXA RICHNESS | 13 | | 8 | | 10 | | 15 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | |

(Table 3-10), but none were present in the Ponar samples (Table 3-11). HD total taxa richness was similar among Stations 52, 56, and 76 (17-21 taxa) but higher (30 taxa) at Station 57. Total HD density was relatively similar between Stations 52, 56, and 57 while substantially higher at Station 76. Total HD density varied largely depending on the abundance of the organisms *Ferrissia*, *Hydra*, *Oligochaeta*, and *Turbellaria*. The freshwater limpet *Ferrissia* was the dominant HD taxon at Station 57 with substantial numbers of *Hydra* and *Oligochaeta* also present. *Turbellaria* dominated the sample at Station 52, representing almost three-quarters of the sample. *Hydra* and *Oligochaeta* were nearly equally dominant in the HD samples at Stations 56, 57, and 76

Ponar total taxa richness was fairly similar between Stations 56 and 57, ranging from eight to 10 taxa while Stations 52 and 76 were represented by 13 and 15 total taxa, respectively (Table 3-11). No EPT taxa were present in the Ponar samples. Ponar densities were similar at Stations 52, 57, and 76 with Station 56 being the lowest of the four stations. These differences were primarily due to variations in the abundance of *Oligochaeta* among the four stations. *Oligochaeta* was the dominant taxon in the Ponar samples accounting for greater than 90 percent of the total density at all four stations except for Station 52 at just over 60 percent. In addition to *Oligochaeta*, the fingernail clam *Musculium* was relatively common at Station 52 as well.

Chironomidae head capsule deformities were observed in both the HD and Ponar samples (Table 3-12). *Chironomus* was the taxon most frequently with deformities. Overall, the percent deformities was low (1-2%) at Stations 52, 57, and 76, but higher in the Ponar samples at Station 56. Highly tolerant taxa accounted for >50% of the individuals at all stations (Tables 3-1, 3-10, and 3-11).

3.1.1.6 Calumet-Sag Channel

The HD and Ponar samples from the three Cal-Sag Stations (43, 58, and 59) yielded 35 total taxa and two EPT taxa. (Table 3-13 and 3-14). HD total taxa richness was similar among all three sampling stations yielding between 18-21 taxa (Table 3-13). Total HD and Ponar densities varied greatly between the three stations. HD total density variation was primarily due to differences in the abundance of *Oligochaeta*, *D. polymorpha*, and the midge *Cricotopus sylvestris* grp. However, in the Ponars, total density variation was almost exclusively due to the abundance of *Oligochaeta* (Table 3-14). *Oligochaeta* was the dominant taxon in the Ponar samples accounting for 86-99 percent of the total density at the three stations. Excluding the midge *Procladius (Holotanypus)*, none of the other taxa in the Ponar samples accounted for greater than one percent of the total density.

Chironomidae head capsule deformities were observed in both the HD and Ponar samples from the Cal-Sag stations (Table 3-15). Except for the Ponar samples at Station 59, the incidence of head capsule deformities at the Cal-Sag stations was fairly low (i.e., approximately one percent or less). In the Station 59 Ponar samples, five of the 51 midge specimens exhibited head capsule deformities and all deformities were observed in the taxon *Procladius (Holotanypus)*. Despite the low occurrence of deformities in most samples, the benthic community at all three locations was represented by a low number of taxa and was dominated by highly tolerant taxa (Tables 3-13 and 3-14). Therefore, it is reasonable to conclude that the benthic community at these locations in the Cal-Sag is highly stressed.

Table 3-12. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the Little Calumet River (L.C.R.) of the Calumet watershed, July 2003.

| Taxa | Hester-Dendy Samples | | Ponar Samples | |
|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | L.C.R @ Indiana Sta. 56 | L.C.R @ Ashland Sta. 57 | L.C.R @ Indiana Sta. 56 | L.C.R @ Halsted Sta. 76 |
| <i>Chironomus sp.</i> | | | | |
| Number Examined | 13 | -- | 5 | 8 |
| Percent Deformed | 15.4 | -- | 60.0 | 13.0 |
| <i>Polypedilum fallax grp.</i> | | | | |
| Number Examined | -- | 7 | -- | -- |
| Percent Deformed | -- | 14.3 | -- | -- |
| <i>Procladius (Holotanypus)</i> | | | | |
| Number Examined | 5 | -- | -- | -- |
| Percent Deformed | 20.0 | -- | -- | -- |
| TOTAL SAMPLE | | | | |
| Total Midges Examined | 181 | 222 | 30 | 104 |
| Percent Deformed | 1.7 | 0.5 | 10.0 | 0.9 |

TABLE 3-13. HESTER-DENDY DENSITIES AT SAMPLING STATIONS 43,58, AND 59 WITHIN THE CAL-SAG CHANNEL, JULY-SEPTEMBER 2003.

| TAXA | 43 | | 58 | | 59 | |
|------------------------------|----------|--------|--------------|--------|-------------|--------|
| | ROUTE 83 | | ASHLAND AVE. | | CICERO AVE. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 294.2 | 6.66 | 113.0 | 1.42 | 520.3 | 3.33 |
| Turbellaria | 7.2 | 0.16 | 593.8 | 7.45 | 1.8 | 0.01 |
| Plumatella | 9.0 | 0.20 | -- | -- | -- | -- |
| Oligochaeta | 934.7 | 21.15 | 2,287.4 | 28.69 | 11,286.3 | 72.31 |
| Helobdella triserialis | -- | -- | 35.9 | 0.45 | -- | -- |
| Erpobdella punctata punctata | -- | -- | 23.3 | 0.29 | -- | -- |
| Mooreobdella microstoma | 7.2 | 0.16 | -- | -- | -- | -- |
| Caecidotea | 5.4 | 0.12 | 19.7 | 0.25 | 96.9 | 0.62 |
| Gammarus | -- | -- | -- | -- | 200.9 | 1.29 |
| Gammarus fasciatus | 249.4 | 5.64 | 364.2 | 4.57 | -- | -- |
| Caenis | 9.0 | 0.20 | -- | -- | -- | -- |
| Argia | -- | -- | 3.6 | 0.05 | -- | -- |
| Cyrnellus fraternus | 1.8 | 0.04 | -- | -- | -- | -- |
| Chironomidae | 80.7 | 1.83 | 44.9 | 0.56 | 93.3 | 0.60 |
| Procladius (Holotanypus) | 3.6 | 0.08 | 17.9 | 0.23 | 17.9 | 0.11 |
| Cricotopus bicinctus grp. | 26.9 | 0.61 | 71.8 | 0.90 | 154.3 | 0.99 |
| Cricotopus sylvestris grp. | 2,131.3 | 48.23 | 9.0 | 0.11 | 470.0 | 3.01 |
| Nanocladius distinctus | 26.9 | 0.61 | 380.3 | 4.77 | 346.3 | 2.22 |
| Rheocricotopus robacki | -- | -- | -- | -- | 17.9 | 0.11 |
| Chironomus | -- | -- | -- | -- | 10.8 | 0.07 |
| Dicrotendipes | -- | -- | 17.9 | 0.23 | -- | -- |
| Dicrotendipes neomodestus | -- | -- | -- | -- | 10.8 | 0.07 |
| Dicrotendipes simpsoni | 113.0 | 2.56 | 2,269.5 | 28.47 | 2,025.5 | 12.98 |
| Glyptotendipes | 296.0 | 6.70 | 9.0 | 0.11 | 10.8 | 0.07 |
| Parachironomus | 53.8 | 1.22 | -- | -- | -- | -- |
| Polypedilum illinoense | 109.4 | 2.48 | 26.9 | 0.34 | 272.7 | 1.75 |
| Stenochironomus | -- | -- | 17.9 | 0.23 | -- | -- |
| Paratanytarsus | 55.6 | 1.26 | -- | -- | 17.9 | 0.11 |
| Xenochironomus xenolabis | -- | -- | 35.9 | 0.45 | -- | -- |
| Amnicola | 1.8 | 0.04 | -- | -- | -- | -- |
| Physa | 1.8 | 0.04 | -- | -- | 17.9 | 0.11 |
| Helisoma | -- | -- | 296.0 | 3.71 | -- | -- |
| Ferrissia | -- | -- | 166.8 | 2.09 | -- | -- |
| Corbicula fluminea | -- | -- | -- | -- | 35.9 | 0.23 |
| Dreissena polymorpha | -- | -- | 1,167.9 | 14.65 | -- | -- |
| TOTAL BENTHOS | 4,418.7 | 100.00 | 7,972.7 | 100.00 | 15,608.2 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | | 21 | | 18 | |
| TOTAL EPT RICHNESS | 2 | | 0 | | 0 | |

TABLE 3-14. PETITE PONAR DENSITIES AT SAMPLING STATIONS 43, 58, AND 59 WITHIN THE CAL-SAG CHANNEL, JULY-SEPTEMBER 2003.

| TAXA | 43 | | 58 | | 59 | |
|--------------------------|----------|--------|--------------|--------|-------------|--------|
| | ROUTE 83 | | ASHLAND AVE. | | CICERO AVE. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Oligochaeta | 11,159.7 | 86.25 | 43,956.9 | 99.42 | 4,219.9 | 91.59 |
| Mooreobdella microstoma | 7.2 | 0.06 | -- | -- | -- | -- |
| Procladius (Holotanypus) | 1,736.7 | 13.42 | 236.8 | 0.54 | 344.5 | 7.48 |
| Nanocladius distinctus | 14.4 | 0.11 | -- | -- | -- | -- |
| Cryptochironomus | 7.2 | 0.06 | -- | -- | -- | -- |
| Dicrotendipes simpsoni | -- | -- | -- | -- | 7.2 | 0.16 |
| Polypedilum illinoense | -- | -- | -- | -- | 14.4 | 0.31 |
| Tanytarsus | 14.4 | 0.11 | -- | -- | -- | -- |
| Corbicula fluminea | -- | -- | -- | -- | 21.5 | 0.47 |
| Pisidium | -- | -- | 21.5 | 0.05 | -- | -- |
| TOTAL BENTHOS | 12,939.5 | 100.00 | 44,215.2 | 100.00 | 4,607.4 | 100.00 |
| TOTAL TAXA RICHNESS | 6 | | 3 | | 5 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | |

Table 3-15. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from stations within the Calumet watershed, July-September 2003.

| Taxa | Hester-Dendy Samples | | |
|-------------------------------|---|--|--|
| | Cal-Sag Channel @ Ashland Sta. 58 | Cal-Sag Channel @ Cicero Sta. 59 | Cal-Sag Channel @ Route 83 Sta. 43 |
| <i>Dicrotendipes simpsoni</i> | | | |
| Number Examined | 158 | 108 | 21 |
| Percent Deformed | 0.6 | 2.8 | 4.8 |
| TOTAL SAMPLE | | | |
| Total Midges Examined | 202 | 196 | 132 |
| Percent Deformed | 0.4 | 1.5 | 0.8 |

| Taxa | Ponar Samples | |
|---------------------------------|--|--|
| | Cal-Sag Channel @ Cicero Sta. 59 | Cal-Sag Channel @ Route 83 Sta. 43 |
| <i>Procladius (Holotanypus)</i> | | |
| Number Examined | 48 | 179 |
| Percent Deformed | 10.4 | 1.1 |
| TOTAL SAMPLE | | |
| Total Midges Examined | 51 | 183 |
| Percent Deformed | 9.8 | 1.1 |

3.1.2 North Branch Chicago River Watershed

Sampling was conducted at three stations in the North Branch of the Chicago River watershed during 2003: one station in the North Shore Channel (NSC) and two stations in the North Branch of the Chicago River (NBCR) (Table 2-1).

In the HD samples collected from the North Branch Chicago River watershed, the dominant taxa were Oligochaeta, Turbellaria, or the sow bug Caecidotea. Oligochaeta was the dominant taxon in the Ponar samples at all but one of the stations.

The incidence of Chironomidae deformities was generally low in the watershed. Based on the dominance of a single taxon, dominance by tolerant taxa, taxa richness, and EPT richness, several stations in the watershed exhibited varying degrees of stress.

3.1.2.1 North Shore Channel

Combined, the HD and Ponar samples from the single station in the North Shore Channel (Station 36) produced 14 total taxa and no EPT taxa (Tables 3-16 and 3-17). In the HD sample, Oligochaeta and Turbellaria were similar in abundance (Table 3-16). Both the midge *Dicrotendipes simpsoni* and the sideswimmer *Gammarus* were observed in substantial numbers in the HD sample as well. Oligochaeta was clearly the dominant taxon for the Ponar samples comprising almost 90 percent of the sample (Table 3-17). With the exception of the flatworm Turbellaria, no other taxon accounted for more than one percent of the total density in the Ponar sample.

Only one chironomid head capsule deformity was observed from the NSC samples (Table 3-18). Nonetheless, the benthic community of the NSC could be characterized as moderately to highly stressed. This assertion is supported by the fact that of the 14 total taxa observed nine are considered highly tolerant and tolerant taxa comprised >50 percent of the benthic community at each station regardless of sample type (Table 3-1).

3.1.2.2 North Branch of the Chicago River (NBCR)

Combined, the HD and Ponar samples from the two stations in the NBCR (Stations 96 and 46) yielded 39 total taxa, including five EPT taxa (Tables 3-19 and 3-20). HD total taxa richness was greatly different between the two stations with Station 96 upstream having 31 total taxa and five EPT taxa, whereas Station 46 downstream had only 13 total taxa and no EPT taxa. Conversely, total HD density at Station 46 was more than five times that of Station 96 due to the abundance of Oligochaeta at Station 46. The dominant taxon for the HD sample at Station 96 was the sow bug *Caecidotea*, representing 76 percent of the sample.

Total Ponar taxa richness varied from only five taxa at Station 46 to 18 taxa at Station 96 (Table 3-20). Again the upstream station, Station 96, contained the only EPT taxon in the Ponar samples. Total Ponar densities were very similar at the two stations. The dominant organism for Station 46 was Oligochaeta comprising over 99 percent of the sample, whereas *Caecidotea*, and the fingernail clam *Musculium* were the dominant organisms collected at Station 96, comprising just over 40 and 30 percent of the sample, respectively.

TABLE 3-16. HESTER-DENDY DENSITIES AT SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL, JULY 2003.

| TAXA | 36 TOUHY AVE. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Turbellaria | 6,745.6 | 37.79 |
| Oligochaeta | 8,575.5 | 48.04 |
| Caecidotea | 80.7 | 0.45 |
| Gammarus | 959.8 | 5.38 |
| Chironomidae | 44.9 | 0.25 |
| Cricotopus sylvestris grp. | 71.8 | 0.40 |
| Nanocladius distinctus | 26.9 | 0.15 |
| Chironomus | 9.0 | 0.05 |
| Dicrotendipes simpsoni | 915.0 | 5.13 |
| Glyptotendipes | 358.8 | 2.01 |
| Parachironomus | 62.8 | 0.35 |
| TOTAL BENTHOS | 17,850.7 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-17. PETITE PONAR DENSITIES AT SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL, JULY 2003.

| TAXA | 36 TOUHY AVE. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Turbellaria | 2,892.2 | 8.09 |
| Oligochaeta | 31,799.7 | 88.98 |
| Helobdella triserialis | 21.5 | 0.06 |
| Caecidotea | 14.4 | 0.04 |
| Gammarus | 7.2 | 0.02 |
| Cricotopus bicinctus grp. | 7.2 | 0.02 |
| Cricotopus sylvestris grp. | 172.2 | 0.48 |
| Nanocladius distinctus | 28.7 | 0.08 |
| Chironomus | 215.3 | 0.60 |
| Dicrotendipes simpsoni | 258.4 | 0.72 |
| Glyptotendipes | 93.3 | 0.26 |
| Parachironomus | 143.5 | 0.40 |
| Polypedilum scalaenum grp. | 71.8 | 0.20 |
| Helisoma | 14.4 | 0.04 |
| TOTAL BENTHOS | 35,739.6 | 100.00 |
| TOTAL TAXA RICHNESS | 14 | |
| EPT TAXA RICHNESS | 0 | |

Table 3-18. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the North Branch of the Chicago River watershed, July 2003.

| Taxa | Hester-Dendy Sample | Ponar Sample |
|--------------------------------------|--|--------------------------------------|
| | N.B.C.R @ Grand Sta. 46 | N.S.C @ Touhy Sta. 36 |
| <i>Chironomus sp.</i> | | |
| Number Examined | -- | 18 |
| Percent Deformed | -- | 5.6 |
| <i>Dicrotendipes simpsoni</i> | | |
| Number Examined | 8.4 | -- |
| Percent Deformed | 1.2 | -- |
| TOTAL SAMPLE | | |
| Total Midges Examined | 107 | 101 |
| Percent Deformed | 0.9 | 1.0 |

TABLE 3-19. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, JULY-AUGUST 2003.

| TAXA | 96 ALBANY AVE. | | 46 GRAND AVE. | |
|--------------------------------------|-------------------|--------|------------------|--------|
| | #/m2 | % | #/m2 | % |
| Hydra | 14.4 | 0.35 | -- | -- |
| Turbellaria | 236.8 | 5.74 | 2,179.8 | 9.49 |
| Oligochaeta | 172.2 | 4.17 | 18,864.4 | 82.15 |
| Helobdella triserialis | 70.0 | 1.69 | 26.9 | 0.12 |
| Erpobdella punctata punctata | 3.6 | 0.09 | -- | -- |
| Mooreobdella microstoma | -- | -- | 9.0 | 0.04 |
| Caecidotea | 3,150.3 | 76.31 | 116.6 | 0.51 |
| Gammarus fasciatus | -- | -- | 17.9 | 0.08 |
| Baetis intercalaris | 5.4 | 0.13 | -- | -- |
| Stenacron | 10.8 | 0.26 | -- | -- |
| Argia | 1.8 | 0.04 | -- | -- |
| Cheumatopsyche | 12.6 | 0.30 | -- | -- |
| Hydropsyche betteni | 9.0 | 0.22 | -- | -- |
| Ceraclea | 1.8 | 0.04 | -- | -- |
| Chironomidae | 1.8 | 0.04 | -- | -- |
| Thienemannimyia grp. | 14.4 | 0.35 | 35.9 | 0.16 |
| Corynoneura | 14.4 | 0.35 | -- | -- |
| Cricotopus bicinctus grp. | 10.8 | 0.26 | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | 9.0 | 0.04 |
| Nanocladius distinctus | 10.8 | 0.26 | 278.1 | 1.21 |
| Nanocladius crassicornus/rectinervis | 7.2 | 0.17 | -- | -- |
| Chironomus | 3.6 | 0.09 | -- | -- |
| Dicrotendipes | 12.6 | 0.30 | -- | -- |
| Dicrotendipes simpsoni | 1.8 | 0.04 | 1,381.4 | 6.02 |
| Glyptotendipes | 1.8 | 0.04 | 17.9 | 0.08 |
| Parachironomus | -- | -- | 17.9 | 0.08 |
| Phaenopsectra punctipes | 1.8 | 0.04 | -- | -- |
| Polypedilum illinoense | 37.7 | 0.91 | 9.0 | 0.04 |
| Polypedilum scalaenum grp. | 17.9 | 0.43 | -- | -- |
| Paratanytarsus | 7.2 | 0.17 | -- | -- |
| Tanytarsus | 5.4 | 0.13 | -- | -- |
| Xenochironomus xenolabis | 55.6 | 1.35 | -- | -- |
| Physa | 12.6 | 0.30 | -- | -- |
| Helisoma | 7.2 | 0.17 | -- | -- |
| Ferrissia | 213.5 | 5.17 | -- | -- |
| Musculium | 1.8 | 0.04 | -- | -- |
| TOTAL BENTHOS | 4,128.1 | 100.00 | 22,963.8 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | | 13 | |
| EPT TAXA RICHNESS | 5 | | 0 | |

TABLE 3-20. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, JULY-AUGUST 2003.

| TAXA | 96 ALBANY AVE. | | 46 GRAND AVE. | |
|------------------------------|-------------------|--------|------------------|--------|
| | #/m2 | % | #/m2 | % |
| Turbellaria | 1,076.5 | 4.97 | -- | -- |
| Oligochaeta | 947.3 | 4.38 | 23,223.6 | 99.81 |
| Helobdella stagnalis | 100.5 | 0.46 | -- | -- |
| Erpobdella punctata punctata | 416.2 | 1.92 | -- | -- |
| Mooreobdella microstoma | -- | -- | 7.2 | 0.03 |
| Caecidotea | 8,942.1 | 41.31 | -- | -- |
| Gammarus | 43.1 | 0.20 | -- | -- |
| Coenagrionidae | 14.4 | 0.07 | -- | -- |
| Cheumatopsyche | 14.4 | 0.07 | -- | -- |
| Stenelmis | 28.7 | 0.13 | -- | -- |
| Procladius (Holotanypus) | -- | -- | 7.2 | 0.03 |
| Thienemannimyia grp. | 43.1 | 0.20 | 7.2 | 0.03 |
| Dicrotendipes | 14.4 | 0.07 | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 21.5 | 0.09 |
| Polypedilum scalaenum grp. | 86.1 | 0.40 | -- | -- |
| Tanytarsus | 14.4 | 0.07 | -- | -- |
| Xenochironomus xenolabis | 28.7 | 0.13 | -- | -- |
| Amnicola | 14.4 | 0.07 | -- | -- |
| Physa | 114.8 | 0.53 | -- | -- |
| Musculium | 6,703.0 | 30.97 | -- | -- |
| Pisidium | 3,042.9 | 14.06 | -- | -- |
| TOTAL BENTHOS | 21,644.7 | 100.00 | 23,266.6 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | | 5 | |
| EPT TAXA RICHNESS | 1 | | 0 | |

The incidence of Chironomidae deformities was low in samples from the North Branch Chicago River (Table 3-18). Only one specimen (7.1 percent) of *Dicrotendipes simpsoni* from the Station 46 HD samples exhibited a deformity. However, the benthic community at Station 46 was almost completely dominated by highly tolerant taxa which suggests the benthic community is at least moderately stressed (Tables 3-19 and 3-20). In contrast, the higher taxa richness at Station 96 indicates the benthic community is more balanced and less stressed compared to the community at Station 46.

3.1.3 South Branch Chicago River and Chicago Sanitary and Ship Canal Watershed

Benthic macroinvertebrate sampling was conducted at three stations all within the Chicago Sanitary and Ship Canal (CSSC) (Table 2-1). Oligochaeta was the dominant taxa at all three stations for both sample types.

3.1.3.1 Chicago Sanitary and Ship Canal

Combined, the HD and Ponar samples from the three CSSC stations (Stations 75, 41, and 92) yielded 26 total taxa and no EPT taxa (Tables 3-21 and 3-22). HD total taxa richness was similar between Stations 75 and 41 at 9 and 12 taxa, respectively. Station 92 had the highest HD taxa richness with 20 total taxa. Total density was similar between Stations 75 and 41 but slightly more than four times higher than at Station 41. Density among the three stations was primarily driven by the abundance of Turbellaria, Oligochaeta, *Dicrotendipes simpsoni*, and *Gammarus fasciatus*. Oligochaeta was the dominant taxon at the two Stations 75 and 41, representing more than 80 percent of the sample at each station. Oligochaeta was the dominant Station 92, however only represented 37 percent of the total density, with *Gammarus fasciatus* nearly as abundant at 23 percent.

Ponar total taxa richness was identical between Stations 41 and 92 with 4 taxa, and only slightly higher (7 taxa) at Station 75 (Table 3-22). Taxa richness in the Station 75 Ponars (seven taxa) was nearly equal to total HD taxa richness (nine taxa) for that station. Total density varied greatly among the three stations due to differences in Oligochaeta density among the three locations.

Chironomid head capsule deformities were observed in the HD samples at two stations and in the Ponar samples at one station in the CSSC (Table 3-23). *Dicrotendipes simpsoni* and *Chironomus* sp. were the taxa exhibiting deformities. Deformities were relatively low at all locations, ranging from one to three individuals with deformities.

The tolerant taxon Oligochaeta was dominant at all three stations for both sample types (Table 3-1). However, based on higher taxa richness and lower abundance of Oligochaeta, it appears that conditions are somewhat better at Station 92.

3.1.4 Des Plaines River Watershed

Sampling was conducted at six stations in the Des Plaines River watershed during 2003: one in Higgins Creek, one in Salt Creek, one in the West Branch of the DuPage River (W.B. DuPage River), and three in the Des Plaines River (Table 2-1).

TABLE 3-21. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, JULY 2003.

| TAXA | 75 CICERO AVE. | | 41 HARLEM AVE. | | 92 LOCKPORT | |
|----------------------------|-------------------|--------|-------------------|--------|----------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 17.9 | 0.06 | 17.9 | 0.06 | 367.8 | 5.84 |
| Turbellaria | 2,368.1 | 8.12 | 627.9 | 2.26 | 1,123.1 | 17.82 |
| Oligochaeta | 25,314.0 | 86.83 | 24,865.4 | 89.65 | 2,335.8 | 37.07 |
| Helobdella stagnalis | -- | -- | 17.9 | 0.06 | 41.3 | 0.65 |
| Helobdella triserialis | -- | -- | -- | -- | 5.4 | 0.09 |
| Mooreobdella microstoma | -- | -- | -- | -- | 1.8 | 0.03 |
| Caecidotea | -- | -- | 35.9 | 0.13 | 10.8 | 0.17 |
| Gammarus | -- | -- | 197.3 | 0.71 | -- | -- |
| Gammarus fasciatus | 125.6 | 0.43 | -- | -- | 1,458.6 | 23.15 |
| Berosus | -- | -- | -- | -- | 1.8 | 0.03 |
| Chironomidae | 17.9 | 0.06 | 161.5 | 0.58 | 9.0 | 0.14 |
| Procladius (Holotanypus) | 17.9 | 0.06 | -- | -- | -- | -- |
| Ablabesmyia mallochii | 17.9 | 0.06 | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | 3.6 | 0.06 |
| Cricotopus sylvestris grp. | -- | -- | 53.8 | 0.19 | 64.6 | 1.03 |
| Nanocladius distinctus | 89.7 | 0.31 | 538.2 | 1.94 | 192.0 | 3.05 |
| Chironomus | -- | -- | 71.8 | 0.26 | -- | -- |
| Dicrotendipes simpsoni | 1,148.2 | 3.94 | 1,076.4 | 3.88 | 584.9 | 9.28 |
| Glyptotendipes | -- | -- | 53.8 | 0.19 | 21.5 | 0.34 |
| Parachironomus | 35.9 | 0.12 | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | -- | -- | 9.0 | 0.14 |
| Polypedilum scalaenum grp. | -- | -- | -- | -- | 5.4 | 0.09 |
| Stenochironomus | -- | -- | -- | -- | 5.4 | 0.09 |
| Xenochironomus xenolabis | -- | -- | -- | -- | 35.9 | 0.57 |
| Physa | -- | -- | 17.9 | 0.06 | -- | -- |
| Ferrissia | -- | -- | -- | -- | 9.0 | 0.14 |
| Corbicula fluminea | -- | -- | -- | -- | 14.4 | 0.23 |
| TOTAL BENTHOS | 29,153.2 | 100.00 | 27,735.9 | 100.00 | 6,300.7 | 100.00 |
| TOTAL TAXA RICHNESS | 9 | | 12 | | 20 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | |

TABLE 3-22. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, JULY 2003.

| TAXA | 75 CICERO AVE. | | 41 HARLEM AVE. | | 92 LOCKPORT | |
|----------------------------|-------------------|--------|-------------------|--------|----------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | 21.5 | 3.26 | -- | -- | -- | -- |
| Oligochaeta | 588.5 | 89.13 | 24,594.3 | 98.14 | 112,027.3 | 98.49 |
| Helobdella triserialis | 7.2 | 1.09 | -- | -- | -- | -- |
| Gammarus fasciatus | -- | -- | -- | -- | 287.1 | 0.25 |
| Chironomidae | -- | -- | -- | -- | 71.8 | 0.06 |
| Procladius (Holotanypus) | 7.2 | 1.09 | 71.8 | 0.29 | 1,291.8 | 1.14 |
| Cricotopus sylvestris grp. | 7.2 | 1.09 | 7.2 | 0.03 | -- | -- |
| Chironomus | -- | -- | 387.5 | 1.55 | -- | -- |
| Tipulidae | 7.2 | 1.09 | -- | -- | -- | -- |
| Corbicula fluminea | 21.5 | 3.26 | -- | -- | 71.8 | 0.06 |
| TOTAL BENTHOS | 660.3 | 100.00 | 25,060.8 | 100.00 | 113,749.7 | 100.00 |
| TOTAL TAXA RICHNESS | 7 | | 4 | | 4 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | |

Table 3-23. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the Chicago Sanitary and Ship Canal, July 2003.

| Taxa | Hester-Dendy Samples | | Ponar Sample |
|-------------------------------|--------------------------------|--------------------------------|----------------------------------|
| | C.S.S.C @ Cicero Sta. 75 | C.S.S.C @ Harlem Sta. 41 | C.S.S.C @ Lockport Sta. 92 |
| <i>Chironomus sp.</i> | | | |
| Number Examined | -- | 9 | -- |
| Percent Deformed | -- | 33.3 | -- |
| <i>Dicrotendipes simpsoni</i> | | | |
| Number Examined | 64 | -- | 126 |
| Percent Deformed | 4.7 | -- | 0.8 |
| TOTAL SAMPLE | | | |
| Total Midges Examined | 73 | 11 | 203 |
| Percent Deformed | 4.1 | 27.3 | 0.5 |

The benthic community in the Des Plaines River watershed exhibited a substantial amount of variability. The dominant taxon for more than half of the HD and Ponar samples was Oligochaeta. However, in the Des Plaines River, midges dominated. The incidence of chironomid deformities was generally low among stations in the Des Plaines watershed. The highest number of deformed specimens in 2003 was observed at Station 22 on the Des Plaines River. In addition, the highest total richness and highest EPT richness for any stations sampled in 2003 were observed in the Des Plaines River watershed.

3.1.4.1 West Branch of the DuPage River

The benthic macroinvertebrate community in the West Branch of the DuPage River (WBDPR) at Station 64 was represented by 25 total taxa and one EPT taxon in the HD and Ponar samples (Tables 3-24 and 3-25). The HD and Ponar samples yielded 23 and 16 total taxa, respectively. Only one EPT taxon was found in the HD samples and none were present in the Ponars. In the HD samples, the highly tolerant taxon Oligochaeta was clearly dominant (Table 3-24). Oligochaeta was also the dominant taxa in the Ponar samples but the relatively tolerant midge *Chironomus* was nearly as abundant.

Chironomid head capsule deformities were observed on several tolerant taxa in the WB DuPage River (Table 3-26). However, no taxon had more than two specimens with deformities. Tolerant taxa comprised >90 percent of the total density in both the HDs and Ponars (Tables 3-24 and 3-25). Based on the presence of only one EPT and the high relative abundance of tolerant taxa in the samples, it is reasonable to characterize the WB DuPage River benthic community as moderately to highly stressed, during 2003.

3.1.4.2 Salt Creek

HD and Ponar samples from the single station in Salt Creek (Station 18) yielded 34 total taxa and a single EPT taxon (Tables 3-27 and 3-28). Total taxa richness ranged from 31 taxa in the HD samples to 19 taxa in the Ponar samples. The EPT taxon *Caenis* was observed in both sample types. Oligochaeta was the dominant taxon in the HD samples whereas the relatively intolerant midge *Cladotanytarsus mancus* grp. was the dominant in the Ponars. A substantial number of *Hydra* was similarly observed in the HD samples. Aside from *Hydra* and Oligochaeta, no single taxon in the HD samples accounted for more than two percent of the total sample. The Ponars were dominated by the midge *Cladotanytarsus mancus* grp. and Oligochaeta, with substantial numbers of the midges *Polypedilum scalaenum* group, *Dicrotendipes fumidus*, and *Chironomus* also observed in the Ponar samples.

Chironomid head capsule deformities were not observed in any HD specimens and on only one midge specimen in the Ponar samples exhibited a deformity (Table 3-26).

Results from the 2003 sampling of Salt Creek were mixed. Tolerant taxa comprised approximately 60 and 35 percent of the HD and Ponar total density (Tables 3-27 and 3-28). This suggests that the Salt Creek benthic community is moderately stressed. In contrast, the presence of Tanytarsini midge taxa as well as the relatively high taxa richness observed in both the HDs and Ponars indicates a healthier benthic assemblage compared to several of the stations surveyed in 2003.

TABLE 3-24. HESTER-DENDY DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH OF THE DUPAGE RIVER, JULY 2003.

| TAXA | 64 LAKE ST. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Hydra | 35.9 | 0.12 |
| Oligochaeta | 22,461.4 | 72.16 |
| Caecidotea | 107.6 | 0.35 |
| Argia | 35.9 | 0.12 |
| Cheumatopsyche | 197.3 | 0.63 |
| Chironomidae | 233.2 | 0.75 |
| Thienemannimyia grp. | 143.5 | 0.46 |
| Thienemanniella xena | 143.5 | 0.46 |
| Cricotopus tremulus grp. | 143.5 | 0.46 |
| Cricotopus bicinctus grp. | 861.1 | 2.77 |
| Cricotopus sylvestris grp. | 1,148.2 | 3.69 |
| Chironomus | 735.6 | 2.36 |
| Dicrotendipes neomodestus | 107.6 | 0.35 |
| Dicrotendipes simpsoni | 143.5 | 0.46 |
| Endochironomus nigricans | 35.9 | 0.12 |
| Glyptotendipes | 2,475.8 | 7.95 |
| Polypedilum flavum | 322.9 | 1.04 |
| Polypedilum illinoense | 251.2 | 0.81 |
| Polypedilum scalaenum grp. | 143.5 | 0.46 |
| Paratanytarsus | 358.8 | 1.15 |
| Tanytarsus | 107.6 | 0.35 |
| Simulium | 861.1 | 2.77 |
| Physa | 17.9 | 0.06 |
| Helisoma | 53.8 | 0.17 |
| TOTAL BENTHOS | 31,126.7 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-25. PETITE PONAR DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH OF THE DUPAGE RIVER, JULY 2003.

| TAXA | 64 LAKE ST. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Oligochaeta | 1,607.6 | 41.56 |
| Caecidotea | 14.4 | 0.37 |
| Chironomidae | 21.5 | 0.56 |
| Cricotopus bicinctus grp. | 71.8 | 1.86 |
| Cricotopus sylvestris grp. | 157.9 | 4.08 |
| Chironomus | 1,449.7 | 37.48 |
| Cryptochironomus | 35.9 | 0.93 |
| Dicrotendipes neomodestus | 21.5 | 0.56 |
| Dicrotendipes simpsoni | 14.4 | 0.37 |
| Endochironomus nigricans | 21.5 | 0.56 |
| Glyptotendipes | 143.5 | 3.71 |
| Polypedilum flavum | 7.2 | 0.19 |
| Polypedilum scalaenum grp. | 150.7 | 3.90 |
| Cladotanytarsus | 14.4 | 0.37 |
| Paratanytarsus | 78.9 | 2.04 |
| Simulium | 50.2 | 1.30 |
| Helisoma | 7.2 | 0.19 |
| TOTAL BENTHOS | 3,868.2 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | |
| EPT TAXA RICHNESS | 0 | |

Table 3-26. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the Des Plaines River watershed, June-September 2003.

| Taxa | Hester-Dendy Samples | | | Ponar Samples | | |
|---|---------------------------------|--------------------------------------|--------------------------------|-----------------------------------|--|--|
| | W.B.D.P.R. @ Lake Sta. 64 | Des Plaines R. @ Ogden Sta. 22 | Salt Cr. @ Devon Sta. 18 | Higgins Cr. @ Wille Sta. 78 | Des Plaines R. @ Lake Cook Sta. 56 | Des Plaines R. @ Material Svc. Sta. 91 |
| <i>Chironomus sp.</i> | | | | | | |
| Number Examined | 20 | 2 | 25 | 13 | -- | 97 |
| Percent Deformed | 10.0 | 50.0 | 4.0 | 23.1 | -- | 4.1 |
| <i>Dicrotendipes simpsoni</i> | | | | | | |
| Number Examined | 4 | -- | -- | -- | -- | -- |
| Percent Deformed | 25.0 | -- | -- | -- | -- | -- |
| <i>Glyptotendipes sp</i> | | | | | | |
| Number Examined | 69 | -- | -- | -- | -- | -- |
| Percent Deformed | 1.4 | -- | -- | -- | -- | -- |
| <i>Polypedilum flavum</i> | | | | | | |
| Number Examined | -- | -- | -- | -- | -- | 61 |
| Percent Deformed | -- | -- | -- | -- | -- | 3.3 |
| <i>Polypedilum scalaenum grp</i> | | | | | | |
| Number Examined | 4 | -- | -- | -- | 39 | -- |
| Percent Deformed | 50.0 | -- | -- | -- | 2.6 | -- |
| <i>Procladius (Holotanypus)</i> | | | | | | |
| Number Examined | -- | 20 | -- | -- | -- | -- |
| Percent Deformed | -- | 25.0 | -- | -- | -- | -- |
| TOTAL SAMPLE | | | | | | |
| Total Midges Examined | 198 | 153 | 199 | 124 | 117 | 195 |
| Percent Deformed | 3.0 | 10.5 | 0.5 | 2.4 | 0.9 | 3.1 |

TABLE 3-27. HESTER-DENDY DENSITIES AT SAMPLING STATION 18 WITHIN SALT CREEK, JUNE 2003.

| TAXA | 18 DEVON AVE. | |
|--------------------------------------|------------------|--------|
| | #/m ² | % |
| Hydra | 9,831.4 | 34.66 |
| Turbellaria | 35.9 | 0.13 |
| Oligochaeta | 16,200.2 | 57.12 |
| Caecidotea | 251.2 | 0.89 |
| Orconectes virilis | 35.9 | 0.13 |
| Caenis | 179.4 | 0.63 |
| Argia | 17.9 | 0.06 |
| Stenelmis | 17.9 | 0.06 |
| Ceratopogonidae | 71.8 | 0.25 |
| Chironomidae | 125.6 | 0.44 |
| Procladius (Holotanypus) | 17.9 | 0.06 |
| Cricotopus tremulus grp. | 53.8 | 0.19 |
| Cricotopus bicinctus grp. | 35.9 | 0.13 |
| Cricotopus sylvestris grp. | 17.9 | 0.06 |
| Nanocladius distinctus | 53.8 | 0.19 |
| Nanocladius crassicornus/rectinervis | 35.9 | 0.13 |
| Chironomus | 35.9 | 0.13 |
| Cryptochironomus | 35.9 | 0.13 |
| Dicrotendipes fumidus | 107.6 | 0.38 |
| Endochironomus nigricans | 17.9 | 0.06 |
| Glyptotendipes | 35.9 | 0.13 |
| Parachironomus | 394.7 | 1.39 |
| Polypedilum illinoense | 35.9 | 0.13 |
| Polypedilum scalaenum grp. | 448.5 | 1.58 |
| Tribelos fuscicorne | 17.9 | 0.06 |
| Cladotanytarsus mancus grp. | 17.9 | 0.06 |
| Paratanytarsus | 53.8 | 0.19 |
| Tanytarsus glabrescens grp. | 35.9 | 0.13 |
| Physa | 35.9 | 0.13 |
| Helisoma | 71.8 | 0.25 |
| Ferrissia | 17.9 | 0.06 |
| Corbicula fluminea | 17.9 | 0.06 |
| TOTAL BENTHOS | 28,363.8 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-28. PETITE PONAR DENSITIES AT SAMPLING STATION 18 WITHIN SALT CREEK, JUNE 2003.

| TAXA | 18 DEVON AVE. | |
|-----------------------------|------------------|--------|
| | #/m ² | % |
| Hydra | 14.4 | 0.24 |
| Oligochaeta | 1,421.0 | 24.15 |
| Caecidotea | 14.4 | 0.24 |
| Caenis | 7.2 | 0.12 |
| Macronychus glabratus | 7.2 | 0.12 |
| Stenelmis | 14.4 | 0.24 |
| Chironomidae | 64.6 | 1.10 |
| Cricotopus tremulus grp. | 28.7 | 0.49 |
| Cricotopus bicinctus grp. | 57.4 | 0.98 |
| Cricotopus sylvestris grp. | 28.7 | 0.49 |
| Chironomus | 523.9 | 8.90 |
| Cladopelma | 14.4 | 0.24 |
| Cryptochironomus | 93.3 | 1.59 |
| Dicrotendipes fumidus | 674.6 | 11.46 |
| Parachironomus | 14.4 | 0.24 |
| Polypedilum scalaenum grp. | 696.1 | 11.83 |
| Stictochironomus | 28.7 | 0.49 |
| Tribelos fuscicorne | 14.4 | 0.24 |
| Cladotanytarsus mancus grp. | 2,045.3 | 34.76 |
| Corbicula fluminea | 122.0 | 2.07 |
| TOTAL BENTHOS | 5,884.8 | 100.00 |
| TOTAL TAXA RICHNESS | 19 | |
| EPT TAXA RICHNESS | 1 | |

3.1.4.3 Higgins Creek

Combined, the HD and Ponar samples from the single station (Station 78) in Higgins Creek yielded 17 total taxa and one EPT taxon (Tables 3-29 and 3-30). Eleven total taxa were observed in the HD samples while 15 taxa were present in the Ponar samples. *Oligochaeta* was the dominant taxon in both the HD and Ponar samples. *Caecidotea* also was observed in substantial numbers in both sample types.

Head capsule deformities were relatively low in Higgins Creek with anomalies being observed on only three specimens (Table 3-26). Highly tolerant taxa comprised >80 percent of the total density for each sample type (Tables 3-29 and 3-30). This suggests that pollution type stress is relatively high in Higgins Creek.

3.1.4.4 Des Plaines River

Combined, the HD and Ponar samples from the three Des Plaines River stations (Stations 13, 22, and 91) yielded 74 total taxa and 17 EPT taxa (Tables 3-31 and 3-32). Total richness was the highest value observed among all the waterways sampled in 2003 while EPT richness was the highest observed in both 2003 and 2004. HD total taxa richness decreased longitudinally from upstream to downstream from 45 taxa at Station 13, the upstream-most station, to 21 taxa at Station 91, the downstream-most station (Table 3-31). EPT taxa richness was much higher (15 taxa) at the upstream Station 13 compared to four EPT taxa at both Stations 22 and 91. The HD richness values observed at Station 91 were highest observed among all the stations sampled during 2003. The dominant taxon at Station 13 was the relatively pollution sensitive midge *Rheotanytarsus*. The EPT taxon *Cheumatopsyche* was the dominant taxon at Station 91 and was also observed in substantial numbers in the HD samples at Station 13. *Oligochaeta* was the dominant organism in the HDs at Station 22. Total HD density was similar at Stations 13 and 91 but over eleven times lower at Station 22. The cause for decline in density at Station 22 was attributable to lower abundance of *Oligochaeta*, *Cheumatopsyche*, *Polypedilum flavum*, and/or *Rheotanytarsus*.

Ponar total taxa richness was similar at Stations 13 and 22 with 23 and 20 taxa, respectively and somewhat higher at Station 91 with 30 taxa (Table 3-32). EPT taxa richness increased upstream to downstream with one EPT at Station 13 and four EPT taxa at Station 91. The richness trends in the Ponar data were the opposite of those described above for the HD data. The dominant taxon at Station 13 was *Polypedilum scalaenum* grp while *Oligochaeta*, *Paracladopelma*, and *Corbicula fluminea* were also well represented. *Oligochaeta* was the dominant taxon at Stations 22 and 91 representing over 60 percent of the specimens taken at those two stations. In addition, *Turbellaria*, *Cheumatopsyche*, and *Polypedilum scalaenum* grp. also were common at Station 22. Elevated numbers of *Cheumatopsyche*, *Polypedilum flavum*, *Gammarus fasciatus*, and *Chironomus* contributed the most to the higher density observed at Station 91.

Chironomid head capsule deformities were observed in the HD sample from Station 22 and the Ponar samples from Stations 13 and 91 (Table 3-26). Overall, the percent incidence of deformity was low (<1%) at Station 13 and somewhat higher (3%) at Stations 22 and 91.

Based on relative abundance, tolerant taxa were a relatively minor component in the samples at Station 13 (Tables 3-31 and 3-32). In contrast, tolerant taxa were a relatively more important

TABLE 3-29. HESTER-DENDY DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JUNE 2003.

| TAXA | 78 WILLE RD. | |
|--------------------------------------|-----------------|--------|
| | #/m2 | % |
| Hydra | 5.4 | 0.04 |
| Turbellaria | 35.9 | 0.29 |
| Oligochaeta | 9,137.1 | 73.14 |
| Caecidotea | 1,614.6 | 12.93 |
| Gammarus | 17.9 | 0.14 |
| Hydroptila | 5.4 | 0.04 |
| Chironomidae | 82.5 | 0.66 |
| Cricotopus tremulus grp. | 830.6 | 6.65 |
| Cricotopus bicinctus grp. | 453.9 | 3.63 |
| Cricotopus sylvestris grp. | 285.3 | 2.28 |
| Nanocladius crassicornus/rectinervis | 5.4 | 0.04 |
| Physa | 17.9 | 0.14 |
| TOTAL BENTHOS | 12,491.9 | 100.00 |
| TOTAL TAXA RICHNESS | 11 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-30. PETITE PONAR DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JUNE 2003.

| TAXA | 78 WILLE RD. | |
|----------------------------|-----------------|--------|
| | #/m2 | % |
| Hydra | 35.9 | 0.12 |
| Turbellaria | 7.2 | 0.02 |
| Oligochaeta | 22,340.9 | 74.40 |
| Caecidotea | 4,026.1 | 13.41 |
| Orconectes | 7.2 | 0.02 |
| Hydroptila | 21.5 | 0.07 |
| Chironomidae | 473.7 | 1.58 |
| Cricotopus tremulus grp. | 1,069.3 | 3.56 |
| Cricotopus bicinctus grp. | 868.4 | 2.89 |
| Cricotopus sylvestris grp. | 488.0 | 1.63 |
| Chironomus | 437.8 | 1.46 |
| Dicrotendipes neomodestus | 100.5 | 0.33 |
| Glyptotendipes | 21.5 | 0.07 |
| Parachironomus | 28.7 | 0.10 |
| Physa | 93.3 | 0.31 |
| Pisidium | 7.2 | 0.02 |
| TOTAL BENTHOS | 30,027.0 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-31. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JUNE 2003.

| TAXA | 13 | | 22 | | 91 | |
|--------------------------------------|---------------|--------|------------|--------|----------------------|--------|
| | LAKE COOK RD. | | OGDEN AVE. | | MATERIAL SERVICE RD. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 818.1 | 5.94 | 12.6 | 1.04 | 35.9 | 0.22 |
| Turbellaria | 91.5 | 0.66 | 26.9 | 2.23 | 358.8 | 2.16 |
| Plumatella | -- | -- | 1.8 | 0.15 | -- | -- |
| Oligochaeta | 1,099.7 | 7.99 | 349.8 | 28.97 | 143.5 | 0.87 |
| Helobdella triserialis | 1.8 | 0.01 | -- | -- | -- | -- |
| Mooreobdella microstoma | 1.8 | 0.01 | -- | -- | -- | -- |
| Caecidotea | 35.9 | 0.26 | 23.3 | 1.93 | -- | -- |
| Gammarus | -- | -- | 1.8 | 0.15 | -- | -- |
| Gammarus fasciatus | 550.8 | 4.00 | -- | -- | -- | -- |
| Orconectes | -- | -- | -- | -- | 17.9 | 0.11 |
| Baetis intercalaris | -- | -- | 3.6 | 0.30 | 592.0 | 3.57 |
| Stenacron | 25.1 | 0.18 | 152.5 | 12.63 | -- | -- |
| Stenonema integrum | 505.9 | 3.67 | -- | -- | -- | -- |
| Stenonema exiguum | 3.6 | 0.03 | -- | -- | -- | -- |
| Tricorythodes | 53.8 | 0.39 | 3.6 | 0.30 | -- | -- |
| Caenis | 1.8 | 0.01 | -- | -- | -- | -- |
| Anthopotamus myops grp. | 61.0 | 0.44 | -- | -- | -- | -- |
| Hexagenia | 21.5 | 0.16 | -- | -- | -- | -- |
| Argia | 16.1 | 0.12 | 91.5 | 7.58 | -- | -- |
| Perlesta | 39.5 | 0.29 | -- | -- | -- | -- |
| Cynellus fraternus | 3.6 | 0.03 | -- | -- | -- | -- |
| Cheumatopsyche | 1,424.5 | 10.35 | 12.6 | 1.04 | 7,194.1 | 43.36 |
| Hydropsyche | 35.9 | 0.26 | -- | -- | 71.8 | 0.43 |
| Hydropsyche simulans | 1.8 | 0.01 | -- | -- | -- | -- |
| Hydropsyche bidens | 17.9 | 0.13 | -- | -- | -- | -- |
| Ceratopsyche morosa | -- | -- | -- | -- | 233.2 | 1.41 |
| Potamyia flava | 5.4 | 0.04 | -- | -- | -- | -- |
| Hydroptila | 17.9 | 0.13 | -- | -- | -- | -- |
| Macronychus glabratus | 1.8 | 0.01 | -- | -- | 17.9 | 0.11 |
| Stenelmis | -- | -- | 9.0 | 0.74 | -- | -- |
| Stenelmis crenata grp. | 157.9 | 1.15 | -- | -- | -- | -- |
| Ceratopogonidae | 17.9 | 0.13 | -- | -- | -- | -- |
| Chironomidae | 138.1 | 1.00 | 10.8 | 0.89 | 35.9 | 0.22 |
| Procladius (Holotanypus) | -- | -- | 73.6 | 6.09 | -- | -- |
| Ablabesmyia janta | 71.8 | 0.52 | 16.1 | 1.34 | -- | -- |
| Ablabesmyia mallochi | -- | -- | 1.8 | 0.15 | -- | -- |
| Thienemanniya grp. | 143.5 | 1.04 | 5.4 | 0.45 | 71.8 | 0.43 |
| Thienemanniella xena | -- | -- | 10.8 | 0.89 | 129.2 | 0.78 |
| Thienemanniella similis | 71.8 | 0.52 | -- | -- | -- | -- |
| Cricotopus tremulus grp. | 394.7 | 2.87 | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | 143.5 | 1.04 | -- | -- | 129.2 | 0.78 |
| Cricotopus sylvestris grp. | 340.9 | 2.48 | -- | -- | -- | -- |
| Nanocladius distinctus | 17.9 | 0.13 | 21.5 | 1.78 | 71.8 | 0.43 |
| Nanocladius crassicornus/rectinervis | -- | -- | 10.8 | 0.89 | 129.2 | 0.78 |
| Rheocricotopus robacki | -- | -- | 1.8 | 0.15 | -- | -- |
| Chironomus | -- | -- | 5.4 | 0.45 | -- | -- |
| Dicrotendipes neomodestus | 242.2 | 1.76 | -- | -- | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 66.4 | 5.50 | -- | -- |
| Endochironomus nigricans | 17.9 | 0.13 | -- | -- | -- | -- |
| Glyptotendipes | 1,706.1 | 12.39 | 3.6 | 0.30 | 71.8 | 0.43 |
| Paracladepelma | 71.8 | 0.52 | 3.6 | 0.30 | -- | -- |
| Polypedilum flavum | 2,242.6 | 16.29 | 9.0 | 0.74 | 6,709.7 | 40.44 |
| Polypedilum illinoense | 37.7 | 0.27 | 61.0 | 5.05 | 129.2 | 0.78 |
| Polypedilum scalaenum grp. | 181.2 | 1.32 | 131.0 | 10.85 | -- | -- |
| Stenochironomus | -- | -- | 39.5 | 3.27 | -- | -- |
| Paratanytarsus | 17.9 | 0.13 | -- | -- | -- | -- |
| Rheotanytarsus | 2,906.4 | 21.11 | -- | -- | 394.7 | 2.38 |
| Simulium | -- | -- | -- | -- | 35.9 | 0.22 |
| Pleurocera | -- | -- | 16.1 | 1.34 | -- | -- |
| Physa | 3.6 | 0.03 | 1.8 | 0.15 | -- | -- |
| Ferrissia | 5.4 | 0.04 | 28.7 | 2.38 | 17.9 | 0.11 |
| TOTAL BENTHOS | 13,767.5 | 100.00 | 1,207.4 | 100.00 | 16,591.3 | 100.00 |
| TOTAL TAXA RICHNESS | 45 | | 31 | | 21 | |
| EPT TAXA RICHNESS | 15 | | 4 | | 4 | |

TABLE 3-32. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JUNE 2003.

| TAXA | 13 LAKE COOK RD. | | 22 OGDEN AVE. | | 91 MATERIAL SERVICE RD. | |
|----------------------------------|---------------------|--------|------------------|--------|-------------------------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | -- | -- | 244.0 | 7.94 | 215.3 | 0.44 |
| Oligochaeta | 373.2 | 10.24 | 2,002.3 | 65.19 | 29,266.3 | 60.37 |
| Helobdella stagnalis | -- | -- | 7.2 | 0.23 | 93.3 | 0.19 |
| Mooreobdella microstoma | -- | -- | -- | -- | 21.5 | 0.04 |
| Caecidotea | -- | -- | 50.2 | 1.64 | 71.8 | 0.15 |
| Gammarus | -- | -- | 7.2 | 0.23 | -- | -- |
| Gammarus fasciatus | 57.4 | 1.57 | -- | -- | 3,624.2 | 7.48 |
| Baetis intercalaris | -- | -- | -- | -- | 21.5 | 0.04 |
| Tricorythodes | -- | -- | 64.6 | 2.10 | 71.8 | 0.15 |
| Caenis | -- | -- | -- | -- | 21.5 | 0.04 |
| Hexagenia | 50.2 | 1.38 | -- | -- | -- | -- |
| Cheumatopsyche | -- | -- | 107.6 | 3.50 | 2,282.2 | 4.71 |
| Dubiraphia | 7.2 | 0.20 | -- | -- | -- | -- |
| Stenelmis | -- | -- | 28.7 | 0.93 | 71.8 | 0.15 |
| Stenelmis crenata grp. | 143.5 | 3.94 | -- | -- | -- | -- |
| Ceratopogonidae | 35.9 | 0.98 | -- | -- | -- | -- |
| Chironomidae | -- | -- | -- | -- | 488.0 | 1.01 |
| Procladius (Holotanypus) | -- | -- | 64.6 | 2.10 | 107.6 | 0.22 |
| Ablabesmyia mallochii | -- | -- | 7.2 | 0.23 | 71.8 | 0.15 |
| Thienemannimyia grp. | -- | -- | 14.4 | 0.47 | -- | -- |
| Thienemanniella xena | -- | -- | -- | -- | 71.8 | 0.15 |
| Thienemanniella similis | -- | -- | -- | -- | 179.4 | 0.37 |
| Cricotopus bicinctus grp. | 78.9 | 2.17 | -- | -- | 1,040.6 | 2.15 |
| Cricotopus trifascia grp. | -- | -- | -- | -- | 143.5 | 0.30 |
| Nanocladius distinctus | -- | -- | -- | -- | 143.5 | 0.30 |
| Chironomus | -- | -- | 14.4 | 0.47 | 4,148.1 | 8.56 |
| Cladopelma | 28.7 | 0.79 | -- | -- | -- | -- |
| Cryptochironomus | 179.4 | 4.92 | 28.7 | 0.93 | 71.8 | 0.15 |
| Dicretendipes neomodestus | 136.4 | 3.74 | -- | -- | 35.9 | 0.07 |
| Glyptotendipes | 21.5 | 0.59 | -- | -- | 71.8 | 0.15 |
| Microtendipes | 114.8 | 3.15 | -- | -- | -- | -- |
| Paracladopelma | 531.1 | 14.57 | -- | -- | -- | -- |
| Polypedilum flavum | 28.7 | 0.79 | 14.4 | 0.47 | 5,238.9 | 10.81 |
| Polypedilum illinoense | -- | -- | -- | -- | 107.6 | 0.22 |
| Polypedilum scalaenum grp. | 889.9 | 24.41 | 172.2 | 5.61 | -- | -- |
| Saetheria | 43.1 | 1.18 | -- | -- | -- | -- |
| Stictochironomus | 21.5 | 0.59 | -- | -- | -- | -- |
| Tribelos fuscicorne | 7.2 | 0.20 | -- | -- | -- | -- |
| Cladotanytarsus mancus grp. | 21.5 | 0.59 | -- | -- | -- | -- |
| Cladotanytarsus vanderwulpi grp. | 136.4 | 3.74 | -- | -- | -- | -- |
| Paratanytarsus | 43.1 | 1.18 | -- | -- | -- | -- |
| Rheotanytarsus | 21.5 | 0.59 | -- | -- | 502.4 | 1.04 |
| Tanytarsus guerlus grp. | -- | -- | -- | -- | 35.9 | 0.07 |
| Amnicola | -- | -- | 7.2 | 0.23 | -- | -- |
| Pleurocera | -- | -- | 78.9 | 2.57 | -- | -- |
| Physa | -- | -- | -- | -- | 21.5 | 0.04 |
| Ferrissia | -- | -- | 7.2 | 0.23 | 143.5 | 0.30 |
| Corbicula fluminea | 674.6 | 18.50 | 50.2 | 1.64 | 21.5 | 0.04 |
| Musculium | -- | -- | -- | -- | 71.8 | 0.15 |
| Pisidium | -- | -- | 100.5 | 3.27 | -- | -- |
| TOTAL BENTHOS | 3,645.7 | 100.00 | 3,071.6 | 100.00 | 48,478.2 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | | 20 | | 30 | |
| EPT TAXA RICHNESS | 1 | | 2 | | 4 | |

component in the samples from Stations 22 and 91. Tolerant taxa relative abundance in the Ponars increased sequentially in a longitudinal manner from <20 percent at Station 13 to about 70 percent at Station 91. This combined with the upstream to downstream decline of HD total taxa richness and EPT richness for both sample types suggests that benthic community quality decreases and environmental stress increases in a downstream manner between Station 13 and Station 91. Station 13 had the best benthic community among the stations sampled in 2003.

3.2 2004 Benthic Macroinvertebrate Results

During 2004, 55 HD samples and 61 Ponar samples were collected from 30 stations in 12 different waterways (Table 2-2). Combined, the 2004 samples yielded 137 taxa, the highest number of taxa observed during the four years of monitoring (Table 3-1). The number of EPT taxa collected in 2004 was similar to the EPT richness observed in 2003 with 19 EPT in 2004 vs. 20 in 2003. As in 2003, Chironomidae was the most taxa rich group with 55 taxa followed by Gastropoda, Trichoptera, Ephemeroptera, and Coleoptera with 11, 10, 9, and 9 taxa, respectively.

3.2.1 Calumet Watershed

The same three stations in the Calumet watershed surveyed during 2003 were sampled again during 2004: one station in the Calumet River, one station in the Little Calumet River, and one station in the Cal-Sag (Table 2-2). Results among the three waterbodies were generally similar. As in 2003, Oligochaeta dominated the Ponar samples while Zebra mussel (*Dreissena polymorpha*) dominated the HD samples in the Calumet watershed in 2004.

3.2.1.1 Calumet River

Combined, the HD and Ponar samples from the single station in the Calumet River (Station 55) yielded 18 total taxa and one EPT taxon (Tables 3-33 and 3-34). Twelve total taxa and one EPT taxon were observed in the HD samples while ten total taxa were present in the Ponar samples with no EPT taxa. Total density in the HD samples was more than 50 times higher than in the Ponar samples due to the extreme abundance of zebra mussels (*Dreissena polymorpha*). Zebra mussel was the most dominant HD taxon, representing over 95 percent of the total density (Table 3-33). With the exception of *Gammarus fasciatus*, all the remaining taxa observed in the HD samples were individually represented by less than one percent of the total density.

In contrast to the HD samples, Oligochaeta was clearly the most dominant taxon representing nearly 90 percent of the total abundance in the Ponars (Table 3-34). The only other taxa that attained greater than one percent in the Ponar samples were Chironomidae.

No Chironomidae head capsule deformities were observed in either the HD or Ponar samples at Station 55. However, based on the relatively low taxa richness in both sample types and the fact that tolerant taxa comprised 88 percent of the total density in the Ponars (Table 3-34), it is reasonable to characterize the benthic community at Station 55 in the Calumet River as moderately to highly stressed.

TABLE 3-33. HESTER-DENDY DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, SEPTEMBER 2004.

| TAXA | 55 130TH ST. | |
|---------------------------|------------------|--------|
| | #/m ² | % |
| Hydra | 143.5 | 0.16 |
| Plumatella | 1.8 | 0.00 |
| Oligochaeta | 53.8 | 0.06 |
| Gammarus fasciatus | 2,601.4 | 2.96 |
| Cyrenellus fraternus | 269.1 | 0.31 |
| Cricotopus bicinctus grp. | 17.9 | 0.02 |
| Nanocladius distinctus | 53.8 | 0.06 |
| Dicrotendipes simpsoni | 197.3 | 0.22 |
| Polypedilum flavum | 35.9 | 0.04 |
| Simulium | 89.7 | 0.10 |
| Ferrissia | 322.9 | 0.37 |
| Dreissena polymorpha | 84,104.8 | 95.69 |
| TOTAL BENTHOS | 87,892.0 | 100.00 |
| TOTAL TAXA RICHNESS | 12 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-34. PETITE PONAR DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, SEPTEMBER 2004.

| TAXA | 55 130TH ST. | |
|----------------------------|------------------|--------|
| | #/m ² | % |
| Oligochaeta | 1,449.7 | 87.83 |
| Gammarus fasciatus | 7.2 | 0.43 |
| Procladius (Holotanypus) | 35.9 | 2.17 |
| Coelotanypus | 7.2 | 0.43 |
| Parakiefferiella | 7.2 | 0.43 |
| Chironomus | 35.9 | 2.17 |
| Cryptochironomus | 64.6 | 3.91 |
| Dicrotendipes simpsoni | 7.2 | 0.43 |
| Polypedilum halterale grp. | 21.5 | 1.30 |
| Dreissena polymorpha | 14.4 | 0.87 |
| TOTAL BENTHOS | 1,650.6 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 0 | |

3.2.1.2 Little Calumet River

The HD and Ponar samples from the single station in the Little Calumet River (Station 76) yielded 20 total taxa and two EPT taxa (Tables 3-35 and 3-36). Total taxa richness in the HD samples was slightly higher compared to the Ponars with 15 and 12 taxa being collected, respectively. Both EPT taxa, *Cyrrnellus fraternus* and *Hydroptila*, were observed in the HD samples. As was the case for the Calumet River, zebra mussel was the dominant taxon in the HD samples while Oligochaeta was the dominant in the Ponars. The amphipod *Gammarus fasciatus* and the tolerant midge *Dicrotendipes simpsoni* also were common in the HD sample. In contrast, all taxa except Oligochaeta were represented by less than one percent of the total density in the Ponar samples.

As with the Calumet River samples, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples at Station 76. However, many of the taxa represented in the HD and Ponar samples are considered highly tolerant of pollution indicating a moderately to highly stressed benthic assemblage (Table 3-1). Furthermore, highly tolerant Oligochaeta accounted for >98% of the specimens in the Ponar sample (Table 3-36). As such, it appears the benthic community at Station 76 is moderately to highly stressed.

3.2.1.3 Calumet-Sag Channel

Together, the HD and Ponar samples from the single station in the Cal-Sag (Station 59) combined to yield 21 total taxa and two EPT taxa (Tables 3-37 and 3-38). Nineteen total taxa and two EPT taxa were observed in the HD samples compared to 10 total taxa and no EPT taxa in the Ponar samples. Zebra mussel and Oligochaeta again were the two dominant taxa in the HD and Ponar samples, respectively.

Although the density difference between the two sample types was largely driven by high *Dreissena polymorpha* abundance in the HDs, Oligochaeta and *Dicrotendipes simpsoni* also were relatively common in the HD samples (Table 3-37). The midge Procladius was the only other common taxon in the Ponar samples (Table 3-38).

Like the other two stations in the watershed, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples. Nonetheless, the abundance of tolerant taxa in both sample types together with the low density of pollution sensitive taxa (i.e., EPT) suggests that the benthic community at Station 59 in the Cal-Sag is moderately to highly stressed (Table 3-1).

3.2.2 North Branch Chicago River Watershed

Sampling was conducted at four stations in the North Branch Chicago River watershed during 2004: one station in the NSC and three stations in the NBCR (Table 2-2). All these stations except the CFAR Station had been sampled in 2003. Hester-Dendy and Ponar samples were taken at all stations except at the CFAR Station where only Ponar samples were collected.

Oligochaeta dominated both sample types at Station 36 in the NSC and at Stations 46 and CFAR in NBCR. Fingernail clam dominated the Ponar samples at Station 96 in 2004. No chironomid head deformities were observed at any station in the North Branch Chicago River Watershed.

TABLE 3-35. HESTER-DENDY DENSITIES AT SAMPLING STATION 76 WITHIN LITTLE CALUMET RIVER, SEPTEMBER 2004.

| TAXA | 76 HALSTED ST. | |
|---------------------------|-------------------|--------|
| | #/m ² | % |
| Dugesia | 17.9 | 0.09 |
| Oligochaeta | 610.0 | 3.12 |
| Hyalella azteca | 287.0 | 1.47 |
| Gammarus fasciatus | 2,081.1 | 10.64 |
| Cyrtoneurus fraternus | 89.7 | 0.46 |
| Hydroptila | 17.9 | 0.09 |
| Ablabesmyia | 17.9 | 0.09 |
| Cricotopus bicinctus grp. | 161.5 | 0.83 |
| Nanocladius distinctus | 17.9 | 0.09 |
| Dicortendipes simpsoni | 2,045.2 | 10.46 |
| Stenochironomus | 89.7 | 0.46 |
| Xenochironomus xenolabis | 35.9 | 0.18 |
| Menetus dilatatus | 17.9 | 0.09 |
| Ferrissia | 179.4 | 0.92 |
| Dreissena polymorpha | 13,885.9 | 71.01 |
| TOTAL BENTHOS | 19,555.1 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | |
| EPT TAXA RICHNESS | 2 | |

TABLE 3-36. PETITE PONAR DENSITIES AT SAMPLING STATION 76 WITHIN LITTLE CALUMET RIVER, SEPTEMBER 2004.

| TAXA | 76 HALSTED ST. | |
|---------------------------|-------------------|--------|
| | #/m ² | % |
| Oligochaeta | 24,989.0 | 98.03 |
| Mooreobdella microstoma | 7.2 | 0.03 |
| Hyalella azteca | 7.2 | 0.03 |
| Gammarus fasciatus | 64.6 | 0.25 |
| Procladius (Holotanypus) | 165.1 | 0.65 |
| Cricotopus bicinctus grp. | 7.2 | 0.03 |
| Chironomus | 14.4 | 0.06 |
| Cryptochironomus | 150.7 | 0.59 |
| Dicortendipes simpsoni | 7.2 | 0.03 |
| Ferrissia | 7.2 | 0.03 |
| Corbicula fluminea | 64.6 | 0.25 |
| Dreissena polymorpha | 7.2 | 0.03 |
| TOTAL BENTHOS | 25,491.4 | 100.00 |
| TOTAL TAXA RICHNESS | 12 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-37. HESTER-DENDY DENSITIES AT SAMPLING STATION 59 WITHIN CAL-SAG CHANNEL, AUGUST 2004.

| TAXA | 59 CICERO AVE. | |
|----------------------------|-------------------|--------|
| | #/m2 | % |
| Hydra | 479.0 | 5.88 |
| Turbellaria | 1.8 | 0.02 |
| Oligochaeta | 588.4 | 7.23 |
| Caecidotea | 19.7 | 0.24 |
| Hyalella azteca | 17.9 | 0.22 |
| Gammarus fasciatus | 152.5 | 1.87 |
| Cyrenellus fraternus | 28.7 | 0.35 |
| Hydroptila | 9.0 | 0.11 |
| Procladius (Holotanypus) | 17.9 | 0.22 |
| Cricotopus tremulus grp. | 44.9 | 0.55 |
| Cricotopus sylvestris grp. | 337.3 | 4.14 |
| Nanocladius distinctus | 213.5 | 2.62 |
| Dicortendipes simpsoni | 2,145.7 | 26.35 |
| Polypedilum illinoense | 118.4 | 1.45 |
| Paratanytarsus | 5.4 | 0.07 |
| Gyraulus | 1.8 | 0.02 |
| Ferrissia | 68.2 | 0.84 |
| Corbicula fluminea | 26.9 | 0.33 |
| Dreissena polymorpha | 3,866.2 | 47.48 |
| TOTAL BENTHOS | 8,143.2 | 100.00 |
| TOTAL TAXA RICHNESS | 19 | |
| EPT TAXA RICHNESS | 2 | |

TABLE 3-38. PETITE PONAR DENSITIES AT SAMPLING STATION 59 WITHIN CAL-SAG CHANNEL, AUGUST 2004.

| TAXA | 59 CICERO AVE. | |
|----------------------------|-------------------|--------|
| | #/m2 | % |
| Oligochaeta | 1,672.2 | 73.50 |
| Hyalella azteca | 35.9 | 1.58 |
| Gammarus fasciatus | 64.6 | 2.84 |
| Procladius (Holotanypus) | 416.2 | 18.30 |
| Cricotopus bicinctus grp. | 14.4 | 0.63 |
| Cricotopus sylvestris grp. | 7.2 | 0.32 |
| Cryptochironomus | 7.2 | 0.32 |
| Polypedilum illinoense | 7.2 | 0.32 |
| Corbicula fluminea | 35.9 | 1.58 |
| Dreissena polymorpha | 14.4 | 0.63 |
| TOTAL BENTHOS | 2,275.0 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 0 | |

3.2.2.1 North Shore Channel

The HD and Ponar samples from the single station in the NSC (Station 36) yielded 23 total taxa and three EPT taxa combined (Tables 3-39 and 3-40). Twenty total taxa, including three EPT taxa were observed in the HD samples compared to 16 total taxa and no EPT taxa in the Ponars. Oligochaeta was the dominant taxon in both sample types. Total density was very high in the HD samples due to the high abundance of Oligochaeta and the highly tolerant midge *Dicrotendipes simpsoni*. Oligochaeta and *Dicrotendipes simpsoni* comprised over 46 percent and 20 percent of the total density, respectively in the HD samples as compared to 78 percent and six percent, in the Ponars (Table 3-40).

No Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, nearly half of the total taxa collected were highly tolerant taxa. In addition, based on density, tolerant taxa were >80% of the benthos in both the HDs and the Ponars (Tables 3-39 and 3-40). As such, it appears the benthic community at Station 36 in the NSC is moderately to highly stressed.

3.2.2.2 North Branch of the Chicago River

The combined number of taxa collected in the HD and Ponar samples from the two NBCR stations (Stations 96 and 46) and the CFAR station at Fullerton Ave. (Ponar only) was 40 total taxa and five EPT taxa (Tables 3-41 and 3-42). HD total taxa richness was decidedly higher at the upstream Station 96 (26 taxa) compared to the 10 taxa observed at Station 46 (Table 3-41). In addition, five of the six EPT taxa observed in the NBCR were collected in the HDs at Station 96. *Caecidotea* and *Cheumatopsyche* were the dominant taxa at Station 96 representing nearly 22 and 23 percent of the total density. In contrast, the tolerant taxon Oligochaeta clearly was the dominant taxon at Station 46 representing nearly 57 percent of the total density.

As with the HD samples, Ponar total taxa richness was greatest at Station 96 with 29 taxa. Station 46 had 4 taxa and the CFAR station had only a single taxon (Table 3-41). The only EPT taxon collected in the Ponar samples was collected at Station 96. The fingernail clam *Musculium transversum* was the dominant taxon at Station 96 with substantial numbers of *Pisidium* and Oligochaeta also present. Oligochaeta comprised 100 percent of the total benthos at the CFAR station and nearly so at Station 46 with over 98 percent. Total Ponar density, excluding the CFAR station, was more than ten times higher upstream at Station 96 compared to downstream at Station 46 (Table 3-41). This was largely due to large numbers of *Musculium transversum*, *Pisidium* and Oligochaeta at Station 96. The density of the single taxon (Oligochaeta) at the CFAR station was about 10 times the total density at Station 96 and about 100 times the total density of Station 46.

Chironomid head capsule deformities were not observed on any of the midges at Stations 46, 96, and CFAR (Tables 3-41 and 3-42).

Overall, based on the higher taxa richness and presence of EPT taxa at Station 96, combined with the higher density of tolerant taxa at Station 46, it appears the benthic community at Station 46 is considerably more stressed than at Station 96. The benthic community at the CFAR Station was the poorest benthic community observed in 2004.

TABLE 3-39. HESTER-DENDY DENSITIES AT SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL, SEPTEMBER 2004.

| TAXA | 36 TOUHY AVE. | |
|---------------------------|------------------|--------|
| | #/m ² | % |
| Hydra | 2,762.8 | 5.62 |
| Turbellaria | 2,852.5 | 5.81 |
| Oligochaeta | 22,999.6 | 46.82 |
| Helobdella papiliata | 53.8 | 0.11 |
| Ostracoda | 484.4 | 0.99 |
| Caecidotea | 17.9 | 0.04 |
| Gammarus fasciatus | 5,453.9 | 11.10 |
| Baetis | 17.9 | 0.04 |
| Enallagma | 17.9 | 0.04 |
| Cheumatopsyche | 53.8 | 0.11 |
| Hydroptila | 17.9 | 0.04 |
| Cricotopus bicinctus grp. | 125.6 | 0.26 |
| Nanocladius distinctus | 897.0 | 1.83 |
| Chironomus | 71.8 | 0.15 |
| Dicrotendipes simpsoni | 10,244.0 | 20.85 |
| Glyptotendipes | 2,709.0 | 5.51 |
| Parachironomus | 143.5 | 0.29 |
| Gyraulus | 17.9 | 0.04 |
| Ferrissia | 107.6 | 0.22 |
| Dreissena polymorpha | 71.8 | 0.15 |
| TOTAL BENTHOS | 49,120.9 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | |
| EPT TAXA RICHNESS | 3 | |

TABLE 3-40. PETITE PONAR DENSITIES AT SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL, SEPTEMBER 2004.

| TAXA | 36 TOUHY AVE. | |
|---------------------------|------------------|--------|
| | #/m ² | % |
| Hydra | 7.2 | 0.10 |
| Turbellaria | 624.4 | 8.27 |
| Oligochaeta | 5,884.8 | 77.95 |
| Ostracoda | 7.2 | 0.10 |
| Caecidotea | 14.4 | 0.19 |
| Gammarus fasciatus | 21.5 | 0.29 |
| Procladius (Holotanypus) | 7.2 | 0.10 |
| Cricotopus bicinctus grp. | 7.2 | 0.10 |
| Nanocladius distinctus | 21.5 | 0.29 |
| Chironomus | 28.7 | 0.38 |
| Cryptochironomus | 7.2 | 0.10 |
| Dicrotendipes neomodestus | 14.4 | 0.19 |
| Dicrotendipes simpsoni | 480.8 | 6.37 |
| Glyptotendipes | 322.9 | 4.28 |
| Parachironomus | 86.1 | 1.14 |
| Ferrissia | 14.4 | 0.19 |
| TOTAL BENTHOS | 7,549.8 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-41. HESTER-DENDY DENSITIES AT SAMPLING STATIONS 96, AND 46 WITHIN THE NORTH BRANCH CHICAGO RIVER, JUNE-AUGUST 2004.

| TAXA | 96 ALBANY AVE. | | 46 GRAND AVE. | |
|----------------------------|-------------------|--------|------------------|--------|
| | #/m2 | % | #/m2 | % |
| Hydra | 39.5 | 1.23 | 3.6 | 0.09 |
| Turbellaria | 279.9 | 8.69 | 1,002.9 | 23.95 |
| Plumatella | -- | -- | 1.8 | 0.04 |
| Oligochaeta | 220.7 | 6.85 | 2,386.1 | 56.98 |
| Ostracoda | 16.1 | 0.50 | -- | -- |
| Caecidotea | 696.1 | 21.62 | -- | -- |
| Hyalella azteca | -- | -- | 9.0 | 0.21 |
| Gammarus fasciatus | 26.9 | 0.84 | -- | -- |
| Hydracarina | 5.4 | 0.17 | -- | -- |
| Baetis intercalaris | 104.1 | 3.23 | -- | -- |
| Stenacron | 195.6 | 6.07 | -- | -- |
| Tricorythodes | 3.6 | 0.11 | -- | -- |
| Coenagrionidae | 1.8 | 0.06 | -- | -- |
| Cheumatopsyche | 751.7 | 23.34 | -- | -- |
| Hydropsyche betteni | 170.4 | 5.29 | -- | -- |
| Stenelmis crenata grp. | 3.6 | 0.11 | -- | -- |
| Thienemanniya grp. | 5.4 | 0.17 | -- | -- |
| Corynoneura | 26.9 | 0.84 | -- | -- |
| Thienemanniella xena | 23.3 | 0.72 | -- | -- |
| Nanocladius distinctus | 17.9 | 0.56 | 7.2 | 0.17 |
| Rheocricotopus robacki | 292.4 | 9.08 | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 751.7 | 17.95 |
| Glyptotendipes | -- | -- | 7.2 | 0.17 |
| Polypedilum flavum | 209.9 | 6.52 | -- | -- |
| Polypedilum illinoense | 5.4 | 0.17 | -- | -- |
| Polypedilum scalaenum grp. | 28.7 | 0.89 | 14.4 | 0.34 |
| Amnicola | 1.8 | 0.06 | -- | -- |
| Ferrissia | 78.9 | 2.45 | 3.6 | 0.09 |
| Musculium | 7.2 | 0.22 | -- | -- |
| Dreissena polymorpha | 7.2 | 0.22 | -- | -- |
| TOTAL BENTHOS | 3,220.3 | 100.00 | 4,187.3 | 100.00 |
| TOTAL TAXA RICHNESS | 26 | | 10 | |
| EPT TAXA RICHNESS | 5 | | 0 | |

TABLE 3-42. PETITE PONAR DENSITIES AT SAMPLING STATIONS 96, CFAR, AND 46 WITHIN THE NORTH BRANCH CHICAGO RIVER, JUNE-AUGUST 2004.

| TAXA | 96 | | CFAR | | 46 | |
|--------------------------------------|-------------|--------|----------------|--------|------------|--------|
| | ALBANY AVE. | | FULLERTON AVE. | | GRAND AVE. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 21.5 | 0.06 | -- | -- | -- | -- |
| Turbellaria | 1,937.7 | 5.77 | -- | -- | 7.2 | 0.22 |
| Plumatelia | 7.2 | 0.02 | -- | -- | -- | -- |
| Oligochaeta | 6,387.2 | 19.03 | 321,513.2 | 100.00 | 3,150.5 | 98.43 |
| Helobdella stagnalis | 114.8 | 0.34 | -- | -- | -- | -- |
| Erpobdella punctata punctata | 430.6 | 1.28 | -- | -- | -- | -- |
| Mooreobdella microstoma | 430.6 | 1.28 | -- | -- | -- | -- |
| Caecidotea | 1,040.6 | 3.10 | -- | -- | 7.2 | 0.22 |
| Gammarus fasciatus | 57.4 | 0.17 | -- | -- | -- | -- |
| Hydropsychidae | 7.2 | 0.02 | -- | -- | -- | -- |
| Procladius (Holotanypus) | -- | -- | -- | -- | 28.7 | 0.90 |
| Thienemanniya grp. | 71.8 | 0.21 | -- | -- | -- | -- |
| Corynoneura lobata | 1,255.9 | 3.74 | -- | -- | -- | -- |
| Thienemanniella xena | 179.4 | 0.53 | -- | -- | -- | -- |
| Nanocladius distinctus | 366.0 | 1.09 | -- | -- | -- | -- |
| Nanocladius crassicornus/rectinervis | 107.6 | 0.32 | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 1,543.0 | 4.60 | -- | -- | -- | -- |
| Glyptotendipes | 50.2 | 0.15 | -- | -- | -- | -- |
| Polypedilum flavum | 35.9 | 0.11 | -- | -- | -- | -- |
| Polypedilum illinoense | 968.8 | 2.89 | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | 574.1 | 1.71 | -- | -- | -- | -- |
| Paratanytarsus | 35.9 | 0.11 | -- | -- | -- | -- |
| Valvata | 35.9 | 0.11 | -- | -- | -- | -- |
| Amnicola | 35.9 | 0.11 | -- | -- | -- | -- |
| Menetus dilatatus | 50.2 | 0.15 | -- | -- | -- | -- |
| Ferrissia | 7.2 | 0.02 | -- | -- | -- | -- |
| Corbicula fluminea | 7.2 | 0.02 | -- | -- | -- | -- |
| Musculium transversum | 9,616.7 | 28.66 | -- | -- | -- | -- |
| Pisidium | 8,145.5 | 24.27 | -- | -- | 7.2 | 0.22 |
| Dreissena polymorpha | 35.9 | 0.11 | -- | -- | -- | -- |
| TOTAL BENTHOS | 33,557.9 | 100.00 | 321,513.2 | 100.00 | 3,200.8 | 100.00 |
| TOTAL TAXA RICHNESS | 29 | | 1 | | 4 | |
| EPT TAXA RICHNESS | 1 | | 0 | | 0 | |

3.2.3 South Branch Chicago River and Chicago Sanitary and Ship Canal Watershed

Benthic macroinvertebrate sampling was conducted at three stations exclusively within the CSSC waterway during 2004 (Table 2-2). Tolerant taxa were dominant in all locations in 2004. In all but one of these instances, the tolerant taxon was *Oligochaeta*. No chironomid head capsule deformities were observed at any of the stations in the SBCR and CSSC watershed in 2004.

3.2.3.1 Chicago Sanitary and Ship Canal

The HD and Ponar samples from the three CSSC stations combined yielded 37 total taxa and six EPT taxa (Tables 3-43 and 3-44). HD total taxa richness ranged from 21 taxa at Station 92 to 16 taxa at Station 41 (Table 3-43). Total richness was similar at Stations 41 and 75 but somewhat higher at Station 92. *Oligochaeta* was the dominant taxon in the HD samples at Stations 75 and 41 whereas at Station 92 substantial numbers of the following taxa were observed: *Turbellaria*, *Oligochaeta*, *Gammarus fasciatus*, *Dicrotendipes simpsoni*, and *Ferrissia*. *Ferrissia* was the most common taxon at Station 92 in the HD samples, but accounted for only 23 percent of the total sample. Total density was greatest at Station 41 and lowest at Station 92. Total density at Station 75 was slightly more than one and a half times that of Station 92, but more than four times less than Stations 41. The higher density observed at Station 41 was primarily due to the abundance of *Oligochaeta*, which comprised over 80 percent of the total density.

Ponar total taxa richness was similarly low at Stations 75 and 41 with 4 and 5 taxa, respectively (Table 3-44). Station 92 had 11 total taxa. Only one EPT taxon was found in the Ponar samples at Station 75. *Oligochaeta* was the dominant taxon at all three stations representing between 75 and 95 percent of the total density. Total density varied greatly among the three stations. Ponar total density was low at Stations 75 and 41. However, the total density observed at Station 92 was nearly 37 times greater compared to Station 41 and well over 100 times that of Station 75. Total density at the three stations was dictated by the abundance of *Oligochaeta* in the samples.

No Chironomid head capsule deformities only were observed in the samples at the three stations in the CSSC. Although no deformities were noted, the benthic community at Stations 75 and 41 appears to be highly stressed as judged by high percentages of tolerant organisms and fairly low taxa richness. Based on higher taxa richness, less dominance by tolerant organisms, and overall more balanced assemblage, Station 92 appears to be moderately stressed.

3.2.4 Fox River Watershed

The only waterbody sampled in the Fox River watershed was Poplar Creek. 2004 marks the first time Poplar Creek has been sampled during the current monitoring program (Table 2-2).

3.2.4.1 Poplar Creek

Combined, the HD and Ponar samples from Station 90 of Poplar Creek yielded 45 taxa, including three EPT taxa (Tables 3-45 and 3-46). Total taxa richness varied from 32 taxa in the

TABLE 3-43. HESTER-DENDY DENSITIES AT SAMPLING STATIONS 75, 41, AND 92 WITHIN THE CHICAGO SANITARY SHIP CHANNEL, AUGUST 2004.

| TAXA | 75 | | 41 | | 92 | |
|----------------------------|------------------|--------|------------------|--------|------------------|--------|
| | CICERO AVE. | | HARLEM AVE. | | LOCKPORT | |
| | #/m ² | % | #/m ² | % | #/m ² | % |
| Hydra | 14.4 | 0.20 | 430.6 | 1.47 | 224.3 | 5.26 |
| Turbellaria | 2,902.8 | 41.21 | 1,596.7 | 5.46 | 622.5 | 14.59 |
| Urnatella gracilis | 28.7 | 0.41 | 35.9 | 0.12 | -- | -- |
| Plumatella | -- | -- | 125.6 | 0.43 | 5.4 | 0.13 |
| Oligochaeta | 3,541.4 | 50.28 | 23,493.0 | 80.31 | 554.4 | 12.99 |
| Helobdella papillata | 17.9 | 0.25 | -- | -- | 48.4 | 1.14 |
| Placobdella pediculata | 3.6 | 0.05 | -- | -- | -- | -- |
| Caecidotea | -- | -- | 233.2 | 0.80 | -- | -- |
| Gammarus fasciatus | 10.8 | 0.15 | 188.4 | 0.64 | 583.1 | 13.67 |
| Baetis intercalaris | 28.7 | 0.41 | -- | -- | -- | -- |
| Stenacron | 3.6 | 0.05 | -- | -- | 3.6 | 0.08 |
| Stenonema integrum | -- | -- | -- | -- | 3.6 | 0.08 |
| Argia | -- | -- | 17.9 | 0.06 | -- | -- |
| Cyrnellus fraternus | 3.6 | 0.05 | -- | -- | 1.8 | 0.04 |
| Cheumatopsyche | 17.9 | 0.25 | -- | -- | 1.8 | 0.04 |
| Ablabesmyia janta | -- | -- | -- | -- | 7.2 | 0.17 |
| Cricotopus | 3.6 | 0.05 | -- | -- | 3.6 | 0.08 |
| Cricotopus sylvestris grp. | -- | -- | 17.9 | 0.06 | -- | -- |
| Nanocladius distinctus | 43.1 | 0.61 | 269.1 | 0.92 | 254.8 | 5.97 |
| Chironomus | 3.6 | 0.05 | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 380.3 | 5.40 | 1,300.7 | 4.45 | 870.1 | 20.40 |
| Glyptotendipes | -- | -- | 9.0 | 0.03 | -- | -- |
| Parachironomus | -- | -- | 9.0 | 0.03 | -- | -- |
| Polypedilum flavum | -- | -- | 9.0 | 0.03 | -- | -- |
| Xenochironomus xenolabis | -- | -- | -- | -- | 26.9 | 0.63 |
| Phylla | -- | -- | -- | -- | 7.2 | 0.17 |
| Menetus dilatatus | -- | -- | -- | -- | 5.4 | 0.13 |
| Ferrissia | 21.5 | 0.31 | 26.9 | 0.09 | 965.2 | 22.62 |
| Corbicula fluminea | 17.9 | 0.25 | -- | -- | 5.4 | 0.13 |
| Musculium | -- | -- | -- | -- | 5.4 | 0.13 |
| Dreissena polymorpha | -- | -- | 1,489.1 | 5.09 | 66.4 | 1.56 |
| TOTAL BENTHOS | 7,043.4 | 100.00 | 29,251.9 | 100.00 | 4,266.2 | 100.00 |
| TOTAL TAXA RICHNESS | 17 | | 16 | | 21 | |
| EPT TAXA RICHNESS | 4 | | 0 | | 4 | |

TABLE 3-44. PETITE PONAR DENSITIES AT SAMPLING STATIONS 75, 41, AND 92 WITHIN THE CHICAGO SANITARY SHIP CHANNEL, AUGUST 2004.

| TAXA | 75 | | 41 | | 92 | |
|------------------------------|------------------|--------|------------------|--------|------------------|--------|
| | CICERO AVE. | | HARLEM AVE. | | LOCKPORT | |
| | #/m ² | % | #/m ² | % | #/m ² | % |
| Turbellaria | -- | -- | 222.5 | 17.03 | 71.8 | 0.15 |
| Plumatella | -- | -- | 43.1 | 3.30 | -- | -- |
| Oligochaeta | 236.8 | 89.19 | 976.0 | 74.73 | 45,212.8 | 95.21 |
| Erpobdella punctata punctata | -- | -- | -- | -- | 143.5 | 0.30 |
| Gammarus fasciatus | -- | -- | 21.5 | 1.65 | 933.0 | 1.96 |
| Tricorythodes | 7.2 | 2.70 | -- | -- | -- | -- |
| Tanytus | -- | -- | -- | -- | 71.8 | 0.15 |
| Procladius (Holotanytus) | -- | -- | -- | -- | 538.2 | 1.13 |
| Cryptochironomus | -- | -- | -- | -- | 179.4 | 0.38 |
| Dicrotendipes simpsoni | 14.4 | 5.41 | 43.1 | 3.30 | 71.8 | 0.15 |
| Pericoma | -- | -- | -- | -- | 14.4 | 0.03 |
| Ferrissia | -- | -- | -- | -- | 215.3 | 0.45 |
| Corbicula fluminea | 7.2 | 2.70 | -- | -- | 35.9 | 0.08 |
| TOTAL BENTHOS | 265.5 | 100.00 | 1,306.1 | 100.00 | 47,487.8 | 100.00 |
| TOTAL TAXA RICHNESS | 4 | | 5 | | 11 | |
| EPT TAXA RICHNESS | 1 | | 0 | | 0 | |

TABLE 3-45. HESTER-DENDY DENSITIES AT SAMPLING STATION 90 WITHIN POPLAR CREEK, JULY 2004.

| TAXA | 90 ROUTE 19 | |
|--------------------------------------|----------------|--------|
| | #/m2 | % |
| Turbellaria | 114.8 | 17.02 |
| Oligochaeta | 89.7 | 13.30 |
| Gammarus fasciatus | 3.6 | 0.53 |
| Cambarus bartonii | 1.8 | 0.27 |
| Stenacron | 19.7 | 2.92 |
| Caenis | 1.8 | 0.27 |
| Sialis | 1.8 | 0.27 |
| Cheumatopsyche | 25.1 | 3.72 |
| Dubiraphia | 7.2 | 1.07 |
| Macronychus glabratus | 14.4 | 2.13 |
| Stenelmis | 3.6 | 0.53 |
| Thienemannimyia grp. | 34.1 | 5.05 |
| Thienemanniella xena | 10.8 | 1.60 |
| Nanocladius crassicornus/rectinervis | 21.5 | 3.19 |
| Dicrotendipes | 7.2 | 1.07 |
| Dicrotendipes neomodestus | 1.8 | 0.27 |
| Glyptotendipes | 3.6 | 0.53 |
| Microtendipes | 43.1 | 6.39 |
| Paratendipes | 1.8 | 0.27 |
| Polypedilum fallax grp. | 3.6 | 0.53 |
| Polypedilum flavum | 5.4 | 0.80 |
| Polypedilum scalaenum grp. | 19.7 | 2.92 |
| Tribelos fuscicorne | 3.6 | 0.53 |
| Micropsectra | 3.6 | 0.53 |
| Paratanytarsus | 43.1 | 6.39 |
| Rheotanytarsus | 120.2 | 17.82 |
| Tanytarsus | 3.6 | 0.53 |
| Valvata | 3.6 | 0.53 |
| Viviparus | 1.8 | 0.27 |
| Pleurocera | 7.2 | 1.07 |
| Physa | 3.6 | 0.53 |
| Ferrissia | 48.4 | 7.17 |
| TOTAL BENTHOS | 674.6 | 100.00 |
| TOTAL TAXA RICHNESS | 32 | |
| EPT TAXA RICHNESS | 3 | |

TABLE 3-46. PETITE PONAR DENSITIES AT SAMPLING STATION 90 WITHIN POPLAR CREEK, JULY 2004.

| TAXA | 90 ROUTE 19 | |
|-----------------------------|----------------|--------|
| | #/m2 | % |
| Turbellaria | 64.6 | 2.87 |
| Oligochaeta | 1,356.4 | 60.19 |
| Helobdella stagnalis | 14.4 | 0.64 |
| Mooreobdella microstoma | 50.2 | 2.23 |
| Stenacron | 7.2 | 0.32 |
| Caenis | 7.2 | 0.32 |
| Cheumatopsyche | 7.2 | 0.32 |
| Dubiraphia | 100.5 | 4.46 |
| Ectopria | 35.9 | 1.59 |
| Procladius (Holotanypus) | 28.7 | 1.27 |
| Thienemanimyia grp. | 14.4 | 0.64 |
| Thienemanniella n. sp. 3 | 21.5 | 0.96 |
| Chironomus | 7.2 | 0.32 |
| Cryptochironomus | 21.5 | 0.96 |
| Cryptotendipes | 86.1 | 3.82 |
| Dicrotendipes neomodestus | 7.2 | 0.32 |
| Polypedilum halterale grp. | 7.2 | 0.32 |
| Polypedilum scalaenum grp. | 7.2 | 0.32 |
| Cladotanytarsus mancus grp. | 7.2 | 0.32 |
| Viviparus | 122.0 | 5.41 |
| Ammicola | 186.6 | 8.28 |
| Corbicula fluminea | 7.2 | 0.32 |
| Sphaerium simile | 86.1 | 3.82 |
| TOTAL BENTHOS | 2,253.5 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | |
| EPT TAXA RICHNESS | 3 | |

HDs to 23 taxa in the Ponars. The midge *Rheotanytarsus* and the flatworm *Turbellaria* were very nearly co-dominant in the HD sample, whereas Oligochaeta dominated the Ponar sample accounting for over 60 percent of the total benthos.

No midges with head capsule deformities were noted in Poplar Creek. However, based on the relatively balanced benthic community, particularly evident in the HD samples, Poplar Creek appears to be slightly to moderately stressed.

3.2.5 Des Plaines River Watershed

The same six stations in the Des Plaines River watershed that were surveyed during 2003 were sampled again during 2004. The 2004 sampling also included 16 new stations: two stations in the West Branch of the DuPage River, one station in Buffalo Creek, five stations in Salt Creek, one station in Higgins Creek, and six stations (including one CFAR station) in the Des Plaines River (Table 2-2).

As in 2003, Oligochaeta was the dominant taxon in 2004 at the majority of the Ponar sampling stations. In addition, as previously seen in 2003, tolerant taxa remained dominant at more than half of the stations in 2004. Chironomidae capsule deformities remained relatively rare in the watershed while taxa richness and EPT richness remained relatively high compared to the other watersheds sampled in 2004.

3.2.5.1 West Branch of the DuPage River

The benthic macroinvertebrate community in the WB DuPage River at Stations 110, 89, and 64 was represented by 49 total taxa and six EPT taxa in the HD and Ponar samples combined (Tables 3-47 and 3-48). HD total taxa richness was higher at the downstream sites (Stations 89 and 64) with 28 total taxa at each site while the upstream site (Station 110) yielded only 11 total taxa (Table 3-47). EPT taxa richness in the HD samples was highest downstream at Station 64 with 3 taxa and lowest upstream at Station 110 with no EPT taxa. Station 89 had only a single EPT taxon. Oligochaeta was the dominant taxon for the HD samples at the two downstream stations (Stations 89 and 64), while *Caecidotea* was the dominant taxon for upstream station (Station 110), accounting for more than 65 percent of the total sample. Total density was highest at Station 89, lower at Station 64, and substantially lower furthest upstream at Station 110. The noticeably higher density of Station 89 was the result of high numbers of Oligochaeta and the midges *Chironomus* and *Polypedilum illinoense*.

Ponar total taxa richness was lowest in the upstream site (Station 110) and progressively increased downstream at Stations 89 and 64 (Table 3-48). EPT taxa richness was similarly low (1-2 taxa) at each station. In contrast to the HD samples, total density for the Ponar stations was highest at the upstream station (Station 110) and progressively decreased through the downstream stations (Stations 89 and 64). Substantial numbers of the midge *Chironomus* were observed at Station 89. However, density in the Ponars was driven primarily by the abundance of Oligochaeta.

TABLE 3-47. HESTER-DENDY DENSITIES AT SAMPLING STATIONS 110, 89, AND 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2004.

| TAXA | 110 SPRINGINGGUTH RD. | | 89 WALNUT AVE. | | 64 LAKE ST. | |
|--------------------------------------|-----------------------------|--------|-------------------|--------|----------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | -- | -- | 5.4 | 0.06 |
| Turbellaria | -- | -- | 780.4 | 5.30 | 224.3 | 2.37 |
| Oligochaeta | 172.2 | 26.52 | 5,823.5 | 39.56 | 2,705.4 | 28.55 |
| Helobdella | -- | -- | 39.5 | 0.27 | -- | -- |
| Helobdella stagnalis | 5.4 | 0.83 | -- | -- | -- | -- |
| Erpobdella punctata punctata | -- | -- | 17.9 | 0.12 | 5.4 | 0.06 |
| Ostracoda | -- | -- | 35.9 | 0.24 | 5.4 | 0.06 |
| Caecidotea | 427.0 | 65.75 | 251.2 | 1.71 | 968.8 | 10.22 |
| Stenacron | -- | -- | -- | -- | 17.9 | 0.19 |
| Coenagrionidae | -- | -- | -- | -- | 5.4 | 0.06 |
| Argia | -- | -- | 9.0 | 0.06 | -- | -- |
| Enallagma | -- | -- | 14.4 | 0.10 | -- | -- |
| Cheumatopsyche | -- | -- | 107.6 | 0.73 | 1,304.3 | 13.76 |
| Hydropsyche | -- | -- | -- | -- | 35.9 | 0.38 |
| Seromyia | -- | -- | 17.9 | 0.12 | -- | -- |
| Tanytus | -- | -- | 5.4 | 0.04 | -- | -- |
| Procladius (Holotanytus) | -- | -- | 5.4 | 0.04 | 30.5 | 0.32 |
| Thienemannimyia grp. | 1.8 | 0.28 | -- | -- | 71.8 | 0.76 |
| Thienemanniella xena | -- | -- | 53.8 | 0.37 | 93.3 | 0.98 |
| Cricotopus tremulus grp. | 3.6 | 0.55 | 23.3 | 0.16 | 120.2 | 1.27 |
| Cricotopus bicinctus grp. | -- | -- | 227.8 | 1.55 | 147.1 | 1.55 |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 17.9 | 0.19 |
| Nanocladius | 1.8 | 0.28 | -- | -- | 26.9 | 0.28 |
| Nanocladius crassicornus/rectinervis | -- | -- | 179.4 | 1.22 | -- | -- |
| Chironomini | -- | -- | -- | -- | 17.9 | 0.19 |
| Chironomus | 26.9 | 4.14 | 3,252.6 | 22.10 | -- | -- |
| Dicrotendipes neomodestus | -- | -- | 165.1 | 1.12 | 44.9 | 0.47 |
| Dicrotendipes simpsoni | -- | -- | 53.8 | 0.37 | 166.8 | 1.76 |
| Glyptotendipes | -- | -- | 44.9 | 0.30 | 1,817.4 | 19.18 |
| Parachironomus | 5.4 | 0.83 | 174.0 | 1.18 | -- | -- |
| Polypedilum flavum | 1.8 | 0.28 | -- | -- | 179.4 | 1.89 |
| Polypedilum illinoense | 1.8 | 0.28 | 2,454.3 | 16.67 | 819.9 | 8.65 |
| Polypedilum scalaenum grp. | -- | -- | -- | -- | 62.8 | 0.66 |
| Stictochironomus | -- | -- | 59.2 | 0.40 | -- | -- |
| Micropsectra | -- | -- | 292.4 | 1.99 | -- | -- |
| Paratanytarsus | 1.8 | 0.28 | 425.2 | 2.89 | 17.9 | 0.19 |
| Simulium | -- | -- | -- | -- | 143.5 | 1.51 |
| Hemerodromia | -- | -- | 17.9 | 0.12 | -- | -- |
| Physa | -- | -- | 35.9 | 0.24 | -- | -- |
| Gyraulus | -- | -- | -- | -- | 389.3 | 4.11 |
| Ferrissia | -- | -- | 152.5 | 1.04 | 30.5 | 0.32 |
| TOTAL BENTHOS | 649.4 | 100.00 | 14,720.1 | 100.00 | 9,476.1 | 100.00 |
| TOTAL TAXA RICHNESS | 11 | | 28 | | 28 | |
| EPT TAXA RICHNESS | 0 | | 1 | | 3 | |

TABLE 3-48. PETITE PONAR DENSITIES AT SAMPLING STATIONS 110, 89, AND 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2004.

| TAXA | 110 SPRINGINSGUTH RD. | | 89 WALNUT AVE. | | 64 LAKE ST. | |
|------------------------------|-----------------------------|--------|-------------------|--------|----------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | -- | -- | 380.4 | 11.55 |
| Plumatella | -- | -- | -- | -- | 14.4 | 0.44 |
| Oligochaeta | 5,884.8 | 80.55 | 2,691.2 | 48.08 | 1,255.9 | 38.13 |
| Helobdella | -- | -- | 14.4 | 0.26 | -- | -- |
| Erpobdella punctata punctata | -- | -- | -- | -- | 7.2 | 0.22 |
| Mooreobdella bucera | 14.4 | 0.20 | -- | -- | -- | -- |
| Ostracoda | -- | -- | -- | -- | 122.0 | 3.70 |
| Caecidotea | 322.9 | 4.42 | -- | -- | -- | -- |
| Baetis intercalaris | -- | -- | 14.4 | 0.26 | -- | -- |
| Caenis | 7.2 | 0.10 | -- | -- | -- | -- |
| Cheumatopsyche | -- | -- | 7.2 | 0.13 | -- | -- |
| Oecetis | -- | -- | -- | -- | 7.2 | 0.22 |
| Peltodytes | -- | -- | 7.2 | 0.13 | -- | -- |
| Psectrotanypus dyari | 35.9 | 0.49 | -- | -- | -- | -- |
| Proctadius (Holotanypus) | -- | -- | 7.2 | 0.13 | 7.2 | 0.22 |
| Thienemanniya grp. | -- | -- | 43.1 | 0.77 | 7.2 | 0.22 |
| Thienemanniella xena | -- | -- | -- | -- | 14.4 | 0.44 |
| Cricotopus | -- | -- | -- | -- | 28.7 | 0.87 |
| Cricotopus tremulus grp. | 21.5 | 0.29 | 71.8 | 1.28 | -- | -- |
| Cricotopus bicinctus grp. | 7.2 | 0.10 | 43.1 | 0.77 | 7.2 | 0.22 |
| Cricotopus sylvestris grp. | -- | -- | 21.5 | 0.38 | 7.2 | 0.22 |
| Chironomus | 789.4 | 10.81 | 1,980.8 | 35.38 | 14.4 | 0.44 |
| Cryptochironomus | 14.4 | 0.20 | 64.6 | 1.15 | 703.3 | 21.35 |
| Dicrotendipes neomodestus | -- | -- | 86.1 | 1.54 | 7.2 | 0.22 |
| Paratendipes | 7.2 | 0.10 | -- | -- | -- | -- |
| Polypedilum halterale grp. | 7.2 | 0.10 | -- | -- | -- | -- |
| Polypedilum illinoense | 14.4 | 0.20 | 244.0 | 4.36 | 57.4 | 1.74 |
| Polypedilum scalaenum grp. | -- | -- | 86.1 | 1.54 | 516.7 | 15.69 |
| Stictochironomus | -- | -- | 43.1 | 0.77 | -- | -- |
| Micropsectra | -- | -- | 21.5 | 0.38 | -- | -- |
| Paratanytarsus | -- | -- | 129.2 | 2.31 | -- | -- |
| Simulium | -- | -- | -- | -- | 7.2 | 0.22 |
| Hemerodromia | 7.2 | 0.10 | -- | -- | -- | -- |
| Physa | 14.4 | 0.20 | 21.5 | 0.38 | 7.2 | 0.22 |
| Gyraulus | -- | -- | -- | -- | 7.2 | 0.22 |
| Ferrissia | -- | -- | -- | -- | 114.8 | 3.49 |
| Sphaeriidae | 157.9 | 2.16 | -- | -- | -- | -- |
| TOTAL BENTHOS | 7,305.8 | 100.00 | 5,597.8 | 100.00 | 3,294.1 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | | 19 | | 21 | |
| EPT TAXA RICHNESS | 1 | | 2 | | 1 | |

Chironomid head capsule deformities were relatively low or absent in the samples from WB DuPage River (Table 3-49). Deformities were observed in the HD samples at Stations 89 and 64. Three *Chironomus* and a single specimen of *Glyptotendipes* exhibited deformities in the HD samples at Stations 89 and 64, respectively. In addition, two specimens of *Chironomus* in the Station 89 Ponar samples also exhibited deformities. Based on taxa richness and percent tolerant organisms, Stations 64 and 89 would be considered moderately stressed, while Station 110 would be considered highly stressed (Tables 3-47 and 3-48).

3.2.5.2 Buffalo Creek

HD and Ponar samples from the single station in Buffalo Creek (Station 12) yielded 45 total taxa and six EPT taxa (Tables 3-50 and 3-51). The HD samples produced 33 total taxa and six EPT taxa, whereas the Ponar samples had 30 total taxa and only one EPT taxon. The midge *Polypedilum flavum* was the dominant taxon in the HD samples, however, the flatworm *Turbellaria* and several midge species also were well represented in the HD samples (Table 3-50). Oligochaeta was clearly the dominant taxon in the Ponar samples representing more than 66 percent of the total sample.

No head capsule deformities were noted at this station. Given the number of taxa, presence of relatively pollution sensitive Tanytarsini midges, and distribution of abundance among taxa, particularly in the HD samples, it appears the benthic community at Station 12 is slightly stressed.

3.2.5.3 Salt Creek

Both HD and Ponar samples were taken at Stations 79, 18, 24 and 109. In addition to these four stations, Ponar samples were also taken at the CFAR station at J.F.K Blvd. and Station 80. Combined, these stations yielded 83 total taxa and 10 EPT taxa (Tables 3-52 and 3-53). The HD samples produced 83 total taxa and 10 EPT taxa (Table 3-52). Total taxa richness for the HD samples was fairly similar among the four sites ranging between 30 and 40 taxa. EPT taxa increased from three upstream (Station 79) to as high as six taxa downstream (Station 109). The dominant taxon for the upstream station (Station 79) was the tolerant midge *Glyptotendipes*, also present in substantial numbers were Oligochaeta and the midge *Dicrotendipes simpsoni*. Aside from these nearly co-dominant taxa, no other taxa at this station accounted for more than three percent of the total sample. Oligochaeta dominated both Stations 18 and 109, representing over half the sample at Station 18 but only 14 percent at Station 109. The flatworm *Turbellaria* dominated the sample of Station 24. HD total density varied substantially between the four stations, steadily decreasing from upstream (Station 79) to downstream (Station 109) largely driven by the abundance of Oligochaeta and *Glyptotendipes*.

Ponar samples produced 52 total taxa and three EPT taxa (Table 3-53). Except for Station 80 which only yielded 13 taxa, total richness was relatively consistent among the stations ranging from 16 to 22 taxa. Oligochaeta dominated all of the stations except Station 80 where the midge taxa *Cladotanytarsus mancus* grp. accounted for nearly 72 percent of the sample. Total density in the Ponars varied widely among the six stations. The Ponar density at the CFAR station was just over 26 times the density at Station 109. Except for Station 80, the abundance of Oligochaeta determined the total density pattern at all the stations.

Table 3-49. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the West Branch of the Du Page River (W.B.D.P.R.) and Salt Creek of the Des Plaines River watershed, July 2004

| Taxa | Hester-Dendy Samples | | | | Ponar Sample |
|---|-----------------------------------|---------------------------------|------------------------------------|---------------------------------|-----------------------------------|
| | W.B.D.P.R. @ Walnut Sta. 89 | W.B.D.P.R. @ Lake Sta. 64 | Salt Creek @ Higgins Sta. 79 | Salt Creek @ Wolf Sta. 24 | W.B.D.P.R. @ Walnut Sta. 89 |
| <i>Chironomus sp.</i> | | | | | |
| Number Examined | 77 | -- | 16 | -- | 120 |
| Percent Deformed | 3.9 | -- | 6.3 | -- | 1.7 |
| <i>Glyptotendipes sp.</i> | | | | | |
| Number Examined | -- | 114 | 131 | -- | -- |
| Percent Deformed | -- | 0.9 | 2.3 | -- | -- |
| <i>Polypedium scalaenum grp.</i> | | | | | |
| Number Examined | -- | -- | -- | 31 | -- |
| Percent Deformed | -- | -- | -- | 3.2 | -- |
| <i>Procladius sp.</i> | | | | | |
| Number Examined | -- | -- | -- | 14 | -- |
| Percent Deformed | -- | -- | -- | 7.1 | -- |
| TOTAL SAMPLE | | | | | |
| Total Midges Examined | 239 | 233 | 232 | 172 | 167 |
| Percent Deformed | 1.3 | 0.4 | 1.7 | 1.2 | 1.2 |

TABLE 3-50. HESTER-DENDY DENSITIES AT SAMPLING STATION 12 WITHIN BUFFALO CREEK, JULY 2004.

| TAXA | 12 LAKE COOK RD. | |
|--------------------------------------|---------------------|--------|
| | #/m2 | % |
| Hydra | 107.6 | 0.44 |
| Turbellaria | 4,018.7 | 16.57 |
| Oligochaeta | 2,870.5 | 11.83 |
| Ostracoda | 197.3 | 0.81 |
| Caecidotea | 35.9 | 0.15 |
| Baetis intercalaris | 17.9 | 0.07 |
| Stenacron | 35.9 | 0.15 |
| Caenis | 17.9 | 0.07 |
| Sialis | 17.9 | 0.07 |
| Cheumatopsyche | 322.9 | 1.33 |
| Hydropsyche betteni | 17.9 | 0.07 |
| Ceraclea | 17.9 | 0.07 |
| Dubiraphia | 53.8 | 0.22 |
| Ablabesmyia mallochi | 71.8 | 0.30 |
| Thienemanimyia grp. | 358.8 | 1.48 |
| Thienemanniella xena | 1,686.4 | 6.95 |
| Cricotopus/Orthocladius | 681.7 | 2.81 |
| Cricotopus bicinctus grp. | 1,632.6 | 6.73 |
| Cricotopus sylvestris grp. | 340.9 | 1.41 |
| Nanocladius distinctus | 161.5 | 0.67 |
| Nanocladius crassicornus/rectinervis | 394.7 | 1.63 |
| Rheocricotopus robacki | 89.7 | 0.37 |
| Cryptochironomus | 89.7 | 0.37 |
| Dicrotendipes neomodestus | 1,596.7 | 6.58 |
| Dicrotendipes simpsoni | 2,134.9 | 8.80 |
| Endochironomus nigricans | 71.8 | 0.30 |
| Glyptotendipes | 1,722.3 | 7.10 |
| Polypedilum flavum | 4,449.2 | 18.34 |
| Polypedilum scalaenum grp. | 322.9 | 1.33 |
| Micropsectra | 305.0 | 1.26 |
| Paratanytarsus | 305.0 | 1.26 |
| Tanytarsus | 89.7 | 0.37 |
| Hemerodromia | 17.9 | 0.07 |
| TOTAL BENTHOS | 24,255.5 | 100.00 |
| TOTAL TAXA RICHNESS | 33 | |
| EPT TAXA RICHNESS | 6 | |

TABLE 3-51. PETITE PONAR DENSITIES AT SAMPLING STATION 12 WITHIN BUFFALO CREEK, JULY 2004.

| TAXA | 12 LAKE COOK RD. | |
|-------------------------------------|---------------------|--------|
| | #/m ² | % |
| Turbellaria | 14.4 | 0.17 |
| Oligochaeta | 5,705.4 | 66.69 |
| Ostracoda | 7.2 | 0.08 |
| Caecidotea | 7.2 | 0.08 |
| Cheumatopsyche | 35.9 | 0.42 |
| Dubiraphia | 14.4 | 0.17 |
| Stenelmis | 64.6 | 0.76 |
| Thienemanniella xena | 7.2 | 0.08 |
| Cricotopus/Orthocladus | 7.2 | 0.08 |
| Cricotopus bicornis grp. | 28.7 | 0.34 |
| Nanocladus distinctus | 7.2 | 0.08 |
| Nanocladus crassicornus/rectinervis | 21.5 | 0.25 |
| Chironomus | 43.1 | 0.50 |
| Cryptochironomus | 208.1 | 2.43 |
| Cryptotendipes | 35.9 | 0.42 |
| Dicrotendipes neomodestus | 696.1 | 8.14 |
| Glyptotendipes | 50.2 | 0.59 |
| Microtendipes | 21.5 | 0.25 |
| Polypedilum flavum | 452.1 | 5.29 |
| Polypedilum scabrae grp. | 208.1 | 2.43 |
| Pseudochironomus | 43.1 | 0.50 |
| Stictochironomus | 394.7 | 4.61 |
| Cladotanytarsus mancus grp. | 21.5 | 0.25 |
| Paratanytarsus | 14.4 | 0.17 |
| Rheotanytarsus | 7.2 | 0.08 |
| Tanytarsus | 57.4 | 0.67 |
| Sphaerium simile | 71.8 | 0.84 |
| Musculium | 93.3 | 1.09 |
| Pisidium | 208.1 | 2.43 |
| Lasmigona complanata | 7.2 | 0.08 |
| TOTAL BENTHOS | 8,554.5 | 100.00 |
| TOTAL TAXA RICHNESS | 30 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-52. HESTER-DENDY DENSITIES AT SAMPLING STATIONS 79, 18, 24, AND 109 WITHIN SALT CREEK, JULY-SEPTEMBER 2004.

| TAXA | 79 | | 18 | | 24 | | 109 | |
|--------------------------------------|-------------|-------|------------|-------|----------|-------|-----------------|-------|
| | HIGGINS RD. | | DEVON AVE. | | WOLF RD. | | BROOKFIELD AVE. | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 141.7 | 1.42 | 10.8 | 0.23 | -- | -- | 12.6 | 2.29 |
| Turbellaria | 127.4 | 1.27 | 231.4 | 4.85 | 798.3 | 46.99 | 19.7 | 3.59 |
| Nematoda | -- | -- | 3.6 | 0.08 | -- | -- | -- | -- |
| Urnatella gracilis | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Oligochaeta | 2,371.7 | 23.69 | 2,746.7 | 57.56 | 206.3 | 12.14 | 78.9 | 14.38 |
| Helobdella | -- | -- | -- | -- | -- | -- | 3.6 | 0.65 |
| Helobdella stagnalis | 3.6 | 0.04 | -- | -- | -- | -- | -- | -- |
| Ostracoda | 80.7 | 0.81 | 118.4 | 2.48 | -- | -- | 1.8 | 0.33 |
| Caecidotea | 1.8 | 0.02 | 244.0 | 5.11 | 1.8 | 0.11 | 26.9 | 4.90 |
| Gammarus fasciatus | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Crangonyx | 17.9 | 0.18 | -- | -- | -- | -- | -- | -- |
| Hydracarina | 1.8 | 0.02 | -- | -- | -- | -- | -- | -- |
| Baetis intercalaris | -- | -- | -- | -- | 12.6 | 0.74 | -- | -- |
| Baetis flavistriga | -- | -- | -- | -- | -- | -- | 1.8 | 0.33 |
| Callibaetis | -- | -- | -- | -- | -- | -- | 1.8 | 0.33 |
| Stenacron | -- | -- | 7.2 | 0.15 | 95.1 | 5.60 | 37.7 | 6.86 |
| Tricorythodes | -- | -- | -- | -- | 14.4 | 0.84 | -- | -- |
| Caenis | 17.9 | 0.18 | -- | -- | -- | -- | 1.8 | 0.33 |
| Coenagrionidae | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Argia | -- | -- | -- | -- | 5.4 | 0.32 | 28.7 | 5.23 |
| Enallagma | 17.9 | 0.18 | -- | -- | -- | -- | -- | -- |
| Corixidae | 32.3 | 0.32 | 5.4 | 0.11 | -- | -- | -- | -- |
| Sialis | -- | -- | -- | -- | 10.8 | 0.63 | -- | -- |
| Cyrnellus fraternus | 272.7 | 2.72 | 224.3 | 4.70 | 1.8 | 0.11 | -- | -- |
| Cheumatopsyche | -- | -- | 48.4 | 1.02 | 105.8 | 6.23 | 10.8 | 1.96 |
| Hydropsyche betteni | -- | -- | -- | -- | -- | -- | 7.2 | 1.31 |
| Oecetis | 1.8 | 0.02 | -- | -- | -- | -- | -- | -- |
| Dubiraphia | 62.8 | 0.63 | 5.4 | 0.11 | -- | -- | -- | -- |
| Stenelmis | -- | -- | 1.8 | 0.04 | 9.0 | 0.53 | 12.6 | 2.29 |
| Ceratopogon | 1.8 | 0.02 | -- | -- | -- | -- | -- | -- |
| Culicoides | 17.9 | 0.18 | -- | -- | -- | -- | -- | -- |
| Bezzia | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Tanytus | 10.8 | 0.11 | -- | -- | -- | -- | -- | -- |
| Natarsia sp. A | -- | -- | -- | -- | -- | -- | 1.8 | 0.33 |
| Procladius (Holotanytus) | 75.3 | 0.75 | 100.5 | 2.11 | 25.1 | 1.48 | 1.8 | 0.33 |
| Ablabesmyia janta | 107.6 | 1.08 | -- | -- | -- | -- | -- | -- |
| Ablabesmyia mallochii | -- | -- | -- | -- | 1.8 | 0.11 | 7.2 | 1.31 |
| Nilotanytus fimbriatus | -- | -- | -- | -- | -- | -- | 1.8 | 0.33 |
| Thienemannimyia grp. | -- | -- | 7.2 | 0.15 | 32.3 | 1.90 | 25.1 | 4.58 |
| Corynoneura lobata | -- | -- | -- | -- | 3.6 | 0.21 | -- | -- |
| Thienemanniella xena | -- | -- | -- | -- | 68.2 | 4.01 | 1.8 | 0.33 |
| Cricotopus/Orthocladius | -- | -- | -- | -- | 7.2 | 0.42 | 5.4 | 0.98 |
| Cricotopus | -- | -- | -- | -- | -- | -- | 10.8 | 1.96 |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | 39.5 | 2.32 | 10.8 | 1.96 |
| Nanocladius distinctus | -- | -- | -- | -- | 3.6 | 0.21 | -- | -- |
| Nanocladius crassicornus/rectinervis | 53.8 | 0.54 | 57.4 | 1.20 | 1.8 | 0.11 | -- | -- |
| Rheocricotopus robacki | -- | -- | -- | -- | 1.8 | 0.11 | 21.5 | 3.92 |
| Chironomus | 84.3 | 0.84 | 50.2 | 1.05 | -- | -- | 1.8 | 0.33 |
| Cladopelma | 159.7 | 1.59 | 7.2 | 0.15 | -- | -- | -- | -- |
| Cryptochironomus | -- | -- | 35.9 | 0.75 | 10.8 | 0.63 | 9.0 | 1.63 |
| Dicrotendipes neomodestus | -- | -- | 21.5 | 0.45 | 14.4 | 0.84 | 1.8 | 0.33 |
| Dicrotendipes simpsoni | 2,160.0 | 21.57 | 93.3 | 1.95 | 1.8 | 0.11 | -- | -- |
| Endochironomus nigricans | -- | -- | 43.1 | 0.90 | -- | -- | -- | -- |
| Glyptotendipes | 3,862.6 | 38.58 | 71.8 | 1.50 | -- | -- | -- | -- |
| Harnischia | -- | -- | 7.2 | 0.15 | -- | -- | 3.6 | 0.65 |
| Parachironomus | 64.6 | 0.65 | -- | -- | -- | -- | -- | -- |
| Polypedilum fallax grp. | -- | -- | -- | -- | 9.0 | 0.53 | 5.4 | 0.98 |
| Polypedilum flavum | -- | -- | 28.7 | 0.60 | 77.1 | 4.54 | 21.5 | 3.92 |
| Polypedilum halterale grp. | -- | -- | -- | -- | 12.6 | 0.74 | 1.8 | 0.33 |
| Polypedilum illinoense | 59.2 | 0.59 | 21.5 | 0.45 | 17.9 | 1.06 | 68.2 | 12.42 |
| Polypedilum scalaenum grp. | -- | -- | 138.1 | 2.89 | 77.1 | 4.54 | 41.3 | 7.52 |
| Pseudochironomus | -- | -- | 35.9 | 0.75 | -- | -- | -- | -- |
| Stenochironomus | -- | -- | 14.4 | 0.30 | 7.2 | 0.42 | 1.8 | 0.33 |
| Stictochironomus | 59.2 | 0.59 | -- | -- | -- | -- | -- | -- |
| Cladotanytarsus mancus grp. | -- | -- | 9.0 | 0.19 | -- | -- | -- | -- |
| Rheotanytarsus | -- | -- | 14.4 | 0.30 | -- | -- | 1.8 | 0.33 |
| Tanytarsus | -- | -- | 21.5 | 0.45 | -- | -- | 5.4 | 0.98 |
| Rhamphomyia | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Amnicola | -- | -- | -- | -- | -- | -- | 1.8 | 0.33 |
| Pleurocera | -- | -- | -- | -- | 7.2 | 0.42 | -- | -- |
| Physa | 53.8 | 0.54 | -- | -- | -- | -- | 1.8 | 0.30 |

TABLE 3-52 (cont.)

| TAXA | 79 HIGGINS RD. | | 18 DEVON AVE. | | 24 WOLF RD. | | 109 BROOKFIELD AVE. | |
|----------------------|-------------------|--------|------------------|--------|----------------|--------|------------------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Helisoma | 19.7 | 0.20 | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | 274.5 | 5.75 | 16.1 | 0.95 | -- | -- |
| Ferrissia | 70.0 | 0.70 | 39.5 | 0.83 | -- | -- | 46.6 | 8.50 |
| Corbicula fluminea | -- | -- | 21.5 | 0.45 | 1.8 | 0.11 | -- | -- |
| Dreissena polymorpha | -- | -- | 1.8 | 0.04 | -- | -- | 1.8 | 0.33 |
| TOTAL BENTHOS | 10,012.6 | 100.00 | 4,772.2 | 100.00 | 1,699.0 | 100.00 | 549.0 | 100.00 |
| TOTAL TAXA RICHNESS | 30 | | 40 | | 33 | | 40 | |
| EPT TAXA RICHNESS | 3 | | 3 | | 5 | | 6 | |

TABLE 3-53. PETITE PONAR DENSITIES AT SAMPLING STATIONS 79, 80, CFAR, 18, 24, AND 109 WITHIN SALT CREEK, MAY-SEPTEMBER 2004.

| TAXA | 79 HIGGINS RD. | | 80 ARLINGTON HTS. RD. | | CFAR J. F. K. BLVD. | | 18 DEVON AVE. | | 24 WOLF RD. | | 109 BROOKFIELD AVE. | |
|-----------------------------|-------------------|--------|-----------------------------|--------|------------------------|--------|------------------|--------|------------------|--------|------------------------|--------|
| | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % |
| Turbellaria | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.74 | -- | -- |
| Nematoda | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 | -- | -- | -- | -- |
| Urnatella gracilis | 14.4 | 0.30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Plumatella | -- | -- | -- | -- | 14.4 | 0.08 | -- | -- | -- | -- | -- | -- |
| Oligochaeta | 3,710.3 | 76.93 | 545.4 | 3.95 | 6,961.3 | 36.55 | 2,346.8 | 38.79 | 480.8 | 49.26 | 208.1 | 29.29 |
| Ostracoda | 28.7 | 0.60 | 7.2 | 0.05 | 10,851.1 | 56.97 | 172.2 | 2.85 | -- | -- | -- | -- |
| Caecidotea | -- | -- | -- | -- | -- | -- | 222.5 | 3.68 | -- | -- | -- | -- |
| Baetis intercalaris | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 1.01 |
| Caenis | 43.1 | 0.89 | -- | -- | 14.4 | 0.08 | -- | -- | 14.4 | 1.47 | -- | -- |
| Cheumatopsyche | -- | -- | -- | -- | -- | -- | 35.9 | 0.59 | -- | -- | -- | -- |
| Dubiraphia | 114.8 | 2.38 | -- | -- | 14.4 | 0.08 | 14.4 | 0.24 | -- | -- | -- | -- |
| Stenelmis | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 | 50.2 | 5.15 | 14.4 | 2.02 |
| Ceratopogon | 14.4 | 0.30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bezzia | -- | -- | -- | -- | 14.4 | 0.08 | -- | -- | -- | -- | -- | -- |
| Tanypus | 43.1 | 0.89 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Natarsia sp. A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 1.01 |
| Procladius (Holotanypus) | 172.2 | 3.57 | -- | -- | -- | -- | 14.4 | 0.24 | 7.2 | 0.74 | -- | -- |
| Ablabesmyia mallochii | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 | -- | -- | -- | -- |
| Thienemanniella xena | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 | 7.2 | 0.74 | 14.4 | 2.02 |
| Cricotopus/Orthocladus | -- | -- | -- | -- | 28.7 | 0.15 | -- | -- | -- | -- | -- | -- |
| Cricotopus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 43.1 | 6.06 |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | 71.8 | 0.38 | -- | -- | -- | -- | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 215.3 | 1.13 | -- | -- | -- | -- | -- | -- |
| Parakiefferiella | -- | -- | -- | -- | 43.1 | 0.23 | -- | -- | -- | -- | -- | -- |
| Chironomus | 14.4 | 0.30 | 14.4 | 0.10 | 445.0 | 2.34 | 7.2 | 0.12 | 14.4 | 1.47 | -- | -- |
| Cladopelma | 14.4 | 0.30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cryptochironomus | 64.6 | 1.34 | 531.1 | 3.85 | -- | -- | 552.6 | 9.13 | 28.7 | 2.94 | 21.5 | 3.03 |
| Cryptotendipes | 57.4 | 1.19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes neomodestus | -- | -- | 136.4 | 0.99 | 200.9 | 1.06 | -- | -- | 14.4 | 1.47 | 14.4 | 2.02 |
| Dicrotendipes simpsoni | -- | -- | -- | -- | 14.4 | 0.08 | -- | -- | -- | -- | -- | -- |
| Glyptotendipes | 7.2 | 0.15 | -- | -- | -- | -- | 14.4 | 0.24 | -- | -- | -- | -- |
| Harnischia | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 | -- | -- | -- | -- |
| Polypedilum flavum | -- | -- | 229.7 | 1.66 | -- | -- | -- | -- | 7.2 | 0.74 | 64.6 | 9.09 |
| Polypedilum halterale grp. | 21.5 | 0.45 | -- | -- | 14.4 | 0.08 | 86.1 | 1.42 | 50.2 | 5.15 | 21.5 | 3.03 |
| Polypedilum illinoense | -- | -- | 7.2 | 0.05 | 14.4 | 0.08 | 7.2 | 0.12 | 7.2 | 0.74 | -- | -- |
| Polypedilum scalaenum grp. | -- | -- | 1,665.0 | 12.06 | -- | -- | 595.7 | 9.85 | 57.4 | 5.88 | 129.2 | 18.18 |
| Pseudochironomus | -- | -- | 358.8 | 2.60 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenochironomus | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.74 | -- | -- |
| Stictochironomus | 14.4 | 0.30 | 358.8 | 2.60 | -- | -- | 28.7 | 0.47 | -- | -- | -- | -- |
| Cladotanytarsus mancus grp. | -- | -- | 9,910.9 | 71.78 | 57.4 | 0.30 | 1,507.1 | 24.91 | -- | -- | 14.4 | 2.02 |
| Micropsectra | -- | -- | 21.5 | 0.16 | 28.7 | 0.15 | -- | -- | -- | -- | -- | -- |
| Paratanytarsus | -- | -- | 21.5 | 0.16 | 43.1 | 0.23 | -- | -- | -- | -- | -- | -- |
| Rheotanytarsus | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 | -- | -- | -- | -- |
| Tanytarsus | 358.8 | 7.44 | -- | -- | -- | -- | -- | -- | 14.4 | 1.47 | 7.2 | 1.01 |
| Amnicola | -- | -- | -- | -- | -- | -- | -- | -- | 21.5 | 2.21 | -- | -- |
| Pleurocera | -- | -- | -- | -- | -- | -- | -- | -- | 57.4 | 5.88 | -- | -- |
| Physa | 64.6 | 1.34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Gyraulus | 7.2 | 0.15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Helisoma | -- | -- | -- | -- | -- | -- | 7.2 | 0.12 | -- | -- | -- | -- |
| Corbicula fluminea | 50.2 | 1.04 | -- | -- | -- | -- | 394.7 | 6.52 | 129.2 | 13.24 | 100.5 | 14.14 |
| Musculium | 7.2 | 0.15 | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 1.01 |
| Pisidium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 35.9 | 5.05 |
| TOTAL BENTHOS | 4,822.7 | 100.00 | 13,807.8 | 100.00 | 19,046.8 | 100.00 | 6,049.9 | 100.00 | 976.0 | 100.00 | 710.5 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | | 13 | | 18 | | 22 | | 18 | | 16 | |
| EPT TAXA RICHNESS | 1 | | 0 | | 1 | | 1 | | 1 | | 1 | |

Chironomid head capsule deformities were observed in the HD samples from Stations 24 and 79 (Table 3-49). At Station 79, one specimen of *Chironomus* and three specimens of *Glyptotendipes* exhibited deformities, whereas two of 120 specimens of *Chironomus* displayed deformities at Station 24. Taxa richness was fairly high at all the Salt Creek Stations. However, EPT taxa richness was low and highly tolerant taxa were common to abundant. Therefore, Salt Creek appears to be slightly to moderately stressed. No longitudinal pattern was apparent (Tables 3-52 and 3-53).

3.2.5.4 Higgins Creek

Combined, the HD and Ponar samples from Stations 77 and 78 in Higgins Creek yielded 38 total taxa and two EPT taxa (Tables 3-54 and 3-55). Total taxa richness was identical (28 taxa) for both the HD and Ponar samples for stations combined. *Caecidotea* was the dominant taxon at both stations in the HD samples, representing 36 and 90 percent of the total density at Stations 77 and 78, respectively. Oligochaeta also was fairly common (33 percent) in the HD samples from Station 77 while representing only three percent in the Station 78 HD samples. HD total density was similar between the two stations

In the Ponar samples, Oligochaeta was the dominant taxon at Station 77 while *Caecidotea* was the most common taxon at Station 78 (Table 3-55). In addition, *Chironomus* and Turbellaria were fairly abundant at Station 77 and 78, respectively. Total density varied considerably in the Ponar samples. As a result of very high densities of *Caecidotea*, total density in the Station 78 Ponar samples was nearly 33 times that at Station 77.

The only taxon to exhibit deformities in Higgins Creek was *Chironomus*, however, all specimens were observed in the samples from Station 77 (Table 3-56). Two midges with head capsule deformities were observed in the HD samples while four specimens exhibited deformities in the Station 77 Ponar samples. Although the incidence of head capsule deformities does not provide clear evidence, together with the greater abundance of tolerant taxa at Station 77 suggests that the benthic community is slightly more stressed at Station 77 compared to Station 78.

3.2.5.5 Des Plaines River

The HD and Ponar samples from the eight Des Plaines River stations (Stations 13, 17, 19, 20, 22, 23, 29, and 91), plus the additional CFAR Ponar station, yielded 92 total taxa and 16 EPT taxa (Tables 3-57 and 3-58). This was the highest total richness value observed among all the waterways sampled in 2003 and 2004 and the second highest EPT richness value between the two years. EPT richness from the Des Plaines River in 2004 was nearly identical to 2003. HD total taxa richness ranged from 13 to 41 taxa and decreased longitudinally upstream to downstream among Stations 13 through 20. However, the decreasing trend was not evident at the remaining stations (Table 3-57). Taxa richness at Stations 13, 22, and 29 was similarly high ranging from 38 to 41 taxa. In contrast, the lowest taxa richness was observed at Stations 20 and 23 with 16 and 13 taxa, respectively.

EPT taxa richness varied throughout the eight HD stations, ranging from the 13 taxa at Station 29 to only one EPT taxon at Station 20 (Table 3-57). The tolerant taxon Oligochaeta was the

TABLE 3-54 HESTER-DENDY DENSITIES AT SAMPLING STATIONS 77 AND 78 WITHIN HIGGINS CREEK, JULY 2004.

| TAXA | 77 ELMHURST RD. | | 78 WILLE RD. | |
|--------------------------------------|--------------------|--------|-----------------|--------|
| | #/m2 | % | #/m2 | % |
| Turbellaria | 5.4 | 0.07 | 95.1 | 0.99 |
| Plumatella | 23.3 | 0.30 | 17.9 | 0.19 |
| Oligochaeta | 2,527.8 | 32.83 | 292.4 | 3.05 |
| Erpobdella punctata punctata | 14.4 | 0.19 | 17.9 | 0.19 |
| Ostracoda | -- | -- | 30.5 | 0.32 |
| Caecidotea | 2,777.2 | 36.07 | 8,624.0 | 89.97 |
| Argia | 35.9 | 0.47 | -- | -- |
| Agabus | 1.8 | 0.02 | -- | -- |
| Laccophilus maculosus | 1.8 | 0.02 | -- | -- |
| Tropisternus | 5.4 | 0.07 | -- | -- |
| Tanytus | 122.0 | 1.58 | -- | -- |
| Procladius (Holotanytus) | 14.4 | 0.19 | -- | -- |
| Thienemanniya grp. | 113.0 | 1.47 | 5.4 | 0.06 |
| Cricotopus/Orthocladius | 30.5 | 0.40 | -- | -- |
| Cricotopus tremulus grp. | -- | -- | 66.4 | 0.69 |
| Cricotopus bicinctus grp. | 217.1 | 2.82 | 269.1 | 2.81 |
| Cricotopus sylvestris grp. | 89.7 | 1.16 | 41.3 | 0.43 |
| Orthocladius | -- | -- | 17.9 | 0.19 |
| Nanocladius distinctus | 91.5 | 1.19 | -- | -- |
| Nanocladius crassicornus/rectinervis | 733.8 | 9.53 | 17.9 | 0.19 |
| Chironomus | 403.7 | 5.24 | 12.6 | 0.13 |
| Cryptochironomus | 1.8 | 0.02 | -- | -- |
| Dicrotendipes neomodestus | 30.5 | 0.40 | -- | -- |
| Polypedilum illinoense | -- | -- | 35.9 | 0.37 |
| Simulium | -- | -- | 5.4 | 0.06 |
| Physa | 279.9 | 3.63 | -- | -- |
| Planorbella | 30.5 | 0.40 | -- | -- |
| Ferrissia | 148.9 | 1.93 | 35.9 | 0.37 |
| TOTAL BENTHOS | 7,700.0 | 100.00 | 9,585.6 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | | 16 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

TABLE 3-55. PETITE PONAR DENSITIES AT SAMPLING STATIONS 77 AND 78 WITHIN HIGGINS CREEK, JULY 2004.

| TAXA | 77 ELMHURST RD. | | 78 WILLE RD. | |
|--------------------------------------|--------------------|--------|------------------|--------|
| | #/m ² | % | #/m ² | % |
| Hydra | -- | -- | 531.1 | 0.63 |
| Turbellaria | -- | -- | 15,365.2 | 18.36 |
| Oligochaeta | 1,758.3 | 69.21 | 2,203.2 | 2.63 |
| Erpobdella punctata punctata | 71.8 | 2.82 | 251.2 | 0.30 |
| Ostracoda | -- | -- | 3,243.8 | 3.88 |
| Caecidotea | -- | -- | 60,204.8 | 71.94 |
| Libellulidae | 7.2 | 0.28 | -- | -- |
| Hydropsychidae | -- | -- | 43.1 | 0.05 |
| Hydroptila | -- | -- | 43.1 | 0.05 |
| Tanytus | 78.9 | 3.11 | -- | -- |
| Procladius (Holotanytus) | 21.5 | 0.85 | -- | -- |
| Thienemannimyia grp. | -- | -- | 35.9 | 0.04 |
| Cricotopus tremulus grp. | -- | -- | 14.4 | 0.02 |
| Cricotopus bicinctus grp. | 7.2 | 0.28 | 846.8 | 1.01 |
| Cricotopus trifascia grp. | -- | -- | 122.0 | 0.15 |
| Cricotopus sylvestris grp. | -- | -- | 43.1 | 0.05 |
| Nanocladius crassicornus/rectinervis | -- | -- | 416.2 | 0.50 |
| Chironomus | 552.6 | 21.75 | -- | -- |
| Cryptochironomus | 14.4 | 0.56 | 14.4 | 0.02 |
| Endochironomus nigricans | -- | -- | 7.2 | 0.01 |
| Polypedilum flavum | -- | -- | 14.4 | 0.02 |
| Polypedilum illinoense | 7.2 | 0.28 | 28.7 | 0.03 |
| Rheotanytarsus | -- | -- | 7.2 | 0.01 |
| Pericoma | -- | -- | 7.2 | 0.01 |
| Physa | -- | -- | 78.9 | 0.09 |
| Ferrissia | -- | -- | 71.8 | 0.09 |
| Sphaerium simile | -- | -- | 93.3 | 0.11 |
| Pisidium | 21.5 | 0.85 | -- | -- |
| TOTAL BENTHOS | 2,540.5 | 100.00 | 83,686.7 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | | 23 | |
| EPT TAXA RICHNESS | 0 | | 2 | |

Table 3-56. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from Higgins Creek and the Des Plaines River of the Des Plaines River watershed, July 2004

| Taxa | Hester-Dendy Sample | Ponar Samples | |
|------------------------------------|--|--|--|
| | Higgins Creek @ Elmhurst Sta. 77 | Des Plaines R. @ Lake-Cook Sta. 13 | Higgins Creek @ Elmhurst Sta. 77 |
| <i>Chironomus sp.</i> | | | |
| Number Examined | 31 | --- | 77 |
| Percent Deformed | 6.5 | --- | 5.2 |
| <i>Cladotanytarsus mancus grp.</i> | | 3 | |
| Number Examined | | 33.3 | |
| Percent Deformed | | | |
| TOTAL SAMPLE | | | |
| Total Midges Examined | 146 | 109 | 95 |
| Percent Deformed | 1.4 | 0.9 | 4.2 |

TABLE 3-57 HESTER-DENDY DENSITIES AT SAMPLING STATIONS 13, 17, 19, 20, 22, 23, 29, AND 91 WITHIN THE DES PLAINES RIVER, JULY AND SEPTEMBER 2004.

| TAXA | 13 LAKE COOK RD. | | 17 OAKTON ST. | | 19 BELMONT AVE. | | 20 ROOSEVELT RD. | | 22 OGDEN AVE. | | 23 WILLOW SPRINGS RD. | | 29 STEPHEN ST. | | 91 MATERIAL SERVICE RD. | |
|--------------------------|---------------------|-------|------------------|-------|--------------------|-------|---------------------|-------|------------------|-------|-----------------------------|-------|-------------------|-------|-------------------------------|-------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.42 | 50.2 | 4.36 | -- | -- | -- | -- |
| Turbellaria | 77.1 | 2.57 | 16.1 | 1.03 | 9.0 | 0.77 | -- | -- | 351.6 | 8.15 | -- | -- | 592.0 | 5.86 | 1,828.1 | 28.48 |
| Urnatella gracilis | -- | -- | 3.6 | 0.23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Plumatella | -- | -- | 3.6 | 0.23 | -- | -- | -- | -- | -- | -- | -- | -- | 37.7 | 0.37 | 5.4 | 0.08 |
| Oligochaeta | 579.5 | 19.30 | 1,114.1 | 71.38 | 319.3 | 27.30 | 190.2 | 42.57 | 425.2 | 9.85 | 1,026.2 | 89.10 | 209.9 | 2.08 | 518.5 | 8.08 |
| Helobdella stagnalis | 1.8 | 0.06 | 1.8 | 0.11 | -- | -- | -- | -- | -- | -- | 7.2 | 0.62 | -- | -- | -- | -- |
| Placobdella pediculata | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | 0.21 | -- | -- | -- | -- | -- | -- |
| Ostracoda | -- | -- | 3.6 | 0.23 | -- | -- | -- | -- | -- | -- | -- | -- | 12.6 | 0.12 | -- | -- |
| Caecidotea | 17.9 | 0.60 | 21.5 | 1.38 | 1.8 | 0.15 | 25.1 | 5.62 | 5.4 | 0.12 | 3.6 | 0.31 | -- | -- | 9.0 | 0.14 |
| Gammarus fasciatus | 57.4 | 1.91 | 154.3 | 9.89 | 89.7 | 7.67 | 30.5 | 6.83 | 14.4 | 0.33 | -- | -- | 32.3 | 0.32 | 9.0 | 0.14 |
| Hydracarina | -- | -- | -- | -- | 1.8 | 0.15 | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- | -- | -- |
| Baetis intercalaris | 7.2 | 0.24 | -- | -- | 46.6 | 3.99 | -- | -- | 265.5 | 6.15 | -- | -- | 432.4 | 4.28 | 251.2 | 3.91 |
| Stenacron | 26.9 | 0.90 | 73.6 | 4.71 | 104.1 | 8.90 | 39.5 | 8.84 | 55.6 | 1.29 | 10.8 | 0.93 | 170.4 | 1.69 | 17.9 | 0.28 |
| Stenonema integrum | 147.1 | 4.90 | -- | -- | -- | -- | -- | -- | 3.6 | 0.08 | -- | -- | 1.8 | 0.02 | -- | -- |
| Stenonema terminatum | 17.9 | 0.60 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 125.6 | 1.24 | -- | -- |
| Tricorythodes | 184.8 | 6.15 | 3.6 | 0.23 | -- | -- | -- | -- | 57.4 | 1.33 | -- | -- | 143.5 | 1.42 | 17.9 | 0.28 |
| Caenis | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | 10.8 | 0.11 | -- | -- |
| Anthopotamus myops grp. | 30.5 | 1.02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.02 | -- | -- |
| Argia | 21.5 | 0.72 | 12.6 | 0.80 | 17.9 | 1.53 | 50.2 | 11.24 | 16.1 | 0.37 | 17.9 | 1.56 | 12.6 | 0.12 | 5.4 | 0.08 |
| Somatochlora | -- | -- | -- | -- | -- | -- | 1.8 | 0.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| Trepobates | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- | 5.4 | 0.08 |
| Sialis | 1.8 | 0.06 | 1.8 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cynellus fraternus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10.8 | 0.93 | 28.7 | 0.28 | -- | -- |
| Cheumatopsyche | 663.8 | 22.10 | 23.3 | 1.49 | 206.3 | 17.64 | -- | -- | 1,460.4 | 33.85 | -- | -- | 4,332.6 | 42.90 | 2,185.1 | 34.04 |
| Hydropsyche betten | -- | -- | -- | -- | 3.6 | 0.31 | -- | -- | 16.1 | 0.37 | -- | -- | -- | -- | -- | -- |
| Hydropsyche orris | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,458.6 | 14.44 | 14.4 | 0.22 |
| Hydropsyche simulans | 132.8 | 4.42 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 53.8 | 0.53 | 17.9 | 0.28 |
| Hydropsyche bidens | 25.1 | 0.84 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Ceratopsyche morosa | 10.8 | 0.36 | -- | -- | -- | -- | -- | -- | 35.9 | 0.83 | -- | -- | 143.5 | 1.42 | 9.0 | 0.14 |
| Hydroptila | -- | -- | -- | -- | -- | -- | -- | -- | 12.6 | 0.29 | -- | -- | 17.9 | 0.18 | -- | -- |
| Petrophila | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 0.06 |
| Ancyronyx variegata | 3.6 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dubiraphia | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Macronychus glabratus | 16.1 | 0.54 | -- | -- | 19.7 | 1.69 | -- | -- | 10.8 | 0.25 | -- | -- | 9.0 | 0.09 | 16.1 | 0.25 |
| Stenelmis | 43.1 | 1.43 | 1.8 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.28 |
| Stenelmis crenata grp. | -- | -- | -- | -- | 19.7 | 1.69 | -- | -- | 7.2 | 0.17 | -- | -- | 113.0 | 1.12 | -- | -- |
| Tanytus | -- | -- | -- | -- | 3.6 | 0.31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Procladius (Holotanytus) | -- | -- | -- | -- | 9.0 | 0.77 | 1.8 | 0.40 | -- | -- | 3.6 | 0.31 | -- | -- | -- | -- |
| Ablabesmyia janta | -- | -- | 1.8 | 0.11 | -- | -- | 1.8 | 0.40 | -- | -- | -- | -- | 19.7 | 0.20 | -- | -- |

TABLE 3-57(cont).

| TAXA | 13 LAKE COOK RD. | | 17 OAKTON ST. | | 19 BELMONT AVE. | | 20 ROOSEVELT RD. | | 22 OGDEN AVE. | | 23 WILLOW SPRINGS RD. | | 29 STEPHEN ST. | | 91 MATERIAL SERVICE RD. | |
|--|---------------------|--------|------------------|--------|--------------------|--------|---------------------|--------|------------------|--------|-----------------------------|--------|-------------------|--------|-------------------------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | #/m2 |
| <i>Nilotanypus fimbriatus</i> | 25.1 | 0.84 | 1.8 | 0.11 | -- | -- | -- | -- | 61.0 | 1.41 | -- | -- | -- | -- | -- | -- |
| <i>Thienemannimyia</i> grp. | 25.1 | 0.84 | 7.2 | 0.46 | -- | -- | -- | -- | 120.2 | 2.79 | -- | -- | 382.1 | 3.78 | -- | -- |
| <i>Corynoneura lobata</i> | -- | -- | -- | -- | 35.9 | 3.07 | 3.6 | 0.80 | 37.7 | 0.87 | -- | -- | 7.2 | 0.07 | -- | -- |
| <i>Thienemanniella xena</i> | 7.2 | 0.24 | 1.8 | 0.11 | 78.9 | 6.75 | -- | -- | 19.7 | 0.46 | -- | -- | 37.7 | 0.37 | 39.5 | 0.61 |
| <i>Cricotopus/Orthocladus</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.07 | -- | -- |
| <i>Orthocladus</i> | -- | -- | -- | -- | -- | -- | -- | -- | 154.3 | 3.58 | -- | -- | -- | -- | -- | -- |
| <i>Nanocladus</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 357.0 | 3.53 | -- | -- |
| <i>Nanocladus distinctus</i> | -- | -- | -- | -- | -- | -- | -- | -- | 109.4 | 2.54 | -- | -- | 586.7 | 5.81 | 53.8 | 0.84 |
| <i>Nanocladus crassicornus/rectinervis</i> | -- | -- | 7.2 | 0.46 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 229.6 | 3.58 |
| <i>Parakiefferiella</i> | -- | -- | -- | -- | 5.4 | 0.46 | 3.6 | 0.80 | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Rheocricotopus robacki</i> | 25.1 | 0.84 | 1.8 | 0.11 | 23.3 | 1.99 | -- | -- | 122.0 | 2.83 | -- | -- | -- | -- | -- | -- |
| <i>Tvetenia discoloripes</i> grp. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 96.9 | 0.96 | 17.9 | 0.28 |
| <i>Cryptochironomus</i> | -- | -- | 3.6 | 0.23 | -- | -- | -- | -- | -- | -- | 3.6 | 0.31 | -- | -- | -- | -- |
| <i>Dicrotendipes</i> | 7.2 | 0.24 | -- | -- | 3.6 | 0.31 | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.28 |
| <i>Dicrotendipes neomodestus</i> | -- | -- | 3.6 | 0.23 | -- | -- | 1.8 | 0.40 | 14.4 | 0.33 | -- | -- | -- | -- | -- | -- |
| <i>Dicrotendipes simpsoni</i> | 2.6 | 0.42 | 3.6 | 0.23 | -- | -- | -- | -- | -- | -- | -- | -- | 37.7 | 0.37 | -- | -- |
| <i>Endochironomus nigricans</i> | 3.6 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Glyptotendipes</i> | 34.1 | 1.14 | 21.5 | 1.38 | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | 7.2 | 0.07 | 5.4 | 0.08 |
| <i>Harnischia</i> | -- | -- | 10.8 | 0.69 | -- | -- | 1.8 | 0.40 | -- | -- | -- | -- | 7.2 | 0.07 | -- | -- |
| <i>Microtendipes</i> | 41.3 | 1.37 | 1.8 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Parachironomus</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.07 | -- | -- |
| <i>Polypedilum flavum</i> | 45.9 | 21.51 | 12.6 | 0.80 | 10.8 | 0.92 | -- | -- | 681.7 | 15.80 | -- | -- | 251.2 | 2.49 | 566.9 | 8.83 |
| <i>Polypedilum illinoense</i> | -- | -- | 5.4 | 0.34 | 34.1 | 2.91 | 23.3 | 5.22 | 75.3 | 1.75 | -- | -- | 25.1 | 0.25 | 10.8 | 0.17 |
| <i>Polypedilum scalaenum</i> grp. | 32.3 | 1.08 | 23.3 | 1.49 | 73.6 | 6.29 | 5.4 | 1.20 | 1.8 | 0.04 | 3.6 | 0.31 | -- | -- | -- | -- |
| <i>Stenochironomus</i> | 7.2 | 0.24 | 10.8 | 0.69 | 12.6 | 1.07 | -- | -- | 50.2 | 1.16 | 3.6 | 0.31 | 57.4 | 0.57 | 5.4 | 0.08 |
| <i>Tribelos fuscicorne</i> | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Paratanytarsus</i> | -- | -- | -- | -- | -- | -- | 1.8 | 0.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Rheotanytarsus</i> | 46.6 | 1.55 | 3.6 | 0.23 | 9.0 | 0.77 | -- | -- | 39.5 | 0.91 | -- | -- | 30.5 | 0.30 | 344.5 | 5.37 |
| <i>Tanytarsus</i> | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.33 | -- | -- | 7.2 | 0.07 | -- | -- |
| <i>Simulium</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 0.06 |
| <i>Hemerodromia</i> | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | 37.7 | 0.37 | 1.8 | 0.03 |
| <i>Menetus dilatatus</i> | 3.6 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.18 | -- | -- |
| <i>Ferrissia</i> | 1.8 | 0.06 | 1.8 | 0.11 | 30.5 | 2.61 | 64.6 | 14.46 | 28.7 | 0.67 | 7.2 | 0.62 | 175.8 | 1.74 | 172.2 | 2.68 |
| <i>Corbicula fluminea</i> | 5.4 | 0.18 | 1.8 | 0.11 | -- | -- | -- | -- | 10.8 | 0.25 | 3.6 | 0.31 | 3.6 | 0.04 | -- | -- |
| <i>Sphaerium</i> | 5.4 | 0.18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Musculium</i> | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| <i>Musculium transversum</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 0.06 |
| <i>Dreissena polymorpha</i> | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.22 |
| TOTAL BENTHOS | 3,003.2 | 100.00 | 1,560.8 | 100.00 | 1,169.7 | 100.00 | 446.7 | 100.00 | 4,314.7 | 100.00 | 1,151.8 | 100.00 | 10,100.5 | 100.00 | 6,419.1 | 100.00 |
| TOTAL TAXA RICHNESS | 41 | | 33 | | 25 | | 16 | | 38 | | 13 | | 41 | | 32 | |
| EPT TAXA RICHNESS | 10 | | 3 | | 4 | | 1 | | 9 | | 2 | | 13 | | 7 | |

TABLE 3-58. PETITE PONAR DENSITIES AT SAMPLING STATIONS 13, 17, CFAR, 19, 20, 22, 23, 29, AND 91 WITHIN THE DES PLAINES RIVER, JULY-SEPTEMBER 2004.

| TAXA | 13 LAKE COOK RD. | | 17 OAKTON ST. | | CFAR IRVING PARK RD. | | 19 BELMONT AVE. | | 20 ROOSEVELT RD. | | 22 OGDEN AVE. | | 23 WILLOW SPRINGS RD. | | 29 STEPHEN ST. | | 91 MATERIAL SERVICE RD. | |
|---------------------------|---------------------|------|------------------|------|----------------------------|------|--------------------|------|---------------------|------|------------------|------|-----------------------------|------|-------------------|------|-------------------------------|------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 28.7 | 0.9 | -- | -- | -- | -- | 78.9 | 1.7 |
| Nematoda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 |
| Plumatella | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oligochaeta | -- | -- | 4,499.7 | 90.1 | 8,999.5 | 91.0 | 5,102.6 | 86.8 | 3,602.7 | 95.8 | 2,260.6 | 68.0 | 3,997.4 | 92.7 | 35.9 | 55.6 | 2,949.6 | 64.4 |
| Helobdella stagnalis | 14.4 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Placobdella pediculata | -- | -- | -- | -- | 14.4 | 0.1 | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | -- | -- | 14.4 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Ostracoda | 28.7 | 1.4 | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 322.9 | 7.1 |
| Caecidotea | -- | -- | -- | -- | 14.4 | 0.1 | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Gammarus fasciatus | 150.7 | 7.3 | 28.7 | 0.6 | 172.2 | 1.7 | 21.5 | 0.4 | 35.9 | 1.0 | 14.4 | 0.4 | -- | -- | 7.2 | 11.1 | 78.9 | 1.7 |
| Baetis intercalaris | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | 21.5 | 0.5 |
| Baetis flavistriga | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | -- | -- |
| Stenacron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | -- | -- |
| Stenonema terminatum | 28.7 | 1.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricorythodes | 21.5 | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | 71.8 | 2.2 | -- | -- | -- | -- | 21.5 | 0.5 |
| Caenis | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 |
| Anthopotamus myops grp. | 35.9 | 1.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stylurus | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Corixidae | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | 14.4 | 0.3 |
| Hydropsychidae | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 229.7 | 11.2 | -- | -- | 14.4 | 0.1 | 7.2 | 0.1 | -- | -- | 21.5 | 0.6 | -- | -- | -- | -- | 93.3 | 2.0 |
| Ceratopsyche morosa | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | -- | -- |
| Hydroptila | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | -- | -- |
| Dubiraphia | 7.2 | 0.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Macronychus glabratus | -- | -- | -- | -- | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenelmis | 57.4 | 2.8 | -- | -- | 28.7 | 0.3 | -- | -- | -- | -- | 50.2 | 1.5 | -- | -- | -- | -- | 57.4 | 1.3 |
| Ceratopogon | -- | -- | -- | -- | 14.4 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Culicoides | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- |
| Procladius (Holotanypus) | 14.4 | 0.7 | -- | -- | 14.4 | 0.1 | -- | -- | 35.9 | 1.0 | 35.9 | 1.1 | 57.4 | 1.3 | -- | -- | 14.4 | 0.3 |
| Ablabesmyia maltochi | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 |
| Thienemannimyia grp. | 93.3 | 4.5 | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | -- | -- |
| Thienemanniella xena | 14.4 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | 78.9 | 1.7 |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 28.7 | 0.6 |
| Orthocladius | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 43.1 | 0.9 |
| Rheocricotopus robacki | 14.4 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 229.7 | 5.3 | -- | -- | 35.9 | 0.8 |
| Cryptochironomus | 50.2 | 2.4 | 50.2 | 1.0 | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | 7.2 | 0.2 |
| Dicrotendipes | 14.4 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 35.9 | 0.8 |
| Dicrotendipes neomodestus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.3 |
| Harnischia | -- | -- | 35.9 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Microtendipes | 14.4 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Paracladopelma | -- | -- | 129.2 | 2.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | 351.7 | 17.1 | 14.4 | 0.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 236.8 | 5.2 |

TABLE 3-58 (cont.)

| TAXA (cont.) | 13 LAKE COOK RD. | | 17 OAKTON ST. | | CFAR IRVING PARK RD. | | 19 BELMONT AVE. | | 20 ROOSEVELT RD. | | 22 OGDEN AVE. | | 23 WILLOW SPRINGS RD. | | 29 STEPHEN ST. | | 91 MATERIAL SERVICE RD. | |
|----------------------------------|---------------------|-------|------------------|-------|----------------------------|-------|--------------------|-------|---------------------|-------|------------------|-------|-----------------------------|-------|-------------------|-------|-------------------------------|-------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Polypedilum halterale grp. | 57.4 | 2.8 | 14.4 | 0.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 |
| Polypedilum illinoense | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | 7.2 | 0.2 |
| Polypedilum scalaenum grp. | 215.3 | 10.5 | 78.9 | 1.6 | -- | -- | 7.2 | 0.1 | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | 71.8 | 1.6 |
| Saetheria | 179.4 | 8.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tribelos fuscicorne | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 |
| Cladotanytarsus mancus grp. | 35.9 | 1.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cladotanytarsus vanderwulpi grp. | 200.9 | 9.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 |
| Rheotanytarsus | 14.4 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 11.1 | 28.7 | 0.6 |
| Tanytarsus | 35.9 | 1.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 114.8 | 2.5 |
| Campeloma decisum | -- | -- | -- | -- | 57.4 | 0.6 | 28.7 | 0.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Amnicola | -- | -- | 14.4 | 0.3 | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Pleurocera | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.3 |
| Ferrissia | -- | -- | -- | -- | 28.7 | 0.3 | -- | -- | -- | -- | 28.7 | 0.9 | 7.2 | 0.2 | 14.4 | 22.2 | 50.2 | 1.1 |
| Corbicula fluminea | 64.6 | 3.1 | 78.9 | 1.6 | 315.8 | 3.2 | 689.0 | 11.7 | 71.8 | 1.9 | 667.4 | 20.1 | -- | -- | -- | -- | 107.6 | 2.4 |
| Sphaerium | 86.1 | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | 43.1 | 1.3 | -- | -- | -- | -- | -- | -- |
| Sphaerium simile | -- | -- | -- | -- | -- | -- | 7.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Musculium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.2 | -- | -- | -- | -- | 7.2 | 0.2 |
| Musculium transversum | -- | -- | -- | -- | 200.9 | 2.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Pisidium | 21.5 | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | 28.7 | 0.9 | -- | -- | -- | -- | -- | -- |
| TOTAL BENTHOS | 2,052.5 | 100.0 | 4,994.9 | 100.0 | 9,889.4 | 100.0 | 5,877.7 | 100.0 | 3,760.6 | 100.0 | 3,322.8 | 100.0 | 4,313.2 | 100.0 | 64.6 | 100.0 | 4,578.7 | 100.0 |
| TOTAL TAXA RICHNESS | 27 | | 17 | | 13 | | 9 | | 6 | | 21 | | 7 | | 4 | | 32 | |
| EPT TAXA RICHNESS | 4 | | 1 | | 1 | | 1 | | 0 | | 7 | | 0 | | 0 | | 4 | |

dominant taxa at half of the HD stations (Stations 17, 19, 20, and 23). The other stations (Stations 13, 22, 29 and 91) were dominated by the EPT taxon *Cheumatopsyche*. Oligochaeta and the midge *Polypedilum flavum* were nearly co-dominant with *Cheumatopsyche* in the HD sample at Station 13, while *Cheumatopsyche* was also well represented at Station 19. At Station 91 there were substantial numbers of Turbellaria and *Cheumatopsyche*. Total density varied greatly among the eight stations being lowest (447/m²) at Station 20, intermediate at Stations 17, 19, 23 and highest at downstream Stations 29 and 91 (6,419 to 10,100/m²). The noticeably higher densities at Stations 29 and 91 were primarily due to the elevated abundance of the filter-feeding caddisfly *Cheumatopsyche* at both stations.

Except for Station 29, Ponar taxa richness followed a similar trend as HD total richness (Table 3-58). Ponar total richness was highest at Stations 13 and 91, intermediate at Stations 17 and 22, and lowest at Stations 19, 20, 23, 29, and the CFAR station (Table 3-58). Zero or one EPT taxa were observed in the Ponar samples at six of the nine stations. EPT taxa richness was similar in the Ponar samples at Stations 13 and 91 (4 taxa each) while seven EPT taxa were found at Station 29. The dominant taxon at Station 13 was *Polypedilum flavum* with substantial numbers of the EPT taxon *Cheumatopsyche* also present. Oligochaeta dominated the Ponar samples at the remaining stations. In addition, the Asiatic clam *Corbicula fluminea* was relatively common at Stations 19 and 22. Ponar total density was highest at the CFAR Station and Station 19, intermediate at Stations 17, 20, 22, 23, and 91, and lowest at Station 29. With the exception of Station 13, the relative abundance of the tolerant taxa Oligochaeta appeared to drive the total densities of those stations.

A single specimen in the Ponar sample from Station 13 exhibited a head capsule deformity (Table 3-56). Given that deformities were absent in all the other samples examined, the percent incidence of deformity observed in these samples is likely insignificant.

Results of the Des Plaines River benthic macroinvertebrate sampling were mixed. Station 13 had some of the highest total richness in both the HD and Ponar samples and the highest EPT richness in the HD samples. In addition, the Station 13 Ponars had the lowest percentage of tolerant taxa among the stations. It appears that the benthic community at all the stations is affected by environmental perturbation in varying degrees of severity and/or types of disturbance. Overall, Station 13 was the best of the Des Plaines River stations and one of the best stations overall in 2004. On the other hand, Stations 20, 23, and CFAR are highly stressed. The others appear to be slightly to moderately stressed. Station 29 was interesting. It had a very poor benthic community as judged by the Ponar results (Table 3-58) but a good one as judged by the HD results (Table 3-57). This suggests that water quality is good at this location but the substrate is very poor.

3.3 Inter-Year Comparisons: 2003 vs. 2004

Of the 30 stations sampled in 2003 and 2004, 15 stations in 10 different waterways were sampled in both 2003 and 2004, as well as in 2001-2002. In an effort to analyze for trends and gauge variability within these systems, comparisons between the two years, 2003 and 2004, by sample type and station are summarized in the following sections. Differences between years could be the result of changes in flow conditions, changes in the amount and type of stressors, or natural variability. However, for the purposes of these studies, no attempt was made to ascertain a specific cause.

3.3.1 Calumet Watershed

The same three stations in the Calumet watershed were surveyed during 2003 and 2004: Station 55 in the Calumet River, Station 76 in the Little Calumet River, and Station 59 in the Cal-Sag (Tables 2-1 and 2-2).

3.3.1.1 Calumet River

The HD results from Station 55 can not be compared between years because a HD sample was not collected at Station 55 in 2004. However, the Ponar results at Station 55 were largely similar between the two years (Table 3-59). Total taxa richness and density were similar each year and no EPT taxa were found in the Ponar samples for either year.

Overall, 8 total taxa were collected in the 2003 Ponar samples from Station 55 compared to 10 total taxa in 2004 (Table 3-59). There were five taxa not common between the two years. However, these taxa accounted for less than three percent of their respective total samples in both years.

Chironomid head capsule deformities were not observed in either year. In terms of density, relative abundance and richness, tolerant taxa were relatively similar between 2003 and 2004 (Table 3-1).

3.3.1.2 Little Calumet River

Results from the HD sampling at Station 76 were not very comparable between the two years. (Table 3-60). Total taxa richness was higher in 2003 than in 2004. Two EPT taxa were collected in 2004 compared to one in 2003. The dominant taxa switched from very high numbers of *Hydra* and *Oligochaeta* in 2003 to high numbers of *Dreissena polymorpha*, *G. fasciatus*, and *Dicrotendipes simpsoni* in the 2004 HD samples. The extremely high abundance of zebra mussel in the 2004 HD sample resulted in the total density in 2004 being just over twice the total density of 2003 HD sample.

On the other hand, Ponar results from 2003 and 2004 were quite comparable (Table 3-61). Total taxa richness differed by only three taxa and EPT richness was zero both years. *Oligochaeta* was the dominant taxon in both years, and total density was similar between the two years as well. Chironomidae head capsule deformities were low in 2003 (Table 3-12) and absent in 2004.

3.3.1.3 Calumet-Sag Channel

In terms of taxa richness, the benthic community in the HD samples exhibited few changes between 2003 and 2004 (Table 3-62). Total taxa and EPT richness both increased by only one and two taxa, respectively from 2003 to 2004. Total density decreased by nearly 50 percent from 2003 to 2004 because of the decline in *Oligochaeta* density from 11,286/m² in 2003 to 588/m² in 2004. *Oligochaeta* dominated the 2003 HD sample, but zebra mussel was the dominant taxon in the 2004 HD sample.

TABLE 3-59. COMPARISON OF PETITE PONAR DENSITIES BETWEEN AUGUST 2003 AND SEPTEMBER 2004 FOR SAMPLING STATION 55 WITHIN THE CALUMET RIVER.

| TAXA | 55 130TH ST. | | | |
|----------------------------|-----------------|--------|---------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Oligochaeta | 1,284.6 | 91.79 | 1,449.7 | 87.83 |
| Gammarus fasciatus | 7.2 | 0.51 | 7.2 | 0.43 |
| Chironomidae | 7.2 | 0.51 | -- | -- |
| Procladius (Holotanypus) | 14.4 | 1.03 | 35.9 | 2.17 |
| Coelotanypus | 28.7 | 2.05 | 7.2 | 0.43 |
| Parakiefferiella | -- | -- | 7.2 | 0.43 |
| Chironomus | 7.2 | 0.51 | 35.9 | 2.17 |
| Cryptochironomus | 7.2 | 0.51 | 64.6 | 3.91 |
| Dicrotendipes simpsoni | -- | -- | 7.2 | 0.43 |
| Microchironomus | 7.2 | 0.51 | -- | -- |
| Polypedilum halterale grp. | -- | -- | 21.5 | 1.30 |
| Polypedilum scalaenum grp. | 35.9 | 2.56 | -- | -- |
| Dreissena polymorpha | -- | -- | 14.4 | 0.87 |
| TOTAL BENTHOS | 1,399.4 | 100.00 | 1,650.6 | 100.00 |
| TOTAL TAXA RICHNESS | 8 | | 10 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

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TABLE 3-60. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY-SEPTEMBER 2003 AND SEPTEMBER 2004 FOR SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER.

| TAXA | 76 HALSTED ST. | | | |
|----------------------------|-------------------|--------|----------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Hydra | 3,948.7 | 40.73 | -- | -- |
| Turbellaria | 9.0 | 0.09 | 17.9 | 0.09 |
| Plumatella | 1.8 | 0.02 | -- | -- |
| Oligochaeta | 4,029.4 | 41.56 | 610.0 | 3.12 |
| Mooreobdella microstoma | 17.9 | 0.19 | -- | -- |
| Caecidotea | 9.0 | 0.09 | -- | -- |
| Hyalella azteca | -- | -- | 287.0 | 1.47 |
| Gammarus fasciatus | 193.8 | 2.00 | 2,081.1 | 10.64 |
| Cyrenellus fraternus | -- | -- | 89.7 | 0.46 |
| Cheumatopsyche | 1.8 | 0.02 | -- | -- |
| Hydroptila | -- | -- | 17.9 | 0.09 |
| Chironomidae | 48.4 | 0.50 | -- | -- |
| Ablabesmyia | -- | -- | 17.9 | 0.09 |
| Cricotopus bicinctus grp. | 68.2 | 0.70 | 161.5 | 0.83 |
| Cricotopus sylvestris grp. | 179.4 | 1.85 | -- | -- |
| Nanocladius distinctus | 161.5 | 1.67 | 17.9 | 0.09 |
| Chironomus | 26.9 | 0.28 | -- | -- |
| Dicrotendipes simpsoni | 733.8 | 7.57 | 2,045.2 | 10.46 |
| Glyptotendipes | 43.1 | 0.44 | -- | -- |
| Parachironomus | 25.1 | 0.26 | -- | -- |
| Polypedilum illinoense | 9.0 | 0.09 | -- | -- |
| Polypedilum scalaenum grp. | 9.0 | 0.09 | -- | -- |
| Stenochironomus | -- | -- | 89.7 | 0.46 |
| Paratanytarsus | 25.1 | 0.26 | -- | -- |
| Xenochironomus xenolabis | -- | -- | 35.9 | 0.18 |
| Amnicola | 9.0 | 0.09 | -- | -- |
| Physa | 145.3 | 1.50 | -- | -- |
| Menetus dilatatus | -- | -- | 17.9 | 0.09 |
| Ferrissia | -- | -- | 179.4 | 0.92 |
| Dreissena polymorpha | -- | -- | 13,885.9 | 71.01 |
| TOTAL BENTHOS | 9,695.0 | 100.00 | 19,555.1 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | | 15 | |
| EPT TAXA RICHNESS | 1 | | 2 | |

TABLE 3-61. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY-SEPTEMBER 2003 AND SEPTEMBER 2004 FOR SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER.

| TAXA | 76 HALSTED ST. | | | |
|----------------------------|-------------------|--------|----------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Oligochaeta | 26,158.8 | 95.95 | 24,989.0 | 98.03 |
| Mooreobdella microstoma | --- | --- | 7.2 | 0.03 |
| Caecidotea | 7.2 | 0.03 | --- | --- |
| Hyalella azteca | --- | --- | 7.2 | 0.03 |
| Gammarus | 122.0 | 0.45 | --- | --- |
| Gammarus fasciatus | --- | --- | 64.6 | 0.25 |
| Chironomidae | 28.7 | 0.11 | --- | --- |
| Procladius (Holotanypus) | 71.8 | 0.26 | 165.1 | 0.65 |
| Ablabesmyia mallochii | 7.2 | 0.03 | --- | --- |
| Cricotopus bicinctus grp. | 100.5 | 0.37 | 7.2 | 0.03 |
| Cricotopus sylvestris grp. | 315.8 | 1.16 | --- | --- |
| Chironomus | 57.4 | 0.21 | 14.4 | 0.06 |
| Cryptochironomus | 71.8 | 0.26 | 150.7 | 0.59 |
| Dicrotendipes simpsoni | 7.2 | 0.03 | 7.2 | 0.03 |
| Parachironomus | 50.2 | 0.18 | --- | --- |
| Paratanytarsus | 28.7 | 0.11 | --- | --- |
| Ammicola | 71.8 | 0.26 | --- | --- |
| Ferrissia | --- | --- | 7.2 | 0.03 |
| Corbicula fluminea | 93.3 | 0.34 | 64.6 | 0.25 |
| Dreissena polymorpha | 71.8 | 0.26 | 7.2 | 0.03 |
| TOTAL BENTHOS | 27,264.0 | 100.00 | 25,491.4 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | | 12 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

TABLE 3-62. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY-SEPTEMBER 2003 AND AUGUST 2004 FOR SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL.

| TAXA | 59 CICERO AVE. | | | |
|----------------------------|-------------------|--------|------------------|--------|
| | 2003 | | 2004 | |
| | #/m ² | % | #/m ² | % |
| Hydra | 520.3 | 3.33 | 479.0 | 5.88 |
| Turbellaria | 1.8 | 0.01 | 1.8 | 0.02 |
| Oligochaeta | 11,286.3 | 72.31 | 588.4 | 7.23 |
| Caecidotea | 96.9 | 0.62 | 19.7 | 0.24 |
| Hyalella azteca | -- | -- | 17.9 | 0.22 |
| Gammarus | 200.9 | 1.29 | -- | -- |
| Gammarus fasciatus | -- | -- | 152.5 | 1.87 |
| Cyrenellus fraternus | -- | -- | 28.7 | 0.35 |
| Hydroptila | -- | -- | 9.0 | 0.11 |
| Chironomidae | 93.3 | 0.60 | -- | -- |
| Procladius (Holotanypus) | 17.9 | 0.11 | 17.9 | 0.22 |
| Cricotopus tremulus grp. | -- | -- | 44.9 | 0.55 |
| Cricotopus bicinctus grp. | 154.3 | 0.99 | -- | -- |
| Cricotopus sylvestris grp. | 470.0 | 3.01 | 337.3 | 4.14 |
| Nanocladius distinctus | 346.3 | 2.22 | 213.5 | 2.62 |
| Rheocricotopus robacki | 17.9 | 0.11 | -- | -- |
| Chironomus | 10.8 | 0.07 | -- | -- |
| Dicrotendipes neomodestus | 10.8 | 0.07 | -- | -- |
| Dicrotendipes simpsoni | 2,025.5 | 12.98 | 2,145.7 | 26.35 |
| Glyptotendipes | 10.8 | 0.07 | -- | -- |
| Polypedilum illinoense | 272.7 | 1.75 | 118.4 | 1.45 |
| Paratanytarsus | 17.9 | 0.11 | 5.4 | 0.07 |
| Physa | 17.9 | 0.11 | -- | -- |
| Gyraulus | -- | -- | 1.8 | 0.02 |
| Ferrissia | -- | -- | 68.2 | 0.84 |
| Corbicula fluminea | 35.9 | 0.23 | 26.9 | 0.33 |
| Dreissena polymorpha | -- | -- | 3,866.2 | 47.48 |
| TOTAL BENTHOS | 15,608.2 | 100.00 | 8,143.2 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | | 19 | |
| EPT TAXA RICHNESS | 0 | | 2 | |

TABLE 3-63. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY-SEPTEMBER 2003 AND AUGUST 2004 FOR SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL.

| TAXA | 59 CICERO AVE. | | | |
|----------------------------|-------------------|--------|------------------|--------|
| | 2003 | | 2004 | |
| | #/m ² | % | #/m ² | % |
| Oligochaeta | 4,219.9 | 91.59 | 1,672.2 | 73.50 |
| Hyalella azteca | -- | -- | 35.9 | 1.58 |
| Gammarus fasciatus | -- | -- | 64.6 | 2.84 |
| Procladius (Holotanypus) | 344.5 | 7.48 | 416.2 | 18.30 |
| Cricotopus bicinctus grp. | -- | -- | 14.4 | 0.63 |
| Cricotopus sylvestris grp. | -- | -- | 7.2 | 0.32 |
| Cryptochironomus | -- | -- | 7.2 | 0.32 |
| Dicrotendipes simpsoni | 7.2 | 0.16 | -- | -- |
| Polypedilum illinoense | 14.4 | 0.31 | 7.2 | 0.32 |
| Corbicula fluminea | 21.5 | 0.47 | 35.9 | 1.58 |
| Dreissena polymorpha | -- | -- | 14.4 | 0.63 |
| TOTAL BENTHOS | 4,607.4 | 100.00 | 2,275.0 | 100.00 |
| TOTAL TAXA RICHNESS | 5 | | 10 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

Ponar results were somewhat different between the years. Total taxa doubled but EPT richness was zero both years (Table 3-63). Oligochaeta was the dominant taxon both years. However, substantially lower numbers of Oligochaeta in 2004 resulted in a decrease of nearly one-half in total density between years. Chironomidae deformities were observed in both the HD and Ponar samples collected during 2003 but were not observed in either sample type during 2004 (Table 3-15). Nonetheless, these differences do not appear to have changed the overall quality of the benthic community at Station 59.

3.3.2 North Branch Chicago River Watershed

Of the 4 stations sampled in the NBCR Watershed during 2003 and 2004, three were sampled both years: Station 36 in the NSC and Stations 96 and 46 in the NBCR (Tables 2-1 and 2-2).

3.3.2.1 North Shore Channel

HD results from Station 36 were considerably different in 2003 and 2004 (Table 3-64). Total taxa richness was much higher in 2004 with 20 taxa compared to 10 taxa in 2003. The most notable additions to the 2004 taxa list were the three EPT taxa *Baetis*, *Cheumatopsyche*, and *Hydroptila*, whereas no EPT taxa were found during the 2003 sampling period. In addition, dominance and total density differed noticeably between the two years. In 2003, the benthic community in the HD samples was dominated by the tolerant taxon Oligochaeta and Turbellaria. Between 2003 and 2004, the density of Oligochaeta more than doubled and densities of the tolerant midges *D. simpsoni* and *Glyptotendipes* increased by several orders of magnitude over the same period.

The results from the Ponar sampling were generally more similar between years than the HD samples in terms of total taxa richness and dominant taxa (Table 3-65). Total and EPT richness varied little between 2003 and 2004. Although Oligochaeta experienced an over five-fold decrease in density between 2003 and 2004, it remained the dominant taxon in 2004.

Overall, the benthic macroinvertebrate community was represented by 11 total taxa and no EPT taxa in 2003 compared to 24 total taxa and three EPT taxa in 2004 (Tables 3-65 and 3-66). Chironomid head capsule deformities were observed in 2003 at Station 36 (Table 3-18) but not in 2004. Oligochaeta density increased substantially in the HD samples between 2003 and 2004, but decreased considerably between years in the Ponar samples. Despite these differences in total richness between the years, tolerant organisms represented over half the total richness observed in each year.

3.3.2.2 North Branch of the Chicago River

The HD results from Station 46 were quite similar between the two study years (Table 3-66). At Station 96, density, total richness, and EPT richness were similar between the years. *Caecidotea*, which was clearly the dominant taxon at Station 96 in 2003, was co-dominant with *Cheumatopsyche* in 2004 (Table 3-66).

TABLE 3-64. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2003 AND SEPTEMBER 2004 FOR SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL.

| TAXA | 36 TOUHY AVE. | | | |
|----------------------------|------------------|--------|----------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 2,762.8 | 5.62 |
| Turbellaria | 6,745.6 | 37.79 | 2,852.5 | 5.81 |
| Oligochaeta | 8,575.5 | 48.04 | 22,999.6 | 46.82 |
| Helobdella papillata | -- | -- | 53.8 | 0.11 |
| Ostracoda | -- | -- | 484.4 | 0.99 |
| Caecidotea | 80.7 | 0.45 | 17.9 | 0.04 |
| Gammarus | 959.8 | 5.38 | -- | -- |
| Gammarus fasciatus | -- | -- | 5,453.9 | 11.10 |
| Baetis | -- | -- | 17.9 | 0.04 |
| Enallagma | -- | -- | 17.9 | 0.04 |
| Cheumatopsyche | -- | -- | 53.8 | 0.11 |
| Hydroptila | -- | -- | 17.9 | 0.04 |
| Chironomidae | 44.9 | 0.25 | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | 125.6 | 0.26 |
| Cricotopus sylvestris grp. | 71.8 | 0.40 | -- | -- |
| Nanocladius distinctus | 26.9 | 0.15 | 897.0 | 1.83 |
| Chironomus | 9.0 | 0.05 | 71.8 | 0.15 |
| Dicrotendipes simpsoni | 915.0 | 5.13 | 10,244.0 | 20.85 |
| Glyptotendipes | 358.8 | 2.01 | 2,709.0 | 5.51 |
| Parachironomus | 62.8 | 0.35 | 143.5 | 0.29 |
| Gyraulus | -- | -- | 17.9 | 0.04 |
| Ferrissia | -- | -- | 107.6 | 0.22 |
| Dreissena polymorpha | -- | -- | 71.8 | 0.15 |
| TOTAL BENTHOS | 17,850.7 | 100.00 | 49,120.9 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | | 20 | |
| EPT TAXA RICHNESS | 0 | | 3 | |

TABLE 3-65. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY 2003 AND SEPTEMBER 2004 FOR SAMPLING STATION 36 WITHIN THE NORTH SHORE CHANNEL.

| TAXA | 36 TOUHY AVE. | | | |
|----------------------------|------------------|--------|---------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 7.2 | 0.10 |
| Turbellaria | 2,892.2 | 8.09 | 624.4 | 8.27 |
| Oligochaeta | 31,799.7 | 88.98 | 5,884.8 | 77.95 |
| Helobdella triserialis | 21.5 | 0.06 | -- | -- |
| Ostracoda | -- | -- | 7.2 | 0.10 |
| Caecidotea | 14.4 | 0.04 | 14.4 | 0.19 |
| Gammarus | 7.2 | 0.02 | -- | -- |
| Gammarus fasciatus | -- | -- | 21.5 | 0.29 |
| Procladius (Holotanypus) | -- | -- | 7.2 | 0.10 |
| Cricotopus bicinctus grp. | 7.2 | 0.02 | 7.2 | 0.10 |
| Cricotopus sylvestris grp. | 172.2 | 0.48 | -- | -- |
| Nanocladius distinctus | 28.7 | 0.08 | 21.5 | 0.29 |
| Chironomus | 215.3 | 0.60 | 28.7 | 0.38 |
| Cryptochironomus | -- | -- | 7.2 | 0.10 |
| Dicrotendipes neomodestus | -- | -- | 14.4 | 0.19 |
| Dicrotendipes simpsoni | 258.4 | 0.72 | 480.8 | 6.37 |
| Glyptotendipes | 93.3 | 0.26 | 322.9 | 4.28 |
| Parachironomus | 143.5 | 0.40 | 86.1 | 1.14 |
| Polypedilum scalaenum grp. | 71.8 | 0.20 | -- | -- |
| Helisoma | 14.4 | 0.04 | -- | -- |
| Ferrissia | -- | -- | 14.4 | 0.19 |
| TOTAL BENTHOS | 35,739.6 | 100.00 | 7,549.8 | 100.00 |
| TOTAL TAXA RICHNESS | 14 | | 16 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

TABLE 3-66. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY-AUGUST 2003 AND JUNE-AUGUST 2004 FOR SAMPLING STATIONS WITHIN THE NORTH BRANCH CHICAGO RIVER.

| TAXA | 96 ALBANY AVE. | | | | 46 GRAND AVE. | | | |
|--------------------------------------|-------------------|--------|---------|--------|------------------|--------|---------|--------|
| | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 14.4 | 0.35 | 39.5 | 1.23 | -- | -- | 3.6 | 0.09 |
| Turbellaria | 236.8 | 5.74 | 279.9 | 8.69 | 2,179.8 | 9.49 | 1,002.9 | 23.95 |
| Plumatella | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 |
| Oligochaeta | 172.2 | 4.17 | 220.7 | 6.85 | 18,864.4 | 82.15 | 2,386.1 | 56.98 |
| Helobdella triserialis | 70.0 | 1.69 | -- | -- | 26.9 | 0.12 | -- | -- |
| Erpobdella punctata punctata | 3.6 | 0.09 | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | -- | -- | 9.0 | 0.04 | -- | -- |
| Ostracoda | -- | -- | 16.1 | 0.50 | -- | -- | -- | -- |
| Caecidotea | 3,150.3 | 76.31 | 696.1 | 21.62 | 116.6 | 0.51 | -- | -- |
| Hyalella azteca | -- | -- | -- | -- | -- | -- | 9.0 | 0.21 |
| Gammarus fasciatus | -- | -- | 26.9 | 0.84 | 17.9 | 0.08 | -- | -- |
| Hydracarina | -- | -- | 5.4 | 0.17 | -- | -- | -- | -- |
| Baetis intercalaris | 5.4 | 0.13 | 104.1 | 3.23 | -- | -- | -- | -- |
| Stenacron | 10.8 | 0.26 | 195.6 | 6.07 | -- | -- | -- | -- |
| Tricorythodes | -- | -- | 3.6 | 0.11 | -- | -- | -- | -- |
| Coenagrionidae | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- |
| Argia | 1.8 | 0.04 | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 12.6 | 0.30 | 751.7 | 23.34 | -- | -- | -- | -- |
| Hydropsyche betteni | 9.0 | 0.22 | 170.4 | 5.29 | -- | -- | -- | -- |
| Ceraclea | 1.8 | 0.04 | -- | -- | -- | -- | -- | -- |
| Stenelmis crenata grp. | -- | -- | 3.6 | 0.11 | -- | -- | -- | -- |
| Chironomidae | 1.8 | 0.04 | -- | -- | -- | -- | -- | -- |
| Thienemannimyia grp. | 14.4 | 0.35 | 5.4 | 0.17 | 35.9 | 0.16 | -- | -- |
| Corynoneura | 14.4 | 0.35 | 26.9 | 0.84 | -- | -- | -- | -- |
| Thienemanniella xena | -- | -- | 23.3 | 0.72 | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | 10.8 | 0.26 | -- | -- | -- | -- | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 9.0 | 0.04 | -- | -- |
| Nanocladius distinctus | 10.8 | 0.26 | 17.9 | 0.56 | 278.1 | 1.21 | 7.2 | 0.17 |
| Nanocladius crassicornus/rectinervis | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- |
| Rheocricotopus robacki | -- | -- | 292.4 | 9.08 | -- | -- | -- | -- |
| Chironomus | 3.6 | 0.09 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes | 12.6 | 0.30 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 1.8 | 0.04 | -- | -- | 1,381.4 | 6.02 | 751.7 | 17.95 |
| Glyptotendipes | 1.8 | 0.04 | -- | -- | 17.9 | 0.08 | 7.2 | 0.17 |
| Parachironomus | -- | -- | -- | -- | 17.9 | 0.08 | -- | -- |
| Phaenopsectra punctipes | 1.8 | 0.04 | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | -- | -- | 209.9 | 6.52 | -- | -- | -- | -- |
| Polypedilum illinoense | 37.7 | 0.91 | 5.4 | 0.17 | 9.0 | 0.04 | -- | -- |
| Polypedilum scalaenum grp. | 17.9 | 0.43 | 28.7 | 0.89 | -- | -- | 14.4 | 0.34 |
| Paratanytarsus | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- |
| Tanytarsus | 5.4 | 0.13 | -- | -- | -- | -- | -- | -- |
| Xenochironomus xenolabis | 55.6 | 1.35 | -- | -- | -- | -- | -- | -- |
| Amhicola | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- |
| Phylla | 12.6 | 0.30 | -- | -- | -- | -- | -- | -- |
| Helisoma | 7.2 | 0.17 | -- | -- | -- | -- | -- | -- |
| Ferrissia | 213.5 | 5.17 | 78.9 | 2.45 | -- | -- | 3.6 | 0.09 |
| Musculium | 1.8 | 0.04 | 7.2 | 0.22 | -- | -- | -- | -- |
| Dreissena polymorpha | -- | -- | 7.2 | 0.22 | -- | -- | -- | -- |
| TOTAL BENTHOS | 4,128.1 | 100.00 | 3,220.3 | 100.00 | 22,963.8 | 100.00 | 4,187.3 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | | 26 | | 13 | | 10 | |
| EPT TAXA RICHNESS | 5 | | 5 | | 0 | | 0 | |

The 2003 and 2004 Ponar richness results at Station 46 were very similar and although its density changed, Oligochaetes dominated at this Station both years (Table 3-67). At Station 96, both density and total taxa richness increased by roughly 50 percent from 2003 to 2004. Taxonomically, the main changes from 2003 to 2004 at this station were an 8-fold density decline in *Caecidotea* and a large increase in *D. simpsoni*.

Chironomid head capsule deformities only were observed at the Station 46 HD samples in 2003 (Table 3-18).

Based on the combined results of the HD and Ponar samples, richness was relatively similar at Station 96 with 35 total taxa in 2003 and 37 total taxa in 2004 with five EPT taxa at both stations for both years. (Tables 3-66 and 3-67). Similarly, total taxa richness at Station 46 was also relatively similar with 14 taxa in 2003 to 13 taxa in 2004 and no EPT taxa in either year.

3.3.3 South Branch Chicago River and Chicago Sanitary and Ship Canal Watershed

Three stations were sampled in the SBCR and CSSC watershed in 2003 and 2004: Stations 75, 41, and 92 in the CSSC (Tables 2-1 and 2-2).

The HD sampling at the three CSSC stations exhibited some differences between 2003 and 2004. However, few consistent trends were evident among all three stations. Total taxa richness showed a modest increase at Station 75 (Table 3-68). However, at Stations 41 and 92, total taxa richness was relatively similar between the two years. In addition, EPT taxa richness increased from 0 to 4 at both Stations 75 and 92. Density was similar both years at Stations 41 and 92. At Station 75, there was a 3-fold decline due to a large decrease in Oligochaeta.

Similar to the other watersheds, the Ponar data collected from the three CSSC stations in 2003 and 2004 exhibited a lesser degree of variability compared to the HD data (Table 3-69). Total richness was relatively similar between years at Stations 75 and 41 but more than doubled at Station 92. The only EPT taxon collected in the Ponars among the three stations was observed at Station 75 in 2004. Densities at each station changed considerably between the years, but these were due exclusively to changes in Oligochaeta densities. Low incidence of Chironomidae head capsule deformities were observed in the samples at all three stations in 2003 but were not observed in 2004 (Tables 3-23).

3.3.4 Des Plaines River Watershed

Six stations in the Des Plaines River watershed were sampled during both 2003 and 2004: Station 78 in Higgins Creek, Station 18 in Salt Creek, Station 64 in the West Branch of the DuPage River, and Stations 13, 22, and 91 in the Des Plaines River (Tables 2-1 and 2-2).

3.3.4.1 West Branch of the DuPage River

The HD results from Station 64 were generally similar between years (Table 3-70). Total richness and EPT richness were slightly higher in 2004. EPT density increased in 2004 due to the higher abundance of all EPT taxa, particularly *Cheumatopsyche*. Also, the density of several tolerant taxa decreased in 2004. This was most evident in Oligochaeta whose density declined by nearly 10-fold from 2003 to 2004.

TABLE 3-67. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY-AUGUST 2003 AND JUNE-AUGUST 2004 FOR SAMPLING STATIONS WITHIN THE NORTH BRANCH CHICAGO RIVER.

| TAXA | 96 ALBANY AVE. | | | | 46 GRAND AVE. | | | |
|--------------------------------------|-------------------|--------|----------|--------|------------------|--------|---------|--------|
| | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 21.5 | 0.06 | -- | -- | -- | -- |
| Turbellaria | 1,076.5 | 4.97 | 1,937.7 | 5.77 | -- | -- | 7.2 | 0.22 |
| Plumatella | -- | -- | 7.2 | 0.02 | -- | -- | -- | -- |
| Oligochaeta | 947.3 | 4.38 | 6,387.2 | 19.03 | 23,223.6 | 99.81 | 3,150.5 | 98.43 |
| Helobdella stagnalis | 100.5 | 0.46 | 114.8 | 0.34 | -- | -- | -- | -- |
| Erpobdella punctata punctata | 416.2 | 1.92 | 430.6 | 1.28 | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | 430.6 | 1.28 | 7.2 | 0.03 | -- | -- |
| Caecidotea | 8,942.1 | 41.31 | 1,040.6 | 3.10 | -- | -- | 7.2 | 0.22 |
| Gammarus | 43.1 | 0.20 | -- | -- | -- | -- | -- | -- |
| Gammarus fasciatus | -- | -- | 57.4 | 0.17 | -- | -- | -- | -- |
| Coenagrionidae | 14.4 | 0.07 | -- | -- | -- | -- | -- | -- |
| Hydropsychidae | -- | -- | 7.2 | 0.02 | -- | -- | -- | -- |
| Cheumatopsyche | 14.4 | 0.07 | -- | -- | -- | -- | -- | -- |
| Stenelmis | 28.7 | 0.13 | -- | -- | -- | -- | -- | -- |
| Procladius (Holotanypus) | -- | -- | -- | -- | 7.2 | 0.03 | 28.7 | 0.90 |
| Thienemannimyia grp. | 43.1 | 0.20 | 71.8 | 0.21 | 7.2 | 0.03 | -- | -- |
| Corynoneura lobata | -- | -- | 1,255.9 | 3.74 | -- | -- | -- | -- |
| Thienemanniella xena | -- | -- | 179.4 | 0.53 | -- | -- | -- | -- |
| Nanocladius distinctus | -- | -- | 366.0 | 1.09 | -- | -- | -- | -- |
| Nanocladius crassicornus/rectinervis | -- | -- | 107.6 | 0.32 | -- | -- | -- | -- |
| Dicrotendipes | 14.4 | 0.07 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 1,543.0 | 4.60 | 21.5 | 0.09 | -- | -- |
| Glyptotendipes | -- | -- | 50.2 | 0.15 | -- | -- | -- | -- |
| Polypedilum flavum | -- | -- | 35.9 | 0.11 | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | 968.8 | 2.89 | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | 86.1 | 0.40 | 574.1 | 1.71 | -- | -- | -- | -- |
| Paratanytarsus | -- | -- | 35.9 | 0.11 | -- | -- | -- | -- |
| Tanytarsus | 14.4 | 0.07 | -- | -- | -- | -- | -- | -- |
| Xenochironomus xenolabis | 28.7 | 0.13 | -- | -- | -- | -- | -- | -- |
| Valvata | -- | -- | 35.9 | 0.11 | -- | -- | -- | -- |
| Amnicola | 14.4 | 0.07 | 35.9 | 0.11 | -- | -- | -- | -- |
| Physa | 114.8 | 0.53 | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | 50.2 | 0.15 | -- | -- | -- | -- |
| Ferrissia | -- | -- | 7.2 | 0.02 | -- | -- | -- | -- |
| Corbicula fluminea | -- | -- | 7.2 | 0.02 | -- | -- | -- | -- |
| Musculium | 6,703.0 | 30.97 | -- | -- | -- | -- | -- | -- |
| Musculium transversum | -- | -- | 9,616.7 | 28.66 | -- | -- | -- | -- |
| Pisidium | 3,042.9 | 14.06 | 8,145.5 | 24.27 | -- | -- | 7.2 | 0.22 |
| Dreissena polymorpha | -- | -- | 35.9 | 0.11 | -- | -- | -- | -- |
| TOTAL BENTHOS | 21,644.7 | 100.00 | 33,557.9 | 100.00 | 23,266.6 | 100.00 | 3,200.8 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | | 29 | | 5 | | 4 | |
| EPT TAXA RICHNESS | 1 | | 1 | | 0 | | 0 | |

TABLE 3-68. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2003 AND AUGUST 2004 FOR SAMPLING STATIONS WITHIN THE CHICAGO SANITARY AND SHIP CANAL.

| TAXA | 75 CICERO AVE. | | | | 41 HARLEM AVE. | | | | 92 LOCKPORT | | | |
|----------------------------|-------------------|--------|---------|--------|-------------------|--------|----------|--------|----------------|--------|---------|--------|
| | 2003 | | 2004 | | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 17.9 | 0.06 | 14.4 | 0.20 | 17.9 | 0.06 | 430.6 | 1.47 | 367.8 | 5.84 | 224.3 | 5.26 |
| Turbellaria | 2,368.1 | 8.12 | 2,902.8 | 41.21 | 627.9 | 2.26 | 1,596.7 | 5.46 | 1,123.1 | 17.82 | 622.5 | 14.59 |
| Urnatella gracilis | -- | -- | 28.7 | 0.41 | -- | -- | 35.9 | 0.12 | -- | -- | -- | -- |
| Plumatella | -- | -- | -- | -- | -- | -- | 125.6 | 0.43 | -- | -- | 5.4 | 0.13 |
| Oligochaeta | 25,314.0 | 86.83 | 3,541.4 | 50.28 | 24,865.4 | 89.65 | 23,493.0 | 80.31 | 2,335.8 | 37.07 | 554.4 | 12.99 |
| Helobdella papillata | -- | -- | 17.9 | 0.25 | -- | -- | -- | -- | -- | -- | 48.4 | 1.14 |
| Helobdella stagnalis | -- | -- | -- | -- | 17.9 | 0.06 | -- | -- | 41.3 | 0.65 | -- | -- |
| Helobdella triserialis | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | 0.09 | -- | -- |
| Placobdella pediculata | -- | -- | 3.6 | 0.05 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.03 | -- | -- |
| Caecidotea | -- | -- | -- | -- | 35.9 | 0.13 | 233.2 | 0.80 | 10.8 | 0.17 | -- | -- |
| Gammarus | -- | -- | -- | -- | 197.3 | 0.71 | -- | -- | -- | -- | -- | -- |
| Gammarus fasciatus | 125.6 | 0.43 | 10.8 | 0.15 | -- | -- | 188.4 | 0.64 | 1,458.6 | 23.15 | 583.1 | 13.67 |
| Baetis intercalaris | -- | -- | 28.7 | 0.41 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenacron | -- | -- | 3.6 | 0.05 | -- | -- | -- | -- | -- | -- | 3.6 | 0.08 |
| Stenonema integrum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 0.08 |
| Argia | -- | -- | -- | -- | -- | -- | 17.9 | 0.06 | -- | -- | -- | -- |
| Cyrnellus fraternus | -- | -- | 3.6 | 0.05 | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 |
| Cheumatopsyche | -- | -- | 17.9 | 0.25 | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 |
| Berosus | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.03 | -- | -- |
| Chironomidae | 17.9 | 0.06 | -- | -- | 161.5 | 0.58 | -- | -- | 9.0 | 0.14 | -- | -- |
| Procladius (Holotanypus) | 17.9 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Ablabesmyia janta | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.17 |
| Ablabesmyia mallochii | 17.9 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus | -- | -- | 3.6 | 0.05 | -- | -- | -- | -- | -- | -- | 3.6 | 0.08 |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 0.06 | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 53.8 | 0.19 | 17.9 | 0.06 | 64.6 | 1.03 | -- | -- |
| Nanocladius distinctus | 89.7 | 0.31 | 43.1 | 0.61 | 538.2 | 1.94 | 269.1 | 0.92 | 192.0 | 3.05 | 254.8 | 5.97 |
| Chironomus | -- | -- | 3.6 | 0.05 | 71.8 | 0.26 | -- | -- | -- | -- | -- | -- |
| Dicretendipes simpsoni | 1,148.2 | 3.94 | 380.3 | 5.40 | 1,076.4 | 3.88 | 1,300.7 | 4.45 | 584.9 | 9.28 | 870.1 | 20.40 |
| Glyptotendipes | -- | -- | -- | -- | 53.8 | 0.19 | 9.0 | 0.03 | 21.5 | 0.34 | -- | -- |
| Parachironomus | 35.9 | 0.12 | -- | -- | -- | -- | 9.0 | 0.03 | -- | -- | -- | -- |
| Polypedilum flavum | -- | -- | -- | -- | -- | -- | 9.0 | 0.03 | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | 0.14 | -- | -- |
| Polypedilum scalaenum grp. | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | 0.09 | -- | -- |
| Stenochironomus | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | 0.09 | -- | -- |
| Xenochironomus xenolabis | -- | -- | -- | -- | -- | -- | -- | -- | 35.9 | 0.57 | 26.9 | 0.63 |
| Physa | -- | -- | -- | -- | 17.9 | 0.06 | -- | -- | -- | -- | 7.2 | 0.17 |
| Menetus dilatatus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | 0.13 |
| Ferrissia | -- | -- | 21.5 | 0.31 | -- | -- | 26.9 | 0.09 | 9.0 | 0.14 | 965.2 | 22.62 |
| Corbicula fluminea | -- | -- | 17.9 | 0.25 | -- | -- | -- | -- | 14.4 | 0.23 | 5.4 | 0.13 |
| Musculium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | 0.13 |
| Dreissena polymorpha | -- | -- | -- | -- | -- | -- | 1,489.1 | 5.09 | -- | -- | 66.4 | 1.56 |
| TOTAL BENTHOS | 29,153.2 | 100.00 | 7,043.4 | 100.00 | 27,735.9 | 100.00 | 29,251.9 | 100.00 | 6,300.7 | 100.00 | 4,266.2 | 100.00 |
| TOTAL TAXA RICHNESS | 9 | | 17 | | 12 | | 16 | | 20 | | 21 | |
| EPT TAXA RICHNESS | 0 | | 4 | | 0 | | 0 | | 0 | | 4 | |

TABLE 3-69. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY 2003 AND AUGUST 2004 FOR SAMPLING STATIONS WITHIN THE CHICAGO SANITARY AND SHIP CANAL.

| TAXA | 75 CICERO AVE. | | | | 41 HARLEM AVE. | | | | 92 LOCKPORT | | | |
|------------------------------|-------------------|--------|-------|--------|-------------------|--------|---------|--------|----------------|--------|----------|--------|
| | 2003 | | 2004 | | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | 21.5 | 3.26 | -- | -- | -- | -- | 222.5 | 17.03 | -- | -- | 71.8 | 0.15 |
| Plumatella | -- | -- | -- | -- | -- | -- | 43.1 | 3.30 | -- | -- | -- | -- |
| Oligochaeta | 588.5 | 89.13 | 236.8 | 89.19 | 24,594.3 | 98.14 | 976.0 | 74.73 | 112,027.3 | 98.49 | 45,212.8 | 95.21 |
| Helobdella triserialis | 7.2 | 1.09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Erpobdella punctata punctata | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 143.5 | 0.30 |
| Gammarus fasciatus | -- | -- | -- | -- | -- | -- | 21.5 | 1.65 | 287.1 | 0.25 | 933.0 | 1.96 |
| Tricorythodes | -- | -- | 7.2 | 2.70 | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomidae | -- | -- | -- | -- | -- | -- | -- | -- | 71.8 | 0.06 | -- | -- |
| Tanypus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 71.8 | 0.15 |
| Procladius (Holotanypus) | 7.2 | 1.09 | -- | -- | 71.8 | 0.29 | -- | -- | 1,291.8 | 1.14 | 538.2 | 1.13 |
| Cricotopus sylvestris grp. | 7.2 | 1.09 | -- | -- | 7.2 | 0.03 | -- | -- | -- | -- | -- | -- |
| Chironomus | -- | -- | -- | -- | 387.5 | 1.55 | -- | -- | -- | -- | -- | -- |
| Cryptochironomus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 179.4 | 0.38 |
| Dicrotendipes simpsoni | -- | -- | 14.4 | 5.41 | -- | -- | 43.1 | 3.30 | -- | -- | 71.8 | 0.15 |
| Pericoma | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.03 |
| Tipulidae | 7.2 | 1.09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 215.3 | 0.45 |
| Corbicula fluminea | 21.5 | 3.26 | 7.2 | 2.70 | -- | -- | -- | -- | 71.8 | 0.06 | 35.9 | 0.08 |
| TOTAL BENTHOS | 660.3 | 100.00 | 265.5 | 100.00 | 25,060.8 | 100.00 | 1,306.1 | 100.00 | 113,749.7 | 100.00 | 47,487.8 | 100.00 |
| TOTAL TAXA RICHNESS | 7 | | 4 | | 4 | | 5 | | 4 | | 11 | |
| EPT TAXA RICHNESS | 0 | | 1 | | 0 | | 0 | | 0 | | 0 | |

TABLE 3-70. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JULY 2003 AND JULY 2004 FOR SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER.

| TAXA | 64 LAKE ST. | | | |
|------------------------------|----------------|--------|---------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Hydra | 35.9 | 0.12 | 5.4 | 0.06 |
| Turbellaria | -- | -- | 224.3 | 2.37 |
| Oligochaeta | 22,461.4 | 72.16 | 2,705.4 | 28.55 |
| Erpobdella punctata punctata | -- | -- | 5.4 | 0.06 |
| Ostracoda | -- | -- | 5.4 | 0.06 |
| Caecidotea | 107.6 | 0.35 | 968.8 | 10.22 |
| Stenacron | -- | -- | 17.9 | 0.19 |
| Coenagrionidae | -- | -- | 5.4 | 0.06 |
| Argia | 35.9 | 0.12 | -- | -- |
| Cheumatopsyche | 197.3 | 0.63 | 1,304.3 | 13.76 |
| Hydropsyche | -- | -- | 35.9 | 0.38 |
| Chironomidae | 233.2 | 0.75 | -- | -- |
| Procladius (Holotanypus) | -- | -- | 30.5 | 0.32 |
| Thienemanniya grp. | 143.5 | 0.46 | 71.8 | 0.76 |
| Thienemanniella xena | 143.5 | 0.46 | 93.3 | 0.98 |
| Cricotopus tremulus grp. | 143.5 | 0.46 | 120.2 | 1.27 |
| Cricotopus bicinctus grp. | 861.1 | 2.77 | 147.1 | 1.55 |
| Cricotopus sylvestris grp. | 1,148.2 | 3.69 | 17.9 | 0.19 |
| Nanocladius | -- | -- | 26.9 | 0.28 |
| Chironomini | -- | -- | 17.9 | 0.19 |
| Chironomus | 735.6 | 2.36 | -- | -- |
| Dicrotendipes neomodestus | 107.6 | 0.35 | 44.9 | 0.47 |
| Dicrotendipes simpsoni | 143.5 | 0.46 | 166.8 | 1.76 |
| Endochironomus nigricans | 35.9 | 0.12 | -- | -- |
| Glyptotendipes | 2,475.8 | 7.95 | 1,817.4 | 19.18 |
| Polypedilum flavum | 322.9 | 1.04 | 179.4 | 1.89 |
| Polypedilum illinoense | 251.2 | 0.81 | 819.9 | 8.65 |
| Polypedilum scalaenum grp. | 143.5 | 0.46 | 62.8 | 0.66 |
| Paratanytarsus | 358.8 | 1.15 | 17.9 | 0.19 |
| Tanytarsus | 107.6 | 0.35 | -- | -- |
| Simulium | 861.1 | 2.77 | 143.5 | 1.51 |
| Physa | 17.9 | 0.06 | -- | -- |
| Gyraulus | -- | -- | 389.3 | 4.11 |
| Helisoma | 53.8 | 0.17 | -- | -- |
| ferrissia | -- | -- | 30.5 | 0.32 |
| TOTAL BENTHOS | 31,126.7 | 100.00 | 9,476.1 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | | 28 | |
| EPT TAXA RICHNESS | 1 | | 3 | |

The Ponar results were similar between years (Table 3-71). Total richness, EPT richness, and density were similar between years and Oligochaeta was the dominant taxon both years.

Chironomid head capsule deformities were observed in samples during both 2003 and 2004 (Tables 3-26 and 3-49). In 2003, six specimens of *Chironomus* in the HD samples exhibited deformities, whereas only one specimen of *Glyptotendipes* exhibited a deformity in 2004. The decrease of deformities in 2004 together with the increase in EPT richness and abundance in HD samples suggests that conditions improved between years and were more conducive to the benthic macroinvertebrate community at Station 64.

3.3.4.2 Salt Creek

As with the WB DuPage River, the HD results from Station 18 suggest that conditions improved between 2003 and 2004 (Table 3-72). Total taxa richness and EPT richness were both higher in 2004. The highly tolerant taxon, Oligochaeta declined by 6-fold from 2003 to 2004, while the caddisfly, *Cyrnellus fraternus* became fairly abundant in 2004.

Ponar sampling results were very similar between the two years (Table 3-73). Total richness, EPT richness, and total density, were very similar both years. Oligochaeta and the midge *Cladotanytarsus mancus* were the dominant taxa both years.

The incidence of head capsule deformities was very low at Station 18 in both 2003 and 2004. Only one chironomid specimen in the 2003 Ponar samples from Station 18 exhibited a head capsule deformity while no deformities were observed in either the HD or Ponar samples from Station 18 in 2004 (Table 3-26).

3.3.4.3 Higgins Creek

Total taxa richness in the HD samples was somewhat higher in 2004 compared to 2003 while EPT taxa were rare both years. *Caecidotea* was the dominant taxon in 2004 with Oligochaeta being the second most common. In 2003, the order of these two taxa was reversed but *Cricotopus* spp. remained fairly common both years (Table 3-74).

Ponar results also were somewhat different between years and exhibited a pattern that was similar to the HD results (Tables 3-74 and 3-75). As was true for the HDs, total Ponar taxa richness was slightly higher in 2004 and EPT richness was similar between the years. The more tolerant Oligochaeta was dominant in 2003. However, as with the HD samples, Oligochaeta density decreased substantially and the density of *Caecidotea* increased dramatically from 2003 to 2004 so that *Caecidotea* became the dominant taxon.

Three *Chironomus* specimens exhibited deformities at Station 78 in 2003 (Table 3-26). However, no deformities were observed among the midges collected at Station 78 in 2004.

3.3.4.4 Des Plaines River

Both total taxa richness and EPT taxa richness in the HD samples from Station 13 declined slightly from 2004 to 2003 (Table 3-76). Also, there was about a 4-fold decline in HD density from 2004 to 2003. This decline was the result of several taxa decreasing rather than a large

TABLE 3-71. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JULY 2003 AND JULY 2004 FOR SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER.

| TAXA | 64 LAKE ST. | | | |
|------------------------------|----------------|--------|---------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 380.4 | 11.55 |
| Plumatella | -- | -- | 14.4 | 0.44 |
| Oligochaeta | 1,607.6 | 41.56 | 1,255.9 | 38.13 |
| Erpobdella punctata punctata | -- | -- | 7.2 | 0.22 |
| Ostracoda | -- | -- | 122.0 | 3.70 |
| Caecidotea | 14.4 | 0.37 | -- | -- |
| Oecetis | -- | -- | 7.2 | 0.22 |
| Chironomidae | 21.5 | 0.56 | -- | -- |
| Procladius (Holotanypus) | -- | -- | 7.2 | 0.22 |
| Thienemanimyia grp. | -- | -- | 7.2 | 0.22 |
| Thienemanniella xena | -- | -- | 14.4 | 0.44 |
| Cricotopus | -- | -- | 28.7 | 0.87 |
| Cricotopus bicinctus grp. | 71.8 | 1.86 | 7.2 | 0.22 |
| Cricotopus sylvestris grp. | 157.9 | 4.08 | 7.2 | 0.22 |
| Chironomus | 1,449.7 | 37.48 | 14.4 | 0.44 |
| Cryptochironomus | 35.9 | 0.93 | 703.3 | 21.35 |
| Dicotendipes neomodestus | 21.5 | 0.56 | 7.2 | 0.22 |
| Dicotendipes simpsoni | 14.4 | 0.37 | -- | -- |
| Endochironomus nigricans | 21.5 | 0.56 | -- | -- |
| Glyptotendipes | 143.5 | 3.71 | -- | -- |
| Polypedilum flavum | 7.2 | 0.19 | -- | -- |
| Polypedilum illinoense | -- | -- | 57.4 | 1.74 |
| Polypedilum scalaenum grp. | 150.7 | 3.90 | 516.7 | 15.69 |
| Cladotanytarsus | 14.4 | 0.37 | -- | -- |
| Paratanytarsus | 78.9 | 2.04 | -- | -- |
| Simulium | 50.2 | 1.30 | 7.2 | 0.22 |
| Physa | -- | -- | 7.2 | 0.22 |
| Gyraulus | -- | -- | 7.2 | 0.22 |
| Helisoma | 7.2 | 0.19 | -- | -- |
| Ferrissia | -- | -- | 114.8 | 3.49 |
| TOTAL BENTHOS | 3,868.2 | 100.00 | 3,294.1 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | | 21 | |
| EPT TAXA RICHNESS | 0 | | 1 | |

TABLE 3-72. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JUNE 2003 AND JULY 2004 FOR SAMPLING STATION 18 WITHIN SALT CREEK.

| TAXA | 18 DEVON AVE. | | | |
|--------------------------------------|------------------|--------|------------------|--------|
| | 2003 | | 2004 | |
| | #/m ² | % | #/m ² | % |
| Hydra | 9,831.4 | 34.66 | 10.8 | 0.23 |
| Turbellaria | 35.9 | 0.13 | 231.4 | 4.85 |
| Nematoda | -- | -- | 3.6 | 0.08 |
| Urnatella gracilis | -- | -- | 1.8 | 0.04 |
| Oligochaeta | 16,200.2 | 57.12 | 2,746.7 | 57.56 |
| Ostracoda | -- | -- | 118.4 | 2.48 |
| Caecidotea | 251.2 | 0.89 | 244.0 | 5.11 |
| Gammarus fasciatus | -- | -- | 1.8 | 0.04 |
| Orconectes virilis | 35.9 | 0.13 | -- | -- |
| Stenacron | -- | -- | 7.2 | 0.15 |
| Caenis | 179.4 | 0.63 | -- | -- |
| Coenagrionidae | -- | -- | 1.8 | 0.04 |
| Argia | 17.9 | 0.06 | -- | -- |
| Corixidae | -- | -- | 5.4 | 0.11 |
| Cyrnellus fraternus | -- | -- | 224.3 | 4.70 |
| Cheumatopsyche | -- | -- | 48.4 | 1.02 |
| Dubiraphia | -- | -- | 5.4 | 0.11 |
| Stenelmis | 17.9 | 0.06 | 1.8 | 0.04 |
| Ceratopogonidae | 71.8 | 0.25 | -- | -- |
| Bezzia | -- | -- | 1.8 | 0.04 |
| Chironomidae | 125.6 | 0.44 | -- | -- |
| Procladius (Holotanypus) | 17.9 | 0.06 | 100.5 | 2.11 |
| Thienemannimyia grp. | -- | -- | 7.2 | 0.15 |
| Cricotopus tremulus grp. | 53.8 | 0.19 | -- | -- |
| Cricotopus bicinctus grp. | 35.9 | 0.13 | -- | -- |
| Cricotopus sylvestris grp. | 17.9 | 0.06 | -- | -- |
| Nanocladius distinctus | 53.8 | 0.19 | -- | -- |
| Nanocladius crassicornus/rectinervis | 35.9 | 0.13 | 57.4 | 1.20 |
| Chironomus | 35.9 | 0.13 | 50.2 | 1.05 |
| Cladopelma | -- | -- | 7.2 | 0.15 |
| Cryptochironomus | 35.9 | 0.13 | 35.9 | 0.75 |
| Dicrotendipes neomodestus | -- | -- | 21.5 | 0.45 |
| Dicrotendipes fumidus | 107.6 | 0.38 | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 93.3 | 1.95 |
| Endochironomus nigricans | 17.9 | 0.06 | 43.1 | 0.90 |
| Glyptotendipes | 35.9 | 0.13 | 71.8 | 1.50 |
| Harnischia | -- | -- | 7.2 | 0.15 |
| Parachironomus | 394.7 | 1.39 | -- | -- |
| Polypedilum flavum | -- | -- | 28.7 | 0.60 |
| Polypedilum illinoense | 35.9 | 0.13 | 21.5 | 0.45 |
| Polypedilum scalaenum grp. | 448.5 | 1.58 | 138.1 | 2.89 |
| Pseudochironomus | -- | -- | 35.9 | 0.75 |
| Stenochironomus | -- | -- | 14.4 | 0.30 |
| Tribelos fuscicorne | 17.9 | 0.06 | -- | -- |
| Cladotanytarsus mancus grp. | 17.9 | 0.06 | 9.0 | 0.19 |
| Paratanytarsus | 53.8 | 0.19 | -- | -- |
| Rheotanytarsus | -- | -- | 14.4 | 0.30 |
| Tanytarsus | -- | -- | 21.5 | 0.45 |
| Tanytarsus glabrescens grp. | 35.9 | 0.13 | -- | -- |
| Rhamphomyia | -- | -- | 1.8 | 0.04 |
| Physa | 35.9 | 0.13 | -- | -- |
| Helisoma | 71.8 | 0.25 | -- | -- |
| Menetus dilatatus | -- | -- | 274.5 | 5.75 |
| Ferrissia | 17.9 | 0.06 | 39.5 | 0.83 |
| Corbicula fluminea | 17.9 | 0.06 | 21.5 | 0.45 |
| Dreissena polymorpha | -- | -- | 1.8 | 0.04 |
| TOTAL BENTHOS | 28,363.8 | 100.00 | 4,772.2 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | | 40 | |
| EPT TAXA RICHNESS | 1 | | 3 | |

TABLE 3-73. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JUNE 2003 AND MAY-SEPTEMBER 2004 FOR SAMPLING STATION 18 WITHIN SALT CREEK.

| TAXA | 18 DEVON AVE. | | | |
|-----------------------------|------------------|--------|------------------|--------|
| | 2003 | | 2004 | |
| | #/m ² | % | #/m ² | % |
| Hydra | 14.4 | 0.24 | -- | -- |
| Nematoda | -- | -- | 7.2 | 0.12 |
| Oligochaeta | 1,421.0 | 24.15 | 2,346.8 | 38.79 |
| Ostracoda | -- | -- | 172.2 | 2.85 |
| Caecidotea | 14.4 | 0.24 | 222.5 | 3.68 |
| Caenis | 7.2 | 0.12 | -- | -- |
| Cheumatopsyche | -- | -- | 35.9 | 0.59 |
| Dubiraphia | -- | -- | 14.4 | 0.24 |
| Macronychus glabratus | 7.2 | 0.12 | -- | -- |
| Stenelmis | 14.4 | 0.24 | 7.2 | 0.12 |
| Chironomidae | 64.6 | 1.10 | -- | -- |
| Procladius (Holotanypus) | -- | -- | 14.4 | 0.24 |
| Ablabesmyia mallochii | -- | -- | 7.2 | 0.12 |
| Thienemanniella xena | -- | -- | 7.2 | 0.12 |
| Cricotopus tremulus grp. | 28.7 | 0.49 | -- | -- |
| Cricotopus bicinctus grp. | 57.4 | 0.98 | -- | -- |
| Cricotopus sylvestris grp. | 28.7 | 0.49 | -- | -- |
| Chironomus | 523.9 | 8.90 | 7.2 | 0.12 |
| Cladopelma | 14.4 | 0.24 | -- | -- |
| Cryptochironomus | 93.3 | 1.59 | 552.6 | 9.13 |
| Dicrotendipes fumidus | 674.6 | 11.46 | -- | -- |
| Glyptotendipes | -- | -- | 14.4 | 0.24 |
| Harnischia | -- | -- | 7.2 | 0.12 |
| Parachironomus | 14.4 | 0.24 | -- | -- |
| Polypedilum halterale grp. | -- | -- | 86.1 | 1.42 |
| Polypedilum illinoense | -- | -- | 7.2 | 0.12 |
| Polypedilum scalaenum grp. | 696.1 | 11.83 | 595.7 | 9.85 |
| Stictochironomus | 28.7 | 0.49 | 28.7 | 0.47 |
| Tribelos fuscicorne | 14.4 | 0.24 | -- | -- |
| Cladotanytarsus mancus grp. | 2,045.3 | 34.76 | 1,507.1 | 24.91 |
| Rheotanytarsus | -- | -- | 7.2 | 0.12 |
| Helisoma | -- | -- | 7.2 | 0.12 |
| Corbicula fluminea | 122.0 | 2.07 | 394.7 | 6.52 |
| TOTAL BENTHOS | 5,884.8 | 100.00 | 6,049.9 | 100.00 |
| TOTAL TAXA RICHNESS | 19 | | 22 | |
| EPT TAXA RICHNESS | 1 | | 1 | |

TABLE 3-74. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JUNE 2003 AND JULY 2004 FOR SAMPLING STATION 78 WITHIN HIGGINS CREEK.

| TAXA | 78 WILLE RD. | | | |
|--------------------------------------|------------------|--------|------------------|--------|
| | 2003 | | 2004 | |
| | #/m ² | % | #/m ² | % |
| Hydra | 5.4 | 0.04 | -- | -- |
| Turbellaria | 35.9 | 0.29 | 95.1 | 0.99 |
| Plumatella | -- | -- | 17.9 | 0.19 |
| Oligochaeta | 9,137.1 | 73.14 | 292.4 | 3.05 |
| Erpobdella punctata punctata | -- | -- | 17.9 | 0.19 |
| Ostracoda | -- | -- | 30.5 | 0.32 |
| Caecidotea | 1,614.6 | 12.93 | 8,624.0 | 89.97 |
| Gammarus | 17.9 | 0.14 | -- | -- |
| Hydroptila | 5.4 | 0.04 | -- | -- |
| Chironomidae | 82.5 | 0.66 | -- | -- |
| Thienemannimyia grp. | -- | -- | 5.4 | 0.06 |
| Cricotopus tremulus grp. | 830.6 | 6.65 | 66.4 | 0.69 |
| Cricotopus bicinctus grp. | 453.9 | 3.63 | 269.1 | 2.81 |
| Cricotopus sylvestris grp. | 285.3 | 2.28 | 41.3 | 0.43 |
| Orthocladus | -- | -- | 17.9 | 0.19 |
| Nanocladius crassicornus/rectinervis | 5.4 | 0.04 | 17.9 | 0.19 |
| Chironomus | -- | -- | 12.6 | 0.13 |
| Polypedilum illinoense | -- | -- | 35.9 | 0.37 |
| Simulium | -- | -- | 5.4 | 0.06 |
| Physa | 17.9 | 0.14 | -- | -- |
| Ferrissia | -- | -- | 35.9 | 0.37 |
| TOTAL BENTHOS | 12,491.9 | 100.00 | 9,585.6 | 100.00 |
| TOTAL TAXA RICHNESS | 11 | | 16 | |
| EPT TAXA RICHNESS | 1 | | 0 | |

TABLE 3-75. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JUNE 2003 AND JULY 2004 FOR SAMPLING STATION 78 WITHIN HIGGINS CREEK.

| TAXA | 78 WILLE RD. | | | |
|--------------------------------------|-----------------|--------|----------|--------|
| | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % |
| Hydra | 35.9 | 0.12 | 531.1 | 0.63 |
| Turbellaria | 7.2 | 0.02 | 15,365.2 | 18.36 |
| Oligochaeta | 22,340.9 | 74.40 | 2,203.2 | 2.63 |
| Erpobdella punctata punctata | -- | -- | 251.2 | 0.30 |
| Ostracoda | -- | -- | 3,243.8 | 3.88 |
| Caecidotea | 4,026.1 | 13.41 | 60,204.8 | 71.94 |
| Orconectes | 7.2 | 0.02 | -- | -- |
| Hydropsychidae | -- | -- | 43.1 | 0.05 |
| Hydroptila | 21.5 | 0.07 | 43.1 | 0.05 |
| Chironomidae | 473.7 | 1.58 | -- | -- |
| Thienemanniya grp. | -- | -- | 35.9 | 0.04 |
| Cricotopus tremulus grp. | 1,069.3 | 3.56 | 14.4 | 0.02 |
| Cricotopus bicinctus grp. | 868.4 | 2.89 | 846.8 | 1.01 |
| Cricotopus trifascia grp. | -- | -- | 122.0 | 0.15 |
| Cricotopus sylvestris grp. | 488.0 | 1.63 | 43.1 | 0.05 |
| Nanocladius crassicornus/rectinervis | -- | -- | 416.2 | 0.50 |
| Chironomus | 437.8 | 1.46 | -- | -- |
| Cryptochironomus | -- | -- | 14.4 | 0.02 |
| Dicrotendipes neomodestus | 100.5 | 0.33 | -- | -- |
| Endochironomus nigricans | -- | -- | 7.2 | 0.01 |
| Glyptotendipes | 21.5 | 0.07 | -- | -- |
| Parachironomus | 28.7 | 0.10 | -- | -- |
| Polypedilum flavum | -- | -- | 14.4 | 0.02 |
| Polypedilum illinoense | -- | -- | 28.7 | 0.03 |
| Rheotanytarsus | -- | -- | 7.2 | 0.01 |
| Pericoma | -- | -- | 7.2 | 0.01 |
| Physa | 93.3 | 0.31 | 78.9 | 0.09 |
| Ferrissia | -- | -- | 71.8 | 0.09 |
| Sphaerium simile | -- | -- | 93.3 | 0.11 |
| Pisidium | 7.2 | 0.02 | -- | -- |
| TOTAL BENTHOS | 30,027.0 | 100.00 | 83,686.7 | 100.00 |
| TOTAL TAXA RICHNESS | 15 | | 23 | |
| EPT TAXA RICHNESS | 1 | | 2 | |

TABLE 3-76. COMPARISON OF HESTER-DENDY DENSITIES BETWEEN JUNE 2003 AND JULY-SEPTEMBER 2004 FOR SAMPLING STATIONS WITHIN THE DES PLAINES RIVER.

| TAXA | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|--------------------------|---------------------|-------|------------------|-------|------------------|-------|------------------|-------|----------------------------|-------|------------------|-------|
| | 2003 | | 2004 | | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % |
| Hydra | 818.1 | 5.94 | -- | -- | 12.6 | 1.04 | 17.9 | 0.42 | 35.9 | 0.22 | -- | -- |
| Turbellaria | 91.5 | 0.66 | 77.1 | 2.57 | 26.9 | 2.23 | 351.6 | 8.15 | 358.8 | 2.16 | 1,828.1 | 28.48 |
| Plumatella | -- | -- | -- | -- | 1.8 | 0.15 | -- | -- | -- | -- | 5.4 | 0.08 |
| Oligochaeta | 1,099.7 | 7.99 | 579.5 | 19.30 | 349.8 | 28.97 | 425.2 | 9.85 | 143.5 | 0.87 | 518.5 | 8.08 |
| Helobdella stagnalis | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Helobdella triserialis | 1.8 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Placobdella pediculata | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | 1.8 | 0.01 | -- | -- | -- | -- | 9.0 | 0.21 | -- | -- | -- | -- |
| Caecidotea | 35.9 | 0.26 | 17.9 | 0.60 | 23.3 | 1.93 | 5.4 | 0.12 | -- | -- | 9.0 | 0.14 |
| Gammarus | -- | -- | -- | -- | 1.8 | 0.15 | -- | -- | -- | -- | -- | -- |
| Gammarus fasciatus | 550.8 | 4.00 | 57.4 | 1.91 | -- | -- | 14.4 | 0.33 | -- | -- | 9.0 | 0.14 |
| Orconectes | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.11 | -- | -- |
| Hydracarina | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Baetis intercalaris | -- | -- | 7.2 | 0.24 | 3.6 | 0.30 | 265.5 | 6.15 | 592.0 | 3.57 | 251.2 | 3.91 |
| Stenacron | 25.1 | 0.18 | 26.9 | 0.90 | 152.5 | 12.63 | 55.6 | 1.29 | -- | -- | 17.9 | 0.28 |
| Stenonema integrum | 505.9 | 3.67 | 147.1 | 4.90 | -- | -- | 3.6 | 0.08 | -- | -- | -- | -- |
| Stenonema terminatum | -- | -- | 17.9 | 0.60 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenonema exiguum | 3.6 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricorythodes | 53.8 | 0.39 | 184.8 | 6.15 | 3.6 | 0.30 | 57.4 | 1.33 | -- | -- | 17.9 | 0.28 |
| Caenis | 1.8 | 0.01 | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | -- | -- |
| Anthopotamus myops grp. | 61.0 | 0.44 | 30.5 | 1.02 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hexagenia | 21.5 | 0.16 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Argia | 16.1 | 0.12 | 21.5 | 0.72 | 91.5 | 7.58 | 16.1 | 0.37 | -- | -- | 5.4 | 0.08 |
| Perlesta | 39.5 | 0.29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Trepobates | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | 5.4 | 0.08 |
| Sialis | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cynellus fraternus | 3.6 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 1,424.5 | 10.35 | 663.8 | 22.10 | 12.6 | 1.04 | 1,460.4 | 33.85 | 7,194.1 | 43.36 | 2,185.1 | 34.04 |
| Hydropsyche | 35.9 | 0.26 | -- | -- | -- | -- | -- | -- | 71.8 | 0.43 | -- | -- |
| Hydropsyche betteni | -- | -- | -- | -- | -- | -- | 16.1 | 0.37 | -- | -- | -- | -- |
| Hydropsyche orris | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.22 |
| Hydropsyche simulans | 1.8 | 0.01 | 132.8 | 4.42 | -- | -- | -- | -- | -- | -- | 17.9 | 0.28 |
| Hydropsyche bidens | 17.9 | 0.13 | 25.1 | 0.84 | -- | -- | -- | -- | -- | -- | -- | -- |
| Ceratopsyche morosa | -- | -- | 10.8 | 0.36 | -- | -- | 35.9 | 0.83 | 233.2 | 1.41 | 9.0 | 0.14 |
| Potamyia flava | 5.4 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydroptila | 17.9 | 0.13 | -- | -- | -- | -- | 12.6 | 0.29 | -- | -- | -- | -- |
| Petrophila | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 0.06 |
| Ancyronyx variegata | -- | -- | 3.6 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dubiraphia | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Macronychus glabratus | 1.8 | 0.01 | 16.1 | 0.54 | -- | -- | 10.8 | 0.25 | 17.9 | 0.11 | 16.1 | 0.25 |
| Stenelmis | -- | -- | 43.1 | 1.43 | 9.0 | 0.74 | -- | -- | -- | -- | 17.9 | 0.28 |
| Stenelmis crenata grp. | 157.9 | 1.15 | -- | -- | -- | -- | 7.2 | 0.17 | -- | -- | -- | -- |
| Ceratopogonidae | 17.9 | 0.13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomidae | 138.1 | 1.00 | -- | -- | 10.8 | 0.89 | -- | -- | 35.9 | 0.22 | -- | -- |
| Procladius (Holotanypus) | -- | -- | -- | -- | 73.6 | 6.09 | -- | -- | -- | -- | -- | -- |
| Ablabesmyia janta | 71.8 | 0.52 | -- | -- | 16.1 | 1.34 | -- | -- | -- | -- | -- | -- |
| Ablabesmyia mallochii | -- | -- | -- | -- | 1.8 | 0.15 | -- | -- | -- | -- | -- | -- |
| Nilotanypus fimbriatus | -- | -- | 25.1 | 0.84 | -- | -- | 61.0 | 1.41 | -- | -- | -- | -- |

TABLE 3-76 (cont.)

| TAXA (cont.) | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|-------------------------------------|---------------------|--------|------------------|--------|------------------|--------|------------------|--------|----------------------------|--------|------------------|--------|
| | 2003 | | 2004 | | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % | #/m ² | % |
| Thienemanniya grp. | 143.5 | 1.04 | 25.1 | 0.84 | 5.4 | 0.45 | 120.2 | 2.79 | 71.8 | 0.43 | -- | -- |
| Corynoneura lobata | -- | -- | -- | -- | -- | -- | 37.7 | 0.87 | -- | -- | -- | -- |
| Thienemanniella xena | -- | -- | 7.2 | 0.24 | 10.8 | 0.89 | 19.7 | 0.46 | 129.2 | 0.78 | 39.5 | 0.61 |
| Thienemanniella similis | 71.8 | 0.52 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus tremulus grp. | 394.7 | 2.87 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | 143.5 | 1.04 | -- | -- | -- | -- | -- | -- | 129.2 | 0.78 | -- | -- |
| Cricotopus sylvestris grp. | 340.9 | 2.48 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Orthocladus | -- | -- | -- | -- | -- | -- | 154.3 | 3.58 | -- | -- | -- | -- |
| Nanocladus distinctus | 17.9 | 0.13 | -- | -- | 21.5 | 1.78 | 109.4 | 2.54 | 71.8 | 0.43 | 53.8 | 0.84 |
| Nanocladus crassicornus/rectinervis | -- | -- | -- | -- | 10.8 | 0.89 | -- | -- | 129.2 | 0.78 | 229.6 | 3.58 |
| Rheocricotopus robacki | -- | -- | 25.1 | 0.84 | 1.8 | 0.15 | 122.0 | 2.83 | -- | -- | -- | -- |
| Tvetenia discoloripes grp. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17.9 | 0.28 |
| Chironomus | -- | -- | -- | -- | 5.4 | 0.45 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes | -- | -- | 7.2 | 0.24 | -- | -- | -- | -- | -- | -- | 17.9 | 0.28 |
| Dicrotendipes neomolestus | 242.2 | 1.76 | -- | -- | -- | -- | 14.4 | 0.33 | -- | -- | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 12.6 | 0.42 | 66.4 | 5.50 | -- | -- | -- | -- | -- | -- |
| Endochironomus nigricans | 17.9 | 0.13 | 3.6 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Glyptotendipes | 1,706.1 | 12.39 | 34.1 | 1.14 | 3.6 | 0.30 | 1.8 | 0.04 | 71.8 | 0.43 | 5.4 | 0.08 |
| Microtendipes | -- | -- | 41.3 | 1.37 | -- | -- | -- | -- | -- | -- | -- | -- |
| Paracladopelma | 71.8 | 0.52 | -- | -- | 3.6 | 0.30 | -- | -- | -- | -- | -- | -- |
| Polypedium flavum | 2,242.6 | 16.29 | 645.9 | 21.51 | 9.0 | 0.74 | 681.7 | 15.80 | 6,709.7 | 40.44 | 566.9 | 8.83 |
| Polypedium illinoense | 37.7 | 0.27 | -- | -- | 61.0 | 5.05 | 75.3 | 1.75 | 129.2 | 0.78 | 10.8 | 0.17 |
| Polypedium scalaenum grp. | 181.2 | 1.32 | 32.3 | 1.08 | 131.0 | 10.85 | 1.8 | 0.04 | -- | -- | -- | -- |
| Stenochironomus | -- | -- | 7.2 | 0.24 | 39.5 | 3.27 | 50.2 | 1.16 | -- | -- | 5.4 | 0.08 |
| Tribelos fuscicorne | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Paratanytarsus | 17.9 | 0.13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Rheotanytarsus | 2,906.4 | 21.11 | 46.6 | 1.55 | -- | -- | 39.5 | 0.91 | 394.7 | 2.38 | 344.5 | 5.37 |
| Tanytarsus | -- | -- | -- | -- | -- | -- | 14.4 | 0.33 | -- | -- | -- | -- |
| Simulium | -- | -- | -- | -- | -- | -- | -- | -- | 35.9 | 0.22 | 3.6 | 0.06 |
| Hemerodromia | -- | -- | -- | -- | -- | -- | 1.8 | 0.04 | -- | -- | 1.8 | 0.03 |
| Pleurocera | -- | -- | -- | -- | 16.1 | 1.34 | -- | -- | -- | -- | -- | -- |
| Physa | 3.6 | 0.03 | -- | -- | 1.8 | 0.15 | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | 3.6 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Ferrissia | 5.4 | 0.04 | 1.8 | 0.06 | 28.7 | 2.38 | 28.7 | 0.67 | 17.9 | 0.11 | 172.2 | 2.68 |
| Corbicula fluminea | -- | -- | 5.4 | 0.18 | -- | -- | 10.8 | 0.25 | -- | -- | -- | -- |
| Sphaerium | -- | -- | 5.4 | 0.18 | -- | -- | -- | -- | -- | -- | -- | -- |
| Musculium | -- | -- | 1.8 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Musculium transversum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 0.06 |
| Dreissena polymorpha | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.22 |
| TOTAL BENTHOS | 13,767.5 | 100.00 | 3,003.2 | 100.00 | 1,207.4 | 100.00 | 4,314.7 | 100.00 | 16,591.3 | 100.00 | 6,419.1 | 100.00 |
| TOTAL TAXA RICHNESS | 45 | | 41 | | 31 | | 38 | | 21 | | 32 | |
| EPT TAXA RICHNESS | 15 | | 10 | | 4 | | 9 | | 4 | | 7 | |

decline of one or two dominant taxa. The relatively pollution sensitive chironomid *Rheotanytarsus* was the dominant taxa during 2003. Despite a decrease in density by over half between years, the EPT taxon *Cheumatopsyche* was dominant in 2004.

In contrast, both total taxa richness and EPT taxa richness increased in the Station 13 Ponar samples and density declined only modestly (Table 3-77). As with the HDs, dominance shifted between taxa from 2003 to 2004. In 2003, Asiatic clam was dominant. However, in 2004, the midge *Polypedilum flavum* became the dominant taxon in the Station 13 Ponar samples.

The incidence of head capsule deformities was very low both years at Station 13. In 2003, no deformities were observed and in 2004 only one midge specimen exhibited deformities (Table 3-56).

At Station 22, total taxa and especially EPT taxa richness increased in the HD samples (Table 3-76). Density also increased nearly four fold between 2003 and 2004. Much of the density increase was due to a large increase in *Cheumatopsyche* numbers. Oligochaeta was the dominant taxon in 2003 while *Cheumatopsyche* was dominant in 2004. In addition, chironomid head capsule deformities decreased from six specimens in 2003 to zero in 2004 (Table 3-26).

Total taxa richness and density in the Ponar samples from Station 22 were essentially unchanged from 2003 to 2004 (Table 3-77). In addition, Oligochaeta was the dominant taxon both years. However, EPT richness increased from only two taxa in 2003 to seven taxa in 2004.

Collectively, the HD and Ponar results suggest improving conditions at Station 22, especially in terms of EPT richness.

At Station 91, both total and EPT richness in the HD samples increased from 2003 to 2004 (Table 3-76). Density declined due mainly to declines in *Cheumatopsyche* and *Polypedilum flavum*. Nonetheless, *Cheumatopsyche* remained the dominant taxon in both years. No head capsule deformities were observed in the HD samples from Station 91 in either year.

Total richness was similar and EPT richness remained unchanged from 2003 to 2004 in the Ponar samples (Table 3-77). Ponar density declined 10-fold from 2003 to 2004 due to greatly reduced numbers of Oligochaeta, *Gammarus fasciatus*, *Cheumatopsyche*, *Cricotopus bicinctus* grp., *Chironomus*, and *Polypedilum flavum*. In addition, the incidence of head capsule deformities decreased from 2003 to 2004. Six specimens exhibited deformities in the 2003 Ponar samples as opposed to zero in 2004 (Table 3-26). Despite a substantial decline in density, Oligochaeta was the dominant taxon in both years.

Collectively, the HD and Ponar data suggest that conditions were fairly similar between the years at Station 91.

TABLE 3-77. COMPARISON OF PETITE PONAR DENSITIES BETWEEN JUNE 2003 AND JULY-SEPTEMBER 2004 FOR SAMPLING STATIONS WITHIN THE DES PLAINES RIVER.

| TAXA | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|----------------------------|---------------------|-------|-------|-------|------------------|-------|---------|-------|----------------------------|-------|---------|-------|
| | 2003 | | 2004 | | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | -- | -- | -- | -- | 244.0 | 7.94 | 28.7 | 0.86 | 215.3 | 0.44 | 78.9 | 1.72 |
| Nematoda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.16 |
| Oligochaeta | 373.2 | 10.24 | -- | -- | 2,002.3 | 65.19 | 2,260.6 | 68.03 | 29,266.3 | 60.37 | 2,949.6 | 64.42 |
| Helobdella stagnalis | -- | -- | 14.4 | 0.70 | 7.2 | 0.23 | -- | -- | 93.3 | 0.19 | -- | -- |
| Mooreobdella microstoma | -- | -- | -- | -- | -- | -- | -- | -- | 21.5 | 0.04 | -- | -- |
| Ostracoda | -- | -- | 28.7 | 1.40 | -- | -- | -- | -- | -- | -- | 322.9 | 7.05 |
| Caecidotea | -- | -- | -- | -- | 50.2 | 1.64 | -- | -- | 71.8 | 0.15 | -- | -- |
| Gammarus | -- | -- | -- | -- | 7.2 | 0.23 | -- | -- | -- | -- | -- | -- |
| Gammarus fasciatus | 57.4 | 1.57 | 150.7 | 7.34 | -- | -- | 14.4 | 0.43 | 3,624.2 | 7.48 | 78.9 | 1.72 |
| Baetis intercalaris | -- | -- | -- | -- | -- | -- | 7.2 | 0.22 | 21.5 | 0.04 | 21.5 | 0.47 |
| Baetis flavistriga | -- | -- | -- | -- | -- | -- | 7.2 | 0.22 | -- | -- | -- | -- |
| Stenacron | -- | -- | -- | -- | -- | -- | 7.2 | 0.22 | -- | -- | -- | -- |
| Stenonema terminatum | -- | -- | 28.7 | 1.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricorythodes | -- | -- | 21.5 | 1.05 | 64.6 | 2.10 | 71.8 | 2.16 | 71.8 | 0.15 | 21.5 | 0.47 |
| Caenis | -- | -- | -- | -- | -- | -- | -- | -- | 21.5 | 0.04 | 7.2 | 0.16 |
| Anthopotamus myops grp. | -- | -- | 35.9 | 1.75 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hexagenia | 50.2 | 1.38 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Corixidae | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.31 |
| Cheumatopsyche | -- | -- | 229.7 | 11.19 | 107.6 | 3.50 | 21.5 | 0.65 | 2,282.2 | 4.71 | 93.3 | 2.04 |
| Ceratopsyche morosa | -- | -- | -- | -- | -- | -- | 7.2 | 0.22 | -- | -- | -- | -- |
| Hydroptila | -- | -- | -- | -- | -- | -- | 7.2 | 0.22 | -- | -- | -- | -- |
| Dubiraphia | 7.2 | 0.20 | 7.2 | 0.35 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenelmis | -- | -- | 57.4 | 2.80 | 28.7 | 0.93 | 50.2 | 1.51 | 71.8 | 0.15 | 57.4 | 1.25 |
| Stenelmis crenata grp. | 143.5 | 3.94 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Ceratopogonidae | 35.9 | 0.98 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomidae | -- | -- | -- | -- | -- | -- | -- | -- | 488.0 | 1.01 | -- | -- |
| Procladius (Holotanypus) | -- | -- | 14.4 | 0.70 | 64.6 | 2.10 | 35.9 | 1.08 | 107.6 | 0.22 | 14.4 | 0.31 |
| Ablabesmyia mallochii | -- | -- | -- | -- | 7.2 | 0.23 | -- | -- | 71.8 | 0.15 | 7.2 | 0.16 |
| Thienemannimyia grp. | -- | -- | 93.3 | 4.55 | 14.4 | 0.47 | 7.2 | 0.22 | -- | -- | -- | -- |
| Thienemanniella xena | -- | -- | 14.4 | 0.70 | -- | -- | 7.2 | 0.22 | 71.8 | 0.15 | 78.9 | 1.72 |
| Thienemanniella similis | -- | -- | -- | -- | -- | -- | -- | -- | 179.4 | 0.37 | -- | -- |
| Cricotopus bicinctus grp. | 78.9 | 2.17 | -- | -- | -- | -- | -- | -- | 1,040.6 | 2.15 | 28.7 | 0.63 |
| Cricotopus trifascia grp. | -- | -- | -- | -- | -- | -- | -- | -- | 143.5 | 0.30 | -- | -- |
| Orthocladius | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 43.1 | 0.94 |
| Nanocladius distinctus | -- | -- | -- | -- | -- | -- | -- | -- | 143.5 | 0.30 | -- | -- |
| Rheocricotopus robacki | -- | -- | 14.4 | 0.70 | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomus | -- | -- | -- | -- | 14.4 | 0.47 | -- | -- | 4,148.1 | 8.56 | 35.9 | 0.78 |
| Cladopelma | 28.7 | 0.79 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cryptochironomus | 179.4 | 4.92 | 50.2 | 2.45 | 28.7 | 0.93 | 7.2 | 0.22 | 71.8 | 0.15 | 7.2 | 0.16 |
| Dicrotendipes | -- | -- | 14.4 | 0.70 | -- | -- | -- | -- | -- | -- | 35.9 | 0.78 |
| Dicrotendipes neomodestus | 136.4 | 3.74 | -- | -- | -- | -- | -- | -- | 35.9 | 0.07 | 14.4 | 0.31 |
| Glyptotendipes | 21.5 | 0.59 | -- | -- | -- | -- | -- | -- | 71.8 | 0.15 | -- | -- |
| Microtendipes | 114.8 | 3.15 | 14.4 | 0.70 | -- | -- | -- | -- | -- | -- | -- | -- |
| Paracladopelma | 531.1 | 14.57 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | 28.7 | 0.79 | 351.7 | 17.13 | 14.4 | 0.47 | -- | -- | 5,238.9 | 10.81 | 236.8 | 5.17 |
| Polypedilum halterale grp. | -- | -- | 57.4 | 2.80 | -- | -- | -- | -- | -- | -- | 7.2 | 0.16 |
| Polypedilum illinoense | -- | -- | -- | -- | -- | -- | -- | -- | 107.6 | 0.22 | 7.2 | 0.16 |
| Polypedilum scalaenum grp. | 889.9 | 24.41 | 215.3 | 10.49 | 172.2 | 5.61 | 7.2 | 0.22 | -- | -- | 71.8 | 1.57 |

TABLE 3-77 (cont.)

| TAXA (cont.) | 13 LAKE COOK RD. | | | | 22 OGDEN AVE. | | | | 91 MATERIAL SERVICE RD. | | | |
|----------------------------------|---------------------|--------|---------|--------|------------------|--------|---------|--------|----------------------------|--------|---------|--------|
| | 2003 | | 2004 | | 2003 | | 2004 | | 2003 | | 2004 | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Saetheria | 43.1 | 1.18 | 179.4 | 8.74 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stictochironomus | 21.5 | 0.59 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tribelos fuscicorne | 7.2 | 0.20 | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.16 |
| Cladotanytarsus mancus grp. | 21.5 | 0.59 | 35.9 | 1.75 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cladotanytarsus vanderwulpi grp. | 136.4 | 3.74 | 200.9 | 9.79 | -- | -- | -- | -- | -- | -- | 7.2 | 0.16 |
| Paratanytarsus | 43.1 | 1.18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Rheotanytarsus | 21.5 | 0.59 | 14.4 | 0.70 | -- | -- | -- | -- | 502.4 | 1.04 | 28.7 | 0.63 |
| Tanytarsus | -- | -- | 35.9 | 1.75 | -- | -- | -- | -- | -- | -- | 114.8 | 2.51 |
| Tanytarsus guerlus grp. | -- | -- | -- | -- | -- | -- | -- | -- | 35.9 | 0.07 | -- | -- |
| Ammicola | -- | -- | -- | -- | 7.2 | 0.23 | -- | -- | -- | -- | -- | -- |
| Pleurocera | -- | -- | -- | -- | 78.9 | 2.57 | -- | -- | -- | -- | -- | -- |
| Physa | -- | -- | -- | -- | -- | -- | -- | -- | 21.5 | 0.04 | -- | -- |
| Menetus dilatatus | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.31 |
| Ferrissia | -- | -- | -- | -- | 7.2 | 0.23 | 28.7 | 0.86 | 143.5 | 0.30 | 50.2 | 1.10 |
| Corbicula fluminea | 674.6 | 18.50 | 64.6 | 3.15 | 50.2 | 1.64 | 667.4 | 20.09 | 21.5 | 0.04 | 107.6 | 2.35 |
| Sphaerium | -- | -- | 86.1 | 4.20 | -- | -- | 43.1 | 1.30 | -- | -- | -- | -- |
| Musculium | -- | -- | -- | -- | -- | -- | 7.2 | 0.22 | 71.8 | 0.15 | 7.2 | 0.16 |
| Pisidium | -- | -- | 21.5 | 1.05 | 100.5 | 3.27 | 28.7 | 0.86 | -- | -- | -- | -- |
| TOTAL BENTHOS | 3,645.7 | 100.00 | 2,052.5 | 100.00 | 3,071.6 | 100.00 | 3,322.8 | 100.00 | 48,478.2 | 100.00 | 4,578.7 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | | 27 | | 20 | | 21 | | 30 | | 32 | |
| EPT TAXA RICHNESS | 1 | | 4 | | 2 | | 7 | | 4 | | 4 | |

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APPENDIX A

2003 CENTER AND NEAR SHORE HD AND PONAR DATA

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= C.S.C.,
 LOCATION= ASHLAND AVE.,
 STATION= 58,
 and DATE= 05SEP03

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 63 | 226.0 | 2.29 | 0 | 0.0 | 0.00 |
| Turbellaria | 48 | 172.2 | 1.74 | 283 | 1,015.4 | 16.73 |
| Oligochaeta | 898 | 3,222.1 | 32.63 | 377 | 1,352.7 | 22.28 |
| Helobdella triserialis | 20 | 71.8 | 0.73 | 0 | 0.0 | 0.00 |
| Erpobdella punctata punctata | 13 | 46.6 | 0.47 | 0 | 0.0 | 0.00 |
| Caecidotea | 8 | 28.7 | 0.29 | 3 | 10.8 | 0.18 |
| Gammarus fasciatus | 28 | 100.5 | 1.02 | 175 | 627.9 | 10.34 |
| Argia | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |
| Chironomidae | 18 | 64.6 | 0.65 | 7 | 25.1 | 0.41 |
| Procladius (Holotanypus) | 10 | 35.9 | 0.36 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 20 | 71.8 | 0.73 | 20 | 71.8 | 1.18 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.30 |
| Nanocladius distinctus | 160 | 574.1 | 5.81 | 52 | 186.6 | 3.07 |
| Dicrotendipes | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.59 |
| Dicrotendipes simpsoni | 888 | 3,186.2 | 32.27 | 377 | 1,352.7 | 22.28 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.30 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.89 |
| Stenochironomus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.59 |
| Xenochironomus xenolabis | 0 | 0.0 | 0.00 | 20 | 71.8 | 1.18 |
| Helisoma | 5 | 17.9 | 0.18 | 160 | 574.1 | 9.46 |
| Ferrissia | 35 | 125.6 | 1.27 | 58 | 208.1 | 3.43 |
| Dreissena polymorpha | 538 | 1,930.4 | 19.55 | 113 | 405.5 | 6.68 |
| TOTAL BENTHOS | 2,752 | 9,874.4 | 100.00 | 1,692 | 6,071.0 | 100.00 |

WATERWAY= C.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 31JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 290 | 1,040.5 | 3.90 | 0 | 0.0 | 0.00 |
| Turbellaria | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.08 |
| Oligochaeta | 5,760 | 20,667.4 | 77.52 | 531 | 1,905.3 | 41.81 |
| Caecidotea | 40 | 143.5 | 0.54 | 14 | 50.2 | 1.10 |
| Gammarus | 50 | 179.4 | 0.67 | 62 | 222.5 | 4.88 |
| Chironomidae | 30 | 107.6 | 0.40 | 22 | 78.9 | 1.73 |
| Procladius (Holotanypus) | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 80 | 287.0 | 1.08 | 6 | 21.5 | 0.47 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 262 | 940.1 | 20.63 |
| Nanocladius distinctus | 160 | 574.1 | 2.15 | 33 | 118.4 | 2.60 |
| Rheocricotopus robacki | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.47 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.47 |
| Dicrotendipes simpsoni | 880 | 3,157.5 | 11.84 | 249 | 893.4 | 19.61 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.47 |
| Polypedilum illinoense | 80 | 287.0 | 1.08 | 72 | 258.3 | 5.67 |
| Paratanytarsus | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Physa | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 20 | 71.8 | 0.27 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 7,430 | 26,659.5 | 100.00 | 1,270 | 4,556.9 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= C.S.C.,
 LOCATION= ROUTE 83,
 STATION= 43,
 and DATE= 30JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 159 | 570.5 | 50.80 | 5 | 17.9 | 0.23 |
| Turbellaria | 4 | 14.4 | 1.28 | 0 | 0.0 | 0.00 |
| Piumatella | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.23 |
| Oligochaeta | 91 | 326.5 | 29.07 | 430 | 1,542.9 | 20.00 |
| Mooreobdella microstoma | 4 | 14.4 | 1.28 | 0 | 0.0 | 0.00 |
| Caecidotea | 3 | 10.8 | 0.96 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 19 | 68.2 | 6.07 | 120 | 430.6 | 5.58 |
| Caenis | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.23 |
| Cyrnellus fraternus | 1 | 3.6 | 0.32 | 0 | 0.0 | 0.00 |
| Chironomidae | 0 | 0.0 | 0.00 | 45 | 161.5 | 2.09 |
| Procladius (Holotanypus) | 2 | 7.2 | 0.64 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.70 |
| Cricotopus sylvestris grp. | 8 | 28.7 | 2.56 | 1,180 | 4,233.9 | 54.88 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.70 |
| Dicrotendipes simpsoni | 18 | 64.6 | 5.75 | 45 | 161.5 | 2.09 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 165 | 592.0 | 7.67 |
| Parachironomus | 0 | 0.0 | 0.00 | 30 | 107.6 | 1.40 |
| Polypedilum illinoense | 1 | 3.6 | 0.32 | 60 | 215.3 | 2.79 |
| Paratanytarsus | 1 | 3.6 | 0.32 | 30 | 107.6 | 1.40 |
| Amnicola | 1 | 3.6 | 0.32 | 0 | 0.0 | 0.00 |
| Physa | 1 | 3.6 | 0.32 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 313 | 1,123.1 | 100.00 | 2,150 | 7,714.4 | 100.00 |

WATERWAY= C.S.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 18JUL03

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|--------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.09 |
| Turbellaria | 190 | 681.7 | 4.23 | 1,130 | 4,054.5 | 9.61 |
| Oligochaeta | 4,140 | 14,854.7 | 92.20 | 9,970 | 35,773.2 | 84.78 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 70 | 251.2 | 0.60 |
| Chironomidae | 10 | 35.9 | 0.22 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 10 | 35.9 | 0.22 | 0 | 0.0 | 0.00 |
| Ablabesmyia mallochii | 10 | 35.9 | 0.22 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 10 | 35.9 | 0.22 | 40 | 143.5 | 0.34 |
| Dicrotendipes simpsoni | 120 | 430.6 | 2.67 | 520 | 1,865.8 | 4.42 |
| Parachironomus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.17 |
| TOTAL BENTHOS | 4,490 | 16,110.5 | 100.00 | 11,760 | 42,195.9 | 100.00 |

WATERWAY= C.S.S.C.,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 21JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.13 |
| Turbellaria | 150 | 538.2 | 1.94 | 200 | 717.6 | 2.58 |
| Oligochaeta | 7,230 | 25,941.9 | 93.65 | 6,630 | 23,789.0 | 85.66 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.13 |
| Caecidotea | 10 | 35.9 | 0.13 | 10 | 35.9 | 0.13 |
| Gammarus | 0 | 0.0 | 0.00 | 110 | 394.7 | 1.42 |
| Chironomidae | 10 | 35.9 | 0.13 | 80 | 287.0 | 1.03 |
| Cricotopus sylvestris grp. | 10 | 35.9 | 0.13 | 20 | 71.8 | 0.26 |
| Nanocladius distinctus | 40 | 143.5 | 0.52 | 260 | 932.9 | 3.36 |
| Chironomus | 20 | 71.8 | 0.26 | 20 | 71.8 | 0.26 |
| Dicrotendipes simpsoni | 240 | 861.1 | 3.11 | 360 | 1,291.7 | 4.65 |
| Glyptotendipes | 10 | 35.9 | 0.13 | 20 | 71.8 | 0.26 |
| Physa | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.13 |
| TOTAL BENTHOS | 7,720 | 27,700.0 | 100.00 | 7,740 | 27,771.8 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= C.S.S.C.,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 29JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 204 | 732.0 | 9.55 | 1 | 3.6 | 0.07 |
| Turbellaria | 624 | 2,239.0 | 29.21 | 2 | 7.2 | 0.15 |
| Oligochaeta | 577 | 2,070.3 | 27.01 | 725 | 2,601.4 | 52.69 |
| Helobdella stagnalis | 23 | 82.5 | 1.08 | 0 | 0.0 | 0.00 |
| Helobdella triserialis | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Mooreobdella microstoma | 1 | 3.6 | 0.05 | 0 | 0.0 | 0.00 |
| Caecidotea | 6 | 21.5 | 0.28 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 406 | 1,456.8 | 19.01 | 407 | 1,460.4 | 29.58 |
| Berosus | 1 | 3.6 | 0.05 | 0 | 0.0 | 0.00 |
| Chironomidae | 4 | 14.4 | 0.19 | 1 | 3.6 | 0.07 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.15 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 36 | 129.2 | 2.62 |
| Nanocladius distinctus | 36 | 129.2 | 1.69 | 71 | 254.8 | 5.16 |
| Dicretodipes simpsoni | 229 | 821.7 | 10.72 | 97 | 348.0 | 7.05 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.87 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.36 |
| Polypedilum scalaenum grp. | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Stenochironomus | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Xenochironomus xenolabis | 6 | 21.5 | 0.28 | 14 | 50.2 | 1.02 |
| Ferrissia | 2 | 7.2 | 0.09 | 3 | 10.8 | 0.22 |
| Corbicula fluminea | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 2,136 | 7,664.2 | 100.00 | 1,376 | 4,937.2 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= EWING AVE.,
 STATION= 49,
 and DATE= 01AUG03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 6,420 | 23,035.5 | 95.11 | 147 | 527.4 | 40.27 |
| Oligochaeta | 160 | 574.1 | 2.37 | 86 | 308.6 | 23.56 |
| Caecidotea | 30 | 107.6 | 0.44 | 3 | 10.8 | 0.82 |
| Gammarus fasciatus | 10 | 35.9 | 0.15 | 35 | 125.6 | 9.59 |
| Hydropsyche | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Hydropsyche orris | 10 | 35.9 | 0.15 | 0 | 0.0 | 0.00 |
| Chironomidae | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.82 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Cricotopus bicinctus grp. | 20 | 71.8 | 0.30 | 7 | 25.1 | 1.92 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 4 | 14.4 | 1.10 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.82 |
| Dicretodipes simpsoni | 20 | 71.8 | 0.30 | 10 | 35.9 | 2.74 |
| Glyptotendipes | 10 | 35.9 | 0.15 | 3 | 10.8 | 0.82 |
| Parachironomus | 10 | 35.9 | 0.15 | 2 | 7.2 | 0.55 |
| Polypedilum flavum | 50 | 179.4 | 0.74 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 10 | 35.9 | 0.15 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 59 | 211.7 | 16.16 |
| TOTAL BENTHOS | 6,750 | 24,219.6 | 100.00 | 365 | 1,309.7 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13,
 and DATE= 18JUN03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 340 | 1,219.9 | 5.75 | 116 | 416.2 | 6.58 |
| Turbellaria | 50 | 179.4 | 0.85 | 1 | 3.6 | 0.06 |
| Oligochaeta | 470 | 1,686.4 | 7.95 | 143 | 513.1 | 8.11 |
| Helobdella triserialis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Caecidotea | 20 | 71.8 | 0.34 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 40 | 143.5 | 0.68 | 267 | 958.0 | 15.14 |
| Stenacron | 0 | 0.0 | 0.00 | 14 | 50.2 | 0.79 |
| Stenonema integrum | 240 | 861.1 | 4.06 | 42 | 150.7 | 2.38 |
| Stenonema exiguum | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.11 |
| Tricorythodes | 30 | 107.6 | 0.51 | 0 | 0.0 | 0.00 |
| Caenis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Anthopotamus myops grp. | 30 | 107.6 | 0.51 | 4 | 14.4 | 0.23 |
| Hexagenia | 10 | 35.9 | 0.17 | 2 | 7.2 | 0.11 |
| Argia | 0 | 0.0 | 0.00 | 9 | 32.3 | 0.51 |
| Perlesta | 10 | 35.9 | 0.17 | 12 | 43.1 | 0.68 |
| Cyrnellus fraternus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.11 |
| Cheumatopsyche | 790 | 2,834.6 | 13.37 | 4 | 14.4 | 0.23 |
| Hydropsyche | 20 | 71.8 | 0.34 | 0 | 0.0 | 0.00 |
| Hydropsyche simulans | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Hydropsyche bidens | 10 | 35.9 | 0.17 | 0 | 0.0 | 0.00 |
| Potamyia flava | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.17 |
| Hydroptila | 10 | 35.9 | 0.17 | 0 | 0.0 | 0.00 |
| Macronychus glabratus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Stenelmis crenata grp. | 70 | 251.2 | 1.18 | 18 | 64.6 | 1.02 |
| Ceratopogonidae | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.57 |
| Chironomidae | 70 | 251.2 | 1.18 | 7 | 25.1 | 0.40 |
| Ablabesmyia janta | 40 | 143.5 | 0.68 | 0 | 0.0 | 0.00 |
| Thienemanniya grp. | 70 | 251.2 | 1.18 | 10 | 35.9 | 0.57 |
| Thienemanniella similis | 40 | 143.5 | 0.68 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 220 | 789.4 | 3.72 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 70 | 251.2 | 1.18 | 10 | 35.9 | 0.57 |
| Cricotopus sylvestris grp. | 190 | 681.7 | 3.21 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.57 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 135 | 484.4 | 7.65 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.57 |
| Glyptotendipes | 110 | 394.7 | 1.86 | 841 | 3,017.6 | 47.68 |
| Paracladopelma | 40 | 143.5 | 0.68 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 1,240 | 4,449.2 | 20.98 | 10 | 35.9 | 0.57 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 21 | 75.3 | 1.19 |
| Polypedilum scalaenum grp. | 70 | 251.2 | 1.18 | 31 | 111.2 | 1.76 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.57 |
| Rheotanytarsus | 1,610 | 5,776.8 | 27.24 | 10 | 35.9 | 0.57 |
| Physa | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.11 |
| Ferrissia | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.17 |
| TOTAL BENTHOS | 5,910 | 21,205.6 | 100.00 | 1,764 | 6,329.4 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 27JUN03

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|------|------|----|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 35.9 | 0.22 | -- | -- | -- |
| Turbellaria | 100 | 358.8 | 2.16 | -- | -- | -- |
| Oligochaeta | 40 | 143.5 | 0.87 | -- | -- | -- |
| Orconectes | 5 | 17.9 | 0.11 | -- | -- | -- |
| Baetis intercalaris | 165 | 592.0 | 3.57 | -- | -- | -- |
| Cheumatopsyche | 2,005 | 7,194.1 | 43.36 | -- | -- | -- |
| Hydropsyche | 20 | 71.8 | 0.43 | -- | -- | -- |
| Ceratopsyche morosa | 65 | 233.2 | 1.41 | -- | -- | -- |
| Macronychus glabratus | 5 | 17.9 | 0.11 | -- | -- | -- |
| Chironomidae | 10 | 35.9 | 0.22 | -- | -- | -- |
| Thienemanniya grp. | 20 | 71.8 | 0.43 | -- | -- | -- |
| Thienemanniella xena | 36 | 129.2 | 0.78 | -- | -- | -- |
| Cricotopus bicinctus grp. | 36 | 129.2 | 0.78 | -- | -- | -- |
| Nanocladius distinctus | 20 | 71.8 | 0.43 | -- | -- | -- |
| Nanocladius crassicornus/rectinervis | 36 | 129.2 | 0.78 | -- | -- | -- |
| Glyptotendipes | 20 | 71.8 | 0.43 | -- | -- | -- |
| Polypedilum flavum | 1,870 | 6,709.7 | 40.44 | -- | -- | -- |
| Polypedilum illinoense | 36 | 129.2 | 0.78 | -- | -- | -- |
| Rheotanytarsus | 110 | 394.7 | 2.38 | -- | -- | -- |
| Simulium | 10 | 35.9 | 0.22 | -- | -- | -- |
| Ferrissia | 5 | 17.9 | 0.11 | -- | -- | -- |
| TOTAL BENTHOS | 4,624 | 16,591.3 | 100.00 | -- | -- | -- |

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 07AUG03

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 7 | 25.1 | 1.22 | 0 | 0.0 | 0.00 |
| Turbellaria | 15 | 53.8 | 2.60 | 0 | 0.0 | 0.00 |
| Plumatella | 1 | 3.6 | 0.17 | 0 | 0.0 | 0.00 |
| Oligochaeta | 172 | 617.2 | 29.86 | 23 | 82.5 | 23.71 |
| Caecidotea | 8 | 28.7 | 1.39 | 5 | 17.9 | 5.15 |
| Gammarus | 1 | 3.6 | 0.17 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 0 | 0.0 | 0.00 | 2 | 7.2 | 2.06 |
| Stenacron | 84 | 301.4 | 14.58 | 1 | 3.6 | 1.03 |
| Tricorythodes | 2 | 7.2 | 0.35 | 0 | 0.0 | 0.00 |
| Argia | 51 | 183.0 | 8.85 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 7 | 25.1 | 7.22 |
| Stenelmis | 0 | 0.0 | 0.00 | 5 | 17.9 | 5.15 |
| Chironomidae | 6 | 21.5 | 1.04 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 41 | 147.1 | 7.12 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 8 | 28.7 | 1.39 | 1 | 3.6 | 1.03 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.03 |
| Thienemanniya grp. | 2 | 7.2 | 0.35 | 1 | 3.6 | 1.03 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 6 | 21.5 | 6.19 |
| Nanocladius distinctus | 8 | 28.7 | 1.39 | 4 | 14.4 | 4.12 |
| Nanocladius crassicornus/rectinervis | 4 | 14.4 | 0.69 | 2 | 7.2 | 2.06 |
| Rheocricotopus robacki | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.03 |
| Chironomus | 2 | 7.2 | 0.35 | 1 | 3.6 | 1.03 |
| Dicrotendipes simpsoni | 37 | 132.8 | 6.42 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 2 | 7.2 | 0.35 | 0 | 0.0 | 0.00 |
| Paracladopelma | 2 | 7.2 | 0.35 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 2 | 7.2 | 0.35 | 3 | 10.8 | 3.09 |
| Polypedilum illinoense | 8 | 28.7 | 1.39 | 26 | 93.3 | 26.80 |
| Polypedilum scalaenum grp. | 66 | 236.8 | 11.46 | 7 | 25.1 | 7.22 |
| Stenochironomus | 22 | 78.9 | 3.82 | 0 | 0.0 | 0.00 |
| Pleurocera | 9 | 32.3 | 1.56 | 0 | 0.0 | 0.00 |
| Physa | 0 | 0.0 | 0.00 | 1 | 3.6 | 1.03 |
| Ferrissia | 16 | 57.4 | 2.78 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 576 | 2,066.7 | 100.00 | 97 | 348.0 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= G.C.R.,
 LOCATION= BURNHAM AVE.,
 STATION= 86,
 and DATE= 03SEP03

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 124 | 444.9 | 94.66 | 152 | 545.4 | 87.36 |
| Helobdella stagnalis | 1 | 3.6 | 0.76 | 0 | 0.0 | 0.00 |
| Erpobdella punctata punctata | 2 | 7.2 | 1.53 | 0 | 0.0 | 0.00 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.57 |
| Chironomidae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.57 |
| Tanypus | 1 | 3.6 | 0.76 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.57 |
| Cricotopus bicinctus grp. | 1 | 3.6 | 0.76 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 2 | 7.2 | 1.53 | 8 | 28.7 | 4.60 |
| Parachironomus | 0 | 0.0 | 0.00 | 9 | 32.3 | 5.17 |
| Helisoma | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.15 |
| TOTAL BENTHOS | 131 | 470.0 | 100.00 | 174 | 624.3 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 09JUN03

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.17 |
| Turbellaria | 10 | 35.9 | 0.19 | 10 | 35.9 | 0.56 |
| Oligochaeta | 3,710 | 13,311.8 | 71.62 | 1,383 | 4,962.3 | 77.57 |
| Caecidotea | 690 | 2,475.8 | 13.32 | 210 | 753.5 | 11.78 |
| Gammarus | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Hydroptila | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.17 |
| Chironomidae | 40 | 143.5 | 0.77 | 6 | 21.5 | 0.34 |
| Cricotopus tremulus grp. | 450 | 1,614.6 | 8.69 | 13 | 46.6 | 0.73 |
| Cricotopus bicinctus grp. | 170 | 610.0 | 3.28 | 83 | 297.8 | 4.66 |
| Cricotopus sylvestris grp. | 100 | 358.8 | 1.93 | 59 | 211.7 | 3.31 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.17 |
| Physa | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.56 |
| TOTAL BENTHOS | 5,180 | 18,586.3 | 100.00 | 1,783 | 6,397.6 | 100.00 |

WATERWAY= L.C.R.,
 LOCATION= AHSLAND AVE.,
 STATION= 57,
 and DATE= 13AUG03

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|-------|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 257 | 922.1 | 13.76 | 371 | 1,331.2 | 31.52 |
| Turbellaria | 3 | 10.8 | 0.16 | 7 | 25.1 | 0.59 |
| Oligochaeta | 353 | 1,266.6 | 18.90 | 345 | 1,237.9 | 29.31 |
| Helobdella triserialis | 19 | 68.2 | 1.02 | 17 | 61.0 | 1.44 |
| Caecidotea | 81 | 290.6 | 4.34 | 37 | 132.8 | 3.14 |
| Gammarus | 1 | 3.6 | 0.05 | 5 | 17.9 | 0.42 |
| Stenacron | 1 | 3.6 | 0.05 | 3 | 10.8 | 0.25 |
| Enallagma | 1 | 3.6 | 0.05 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 7 | 25.1 | 0.37 | 1 | 3.6 | 0.08 |
| Hydropsyche betteni | 3 | 10.8 | 0.16 | 0 | 0.0 | 0.00 |
| Chironomidae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.08 |
| Ablabesmyia janta | 3 | 10.8 | 0.16 | 1 | 3.6 | 0.08 |
| Thienemannimyia grp. | 29 | 104.1 | 1.55 | 3 | 10.8 | 0.25 |
| Corynoneura | 3 | 10.8 | 0.16 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.08 |
| Nanocladius distinctus | 2 | 7.2 | 0.11 | 6 | 21.5 | 0.51 |
| Nanocladius crassicornus/rectinervis | 5 | 17.9 | 0.27 | 1 | 3.6 | 0.08 |
| Rheocricotopus robacki | 2 | 7.2 | 0.11 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.08 |
| Cryptochironomus | 2 | 7.2 | 0.11 | 4 | 14.4 | 0.34 |
| Dicrotendipes neomodestus | 3 | 10.8 | 0.16 | 2 | 7.2 | 0.17 |
| Dicrotendipes simpsoni | 43 | 154.3 | 2.30 | 23 | 82.5 | 1.95 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.17 |
| Parachironomus | 2 | 7.2 | 0.11 | 1 | 3.6 | 0.08 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= L.C.R.,
LOCATION= AHLAND AVE.,
STATION= 57,
and DATE= 13AUG03

| TAXA (cont.) | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Polypedilum fallax grp. | 5 | 17.9 | 0.27 | 2 | 7.2 | 0.17 |
| Polypedilum illinoense | 32 | 114.8 | 1.71 | 14 | 50.2 | 1.19 |
| Polypedilum scalaenum grp. | 11 | 39.5 | 0.59 | 8 | 28.7 | 0.68 |
| Paratanytarsus | 9 | 32.3 | 0.48 | 2 | 7.2 | 0.17 |
| Physa | 5 | 17.9 | 0.27 | 19 | 68.2 | 1.61 |
| Helisoma | 0 | 0.0 | 0.00 | 22 | 78.9 | 1.87 |
| Ferrissia | 986 | 3,537.9 | 52.78 | 278 | 997.5 | 23.62 |
| TOTAL BENTHOS | 1,868 | 6,702.5 | 100.00 | 1,177 | 4,223.2 | 100.00 |

WATERWAY= L.C.R.,
LOCATION= HALSTED ST.,
STATION= 76,
and DATE= 11JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 1,940 | 6,960.9 | 43.99 | 261 | 936.5 | 26.26 |
| Turbellaria | 5 | 17.9 | 0.11 | 0 | 0.0 | 0.00 |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Oligochaeta | 2,070 | 7,427.3 | 46.94 | 176 | 631.5 | 17.71 |
| Mooreobdella microstoma | 10 | 35.9 | 0.23 | 0 | 0.0 | 0.00 |
| Caecidotea | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.50 |
| Gammarus fasciatus | 55 | 197.3 | 1.25 | 53 | 190.2 | 5.33 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Chironomidae | 10 | 35.9 | 0.23 | 17 | 61.0 | 1.71 |
| Cricotopus bicinctus grp. | 10 | 35.9 | 0.23 | 28 | 100.5 | 2.82 |
| Cricotopus sylvestris grp. | 20 | 71.8 | 0.45 | 80 | 287.0 | 8.05 |
| Nanocladius distinctus | 15 | 53.8 | 0.34 | 75 | 269.1 | 7.55 |
| Chironomus | 15 | 53.8 | 0.34 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 140 | 502.3 | 3.17 | 269 | 965.2 | 27.06 |
| Glyptotendipes | 15 | 53.8 | 0.34 | 9 | 32.3 | 0.91 |
| Parachironomus | 5 | 17.9 | 0.11 | 9 | 32.3 | 0.91 |
| Polypedilum illinoense | 5 | 17.9 | 0.11 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 5 | 17.9 | 0.11 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 5 | 17.9 | 0.11 | 9 | 32.3 | 0.91 |
| Amnicola | 5 | 17.9 | 0.11 | 0 | 0.0 | 0.00 |
| Physa | 80 | 287.0 | 1.81 | 1 | 3.6 | 0.10 |
| TOTAL BENTHOS | 4,410 | 15,823.5 | 100.00 | 994 | 3,566.6 | 100.00 |

WATERWAY= L.C.R., LOCATION= INDIANA AVE.,
STATION= 56,
and DATE= 14JUL03

| TAXA | CENTER | | | SIDE | | | |
|----------------------------|--------|---------|--------|-------|---------|--------|------|
| | # | #/m2 | % | # | #/m2 | % | |
| Hydra | 1,190 | 4,269.8 | 55.56 | 14 | 50.2 | 1.17 | |
| Turbellaria | 0 | 0.0 | 0.00 | 32 | 114.8 | 2.68 | |
| Oligochaeta | 653 | 2,343.0 | 30.49 | 620 | 2,224.6 | 51.93 | |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.17 | |
| Gammarus | 13 | 46.6 | 0.61 | 8 | 28.7 | 0.67 | |
| Caenis | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.17 | |
| Cyrnellus fraternus | 7 | 25.1 | 0.33 | 72 | 258.3 | 6.03 | |
| Potamyia flava | 0 | 0.0 | 0.00 | 0.00 | 2 | 7.2 | 0.17 |
| Chironomidae | 20 | 71.8 | 0.93 | 18 | 64.6 | 1.51 | |
| Procladius (Holotanypus) | 10 | 35.9 | 0.47 | 8 | 28.7 | 0.67 | |
| Nanocladius distinctus | 17 | 61.0 | 0.79 | 22 | 78.9 | 1.84 | |
| Chironomus | 23 | 82.5 | 1.07 | 22 | 78.9 | 1.84 | |
| Dicrotendipes neomodestus | 3 | 10.8 | 0.14 | 12 | 43.1 | 1.01 | |
| Dicrotendipes simpsoni | 43 | 154.3 | 2.01 | 110 | 394.7 | 9.21 | |
| Glyptotendipes | 150 | 538.2 | 7.00 | 206 | 739.1 | 17.25 | |
| Parachironomus | 10 | 35.9 | 0.47 | 0 | 0.0 | 0.00 | |
| Polypedilum scalaenum grp. | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 | |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 44 | 157.9 | 3.69 | |
| TOTAL BENTHOS | 2,142 | 7,685.7 | 100.00 | 1,194 | 4,284.2 | 100.00 | |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= L.C.R.,
 LOCATION= WENTWORTH AVE.,
 STATION= 52,
 and DATE= 08SEP03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 3 | 10.8 | 0.15 | 7 | 25.1 | 0.48 |
| Turbellaria | 1,430 | 5,131.0 | 70.51 | 1,137 | 4,079.7 | 77.45 |
| Oligochaeta | 337 | 1,209.2 | 16.62 | 183 | 656.6 | 12.47 |
| Helobdella triserialis | 3 | 10.8 | 0.15 | 3 | 10.8 | 0.20 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.20 |
| Caecidotea | 20 | 71.8 | 0.99 | 43 | 154.3 | 2.93 |
| Gammarus | 7 | 25.1 | 0.35 | 23 | 82.5 | 1.57 |
| Argia | 3 | 10.8 | 0.15 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 13 | 46.6 | 0.64 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 7 | 25.1 | 0.35 | 3 | 10.8 | 0.20 |
| Nanocladius distinctus | 7 | 25.1 | 0.35 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 3 | 10.8 | 0.15 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 23 | 82.5 | 1.57 |
| Polypedilum flavum | 3 | 10.8 | 0.15 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 183 | 656.6 | 9.02 | 3 | 10.8 | 0.20 |
| Paratanytarsus | 3 | 10.8 | 0.15 | 0 | 0.0 | 0.00 |
| Tanytarsus | 3 | 10.8 | 0.15 | 0 | 0.0 | 0.00 |
| Physa | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.48 |
| Helisoma | 3 | 10.8 | 0.15 | 20 | 71.8 | 1.36 |
| Ferrissia | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.68 |
| Pisidium | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.20 |
| TOTAL BENTHOS | 2,028 | 7,276.6 | 100.00 | 1,468 | 5,267.3 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 06AUG03

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 4 | 14.4 | 0.29 | 4 | 14.4 | 0.43 |
| Turbellaria | 114 | 409.0 | 8.36 | 18 | 64.6 | 1.92 |
| Oligochaeta | 55 | 197.3 | 4.03 | 41 | 147.1 | 4.38 |
| Helobdella triserialis | 2 | 7.2 | 0.15 | 37 | 132.8 | 3.95 |
| Erpobdella punctata punctata | 1 | 3.6 | 0.07 | 1 | 3.6 | 0.11 |
| Caecidotea | 1,075 | 3,857.2 | 78.81 | 681 | 2,443.5 | 72.68 |
| Baetis intercalaris | 3 | 10.8 | 0.22 | 0 | 0.0 | 0.00 |
| Stenacron | 2 | 7.2 | 0.15 | 4 | 14.4 | 0.43 |
| Argia | 1 | 3.6 | 0.07 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 6 | 21.5 | 0.44 | 1 | 3.6 | 0.11 |
| Hydropsyche betteni | 4 | 14.4 | 0.29 | 1 | 3.6 | 0.11 |
| Ceraclea | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.11 |
| Chironomidae | 1 | 3.6 | 0.07 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 4 | 14.4 | 0.29 | 4 | 14.4 | 0.43 |
| Corynoneura | 4 | 14.4 | 0.29 | 4 | 14.4 | 0.43 |
| Cricotopus bicinctus grp. | 2 | 7.2 | 0.15 | 4 | 14.4 | 0.43 |
| Nanocladius distinctus | 4 | 14.4 | 0.29 | 2 | 7.2 | 0.21 |
| Nanocladius crassicornus/rectinervis | 2 | 7.2 | 0.15 | 2 | 7.2 | 0.21 |
| Chironomus | 1 | 3.6 | 0.07 | 1 | 3.6 | 0.11 |
| Dicrotendipes | 3 | 10.8 | 0.22 | 4 | 14.4 | 0.43 |
| Dicrotendipes simpsoni | 1 | 3.6 | 0.07 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 1 | 3.6 | 0.07 | 0 | 0.0 | 0.00 |
| Phaenopsectra punctipes | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.11 |
| Polypedilum illinoense | 10 | 35.9 | 0.73 | 11 | 39.5 | 1.17 |
| Polypedilum scalaenum grp. | 6 | 21.5 | 0.44 | 4 | 14.4 | 0.43 |
| Paratanytarsus | 2 | 7.2 | 0.15 | 2 | 7.2 | 0.21 |
| Tanytarsus | 1 | 3.6 | 0.07 | 2 | 7.2 | 0.21 |
| Xenochironomus xenolabis | 15 | 53.8 | 1.10 | 16 | 57.4 | 1.71 |
| Physa | 1 | 3.6 | 0.07 | 6 | 21.5 | 0.64 |
| Helisoma | 4 | 14.4 | 0.29 | 0 | 0.0 | 0.00 |
| Ferrissia | 34 | 122.0 | 2.49 | 85 | 305.0 | 9.07 |
| Musculium | 1 | 3.6 | 0.07 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,364 | 4,894.2 | 100.00 | 937 | 3,362.0 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= N.B.C.R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 23JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------------|-----------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1,155 | 4,144.2 | 32.81 | 60 | 215.3 | 0.65 |
| Oligochaeta | 2,195 | 7,875.9 | 62.36 | 8,320 | 29,852.9 | 89.66 |
| Helobdella triserialis | 5 | 17.9 | 0.14 | 10 | 35.9 | 0.11 |
| Mooreobdella microstoma | 5 | 17.9 | 0.14 | 0 | 0.0 | 0.00 |
| Caecidotea | 65 | 233.2 | 1.85 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.11 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.22 |
| Cricotopus sylvestris grp. | 5 | 17.9 | 0.14 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 15 | 53.8 | 0.43 | 140 | 502.3 | 1.51 |
| Dicrotendipes simpsoni | 70 | 251.2 | 1.99 | 700 | 2,511.7 | 7.54 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.11 |
| Parachironomus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.11 |
| Polypedilum illinoense | 5 | 17.9 | 0.14 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 3,520 | 12,630.1 | 100.00 | 9,280 | 33,297.5 | 100.00 |

WATERWAY= N.S.C.,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 24JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------------|-----------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 2,505 | 8,988.2 | 58.60 | 1,255 | 4,503.0 | 22.11 |
| Oligochaeta | 1,455 | 5,220.7 | 34.04 | 3,325 | 11,930.4 | 58.59 |
| Caecidotea | 0 | 0.0 | 0.00 | 45 | 161.5 | 0.79 |
| Gammarus | 5 | 17.9 | 0.12 | 530 | 1,901.7 | 9.34 |
| Chironomidae | 0 | 0.0 | 0.00 | 25 | 89.7 | 0.44 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 40 | 143.5 | 0.70 |
| Nanocladius distinctus | 15 | 53.8 | 0.35 | 0 | 0.0 | 0.00 |
| Chironomus | 5 | 17.9 | 0.12 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 290 | 1,040.5 | 6.78 | 220 | 789.4 | 3.88 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 200 | 717.6 | 3.52 |
| Parachironomus | 0 | 0.0 | 0.00 | 35 | 125.6 | 0.62 |
| TOTAL BENTHOS | 4,275 | 15,339.1 | 100.00 | 5,675 | 20,362.4 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 10JUN03

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|-------|-------|----------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 3,120 | 11,194.8 | 40.26 | 2,360 | 8,467.9 | 29.28 |
| Turbellaria | 20 | 71.8 | 0.26 | 0 | 0.0 | 0.00 |
| Oligochaeta | 4,120 | 14,782.9 | 53.16 | 4,910 | 17,617.5 | 60.92 |
| Caecidotea | 100 | 358.8 | 1.29 | 40 | 143.5 | 0.50 |
| Orconectes virilis | 20 | 71.8 | 0.26 | 0 | 0.0 | 0.00 |
| Caenis | 0 | 0.0 | 0.00 | 100 | 358.8 | 1.24 |
| Argia | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Stenelmis | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Ceratopogonidae | 10 | 35.9 | 0.13 | 30 | 107.6 | 0.37 |
| Chironomidae | 40 | 143.5 | 0.52 | 30 | 107.6 | 0.37 |
| Procladius (Holotanypus) | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 10 | 35.9 | 0.13 | 20 | 71.8 | 0.25 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.25 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.37 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.25 |
| Chironomus | 10 | 35.9 | 0.13 | 10 | 35.9 | 0.12 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.25 |
| Dicrotendipes fumidus | 40 | 143.5 | 0.52 | 20 | 71.8 | 0.25 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.25 |
| Parachironomus | 80 | 287.0 | 1.03 | 140 | 502.3 | 1.74 |
| Polypedilum illinoense | 10 | 35.9 | 0.13 | 10 | 35.9 | 0.12 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 10JUN03

| TAXA (cont.) | CENTER | | | SIDE | | |
|-----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Polypedilum scalaenum grp. | 80 | 287.0 | 1.03 | 170 | 610.0 | 2.11 |
| Tribelos fuscicorne | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.37 |
| Tanytarsus glabrescens grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.25 |
| Physa | 10 | 35.9 | 0.13 | 10 | 35.9 | 0.12 |
| Helisoma | 40 | 143.5 | 0.52 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.12 |
| TOTAL BENTHOS | 7,750 | 27,807.7 | 100.00 | 8,060 | 28,920.0 | 100.00 |

WATERWAY= THORN CR.,
 LOCATION= 170TH ST.,
 STATION= 97,
 and DATE= 09JUL03

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 76 | 272.7 | 7.20 | 2 | 7.2 | 0.26 |
| Turbellaria | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Oligochaeta | 458 | 1,643.3 | 43.41 | 481 | 1,725.9 | 62.88 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.13 |
| Caecidotea | 39 | 139.9 | 3.70 | 85 | 305.0 | 11.11 |
| Stenacron | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.13 |
| Argia | 2 | 7.2 | 0.19 | 1 | 3.6 | 0.13 |
| Perlesta | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 335 | 1,202.0 | 31.75 | 65 | 233.2 | 8.50 |
| Hydropsyche betteni | 8 | 28.7 | 0.76 | 0 | 0.0 | 0.00 |
| Ancyronyx variegata | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Paracymus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.13 |
| Atrichopogon | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Chironomidae | 2 | 7.2 | 0.19 | 17 | 61.0 | 2.22 |
| Ablabesmyia mallochii | 3 | 10.8 | 0.28 | 1 | 3.6 | 0.13 |
| Thienemannimyia grp. | 2 | 7.2 | 0.19 | 5 | 17.9 | 0.65 |
| Corynoneura | 2 | 7.2 | 0.19 | 3 | 10.8 | 0.39 |
| Thienemanniella xena | 3 | 10.8 | 0.28 | 15 | 53.8 | 1.96 |
| Euryhopsis | 1 | 3.6 | 0.09 | 3 | 10.8 | 0.39 |
| Nanocladius distinctus | 3 | 10.8 | 0.28 | 0 | 0.0 | 0.00 |
| Nanocladius crassicornus/rectinervis | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 29 | 104.1 | 2.75 | 37 | 132.8 | 4.84 |
| Chironomus | 10 | 35.9 | 0.95 | 10 | 35.9 | 1.31 |
| Cryptochironomus | 3 | 10.8 | 0.28 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 1 | 3.6 | 0.09 | 2 | 7.2 | 0.26 |
| Polypedilum fallax grp. | 2 | 7.2 | 0.19 | 8 | 28.7 | 1.05 |
| Polypedilum illinoense | 4 | 14.4 | 0.38 | 9 | 32.3 | 1.18 |
| Polypedilum scalaenum grp. | 5 | 17.9 | 0.47 | 11 | 39.5 | 1.44 |
| Paratanytarsus | 2 | 7.2 | 0.19 | 4 | 14.4 | 0.52 |
| Tanytarsus | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Culicidae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.13 |
| Simulium | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.13 |
| Tipula | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.13 |
| Physa | 12 | 43.1 | 1.14 | 0 | 0.0 | 0.00 |
| Ferrissia | 44 | 157.9 | 4.17 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 3 | 10.8 | 0.28 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,055 | 3,785.4 | 100.00 | 765 | 2,744.9 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= THORN CR.,
 LOCATION= JOE ORR RD.,
 STATION= 54,
 and DATE= 12AUG03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 17 | 61.0 | 0.71 | 2 | 7.2 | 0.24 |
| Oligochaeta | 1,020 | 3,659.8 | 42.71 | 8 | 28.7 | 0.97 |
| Caecidotea | 40 | 143.5 | 1.68 | 19 | 68.2 | 2.31 |
| Cheumatopsyche | 33 | 118.4 | 1.38 | 5 | 17.9 | 0.61 |
| Hydropsyche betteni | 33 | 118.4 | 1.38 | 4 | 14.4 | 0.49 |
| Chironomidae | 87 | 312.2 | 3.64 | 29 | 104.1 | 3.53 |
| Ablabesmyia mallochii | 10 | 35.9 | 0.42 | 0 | 0.0 | 0.00 |
| Thienemanniomyia grp. | 47 | 168.6 | 1.97 | 7 | 25.1 | 0.85 |
| Corynoneura | 57 | 204.5 | 2.39 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 227 | 814.5 | 9.51 | 47 | 168.6 | 5.72 |
| Cricotopus bicinctus grp. | 27 | 96.9 | 1.13 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 20 | 71.8 | 0.84 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 10 | 35.9 | 0.42 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 47 | 168.6 | 1.97 | 0 | 0.0 | 0.00 |
| Chironomus | 143 | 513.1 | 5.99 | 7 | 25.1 | 0.85 |
| Cryptochironomus | 10 | 35.9 | 0.42 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 20 | 71.8 | 0.84 | 7 | 25.1 | 0.85 |
| Dicrotendipes simpsoni | 10 | 35.9 | 0.42 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 10 | 35.9 | 0.42 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 313 | 1,123.1 | 13.11 | 514 | 1,844.3 | 62.53 |
| Polypedilum scalaenum grp. | 10 | 35.9 | 0.42 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 27 | 96.9 | 1.13 | 80 | 287.0 | 9.73 |
| Simulium | 33 | 118.4 | 1.38 | 0 | 0.0 | 0.00 |
| Physa | 17 | 61.0 | 0.71 | 0 | 0.0 | 0.00 |
| Ferrissia | 120 | 430.6 | 5.03 | 93 | 333.7 | 11.31 |
| TOTAL BENTHOS | 2,388 | 8,568.4 | 100.00 | 822 | 2,949.4 | 100.00 |

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 11JUN03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 20 | 71.8 | 0.25 | 0 | 0.0 | 0.00 |
| Oligochaeta | 5,290 | 18,981.0 | 67.30 | 7,230 | 25,941.9 | 76.19 |
| Caecidotea | 40 | 143.5 | 0.51 | 20 | 71.8 | 0.21 |
| Argia | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.21 |
| Cheumatopsyche | 100 | 358.8 | 1.27 | 10 | 35.9 | 0.11 |
| Chironomidae | 60 | 215.3 | 0.76 | 70 | 251.2 | 0.74 |
| Thienemanniomyia grp. | 40 | 143.5 | 0.51 | 40 | 143.5 | 0.42 |
| Thienemanniella xena | 60 | 215.3 | 0.76 | 20 | 71.8 | 0.21 |
| Cricotopus tremulus grp. | 60 | 215.3 | 0.76 | 20 | 71.8 | 0.21 |
| Cricotopus bicinctus grp. | 230 | 825.3 | 2.93 | 250 | 897.0 | 2.63 |
| Cricotopus sylvestris grp. | 330 | 1,184.1 | 4.20 | 310 | 1,112.3 | 3.27 |
| Chironomus | 180 | 645.9 | 2.29 | 230 | 825.3 | 2.42 |
| Dicrotendipes neomodestus | 20 | 71.8 | 0.25 | 40 | 143.5 | 0.42 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 80 | 287.0 | 0.84 |
| Endochironomus nigricans | 20 | 71.8 | 0.25 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 580 | 2,081.1 | 7.38 | 800 | 2,870.5 | 8.43 |
| Polypedilum flavum | 140 | 502.3 | 1.78 | 40 | 143.5 | 0.42 |
| Polypedilum illinoense | 80 | 287.0 | 1.02 | 60 | 215.3 | 0.63 |
| Polypedilum scalaenum grp. | 60 | 215.3 | 0.76 | 20 | 71.8 | 0.21 |
| Paratanytarsus | 80 | 287.0 | 1.02 | 120 | 430.6 | 1.26 |
| Tanytarsus | 60 | 215.3 | 0.76 | 0 | 0.0 | 0.00 |
| Simulium | 380 | 1,363.5 | 4.83 | 100 | 358.8 | 1.05 |
| Physa | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Helisoma | 20 | 71.8 | 0.25 | 10 | 35.9 | 0.11 |
| TOTAL BENTHOS | 7,860 | 28,202.4 | 100.00 | 9,490 | 34,051.0 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= C.S.C.,
 LOCATION= ASHLAND AVE.,
 STATION= 58,
 and DATE= 05SEP03

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 1,155 | 16,578.0 | 99.48 | 4,970 | 71,335.7 | 99.40 |
| Procladius (Holotanypus) | 3 | 43.1 | 0.26 | 30 | 430.6 | 0.60 |
| Pisidium | 3 | 43.1 | 0.26 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,161 | 16,664.1 | 100.00 | 5,000 | 71,766.3 | 100.00 |

WATERWAY= C.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 31JUL03

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 289 | 4,148.1 | 87.05 | 299 | 4,291.6 | 96.45 |
| Procladius (Holotanypus) | 42 | 602.8 | 12.65 | 6 | 86.1 | 1.94 |
| Dicrotendipes simpsoni | 1 | 14.4 | 0.30 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.65 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.97 |
| TOTAL BENTHOS | 332 | 4,765.3 | 100.00 | 310 | 4,449.5 | 100.00 |

WATERWAY= C.S.C.,
 LOCATION= ROUTE 83,
 STATION= 43,
 and DATE= 30JUL03

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 796 | 11,425.2 | 82.83 | 759 | 10,894.1 | 90.14 |
| Mooreobdella microstoma | 1 | 14.4 | 0.10 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 162 | 2,325.2 | 16.86 | 80 | 1,148.3 | 9.50 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.24 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.12 |
| Tanytarsus | 2 | 28.7 | 0.21 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 961 | 13,793.5 | 100.00 | 842 | 12,085.5 | 100.00 |

WATERWAY= C.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 18JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 3 | 43.1 | 10.34 |
| Oligochaeta | 61 | 875.5 | 96.83 | 21 | 301.4 | 72.41 |
| Helobdella triserialis | 0 | 0.0 | 0.00 | 1 | 14.4 | 3.45 |
| Procladius (Holotanypus) | 1 | 14.4 | 1.59 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 3.45 |
| Tipulidae | 1 | 14.4 | 1.59 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 43.1 | 10.34 |
| TOTAL BENTHOS | 63 | 904.3 | 100.00 | 29 | 416.2 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= C.S.S.C.,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 21JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 267 | 3,832.3 | 98.16 | 3,160 | 45,356.3 | 98.14 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.31 |
| Cricotopus sylvestris grp. | 1 | 14.4 | 0.37 | 0 | 0.0 | 0.00 |
| Chironomus | 4 | 57.4 | 1.47 | 50 | 717.7 | 1.55 |
| TOTAL BENTHOS | 272 | 3,904.1 | 100.00 | 3,220 | 46,217.5 | 100.00 |

WATERWAY= C.S.S.C.,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 29JUL03

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|-----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 9,430 | 135,351.3 | 98.95 | 6,180 | 88,703.2 | 97.78 |
| Gammarus fasciatus | 20 | 287.1 | 0.21 | 20 | 287.1 | 0.32 |
| Chironomidae | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.16 |
| Procladius (Holotanypus) | 80 | 1,148.3 | 0.84 | 100 | 1,435.3 | 1.58 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.16 |
| TOTAL BENTHOS | 9,530 | 136,786.7 | 100.00 | 6,320 | 90,712.7 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 08AUG03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 130 | 1,865.9 | 94.89 | 49 | 703.3 | 84.48 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.72 |
| Chironomidae | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.72 |
| Procladius (Holotanypus) | 1 | 14.4 | 0.73 | 1 | 14.4 | 1.72 |
| Coelotanypus | 4 | 57.4 | 2.92 | 0 | 0.0 | 0.00 |
| Chironomus | 1 | 14.4 | 0.73 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.72 |
| Microchironomus | 1 | 14.4 | 0.73 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 5 | 71.8 | 8.62 |
| TOTAL BENTHOS | 137 | 1,966.4 | 100.00 | 58 | 832.5 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= EWING AVE.,
 STATION= 49,
 and DATE= 01AUG03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 0 | 0.0 | 0.00 | 205 | 2,942.4 | 93.61 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.46 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.91 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 3 | 43.1 | 1.37 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.46 |
| Rheocricotopus robacki | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.46 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.46 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.91 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.46 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.46 |
| Xenochironomus xenolabis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.46 |
| Dreissena polymorpha | 5 | 71.8 | 100.00 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 5 | 71.8 | 100.00 | 219 | 3,143.4 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13,
 and DATE= 18JUN03

| TAXA | CENTER | | | SIDE | | |
|----------------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 46 | 660.3 | 10.02 | 6 | 86.1 | 12.24 |
| Gammarus fasciatus | 8 | 114.8 | 1.74 | 0 | 0.0 | 0.00 |
| Hexagenia | 7 | 100.5 | 1.53 | 0 | 0.0 | 0.00 |
| Dubiraphia | 1 | 14.4 | 0.22 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 17 | 244.0 | 3.70 | 3 | 43.1 | 6.12 |
| Ceratopogonidae | 0 | 0.0 | 0.00 | 5 | 71.8 | 10.20 |
| Cricotopus bicinctus grp. | 10 | 143.5 | 2.18 | 1 | 14.4 | 2.04 |
| Cladopelma | 3 | 43.1 | 0.65 | 1 | 14.4 | 2.04 |
| Cryptochironomus | 19 | 272.7 | 4.14 | 6 | 86.1 | 12.24 |
| Dicrotendipes neomodestus | 16 | 229.7 | 3.49 | 3 | 43.1 | 6.12 |
| Glyptotendipes | 3 | 43.1 | 0.65 | 0 | 0.0 | 0.00 |
| Microtendipes | 16 | 229.7 | 3.49 | 0 | 0.0 | 0.00 |
| Paracladopelma | 73 | 1,047.8 | 15.90 | 1 | 14.4 | 2.04 |
| Polypedilum flavum | 3 | 43.1 | 0.65 | 1 | 14.4 | 2.04 |
| Polypedilum scalaenum grp. | 124 | 1,779.8 | 27.02 | 0 | 0.0 | 0.00 |
| Saetheria | 6 | 86.1 | 1.31 | 0 | 0.0 | 0.00 |
| Stictochironomus | 3 | 43.1 | 0.65 | 0 | 0.0 | 0.00 |
| Tribelos fuscicorne | 0 | 0.0 | 0.00 | 1 | 14.4 | 2.04 |
| Cladotanytarsus mancus grp. | 0 | 0.0 | 0.00 | 3 | 43.1 | 6.12 |
| Cladotanytarsus vanderwulpi grp. | 19 | 272.7 | 4.14 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 6 | 86.1 | 1.31 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 3 | 43.1 | 0.65 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 76 | 1,090.8 | 16.56 | 18 | 258.4 | 36.73 |
| TOTAL BENTHOS | 459 | 6,588.2 | 100.00 | 49 | 703.3 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 27JUN03

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 30 | 430.6 | 0.60 | 0 | 0.0 | 0.00 |
| Oligochaeta | 3,140 | 45,069.3 | 62.30 | 938 | 13,463.4 | 54.69 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 13 | 186.6 | 0.76 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.17 |
| Caecidotea | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.58 |
| Gammarus fasciatus | 250 | 3,588.3 | 4.96 | 255 | 3,660.1 | 14.87 |
| Baetis intercalaris | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.17 |
| Tricorythodes | 10 | 143.5 | 0.20 | 0 | 0.0 | 0.00 |
| Caenis | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.17 |
| Cheumatopsyche | 310 | 4,449.5 | 6.15 | 8 | 114.8 | 0.47 |
| Stenelmis | 10 | 143.5 | 0.20 | 0 | 0.0 | 0.00 |
| Chironomidae | 60 | 861.2 | 1.19 | 8 | 114.8 | 0.47 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 15 | 215.3 | 0.87 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.58 |
| Thienemanniella xena | 10 | 143.5 | 0.20 | 0 | 0.0 | 0.00 |
| Thienemanniella similis | 10 | 143.5 | 0.20 | 15 | 215.3 | 0.87 |
| Cricotopus bicinctus grp. | 140 | 2,009.5 | 2.78 | 5 | 71.8 | 0.29 |
| Cricotopus trifascia grp. | 20 | 287.1 | 0.40 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 20 | 287.1 | 0.40 | 0 | 0.0 | 0.00 |
| Chironomus | 190 | 2,727.1 | 3.77 | 388 | 5,569.1 | 22.62 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.58 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.29 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.58 |
| Polypedilum flavum | 730 | 10,477.9 | 14.48 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 10 | 143.5 | 0.20 | 5 | 71.8 | 0.29 |
| Rheotanytarsus | 70 | 1,004.7 | 1.39 | 0 | 0.0 | 0.00 |
| Tanytarsus guerlus grp. | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.29 |
| Physa | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.17 |
| Ferrissia | 20 | 287.1 | 0.40 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.17 |
| Musculium | 10 | 143.5 | 0.20 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 5,040 | 72,340.5 | 100.00 | 1,715 | 24,615.9 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 07AUG03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 34 | 488.0 | 24.11 | 0 | 0.0 | 0.00 |
| Oligochaeta | 9 | 129.2 | 6.38 | 270 | 3,875.4 | 94.08 |
| Helobdella stagnalis | 1 | 14.4 | 0.71 | 0 | 0.0 | 0.00 |
| Caecidotea | 5 | 71.8 | 3.55 | 2 | 28.7 | 0.70 |
| Gammarus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Tricorythodes | 9 | 129.2 | 6.38 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 15 | 215.3 | 10.64 | 0 | 0.0 | 0.00 |
| Stenelmis | 4 | 57.4 | 2.84 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 9 | 129.2 | 3.14 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Thienemannimyia grp. | 2 | 28.7 | 1.42 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.70 |
| Cryptochironomus | 3 | 43.1 | 2.13 | 1 | 14.4 | 0.35 |
| Polypedilum flavum | 2 | 28.7 | 1.42 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 24 | 344.5 | 17.02 | 0 | 0.0 | 0.00 |
| Amnicola | 1 | 14.4 | 0.71 | 0 | 0.0 | 0.00 |
| Pleurocera | 11 | 157.9 | 7.80 | 0 | 0.0 | 0.00 |
| Ferrissia | 1 | 14.4 | 0.71 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 6 | 86.1 | 4.26 | 1 | 14.4 | 0.35 |
| Pisidium | 14 | 200.9 | 9.93 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 141 | 2,023.8 | 100.00 | 287 | 4,119.4 | 100.00 |

WATERWAY= G.C.R.,
 LOCATION= BURNHAM AVE.,
 STATION= 86,
 and DATE= 03SEP03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 526 | 7,549.8 | 93.59 | 253 | 3,631.4 | 95.47 |
| Enallagma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.38 |
| Chironomidae | 1 | 14.4 | 0.18 | 0 | 0.0 | 0.00 |
| Tanytus | 27 | 387.5 | 4.80 | 4 | 57.4 | 1.51 |
| Cricotopus sylvestris grp. | 4 | 57.4 | 0.71 | 3 | 43.1 | 1.13 |
| Dicrotendipes neomodestus | 1 | 14.4 | 0.18 | 0 | 0.0 | 0.00 |
| Parachironomus | 3 | 43.1 | 0.53 | 4 | 57.4 | 1.51 |
| TOTAL BENTHOS | 562 | 8,066.5 | 100.00 | 265 | 3,803.6 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 09JUN03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.27 |
| Turbellaria | 1 | 14.4 | 0.04 | 0 | 0.0 | 0.00 |
| Oligochaeta | 1,483 | 21,285.9 | 63.98 | 1,630 | 23,395.8 | 87.35 |
| Caecidotea | 451 | 6,473.3 | 19.46 | 110 | 1,578.9 | 5.89 |
| Orconectes | 1 | 14.4 | 0.04 | 0 | 0.0 | 0.00 |
| Hydroptila | 3 | 43.1 | 0.13 | 0 | 0.0 | 0.00 |
| Chironomidae | 51 | 732.0 | 2.20 | 15 | 215.3 | 0.80 |
| Cricotopus tremulus grp. | 139 | 1,995.1 | 6.00 | 10 | 143.5 | 0.54 |
| Cricotopus bicinctus grp. | 96 | 1,377.9 | 4.14 | 25 | 358.8 | 1.34 |
| Cricotopus sylvestris grp. | 68 | 976.0 | 2.93 | 0 | 0.0 | 0.00 |
| Chironomus | 6 | 86.1 | 0.26 | 55 | 789.4 | 2.95 |
| Dicrotendipes neomodestus | 9 | 129.2 | 0.39 | 5 | 71.8 | 0.27 |
| Glyptotendipes | 3 | 43.1 | 0.13 | 0 | 0.0 | 0.00 |
| Parachironomus | 3 | 43.1 | 0.13 | 1 | 14.4 | 0.05 |
| Physa | 3 | 43.1 | 0.13 | 10 | 143.5 | 0.54 |
| Pisidium | 1 | 14.4 | 0.04 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 2,318 | 33,270.9 | 100.00 | 1,866 | 26,783.2 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= L.C.R.,
 LOCATION= AHSLAND AVE.,
 STATION= 57,
 and DATE= 13AUG03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 623 | 8,942.1 | 94.82 | 3,201 | 45,944.8 | 99.44 |
| Helobdella stagnalis | 1 | 14.4 | 0.15 | 0 | 0.0 | 0.00 |
| Helobdella triserialis | 1 | 14.4 | 0.15 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1 | 14.4 | 0.15 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.09 |
| Cryptochironomus | 4 | 57.4 | 0.61 | 3 | 43.1 | 0.09 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.06 |
| Polypedilum illinoense | 16 | 229.7 | 2.44 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 4 | 57.4 | 0.61 | 0 | 0.0 | 0.00 |
| Ferrissia | 7 | 100.5 | 1.07 | 10 | 143.5 | 0.31 |
| TOTAL BENTHOS | 657 | 9,430.1 | 100.00 | 3,219 | 46,203.2 | 100.00 |

WATERWAY= L.C.R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 11JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 3,170 | 45,499.9 | 98.75 | 475 | 6,817.8 | 80.65 |
| Caecidotea | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Gammarus | 10 | 143.5 | 0.31 | 7 | 100.5 | 1.19 |
| Chironomidae | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.68 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 10 | 143.5 | 1.70 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 14 | 200.9 | 2.38 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 44 | 631.5 | 7.47 |
| Chironomus | 0 | 0.0 | 0.00 | 8 | 114.8 | 1.36 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 10 | 143.5 | 1.70 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Parachironomus | 0 | 0.0 | 0.00 | 7 | 100.5 | 1.19 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.68 |
| Amnicola | 10 | 143.5 | 0.31 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 10 | 143.5 | 0.31 | 3 | 43.1 | 0.51 |
| Dreissena polymorpha | 10 | 143.5 | 0.31 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 3,210 | 46,074.0 | 100.00 | 589 | 8,454.1 | 100.00 |

WATERWAY= L.C.R.,
 LOCATION= INDIANA AVE.,
 STATION= 56,
 and DATE= 14JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 137 | 1,966.4 | 91.33 | 159 | 2,282.2 | 89.83 |
| Procladius (Holotanypus) | 6 | 86.1 | 4.00 | 7 | 100.5 | 3.95 |
| Coelotanypus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.56 |
| Chironomus | 4 | 57.4 | 2.67 | 1 | 14.4 | 0.56 |
| Cryptochironomus | 1 | 14.4 | 0.67 | 4 | 57.4 | 2.26 |
| Microchironomus | 1 | 14.4 | 0.67 | 1 | 14.4 | 0.56 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 4 | 57.4 | 2.26 |
| Dreissena polymorpha | 1 | 14.4 | 0.67 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 150 | 2,153.0 | 100.00 | 177 | 2,540.5 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= L.C.R.,
 LOCATION= WENTWORTH AVE.,
 STATION= 52,
 and DATE= 08SEP03

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 41 | 588.5 | 3.66 | 28 | 401.9 | 2.44 |
| Oligochaeta | 820 | 11,769.7 | 73.28 | 584 | 8,382.3 | 50.83 |
| Erpobdella punctata punctata | 4 | 57.4 | 0.36 | 74 | 1,062.1 | 6.44 |
| Caecidotea | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.17 |
| Gammarus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.09 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.09 |
| Cryptochironomus | 2 | 28.7 | 0.18 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 2 | 28.7 | 0.18 | 2 | 28.7 | 0.17 |
| Valvata | 1 | 14.4 | 0.09 | 25 | 358.8 | 2.18 |
| Physa | 2 | 28.7 | 0.18 | 0 | 0.0 | 0.00 |
| Helisoma | 2 | 28.7 | 0.18 | 3 | 43.1 | 0.26 |
| Musculium | 203 | 2,913.7 | 18.14 | 362 | 5,195.9 | 31.51 |
| Pisidium | 42 | 602.8 | 3.75 | 67 | 961.7 | 5.83 |
| TOTAL BENTHOS | 1,119 | 16,061.3 | 100.00 | 1,149 | 16,491.9 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 06AUG03

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|------|----|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | -- | -- | -- | 75 | 1,076.5 | 4.97 |
| Oligochaeta | -- | -- | -- | 66 | 947.3 | 4.38 |
| Helobdella stagnalis | -- | -- | -- | 7 | 100.5 | 0.46 |
| Erpobdella punctata punctata | -- | -- | -- | 29 | 416.2 | 1.92 |
| Caecidotea | -- | -- | -- | 623 | 8,942.1 | 41.31 |
| Gammarus | -- | -- | -- | 3 | 43.1 | 0.20 |
| Coenagrionidae | -- | -- | -- | 1 | 14.4 | 0.07 |
| Cheumatopsyche | -- | -- | -- | 1 | 14.4 | 0.07 |
| Stenelmis | -- | -- | -- | 2 | 28.7 | 0.13 |
| Thienemannimyia grp. | -- | -- | -- | 3 | 43.1 | 0.20 |
| Dicrotendipes | -- | -- | -- | 1 | 14.4 | 0.07 |
| Polypedilum scalaenum grp. | -- | -- | -- | 6 | 86.1 | 0.40 |
| Tanytarsus | -- | -- | -- | 1 | 14.4 | 0.07 |
| Xenochironomus xenolabis | -- | -- | -- | 2 | 28.7 | 0.13 |
| Annicola | -- | -- | -- | 1 | 14.4 | 0.07 |
| Physa | -- | -- | -- | 8 | 114.8 | 0.53 |
| Musculium | -- | -- | -- | 467 | 6,703.0 | 30.97 |
| Pisidium | -- | -- | -- | 212 | 3,042.9 | 14.06 |
| TOTAL BENTHOS | -- | -- | -- | 1,508 | 21,644.7 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 23JUL03

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 3,130 | 44,925.7 | 100.00 | 106 | 1,521.4 | 94.64 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.89 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.89 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.89 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 3 | 43.1 | 2.68 |
| TOTAL BENTHOS | 3,130 | 44,925.7 | 100.00 | 112 | 1,607.6 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= N.S.C.,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 24JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 403 | 5,784.4 | 30.53 |
| Oligochaeta | 3,640 | 52,245.9 | 99.45 | 791 | 11,353.4 | 59.92 |
| Helobdella triserialis | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.23 |
| Caecidotea | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.15 |
| Gammarus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.08 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.08 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 24 | 344.5 | 1.82 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.30 |
| Chironomus | 10 | 143.5 | 0.27 | 20 | 287.1 | 1.52 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 36 | 516.7 | 2.73 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 13 | 186.6 | 0.98 |
| Parachironomus | 0 | 0.0 | 0.00 | 20 | 287.1 | 1.52 |
| Polypedilum scalaenum grp. | 10 | 143.5 | 0.27 | 0 | 0.0 | 0.00 |
| Helisoma | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.15 |
| TOTAL BENTHOS | 3,660 | 52,533.0 | 100.00 | 1,320 | 18,946.3 | 100.00 |

WATERWAY= SALT CR., LOCATION= DEVON AVE., STATION= 18,
 and DATE= 10JUN03

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.56 |
| Oligochaeta | 27 | 387.5 | 5.84 | 171 | 2,454.4 | 47.77 |
| Caecidotea | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.56 |
| Caenis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.28 |
| Macronychus glabratus | 1 | 14.4 | 0.22 | 0 | 0.0 | 0.00 |
| Stenelmis | 2 | 28.7 | 0.43 | 0 | 0.0 | 0.00 |
| Chironomidae | 5 | 71.8 | 1.08 | 4 | 57.4 | 1.12 |
| Cricotopus tremulus grp. | 4 | 57.4 | 0.87 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 8 | 114.8 | 1.73 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 4 | 57.4 | 0.87 | 0 | 0.0 | 0.00 |
| Chironomus | 50 | 717.7 | 10.82 | 23 | 330.1 | 6.42 |
| Cladopelma | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.56 |
| Cryptochironomus | 8 | 114.8 | 1.73 | 5 | 71.8 | 1.40 |
| Dicrotendipes fumidus | 66 | 947.3 | 14.29 | 28 | 401.9 | 7.82 |
| Parachironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.56 |
| Polypedilum scalaenum grp. | 62 | 889.9 | 13.42 | 35 | 502.4 | 9.78 |
| Stictochironomus | 0 | 0.0 | 0.00 | 4 | 57.4 | 1.12 |
| Tribelos fuscicornis | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.56 |
| Cladotanytarsus mancus grp. | 211 | 3,028.5 | 45.67 | 74 | 1,062.1 | 20.67 |
| Corbicula fluminea | 14 | 200.9 | 3.03 | 3 | 43.1 | 0.84 |
| TOTAL BENTHOS | 462 | 6,631.2 | 100.00 | 358 | 5,138.5 | 100.00 |

WATERWAY= THORN CR., LOCATION= 170TH ST., STATION= 97, and DATE= 09JUL03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 85 | 1,220.0 | 62.96 | 497 | 7,133.6 | 83.81 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.34 |
| Caecidotea | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.84 |
| Cheumatopsyche | 1 | 14.4 | 0.74 | 0 | 0.0 | 0.00 |
| Stenelmis | 1 | 14.4 | 0.74 | 0 | 0.0 | 0.00 |
| Chironomidae | 1 | 14.4 | 0.74 | 5 | 71.8 | 0.84 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Chironomus | 0 | 0.0 | 0.00 | 52 | 746.4 | 8.77 |
| Cryptochironomus | 10 | 143.5 | 7.41 | 4 | 57.4 | 0.67 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Polypedilum fallax grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Polypedilum halterale grp. | 1 | 14.4 | 0.74 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 1 | 14.4 | 0.74 | 1 | 14.4 | 0.17 |
| Polypedilum scalaenum grp. | 2 | 28.7 | 1.48 | 7 | 100.5 | 1.18 |
| Corbicula fluminea | 33 | 473.7 | 24.44 | 17 | 244.0 | 2.87 |
| TOTAL BENTHOS | 135 | 1,937.7 | 100.00 | 593 | 8,511.5 | 100.00 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= THORN CR.,
 LOCATION= JOE ORR RD.,
 STATION= 54,
 and DATE= 12AUG03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 9 | 129.2 | 12.16 | 113 | 1,621.9 | 96.58 |
| Chironomidae | 2 | 28.7 | 2.70 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 4 | 57.4 | 5.41 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 1 | 14.4 | 1.35 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 2 | 28.7 | 2.70 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 1 | 14.4 | 1.35 | 0 | 0.0 | 0.00 |
| Chironomus | 7 | 100.5 | 9.46 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 41 | 588.5 | 55.41 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 1 | 14.4 | 1.35 | 3 | 43.1 | 2.56 |
| Paratanytarsus | 1 | 14.4 | 1.35 | 0 | 0.0 | 0.00 |
| Simulium | 2 | 28.7 | 2.70 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 3 | 43.1 | 4.05 | 1 | 14.4 | 0.85 |
| TOTAL BENTHOS | 74 | 1,062.1 | 100.00 | 117 | 1,679.3 | 100.00 |

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 11JUN03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 65 | 933.0 | 37.79 | 159 | 2,282.2 | 43.32 |
| Caecidotea | 1 | 14.4 | 0.58 | 1 | 14.4 | 0.27 |
| Chironomidae | 2 | 28.7 | 1.16 | 1 | 14.4 | 0.27 |
| Cricotopus bicinctus grp. | 6 | 86.1 | 3.49 | 4 | 57.4 | 1.09 |
| Cricotopus sylvestris grp. | 22 | 315.8 | 12.79 | 0 | 0.0 | 0.00 |
| Chironomus | 36 | 516.7 | 20.93 | 166 | 2,382.6 | 45.23 |
| Cryptochironomus | 1 | 14.4 | 0.58 | 4 | 57.4 | 1.09 |
| Dicrotendipes neomodestus | 3 | 43.1 | 1.74 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.54 |
| Endochironomus nigricans | 1 | 14.4 | 0.58 | 2 | 28.7 | 0.54 |
| Glyptotendipes | 14 | 200.9 | 8.14 | 6 | 86.1 | 1.63 |
| Polypedilum flavum | 1 | 14.4 | 0.58 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 7 | 100.5 | 4.07 | 14 | 200.9 | 3.81 |
| Cladotanytarsus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.54 |
| Paratanytarsus | 7 | 100.5 | 4.07 | 4 | 57.4 | 1.09 |
| Simulium | 6 | 86.1 | 3.49 | 1 | 14.4 | 0.27 |
| Helisoma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.27 |
| TOTAL BENTHOS | 172 | 2,468.8 | 100.00 | 367 | 5,267.6 | 100.00 |

WATERWAY= WOLF LAKE D.C.,
 LOCATION= BURNHAM AVE.,
 STATION= 50,
 and DATE= 27JUN03

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|-------|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.45 | 0 | 0.0 | 0.00 |
| Oligochaeta | 95 | 1,363.6 | 43.18 | 160 | 2,296.5 | 48.93 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.31 |
| Gammarus fasciatus | 23 | 330.1 | 10.45 | 11 | 157.9 | 3.36 |
| Caenis | 11 | 157.9 | 5.00 | 4 | 57.4 | 1.22 |
| Hexagenia limbata | 0 | 0.0 | 0.00 | 5 | 71.8 | 1.53 |
| Lestes | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.31 |
| Corixidae | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.61 |
| Corydalus cornutus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.31 |
| Cheumatopsyche | 12 | 172.2 | 5.45 | 1 | 14.4 | 0.31 |
| Oecetis | 1 | 14.4 | 0.45 | 1 | 14.4 | 0.31 |
| Ceratopogonidae | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.31 |
| Chironomidae | 2 | 28.7 | 0.91 | 7 | 100.5 | 2.14 |
| Tanytus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.31 |
| Procladius (Holotanytus) | 2 | 28.7 | 0.91 | 8 | 114.8 | 2.45 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 4 | 57.4 | 1.22 |
| Cricotopus bicinctus grp. | 1 | 14.4 | 0.45 | 1 | 14.4 | 0.31 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 4 | 57.4 | 1.22 |

APPENDIX A - 2003 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= WOLF LAKE D.C.,
 LOCATION= BURNHAM AVE.,
 STATION= 50,
 and DATE= 27JUN03

| TAXA (cont.) | CENTER | | | SIDE | | |
|-----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Chironomus | 3 | 43.1 | 1.36 | 68 | 976.0 | 20.80 |
| Cladopelma | 8 | 114.8 | 3.64 | 28 | 401.9 | 8.56 |
| Cryptochironomus | 13 | 186.6 | 5.91 | 4 | 57.4 | 1.22 |
| Cryptotendipes sp. 15 | 2 | 28.7 | 0.91 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 1 | 14.4 | 0.45 | 1 | 14.4 | 0.31 |
| Dicrotendipes simpsoni | 1 | 14.4 | 0.45 | 1 | 14.4 | 0.31 |
| Polypedilum halterale grp. | 19 | 272.7 | 8.64 | 8 | 114.8 | 2.45 |
| Polypedilum scalaenum grp. | 12 | 172.2 | 5.45 | 1 | 14.4 | 0.31 |
| Cladotanytarsus mancus grp. | 1 | 14.4 | 0.45 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.31 |
| Rheotanytarsus | 1 | 14.4 | 0.45 | 1 | 14.4 | 0.31 |
| Tanytarsus guerlus grp. | 10 | 143.5 | 4.55 | 1 | 14.4 | 0.31 |
| Hemerodromia | 1 | 14.4 | 0.45 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 220 | 3,157.7 | 100.00 | 327 | 4,693.5 | 100.00 |

APPENDIX B

2004 CENTER AND NEAR SHORE HD AND PONAR DATA

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= BUFFALO CR.,
 LOCATION= LAKE COOK RD.,
 STATION= 12,
 and DATE= 01JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 20 | 71.8 | 0.28 | 40 | 143.5 | 0.62 |
| Turbellaria | 1,010 | 3,624.0 | 14.39 | 1,230 | 4,413.3 | 18.92 |
| Oligochaeta | 460 | 1,650.5 | 6.55 | 1,140 | 4,090.4 | 17.54 |
| Ostracoda | 0 | 0.0 | 0.00 | 110 | 394.7 | 1.69 |
| Caecidotea | 20 | 71.8 | 0.28 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 10 | 35.9 | 0.14 | 0 | 0.0 | 0.00 |
| Stenacron | 10 | 35.9 | 0.14 | 10 | 35.9 | 0.15 |
| Caenis | 10 | 35.9 | 0.14 | 0 | 0.0 | 0.00 |
| Sialis | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.15 |
| Cheumatopsyche | 120 | 430.6 | 1.71 | 60 | 215.3 | 0.92 |
| Hydropsyche betteni | 10 | 35.9 | 0.14 | 0 | 0.0 | 0.00 |
| Ceraclea | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.15 |
| Dubiraphia | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.46 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 40 | 143.5 | 0.62 |
| Thienemannimyia grp. | 200 | 717.6 | 2.85 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 900 | 3,229.3 | 12.82 | 40 | 143.5 | 0.62 |
| Cricotopus/Orthocladius | 200 | 717.6 | 2.85 | 180 | 645.9 | 2.77 |
| Cricotopus bicinctus grp. | 400 | 1,435.2 | 5.70 | 510 | 1,829.9 | 7.85 |
| Cricotopus sylvestris grp. | 50 | 179.4 | 0.71 | 140 | 502.3 | 2.15 |
| Nanocladius distinctus | 50 | 179.4 | 0.71 | 40 | 143.5 | 0.62 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 220 | 789.4 | 3.38 |
| Rheocricotopus robacki | 50 | 179.4 | 0.71 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 50 | 179.4 | 0.71 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 450 | 1,614.6 | 6.41 | 440 | 1,578.8 | 6.77 |
| Dicrotendipes simpsoni | 500 | 1,794.0 | 7.12 | 690 | 2,475.8 | 10.62 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 40 | 143.5 | 0.62 |
| Glyptotendipes | 600 | 2,152.9 | 8.55 | 360 | 1,291.7 | 5.54 |
| Polypedilum flavum | 1,640 | 5,884.5 | 23.36 | 840 | 3,014.0 | 12.92 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 180 | 645.9 | 2.77 |
| Micropsectra | 100 | 358.8 | 1.42 | 70 | 251.2 | 1.08 |
| Paratanytarsus | 100 | 358.8 | 1.42 | 70 | 251.2 | 1.08 |
| Tanytarsus | 50 | 179.4 | 0.71 | 0 | 0.0 | 0.00 |
| Hemerodromia | 10 | 35.9 | 0.14 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 7,020 | 25,188.4 | 100.00 | 6,500 | 23,322.6 | 100.00 |

WATERWAY= C.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 31AUG04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 17 | 61.0 | 2.32 | 250 | 897.0 | 6.57 |
| Turbellaria | 1 | 3.6 | 0.14 | 0 | 0.0 | 0.00 |
| Oligochaeta | 13 | 46.6 | 1.77 | 315 | 1,130.2 | 8.28 |
| Caecidotea | 1 | 3.6 | 0.14 | 10 | 35.9 | 0.26 |
| Hyalella azteca | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.26 |
| Gammarus fasciatus | 20 | 71.8 | 2.72 | 65 | 233.2 | 1.71 |
| Cyrenellus fraternus | 1 | 3.6 | 0.14 | 15 | 53.8 | 0.39 |
| Hydroptila | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.13 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.26 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 25 | 89.7 | 0.66 |
| Cricotopus sylvestris grp. | 3 | 10.8 | 0.41 | 185 | 663.8 | 4.86 |
| Nanocladius distinctus | 34 | 122.0 | 4.63 | 85 | 305.0 | 2.23 |
| Dicrotendipes simpsoni | 266 | 954.4 | 36.24 | 930 | 3,336.9 | 24.44 |
| Polypedilum illinoense | 6 | 21.5 | 0.82 | 60 | 215.3 | 1.58 |
| Paratanytarsus | 3 | 10.8 | 0.41 | 0 | 0.0 | 0.00 |
| Gyraulus | 1 | 3.6 | 0.14 | 0 | 0.0 | 0.00 |
| Ferrissia | 38 | 136.3 | 5.18 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.39 |
| Dreissena polymorpha | 330 | 1,184.1 | 44.96 | 1,825 | 6,548.3 | 47.96 |
| TOTAL BENTHOS | 734 | 2,633.7 | 100.00 | 3,805 | 13,652.7 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= C.S.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 23AUG04

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|------|----|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | -- | -- | -- | 4 | 14.4 | 0.20 |
| Turbellaria | -- | -- | -- | 809 | 2,902.8 | 41.21 |
| Urnatella gracilis | -- | -- | -- | 8 | 28.7 | 0.41 |
| Oligochaeta | -- | -- | -- | 987 | 3,541.4 | 50.28 |
| Helobdella papillata | -- | -- | -- | 5 | 17.9 | 0.25 |
| Placobdella pediculata | -- | -- | -- | 1 | 3.6 | 0.05 |
| Gammarus fasciatus | -- | -- | -- | 3 | 10.8 | 0.15 |
| Baetis intercalaris | -- | -- | -- | 8 | 28.7 | 0.41 |
| Stenacron | -- | -- | -- | 1 | 3.6 | 0.05 |
| Cyrnellus fraternus | -- | -- | -- | 1 | 3.6 | 0.05 |
| Cheumatopsyche | -- | -- | -- | 5 | 17.9 | 0.25 |
| Cricotopus | -- | -- | -- | 1 | 3.6 | 0.05 |
| Nanocladius distinctus | -- | -- | -- | 12 | 43.1 | 0.61 |
| Chironomus | -- | -- | -- | 1 | 3.6 | 0.05 |
| Dicrotendipes simpsoni | -- | -- | -- | 106 | 380.3 | 5.40 |
| Ferrissia | -- | -- | -- | 6 | 21.5 | 0.31 |
| Corbicula fluminea | -- | -- | -- | 5 | 17.9 | 0.25 |
| TOTAL BENTHOS | -- | -- | -- | 1,963 | 7,043.4 | 100.00 |

WATERWAY= C.S.S.C.,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 23AUG04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 170 | 610.0 | 1.37 | 70 | 251.2 | 1.82 |
| Turbellaria | 680 | 2,439.9 | 5.46 | 210 | 753.5 | 5.45 |
| Urnatella gracilis | 20 | 71.8 | 0.16 | 0 | 0.0 | 0.00 |
| Plumatella | 0 | 0.0 | 0.00 | 70 | 251.2 | 1.82 |
| Oligochaeta | 11,110 | 39,863.7 | 89.24 | 1,985 | 7,122.4 | 51.49 |
| Caecidotea | 130 | 466.5 | 1.04 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 20 | 71.8 | 0.16 | 85 | 305.0 | 2.20 |
| Argia | 10 | 35.9 | 0.08 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 10 | 35.9 | 0.08 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 50 | 179.4 | 0.40 | 100 | 358.8 | 2.59 |
| Dicrotendipes simpsoni | 250 | 897.0 | 2.01 | 475 | 1,704.3 | 12.32 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.13 |
| Parachironomus | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.13 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.13 |
| Ferrissia | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.39 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 830 | 2,978.1 | 21.53 |
| TOTAL BENTHOS | 12,450 | 44,671.7 | 100.00 | 3,855 | 13,832.1 | 100.00 |

WATERWAY= C.S.S.C.,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 30AUG04

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|---------|-------|------|-------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 83 | 297.8 | 6.71 | 42 | 150.7 | 3.68 |
| Turbellaria | 229 | 821.7 | 18.51 | 118 | 423.4 | 10.34 |
| Plumatella | 3 | 10.8 | 0.24 | 0 | 0.0 | 0.00 |
| Oligochaeta | 132 | 473.6 | 10.67 | 177 | 635.1 | 15.51 |
| Helobdella papillata | 1 | 3.6 | 0.08 | 26 | 93.3 | 2.28 |
| Gammarus fasciatus | 91 | 326.5 | 7.36 | 234 | 839.6 | 20.51 |
| Stenacron | 1 | 3.6 | 0.08 | 1 | 3.6 | 0.09 |
| Stenonema integrum | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.18 |
| Cyrnellus fraternus | 1 | 3.6 | 0.08 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 1 | 3.6 | 0.08 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 4 | 14.4 | 0.32 | 0 | 0.0 | 0.00 |
| Cricotopus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.18 |
| Nanocladius distinctus | 51 | 183.0 | 4.12 | 91 | 326.5 | 7.98 |
| Dicrotendipes simpsoni | 332 | 1,191.2 | 26.84 | 153 | 549.0 | 13.41 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= C.S.S.C.,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 30AUG04

| TAXA (cont.) | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Xenochironomus xenolabis | 0 | 0.0 | 0.00 | 15 | 53.8 | 1.31 |
| Physa | 4 | 14.4 | 0.32 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 3 | 10.8 | 0.24 | 0 | 0.0 | 0.00 |
| Ferrissia | 291 | 1,044.1 | 23.52 | 247 | 886.3 | 21.65 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.26 |
| Musculium | 3 | 10.8 | 0.24 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 7 | 25.1 | 0.57 | 30 | 107.6 | 2.63 |
| TOTAL BENTHOS | 1,237 | 4,438.5 | 100.00 | 1,141 | 4,094.0 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 01SEP04

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|-----------|--------|--------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 80 | 287.0 | 0.29 | 0 | 0.0 | 0.00 |
| Planorbella | 1 | 3.6 | 0.00 | 0 | 0.0 | 0.00 |
| Oligochaeta | 30 | 107.6 | 0.11 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 1,200 | 4,305.7 | 4.30 | 250 | 897.0 | 1.18 |
| Cyrtolus fraternus | 0 | 0.0 | 0.00 | 150 | 538.2 | 0.71 |
| Cricotopus bicinctus grp. | 10 | 35.9 | 0.04 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 30 | 107.6 | 0.11 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 10 | 35.9 | 0.04 | 100 | 358.8 | 0.47 |
| Polypedilum flavum | 20 | 71.8 | 0.07 | 0 | 0.0 | 0.00 |
| Simulium | 0 | 0.0 | 0.00 | 50 | 179.4 | 0.24 |
| Ferrissia | 180 | 645.9 | 0.65 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 26,330 | 94,474.3 | 94.40 | 20,550 | 73,735.2 | 97.39 |
| TOTAL BENTHOS | 27,891 | 100,075.3 | 100.00 | 21,100 | 75,708.6 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= BELMONT AVE.,
 STATION= 19,
 and DATE= 20SEP04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 5 | 17.9 | 1.25 | 0 | 0.0 | 0.00 |
| Oligochaeta | 4 | 14.4 | 1.00 | 174 | 624.3 | 69.32 |
| Caecidotea | 1 | 3.6 | 0.25 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 44 | 157.9 | 10.97 | 6 | 21.5 | 2.39 |
| Hydracarina | 1 | 3.6 | 0.25 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 26 | 93.3 | 6.48 | 0 | 0.0 | 0.00 |
| Stenacron | 21 | 75.3 | 5.24 | 37 | 132.8 | 14.74 |
| Argia | 5 | 17.9 | 1.25 | 5 | 17.9 | 1.99 |
| Cheumatopsyche | 115 | 412.6 | 28.68 | 0 | 0.0 | 0.00 |
| Hydropsyche betteni | 2 | 7.2 | 0.50 | 0 | 0.0 | 0.00 |
| Macronychus glabratus | 11 | 39.5 | 2.74 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 11 | 39.5 | 2.74 | 0 | 0.0 | 0.00 |
| Tanytus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.80 |
| Procladius (Holotanytus) | 1 | 3.6 | 0.25 | 4 | 14.4 | 1.59 |
| Corynoneura lobata | 20 | 71.8 | 4.99 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 44 | 157.9 | 10.97 | 0 | 0.0 | 0.00 |
| Parakiefferiella | 3 | 10.8 | 0.75 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 13 | 46.6 | 3.24 | 0 | 0.0 | 0.00 |
| Dicrotendipes | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.80 |
| Polypedilum flavum | 6 | 21.5 | 1.50 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 13 | 46.6 | 3.24 | 6 | 21.5 | 2.39 |
| Polypedilum scalaenum grp. | 26 | 93.3 | 6.48 | 15 | 53.8 | 5.98 |
| Stenochironomus | 7 | 25.1 | 1.75 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 5 | 17.9 | 1.25 | 0 | 0.0 | 0.00 |
| Ferrissia | 17 | 61.0 | 4.24 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 401 | 1,438.8 | 100.00 | 251 | 900.6 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13,
 and DATE= 06JUL04

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 38 | 136.3 | 2.64 | 5 | 17.9 | 2.12 |
| Oligochaeta | 154 | 552.6 | 10.71 | 169 | 606.4 | 71.61 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Placobdella pediculata | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Caecidotea | 10 | 35.9 | 0.70 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 22 | 78.9 | 1.53 | 10 | 35.9 | 4.24 |
| Baetis intercalaris | 4 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| Stenacron | 14 | 50.2 | 0.97 | 1 | 3.6 | 0.42 |
| Stenonema integrum | 82 | 294.2 | 5.70 | 0 | 0.0 | 0.00 |
| Stenonema terminatum | 10 | 35.9 | 0.70 | 0 | 0.0 | 0.00 |
| Tricorythodes | 102 | 366.0 | 7.09 | 1 | 3.6 | 0.42 |
| Anthopotamus myops grp. | 16 | 57.4 | 1.11 | 1 | 3.6 | 0.42 |
| Argia | 4 | 14.4 | 0.28 | 8 | 28.7 | 3.39 |
| Sialis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Cheumatopsyche | 370 | 1,327.6 | 25.73 | 0 | 0.0 | 0.00 |
| Hydropsyche simulans | 74 | 265.5 | 5.15 | 0 | 0.0 | 0.00 |
| Hydropsyche bidens | 14 | 50.2 | 0.97 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 6 | 21.5 | 0.42 | 0 | 0.0 | 0.00 |
| Ancyronyx variegata | 2 | 7.2 | 0.14 | 0 | 0.0 | 0.00 |
| Dubiraphia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Macronychus glabratus | 8 | 28.7 | 0.56 | 1 | 3.6 | 0.42 |
| Stenelmis | 24 | 86.1 | 1.67 | 0 | 0.0 | 0.00 |
| Nilotanypus fimbriatus | 14 | 50.2 | 0.97 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 14 | 50.2 | 0.97 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 4 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 14 | 50.2 | 0.97 | 0 | 0.0 | 0.00 |
| Dicrotendipes | 0 | 0.0 | 0.00 | 4 | 14.4 | 1.69 |
| Dicrotendipes simpsoni | 4 | 14.4 | 0.28 | 3 | 10.8 | 1.27 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.85 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 19 | 68.2 | 8.05 |
| Microtendipes | 22 | 78.9 | 1.53 | 1 | 3.6 | 0.42 |
| Polypedilum flavum | 360 | 1,291.7 | 25.03 | 0 | 0.0 | 0.00 |
| Polypedilum scalaeum grp. | 18 | 64.6 | 1.25 | 0 | 0.0 | 0.00 |
| Stenochironomus | 4 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| Tribelos fuscicorne | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Rheotanytarsus | 26 | 93.3 | 1.81 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 2 | 7.2 | 0.14 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| Corbicula fluminea | 2 | 7.2 | 0.14 | 1 | 3.6 | 0.42 |
| Sphaerium | 0 | 0.0 | 0.00 | 3 | 10.8 | 1.27 |
| Musculium | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.42 |
| TOTAL BENTHOS | 1,438 | 5,159.7 | 100.00 | 236 | 846.8 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 10SEP04

| TAXA | CENTER | | | SIDE | | |
|-----------------------|--------|---------|-------|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 595 | 2,134.9 | 30.19 | 424 | 1,521.3 | 26.38 |
| Plumatella | 2 | 7.2 | 0.10 | 1 | 3.6 | 0.06 |
| Oligochaeta | 57 | 204.5 | 2.89 | 232 | 832.4 | 14.44 |
| Caecidotea | 5 | 17.9 | 0.25 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 5 | 17.9 | 0.25 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 135 | 484.4 | 6.85 | 5 | 17.9 | 0.31 |
| Stenacron | 5 | 17.9 | 0.25 | 5 | 17.9 | 0.31 |
| Tricorythodes | 5 | 17.9 | 0.25 | 5 | 17.9 | 0.31 |
| Argia | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Trepobates | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Cheumatopsyche | 722 | 2,590.6 | 36.63 | 496 | 1,779.7 | 30.86 |
| Hydropsyche orris | 2 | 7.2 | 0.10 | 6 | 21.5 | 0.37 |
| Hydropsyche simulans | 8 | 28.7 | 0.41 | 2 | 7.2 | 0.12 |
| Ceratopsyche morosa | 5 | 17.9 | 0.25 | 0 | 0.0 | 0.00 |
| Petrophila | 2 | 7.2 | 0.10 | 0 | 0.0 | 0.00 |
| Macronychus glabratus | 0 | 0.0 | 0.00 | 9 | 32.3 | 0.56 |
| Stenelmis | 8 | 28.7 | 0.41 | 2 | 7.2 | 0.12 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 10SEP04

| TAXA (cont.) | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Thienemanniella xena | 22 | 78.9 | 1.12 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 30 | 107.6 | 1.52 | 0 | 0.0 | 0.00 |
| Nanocladius crassicornus/rectinervis | 115 | 412.6 | 5.83 | 13 | 46.6 | 0.81 |
| Tvetenia discoloripes grp. | 10 | 35.9 | 0.51 | 0 | 0.0 | 0.00 |
| Dicrotendipes | 10 | 35.9 | 0.51 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Polypedilum flavum | 168 | 602.8 | 8.52 | 148 | 531.0 | 9.21 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.37 |
| Stenochironomus | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Rheotanytarsus | 22 | 78.9 | 1.12 | 170 | 610.0 | 10.58 |
| Simulium | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |
| Hemerodromia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Ferrissia | 28 | 100.5 | 1.42 | 68 | 244.0 | 4.23 |
| Musculium transversum | 2 | 7.2 | 0.10 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 8 | 28.7 | 0.41 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,971 | 7,072.1 | 100.00 | 1,607 | 5,766.1 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= OAKTON ST.,
 STATION= 17,
 and DATE= 07JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 9 | 32.3 | 2.39 |
| Urnatella gracilis | 2 | 7.2 | 0.40 | 0 | 0.0 | 0.00 |
| Plumatella | 1 | 3.6 | 0.20 | 1 | 3.6 | 0.27 |
| Oligochaeta | 477 | 1,711.5 | 96.56 | 144 | 516.7 | 38.30 |
| Helobdella stagnalis | 1 | 3.6 | 0.20 | 0 | 0.0 | 0.00 |
| Ostracoda | 2 | 7.2 | 0.40 | 0 | 0.0 | 0.00 |
| Caecidotea | 0 | 0.0 | 0.00 | 12 | 43.1 | 3.19 |
| Gammarus fasciatus | 1 | 3.6 | 0.20 | 85 | 305.0 | 22.61 |
| Stenacron | 0 | 0.0 | 0.00 | 41 | 147.1 | 10.90 |
| Tricorythodes | 1 | 3.6 | 0.20 | 1 | 3.6 | 0.27 |
| Argia | 0 | 0.0 | 0.00 | 7 | 25.1 | 1.86 |
| Sialis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Cheumatopsyche | 2 | 7.2 | 0.40 | 11 | 39.5 | 2.93 |
| Stenelmis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Nilotanytus fimbriatus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 4 | 14.4 | 1.06 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Rheocricotopus robacki | 0 | 0.0 | 0.00 | 4 | 14.4 | 1.06 |
| Rheocricotopus robacki | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.53 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.53 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.53 |
| Glyptotendipes | 1 | 3.6 | 0.20 | 11 | 39.5 | 2.93 |
| Harnischia | 0 | 0.0 | 0.00 | 6 | 21.5 | 1.60 |
| Microtendipes | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Polypedilum flavum | 3 | 10.8 | 0.61 | 4 | 14.4 | 1.06 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.80 |
| Polypedilum scalaenum grp. | 2 | 7.2 | 0.40 | 11 | 39.5 | 2.93 |
| Stenochironomus | 0 | 0.0 | 0.00 | 6 | 21.5 | 1.60 |
| Rheotanytarsus | 1 | 3.6 | 0.20 | 1 | 3.6 | 0.27 |
| Ferrissia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.27 |
| TOTAL BENTHOS | 494 | 1,772.5 | 100.00 | 376 | 1,349.1 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 08SEP04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 10 | 35.9 | 1.79 |
| Turbellaria | 195 | 699.7 | 10.56 | 1 | 3.6 | 0.18 |
| Oligochaeta | 152 | 545.4 | 8.23 | 85 | 305.0 | 15.21 |
| Mooreobdella microstoma | 5 | 17.9 | 0.27 | 0 | 0.0 | 0.00 |
| Caecidotea | 2 | 7.2 | 0.11 | 1 | 3.6 | 0.18 |
| Gammarus fasciatus | 5 | 17.9 | 0.27 | 3 | 10.8 | 0.54 |
| Hydracarina | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.18 |
| Baetis intercalaris | 120 | 430.6 | 6.50 | 28 | 100.5 | 5.01 |
| Stenacron | 0 | 0.0 | 0.00 | 31 | 111.2 | 5.55 |
| Stenonema integrum | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.36 |
| Tricorythodes | 32 | 114.8 | 1.73 | 0 | 0.0 | 0.00 |
| Caenis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.18 |
| Argia | 5 | 17.9 | 0.27 | 4 | 14.4 | 0.72 |
| Trepobates | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.18 |
| Cheumatopsyche | 585 | 2,099.0 | 31.69 | 229 | 821.7 | 40.97 |
| Hydropsyche betteni | 2 | 7.2 | 0.11 | 7 | 25.1 | 1.25 |
| Ceratopsyche morosa | 20 | 71.8 | 1.08 | 0 | 0.0 | 0.00 |
| Hydroptila | 5 | 17.9 | 0.27 | 2 | 7.2 | 0.36 |
| Macronychus glabratus | 5 | 17.9 | 0.27 | 1 | 3.6 | 0.18 |
| Stenelmis crenata grp. | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.72 |
| Nilotanypus fimbriatus | 20 | 71.8 | 1.08 | 14 | 50.2 | 2.50 |
| Thienemannimyia grp. | 55 | 197.3 | 2.98 | 12 | 43.1 | 2.15 |
| Corynoneura lobata | 0 | 0.0 | 0.00 | 21 | 75.3 | 3.76 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 11 | 39.5 | 1.97 |
| Orthocladius | 80 | 287.0 | 4.33 | 6 | 21.5 | 1.07 |
| Nanocladius distinctus | 60 | 215.3 | 3.25 | 1 | 3.6 | 0.18 |
| Rheocricotopus robacki | 60 | 215.3 | 3.25 | 8 | 28.7 | 1.43 |
| Dicrotendipes neomodestus | 8 | 28.7 | 0.43 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.18 |
| Polypedilum flavum | 350 | 1,255.8 | 18.96 | 30 | 107.6 | 5.37 |
| Polypedilum illinoense | 40 | 143.5 | 2.17 | 2 | 7.2 | 0.36 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.18 |
| Stenochironomus | 12 | 43.1 | 0.65 | 16 | 57.4 | 2.86 |
| Rheotanytarsus | 20 | 71.8 | 1.08 | 2 | 7.2 | 0.36 |
| Tanytarsus | 8 | 28.7 | 0.43 | 0 | 0.0 | 0.00 |
| Hemerodromia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.18 |
| Ferrissia | 0 | 0.0 | 0.00 | 16 | 57.4 | 2.86 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 6 | 21.5 | 1.07 |
| TOTAL BENTHOS | 1,846 | 6,623.6 | 100.00 | 559 | 2,005.7 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= ROOSEVELT RD.,
 STATION= 20,
 and DATE= 04SEP04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 6 | 21.5 | 7.59 | 100 | 358.8 | 58.82 |
| Caecidotea | 6 | 21.5 | 7.59 | 8 | 28.7 | 4.71 |
| Gammarus fasciatus | 2 | 7.2 | 2.53 | 15 | 53.8 | 8.82 |
| Stenacron | 21 | 75.3 | 26.58 | 1 | 3.6 | 0.59 |
| Argia | 25 | 89.7 | 31.65 | 3 | 10.8 | 1.76 |
| Somatochlora | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.59 |
| Procladius (Holotanypus) | 1 | 3.6 | 1.27 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 1 | 3.6 | 1.27 | 0 | 0.0 | 0.00 |
| Corynoneura lobata | 1 | 3.6 | 1.27 | 1 | 3.6 | 0.59 |
| Parakiefferiella | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.18 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.59 |
| Harnischia | 1 | 3.6 | 1.27 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 13 | 46.6 | 7.65 |
| Polypedilum scalaenum grp. | 3 | 10.8 | 3.80 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.59 |
| Ferrissia | 12 | 43.1 | 15.19 | 24 | 86.1 | 14.12 |
| TOTAL BENTHOS | 79 | 283.5 | 100.00 | 170 | 610.0 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= STEPHEN ST.,
 STATION= 29,
 and DATE= 22SEPD4

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 330 | 1,184.1 | 7.08 | 0 | 0.0 | 0.00 |
| Plumatella | 0 | 0.0 | 0.00 | 21 | 75.3 | 2.16 |
| Oligochaeta | 60 | 215.3 | 1.29 | 57 | 204.5 | 5.88 |
| Ostracoda | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.72 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 18 | 64.6 | 1.86 |
| Baetis intercalaris | 240 | 861.1 | 5.15 | 1 | 3.6 | 0.10 |
| Stenacron | 20 | 71.8 | 0.43 | 75 | 269.1 | 7.73 |
| Stenonema integrum | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Stenonema terminatum | 50 | 179.4 | 1.07 | 20 | 71.8 | 2.06 |
| Tricorythodes | 80 | 287.0 | 1.72 | 0 | 0.0 | 0.00 |
| Caenis | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.62 |
| Anthopotamus myops grp. | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Argia | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.72 |
| Cyrnellus fraternus | 10 | 35.9 | 0.21 | 6 | 21.5 | 0.62 |
| Cheumatopsyche | 2,200 | 7,893.8 | 47.21 | 215 | 771.4 | 22.16 |
| Hydropsyche orris | 810 | 2,906.4 | 17.38 | 3 | 10.8 | 0.31 |
| Hydropsyche simulans | 30 | 107.6 | 0.64 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 80 | 287.0 | 1.72 | 0 | 0.0 | 0.00 |
| Hydroptila | 10 | 35.9 | 0.21 | 0 | 0.0 | 0.00 |
| Macronychus glabratus | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.52 |
| Stenelmis crenata grp. | 30 | 107.6 | 0.64 | 33 | 118.4 | 3.40 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 11 | 39.5 | 1.13 |
| Thienemannimyia grp. | 180 | 645.9 | 3.86 | 33 | 118.4 | 3.40 |
| Corynoneura lobata | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.41 |
| Thienemanniella xena | 10 | 35.9 | 0.21 | 11 | 39.5 | 1.13 |
| Cricotopus/Orthocladius | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.41 |
| Nanocladus | 140 | 502.3 | 3.00 | 59 | 211.7 | 6.08 |
| Nanocladus distinctus | 160 | 574.1 | 3.43 | 167 | 599.2 | 17.22 |
| Tvetenia discoloripes grp. | 10 | 35.9 | 0.21 | 44 | 157.9 | 4.54 |
| Dicrotendipes simpsoni | 10 | 35.9 | 0.21 | 11 | 39.5 | 1.13 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.41 |
| Harnischia | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.41 |
| Parachironomus | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.41 |
| Polypedilum flavum | 140 | 502.3 | 3.00 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 10 | 35.9 | 0.21 | 4 | 14.4 | 0.41 |
| Stenochironomus | 10 | 35.9 | 0.21 | 22 | 78.9 | 2.27 |
| Rheotanytarsus | 10 | 35.9 | 0.21 | 7 | 25.1 | 0.72 |
| Tanytarsus | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.41 |
| Hemerodromia | 20 | 71.8 | 0.43 | 1 | 3.6 | 0.10 |
| Menetus dilatatus | 10 | 35.9 | 0.21 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 98 | 351.6 | 10.10 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.21 |
| TOTAL BENTHOS | 4,660 | 16,720.5 | 100.00 | 970 | 3,480.4 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= WILLOW SPRINGS RD.,
 STATION= 23,
 and DATE= 21SEPD4

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|------|----|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 14 | 50.2 | 4.36 | -- | -- | -- |
| Oligochaeta | 286 | 1,026.2 | 89.10 | -- | -- | -- |
| Helobdella stagnalis | 2 | 7.2 | 0.62 | -- | -- | -- |
| Caecidotea | 1 | 3.6 | 0.31 | -- | -- | -- |
| Stenacron | 3 | 10.8 | 0.93 | -- | -- | -- |
| Argia | 5 | 17.9 | 1.56 | -- | -- | -- |
| Cyrnellus fraternus | 3 | 10.8 | 0.93 | -- | -- | -- |
| Procladius (Holotanypus) | 1 | 3.6 | 0.31 | -- | -- | -- |
| Cryptochironomus | 1 | 3.6 | 0.31 | -- | -- | -- |
| Polypedilum scalaenum grp. | 1 | 3.6 | 0.31 | -- | -- | -- |
| Stenochironomus | 1 | 3.6 | 0.31 | -- | -- | -- |
| Ferrissia | 2 | 7.2 | 0.62 | -- | -- | -- |
| Corbicula fluminea | 1 | 3.6 | 0.31 | -- | -- | -- |
| TOTAL BENTHOS | 321 | 1,151.8 | 100.00 | -- | -- | -- |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= HIGGINS CR.,
 LOCATION= ELMHURST RD.,
 STATION= 77,
 and DATE= 20JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 3 | 10.8 | 0.07 | 0 | 0.0 | 0.00 |
| Plumatella | 13 | 46.6 | 0.31 | 0 | 0.0 | 0.00 |
| Oligochaeta | 1,373 | 4,926.4 | 33.19 | 36 | 129.2 | 23.23 |
| Erpobdella punctata punctata | 7 | 25.1 | 0.17 | 1 | 3.6 | 0.65 |
| Caecidotea | 1,467 | 5,263.7 | 35.46 | 81 | 290.6 | 52.26 |
| Argia | 20 | 71.8 | 0.48 | 0 | 0.0 | 0.00 |
| Agabus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.65 |
| Laccophilus maculosus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.65 |
| Tropisternus | 3 | 10.8 | 0.07 | 0 | 0.0 | 0.00 |
| Tanytus | 67 | 240.4 | 1.62 | 1 | 3.6 | 0.65 |
| Procladius (Holotanytus) | 7 | 25.1 | 0.17 | 1 | 3.6 | 0.65 |
| Thienemanniomyia grp. | 60 | 215.3 | 1.45 | 3 | 10.8 | 1.94 |
| Cricotopus/Orthocladius | 17 | 61.0 | 0.41 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 120 | 430.6 | 2.90 | 1 | 3.6 | 0.65 |
| Cricotopus sylvestris grp. | 50 | 179.4 | 1.21 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 50 | 179.4 | 1.21 | 1 | 3.6 | 0.65 |
| Nanocladius crassicornus/rectinervis | 393 | 1,410.1 | 9.50 | 16 | 57.4 | 10.32 |
| Chironomus | 220 | 789.4 | 5.32 | 5 | 17.9 | 3.23 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.65 |
| Dicrotendipes neomodestus | 17 | 61.0 | 0.41 | 0 | 0.0 | 0.00 |
| Physa | 153 | 549.0 | 3.70 | 3 | 10.8 | 1.94 |
| Planorbella | 17 | 61.0 | 0.41 | 0 | 0.0 | 0.00 |
| Ferrissia | 80 | 287.0 | 1.93 | 3 | 10.8 | 1.94 |
| TOTAL BENTHOS | 4,137 | 14,843.9 | 100.00 | 155 | 556.2 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 21JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 40 | 143.5 | 0.83 | 13 | 46.6 | 2.44 |
| Plumatella | 10 | 35.9 | 0.21 | 0 | 0.0 | 0.00 |
| Oligochaeta | 100 | 358.8 | 2.08 | 63 | 226.0 | 11.82 |
| Erpobdella punctata punctata | 10 | 35.9 | 0.21 | 0 | 0.0 | 0.00 |
| Ostracoda | 10 | 35.9 | 0.21 | 7 | 25.1 | 1.31 |
| Caecidotea | 4,560 | 16,361.7 | 94.80 | 247 | 886.3 | 46.34 |
| Thienemanniomyia grp. | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.56 |
| Cricotopus tremulus grp. | 20 | 71.8 | 0.42 | 17 | 61.0 | 3.19 |
| Cricotopus bicinctus grp. | 30 | 107.6 | 0.62 | 120 | 430.6 | 22.51 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 23 | 82.5 | 4.32 |
| Orthocladius | 0 | 0.0 | 0.00 | 10 | 35.9 | 1.88 |
| Nanocladius crassicornus/rectinervis | 10 | 35.9 | 0.21 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 7 | 25.1 | 1.31 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 20 | 71.8 | 3.75 |
| Simulium | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.56 |
| Ferrissia | 20 | 71.8 | 0.42 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 4,810 | 17,258.7 | 100.00 | 533 | 1,912.5 | 100.00 |

WATERWAY= L.C.R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 30SEP04

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|------|------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Oligochaeta | 160 | 574.1 | 3.12 | 180 | 645.9 | 3.12 |
| Hyaella azteca | 20 | 71.8 | 0.39 | 140 | 502.3 | 2.43 |
| Gammarus fasciatus | 380 | 1,363.5 | 7.41 | 780 | 2,798.7 | 13.52 |
| Cyrenellus fraternus | 20 | 71.8 | 0.39 | 30 | 107.6 | 0.52 |
| Hydroptila | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.17 |
| Ablabesmyia | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 50 | 179.4 | 0.97 | 40 | 143.5 | 0.69 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= L.C.R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 30SEP04

| TAXA (cont.) | CENTER | | | SIDE | | |
|--------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Nanocladius distinctus | 10 | 35.9 | 0.19 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 530 | 1,901.7 | 10.33 | 610 | 2,188.7 | 10.57 |
| Stenochironomus | 10 | 35.9 | 0.19 | 40 | 143.5 | 0.69 |
| Xenochironomus xenolabis | 10 | 35.9 | 0.19 | 10 | 35.9 | 0.17 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.17 |
| Ferrissia | 30 | 107.6 | 0.58 | 70 | 251.2 | 1.21 |
| Dreissena polymorpha | 3,890 | 13,957.7 | 75.83 | 3,850 | 13,814.1 | 66.72 |
| TOTAL BENTHOS | 5,130 | 18,406.9 | 100.00 | 5,770 | 20,703.3 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 10AUG04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 22 | 78.9 | 3.63 |
| Turbellaria | 90 | 322.9 | 7.57 | 66 | 236.8 | 10.89 |
| Oligochaeta | 43 | 154.3 | 3.62 | 80 | 287.0 | 13.20 |
| Ostracoda | 0 | 0.0 | 0.00 | 9 | 32.3 | 1.49 |
| Caecidotea | 112 | 401.9 | 9.42 | 276 | 990.3 | 45.54 |
| Gammarus fasciatus | 15 | 53.8 | 1.26 | 0 | 0.0 | 0.00 |
| Hydracarina | 2 | 7.2 | 0.17 | 1 | 3.6 | 0.17 |
| Baetis intercalaris | 58 | 208.1 | 4.88 | 0 | 0.0 | 0.00 |
| Stenacron | 8 | 28.7 | 0.67 | 101 | 362.4 | 16.67 |
| Tricorythodes | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.33 |
| Coenagrionidae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.17 |
| Cheumatopsyche | 413 | 1,481.9 | 34.74 | 6 | 21.5 | 0.99 |
| Hydropsyche betteni | 95 | 340.9 | 7.99 | 0 | 0.0 | 0.00 |
| Stenelmis crenata grp. | 2 | 7.2 | 0.17 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 3 | 10.8 | 0.25 | 0 | 0.0 | 0.00 |
| Corynoneura | 15 | 53.8 | 1.26 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 13 | 46.6 | 1.09 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 10 | 35.9 | 0.84 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 163 | 584.9 | 13.71 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 117 | 419.8 | 9.84 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 3 | 10.8 | 0.25 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 15 | 53.8 | 1.26 | 1 | 3.6 | 0.17 |
| Amnicola | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.17 |
| Ferrissia | 12 | 43.1 | 1.01 | 32 | 114.8 | 5.28 |
| Musculium | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.66 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.66 |
| TOTAL BENTHOS | 1,189 | 4,266.2 | 100.00 | 606 | 2,174.4 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 27AUG04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.13 |
| Turbellaria | 122 | 437.7 | 16.35 | 437 | 1,568.0 | 27.52 |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Oligochaeta | 189 | 678.1 | 25.34 | 1,141 | 4,094.0 | 71.85 |
| Hyalella azteca | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.31 |
| Nanocladius distinctus | 4 | 14.4 | 0.54 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 419 | 1,503.4 | 56.17 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 4 | 14.4 | 0.54 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 8 | 28.7 | 1.07 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.13 |
| TOTAL BENTHOS | 746 | 2,676.7 | 100.00 | 1,588 | 5,697.9 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES -- RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= N.S.C.,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 29SEP04

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|----------|--------|--------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 1,540 | 5,525.7 | 10.29 |
| Turbellaria | 620 | 2,224.6 | 4.99 | 970 | 3,480.4 | 6.48 |
| Oligochaeta | 8,060 | 28,920.0 | 64.90 | 4,760 | 17,079.3 | 31.82 |
| Helobdella papillata | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.20 |
| Ostracoda | 10 | 35.9 | 0.08 | 260 | 932.9 | 1.74 |
| Caecidotea | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.07 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 3,040 | 10,907.8 | 20.32 |
| Baetis | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.07 |
| Enallagma | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.07 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.20 |
| Hydroptila | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.07 |
| Cricotopus bicinctus grp. | 70 | 251.2 | 0.56 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 420 | 1,507.0 | 3.38 | 80 | 287.0 | 0.53 |
| Chironomus | 40 | 143.5 | 0.32 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 2,590 | 9,293.1 | 20.85 | 3,120 | 11,194.8 | 20.86 |
| Glyptotendipes | 570 | 2,045.2 | 4.59 | 940 | 3,372.8 | 6.28 |
| Parachironomus | 40 | 143.5 | 0.32 | 40 | 143.5 | 0.27 |
| Gyraulus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.07 |
| Ferrissia | 0 | 0.0 | 0.00 | 60 | 215.3 | 0.40 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 40 | 143.5 | 0.27 |
| TOTAL BENTHOS | 12,420 | 44,564.0 | 100.00 | 14,960 | 53,677.8 | 100.00 |

WATERWAY= POPLAR CR.,
 LOCATION= ROUTE 19,
 STATION= 90,
 and DATE= 08JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Dugesia | 27 | 96.9 | 12.74 | 37 | 132.8 | 22.42 |
| Oligochaeta | 30 | 107.6 | 14.15 | 20 | 71.8 | 12.12 |
| Copepoda | 1 | 3.6 | 0.47 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.21 |
| Cambarus bartonii | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Stenacron | 1 | 3.6 | 0.47 | 10 | 35.9 | 6.06 |
| Caenis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Sialis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Cheumatopsyche | 14 | 50.2 | 6.60 | 0 | 0.0 | 0.00 |
| Dubiraphia | 1 | 3.6 | 0.47 | 3 | 10.8 | 1.82 |
| Macronychus glabratus | 5 | 17.9 | 2.36 | 3 | 10.8 | 1.82 |
| Stenelmis | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.21 |
| Thienemanniya grp. | 8 | 28.7 | 3.77 | 11 | 39.5 | 6.67 |
| Thienemanniella xena | 6 | 21.5 | 2.83 | 0 | 0.0 | 0.00 |
| Nanocladius crassicornus/rectinervis | 12 | 43.1 | 5.66 | 0 | 0.0 | 0.00 |
| Dicrotendipes | 2 | 7.2 | 0.94 | 2 | 7.2 | 1.21 |
| Dicrotendipes neomodestus | 1 | 3.6 | 0.47 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.21 |
| Microtendipes | 11 | 39.5 | 5.19 | 13 | 46.6 | 7.88 |
| Paratendipes albimanus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Polypedilum fallax grp. | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.21 |
| Polypedilum flavum | 1 | 3.6 | 0.47 | 2 | 7.2 | 1.21 |
| Polypedilum scalaenum grp. | 3 | 10.8 | 1.42 | 8 | 28.7 | 4.85 |
| Tribelos fuscicorne | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.21 |
| Micropsectra | 2 | 7.2 | 0.94 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 17 | 61.0 | 8.02 | 7 | 25.1 | 4.24 |
| Rheotanytarsus | 42 | 150.7 | 19.81 | 25 | 89.7 | 15.15 |
| Tanytarsus | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.21 |
| Valvata | 2 | 7.2 | 0.94 | 0 | 0.0 | 0.00 |
| Viviparus | 1 | 3.6 | 0.47 | 0 | 0.0 | 0.00 |
| Pleurocera | 4 | 14.4 | 1.89 | 0 | 0.0 | 0.00 |
| Physa | 2 | 7.2 | 0.94 | 0 | 0.0 | 0.00 |
| Ferrissia | 19 | 68.2 | 8.96 | 8 | 28.7 | 4.85 |
| TOTAL BENTHOS | 212 | 760.7 | 100.00 | 165 | 592.0 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SALT CR.,
 LOCATION= BROOKFIELD AVE.,
 STATION= 109,
 and DATE= 07SEP04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 7 | 25.1 | 4.29 |
| Turbellaria | 6 | 21.5 | 4.20 | 5 | 17.9 | 3.07 |
| Oligochaeta | 13 | 46.6 | 9.09 | 31 | 111.2 | 19.02 |
| Helobdella | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.23 |
| Ostracoda | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Caecidotea | 7 | 25.1 | 4.90 | 8 | 28.7 | 4.91 |
| Baetis flavistriga | 1 | 3.6 | 0.70 | 0 | 0.0 | 0.00 |
| Callibaetis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Stenacron | 10 | 35.9 | 6.99 | 11 | 39.5 | 6.75 |
| Caenis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Argia | 6 | 21.5 | 4.20 | 10 | 35.9 | 6.13 |
| Cheumatopsyche | 6 | 21.5 | 4.20 | 0 | 0.0 | 0.00 |
| Hydropsyche betteni | 3 | 10.8 | 2.10 | 1 | 3.6 | 0.61 |
| Stenelmis | 1 | 3.6 | 0.70 | 6 | 21.5 | 3.68 |
| Natarsia sp. A | 1 | 3.6 | 0.70 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 4 | 14.4 | 2.45 |
| Nilotanypus fimbriatus | 1 | 3.6 | 0.70 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 12 | 43.1 | 8.39 | 2 | 7.2 | 1.23 |
| Thienemanniella xena | 1 | 3.6 | 0.70 | 0 | 0.0 | 0.00 |
| Cricotopus/Orthocladus | 0 | 0.0 | 0.00 | 3 | 10.8 | 1.84 |
| Cricotopus | 0 | 0.0 | 0.00 | 6 | 21.5 | 3.68 |
| Cricotopus bicinctus grp. | 6 | 21.5 | 4.20 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 12 | 43.1 | 8.39 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Cryptochironomus | 3 | 10.8 | 2.10 | 2 | 7.2 | 1.23 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Harnischia | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.23 |
| Polypedilum fallax grp. | 2 | 7.2 | 1.40 | 1 | 3.6 | 0.61 |
| Polypedilum flavum | 12 | 43.1 | 8.39 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Polypedilum illinoense | 8 | 28.7 | 5.59 | 30 | 107.6 | 18.40 |
| Polypedilum scalaenum grp. | 8 | 28.7 | 5.59 | 15 | 53.8 | 9.20 |
| Stenochironomus | 1 | 3.6 | 0.70 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 1 | 3.6 | 0.70 | 0 | 0.0 | 0.00 |
| Tanytarsus | 2 | 7.2 | 1.40 | 1 | 3.6 | 0.61 |
| Amnicola | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Physa | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.61 |
| Ferrissia | 19 | 68.2 | 13.29 | 7 | 25.1 | 4.29 |
| Dreissena polymorpha | 1 | 3.6 | 0.70 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 143 | 513.1 | 100.00 | 163 | 584.9 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 19JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|-------|-------|-------|---------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.23 |
| Turbellaria | 1 | 3.6 | 1.41 | 128 | 459.3 | 4.94 |
| Nematoda | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.08 |
| Urnatella gracilis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Oligochaeta | 68 | 244.0 | 95.77 | 1,463 | 5,249.4 | 56.51 |
| Ostracoda | 0 | 0.0 | 0.00 | 66 | 236.8 | 2.55 |
| Caecidotea | 0 | 0.0 | 0.00 | 136 | 488.0 | 5.25 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Stenacron | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.15 |
| Coenagrionidae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Corixidae | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.12 |
| Cyrrnellus fraternus | 0 | 0.0 | 0.00 | 125 | 448.5 | 4.83 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 27 | 96.9 | 1.04 |
| Dubiraphia | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.12 |
| Stenelmis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Bezzia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 56 | 200.9 | 2.16 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.15 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 19JUL04

| TAXA (cont.) | CENTER | | | SIDE | | |
|--------------------------------------|--------|-------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 32 | 114.8 | 1.24 |
| Chironomus | 0 | 0.0 | 0.00 | 28 | 100.5 | 1.08 |
| Cladopelma | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.15 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.77 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.46 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 52 | 186.6 | 2.01 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 24 | 86.1 | 0.93 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 40 | 143.5 | 1.54 |
| Harnischia | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.15 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 16 | 57.4 | 0.62 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.46 |
| Polypedilum scalaenum grp. | 1 | 3.6 | 1.41 | 76 | 272.7 | 2.94 |
| Pseudochironomus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.77 |
| Stenochironomus | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.31 |
| Cladotanytarsus mancus grp. | 1 | 3.6 | 1.41 | 4 | 14.4 | 0.15 |
| Rheotanytarsus | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.31 |
| Tanytarsus | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.46 |
| Rhamphomyia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 153 | 549.0 | 5.91 |
| Ferrissia | 0 | 0.0 | 0.00 | 22 | 78.9 | 0.85 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.46 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| TOTAL BENTHOS | 71 | 254.8 | 100.00 | 2,589 | 9,289.6 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= HIGGINS RD.,
 STATION= 79,
 and DATE= 15JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 39 | 139.9 | 6.83 | 40 | 143.5 | 0.80 |
| Turbellaria | 1 | 3.6 | 0.18 | 70 | 251.2 | 1.40 |
| Oligochaeta | 132 | 473.6 | 23.12 | 1,190 | 4,269.8 | 23.75 |
| Helobdella stagnalis | 2 | 7.2 | 0.35 | 0 | 0.0 | 0.00 |
| Ostracoda | 15 | 53.8 | 2.63 | 30 | 107.6 | 0.60 |
| Caecidotea | 1 | 3.6 | 0.18 | 0 | 0.0 | 0.00 |
| Crangonyx | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.20 |
| Hydracarina | 1 | 3.6 | 0.18 | 0 | 0.0 | 0.00 |
| Caenis | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.20 |
| Enallagma | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.20 |
| Corixidae | 8 | 28.7 | 1.40 | 10 | 35.9 | 0.20 |
| Cyrrnellus fraternus | 2 | 7.2 | 0.35 | 150 | 538.2 | 2.99 |
| Oecetis | 1 | 3.6 | 0.18 | 0 | 0.0 | 0.00 |
| Dubiraphia | 5 | 17.9 | 0.88 | 30 | 107.6 | 0.60 |
| Ceratopogon | 1 | 3.6 | 0.18 | 0 | 0.0 | 0.00 |
| Culicoides | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.20 |
| Tanytus | 6 | 21.5 | 1.05 | 0 | 0.0 | 0.00 |
| Procladius (Holotanytus) | 12 | 43.1 | 2.10 | 30 | 107.6 | 0.60 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 60 | 215.3 | 1.20 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.60 |
| Chironomus | 47 | 168.6 | 8.23 | 0 | 0.0 | 0.00 |
| Cladopelma | 9 | 32.3 | 1.58 | 80 | 287.0 | 1.60 |
| Dicrotendipes simpsoni | 74 | 265.5 | 12.96 | 1,130 | 4,054.5 | 22.55 |
| Glyptotendipes | 183 | 656.6 | 32.05 | 1,970 | 7,068.5 | 39.32 |
| Parachironomus | 6 | 21.5 | 1.05 | 30 | 107.6 | 0.60 |
| Polypedilum illinoense | 3 | 10.8 | 0.53 | 30 | 107.6 | 0.60 |
| Stictochironomus | 3 | 10.8 | 0.53 | 30 | 107.6 | 0.60 |
| Physa | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.60 |
| Helisoma | 11 | 39.5 | 1.93 | 0 | 0.0 | 0.00 |
| Ferrissia | 9 | 32.3 | 1.58 | 30 | 107.6 | 0.60 |
| TOTAL BENTHOS | 571 | 2,048.8 | 100.00 | 5,010 | 17,976.3 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SALT CR., LOCATION= WOLF RD., STATION= 24, and DATE= 22JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 444 | 1,593.1 | 54.48 | 1 | 3.6 | 0.76 |
| Oligochaeta | 52 | 186.6 | 6.38 | 63 | 226.0 | 47.73 |
| Caecidotea | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.76 |
| Baetis intercalaris | 7 | 25.1 | 0.86 | 0 | 0.0 | 0.00 |
| Stenacron | 45 | 161.5 | 5.52 | 8 | 28.7 | 6.06 |
| Tricorythodes | 8 | 28.7 | 0.98 | 0 | 0.0 | 0.00 |
| Argia | 1 | 3.6 | 0.12 | 2 | 7.2 | 1.52 |
| Sialis | 3 | 10.8 | 0.37 | 3 | 10.8 | 2.27 |
| Cyrnellus fraternus | 1 | 3.6 | 0.12 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 58 | 208.1 | 7.12 | 1 | 3.6 | 0.76 |
| Stenelmis | 2 | 7.2 | 0.25 | 3 | 10.8 | 2.27 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 14 | 50.2 | 10.61 |
| Ablabesmyia mallochii | 1 | 3.6 | 0.12 | 0 | 0.0 | 0.00 |
| Thienemanniya grp. | 16 | 57.4 | 1.96 | 2 | 7.2 | 1.52 |
| Corynoneura lobata | 1 | 3.6 | 0.12 | 1 | 3.6 | 0.76 |
| Thienemanniella xena | 38 | 136.3 | 4.66 | 0 | 0.0 | 0.00 |
| Cricotopus/Orthocladius | 4 | 14.4 | 0.49 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 22 | 78.9 | 2.70 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1 | 3.6 | 0.12 | 1 | 3.6 | 0.76 |
| Nanocladius crassicornus/rectinervis | 1 | 3.6 | 0.12 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 1 | 3.6 | 0.12 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 6 | 21.5 | 0.74 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 7 | 25.1 | 0.86 | 1 | 3.6 | 0.76 |
| Dicrotendipes simpsoni | 1 | 3.6 | 0.12 | 0 | 0.0 | 0.00 |
| Polypedilum fallax grp. | 3 | 10.8 | 0.37 | 2 | 7.2 | 1.52 |
| Polypedilum flavum | 43 | 154.3 | 5.28 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 7 | 25.1 | 5.30 |
| Polypedilum illinoense | 4 | 14.4 | 0.49 | 6 | 21.5 | 4.55 |
| Polypedilum scalaenum grp. | 37 | 132.8 | 4.54 | 6 | 21.5 | 4.55 |
| Stenochironomus | 3 | 10.8 | 0.37 | 1 | 3.6 | 0.76 |
| Pleurocera | 4 | 14.4 | 0.49 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 9 | 32.3 | 6.82 |
| Corbicula fluminea | 1 | 3.6 | 0.12 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 815 | 2,924.3 | 100.00 | 132 | 473.6 | 100.00 |

WATERWAY= W.B. DUPAGE R., LOCATION= LAKE ST., STATION= 64, and DATE= 13JUL04

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.13 |
| Turbellaria | 75 | 269.1 | 2.52 | 50 | 179.4 | 2.17 |
| Oligochaeta | 755 | 2,709.0 | 25.38 | 753 | 2,701.8 | 32.64 |
| Erpobdella punctata punctata | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.13 |
| Ostracoda | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.13 |
| Caecidotea | 360 | 1,291.7 | 12.10 | 180 | 645.9 | 7.80 |
| Stenacron | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.43 |
| Coenagrionidae | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.13 |
| Cheumatopsyche | 710 | 2,547.5 | 23.87 | 17 | 61.0 | 0.74 |
| Hydropsyche | 20 | 71.8 | 0.67 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 17 | 61.0 | 0.74 |
| Thienemanniya grp. | 40 | 143.5 | 1.34 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 35 | 125.6 | 1.18 | 17 | 61.0 | 0.74 |
| Cricotopus tremulus grp. | 50 | 179.4 | 1.68 | 17 | 61.0 | 0.74 |
| Cricotopus bicinctus grp. | 65 | 233.2 | 2.18 | 17 | 61.0 | 0.74 |
| Cricotopus sylvestris grp. | 10 | 35.9 | 0.34 | 0 | 0.0 | 0.00 |
| Nanocladius | 15 | 53.8 | 0.50 | 0 | 0.0 | 0.00 |
| Chironomini | 10 | 35.9 | 0.34 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 15 | 53.8 | 0.50 | 10 | 35.9 | 0.43 |
| Dicrotendipes simpsoni | 40 | 143.5 | 1.34 | 53 | 190.2 | 2.30 |
| Glyptotendipes | 250 | 897.0 | 8.40 | 763 | 2,737.7 | 33.07 |
| Polypedilum flavum | 90 | 322.9 | 3.03 | 10 | 35.9 | 0.43 |
| Polypedilum illinoense | 320 | 1,148.2 | 10.76 | 137 | 491.6 | 5.94 |
| Polypedilum scalaenum grp. | 25 | 89.7 | 0.84 | 10 | 35.9 | 0.43 |
| Paratanytarsus | 10 | 35.9 | 0.34 | 0 | 0.0 | 0.00 |
| Simulium | 80 | 287.0 | 2.69 | 0 | 0.0 | 0.00 |
| Gyraulus | 0 | 0.0 | 0.00 | 217 | 778.6 | 9.41 |
| Ferrissia | 0 | 0.0 | 0.00 | 17 | 61.0 | 0.74 |
| TOTAL BENTHOS | 2,975 | 10,674.6 | 100.00 | 2,307 | 8,277.7 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= W.B. DUPAGE R.,
 LOCATION= SPRINGSGUTH RD.,
 STATION= 110,
 and DATE= 09JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|-------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 57 | 204.5 | 79.17 | 39 | 139.9 | 13.45 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 3 | 10.8 | 1.03 |
| Caecidotea | 11 | 39.5 | 15.28 | 227 | 814.5 | 78.28 |
| Thienemanimyia grp. | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.34 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.69 |
| Nanocladius | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.34 |
| Chironomus | 1 | 3.6 | 1.39 | 14 | 50.2 | 4.83 |
| Parachironomus | 1 | 3.6 | 1.39 | 2 | 7.2 | 0.69 |
| Polypedilum flavum | 1 | 3.6 | 1.39 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 1 | 3.6 | 1.39 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.34 |
| TOTAL BENTHOS | 72 | 258.3 | 100.00 | 290 | 1,040.5 | 100.00 |

WATERWAY= W.B. DUPAGE R.,
 LOCATION= WALNUT AVE.,
 STATION= 89,
 and DATE= 12JUL04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 300 | 1,076.4 | 4.04 | 135 | 484.4 | 17.20 |
| Oligochaeta | 3,070 | 11,015.4 | 41.37 | 176 | 631.5 | 22.42 |
| Helobdella | 20 | 71.8 | 0.27 | 2 | 7.2 | 0.25 |
| Erpobdella punctata punctata | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Ostracoda | 20 | 71.8 | 0.27 | 0 | 0.0 | 0.00 |
| Caecidotea | 110 | 394.7 | 1.48 | 30 | 107.6 | 3.82 |
| Argia | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.64 |
| Enallagma | 0 | 0.0 | 0.00 | 8 | 28.7 | 1.02 |
| Cheumatopsyche | 60 | 215.3 | 0.81 | 0 | 0.0 | 0.00 |
| Sermyia | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Tanytus | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.38 |
| Procladius (Holotanytus) | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.38 |
| Thienemanniella xena | 30 | 107.6 | 0.40 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 13 | 46.6 | 1.66 |
| Cricotopus bicinctus grp. | 120 | 430.6 | 1.62 | 7 | 25.1 | 0.89 |
| Nanocladius crassicornus/rectinervis | 90 | 322.9 | 1.21 | 10 | 35.9 | 1.27 |
| Chironomus | 1,740 | 6,243.3 | 23.45 | 73 | 261.9 | 9.30 |
| Dicrotendipes neomodestus | 60 | 215.3 | 0.81 | 32 | 114.8 | 4.08 |
| Dicrotendipes simpsoni | 30 | 107.6 | 0.40 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 25 | 89.7 | 3.18 |
| Parachironomus | 90 | 322.9 | 1.21 | 7 | 25.1 | 0.89 |
| Polypedilum illinoense | 1,210 | 4,341.6 | 16.31 | 158 | 566.9 | 20.13 |
| Stictochironomus | 30 | 107.6 | 0.40 | 3 | 10.8 | 0.38 |
| Micropsectra | 160 | 574.1 | 2.16 | 3 | 10.8 | 0.38 |
| Paratanytarsus | 160 | 574.1 | 2.16 | 77 | 276.3 | 9.81 |
| Hemerodromia | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Physa | 20 | 71.8 | 0.27 | 0 | 0.0 | 0.00 |
| Ferrissia | 70 | 251.2 | 0.94 | 15 | 53.8 | 1.91 |
| TOTAL BENTHOS | 7,420 | 26,623.6 | 100.00 | 785 | 2,816.6 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= BUFFALO CR.,
 LOCATION= LAKE COOK RD.,
 STATION= 12,
 and DATE= 01JUL04

| TAXA | CENTER | | | SIDE | | |
|-------------------------------------|--------|---------|--------|------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.36 | 1 | 14.4 | 0.11 |
| Oligochaeta | 112 | 1,607.6 | 40.58 | 683 | 9,803.3 | 74.56 |
| Ostracoda | 1 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Caecidotea | 1 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 5 | 71.8 | 1.81 | 0 | 0.0 | 0.00 |
| Dubiraphia | 1 | 14.4 | 0.36 | 1 | 14.4 | 0.11 |
| Stenelmis | 3 | 43.1 | 1.09 | 6 | 86.1 | 0.66 |
| Thienemanniella xena | 1 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Cricotopus/Orthocladus | 1 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 1 | 14.4 | 0.36 | 3 | 43.1 | 0.33 |
| Nanocladus distinctus | 1 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Nanocladus crassicornus/rectinervis | 3 | 43.1 | 1.09 | 0 | 0.0 | 0.00 |
| Chironomus | 1 | 14.4 | 0.36 | 5 | 71.8 | 0.55 |
| Cryptochironomus | 15 | 215.3 | 5.43 | 14 | 200.9 | 1.53 |
| Cryptotendipes | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.55 |
| Dicrotendipes neomodestus | 39 | 559.8 | 14.13 | 58 | 832.5 | 6.33 |
| Glyptotendipes | 7 | 100.5 | 2.54 | 0 | 0.0 | 0.00 |
| Microtendipes | 1 | 14.4 | 0.36 | 2 | 28.7 | 0.22 |
| Polypedilum flavum | 51 | 732.0 | 18.48 | 12 | 172.2 | 1.31 |
| Polypedilum scalaenum grp. | 7 | 100.5 | 2.54 | 22 | 315.8 | 2.40 |
| Pseudochironomus | 4 | 57.4 | 1.45 | 2 | 28.7 | 0.22 |
| Stictochironomus | 4 | 57.4 | 1.45 | 51 | 732.0 | 5.57 |
| Cladotanytarsus mancus grp. | 3 | 43.1 | 1.09 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.22 |
| Rheotanytarsus | 1 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Tanytarsus | 1 | 14.4 | 0.36 | 7 | 100.5 | 0.76 |
| Sphaerium simile | 10 | 143.5 | 3.62 | 0 | 0.0 | 0.00 |
| Musculium | 0 | 0.0 | 0.00 | 13 | 186.6 | 1.42 |
| Pisidium | 0 | 0.0 | 0.00 | 29 | 416.2 | 3.17 |
| Lasmigona complanata | 1 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 276 | 3,961.5 | 100.00 | 916 | 13,147.6 | 100.00 |

WATERWAY= C.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 31AUG04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 108 | 1,550.2 | 89.26 | 125 | 1,794.2 | 63.78 |
| Hyalella azteca | 0 | 0.0 | 0.00 | 5 | 71.8 | 2.55 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 9 | 129.2 | 4.59 |
| Procladius (Holotanypus) | 12 | 172.2 | 9.92 | 46 | 660.3 | 23.47 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 1.02 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.51 |
| Cryptochironomus | 1 | 14.4 | 0.83 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.51 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 5 | 71.8 | 2.55 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 2 | 28.7 | 1.02 |
| TOTAL BENTHOS | 121 | 1,736.7 | 100.00 | 196 | 2,813.2 | 100.00 |

WATERWAY= C.S.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 23AUG04

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|-------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 7 | 100.5 | 77.78 | 26 | 373.2 | 92.86 |
| Tricorythodes | 1 | 14.4 | 11.11 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 2 | 28.7 | 7.14 |
| Corbicula fluminea | 1 | 14.4 | 11.11 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 9 | 129.2 | 100.00 | 28 | 401.9 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= C.S.S.C.,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 23AUG04

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|-------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 31 | 445.0 | 25.83 |
| Plumatella | 0 | 0.0 | 0.00 | 6 | 86.1 | 5.00 |
| Oligochaeta | 62 | 889.9 | 100.00 | 74 | 1,062.1 | 61.67 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 3 | 43.1 | 2.50 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 6 | 86.1 | 5.00 |
| TOTAL BENTHOS | 62 | 889.9 | 100.00 | 120 | 1,722.4 | 100.00 |

WATERWAY= C.S.S.C.,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 30AUG04

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.21 |
| Oligochaeta | 1,820 | 26,122.9 | 98.01 | 4,480 | 64,302.6 | 94.12 |
| Erpobdella punctata punctata | 0 | 0.0 | 0.00 | 20 | 287.1 | 0.42 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 130 | 1,865.9 | 2.73 |
| Tanytus | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.21 |
| Procladius (Holotanytus) | 5 | 71.8 | 0.27 | 70 | 1,004.7 | 1.47 |
| Cryptochironomus | 25 | 358.8 | 1.35 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.21 |
| Pericoma | 2 | 28.7 | 0.11 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 30 | 430.6 | 0.63 |
| Corbicula fluminea | 5 | 71.8 | 0.27 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,857 | 26,654.0 | 100.00 | 4,760 | 68,321.6 | 100.00 |

WATERWAY= CALUMET R.,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 01SEP04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 152 | 2,181.7 | 91.57 | 50 | 717.7 | 78.13 |
| Gammarus fasciatus | 1 | 14.4 | 0.60 | 0 | 0.0 | 0.00 |
| Procladius (Holotanytus) | 3 | 43.1 | 1.81 | 2 | 28.7 | 3.13 |
| Coelotanytus | 1 | 14.4 | 0.60 | 0 | 0.0 | 0.00 |
| Parakiefferiella | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.56 |
| Chironomus | 5 | 71.8 | 3.01 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 4 | 57.4 | 2.41 | 5 | 71.8 | 7.81 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.56 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 3 | 43.1 | 4.69 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 2 | 28.7 | 3.13 |
| TOTAL BENTHOS | 166 | 2,382.6 | 100.00 | 64 | 918.6 | 100.00 |

WATERWAY= DES PLAINES R., LOCATION= BELMONT AVE.,
 STATION= 19,
 and DATE= 20SEP04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 167 | 2,397.0 | 63.02 | 544 | 7,808.2 | 98.19 |
| Gammarus fasciatus | 2 | 28.7 | 0.75 | 1 | 14.4 | 0.18 |
| Cheumatopsyche | 1 | 14.4 | 0.38 | 0 | 0.0 | 0.00 |
| Macronychus glabratus | 1 | 14.4 | 0.38 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 1 | 14.4 | 0.38 | 0 | 0.0 | 0.00 |
| Campeloma decisum | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.72 |
| Ammicola | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| Corbicula fluminea | 92 | 1,320.5 | 34.72 | 4 | 57.4 | 0.72 |
| Sphaerium simile | 1 | 14.4 | 0.38 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 265 | 3,803.6 | 100.00 | 554 | 7,951.7 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= IRVING PARK RD.,
 STATION= CFAR,
 and DATE= 16JUL04

| TAXA | CFAR | | |
|--------------------------|------|---------|--------|
| | # | #/m2 | % |
| Oligochaeta | 627 | 8,999.5 | 91.00 |
| Placobdella pediculata | 1 | 14.4 | 0.15 |
| Mooreobdella microstoma | 1 | 14.4 | 0.15 |
| Caecidotea | 1 | 14.4 | 0.15 |
| Gammarus fasciatus | 12 | 172.2 | 1.74 |
| Cheumatopsyche | 1 | 14.4 | 0.15 |
| Stenelmis | 2 | 28.7 | 0.29 |
| Ceratopogon | 1 | 14.4 | 0.15 |
| Procladius (Holotanypus) | 1 | 14.4 | 0.15 |
| Campeoloma decisum | 4 | 57.4 | 0.58 |
| Ferrissia | 2 | 28.7 | 0.29 |
| Corbicula fluminea | 22 | 315.8 | 3.19 |
| Musculium transversum | 14 | 200.9 | 2.03 |
| TOTAL BENTHOS | 689 | 9,889.4 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13,
 and DATE= 06JUL04

| TAXA | CENTER | | | SIDE | | |
|----------------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 2 | 28.7 | 10.00 |
| Ostracoda | 4 | 57.4 | 1.50 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 21 | 301.4 | 7.89 | 0 | 0.0 | 0.00 |
| Stenonema terminatum | 4 | 57.4 | 1.50 | 0 | 0.0 | 0.00 |
| Tricorythodes | 3 | 43.1 | 1.13 | 0 | 0.0 | 0.00 |
| Anthopotamus myops grp. | 5 | 71.8 | 1.88 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 32 | 459.3 | 12.03 | 0 | 0.0 | 0.00 |
| Dubiraphia | 1 | 14.4 | 0.38 | 0 | 0.0 | 0.00 |
| Stenelmis | 8 | 114.8 | 3.01 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 2 | 28.7 | 10.00 |
| Thienemanimyia grp. | 12 | 172.2 | 4.51 | 1 | 14.4 | 5.00 |
| Thienemanniella xena | 2 | 28.7 | 0.75 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 2 | 28.7 | 0.75 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 7 | 100.5 | 2.63 | 0 | 0.0 | 0.00 |
| Dicrotendipes | 2 | 28.7 | 0.75 | 0 | 0.0 | 0.00 |
| Microtendipes | 2 | 28.7 | 0.75 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 49 | 703.3 | 18.42 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 8 | 114.8 | 3.01 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 30 | 430.6 | 11.28 | 0 | 0.0 | 0.00 |
| Saetheria | 25 | 358.8 | 9.40 | 0 | 0.0 | 0.00 |
| Cladotanytarsus manicus grp. | 5 | 71.8 | 1.88 | 0 | 0.0 | 0.00 |
| Cladotanytarsus vanderwulpi grp. | 28 | 401.9 | 10.53 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 2 | 28.7 | 0.75 | 0 | 0.0 | 0.00 |
| Tanytarsus | 5 | 71.8 | 1.88 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 9 | 129.2 | 3.38 | 0 | 0.0 | 0.00 |
| Sphaerium | 0 | 0.0 | 0.00 | 12 | 172.2 | 60.00 |
| Pisidium | 0 | 0.0 | 0.00 | 3 | 43.1 | 15.00 |
| TOTAL BENTHOS | 266 | 3,818.0 | 100.00 | 20 | 287.1 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 10SEP04

| TAXA | CENTER | | | SIDE | | |
|----------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 7 | 100.5 | 5.04 | 4 | 57.4 | 0.80 |
| Nematoda | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Oligochaeta | 51 | 732.0 | 36.69 | 360 | 5,167.2 | 72.14 |
| Ostracoda | 0 | 0.0 | 0.00 | 45 | 645.9 | 9.02 |
| Gammarus fasciatus | 1 | 14.4 | 0.72 | 10 | 143.5 | 2.00 |
| Baetis intercalaris | 2 | 28.7 | 1.44 | 1 | 14.4 | 0.20 |
| Tricorythodes | 2 | 28.7 | 1.44 | 1 | 14.4 | 0.20 |
| Caenis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Corixidae | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.40 |
| Cheumatopsyche | 5 | 71.8 | 3.60 | 8 | 114.8 | 1.60 |
| Stenelmis | 7 | 100.5 | 5.04 | 1 | 14.4 | 0.20 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.40 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Thienemanniella xena | 11 | 157.9 | 7.91 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 1 | 14.4 | 0.72 | 3 | 43.1 | 0.60 |
| Orthocladus | 1 | 14.4 | 0.72 | 5 | 71.8 | 1.00 |
| Chironomus | 0 | 0.0 | 0.00 | 5 | 71.8 | 1.00 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Dicrotendipes | 1 | 14.4 | 0.72 | 4 | 57.4 | 0.80 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.40 |
| Polypedilum flavum | 30 | 430.6 | 21.58 | 3 | 43.1 | 0.60 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Polypedilum scalaenum grp. | 3 | 43.1 | 2.16 | 7 | 100.5 | 1.40 |
| Tribelos fuscicornis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Cladotanytarsus vanderwulpi grp. | 1 | 14.4 | 0.72 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 4 | 57.4 | 2.88 | 0 | 0.0 | 0.00 |
| Tanytarsus | 0 | 0.0 | 0.00 | 16 | 229.7 | 3.21 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.40 |
| Ferrissia | 1 | 14.4 | 0.72 | 6 | 86.1 | 1.20 |
| Corbicula fluminea | 11 | 157.9 | 7.91 | 4 | 57.4 | 0.80 |
| Musculium | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| TOTAL BENTHOS | 139 | 1,995.1 | 100.00 | 499 | 7,162.3 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= OAKTON ST.,
 STATION= 17,
 and DATE= 07JUL04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Plumatella | 1 | 14.4 | 0.96 | 0 | 0.0 | 0.00 |
| Oligochaeta | 47 | 674.6 | 45.19 | 580 | 8,324.9 | 97.97 |
| Ostracoda | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Gammarus fasciatus | 4 | 57.4 | 3.85 | 0 | 0.0 | 0.00 |
| Stylurus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Hydropsychidae | 1 | 14.4 | 0.96 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 1 | 14.4 | 0.96 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 7 | 100.5 | 6.73 | 0 | 0.0 | 0.00 |
| Harnischia | 1 | 14.4 | 0.96 | 4 | 57.4 | 0.68 |
| Paracladopelma | 18 | 258.4 | 17.31 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 2 | 28.7 | 1.92 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 2 | 28.7 | 1.92 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 1 | 14.4 | 0.96 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 11 | 157.9 | 10.58 | 0 | 0.0 | 0.00 |
| Amnicola | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.34 |
| Pleurocera | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.17 |
| Corbicula fluminea | 8 | 114.8 | 7.69 | 3 | 43.1 | 0.51 |
| TOTAL BENTHOS | 104 | 1,492.7 | 100.00 | 592 | 8,497.1 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 08SEPD4

| TAXA | CENTER | | | SIDE | | |
|----------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 4 | 57.4 | 2.25 | 0 | 0.0 | 0.00 |
| Oligochaeta | 47 | 674.6 | 26.40 | 268 | 3,846.7 | 94.04 |
| Gammarus fasciatus | 2 | 28.7 | 1.12 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Baetis flavistriga | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Stenacron | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Tricorythodes | 10 | 143.5 | 5.62 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 1 | 14.4 | 0.56 | 2 | 28.7 | 0.70 |
| Ceratopsyche morosa | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Hydroptila | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Stenelmis | 7 | 100.5 | 3.93 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 5 | 71.8 | 1.75 |
| Thienemanniya grp. | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 1 | 14.4 | 0.56 | 0 | 0.0 | 0.00 |
| Ferrissia | 4 | 57.4 | 2.25 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 89 | 1,277.4 | 50.00 | 4 | 57.4 | 1.40 |
| Sphaerium | 6 | 86.1 | 3.37 | 0 | 0.0 | 0.00 |
| Musculium | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Pisidium | 0 | 0.0 | 0.00 | 4 | 57.4 | 1.40 |
| TOTAL BENTHOS | 178 | 2,554.9 | 100.00 | 285 | 4,090.7 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= ROOSEVELT RD.,
 STATION= 20,
 and DATE= 04SEPD4

| TAXA | CENTER | | | SIDE | | |
|--------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 189 | 2,712.8 | 91.30 | 313 | 4,492.6 | 98.74 |
| Placobdella pediculata | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.32 |
| Caecidotea | 1 | 14.4 | 0.48 | 0 | 0.0 | 0.00 |
| Gammarus fasciatus | 4 | 57.4 | 1.93 | 1 | 14.4 | 0.32 |
| Procladius (Holotanypus) | 3 | 43.1 | 1.45 | 2 | 28.7 | 0.63 |
| Corbicula fluminea | 10 | 143.5 | 4.83 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 207 | 2,971.1 | 100.00 | 317 | 4,550.0 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= STEPHEN ST.,
 STATION= 29,
 and DATE= 22SEPD4

| TAXA | CENTER | | | SIDE | | |
|----------------------|----------|-------------|---------------|----------|-------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 3 | 43.1 | 75.00 | 2 | 28.7 | 40.00 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 1 | 14.4 | 20.00 |
| Rheotanytarsus | 1 | 14.4 | 25.00 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 2 | 28.7 | 40.00 |
| TOTAL BENTHOS | 4 | 57.4 | 100.00 | 5 | 71.8 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= WILLOW SPRINGS RD.,
 STATION= 23,
 and DATE= 21SEPO4

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 375 | 5,382.5 | 98.43 | 182 | 2,612.3 | 82.73 |
| Corixidae | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.45 |
| Culicoides | 1 | 14.4 | 0.26 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 3 | 43.1 | 0.79 | 5 | 71.8 | 2.27 |
| Chironomus | 2 | 28.7 | 0.52 | 30 | 430.6 | 13.64 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.45 |
| Ferrissia | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.45 |
| TOTAL BENTHOS | 381 | 5,468.6 | 100.00 | 220 | 3,157.7 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= ELMHURST RD.,
 STATION= 77,
 and DATE= 20JULO4

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 193 | 2,770.2 | 85.02 | 52 | 746.4 | 40.94 |
| Erpobdella punctata punctata | 4 | 57.4 | 1.76 | 6 | 86.1 | 4.72 |
| Libellulidae | 1 | 14.4 | 0.44 | 0 | 0.0 | 0.00 |
| Tanypus | 1 | 14.4 | 0.44 | 10 | 143.5 | 7.87 |
| Procladius (Holotanypus) | 1 | 14.4 | 0.44 | 2 | 28.7 | 1.57 |
| Cricotopus bicinctus grp. | 1 | 14.4 | 0.44 | 0 | 0.0 | 0.00 |
| Chironomus | 25 | 358.8 | 11.01 | 52 | 746.4 | 40.94 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 1.57 |
| Polypedilum illinoense | 1 | 14.4 | 0.44 | 0 | 0.0 | 0.00 |
| Pisidium | 0 | 0.0 | 0.00 | 3 | 43.1 | 2.36 |
| TOTAL BENTHOS | 227 | 3,258.2 | 100.00 | 127 | 1,822.9 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 21JULO4

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|-----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 74 | 1,062.1 | 0.98 | 0 | 0.0 | 0.00 |
| Turbellaria | 1,469 | 21,085.0 | 19.46 | 672 | 9,645.4 | 16.33 |
| Oligochaeta | 178 | 2,554.9 | 2.36 | 129 | 1,851.6 | 3.14 |
| Erpobdella punctata punctata | 11 | 157.9 | 0.15 | 24 | 344.5 | 0.58 |
| Ostracoda | 452 | 6,487.7 | 5.99 | 0 | 0.0 | 0.00 |
| Caecidotea | 5,222 | 74,952.8 | 69.19 | 3,167 | 45,456.8 | 76.98 |
| Hydropsychidae | 0 | 0.0 | 0.00 | 6 | 86.1 | 0.15 |
| Hydroptila | 0 | 0.0 | 0.00 | 6 | 86.1 | 0.15 |
| Thienemannimyia grp. | 1 | 14.4 | 0.01 | 4 | 57.4 | 0.10 |
| Cricotopus tremulus grp. | 2 | 28.7 | 0.03 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 34 | 488.0 | 0.45 | 84 | 1,205.7 | 2.04 |
| Cricotopus trifascia grp. | 6 | 86.1 | 0.08 | 11 | 157.9 | 0.27 |
| Cricotopus sylvestris grp. | 4 | 57.4 | 0.05 | 2 | 28.7 | 0.05 |
| Nanocladius crassicornus/rectinervis | 58 | 832.5 | 0.77 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 1 | 14.4 | 0.01 | 1 | 14.4 | 0.02 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.02 |
| Polypedilum flavum | 2 | 28.7 | 0.03 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 4 | 57.4 | 0.05 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.02 |
| Pericoma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.02 |
| Physa | 6 | 86.1 | 0.08 | 5 | 71.8 | 0.12 |
| Ferrissia | 10 | 143.5 | 0.13 | 0 | 0.0 | 0.00 |
| Sphaerium simile | 13 | 186.6 | 0.17 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 7,547 | 108,324.1 | 100.00 | 4,114 | 59,049.3 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= L.C.R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 30SEP04

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 3,279 | 47,064.4 | 98.65 | 203 | 2,913.7 | 89.04 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.44 |
| Hyalella azteca | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.44 |
| Gammarus fasciatus | 8 | 114.8 | 0.24 | 1 | 14.4 | 0.44 |
| Procladius (Holotanypus) | 21 | 301.4 | 0.63 | 2 | 28.7 | 0.88 |
| Cricotopus bicinctus grp. | 1 | 14.4 | 0.03 | 0 | 0.0 | 0.00 |
| Chironomus | 2 | 28.7 | 0.06 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 10 | 143.5 | 0.30 | 11 | 157.9 | 4.82 |
| Dicrotendipes simpsoni | 1 | 14.4 | 0.03 | 0 | 0.0 | 0.00 |
| Ferrissia | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.44 |
| Corbicula fluminea | 2 | 28.7 | 0.06 | 7 | 100.5 | 3.07 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.44 |
| TOTAL BENTHOS | 3,324 | 47,710.3 | 100.00 | 228 | 3,272.5 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 10AUG04

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 3 | 43.1 | 0.39 | 0 | 0.0 | 0.00 |
| Turbellaria | 265 | 3,803.6 | 34.82 | 5 | 71.8 | 0.13 |
| Plumatella | 1 | 14.4 | 0.13 | 0 | 0.0 | 0.00 |
| Oligochaeta | 270 | 3,875.4 | 35.48 | 620 | 8,899.0 | 15.84 |
| Helobdella stagnalis | 1 | 14.4 | 0.13 | 15 | 215.3 | 0.38 |
| Erpobdella punctata punctata | 0 | 0.0 | 0.00 | 60 | 861.2 | 1.53 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 60 | 861.2 | 1.53 |
| Caecidotea | 0 | 0.0 | 0.00 | 145 | 2,081.2 | 3.70 |
| Gammarus fasciatus | 3 | 43.1 | 0.39 | 5 | 71.8 | 0.13 |
| Hydropsychidae | 1 | 14.4 | 0.13 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.26 |
| Corynoneura lobata | 0 | 0.0 | 0.00 | 175 | 2,511.8 | 4.47 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 25 | 358.8 | 0.64 |
| Nanocladius distinctus | 6 | 86.1 | 0.79 | 45 | 645.9 | 1.15 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 15 | 215.3 | 0.38 |
| Dicrotendipes simpsoni | 195 | 2,798.9 | 25.62 | 20 | 287.1 | 0.51 |
| Glyptotendipes | 2 | 28.7 | 0.26 | 5 | 71.8 | 0.13 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.13 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 135 | 1,937.7 | 3.45 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 80 | 1,148.3 | 2.04 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.13 |
| Valvata | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.13 |
| Amnicola | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.13 |
| Menetus dilatatus | 7 | 100.5 | 0.92 | 0 | 0.0 | 0.00 |
| Ferrissia | 1 | 14.4 | 0.13 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 1 | 14.4 | 0.13 | 0 | 0.0 | 0.00 |
| Musculium transversum | 0 | 0.0 | 0.00 | 1,340 | 19,233.4 | 34.23 |
| Pisidium | 0 | 0.0 | 0.00 | 1,135 | 16,291.0 | 28.99 |
| Dreissena polymorpha | 5 | 71.8 | 0.66 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 761 | 10,922.8 | 100.00 | 3,915 | 56,193.0 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= FULLERTON AVE.,
 STATION= CFAR,
 and DATE= 01JUN04

| TAXA | CFAR | | |
|---------------|--------|-----------|--------|
| | # | #/m2 | % |
| Oligochaeta | 22,400 | 321,513.2 | 100.00 |
| TOTAL BENTHOS | 22,400 | 321,513.2 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= N.B.C.R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 27AUG04

| TAXA | CENTER | | | SIDE | | |
|--------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.45 | 0 | 0.0 | 0.00 |
| Oligochaeta | 216 | 3,100.3 | 96.86 | 223 | 3,200.8 | 100.00 |
| Caecidotea | 1 | 14.4 | 0.45 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 4 | 57.4 | 1.79 | 0 | 0.0 | 0.00 |
| Pisidium | 1 | 14.4 | 0.45 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 223 | 3,200.8 | 100.00 | 223 | 3,200.8 | 100.00 |

WATERWAY= N.S.C.,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 29SEP04

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Turbellaria | 1 | 14.4 | 0.25 | 86 | 1,234.4 | 13.13 |
| Oligochaeta | 389 | 5,583.4 | 97.98 | 431 | 6,186.3 | 65.80 |
| Ostracoda | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Caecidotea | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.31 |
| Gammarus fasciatus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.46 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Nanocladius distinctus | 1 | 14.4 | 0.25 | 2 | 28.7 | 0.31 |
| Chironomus | 3 | 43.1 | 0.76 | 1 | 14.4 | 0.15 |
| Cryptochironomus | 1 | 14.4 | 0.25 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.31 |
| Dicrotendipes simpsoni | 1 | 14.4 | 0.25 | 66 | 947.3 | 10.08 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 45 | 645.9 | 6.87 |
| Parachironomus | 0 | 0.0 | 0.00 | 12 | 172.2 | 1.83 |
| Ferrissia | 1 | 14.4 | 0.25 | 1 | 14.4 | 0.15 |
| TOTAL BENTHOS | 397 | 5,698.2 | 100.00 | 655 | 9,401.4 | 100.00 |

WATERWAY= POPLAR CR.,
 LOCATION= ROUTE 19,
 STATION= 90,
 and DATE= 08JUL04

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|-------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 9 | 129.2 | 31.03 | 0 | 0.0 | 0.00 |
| Oligochaeta | 4 | 57.4 | 13.79 | 185 | 2,655.4 | 64.91 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.70 |
| Mooreobdella microstoma | 3 | 43.1 | 10.34 | 4 | 57.4 | 1.40 |
| Stenacron | 1 | 14.4 | 3.45 | 0 | 0.0 | 0.00 |
| Caenis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Cheumatopsyche | 1 | 14.4 | 3.45 | 0 | 0.0 | 0.00 |
| Dubiraphia | 0 | 0.0 | 0.00 | 14 | 200.9 | 4.91 |
| Ectopria | 5 | 71.8 | 17.24 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 4 | 57.4 | 1.40 |
| Thienemanniya grp. | 2 | 28.7 | 6.90 | 0 | 0.0 | 0.00 |
| Thienemanniella n. sp. 3 | 3 | 43.1 | 10.34 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 3 | 43.1 | 1.05 |
| Cryptotendipes | 0 | 0.0 | 0.00 | 12 | 172.2 | 4.21 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Polypedilum scalaenum grp. | 1 | 14.4 | 3.45 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Viviparus | 0 | 0.0 | 0.00 | 17 | 244.0 | 5.96 |
| Amnicola | 0 | 0.0 | 0.00 | 26 | 373.2 | 9.12 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.35 |
| Sphaerium simile | 0 | 0.0 | 0.00 | 12 | 172.2 | 4.21 |
| TOTAL BENTHOS | 29 | 416.2 | 100.00 | 285 | 4,090.7 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= SALT CR., LOCATION= ARLINGTON HTS. RD., STATION= 80,
and DATE= 14JUL04

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 29 | 416.2 | 39.19 | 47 | 674.6 | 2.54 |
| Ostracoda | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.05 |
| Chironomus | 2 | 28.7 | 2.70 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 9 | 129.2 | 12.16 | 65 | 933.0 | 3.51 |
| Dicrotendipes neomodestus | 3 | 43.1 | 4.05 | 16 | 229.7 | 0.86 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 32 | 459.3 | 1.73 |
| Polypedilum illinoense | 1 | 14.4 | 1.35 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 21 | 301.4 | 28.38 | 211 | 3,028.5 | 11.41 |
| Pseudochironomus | 1 | 14.4 | 1.35 | 49 | 703.3 | 2.65 |
| Stictochironomus | 1 | 14.4 | 1.35 | 49 | 703.3 | 2.65 |
| Cladotanytarsus mancus grp. | 1 | 14.4 | 1.35 | 1,380 | 19,807.5 | 74.59 |
| Micropsectra | 3 | 43.1 | 4.05 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 3 | 43.1 | 4.05 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 74 | 1,062.1 | 100.00 | 1,850 | 26,553.5 | 100.00 |

WATERWAY= SALT CR., LOCATION= BROOKFIELD AVE., STATION= 109,
and DATE= 07SEP04

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 23 | 330.1 | 28.40 | 6 | 86.1 | 33.33 |
| Baetis intercalaris | 1 | 14.4 | 1.23 | 0 | 0.0 | 0.00 |
| Stenelmis | 2 | 28.7 | 2.47 | 0 | 0.0 | 0.00 |
| Natarsia | 1 | 14.4 | 1.23 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 2 | 28.7 | 2.47 | 0 | 0.0 | 0.00 |
| Cricotopus | 6 | 86.1 | 7.41 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 3 | 43.1 | 3.70 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 2 | 28.7 | 2.47 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 9 | 129.2 | 11.11 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 3 | 43.1 | 3.70 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 18 | 258.4 | 22.22 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 2 | 28.7 | 2.47 | 0 | 0.0 | 0.00 |
| Tanytarsus | 1 | 14.4 | 1.23 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 7 | 100.5 | 8.64 | 7 | 100.5 | 38.89 |
| Musculium | 0 | 0.0 | 0.00 | 1 | 14.4 | 5.56 |
| Pisidium | 1 | 14.4 | 1.23 | 4 | 57.4 | 22.22 |
| TOTAL BENTHOS | 81 | 1,162.6 | 100.00 | 18 | 258.4 | 100.00 |

WATERWAY= SALT CR., LOCATION= DEVON AVE., STATION= 18,
and DATE= 19JUL04

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Nematoda | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Oligochaeta | 96 | 1,377.9 | 19.24 | 231 | 3,315.6 | 67.15 |
| Ostracoda | 0 | 0.0 | 0.00 | 24 | 344.5 | 6.98 |
| Caecidotea | 1 | 14.4 | 0.20 | 30 | 430.6 | 8.72 |
| Cheumatopsyche | 5 | 71.8 | 1.00 | 0 | 0.0 | 0.00 |
| Dubiraphia | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.58 |
| Stenelmis | 1 | 14.4 | 0.20 | 0 | 0.0 | 0.00 |
| Procladius (Holotanypus) | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.58 |
| Ablabesmyia mallochii | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Cryptochironomus | 68 | 976.0 | 13.63 | 9 | 129.2 | 2.62 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.58 |
| Harnischia | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Polypedilum halterale grp. | 6 | 86.1 | 1.20 | 6 | 86.1 | 1.74 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Polypedilum scalaenum grp. | 77 | 1,105.2 | 15.43 | 6 | 86.1 | 1.74 |
| Stictochironomus | 3 | 43.1 | 0.60 | 1 | 14.4 | 0.29 |
| Cladotanytarsus mancus grp. | 201 | 2,885.0 | 40.28 | 9 | 129.2 | 2.62 |
| Rheotanytarsus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Helisoma | 1 | 14.4 | 0.20 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 40 | 574.1 | 8.02 | 15 | 215.3 | 4.36 |
| TOTAL BENTHOS | 499 | 7,162.3 | 100.00 | 344 | 4,937.5 | 100.00 |

APPENDIX B - 2004 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= SALT CR.,
 LOCATION= HIGGINS RD.,
 STATION= 79,
 and DATE= 15JUL04

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Urnatella gracilis | 2 | 28.7 | 0.77 | 0 | 0.0 | 0.00 |
| Oligochaeta | 135 | 1,937.7 | 51.72 | 382 | 5,482.9 | 92.94 |
| Ostracoda | 1 | 14.4 | 0.38 | 3 | 43.1 | 0.73 |
| Caenis | 6 | 86.1 | 2.30 | 0 | 0.0 | 0.00 |
| Dubiraphia | 14 | 200.9 | 5.36 | 2 | 28.7 | 0.49 |
| Ceratopogon | 2 | 28.7 | 0.77 | 0 | 0.0 | 0.00 |
| Tanytus | 4 | 57.4 | 1.53 | 2 | 28.7 | 0.49 |
| Procladius (Holotanytus) | 23 | 330.1 | 8.81 | 1 | 14.4 | 0.24 |
| Chironomus | 1 | 14.4 | 0.38 | 1 | 14.4 | 0.24 |
| Cladopelma | 2 | 28.7 | 0.77 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 6 | 86.1 | 2.30 | 3 | 43.1 | 0.73 |
| Cryptotendipes | 7 | 100.5 | 2.68 | 1 | 14.4 | 0.24 |
| Glyptotendipes | 1 | 14.4 | 0.38 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 3 | 43.1 | 1.15 | 0 | 0.0 | 0.00 |
| Stictochironomus | 2 | 28.7 | 0.77 | 0 | 0.0 | 0.00 |
| Tanytarsus | 50 | 717.7 | 19.16 | 0 | 0.0 | 0.00 |
| Physa | 0 | 0.0 | 0.00 | 9 | 129.2 | 2.19 |
| Gyraulid | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.24 |
| Corbicula fluminea | 1 | 14.4 | 0.38 | 6 | 86.1 | 1.46 |
| Musculium | 1 | 14.4 | 0.38 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 261 | 3,746.2 | 100.00 | 411 | 5,899.2 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= J.F.K. BLVD.,
 STATION= CFAR,
 and DATE= 19MAY04

| TAXA | CFAR | | |
|-----------------------------|-------|----------|--------|
| | # | #/m2 | % |
| Plumatella | 1 | 14.4 | 0.08 |
| Oligochaeta | 485 | 6,961.3 | 36.55 |
| Ostracoda | 756 | 10,851.1 | 56.97 |
| Caenis | 1 | 14.4 | 0.08 |
| Dubiraphia | 1 | 14.4 | 0.08 |
| Bezzia | 1 | 14.4 | 0.08 |
| Cricotopus/Orthocladus | 2 | 28.7 | 0.15 |
| Cricotopus bicinctus grp. | 5 | 71.8 | 0.38 |
| Cricotopus sylvestris grp. | 15 | 215.3 | 1.13 |
| Parakiefferiella | 3 | 43.1 | 0.23 |
| Chironomus | 31 | 445.0 | 2.34 |
| Dicrotendipes neomodestus | 14 | 200.9 | 1.06 |
| Dicrotendipes simpsoni | 1 | 14.4 | 0.08 |
| Polypedilum halterale grp. | 1 | 14.4 | 0.08 |
| Polypedilum illinoense | 1 | 14.4 | 0.08 |
| Cladotanytarsus mancus grp. | 4 | 57.4 | 0.30 |
| Micropsectra | 2 | 28.7 | 0.15 |
| Paratanytarsus | 3 | 43.1 | 0.23 |
| TOTAL BENTHOS | 1,327 | 19,046.8 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= WOLF RD.,
 STATION= 24,
 and DATE= 22JUL04

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|-------|-------|------|-------|-------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 1.28 | 0 | 0.0 | 0.00 |
| Oligochaeta | 30 | 430.6 | 38.46 | 37 | 531.1 | 63.79 |
| Caenis | 2 | 28.7 | 2.56 | 0 | 0.0 | 0.00 |
| Stenelmis | 6 | 86.1 | 7.69 | 1 | 14.4 | 1.72 |
| Procladius (Holotanytus) | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.72 |
| Thienemanniella xena | 1 | 14.4 | 1.28 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 2 | 28.7 | 3.45 |
| Cryptochironomus | 2 | 28.7 | 2.56 | 2 | 28.7 | 3.45 |
| Dicrotendipes neomodestus | 2 | 28.7 | 2.56 | 0 | 0.0 | 0.00 |

Attachment 24

**A STUDY OF THE
BENTHIC MACROINVERTEBRATE COMMUNITY
IN SELECTED CHICAGO METROPOLITAN AREA
WATERWAYS DURING 2005**

Prepared for:

Metropolitan Water Reclamation District of Greater Chicago
Research and Development Department

Prepared by:

EA Engineering, Science, and Technology, Inc.
444 Lake Cook Road, Suite 18
Deerfield, IL 60015

April 2007

EA Project 61755.01

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1. INTRODUCTION

The Upper Illinois River watershed consists of several natural, constructed, and altered waterways and their tributaries. The major waterways of the Chicago Metropolitan Area within the Upper Illinois River watershed include, in part, the Calumet River, Calumet-Sag Channel, North Branch of the Chicago River, South Branch of the Chicago River, Chicago Sanitary and Ship Canal, and Des Plaines River. Through their comprehensive ambient water quality monitoring program (AWQM), the Metropolitan Water Reclamation District of Greater Chicago (District) has collected a substantial amount of physicochemical and biological data describing the condition of these waterways since 1972. These data provide the Illinois Environmental Protection Agency (IEPA) with current information to assess the quality of the waterways within the District's service area as well as offering the unique opportunity to examine trends via the District's long-term database.

In an effort to support and strengthen their AWQM program, the District has implemented an ancillary monitoring program to evaluate the biological resources, sediment quality, and habitat condition on waterways within their service area. As part of this initiative, a benthic macroinvertebrate sampling program began in 2001 to collect samples at established stations in five watersheds: North Branch Chicago River, South Branch Chicago River and Chicago Sanitary and Ship Canal, Calumet River, Fox River, and Des Plaines River. Each of these watersheds will be sampled on a four-year rotation. In addition to the target watersheds, a core group of stations throughout the District's service area will be evaluated annually. The first primary watershed sampled was the North Branch Chicago River. The 2005 monitoring year represents the start of a new four year cycle. As in 2001, the primary watershed sampled in 2005 was the North Branch of the Chicago River (EA 2004). This report presents the study design and benthic macroinvertebrate data for the 2005 program year.

2. METHODS

In 2005, benthic macroinvertebrate samples were collected at 33 stations on 13 Chicago Metropolitan Area waterways. All locations were located in the Calumet River, North Branch of the Chicago River, South Branch of the Chicago River (SBCR) and Chicago Sanitary and Ship Canal (CSSC), and Des Plaines River watersheds (Table 2-1). Of the 33 stations, 29 were sampled as part of the District's ambient monitoring program and four were sampled as part of an Illinois Council on Food and Agricultural Research (CFAR) study specifically designed to address phosphorus issues in Illinois streams. Field sampling was conducted by District personnel using Hester-Dendy (HD) artificial substrates and Ponar grabs. A combination of HD and Ponar samples were collected at ambient stations while CFAR collections consisted of only Ponar sampling. Figure 2-1 presents the benthic macroinvertebrate sampling locations for the District's ambient water quality program.

Each HD sampler consisted of nine, three-inch square plates with uniform spacing. The total surface area of one HD sampler, excluding the bolt and spacers was 0.031 m². At each location, a group of three HD samplers (sampler array) were deployed near shore in the littoral zone and an additional group of three samplers were deployed mid-channel of the waterway. Each HD sampler array was constructed of a 10-16" length of 2" diameter transparent, schedule 80 PVC pipe secured to the top of an 18 pound river anchor by placing a ¼" stainless steel bolt through the anchor eye and two holes drilled in the pipe (Figure 2-2). Three-inch stainless steel eyebolts are located radially, approximately 120 degrees apart, through holes drilled one-inch from the top of the PVC pipe. The HD arrays were suspended from the eyebolts approximately 12-18" off the bottom using nylon cable ties. One cable was used to anchor both arrays to a structure on shore.

The two HD sampler arrays at each station were retrieved by using the shore-attachment cable to lift the samplers into a custom-made dipnet with an attached plankton bucket. The mesh size of both the dipnet and plankton bucket was Standard Testing No. 60 (250 µ) mesh (Figure 2-3). The cable tie connecting each HD sampler to the anchoring system was cut and each sampler was placed, fully assembled into a one-gallon plastic sample pail. The dipnet was thoroughly rinsed with river water and contents of the plankton bucket were transferred to the sample pail. The contents of each sample pail were fixed with approximately 5% formalin before the lid was attached. Deployment and retrieval dates for the HD samples in each watershed were as follows:

| <u>Watershed</u> | <u>Deployed</u> | <u>Retrieved</u> |
|----------------------------|------------------|--------------------------|
| Calumet | 3-6 June | 29 August – 28 September |
| North Branch Chicago River | 2-23 May | 21 June – 28 July |
| SBCR and CSSC | 31 May – 10 June | 22 August – 15 September |
| Des Plaines River | 2 May – 16 June | 20 June – 18 August |

HD samples were collected from the near-shore and mid-channel area at 28 of the 29 sample stations. The samplers set at Busse Dam on Salt Creek were vandalized shortly before the scheduled retrieval in early August.

Table 2-1. Description of benthic macroinvertebrate monitoring stations sampled during 2005. Stations arranged by major watershed, upstream to downstream within each waterway. Highlighted stations were sampled every year from 2001 to 2005.

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description |
|----------------------------|-------------------|----------------------------------|------------------------------------|--|
| Calumet | 55- 130th St. | Calumet River | 41° 39' 33.9"N 87° 34' 20.1"W | 50' upstream of 130th St. (40' from east bank and center channel) |
| | 76- Halsted St. | Little Calumet River | 41° 39' 25.9"N 87° 38' 27.3"W | 20' upstream of Halsted St. (20' from south bank and center channel) |
| | 59- Cicero Ave. | Calumet Sag Channel | 41° 35' 19.4"N 87° 44' 15.6"W | 150' upstream of Cicero Ave. (30' from north bank and center channel) |
| North Branch Chicago River | 106- Dundee Rd. | W. Fork N. Branch Chicago R. | 42° 08' 19.03"N 87° 50' 5.07"W | 0.1 mile downstream of Dundee Rd. (5' from west bank and center channel) |
| | 103- Golf Rd. | W. Fork N. Branch Chicago R. | 42° 03' 19.21"N 87° 46' 54.99"W | 20' upstream of Golf Rd. (5' from east bank and center channel) |
| | 31- Lake-Cook Rd. | Middle Fork N. Branch Chicago R. | 42° 08' 56.5"N 87° 48' 51.0"W | 900' above I-94, 75' below diversion channel to Middle Fork Reservoir (5' from west bank and center channel) |
| | 32- Lake-Cook Rd. | Skokie River | 42° 09' 9.7"N 87° 47' 38.0"W | 10' upstream of Lake-Cook Rd. (10' from east bank and center channel) |
| | 105- Frontage Rd. | Skokie River | 42° 05' 16.1"N 87° 45' 38.2"W | 100' downstream of Frontage Rd. (10' from south bank and center channel) |
| | 35- Central Rd. | N. Shore Channel | 42° 3' 52.93"N 87° 41' 13.97"W | 30' feet upstream of Central St. (15' from east bank and center channel) |
| | 102- Oakton St. | N. Shore Channel | 42° 01' 35.50"N 87° 42' 35.96"W | 75' upstream of Oakton St. (15' from east bank and center channel) |
| | 36- Touhy Ave. | N. Shore Channel | 42° 00' 43.7"N 87° 42' 37.2"W | 10' upstream of Touhy Ave. (15' from east bank and center channel) |
| | 101- Foster Ave. | N. Shore Channel | 41° 58' 32.59"N 87° 42' 16.61"W | 50' upstream of Foster Ave. (10' from west bank and center channel) |

Table 2-1 - Continued

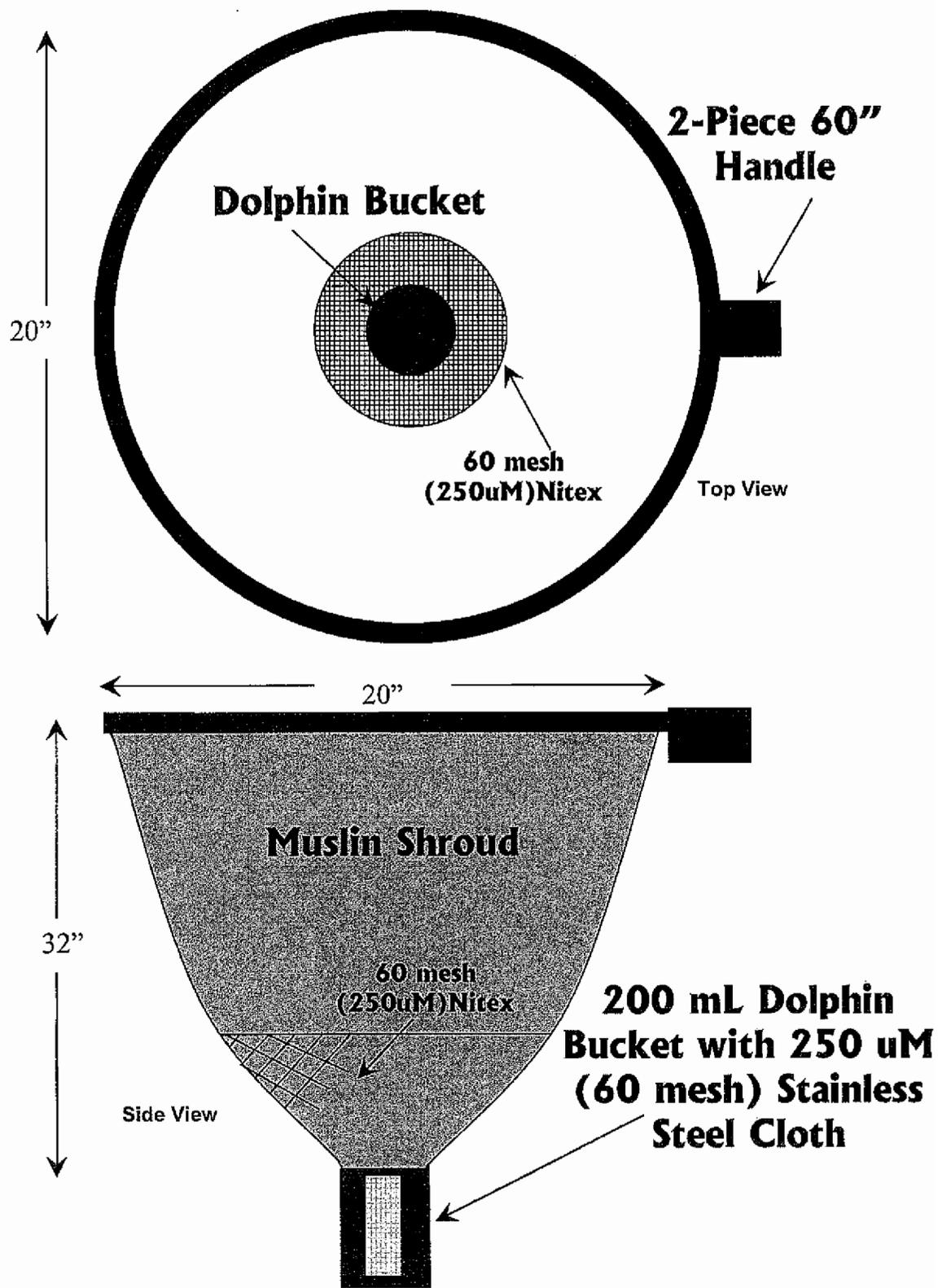
| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description |
|------------------------------|-------------------------|---------------------------------|------------------------------------|--|
| North Branch Chicago River | 104- Glenview Rd. | N. Branch Chicago R. | 42° 04' 8.33"N 87° 46' 27.47"W | 100' upstream of Glenview Rd. (5' from east bank and center channel) |
| | 34- Dempster St. | N. Branch Chicago R. | 42° 02' 30.9"N 87° 47' 16.9"W | 500' upstream of Dempster St. (5' from east bank and center channel) |
| | 96- Albany Ave. | N. Branch Chicago R. | 41° 58' 21.7"N 87° 42' 44.3"W | 250' downstream of Kimball Ave. (5' from south bank and center channel) |
| | 37- Wilson Ave. | N. Branch Chicago R. | 41° 57' 52.66"N 87° 41' 50.50"W | 10' upstream of Wilson Ave. (10' from west bank and center channel) |
| | 73- Diversey Pkwy. | N. Branch Chicago R. | 41° 55' 55.79"N 87° 40' 56.89"W | 50' upstream of Diversey Ave. (30' from east bank and center channel) |
| | CFAR Fullerton Ave. | N. Branch Chicago R. | | |
| SBCR and CSSC ⁽¹⁾ | 46- Grand Ave. | N. Branch Chicago R. | 41° 53' 29.16"N 87° 38' 9.29"W | 50' upstream of Grand Ave. (40' from east bank and center channel) |
| | 75- Cicero Ave. | Chicago Sanitary and Ship Canal | 41° 49' 11.4"N 87° 44' 35.7"W | 20' upstream of Cicero Ave. (70' from north bank and center channel) |
| | 41- Harlem Ave. | Chicago Sanitary and Ship Canal | 41° 48' 4.01"N 87° 48' 5.64"W | 50' upstream of Harlem Ave. (50' from south bank and center channel) |
| Des Plaines River | 92- Lockport (16th St.) | Chicago Sanitary and Ship Canal | 41° 34' 58"N 88° 04' 09.4"W | 75' upstream of former Division St. bridge location (20' from west bank and center channel) |
| | 78- Wille Road | Higgins Cr. | 42° 01' 7.24"N 87° 56' 12.03"W | 200' downstream of Wille Rd. inside entrance to culvert (5' from west bank and center channel) |
| | Busse Dam | Salt Cr. | | |
| | CFAR J.F. Kennedy Blvd. | Salt Cr. | | |
| | Thorndale Ave. | Salt Cr. | | |

⁽¹⁾SBCR = South Branch of the Chicago River, CSSC = Chicago Sanitary and Ship Canal.

Table 2-1 - Continued

| Watershed | Sampling Station | Waterway | Lat./Lon. | Location Description |
|-------------------|---------------------------|---------------------|------------------------------------|--|
| Des Plaines River | 18- Devon Ave | Salt Cr. | 41° 59' 34.6" N 87° 59' 42.9" W | 150' feet upstream of Devon Ave. (10' from west bank and center channel) |
| | 24- Wolf Rd. CFAR | Salt Cr. | 41° 49.548' N 87° 54.025' W | 150' upstream of Wolf Rd. (10' from north bank and center channel) |
| | 64- Lake St | W Branch Du Page R. | 41° 58' 43.1" N 88° 07' 59.4" W | 75' upstream of Lake St. (5' from west bank and center channel) |
| | 13- Lake-Cook Rd. CFAR | Des Plaines R. | 42° 09' 9.8" N 87° 54' 36.2" W | 20' downstream of Lake-Cook Rd. (20' from west bank and center channel) |
| | Irving Park Road | Des Plaines R. | | |
| | 22- Ogden Ave. | Des Plaines R. | 41° 49' 14.4" N 87° 48' 38.2" W | 50' upstream of Ogden Ave. (20' from east bank and center channel) |
| | 91- Material Service Rd. | Des Plaines R. | 41° 35' 29.3" N 88° 4' 8.30" W | 20' upstream of Material Service Rd. (20' from east bank and center channel) |

Figure 2-3. Dipnet for Hester-Dendy sampler retrieval.



Ponar grab samples were collected at each ambient station in conjunction with the HD retrieval. All grab samples were collected using a 6" X 6" Petite-Ponar sampler. As with the HD sampling, two Ponar samples were collected at each ambient station; one from a near shore area and one from mid-channel. Each ambient Ponar sample consisted of three grabs. For the CFAR stations, Ponar samples were collected only in mid-channel but consisted of three composite grabs. Ambient Ponar samples were collected within 30 to 50 feet of the HD samples. All three grabs for each sample were combined in the field and washed in a No. 60 (250 μ) mesh sieving bucket to remove most of the fine sediment. The sample was then transferred to a one-gallon bottle and preserved with 5% formalin. Ponar samples could not be collected from the near-shore location of the Des Plaines River at Material Service Road (Station 91).

In the laboratory, each sample was processed by first pouring the contents of the sample bottle into a No. 60 mesh sieve where it could be rinsed. Under a stream of water, the individual HD plates and hardware were scrubbed with a 2-inch paintbrush into the sieve. The sample was then rinsed from the sieve into a white plastic tray partially filled with water. Sample aliquots were removed from the tray and placed in a small petri dish for counting under a dissecting microscope with 15X to 40X magnification. Following counting, the samples were preserved with 70% isopropanol solution. The subject samples were delivered to EA Engineering, Science, and Technology, Inc. (EA) in Deerfield, Illinois for further processing and taxonomic identification.

Upon arrival at EA's laboratory, the samples were logged in and assigned an individual tracking number. Except for Oligochaeta, macroinvertebrate identifications were made to the lowest practical taxonomic level using the most current literature available (see Section 5). If necessary, Chironomidae larvae were subsampled. Chironomid larvae were placed in a grided petri dish. Squares were randomly chosen until at least 100 larvae were removed. Chironomid larvae were then cleared in 10% potassium hydroxide and permanently mounted in CMC-10. All specimens were identified, enumerated, and coded on EA's standard laboratory bench sheet for data processing.

Each slide-mounted chironomid specimen was examined for a variety of head capsule deformities. The use of chironomid head capsule deformities as indicators of benthic community quality has become widely accepted throughout the world (Burt et al. 2003, Canfield et al. 1996, De Pauw and Heylen 2001, Jeyasingham and Ling 2000, Lenat 1993). However, factors such as seasonal, temporal, and climatic variability, as well as limited baseline information and poorly understood relationships with a variety of contaminants may complicate the interpretation of deformity results (Servia et al. 2000, Servia et al. 2004, Burt et al 2003). Nonetheless, the relationship between increasing levels of environmental perturbation and incidence of chironomid deformities has been thoroughly documented. Recent studies have linked several agents found in industrial and domestic waste to midge deformities. These include endocrine disruptors (e.g., detergents; Kwak and Lee 2005, Vazquez-Duhalt et al. 2005, Vermeulen et al. 2000), heavy metals (e.g., Cu, Hg, Pb, Zn; Janssens de Bisthoven and Ollevier 1998, Janssens de Bisthoven et al. 1998, Martinez et al. 2004, Swansburg et al. 2002), polynuclear aromatic hydrocarbons (e.g., coal tar; Dickman et al. 1992, Hudson and Ciborowski 1996a), organochlorine compounds (e.g., pesticides; Hudson and Ciborowski 1996b) and radionuclides (e.g., radium and uranium refining; Warwick et al. 1987). In addition, as more studies are conducted under a variety of conditions

in different regions, reasonable expectations of what constitutes baseline conditions will become more established. Therefore, chironomid deformity analysis is likely to become an even more integral tool of bioassessment over time.

For Orthocladiinae, Chironomini, and Tanytarsini specimens, the structures examined for deformities included the mentum, mandibles, premandibles, and pecten epipharyngis (Sæther 1980). Tanypodinae structures included the ligula, dorsomentum, mandibles, paraligula, and pecten hypopharyngis (Sæther 1980). Guidance as to what constituted a deformity as well as descriptions of deformities for the structures and taxa listed above was derived from a variety of sources, most notably Bird (1994), Dermott (1991), Dickman et al. (1992), Groenendijk et al. (1998), Hudson and Ciborowski (1996b), MacDonald and Taylor (2006), Nazarova et al. (2004), Warwick (1985 and 1991), Warwick and Tisdale (1988), and Warwick et al. (1987). A conservative approach was used to distinguish deformities or malformations from broken or severely worn larval structures. In general, deformities and malformations were easily distinguished from worn or damaged structures for the specimens examined during this study. However, if any suspicion existed as to the cause of an irregular structure, that irregularity was not counted as a deformity.

Whenever possible, for the waterways with multiple sampling stations, comparisons were made longitudinally between monitoring stations. Metrics used included density, relative abundance (percent), total taxa richness, number of Ephemeroptera+Plecoptera+Trichoptera (EPT) taxa, dominant taxa composition, and percent Chironomidae head capsule deformities. In some instances, notable differences in the benthic macroinvertebrate community were observed among the stations. These differences could be the result of differences in water or sediment quality related to point and non-point sources, differences in habitat quality, or natural variability within the benthic community. However, since it was unclear what factors may have affected the sample results, the differences were described in varying degrees of “stress”, which is intended to encompass all potential impact types. For the purpose of summarizing and discussing the 2005 results, the center and near shore samples were combined for each site by sample type. The center and near shore data are presented separately for each station and sample type in Appendix A.

3. RESULTS AND DISCUSSION

3.1 2005 Benthic Macroinvertebrate Results

During 2005, 56 HD samples and 61 Ponar samples were collected from 33 stations in 13 different waterways (Table 2-1). Combined, these samples yielded 135 total taxa and 23 relatively pollution sensitive EPT taxa (Table 3-1). Chironomidae was the most taxa rich group with 61 taxa followed by Ephemeroptera and Trichoptera with 11 and 12 taxa, respectively. The taxa that are underlined in Table 3-1 represent those that are considered highly tolerant of pollution caused stressors. For the purposes of this study, several literature sources were considered to determine the tolerance of any particular taxon including Barbour et al. (1999), Illinois Environmental Protection Agency (IEPA) (1987), Ohio Environmental Protection Agency (OEPA) (1988), and Simpson and Bode (1980). Taxa were regarded as highly tolerant if they were listed as such in the literature and/or their assigned tolerance values from various regions in the U.S. averaged eight or greater on a zero to ten or eleven scale with ten/eleven being the most tolerant.

3.1.1 Calumet Watershed

Three stations were sampled in the Calumet watershed during 2005: one station in the Calumet River, one station in the Little Calumet River, and one station in the Cal-Sag Channel (Table 2-1).

Overall, the HD samples from the Calumet watershed were either dominated by zebra mussels (*Dreissena polymorpha*) or highly tolerant taxa whereas all of the Ponar samples were dominated by zebra mussels or Oligochaeta. Chironomid head capsule deformities were absent at two of the stations sampled and low at the third station. Despite the absence of deformities in the majority of midge specimens examined, the benthic community in the Calumet watershed largely consisted of tolerant taxa.

3.1.1.1 Calumet River

Combined, the HD and Ponar samples from the single station in the Calumet River (Station 55) yielded 20 total taxa and two EPT taxa (Tables 3-2 and 3-3). Eight total taxa and one EPT taxon were observed in the HD samples while 14 total taxa and one EPT taxon were present in the Ponar samples. Total density in the HD samples was nearly thirty times higher than in the Ponar samples. The higher density in the HD samples was almost exclusively due to the abundance of zebra mussels, which prefer hard surfaces, like the HD samplers for attachment (Table 3-2). Zebra mussel was the most dominant HD taxon, representing over 93 percent of the total density. Except for the side swimmer *Gammarus*, the remaining taxa observed in the HD samples were individually represented by less than one percent of the total density. As with the HD samples, zebra mussel also was the most dominant taxon by percent in the Ponars (Table 3-3). With the exception of Oligochaeta, no other taxon collected in the Ponar samples attained one percent of the total density.

Table 3-1. List of benthic macroinvertebrate taxa collected in Hester-Dendy and Ponar samples from several Chicago Metropolitan Area waterways (EA 2004 and 2006). Underlined taxa are those considered to be highly tolerant based on literature sources.

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|--|----------------|---------------|----------------|----------------|------------|---------------|----------------|----------------|----------------|---------------|
| PORIFERA (Sponges) | | | | | | | | | X | |
| COELENTERATA (Hydroids) | | | | | | | | | | |
| <i>Hydra</i> | X | X | X | X | X | X | X | X | X | X |
| PLATYHELMINTHES (Flat worms) | | | | | | | | | | |
| Turbellaria | X | X | X | X | X | X | X | X | X | X |
| NEMATODA (Round worms) | | | | | | | X | X | | |
| ENTOPROCTA (Moss Animalcules) | | | | | | | | | | |
| <i>Urnatella gracilis</i> | | X | | | | | X | X | X | X |
| ECTOPROCTA (Bryozoans) | | | | | | | | | | |
| <i>Plumatella</i> | X | X | X | X | X | | X | X | X | X |
| ANNELLIDA | | | | | | | | | | |
| <u>Oligochaeta (Aquatic Worms)</u> | X | X | X | X | X | X | X | X | X | X |
| Hirudinea (Leeches) | | | | | | | | | | |
| Glossiphoniidae ¹ | | | X ¹ | X ¹ | | | | | | |
| <u>Desserobdella phalera</u> | | | | | | | | | X | |
| <i>Helobdella</i> ¹ | X ¹ | | | | | | X ¹ | X ¹ | X ¹ | |
| <i>Helobdella papillata</i> | | | | | | | X | | | |
| <i>Helobdella stagnalis</i> | X | X | X | X | X | X | X | X | X | X |
| <u><i>Helobdella triserialis</i></u> | X | X | X | | X | X | | | X | X |
| <i>Placobdella</i> | | | X | | | | | | | |
| <i>Placobdella montifera</i> | | | | | | | | | X | |
| <i>Placobdella pediculata</i> | | | | | | | X | X | | |
| <u><i>Ernobdella punctata punctata</i></u> | X | X | | X | X | X | X | X | X | X |
| <u><i>Mooreobdella bucera</i></u> | | | | | | | | X | | |
| <u><i>Mooreobdella microstoma</i></u> | X | X | X | X | X | X | X | X | X | X |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|---------------------------------|------------|---------------|------------|----------------|----------------|----------------|----------------|---------------|------------|---------------|
| CRUSTACEA | | | | | | | | | | |
| Ostracoda (Seed Shrimp) | | X | | | | | X | X | | |
| Isopoda (Sow Bugs) | | | | | | | | | | |
| <i>Caecidotea</i> | X | X | X | X | X | X | X | X | X | X |
| Amphipoda (Side Swimmers) | | | | | | | | | | |
| <u><i>Crangonyx</i></u> | | | | | | | X | | X | |
| <i>Gammarus</i> ¹ | | | | X ¹ | X ¹ | X ¹ | | | X | X |
| <i>Gammarus fasciatus</i> | X | X | X | X | X | X | X | X | | |
| <i>Hyaella azteca</i> | | | | | | | X | X | X | X |
| Decapoda (Crayfish) | | | | | | | | | | |
| <i>Cambarus bartonii</i> | | | | | | | X | | | |
| <i>Orconectes</i> ¹ | | | | | X ¹ | X | | | X | X |
| <i>Orconectes immunis</i> | | X | | | | | | | | |
| <i>Orconectes virilis</i> | X | | | X | X | | | | | |
| <i>Procambarus acutus</i> | | | | | | | | | X | |
| ARACHNOIDEA | | | | | | | | | | |
| Hydracarina (Water Mites) | X | X | | | | | X | | X | X |
| INSECTA | | | | | | | | | | |
| Collembola (Springtails) | | | | | | | | | X | X |
| Ephemeroptera (Mayflies) | | | | | | | | | | |
| <i>Isonychia</i> | X | | X | | | | | | X | |
| <i>Baetis</i> ¹ | | | | | | | X ¹ | | | |
| <i>Baetis flavistriga</i> | | | | | | | X | X | | |
| <i>Baetis intercalaris</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Callibaetis</i> | | | | | | | X | | | |
| <i>Centroptilum</i> | | | | | | | | | X | X |
| <i>Pseudocloeon ephippiatum</i> | X | | | | | | | | | |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|---------------------------------------|----------------|----------------|------------|---------------|------------|----------------|----------------|---------------|----------------|----------------|
| Ephemeroptera (cont.) | | | | | | | | | | |
| Heptageniidae ¹ | X ¹ | X ¹ | | | | | | | | |
| <i>Heptagenia</i> | X | | X | | | | | | X | |
| <i>Leucrocuta</i> | X | | X | | | | | | | |
| <i>Maccaffertium</i> ^{1,2} | X ¹ | X | | | | | | | | |
| <i>Maccaffertium exiguum</i> | | | | | X | | | | | |
| <i>Maccaffertium integrum</i> | X | | X | | X | | X | | X | |
| <i>Maccaffertium terminatum</i> | X | | X | | | | X | X | X | |
| <i>Stenacron</i> | X | | X | | X | | X | X | X | X |
| <i>Stenonema femoratum</i> | | | | | | | | | X | |
| <i>Caenis</i> | | X | | | X | X | X | X | | X |
| <i>Tricorythodes</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Anthopotamus myops</i> grp. | | | | | X | | X | X | | X |
| <i>Hexagenia</i> ¹ | | | | | X | X ¹ | | | | |
| <i>Hexagenia bilineata</i> | | | | X | | | | | | |
| <i>Hexagenia limbata</i> | | | | | | X | | | | |
| Odonata (Damselflies and Dragonflies) | | | | | | | | | | |
| Zygoptera ¹ | | | | | | | | | | X ¹ |
| <i>Calopteryx</i> | X | | | | | | | | | |
| Coenagrionidae ¹ | | | | | | X ¹ | X ¹ | | X ¹ | |
| <i>Argia</i> | X | | X | | X | | X | | X | |
| <i>Enallagma</i> | X | X | X | | X | X | X | | X | X |
| <i>Lestes</i> | | | | | | X | | | | |
| Libellulidae | | | | | | | | X | | |
| <i>Somatochlora</i> | | | X | | | | X | | | |
| <i>Stylurus</i> | | X | | | | | | X | | |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|--|------------|---------------|------------|----------------|------------|---------------|------------|----------------|------------|---------------|
| Plecoptera | | | | | | | | | | |
| <i>Perlesta</i> | | | | | X | | | | | |
| Hemiptera (True Bugs) | | | | | | | | | | |
| <i>Rheumatobates</i> | | | | | | | | | X | |
| <i>Trepobates</i> | | | X | | | | X | | | |
| Corixidae | | | X | X | | X | X | X | X | |
| <i>Palmacorixa</i> | | X | | | | | | | | |
| Megaloptera (Dobsonflies and Alderflies) | | | | | | | | | | |
| <i>Corydalus cornutus</i> | | | | | | X | | | | |
| <i>Sialis</i> | | | | | | | X | | | |
| Neuroptera (Spongillaflyies) | | | | | | | | | | |
| Sisyridae | | | | | | | | | X | |
| Trichoptera (Caddisflies) | | | | | | | | | | |
| <i>Cyrnellus fraternus</i> | X | X | X | | X | | X | | X | |
| Hydropsychidae ¹ | | | | X ¹ | | | | X ¹ | | |
| <i>Ceratopsyche morosa</i> | X | | X | | X | | X | X | X | |
| <i>Cheumatopsyche</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Hydropsyche</i> | X | | X | | X | | X | | X | |
| <i>Hydropsyche betteni</i> | X | X | X | | X | | X | | X | |
| <i>Hydropsyche bidens</i> | X | | X | | X | | X | | X | |
| <i>Hydropsyche orris</i> | X | | X | | X | | X | | X | |
| <i>Hydropsyche simulans</i> | X | | X | | X | | X | | X | |
| <i>Potamyia flava</i> | X | X | X | X | X | | | | | |
| <i>Hydroptila</i> | X | | X | | X | X | X | X | X | X |
| <i>Oxyethira</i> | | | | | | | | | | X |
| <i>Ceraclea</i> ¹ | | | | | X | | X | | | |
| <i>Ceraclea maculata</i> | | | | | | | | | X | |
| <i>Ocecetis</i> | | | | | | X | X | X | X | X |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|------------------------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|
| Lepidoptera (Aquatic Moths) | | | | | | | | | | |
| Noctuidae | | | | | | | | | | X |
| <i>Petrophila</i> | X | | X | | | | X | | X | |
| Coleoptera (Beetles) | | | | | | | | | | |
| <i>Agabus</i> | | | | | | | X | | | |
| <i>Copelatus</i> | | | X | | | | | | | |
| <i>Laccophilus maculosus</i> | | | X | | | | X | | | |
| <i>Ancyronyx variegata</i> | | | | | X | | X | | | |
| <i>Dubiraphia</i> | X | X | | X | | X | X | X | X | X |
| <i>Macronychus glabratus</i> | X | X | X | | X | X | X | X | X | |
| <i>Stenelmis</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Peltodytes</i> | | | | | | | | X | | |
| <i>Berosus</i> | X | X | | | X | | | | | X |
| <i>Enochrus</i> | | | | | | | | | X | |
| <i>Paracymus</i> | | | | | X | | | | | |
| <i>Tropisternus</i> | | | X | | | | X | | | |
| <i>Ectopria</i> | | | | | | | | X | | |
| Diptera (True Flies) | | | | | | | | | | |
| <u><i>Chaoborus</i></u> | X | X | | | | | | | | X |
| Ceratopogonidae | | | | | X | X | | | X | X |
| <i>Atrichopogon</i> | | | | | X | | | | | |
| <i>Bezzia</i> | | X | | | | | X | X | | |
| <i>Ceratopogon</i> | | | | | | | X | X | | |
| <i>Culicoides</i> | | | | | | | X | X | | |
| <i>Serromyia</i> | | | | | | | X | | | |
| <u>Culicidae</u> | | | | | X | | | | | |
| <i>Hemerodromia</i> | X | | | | | X | X | X | X | |
| <i>Rhamphomyia</i> | | | | | | | X | | | |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------|---------------|------------|---------------|
| Diptera (cont.) | | | | | | | | | | |
| Muscidae | | | | | | | | | | X |
| <i>Pericoma</i> | | | | | | | | X | | |
| <u><i>Psychoda</i></u> | | | | | | | | | X | |
| <i>Simulium</i> | X | X | | | X | X | X | X | X | |
| Tipulidae | | | | | | X | | | | |
| <i>Tipula</i> | | | X | | X | | | | | |
| Chironomidae (Midges) ¹ | X ¹ | | | | |
| <i>Alotanypus</i> | | | | | | | | | X | |
| <u><i>Procladius</i></u> | X | X | X | X | X | X | X | X | X | X |
| <u><i>Tanytus</i></u> | | X | | | X | X | X | X | X | X |
| <u><i>Psectrotanytus</i></u> | | | | | | | | X | | X |
| <i>Clinotanytus</i> | | X | | | | | | | | |
| <i>Coelotanytus</i> | | | | X | | X | | X | | X |
| <i>Ablabesmyia</i> | | | | | | | X | | X | |
| <i>Ablabesmyia annulata</i> | | | | | | | | | X | |
| <i>Ablabesmyia janta</i> | X | | X | X | X | X | X | | X | X |
| <i>Ablabesmyia mallochi</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Labrundinia neopilosella</i> | | | | | | | | | | X |
| <i>Larsia</i> | | | | | | | | | | X |
| <u><i>Natarsia</i></u> | | | | | | | | X | | |
| <u><i>Natarsia sp. A</i></u> | | X | | | | | X | | | |
| <i>Nilotanytus fimbriatus</i> | X | | X | | | | X | | | |
| <i>Pentaneura</i> | | | | | | | | | X | X |
| <i>Thienemannimyia</i> grp. | X | X | X | X | X | X | X | X | X | X |
| <i>Corynoneura</i> | X | X | | | X | | X | | X | |
| <i>Corynoneura lobata</i> | | | | | | | X | X | | |
| <u><i>Cricotopus</i></u> | | | | | | | X | X | | X |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|---|------------|----------------|------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Chironomidae (cont.) | | | | | | | | | | |
| <i>Cricotopus bicinctus</i> grp. | X | X | X | X | X | X | X | X | X | X |
| <i>Cricotopus sylvestris</i> grp. | X | X | X | X | X | X | X | X | X | X |
| <i>Cricotopus tremulus</i> grp. | X | | X | X | X | X | X | X | X | X |
| <i>Cricotopus trifascia</i> grp. | | | X | X | | X | | X | | X |
| <i>Cricotopus/Orthocladius</i> | | | | | | | X | X | | |
| <i>Euryhapsis</i> | | | | | X | | | | | |
| <i>Heterotrissocladius</i> | | | X | | | | | | | |
| <i>Nanocladius</i> ¹ | | X ¹ | | | | | X ¹ | | X ¹ | |
| <i>Nanocladius crassicornus/rectinervis</i> | X | X | X | | X | | X | X | X | |
| <i>Nanocladius distinctus</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Nanocladius spiniplenus</i> | | | | | | | | | X | |
| <i>Orthocladius</i> | | | | | | | X | X | | |
| <i>Parakiefferiella</i> | | | | | | | X | X | X | X |
| <i>Psectrocladius</i> | | | | | | | | | | X |
| <i>Rheocricotopus robacki</i> | X | | X | | X | X | X | X | X | X |
| <i>Thienemanniella</i> n. sp. 3 | | | | | | | | X | | |
| <i>Thienemanniella similis</i> | X | X | | | X | X | | | X | X |
| <i>Thienemanniella xena</i> | X | | X | | X | X | X | X | X | X |
| <i>Tvetenia discoloripes</i> grp | | | | | | | X | | | |
| Chironomini ¹ | | | | | | | X ¹ | | | |
| <i>Chironomus</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Cladopelma</i> | | X | X | | | X | X | X | X | X |
| <i>Cryptochironomus</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Cryptotendipes</i> | | | | | | | | X | X | X |
| <i>Cryptotendipes</i> sp. 15 | | | | | | X | | | | |
| <i>Dicrotendipes</i> ¹ | | | | | X ¹ | X ¹ | X ¹ | X ¹ | | X ¹ |
| <i>Dicrotendipes fumidus</i> | | | | | X | X | | | X | X |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|--|------------|---------------|------------|---------------|------------|----------------|------------|---------------|------------|---------------|
| Chironomidae (cont.) | | | | | | | | | | |
| <i>Dicrotendipes modestus</i> | | | | | | | | | X | X |
| <i>Dicrotendipes neomodestus</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Dicrotendipes simpsoni</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Endochironomus nigricans</i> | X | | | | X | X | X | X | X | |
| <i>Glyptotendipes</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Harnischia</i> | | | | | | | X | X | X | X |
| <i>Microchironomus</i> | | X | X | | | X | | | | |
| <i>Microtendipes</i> | | X | | X | | X | X | X | X | |
| <i>Parachironomus</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Paracladopelma</i> | X | X | | X | X | X | | X | | |
| <i>Paralauterborniella nigrohalteralis</i> | | | | | | | | | | X |
| <i>Paratendipes</i> | | | | | | | X | X | X | X |
| <i>Phaenopsectra</i> | X | | | | | | | | | X |
| <i>Phaenopsectra obediens</i> grp. | | | | | | | | | X | X |
| <i>Phaenopsectra punctipes</i> | | | | | X | | | | X | X |
| <i>Polypedilum fallax</i> grp. | X | X | X | | X | X | X | | X | |
| <i>Polypedilum flavum</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Polypedilum halterale</i> grp. | X | X | X | X | | X | X | X | X | X |
| <i>Polypedilum illinoense</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Polypedilum scalaenum</i> grp. | X | X | X | X | X | X | X | X | X | X |
| <i>Pseudochironomus</i> | | | | | | | X | X | X | X |
| <i>Saetheria</i> | | | | | | X | | X | | |
| <i>Stenochironomus</i> | X | X | X | | X | | X | X | X | X |
| <i>Stictochironomus</i> | | | | | | X | X | X | | X |
| <i>Tribelos fusciorne</i> | | | | | X | X | X | X | | |
| <i>Xenochironomus xenolabis</i> | | | X | | X | X | X | | X | |
| <i>Cladotanytarsus</i> ¹ | | | | | | X ¹ | | | | |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|---|----------------|----------------|------------|---------------|------------|---------------|----------------|----------------|----------------|---------------|
| Chironomidae (cont.) | | | | | | | | | | |
| <i>Cladotanytarsus mancus</i> grp. | | X | X | X | X | X | X | X | X | X |
| <i>Cladotanytarsus vanderwulpi</i> grp. | | X | | | | X | | X | X | X |
| <i>Micropsectra</i> | | | X | | | | X | X | | |
| <i>Paratanytarsus</i> | X | | X | X | X | X | X | X | X | X |
| <i>Rheotanytarsus</i> | X | X | X | | X | X | X | X | X | |
| <i>Tanytarsus</i> | | | X | X | X | X | X | X | X | X |
| <i>Tanytarsus glabrescens</i> grp. | | | | X | X | | | | X | |
| <i>Tanytarsus guerlus</i> grp. | X | X | X | | | X | | | X | X |
| GASTROPODA (Snails) | | | | | | | | | | |
| <i>Ferrissia</i> | X | | X | X | X | X | X | X | X | X |
| <i>Bithynia tentaculata</i> | | | | | | | | | X | X |
| <i>Amnicola</i> | | X | | X | X | X | X | X | X | X |
| <i>Physa</i> | X | X | X | | X | X | X | X | X | X |
| <i>Gyraulus</i> | | | | | | | X | X | X | |
| <i>Helisoma</i> | | | | | X | X | X | X | X | X |
| <i>Menetus dilatatus</i> | X | X | X | | | | X | X | X | X |
| <i>Planorbella</i> | | | | | | | X | | | |
| <i>Pleurocera</i> | X | X | | | X | X | X | X | X | X |
| <i>Valvata</i> | | | | | | X | X | X | | |
| <i>Campeloma decisum</i> | | | | | | | | X | | |
| <i>Viviparus</i> | | | | | | | X | X | | |
| PELECYPODA (Mussels and Clams)¹ | | | | | | | | | | |
| <i>Corbicula fluminea</i> | X ¹ | | | | | | | | | |
| <i>Corbicula fluminea</i> | X | X | X | X | X | X | X | X | X | X |
| <i>Dreissena polymorpha</i> | X | X | X | X | X | X | X | X | X | X |
| Sphaeriidae ¹ | | | | | | | | | X ¹ | |
| <i>Musculium</i> ¹ | | X ¹ | X | | X | X | X ¹ | X ¹ | X | X |

Table 3-1 (cont.)

| Taxa | HD 2001 | Ponar 2001 | HD 2002 | Ponar 2002 | HD 2003 | Ponar 2003 | HD 2004 | Ponar 2004 | HD 2005 | Ponar 2005 |
|--|------------|----------------|------------|---------------|------------|---------------|------------|----------------|------------|---------------|
| PELECYPODA (cont.) | | | | | | | | | | |
| <i>Musculium transversum</i> | X | X | | X | | | X | X | | |
| <i>Pisidium</i> ¹ | X | X ¹ | | | X | X | | X | X | X |
| <i>Pisidium compressum</i> | | X | | | | | | | | |
| <i>Pisidium nitidum</i> | | | | X | | | | | | |
| <i>Sphaerium</i> ¹ | | | | | | | X | X ¹ | X | X |
| <i>Sphaerium simile</i> | | X | | | | | | X | | |
| <i>Lasmigona complanata</i> | | X | | | | | | X | | |
| TOTAL RICHNESS BY SAMPLE TYPE³ | 82 | 74 | 81 | 50 | 89 | 80 | 121 | 105 | 118 | 94 |
| EPT RICHNESS BY SAMPLE TYPE³ | 19 | 8 | 18 | 5 | 20 | 7 | 20 | 11 | 20 | 10 |
| TOTAL RICHNESS BY YEAR³ | 100 | | 90 | | 108 | | 139 | | 135 | |
| EPT RICHNESS BY YEAR³ | 20 | | 19 | | 21 | | 20 | | 23 | |

¹Taxon unidentifiable beyond level indicated. Not counted as a discreet taxon for all samples and years combined. May be counted as a discreet taxon for individual samples, sample types, stations, or locations if it is the only representative of that taxonomic order, family, or genus.

²The *Stenonema* subgenus *Maccaffertium* was elevated to genus status by Wang and McCafferty (2004). Only *S. femoratum* remains in *Stenonema*.

³Data for sample years 2001 and 2005 are comparable. However, sample stations during 2002-2004 are different than 2001 and 2005. Therefore, any comparisons among the various years must take this fact into consideration.

TABLE 3-2. HESTER-DENDY DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, SEPTEMBER 2005.

| TAXA | 55 | |
|------------------------|-----------|--------|
| | 130TH ST. | |
| | #/m2 | % |
| Hydra | 179.4 | 0.21 |
| Oligochaeta | 448.5 | 0.51 |
| Gammarus | 4,843.9 | 5.54 |
| Cyrenellus fraternus | 89.7 | 0.10 |
| Dicrotendipes simpsoni | 89.7 | 0.10 |
| Glyptotendipes | 89.7 | 0.10 |
| Ferrissia | 89.7 | 0.10 |
| Dreissena polymorpha | 81,629.0 | 93.33 |
| TOTAL BENTHOS | 87,459.6 | 100.00 |
| TOTAL TAXA RICHNESS | 8 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-3. PETITE PONAR DENSITIES AT SAMPLING STATION 55 WITHIN THE CALUMET RIVER, SEPTEMBER 2005.

| TAXA | 55 | |
|----------------------------|-----------|--------|
| | 130TH ST. | |
| | #/m2 | % |
| Plumatella | 7.2 | 0.22 |
| Oligochaeta | 574.1 | 17.74 |
| Hydroptila | 7.2 | 0.22 |
| Ablabesmyia mallochi | 7.2 | 0.22 |
| Parakiefferiella | 14.4 | 0.44 |
| Psectrocladius | 21.5 | 0.67 |
| Chironomus | 21.5 | 0.67 |
| Cryptochironomus | 7.2 | 0.22 |
| Dicrotendipes modestus | 28.7 | 0.89 |
| Dicrotendipes neomodestus | 7.2 | 0.22 |
| Parachironomus | 7.2 | 0.22 |
| Polypedilum halterale grp. | 7.2 | 0.22 |
| Paratanytarsus | 21.5 | 0.67 |
| Dreissena polymorpha | 2,504.6 | 77.38 |
| TOTAL BENTHOS | 3,236.7 | 100.00 |
| TOTAL TAXA RICHNESS | 14 | |
| EPT TAXA RICHNESS | 1 | |

No chironomid deformities were observed in either the HD or Ponar samples. However, the benthic community represented in both the HD and Ponar samples largely consisted of taxa that are considered moderately to extremely tolerant of pollution. Of the 20 taxa, seven are typically classified as tolerant suggesting some degree and type of environmental stress is affecting the benthic community at Station 55 (Table 3-1).

3.1.1.2 Little Calumet River

Combined, the HD and Ponar samples from the single station in the Little Calumet River (Station 76) yielded 32 total taxa and two EPT taxa (Tables 3-4 and 3-5). Total taxa richness ranged from 30 taxa in the HD samples to seven taxa in the Ponar samples. The two EPT taxa only were observed in HD samples. Total Ponar density was slightly less than one-fifth of that observed in the HDs due primarily to the abundance of zebra mussel and the tolerant chironomid *Dicrotendipes simpsoni* on the artificial substrates. Again, zebra mussel was the most abundant taxon by percent in the HD samples (Table 3-4). However, unlike the HD sample from the Calumet River, 10 of the 30 taxa were individually represented by more than one percent of the total density. In contrast to the HD samples, the Ponar samples from the Little Calumet were dominated by Oligochaeta, which composed over 90 percent of the total density (Table 3-5). Four other taxa, including the fingernail clam *Pisidium* and zebra mussel achieved more than one percent of the total Ponar density.

As with the Calumet River samples, no Chironomidae head capsule deformities were observed in either the HD or Ponar samples. However, nearly half of the taxa represented in the HD and the dominant taxon in the Ponar samples are considered highly tolerant of pollution indicating a stressed environment (Table 3-1).

3.1.1.3 Calumet-Sag Channel

Combined, the HD and Ponar samples from the single station in the Calumet-Sag Channel (Station 59) yielded 25 total taxa and one EPT taxon (Tables 3-6 and 3-7). There were 23 total taxa and one EPT taxon in the HD samples while only five total taxa were present in the Ponar samples. Total density in the HD samples was nearly two times greater than in the Ponars. This difference was largely due to the abundance of three tolerant taxa: *Dicrotendipes simpsoni*, the chironomid *Nanocladius distinctus*, and the snail *Ferrissia*, which represented 65 percent of the total density (Table 3-6). Although the tolerant midge *Procladius* was well represented in the Ponar samples, Oligochaeta was clearly the most dominant taxon accounting for nearly 87 percent of the total density (Table 3-7). No other taxon collected in the Ponar samples was represented by more than 0.5 percent of the total density.

The only head capsule deformities in samples from the Calumet River watershed were observed at Station 59 (Table 3-8). One *Dicrotendipes neomodestus* with a deformity was observed in the HD samples while four of 57 *Procladius* specimens exhibited deformities in the Station 59 Ponar samples. All deformities were expressed on the mentum or ligula (teeth) in the affected specimens.

TABLE 3-4. HESTER-DENDY DENSITIES AT SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER, SEPTEMBER 2005.

| TAXA | 76 | |
|---------------------------|-------------|--------|
| | HALSTED ST. | |
| | #/m2 | % |
| Porifera | 3.6 | 0.07 |
| Hydra | 78.9 | 1.47 |
| Turbellaria | 134.6 | 2.51 |
| Oligochaeta | 468.2 | 8.72 |
| Mooreobdella microstoma | 5.4 | 0.10 |
| Caecidotea | 5.4 | 0.10 |
| Hyalella azteca | 1.8 | 0.03 |
| Gammarus | 139.9 | 2.61 |
| Argia | 3.6 | 0.07 |
| Enallagma | 3.6 | 0.07 |
| Sisyridae | 1.8 | 0.03 |
| Cyrnellus fraternus | 511.3 | 9.52 |
| Hydroptila | 1.8 | 0.03 |
| Procladius | 12.6 | 0.23 |
| Ablabesmyia janta | 26.9 | 0.50 |
| Ablabesmyia mallochi | 7.2 | 0.13 |
| Cricotopus bicinctus grp. | 14.4 | 0.27 |
| Nanocladius distinctus | 253.0 | 4.71 |
| Chironomus | 7.2 | 0.13 |
| Dicrotendipes simpsoni | 1,221.7 | 22.75 |
| Glyptotendipes | 55.6 | 1.04 |
| Parachironomus | 12.6 | 0.23 |
| Stenochironomus | 141.7 | 2.64 |
| Xenochironomus xenolabis | 233.2 | 4.34 |
| Bithynia tentaculata | 3.6 | 0.07 |
| Physa | 12.6 | 0.23 |
| Helisoma | 1.8 | 0.03 |
| Ferrissia | 37.7 | 0.70 |
| Corbicula fluminea | 35.9 | 0.67 |
| Dreissena polymorpha | 1,934.0 | 36.01 |
| TOTAL BENTHOS | 5,371.4 | 100.00 |
| TOTAL TAXA RICHNESS | 30 | |
| EPT TAXA RICHNESS | 2 | |

TABLE 3-5. PETITE PONAR DENSITIES AT SAMPLING STATION 76 WITHIN THE LITTLE CALUMET RIVER, SEPTEMBER 2005.

| TAXA | 76 | |
|----------------------------|-------------|--------|
| | HALSTED ST. | |
| | #/m2 | % |
| Oligochaeta | 861.2 | 90.23 |
| Gammarus | 14.4 | 1.50 |
| Dicrotendipes simpsoni | 7.2 | 0.75 |
| Polypedilum halterale grp. | 7.2 | 0.75 |
| Corbicula fluminea | 14.4 | 1.50 |
| Pisidium | 21.5 | 2.26 |
| Dreissena polymorpha | 28.7 | 3.01 |
| TOTAL BENTHOS | 954.5 | 100.00 |
| TOTAL TAXA RICHNESS | 7 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-6. HESTER-DENDY DENSITIES AT SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL, AUGUST 2005.

| TAXA | 59 | |
|---------------------------|-------------|--------|
| | CICERO AVE. | |
| | #/m2 | % |
| Hydra | 475.4 | 7.96 |
| Turbellaria | 50.2 | 0.84 |
| Oligochaeta | 104.1 | 1.74 |
| Caecidotea | 1.8 | 0.03 |
| Hyalella azteca | 107.6 | 1.80 |
| Gammarus | 186.6 | 3.12 |
| Collembola | 9.0 | 0.15 |
| Argia | 1.8 | 0.03 |
| Enallagma | 1.8 | 0.03 |
| Cyrnellus fraternus | 62.8 | 1.05 |
| Procladius | 48.4 | 0.81 |
| Ablabesmyia janta | 71.8 | 1.20 |
| Cricotopus bicinctus grp. | 12.6 | 0.21 |
| Nanocladius distinctus | 936.5 | 15.67 |
| Dicrotendipes neomodestus | 100.5 | 1.68 |
| Dicrotendipes simpsoni | 2,366.3 | 39.60 |
| Glyptotendipes | 98.7 | 1.65 |
| Parachironomus | 26.9 | 0.45 |
| Stenochironomus | 150.7 | 2.52 |
| Xenochironomus xenolabis | 141.7 | 2.37 |
| Ferrissia | 613.6 | 10.27 |
| Corbicula fluminea | 41.3 | 0.69 |
| Dreissena polymorpha | 366.0 | 6.12 |
| TOTAL BENTHOS | 5,976.0 | 100.00 |
| TOTAL TAXA RICHNESS | 23 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-7. PETITE PONAR DENSITIES AT SAMPLING STATION 59 WITHIN THE CAL-SAG CHANNEL, AUGUST 2005.

| TAXA | 59 | |
|------------------------|-------------|--------|
| | CICERO AVE. | |
| | #/m2 | % |
| Oligochaeta | 2,712.8 | 86.90 |
| Procladius | 380.4 | 12.18 |
| Coelotanytus | 7.2 | 0.23 |
| Cryptochironomus | 7.2 | 0.23 |
| Dicrotendipes simpsoni | 14.4 | 0.46 |
| TOTAL BENTHOS | 3,121.8 | 100.00 |
| TOTAL TAXA RICHNESS | 5 | |
| EPT TAXA RICHNESS | 0 | |

Table 3-8. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the Cal-Sag Channel, August 2005.

| Taxa | Hester-Dendy Sample | Ponar Sample |
|----------------------------------|------------------------------|------------------------------|
| | C.S.C @ Cicero Sta. 59 | C.S.C @ Cicero Sta. 59 |
| <i>Procladius</i> | | |
| Number Examined | 4 | 53 |
| Percent Deformed | 0.0 | 7.5 |
| <i>Dicrotendipes neomodestus</i> | | |
| Number Examined | 21 | 0 |
| Percent Deformed | 4.8 | 0.0 |
| TOTAL SAMPLE | | |
| Total Midges Examined | 198 | 57 |
| Percent Deformed | 0.5 | 7.0 |

Baseline deformity levels have not been established for Chironomidae in the Chicago Metropolitan Area waterways. A study of deformity levels at 211 reference sites throughout the Great Lakes, including lower Lake Michigan, found that background levels were 2.27 percent for *Procladius* (Burt et al. 2003). However, the sample size used in this study was far greater than the number specimens examined at Station 59 in 2005. Additional studies conducted in the Great Lakes region by Hudson and Ciborowski (1996b) and Dermont (1991) suggest that an incidence of three percent is typical of reference conditions. Since the number of deformed *Procladius* observed in the Ponar samples is only slightly higher than these reference levels and given the small sample size, it is unlikely that the level observed in the Station 59 Ponar sample is indicative of an impact.

Although the incidence of head capsule deformities does not provide clear evidence, the abundance of tolerant taxa at Station 59 suggests that the benthic community is at least moderately stressed (Table 3-1).

3.1.2 North Branch Chicago River Watershed

Sampling was conducted at 16 stations in the North Branch of the Chicago River watershed during 2005: two stations in the West Fork of the North Branch of the Chicago River (WFNBKR), one station in the Middle Fork of the North Branch of the Chicago River (MFNBKR), two stations in the Skokie River, four stations in the North Shore Channel (NSC), and seven stations in the North Branch of the Chicago River (NBR) (Table 2-1).

Tolerant taxa were the most abundant organisms in nine of the 15 HD samples collected from the North Branch Chicago River watershed. Likewise, Oligochaeta was the dominant taxon in 13 of

16 Ponar samples. Chironomidae deformities were observed in the majority of HD and Ponar samples collected in the watershed with some incidence levels being among the highest observed in the 2005 samples. Based on the dominance of a single taxon, dominance by tolerant taxa, total richness, EPT richness, and/or head capsule deformities, several stations in the watershed exhibited varying degrees of stress.

3.1.2.1 West Fork of the North Branch of the Chicago River

Together, the HD and Ponar samples from the two WFNBCR stations (Stations 106 and 103) yielded 40 total taxa and two EPT taxa (Tables 3-9 and 3-10). HD total taxa richness at Station 106 was double the total richness at Station 103 (Table 3-9). This difference was largely due to a more diverse chironomid assemblage at Station 106 where 16 midge taxa were observed compared to nine midge taxa at Station 103. In addition, the only EPT taxon observed in the HD samples was collected from Station 106. Total density was more than four times higher at Station 103 compared to Station 106. This difference was primarily due to noticeably higher numbers of *Hydra* and *Turbellaria*, as well as the tolerant taxa *Oligochaeta* and *Dicrotendipes simpsoni*. The most abundant taxa at Station 106 were *Oligochaeta*, *Caecidotea*, and *Chironomus* while at Station 103 *Hydra* was the dominant taxon.

Results from the HD and Ponar samples were generally similar. Ponar total taxa richness was noticeably higher at Station 106 with 22 taxa compared to nine taxa at Station 103 (Table 3-10). Again, total density was substantially greater downstream at Station 103 compared to Station 106. This difference was primarily due to a higher number of *Oligochaeta* at Station 103. *Oligochaeta* was abundant at both Stations. However, at Station 103, *Oligochaeta* contributed 98 percent of the total density while *Chironomus* and *Oligochaeta* combined to yield only 61 percent of the density at Station 106.

Chironomid head capsule deformities in the WFNBCR were restricted to *Chironomus* in both the HD and Ponar samples from the Station 106. This taxon was not observed in the HD and Ponar samples from Station 103 and no deformities were observed in the samples from Station 103. Of the 111 *Chironomus* examined in the HD samples, 54.1 percent were deformed (Table 3-11). Likewise, 26.5 percent of the 102 *Chironomus* in the Ponars samples exhibited clear deformities (Table 3-12). Overall, the deformity levels observed in the HD and Ponar samples from Station 106 were either the highest or among the highest observed among all the stations sampled in 2005.

All of the observed deformities were expressed on the mentum except one specimen from the Ponar samples that had both a deformed mentum and antenna. Of the mentum deformities, the vast majority involved extra teeth or malformed teeth. Deformities of this nature have been linked to elevated levels of organochlorines, polynuclear aromatic hydrocarbons, and heavy metals (Bisthoven and Ollevier 1998, Bisthoven et al. 1998, Dermont 1991, Hudson and Ciborowski 1996a, Hudson and Ciborowski 1996b, Swansburg et al. 2002). Burt et al. (2003) found that reference deformity levels for *Chironomus* were 2.15 percent in the Great Lakes. Other investigators have reported background levels from zero to 14 percent for *Chironomus* (Bird 1994, Burt et al. 2003, Lenat 1993, Swansburg et al. 2002). Despite the lack of consensus

TABLE 3-9. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE WEST FORK NORTH BRANCH CHICAGO RIVER, JUNE 2005.

| TAXA | 106 DUNDEE RD. | | 103 GOLF RD. | |
|--------------------------------------|-------------------|--------|-----------------|--------|
| | #/m2 | % | #/m2 | % |
| Hydra | 321.1 | 6.92 | 8,396.1 | 48.17 |
| Turbellaria | 209.9 | 4.53 | 1,838.9 | 10.55 |
| Oligochaeta | 1,227.1 | 26.46 | 2,691.1 | 15.44 |
| Helobdella stagnalis | 224.3 | 4.84 | -- | -- |
| Erpobdella punctata punctata | 35.9 | 0.77 | -- | -- |
| Caecidotea | 940.1 | 20.27 | 1,211.0 | 6.95 |
| Crangonyx | 3.6 | 0.08 | -- | -- |
| Coenagrionidae | 3.6 | 0.08 | -- | -- |
| Cheumatopsyche | 1.8 | 0.04 | -- | -- |
| Enochrus | 3.6 | 0.08 | -- | -- |
| Alotanypus | 5.4 | 0.12 | -- | -- |
| Procladius | 114.8 | 2.48 | 143.5 | 0.82 |
| Ablabesmyia | 10.8 | 0.23 | -- | -- |
| Pentaneura | 21.5 | 0.46 | -- | -- |
| Thienemannimyia grp. | 217.1 | 4.68 | -- | -- |
| Cricotopus tremulus grp. | 10.8 | 0.23 | -- | -- |
| Cricotopus bicinctus grp. | 39.5 | 0.85 | -- | -- |
| Cricotopus sylvestris grp. | 5.4 | 0.12 | 35.9 | 0.21 |
| Nanocladius crassicornus/rectinervis | 16.1 | 0.35 | 35.9 | 0.21 |
| Chironomus | 904.2 | 19.50 | -- | -- |
| Cryptochironomus | 10.8 | 0.23 | -- | -- |
| Dicrotendipes neomodestus | 5.4 | 0.12 | -- | -- |
| Dicrotendipes simpsoni | 26.9 | 0.58 | 2,583.4 | 14.82 |
| Glyptotendipes | -- | -- | 161.5 | 0.93 |
| Harnischia | -- | -- | 53.8 | 0.31 |
| Polypedilum halterale grp. | -- | -- | 35.9 | 0.21 |
| Polypedilum illinoense | 16.1 | 0.35 | 125.6 | 0.72 |
| Polypedilum scalaenum grp. | -- | -- | 17.9 | 0.10 |
| Paratanytarsus | 204.5 | 4.41 | -- | -- |
| Tanytarsus guerlus grp. | 16.1 | 0.35 | -- | -- |
| Psychoda | 1.8 | 0.04 | -- | -- |
| Physa | 23.3 | 0.50 | 26.9 | 0.15 |
| Menetus dilatatus | 1.8 | 0.04 | -- | -- |
| Ferriesia | -- | -- | 71.8 | 0.41 |
| Musculium | 3.6 | 0.08 | -- | -- |
| Eisidium | 10.8 | 0.23 | -- | -- |
| TOTAL BENTHOS | 4,637.6 | 100.00 | 17,429.1 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | | 15 | |
| EPT TAXA RICHNESS | 1 | | 0 | |

TABLE 3-10. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE WEST FORK NORTH BRANCH CHICAGO RIVER, JUNE 2005.

| TAXA | 106 DUNDEE RD. | | 103 GOLF RD. | |
|------------------------------|-------------------|--------|-----------------|--------|
| | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 71.8 | 0.13 |
| Oligochaeta | 3,251.0 | 28.87 | 54,183.6 | 98.18 |
| Erpobdella punctata punctata | 416.2 | 3.70 | -- | -- |
| Caecidotea | 21.5 | 0.19 | -- | -- |
| Collembola | 7.2 | 0.06 | -- | -- |
| Cecetis | 129.2 | 1.15 | 71.8 | 0.13 |
| Procladius | 265.5 | 2.36 | 143.5 | 0.26 |
| Pentaneura | 21.5 | 0.19 | -- | -- |
| Thienemannimyia grp. | 21.5 | 0.19 | -- | -- |
| Cricotopus bicinctus grp. | 21.5 | 0.19 | -- | -- |
| Cricotopus sylvestris grp. | 21.5 | 0.19 | -- | -- |
| Nanocladius distinctus | 21.5 | 0.19 | -- | -- |
| Chironomus | 3,638.6 | 32.31 | -- | -- |
| Cryptochironomus | 165.1 | 1.47 | 143.5 | 0.26 |
| Dicrotendipes neomodestus | 1,521.4 | 13.51 | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 71.8 | 0.13 |
| Paratendipes | 21.5 | 0.19 | -- | -- |
| Polypedilum halterale grp. | 43.1 | 0.38 | 71.8 | 0.13 |
| Polypedilum scalaenum grp. | 409.1 | 3.63 | -- | -- |
| Paratanytarsus | 215.3 | 1.91 | -- | -- |
| Physa | 57.4 | 0.51 | -- | -- |
| Menetus dilatatus | 7.2 | 0.06 | -- | -- |
| Musculium | 610.0 | 5.42 | 358.8 | 0.65 |
| Eisidium | 373.2 | 3.31 | 71.8 | 0.13 |
| TOTAL BENTHOS | 11,260.1 | 100.00 | 55,188.3 | 100.00 |
| TOTAL TAXA RICHNESS | 22 | | 9 | |
| EPT TAXA RICHNESS | 1 | | 1 | |

Table 3-11. Chironomidae head capsule deformities observed in Hester-Dendy samples from the North Branch of the Chicago River watershed, June - July 2005.

| Taxa | Hester Dendy Samples | | | | | | | |
|--------------------------------------|--------------------------------------|-------------------------------------|-------------------------------------|--------------------------------|--------------------------------|------------------------------|-----------------------------------|-----------------------------------|
| | W.F.N.B.C.R. @ Dundee Sta. 106 | Skokie R. @ Lake Cook Sta. 32 | Skokie R. @ Frontage Sta. 105 | N.S.C. @ Central Sta. 35 | N.S.C. @ Oakton Sta. 102 | N.S.C. @ Touhy Sta. 36 | N.B.C.R. @ Dempster Sta. 34 | N.B.C.R. @ Diversey Sta. 73 |
| <i>Chironomus</i> | | | | | | | | |
| Number Examined | 111 | 49 | 47 | 6 | 1 | -- | -- | -- |
| Percent Deformed | 54.1 | 22.4 | 8.5 | 33.3 | 0.0 | -- | -- | -- |
| <i>Dicrotendipes modestus</i> | | | | | | | | |
| Number Examined | -- | -- | 32 | 81 | 18 | 4 | 13 | -- |
| Percent Deformed | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 7.7 | -- |
| <i>Dicrotendipes simpsoni</i> | | | | | | | | |
| Number Examined | 1 | 13 | 29 | 67 | 163 | 134 | 27 | 162 |
| Percent Deformed | 0.0 | 7.7 | 3.4 | 0.0 | 1.8 | 0.0 | 0.0 | 0.6 |
| <i>Glyptotendipes</i> | | | | | | | | |
| Number Examined | 2 | -- | 13 | -- | 1 | 68 | 7 | 9 |
| Percent Deformed | 0.0 | -- | 0.0 | -- | 0.0 | 1.5 | 0.0 | 0.0 |
| TOTAL SAMPLE | | | | | | | | |
| Total Midges Examined | 198 | 72 | 175 | 202 | 195 | 231 | 165 | 194 |
| Percent Deformed | 30.3 | 16.7 | 2.9 | 1.0 | 1.5 | 0.4 | 0.6 | 0.5 |

Table 3-12. Chironomidae head capsule deformities observed in Ponar samples from the North Branch of the Chicago River watershed, June - July 2005.

| Taxa | Ponar Samples | | | | | | |
|-----------------------|--------------------------------------|--|-------------------------------------|-------------------------------------|--------------------------------|--------------------------------|--------------------------------|
| | W.F.N.B.C.R. @ Dundee Sta. 106 | M.F.N.B.C.R. @ Lake Cook Sta. 31 | Skokie R. @ Lake Cook Sta. 32 | Skokie R. @ Frontage Sta. 105 | N.S.C. @ Central Sta. 35 | N.S.C. @ Oakton Sta. 102 | N.S.C. @ Foster Sta. 101 |
| <i>Procladius</i> | | | | | | | |
| Number Examined | 9 | 57 | 7 | 6 | 23 | 29 | 1 |
| Percent Deformed | 0.0 | 0.0 | 0.0 | 33.3 | 8.7 | 6.9 | 0.0 |
| <i>Chironomus</i> | | | | | | | |
| Number Examined | 102 | 24 | 182 | 126 | 23 | 1 | 30 |
| Percent Deformed | 26.5 | 4.2 | 8.8 | 1.6 | 0.0 | 0.0 | 13.3 |
| TOTAL SAMPLE | | | | | | | |
| Total Midges Examined | 195 | 84 | 197 | 154 | 145 | 63 | 51 |
| Percent Deformed | 13.8 | 1.2 | 8.1 | 2.6 | 1.4 | 3.2 | 7.8 |

| Taxa | Ponar Samples | | | |
|-----------------------|------------------------------------|-----------------------------------|---------------------------------|-----------------------------------|
| | N.B.C.R. @ Glenview Sta. 104 | N.B.C.R. @ Dempster Sta. 34 | N.B.C.R. @ Wilson Sta. 37 | N.B.C.R. @ Diversey Sta. 73 |
| <i>Procladius</i> | | | | |
| Number Examined | 2 | 65 | 6 | 23 |
| Percent Deformed | 0.0 | 3.1 | 0.0 | 0.0 |
| <i>Chironomus</i> | | | | |
| Number Examined | 28 | 21 | 21 | 5 |
| Percent Deformed | 35.7 | 42.9 | 52.4 | 40.0 |
| TOTAL SAMPLE | | | | |
| Total Midges Examined | 123 | 139 | 59 | 30 |
| Percent Deformed | 8.1 | 7.9 | 18.6 | 6.7 |

regarding reference levels, the incidence of deformities observed at Station 106 are substantially greater than previously identified background levels. While the absence of midge deformities at Station 103 may be indicative of less toxic stress compared to Station 106 (Lenat 1993), it equally could be the result of conditions at Station 103 being stressed beyond the survival threshold for *Chironomus* or other taxa that may exhibit deformities (Janssens de Bisthoven et al. 1998, Wiederholm 1984). These results suggest that the benthic communities at both stations are moderately stressed. However, based on the noticeably higher total richness and more even distribution of abundance among taxa, impairment at Station 106 appears to be relatively less compared to Station 103.

3.1.2.2 Middle Fork of the North Branch of the Chicago River

Combined, the HD and Ponar samples from the single station in the MFNBCR (Station 31) yielded 21 total taxa (Tables 3-13 and 3-14). Thirteen total taxa were observed in the HD samples while 18 total taxa were present in the Ponar samples. Total density in the HD and Ponar samples was similar though slightly higher in the Ponars. The dominant taxon in both the HD and Ponar samples was *Caecidotea*. However, in addition to *Caecidotea*, *Oligochaeta*, *Procladius*, and *Pisidium* were represented by more than five percent of the total density in the Ponar samples (Table 3-14). In contrast, only *Caecidotea* and *Hydra* achieved more than five percent in the HD samples (Table 3-13).

A single *Chironomus* specimen in the Ponar samples exhibited a head capsule deformity (Table 3-12). This specimen composed 4.2 percent of the *Chironomus* and 1.2 percent of all the chironomids examined in the Ponar samples. Given the small sample size, the percent incidence of deformity observed in these samples is likely insignificant. However, several of the benthic taxa represented in both the HD and Ponar samples are considered moderately to extremely tolerant of pollution. Of the 21 taxa observed, nine are typically classified as tolerant (Table 3-1). As such, it is reasonable to consider the benthic community at Station 31 as moderately stressed.

3.1.2.3 Skokie River

Combined, the HD and Ponar samples from the two Skokie River stations (Stations 32 and 105) yielded 44 total taxa and three EPT taxa (Tables 3-15 and 3-16). HD total taxa richness was slightly higher at the downstream Station 105 (29 taxa) compared to Station 32 (20 taxa) (Table 3-15). In addition, EPT richness was zero at Station 32 while three EPT taxa were observed in the Station 105 HDs. Total density was nearly identical between the two stations and the dominant taxon at each station was *Oligochaeta*.

Ponar taxa richness was similar with 16 and 13 total at Stations 32 and 105, respectively and no EPT taxa (Table 3-16). In addition, *Oligochaeta* was similarly the dominant taxon at both stations in terms of relative abundance. However, the density of *Oligochaeta* was more than two times greater at Station 32 compared to Station 105. That combined with the substantially higher density of *Chironomus* at Station 32 resulted in a nearly three-fold difference in total density between the two stations.

TABLE 3-13. HESTER-DENDY DENSITIES AT SAMPLING STATION 31 WITHIN THE MIDDLE FORK NORTH BRANCH CHICAGO RIVER, JUNE 2005.

| TAXA | 31 | |
|----------------------|---------------|--------|
| | LAKE COOK RD. | |
| | #/m2 | % |
| Hydra | 1,892.7 | 5.78 |
| Turbellaria | 1,453.2 | 4.43 |
| Oligochaeta | 170.4 | 0.52 |
| Helobdella stagnalis | 35.9 | 0.11 |
| Caecidotea | 28,597.1 | 87.27 |
| Hydracarina | 17.9 | 0.05 |
| Procladius | 17.9 | 0.05 |
| Thienemannimyia grp. | 35.9 | 0.11 |
| Chironomus | 44.9 | 0.14 |
| Glyptotendipes | 35.9 | 0.11 |
| Physa | 251.2 | 0.77 |
| Sphaerium | 89.7 | 0.27 |
| Musculium | 125.6 | 0.38 |
| TOTAL BENTHOS | 32,768.2 | 100.00 |
| TOTAL TAXA RICHNESS | 13 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-14. PETITE PONAR DENSITIES AT SAMPLING STATION 31 WITHIN THE MIDDLE FORK NORTH BRANCH CHICAGO RIVER, JUNE 2005.

| TAXA | 31 | |
|------------------------------|---------------|--------|
| | LAKE COOK RD. | |
| | #/m2 | % |
| Hydra | 251.2 | 0.66 |
| Turbellaria | 265.5 | 0.70 |
| Oligochaeta | 10,664.5 | 27.98 |
| Helobdella stagnalis | 172.2 | 0.45 |
| Erpobdella punctata punctata | 129.2 | 0.34 |
| Caecidotea | 19,341.0 | 50.74 |
| Enallagma | 21.5 | 0.06 |
| Procladius | 2,368.3 | 6.21 |
| Chironomus | 172.2 | 0.45 |
| Paratendipes | 43.1 | 0.11 |
| Polypedilum flavum | 35.9 | 0.09 |
| Annicola | 7.2 | 0.02 |
| Physa | 552.6 | 1.45 |
| Menetus dilatatus | 7.2 | 0.02 |
| Ferrissia | 35.9 | 0.09 |
| Sphaerium | 588.5 | 1.54 |
| Musculium | 480.8 | 1.26 |
| Pisidium | 2,978.3 | 7.81 |
| TOTAL BENTHOS | 38,115.1 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-15. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE SKOKIE RIVER, JUNE 2005.

| TAXA | 32 | | 105 | |
|------------------------------|---------------|--------|--------------|--------|
| | LAKE COOK RD. | | FRONTAGE RD. | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 165.1 | 9.81 | 26.9 | 1.64 |
| Oligochaeta | 958.0 | 56.93 | 586.7 | 35.86 |
| Helobdella stagnalis | 120.2 | 7.14 | -- | -- |
| Helobdella triserialis | 1.8 | 0.11 | -- | -- |
| Erpobdella punctata punctata | 3.6 | 0.21 | -- | -- |
| Caecidotea | 253.0 | 15.03 | 30.5 | 1.86 |
| Gammarus | 3.6 | 0.21 | 407.2 | 24.89 |
| Procambarus acutus | 1.8 | 0.11 | 5.4 | 0.33 |
| Hydracarina | 1.8 | 0.11 | -- | -- |
| Stenacron | -- | -- | 3.6 | 0.22 |
| Rheumatobates | -- | -- | 1.8 | 0.11 |
| Cyrenellus fraternus | -- | -- | 14.4 | 0.88 |
| Cheumatopsyche | -- | -- | 10.8 | 0.66 |
| Procladius | 3.6 | 0.21 | 41.3 | 2.52 |
| Ablabesmyia annulata | -- | -- | 7.2 | 0.44 |
| Cricotopus bicinctus grp. | -- | -- | 9.0 | 0.55 |
| Cricotopus sylvestris grp. | 9.0 | 0.53 | 7.2 | 0.44 |
| Nanocladius distinctus | -- | -- | 1.8 | 0.11 |
| Chironomus | 116.6 | 6.93 | 116.6 | 7.13 |
| Dicrotendipes modestus | -- | -- | 73.6 | 4.50 |
| Dicrotendipes neomodestus | 1.8 | 0.11 | 7.2 | 0.44 |
| Dicrotendipes simpsoni | 23.3 | 1.39 | 59.2 | 3.62 |
| Glyptotendipes | -- | -- | 23.3 | 1.43 |
| Harnischia | -- | -- | 12.6 | 0.77 |
| Paratendipes | -- | -- | 7.2 | 0.44 |
| Phaenopsectra punctipes grp. | 3.6 | 0.21 | -- | -- |
| Polypedilum halterale grp. | -- | -- | 1.8 | 0.11 |
| Polypedilum illinoense | 1.8 | 0.11 | 1.8 | 0.11 |
| Polypedilum scalaenum grp. | -- | -- | 1.8 | 0.11 |
| Paratanytarsus | 1.8 | 0.11 | 5.4 | 0.33 |
| Rhaotanytarsus | -- | -- | 10.8 | 0.66 |
| Physa | 7.2 | 0.43 | -- | -- |
| Ferrissia | -- | -- | 12.6 | 0.77 |
| Corbicula fluminea | -- | -- | 86.1 | 5.26 |
| Sphaerium | -- | -- | 62.8 | 3.84 |
| Musculium | 1.8 | 0.11 | -- | -- |
| Pisidium | 3.6 | 0.21 | -- | -- |
| TOTAL BENTHOS | 1,682.8 | 100.00 | 1,636.2 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | | 29 | |
| EPT TAXA RICHNESS | 0 | | 3 | |

TABLE 3-16. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE SKOKIE RIVER, JUNE 2005.

| TAXA | 32 | | 105 | |
|------------------------------|---------------|--------|--------------|--------|
| | LAKE COOK RD. | | FRONTAGE RD. | |
| | #/m2 | % | #/m2 | % |
| Turbellaria | 14.4 | 0.08 | -- | -- |
| Oligochaeta | 12,458.6 | 70.54 | 5,030.8 | 72.12 |
| Helobdella stagnalis | 28.7 | 0.16 | -- | -- |
| Erpobdella punctata punctata | 7.2 | 0.04 | -- | -- |
| Caecidotea | 43.1 | 0.24 | -- | -- |
| Gammarus | 14.4 | 0.08 | 35.9 | 0.51 |
| Enallagma | 7.2 | 0.04 | -- | -- |
| Noctuidae | -- | -- | 7.2 | 0.10 |
| Dubiraphia | -- | -- | 64.6 | 0.93 |
| Ceratopogonidae | -- | -- | 7.2 | 0.10 |
| Tanytus | 200.9 | 1.14 | -- | -- |
| Procladius | 129.2 | 0.73 | 64.6 | 0.93 |
| Cricotopus bicinctus grp. | 14.4 | 0.08 | -- | -- |
| Cricotopus sylvestris grp. | 14.4 | 0.08 | -- | -- |
| Chironomus | 4,478.2 | 25.36 | 1,363.6 | 19.55 |
| Cryptochironomus | -- | -- | 157.9 | 2.26 |
| Dicrotendipes modestus | -- | -- | 28.7 | 0.41 |
| Harnischia | -- | -- | 50.2 | 0.72 |
| Polypedilum scalaenum grp. | -- | -- | 7.2 | 0.10 |
| Amnicola | -- | -- | 7.2 | 0.10 |
| Physa | 14.4 | 0.08 | -- | -- |
| Corbicula fluminea | -- | -- | 150.7 | 2.16 |
| Sphaerium | 71.8 | 0.41 | -- | -- |
| Musculium | 43.1 | 0.24 | -- | -- |
| Pisidium | 122.0 | 0.69 | -- | -- |
| TOTAL BENTHOS | 17,661.7 | 100.00 | 6,975.7 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | | 13 | |
| EPT TAXA RICHNESS | 0 | | 0 | |

Chironomid head capsule deformities were observed in the HD and Ponar samples from both stations (Table 3-11 and 3-12). In the HD samples, deformities were observed in 22.4 percent (n=49) and 8.5 (n=47) of *Chironomus* examined from Stations 32 and 105, respectively (Table 3-11). In contrast, a single deformed specimen of *Dicrotendipes simpsoni* was observed in the HD samples from each station. Mentum anomalies were also observed on *Chironomus* specimens in the Ponar samples at both Stations (Table 3-12). Again, the specimens examined from Station 32 exhibited a noticeably higher incidence of deformity with 8.8 percent (n=182) compared to 1.6 percent (n=126) of the *Chironomus* examined from Station 105. In addition to *Chironomus*, deformities were also observed on *Procladius* in Ponars collected from Station 105. Although the sample size for *Chironomus* was fairly small at each station and both sample types, the number of deformities observed at Station 32 was above expected background levels (Burt et al. 2003) and suggests the presence of one or more persistent stressors.

The benthic community at both stations could be characterized as relatively pollution tolerant and moderately stressed based on composition, relative abundance of tolerant taxa, and incidence of chironomid deformities (Tables 3-1, 3-11, and 3-12). However, based on the substantially higher density of tolerant taxa such as Oligochaeta and *Dicrotendipes simpsoni* combined with the noticeably higher incidence of deformities and lack of EPT taxa, it appears that the benthic community at the upstream Station 32 is relatively more stressed compared to Station 105.

3.1.2.4 North Shore Channel

HD and Ponar samples from the four NSC stations (Stations 35, 102, 36, and 101) yielded a combined 44 total taxa (Tables 3-17 and 3-18). The three EPT taxa observed in the NSC were restricted to the HD samples at two of the Stations. HD total taxa richness decreased consecutively among the stations from upstream to downstream from 31 taxa at Station 35 to 13 taxa at Station 101 (Table 3-17). Likewise, two EPT taxa were observed in samples from the upstream Stations 35 and 102 but were absent from Stations 36 and 101. Total density was nearly the opposite of richness in that it was noticeably higher at the downstream Stations 36 and 101 compared to Stations 35 and 102. This difference was partly due to higher densities of Turbellaria and Oligochaeta downstream. However, dominance in terms of relative abundance and density varied greatly among the four stations. The most abundant taxa at Station 35 were Oligochaeta, *Dicrotendipes fumidus*, and *Dicrotendipes simpsoni*, which each composed greater than 20 percent of the total density. In contrast, the relative abundance of *Dicrotendipes simpsoni* was nearly double that of Oligochaeta at Station 102 whereas Turbellaria and Oligochaeta clearly were the dominant taxa at Stations 36 and 101.

Ponar total taxa richness was fairly similar among Stations 35, 102, and 101 ranging from 14 to 18 taxa while Station 36 was represented by seven total taxa (Table 3-18). Similarly, total Ponar density did not exhibit any discernable longitudinal pattern. Total density was substantially higher at Station 36, similarly moderate at Stations 35 and 101, and noticeably lower at Station 102. The density at Station 36 was the highest observed among all stations sampled in 2005. At all stations, total density was almost exclusively driven by variability of the dominant taxon, Oligochaeta.

TABLE 3-17. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH SHORE CHANNEL, JULY 2005.

| TAXA | 35 CENTRAL RD. | | 102 OAKTON ST. | | 36 TOUHY AVE. | | 101 FOSTER AVE. | |
|------------------------------|-------------------|--------|-------------------|--------|------------------|--------|--------------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| | Hydra | 109.4 | 3.31 | --- | --- | 376.7 | 1.97 | 9.0 |
| Turbellaria | 82.5 | 2.50 | 493.4 | 5.37 | 4,345.2 | 22.74 | 6,727.7 | 48.80 |
| Oligochaeta | 798.3 | 24.16 | 2,547.5 | 27.71 | 7,228.2 | 37.83 | 4,377.5 | 31.75 |
| Helobdella stagnalis | 1.8 | 0.05 | 53.8 | 0.59 | --- | --- | --- | --- |
| Helobdella triserialis | 3.6 | 0.11 | --- | --- | --- | --- | --- | --- |
| Caecidotea | 3.6 | 0.11 | 107.6 | 1.17 | 125.6 | 0.66 | 287.0 | 2.08 |
| Hyalella azteca | --- | --- | --- | --- | 1,076.4 | 5.63 | 98.7 | 0.72 |
| Gammarus | 193.8 | 5.86 | 53.8 | 0.59 | --- | --- | --- | --- |
| Baetis intercalaris | --- | --- | 9.0 | 0.10 | --- | --- | --- | --- |
| Stenacron | 1.8 | 0.05 | 9.0 | 0.10 | --- | --- | --- | --- |
| Enallagma | 3.6 | 0.11 | --- | --- | --- | --- | --- | --- |
| Ceraclea maculata | 3.6 | 0.11 | --- | --- | --- | --- | --- | --- |
| Procladius | 41.3 | 1.25 | 26.9 | 0.29 | --- | --- | 17.9 | 0.13 |
| Ablabesmyia annulata | 23.3 | 0.71 | 26.9 | 0.29 | --- | --- | --- | --- |
| Thienemannimyia grp. | 12.6 | 0.38 | --- | --- | 3.6 | 0.02 | --- | --- |
| Cricotopus tremulus grp. | 9.0 | 0.27 | --- | --- | --- | --- | --- | --- |
| Cricotopus bicinctus grp. | 21.5 | 0.65 | 26.9 | 0.29 | --- | --- | 26.9 | 0.20 |
| Cricotopus sylvestris grp. | 23.3 | 0.71 | 89.7 | 0.98 | 5.4 | 0.03 | --- | --- |
| Nanocladius distinctus | 12.6 | 0.38 | --- | --- | 21.5 | 0.11 | 170.4 | 1.24 |
| Parakiefferiella | 32.3 | 0.98 | --- | --- | --- | --- | --- | --- |
| Chironomus | 70.0 | 2.12 | 26.9 | 0.29 | 107.6 | 0.56 | --- | --- |
| Cladopelma | --- | --- | 26.9 | 0.29 | --- | --- | --- | --- |
| Cryptochironomus | 9.0 | 0.27 | --- | --- | --- | --- | --- | --- |
| Cryptotendipes | 12.6 | 0.38 | --- | --- | --- | --- | --- | --- |
| Dicrotendipes modestus | 78.9 | 2.39 | 538.2 | 5.85 | 12.6 | 0.07 | 17.9 | 0.13 |
| Dicrotendipes fumidus | 832.4 | 25.19 | --- | --- | 9.0 | 0.05 | --- | --- |
| Dicrotendipes simpsoni | 672.8 | 20.36 | 4,969.5 | 54.05 | 2,253.3 | 11.79 | 1,865.8 | 13.53 |
| Glyptotendipes | --- | --- | 26.9 | 0.29 | 3,310.0 | 17.32 | 62.8 | 0.46 |
| Parachironomus | --- | --- | 26.9 | 0.29 | 229.6 | 1.20 | 116.6 | 0.85 |
| Phaenopsectra obediens grp. | 12.6 | 0.38 | --- | --- | --- | --- | --- | --- |
| Phaenopsectra punctipes grp. | 53.8 | 1.63 | 26.9 | 0.29 | --- | --- | --- | --- |
| Polypedilum illinoense | --- | --- | 26.9 | 0.29 | 3.6 | 0.02 | --- | --- |
| Paratanytarsus | --- | --- | 62.8 | 0.68 | --- | --- | --- | --- |
| Tanytarsus | 154.3 | 4.67 | --- | --- | --- | --- | --- | --- |
| Physo | 3.6 | 0.11 | --- | --- | --- | --- | --- | --- |
| Cyraulid | 19.7 | 0.60 | 17.9 | 0.20 | --- | --- | 9.0 | 0.07 |
| Helisoma | 1.8 | 0.05 | --- | --- | --- | --- | --- | --- |
| Menetus dilatatus | 5.4 | 0.16 | --- | --- | --- | --- | --- | --- |
| TOTAL BENTHOS | 3,304.6 | 100.00 | 9,194.5 | 100.00 | 19,108.4 | 100.00 | 13,787.2 | 100.00 |
| TOTAL TAXA RICHNESS | 31 | | 21 | | 15 | | 13 | |
| EPT TAXA RICHNESS | 2 | | 2 | | 0 | | 0 | |

TABLE 3-18. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH SHORE CHANNEL, JULY 2005.

| TAXA | 35 CENTRAL RD. | | 102 OAKTON ST. | | 36 TOUHY AVE. | | 101 FOSTER AVE. | |
|------------------------------|-------------------|--------|-------------------|--------|------------------|--------|--------------------|--------|
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| | Turbellaria | --- | --- | 21.5 | 0.22 | 143.5 | 0.11 | 35.9 |
| Oligochaeta | 33,278.1 | 85.55 | 9,164.6 | 92.47 | 127,837.4 | 99.16 | 35,050.7 | 98.37 |
| Helobdella stagnalis | 14.4 | 0.04 | 122.0 | 1.23 | --- | --- | --- | --- |
| Mooreobdella microstoma | --- | --- | 21.5 | 0.22 | --- | --- | --- | --- |
| Caecidotea | 7.2 | 0.02 | 78.9 | 0.80 | --- | --- | 14.4 | 0.04 |
| Hyalella azteca | --- | --- | --- | --- | --- | --- | 78.9 | 0.22 |
| Gammarus | 78.9 | 0.20 | 35.9 | 0.36 | --- | --- | --- | --- |
| Tanytus | --- | --- | 7.2 | 0.07 | --- | --- | --- | --- |
| Procladius | 732.0 | 1.88 | 208.1 | 2.10 | --- | --- | 7.2 | 0.02 |
| Psectrotanytus | 71.8 | 0.18 | --- | --- | --- | --- | --- | --- |
| Ablabesmyia mallochi | --- | --- | 7.2 | 0.07 | --- | --- | --- | --- |
| Cricotopus sylvestris grp. | --- | --- | --- | --- | 215.3 | 0.17 | --- | --- |
| Nanocladius distinctus | --- | --- | --- | --- | --- | --- | 71.8 | 0.20 |
| Parakiefferiella | 14.4 | 0.04 | --- | --- | --- | --- | --- | --- |
| Chironomus | 1,650.6 | 4.24 | 7.2 | 0.07 | --- | --- | 215.3 | 0.60 |
| Cladopelma | 933.0 | 2.40 | 14.4 | 0.14 | --- | --- | --- | --- |
| Cryptochironomus | --- | --- | 35.9 | 0.36 | --- | --- | 35.9 | 0.10 |
| Dicrotendipes modestus | 107.6 | 0.28 | 129.2 | 1.30 | --- | --- | 21.5 | 0.06 |
| Dicrotendipes simpsoni | --- | --- | 21.5 | 0.22 | 358.8 | 0.28 | 50.2 | 0.14 |
| Glyptotendipes | --- | --- | --- | --- | 71.8 | 0.06 | 14.4 | 0.04 |
| Parachironomus | --- | --- | --- | --- | 215.3 | 0.17 | 7.2 | 0.02 |
| Phaenopsectra obediens grp. | 14.4 | 0.04 | --- | --- | --- | --- | --- | --- |
| Phaenopsectra punctipes grp. | 14.4 | 0.04 | --- | --- | --- | --- | --- | --- |
| Polypedilum flavum | --- | --- | --- | --- | --- | --- | 7.2 | 0.02 |
| Polypedilum halterale grp. | 674.6 | 1.73 | 14.4 | 0.14 | --- | --- | --- | --- |
| Paratanytarsus | --- | --- | --- | --- | 71.8 | 0.06 | --- | --- |
| Tanytarsus | 940.1 | 2.42 | 7.2 | 0.07 | --- | --- | --- | --- |
| Sphaerium | 358.8 | 0.92 | 7.2 | 0.07 | --- | --- | --- | --- |
| Pisidium | --- | --- | 7.2 | 0.07 | --- | --- | 21.5 | 0.06 |
| Dreissena polymorpha | 7.2 | 0.02 | --- | --- | --- | --- | --- | --- |
| TOTAL BENTHOS | 38,897.4 | 100.00 | 9,910.9 | 100.00 | 128,913.9 | 100.00 | 35,632.0 | 100.00 |
| TOTAL TAXA RICHNESS | 16 | | 18 | | 7 | | 14 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | | 0 | |

Chironomid head capsule deformities were observed in HD and Ponar samples from Stations 35 and 102, in the HD samples from Station 36, and in the Ponar samples from Station 101 (Tables 3-11 and 3-12). In the HD samples, two *Chironomus*, three *Dicrotendipes simpsoni*, and one *Glyptotendipes* were deformed at Stations 35, 102, and 36, respectively (Table 3-11). These deformities amounted to less than two percent of the midges examined at each Station. In the Ponar samples, Stations 35 and 102 each had two *Procladius* specimens with head capsule deformities while four *Chironomus* exhibited deformities at Station 101. Overall, the deformity levels observed at Stations 35, 102, and 36 are below or near expected background levels (Burt et al. 2003) while the higher incidence of deformities at Station 101 may be more suggestive of environmental stress (Lenat 1993).

Based on the number of tolerant taxa and abundance of tolerant taxa, particularly in the Ponar samples, the benthic community of the NSC could be characterized as moderately stressed (Table 3-1). However, in terms of total and EPT richness in the HD samples, it appears that environmental stress increases from upstream to downstream and is less evident in the water column (Table 3-17 and 3-18).

3.1.2.5 North Branch of the Chicago River

The combined number of taxa collected in the HD and Ponar samples from the six ambient stations and one CFAR station in the NBCR (Stations 104, 34, 96, 37, 73, CFAR Fullerton Avenue, and 46) was 63 total and five EPT taxa (Tables 3-19 and 3-20). HD total taxa richness ranged from 37 taxa at Station 34 to 12 taxa at the most downstream Station 46 (Table 3-19). The total richness observed at Station 34 was the highest recorded in the NBCR watershed in 2005. Total richness was highest among the three most upstream stations and decreased consecutively among the three downstream stations. As with total richness, EPT richness was lowest at Station 46 where no EPT taxa were collected. However, EPT richness ranged from two to five taxa among the remaining five stations. Although no discernable longitudinal trend was evident among the stations, the five EPT taxa observed at Station 96 was the highest among all stations sampled in the NBCR watershed. As with EPT richness, no trends were observed in total density, which was lowest at Stations 104, 34, and 37 and two to four times higher at Stations 96, 73, and 46. At Station 96, the higher density was due to greater numbers of several taxa including *Caecidotea*, *Gammarus*, *Cheumatopsyche*, and *Ferrissia* whereas higher numbers of the tolerant taxa *Oligochaeta* and *Dicrotendipes simpsoni* increased the density at Stations 73 and 46. Similarly, there was no single dominant taxon among the majority of the NBCR stations. Five different taxa achieved dominance among the six stations. Most notable of these was the abundance of the relatively sensitive EPT taxon, *Cheumatopsyche* at Station 96 and the magnitude of *Oligochaeta* abundance at Station 46.

Ponar total taxa richness followed a trend similar to what was observed in the HD samples. Total richness was similarly higher among the three upstream stations, ranging from 20 to 23 taxa, and generally decreased among the four downstream stations (Table 3-20). The lowest number of total taxa observed among the seven Stations was three at the Fullerton Avenue CFAR Station. The single EPT taxon, *Cheumatopsyche* was only observed at Stations 104 and 96 where it composed less than one percent of the total density. *Oligochaeta* was the dominant taxon at all stations except the upstream Station 104 where *Polypedilum scalaenum* grp. was

TABLE 3-19. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, JUNE-JULY 2005.

| TAXA | 104 | | 34 | | 96 | | 37 | | 73 | | 46 | |
|----------------------------|--------------|--------|--------------|--------|-------------|--------|-------------|--------|--------------|--------|------------|--------|
| | GLENVIEW RD. | | DEMPSTER ST. | | ALBANY AVE. | | WILSON AVE. | | DIVERSY AVE. | | GRAND AVE. | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | -- | -- | 161.5 | 2.62 | 197.3 | 1.62 | -- | -- | 10.8 | 0.10 | 23.3 | 0.20 |
| Turbellaria | 141.7 | 3.04 | 387.5 | 6.29 | 846.8 | 6.93 | 1,957.3 | 53.90 | 2,267.7 | 21.02 | 927.5 | 8.00 |
| Plumatella | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | 0.02 |
| Oligochaeta | 419.8 | 9.01 | 3,193.4 | 51.85 | 41.3 | 0.34 | 1,194.8 | 32.91 | 3,139.6 | 29.10 | 8,729.8 | 75.33 |
| Helobdella triserialis | -- | -- | -- | -- | -- | -- | 3.6 | 0.10 | -- | -- | -- | -- |
| Placobdella montifera | -- | -- | 1.8 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | -- | -- | 1.8 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Caecidotea | 14.4 | 0.31 | 511.3 | 8.30 | 1,013.6 | 8.30 | 61.0 | 1.68 | -- | -- | -- | -- |
| Hyalella azteca | -- | -- | -- | -- | -- | -- | 30.5 | 0.84 | 46.6 | 0.43 | 192.0 | 1.66 |
| Gammarus | 1,978.8 | 42.47 | 575.9 | 9.35 | 3,078.6 | 25.20 | 3.6 | 0.10 | -- | -- | 3.6 | 0.03 |
| Orconectes | -- | -- | 3.6 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydracarina | -- | -- | -- | -- | 1.8 | 0.01 | -- | -- | -- | -- | -- | -- |
| Baetis intercalaris | -- | -- | -- | -- | 46.6 | 0.38 | -- | -- | -- | -- | -- | -- |
| Stenacron | 5.4 | 0.12 | 9.0 | 0.15 | 105.8 | 0.87 | 1.8 | 0.05 | 1.8 | 0.02 | -- | -- |
| Argia | 5.4 | 0.12 | 1.8 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 579.5 | 12.44 | 423.4 | 6.87 | 3,683.2 | 30.15 | 3.6 | 0.10 | 3.6 | 0.03 | -- | -- |
| Hydropsyche betteni | -- | -- | -- | -- | 23.3 | 0.19 | -- | -- | -- | -- | -- | -- |
| Hydroptila | -- | -- | 3.6 | 0.06 | 466.5 | 3.82 | -- | -- | -- | -- | -- | -- |
| Dubiraphia | -- | -- | 1.8 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Tanyptus | 14.4 | 0.31 | 9.0 | 0.15 | -- | -- | -- | -- | -- | -- | -- | -- |
| Procladius | 73.6 | 1.58 | 249.4 | 4.05 | -- | -- | 1.8 | 0.05 | -- | -- | 5.4 | 0.05 |
| Ablabesmyia mallochii | -- | -- | -- | -- | -- | -- | -- | -- | 35.9 | 0.33 | -- | -- |
| Ablabesmyia annulata | -- | -- | -- | -- | 3.6 | 0.03 | -- | -- | -- | -- | -- | -- |
| Thienemanniomyia grp. | 14.4 | 0.31 | 17.9 | 0.29 | 143.5 | 1.17 | -- | -- | -- | -- | -- | -- |
| Thienemanniella xena | 740.9 | 15.90 | 3.6 | 0.06 | 227.8 | 1.86 | -- | -- | -- | -- | -- | -- |
| Cricotopus tremulus grp. | 14.4 | 0.31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | 26.9 | 0.58 | 30.5 | 0.50 | 148.9 | 1.22 | 9.0 | 0.25 | -- | -- | -- | -- |
| Cricotopus sylvestris grp. | 41.3 | 0.89 | 3.6 | 0.06 | -- | -- | 1.8 | 0.05 | -- | -- | -- | -- |
| Nanocladius distinctus | 16.1 | 0.35 | 1.8 | 0.03 | 14.4 | 0.12 | 3.6 | 0.10 | 57.4 | 0.53 | 9.0 | 0.09 |
| Nanocladius spinipennis | -- | -- | -- | -- | 34.1 | 0.28 | -- | -- | -- | -- | -- | -- |
| Rheocricotopus robacki | -- | -- | 1.8 | 0.03 | 592.0 | 4.85 | -- | -- | -- | -- | -- | -- |
| Chironomus | 3.6 | 0.08 | 30.5 | 0.50 | -- | -- | 5.4 | 0.15 | -- | -- | 17.9 | 0.15 |
| Cryptochironomus | -- | -- | 1.8 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes modestus | -- | -- | 95.1 | 1.54 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes neomodestus | -- | -- | 12.6 | 0.20 | 3.6 | 0.03 | -- | -- | 37.7 | 0.35 | -- | -- |
| Dicrotendipes fumidus | -- | -- | 3.6 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 30.5 | 0.65 | 215.3 | 3.50 | 3.6 | 0.03 | 306.8 | 8.45 | 4,569.4 | 42.36 | 1,659.5 | 14.32 |
| Glyptotendipes | -- | -- | 19.7 | 0.32 | 3.6 | 0.03 | 23.3 | 0.64 | 238.6 | 2.21 | -- | -- |
| Harnischia | 1.8 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Parachironomus | -- | -- | -- | -- | -- | -- | 7.2 | 0.20 | -- | -- | 17.9 | 0.15 |
| Polypedilum fallax grp. | 14.4 | 0.31 | -- | -- | 17.9 | 0.15 | -- | -- | 19.7 | 0.18 | -- | -- |
| Polypedilum flavum | 41.3 | 0.89 | 25.1 | 0.41 | 281.7 | 2.31 | 3.6 | 0.10 | 55.6 | 0.52 | -- | -- |
| Polypedilum halterale grp. | -- | -- | 3.6 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | 265.5 | 5.70 | 48.4 | 0.79 | 111.2 | 0.91 | 7.2 | 0.20 | 152.5 | 1.41 | -- | -- |
| Polypedilum scalaeum grp. | 57.4 | 1.23 | 23.3 | 0.38 | -- | -- | 1.8 | 0.05 | 131.0 | 1.21 | -- | -- |
| Stenochironomus | -- | -- | 1.8 | 0.03 | 66.4 | 0.54 | -- | -- | -- | -- | -- | -- |
| Paratanytarsus | 70.0 | 1.50 | 10.8 | 0.17 | -- | -- | -- | -- | -- | -- | -- | -- |
| Rheotanytarsus | 26.9 | 0.58 | -- | -- | 7.2 | 0.06 | -- | -- | -- | -- | -- | -- |
| Tanytarsus | 14.4 | 0.31 | 3.6 | 0.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Simulium | -- | -- | -- | -- | 3.6 | 0.03 | -- | -- | -- | -- | -- | -- |
| Amnicola | 1.8 | 0.04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cyraulus | -- | -- | 17.9 | 0.29 | -- | -- | -- | -- | -- | -- | -- | -- |
| Menetus dilatatus | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | 0.05 | 1.8 | 0.02 |
| Ferrissia | 44.9 | 0.96 | 52.0 | 0.84 | 1,049.5 | 8.59 | 1.8 | 0.05 | 10.8 | 0.10 | -- | -- |
| Corbicula fluminea | -- | -- | -- | -- | -- | -- | 1.8 | 0.05 | 3.6 | 0.03 | -- | -- |
| TOTAL BENTHOS | 4,659.1 | 100.00 | 6,159.0 | 100.00 | 12,217.4 | 100.00 | 3,631.1 | 100.00 | 10,787.6 | 100.00 | 11,589.5 | 100.00 |
| TOTAL TAXA RICHNESS | 27 | | 37 | | 28 | | 21 | | 18 | | 12 | |
| EPT TAXA RICHNESS | 2 | | 3 | | 5 | | 2 | | 2 | | 0 | |

TABLE 3-20. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE NORTH BRANCH CHICAGO RIVER, JUNE-JULY 2005.

| TAXA | 104 | | 34 | | 96 | | 37 | | 73 | | CFAR | | 46 | |
|------------------------------|--------------|--------|--------------|--------|-------------|--------|-------------|--------|--------------|--------|----------------|--------|------------|--------|
| | GLENVIEW RD. | | DEMPSTER ST. | | ALBANY AVE. | | WILSON AVE. | | DIVERSY AVE. | | FULLERTON AVE. | | GRAND AVE. | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | 14.4 | 0.47 | -- | -- | -- | -- | 86.1 | 0.09 | 7.2 | 0.01 | -- | -- | 21.5 | 0.25 |
| Oligochaeta | 846.8 | 27.51 | 8,899.0 | 88.01 | 1,550.2 | 43.11 | 99,504.0 | 98.46 | 76,553.2 | 99.37 | 15,243.2 | 99.81 | 8,619.1 | 99.09 |
| Expobdella punctata punctata | -- | -- | -- | -- | 57.4 | 1.60 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mooreobdella microstoma | 14.4 | 0.47 | 7.2 | 0.07 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Caecidotea | 7.2 | 0.23 | 14.4 | 0.14 | 179.4 | 4.99 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hyalella azteca | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.01 | -- | -- | -- | -- |
| Gammarus | 107.6 | 3.50 | 136.4 | 1.35 | 107.6 | 2.99 | -- | -- | 21.5 | 0.03 | -- | -- | -- | -- |
| Orconectes | -- | -- | -- | -- | 7.2 | 0.20 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydracarina | 7.2 | 0.23 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | 7.2 | 0.23 | -- | -- | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenelmis | 78.9 | 2.56 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chaoborus | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | 0.01 | -- | -- | -- | -- |
| Procladius | 21.5 | 0.70 | 466.5 | 4.61 | 1,047.8 | 29.14 | 430.6 | 0.43 | 394.7 | 0.51 | -- | -- | 35.9 | 0.41 |
| Ablabesmyia mallochii | -- | -- | -- | -- | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| Thienemannimyia grp. | -- | -- | -- | -- | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| Thienemanniella xena | -- | -- | 14.4 | 0.14 | 14.4 | 0.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus | -- | -- | -- | -- | 50.2 | 1.40 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus tremulus grp. | 14.4 | 0.47 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | -- | -- | 50.2 | 0.50 | -- | -- | -- | -- | -- | -- | 14.4 | 0.09 | -- | -- |
| Cricotopus sylvestris grp. | 50.2 | 1.63 | 14.4 | 0.14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nanocladius distinctus | -- | -- | 7.2 | 0.07 | 7.2 | 0.20 | 71.8 | 0.07 | -- | -- | -- | -- | -- | -- |
| Rheocricotopus robacki | -- | -- | -- | -- | 21.5 | 0.60 | -- | -- | -- | -- | -- | -- | -- | -- |
| Chironomus | 287.1 | 9.32 | 150.7 | 1.49 | 50.2 | 1.40 | 667.4 | 0.66 | 35.9 | 0.05 | -- | -- | -- | -- |
| Cryptochironomus | 78.9 | 2.56 | 57.4 | 0.57 | 21.5 | 0.60 | 100.5 | 0.10 | -- | -- | -- | -- | -- | -- |
| Dicrotendipes modestus | -- | -- | 7.2 | 0.07 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes neomodestus | 57.4 | 1.86 | 21.5 | 0.21 | 64.6 | 1.80 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes simpsoni | -- | -- | 7.2 | 0.07 | -- | -- | 71.8 | 0.07 | -- | -- | -- | -- | 21.5 | 0.25 |
| Parachironomus | -- | -- | -- | -- | -- | -- | -- | -- | 14.4 | 0.02 | -- | -- | -- | -- |
| Paratendipes | 14.4 | 0.47 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | 93.3 | 3.03 | 7.2 | 0.07 | -- | -- | -- | -- | -- | -- | 14.4 | 0.09 | -- | -- |
| Polypedilum halterale grp. | -- | -- | 86.1 | 0.85 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum illinoense | -- | -- | 7.2 | 0.07 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Polypedilum scalaenum grp. | 1,191.3 | 38.69 | 100.5 | 0.99 | 28.7 | 0.80 | 107.6 | 0.11 | -- | -- | -- | -- | -- | -- |
| Paratanytarsus | -- | -- | -- | -- | 7.2 | 0.20 | -- | -- | -- | -- | -- | -- | -- | -- |
| Tanytarsus | 50.2 | 1.63 | -- | -- | 14.4 | 0.40 | 7.2 | 0.01 | -- | -- | -- | -- | -- | -- |
| Ammicola | -- | -- | -- | -- | 21.5 | 0.60 | -- | -- | -- | -- | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | 7.2 | 0.20 | -- | -- | -- | -- | -- | -- | -- | -- |
| Corbicula fluminea | 93.3 | 3.03 | -- | -- | -- | -- | 14.4 | 0.01 | -- | -- | -- | -- | -- | -- |
| Sphaerium | -- | -- | -- | -- | 21.5 | 0.60 | -- | -- | -- | -- | -- | -- | -- | -- |
| Musculium | 43.1 | 1.40 | 35.9 | 0.35 | 272.7 | 7.58 | -- | -- | -- | -- | -- | -- | -- | -- |
| Pisidium | -- | -- | 21.5 | 0.21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOTAL BENTHOS | 3,078.8 | 100.00 | 10,111.9 | 100.00 | 3,595.5 | 100.00 | 101061.4 | 100.00 | 77,041.2 | 100.00 | 15,271.9 | 100.00 | 8,698.1 | 100.00 |
| TOTAL TAXA RICHNESS | 20 | | 20 | | 23 | | 10 | | 8 | | 3 | | 4 | |
| EPT TAXA RICHNESS | 1 | | 0 | | 1 | | 0 | | 0 | | 0 | | 0 | |

3-28

dominant. As with the HD samples, total Ponar density was variable among the seven stations and was dictated solely by *Oligochaeta* density.

Chironomid head capsule deformities were observed in HD samples from two stations and in the Ponar samples at four stations (Tables 3-11 and 3-12). In the HD samples, chironomid head capsule deformities affected only one species at both Stations 34 and 73 and were very low, accounting for less than one percent of all midges examined at these stations (Table 3-11). However, deformities in the Ponar samples were noticeably more common. The majority of malformed structures were observed on *Chironomus* at Stations 104, 34, 37, and 73 (Table 3-12). Despite being collected at each of these four stations, *Procladius* with anomalies were only observed at Station 34. Total incidence levels in the affected Ponar samples ranged from 6.7 percent (n=30) at Station 73 to 18.6 percent (n=59) at Station 37. The number of deformed *Chironomus* was relatively similar among Stations 104, 34, and 37 but noticeably lower at Station 73. The lack of chironomid deformities at the downstream stations may be the result of conditions at those stations being degraded beyond the survival threshold for taxa that routinely express deformities under moderately stressed conditions (Janssens de Bisthoven et al. 1998, Wiederhom 1984). Although small sample size may have inflated *Chironomus* incidence levels, especially at Station 73, the numbers of deformed specimens observed at Stations 104, 34, and 37 are above expected reference levels (Burt et al. 2003) and are likely indicative of one or more persistent stressors.

The seven sampling stations generally clustered into three major groups of decreasing quality from upstream to downstream: 1) Stations 104, 34, and 96; 2) Stations 37 and 73; and 3) Station 46. This assertion is based on the higher total richness, EPT richness, and abundance of more environmentally sensitive EPT and Tanytarsini among the three upstream stations as well as the generally higher abundance of the more tolerant *Oligochaeta* downstream. Overall, benthic community quality as measured by these parameters suggests that the NBCR sampling stations range from moderately stressed upstream to highly stressed downstream.

3.1.3 South Branch Chicago River and Chicago Sanitary and Ship Canal Watershed

Benthic macroinvertebrate sampling was conducted at three stations all within the Chicago Sanitary and Ship Canal (CSSC) (Table 2-1).

3.1.3.1 Chicago Sanitary and Ship Canal

Together, the HD and Ponar samples from the three CSSC stations (Stations 75, 41, and 92) yielded 37 total taxa and four EPT taxa (Tables 3-21 and 3-22). HD total and EPT taxa richness was identical between the two upstream stations (75 and 41) with 11 total taxa and one EPT taxon (Table 3-21). However, total richness was substantially higher and EPT richness was slightly higher at the downstream Station 92. Total density was similar between Stations 75 and 92 but more than five times higher at Station 41 primarily due to relatively greater abundance of *Oligochaeta*. However, tolerant taxa were dominant taxon at all three stations (Table 3-1).

Ponar total taxa richness was nearly identical among all three stations ranging from three to five taxa (Table 3-22). No EPT taxa were observed in the Ponar samples. Total density decreased

TABLE 3-21. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, AUGUST-SEPTEMBER 2005.

| TAXA | 75 | | 41 | | 92 | |
|-----------------------------|-------------|--------|-------------|--------|----------|--------|
| | CICERO AVE. | | HARLEM AVE. | | LOCKPORT | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Hydra | 59.2 | 1.89 | 53.8 | 0.32 | 95.1 | 2.79 |
| Turbellaria | 335.5 | 10.73 | 3,902.0 | 23.45 | 656.6 | 19.24 |
| Urnatella gracilis | 1.8 | 0.06 | -- | -- | -- | -- |
| Plumatella | -- | -- | -- | -- | 1.8 | 0.05 |
| Oligochaeta | 841.4 | 26.91 | 11,105.1 | 66.74 | 46.6 | 1.37 |
| Helobdella triserialis | 5.4 | 0.17 | -- | -- | -- | -- |
| Hyalella azteca | -- | -- | 98.7 | 0.59 | 267.3 | 7.83 |
| Gammarus | -- | -- | -- | -- | 16.1 | 0.47 |
| Stenacron | -- | -- | -- | -- | 21.5 | 0.63 |
| Cyrrallus fraternus | -- | -- | 89.7 | 0.54 | 48.4 | 1.42 |
| Hydropsyche | 5.4 | 0.17 | -- | -- | -- | -- |
| Hydroptila | -- | -- | -- | -- | 1.8 | 0.05 |
| Procladius | -- | -- | -- | -- | 1.8 | 0.05 |
| Ablabesmyia janta | 35.9 | 1.15 | 71.8 | 0.43 | 26.9 | 0.79 |
| Thienemanniya grp. | -- | -- | -- | -- | 1.8 | 0.05 |
| Thienemanniella similis | -- | -- | -- | -- | 5.4 | 0.16 |
| Cricotopus bicinctus grp. | -- | -- | -- | -- | 5.4 | 0.16 |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 3.6 | 0.11 |
| Nanocladius distinctus | 59.2 | 1.89 | 71.8 | 0.43 | 3.6 | 0.11 |
| Dicrotendipes neomodestus | -- | -- | -- | -- | 7.2 | 0.21 |
| Dicrotendipes simpsoni | 1,734.8 | 55.48 | 1,040.5 | 6.25 | 242.2 | 7.10 |
| Glyptotendipes | -- | -- | -- | -- | 12.6 | 0.37 |
| Parachironomus | 35.9 | 1.15 | -- | -- | 3.6 | 0.11 |
| Polypedilum flavum | -- | -- | -- | -- | 5.4 | 0.16 |
| Polypedilum scalaenum grp. | -- | -- | -- | -- | 5.4 | 0.16 |
| Pseudochironomus | -- | -- | 179.4 | 1.08 | -- | -- |
| Stenochironomus | -- | -- | -- | -- | 48.4 | 1.42 |
| Cladotanytarsus mancus grp. | -- | -- | 17.9 | 0.11 | -- | -- |
| Xenochironomus xenolabis | -- | -- | -- | -- | 44.9 | 1.31 |
| Physa | -- | -- | -- | -- | 25.1 | 0.74 |
| Helisoma | -- | -- | -- | -- | 14.4 | 0.42 |
| Ferrissia | 12.6 | 0.40 | -- | -- | 1,706.1 | 50.00 |
| Corbicula fluminea | -- | -- | -- | -- | 53.8 | 1.58 |
| Musculium | -- | -- | 9.0 | 0.05 | 39.5 | 1.16 |
| TOTAL BENTHOS | 3,127.0 | 100.00 | 16,639.8 | 100.00 | 3,412.3 | 100.00 |
| TOTAL TAXA RICHNESS | 11 | | 11 | | 29 | |
| EPT TAXA RICHNESS | 1 | | 1 | | 3 | |

TABLE 3-22. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE CHICAGO SANITARY AND SHIP CANAL, AUGUST-SEPTEMBER 2005.

| TAXA | 75 | | 41 | | 92 | |
|----------------------------|-------------|--------|-------------|--------|----------|--------|
| | CICERO AVE. | | HARLEM AVE. | | LOCKPORT | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Oligochaeta | 9,860.7 | 99.28 | 6,537.9 | 99.35 | 3,258.2 | 94.39 |
| Hyalella azteca | -- | -- | 7.2 | 0.11 | -- | -- |
| Dubiraphia | -- | -- | 7.2 | 0.11 | -- | -- |
| Procladius | 50.2 | 0.51 | -- | -- | 14.4 | 0.42 |
| Cryptochironomus | -- | -- | 21.5 | 0.33 | 50.2 | 1.46 |
| Polypedilum halterale grp. | -- | -- | 7.2 | 0.11 | -- | -- |
| Corbicula fluminea | 21.5 | 0.22 | -- | -- | 129.2 | 3.74 |
| TOTAL BENTHOS | 9,932.5 | 100.00 | 6,581.0 | 100.00 | 3,452.0 | 100.00 |
| TOTAL TAXA RICHNESS | 3 | | 5 | | 4 | |
| EPT TAXA RICHNESS | 0 | | 0 | | 0 | |

three-fold from upstream to downstream. Oligochaeta was the dominant taxon and the difference in density among the three locations.

Chironomid head capsule deformities were observed in the HD samples at Stations 75 and 41 (Table 3-23). In both cases, *Dicrotendipes simpsoni* was the taxon exhibiting the deformities. At Station 75, only one deformed specimen was observed while four specimens at Station 41 expressed deformities. The single deformed specimen observed at Station 75 is likely representative of background conditions. However, the higher incidence of deformities at Station 41 may be more suggestive of environmental stress.

Table 3-23. Chironomidae head capsule deformities observed in Hester-Dendy samples from the Chicago Sanitary and Ship Canal, August 2005.

| Taxa | Hester-Dendy Samples | |
|-------------------------------|--------------------------------|---------------------------------|
| | C.S.S.C @ Cicero Sta. 75 | C.S.S.C. @ Harlem Sta. 41 |
| <i>Dicrotendipes simpsoni</i> | | |
| Number Examined | 91 | 68 |
| Percent Deformed | 1.1 | 5.9 |
| TOTAL SAMPLE | | |
| Total Midges Examined | 98 | 75 |
| Percent Deformed | 1.0 | 5.3 |

Although the dominance by tolerant taxa at all three stations and both sample types suggests that three stations are equally impaired, based on total and EPT richness in the HDs and decreasing abundance of Oligochaeta in the Ponar samples, it appears that Station 92 is less stressed compared to Stations 75 and 41.

3.1.4 Des Plaines River Watershed

Sampling was conducted at 11 stations in the Des Plaines River watershed during 2005: one station in Higgins Creek, two CFAR and three ambient stations in Salt Creek, one station in the West Branch of the DuPage River (WB DuPage River), and one CFAR station and three ambient stations in the Des Plaines River (Table 2-1).

The benthic community in the Des Plaines River watershed exhibited a substantial amount of variability. In the HD samples density was spread more evenly among a variety of taxa in nearly all of the waterways sampled. However, Oligochaeta was the dominant taxon in the majority of Ponar samples from the watershed. The incidence of chironomid deformities was generally low among stations. In addition, the highest total richness and highest EPT richness for any station were observed in the Des Plaines River watershed.

3.1.4.1 Higgins Creek

Combined, the HD and Ponar samples from the single station in Higgins Creek (Station 78) yielded 23 total taxa (Tables 3-24 and 3-25). Ten total taxa were observed in the HD samples while 21 taxa were present in the Ponar samples. Turbellaria and *Caecidotea* were the most abundant taxa in the HD samples while Turbellaria, *Caecidotea*, and *Cricotopus bicinctus* grp. were most abundant in the Ponars. Total density was nearly four times higher in the Ponar samples compared to the HDs due to the greater abundance of the dominant taxa in those samples.

No chironomid head capsule deformities were observed in Higgins Creek. Although highly tolerant taxa composed nearly half of the combined total taxa richness, these taxa represented less than five percent of the total density in the HD samples and approximately one-fourth of the density in the Ponars (Tables 3-1, 3-24, and 3-25). This suggests that despite the low richness in the HD samples and lack of EPT taxa, pollution type stress may be relatively low in Higgins Creek.

3.1.4.2 Salt Creek

In 2005, HD samples were collected at two ambient monitoring stations in Salt Creek at Thorndale and Station 18 (Table 2-1). Vandalism prevented the collection of HD samples at the ambient Busse Dam station. Ponar samples were collected from the three ambient stations and two CFAR stations in Salt Creek (Busse Dam, CFAR JFK Boulevard, Thorndale, Station 18, and CFAR Wolf Road). Combined the HD and Ponar samples yielded 74 total taxa and 13 EPT taxa (Tables 3-26 and 3-27). HD total richness was nearly identical between the two HD stations with 46 and 47 taxa observed at Thorndale and Station 18 (Table 3-26). However, one additional mayfly taxon and two additional caddisfly taxa contributed to the slightly higher EPT richness observed at the Thorndale station. *Cheumatopsyche*, *Thienemannimyia* grp., and *Dicrotendipes neomodestus* were the most abundant taxa at the Thorndale station whereas *Oligochaeta* was the dominant taxa at Station 18. Total density was nearly twice as high at the downstream Station 18 compared to Thorndale primarily due to higher densities of Turbellaria, *Oligochaeta* and several chironomid taxa.

Ponar total richness was substantially higher among the four upstream locations compared to the Wolf Road CFAR station (Table 3-27). Total richness among the four upstream stations was similar at Busse Dam, Thorndale, and Station 18, slightly lower at the JFK Boulevard station, and four to seven times lower at the Wolf Road CFAR station. EPT richness ranged from zero at the two CFAR stations to six at the Busse Dam station. The total and EPT richness observed at Busse Dam was the highest recorded among all Ponar samples collected in 2005. Numerical dominance varied among the five sampling stations and exhibited no discernable pattern. Likewise, no trends were observed in terms of total density. Total density was highest at Busse Dam, moderate at Thorndale and Station 18, and substantially lower at the two CFAR stations.

Chironomid head capsule deformities were observed in both the HD and Ponar samples and were exhibited by two taxa, *Procladius* and *Polypedilum halterale* grp. (Table 3-28). The number of deformed specimens in the Busse Dam and Station 18 Ponar samples was fairly low with only

TABLE 3-24. HESTER-DENDY DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JULY 2005.

| TAXA | 78 | |
|----------------------------|-----------|--------|
| | WILLE RD. | |
| | #/m2 | % |
| Hydra | 107.6 | 0.71 |
| Turbellaria | 9,110.2 | 59.78 |
| Oligochaeta | 369.6 | 2.43 |
| Caecidotea | 5,383.9 | 35.33 |
| Procladius | 17.9 | 0.12 |
| Cricotopus tremulus grp. | 23.3 | 0.15 |
| Cricotopus bicinctus grp. | 116.6 | 0.77 |
| Cricotopus sylvestris grp. | 37.7 | 0.25 |
| Dicrotendipes simpsoni | 17.9 | 0.12 |
| Physa | 53.8 | 0.35 |
| TOTAL BENTHOS | 15,238.6 | 100.00 |
| TOTAL TAXA RICHNESS | 10 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-25. PETITE PONAR DENSITIES AT SAMPLING STATION 78 WITHIN HIGGINS CREEK, JULY 2005.

| TAXA | 78 | |
|-----------------------------|-----------|--------|
| | WILLE RD. | |
| | #/m2 | % |
| Hydra | 143.5 | 0.24 |
| Turbellaria | 19,298.0 | 32.08 |
| Oligochaeta | 1,076.5 | 1.79 |
| Mooreobdella microstoma | 373.2 | 0.62 |
| Caecidotea | 22,642.3 | 37.64 |
| Hydracarina | 7.2 | 0.01 |
| Enallagma | 71.8 | 0.12 |
| Ceratopogonidae | 71.8 | 0.12 |
| Thienemannimyia grp. | 143.5 | 0.24 |
| Cricotopus tremulus grp. | 301.4 | 0.50 |
| Cricotopus bicinctus grp. | 13,362.9 | 22.22 |
| Cricotopus trifascia grp. | 14.4 | 0.02 |
| Cricotopus sylvestris grp. | 1,076.5 | 1.79 |
| Chironomus | 287.1 | 0.48 |
| Dicrotendipes neomodestus | 301.4 | 0.50 |
| Dicrotendipes fumidus | 574.1 | 0.95 |
| Dicrotendipes simpsoni | 14.4 | 0.02 |
| Cladotanytarsus mancus grp. | 143.5 | 0.24 |
| Amnicola | 7.2 | 0.01 |
| Musculium | 71.8 | 0.12 |
| Pisidium | 165.1 | 0.27 |
| TOTAL BENTHOS | 60,147.4 | 100.00 |
| TOTAL TAXA RICHNESS | 21 | |
| EPT TAXA RICHNESS | 0 | |

TABLE 3-26. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN SALT CREEK, JULY-AUGUST 2005.

| TAXA | 18 | | | |
|--------------------------------------|-----------|--------|------------|--------|
| | THORNDALE | | DEVON AVE. | |
| | #/m2 | % | #/m2 | % |
| Hydra | 26.9 | 0.57 | 55.6 | 0.68 |
| Turbellaria | 147.1 | 3.12 | 495.2 | 6.06 |
| Oligochaeta | 200.9 | 4.26 | 1,919.6 | 23.51 |
| Desserobdella phalera | -- | -- | 1.8 | 0.02 |
| Helobdella triserialis | 5.4 | 0.11 | 32.3 | 0.40 |
| Caecidotea | -- | -- | 497.0 | 6.09 |
| Hydracarina | 1.8 | 0.04 | -- | -- |
| Baetis intercalaris | 105.8 | 2.24 | 12.6 | 0.15 |
| Stenacron | 3.6 | 0.08 | -- | -- |
| Stenonema femoratum | 1.8 | 0.04 | -- | -- |
| Tricorythodes | 43.1 | 0.91 | 1.8 | 0.02 |
| Argia | 32.3 | 0.68 | -- | -- |
| Enallagma | 3.6 | 0.08 | 5.4 | 0.07 |
| Cyrnellus fraternus | 71.8 | 1.52 | 26.9 | 0.33 |
| Cheumatopsyche | 710.4 | 15.06 | 430.6 | 5.27 |
| Hydropsyche betteni | 23.3 | 0.49 | -- | -- |
| Ceratopsyche morosa | 5.4 | 0.11 | -- | -- |
| Hydroptila | 186.6 | 3.96 | 484.4 | 5.93 |
| Oecetis | -- | -- | 1.8 | 0.02 |
| Dubiraphia | 7.2 | 0.15 | 9.0 | 0.11 |
| Stenelmis | -- | -- | 5.4 | 0.07 |
| Ceratopogonidae | 5.4 | 0.11 | -- | -- |
| Tanytus | 17.9 | 0.38 | -- | -- |
| Procladius | 145.3 | 3.08 | 148.9 | 1.82 |
| Ablabesmyia janta | 147.1 | 3.12 | 285.3 | 3.49 |
| Ablabesmyia mallochii | 41.3 | 0.87 | -- | -- |
| Thienemanniya grp. | 502.3 | 10.65 | 520.3 | 6.37 |
| Thienemanniella xena | 281.7 | 5.97 | -- | -- |
| Cricotopus tremulus grp. | -- | -- | 35.9 | 0.44 |
| Cricotopus bicinctus grp. | 53.8 | 1.14 | 35.9 | 0.44 |
| Cricotopus sylvestris grp. | -- | -- | 44.9 | 0.55 |
| Nanocladius | -- | -- | 62.8 | 0.77 |
| Nanocladius distinctus | 30.5 | 0.65 | 44.9 | 0.55 |
| Nanocladius crassicornus/rectinervis | 12.6 | 0.27 | -- | -- |
| Cryptochironomus | 53.8 | 1.14 | 17.9 | 0.22 |
| Dicrotendipes modestus | -- | -- | 9.0 | 0.11 |
| Dicrotendipes neomodestus | 502.3 | 10.65 | 410.8 | 5.03 |
| Dicrotendipes fumidus | 41.3 | 0.87 | 349.8 | 4.28 |
| Dicrotendipes simpsoni | 25.1 | 0.53 | 224.3 | 2.75 |
| Endochironomus nigricans | 12.6 | 0.27 | 89.7 | 1.10 |
| Glyptotendipes | 170.4 | 3.61 | 9.0 | 0.11 |
| Harnischia | 17.9 | 0.38 | 17.9 | 0.22 |
| Microtendipes | -- | -- | 9.0 | 0.11 |
| Parachironomus | 30.5 | 0.65 | 35.9 | 0.44 |
| Phaenopsectra obediens grp. | -- | -- | 17.9 | 0.22 |
| Polypedilum flavum | 148.9 | 3.16 | 482.6 | 5.91 |
| Polypedilum illincense | 287.0 | 6.09 | 516.7 | 6.33 |
| Polypedilum scalaenum grp. | 43.1 | 0.91 | 52.0 | 0.64 |
| Pseudochironomus | 30.5 | 0.65 | 44.9 | 0.55 |
| Stenochironomus | 30.5 | 0.65 | 44.9 | 0.55 |
| Cladotanytarsus mancus grp. | 17.9 | 0.38 | 9.0 | 0.11 |
| Paratanytarsus | 131.0 | 2.78 | 285.3 | 3.49 |
| Tanytarsus | -- | -- | 17.9 | 0.22 |
| Tanytarsus glabrescens grp. | 66.4 | 1.41 | -- | -- |
| Tanytarsus guerius grp. | 220.7 | 4.68 | 53.8 | 0.66 |
| Hemerodromia | -- | -- | 10.8 | 0.13 |
| Helisoma | -- | -- | 118.4 | 1.45 |
| Ferrissia | 53.8 | 1.14 | 172.2 | 2.11 |
| Corbicula fluminea | 17.9 | 0.38 | 5.4 | 0.07 |
| Pisidium | -- | -- | 1.8 | 0.02 |
| TOTAL BENTHOS | 4,716.5 | 100.00 | 8,164.7 | 100.00 |
| TOTAL TAXA RICHNESS | 46 | | 47 | |
| EPT TAXA RICHNESS | 9 | | 6 | |

TABLE 3-27. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN SALT CREEK, JULY-AUGUST 2005.

| TAXA | CFAR | | | | 18 | | | | CFAR | |
|-----------------------------|-----------|--------|--------------|--------|-----------|--------|------------|--------|----------|--------|
| | BUSSE DAM | | J.F.K. BLVD. | | THORNDALE | | DEVON AVE. | | WOLF RD. | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | -- | -- | -- | -- | 7.2 | 0.06 | -- | -- | -- | -- |
| Oligochaeta | 3,186.4 | 7.72 | 445.0 | 24.41 | 1,464.0 | 13.25 | 6,487.7 | 41.28 | 28.7 | 22.22 |
| Hydracarina | 14.4 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Baetis intercalaris | -- | -- | -- | -- | 35.9 | 0.32 | -- | -- | -- | -- |
| Centroptilum | 14.4 | 0.03 | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricorythodes | -- | -- | -- | -- | 7.2 | 0.06 | -- | -- | -- | -- |
| Caenis | 437.8 | 1.06 | -- | -- | -- | -- | -- | -- | -- | -- |
| Enallagma | 28.7 | 0.07 | -- | -- | -- | -- | 21.5 | 0.14 | -- | -- |
| Cheumatopsyche | 7.2 | 0.02 | -- | -- | 7.2 | 0.06 | -- | -- | -- | -- |
| Hydroptila | 251.2 | 0.61 | -- | -- | 14.4 | 0.13 | 7.2 | 0.05 | -- | -- |
| Oxyethira | 43.1 | 0.10 | -- | -- | -- | -- | -- | -- | -- | -- |
| Oecetis | 100.5 | 0.24 | -- | -- | -- | -- | 7.2 | 0.05 | -- | -- |
| Dubiraphia | 14.4 | 0.03 | 14.4 | 0.79 | 21.5 | 0.19 | 7.2 | 0.05 | -- | -- |
| Stenelmis | -- | -- | 143.5 | 7.87 | 28.7 | 0.26 | -- | -- | 14.4 | 11.11 |
| Berosus | 7.2 | 0.02 | -- | -- | -- | -- | -- | -- | -- | -- |
| Ceratopogonidae | 136.4 | 0.33 | -- | -- | -- | -- | 21.5 | 0.14 | -- | -- |
| Procladius | 4,686.3 | 11.35 | 100.5 | 5.51 | 122.0 | 1.10 | 1,184.1 | 7.53 | -- | -- |
| Ablabesmyia janta | -- | -- | -- | -- | -- | -- | 7.2 | 0.05 | -- | -- |
| Ablabesmyia mallochi | 287.1 | 0.70 | -- | -- | -- | -- | -- | -- | -- | -- |
| Labrundinia neopilosella | 337.3 | 0.82 | -- | -- | -- | -- | -- | -- | -- | -- |
| Larsia | 107.6 | 0.26 | -- | -- | -- | -- | -- | -- | -- | -- |
| Thienemannimyia grp. | 660.3 | 1.60 | 14.4 | 0.79 | 724.8 | 6.56 | -- | -- | -- | -- |
| Chironomus | -- | -- | 43.1 | 2.36 | -- | -- | 7.2 | 0.05 | -- | -- |
| Cryptochironomus | 5,368.1 | 13.00 | 186.6 | 10.24 | 3,423.3 | 30.97 | 1,205.7 | 7.67 | -- | -- |
| Cryptotendipes | 50.2 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Dicrotendipes modestus | 50.2 | 0.12 | -- | -- | -- | -- | 100.5 | 0.64 | -- | -- |
| Dicrotendipes neomodestus | -- | -- | 28.7 | 1.57 | 545.4 | 4.94 | 7.2 | 0.05 | -- | -- |
| Dicrotendipes fumidus | -- | -- | 344.5 | 18.90 | 100.5 | 0.91 | -- | -- | -- | -- |
| Dicrotendipes simpsoni | 50.2 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Harnischia | -- | -- | -- | -- | 14.4 | 0.13 | 7.2 | 0.05 | -- | -- |
| Paratendipes | -- | -- | -- | -- | -- | -- | 14.4 | 0.09 | -- | -- |
| Phaenopsectra | -- | -- | -- | -- | -- | -- | 93.3 | 0.59 | -- | -- |
| Phaenopsectra obediens grp. | -- | -- | 14.4 | 0.79 | -- | -- | -- | -- | -- | -- |
| Polypedilum halterale grp. | 3,832.3 | 9.28 | 28.7 | 1.57 | 186.6 | 1.69 | 1,995.1 | 12.69 | -- | -- |
| Polypedilum illinoense | -- | -- | -- | -- | 7.2 | 0.06 | 7.2 | 0.05 | -- | -- |
| Polypedilum scalaenum grp. | -- | -- | 143.5 | 7.87 | 179.4 | 1.62 | 724.8 | 4.61 | -- | -- |
| Pseudochironomus | 16,671.3 | 40.37 | 57.4 | 3.15 | 100.5 | 0.91 | -- | -- | -- | -- |
| Stenochironomus | 50.2 | 0.12 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stictochironomus | -- | -- | 86.1 | 4.72 | 93.3 | 0.84 | 107.6 | 0.68 | -- | -- |
| Cladotanytarsus mancus grp. | 3,545.3 | 8.59 | 157.9 | 8.66 | 3,588.3 | 32.47 | 3,373.0 | 21.46 | -- | -- |
| Tanytarsus | -- | -- | -- | -- | 93.3 | 0.84 | -- | -- | -- | -- |
| Tanytarsus guerlus grp. | 854.0 | 2.07 | -- | -- | 179.4 | 1.62 | 265.5 | 1.69 | -- | -- |
| Muscidae | -- | -- | -- | -- | -- | -- | -- | -- | 57.4 | 44.44 |
| Pleurocera | -- | -- | -- | -- | -- | -- | -- | -- | 28.7 | 22.22 |
| Physa | 21.5 | 0.05 | -- | -- | -- | -- | -- | -- | -- | -- |
| Corbicula fluminea | 480.8 | 1.16 | 14.4 | 0.79 | 107.6 | 0.97 | 64.6 | 0.41 | -- | -- |
| TOTAL BENTHOS | 41,294.4 | 100.00 | 1,822.9 | 100.00 | 11,052.0 | 100.00 | 15,716.8 | 100.00 | 129.2 | 100.00 |
| TOTAL TAXA RICHNESS | 28 | | 16 | | 23 | | 22 | | 4 | |
| EPT TAXA RICHNESS | 6 | | 0 | | 4 | | 2 | | 0 | |

Table 3-28. Chironomidae head capsule deformities observed in Hester-Dendy and Ponar samples from the Des Plaines River watershed, June - August 2005.

| Taxa | Hester-Dendy Samples | | Ponar Samples | | |
|--|--------------------------------|--------------------------------------|-------------------------|--------------------------------|--|
| | Salt Cr. @ Devon Sta. 18 | W.B. Du Page R. @ Lake Sta. 64 | Salt Cr. @ Busse Dam | Salt Cr. @ Devon Sta. 18 | Des Plaines R. @ Lake Cook Sta. 13 |
| <i>Procladius</i> | | | | | |
| Number Examined | 12 | 1 | 34 | 36 | 2 |
| Percent Deformed | 33.3 | 0.0 | 2.9 | 2.8 | 0.0 |
| <i>Chironomus</i> | | | | | |
| Number Examined | -- | -- | -- | 1 | 83 |
| Percent Deformed | -- | -- | -- | 0.0 | 13.3 |
| <i>Polypedilum flavum</i> | | | | | |
| Number Examined | 18 | 37 | -- | -- | -- |
| Percent Deformed | 0.0 | 2.7 | -- | -- | -- |
| <i>Polypedilum halterale</i> grp. | | | | | |
| Number Examined | -- | -- | 18 | 23 | -- |
| Percent Deformed | -- | -- | 0.0 | 4.3 | -- |
| TOTAL SAMPLE | | | | | |
| Total Midges Examined | 195 | 202 | 205 | 142 | 133 |
| Percent Deformed | 2.1 | 0.5 | 0.5 | 1.4 | 8.3 |

one or two affected specimens. These levels of incidence are below published reference levels (Burt et al. 2003). However, despite the low sample size, the slightly higher number of deformities in the Station 18 HD samples may be more suggestive of environmental stress.

Based on total and EPT richness, abundance of the dominant taxa, tolerant taxa abundance, the abundance of sensitive EPT and Tanytarsini midge taxa, and the low incidence of head capsule deformities, the benthic communities at the Busse Dam and Thorndale stations are among the best observed in 2005 and likely represent slightly stressed conditions. Based on the greater abundance of tolerant taxa (Table 3-1), lower abundance of sensitive taxa, and the slightly higher incidence of chironomid deformities Station 18 appears to be somewhat more stressed compared to the upstream stations, while the two CFAR stations appear to be moderately to highly stressed according to these same measures.

3.1.4.3 West Branch of the DuPage River

The benthic macroinvertebrate community in the WB DuPage River at Station 64 was represented by 35 total taxa and three EPT taxa in the HD and Ponar samples (Tables 3-29 and 3-30). Total richness was noticeably higher in the HD compared to the Ponar samples with 28 and 18 taxa, respectively. However, EPT richness was only slightly higher in the HDs (three taxa) relative to the Ponars (one taxon). Tolerant taxa were the dominant for both sample types. The most abundant taxa in the HD samples were *Oligochaeta*, *Nanocladius distinctus*, *Glyptotendipes*, and *Polypedilum flavum* while *Oligochaeta* was clearly the dominant taxon in the Ponars. Total density was considerably higher in the HD samples due to several taxa, including the relatively pollution sensitive *Cheumatopsyche*.

Chironomid head capsule deformities were observed in a single *Polypedilum flavum* specimen collected in the HD samples (Table 3-28). However, tolerant taxa composed 62 and 90 percent of the total density in the HDs and Ponars, respectively (Table 3-1). Despite the moderately high taxa richness in each sample type and the presence of some environmentally sensitive EPT and Tanytarsini taxa, based on the richness and relative abundance of tolerant taxa in the samples, it is reasonable to characterize the WB DuPage River benthic community at Station 64 as moderately stressed.

3.1.4.4 Des Plaines River

Combined, the HD and Ponar samples from the three ambient stations (Stations 13, 22, and 91) and the CFAR Irving Park Road station on the Des Plaines River yielded 79 total taxa and 17 EPT taxa (Tables 3-31 and 3-32). These were the highest richness values observed among all the waterways sampled in 2005. HD total taxa richness decreased upstream to downstream among the three stations from 50 taxa at Station 13 to 31 taxa at Station 91 (Table 3-31). Likewise, EPT taxa richness was highest at the upstream Station 13 with 15 taxa compared to seven EPT taxa at both downstream Stations 22 and 91. The HD richness values observed at Station 13 were highest observed among all the stations sampled during 2005. The dominant taxon at Station 13 was *Polypedilum flavum*. However, at Stations 22 and 91, abundance was more evenly distributed among *Oligochaeta*, *Cheumatopsyche*, and *Polypedilum flavum*. Total density was noticeably higher at Station 13 and similarly lower at Stations 22 and 91. The primary cause for

TABLE 3-29. HESTER-DENDY DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2005.

| TAXA | 64 | |
|----------------------------|----------|--------|
| | LAKE ST. | |
| | #/m2 | % |
| Hydra | 71.8 | 0.28 |
| Turbellaria | 627.9 | 2.45 |
| Plumatella | 1.8 | 0.01 |
| Oligochaeta | 5,059.2 | 19.75 |
| Caecidotea | 53.8 | 0.21 |
| Hydracarina | 17.9 | 0.07 |
| Baetis intercalaris | 35.9 | 0.14 |
| Cheumatopsyche | 2,134.9 | 8.33 |
| Hydroptila | 17.9 | 0.07 |
| Dubiraphia | 17.9 | 0.07 |
| Procladius | 89.7 | 0.35 |
| Ablabesmyia janta | 520.3 | 2.03 |
| Thienemanimyia grp. | 950.8 | 3.71 |
| Thienemanniella xena | 430.6 | 1.68 |
| Cricotopus tremulus grp. | 179.4 | 0.70 |
| Cricotopus bicinctus grp. | 502.3 | 1.96 |
| Cricotopus sylvestris grp. | 89.7 | 0.35 |
| Nanocladius distinctus | 3,390.7 | 13.23 |
| Rheocricotopus robacki | 89.7 | 0.35 |
| Cladopelma | 89.7 | 0.35 |
| Dicrotendipes simpsoni | 2,404.0 | 9.38 |
| Glyptotendipes | 4,126.3 | 16.11 |
| Polypedilum flavum | 3,157.5 | 12.32 |
| Polypedilum scalaenum grp. | 179.4 | 0.70 |
| Paratanytarsus | 1,094.4 | 4.27 |
| Simulium | 89.7 | 0.35 |
| Helisoma | 179.4 | 0.70 |
| Ferrissia | 17.9 | 0.07 |
| TOTAL BENTHOS | 25,620.7 | 100.00 |
| TOTAL TAXA RICHNESS | 28 | |
| EPT TAXA RICHNESS | 3 | |

TABLE 3-30. PETITE PONAR DENSITIES AT SAMPLING STATION 64 WITHIN THE WEST BRANCH DUPAGE RIVER, JULY 2005.

| TAXA | 64 | |
|-----------------------------|----------|--------|
| | LAKE ST. | |
| | #/m2 | % |
| Oligochaeta | 1,428.2 | 65.25 |
| Zygoptera | 7.2 | 0.33 |
| Cheumatopsyche | 7.2 | 0.33 |
| Procladius | 136.4 | 6.23 |
| Ablabesmyia janta | 14.4 | 0.66 |
| Ablabesmyia mallochii | 14.4 | 0.66 |
| Thienemanimyia grp. | 7.2 | 0.33 |
| Nanocladius distinctus | 35.9 | 1.64 |
| Chironomus | 7.2 | 0.33 |
| Cryptochironomus | 86.1 | 3.93 |
| Dicrotendipes modestus | 14.4 | 0.66 |
| Dicrotendipes simpsoni | 107.6 | 4.92 |
| Glyptotendipes | 157.9 | 7.21 |
| Polypedilum illincense | 21.5 | 0.98 |
| Polypedilum scalaenum grp. | 50.2 | 2.30 |
| Cladotanytarsus mancus grp. | 21.5 | 0.98 |
| Paratanytarsus | 57.4 | 2.62 |
| Helisoma | 14.4 | 0.66 |
| TOTAL BENTHOS | 2,188.9 | 100.00 |
| TOTAL TAXA RICHNESS | 18 | |
| EPT TAXA RICHNESS | 1 | |

TABLE 3-31. HESTER-DENDY DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JUNE-AUGUST 2005.

| TAXA | 13 | | 22 | | 91 | |
|----------------------------------|---------------|--------|------------|--------|----------------------|--------|
| | LAKE COOK RD. | | OGDEN AVE. | | MATERIAL SERVICE RD. | |
| | #/m2 | % | #/m2 | % | #/m2 | % |
| Porifera | -- | -- | -- | -- | 1.8 | 0.01 |
| Hydra | 19.7 | 0.10 | -- | -- | -- | -- |
| Turbellaria | 846.8 | 4.22 | 1,905.3 | 21.82 | 4,329.0 | 33.25 |
| Urnatella gracilis | -- | -- | 1.8 | 0.02 | -- | -- |
| Plumatella | 1.8 | 0.01 | 3.6 | 0.04 | 3.6 | 0.03 |
| Oligochaeta | 1,361.4 | 6.88 | 845.0 | 9.68 | 837.8 | 6.43 |
| Helobdella | -- | -- | -- | -- | 5.4 | 0.04 |
| Caecidotea | 17.9 | 0.09 | 5.4 | 0.06 | -- | -- |
| Gammarus | 712.2 | 3.55 | 35.9 | 0.41 | -- | -- |
| Hydracarina | -- | -- | -- | -- | 9.0 | 0.07 |
| Isonychia | 1.8 | 0.01 | -- | -- | -- | -- |
| Baetis intercalaris | 12.6 | 0.06 | 14.4 | 0.16 | 84.3 | 0.65 |
| Centroptilum | 1.8 | 0.01 | -- | -- | -- | -- |
| Heptagenia | 9.0 | 0.04 | -- | -- | -- | -- |
| Stenacron | 5.4 | 0.03 | 23.3 | 0.27 | -- | -- |
| Maccaffertium integrum | 251.2 | 1.25 | -- | -- | -- | -- |
| Maccaffertium terminatum | 10.8 | 0.05 | -- | -- | -- | -- |
| Tricorythodes | 82.5 | 0.41 | 100.5 | 1.15 | -- | -- |
| Argia | 1.8 | 0.01 | 14.4 | 0.16 | 5.4 | 0.04 |
| Corixidae | 17.9 | 0.09 | -- | -- | -- | -- |
| Cheumatopsyche | 873.7 | 4.35 | 2,068.5 | 23.70 | 4,795.5 | 36.83 |
| Hydropsyche | 3.6 | 0.02 | -- | -- | 5.4 | 0.04 |
| Hydropsyche betteni | -- | -- | 17.9 | 0.21 | -- | -- |
| Hydropsyche orris | 9.0 | 0.04 | -- | -- | 165.1 | 1.27 |
| Hydropsyche simulans | 87.9 | 0.44 | -- | -- | -- | -- |
| Hydropsyche bidens | 86.1 | 0.43 | -- | -- | 26.9 | 0.21 |
| Ceratopsyche morosa | 12.6 | 0.06 | 5.4 | 0.06 | 80.7 | 0.62 |
| Hydroptila | 1.8 | 0.01 | 154.3 | 1.77 | 5.4 | 0.04 |
| Petrophila | -- | -- | -- | -- | 5.4 | 0.04 |
| Dubivaphia | 35.9 | 0.18 | -- | -- | -- | -- |
| Macronychus glabratus | 3.6 | 0.02 | 9.0 | 0.10 | -- | -- |
| Stenelmis | 35.9 | 0.18 | -- | -- | -- | -- |
| Procladius | -- | -- | 23.3 | 0.27 | -- | -- |
| Ablabesmyia janta | 287.0 | 1.43 | -- | -- | 53.8 | 0.41 |
| Ablabesmyia mallochii | -- | -- | 23.3 | 0.27 | -- | -- |
| Thienemanniya grp. | 91.5 | 0.46 | 131.0 | 1.50 | -- | -- |
| Corynoneura | -- | -- | 14.4 | 0.16 | -- | -- |
| Thienemanniella xena | 3.6 | 0.02 | 37.7 | 0.43 | 53.8 | 0.41 |
| Thienemanniella similis | -- | -- | -- | -- | 53.8 | 0.41 |
| Cricotopus tremulus grp. | 7.2 | 0.04 | -- | -- | -- | -- |
| Cricotopus bicinctus grp. | 9.0 | 0.04 | 283.5 | 3.25 | 35.9 | 0.28 |
| Cricotopus sylvestris grp. | 3.6 | 0.02 | -- | -- | -- | -- |
| Nanocladius distinctus | 601.0 | 3.00 | 364.2 | 4.17 | 26.9 | 0.21 |
| Nanocladius spinipennis | 9.0 | 0.04 | 62.8 | 0.72 | 17.9 | 0.14 |
| Rheocricotopus robacki | 3.6 | 0.02 | -- | -- | -- | -- |
| Chironomus | 592.0 | 2.95 | -- | -- | -- | -- |
| Dicrotendipes modestus | -- | -- | 23.3 | 0.27 | -- | -- |
| Dicrotendipes neomodestus | 37.7 | 0.19 | 82.5 | 0.95 | 53.8 | 0.41 |
| Dicrotendipes fumidus | -- | -- | 14.4 | 0.16 | 17.9 | 0.14 |
| Dicrotendipes simpsoni | 7.2 | 0.04 | 152.5 | 1.75 | 17.9 | 0.14 |
| Endochironomus nigricans | 143.5 | 0.72 | -- | -- | -- | -- |
| Glyptotendipes | 37.7 | 0.19 | -- | -- | 283.5 | 2.18 |
| Parachironomus | 3.6 | 0.02 | 23.3 | 0.27 | 17.9 | 0.14 |
| Polypedilum flavum | 12,709.0 | 63.33 | 1,856.8 | 21.27 | 1,180.5 | 9.07 |
| Polypedilum illinoense | 3.6 | 0.02 | 23.3 | 0.27 | -- | -- |
| Polypedilum scalaenum grp. | 592.0 | 2.95 | 59.2 | 0.68 | 26.9 | 0.21 |
| Stenochironomus | -- | -- | 247.6 | 2.84 | -- | -- |
| Cladotanytarsus vanderwulpi grp. | 3.6 | 0.02 | -- | -- | -- | -- |
| Paratanytarsus | 3.6 | 0.02 | 23.3 | 0.27 | -- | -- |
| Rheotanytarsus | 7.2 | 0.04 | 23.3 | 0.27 | 694.3 | 5.33 |
| Xenochironomus xenolabis | -- | -- | -- | -- | 107.6 | 0.83 |
| Pleurocera | -- | -- | 26.9 | 0.31 | -- | -- |
| Helisoma | 358.8 | 1.79 | -- | -- | -- | -- |
| Ferrissia | 9.0 | 0.04 | 23.3 | 0.27 | 17.9 | 0.14 |
| Corbicula fluminea | 17.9 | 0.09 | 5.4 | 0.06 | -- | -- |
| TOTAL BENTHOS | 20,066.4 | 100.00 | 8,729.8 | 100.00 | 13,021.2 | 100.00 |
| TOTAL TAXA RICHNESS | 50 | | 37 | | 31 | |
| EPT TAXA RICHNESS | 15 | | 7 | | 7 | |

TABLE 3-32. PETITE PONAR DENSITIES AT EACH SAMPLING STATION WITHIN THE DES PLAINES RIVER, JUNE-AUGUST 2005.

| TAXA | 13 | | CFAR | | 22 | | 91 | |
|-------------------------------------|---------------|--------|-----------------|--------|------------|--------|-----------------------|--------|
| | LAKE COOK RD. | | IRVING PARK RD. | | OGDEN AVE. | | MATERIAL SERVICES RD. | |
| | #/m2 | % | #/m2 | % | #/m2 | % | #/m2 | % |
| Turbellaria | -- | -- | -- | -- | 71.8 | 1.54 | 14.4 | 1.92 |
| Urnatella gracilis | -- | -- | -- | -- | -- | -- | 14.4 | 1.92 |
| Oligochaeta | 3,889.7 | 55.48 | 5,296.4 | 81.82 | 1,499.9 | 32.15 | 545.4 | 73.08 |
| Helobdella triserialis | -- | -- | 14.4 | 0.22 | 35.9 | 0.77 | -- | -- |
| Mooreobdella microstoma | -- | -- | 157.9 | 2.44 | -- | -- | -- | -- |
| Gammarus | -- | -- | -- | -- | 7.2 | 0.15 | -- | -- |
| Baetis intercalaris | -- | -- | -- | -- | 78.9 | 1.69 | 14.4 | 1.92 |
| Stenacron | 7.2 | 0.10 | -- | -- | -- | -- | -- | -- |
| Tricorythodes | -- | -- | -- | -- | 1,521.4 | 32.62 | -- | -- |
| Anthopotamus myops grp. | 7.2 | 0.10 | -- | -- | -- | -- | -- | -- |
| Cheumatopsyche | -- | -- | -- | -- | 71.8 | 1.54 | 14.4 | 1.92 |
| Hydroptila | -- | -- | -- | -- | 7.2 | 0.15 | -- | -- |
| Dubiraphia | 28.7 | 0.41 | -- | -- | -- | -- | -- | -- |
| Stenelmis | -- | -- | -- | -- | 64.6 | 1.38 | 28.7 | 3.85 |
| Ceratopogonidae | 14.4 | 0.20 | -- | -- | -- | -- | -- | -- |
| Procladius | 35.9 | 0.51 | 28.7 | 0.44 | -- | -- | -- | -- |
| Thienemannimyia grp. | 21.5 | 0.31 | -- | -- | 43.1 | 0.92 | -- | -- |
| Thienemanniella similis | -- | -- | -- | -- | 14.4 | 0.31 | -- | -- |
| Cricotopus sylvestris grp. | -- | -- | -- | -- | 7.2 | 0.15 | -- | -- |
| Chironomus | 2,375.5 | 33.88 | -- | -- | -- | -- | -- | -- |
| Cryptochironomus | 71.8 | 1.02 | -- | -- | 93.3 | 2.00 | -- | -- |
| Dicrotendipes | 28.7 | 0.41 | -- | -- | -- | -- | -- | -- |
| Harnischia | 165.1 | 2.35 | -- | -- | -- | -- | -- | -- |
| Paralauterborniella nigrohalteralis | 28.7 | 0.41 | -- | -- | -- | -- | -- | -- |
| Paratendipes | 28.7 | 0.41 | -- | -- | -- | -- | -- | -- |
| Polypedilum flavum | -- | -- | -- | -- | 35.9 | 0.77 | 28.7 | 3.85 |
| Polypedilum illinoense | 28.7 | 0.41 | -- | -- | 7.2 | 0.15 | -- | -- |
| Polypedilum scalaenum grp. | 57.4 | 0.82 | -- | -- | 136.4 | 2.92 | 86.1 | 11.54 |
| Cladotanytarsus mancus grp. | 7.2 | 0.10 | -- | -- | -- | -- | -- | -- |
| Cladotanytarsus vanderwulpi grp. | 78.9 | 1.13 | -- | -- | -- | -- | -- | -- |
| Tanytarsus guerlus grp. | 43.1 | 0.61 | -- | -- | -- | -- | -- | -- |
| Bithynia tentaculata | -- | -- | 631.5 | 9.76 | -- | -- | -- | -- |
| Ammicola | -- | -- | 43.1 | 0.67 | -- | -- | -- | -- |
| Pleurocera | -- | -- | 14.4 | 0.22 | 122.0 | 2.62 | -- | -- |
| Halisma | 7.2 | 0.10 | -- | -- | -- | -- | -- | -- |
| Ferrissia | -- | -- | -- | -- | 7.2 | 0.15 | -- | -- |
| Corbicula fluminea | 21.5 | 0.31 | -- | -- | 811.0 | 17.38 | -- | -- |
| Sphaerium | -- | -- | 287.1 | 4.43 | -- | -- | -- | -- |
| Musculium | 7.2 | 0.10 | -- | -- | -- | -- | -- | -- |
| Pisidium | 57.4 | 0.82 | -- | -- | 28.7 | 0.62 | -- | -- |
| TOTAL BENTHOS | 7,011.6 | 100.00 | 6,473.3 | 100.00 | 4,664.8 | 100.00 | 746.4 | 100.00 |
| TOTAL TAXA RICHNESS | 22 | | 8 | | 20 | | 8 | |
| EPT TAXA RICHNESS | 2 | | 0 | | 4 | | 2 | |

this difference was the greater density of *Polypedilum flavum* at Station 13, which as high or higher than the total density at both Stations 22 and 91.

Ponar total taxa richness was similar at Stations 13 and 22 with 22 and 20 taxa, respectively and identically lower at the CFAR station and Stations 91 and with 8 taxa (Table 3-32). EPT taxa richness was highest at Station 22 (four taxa) and slightly lower at Station 13 and 91 (two taxa). No EPT taxa were observed at the CFAR station. Although Oligochaeta was abundant at all the stations, it was clearly the dominant taxon at the CFAR station and Station 91. At Station 13, Oligochaeta and *Chironomus* were the most abundant taxa while at Station 22, Oligochaeta and the mayfly *Tricorythodes* were equally abundant. Total density decreased from upstream to downstream but was considerably lower at Station 91 compared to upstream.

Chironomid head capsule deformities were only observed in *Chironomus* from the Station 13 Ponar sample (Table 3-28). However, the 13.3 percent (n=83) level of incidence was well above published background levels (Burt et al. 2003, Lenat 1993, Hudson and Ciborowski 1996b) and is likely indicative of pollution stress.

Based on abundance, tolerant taxa were a relatively minor component in the HD samples compared to the Ponars. This suggests a level of disparity between water and sediment quality particularly at Station 13 where tolerant taxa abundance increased nearly seven-fold between the HD and Ponar samples and the incidence of head capsule deformities in the Ponars was clearly above expected reference levels. However, based on total richness in both sample types, and EPT richness in the HDs, environmental stress appeared to increase longitudinally among the three ambient stations while the benthic community at the CFAR station was decidedly poor.

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APPENDIX A

2005 CENTER AND NEAR SHORE HD AND PONAR DATA

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= CALUMET RIVER,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 28SEP05

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|--------|-----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 50 | 179.4 | 0.28 | 50 | 179.4 | 0.16 |
| Oligochaeta | 100 | 358.8 | 0.56 | 150 | 538.2 | 0.48 |
| Gammarus | 1,100 | 3,946.9 | 6.18 | 1,600 | 5,740.9 | 5.17 |
| Cyrenellus fraternus | 50 | 179.4 | 0.28 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 50 | 179.4 | 0.28 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 50 | 179.4 | 0.16 |
| Ferrissia | 50 | 179.4 | 0.28 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 16,400 | 58,844.6 | 92.13 | 29,100 | 104,413.3 | 94.02 |
| TOTAL BENTHOS | 17,800 | 63,868.0 | 100.00 | 30,950 | 111,051.3 | 100.00 |

WATERWAY= L.C.R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 27SEP05

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Porifera | 1 | 3.6 | 0.07 | 1 | 3.6 | 0.06 |
| Hydra | 43 | 154.3 | 3.17 | 1 | 3.6 | 0.06 |
| Turbellaria | 66 | 236.8 | 4.86 | 9 | 32.3 | 0.55 |
| Oligochaeta | 86 | 308.6 | 6.34 | 175 | 627.9 | 10.69 |
| Mooreobdella microstoma | 3 | 10.8 | 0.22 | 0 | 0.0 | 0.00 |
| Caecidotea | 3 | 10.8 | 0.22 | 0 | 0.0 | 0.00 |
| Hyalella azteca | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Gammarus | 68 | 244.0 | 5.01 | 10 | 35.9 | 0.61 |
| Argia | 2 | 7.2 | 0.15 | 0 | 0.0 | 0.00 |
| Enallagma | 1 | 3.6 | 0.07 | 1 | 3.6 | 0.06 |
| Sisyridae | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Cyrenellus fraternus | 12 | 43.1 | 0.88 | 273 | 979.5 | 16.68 |
| Hydroptila | 1 | 3.6 | 0.07 | 0 | 0.0 | 0.00 |
| Procladius | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.43 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.92 |
| Ablabesmyia mallochi | 4 | 14.4 | 0.29 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 8 | 28.7 | 0.59 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 53 | 190.2 | 3.91 | 88 | 315.8 | 5.38 |
| Chironomus | 4 | 14.4 | 0.29 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 241 | 864.7 | 17.76 | 440 | 1,578.8 | 26.88 |
| Glyptotendipes | 16 | 57.4 | 1.18 | 15 | 53.8 | 0.92 |
| Parachironomus | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.43 |
| Stenochironomus | 20 | 71.8 | 1.47 | 59 | 211.7 | 3.60 |
| Xenochironomus xenolabis | 49 | 175.8 | 3.61 | 81 | 290.6 | 4.95 |
| Bithynia tentaculata | 2 | 7.2 | 0.15 | 0 | 0.0 | 0.00 |
| Physa | 7 | 25.1 | 0.52 | 0 | 0.0 | 0.00 |
| Helisoma | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Ferrissia | 0 | 0.0 | 0.00 | 21 | 75.3 | 1.28 |
| Corbicula fluminea | 2 | 7.2 | 0.15 | 18 | 64.6 | 1.10 |
| Dreissena polymorpha | 665 | 2,386.1 | 49.01 | 413 | 1,481.9 | 25.23 |
| TOTAL BENTHOS | 1,357 | 4,869.0 | 100.00 | 1,637 | 5,873.7 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= C.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 29AUG05

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 245 | 879.1 | 10.45 | 20 | 71.8 | 2.03 |
| Turbellaria | 5 | 17.9 | 0.21 | 23 | 82.5 | 2.33 |
| Oligochaeta | 50 | 179.4 | 2.13 | 8 | 28.7 | 0.81 |
| Caecidotea | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Hyalella azteca | 0 | 0.0 | 0.00 | 60 | 215.3 | 6.08 |
| Gammarus | 25 | 89.7 | 1.07 | 79 | 283.5 | 8.00 |
| Collembola | 5 | 17.9 | 0.21 | 0 | 0.0 | 0.00 |
| Argia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Enallagma | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.10 |
| Cyrrnellus fraternus | 25 | 89.7 | 1.07 | 10 | 35.9 | 1.01 |
| Procladius | 0 | 0.0 | 0.00 | 27 | 96.9 | 2.74 |
| Ablabesmyia janta | 19 | 68.2 | 0.81 | 21 | 75.3 | 2.13 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.71 |
| Nanocladius distinctus | 440 | 1,578.8 | 18.77 | 82 | 294.2 | 8.31 |
| Dicrotendipes neomodestus | 15 | 53.8 | 0.64 | 41 | 147.1 | 4.15 |
| Dicrotendipes simpsoni | 970 | 3,480.4 | 41.38 | 349 | 1,252.2 | 35.36 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 55 | 197.3 | 5.57 |
| Parachironomus | 15 | 53.8 | 0.64 | 0 | 0.0 | 0.00 |
| Stencchironomus | 15 | 53.8 | 0.64 | 69 | 247.6 | 6.99 |
| Xenochironomus xenolabis | 45 | 161.5 | 1.92 | 34 | 122.0 | 3.44 |
| Ferrissia | 320 | 1,148.2 | 13.65 | 22 | 78.9 | 2.23 |
| Corbicula fluminea | 20 | 71.8 | 0.85 | 3 | 10.8 | 0.30 |
| Dreissena polymorpha | 130 | 466.5 | 5.55 | 74 | 265.5 | 7.50 |
| TOTAL BENTHOS | 2,344 | 8,410.5 | 100.00 | 987 | 3,541.4 | 100.00 |

WATERWAY= W.F.N.B.C.R.,
 LOCATION= DUNDEE RD.,
 STATION= 106,
 and DATE= 23JUN05

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 20 | 71.8 | 2.20 | 159 | 570.5 | 9.49 |
| Turbellaria | 48 | 172.2 | 5.28 | 69 | 247.6 | 4.12 |
| Oligochaeta | 283 | 1,015.4 | 31.13 | 401 | 1,438.8 | 23.93 |
| Helobdella stagnalis | 97 | 348.0 | 10.67 | 28 | 100.5 | 1.67 |
| Erpobdella punctata punctata | 16 | 57.4 | 1.76 | 4 | 14.4 | 0.24 |
| Caecidotea | 128 | 459.3 | 14.08 | 396 | 1,420.9 | 23.63 |
| Crangonyx | 1 | 3.6 | 0.11 | 1 | 3.6 | 0.06 |
| Coenagrionidae | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |
| Cheumatopsyche | 1 | 3.6 | 0.11 | 0 | 0.0 | 0.00 |
| Enochrus | 1 | 3.6 | 0.11 | 1 | 3.6 | 0.06 |
| Alotanytus | 3 | 10.8 | 0.33 | 0 | 0.0 | 0.00 |
| Procladius | 27 | 96.9 | 2.97 | 37 | 132.8 | 2.21 |
| Ablabesmyia | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.36 |
| Pentaneura | 0 | 0.0 | 0.00 | 12 | 43.1 | 0.72 |
| Thienemannimyia grp. | 40 | 143.5 | 4.40 | 81 | 290.6 | 4.83 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.36 |
| Cricotopus bicinctus grp. | 22 | 78.9 | 2.42 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 3 | 10.8 | 0.33 | 0 | 0.0 | 0.00 |
| Nanocladius crassicornus/rectinervis | 3 | 10.8 | 0.33 | 6 | 21.5 | 0.36 |
| Chironomus | 177 | 635.1 | 19.47 | 327 | 1,173.3 | 19.51 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.36 |
| Dicrotendipes neomodestus | 3 | 10.8 | 0.33 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 3 | 10.8 | 0.33 | 12 | 43.1 | 0.72 |
| Polypedilum illinoense | 3 | 10.8 | 0.33 | 6 | 21.5 | 0.36 |
| Paratanytarsus | 21 | 75.3 | 2.31 | 93 | 333.7 | 5.55 |
| Tanytarsus guerlus grp. | 3 | 10.8 | 0.33 | 6 | 21.5 | 0.36 |
| Psychoda | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Physa | 0 | 0.0 | 0.00 | 13 | 46.6 | 0.78 |
| Menetus dilatatus | 1 | 3.6 | 0.11 | 0 | 0.0 | 0.00 |
| Musculium | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.12 |
| Pisidium | 5 | 17.9 | 0.55 | 1 | 3.6 | 0.06 |
| TOTAL BENTHOS | 909 | 3,261.6 | 100.00 | 1,676 | 6,013.6 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= W.F.N.B.C.R.,
 LOCATION= GOLF RD.,
 STATION= 103,
 and DATE= 28JUN05

| TAXA | CENTER | | | SIDE | | |
|-------------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 3,240 | 11,625.4 | 52.43 | 1,440 | 5,166.8 | 40.74 |
| Turbellaria | 670 | 2,404.0 | 10.84 | 355 | 1,273.8 | 10.04 |
| Oligochaeta | 1,010 | 3,624.0 | 16.34 | 490 | 1,758.2 | 13.86 |
| Caecidotea | 410 | 1,471.1 | 6.63 | 265 | 950.8 | 7.50 |
| Procladius | 50 | 179.4 | 0.81 | 30 | 107.6 | 0.85 |
| Cricotopus sylvestris grp. | 20 | 71.8 | 0.32 | 0 | 0.0 | 0.00 |
| Nanocladus crassicornus/rectinervis | 20 | 71.8 | 0.32 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 590 | 2,117.0 | 9.55 | 850 | 3,049.9 | 24.05 |
| Glyptotendipes | 20 | 71.8 | 0.32 | 70 | 251.2 | 1.98 |
| Harnischia | 30 | 107.6 | 0.49 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 20 | 71.8 | 0.32 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 60 | 215.3 | 0.97 | 10 | 35.9 | 0.28 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.28 |
| Physa | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.42 |
| Ferrissia | 40 | 143.5 | 0.65 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 6,180 | 22,174.4 | 100.00 | 3,535 | 12,683.9 | 100.00 |

WATERWAY= M.F.N.B.C.R.,
 LOCATION= LAKE COOK RD.,
 STATION= 31,
 and DATE= 21JUN05

| TAXA | CENTER | | | SIDE | | |
|----------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 780 | 2,798.7 | 9.30 | 275 | 986.7 | 2.78 |
| Turbellaria | 610 | 2,188.7 | 7.27 | 200 | 717.6 | 2.03 |
| Oligochaeta | 70 | 251.2 | 0.83 | 25 | 89.7 | 0.25 |
| Helobdella stagnalis | 20 | 71.8 | 0.24 | 0 | 0.0 | 0.00 |
| Caecidotea | 6,740 | 24,183.7 | 80.33 | 9,200 | 33,010.4 | 93.16 |
| Hydracarina | 10 | 35.9 | 0.12 | 0 | 0.0 | 0.00 |
| Procladius | 10 | 35.9 | 0.12 | 0 | 0.0 | 0.00 |
| Thianemannimyia grp. | 20 | 71.8 | 0.24 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 25 | 89.7 | 0.25 |
| Glyptotendipes | 20 | 71.8 | 0.24 | 0 | 0.0 | 0.00 |
| Physa | 40 | 143.5 | 0.48 | 100 | 358.8 | 1.01 |
| Sphaerium | 0 | 0.0 | 0.00 | 50 | 179.4 | 0.51 |
| Musculium | 70 | 251.2 | 0.83 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 8,390 | 30,104.1 | 100.00 | 9,875 | 35,432.4 | 100.00 |

WATERWAY= SKOKIE R.,
 LOCATION= LAKE COOK RD.,
 STATION= 32,
 and DATE= 22JUN05

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 74 | 265.5 | 9.92 | 18 | 64.6 | 9.38 |
| Oligochaeta | 494 | 1,772.5 | 66.22 | 40 | 143.5 | 20.83 |
| Helobdella stagnalis | 29 | 104.1 | 3.89 | 38 | 136.3 | 19.79 |
| Helobdella triserialis | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Erpobdella punctata punctata | 2 | 7.2 | 0.27 | 0 | 0.0 | 0.00 |
| Caecidotea | 106 | 380.3 | 14.21 | 35 | 125.6 | 18.23 |
| Gammarus | 2 | 7.2 | 0.27 | 0 | 0.0 | 0.00 |
| Procambarus acutus | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Hydracarina | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.52 |
| Procladius | 2 | 7.2 | 0.27 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 2 | 7.2 | 0.27 | 3 | 10.8 | 1.56 |
| Chironomus | 16 | 57.4 | 2.14 | 49 | 175.8 | 25.52 |
| Dicrotendipes neomodestus | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 10 | 35.9 | 1.34 | 3 | 10.8 | 1.56 |
| Phaenopsectra punctipes | 2 | 7.2 | 0.27 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.52 |
| Paratanytarsus | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Physa | 3 | 10.8 | 0.40 | 1 | 3.6 | 0.52 |
| Musculium | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.52 |
| Pisidium | 0 | 0.0 | 0.00 | 2 | 7.2 | 1.04 |
| TOTAL BENTHOS | 746 | 2,676.7 | 100.00 | 192 | 698.9 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SKOKIE R.,
 LOCATION= FRONTAGE RD.,
 STATION= 105,
 and DATE= 29JUN05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 3 | 10.8 | 1.01 | 12 | 43.1 | 1.95 |
| Oligochaeta | 37 | 132.8 | 12.46 | 290 | 1,040.5 | 47.15 |
| Caecidotea | 1 | 3.6 | 0.34 | 16 | 57.4 | 2.60 |
| Gammarus | 131 | 470.0 | 44.11 | 96 | 344.5 | 15.61 |
| Procambarus acutus | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.49 |
| Stenacron | 1 | 3.6 | 0.34 | 1 | 3.6 | 0.16 |
| Rheumatobates | 1 | 3.6 | 0.34 | 0 | 0.0 | 0.00 |
| Cyrrnellus fraternus | 7 | 25.1 | 2.36 | 1 | 3.6 | 0.16 |
| Cheumatopsyche | 6 | 21.5 | 2.02 | 0 | 0.0 | 0.00 |
| Procladius | 3 | 10.8 | 1.01 | 20 | 71.8 | 3.25 |
| Ablabesmyia annulata | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.65 |
| Cricotopus bicinctus grp. | 4 | 14.4 | 1.35 | 1 | 3.6 | 0.16 |
| Cricotopus sylvestris grp. | 4 | 14.4 | 1.35 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1 | 3.6 | 0.34 | 0 | 0.0 | 0.00 |
| Chironomus | 7 | 25.1 | 2.36 | 58 | 208.1 | 9.43 |
| Dicrotendipes modestus | 11 | 39.5 | 3.70 | 30 | 107.6 | 4.88 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.65 |
| Dicrotendipes simpsoni | 19 | 68.2 | 6.40 | 14 | 50.2 | 2.28 |
| Glyptotendipes | 13 | 46.6 | 4.38 | 0 | 0.0 | 0.00 |
| Harnischia | 3 | 10.8 | 1.01 | 4 | 14.4 | 0.65 |
| Paratendipes | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.65 |
| Polypedilum halterale grp. | 1 | 3.6 | 0.34 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 1 | 3.6 | 0.34 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.16 |
| Paratanytarsus | 3 | 10.8 | 1.01 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 6 | 21.5 | 2.02 | 0 | 0.0 | 0.00 |
| Ferrissia | 2 | 7.2 | 0.67 | 5 | 17.9 | 0.81 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 48 | 172.2 | 7.80 |
| Sphaerium | 32 | 114.8 | 10.77 | 3 | 10.8 | 0.49 |
| TOTAL BENTHOS | 297 | 1,065.7 | 100.00 | 615 | 2,206.7 | 100.00 |

WATERWAY= N.S.C.,
 LOCATION= CENTRAL AVE.,
 STATION= 35,
 and DATE= 07JUL05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 56 | 200.9 | 5.86 | 5 | 17.9 | 0.56 |
| Turbellaria | 2 | 7.2 | 0.21 | 44 | 157.9 | 4.97 |
| Oligochaeta | 164 | 588.4 | 17.15 | 281 | 1,008.3 | 31.72 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.11 |
| Helobdella triserialis | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.23 |
| Caecidotea | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.23 |
| Gammarus | 71 | 254.8 | 7.43 | 37 | 132.8 | 4.18 |
| Stenacron | 1 | 3.6 | 0.10 | 0 | 0.0 | 0.00 |
| Enallagma | 1 | 3.6 | 0.10 | 1 | 3.6 | 0.11 |
| Ceraclaea maculata | 2 | 7.2 | 0.21 | 0 | 0.0 | 0.00 |
| Procladius | 13 | 46.6 | 1.36 | 10 | 35.9 | 1.13 |
| Ablabesmyia annulata | 13 | 46.6 | 1.36 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 7 | 25.1 | 0.73 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.56 |
| Cricotopus bicinctus grp. | 7 | 25.1 | 0.73 | 5 | 17.9 | 0.56 |
| Cricotopus sylvestris grp. | 13 | 46.6 | 1.36 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 7 | 25.1 | 0.73 | 0 | 0.0 | 0.00 |
| Parakiefferiella | 13 | 46.6 | 1.36 | 5 | 17.9 | 0.56 |
| Chironomus | 39 | 139.9 | 4.08 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.56 |
| Cryptotendipes | 7 | 25.1 | 0.73 | 0 | 0.0 | 0.00 |
| Dicrotendipes modestus | 39 | 139.9 | 4.08 | 5 | 17.9 | 0.56 |
| Dicrotendipes fumidus | 268 | 961.6 | 28.03 | 196 | 703.3 | 22.12 |
| Dicrotendipes simpsoni | 189 | 678.1 | 19.77 | 186 | 667.4 | 20.99 |
| Phaenopsectra obediens grp. | 7 | 25.1 | 0.73 | 0 | 0.0 | 0.00 |
| Phaenopsectra punctipes | 20 | 71.8 | 2.09 | 10 | 35.9 | 1.13 |
| Tanytarsus | 13 | 46.6 | 1.36 | 73 | 261.9 | 8.24 |
| Physa | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.23 |
| Gyraulus | 0 | 0.0 | 0.00 | 11 | 39.5 | 1.24 |
| Helisoma | 1 | 3.6 | 0.10 | 0 | 0.0 | 0.00 |
| Menetus dilatatus | 3 | 10.8 | 0.31 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 956 | 3,430.2 | 100.00 | 886 | 3,179.0 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= N.S.C.,
 LOCATION= OAKTON AVE.,
 STATION= 102,
 and DATE= 20JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 215 | 771.4 | 7.41 | 60 | 215.3 | 2.70 |
| Oligochaeta | 970 | 3,480.4 | 33.45 | 450 | 1,614.6 | 20.22 |
| Helobdella stagnalis | 15 | 53.8 | 0.52 | 15 | 53.8 | 0.67 |
| Caecidotea | 60 | 215.3 | 2.07 | 0 | 0.0 | 0.00 |
| Gammarus | 5 | 17.9 | 0.17 | 25 | 89.7 | 1.12 |
| Baetis intercalaris | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.22 |
| Stenacron | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.22 |
| Procladius | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.67 |
| Ablabesmyia annulata | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.67 |
| Cricotopus bicinctus grp. | 15 | 53.8 | 0.52 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 35 | 125.6 | 1.21 | 15 | 53.8 | 0.67 |
| Chironomus | 15 | 53.8 | 0.52 | 0 | 0.0 | 0.00 |
| Cladopelma | 15 | 53.8 | 0.52 | 0 | 0.0 | 0.00 |
| Dicrotendipes modestus | 265 | 950.8 | 9.14 | 33 | 125.6 | 1.57 |
| Dicrotendipes simpsoni | 1,190 | 4,269.8 | 41.03 | 1,580 | 5,669.2 | 71.01 |
| Glyptotendipes | 15 | 53.8 | 0.52 | 0 | 0.0 | 0.00 |
| Parachironomus | 15 | 53.8 | 0.52 | 0 | 0.0 | 0.00 |
| Phaenopsectra punctipes | 15 | 53.8 | 0.52 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 15 | 53.8 | 0.52 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 35 | 125.6 | 1.21 | 0 | 0.0 | 0.00 |
| Gyraulus | 5 | 17.9 | 0.17 | 5 | 17.9 | 0.22 |
| TOTAL BENTHOS | 2,900 | 10,405.5 | 100.00 | 2,225 | 7,983.5 | 100.00 |

WATERWAY= N.S.C.,
 LOCATION= TOUHY AVE.,
 STATION= 36,
 and DATE= 21JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 210 | 753.5 | 2.34 |
| Turbellaria | 872 | 3,128.8 | 51.87 | 1,550 | 5,561.5 | 17.28 |
| Oligochaeta | 589 | 2,113.4 | 35.04 | 3,440 | 12,343.0 | 38.35 |
| Caecidotea | 0 | 0.0 | 0.00 | 70 | 251.2 | 0.78 |
| Hyalabella azteca | 0 | 0.0 | 0.00 | 600 | 2,152.9 | 6.69 |
| Thienemannimyia grp. | 2 | 7.2 | 0.12 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 3 | 10.8 | 0.18 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 12 | 43.1 | 0.71 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 60 | 215.3 | 0.67 |
| Dicrotendipes modestus | 7 | 25.1 | 0.42 | 0 | 0.0 | 0.00 |
| Dicrotendipes fumidus | 5 | 17.9 | 0.30 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 166 | 595.6 | 9.88 | 1,090 | 3,911.0 | 12.15 |
| Glyptotendipes | 15 | 53.8 | 0.89 | 1,830 | 6,566.2 | 20.40 |
| Parachironomus | 8 | 28.7 | 0.48 | 120 | 430.6 | 1.34 |
| Polypedilum illinoense | 2 | 7.2 | 0.12 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,681 | 6,031.6 | 100.00 | 8,970 | 32,185.1 | 100.00 |

WATERWAY= N.S.C., LOCATION= FOSTER AVE.,
 STATION= 101,
 and DATE= 27JUL05

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.13 |
| Turbellaria | 3,040 | 10,907.8 | 76.77 | 710 | 2,547.5 | 19.06 |
| Oligochaeta | 450 | 1,614.6 | 11.36 | 1,990 | 7,140.3 | 53.42 |
| Caecidotea | 10 | 35.9 | 0.25 | 130 | 538.2 | 4.03 |
| Hyalabella azteca | 0 | 0.0 | 0.00 | 55 | 197.3 | 1.48 |
| Procladius | 10 | 35.9 | 0.25 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.40 |
| Nanocladius distinctus | 70 | 251.2 | 1.77 | 25 | 89.7 | 0.67 |
| Dicrotendipes modestus | 10 | 35.9 | 0.25 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 350 | 1,255.8 | 8.84 | 690 | 2,475.8 | 18.52 |
| Glyptotendipes | 10 | 35.9 | 0.25 | 25 | 89.7 | 0.67 |
| Parachironomus | 10 | 35.9 | 0.25 | 55 | 197.3 | 1.48 |
| Gyraulus | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.13 |
| TOTAL BENTHOS | 3,960 | 14,208.8 | 100.00 | 3,725 | 13,365.6 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= N.B.C.R.,
 LOCATION= GLENVIEW RD.,
 STATION= 104,
 and DATE= 30JUN05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 68 | 244.0 | 3.11 | 11 | 39.5 | 2.66 |
| Oligochaeta | 220 | 789.4 | 10.08 | 14 | 50.2 | 3.38 |
| Caecidotea | 5 | 17.9 | 0.23 | 3 | 10.8 | 0.72 |
| Gammarus | 738 | 2,648.0 | 33.81 | 365 | 1,309.7 | 88.16 |
| Stenacron | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Argia | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 323 | 1,159.0 | 14.80 | 0 | 0.0 | 0.00 |
| Tanytus | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| Procladius | 30 | 107.6 | 1.37 | 11 | 39.5 | 2.66 |
| Thienemannimyia grp. | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 413 | 1,481.9 | 18.92 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 15 | 53.8 | 0.69 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 23 | 82.5 | 1.05 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 8 | 28.7 | 0.37 | 1 | 3.6 | 0.24 |
| Chironomus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.48 |
| Dicrotendipes simpsoni | 15 | 53.8 | 0.69 | 2 | 7.2 | 0.48 |
| Harnischia | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.24 |
| Polypedilum fallax grp. | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 23 | 82.5 | 1.05 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 148 | 531.0 | 6.78 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 30 | 107.6 | 1.37 | 2 | 7.2 | 0.48 |
| Paratanytarsus | 38 | 136.3 | 1.74 | 1 | 3.6 | 0.24 |
| Rheotanytarsus | 15 | 53.8 | 0.69 | 0 | 0.0 | 0.00 |
| Tanytarsus | 8 | 28.7 | 0.37 | 0 | 0.0 | 0.00 |
| Ammicola | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.24 |
| Ferrissia | 25 | 89.7 | 1.15 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 2,183 | 7,832.8 | 100.00 | 414 | 1,485.5 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= DEMPSTER ST.,
 STATION= 34,
 and DATE= 13JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 90 | 322.9 | 3.42 |
| Turbellaria | 101 | 362.4 | 12.66 | 115 | 412.6 | 4.36 |
| Oligochaeta | 55 | 197.3 | 6.89 | 1,725 | 6,189.5 | 65.46 |
| Placobdella montifera | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Mooreobdella microstoma | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Caecidotea | 0 | 0.0 | 0.00 | 285 | 1,022.6 | 10.82 |
| Gammarus | 291 | 1,044.1 | 36.47 | 30 | 107.6 | 1.14 |
| Orconectes | 2 | 7.2 | 0.25 | 0 | 0.0 | 0.00 |
| Stenacron | 5 | 17.9 | 0.63 | 0 | 0.0 | 0.00 |
| Argia | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 236 | 846.8 | 29.57 | 0 | 0.0 | 0.00 |
| Hydroptila | 2 | 7.2 | 0.25 | 0 | 0.0 | 0.00 |
| Dubiraphia | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Tanytus | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.19 |
| Procladius | 4 | 14.4 | 0.50 | 135 | 484.4 | 5.12 |
| Thienemannimyia grp. | 5 | 17.9 | 0.63 | 5 | 17.9 | 0.19 |
| Thienemanniella xena | 2 | 7.2 | 0.25 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 17 | 61.0 | 2.13 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 2 | 7.2 | 0.25 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Chironomus | 2 | 7.2 | 0.25 | 15 | 53.8 | 0.57 |
| Cryptochironomus | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Dicrotendipes modestus | 3 | 10.8 | 0.38 | 50 | 179.4 | 1.90 |
| Dicrotendipes neomodestus | 2 | 7.2 | 0.25 | 5 | 17.9 | 0.19 |
| Dicrotendipes fumidus | 2 | 7.2 | 0.25 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 5 | 17.9 | 0.63 | 115 | 412.6 | 4.36 |
| Glyptotendipes | 6 | 21.5 | 0.75 | 5 | 17.9 | 0.19 |
| Polypedilum flavum | 14 | 50.2 | 1.75 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 2 | 7.2 | 0.25 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 7 | 25.1 | 0.88 | 20 | 71.8 | 0.76 |
| Polypedilum scalaenum grp. | 8 | 28.7 | 1.00 | 5 | 17.9 | 0.19 |
| Stenochironomus | 1 | 3.6 | 0.13 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 6 | 21.5 | 0.75 | 0 | 0.0 | 0.00 |
| Tanytarsus | 2 | 7.2 | 0.25 | 0 | 0.0 | 0.00 |
| Cyraulid | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.38 |
| Ferrissia | 9 | 32.3 | 1.13 | 20 | 71.8 | 0.76 |
| TOTAL BENTHOS | 798 | 2,863.3 | 100.00 | 2,635 | 9,454.6 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= N.B.C.R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 19JUL05

| TAXA | CENTER | | | SIDE | | |
|---------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 35.9 | 0.82 | 100 | 358.8 | 1.79 |
| Turbellaria | 62 | 222.5 | 5.08 | 410 | 1,471.1 | 7.33 |
| Oligochaeta | 18 | 64.6 | 1.48 | 5 | 17.9 | 0.09 |
| Caecidotea | 5 | 17.9 | 0.41 | 560 | 2,009.3 | 10.02 |
| Gammarus | 266 | 954.4 | 21.80 | 1,450 | 5,202.7 | 25.94 |
| Hydracarina | 1 | 3.6 | 0.08 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 21 | 75.3 | 1.72 | 5 | 17.9 | 0.09 |
| Stenacron | 24 | 86.1 | 1.97 | 35 | 125.6 | 0.63 |
| Cheumatopsyche | 413 | 1,481.9 | 33.85 | 1,640 | 5,884.5 | 29.34 |
| Hydropsyche betteni | 3 | 10.8 | 0.25 | 10 | 35.9 | 0.18 |
| Hydroptila | 15 | 53.8 | 1.23 | 245 | 879.1 | 4.38 |
| Ablabesmyia annulata | 2 | 7.2 | 0.16 | 0 | 0.0 | 0.00 |
| Thienemanniella grp. | 20 | 71.8 | 1.64 | 60 | 215.3 | 1.07 |
| Thienemanniella xena | 12 | 43.1 | 0.98 | 115 | 412.6 | 2.06 |
| Cricotopus bicinctus grp. | 8 | 28.7 | 0.66 | 75 | 269.1 | 1.34 |
| Nanocladius distinctus | 8 | 28.7 | 0.66 | 0 | 0.0 | 0.00 |
| Nanocladius spinipennis | 4 | 14.4 | 0.33 | 15 | 53.8 | 0.27 |
| Rheocricotopus robacki | 55 | 197.3 | 4.51 | 275 | 986.7 | 4.92 |
| Dicrotendipes neomodestus | 2 | 7.2 | 0.16 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 2 | 7.2 | 0.16 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 2 | 7.2 | 0.16 | 0 | 0.0 | 0.00 |
| Polypedilum fallax grp. | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.18 |
| Polypedilum flavum | 37 | 132.8 | 3.03 | 120 | 430.6 | 2.15 |
| Polypedilum illinoense | 2 | 7.2 | 0.16 | 60 | 215.3 | 1.07 |
| Stenochironomus | 27 | 96.9 | 2.21 | 10 | 35.9 | 0.18 |
| Rheotanytarsus | 4 | 14.4 | 0.33 | 0 | 0.0 | 0.00 |
| Simulium | 2 | 7.2 | 0.16 | 0 | 0.0 | 0.00 |
| Ferrissia | 195 | 699.7 | 15.98 | 390 | 1,399.4 | 6.98 |
| TOTAL BENTHOS | 1,220 | 4,377.5 | 100.00 | 5,590 | 20,057.4 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= WILSON AVE.,
 STATION= 37,
 and DATE= 27JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1,005 | 3,606.0 | 58.26 | 86 | 308.6 | 28.76 |
| Oligochaeta | 541 | 1,941.2 | 31.36 | 125 | 448.5 | 41.81 |
| Helobdella triserialis | 2 | 7.2 | 0.12 | 0 | 0.0 | 0.00 |
| Caecidotea | 29 | 104.1 | 1.68 | 5 | 17.9 | 1.67 |
| Hyalella azteca | 15 | 53.8 | 0.87 | 2 | 7.2 | 0.67 |
| Gammarus | 2 | 7.2 | 0.12 | 0 | 0.0 | 0.00 |
| Stenacron | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 1 | 3.6 | 0.06 | 1 | 3.6 | 0.33 |
| Procladius | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 4 | 14.4 | 0.23 | 1 | 3.6 | 0.33 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.33 |
| Nanocladius distinctus | 1 | 3.6 | 0.06 | 1 | 3.6 | 0.33 |
| Chironomus | 3 | 10.8 | 0.17 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 103 | 369.6 | 5.97 | 68 | 244.0 | 22.74 |
| Glyptotendipes | 8 | 28.7 | 0.46 | 5 | 17.9 | 1.67 |
| Parachironomus | 4 | 14.4 | 0.23 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 1 | 3.6 | 0.06 | 1 | 3.6 | 0.33 |
| Polypedilum illinoense | 1 | 3.6 | 0.06 | 3 | 10.8 | 1.00 |
| Polypedilum scalaenum grp. | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Ferrissia | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 1 | 3.6 | 0.06 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,725 | 6,189.5 | 100.00 | 299 | 1,072.8 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= N.B.C.R.,
 LOCATION= DIVERSY AVE.,
 STATION= 73,
 and DATE= 28JUL05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------------|-----------------|---------------|--------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 5 | 17.9 | 0.14 | 1 | 3.6 | 0.04 |
| Turbellaria | 1,065 | 3,821.3 | 29.79 | 199 | 714.0 | 8.16 |
| Oligochaeta | 565 | 2,027.3 | 15.80 | 1,185 | 4,251.9 | 48.61 |
| Hyalella azteca | 10 | 35.9 | 0.28 | 16 | 57.4 | 0.66 |
| Stenacron | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.08 |
| Ablabesmyia mallochii | 20 | 71.8 | 0.56 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 32 | 114.8 | 1.31 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 21 | 75.3 | 0.86 |
| Dicrotendipes simpsoni | 1,790 | 6,422.7 | 50.07 | 757 | 2,716.2 | 31.05 |
| Glyptotendipes | 80 | 287.0 | 2.24 | 53 | 190.2 | 2.17 |
| Polypedilum fallax grp. | 0 | 0.0 | 0.00 | 11 | 39.5 | 0.45 |
| Polypedilum flavum | 20 | 71.8 | 0.56 | 11 | 39.5 | 0.45 |
| Polypedilum illincense | 0 | 0.0 | 0.00 | 85 | 305.0 | 3.49 |
| Polypedilum scalaenuma grp. | 20 | 71.8 | 0.56 | 53 | 190.2 | 2.17 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.12 |
| Ferrissia | 0 | 0.0 | 0.00 | 6 | 21.5 | 0.25 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.08 |
| TOTAL BENTHOS | 3,575 | 12,827.4 | 100.00 | 2,438 | 8,747.8 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 18JUL05

| TAXA | CENTER | | | SIDE | | |
|------------------------|------------|----------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 13 | 46.6 | 1.76 | 0 | 0.0 | 0.00 |
| Turbellaria | 147 | 527.4 | 19.86 | 370 | 1,327.6 | 6.47 |
| Plumatella | 1 | 3.6 | 0.14 | 0 | 0.0 | 0.00 |
| Oligochaeta | 386 | 1,385.0 | 52.16 | 4,480 | 16,074.6 | 78.32 |
| Hyalella azteca | 37 | 132.8 | 5.00 | 70 | 251.2 | 1.22 |
| Gammarus | 2 | 7.2 | 0.27 | 0 | 0.0 | 0.00 |
| Procladius | 3 | 10.8 | 0.41 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 5 | 17.9 | 0.68 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.17 |
| Dicrotendipes simpsoni | 145 | 520.3 | 19.59 | 780 | 2,798.7 | 13.64 |
| Parachironomus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.17 |
| Menetus dilatatus | 1 | 3.6 | 0.14 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 740 | 2,655.2 | 100.00 | 5,720 | 20,523.9 | 100.00 |

WATERWAY= C.S.S.C,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 22AUG05

| TAXA | CENTER | | | SIDE | | |
|------------------------|-----------|--------------|---------------|--------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 33 | 118.4 | 1.93 |
| Turbellaria | 0 | 0.0 | 0.00 | 187 | 671.0 | 10.91 |
| Urnatella gracilis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Oligochaeta | 29 | 104.1 | 100.00 | 440 | 1,578.8 | 25.67 |
| Helobdella triserialis | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.18 |
| Hydropsyche | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.18 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 20 | 71.8 | 1.17 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 33 | 118.4 | 1.93 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 967 | 3,469.7 | 56.42 |
| Parachironomus | 0 | 0.0 | 0.00 | 20 | 71.8 | 1.17 |
| Ferrissia | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.41 |
| TOTAL BENTHOS | 29 | 104.1 | 100.00 | 1,714 | 6,150.0 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= C.S.S.C,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 26AUG05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------------|-----------------|---------------|--------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.77 |
| Turbellaria | 1,170 | 4,198.1 | 21.75 | 1,005 | 3,606.0 | 25.80 |
| Oligochaeta | 4,120 | 14,782.9 | 76.58 | 2,070 | 7,427.3 | 53.15 |
| Hyalella azteca | 20 | 71.8 | 0.37 | 35 | 125.6 | 0.90 |
| Cyrrnellus fraternus | 0 | 0.0 | 0.00 | 50 | 179.4 | 1.28 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 40 | 143.5 | 1.03 |
| Nanocladius distinctus | 10 | 35.9 | 0.19 | 30 | 107.6 | 0.77 |
| Dicrotendipes simpsoni | 60 | 215.3 | 1.12 | 520 | 1,865.8 | 13.35 |
| Pseudochironomus | 0 | 0.0 | 0.00 | 100 | 358.8 | 2.57 |
| Cladotanytarsus mancus grp. | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.26 |
| Musculium | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.13 |
| TOTAL BENTHOS | 5,380 | 19,303.9 | 100.00 | 3,895 | 13,975.6 | 100.00 |

WATERWAY= C.S.S.C,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 15SEP05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|------------|----------------|---------------|--------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 23 | 82.5 | 7.35 | 30 | 107.6 | 1.89 |
| Turbellaria | 65 | 233.2 | 20.77 | 301 | 1,080.0 | 18.94 |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Oligochaeta | 10 | 35.9 | 3.19 | 16 | 57.4 | 1.01 |
| Hyalella azteca | 32 | 114.8 | 10.22 | 117 | 419.8 | 7.36 |
| Gammarus | 4 | 14.4 | 1.28 | 5 | 17.9 | 0.31 |
| Stenacron | 3 | 10.8 | 0.96 | 9 | 32.3 | 0.57 |
| Cyrrnellus fraternus | 15 | 53.8 | 4.79 | 12 | 43.1 | 0.76 |
| Hydroptila | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.06 |
| Procladius | 1 | 3.6 | 0.32 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 6 | 21.5 | 1.92 | 9 | 32.3 | 0.57 |
| Thienemanniella grp. | 1 | 3.6 | 0.32 | 0 | 0.0 | 0.00 |
| Thienemanniella similis | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.13 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.13 |
| Dicrotendipes neomodestus | 2 | 7.2 | 0.64 | 2 | 7.2 | 0.13 |
| Dicrotendipes simpsoni | 56 | 200.9 | 17.89 | 79 | 283.5 | 4.97 |
| Glyptotendipes | 2 | 7.2 | 0.64 | 5 | 17.9 | 0.31 |
| Parachironomus | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.13 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.19 |
| Polypedilum scalaenum grp. | 3 | 10.8 | 0.96 | 0 | 0.0 | 0.00 |
| Stenochironomus | 2 | 7.2 | 0.64 | 25 | 89.7 | 1.57 |
| Xenochironomus xenolabis | 5 | 17.9 | 1.60 | 20 | 71.8 | 1.26 |
| Physsa | 13 | 46.6 | 4.15 | 1 | 3.6 | 0.06 |
| Helisoma | 7 | 25.1 | 2.24 | 1 | 3.6 | 0.06 |
| Ferrissia | 13 | 46.6 | 4.15 | 938 | 3,365.6 | 59.03 |
| Corbicula fluminea | 28 | 100.5 | 8.95 | 2 | 7.2 | 0.13 |
| Musculium | 22 | 78.9 | 7.03 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 313 | 1,123.1 | 100.00 | 1,589 | 5,701.5 | 100.00 |

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 14JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------------|-----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 60 | 215.3 | 0.75 | 0 | 0.0 | 0.00 |
| Turbellaria | 4,970 | 17,832.8 | 62.20 | 108 | 387.5 | 21.43 |
| Oligochaeta | 180 | 645.9 | 2.25 | 26 | 93.3 | 5.16 |
| Caecidotea | 2,640 | 9,472.6 | 33.04 | 361 | 1,295.3 | 71.63 |
| Procladius | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 10 | 35.9 | 0.13 | 3 | 10.8 | 0.60 |
| Cricotopus bicinctus grp. | 60 | 215.3 | 0.75 | 5 | 17.9 | 0.99 |
| Cricotopus sylvestris grp. | 20 | 71.8 | 0.25 | 1 | 3.6 | 0.20 |
| Dicrotendipes simpsoni | 10 | 35.9 | 0.13 | 0 | 0.0 | 0.00 |
| Physsa | 30 | 107.6 | 0.38 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 7,990 | 28,668.8 | 100.00 | 504 | 1,808.4 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SALT CR.,
 LOCATION= THORNDALE,
 STATION=
 and DATE= 03AUG05

| TAXA | CENTER | | | SIDE | | |
|--------------------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 35.9 | 0.58 | 5 | 17.9 | 0.54 |
| Turbellaria | 40 | 143.5 | 2.34 | 42 | 150.7 | 4.57 |
| Oligochaeta | 80 | 287.0 | 4.68 | 32 | 114.8 | 3.48 |
| Helobdella triserialis | 3 | 10.8 | 0.18 | 0 | 0.0 | 0.00 |
| Hydracarina | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.11 |
| Baetis intercalaris | 37 | 132.8 | 2.16 | 22 | 78.9 | 2.39 |
| Stenacron | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.22 |
| Stenonema femoratum | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.11 |
| Tricorythodes | 23 | 82.5 | 1.35 | 1 | 3.6 | 0.11 |
| Argia | 13 | 46.6 | 0.76 | 5 | 17.9 | 0.54 |
| Enallagma | 0 | 0.0 | 0.00 | 2 | 7.2 | 0.22 |
| Cyrrnellus fraternus | 27 | 96.9 | 1.58 | 13 | 46.6 | 1.41 |
| Cheumatopsyche | 277 | 993.9 | 16.20 | 119 | 427.0 | 12.95 |
| Hydropsyche betteni | 13 | 46.6 | 0.76 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 3 | 10.8 | 0.18 | 0 | 0.0 | 0.00 |
| Hydroptila | 90 | 322.9 | 5.26 | 14 | 50.2 | 1.52 |
| Dubiraphia | 0 | 0.0 | 0.00 | 4 | 14.4 | 0.44 |
| Ceratopogonidae | 3 | 10.8 | 0.18 | 0 | 0.0 | 0.00 |
| Tanytus | 10 | 35.9 | 0.58 | 0 | 0.0 | 0.00 |
| Procladius | 67 | 240.4 | 3.92 | 14 | 50.2 | 1.52 |
| Ablabesmyia janta | 53 | 190.2 | 3.10 | 29 | 104.1 | 3.16 |
| Ablabesmyia mallochii | 23 | 82.5 | 1.35 | 0 | 0.0 | 0.00 |
| Thienemanniella grp. | 187 | 671.0 | 10.94 | 93 | 333.7 | 10.12 |
| Thienemanniella xena | 43 | 154.3 | 2.51 | 114 | 409.0 | 12.40 |
| Cricotopus bicinctus grp. | 23 | 82.5 | 1.35 | 7 | 25.1 | 0.76 |
| Nanocladius distinctus | 10 | 35.9 | 0.58 | 7 | 25.1 | 0.76 |
| Nanocladius crassicornus/rectinervis | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.76 |
| Cryptochironomus | 23 | 82.5 | 1.35 | 7 | 25.1 | 0.76 |
| Dicrotendipes neomodestus | 230 | 825.3 | 13.45 | 50 | 179.4 | 5.44 |
| Dicrotendipes fumidus | 23 | 82.5 | 1.35 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 14 | 50.2 | 1.52 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 7 | 25.1 | 0.76 |
| Glyptotendipes | 23 | 82.5 | 1.35 | 72 | 258.3 | 7.83 |
| Harnischia | 10 | 35.9 | 0.58 | 0 | 0.0 | 0.00 |
| Parachironomus | 10 | 35.9 | 0.58 | 7 | 25.1 | 0.76 |
| Polypedilum flavum | 33 | 118.4 | 1.93 | 50 | 179.4 | 5.44 |
| Polypedilum illinoense | 110 | 394.7 | 6.43 | 50 | 179.4 | 5.44 |
| Polypedilum scalaenum grp. | 10 | 35.9 | 0.58 | 14 | 50.2 | 1.52 |
| Pseudochironomus | 10 | 35.9 | 0.58 | 7 | 25.1 | 0.76 |
| Stenochironomus | 10 | 35.9 | 0.58 | 7 | 25.1 | 0.76 |
| Cladotanytarsus mancus grp. | 10 | 35.9 | 0.58 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 23 | 82.5 | 1.35 | 50 | 179.4 | 5.44 |
| Tanytarsus glabrescens grp. | 23 | 82.5 | 1.35 | 14 | 50.2 | 1.52 |
| Tanytarsus guerius grp. | 87 | 312.2 | 5.09 | 36 | 129.2 | 3.92 |
| Ferrissia | 30 | 107.6 | 1.75 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 10 | 35.9 | 0.58 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,710 | 6,135.6 | 100.00 | 919 | 3,297.5 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 15JUL05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 26 | 93.3 | 1.17 | 5 | 17.9 | 0.21 |
| Turbellaria | 131 | 470.0 | 5.90 | 145 | 520.3 | 6.22 |
| Oligochaeta | 785 | 2,816.6 | 35.34 | 285 | 1,022.6 | 12.23 |
| Desserobdella phalera | 1 | 3.6 | 0.05 | 0 | 0.0 | 0.00 |
| Helobdella triserialis | 18 | 64.6 | 0.81 | 0 | 0.0 | 0.00 |
| Caecidotea | 262 | 940.1 | 11.80 | 15 | 53.8 | 0.64 |
| Baetis intercalaris | 7 | 25.1 | 0.32 | 0 | 0.0 | 0.00 |
| Tricorythodes | 1 | 3.6 | 0.05 | 0 | 0.0 | 0.00 |
| Enallagma | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Cyrnellus fraternus | 10 | 35.9 | 0.45 | 5 | 17.9 | 0.21 |
| Cheumatopsyche | 90 | 322.9 | 4.05 | 150 | 538.2 | 6.44 |
| Hydroptila | 220 | 789.4 | 9.91 | 50 | 179.4 | 2.15 |
| Oecetis | 1 | 3.6 | 0.05 | 0 | 0.0 | 0.00 |
| Dubiraphia | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.21 |
| Stenelmis | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Procladius | 48 | 172.2 | 2.16 | 35 | 125.6 | 1.50 |
| Ablabesmyia janta | 34 | 122.0 | 1.53 | 125 | 448.5 | 5.36 |
| Thienemannimyia grp. | 150 | 538.2 | 6.75 | 140 | 502.3 | 6.01 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.86 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.86 |
| Cricotopus sylvestris grp. | 5 | 17.9 | 0.23 | 20 | 71.8 | 0.86 |
| Nanocladius | 0 | 0.0 | 0.00 | 35 | 125.6 | 1.50 |
| Nanocladius distinctus | 5 | 17.9 | 0.23 | 20 | 71.8 | 0.86 |
| Cryptochironomus | 10 | 35.9 | 0.45 | 0 | 0.0 | 0.00 |
| Dicrotendipes modestus | 5 | 17.9 | 0.23 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 19 | 68.2 | 0.86 | 210 | 753.5 | 9.01 |
| Dicrotendipes fumidus | 15 | 53.8 | 0.68 | 180 | 645.9 | 7.73 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 125 | 448.5 | 5.36 |
| Endochironomus nigricans | 15 | 53.8 | 0.68 | 35 | 125.6 | 1.50 |
| Glyptotendipes | 5 | 17.9 | 0.23 | 0 | 0.0 | 0.00 |
| Harnischia | 10 | 35.9 | 0.45 | 0 | 0.0 | 0.00 |
| Microtendipes | 5 | 17.9 | 0.23 | 0 | 0.0 | 0.00 |
| Parachironomus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.86 |
| Phaenopsectra obediens grp. | 10 | 35.9 | 0.45 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 19 | 68.2 | 0.86 | 250 | 897.0 | 10.73 |
| Polypedilum illinoense | 58 | 208.1 | 2.61 | 230 | 825.3 | 9.87 |
| Polypedilum scalaenum grp. | 29 | 104.1 | 1.31 | 0 | 0.0 | 0.00 |
| Pseudochironomus | 5 | 17.9 | 0.23 | 20 | 71.8 | 0.86 |
| Stenochironomus | 5 | 17.9 | 0.23 | 20 | 71.8 | 0.86 |
| Cladotanytarsus mancus grp. | 5 | 17.9 | 0.23 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 19 | 68.2 | 0.86 | 140 | 502.3 | 6.01 |
| Tanytarsus | 10 | 35.9 | 0.45 | 0 | 0.0 | 0.00 |
| Tanytarsus guerlus grp. | 10 | 35.9 | 0.45 | 20 | 71.8 | 0.86 |
| Hemerodromia | 1 | 3.6 | 0.05 | 5 | 17.9 | 0.21 |
| Helisoma | 66 | 236.8 | 2.97 | 0 | 0.0 | 0.00 |
| Ferrissia | 96 | 344.5 | 4.32 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 3 | 10.8 | 0.14 | 0 | 0.0 | 0.00 |
| Pisidium | 1 | 3.6 | 0.05 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 2,221 | 7,969.1 | 100.00 | 2,330 | 8,360.2 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 06JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 35.9 | 0.15 | 30 | 107.6 | 0.39 |
| Turbellaria | 140 | 502.3 | 2.11 | 210 | 753.5 | 2.74 |
| Plumatella | 1 | 3.6 | 0.02 | 0 | 0.0 | 0.00 |
| Oligochaeta | 800 | 2,870.5 | 12.08 | 2,020 | 7,247.9 | 26.37 |
| Caecidotea | 30 | 107.6 | 0.45 | 0 | 0.0 | 0.00 |
| Hydracarina | 10 | 35.9 | 0.15 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 20 | 71.8 | 0.30 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 910 | 3,265.2 | 13.74 | 280 | 1,004.7 | 3.66 |
| Hydroptila | 10 | 35.9 | 0.15 | 0 | 0.0 | 0.00 |
| Dubiraphia | 10 | 35.9 | 0.15 | 0 | 0.0 | 0.00 |
| Procladius | 50 | 179.4 | 0.76 | 0 | 0.0 | 0.00 |
| Ablabesmyia janta | 90 | 322.9 | 1.36 | 200 | 717.6 | 2.61 |
| Thienemannimyia grp. | 280 | 1,004.7 | 4.23 | 250 | 897.0 | 3.26 |
| Thienemanniella xena | 140 | 502.3 | 2.11 | 100 | 358.8 | 1.31 |
| Cricotopus tremulus grp. | 0 | 0.0 | 0.00 | 100 | 358.8 | 1.31 |
| Cricotopus bicinctus grp. | 230 | 825.3 | 3.47 | 50 | 179.4 | 0.65 |
| Cricotopus sylvestris grp. | 50 | 179.4 | 0.76 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1,010 | 3,624.0 | 15.25 | 880 | 3,157.5 | 11.49 |
| Rheocricotopus robacki | 50 | 179.4 | 0.76 | 0 | 0.0 | 0.00 |
| Cladopelma | 0 | 0.0 | 0.00 | 50 | 179.4 | 0.65 |
| Dicrotendipes simpsoni | 550 | 1,973.4 | 8.31 | 790 | 2,834.6 | 10.31 |
| Glyptotendipes | 780 | 2,798.7 | 11.78 | 1,520 | 5,453.9 | 19.84 |
| Polypedilum flavum | 920 | 3,301.0 | 13.90 | 840 | 3,014.0 | 10.97 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 100 | 358.8 | 1.31 |
| Paratanytarsus | 460 | 1,650.5 | 6.95 | 150 | 538.2 | 1.96 |
| Simulium | 40 | 143.5 | 0.60 | 10 | 35.9 | 0.13 |
| Helisoma | 20 | 71.8 | 0.30 | 80 | 287.0 | 1.04 |
| Ferrissia | 10 | 35.9 | 0.15 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 6,621 | 23,756.7 | 100.00 | 7,660 | 27,484.8 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13,
 and DATE= 20JUN05

| TAXA | CENTER | | | SIDE | | |
|----------------------------------|--------|---------|--------|--------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 11 | 39.5 | 0.99 | 0 | 0.0 | 0.00 |
| Turbellaria | 102 | 366.0 | 9.15 | 370 | 1,327.6 | 3.67 |
| Plumatella | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Oligochaeta | 0 | 0.0 | 0.00 | 770 | 2,762.8 | 7.65 |
| Caecidotea | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.10 |
| Gammarus | 7 | 25.1 | 0.63 | 390 | 1,399.4 | 3.87 |
| Isonychia | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 7 | 25.1 | 0.63 | 0 | 0.0 | 0.00 |
| Centroptilum | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Heptagenia | 5 | 17.9 | 0.45 | 0 | 0.0 | 0.00 |
| Stenacron | 3 | 10.8 | 0.27 | 0 | 0.0 | 0.00 |
| Maccaffertium integrum | 140 | 502.3 | 12.56 | 0 | 0.0 | 0.00 |
| Maccaffertium terminatum | 6 | 21.5 | 0.54 | 0 | 0.0 | 0.00 |
| Tricorythodes | 46 | 165.1 | 4.13 | 0 | 0.0 | 0.00 |
| Argia | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Corixidae | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.10 |
| Cheumatopsyche | 487 | 1,747.4 | 43.68 | 0 | 0.0 | 0.00 |
| Hydropsyche | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Hydropsyche orris | 5 | 17.9 | 0.45 | 0 | 0.0 | 0.00 |
| Hydropsyche simulans | 49 | 175.8 | 4.39 | 0 | 0.0 | 0.00 |
| Hydropsyche bidens | 48 | 172.2 | 4.30 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 7 | 25.1 | 0.63 | 0 | 0.0 | 0.00 |
| Hydroptila | 1 | 3.6 | 0.09 | 0 | 0.0 | 0.00 |
| Dubiraphia | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.20 |
| Macronychus glabratus | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Stenelmis | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.20 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 160 | 574.1 | 1.59 |
| Thienemannimyia grp. | 51 | 183.0 | 4.57 | 0 | 0.0 | 0.00 |
| Thienemanniella xena | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Cricotopus tremulus grp. | 4 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Cricotopus bicinctus grp. | 5 | 17.9 | 0.45 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 5 | 17.9 | 0.45 | 330 | 1,184.1 | 3.28 |
| Nanocladius spiniplenus | 5 | 17.9 | 0.45 | 0 | 0.0 | 0.00 |
| Rheocricotopus robacki | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 330 | 1,184.1 | 3.28 |
| Dicrotendipes neomodestus | 21 | 75.3 | 1.88 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 4 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Endochironomus nigricans | 0 | 0.0 | 0.00 | 80 | 287.0 | 0.79 |
| Glyptotendipes | 21 | 75.3 | 1.88 | 0 | 0.0 | 0.00 |
| Parachironomus | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 44 | 157.9 | 3.95 | 7,040 | 25,260.1 | 69.91 |
| Polypedilum illinoense | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 330 | 1,184.1 | 3.28 |
| Cladotanytarsus vanderwulpi grp. | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 2 | 7.2 | 0.18 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 4 | 14.4 | 0.36 | 0 | 0.0 | 0.00 |
| Helisoma | 0 | 0.0 | 0.00 | 200 | 717.6 | 1.99 |
| Ferrissia | 5 | 17.9 | 0.45 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.10 |
| TOTAL BENTHOS | 1,115 | 4,000.7 | 100.00 | 10,070 | 36,132.0 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 26JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 77 | 276.3 | 3.06 | 985 | 3,534.3 | 41.93 |
| Urnatella gracilis | 0 | 0.0 | 0.00 | 1 | 3.6 | 0.04 |
| Plumatella | 1 | 3.6 | 0.04 | 1 | 3.6 | 0.04 |
| Oligochaeta | 33 | 118.4 | 1.31 | 438 | 1,571.6 | 18.65 |
| Caecidotea | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.13 |
| Gammarus | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.85 |
| Baetis intercalaris | 3 | 10.8 | 0.12 | 5 | 17.9 | 0.21 |
| Stenacron | 0 | 0.0 | 0.00 | 13 | 46.6 | 0.55 |
| Tricorythodes | 43 | 154.3 | 1.71 | 13 | 46.6 | 0.55 |
| Argia | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.34 |
| Cheumatopsyche | 973 | 3,491.2 | 38.66 | 180 | 645.9 | 7.66 |
| Hydropsyche betteni | 10 | 35.9 | 0.40 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 3 | 10.8 | 0.12 | 0 | 0.0 | 0.00 |
| Hydroptila | 73 | 261.9 | 2.90 | 13 | 46.6 | 0.55 |
| Macronychus glabratus | 0 | 0.0 | 0.00 | 5 | 17.9 | 0.21 |
| Procladius | 13 | 46.6 | 0.52 | 0 | 0.0 | 0.00 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 13 | 46.6 | 0.55 |
| Thienemannimyia grp. | 40 | 143.5 | 1.59 | 33 | 118.4 | 1.40 |
| Corynoneura | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.34 |
| Thienemanniella xena | 13 | 46.6 | 0.52 | 8 | 28.7 | 0.34 |
| Cricotopus bicinctus grp. | 53 | 190.2 | 2.11 | 105 | 376.7 | 4.47 |
| Nanocladius distinctus | 93 | 333.7 | 3.69 | 110 | 394.7 | 4.68 |
| Nanocladius spinipennis | 27 | 96.9 | 1.07 | 8 | 28.7 | 0.34 |
| Dicrotendipes modestus | 13 | 46.6 | 0.52 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 13 | 46.6 | 0.52 | 33 | 118.4 | 1.40 |
| Dicrotendipes fumidus | 0 | 0.0 | 0.00 | 8 | 28.7 | 0.34 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 85 | 305.0 | 3.62 |
| Parachironomus | 0 | 0.0 | 0.00 | 13 | 46.6 | 0.55 |
| Polypedilum flavum | 1,010 | 3,624.0 | 40.13 | 25 | 89.7 | 1.06 |
| Polypedilum illincense | 0 | 0.0 | 0.00 | 13 | 46.6 | 0.55 |
| Polypedilum scalaenum grp. | 0 | 0.0 | 0.00 | 33 | 118.4 | 1.40 |
| Stenochironomus | 0 | 0.0 | 0.00 | 138 | 495.2 | 5.87 |
| Paratanytarsus | 13 | 46.6 | 0.52 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 13 | 46.6 | 0.52 | 0 | 0.0 | 0.00 |
| Pleurocera | 0 | 0.0 | 0.00 | 15 | 53.8 | 0.64 |
| Ferrissia | 0 | 0.0 | 0.00 | 13 | 46.6 | 0.55 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.13 |
| TOTAL BENTHOS | 2,517 | 9,031.2 | 100.00 | 2,349 | 8,428.4 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - HESTER-DENDY DATA

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 18AUG05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Porifera | 1 | 3.6 | 0.02 | 0 | 0.0 | 0.00 |
| Turbellaria | 2,250 | 8,073.2 | 53.42 | 163 | 584.9 | 5.35 |
| Plumatella | 1 | 3.6 | 0.02 | 1 | 3.6 | 0.03 |
| Oligochaeta | 100 | 358.8 | 2.37 | 367 | 1,316.8 | 12.05 |
| Helobdella | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.10 |
| Hydracarina | 5 | 17.9 | 0.12 | 0 | 0.0 | 0.00 |
| Baetis intercalaris | 10 | 35.9 | 0.24 | 37 | 132.8 | 1.21 |
| Argia | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.10 |
| Cheumatopsyche | 1,280 | 4,592.8 | 30.39 | 1,393 | 4,998.2 | 45.73 |
| Hydropsyche | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.10 |
| Hydropsyche orris | 55 | 197.3 | 1.31 | 37 | 132.8 | 1.21 |
| Hydropsyche bidens | 15 | 53.8 | 0.36 | 0 | 0.0 | 0.00 |
| Ceratopsyche morosa | 35 | 125.6 | 0.83 | 10 | 35.9 | 0.33 |
| Hydroptila | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.10 |
| Petrophila | 0 | 0.0 | 0.00 | 3 | 10.8 | 0.10 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.98 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.98 |
| Thienemanniella similis | 10 | 35.9 | 0.24 | 20 | 71.8 | 0.66 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 20 | 71.8 | 0.66 |
| Nanocladius distinctus | 5 | 17.9 | 0.12 | 10 | 35.9 | 0.33 |
| Nanocladius spinipennis | 10 | 35.9 | 0.24 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 30 | 107.6 | 0.98 |
| Dicrotendipes fumidus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.33 |
| Dicrotendipes simpsoni | 10 | 35.9 | 0.24 | 0 | 0.0 | 0.00 |
| Glyptotendipes | 5 | 17.9 | 0.12 | 153 | 549.0 | 5.02 |
| Parachironomus | 0 | 0.0 | 0.00 | 10 | 35.9 | 0.33 |
| Polypedilum flavum | 285 | 1,022.6 | 6.77 | 373 | 1,338.4 | 12.25 |
| Polypedilum scalaenum grp. | 15 | 53.8 | 0.36 | 0 | 0.0 | 0.00 |
| Rheotanytarsus | 50 | 179.4 | 1.19 | 337 | 1,209.2 | 11.06 |
| Xenochironomus xenolabis | 60 | 215.3 | 1.42 | 0 | 0.0 | 0.00 |
| Ferrissia | 10 | 35.9 | 0.24 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 4,212 | 15,113.0 | 100.00 | 3,046 | 10,929.3 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= CALUMET RIVER,
 LOCATION= 130TH ST.,
 STATION= 55,
 and DATE= 28SEP05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Plumatella | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.22 |
| Oligochaeta | 3 | 43.1 | 100.00 | 77 | 1,105.2 | 17.19 |
| Hydroptila | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.22 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.22 |
| Parakiefferiella | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.45 |
| Psectrocladius | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.67 |
| Chironomus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.67 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.22 |
| Dicrotendipes modestus | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.89 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.22 |
| Parachironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.22 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.22 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.67 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 349 | 5,009.3 | 77.90 |
| TOTAL BENTHOS | 3 | 43.1 | 100.00 | 448 | 6,430.3 | 100.00 |

WATERWAY= L.C.R.,
 LOCATION= HALSTED ST.,
 STATION= 76,
 and DATE= 27SEP05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 73 | 1,047.8 | 90.12 | 47 | 674.6 | 90.38 |
| Gammarus | 2 | 28.7 | 2.47 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.92 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.92 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 2 | 28.7 | 3.85 |
| Pisidium | 3 | 43.1 | 3.70 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 3 | 43.1 | 3.70 | 1 | 14.4 | 1.92 |
| TOTAL BENTHOS | 81 | 1,162.6 | 100.00 | 52 | 746.4 | 100.00 |

WATERWAY= C.S.C.,
 LOCATION= CICERO AVE.,
 STATION= 59,
 and DATE= 29AUG05

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 296 | 4,248.6 | 85.06 | 82 | 1,177.0 | 94.25 |
| Procladius | 50 | 717.7 | 14.37 | 3 | 43.1 | 3.45 |
| Coelotanytus | 1 | 14.4 | 0.29 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 1.15 |
| Dicrotendipes simpsoni | 1 | 14.4 | 0.29 | 1 | 14.4 | 1.15 |
| TOTAL BENTHOS | 348 | 4,994.9 | 100.00 | 87 | 1,248.7 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= W.F.N.B.C.R.,
 LOCATION= DUNDEE RD.,
 STATION= 106,
 and DATE= 23JUN05

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 362 | 5,195.9 | 34.25 | 91 | 1,306.1 | 17.77 |
| Erpobdella punctata punctata | 23 | 330.1 | 2.18 | 35 | 502.4 | 6.84 |
| Caecidotea | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.59 |
| Collembola | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Oecetis | 0 | 0.0 | 0.00 | 18 | 258.4 | 3.52 |
| Procladius | 17 | 244.0 | 1.61 | 20 | 287.1 | 3.91 |
| Pentaneura | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.59 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.59 |
| Cricotopus bicinctus grp. | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.59 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.59 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.59 |
| Chironomus | 395 | 5,669.5 | 37.37 | 112 | 1,607.6 | 21.88 |
| Cryptochironomus | 23 | 330.1 | 2.18 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 114 | 1,636.3 | 10.79 | 98 | 1,406.6 | 19.14 |
| Paratendipes | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.59 |
| Polypedilum halterale grp. | 6 | 86.1 | 0.57 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 17 | 244.0 | 1.61 | 40 | 574.1 | 7.81 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 30 | 430.6 | 5.86 |
| Physa | 3 | 43.1 | 0.28 | 5 | 71.8 | 0.98 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.20 |
| Musculium | 45 | 645.9 | 4.26 | 40 | 574.1 | 7.81 |
| Pisidium | 52 | 746.4 | 4.92 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 1,057 | 15,171.4 | 100.00 | 512 | 7,348.9 | 100.00 |

WATERWAY= W.F.N.B.C.R.,
 LOCATION= GOLF RD.,
 STATION= 103,
 and DATE= 28JUN05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 143.5 | 0.24 | 0 | 0.0 | 0.00 |
| Oligochaeta | 4,090 | 58,704.9 | 99.03 | 3,460 | 49,662.3 | 97.19 |
| Oecetis | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.28 |
| Procladius | 0 | 0.0 | 0.00 | 20 | 287.1 | 0.56 |
| Cryptochironomus | 20 | 287.1 | 0.48 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.28 |
| Polypedilum halterale grp. | 10 | 143.5 | 0.24 | 0 | 0.0 | 0.00 |
| Musculium | 0 | 0.0 | 0.00 | 50 | 717.7 | 1.40 |
| Pisidium | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.28 |
| TOTAL BENTHOS | 4,130 | 59,279.0 | 100.00 | 3,560 | 51,097.6 | 100.00 |

WATERWAY= M.F.N.B.C.R.,
 LOCATION= LAKE COOK RD.,
 STATION= 31,
 and DATE= 21JUN05

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 35 | 502.4 | 0.93 | 0 | 0.0 | 0.00 |
| Turbellaria | 30 | 430.6 | 0.80 | 7 | 100.5 | 0.45 |
| Oligochaeta | 565 | 8,109.5 | 14.99 | 921 | 13,219.4 | 59.77 |
| Helobdella stagnalis | 15 | 215.3 | 0.40 | 9 | 129.2 | 0.58 |
| Erpobdella punctata punctata | 15 | 215.3 | 0.40 | 3 | 43.1 | 0.19 |
| Caecidotea | 2,265 | 32,510.2 | 60.08 | 430 | 6,171.9 | 27.90 |
| Enallagma | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.19 |
| Procladius | 275 | 3,947.1 | 7.29 | 55 | 789.4 | 3.57 |
| Chironomus | 0 | 0.0 | 0.00 | 24 | 344.5 | 1.56 |
| Paratendipes | 5 | 71.8 | 0.13 | 1 | 14.4 | 0.06 |
| Polypedilum flavum | 5 | 71.8 | 0.13 | 0 | 0.0 | 0.00 |
| Amnicola | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.06 |
| Physa | 45 | 645.9 | 1.19 | 32 | 459.3 | 2.08 |
| Menetus dilatatus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.06 |
| Ferrissia | 5 | 71.8 | 0.13 | 0 | 0.0 | 0.00 |
| Sphaerium | 65 | 933.0 | 1.72 | 17 | 244.0 | 1.10 |
| Musculium | 60 | 861.2 | 1.59 | 7 | 100.5 | 0.45 |
| Pisidium | 385 | 5,526.0 | 10.21 | 30 | 430.6 | 1.95 |
| TOTAL BENTHOS | 3,770 | 54,111.8 | 100.00 | 1,541 | 22,118.4 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= SKOKIE R.,
 LOCATION= LAKE COOK RD.,
 STATION= 32,
 and DATE= 22JUN05

| TAXA | CENTER | | | SIDE | | |
|------------------------------|--------------|-----------------|---------------|------------|-----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.07 | 1 | 14.4 | 0.10 |
| Oligochaeta | 1,211 | 17,381.8 | 82.61 | 525 | 7,535.5 | 52.76 |
| Helobdella stagnalis | 3 | 43.1 | 0.20 | 1 | 14.4 | 0.10 |
| Erpobdella punctata punctata | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.10 |
| Caecidotea | 3 | 43.1 | 0.20 | 3 | 43.1 | 0.30 |
| Gammarus | 1 | 14.4 | 0.07 | 1 | 14.4 | 0.10 |
| Enallagma | 1 | 14.4 | 0.07 | 0 | 0.0 | 0.00 |
| Tanytus | 0 | 0.0 | 0.00 | 28 | 401.9 | 2.81 |
| Procladius | 13 | 186.6 | 0.89 | 5 | 71.8 | 0.50 |
| Cricotopus bicinctus grp. | 2 | 28.7 | 0.14 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 2 | 28.7 | 0.14 | 0 | 0.0 | 0.00 |
| Chironomus | 199 | 2,856.3 | 13.57 | 425 | 6,100.1 | 42.71 |
| Physa | 1 | 14.4 | 0.07 | 1 | 14.4 | 0.10 |
| Sphaerium | 10 | 143.5 | 0.68 | 0 | 0.0 | 0.00 |
| Musculium | 4 | 57.4 | 0.27 | 2 | 28.7 | 0.20 |
| Pisidium | 15 | 215.3 | 1.02 | 2 | 28.7 | 0.20 |
| TOTAL BENTHOS | 1,466 | 21,041.9 | 100.00 | 995 | 14,281.5 | 100.00 |

WATERWAY= SKOKIE R.,
 LOCATION= FRONTAGE RD.,
 STATION= 105,
 and DATE= 29JUN05

| TAXA | CENTER | | | SIDE | | |
|---------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 230 | 3,301.3 | 79.86 | 471 | 6,760.4 | 68.86 |
| Gammarus | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.73 |
| Noctuidae | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Dubiraphia | 2 | 28.7 | 0.69 | 7 | 100.5 | 1.02 |
| Ceratopogonidae | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Procladius | 2 | 28.7 | 0.69 | 7 | 100.5 | 1.02 |
| Chironomus | 45 | 645.9 | 15.63 | 145 | 2,081.2 | 21.20 |
| Cryptochironomus | 4 | 57.4 | 1.39 | 18 | 258.4 | 2.63 |
| Dicrotendipes modestus | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.58 |
| Harnischia | 3 | 43.1 | 1.04 | 4 | 57.4 | 0.58 |
| Polypedilum scalanum grp. | 1 | 14.4 | 0.35 | 0 | 0.0 | 0.00 |
| Ambicula | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.15 |
| Corbicula fluminea | 1 | 14.4 | 0.35 | 20 | 287.1 | 2.92 |
| TOTAL BENTHOS | 288 | 4,133.7 | 100.00 | 684 | 9,817.6 | 100.00 |

WATERWAY= N.S.C.,
 LOCATION= CENTRAL AVE.,
 STATION= 35,
 and DATE= 07JUL05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------------|-----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 4,370 | 62,723.8 | 89.18 | 267 | 3,832.3 | 51.35 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.38 |
| Caecidotea | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.19 |
| Gammarus | 0 | 0.0 | 0.00 | 11 | 157.9 | 2.12 |
| Procladius | 60 | 861.2 | 1.22 | 42 | 602.8 | 8.08 |
| Psectrotanytus | 10 | 143.5 | 0.20 | 0 | 0.0 | 0.00 |
| Parakiefferiella | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.38 |
| Chironomus | 230 | 3,301.3 | 4.69 | 0 | 0.0 | 0.00 |
| Cladopelma | 130 | 1,865.9 | 2.65 | 0 | 0.0 | 0.00 |
| Dicrotendipes modestus | 0 | 0.0 | 0.00 | 15 | 215.3 | 2.88 |
| Phaenopsectra obediens grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.38 |
| Phaenopsectra punctipes | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.38 |
| Polypedilum halterale grp. | 40 | 574.1 | 0.82 | 54 | 775.1 | 10.38 |
| Tanytarsus | 10 | 143.5 | 0.20 | 121 | 1,736.7 | 23.27 |
| Sphaerium | 50 | 717.7 | 1.02 | 0 | 0.0 | 0.00 |
| Dreissena polymorpha | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.19 |
| TOTAL BENTHOS | 4,900 | 70,331.0 | 100.00 | 520 | 7,463.7 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= N.S.C.,
 LOCATION= OAKTON AVE.,
 STATION= 102,
 and DATE= 20JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.54 |
| Oligochaeta | 796 | 11,425.2 | 96.95 | 481 | 6,903.9 | 85.89 |
| Helobdella stagnalis | 0 | 0.0 | 0.00 | 17 | 244.0 | 3.04 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.54 |
| Caecidotea | 0 | 0.0 | 0.00 | 11 | 157.9 | 1.96 |
| Gammarus | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.89 |
| Tanytus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| Procladius | 20 | 287.1 | 2.44 | 9 | 129.2 | 1.61 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| Cladopelma | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.36 |
| Cryptochironomus | 4 | 57.4 | 0.49 | 1 | 14.4 | 0.18 |
| Dicrotendipes modestus | 0 | 0.0 | 0.00 | 18 | 258.4 | 3.21 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.54 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.36 |
| Tanytarsus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| Sphaerium | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.18 |
| Pisidium | 1 | 14.4 | 0.12 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 821 | 11,784.0 | 100.00 | 560 | 8,037.8 | 100.00 |

WATERWAY= N.S.C.,
 LOCATION= TOUCHY AVE.,
 STATION= 36,
 and DATE= 21JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|-----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 20 | 287.1 | 0.51 |
| Oligochaeta | 14,033 | 201,419.4 | 100.00 | 3,780 | 54,255.4 | 96.18 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 30 | 430.6 | 0.76 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 50 | 717.7 | 1.27 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.25 |
| Parachironomus | 0 | 0.0 | 0.00 | 30 | 430.6 | 0.76 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.25 |
| TOTAL BENTHOS | 14,033 | 201,419.4 | 100.00 | 3,930 | 56,408.3 | 100.00 |

WATERWAY= N.S.C.,
 LOCATION= FOSTER AVE.,
 STATION= 101,
 and DATE= 27JUL05

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.32 |
| Oligochaeta | 3,390 | 48,657.6 | 99.41 | 1,494 | 21,443.8 | 96.08 |
| Caecidotea | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.13 |
| Hyalalla azteca | 10 | 143.5 | 0.29 | 1 | 14.4 | 0.06 |
| Procladius | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.06 |
| Nanocladius distinctus | 10 | 143.5 | 0.29 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 30 | 430.6 | 1.93 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 5 | 71.8 | 0.32 |
| Dicrotendipes modestus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.19 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 7 | 100.5 | 0.45 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.13 |
| Parachironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.06 |
| Polypedilum flavum | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.06 |
| Pisidium | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.19 |
| TOTAL BENTHOS | 3,410 | 48,944.6 | 100.00 | 1,555 | 22,319.3 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= N.B.C.R.,
 LOCATION= GLENVIEW RD.,
 STATION= 104,
 and DATE= 30JUN05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|-------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 0 | 0.0 | 0.00 | 2 | 28.7 | 3.03 |
| Oligochaeta | 95 | 1,363.6 | 26.17 | 23 | 330.1 | 34.85 |
| Mooreobdella microstoma | 2 | 28.7 | 0.55 | 0 | 0.0 | 0.00 |
| Caecidotea | 1 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| Gammarus | 12 | 172.2 | 3.31 | 3 | 43.1 | 4.55 |
| Hydracarina | 1 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 1 | 14.4 | 0.28 | 0 | 0.0 | 0.00 |
| Stenelmis | 10 | 143.5 | 2.75 | 1 | 14.4 | 1.52 |
| Procladius | 2 | 28.7 | 0.55 | 1 | 14.4 | 1.52 |
| Cricotopus tremulus grp. | 2 | 28.7 | 0.55 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 7 | 100.5 | 1.93 | 0 | 0.0 | 0.00 |
| Chironomus | 20 | 287.1 | 5.51 | 20 | 287.1 | 30.30 |
| Cryptochironomus | 7 | 100.5 | 1.93 | 4 | 57.4 | 6.06 |
| Dicrotendipes neomodestus | 7 | 100.5 | 1.93 | 1 | 14.4 | 1.52 |
| Paratendipes | 2 | 28.7 | 0.55 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 12 | 172.2 | 3.31 | 1 | 14.4 | 1.52 |
| Polypedilum scalaenum grp. | 165 | 2,368.3 | 45.45 | 1 | 14.4 | 1.52 |
| Tanytarsus | 7 | 100.5 | 1.93 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 10 | 143.5 | 2.75 | 3 | 43.1 | 4.55 |
| Musculium | 0 | 0.0 | 0.00 | 6 | 86.1 | 9.09 |
| TOTAL BENTHOS | 363 | 5,210.2 | 100.00 | 66 | 947.3 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= DEMPSTER ST.,
 STATION= 34,
 and DATE= 13JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 116 | 1,565.0 | 61.05 | 1,124 | 16,133.1 | 92.21 |
| Mooreobdella microstoma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.08 |
| Caecidotea | 1 | 14.4 | 0.53 | 1 | 14.4 | 0.08 |
| Gammarus | 6 | 86.1 | 3.16 | 13 | 186.6 | 1.07 |
| Procladius | 2 | 28.7 | 1.05 | 63 | 904.3 | 5.17 |
| Thienemanniella xena | 1 | 14.4 | 0.53 | 1 | 14.4 | 0.08 |
| Cricotopus bicinctus grp. | 7 | 100.5 | 3.68 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.16 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.08 |
| Chironomus | 13 | 186.6 | 6.84 | 8 | 114.8 | 0.66 |
| Cryptochironomus | 8 | 114.8 | 4.21 | 0 | 0.0 | 0.00 |
| Dicrotendipes modestus | 1 | 14.4 | 0.53 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 3 | 43.1 | 1.58 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 1 | 14.4 | 0.53 | 0 | 0.0 | 0.00 |
| Polypedilum flavum | 1 | 14.4 | 0.53 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 12 | 172.2 | 6.32 | 0 | 0.0 | 0.00 |
| Polypedilum illinoense | 1 | 14.4 | 0.53 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 14 | 200.9 | 7.37 | 0 | 0.0 | 0.00 |
| Musculium | 3 | 43.1 | 1.58 | 2 | 28.7 | 0.16 |
| Pisidium | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.25 |
| TOTAL BENTHOS | 190 | 2,727.1 | 100.00 | 1,219 | 17,496.6 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= N.B.C.R.,
 LOCATION= ALBANY AVE.,
 STATION= 96,
 and DATE= 19JUL05

| TAXA | CENTER | | | SIDE | | |
|------------------------------|------------|----------------|---------------|------------|----------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 28 | 401.9 | 28.00 | 188 | 2,698.4 | 46.88 |
| Erpobdella punctata punctata | 0 | 0.0 | 0.00 | 8 | 114.8 | 2.00 |
| Caecidotea | 20 | 287.1 | 20.00 | 5 | 71.8 | 1.25 |
| Gammarus | 6 | 86.1 | 6.00 | 9 | 129.2 | 2.24 |
| Orconectes | 1 | 14.4 | 1.00 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 2 | 28.7 | 2.00 | 0 | 0.0 | 0.00 |
| Procladius | 2 | 28.7 | 2.00 | 144 | 2,066.9 | 35.91 |
| Ablabesmyia mallochi | 2 | 28.7 | 2.00 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.50 |
| Thienemanniella xena | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.50 |
| Cricotopus | 7 | 100.5 | 7.00 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1 | 14.4 | 1.00 | 0 | 0.0 | 0.00 |
| Rhaocricotopus robacki | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.75 |
| Chironomus | 1 | 14.4 | 1.00 | 6 | 86.1 | 1.50 |
| Cryptochironomus | 3 | 43.1 | 3.00 | 0 | 0.0 | 0.00 |
| Dicrotendipes neomodestus | 7 | 100.5 | 7.00 | 2 | 28.7 | 0.50 |
| Polypedilum scalaenum grp. | 4 | 57.4 | 4.00 | 0 | 0.0 | 0.00 |
| Paratanytarsus | 1 | 14.4 | 1.00 | 0 | 0.0 | 0.00 |
| Tanytarsus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.50 |
| Ammicola | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.75 |
| Ferrissia | 1 | 14.4 | 1.00 | 0 | 0.0 | 0.00 |
| Sphaerium | 3 | 43.1 | 3.00 | 0 | 0.0 | 0.00 |
| Muscilium | 11 | 157.9 | 11.00 | 27 | 387.5 | 6.73 |
| TOTAL BENTHOS | 100 | 1,435.3 | 100.00 | 401 | 5,755.7 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= WILSON AVE.,
 STATION= 37,
 and DATE= 27JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------------|-----------------|---------------|---------------|------------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 2 | 28.7 | 0.06 | 10 | 143.5 | 0.09 |
| Oligochaeta | 3,065 | 43,992.8 | 98.49 | 10,800 | 155,015.3 | 98.45 |
| Procladius | 0 | 0.0 | 0.00 | 60 | 861.2 | 0.55 |
| Nanocladius distinctus | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.09 |
| Chironomus | 13 | 186.6 | 0.42 | 80 | 1,148.3 | 0.73 |
| Cryptochironomus | 14 | 200.9 | 0.45 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.09 |
| Polypedilum scalaenum grp. | 15 | 215.3 | 0.48 | 0 | 0.0 | 0.00 |
| Tanytarsus | 1 | 14.4 | 0.03 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 2 | 28.7 | 0.06 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 3,112 | 44,667.4 | 100.00 | 10,970 | 157,455.4 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= DIVERSY AVE.,
 STATION= 73,
 and DATE= 28JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------|------------|----------------|---------------|---------------|------------------|---------------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.74 | 0 | 0.0 | 0.00 |
| Oligochaeta | 100 | 1,435.3 | 74.07 | 10,567 | 151,671.0 | 99.69 |
| Hyalella azteca | 1 | 14.4 | 0.74 | 0 | 0.0 | 0.00 |
| Gammarus | 3 | 43.1 | 2.22 | 0 | 0.0 | 0.00 |
| Chaoborus | 1 | 14.4 | 0.74 | 0 | 0.0 | 0.00 |
| Procladius | 22 | 315.8 | 16.30 | 33 | 473.7 | 0.31 |
| Chironomus | 5 | 71.8 | 3.70 | 0 | 0.0 | 0.00 |
| Parachironomus | 2 | 28.7 | 1.48 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 135 | 1,937.7 | 100.00 | 10,600 | 152,144.7 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= N.B.C.R.,
 LOCATION= FULLERTON AVE.,
 STATION= CFAR,
 and DATE= 28JUL05

| TAXA | CFAR | | |
|---------------------------|-------|----------|--------|
| | # | #/m2 | % |
| Oligochaeta | 1,062 | 15,243.2 | 99.81 |
| Cricotopus bicinctus grp. | 1 | 14.4 | 0.09 |
| Polypedilum flavum | 1 | 14.4 | 0.09 |
| TOTAL BENTHOS | 1,064 | 15,271.9 | 100.00 |

WATERWAY= N.B.C.R.,
 LOCATION= GRAND AVE.,
 STATION= 46,
 and DATE= 18JUL05

| TAXA | CENTER | | | SIDE | | |
|------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 3 | 43.1 | 0.37 | 0 | 0.0 | 0.00 |
| Oligochaeta | 803 | 11,525.7 | 98.65 | 398 | 5,712.6 | 100.00 |
| Procladius | 5 | 71.8 | 0.61 | 0 | 0.0 | 0.00 |
| Dicrotendipes simpsoni | 3 | 43.1 | 0.37 | 0 | 0.0 | 0.00 |
| TOTAL BENTHOS | 814 | 11,683.6 | 100.00 | 398 | 5,712.6 | 100.00 |

WATERWAY= C.S.S.C,
 LOCATION= CICERO AVE.,
 STATION= 75,
 and DATE= 22AUG05

| TAXA | CENTER | | | SIDE | | |
|--------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 1,210 | 17,367.5 | 99.42 | 164 | 2,353.9 | 98.20 |
| Procladius | 7 | 100.5 | 0.58 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 0 | 0.0 | 0.00 | 3 | 43.1 | 1.80 |
| TOTAL BENTHOS | 1,217 | 17,467.9 | 100.00 | 167 | 2,397.0 | 100.00 |

WATERWAY= C.S.S.C,
 LOCATION= HARLEM AVE.,
 STATION= 41,
 and DATE= 26AUG05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 402 | 5,770.0 | 100.00 | 509 | 7,305.8 | 98.83 |
| Eysarella azteca | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.19 |
| Dubiraphia | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.19 |
| Cryptochironomus | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.58 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.19 |
| TOTAL BENTHOS | 402 | 5,770.0 | 100.00 | 515 | 7,391.9 | 100.00 |

WATERWAY= C.S.S.C,
 LOCATION= LOCKPORT,
 STATION= 92,
 and DATE= 15SEP05

| TAXA | CENTER | | | SIDE | | |
|--------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 241 | 3,459.1 | 96.02 | 213 | 3,057.2 | 92.61 |
| Procladius | 2 | 28.7 | 0.80 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 1 | 14.4 | 0.40 | 6 | 86.1 | 2.61 |
| Corbicula fluminea | 7 | 100.5 | 2.79 | 11 | 157.9 | 4.78 |
| TOTAL BENTHOS | 251 | 3,602.7 | 100.00 | 230 | 3,301.3 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= HIGGINS CR.,
 LOCATION= WILLE RD.,
 STATION= 78,
 and DATE= 14JUL05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|----------|--------|-------|-----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Hydra | 10 | 143.5 | 1.06 | 10 | 143.5 | 0.13 |
| Turbellaria | 299 | 4,291.6 | 31.77 | 2,390 | 34,304.3 | 32.12 |
| Oligochaeta | 50 | 717.7 | 5.31 | 100 | 1,435.3 | 1.34 |
| Mooreobdella microstoma | 2 | 28.7 | 0.21 | 50 | 717.7 | 0.67 |
| Caecidotea | 385 | 5,526.0 | 40.91 | 2,770 | 39,758.6 | 37.23 |
| Hydracarina | 1 | 14.4 | 0.11 | 0 | 0.0 | 0.00 |
| Enallagma | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.13 |
| Ceratopogonidae | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.13 |
| Thienemannimyia grp. | 0 | 0.0 | 0.00 | 20 | 287.1 | 0.27 |
| Cricotopus tremulus grp. | 2 | 28.7 | 0.21 | 40 | 574.1 | 0.54 |
| Cricotopus bicinctus grp. | 172 | 2,468.8 | 18.28 | 1,690 | 24,257.0 | 22.72 |
| Cricotopus trifascia grp. | 2 | 28.7 | 0.21 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 10 | 143.5 | 1.06 | 140 | 2,009.5 | 1.88 |
| Chironomus | 0 | 0.0 | 0.00 | 40 | 574.1 | 0.54 |
| Dicrotendipes neomodestus | 2 | 28.7 | 0.21 | 40 | 574.1 | 0.54 |
| Dicrotendipes fumidus | 0 | 0.0 | 0.00 | 80 | 1,148.3 | 1.08 |
| Dicrotendipes simpsoni | 2 | 28.7 | 0.21 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 0 | 0.0 | 0.00 | 20 | 287.1 | 0.27 |
| Amnicola | 1 | 14.4 | 0.11 | 0 | 0.0 | 0.00 |
| Musculium | 0 | 0.0 | 0.00 | 10 | 143.5 | 0.13 |
| Pisidium | 3 | 43.1 | 0.32 | 20 | 287.1 | 0.27 |
| TOTAL BENTHOS | 941 | 13,506.4 | 100.00 | 7,440 | 106,788.3 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= BUSSE DAM,
 STATION=
 and DATE= 17AUG05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|----------|--------|-------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 265 | 3,803.6 | 5.59 | 179 | 2,569.2 | 17.65 |
| Hydracarina | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.20 |
| Centroptilum | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.20 |
| Caenis | 35 | 502.4 | 0.74 | 26 | 373.2 | 2.56 |
| Enallagma | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.39 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.10 |
| Hydroptila | 35 | 502.4 | 0.74 | 0 | 0.0 | 0.00 |
| Oxyethira | 0 | 0.0 | 0.00 | 6 | 86.1 | 0.59 |
| Oecetis | 10 | 143.5 | 0.21 | 4 | 57.4 | 0.39 |
| Dubiraphia | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.20 |
| Berosus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.10 |
| Ceratopogonidae | 5 | 71.8 | 0.11 | 14 | 200.9 | 1.38 |
| Procladius | 490 | 7,033.1 | 10.34 | 163 | 2,339.6 | 16.07 |
| Ablabesmyia mallochii | 40 | 574.1 | 0.84 | 0 | 0.0 | 0.00 |
| Labrundinia neopilosella | 40 | 574.1 | 0.84 | 7 | 100.5 | 0.69 |
| Larsia | 0 | 0.0 | 0.00 | 15 | 215.3 | 1.48 |
| Thienemannimyia grp. | 40 | 574.1 | 0.84 | 52 | 746.4 | 5.13 |
| Cryptochironomus | 615 | 8,827.3 | 12.97 | 133 | 1,909.0 | 13.12 |
| Cryptotendipes | 0 | 0.0 | 0.00 | 7 | 100.5 | 0.69 |
| Dicrotendipes modestus | 0 | 0.0 | 0.00 | 7 | 100.5 | 0.69 |
| Dicrotendipes simpsoni | 0 | 0.0 | 0.00 | 7 | 100.5 | 0.69 |
| Polypedilum halterale grp. | 490 | 7,033.1 | 10.34 | 44 | 631.5 | 4.34 |
| Pseudochironomus | 2,205 | 31,649.0 | 46.52 | 118 | 1,693.7 | 11.64 |
| Stenochironomus | 0 | 0.0 | 0.00 | 7 | 100.5 | 0.69 |
| Cladotanytarsus mancus grp. | 450 | 6,459.0 | 9.49 | 44 | 631.5 | 4.34 |
| Tanytarsus guerlus grp. | 0 | 0.0 | 0.00 | 119 | 1,708.0 | 11.74 |
| Phylla | 0 | 0.0 | 0.00 | 3 | 43.1 | 0.30 |
| Corbicula fluminea | 20 | 287.1 | 0.42 | 47 | 674.6 | 4.64 |
| TOTAL BENTHOS | 4,740 | 68,034.5 | 100.00 | 1,014 | 14,554.2 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= SALT CR.,
 LOCATION= J.F.K. BLVD.,
 STATION= CFAR,
 and DATE= 01AUG05

| TAXA | CFAR | | |
|-----------------------------|------|---------|--------|
| | # | #/m2 | % |
| Oligochaeta | 31 | 445.0 | 24.41 |
| Dubiraphia | 1 | 14.4 | 0.79 |
| Stenelmis | 10 | 143.5 | 7.87 |
| Procladius | 7 | 100.5 | 5.51 |
| Thienemannimyia grp. | 1 | 14.4 | 0.79 |
| Chironomus | 3 | 43.1 | 2.36 |
| Cryptochironomus | 13 | 186.6 | 10.24 |
| Dicrotendipes neomodestus | 2 | 28.7 | 1.57 |
| Dicrotendipes fumidus | 24 | 344.5 | 18.90 |
| Faenopspectra obediens grp. | 1 | 14.4 | 0.79 |
| Polypedilum halterale grp. | 2 | 28.7 | 1.57 |
| Polypedilum scalaenum grp. | 10 | 143.5 | 7.87 |
| Pseudochironomus | 4 | 57.4 | 3.15 |
| Stictochironomus | 6 | 86.1 | 4.72 |
| Cladotanytarsus mancus grp. | 11 | 157.9 | 8.66 |
| Corbicula fluminea | 1 | 14.4 | 0.79 |
| TOTAL BENTHOS | 127 | 1,822.9 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= THORNDALE,
 STATION=
 and DATE= 03AUG05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 0.07 | 0 | 0.0 | 0.00 |
| Oligochaeta | 112 | 1,607.6 | 8.18 | 92 | 1,320.5 | 53.80 |
| Baetis intercalaris | 5 | 71.8 | 0.37 | 0 | 0.0 | 0.00 |
| Tricorythodes | 1 | 14.4 | 0.07 | 0 | 0.0 | 0.00 |
| Cheumatopsyche | 1 | 14.4 | 0.07 | 0 | 0.0 | 0.00 |
| Hydroptila | 2 | 28.7 | 0.15 | 0 | 0.0 | 0.00 |
| Dubiraphia | 2 | 28.7 | 0.15 | 1 | 14.4 | 0.58 |
| Stenelmis | 4 | 57.4 | 0.29 | 0 | 0.0 | 0.00 |
| Procladius | 13 | 186.6 | 0.95 | 4 | 57.4 | 2.34 |
| Thienemannimyia grp. | 100 | 1,435.3 | 7.30 | 1 | 14.4 | 0.58 |
| Cryptochironomus | 451 | 6,473.3 | 32.94 | 26 | 373.2 | 15.20 |
| Dicrotendipes neomodestus | 75 | 1,076.5 | 5.48 | 1 | 14.4 | 0.58 |
| Dicrotendipes fumidus | 13 | 186.6 | 0.95 | 1 | 14.4 | 0.58 |
| Harnischia | 0 | 0.0 | 0.00 | 2 | 28.7 | 1.17 |
| Polypedilum halterale grp. | 0 | 0.0 | 0.00 | 26 | 373.2 | 15.20 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.58 |
| Polypedilum scalaenum grp. | 25 | 358.8 | 1.83 | 0 | 0.0 | 0.00 |
| Pseudochironomus | 13 | 186.6 | 0.95 | 1 | 14.4 | 0.58 |
| Stictochironomus | 13 | 186.6 | 0.95 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 489 | 7,018.7 | 35.72 | 11 | 157.9 | 6.43 |
| Tanytarsus | 13 | 186.6 | 0.95 | 0 | 0.0 | 0.00 |
| Tanytarsus guerlus grp. | 25 | 358.8 | 1.83 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 11 | 157.9 | 0.80 | 4 | 57.4 | 2.34 |
| TOTAL BENTHOS | 1,369 | 19,649.6 | 100.00 | 171 | 2,454.4 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= SALT CR.,
 LOCATION= DEVON AVE.,
 STATION= 18,
 and DATE= 15JUL05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|----------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 610 | 8,755.5 | 33.12 | 294 | 4,219.9 | 84.48 |
| Enallagma | 3 | 43.1 | 0.16 | 0 | 0.0 | 0.00 |
| Hydroptila | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Oecetis | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Dubiraphia | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Ceratopogonidae | 3 | 43.1 | 0.16 | 0 | 0.0 | 0.00 |
| Procladius | 140 | 2,009.5 | 7.60 | 25 | 358.8 | 7.18 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Cryptochironomus | 163 | 2,339.6 | 8.85 | 5 | 71.8 | 1.44 |
| Dicrotendipes modestus | 13 | 186.6 | 0.71 | 1 | 14.4 | 0.29 |
| Dicrotendipes neomodestus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Harnischia | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Paratendipes | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.57 |
| Phaenopsectra | 13 | 186.6 | 0.71 | 0 | 0.0 | 0.00 |
| Polypedilum halterale grp. | 277 | 3,975.9 | 15.04 | 1 | 14.4 | 0.29 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.29 |
| Polypedilum scalaenum grp. | 100 | 1,435.3 | 5.43 | 1 | 14.4 | 0.29 |
| Stictochironomus | 13 | 186.6 | 0.71 | 2 | 28.7 | 0.57 |
| Cladotanytarsus mancus grp. | 467 | 6,703.0 | 25.35 | 3 | 43.1 | 0.86 |
| Tanytarsus guerlus grp. | 37 | 531.1 | 2.01 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 3 | 43.1 | 0.16 | 6 | 86.1 | 1.72 |
| TOTAL BENTHOS | 1,842 | 26,438.7 | 100.00 | 348 | 4,994.9 | 100.00 |

WATERWAY= SALT CR.,
 LOCATION= WOLF RD.,
 STATION= CFAR,
 and DATE= 28JUL05

| TAXA | CFAR | | |
|---------------|------|-------|--------|
| | # | #/m2 | % |
| Oligochaeta | 2 | 28.7 | 22.22 |
| Stenelmis | 1 | 14.4 | 11.11 |
| Muscidae | 4 | 57.4 | 44.44 |
| Pleurocera | 2 | 28.7 | 22.22 |
| TOTAL BENTHOS | 9 | 129.2 | 100.00 |

WATERWAY= W.B. DUPAGE R.,
 LOCATION= LAKE ST.,
 STATION= 64,
 and DATE= 06JUL05

| TAXA | CENTER | | | SIDE | | |
|-----------------------------|--------|-------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 11 | 157.9 | 29.21 | 188 | 2,698.4 | 70.68 |
| Zygoptera | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.38 |
| Cheumatopsyche | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.38 |
| Procladius | 1 | 14.4 | 2.56 | 18 | 258.4 | 6.77 |
| Ablabesmyia janta | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.75 |
| Ablabesmyia mallochi | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.75 |
| Thienemannimyia grp. | 1 | 14.4 | 2.56 | 0 | 0.0 | 0.00 |
| Nanocladius distinctus | 1 | 14.4 | 2.56 | 4 | 57.4 | 1.50 |
| Chironomus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.38 |
| Cryptochironomus | 6 | 86.1 | 15.38 | 6 | 86.1 | 2.26 |
| Dicrotendipes modestus | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.75 |
| Dicrotendipes simpsoni | 13 | 157.9 | 28.21 | 4 | 57.4 | 1.50 |
| Glyptotendipes | 0 | 0.0 | 0.00 | 22 | 315.8 | 8.27 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 3 | 43.1 | 1.13 |
| Polypedilum scalaenum grp. | 6 | 86.1 | 15.38 | 1 | 14.4 | 0.38 |
| Cladotanytarsus mancus grp. | 2 | 28.7 | 5.13 | 1 | 14.4 | 0.38 |
| Paratanytarsus | 0 | 0.0 | 0.00 | 8 | 114.8 | 3.01 |
| Helisoma | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.75 |
| TOTAL BENTHOS | 39 | 559.8 | 100.00 | 266 | 3,818.0 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= LAKE COOK RD.,
 STATION= 13,
 and DATE= 20JUN05

| TAXA | CENTER | | | SIDE | | |
|-------------------------------------|--------|-------|--------|------|----------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Oligochaeta | 12 | 172.2 | 21.43 | 530 | 7,607.2 | 57.55 |
| Stenacron | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.11 |
| Anthopotamus myops grp. | 1 | 14.4 | 1.79 | 0 | 0.0 | 0.00 |
| Dubiraphia | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.43 |
| Ceratopogonidae | 0 | 0.0 | 0.00 | 2 | 28.7 | 0.22 |
| Procladius | 1 | 14.4 | 1.79 | 4 | 57.4 | 0.43 |
| Thienemannimyia grp. | 3 | 43.1 | 5.36 | 0 | 0.0 | 0.00 |
| Chironomus | 0 | 0.0 | 0.00 | 331 | 4,750.9 | 35.94 |
| Cryptochironomus | 2 | 28.7 | 3.57 | 8 | 114.8 | 0.87 |
| Dicrotendipes | 4 | 57.4 | 7.14 | 0 | 0.0 | 0.00 |
| Harnischia | 3 | 43.1 | 5.36 | 20 | 287.1 | 2.17 |
| Paralauterborniella nigrohalteralis | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.43 |
| Paratendipes | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.43 |
| Polypedilum illinoense | 0 | 0.0 | 0.00 | 4 | 57.4 | 0.43 |
| Polypedilum scalaenum grp. | 8 | 114.8 | 14.29 | 0 | 0.0 | 0.00 |
| Cladotanytarsus mancus grp. | 1 | 14.4 | 1.79 | 0 | 0.0 | 0.00 |
| Cladotanytarsus vanderwulpi grp. | 11 | 157.9 | 19.64 | 0 | 0.0 | 0.00 |
| Tanytarsus guerlus grp. | 6 | 86.1 | 10.71 | 0 | 0.0 | 0.00 |
| Helisoma | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.11 |
| Corbicula fluminea | 1 | 14.4 | 1.79 | 2 | 28.7 | 0.22 |
| Masculium | 1 | 14.4 | 1.79 | 0 | 0.0 | 0.00 |
| Pisidium | 2 | 28.7 | 3.57 | 6 | 86.1 | 0.65 |
| TOTAL BENTHOS | 56 | 803.8 | 100.00 | 921 | 13,219.4 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= IRVING PARK RD.,
 STATION= CFAR,
 and DATE= 01AUG05

| TAXA | CFAR | | |
|-------------------------|------|---------|--------|
| | # | #/m2 | % |
| Oligochaeta | 369 | 5,296.4 | 81.82 |
| Helobdella triserialis | 1 | 14.4 | 0.22 |
| Mcreeobdella microstoma | 11 | 157.9 | 2.44 |
| Procladius | 2 | 28.7 | 0.44 |
| Bithynia tentaculata | 44 | 631.5 | 9.76 |
| Amnicola | 3 | 43.1 | 0.67 |
| Pleurocera | 1 | 14.4 | 0.22 |
| Sphaerium | 20 | 287.1 | 4.43 |
| TOTAL BENTHOS | 451 | 6,473.3 | 100.00 |

WATERWAY= DES PLAINES R.,
 LOCATION= OGDEN AVE.,
 STATION= 22,
 and DATE= 25JUL05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|---------|--------|------|---------|--------|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 10 | 143.5 | 2.39 | 0 | 0.0 | 0.00 |
| Oligochaeta | 37 | 531.1 | 8.83 | 172 | 2,468.8 | 74.46 |
| Helobdella triserialis | 5 | 71.8 | 1.19 | 0 | 0.0 | 0.00 |
| Gammarus | 0 | 0.0 | 0.00 | 1 | 14.4 | 0.43 |
| Baetis intercalaris | 11 | 157.9 | 2.63 | 0 | 0.0 | 0.00 |
| Tricorythodes | 211 | 3,028.5 | 50.36 | 1 | 14.4 | 0.43 |
| Cheumatopsyche | 10 | 143.5 | 2.39 | 0 | 0.0 | 0.00 |
| Hydroptila | 1 | 14.4 | 0.24 | 0 | 0.0 | 0.00 |
| Stenelmis | 9 | 129.2 | 2.15 | 0 | 0.0 | 0.00 |
| Thienemannimyia grp. | 6 | 86.1 | 1.43 | 0 | 0.0 | 0.00 |
| Thienemanniella similis | 2 | 28.7 | 0.48 | 0 | 0.0 | 0.00 |
| Cricotopus sylvestris grp. | 1 | 14.4 | 0.24 | 0 | 0.0 | 0.00 |
| Cryptochironomus | 1 | 14.4 | 0.24 | 12 | 172.2 | 5.19 |
| Polypedilum flavum | 4 | 57.4 | 0.95 | 1 | 14.4 | 0.43 |
| Polypedilum illinoense | 1 | 14.4 | 0.24 | 0 | 0.0 | 0.00 |
| Polypedilum scalaenum grp. | 17 | 244.0 | 4.06 | 2 | 28.7 | 0.87 |
| Pleurocera | 17 | 244.0 | 4.06 | 0 | 0.0 | 0.00 |
| Ferrissia | 1 | 14.4 | 0.24 | 0 | 0.0 | 0.00 |
| Corbicula fluminea | 72 | 1,033.4 | 17.18 | 41 | 588.5 | 17.75 |
| Pisidium | 3 | 43.1 | 0.72 | 1 | 14.4 | 0.43 |
| TOTAL BENTHOS | 419 | 6,014.0 | 100.00 | 231 | 3,315.6 | 100.00 |

APPENDIX A - 2005 MACROINVERTEBRATE SAMPLES - RAW DATA SUMMARY - PETITE PONAR DATA

WATERWAY= DES PLAINES R.,
 LOCATION= MATERIAL SERVICE RD.,
 STATION= 91,
 and DATE= 18AUG05

| TAXA | CENTER | | | SIDE | | |
|----------------------------|--------|-------|--------|------|------|----|
| | # | #/m2 | % | # | #/m2 | % |
| Turbellaria | 1 | 14.4 | 1.92 | -- | -- | -- |
| Urnatella gracilis | 1 | 14.4 | 1.92 | -- | -- | -- |
| Oligochaeta | 38 | 545.4 | 73.08 | -- | -- | -- |
| Baetis intercalaris | 1 | 14.4 | 1.92 | -- | -- | -- |
| Cheumatopsyche | 1 | 14.4 | 1.92 | -- | -- | -- |
| Stenelmis | 2 | 28.7 | 3.85 | -- | -- | -- |
| Polypedilum flavum | 2 | 28.7 | 3.85 | -- | -- | -- |
| Polypedilum scalaenum grp. | 6 | 86.1 | 11.54 | -- | -- | -- |
| TOTAL BENTHOS | 52 | 746.4 | 100.00 | -- | -- | -- |

