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PHASE II REMEDIAL INVESTIGATION REPORT FORMER GRIESS-PFLEGER TANNERY SITE WAUKEGAN, ILLINOIS

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Prepared for:
Commonwealth Edison Company
One First National Plaza
Chicago, Illinois
and
Beggs and Cobb Corporation
Peabody, Massachusets

Prepared by:
Metcalf & Eddy, Inc.
One Pierce Place, Suite 1400W
Itasca, Illinois

ORIGINAL

EXHIBIT
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EXECUTIVE SUMMARY

The former Griess-Pfleger Tannery is located on the northeast corner of Sand (Pershing) and Dahringer Road. The property consists of approximately 38 acres and is bordered by Dahringer road to the south, Elgin Joliet and Eastern Railroad on the east, a spur of the Chicago Northwestern railroad, which conjoins with the Elgin Joliet and Eastern Railroad (EJ&E) to the north, and Sand (Pershing) Road to the west. The property is currently owned by Commonwealth Edison Company.

The former Griess-Pfleger Tannery was established in 1917 and operated as a leather tanning facility until 1973. As evidenced from the analytical data, chrome tanning processes are believed to have been utilized. Chrome tanning, as generally practiced, consisted of nine basic steps and utilized a number of chemicals in the tanning process. The tanning process produced waste by-products in the form of gaseous reaction products, wastewater, wastewater sludge, and solid waste. Further research is being conducted to determine whether arsenic was part of the tanning process.

In January 1989, the United States Environmental Protection Agency's (USEPA) Field Investigation Team (FIT) performed a preliminary site investigation. Laboratory analyses indicated elevated levels of chromium and lead in the soil.

In June 1992, Commonwealth Edison contracted Metcalf & Eddy, Inc. (M&E) to conduct a Remedial Investigation (RI). The RI conducted at the former tannery was performed voluntarily in cooperation with the Illinois Environmental Protection Agency.

Phase I Remedial Investigation

In May and June 1993, M&E performed various field activities. These activities included installation of seven shallow groundwater monitoring wells; collection of: eleven sediment samples, sixty-eight soil samples (forty-three subsurfical, fifteen surfical and ten monitoring well soil boring samples), two geotechnical samples, nine production waste samples, one cistern water sample, and seven groundwater samples; and performance of a magnetometer survey.

The soil and sediment samples were collected and analyzed for Target Compound List (TCL) volatile and semi-volatile organic compounds, TCL pesticides/PCBs, and Target Analyte List (TAL) inorganic analytes. The production waste samples were analyzed for TCL volatile and semi-volatile organic compounds, TCL pesticides/PCBs, TAL inorganic analytes, and Toxicity Characteristic Leaching Procedure (TCLP) Compounds. The groundwater and cistern water samples were collected for the TCL volatile and semi-volatile organic compounds, TCL pesticides/PCBs, and TAL inorganic analytes in addition to Total Dissolved Solids (TDS). In summary, the Phase I RI investigation results indicated the following:

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Numerous inorganic analytes were identified. Elevated levels of chromium and lead were detected consistently in the surface and subsurface soil throughout Areas II and III of the site. Pesticides, PCBs, and base-neutral acid extractable compounds (BNAs), predominantly polynuclear aromatic hydrocarbons (PNAs), were detected in the soil sporadically throughout the site. The concentration of these compounds decreased with depth.

Groundwater samples were collected from all seven shallow groundwater monitoring wells. The laboratory analyses indicated that the base neutral and acid extractable compounds, pesticides/PCBs, and volatile organic compounds were not in any of the groundwater samples collected. Inorganic analytes, arsenic and lead, were detected in one monitoring well above the Illinois Class I Standards (IAC Title 35, Subpart D, Section 620.410(a)). Iron and manganese were also detected above the Illinois Class I Standards. Analytical results for the background sample also indicated levels of iron and manganese above the Class I Standard. Total Dissolved Solids were present above the Illinois Class I Standard in all seven monitoring wells. These levels are presumed to be naturally occurring.

Three of nine production waste samples collected exceeded the TCLP regulatory limits, two for chromium and one for lead.

More detail regarding the Phase I investigation is provided in the March 1994 Remedial Investigation Report - Phase I for the former Griess-Pfleger Tannery Site, Waukegan, Illinois. This report was made final on July 21, 1994 with minor revisions.

Phase II Remedial Investigation

From January to September of 1995, M&E performed additional field activities as part of the Phase II RI. The objectives of the Phase II activities were to define the magnitude and extent of surface and subsurface impact, characterize the type of constituents in the subsurface, and determine if off site areas have been impacted by former tannery operations. The Phase II data, when used in conjunction with the Phase I investigation data, will allow a Baseline Risk Assessment/Ecological Risk Assessment to be completed.

To accomplish the above mentioned objectives, Metcalf & Eddy, Inc. performed various media sampling. This included performing: chromium speciation, waste volume estimation, and installation of one exploratory soil boring and five additional monitoring wells (two shallow and three deep); and collecting: eighty-one surface/subsurface soil samples, two production waste samples, three wetland sediment/surface water samples, two dioxin/furan samples, two asbestos samples, and five groundwater samples.

Based upon the results obtained from the Phase II investigation, four additional monitoring wells were installed and sampled during Phase IIA and IIB of the investigation. In addition, as part of the Phase IIB investigation, 14 groundwater samples were collected through the use of a Geoprobe® sampling unit.

Geologic Characterization

Both the shallow and deep groundwater monitoring wells installed at the former tannery indicate that groundwater is flowing under unconfined conditions. Deeper soil borings indicated that a clay lens is apparent and discontinuous at the site. Saturated soil was found approximately three to five feet below grade. Static water conditions indicate that the shallow groundwater flow direction is to the east under a gradient of 0.0014 feet per foot. The deeper groundwater flow direction is generally to the east under a hydraulic gradient of 0.0017 feet per foot.

Based on the results of the Phase II site investigation, the geology of the site consists of a well graded to poorly graded sand to silty sand with fill and peat. Clay was apparent in two soil borings but not in significant quantities to justify describing it as a confining layer.

Analytical Characterization

Samples collected were analyzed for either Level III or Level IV IEPA QA/QC. The level of QA/QC was determined based upon the purpose of the sample.

Groundwater

Groundwater analytical results indicated that volatile organic compounds, semi-volatile organic compounds, and pesticide/PCBs, were not detected. However, several inorganic analytes were detected in concentrations exceeding IEPA regulatory limits, including arsenic (total and dissolved), chromium (total), lead (total), and mercury (total). Analytical results for the inorganic analytes indicate that the constituents generally adhere to soil particles whose size is greater than 0.45 micrometers in diameter. Overall, it appears that the inorganic constituents are adsorbed to the soil and not part of the groundwater matrix, with the exception of arsenic.

The Phase II investigation indicated that groundwater containing arsenic exceeding the Illinois Class I Standard has migrated to the eastern edge of the tannery property boundary. Subsequently, two additional monitoring wells were installed as part of the Phase IIA investigation at Commonwealth Edison's Waukegan Generating Station. Analytical results from these two monitoring wells confirmed that groundwater containing arsenic had migrated under the EJ&E railroad tracks and onto Commonwealth Edison's Waukegan Generating Station property. A Phase IIB investigation was undertaken that utilized a Geoprobe® unit to collect groundwater samples to define the extent of the arsenic plume. Using the Geoprobe® collected data, two permanent monitoring wells were installed to confirm the arsenic plume delineation. At the present time, this delineation indicates that the arsenic plume has migrated 400 feet from the former Tannery.

Other inorganic analytes which were detected and exceeded the IEPA regulatory limit include: cadmium (total and dissolved), iron (total), and manganese (total and dissolved). Analytical results for the background sample indicated elevated levels of iron and manganese. Elevated

levels of these constituents were also apparent during Phase I sampling activities. Therefore, these constituents can be considered indicative of naturally occurring constituents.

Total Dissolved Solids were detected at or above the Illinois Class I Standard of 1,200,000 µg/L in eleven of the twelve monitoring wells. These elevated levels are considered naturally occurring.

Surface and Subsurface Soils

Soil analytical results indicate that asbestos was not detected in either of the two soil samples collected.

Elevated levels of semivolatile organic compounds, consisting mainly of polynuclear aromatic hydrocarbons were identified at various locations throughout the site.

Polychlorinated biphenyls were identified at elevated levels in the vicinity or the production waste disposal area.

Significantly elevated levels of pesticides were not identified during the Phase II investigation, indicating that the elevated pesticide concentration identified at one location during the Phase I investigation was an isolated occurrence.

Dioxins and furans were identified in soil samples collected during the Phase II investigation. However, the levels of dioxins/furans identified were not above the USEPA screening levels for protection of human health and the environment.

Elevated levels of chromium, lead, and to a lesser extent arsenic were identified throughout Areas II and III of the site.

Seventeen soil samples exhibiting elevated levels of chromium were analyzed for TCLP metals. The amount of leachable chromium in all of these samples was found to be below regulatory limits. Additionally, these samples were analyzed for hexavalent chromium. It was determined that the chromium exists in the soil as greater than 99.97% trivalent chromium, the more stable, benign, and less mobile form of the two. Leachable metals were not identified in any of the samples above the TCLP regulatory limit, with the exception of mercury at one sampling location.

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SECTION 1.0
INTRODUCTION

1.1 PURPOSE AND SCOPE OF REMEDIAL INVESTIGATION

The purpose of the Phase II Remedial Investigation (RI) is to provide adequate information to further delineate the magnitude and extent of the surface and subsurface impacted areas of the former tannery previously depicted during the Phase I RI. Specifically, the Phase II RI aided in the determination of the volume of the environmental media and helped determine whether off-site areas have been impacted by former tannery operations. These activities were accomplished by performing the following activities:

- Exploratory Soil Boring/Monitoring Well Installation - One exploratory soil boring was installed. The objective of this boring was to determine whether a uniform and continuous confining layer was present at depth prior to installing the deeper monitoring wells.

- Three deep monitoring wells and two shallow monitoring wells were installed to supplement the seven shallow monitoring wells that previously existed on site. The purpose of the deeper monitoring wells was to determine if deeper stratigraphic units or groundwater bearing zones have been impacted. The shallow monitoring wells were installed to assess the extent of groundwater impact and in addition to determine whether constituents were migrating to or from off-site locations.

- Four additional shallow monitoring wells were installed as part of the Phase IIA and IIB of the RI at Commonwealth Edison's Waukegan Generating Station to determine the extent of the arsenic plume migration. In addition, 14 shallow groundwater samples were collected as part of the Phase IIB investigation utilizing a Geoprobe^{R} groundwater sampling unit.

- Waste Volume Estimation - The objective of this was to determine the gross volume of tannery waste material (tannery hide material like production waste sample PW-5) located in the southern edge of Area III's southwestern section.

- Chromium Waste Exclusion - The purpose of this is to determine if on-site wastes qualify for the chromium hazardous waste exclusion as stated in 35 IAC 721.104 (b)(6) as it pertains to tannery waste streams.

- Wetland Sediment Soil and Surface/Subsurface Soil Sampling - The objective of soil sample collection was to collect soil samples in areas not previously sampled and in areas suspected of containing elevated levels of constituents.

- Surface soil samples were collected and analyzed for select inorganic TCLP parameters, specifically chromium, lead, mercury, and arsenic, throughout the site to determine the applicable regulatory framework.
- The speciation of chromium; trivalent chromium (Cr^{+3}) or hexavalent chromium (Cr^{+6}), was determined.
- Soil samples were collected in and around select areas in which elevated levels of specific constituents were identified during Phase I activities to more fully define the lateral extent of impact.
- Soil samples were collected and analyzed for asbestos to determine if it was present in dredge sand used as fill at the site.
- Soil samples were collected where PCBs were detected during Phase I activities. Two samples were analyzed for dioxin/furans.
- Off-site wetland surface water and sediment samples were collected from the wetland area located south of the southeastern section of Area III.

- Sampling and Analysis - Surface/subsurface soil, wetland surface water and sediment, and groundwater media samples were collected and analyzed. The investigation analyte list was reduced for both soil and groundwater to those parameters which were detected in elevated levels during Phase I of the RI. However, those samples submitted for analysis from newly installed monitoring wells or from the wetland area were analyzed for Level IV TCL/TAL parameters. Media samples collected during the Phase II RI investigation were analyzed for the following parameters:

  - **Groundwater/Wetland Surface Water Environmental Sampling (Phase II):**

Monitoring Wells Installed During Phase I Activities (7):	Level III TCL SVOCs, TCL Pesticides/ PCBs (P/PCBs), Total and Dissolved RCRA Metals, Hexavalent Chromium, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Turbidity, Cyanide.
Monitoring Wells Installed During Phase II Activities (5):	Level IV CLP Target Analyte List (TAL, Total and Dissolved), TCL VOCs, TCL SVOCs, TCL P/PCBs, Hexavalent Chromium, TSS, TDS, Turbidity, Cyanide.

Wetland Surface Water (3):	Level IV CLP TCL SVOCs, TCL P/PCBs, TOC, Total and Dissolved RCRA Metals .
Monitoring Wells Installed During Phase IIA (2):	Level III Total and Dissolved RCRA Metals.
Geoprobe® Groundwater Samples During Phase IIB (14):	Level III Total and Dissolved Arsenic.
Monitoring Wells Installed During Phase IIB (2):	Level III Total and Dissolved RCRA Metals.

- **Soil Environmental Sampling (Phase II):**

Phase II Monitoring Well Soil Borings:	Level IV CLP TAL TCL SVOCs, TCL P/PCBs.
Wetland Sediment Sampling:	Level IV CLP TCL SVOCs, TCL P/PCBs, RCRA Metals, TOC, Acid Volatile Sulfide and Selected Simultaneously Extractable Metals (AVS/SEM), Hexavalent Chromium.
Surface/Subsurface Soil Sampling:	TCLP and RCRA Metals; Specific Parameters: Hexavalent Chromium, P/PCBs, Dioxin/Furan, Polynuclear Aromatic Hydrocarbons (PNAs), Asbestos, and Arsenic; Level III TCL SVOC and TCL P/PCBs.

Two deviations from the Phase II RI work plan activities occurred:

- In-situ hydraulic conductivity tests were not conducted in any of the newly installed monitoring wells as stated in M&E's work plan. The purpose of performing the hydraulic conductivity tests would be to determine whether hydraulic communication existed between the shallow and the deep aquifers if a competent clay confining layer was present in the subsurface. Because this confining layer was not apparent and the strata in the newly installed monitoring wells were similar to that encountered during Phase I activities, hydraulic conductivities were assumed to be similar.

- A Shelby tube sample was not collected from the subsurface because no clay layer was encountered. The purpose of the Shelby Tube would be to gather geotechnical data to ensure that the clay layer was competent and continuous with no discernable sand layers. The soil was to be analyzed for the following parameters using appropriate ASTM standards:

  - D 2216 - Moisture Content
  - D 2434-68 - Permeability of Granular Soil via Flexible Wall Permeameter
  - D 422-63/ D 1140-54 - Particle Size Analysis of Soils (Combined Analysis)
  - D 2937-83 - Density of Soil
  - D 4318-84 - Liquid Limit, Plastic Limit, Plasticity Index of Soil
  - D 2248 - Visual Soil Classification

All data gathered from both phases of the investigation were completed in anticipation of performing a Baseline Risk Assessment/Ecological Risk Assessment (BRA/ERA). Conducting a BRA will determine the risk to human health and the environment. Additionally, the ERA is conducted as part of the BRA to evaluate the possibility of adverse ecological effects occurring as a result of exposure. The performance of these activities will be evaluated after all Phase II data have been gathered, reduced, and integrated with Phase I data.

To perform the above referenced activities, M&E utilized existing IEPA-approved planning documents for the proposed sample collection and analysis. The documents that were utilized included the Field Sampling Plan (FSP), dated February 1993, and the Quality Assurance Project Plan (QAPP), dated December 1992. Both of these documents were prepared for the Phase I RI at the Former Griess-Pfleger Tannery Site and were deemed fully applicable for the Phase II RI.

The former Griess-Pfleger Tannery is in the Illinois Pre-Notice Site Cleanup Program (formerly known as the Illinois Voluntary Cleanup Program). M&E and its laboratory subcontractor abided by the data quality objectives set forth in the Analytical Quality Assurance Plan (AQAP) for the IEPA Bureau of Land Pre-Notice Site Cleanup Program. The levels of Data Quality applied during the Phase II RI included Level III, Engineering and Level IV, Confirmational. Details of the level of QA/QC are provided in Section 2 of this report.

1.2 REPORT ORGANIZATION

This RI Report is divided into five sections. These sections include:

- Section 1.0, Introduction. This section provides a brief overview describing the site activities and work objectives.

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- Section 2.0, Environmental Investigation. This section details the methods and techniques of the environmental investigation. Monitoring well, exploratory soil boring, wetland surface water/sediment, and surface and subsurface soil sampling methods and decontamination methods are explained.

- Section 3.0, Results and Discussion of Environmental Investigations. This section details site specific geology and hydrogeology. Most information gathered during Phase I RI activities has not deviated. New information, not submitted as part of the Phase I Report, is presented in this section.

- Section 4.0, Nature and Extent of Contamination. This section describes the nature, extent, and magnitude, of contamination in the soil and groundwater.

- Section 5.0, Summary, Conclusions, and Recommendations. This section summarizes the findings and presents recommendations.

- Section 6.0, References.

The following sections, which were part of the Phase I Report, will not be a part of the Phase II Report as explained below.

- Site Background. The Phase I Report (Section 2.0, Site Background) described the detailed site history, background, and provided a summary of previous investigations. This information was not reiterated in its entirety but it is briefly provided as part of the Phase II Executive Summary.

- Environmental Setting. The Phase I Report (Section 3.0, Environmental Setting), provides information regarding land use and surrounding population, climatology, surface water, soils, topography, regional geology and stratigraphy, regional hydrogeology, and regional groundwater use. This information has not deviated since Phase I RI Report preparation. Therefore, this information is not provided in this report submission.

2.2.1 Exploratory Soil Boring

2.2.1.1 Purpose

According to the Illinois State Water Survey, available well logs indicated that a clay layer had been documented to exist 19 to 22 feet below grade. The exploratory soil boring (EB-1) was drilled on-site to determine whether a uniform and continuous subsurface confining layer existed for the installation of deeper monitoring wells. Existing on-site monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7) extend to a depth of approximately thirteen feet below grade. Only poorly graded to well graded sands or gravelly sands were encountered to the base of each borehole. A confining layer was not encountered.

2.2.1.2 Location and Rationale

One exploratory soil boring was drilled to 30 feet below grade. The location of this boring was based upon ease of accessibility. The exploratory boring was located in the southwestern section of Area II.

2.2.1.3 Exploratory Borehole Soil Sampling

Soil samples were collected continuously to 30 feet below grade during drilling. A two foot long split-spoon sampler (ASTM D1586) was driven by a 140-pound hammer free-falling 30 inches. Upon retrieval, the split spoon was opened and the soil sample was screened using a photoionization detector (PID). A stainless steel knife was used to part the sample in order to survey the interior portion of the soil sample for logging purposes. The stainless steel knife was decontaminated between sample intervals in accordance with the procedures described in Section 2.2.11. An aliquot of soil was collected from the split spoon and placed into sealable plastic bags. After the soil gasses were allowed to equilibrate, a PID reading was taken. Photoionization detection readings are illustrated on the geologic logs located in Appendix A.

The soil samples were described using ASTM Method D2488 (Description of Soils) and classified in the field using the Unified Soil Classification System (USCS). Descriptions and classifications were recorded onto geologic logs which are included in Appendix A.

It was anticipated that the exploratory borehole would penetrate a competent and continuous (one without discernable sand) confining layer approximately 25 feet below grade. Field personnel pursued a greater depth (30 feet) to determine if the confining layer was further below grade. Because a confining layer was not encountered, soil samples were not collected for geotechnical analysis.

2.2.2 Monitoring Well Installation - Shallow and Deep

2.2.2.1 Purpose

Five monitoring wells, two shallow (MW-8, MW-9) and three deep (MW-1A, MW-5A, and MW-7A) were installed during field activities. The purpose of installing the shallow monitoring wells was to better characterize the site to determine if the arsenic impacted the groundwater east of SB-06 and to determine if additional off-site influences could be affecting the site. The deep monitoring wells were installed to determine: whether deeper stratigraphic units were affected by former tannery operations, the groundwater flow direction for the deeper stratigraphic unit(s), and whether contamination is migrating at depth.

Subsequent to installation of the five monitoring wells, Phase IIA and IIB investigations were undertaken. These investigations consisted of installation of four additional shallow monitoring wells (MW-10, MW-11, MW-12, and MW-13) and collection of 14 groundwater samples utilizing a Geoprobe® groundwater sampling unit. These additional monitoring wells were installed to determine the extent of the arsenic plume that had migrated to the eastern edge of the site boundary, as shown by the arsenic concentration in MW-8.

2.2.2.2 Location and Rationale

Two water table monitoring wells (screens intersecting the water table) were installed as part of the field activities. One monitoring well (MW-8) was installed adjacent to the eastern property fence line. The other monitoring well (MW-9) was installed approximately 215 feet west of the eastern property fence line in the northern portion of the site.

Three deep monitoring wells were installed as part of the field activities. Monitoring well MW-7A is located off-site and in the Illinois Department of Transportation's (IDOT's) right-of-way approximately 65 feet east of the soft shoulder of Amstuz Expressway and approximately one-third mile south of Greenwood Avenue. This location was amended with respect to an Illinois Environmental Protection Agency (IEPA) November 30, 1994 request regarding improving the triangulation between the proposed three deep monitoring wells. Two other deep monitoring wells, MW-1A and MW-5A, are located adjacent to downgradient monitoring wells MW-1 and MW-5, respectively. All three monitoring wells will help determine: a) whether the deeper stratigraphic units have been affected by former tannery operations, b) the groundwater flow direction for the deeper stratigraphic unit(s), and c) whether contamination is migrating off-site at depth.

The four additional shallow monitoring wells were installed at Commonwealth Edison's Waukegan Generating Station. One monitoring well (MW-10) was installed approximately 300 feet east of MW-1, and MW-11 was installed approximately 200 feet east of MW-8. Monitoring well MW-12 was installed 300 feet east of MW-10 and MW-13 was installed 450 feet east of MW-11. The locations of the monitoring wells at the Waukegan Generating Station are shown in Figure 2-2.

2.2.2.3 Drilling Method

Due to the shallow nature of the groundwater (approximately three feet below grade) and the general sponginess of the overlying soil, an all-terrain vehicle (ATV) was utilized.

Prior to drilling, the drill rig and related equipment were decontaminated. All drilling was initiated using 4.25-inch hollow stem augers (HSA). Small amounts of potable water were added into the hollow stem augers to alleviate heaving sands. Potable water was obtained from Commonwealth Edison's Waukegan Generating Station which acquires its water from the Waukegan Public Water Supply (The station's water was analyzed prior to inception of Phase I activities). Deep soil borings MW-5A and MW-1A were straight drilled (without sampling) to approximately ten feet below grade because the upper stratigraphy was previously defined during the Phase I RI by the adjacent shallow monitoring wells. Continuous split spoon samples were collected from 10 feet below grade to total depth in MW-1A and MW-5A and from the ground surface to total depth in MW-7A because the distance between MW-7 and MW-7A was too great to correlate the surfical stratigraphy. The stratigraphy was determined by using a split spoon sampler (ASTM D 1586) driven by a 140-pound hammer free-falling 30 inches. The samples were field screened utilizing a photoionization detector (PID). All soil samples were described in the field using ASTM Method D 2488 and classified using the Unified Soil Classification System (USCS). Geologic logs are included as Appendix A.

All drill cutting were containerized in 55 -gallon drums and staged at a central location at the site, with the exception of the four monitoring wells installed at the Generating Station. With approval from IEPA, the cuttings from these monitoring wells was thin spread around the well location. For the soil that was containerized, each drum was labelled with the well number, date, and drum contents.

2.2.2.4 Monitoring Well Borehole Soil Sampling

Upon split spoon sampler retrieval, the sampling device was opened and screened using a PID. A stainless steel knife was used during the screening process to part the sample in order to survey portions of the sample. Portions of the sample were quickly collected and placed into soil sampling jars. Containers for volatile organic compound analysis were filled first, SVOCs second, and P/PCBs and metals last. The stainless steel knife was cleaned between sample intervals. One soil sample was collected from the bottom of each deep monitoring well borehole: MW-1A, 23 - 25 feet below grade; MW-5A, 22 - 24 feet below grade; and MW-7A, 23 - 25 feet below grade.

2.2.3 Monitoring Well Installation/Construction Details

All monitoring wells were installed through the HSAs. All monitoring wells were constructed of 2-inch diameter Type 304 stainless steel with flush joints. The well screens consisted of Type 304 continuous wire-wrap stainless steel with 0.010-inch openings. The well screens were 10 feet in length for both shallow and deep monitoring wells.

Deep Monitoring Wells - MW-1A, MW-5A, and MW-7A

Due to the presence of heaving sands, borings for both MW-5A and MW-7A were over drilled one foot. Therefore, prior to placing the well string in the borehole, 1.0 foot of clean 20/40 sized silica sand was place into the bottom of these boreholes. Heaving sands were not a problem for monitoring well MW-1A. Therefore, this well string was placed at the bottom of the borehole. The silica sand filter pack was placed in the annular space around the well screens to minimize intrusion of fine-grained sediment into the monitoring well. The filter pack was added to the deep monitoring well's annular space to a level approximately two feet above the screened interval.

While slowly adding the filter pack, the HSAs were incrementally withdrawn to allow the filter pack material to drop out of the bottom of the HSA and to prevent the formation from collapsing around the well screen. An eleven to twelve foot thick bentonite chip seal was placed above the filter pack and hydrated with distilled water. Due to the relative shallowness of the groundwater, grout was not necessary to complete the monitoring wells. The bentonite seal was allowed to hydrate a minimum of four hours prior to placing the concrete apron around each monitoring well. The exact dimensions of the annular space materials were adjusted in the field on a well by well basis.

Above grade protective covers (4 inch diameter by 7 feet long) were provided for monitoring wells MW-1A and MW-5A. Monitoring well MW-7A was completed with a flush mounted aluminum cover per IDOT's requirements. Each deep monitoring well was provided with an expandable locking cap. Keyed alike Masterlock padlocks were provided for each monitoring well. A magnet was placed inside MW-7A's above grade annular space for ease of locating the flush mounted monitoring well during the winter time.

Shallow Monitoring Wells

Heaving sands were not a problem for shallow monitoring wells MW-8, MW-9, and MW-11. Therefore, the well strings were placed at the bottom of the drilled borehole. The silica sand filter pack was placed in the annular space to minimize intrusion of fine-grained sediment into the monitoring well.

While slowly adding the filter pack, the HSAs were incrementally withdrawn to allow the filter pack material to drop out of the bottom of the HSA and to prevent the formation from collapsing around the well screen. The filter pack was added to the shallow monitoring well's annular space to a height approximately one-half foot above the screened interval. Due to the shallow nature of the groundwater, it was more important to have an effective surface seal to impede the infiltration of surface water. A 1.5 foot thick bentonite seal was placed above the filter pack and hydrated with distilled water. Due to the relative shallowness of the monitoring wells, grout was not necessary to complete the monitoring wells. The bentonite seal was allowed to hydrate a minimum of four hours prior to placing the concrete apron around each monitoring well. The

exact dimensions of the annular space materials were adjusted in the field on a well by well basis.

Above grade protective covers were provided for the shallow monitoring wells. For MW-8 and MW-9, the standard 4 inch diameter by 7 feet long steel protective covers were cut down to approximately 4 feet in length so as not to interrupt the shallow groundwater flow into the well screens. The remaining monitoring wells installed at the Waukegan Generating Station were completed with flush mount well boxes that were cemented in place.

Organic clay soil cuttings from monitoring well MW-9 adhered to the interior of the HSAs. To avoid bridging of annular space materials, the drillers placed approximately 50 gallons of potable water inside the HSAs to wash out the organic clay.

Heaving sands were encountered during the installation of MW-10, MW-12, and MW-13. Minimal amounts of potable water were added to each of these wells during both drilling and installation. The approximate volumes of water added during installation was 5 gallons, 20 gallons, and 50 gallons, respectively.

Monitoring well construction diagrams are included in Appendix B. The following information was recorded on the geologic/monitoring well construction diagrams.

- General information including the drilling contractor, well number, well site, date the well construction was initiated and finished, and the name of the driller and supervising geologist or engineer.

- Specific information including the drilling method, borehole diameter, type and diameter of the protective casing, riser pipe and well screen, type of annular backfill, annular seal and filter pack, and depths to the top of the annular seal and filter pack and total well and boring depth.

Typical well construction details of the above depth measurements were made in the field using a weighted tape. Measurements are accurate to within 0.01 feet.

2.2.4 Monitoring Well Development Procedures

Well development allows for the free flow of water through the disturbed formation into the filter pack and well screen. Prior to well development and purging, all equipment were decontaminated in accordance to the procedures outlined in the Field Sampling Plan, Section 2.2.9. Well development and purging was accomplished by manually bailing using a three-foot long disposable Teflon™ bailer, or a five foot long PVC bailer. Development was not conducted until the bentonite pellet seal in each well was allowed to set for a minimum of 24 hours. Immediately before sampling, the wells were purged a minimum of three well volumes. Purging the monitoring well allows for a representative sample to be collected from the aquifer.

Each well volume was determined by measuring the static water level in the well with an electronic interface probe (IP) to the nearest 0.01 foot. The static water level from the top of the well casing was subtracted from the total depth of the well from the top of the well casing to determine the height of the water column in the well. The height of the column multiplied by the area of the well equalled one well volume.

Monitoring wells were considered developed after development water was relatively sediment free, and field parameters (pH, temperature, and specific conductance) stabilized to within 10 percent. Calibration, operation, and maintenance procedures for the pH, specific conductivity, and temperature meter is detailed in the approved QAPP. Field parameter readings were collected after each well volume was removed. The parameters were considered stabilized when three successive readings were within 10 percent. Typically, three to five well volumes were removed from each monitoring well during development. Well development/well purging field parameter data tables are illustrated in Appendix C.

Monitoring well MW-9 was developed by using a Grundfos submersible pump. The submersible pump was raised and lowered within the monitoring well and utilized like a surge block. Approximately 50 gallons of water was removed from this monitoring well. This amount equalled the total volume of potable water placed in the monitoring well by the drilling subcontractor to remove the organic clay from the inside of the hollow stem augers. For the monitoring wells that encountered heaving sands during well installation, the amount of water added was removed prior to initiation of the development process. An additional three to five well volumes of water were then removed as part of the well development process.

All development water was containerized in 55-gallon drums.

2.2.5 Static Water Level Measurements

The static water levels were measured in all of the monitoring wells installed at the site. Water levels were measured with an electronic interface probe (IP). Measurements were collected by lowering the probe into the well until the instrument emitted an audible tone. Depth to water from the top of the stainless steel well riser was measured to the nearest 0.01 ft. Total depth of each monitoring well was determined by lowering the IP to the bottom of the well and sounding for total depth. All water level measurements, date and time, instrument used, and field personnel were recorded in a bound field logbook. The electronic interface probe was decontaminated prior to and after a reading was collected as described in Section 2.2.11. Static water level measurements are included in Appendix D.

2.2.6 Groundwater Sampling

In order to assess groundwater quality at the former tannery site, a second round of groundwater samples was collected from the seven monitoring wells installed by M&E during Phase I of the RI. The analytical analyte list was reduced to those parameters which were detected during

Phase I activities. These wells were sampled for Level III TCL SVOCs, TCL P/PCBs, total and dissolved RCRA Metals, hexavalent chromium, TSS, TDS, and Turbidity.

An initial round of groundwater samples was collected from the five monitoring wells installed during Phase II activities. These samples were analyzed for Level IV CLP total and dissolved TAL parameters, TCL VOCs, TCL SVOCs, TCL P/PCBs, hexavalent chromium, TSS, TDS, and Turbidity in accordance with the QAPP and the Illinois Pre-Notice Program Analytical Quality Assurance Plan. Analysis for TSS, TDS, and turbidity were performed in accordance with the methodologies described in Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020: TDS - 160.1, TSS -160.2, and Turbidity - 180.1.

Table 2-2 illustrates the sample identification number and its corresponding laboratory analysis.

The four monitoring wells installed at the Waukegan Generating Station were sampled for Level III total and dissolved RCRA metals. In addition, MW-11 and MW-12 were analyzed for TSS, TDS, and TOC.

The monitoring wells were purged by manual bailing using a disposable Teflon™ bailer. During purging, the pH, specific conductivity, temperature, color, odor, and relative turbidity of the groundwater were recorded. Measurements were made after each well volume was purged and were recorded in the field log book. Groundwater samples were collected with disposable Teflon™ bailers.

Sample containers were filled directly from the bailer. Sample containers for VOCs were filled first, followed by containers for semi-volatile organic compounds, pesticides and PCBs, and metals analyses. The samples collected for dissolved metal analysis were first collected in a one-liter plastic bottle. The sample was then filtered at the well site using a disposable 0.45 micron positive pressure filter. Subsequent to filtering, the water was transferred to other sample bottles for dissolved metal analysis. The sample bottles were pre-preserved by the laboratory. The metal samples were preserved with nitric acid (HNO_3) to a pH < 2. The aliquot for cyanide analysis was preserved with sodium hydroxide (NaOH) to a pH of > 12. After sample collection, all samples were placed directly into a sample cooler where a temperature of 4°C was maintained. Chain of custody procedures for the samples are discussed in Section 2.3.

2.2.7 Surface and Subsurface Soil Sampling

2.2.7.1 Purpose

In order to assess the presence, extent, and magnitude of subsurface impact, additional sample collection occurred. Eighty-one soil samples were collected and analyzed from 51 sample locations. From the results of the Phase I investigation, the trends identified indicate that the highest constituent concentrations were located at the surface (0 - 2 feet below grade) and decreased with depth.

Table 2-2
Soil/Sediment/Groundwater Sample Identification Number and Corresponding Analysis

Surface Soil Samples (51):	SB-44A, SB-45A, SB-46A, SB-47A, SB-48A, SB-49A, SB-50A, SB-51A, SB-52A, SB-53A, SB-54A, SB-55A, SB-56A, SB-57A, SB-58A, SB-59A, SB-60A, SB-61A, SB-62A, SB-63A, SB-64A/CA, SB-65A, SB-66A/CA, SB-67A/CA, SB-69A/CA, SB-70A, SB-71A, SB-72A, SB-73A, SB-74A, SB-75A, SB-76A, SB-77A, SB-78A, SB-79A, SB-80A, SB-81A, SB-82A, SB-83A, SB-84A, SB-85A, SB-86A, SB-100, SB-101, SB-102, SB-103, SB-104, SB-105, SB-106, SB-107
Subsurface Soil Samples (30):	SB-44B, SB-45B, SB-46B, SB-47B, SB-48B, SB-49B, SB-50B, SB-51B, SB-58B, SB-59B, SB-60B, SB-62B, SB-64CB, SB-67B/CB, SB-69B/CB, SB-71B, SB-73B, SB-77B, SB-78B, SB-79B, SB-80B, SB-81B, SB-82B, SB-83B, SB-84B, SB-85B, SB-86B, MW-1A, MW-5A, MW-7A.
Production Waste Samples (2):	PW-5, PW-9.
Groundwater Samples (16):	MW-1, MW-1A, MW-2, MW-3, MW-4, MW-5, MW-5A, MW-6, MW-7, MW-7A, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13.
Wetland Samples (6):	WL-1, WL-2, WL-3, WL-SW-1, WL-SW-2, WL-SW-3.
	Surface, Subsurface, and Sediment
Pesticide Samples (4):	SB-52A, SB-53A, SB-53B, SB-54A.
PCB Samples (15):	SB-55A, SB-56A, SB-57A, SB-58A, SB-58B, SB-59A, SB-60A, SB-100A, SB-101A, SB-102A, SB-103A, SB-104A, SB-105A, SB-106A, SB-107A.
PNA Samples (4):	SB-56A, SB-58A, SB-58B, SB-60A.
Dioxin/Furan Samples (2):	SB-55A, SB-59A.
Asbestos samples (2):	AS-1, AS-2.
Arsenic Specific Samples (36):	SB-44A, SB-44B, SB-45A, SB-45B, SB-46A, SB-46B, SB-47A, SB-47B, SB-48A, SB-48B, SB-49A, SB-49B, SB-50A, SB-50B, SB-51A, SB-51B, SB-77A, SB-77B, SB-78A, SB-78B, SB-79A, SB-79B, SB-80A, SB-80B, SB-81A, SB-81B, SB-82A, SB-82B, SB-83A, SB-83B, SB-84A, SB-84B, SB-85A, SB-85B, SB-86A, SB-86B.
AVS/SEM Samples - (3):	WL-1, WL-2, WL-3.
TAL Metals (3):	MW-1A, MW-5A, MW-7A.
TCL SVOC (18):	MW-1A, MW-5A, MW-7A, WL-1, WL-2, WL-3, SB-61A, SB-62A, SB-62B, SB-63A, SB-64A/CA, SB-65A, SB-66A/CA, SB-67A/CA, SB-67B/CB, SB-68A, SB-69A/CA, SB-69B/CB.
TCL P/PCBs (18):	MW-1A, MW-5A, MW-7A, WL-1, WL-2, WL-3, SB-61A, SB-62A, SB-62B, SB-63A, SB-64A/CA, SB-65A, SB-66A/CA, SB-67A/CA, SB-67B/CB, SB-68A, SB-69A/CA, SB-69B/CB.
RCRA Metals (28):	WL-1, WL-2, WL-3, SB-60B, SB-61A, SB-62A, SB-62B, SB-63A, SB-64A/CA, SB-64CB, SB-65A, SB-66A/CA, SB-67A/CA, SB-67B/CB, SB-68A, SB-69A/CA, SB-69B/CB, SB-70A, SB-71A, SB-71B, SB-72A, SB-73A, SB-73B, SB-74A, SB-75A, SB-76A, PW-5, PW-9.

Table 2-2 (Continued)
Soil/Sediment/Groundwater Sample Identification Number and Corresponding Analysis

Hexavalent Chromium (22):	WL-1, WL-2, WL-3, SB-60B, SB-64A/CA, SB-64CB, SB-66A/CA, SB-67A/CA, SB-67B/CB, SB-69A/CA, SB-69B/CB, SB-70A, SB-71A, SB-71B, SB-72A, SB-73A, SB-73B, SB-74A, SB-75A, SB-76A, PW-5, PW-9.
TOC (8):	WL-1, WL-2, WL-3, WL-SW-1, WL-SW-2, WL-SW-3, MW-10, MW-11.
TCLP Metals (19):	SB-60B, SB-64A/CA, SB-64CB, SB-66A/CA, SB-67A/CA, 67B/CB, SB-69A/CA, SB-69B/CB, SB-70A, SB-71A, SB-71B, SB-72A, SB-73A, SB-73B, SB-74A, SB-75A, SB-76A, PW-5, PW-9.
	Surface Water/Groundwater
TSS (14):	MW-1, MW-1A, MW-2, MW-3, MW-4, MW-5, MW-5A, MW-6, MW-7, MW-7A, MW-8, MW-9, MW-10, MW-11.
TDS (14):	MW-1, MW-1A, MW-2, MW-3, MW-4, MW-5, MW-5A, MW-6, MW-7, MW-7A, MW-8, MW-9, MW-10, MW-11.
Turbidity (12):	MW-1, MW-1A, MW-2, MW-3, MW-4, MW-5, MW-5A, MW-6, MW-7, MW-7A, MW-8, MW-9.
Cyanide (12):	MW-1, MW-1A, MW-2, MW-3, MW-4, MW-5, MW-5A, MW-6, MW-7, MW-7A, MW-8, MW-9.
RCRA Metals (14):	MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-10, MW-11, MW-12, MW-13, WL-SW-1, WL-SW-2, WL-SW-3.
SVOC (12): Level IV SVOC (3):	MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, WL-SW-1, WL-SW-2, WL-SW-3. MW-1A, MW-5A, MW-7A.
P/PCB (12): Level IV P/PCB (3):	MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, WL-SW-1, WL-SW-2, WL-SW-3. MW-1A, MW-5A, MW-7A.
Level IV VOCs (5):	MW-1A, MW-5A, MW-7A, MW-8, MW-9.
Level IV TAL (5):	MW-1A, MW-5A, MW-7A, MW-8, MW-9.
Hexavalent Chromium (12):	MW-1, MW-1A, MW-2, MW-3, MW-4, MW-5, MW-5A, MW-6, MW-7, MW-7A, MW-8, MW-9.

NOTE:
Groundwater samples were collected on February 2, 7, and 8, June 29, and August 31, 1995.
Monitoring well soil boring samples were collected on January 31, and February 1, 1995.
Surface and subsurface soil boring samples were collected on January 12, 17, 18, and 31, 1995 and February 24, 1995.
Wetland surface water and sediment samples were collected on April 10, 1995.
Production waste and asbestos samples were collected on January 18, 1995.

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Parameter specific soil sampling occurred in select areas in which elevated levels of specific constituents were identified in Phase I, to more fully define the lateral extent of impact. The following lists specific activities and their respective purpose.

Table 2-2 illustrates the sample identification number and its corresponding laboratory analysis.

2.2.7.1 (a) Site Classification

In order to determine the regulatory status of the site, both surface and subsurface soil samples were collected and analyzed for RCRA metals, TCLP metals and hexavalent chromium (Cr^{+6}). These analyses were intended to determine the status of the chromium at the former tannery for both regulatory and Risk Assessment purposes. Soil samples were collected from areas shown to have elevated chromium based upon Phase I results. Production waste sample locations PW-5 and PW-9 were analyzed for the same parameters.

2.2.7.1 (b) Parameter Specific Soil Sampling

In order to more accurately assess the presence and to define the vertical and lateral extent of certain constituents, parameter-specific and area-specific sampling was conducted.

Pesticides

In the vicinity of SB-39, a total of four surface soil samples were collected and analyzed for pesticides to determine the extent of pesticide impact in the area.

Polychlorinated Biphenyls, Polynuclear Aromatic Hydrocarbons, and Dioxin/Furans

In the southeastern section of Area III, elevated levels of PCBs were identified during Phase I activities. A total of 15 surface soil samples were collected. Additionally, of those soil samples, four samples were collected and analyzed for polynuclear aromatic hydrocarbons (PNAs) and two samples were collected and analyzed for dioxin/furans. These soil samples were analyzed for dioxin/furans due to concerns raised by the Community Advisory Group (CAG) members regarding alleged former on-site burning of PCBs.

Asbestos Sampling

To assess the presence of asbestos in dredge sand used as fill at the site, two soil samples were collected and analyzed for asbestos using Polarized Light Microscopy (PLM). These samples were collected due to concerns raised at the CAG meeting regarding asbestos deposited into Lake Michigan and being dredged with the sand and subsequently stored temporarily on site.

Arsenic

In the vicinity of MW-1 and SB-06, surface and subsurface soils were analyzed for arsenic only. The purpose of this sampling was to identify the possible source and/or the extent of arsenic in the subsurface. A total of 36 surface and subsurface soil samples were collected.

2.2.7.2 Locations and Rationale

Thirty subsurface samples were obtained from the unsaturated zone immediately above the Static Water Level (SWL) (located approximately 3 feet below grade) and 51 surface soil samples were obtained from the 51 soil boring locations. These surface and subsurface samples were collected in an effort to assess the presence and magnitude of impact to the surface and subsurface from former tannery operations. The surface samples were collected from the surface to a depth of approximately one foot below grade.

2.2.7.3 Surface and Subsurface Soil Sampling Methods and Equipment

Split spoon soil samples were collected from the shallow and deep monitoring wells. Soil samples were collected by using a split-spoon sampler (ASTM D1586) driven by a 140-pound hammer free-falling 30 inches. Once retrieved, the split spoon was opened and screened using a PID. A stainless steel knife was used during the screening process to part the sample in order to survey portions of the sample which were not disturbed by the split spoon sampler. The stainless steel knife was decontaminated between sample intervals as described in Section 2.2.11. Soil collected from the split-spoon sampler was transferred directly to the sample containers.

Due to the shallow nature of the groundwater table at the site, accessibility of the drill rig, and number of soil samples to collect, stainless steel hand augers were used to collect surface and subsurface soil samples. Soil samples collected with a hand auger were composite. A stainless steel spoon was used to transfer the soil from the hand auger into a stainless steel compositing bowl. Soil collected for VOC samples were immediately packed into the sample container and headspace was minimized. All samples were capped as quickly as feasible.

2.2.8 Surface Water and Sediment Sampling

2.2.8.1 Purpose

Wetland surface water and sediment samples were collected and analyzed to provide data for the Ecological Risk Assessment (ERA) and aid in determining if constituents have migrated off-site. In addition to the Level IV CLP TCL SVOC, TCL P/PCB, TOC and RCRA Metal analysis performed on both the surface water and sediment samples, the sediment samples were analyzed for both Hexavalent Chromium and Acid Volatile Sulfide and Selected Simultaneously

Extractable Metals (AVS/SEM)[1]. The TOC Methodology will aid in the determination of the bioavailability of organic material. The SEM/AVS Methodology will determine the persistence of metal constituents in the wetland sediment. The surface water samples were also analyzed for total and dissolved RCRA metals.

2.2.8.2 Locations

A total of three sediment and three surface water samples were collected during Phase II RI activities. The samples were collected in areas where aquatic biota systems were established and thriving. Samples were not collected from an infertile ditch or an intermittent pond or stream. The three samples were collected in the wetland area immediately south of the southeastern site boundary.

2.2.8.3 Sampling Methods and Equipment

The following information presents the sampling method for collecting wetland surface water and sediment samples from the wetland area.

Due to the relatively shallow nature of the water in the wetland area, field personnel traversed the wetland to collect sediment samples. Upon reaching the desired location, field personnel were careful so as not to disturbed the sediment. Prior to collecting the sediment samples, surface water samples were collected by lowering the entire sampling bottle (in an upright position) below the water surface. The mouth of the sample container was approximately four to six inches below the water surface. Samples for TCL SVOC analyses were collected first, followed by TCL P/PCBs, TOC, and total and dissolved RCRA metals.

The sediment samples were collected by using a stainless steel hand auger. Each sample was collected from the upper 12 inches of the wetland sediment. Cattail root matter was encountered during boring. Soil samples collected with a hand auger were composited. A stainless steel spoon was used to transfer the soil from the hand auger into a stainless steel compositing tray. Samples collected for non-volatile organic compound analysis were transferred from the sampling device to a compositing tray then to their respective sample containers. All samples were capped as quickly as feasible and placed into iced coolers to preserve them at 4°C.

2.2.9 Waste Volume Estimation

To determine the gross volume of tannery waste material (tannery hides) present at the site, field personnel traversed the southwestern section of Area III and tested several areas with a hand auger to map the areas anticipated to contain tannery waste material, much like that of PW-5

[1] AVS and SEM are operational definitions in the analysis of sulfide and associated metals (cadmium, copper, lead, mercury, nickel, and zinc) in aquatic sediments. The SEM/AVS ratio has been useful in predicting if a sediment is not acutely toxic (SEM/AVS ratio is less than one) or shows only potential for toxicity (SEM/AVS ratio is greater than one). This is because other binding phases, such as metal oxides and organic matter, may also bind metals thereby reducing their bioavailability.

(bluish grey shavings). A site walk-through revealed that material is confined to an area approximately 15 feet long by four feet wide and three feet deep at the location of PW-5. The total volume of this material is estimated to be 180 cubic feet (6.66 cubic yards). No other location in the southwestern section of the site consisted of the production waste material.

2.2.10 Surveying Methodology

M&E conducted surveying at the former Griess-Pfleger Tannery to establish horizontal and vertical control. The horizontal survey located monitoring wells and soil borings. The vertical survey established top of riser (TOR) elevations of the monitoring wells and ground surface elevations.

The horizontal survey was conducted using a Global Positioning System (GPS) with an accuracy of $\pm$ 5 - 10 millimeters. It was determined that due to the many obstructions at the site blocking the path between points (trees, shrubs), a GPS survey would be more efficient. The type of GPS survey method used was Rapid Static. For the Rapid Static survey, a temporary reference station was situated inside the entrance gate. Field personnel used roving receivers to record the locations of the sampling points. Computer software was used to process the data collected from the receivers and assigned North - East coordinates to the unknown points. The coordinates were used to create a map showing monitoring wells, soil borings, and sediment samples.

The vertical survey of the monitoring well riser locations was established with an automatic level. A reference benchmark was established on MW-4 whose elevations was known from Phase I activities. The riser elevations were taken on the north side of the risers.

2.2.11 Decontamination Procedures

Potable water for decontamination was obtained from Commonwealth Edison's Waukegan Station. This facility obtains its water from the City of Waukegan. Analytical data for the City of Waukegan potable water supply source was obtained during Phase I activities.

All drill rigs, drilling equipment, split spoons, sampling spoons, hand augers, well casing and screen, well development equipment, and water level measurement equipment were decontaminated upon arrival to the site, between each monitoring well or soil boring location and prior to departure. A portable wash tub was used to collect decontamination rinsate water. The rinse water was transferred from the wash tub to labeled 55-gallon drums and staged in a central area. The drums were labelled as to the contents of each drum and date.

Decontamination of the drill rig, downhole tools, well screen and casing, and well development equipment consisted of high pressure steam washing. Any visible residue after steam cleaning was scrubbed with a brush and a solution of phosphate-free laboratory grade detergent (Alconox) and potable water followed by a final steam cleaning. All decontaminated equipment was allowed to air dry prior to use. Well materials were wrapped in new plastic for transport to the well location.

Split spoons were decontaminated between each new well location following the procedure described above. However, during drilling, the split spoons were decontaminated between each sampling interval with a brush and a solution of phosphate-free laboratory grade detergent (Alconox) and potable water followed by a final rinse with distilled water.

New disposable Teflon™ bailers were used to develop and collect groundwater samples from each of the monitoring wells. Therefore, decontamination of this equipment was not needed.

The electronic water level indicator, pH, specific conductivity, and temperature probes were decontaminated at the well site between measurements. The submersible pump was decontaminated with a series of rinses with potable water, dilute nitric acid (10%) solution, and a final double rinse with distilled water. The equipment was allowed to air dry prior to being wrapped in new plastic bags for transport.

2.3 SAMPLE PACKAGING AND SHIPMENT

After collection, all samples were labelled, sealed, packaged, and delivered in person to IEA Laboratory, Inc. in Schaumburg, Illinois. Level III QA/QC samples were analyzed at the Schaumburg location whereas the Level IV CLP QA/QC samples were shipped by IEA Schaumburg to IEA's laboratory in Cary, North Carolina, where they were analyzed. The samples were shipped via next day courier. Temperature in the coolers was maintained at 4°C through the use of ice sealed in plastic bags.

A chain of custody record was completed and accompanied samples during shipment to the laboratory. The chain of custody record was sealed in plastic for protection and taped inside the lid of the cooler. A copy of the chain of custody record was retained by the sampling team. All records included: (1) sample numbers; (2) date and time of collection; (3) locations where samples were collected; (4) type of sample: grab or composite; (5) analytical parameters requested; (6) names and signatures of samplers; and (7) names of persons involved in the chain of possession from time of collection to receipt at the laboratory.

Because each cooler was hand-delivered to the laboratory, custody seals were not used on the coolers.

2.4 INVESTIGATIVE DERIVED WASTE

The fate of drummed investigative derived waste material will be based upon the proper characterization of materials (decontamination/purge/well development water and soil cuttings) currently stored in drums on site. Material will be transported off-site under Commonwealth Edison's direction.

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SECTION 3.0
RESULTS AND DISCUSSION OF ENVIRONMENTAL INVESTIGATION

3.1 SITE GEOLOGY

The site geology is characterized as consisting of surfical unconsolidated material, made-land soils. The subsurface soils, typically described, ranged from pale yellow to black, moist to wet, loose to dense, poorly graded to well graded silty sand to sand. The silty sands are found as surfical deposits but grade to sands at depth. Trace amounts of fine subrounded gravels are present throughout the strata. The sand grain particles range from fine to coarse. Clay was present in the deeper soil borings (EB-1 and MW-7A). The thickness of the clay lens ranged from 4 - 9 inches and is discontinuous. Some boring/monitoring wells (MW-6, MW-4, MW-7A, and MW-9) have spongy organic matter (peat) ranging from the surface to 13 feet below grade. Admixed with the sands are coal, tannery waste material (animal hair), organic material (roots, vegetation), gravel, slag, and asphalt. Tannery wastes can be found up to a depth of 10 feet but, the asphalt and gravel only extend to a depth of five feet below grade. The sand extends to the base of all the borings. The geologic logs of the soil boring/monitoring wells are included in Appendix A. Figures 3-1 and 3-2 illustrate the north-south and west-east cross sections of the site, respectively.

3.2 SITE HYDROGEOLOGY

Groundwater at this site is considered a Class I Potable Resource Groundwater by definition of Title 35 of the Illinois Administrative Code (IAC), Subtitle C, Part 620, Subpart B, Groundwater Classification (e.g. groundwater which is presently being used or has the potential for being put to conventional use).

Both the shallow and the deep monitoring wells installed at the former tannery indicate that groundwater is flowing under unconfined conditions. Deeper soil borings indicate the presence of a clay lens but it was not thick enough (at least 3 to 5 feet thick) nor continuous across the site to segregate the water bearing unit into two separate units.

Using the most recent groundwater elevation data (February 24, 1995) the static water level (SWL) ranged from approximately 93.24 feet (MW-5) to 95.62 feet (MW-7A). The tabulated water elevation data is illustrated in Appendix D. The SWL measurements were collected from the ten on-site monitoring wells and two off-site monitoring wells, all of which are screened in the unconsolidated sediments. The saturated thickness is determined to be at least twenty-three feet. It is anticipated that the saturated thickness of the aquifer is greater because a confining layer was not encountered.

Shallow groundwater flow is toward the east under a gradient of 0.0014 feet/foot. This calculation is identical to the shallow gradient calculated for Phase I activities. The deeper groundwater flow directions is toward the east under a hydraulic gradient of 0.0017 feet/foot.

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The hydraulic conductivity testing for the newly installed monitoring wells was not done because material encountered during Phase II activities is similar to that which was discovered during Phase I activities. Because no thick and continuous clay layer was present, it can be inferred that hydraulic communication exists between the upper and lower water bearing units.

Figures 3-3 and 3-4 are groundwater contour maps illustrating the flow direction from the shallow and deep groundwater monitoring wells, respectively. These data were collected on February 24, 1995 and confirm that the shallow and deep water is one aquifer.

3.3 DETERMINATION OF CHROMIUM WASTE EXCLUSION

Based on 35 IAC 721.104 (Exclusion from the Definition of Hazardous Wastes), specific solid chromium wastes are not hazardous if certain conditions are met. These conditions, as shown below, are met by applicable site wastes (PW-5 and PW-9).

A) The waste fails the toxicity characteristic test because chromium is present and does not fail the test for any other constituents.

During the Phase I investigation, two samples of production waste (PW-5 and PW-9) had constituent concentrations that exceeded the Toxicity Characteristics Leaching Procedure (TCLP) regulatory standards of 5.0 mg/l. Samples PW-5 and PW-9 had a chromium concentrations of 8.06 mg/l and 24.2 mg/l, respectively. The remaining constituents were below the TCLP regulatory limits. As a result, these samples meet the requirements of this subpart of the exclusion

During Phase II investigation, production waste samples PW-5 and PW-9 were resampled. The respective chromium concentrations were 0.6 mg/l and 14 mg/l. The remaining constituents were below the TCLP regulatory limits. As a result, these samples meet the requirements of this subpart of the exclusion.

B) The chromium in the waste is exclusively (or nearly exclusively) trivalent chromium.

Phase II chromium speciation results indicate that chromium used during the tanning process consists of 99.9% trivalent chromium.

C) The waste is generated from an industrial process which uses trivalent chromium exclusively (or nearly exclusively) and the process does not generate hexavalent chromium.

According the U.S. EPA, chromium in the tanning process must be in the trivalent form (and in an acid medium) to perform the tanning (U.S. EPA 1974).

According to available documents and analytical data, trivalent chromium was used in the tanning process. A typical chrome tanning process consists of nine separate steps.

In this process, sulfuric acid and sodium chloride are used to pickle the hides. The pickled hides are immersed in a acidified solution of sodium dichromate. Therefore the chrome was present in an acid medium.

D) The waste is typically and frequently managed in non-oxidizing environments.

In soils, hexavalent chromium may be quickly converted to trivalent chromium which is relatively immobile and the more benign of the two species. Trivalent chromium may be oxidized to hexavalent chromium, but this appears to requires the presence of manganese oxides (U.S. EPA 1980).

A 5-year U.S. EPA study analyzed the land application of trivalent chromium-containing tannery process sludges and found that the chromium remained primarily in the topsoil. Trace amounts of chromium were found in surface water runoff from the sludge-loaded soil, but the chromium transport was associated with movement of soil particles. Oxidation of the chromium to hexavalent chromium was not detected (U.S. EPA 1986).

The tannery waste deposits (PW-5 and PW-9) at the site contained trivalent chromium and no detectable hexavalent chromium.

E) Specific examples of chromium wastes that match these characteristics are given. However, if the water is one of these types, it must still pass TCLP toxicity analysis for constituents beside chromium (must be below the regulatory limits) and must pass hazardous waste characteristic analysis (ignitability, corrosivity, etc.) Among the specific wastes listed are:

i) Chrome (blue) trimmings generated by hair pulp/chrome tan/retan/wet finish or hair save/chrome tan/retan/wet finish or retan/wet finish or no beamhouse or through-the-blue or shearling tanning processes.

ii) Chrome (blue) shavings generated by pulp/chrome tan/retan/wet finish or hair save/chrome tan/retan/wet finish or retan/wet finish or no beamhouse or through-the-blue or shearling tanning processes.

iii) Buffing dust generated by hair pulp/chrome tan/retan/wet finish or hair save/chrome tan/retan/wet finish or retan/wet finish or not beamhouse or through-the-blue tanning processes.

iv) Sewer screening generated by hair pulp/chrome tan/retan/wet finish or hair save/chrome tan/retan/wet finish or retan/wet finish or not beamhouse or through-the-blue tanning processes.

v) Wastewater treatment sludges generated by hair pulp/chrome tan/retan/wet finish or hair save/chrome tan/retan/wet finish or retan/wet finish or not beamhouse or through-the-blue tanning processes.

vi) Wastewater treatment sludges generated by hair pulp/chrome tan/retan/wet finish or hair save/chrome tan/retan/wet finish or through-the-blue tanning processes.

vii) Waste scrap leather from the leather tanning, shoe manufacturing, and other leather product manufacturing industries.

viii) Wastewater treatment sludges from production of titanium dioxide pigment using chromium-bearing ores by the chloride process.

The examples provided in the above subsections include applicable site wastes (PW-5 and PW-9).

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SECTION 4.0
NATURE AND EXTENT OF CONTAMINATION

4.1 GROUNDWATER

In addition to the seven existing shallow monitoring wells, five additional monitoring wells were installed as part of the Phase II investigation, two shallow and three deep. All twelve of the wells were sampled in February, 1995.

The five new wells were sampled for full TAL and TCL, with analysis conducted under IEPA Level IV QA/QC. The seven existing wells were sampled for TCL SVOC, TCL P/PCBs and the RCRA metals. These analyses were conducted under IEPA Level III QA/QC. All metals analyses were conducted on both filtered and unfiltered samples. All samples collected were analyzed by IEA Laboratories. The Level III samples were analyzed at IEA's Schaumburg, Illinois facility. The Level IV samples were analyzed at IEA's Cary, North Carolina facility.

In addition to the parameters identified above, all of the monitoring wells were sampled for hexavalent chromium, total suspended solids (TSS), total dissolved solids (TDS), and turbidity. These analyses were all conducted under Level III QA/QC.

The determination that elevated levels of chemical constituents were present in the groundwater was made by comparing the analytical results obtained with the constituent concentration limits found for Class I Groundwater in IAC Title 35, Subpart D, Section 620.410.

Analytical results from the Phase II investigation indicated that groundwater containing arsenic exceeding the Illinois Class I Standard has migrated to the eastern edge of the tannery property boundary. Subsequently, two additional monitoring wells were installed as part of the Phase IIA investigation at Commonwealth Edison's Waukegan Generating Station. Analytical results from these two monitoring wells confirmed that groundwater containing arsenic had migrated under the EJ&E railroad tracks and onto Commonwealth Edison's Waukegan Generating Station property. A Phase IIB investigation was undertaken that utilized a Geoprobe® unit to collect groundwater samples to define the extent of the arsenic plume. Using the Geoprobe® collected data, two additional permanent monitoring wells were installed to confirm the arsenic plume delineation. At the present time, the delineation indicates that the arsenic plume has migrated 400 feet from the former Tannery.

The groundwater samples collected from the Phase IIA and IIB monitoring wells were analyzed the total and dissolved RCRA metals under Level III QA/QC. The 14 Geoprobe® samples were analyzed for arsenic under Level III QA/QC.

4.1.1 Volatile Organic Compounds

Volatile organic compounds were not detected in any of the newly installed Phase II monitoring wells, MW-1A, MW-5A, MW-7A, MW-8, and MW-9. Samples for VOCs were not collected

from the existing monitoring wells because the Phase I investigation showed a lack of VOCs in the groundwater.

4.1.2 Base-Neutral/Acid Extractable Compounds

Two SVOCs were detected in the groundwater samples collected, di-n-butyl phthalate and bis(2-ethylhexyl) phthalate. Both of these compounds were detected in five of the twelve samples collected. All of the di-n-butyl phthalate were qualified "JB", indicating that the laboratory method blank also contained this analyte, which indicates that this compound is present due to laboratory contamination.

The bis(2-ethylhexyl) phthalate concentrations ranged from an estimated concentration of 2 ppb in MW-1A and MW-7A to an estimated concentration of 5 ppb in MW-5A. Bis(2-ethylhexyl) phthalate, as well as most of the phthalate family, are common laboratory contaminants. The presence of both of these compounds is likely due to laboratory contamination.

4.1.3 Pesticides/PCBs

Pesticides and PCBs (P/PCBs) were not detected in any of the groundwater samples collected.

4.1.4 Inorganics

As expected, inorganic analytes were detected in all samples collected. Many of these analytes are considered naturally occurring in groundwater at varying levels. Additionally, a significant decrease in analyte concentrations is observed when comparing the total (unfiltered) versus dissolved (filtered) concentrations. This concentration decrease from the total to the dissolved value is a result of the acid preservative dissolving the constituents from the suspended solids in the sample containers.

The Class I Groundwater Standard for chromium, as found in IAC Title 35, Subpart D, Section 620.410(a), is 100 μg/l. All of the filtered groundwater samples collected showed dissolved chromium concentrations at less than 40 percent of the Class I standard. The dissolved chromium concentrations ranged from 1 μg/l in MW-4 to 40 μg/l in MW-2.

Chromium was detected above Class I standards in the unfiltered samples from 8 of the twelve wells sampled. Monitoring wells MW-4, MW-5, MW-7, and MW-7A had unfiltered total chromium concentrations below the 100 μg/l standard. The highest total concentration identified was 6,670 μg/l in MW-8. The corresponding dissolved concentration was 10.1 μg/l, a reduction of greater than 600 times the total amount. This data shows that the majority of the chromium is bound to soil particles greater than 0.45μm in size, and not readily desorbed into the aquifer. While reductions of this magnitude were not always realized, this reduction is indicative of general trends throughout the site. The upgradient wells, MW-7 and MW-7A, contained total chromium at concentrations of 19 and 11 μg/l and dissolved chromium at concentrations of 8.2 and 1 μg/l, respectively.

The filtered samples collected during Phase II show chromium results similar to those for the unfiltered samples collected during Phase I of the investigation. The reason for the increase in the chromium concentration in the Phase II unfiltered samples is unknown, but may be due to the geologic conditions encountered, and the locations of the new monitoring wells.

All of the Phase I and Phase II unfiltered monitoring well samples were analyzed for hexavalent chromium. The hexavalent chromium values were all less than 10 µg/l, with the exception of MW-4 which contained 41 µg/l. The total chromium concentration in this sample was 53 µg/l. The dissolved chromium concentration in this sample was less than 10 µg/l. The total chromium concentration for both the filtered and unfiltered samples are both below the Class I standard of 100 µg/l.

Total arsenic concentrations exceeded the Class I standard in four of the monitoring wells; MW-1, MW-2, MW-8, MW-9, MW-10, and MW-11. The highest observed concentration was 2,100 µg/l in MW-1.

Dissolved arsenic concentrations exceeded the Class I standard of 50 µg/l in five monitoring wells; MW-1, MW-8, MW-9, MW-10, and MW-11. The arsenic concentrations in these five wells ranged from 83 µg/l in MW-10 to 1,100 µg/l in MW-1. It should be noted that MW-2 contained 49 µg/l, very close to the Class I standard of 50 µg/l. The arsenic concentration in MW-1 has decreased since the last Phase I concentration of 6,470 µg/l, while the concentration in MW-2 has increased from 28 µg/l.

It has not been confirmed that arsenic usage occurred at this site. However, research is being conducted to verify the type of tanning processes that were utilized on-site.

Total cadmium was identified in four wells above the Class I standard of 5 µg/l; MW-1, MW-3, MW-4, and MW-5. The maximum total cadmium concentration was 18 µg/l. Two of these four wells, MW-4 and MW-5, exhibited dissolved cadmium concentrations either at or above the Class I standard at 5 and 15 µg/l, respectively. Total cadmium was not identified in any of the groundwater samples collected during the Phase I investigation.

Total mercury concentrations in MW-2 and MW-8 were found to be above the Class I standard of 2 µg/l, at 3 and 4.6 µg/l, respectively. All dissolved mercury values were below the Class I standard. All total mercury values from the Phase I samples were below the Class I standard.

Total lead values exceeded the Class I standard of 7.5 µg/l in all monitoring wells with the exception of MW-1, MW-3, MW-4, MW-5, MW-6, and MW-12. Concentrations ranged from 12.4 µg/l in MW-5A to 168 µg/l in MW-8. All dissolved lead concentrations were below the Class I standard.

For all of the Phase II wells, both the filtered and unfiltered samples exceeded the Class I standard of 150 µg/l for manganese. The highest concentration was found in MW-5A at 879 µg/l. These results are consistent with the Phase I groundwater samples which all exceeded the

Class I standard. Additionally, MW-7A, the upgradient well, contained one of the higher manganese concentrations.

Total iron concentrations exceeded the Class I standard of 5,000 μg/l in all of the newly installed wells. The highest concentration was found in MW-5A at 19,100 μg/l. Dissolved iron exceeded the Class I standard in only one well, MW-5A, at a concentration of 15,100 μg/l. Four of the seven Phase I monitoring wells exceeded the Class I standard during Phase I sampling activities. These elevated concentrations are the result of the high TDS values which are considered naturally occurring.

All monitoring wells, with the exception of MW-7A, exceeded the total dissolved solids (TDS) Class I Standard of 1,200,000 μg/l. The TDS result for MW-7A was 930,000 μg/l. These results correspond with the high TDS values obtained during the Phase I investigation. These results show that the high TDS values are naturally occurring.

Overall, the total chromium concentrations from the Phase I sampling event are comparable to those obtained for the filtered Phase II samples. The arsenic concentration in MW-1 has decreased by a factor of three from Phase I to Phase II. The arsenic concentration in MW-2 showed an increase over the Phase I result. At the present time, the arsenic plume, as shown by the results obtained for MW-9, has reached the eastern edge of the site boundary. The Phase IIA monitoring wells, MW-10, and MW-11 show that the arsenic plume has migrated under the EJ&E railroad tracks and onto Commonwealth Edison's Waukegan Generating Station property. Based upon the results of the Phase IIB investigation, the arsenic plume appears to have migrated a distance of approximately 400 feet to the east of the site. Total lead, cadmium and mercury levels have shown an increase in concentration between Phase I and Phase II to above the Class I standards. Phase II dissolved concentration for lead and mercury were below the Class I standard. The reason for the increase in these constituents is unknown, but may be attributable to accumulation of very fine soil particles (less than 0.45μm in diameter) in the wells.

Analytical results for all groundwater samples are summarized in Table 4-1.

4.2 SURFACE AND SUBSURFACE SOILS

Several areas of concern were identified during the Phase I investigation. The concerns associated with the different areas were caused by either a specific compound, for example arsenic in surface/subsurface soils, or a specific class of compounds, such as PCBs. As a result, additional sampling was conducted in these areas of concern for the specific compound or class of compound. This Section summarizes the results of the investigations into the specific areas of concern.

In order to supplement the Phase I investigation, 51 surface soil, 30 subsurface soil, three sediment and two production waste samples were collected. The analytical parameters varied dependant upon the purpose of the sample. Samples were collected to more fully define the extent of certain constituents, characterize the nature of the constituents present, collect sufficient

data to conduct both a Baseline Risk Assessment (BRA) and Ecological Risk Assessment (ERA), and to determine if constituents had migrated beyond the site boundary.

In order to combine the Phase I and Phase II investigations, the analytical data summaries presented below incorporate results from both phases of the investigation. Non-parameter specific data summaries are presented in Table 4-2. All of the Figures presented incorporate data collected during both the Phase I and Phase II investigations.

4.2.1 Pesticides at Location SB-39

During the Phase I investigation, elevated levels of DDT, DDD, and DDE were identified in the surface soils at sampling location SB-39. The total pesticide concentration at this location was 48,000 μg/kg. In order to determine the extent of the surfical pesticides in this area, three surface and one subsurface samples were collected. Analytical results for these four samples indicate that there is not a significant amount of pesticides in these samples, which shows that the elevated pesticide level in the surface soil at this location is an isolated occurrence.

Analytical results for these samples are summarized in Table 4-2. Surfical and subsurfical total pesticide distribution maps are contained in Figures 4-1 and 4-2, respectively.

4.2.2 Polychlorinated Biphenyls and Polynuclear Aromatic Hydrocarbons

During the Phase I investigation, elevated levels of PCBs and PNAs were observed in Area III. In order to more fully define the extent of the PCBs and PNAs, fifteen additional Phase II soil samples were collected, 14 surfical and one subsurfical. All 15 samples were analyzed for PCBs. In addition, four of the samples were analyzed for PNAs. PCBs were detected in all fifteen of the Phase II samples collected. The PCB concentrations ranged from 220 μg/kg at SB-100A to 116,800 μg/kg at SB-56A.

Similar to the Phase I investigation, the predominant Aroclor identified was 1248 coupled with lesser quantities of Aroclor 1254. Small amounts of Aroclor 1260 were found in several of the samples collected. The source of the PCBs at these locations is unknown.

Analytical results for the samples collected during the Phase II investigation are summarized in Table 4-2. Surfical and subsurfical total PCB distribution maps are contained in Figures 4-3 and 4-4, respectively.

4.2.3 Polychlorinated Dibenzo Dioxins/Furans

In response to requests from the Community Action Group (CAG), two of the soil samples collected were analyzed for polychlorinated dibenzo dioxins/furans (PCDD/PCDF). One sample was located near the production waste disposal area and one located in an area exhibiting elevated Phase I PCB concentrations. All of the PCDD and PCDF compounds were identified in SB-55A, and 14 out of the 17 compounds were identified in sample SB-59A. Concentrations

of the various compounds ranged from 5.7 parts per trillion (ppt) of 2,3,4,7,8-hexachlorodibenzofuran in sample SB-59A to 140,000 ppt 1,2,3,4,6,7,8-heptachlorodibenzodioxin in sample SB-59A.

The U.S. EPA has a method for calculating the relative risk to humans of the various PCDD/PCDF compounds. These relative risks are based upon the toxicity of 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD), believed to be the most toxic PCDD/PCDF. With the relative risk factors applied, both of these samples are below the 1 part per billion (ppb) 2,3,7,8-TCDD risk based cleanup threshold. Analytical results for the dioxin/furans are summarized in Table 4-3.

4.2.4 Asbestos

Based upon information supplied by the CAG and others, sand dredged from Lake Michigan and temporarily stored at the former tannery may have been impacted with asbestos. In order to determine the presence of asbestos fibers, two sand samples were submitted for asbestos fiber analysis by polarized light microscopy (PLM). Asbestos fibers were not detected in either of the samples. Analytical results for the asbestos samples are summarized in Table 4-4.

4.2.5 Arsenic Specific Sampling

In order to identify the possible source of the arsenic detected in MW-1 during the Phase I investigation, 36 soil samples; 18 surfical and 18 subsurfical, were collected and analyzed for arsenic only. Slightly elevated arsenic levels were identified in the surface and subsurface soils in the vicinity of MW-1. The arsenic levels identified ranged from 1.2 mg/kg in SB-45B to 10,000 mg/kg in SB-50B. While no distinct arsenic source was identified, the elevated arsenic levels are present throughout Area II. In addition, the two samples exhibiting the highest arsenic concentrations, SB-44A at 4,600 mg/kg and SB-50B at 10,000 mg/kg, were tested for leachable arsenic. *The results for both of these samples did not exceed the 5 mg/l regulatory limit.* Analytical results from these arsenic samples are summarized in Table 4-5.

4.2.6 Chromium Speciation

In order to more fully characterize site conditions, the valence state of the chromium was determined. Chromium generally occurs in two valance states, the more benign and less mobile trivalent state (Cr^{+3}) and the more toxic, more mobile hexavalent state (Cr^{+6}). A total of 22 soil and sediment samples were collected and analyzed for Cr^{+3} and Cr^{+6}. The highest Cr^{+6} concentration in any of the samples collected was 16 mg/kg in sample SB-64A/CA. The corresponding Cr^{+3} concentration was 49,000 mg/kg. This data shows that the chromium present at the site is almost exclusively in the more benign, less mobile trivalent state. The percentages of trivalent chromium range from 99.97% Cr^{+3} in sample SB-64A/CA up to 99.992% Cr^{+3} in sample 67A/CA. Hexavalent chromium analytical results are summarized in Table 4-2.

4.2.7 Site Classification/Characterization

In order to determine if the waste material exhibits the toxicity characteristic as defined in 40 CFR 261.24, a total of 12 surface and five subsurface soil samples were collected and analyzed for RCRA and TCLP metals. In addition, two of the production waste samples were re-sampled for RCRA and TCLP metals.

None of the soil samples collected contained leachable chromium over the 5 mg/l regulatory limit. Total chromium concentrations ranged from 230 mg/kg in SB-69A/CA to 54,000 mg/kg in SB-73B.

Samples SB-69A/CA and SB-69B/CB both exceeded the regulatory limit of 0.2 mg/l for mercury, at 0.57 and 0.58 mg/l, respectively. This sample was taken from the production waste area, and based upon the relatively low total chromium values (230 mg/kg and 1600 mg/kg), this sample does not reflect overall site conditions, only this localized area.

Production waste sample PW-9 exceeded the TCLP regulatory limit of 5 mg/l for chromium at a concentration of 14 mg/l. This result is similar to the TCLP chromium concentration of 24.2 mg/l that was obtained for this sample during the Phase I investigation. Unlike the Phase I investigation, PW-5 did not exceed the TCLP lead limit.

All other samples reported TCLP concentration below the regulatory limits.

4.3 CONSTITUENT DELINEATION

Upon completion of the Phase I investigation, it was determined that there were certain areas in which insufficient analytical data had been collected. As a result, additional data was collected in these areas. This sampling was in response to data gaps identified during preparation of the Phase I RI, not in response to a specific area of concern. This section summarizes the results obtained during this portion of the Phase II investigation.

In order to fill existing data gaps, and to gather additional data for purposes of the BRA, ERA, and site characterization, a total of 15 samples were collected and analyzed for TCL SVOCs, TCL P/PCBs, and RCRA metals.

The samples collected to further delineate extent were SB-61A through SB-69A, SB-62B, SB-67B, SB-69B, and the three samples collected during monitoring well installation, MW-1A, MW-5A, and MW-7A.

Nine of the 15 samples collected were surface soils and 6 were subsurface soils. The three subsurface soil samples collected during monitoring well installation were analyzed for the Target Analyte List (TAL) inorganics.

The following sections summarize the findings of the Phase II investigation and incorporates data from both the Phase I and II investigations into the colored Figures showing constituent distribution. Where appropriate, pertinent Phase I investigation material is incorporated into this section to complete the site overview. Analytical data for these samples is summarized in Table 4-2.

4.3.1 Base-Neutral/Acid Extractables

The only SVOC detected in the soil samples collected during monitoring well installation was di-n-butyl phthalate. This compound was identified in all three samples at concentration ranging from 240 µg/kg in MW-5A to 2,200 µg/kg in MW-1A. All of these concentrations were qualified with a "B", which indicates that this compound is present in the laboratory blank. It is likely that di-n-butylphthalate is not present in the environment at the sampling locations.

The remaining 12 samples, which were collected to gather additional information and close data gaps, were found to contain only PNAs. The PNAs were identified in eight of the 12 samples collected. The concentrations identified ranged from 550 µg/kg in SB-64A/CA to 36,000 in SB-62A. The highest PNA concentration identified during the Phase I investigation was 172,000 µg/kg in SB-15A. The Phase II data shows the same trends as the Phase I data with regard to PNA distribution; decreasing concentrations with increasing depth. Surfical and subsurfical total PNA distribution maps are contained in Figures 4-5 and 4-6, respectively.

4.3.2 Pesticides/PCBs

Pesticides and PCBs were not detected in any of the soil samples collected during monitoring well installation.

As expected from the Phase I data, low levels of pesticides were found in eight of the nine surface soils collected. Only surface soil sample SB-69A/CA did not contain pesticides. None of the subsurface samples were found to contain pesticides. Of the eight surface soils that contained pesticides, the highest total pesticide concentration observed was 2,066 µg/kg in sample SB-63A. The second highest total pesticide concentration was 626 µg/kg in SB-61A. The remaining six samples all contained less than 125µg/kg total pesticides. Similar to the Phase I investigation, total pesticide concentrations tended to decrease with increasing depth.

Polychlorinated biphenyls were identified in five of the 12 surface and subsurface soil samples collected. Similar to the Phase I investigation, the PCBs were not found in the samples collected in Area I, only in the production waste area and in the southern portion of Area II. The total PCB concentrations ranged from 160 µg/kg in SB-65A to 1,080 µg/kg in SB-69B/CB.

4.3.3 Inorganics

Significant quantities of inorganics were not detected in any of the samples collected during monitoring well installation. The arsenic concentrations ranged from 1.2 mg/kg in MW-5A to 3.4 mg/kg in MW-1A.

The chromium concentration ranged from 11.8 mg/kg in MW-1A to 73.5 mg/kg in the upgradient monitoring well location, MW-7A. The lead concentrations ranged from 2.2 mg/kg in MW-1A to 9.0 mg/kg in MW-7A.

The goal of collecting these samples was to more fully define the areas impacted by chromium, lead, and to a lesser extent, arsenic and mercury. Analytical results vary among the samples collected during this portion of the investigation. For example, chromium concentration range from 5.8 mg/kg in SB-62B to 49,000 mg/kg in SB-64A/CA. The surfical and subsurfical chromium distribution maps are contained in Figures 4-7 and 4-8, respectively. The surfical lead distribution map is contained in Figure 4-9. The surfical and subsurfical arsenic distribution maps are contained in Figures 4-10 and 4-11, respectively.

4.4 WETLAND SURFACE WATER/SEDIMENT SAMPLING

In order to collect additional data to support the ERA, three surface water and sediment samples were collected from the wetland area south and east of Area III. These samples were analyzed for TCL SVOCs, TCL P/PCBs, RCRA Metals, Acid Volatile Sulfide (AVS), Simultaneous Extractable Metals (SEM), and Total Organic Carbon (TOC).

4.4.1 Base-Neutral/Acid Extractables

The only class of compounds identified in the wetland sediment samples was PNAs. They were identified in all three samples at relatively low concentrations. Total PNA concentrations ranged from 430 µg/kg in WL-2 to 2,590 µg/kg in WL-1.

The only SVOC detected in the wetland surface water samples was bis(2-ethylhexyl)phthalate in sample WL-2 at an estimated concentration of 3 µg/l. Phthalates, as a class of compounds are common laboratory contaminants. The presence of bis(2-ethylhexyl)phthalate in the environment at this sampling location is questionable. Analytical results are summarized in Table 4-6.

4.4.2 Pesticides/PCBs

Only one pesticide was identified in the three sediment samples collected. Methoxychlor was identified in sample WL-1 at an estimated concentration of 3.9 µg/kg.

Aroclor-1248 was identified in WL-2 and WL-3 at estimated concentrations of 81 µg/kg and 120 µg/kg, respectively.

Pesticides and PCBs were not detected in any of the surface water samples collected

Analytical results are summarized in Table 4-6.

4.4.3 Inorganics

Seven of the eight RCRA metals were not present in the wetland sediments at significant concentrations.

Chromium concentrations in the wetland sediment ranged from 9,410 mg/kg in sample WL-2 to 14,100 mg/kg in WL-3. These values are lower than those found throughout Area II and parts of Area III.

All hexavalent chromium concentrations were below the laboratory Practical Quantitation Limit (PQL). The valence state of the chromium in the wetland sediments is greater than 99.999% Cr^{+3}.

For the surface water samples, both filtered and unfiltered samples were collected. The dissolved metals samples were filtered prior to preservation utilizing a 0.45μm filter.

Barium, chromium, and lead were the only inorganics identified in the surface water samples. These analytes were detected at very low concentrations below Illinois Class I groundwater standards. All barium and detected lead results were flagged with a "B", indicating laboratory induced contamination.

The total chromium concentration in WL-SW-1 was 37.3 μg/l, and the dissolved concentration was 6.5 μg/l. By filtration, it is shown that the majority of the chromium is adsorbed to suspended soil particles and not dissolved in the water. Additionally, all of the low level chromium detections were also flagged with a "B", indicating minor laboratory contamination.

All hexavalent chromium concentrations were below the laboratory PQL.

Analytical results are summarized in Table 4-6.

4.4.4 Acid Volatile Sulfide/Simultaneous Extractable Metals

Acid Volatile Sulfide (AVS) and SEM analysis was performed on three wetland sediment samples to determine their persistence in the aquatic sediments. Acid Volatile Sulfide analysis is determined in a deoxygenated environment whereby sulfide is liberated and trapped. The sulfide concentration is determined by using a spectrophotometer. The SEMs are determined by Inductively Coupled Plasma Spectrometry (ICP). The six metals that are considered in the analysis are cadmium, copper, lead, mercury, nickel, and zinc. Values may be less than those obtained by other methodologies because sample preparation does not require such a rigorous digestion.

The SEM/AVS ratio is useful in predicting the toxicity of aquatic sediments. If the SEM/AVS ratio is less than unity (one), no significant toxicity exists. This is because binding phases (metal oxides, organic matter) reduces their bioavailability. If the SEM/AVS ratio is greater than one, then a toxic potential exists in the aquatic sediment. The laboratory analysis for wetland sediment sample WL-1 indicates a value less than one indicating that metal toxicity would not occur. However, analysis for WL-2 and WL-3 indicate that a toxicity potential exits in the aquatic sediment. Therefore, these metals are available and could potentially cause an ecological risk.

In addition, the surface water and sediment samples were analyzed for total organic carbon (TOC). The purpose of the TOC analysis is to aid in the determination of the bioavailability of organic material, which will enhance completion of the ERA. The TOC content of the soil ranged from 140,000 mg/kg in WL-1 to 330,000 in WL-3. For the surface water samples, the TOC content ranged from 5.9 mg/l in WL-SW-3 to 12 mg/l in WL-SW-1.

Analytical results for these analyses are contained in Table 4-7.

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SECTION 5.0
SUMMARY AND RECOMMENDATIONS

5.1 PURPOSE

The purpose of the Phase II investigation activities was to supplement the Phase I investigation results by collecting sufficient data to fully characterize the site in terms of the impact to on and off site media from chemical compounds. The Phase II activities, used in conjunction with the Phase I activities, will also serve as the primary database for a Baseline Risk Assessment (BRA) and Ecological Risk Assessment (ERA).

The principal soil contaminants at this site, in reference to lateral extent and concentration, are chromium and, to a lesser extent, arsenic, lead, and mercury. Polychlorinated biphenyls, PNAs, and pesticides are present in specific areas of the site. Impact to the groundwater stems primarily from dissolved arsenic.

Parameter specific analyses were conducted during Phase II activities to further determine the extent, concentration, toxicity, and trend of the above compounds. In addition, analyses for dioxins/furans and asbestos were performed on select samples due to community input.

5.2 SUMMARY OF RESULTS

Four samples were collected for pesticide analysis surrounding soil boring SB-39 due to elevated pesticide levels detected at this location during the Phase I investigation. The analytical results indicated that the pesticide concentrations were low and occur in an isolated area. Fifteen soil samples were collected for PCB analysis from Area III due to elevated PCBs in a localized area. Polychlorinated biphenyls were detected in all fifteen soil samples collected during Phase II sampling activities. The predominant Aroclor was 1248.

In response to requests from the CAG, two soil samples were analyzed for PCDD/PCDF due to their concern that PCBs were burned at the site. The analytical results indicated the presence of PDCC/PCDF compounds but, not above the 1 ppb 2,3,7,8-TCDD risk based cleanup threshold. Two additional samples were analyzed for asbestos. It was the concern of CAG members that sand, used as fill at the site, contained asbestos. Asbestos was not present in the two samples.

To supplement data gaps and to gather additional information, additional soil samples were collected and analyzed for TCL Pesticides/PCBs, TCL SVOCs, and RCRA metals Pesticides were detected in eight of the nine soil samples collected. Polychlorinated biphenyls were detected in five of the twelve soil samples collected. Similar to the Phase I investigation, pesticides and PCBs tended to decrease with increasing depth.

Polynuclear aromatic hydrocarbons were detected in eight of 12 soil samples collected during Phase II sampling activities.

Due to elevated arsenic levels detected in select locations of Area II during Phase I activities, thirty-six soil samples were collected and analyzed for arsenic to define the extent of impact within this area. Slightly elevated levels of arsenic were present throughout Area II. Two of the thirty-six soil samples that exhibited the highest arsenic values, SB-44A and SB-50B, were tested for leachable arsenic. Neither result exceeded the 5 μg/l TCLP regulatory limit.

As part of the investigation activities, twenty two soil and sediment samples were collected and analyzed to determine the valence state of chromium; trivalent, the less mobile and less toxic form, or hexavalent, the more mobile and more toxic form. The data indicated that, at a minimum, 99.97% of the chromium exists in the trivalent state.

To determine whether the material on site might be classified as a characteristic waste, twelve surface and five subsurface samples were analyzed for TCLP and RCRA metals. Two production waste samples, PW-5 and PW-9, were re-sampled for RCRA and TCLP metals. Only two soil samples, SB-69A/CA and SB-69B/CB exceeded the TCLP regulatory limit in both cases for mercury. These samples were taken in the production waste area and reflect only an isolated area and not the entire site. Production waste sample PW-9 exceeded the chromium TCLP regulatory limit of 5 mg/l. Phase I analytical results for production waste sample PW-9 also indicated a chromium concentration exceeding the TCLP regulatory limit. Phase II analytical results for Production Waste sample PW-5 did not exceed any TCLP regulatory limits. However, PW-5 had exceeded the chromium TCLP limit during the Phase I investigation. Both PW-5 and PW-9 appear to meet the chromium waste exclusion determination.

Phase II soil samples further defined the areas identified during Phase I as being impacted by chromium and to a lesser extent; lead, arsenic, and mercury.

Groundwater analytical results indicated levels established for Class Groundwater in Illinois Administrative Code (IAC) Title 35, Subpart D, Section 620.140, were not exceeded for VOCs, BNAs, and pesticides/PCBs. But, as expected, inorganic analytes were detected in all samples collected. Dissolved arsenic was detected above the Class I Groundwater Standard (50 μg/l) in five monitoring wells; MW-1, MW-8, MW-9, MW-10, and MW-11. One monitoring well, MW-2, was close to the arsenic Class I Standard but was not included as an exceedance. Two monitoring wells, MW-4 and MW-5, were at or above the dissolved cadmium Class I Groundwater Standard. Dissolved manganese, iron, and TDS exceeded their respective Class I Groundwater Standard in most monitoring wells, however, since these constituents were prevalent in elevated levels during Phase I sampling and in the upgradient monitoring wells during both phases of the investigation, these levels are considered naturally occurring. Dissolved concentrations (filtered samples) did not exceed the Class I Standard for mercury, chromium, and lead.

The Phase IIA and IIB investigation determined the extent of the arsenic plume in the groundwater. Results from these investigations indicate that the plume has migrated approximately 400 feet to the east of the former tannery, under the EJ&E railroad tracks and onto Commonwealth Edison's Waukegan Generating Station.

The groundwater samples were analyzed for hexavalent chromium to determine the valence state of chromium in the groundwater. One monitoring well, MW-4, contained 41 µg/l of total hexavalent chromium. Total chromium concentrations for this well was 53 µg/l whereas the dissolved chromium was less than 10 µg/l.

To support an ERA, three wetland surface water and sediment samples were collected and analyzed for TCL SVOCs, TCL P/PCBs, RCRA Metals, AVS/SEM, and TOC.

Of the SVOCs, only PNA compounds were detected in all three sediment samples. One SVOC, bis(2-ethylhexyl)phthalate, was detected at an estimated valued in the surface water. This phthalate is a common laboratory contaminant.

One pesticide, methoxychlor, was detected in sediment sample WL-1 at 3.9 µg/kg. Aroclor 1248 was identified at estimated concentrations in sediment samples WL-2 and WL-3 at 81 µg/kg and 120 µg/kg, respectively. Surface water analytical results did not indicate the presence of any pesticides or PCBs.

Seven of the eight RCRA metals were not detected at significant levels in each sediment sample collected in the wetland area. Chromium exhibited the highest concentrations ranging from 9,410 mg/kg in WL-2 to 14,100 mg/kg in WL-3. Chromium speciation analysis indicated that 99.99% of the chromium exists as trivalent chromium.

Total and dissolved RCRA metals analysis was performed on the surface water samples. Dissolved lead was detected at concentrations below Illinois Class I groundwater standards. Dissolved barium and chromium were identified and were flagged with a "B" qualifier indicating laboratory induced contamination.

Acid Volatile Sulfide and Simultaneously Extractable Metals were performed on three sediment sample to determine their persistence in the aquatic sediments. The analyses indicate that a toxicity potential exist in sediment samples WL-2 and WL-3 which could pose as an ecological risk.

Total organic carbon analysis were performed on both the sediment and surface water samples to determine the bioavailability of organic material. These data will enhance the completions of the ERA.

At this point, data appears sufficient for performing a BRA/ERA, and further site investigation does not appear necessary. From the activities performed and the data collected, it appears that the next step for this site is to perform a BRA/ERA. The human health risk assessment process

provides a necessary point of definition for whether a site or particular environmental media, is in need of remediation or requires mitigation measures.

A BRA is an evaluation of the potential threat to human health and the environment in the absence of any remedial action. A BRA is key to the process of investigating and formulating appropriate responses to environmental releases or contamination. The risk assessment identifies potential receptors (both human and environmental) and evaluates the likelihood that contaminants present at a site will adversely affect these receptors. It provides information to help EPA determine whether remedial action is necessary at a site.

Ecological risk assessments help identify environmental problems, establish environmental investigation priorities, and provide a scientific basis for regulator actions. The ERA helps evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure. The ERA is a qualitative and/or quantitative appraisal of the actual or potential effects of a site on plants and animals.

SECTION 6.0
REFERENCES

U.S. EPA, 1974, Leather Tanning and Finishing, EPA-440/1-74-016a, Office of Air and Water Programs, Washington, D.C.

U.S. EPA, 1980, Hazardous Waste Land Treatment, SW-874, Office of Water and Waste Management, Washington, D. C.

U.S. EPA, 1986, Project Summary - Field Investigation and Evaluation of Land Treating Tannery Sludges, EPA/600/S2-86/033, Robert S. Kerr Environmental Research Laboratory, Ada, Oklahoma.

9430.00735

Definitions of Data Qualifiers and Terminology

A	This flag is utilized to indicate that a tentatively identified compound (TIC) is a suspected aldolcondensation product formed during sample processing and caution should be applied in interpreting these results.
B	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible and probable blank contamination and warns the data user to use caution when applying the results of this analytes.
BQL	Below quantitation limit indicates the compound was not detected in the samples above the practical quantitation limit.
C	Indicates that a pesticide identification has been confirmed utilizing GC/MS techniques.
D	Indicates that sample extract was diluted by the factor listed due to the sample matrix and/or concentration levels. All method detection limits or practical quantitation limits for the particular samples are therefore increased by this dilution factor.
E	Indicates that the concentration of the specific compound exceeded the calibration range of the instrument for that particular analysis.
J	Indicates an estimated value. It indicates that the compound was analyzed for and determined to be present in the sample. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that met the identification criteria but the result is less that the sample quantitation limit ut greater than zero.
ND	Indicates the compound or analyte was not detected in the sample above the method detection limit or the practical quantitation limit for the particular analysis.
PQL	The practical quantitation limit is the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine operating conditions.
U	Indicates the compound was analyzed for but not detected in the sample above the applicable quantitation limit.

TABLE 4-1
GROUNDWATER ANALYTICAL RESULTS
FORMER GREISS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	MW-1A	MW-5A	MW-7A	MW-8	MW-9	Regulatory
IEA Sample ID Number	950219504	950219501	950219505	950219502	950219503	Standards
VOLATILE ORGANIC COMPOUNDS						
CHLOROMETHANE	<10	<10	<10	<10	<10	--
BROMOMETHANE	<10	<10	<10	<10	<10	--
VINYL CHLORIDE	<10	<10	<10	<10	<10	2
CHLOROETHANE	<10	<10	<10	<10	<10	--
METHYLENE CHLORIDE	<10	<10	<10	<10	<10	--
ACETONE	<10	<10	<10	<10	<10	--
CARBON DISULFIDE	<10	<10	<10	<10	<10	--
1,1-DICHLOROETHENE	<10	<10	<10	<10	<10	7
1,1-DICHLOROETHANE	<10	<10	<10	<10	<10	--
1,2-DICHLOROETHENE (TOTAL)	<10	<10	<10	<10	<10	100
CHLOROFORM	<10	<10	<10	<10	<10	--
1,2-DICHLOROETHANE	<10	<10	<10	<10	<10	5
2-BUTANONE	<10	<10	<10	<10	<10	--
1,1,1-TRICHLORDETHANE	<10	<10	<10	<10	<10	200
CARBON TETRACHLORIDE	<10	<10	<10	<10	<10	5
BROMODICHLOROMETHANE	<10	<10	<10	<10	<10	--
1,2-DICHLOROPROPANE	<10	<10	<10	<10	<10	5
CIS-1,3-DICHLOROPROPENE	<10	<10	<10	<10	<10	--
TRICHLOROETHENE	<10	<10	<10	<10	<10	5
DIBROMOCHLOROMETHANE	<10	<10	<10	<10	<10	--
1,1,2-TRICHLOROETHANE	<10	<10	<10	<10	<10	--
BENZENE	<10	<10	<10	<10	<10	5
TRANS-1,3-DICHLOROPROPENE	<10	<10	<10	<10	<10	--
BROMOFORM	<10	<10	<10	<10	<10	--
4-METHYL-2-PENTANONE	<10	<10	<10	<10	<10	--
2-HEXANONE	<10	<10	<10	<10	<10	--
TETRACHLOROETHENE	<10	<10	<10	<10	<10	5
1,1,2,2-TETRACHLOROETHANE	<10	<10	<10	<10	<10	--
TOLUENE	<10	<10	<10	<10	<10	1000
CHLOROBENZENE	<10	<10	<10	<10	<10	100
ETHYLBENZENE	<10	<10	<10	<10	<10	700
STYRENE	<10	<10	<10	<10	<10	100
XYLENES (TOTAL)	<10	<10	<10	<10	<10	10000

All units are in ug/L (ppb).

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TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number	MW-1 950290005	MW-1A 950219504	MW-2 950301003	MW-3 950290003	MW-4 950301001	MW-5 950290001	MW-5A 950218501	MW-6 950301005
SEMI-VOLATILE ORG. COMPOUNDS								
PHENOL	<10	<10	<10	<10	<10	<10	<10	<10
BIS (2-CHLOROETHYL)ETHER	<10	<10	<10	<10	<10	<10	<10	<10
2-CHLOROPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
1,3-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10	<10	<10
BENZYL ALCOHOL	<10	<10	<10	<10	<10	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10	<10	<10
2-METHYLPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
BIS (2-CHLOROISOPROPYL) ETHER	<10	<10	<10	<10	<10	<10	<10	<10
4-METHYLPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
N-NITROSO-DI-N-PROPYLAMINE	<10	<10	<10	<10	<10	<10	<10	<10
HEXACHLOROTHEANE	<10	<10	<10	<10	<10	<10	<10	<10
NITROBENZENE	<10	<10	<10	<10	<10	<10	<10	<10
ISOPHORONE	<10	<10	<10	<10	<10	<10	<10	<10
2-NITROPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
2,4-DIMETHYLPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
BENZOIC ACID	<10	<10	<10	<10	<10	<10	<10	<10
BIS (2-CHLOROETHOXY) METHANE	<10	<10	<10	<10	<10	<10	<10	<10
2,4-DICHLORPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
1,2,4-TRICHLOROBENZENE	<10	<10	<10	<10	<10	<10	<10	<10
NAPHTHALENE	<10	<10	<10	<10	<10	<10	<10	<10
4 CHLOROANILINE	<10	<10	<10	<10	<10	<10	<10	<10
HEXACHLOROBUTADIENE	<10	<10	<10	<10	<10	<10	<1J	<10
4 CHLORO-3-METHYLPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
2METHYLNAPHTHALENE	<10	<10	<10	<10	<10	<10	<10	<10
HEXACHLOROCYCLOPENTADIENE	<10	<10	<10	<10	<10	<10	<10	<10
2,4,6-TRICHLOROPHENOL	<10	<10	<10	<10	<10	<10	<10	<10
2,4,5-TRICHLOROPHENOL	<50	<25	<50	<50	<50	<50	<25	<50
2-CHLORONAPHTHALENE	<10	<10	<10	<10	<10	<10	<10	<10
2-NITROANILINE	<50	<25	<50	<50	<50	<50	<25	<50
DIMETHYLPHTHALATE	<10	<10	<10	<10	<10	<10	<10	<10
ACENAPHTHYLENE	<10	<10	<10	<10	<10	<10	<10	<10
2,6-DINITROTOLUENE	<10	<10	<10	<10	<10	<10	<10	<10
3-NITROANILINE	<50	<25	<50	<50	<50	<50	<25	<50
ACENAPHTHENE	<10	<10	<10	<10	<10	<10	<10	<10

Units are in ug/L (ppb)
NA = Analysis not performed.

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TABLE 4–1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS–PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number	MW-7 950290007	MW-7A 950290013	MW-8 950290010	MW-9 950290011
SEMI-VOLATILE ORG. COMPOUNDS				
PHENOL	<10	<10	<10	<10
BIS (2-CHLOROETHYL)ETHER	<10	<10	<10	<10
2-CHLOROPHENOL	<10	<10	<10	<10
1,3-DICHLOROBENZENE	<10	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10	<10
BENZYL ALCOHOL	<10	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10	<10
2-METHYLPHENOL	<10	<10	<10	<10
BIS (2-CHLOROISOPROPYL) ETHER	<10	<10	<10	<10
4-METHYLPHENOL	<10	<10	<10	<10
N-NITROSO-DI-N-PROPYLAMINE	<10	<10	<10	<10
HEXACHLOROETHANE	<10	<10	<10	<10
NITROBENZENE	<10	<10	<10	<10
ISOPHORONE	<10	<10	<10	<10
2-NITROPHENOL	<10	<10	<10	<10
2,4-DIMETHYLPHENOL	<10	<10	<10	<10
BENZOIC ACID	<10	<10	<10	<10
BIS (2-CHLOROETHOXY) METHANE	<10	<10	<10	<10
2,4-DICHLOROPHENOL	<10	<10	<10	<10
1,2,4-TRICHLOROBENZENE	<10	<10	<10	<10
NAPHTHALENE	<10	<10	<10	<10
4 CHLOROANILINE	<10	<10	<10	<10
HEXACHLOROBUTADIENE	<10	<10	<10	<10
4 CHLORO-3-METHYLPHENOL	<10	<10	<10	<10
2METHYLNAPHTHALENE	<10	<10	<10	<10
HEXACHLOROCYCLOPENTADIENE	<10	<10	<10	<10
2,4,6-TRICHLOROPHENOL	<10	<10	<10	<10
2,4,5-TRICHLOROPHENOL	<50	<25	<25	<25
2-CHLORONAPHTHALENE	<10	<10	<10	<10
2-NITROANILINE	<50	<25	<25	<25
DIMETHYLPHTHALATE	<10	<10	<10	<10
ACENAPHTHYLENE	<10	<10	<10	<10
2,6-DINITROTOLUENE	<10	<10	<10	<10
3-NITROANILINE	<50	<25	<25	<25
ACENAPHTHENE	<10	<10	<10	<10

Units are in ug/L (ppb)
NA – Analysis not performed.

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number IEA Sample ID Number	MW-1 950290005	MW-1A 950219504	MW-2 950301003	MW-3 950290003	MW-4 950301001	MW-5 950290001	MW-5A 950219501	MW-6 950301005	MW-6 950301005
SEMI-VOLATILE ORG. COMPOUNDS									
2,4-DINITROPHENOL	<50	<25	<50	<50	<50	<50	<25	<50	<50
4-NITROPHENOL	<50	<25	<50	<50	<50	<50	<25	<50	<50
DIBENZOFURAN	<10	<10	<10	<10	<10	<10	<10	<10	<10
2,4-DINITROTOLUENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
DIETHYLPHTHALATE	<10	<10	<10	<10	<10	<10	<10	<10	<10
4-CHLOROPHENYL PHENYL ETHER	<10	<10	<10	<10	<10	<10	<10	<10	<10
FLUORENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
4-NITROANILINE	<50	<25	<50	<50	<50	<50	<25	<50	<50
4,6-DINITRO-2-METHYLPHENOL	<50	<25	<50	<50	<50	<50	<25	<50	<50
N-NITROSODIPHENYLAMINE (1)	<10	<10	<10	<10	<10	<10	<10	<10	<10
4-BROMOPHENYL PHENYL ETHER	<10	<10	<10	<10	<10	<10	<10	<10	<10
HEXACHLOROBENZENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
PENTACHLOROPHENOL	<50	<25	<50	<50	<50	<50	<25	<50	<50
PHENANTHRENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
ANTHRACENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
DI-N-BUTYLPHTHALATE	<10	2J	<10	<10	<10	<10	2J	<10	<10
FLUORANTHENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
PYRENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
BUTYLBENZYLPHTHALATE	<10	<10	<10	<10	<10	<10	<10	<10	<10
3,3'-DICHLOROBENZIDINE	<10	<10	<10	<10	<10	<10	<10	<10	<10
BENZO(A)ANTHRACENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
CHRYSENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10	2J	<10	<10	<10	<10	5J	<10	<10
DI-N-OCTYLPHTHALATE	<10	<10	<10	<10	<10	<10	<10	<10	<10
BENZO(B)FLUORANTHENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
BENZO(K)FLUORANTHENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
BENZO(A)PYRENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
INDENO(1,2,3-CD)PYRENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
DIBENZO(A,H)ANTHRACENE	<10	<10	<10	<10	<10	<10	<10	<10	<10
BENZO(G,H,I)PERYLENE	<10	<10	<10	<10	<10	<10	<10	<10	<10

NA -- Analysis not performed
Units are in ug/L (ppb)

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TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number IEA Sample ID Number	MW-7 950290007	MW-7A 950290013	MW-8 950290010	MW-9 950290011
SEMI-VOLATILE ORG. COMPOUNDS				
2,4-DINITROPHENOL	<50	<25	<25	<25
4-NITROPHENOL	<50	<25	<25	<25
DIBENZOFURAN	<10	<10	<10	<10
2,4-DINITROTOLUENE	<10	<10	<10	<10
DIETHYLPHTHALATE	<10	<10	<10	<10
4-CHLOROPHENYL PHENYL ETHER	<10	<10	<10	<10
FLUORENE	<10	<10	<10	<10
4-NITROANILINE	<50	<25	<25	<25
4,6-DINITRO-2-METHYLPHENOL	<50	<25	<25	<25
N-NITROSODIPHENYLAMINE (1)	<10	<10	<10	<10
4-BROMOPHENYL PHENYL EHTER	<10	<10	<10	<10
HEXACHLOROBENZENE	<10	<10	<10	<10
PENTACHLOROPHENOL	<50	<25	<25	<25
PHENANTHRENE	<10	<10	<10	<10
ANTHRACENE	<10	<10	<10	<10
DI-N-BUTYLPHTHALATE	<10	2JB	2JB	2JB
FLUORANTHENE	<10	<10	<10	<10
PYRENE	<10	<10	<10	<10
BUTYLBENZYLPHTHALATE	<10	<10	<10	<10
3,3-DICHLOROBENZIDINE	<10	<10	<10	<10
BENZO(A)ANTHRACENE	<10	<10	<10	<10
CHRYSENE	<10	<10	<10	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10	2J	4J	3J
DI-N-OCTYLPHTHALATE	<10	<10	<10	<10
BENZO(B)FLUORANTHENE	<10	<10	<10	<10
BENZO(K)FLUORANTHENE	<10	<10	<10	<10
BENZO(A)PYRENE	<10	<10	<10	<10
INDENO(1,2,3-CD)PYRENE	<10	<10	<10	<10
DIBENZO(A,H)ANTHRACENE	<10	<10	<10	<10
BENZO(G,H,I)PERYLENE	<10	<10	<10	<10

NA - Analysis not performed
Units are in ug/L (ppb)

05201D USTES

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number	MW-1 950290005	MW-1A 950219504	MW-2 950301003	MW-3 950290003	MW-4 950301001	MW-5 950290001	MW-5A 950219501	MW-6 950301005
PEST/PCB COMPOUNDS								
ALPHA-BHC	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BETA-BHC	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DELTA-BHC	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
GAMMA-BHC (LINDANE)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEPTACHLOR	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ALDRIN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEPTACHLOR EPOXIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ENDOSULFAN I	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DIELDRIN	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4,4'-DDE	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
ENDRIN	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
ENDOSULFAN II	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4,4'-DDD	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
ENDOSULFAN SULFATE	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4,4'-DDT	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
METHOXYCHLOR	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
ENDRIN KETONE	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
ENDRIN ALDEHYDE	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
ALPHA-CHLORDANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
GAMMA-CHLORDANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TOXAPHENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
AROCLOR - 1016	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1221	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
AROCLOR - 1232	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1242	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1248	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1254	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1260	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Units are in ug/L (ppb).

93130.00166

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number IEA Sample ID Number	MW-7 950290007	MW-7A 950219505	MW-8 950219502	MW-9 950219503
PEST/PCB COMPOUNDS				
ALPHA-BHC	<0.050	<0.050	<0.050	<0.050
BETA-BHC	<0.050	<0.050	<0.050	<0.050
DELTA-BHC	<0.050	<0.050	<0.050	<0.050
GAMMA-BHC (LINDANE)	<0.050	<0.050	<0.050	<0.050
HEPTACHLOR	<0.050	<0.050	<0.050	<0.050
ALDRIN	<0.050	<0.050	<0.050	<0.050
HEPTACHLOR EPOXIDE	<0.050	<0.050	<0.050	<0.050
ENDOSULFAN I	<0.050	<0.050	<0.050	<0.050
DIELDRIN	<0.10	<0.10	<0.10	<0.10
4,4'-DDE	<0.10	<0.10	<0.10	<0.10
ENDRIN	<0.10	<0.10	<0.10	<0.10
ENDOSULFAN II	<0.10	<0.10	<0.10	<0.10
4,4'-DDD	<0.10	<0.10	<0.10	<0.10
ENDOSULFAN SULFATE	<0.10	<0.10	<0.10	<0.10
4,4'-DDT	<0.10	<0.10	<0.10	<0.10
METHOXYCHLOR	<0.50	<0.50	<0.50	<0.50
ENDRIN KETONE	<0.10	<0.10	<0.10	<0.10
ENDRIN ALDEHYDE	<0.10	<0.10	<0.10	<0.10
ALPHA-CHLORDANE	<0.050	<0.050	<0.050	<0.050
GAMMA-CHLORDANE	<0.050	<0.050	<0.050	<0.050
TOXAPHENE	<5.0	<5.0	<5.0	<5.0
AROCLOR - 1016	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1221	<2.0	<2.0	<2.0	<2.0
AROCLOR - 1232	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1242	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1248	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1254	<1.0	<1.0	<1.0	<1.0
AROCLOR - 1260	<1.0	<1.0	<1.0	<1.0

Units are in ug/L (ppb).

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	MW-1	MW-1 (Filtered)	MW-1A	MW-1A (Filtered)	MW-2	MW-2 (Filtered)	MW-3	MW-3 (Filtered)	Regulatory Limit
IEA Sample ID Number	950290005	950290006	950219504	950219504F	950301003	950301004	950290003	950290004	
INORGANIC COMPOUNDS									
ALUMINUM	NA	NA	1770	33.0B	NA	NA	NA	NA	--
ANTIMONY	NA	NA	4.9B	<2.0	NA	NA	NA	NA	--
ARSENIC	[redacted]	[redacted]	36.9	9.1B	[redacted]	49.0	3.5	<2.0	50 - IL
BARIUM	59.0	<50.0	28.0B	13.7B	120.0	78.0	129.0	<50.0	2000 - IL
BERYLLIUM	NA	NA	<1.0	1.0	NA	NA	NA	NA	--
CADMIUM	[redacted]	<1.0	<1.0	1.1B	<5.0	<5.0	[redacted]	<5.0	5 - IL
CALCIUM	NA	NA	234000	221000	NA	NA	NA	NA	--
CHROMIUM	[redacted]	23.0	[redacted]	3.8B	[redacted]	40.0	[redacted]	13.0	100 - IL
HEXAVALENT CHROMIUM	<0.01	NA	<0.01	NA	<0.01	NA	<0.01	NA	--
COBALT	NA	NA	4.0B	1.9B	NA	NA	NA	NA	1000 - IL
COPPER	NA	NA	9.8B	2.1B	NA	NA	NA	NA	650 - IL
IRON	NA	NA	[redacted]	1460	NA	NA	NA	NA	5000 - IL
LEAD	<3.0	<3.0	[redacted]	1.0	[redacted]	<3.0	7.2	<3.0	7.5 - IL
MAGNESIUM	NA	NA	82300	77800	NA	NA	NA	NA	--
MANGANESE	NA	NA	[redacted]	[redacted]	NA	NA	NA	NA	150 - IL
MERCURY	<0.20	0.51	0.24	1.0	[redacted]	<0.20	<0.20	<0.20	2 - IL
NICKEL	NA	NA	22.1	14.1B	NA	NA	NA	NA	100 - IL
POTASSIUM	NA	NA	5800	5730	NA	NA	NA	NA	--
SELENIUM	<3.0	<3.0	<3.0	9.4	<3.0	<3.0	<3.0	<3.0	50 - IL
SILVER	<10.0	<10.0	<1.0	<1.0	<10.0	<10.0	<10.0	<10.0	50 - IL
SODIUM	NA	NA	45500	47100	NA	NA	NA	NA	--
THALLIUM	NA	NA	<3.0	<3.0	NA	NA	NA	NA	--
VANADIUM	NA	NA	10.1B	<1.0	NA	NA	NA	NA	--
ZINC	NA	NA	68.6	3.9B	NA	NA	NA	NA	5000 - IL
TOTAL CYANIDE	<0.005(A)	NA	<10.0	NA	<0.005(A)	NA	<0.005(A)	NA	200 - IL

Units are in ug/L (ppb)
NA -- Not analyzed.
** -- Action level under review.
(A) -- Units are in mg/L

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	MW-4	MW-4 (Filtered)	MW-5	MW-5 (Filtered)	MW-5A	MW-5A (Filtered)	MW-6	MW-6 (Filtered)	Regulatory
IEA Sample ID Number	950301001	950301002	950290001	950290002	950219501	950219501F	950301005	950301006	Limit
INORGANIC COMPOUNDS									
ALUMINUM	NA	NA	NA	NA	2220	46.9	NA	NA	--
ANTIMONY	NA	NA	NA	NA	<2.0	<2.0	NA	NA	--
ARSENIC	18.0	2.5	<2.0	<2.0	<3.0	10.2	3.5	<2.0	50 - IL
BARIUM	120.0	<50.0	<50.0	<50.0	63.5B	44.5B	<50.0	<50.0	2000 - IL
BERYLLIUM	NA	NA	NA	NA	<1.0	<1.0	NA	NA	--
CADMIUM	[redacted]	[redacted]	[redacted]	[redacted]	1.4B	<1.0	<5.0	<5.0	5 - IL
CALCIUM	NA	NA	NA	NA	233000	240000	NA	NA	--
CHROMIUM	53.0	<10.0	80.0	16.0	[redacted]	1.8B	[redacted]	10.0	100 - IL
HEXAVALENT CHROMIUM	41.0	NA	<0.01	NA	<1.0	NA	<0.01	NA	--
COBALT	NA	NA	NA	NA	6.7B	3.6B	NA	NA	1000 - IL
COPPER	NA	NA	NA	NA	15.1B	<1.0	NA	NA	650 - IL
IRON	NA	NA	NA	NA	[redacted]	[redacted]	NA	NA	5000 - IL
LEAD	<3.0	<3.0	<3.0	<3.0	[redacted]	2.3B	6.7	<3.0	7.5 - IL
MAGNESIUM	NA	NA	NA	NA	67000	69400	NA	NA	--
MANGANESE	NA	NA	NA	NA	[redacted]	[redacted]	NA	NA	150 - IL
MERCURY	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	0.25	0.25	2 - IL
NICKEL	NA	NA	NA	NA	9.9B	4.2B	NA	NA	100 - IL
POTASSIUM	NA	NA	NA	NA	21800	23700	NA	NA	--
SELENIUM	<3.0	<3.0	5.0	3.9	<3.0	20.5	<3.0	<3.0	50 - IL
SILVER	<10.0	<10.0	<10.0	<10.0	1.2B	<1.0	13.0	<10.0	50 - IL
SODIUM	NA	NA	NA	NA	134000	140000	NA	NA	--
THALLIUM	NA	NA	NA	NA	<3.0	4.0B	NA	NA	--
VANADIUM	NA	NA	NA	NA	6.9B	<1.0	NA	NA	--
ZINC	NA	NA	NA	NA	43.0	7.3B	NA	NA	5000 - IL
TOTAL CYANIDE	<0.005 (A)	NA	<0.005 (A)	NA	NA	NA	<0.005 (A)	NA	200 - IL

Units are in ug/L (ppb)
NA -- Not analyzed.
** -- Action level under review.
(A) -- Units are in mg/L

MWG13-15_46652

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	MW-7	MW-7 (Filtered)	MW-7A	MW-7A (Filtered)	MW-8	MW-8 (Filtered)	MW-9	MW-9 (Filtered)	Regulatory Limit
IEA Sample ID Number	950290007	950290008	950219305	950219305F	950219302	950219302F	950219303	950219303F	
INORGANIC COMPOUNDS									
ALUMINUM	NA	NA	1680	35.7B	2360	41.3B	1170	33.6B	--
ANTIMONY	NA	NA	<2.0	<2.0	33.6B	5.7B	8.4B	<2.0	--
ARSENIC	8.8	<2.0	5.6B	6.6B	[redacted]	[redacted]	[redacted]	[redacted]	50 - IL
BARIUM	190.0	58.0	99.7B	70.0B	1029	31.2B	121B	90.0B	2000 - IL
BERYLLIUM	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
CADMIUM	<5.0	<5.0	<1.0	<1.0	1.7B	<1.0	<1.0	<1.0	5 - IL
CALCIUM	NA	NA	148000	113000	250000	200000	191000	136000	--
CHROMIUM	19.0	11.0	8.2B	1.0	[redacted]	10.1	[redacted]	1.6B	100 - IL
HEXAVALENT CHROMIUM	<0.01	<0.01	<0.01	NA	<0.01	NA	<0.01	NA	--
COBALT	NA	NA	4.8B	1.8B	4.1B	2.7B	2.0B	<1.0	1000 - IL
COPPER	NA	NA	12.4B	<1.0	24.6B	1.7B	13.6B	<1.0	650 - IL
IRON	NA	NA	[redacted]	2360	[redacted]	2770	[redacted]	3080	5000 - IL
LEAD	[redacted]	<1.0	[redacted]	<1.0	[redacted]	2.4B	[redacted]	1.4B	7.5 - IL
MAGNESIUM	NA	NA	49100	34300	125000	127000	33400	29300	--
MANGANESE	NA	NA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	207	150 - IL
MERCURY	0.39	<0.20	<0.20	<0.20	[redacted]	<0.20	0.49	<0.20	2 - IL
NICKEL	NA	NA	9.2B	4.0B	10.6B	3.1B	22.2B	4.0B	100 - IL
POTASSIUM	NA	NA	138000	14100	5990	6120	54800	58700	--
SELENIUM	<3.0	<3.0	<3.0	11.1	<3.0	27.9	<3.0	12.9	50 - IL
SILVER	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	50 - IL
SODIUM	NA	NA	144000	148000	84800	90400	153000	158000	--
THALLIUM	NA	NA	<3.0	<3.0	<3.0	4.5B	<3.0	<3.0	--
VANADIUM	NA	NA	10.2B	<1.0	13.6B	<1.0	5.1B	<1.0	--
ZINC	NA	NA	52.4	1.2B	143	4.1B	161	1.7B	5000 - IL
TOTAL CYANIDE	<0.005 (A)	NA	<10.0	NA	<10.0	NA	<10.0	NA	200 - IL

MWG13-15_46653

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIEBB-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	MW-10	MW-10 (Filtered)	MW-11	MW-11 (Filtered)	MW-12	MW-12 (Filtered)	MW-13	MW-13 (Filtered)	Regulatory Limit
IEA Sample ID Number	951197001	951197002	951197003	951197004	951587002	951587001	951587004	951587003	
INORGANIC COMPOUNDS									
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	--
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	--
ARSENIC	[redacted]	[redacted]	[redacted]	[redacted]	5.6	2	10	5.6	50 - IL
BARIUM	120	68	200	<50.0	68	<50.0	130	79	2000 - IL
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
CADMIUM	<5.0	[redacted]	[redacted]	[redacted]	<5.0	[redacted]	<5.0	<5.0	5 - IL
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
CHROMIUM	21	<10.0	66	<10.0	<10.0	<10.0	11	<10.0	100 - IL
HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	1000 - IL
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	650 - IL
IRON	NA	NA	NA	NA	NA	NA	NA	NA	5000 - IL
LEAD	[redacted]	<3.0	17	<3.0	<3.0	3.1	[redacted]	<3.0	7.5 - IL
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	150 - IL
MERCURY	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2 - IL
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	100 - IL
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
SELENIUM	<3.0	<3.0	<3.0	<3.0	<30.0	<30.0	<30.0	<30.0	50 - IL
SILVER	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	50 - IL
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	--
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	5000 - IL
TOTAL CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	200 - IL

Units are in ug/L (ppb)
NA - Not analyzed.
** - Action level under review.
(A) - Units are in mg/l.

96130.000796

TABLE 4-1 (Continued)
GROUNDWATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	MW-1	MW-1A	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	Regulatory
IEA Sample ID Number	95029005	9502205504	950301003	95029003	950301001	950290001	950220501	950301005	Limit
WET CHEMISTRY									
TURBIDITY	30000	100000	47000	420000	4000000	100000	280000	110000	--
TOTAL DISSOLED SOLIDS	160000	1300000	1700000	1800000	1200000	2700000	1700000	1500000	1200000
TOTAL SUSPENDED SOLIDS	72000	180000	160000	220000	150000	50000	160000	54000	--

Sample ID Number	MW-7	MW-7A	MW-8	MW-9	Regulatory
IEA Sample ID Number	95029007	950220505	950220502	950220503	Limit
WET CHEMISTRY					
TURBIDITY	310000	600000	430000	170000	--
TOTAL DISSOLED SOLIDS	1200000	930000	1500000	1200000	1200000
TOTAL SUSPENDED SOLIDS	720000	630000	510000	190000	--

NA - Not analyzed.

94130.00075

TABLE 4-2
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-52A	SB-53A	SB-53B	SB-54A	SB-55A	SB-56A	SB-57A
IEA Sample ID Number	950153017	950153018	950153019	950153020	950162001	950162002	950162003
PESTICIDE/PCB COMPOUNDS							
ALPHA-BHC	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
BETA-BHC	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
DELTA-BHC	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
GAMMA-BHC (LINDANE)	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
HEPTACHLOR	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
ALDRIN	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
HEPTACHLOR EPOXIDE	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
ENDOSULFAN I	<8.0	<8.0	<8.0	<8.0	NA	NA	NA
DIELDRIN	<16.0	<16.0	<16.0	U	NA	NA	NA
4,4'-DDE	410	20	<16.0	39	NA	NA	NA
ENDRIN	<16.0	<16.0	<16.0	<16.0	NA	NA	NA
ENDOSULFAN II	<16.0	<16.0	<16.0	<16.0	NA	NA	NA
4,4'-DDD	190	<16.0	<16.0	<16.0	NA	NA	NA
ENDOSULFAN SULFATE	<16.0	<16.0	<16.0	<16.0	NA	NA	NA
4,4'-DDT	590	40	33	150	NA	NA	NA
METHOXYCHLOR	<80.0	<80.0	<80.0	<80.0	NA	NA	NA
ENDRIN ALDEHYDE	<16.0	<16.0	<16.0	<16.0	NA	NA	NA
ALPHA-CHLORDANE	<16.0	<16.0	<16.0	<16.0	NA	NA	NA
GAMMA-CHLORDANE	<80.0	<80.0	<80.0	<80.0	NA	NA	NA
TOXAPHENE	<160.0	<160.0	<160.0	<160.0	NA	NA	NA
TOTAL PESTICIDES	1190	60	33	222	0	0	0
AROCLOR - 1016	NA	NA	NA	NA	<80.0	U	U
AROCLOR - 1221	NA	NA	NA	NA	<80.0	U	U
AROCLOR - 1232	NA	NA	NA	NA	<80.0	U	U
AROCLOR - 1242	NA	NA	NA	NA	<80.0	U	U
AROCLOR - 1248	NA	NA	NA	NA	<80.0	91000	46000
AROCLOR - 1254	NA	NA	NA	NA	580	20000	9100
AROCLOR - 1260	NA	NA	NA	NA	<160.0	5800	3100
TOTAL AROCLORS	0	0	0	0	580	116800	58200

Units are in ug/kg.

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TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-58A	SB-58B	SB-59A	SB-60A	SB - 61A	SB - 62A	SB-62B	SB-63A
IEA Sample ID Number	950182004	950182005	950182006	950182007	950182008	950182009	950182010	950182011
PESTICIDE/PCB COMPOUNDS								
ALPHA-BHC	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
BETA-BHC	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
DELTA-BHC	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
HEPTACHLOR	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
ALDRIN	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
ENDOSULFAN I	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
DIELDRIN	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
4,4'-DDE	NA	NA	NA	NA	380	25	<1.7	870
ENDRIN	NA	NA	NA	NA	<3.3	<3.3	<3.3	<3.3
ENDOSULFAN II	NA	NA	NA	NA	<3.3	<3.3	<3.3	<3.3
4,4'-DDD	NA	NA	NA	NA	36	<3.3	<3.3	220
ENDOSULFAN SULFATE	NA	NA	NA	NA	<3.3	<3.3	<3.3	<3.3
4,4'-DDT	NA	NA	NA	NA	210	30	<3.3	890
METHOXYCHLOR	NA	NA	NA	NA	<17	<17	<17	<17
ENDRIN ALDEHYDE	NA	NA	NA	NA	<3.3	<3.3	<3.3	<3.3
ALPHA-CHLORDANE	NA	NA	NA	NA	<3.3	<3.3	<3.3	48
GAMMA-CHLORDANE	NA	NA	NA	NA	<1.7	<1.7	<1.7	37
TOXAPHENE	NA	NA	NA	NA	<1.7	<1.7	<1.7	<1.7
TOTAL PESTICIDES	0	0	0	0	626	55	0	2066
AROCLOR - 1016	<80.0	<80.0	<80.0	<80.0	<33	<33	<33	<33
AROCLOR - 1221	<80.0	<80.0	<80.0	<80.0	<67	<67	<67	<67
AROCLOR - 1232	<80.0	<80.0	<80.0	<80.0	<33	<33	<33	<33
AROCLOR - 1242	<80.0	<80.0	<80.0	<80.0	<33	<33	<33	<33
AROCLOR - 1248	1100	<80.0	26000	<80.0	<33	<33	<33	<33
AROCLOR - 1254	680	1900	9500	1200	<33	<33	<33	<33
AROCLOR - 1260	210	200	2100	250	<33	<33	<33	<33
TOTAL AROCLORS	1990	2100	37600	1450	0	0	0	0

Units are in ug/kg.

9911230 1005

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-64A/CA	SB-65A	SB-66A/CA	SB-67A/CA	SB-67B/CB	SB-68A	SB-69A/CA	SB-69B/CB
IEA Sample ID Number	950182012	950182014	950182015	950182016	950182017	950182018	950182019	950182020
PESTICIDE/PCB COMPOUNDS								
ALPHA-BHC	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
BETA-BHC	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
DELTA-BHC	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
GAMMA-BHC (LINDANE)	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
HEPTACHLOR	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
ALDRIN	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
HEPTACHLOR EPOXIDE	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
ENDOSULFAN I	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
DIELDRIN	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
4,4'-DDE	18	23	<3.3	73	<3.3	14	<3.3	<3.3
ENDRIN	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
ENDOSULFAN II	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
4,4'-DDD	19	6.2	<3.3	9	<3.3	12	<3.3	<3.3
ENDOSULFAN SULFATE	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
4,4'-DDT	9.3	13	13	36	<3.3	<3.3	<3.3	<3.3
METHOXYCHLOR	<17	<17	<17	<17	<17	<17	<17	<17
ENDRIN ALDEHYDE	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
ALPHA-CHLORDANE	35	14	<1.7	<1.7	<1.7	14	<1.7	<1.7
GAMMA-CHLORDANE	25	11	<1.7	<1.7	<1.7	17	<1.7	<1.7
TOXAPHENE	<170	<170	<170	<170	<170	<170	<170	<170
TOTAL PESTICIDES	100.3	67.2	13	118	0	57	0	0
AROCLOR - 1016	<33	<33	<33	<33	<33	<33	<33	<33
AROCLOR - 1221	<67	<67	<67	<67	<67	<67	<67	<67
AROCLOR - 1232	<33	<33	<33	<33	<33	<33	<33	<33
AROCLOR - 1242	<33	<33	<33	<33	<33	<33	<33	<33
AROCLOR - 1248	<33	<33	<33	<33	<33	<33	<33	<33
AROCLOR - 1254	<33	<33	<33	<33	<33	<33	410	820
AROCLOR - 1260	<33	160	170	220	<33	<33	180	260
TOTAL AROCLORS	0	160	170	220	0	0	590	1080

Units are in ug/kg.

000800-02756

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-100A	SB-101A	SB-102A	SB-103A	SB-104A	SB-105A	SB-106A	SB-107A
IEA Sample ID Number	950424005	950424001	950424004	950424003	950424006	950424002	950424008	950182007
PESTICIDE/PCBS COMPOUNDS								
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	NA	NA	NA	NA	NA	NA	NA	NA
DIELDRIN	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA
METHOXYCHLOR	NA	NA	NA	NA	NA	NA	NA	NA
ENDRIN ALDEHYDE	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	NA	NA
TOXAPHENE	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PESTICIDES	0	0	0	0	0	0	0	0
AROCLOR - 1016	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<33
AROCLOR - 1221	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<67
AROCLOR - 1232	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<33
AROCLOR - 1242	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<80.0	<33
AROCLOR - 1248	<80.0	240	<80.0	<80.0	210	38000	<80.0	670
AROCLOR - 1254	220	460	290	2500	250	19000	240	<160.0
AROCLOR - 1260	<160.0	260	170	440	<160	27000	<160.0	<160.0
TOTAL AROCLORS	220	960	460	2940	460	82000	240	670

Units are in ug/kg.

991230-031765

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	MW-1A	MW-5A	MW-7A
IEA Sample ID Number	950211802	950211803	950211801
PESTICIDE/PCBS COMPOUNDS			
ALPHA-BHC	<2.0	<2.0	<2.0
BETA-BHC	<2.0	<2.0	<2.0
DELTA-BHC	<2.0	<2.0	<2.0
GAMMA-BHC (LINDANE)	<2.0	<2.0	<2.0
HEPTACHLOR	<2.0	<2.0	<2.0
ALDRIN	<2.0	<2.0	<2.0
HEPTACHLOR EPOXIDE	<2.0	<2.0	<2.0
ENDOSULFAN I	<2.0	<2.0	<2.0
DIELDRIN	<4.0	<4.0	<4.0
4,4'-DDE	<4.0	<4.0	<4.0
ENDRIN	<4.0	<4.0	<4.0
ENDOSULFAN II	<4.0	<4.0	<4.0
4,4'-DDD	<4.0	<4.0	<4.0
ENDOSULFAN SULFATE	<4.0	<4.0	<4.0
4,4'-DDT	<4.0	<4.0	<4.0
METHOXYCHLOR	<20	<20	<20
ENDRIN ALDEHYDE	<4.0	<4.0	<4.0
ALPHA-CHLORDANE	<2.0	<2.0	<2.0
GAMMA-CHLORDANE	<2.0	<2.0	<2.0
TOXAPHENE	<200	<200	<200
TOTAL PESTICIDES	0	0	0
AROCLOR - 1016	<40	<40	<40
AROCLOR - 1221	<81	<81	<81
AROCLOR - 1232	<40	<40	<40
AROCLOR - 1242	<40	<40	<40
AROCLOR - 1248	<40	<40	<40
AROCLOR - 1254	<40	<40	<40
AROCLOR - 1260	<40	<40	<40
TOTAL AROCLORS	0	0	0

Units are in ug/kg.

208000 0STB65

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number	SB-58A 950182002	SB-59A 950182004	SB-59B 950182005	SB-60A 950182007	SB-61A 950182008	SB-62A 950182009	SB-62B 950182010	SB-63A 950182011	SB-63A 950182011	SB-64A/CA 950182012
SEMI-VOLATILE ORG. COMPOUNDS										
PHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
BIS (2-CHLOROETHYL)ETHER	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2-CHLOROPHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
1,3-DICHLOROBENZENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
1,4-DICHLOROBENZENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
BENZYL ALCOHOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
1,2-DICHLOROBENZENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2-METHYLPHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
BIS (2-CHLOROISOPROPYL) ETHER	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
4-METHYLPHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
N-NITROSO-DI-N-PROPYLAMINE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
HEXACHLOROTHEANE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
NITROBENZENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
ISOPHORONE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2-NITROPHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2,4-DIMETHYLPHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
BENZOIC ACID	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
BIS (2-CHLOROETHOXY) METHANE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2,4-DICHLORPHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
1,2,4-TRICHLOROBENZENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
NAPHTHALENE	<660	<660	<660	<660	1600	<330	<330	<330	<330	<330
4 CHLOROANLINE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
HEXACHLOROBUTADIENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
4 CHLORO-3-METHYLPHENOL	NA	NA	NA	NA	<660	<660	<660	<660	<660	<660
2METHYLNAPHTHALENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
HEXACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2,4,6-TRICHLOROPHENOL	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2,4,5-TRICHLOROPHENOL	NA	NA	NA	NA	<1600	<1600	<1600	<1600	<1600	<1600
2-CHLORONAPHTHALENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
2-NITROANILINE	NA	NA	NA	NA	<1600	<1600	<1600	<1600	<1600	<1600
DIMETHYLPHTHALATE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
ACENAPHTHYLENE	<660	<660	<660	<660	<330	<330	<330	<330	<330	<330
2,6-DINITROTOLUENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
CARBAZOLE	NA	NA	NA	NA	870	<330	<330	<330	<330	<330
TOTAL PNAs	0	0	0	0	1600	0	0	0	0	0

Units are in ug/kg (ppb)
NA = Analysis not performed.

693130 0008 03

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number	SB-65A 950182014	SB-66A/CA 950182015	SB-67A/CA 950182016	SB-67B/CB 950182017	SB-68A 950182018	SB-69A/CA 950182019	SB-69B/CB 950182020	MW-1A 950211802	MW-5A 950211803	MW-7A 950211801
SEMI-VOLATILE ORG. COMPOUNDS										
PHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
BIS (2-CHLOROETHYL)ETHER	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2-CHLOROPHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
1,3-DICHLOROBENZENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
1,4-DICHLOROBENZENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
BENZYL ALCOHOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
1,2-DICHLOROBENZENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2-METHYLPHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
BIS (2-CHLOROISOPROPYL) ETHER	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
4-METHYLPHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
N-NITROSO-DI-N-PROPYLAMINE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
HEXACHLOROTHEANE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
NITROBENZENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
ISOPHORONE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2-NITROPHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2,4-DIMETHYLPHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
BENZOIC ACID	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
BIS (2-CHLOROETHOXY) METHANE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2,4-DICHLOROPHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
1,2,4-TRICHLOROBENZENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
NAPHTHALENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
4 CHLOROANILINE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
HEXACHLOROBUTADIENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
4 CHLORO-3-METHYLPHENOL	<660	<660	<660	<660	<660	<660	<660	<400	<390	<380
2METHYLNAPHTHALENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
HEXACHLOROCYCLOPENTADIENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2,4,6-TRICHLOROPHENOL	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2,4,5-TRICHLOROPHENOL	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<970	<950	<940
2-CHLORONAPHTHALENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2-NITROANILINE	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<970	<950	<940
DIMETHYLPHTHALATE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
ACENAPHTHYLENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
2,6-DINITROTOLUENE	<330	<330	<330	<330	<330	<330	<330	<970	<950	<940
CARBAZOLE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<380
TOTAL PNAs	0	0	0	0	0	0	0	0	0	0

NA - Analysis not performed
Units are in ug/kg (ppb)

00800-0135-9916

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number	SB-58A 950182002	SB-58A 950182004	SB-58B 950182005	SB-60A 950182007	SB-61A 950182008	SB-62A 950182009	SB-62B 950182010	SB-63A 950182011	SB-63A 950182011	SB-64A/CA 950182012
SEMI-VOLATILE ORG. COMPOUNDS										
3-NITROANILINE	NA	NA	NA	NA	<1600	<1600	<1600	<1600	<1600	<1600
ACENAPHTHENE	<1200	<1200	<1200	<1200	1800	<330	<330	330	<330	<330
2,4-DINITROPHENOL	NA	NA	NA	NA	<1600	<1600	<1600	<1600	<1600	<1600
4-NITROPHENOL	NA	NA	NA	NA	<1600	<1600	<1600	<1600	<1600	<1600
DIBENZOFURAN	NA	NA	NA	NA	1400	<330	<330	<330	<330	<330
2,6-DINITROTOLUENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
DIETHYLPHTHALATE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
4-CHLOROPHENYL PHENYL ETHER	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
FLUORENE	200	<140	<140	<140	2200	<330	<330	<330	<330	<330
4-NITROANILINE	NA	NA	NA	NA	<1600	<1600	<1600	<1600	<1600	<1600
4,6-DINITRO-2-METHYLPHENOL	NA	NA	NA	NA	<1600	<1600	<1600	<1600	<1600	<1600
N-NITROSODIPHENYLAMINE (1)	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
4-BROMOPHENYL PHENYL ENTER	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
HEXACHLOROBENZENE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
PENTACHLOROPHENOL	NA	NA	NA	NA	<1600	<1600	<330	<330	<330	<330
PHENANTHRENE	820	<660	<660	<660	13000	4200	<330	2600	2600	<330
ANTHRACENE	<660	<660	<660	<660	<330	<330	<330	410	360	<330
DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
FLUORANTHENE	870	<660	<660	700	13000	4000	<330	2400	2100	<330
PYRENE	1600	<180	<180	250	28000	9500	<330	6500	6400	350
BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
3,3'-DICHLOROBENZIDINE	NA	NA	NA	NA	<660	<660	<660	<660	<660	<660
BENZO(A)ANTHRACENE	200	20	3000	510	9200	2900	<330	1500	1500	<330
CHRYSENE	260	<100	<100	780	8900	3000	<330	1700	1700	<330
BIS(2-ETHYLHEXYL)PHTHALATE	NA	NA	NA	NA	<330	<330	<330	480	730	<330
DI-N-OCTYLPHTHALATE	NA	NA	NA	NA	<330	<330	<330	<330	<330	<330
BENZO(B)FLUORANTHENE	450	38	42	1400	8000	2700	<330	1700	1900	<330
BENZO(K)FLUORANTHENE	170	<11	25	750	3300	1600	<330	870	1500	<330
BENZO(A)PYRENE	390	37	33	1200	4800	1900	<330	1400	1700	<330
INDENO(1,2,3-CD)PYRENE	270	41	<20	1200	5800	2800	<330	1300	<330	<330
DIBENZO(A,H)ANTHRACENE	35	<20	<20	190	1900	1000	<330	<330	<330	<330
BENZO(G,H,I)PERYLENE	250	51	51	1600	8100	2300	<330	1300	<330	<330
TOTAL PNAs	5055	187	3141	6540	105000	36000	0	23110	18780	350

NA = Analysis not performed
Units are in ug/kg (ppb)

0008805

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS--PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number IEA Sample ID Number	SB-65A 950182014	SB-66A/CA 950182015	SB-67A/CA 950182016	SB-67B/CB 950182017	SB-68A 950182018	SB-69A/CA 950182019	SB-69B/CB 950182020	MW-1A 950211802	MW-5A 950211803	MW-7A 950211801
SEMI-VOLATILE ORG. COMPOUNDS										
3-NITROANILINE	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<870	<850	<940
ACENAPHTHENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
2,4-DINITROPHENOL	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<870	<850	<940
4-NITROPHENOL	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<870	<850	<940
DIBENZOFURAN	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
2,4-DINITROTOLUENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
DIETHYLPHTHALATE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
4-CHLOROPHENYL PHENYL ETHER	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
FLUORENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
4-NITROANILINE	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<870	<850	<940
4,6-DINITRO-2-METHYLPHENOL	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<870	<850	<940
N-NITROSODIPHENYLAMINE (1)	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
4-BROMOPHENYL PHENYL EHTER	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
HEXACHLOROBENZENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
PENTACHLOROPHENOL	<330	<330	<330	<330	<330	<330	<330	<870	<850	<940
PHENANTHRENE	<330	480	<330	<330	<330	<330	<330	<400	<390	<390
ANTHRACENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
DI-N-BUTYLPHTHALATE	<330	<330	<330	<330	<330	<330	<330	2220JB	240JB	300JB
FLUORANTHENE	<330	500	<330	<330	<330	<330	<330	<400	<390	<390
PYRENE	870	1500	800	<330	730	<330	<330	<400	<390	<390
BUTYLBENZYLPHTHALATE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
3,3'-DICHLOROBENZIDINE	<660	<660	<660	<660	<660	<660	<660	<400	<390	<390
BENZO(A)ANTHRACENE	340	370	<330	<330	<330	<330	<330	<400	<390	<390
CHRYSENE	<330	510	<330	<330	<330	<330	<330	<400	<390	<390
BIS(2-ETHYLHEXYL)PHTHALATE	<330	<330	700	<330	1400	450	490	<400	<390	<390
DI-N-OCTYLPHTHALATE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
BENZO(B)FLUORANTHENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
BENZO(K)FLUORANTHENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
BENZO(A)PYRENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
INDENO(1,2,3-CD)PYRENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
DIBENZO(A,H)ANTHRACENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
BENZO(G,H,I)PERYLENE	<330	<330	<330	<330	<330	<330	<330	<400	<390	<390
TOTAL PNAs	1210	3380	800	0	730	0	0	0	0	0

NA – Analysis not performed
Units are in ug/kg (ppb)

MWG13-15_46664

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-60B	SB-61A	SB-62A	SB-62B	SB-63A	SB-64A/CA	SB-64CB	SB-65A	SB-66A/CA	SB-67A/CA
IEA Sample ID Number	950188014	950182008	950182009	950182010	950182011	950182012	950182013	950182014	950182015	950182016
INORGANIC COMPOUNDS										
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	7.1	6.0	5.0	1.9	111	9.4	140**	63**	380**	78**
BARIUM	740	520	180	<4.0	140	180	300	120	250	320
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	45	4.7	1.4	<0.40	22	81	4.4	2.8	4.9	2.5
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	5000	1100	160	5.8	36000	49000	27000	32000	31000	36000
HEXAVALENT CHROMIUM	<1.4	NA	NA	NA	NA	16	12	NA	<2.7	2.5
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	1000	220	170	1.6*	480	930	470	720	550	410
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	3.2	0.96	0.092	<0.094	5.0	4.5	0.84	5.5	0.39	0.25
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	<3.7	<1.5	<1.7	1.2	<2.5	<3.4	<3.7	<3.5	<2.7	<2.8
SILVER	260	<0.91	<1.1	<0.58	<20	<2.2	<2.4	<2.0	<2.4	2.3
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Units are in mg/kg (ppm)
NA = Not analyzed.
* = Analysis by 7421 on 2/3/95 with PQAL of 0.3 mg/kg
** = PQL varied with samples weight and percent solids.

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MWG13-15_46665

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-60B	SB-61A	SB-62A	SB-62B	SB-63A	SB-64A/CA	SB-64CB	SB-65A	SB-66A/CA	SB-67A/CA
IEA Sample ID Number	950188014	950182008	950182009	950182010	950182011	950182012	950182013	950182014	950182015	950182016
INORGANIC COMPOUNDS										
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	7.1	6.0	5.0	1.9	111	9.4	140**	63**	380**	78**
BARIUM	740	520	180	<4.0	140	180	300	120	250	320
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	45	4.7	1.4	<0.40	22	81	4.4	2.9	4.9	2.5
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	5000	1100	180	5.8	36000	49000	27000	32000	31000	36000
HEXAVALENT CHROMIUM	<1.4	NA	NA	NA	NA	16	12	NA	<2.7	2.6
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	1000	220	170	1.8*	480	930	470	720	560	410
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	3.2	0.96	0.092	<0.094	5.0	4.5	0.54	5.5	0.39	0.25
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	<3.7	<1.5	<1.7	1.2	<2.5	<3.4	<3.7	<3.5	<2.7	<2.8
SILVER	260	<0.91	<1.1	<0.08	<20	<2.2	<2.4	<2.0	<2.4	2.3
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Units are in mg/kg (ppm)
NA - Not analyzed.
* - Analysis by 7421 on 2/3/95 with PQAL of 0.3 mg/kg
** - PQL varied with samples weight and percent solids.

MWG13-15_46666

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-67B	SB-68A	SB-69A/CA	SB-69B/CB	SB-70A	SB-71A	SB-71B	SB-72A	SB-73A	SB-73B
IEA Sample ID Number	950182017	950182018	950182019	950182020	950188001	950188002	950188003	950188004	950188006	950188007
INORGANIC COMPOUNDS										
ALUMINUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	370**	16	4.0	5.4	<3.6	38**	20	14	11	98**
BARIUM	130	140	250	280	120	150	120	150	68	330
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	3.2	3.7	9.5	21	40	6.5	3.3	14	<1.2	8.2
CALCIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	3600	44000	230	1600	820	27000	37000	49000	42000	54000
HEXAVALENT CHROMIUM	<1.6	NA	<1.8	<1.9	<1.6	<1.75	<2.1	<2.3	<2.4	<3.1
COBALT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	100	970	180	700	360	880	920	1200	1000	330
MANGANESE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	0.55	9.5	16	35	3.9	6.8	11	16	11	4.3
NICKEL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	<1.9	<3.7	<1.8	<2.4	<3.0	<4.1	<6.3	<6.3	<6.1	<9.1
SILVER	<1.3	<2.0	92	230	69	<1.4	<2.0	2.7	<2.3	<3.0
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not analyzed.
* = Analysis by 7421 on 2/3/95 with PQAL of 0.3 mg/kg
** = PQL varied with samples weight and percent solids.

[redacted]

MWG13-15_46667

TABLE 4-2 (Continued)
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-74A	SB-75A	SB-76A	PW-5	PW-8	MW-1A	MW-5A	MW-7A	MW-10	MW-11
IEA Sample ID Number	9501888008	9501888009	9501888010	9501888006	9501888011	9501888002	9501888003	9501888001	9511879001	9511879002
INORGANIC COMPOUNDS										
ALUMINUM	NA	NA	NA	NA	NA	965	1280	1550	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	<0.47	<0.36	<0.39	NA	NA
ARSENIC	16	18	12	5.1	0.69	3.4	1.2B	3.1	6.3	6.0
BARIUM	390	220	480	39	<8.4	3.1B	4.3B	17.5B	18	36
BERYLLIUM	NA	NA	NA	NA	NA	<0.24	<0.18	0.24B	NA	NA
CADMIUM	<1.6	42	3.6	1.7	<1.4	<0.24	0.19B	0.21B	<0.56	0.76
CALCIUM	NA	NA	NA	NA	NA	38800	25700	29700	NA	NA
CHROMIUM	40000	41000	37000	21000	23000	11.8	20.0	73.5	7.4	6.9
HEXAVALENT CHROMIUM	<5.0	3.5	<3.03	<2.7	<2.5	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	1.5B	1.8B	2.0B	NA	NA
COPPER	NA	NA	NA	NA	NA	1.7B	3.1B	4.4B	NA	NA
IRON	NA	NA	NA	NA	NA	2680	3640	4350	NA	NA
LEAD	490	1400	191	16	16	2.2	3.0	9.0	1.3	1.6
MAGNESIUM	NA	NA	NA	NA	NA	18400	12300	1114200	NA	NA
MANGANESE	NA	NA	NA	NA	NA	141	1116	130	NA	NA
MERCURY	1.4	0.75	0.24	2.5	<0.2	<0.12	<0.11	<0.11	<0.12	<0.13
NICKEL	NA	NA	NA	NA	NA	2.5B	2.9B	7.3B	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	237B	344B	354B	NA	NA
SELENIUM	<11	<7.7	<7.8	<7.7	<7.1	<0.71	<0.53	<0.58	<1.5	<1.6
SILVER	<3.2	<2.2	<2.9	<2.1	<2.6	<0.24	<0.18	<0.19	<1.1	<1.2
SODIUM	NA	NA	NA	NA	NA	76.3B	126	113B	NA	NA
THALLIUM	NA	NA	NA	NA	NA	0.72B	<0.53	<0.58	NA	NA
VANADIUM	NA	NA	NA	NA	NA	7.8B	9.9	11.3	NA	NA
ZINC	NA	NA	NA	NA	NA	20.2	22.1	20.8	NA	NA
CYANIDE	NA	NA	NA	NA	NA	<0.58	<0.54	<0.54	NA	NA

NA - Not analyzed.
* - Analysis by 7421 on 2/3/95 with PQAL of 0.3 mg/kg
** - PQL varied with samples weight and percent solids.

TABLE 4-3
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	SB-55A	SB-59A
PACE Sample ID Number	SAM0213061	SAM0213071
PCDD/PCDF COMPOUNDS		
2378-TCDD	74.17	ND
12378-PeCDD	209.09	ND
123478-HxCDD	269.85	58.44
123678-HxCDD	470.68	422.87
123789HxCDD	464.46	167.09
1234678-HpCDD	7406.49	13993.85
OCDD	51187.16	138807.5
2378-TCDF	74.24	37.12
12378-PeCDF	263.73	233.57
23478-HxCDF	20.67	5.7
123478-HxCDF	58.33	86.96
123678-HxCDF	25.57	40.25
123789HxCDF	17.02	29.92
234678-HxCDF	46.17	70.76
1234678-HpCDF	611.14	1923.63
1234789-HpCDF	61.31	142.86
OCDF	850.32	7785.78
Total TCDD	1125.17	3.81
Total PeCDD	1485.03	ND
Total HxCDD	4551.55	2429.83
Total HpCDD	15510.15	24455.53
Total TCDF	610.67	344.83
Total PeCDF	702.25	1016.67
Total HxCDF	2997.99	6245.72
Total HpCDF	4426.37	15924.28

Units are pg/g – parts per trillion (ppt)

TABLE 4-4
ASBESTOS ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOS

Sample ID Number	AS-1	AS-2
Asbestos Analytical Results		
Asbestos	None	None
% Non-Asbestos Fiber - Cellulose	30	40
% Non-Fiber Matter - Mineral Grains	70	60

Bulk asbestos analysis by PLM-DS

TABLE 4-5
SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOS

Sample ID Number	SB-44A	SB-44B	SB-45A	SB-45B	SB-46A	SB-46B	SB-47A	SB-47B	SB-48A	SB-48B
IEA Sample ID Number	950153001	950153002	950153003	950153004	950153005	950153005	950153006	950153007	950153008	950153009
INORG. COMPD - Arsenic Only										
Arsenic	4600	5.0	24	1.2	17	13	46	15	25	23

Units are in mg/kg (ppm)

Sample ID Number	SB-44A	Regualtory
IEA Sample ID Number	950153010	Limit
INORG. COMPD - Arsenic Only		
TCLP Arsenic	0.4	5.0

Units are in mg/L (ppm)

Sample ID Number	SB-49A	SB-49B	SB-50A	SB-50B	SB-51A	SB-51B	SB-77A	SB-77B	SB-78A	SB-78B
IEA Sample ID Number	950153010	950153011	950153012	950153014	950153015	950153016	950248015	950248016	950248017	950248018
INORG. COMPD - Arsenic Only										
Arsenic	18	9.5	3.5	10000	16	25	8.5	8.5	13	7.8

Units are in mg/kg (ppm)

Sample ID Number	SB-50B	Regualtory
IEA Sample ID Number	950153011	Limit
INORG. COMPD - Arsenic Only		
TCLP Arsenic	2.2	5.0

Units are in mg/L (ppm)

Sample ID Number	SB-79A	SB-79B	SB-80A	SB-80B	SB-81A	SB-81B	SB-82A	SB-82B	SB-83A	SB-83B
IEA Sample ID Number	950248013	950248014	950248019	950248020	950153001	950153002	950153003	950153004	950153005	950153006
INORG. COMPD - Arsenic Only										
Arsenic	23	780	1500	710	49	55	180	240	12	22

Units are in mg/kg (ppm)

Sample ID Number	SB-84A	SB-84B	SB-85A	SB-85B	SB-86A	SB-86B
IEA Sample ID Number	950153007	950153008	950153009	950153010	950153011	950153012
INORG. COMPD - Arsenic Only						
Arsenic	7.1	19	210	70	21	4800

Units are in mg/kg (ppm)

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TABLE 4-6
WETLAND SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number REA Sample ID Number SEMI-VOL. ORG. COMPOUNDS	WL-1 9504269-04A	WL-2 9504269-03A	WL-3 9504269-06A
PHENOL	<1900	<1600	<2200
BIS (2-CHLOROETHYL)ETHER	<1900	<1600	<2200
2-CHLOROPHENOL	<1900	<1600	<2200
1,3-DICHLOROBENZENE	<1900	<1600	<2200
1,4-DICHLOROBENZENE	<1900	<1600	<2200
BENZYL ALCOHOL	<1900	<1600	<2200
1,2-DICHLOROBENZENE	<1900	<1600	<2200
2-METHYLPHENOL	<1900	<1600	<2200
BIS (2-CHLOROISOPROPYL) ETHER	<1900	<1600	<2200
4-METHYLPHENOL	<1900	<1600	<2200
N-NITROSO-DI-N-PROPYLAMINE	<1900	<1600	<2200
HEXACHLOROTHEANE	<1900	<1600	<2200
NITROBENZENE	<1900	<1600	<2200
ISOPHORONE	<1900	<1600	<2200
2-NITROPHENOL	<1900	<1600	<2200
2,4-DIMETHYLPHENOL	<1900	<1600	<2200
BENZOIC ACID	<1900	<1600	<2200
BIS (2-CHLOROETHOXY) METHANE	<1900	<1600	<2200
2,4-DICHLORPHENOL	<1900	<1600	<2200
1,2,4-TRICHLOROBENZENE	<1900	<1600	<2200
NAPHTHALENE	<1900	<1600	<2200
4 CHLOROANILINE	<1900	<1600	<2200
HEXACHLOROBUTADIENE	<1900	<1600	<2200
4 CHLORO-3-METHYLPHENOL	<1900	<1600	<2200
2METHYLNAPHTHALENE	<1900	<1600	<2200
HEXACHLOROCYCLOPENTADIENE	<1900	<1600	<2200
2,4,6-TRICHLOROPHENOL	<1900	<1600	<2200
2,4,5-TRICHLOROPHENOL	<4700	<4000	<5300
2-CHLORONAPHTHALENE	<1900	<1600	<2200
2-NITROANLINE	<4700	<4000	<5300
DIMETHYLPHTHALATE	<1900	<1600	<2200
ACENAPHTHYLENE	<1900	<1600	<2200
2,6-DINITROTOLUENE	<1900	<1600	<2200
3-NITROANLINE	<4700	<4000	<5300
ACENAPHTHENE	<1900	<1600	<2200

Units are in ug/kg (ppb)

TABLE 4-6 (Continued)
WETLAND SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number IEA Sample ID Number SEMI-VOL. ORG. COMPOUNDS	WL-1 9504269-04A	WL-2 9504269-05A	WL-3 9504269-06A
2,4-DINITROPHENOL	<4700	<4000	<5300
4-NITROPHENOL	<4700	<4000	<5300
DIBENZOFURAN	<1900	<1600	<2200
2,4-DINITROTOLUENE	<1900	<1600	<2200
DIETHYLPHTHALATE	<1900	<1600	<2200
4-CHLOROPHENYL PHENYL ETHER	<1900	<1900	<2200
FLUORENE	<1900	<1600	<2200
4-NITROANILINE	<4700	<4000	<5300
4,6-DINITRO-2-METHYLPHENOL	<4700	<4000	<5300
N-NITROSODIPHENYLAMINE (1)	<1900	<1900	<2200
4-BROMOPHENYL PHENYL EHTER	<1900	<1600	<2200
HEXACHLOROBENZENE	<1900	<1600	<2200
PENTACHLOROPHENOL	<4700	<4000	<5300
PHENANTHRENE	400J	<1600	300J
ANTHRACENE	<1900	<1600	<2200
CARBAZOLE	<1900	<1600	<2200
DI-N-BUTYLPHTHALATE	<1900	<1600	<2200
FLUORANTHENE	350J	230J	520J
PYRENE	450J	200J	420J
BUTYLBENZYLPHTHALATE	<1900	<1600	<2200
3,3'-DICHLOROBENZIDINE	<1900	<1600	<2200
BENZO(A)ANTHRACENE	210J	<1600	<2200
CHRYSENE	290J	<1600	270J
BIS(2-ETHYLHEXYL)PHTHALATE	<1900	<1600	<2200
DI-N-OCTYLPHTHALATE	<1900	<1600	<2200
BENZO(B)FLUORANTHENE	250J	<1600	250J
BENZO(K)FLUORANTHENE	210J	<1600	<2200
BENZO(A)PYRENE	230	<1600	<2200
INDENO(1,2,3-CD)PYRENE	<1900	<1600	<2200
DIBENZO(A,H)ANTHRACENE	<1900	<1600	<2200
BENZO(G,H,I)PERYLENE	<1900	<1600	<2200

NA - Analysis not performed

TABLE 4-6 (Continued)
WETLAND SURFACE WATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number	WL-1 950426901	WL-2 950426902	WL-3 950426903
SEMI-VOL. ORG. COMPOUNDS			
PHENOL	<10	<10	<10
BIS (2-CHLOROETHYL)ETHER	<10	<10	<10
2-CHLOROPHENOL	<10	<10	<10
1,3-DICHLOROBENZENE	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10
BENZYL ALCOHOL	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10
2-METHYLPHENOL	<10	<10	<10
BIS (2-CHLOROISOPROPYL) ETHER	<10	<10	<10
4-METHYLPHENOL	<10	<10	<10
N-NITROSO-DI-N-PROPYLAMINE	<10	<10	<10
HEXACHLOROTHEANE	<10	<10	<10
NITROBENZENE	<10	<10	<10
ISOPHORONE	<10	<10	<10
2-NITROPHENOL	<10	<10	<10
2,4-DIMETHYLPHENOL	<10	<10	<10
BENZOIC ACID	<10	<10	<10
BIS (2-CHLOROETHOXY) METHANE	<10	<10	<10
2,4-DICHLORPHENOL	<10	<10	<10
1,2,4-TRICHLOROBENZENE	<10	<10	<10
NAPHTHALENE	<10	<10	<10
4 CHLOROANILINE	<10	<10	<10
HEXACHLOROBUTADIENE	<10	<10	<10
4 CHLORO-3-METHYLPHENOL	<10	<10	<10
2METHYLNAPHTHALENE	<10	<10	<10
HEXACHLOROCYCLOPENTADIENE	<10	<10	<10
2,4,6-TRICHLOROPHENOL	<10	<10	<10
2,4,5-TRICHLOROPHENOL	<25	<25	<25
2-CHLORONAPHTHALENE	<10	<10	<10
2-NITROANILINE	<25	<25	<25
DIMETHYLPHTHALATE	<10	<10	<10
ACENAPHTHYLENE	<10	<10	<10
2,6-DINITROTOLUENE	<10	<10	<10
3-NITROANILINE	<25	<25	<25
ACENAPHTHENE	<10	<10	<10

Units are in ug/L (ppb)

TABLE 4-6 (Continued)
WETLAND SURFACE WATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number IEA Sample ID Number	WL-1 9504289-04A	WL-2 9504289-05A	WL-3 9504289-06A
SEMI-VOL. ORG. COMPOUNDS			
2,4-DINITROPHENOL	<25	<25	<25
4-NITROPHENOL	<25	<25	<25
DIBENZOFURAN	<10	<10	<10
2,4-DINITROTOLUENE	<10	<10	<10
DIETHYLPHTHALATE	<10	<10	<10
4-CHLOROPHENYL PHENYL ETHER	<10	<10	<10
FLUORENE	<10	<10	<10
4-NITROANILINE	<25	<25	<25
4,6-DINITRO-2-METHYLPHENOL	<25	<25	<25
N-NITROSODIPHENYLAMINE (1)	<10	<10	<10
4-BROMOPHENYL PHENYL EHTER	<10	<10	<10
HEXACHLOROBENZENE	<10	<10	<10
PENTACHLOROPHENOL	<25	<25	<25
PHENANTHRENE	<10	<10	<10
ANTHRACENE	<10	<10	<10
CARBAZOLE	<10	<10	<10
DI-N-BUTYLPHTHALATE	<10	<10	<10
FLUORANTHENE	<10	<10	<10
PYRENE	<10	<10	<10
BUTYLBENZYLPHTHALATE	<10	<10	<10
3,3'-DICHLOROBENZIDINE	<10	<10	<10
BENZO(A)ANTHRACENE	<10	<10	<10
CHRYSENE	<10	<10	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10	3J	<10
DI-N-OCTYLPHTHALATE	<10	<10	<10
BENZO(B)FLUORANTHENE	<10	<10	<10
BENZO(K)FLUORANTHENE	<10	<10	<10
BENZO(A)PYRENE	<10	<10	<10
INDENO(1,2,3-CD)PYRENE	<10	<10	<10
DIBENZO(A,H)ANTHRACENE	<10	<10	<10
BENZO(G,H,I)PERYLENE	<10	<10	<10

Units are in ug/L

TABLE 4-6 (Continued)
WETLAND SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	WL-1	WL-2	WL-3
IEA Sample ID Number	950469-04A	950469-05A	950469-06A
PEST/PCBS COMPOUNDS			
ALPHA-BHC	<10	<8.5	<11
BETA-BHC	<10	<8.5	<11
DELTA-BHC	<10	<8.5	<11
GAMMA-BHC (LINDANE)	<10	<8.5	<11
HEPTACHLOR	<10	<8.5	<11
ALDRIN	<10	<8.5	<11
HEPTACHLOR EPOXIDE	<10	<8.5	<11
ENDOSULFAN I	<10	<8.5	<11
DIELDRIN	<19	<16	<22
4,4'-DDE	<19	<16	<12
ENDRIN	<19	<16	<22
ENDOSULFAN II	<19	<16	<22
4,4'-DDD	<19	<16	<21
ENDOSULFAN SULFATE	<19	<16	<22
4,4'-DDT	<19	<16	<22
METHOXYCHLOR	3.9JP	<85	<110
ENDRIN KETONE	<19	<16	<22
ENDRIN ALDEHYDE	<19	<16	<22
ALPHA-CHLORDANE	<10	<8.5	<11
GAMMA-CHLORDANE	<10	<8.5	<11
TOXAPHENE	<1000	<850	<1100
AROCLOR - 1016	<190	<160	<220
AROCLOR - 1221	<390	<340	<440
AROCLOR - 1232	<190	<160	<220
AROCLOR - 1242	<190	<160	<220
AROCLOR - 1248	<190	81J	120JP
AROCLOR - 1254	<190	<160	<220
AROCLOR - 1260	<190	<160	<220

Units are in ug/kg.

TABLE 4-6 (Continued)
WETLAND SURFACE WATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	WL-SW-1	WL-SW-2	WL-SW-3
IEA Sample ID Number	9504269-01A	9504269-02A	9504269-03A
PEST/PCBS COMPOUNDS			
ALPHA-BHC	<0.050	<0.050	<0.050
BETA-BHC	<0.050	<0.050	<0.050
DELTA-BHC	<0.050	<0.050	<0.050
GAMMA-BHC (LINDANE)	<0.050	<0.050	<0.050
HEPTACHLOR	<0.050	<0.050	<0.050
ALDRIN	<0.050	<0.050	<0.050
HEPTACHLOR EPOXIDE	<0.050	<0.050	<0.050
ENDOSULFAN I	<0.050	<0.050	<0.050
DIELDRIN	<0.10	<0.10	<0.10
4,4'-DDE	<0.10	<0.10	<0.10
ENDRIN	<0.10	<0.10	<0.10
ENDOSULFAN II	<0.10	<0.10	<0.10
4,4'-DDD	<0.10	<0.10	<0.10
ENDOSULFAN SULFATE	<0.10	<0.10	<0.10
4,4'-DDT	<0.10	<0.10	<0.10
METHOXYCHLOR	<0.50	<0.50	<0.50
ENDRIN KETONE	<0.10	<0.10	<0.10
ENDRIN ALDEHYDE	<0.10	<0.10	<0.10
ALPHA-CHLORDANE	<0.050	<0.050	<0.050
GAMMA-CHLORDANE	<0.050	<0.050	<0.050
TOXAPHENE	<5.0	<5.0	<5.0
AROCLOR - 1016	<1.0	<1.0	<1.0
AROCLOR - 1221	<2.0	<2.0	<2.0
AROCLOR - 1232	<1.0	<1.0	<1.0
AROCLOR - 1242	<1.0	<1.0	<1.0
AROCLOR - 1248	<1.0	<1.0	<1.0
AROCLOR - 1254	<1.0	<1.0	<1.0
AROCLOR - 1260	<1.0	<1.0	<1.0

Units are in ug/L

9T8000-0S7E9

TABLE 4-6 (Continued)
WETLAND SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	WL-1	WL-2	WL-3
IEA Sample ID Number	950426904	950426905	950426906
INORGANIC COMPOUNDS			
Arsenic	41.3	34.6	43.3
Barium	126	92.3B	265
Cadmium	3.5	1.5B	3.3
Chromium	11400	9410	14100
Hexavalent Chromium	<0.18	<0.17	<0.18
Lead	143	128	154
Mercury	2.6	0.77	0.81
Selenium	8.0	2.0B	2.1B
Silver	3.6B	2.6B	2.1B

Units are in mg/kg

028000 0X1A6

TABLE 4-6 (Continued)
WETLAND SURFACE WATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number / IEA Sample ID Number / INORGANIC COMPOUNDS	WL-SW-1 950426901	WL-SW-1F 950426901F	WL-SW-2 950426902	WL-SW-2F 950426902F	WL-SW-3 950426903	WL-SW-3F 950426903F
Arsenic	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Barium	45.4B	42.8B	42.9B	39.4B	40.1B	38.1B
Cadmium	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chromium	37.3	6.5B	3.6B	1.3B	2.9B	<1.0
Hexavalent Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	2.9B	2.6B	<2.0	<2.0	<2.0	<2.0
Mercury	<0.20	<0.80	<0.20	<0.40	<0.20	<0.40
Selenium	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Silver	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Units are in ug/L

93130-000021

TABLE 4-7
AVS and SEM ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID	Cadmium	Copper	Lead	Mercury	Nickel	Zinc
WL-1#1	4.473	54.00	209.4	0.89	30.74	740.2
WL-1#2	4.068	27.21	139.9	0.00	38.54	602.9
WL-2#1	3.598	56.03	205.1	0.20	13.72	272.2
WL-2#2	3.966	44.68	183.9	0.19	12.79	303.8
WL-3#1	2.506	31.41	72.2	0.12	10.24	128.4
WL-3#2	2.378	29.02	72.0	0.05	25.05	149.7

Units are in mg/kg

Sample ID	Cadmium	Copper	Lead	Mercury	Nickel	Zinc	SEM
WL-1#1	0.04	0.850	1.011	0.004	0.524	11.32	13.75
WL-1#2	0.036	0.428	0.675	0.000	0.657	9.22	11.02
WL-2#1	0.032	0.913	0.990	0.001	0.234	4.16	6.33
WL-2#2	0.035	0.703	0.888	0.001	0.218	4.65	6.49
WL-3#1	0.022	0.494	0.348	0.001	0.174	1.96	3.00
WL-3#2	0.021	0.457	0.347	0.000	0.427	2.29	3.54

SEM = Cd+Cu+Pb+Hg+Ni+Zn
Units are in micromoles per gram

Sample ID	SEM 1	SEM 2	Ave. SEM
WL-1	13.75	11.02	12.39
WL-2	6.33	6.49	6.41
WL-3	3.00	3.54	3.27

Units are in micromoles per gram

Sample ID	AVS 1	AVS 2	Ave. AVS
WL-1	23.2	19.35	21.28
WL-2	1.41	1.36	1.39
WL-3	2.89	3.07	6.04

Units are in micromoles per gram

Sample ID	W dry/ W wet	Ave. AVS	Ave. SEM	Ave. SEM/ Ave. AVS
WL-1	0.18	21.28	12.39	0.58
WL-2	0.18	1.39	6.41	4.61
WL-3	0.26	2.98	3.27	1.10

Units are in micromoles per gram

2480010450

TABLE 4-7 (Continued)
WETLAND SOIL ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOIS

Sample ID Number	WL-1	WL-2	WL-3
IEA Sample ID Number	NA	NA	NA
SOIL CHEMISTRY			
TOC	140000	270000	330000

Units are in mg/L (ppm)

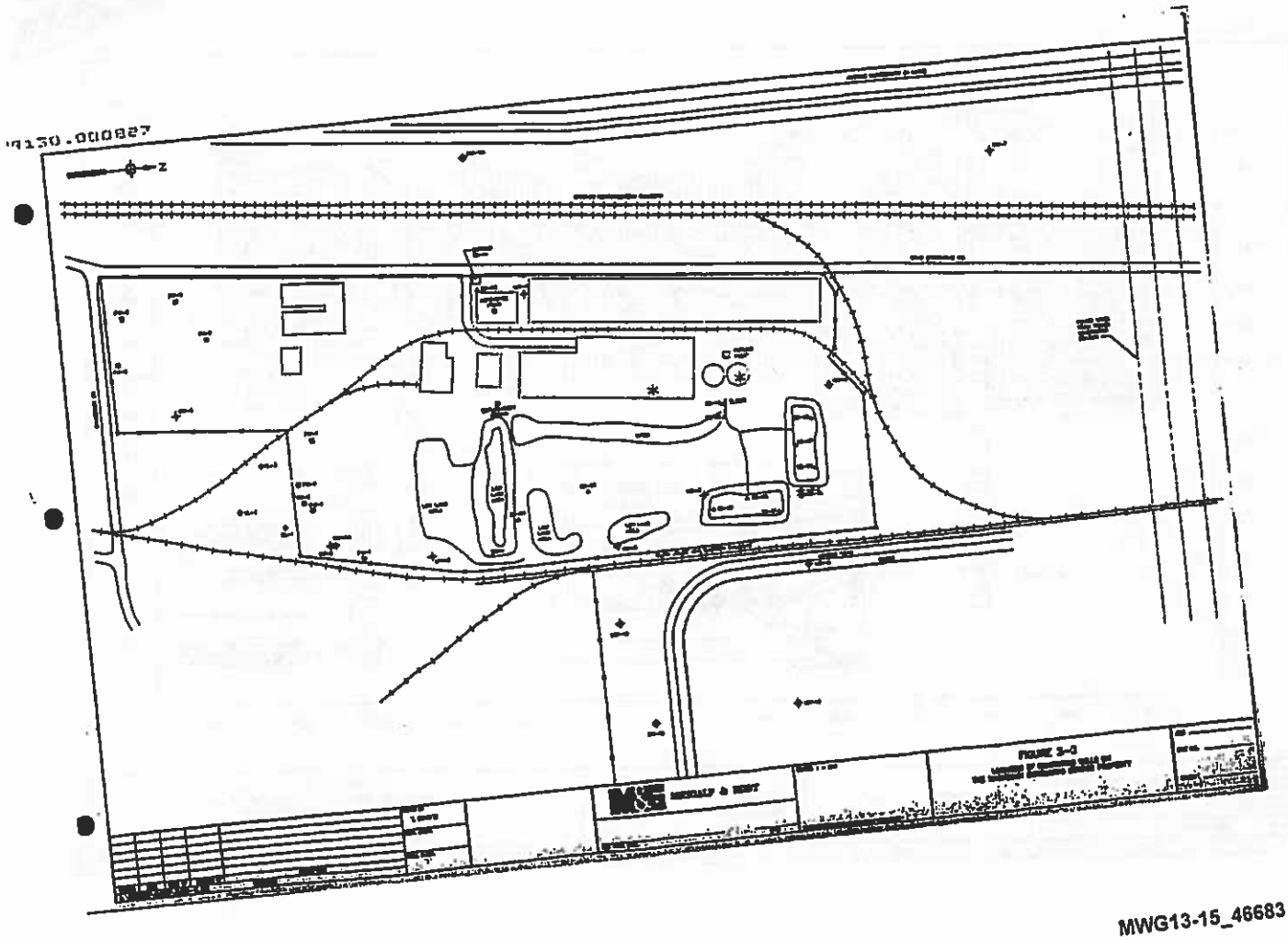
223000-009130

TABLE 4-7 (Continued)
WETLAND SURFACE WATER ANALYTICAL RESULTS
FORMER GRIESS-PFLEGER TANNERY
COMMONWEALTH EDISON COMPANY
WAUKEGAN, ILLINOS

Sample ID Number	WL-SW-1	WL-SW-2	WL-SW-3
IEA Sample ID Number	NA	NA	NA
WET CHEMISTRY			
TOC	12	9.2	5.9

Units are in mg/L (ppm)

991130.000824



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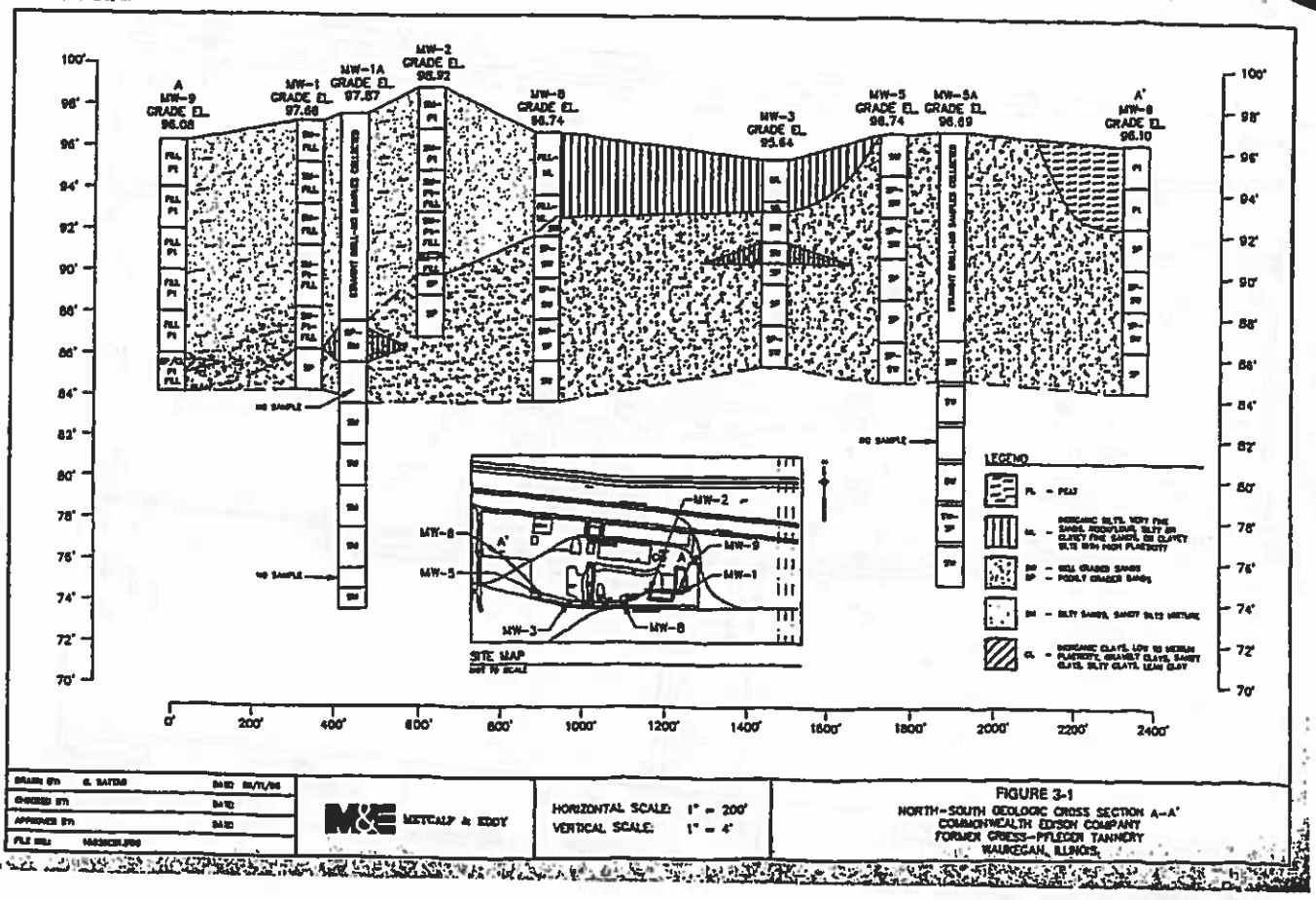

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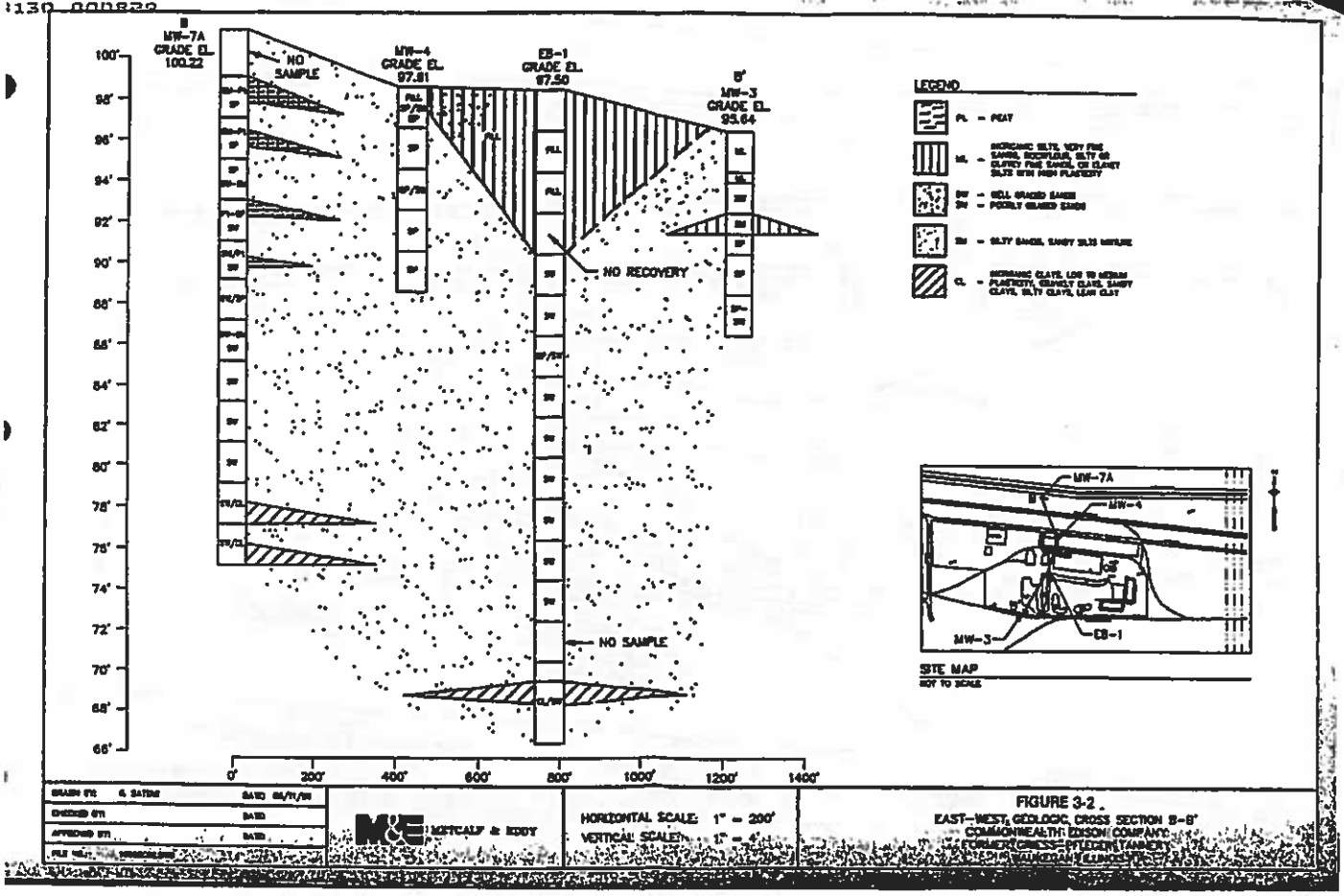

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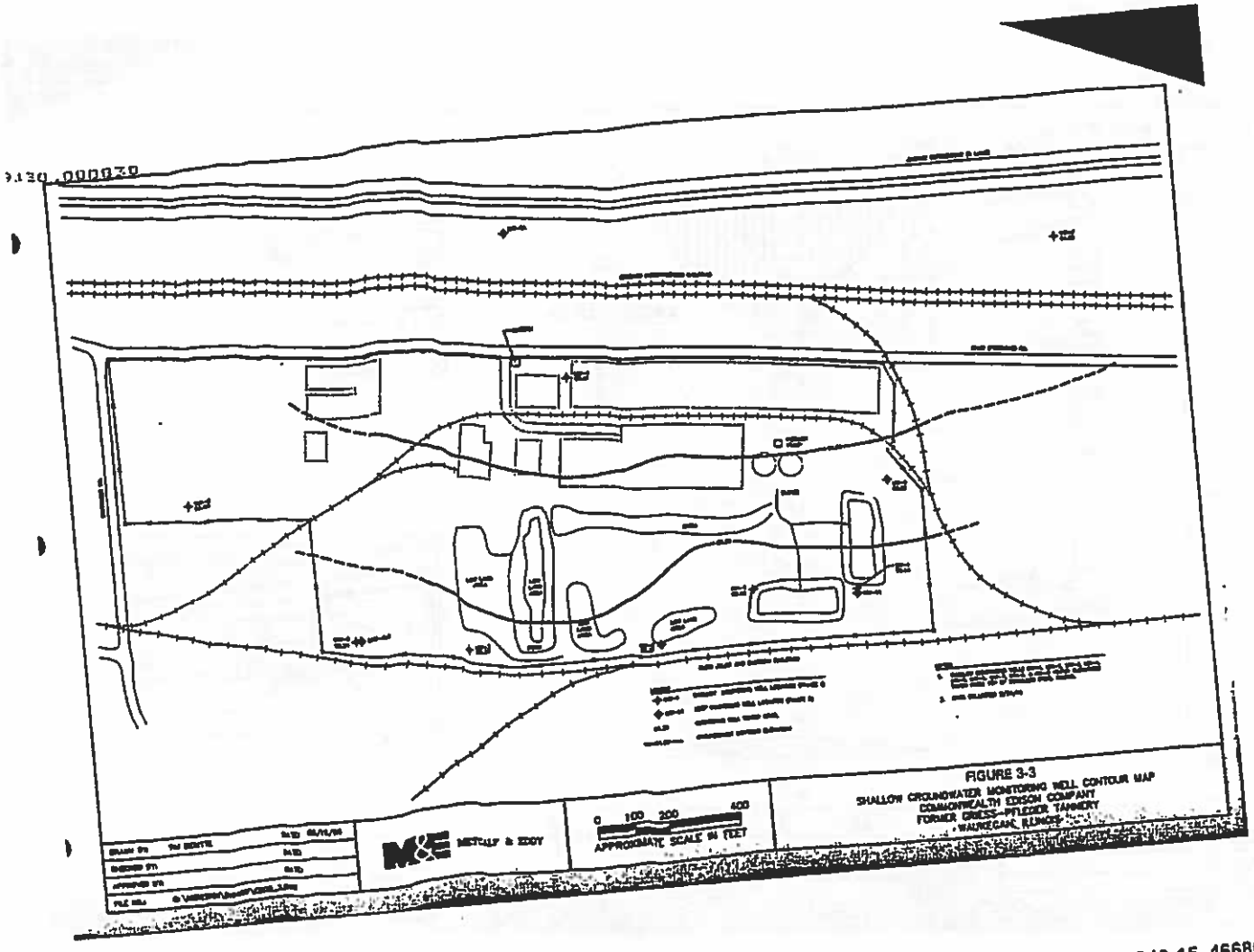

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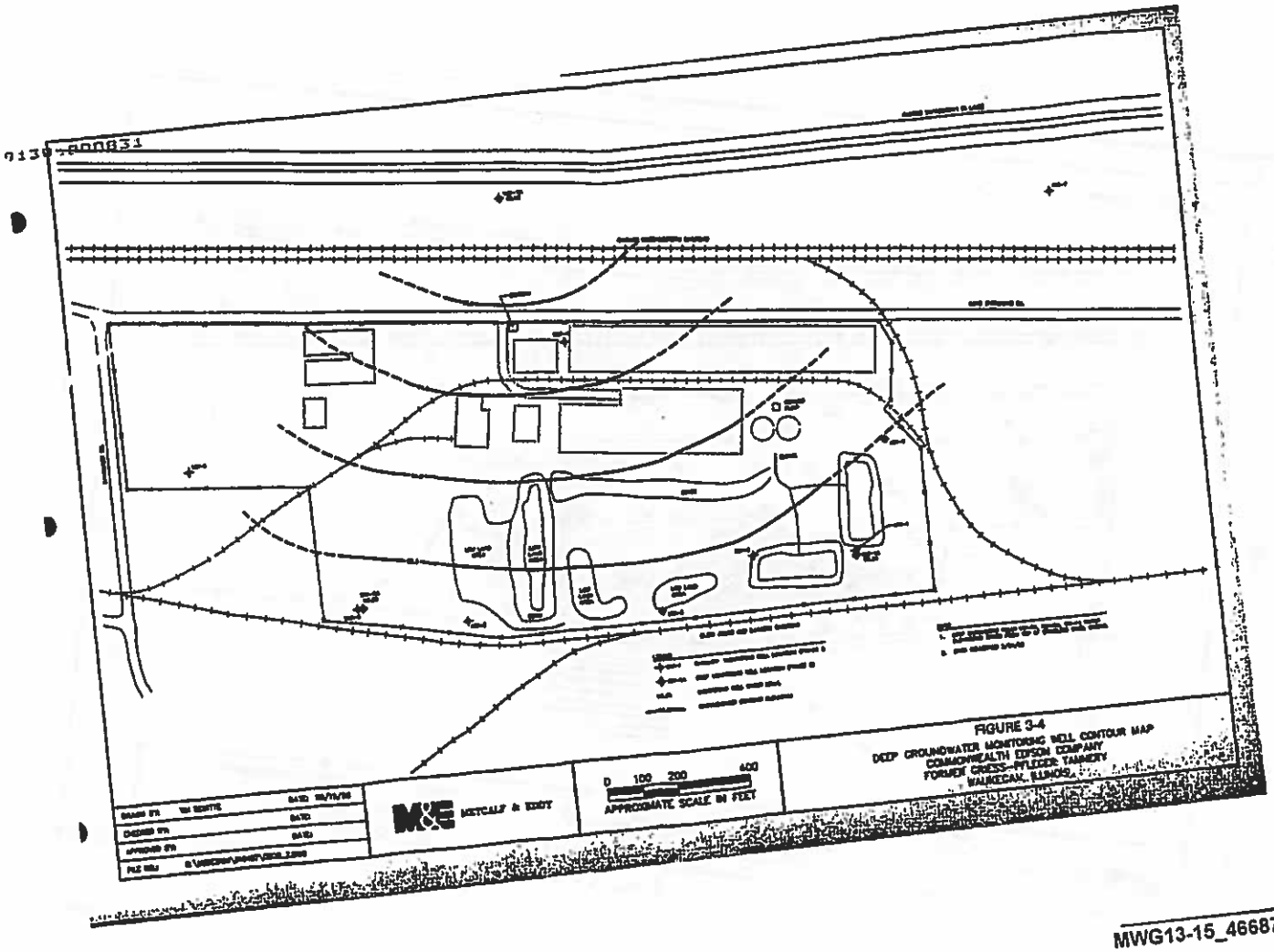

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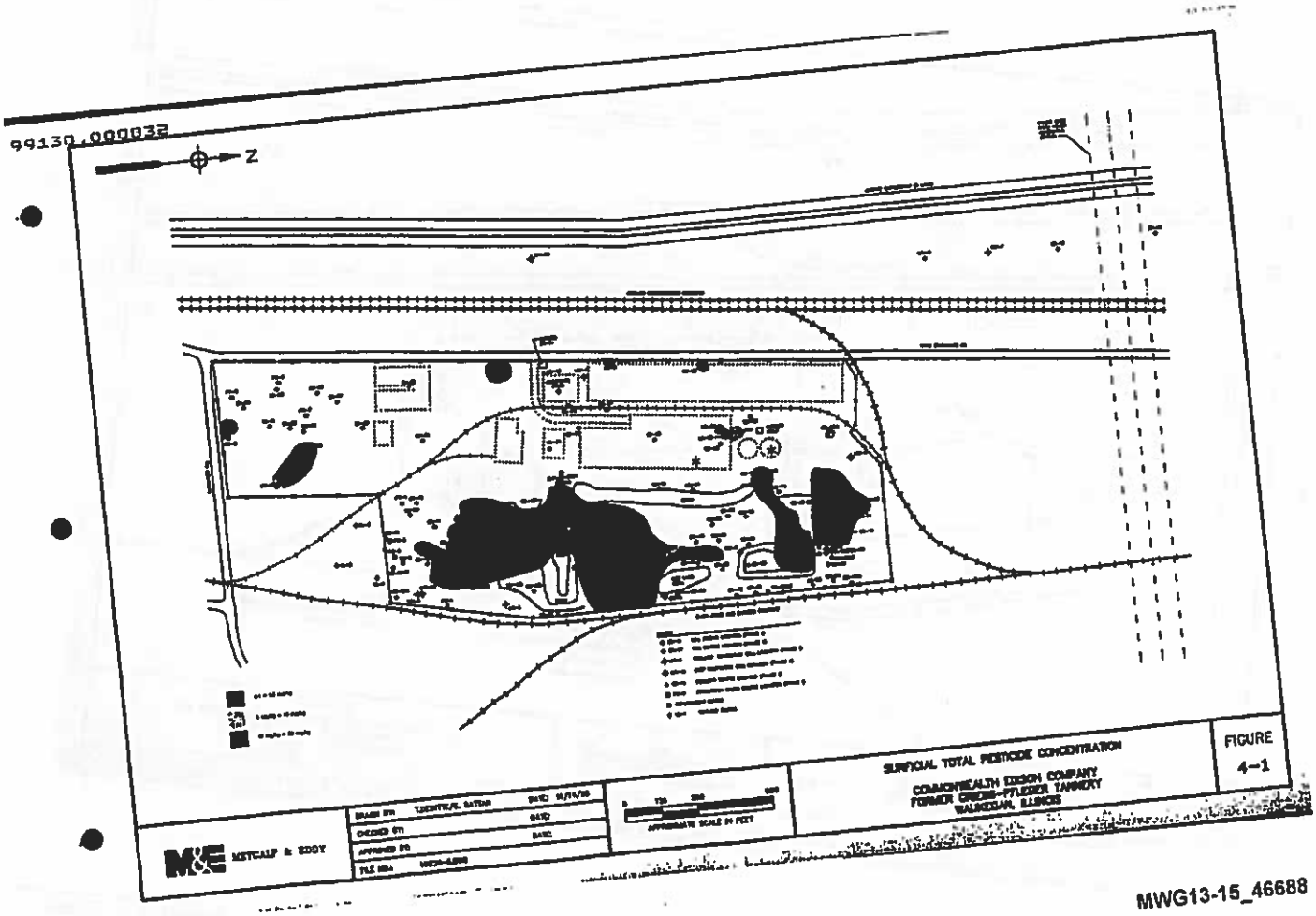

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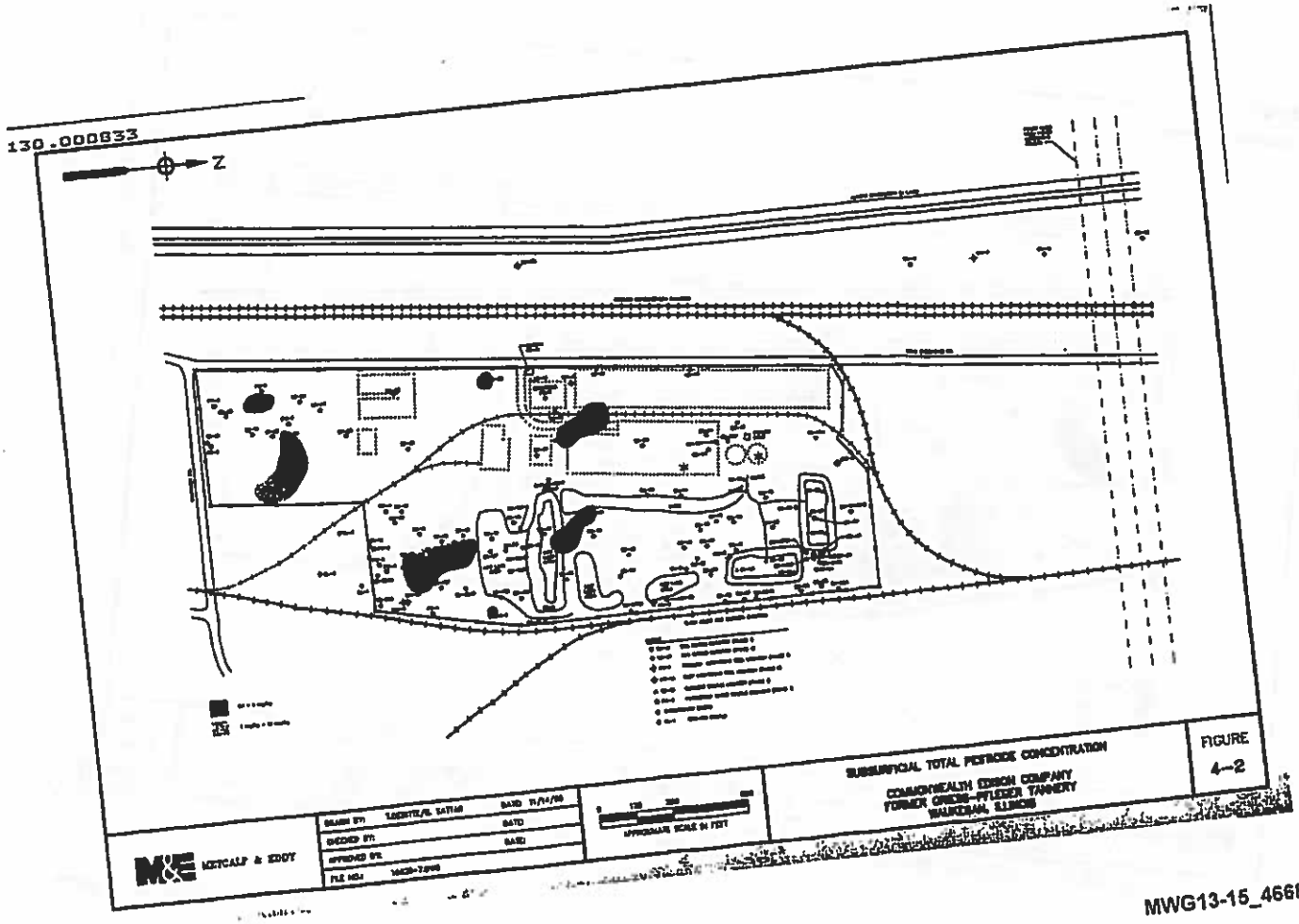

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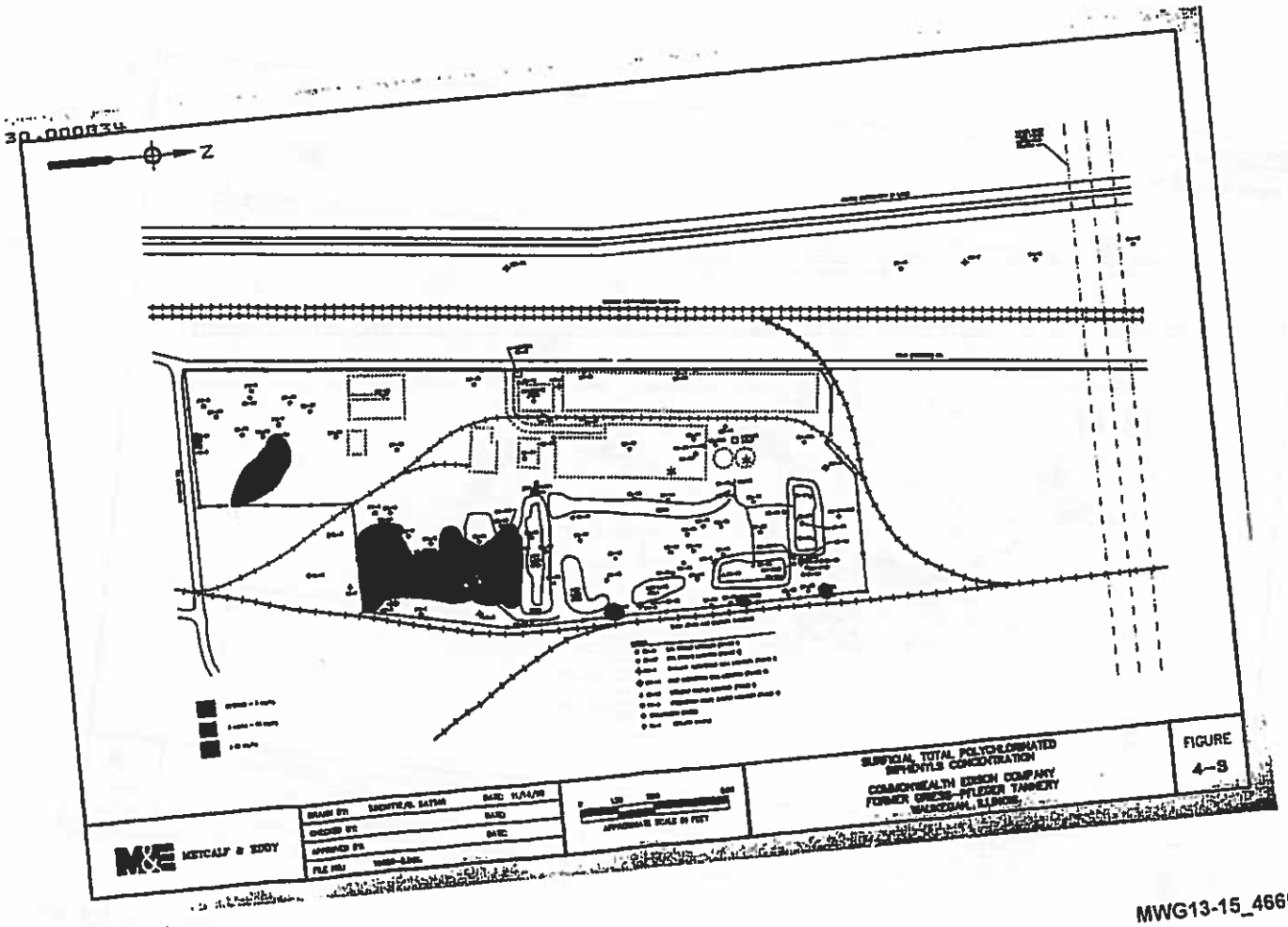

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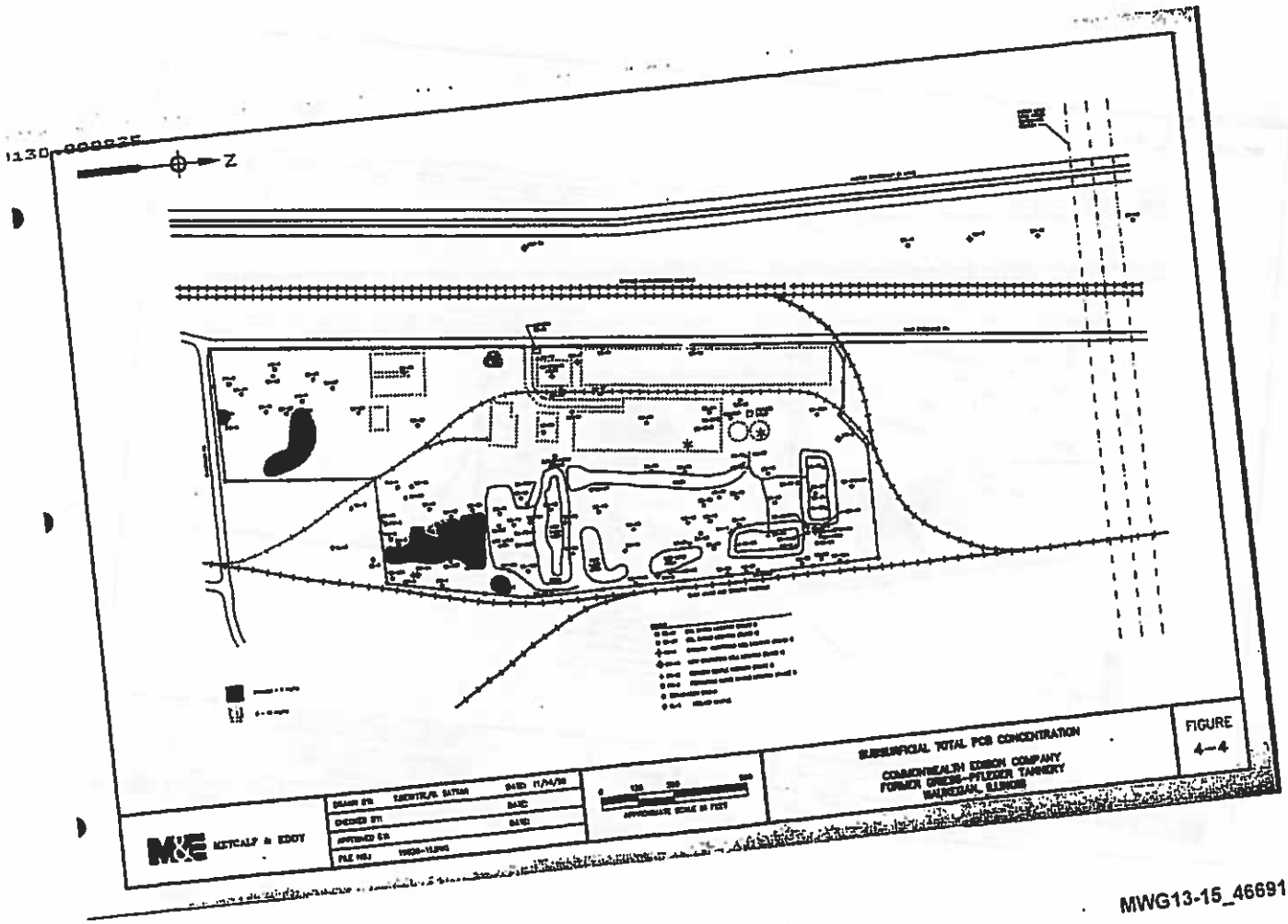

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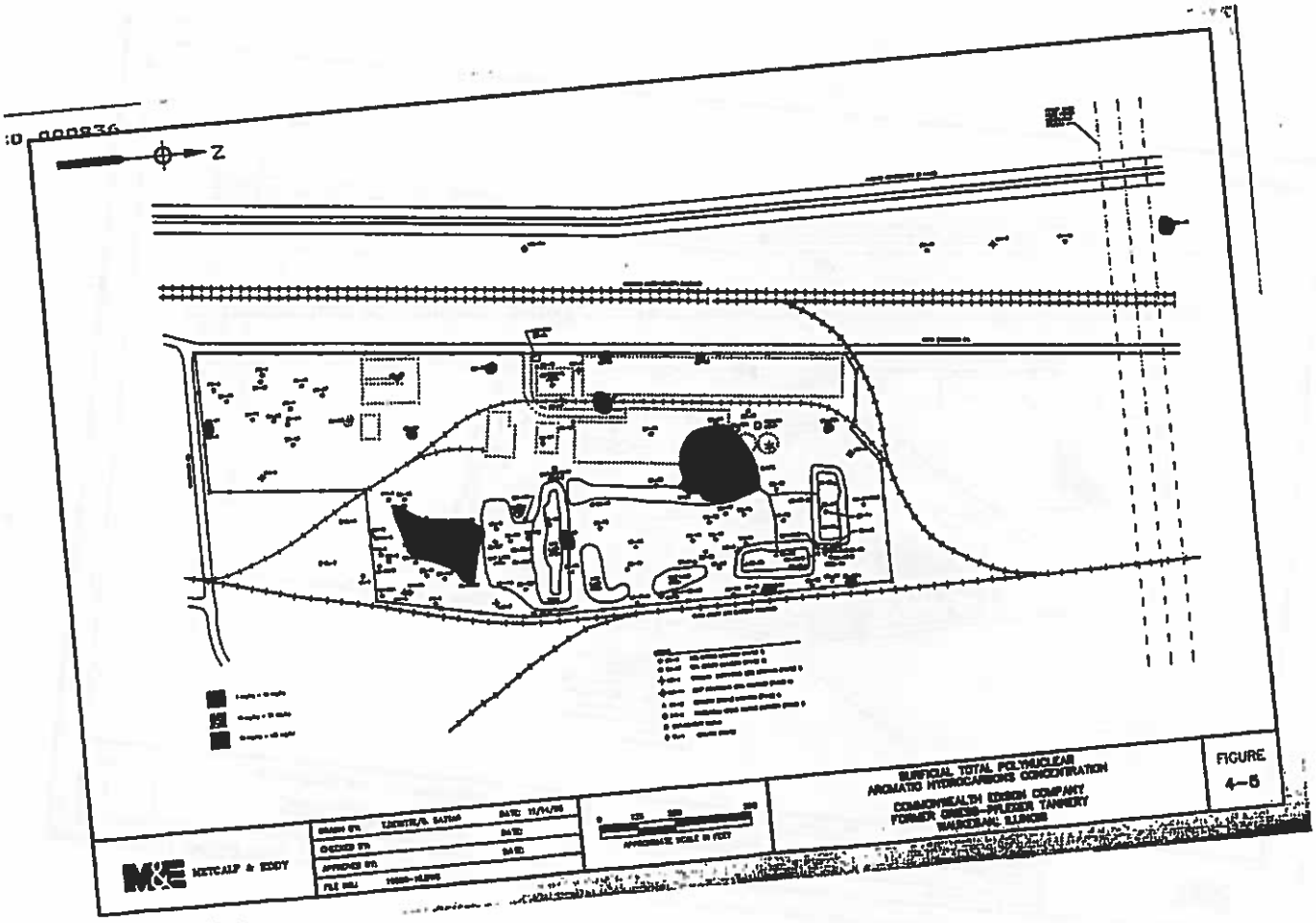

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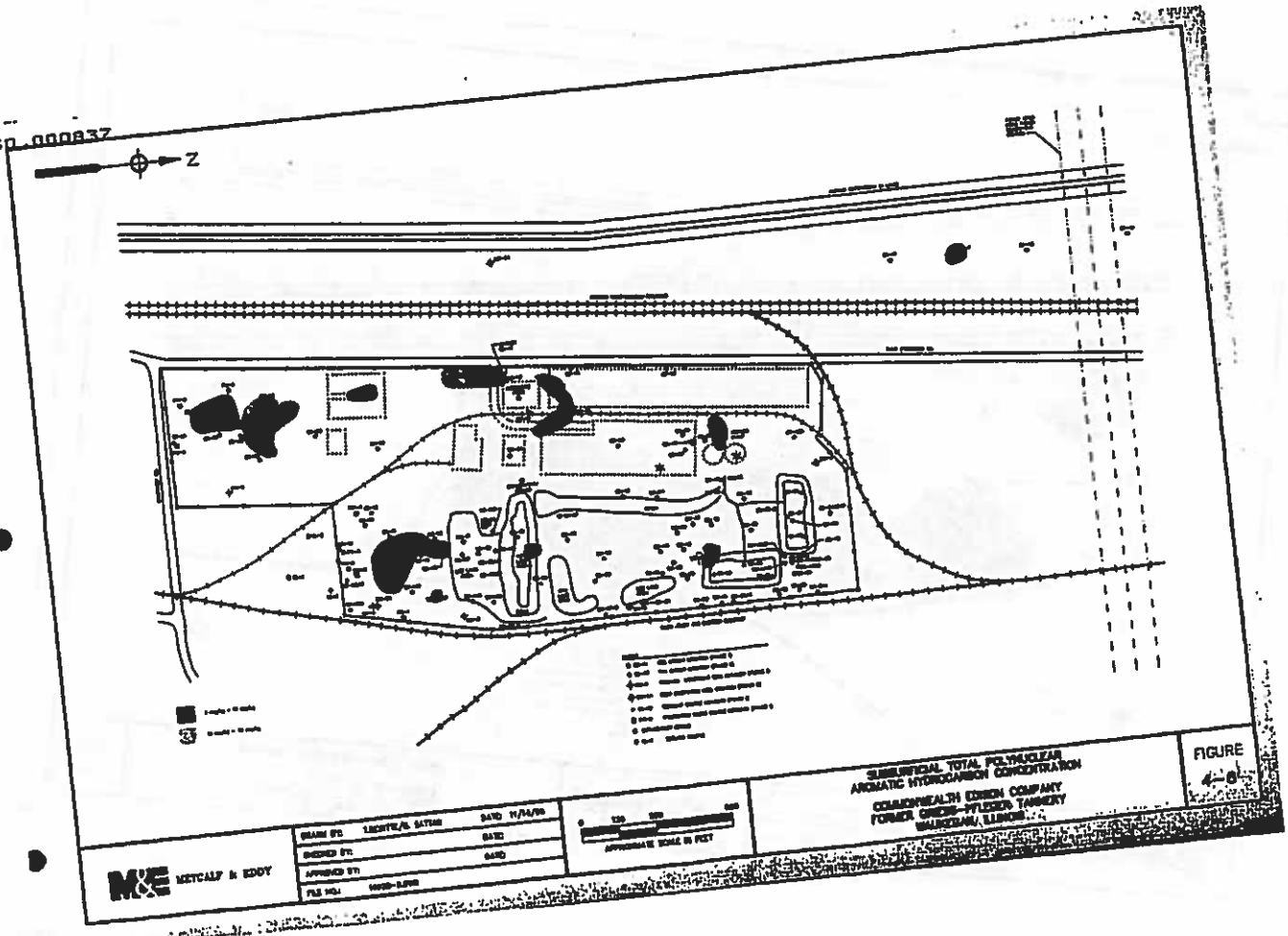

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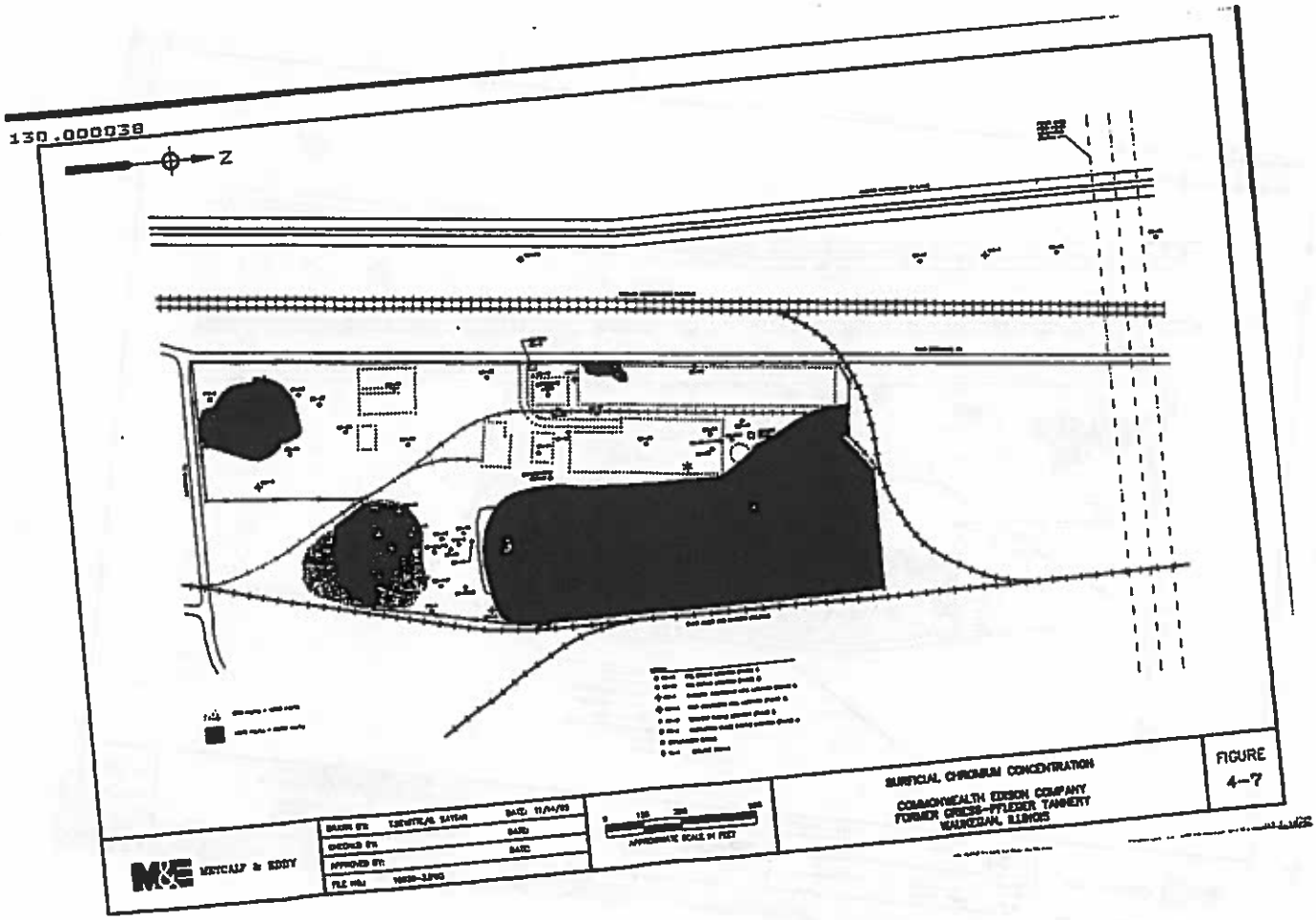

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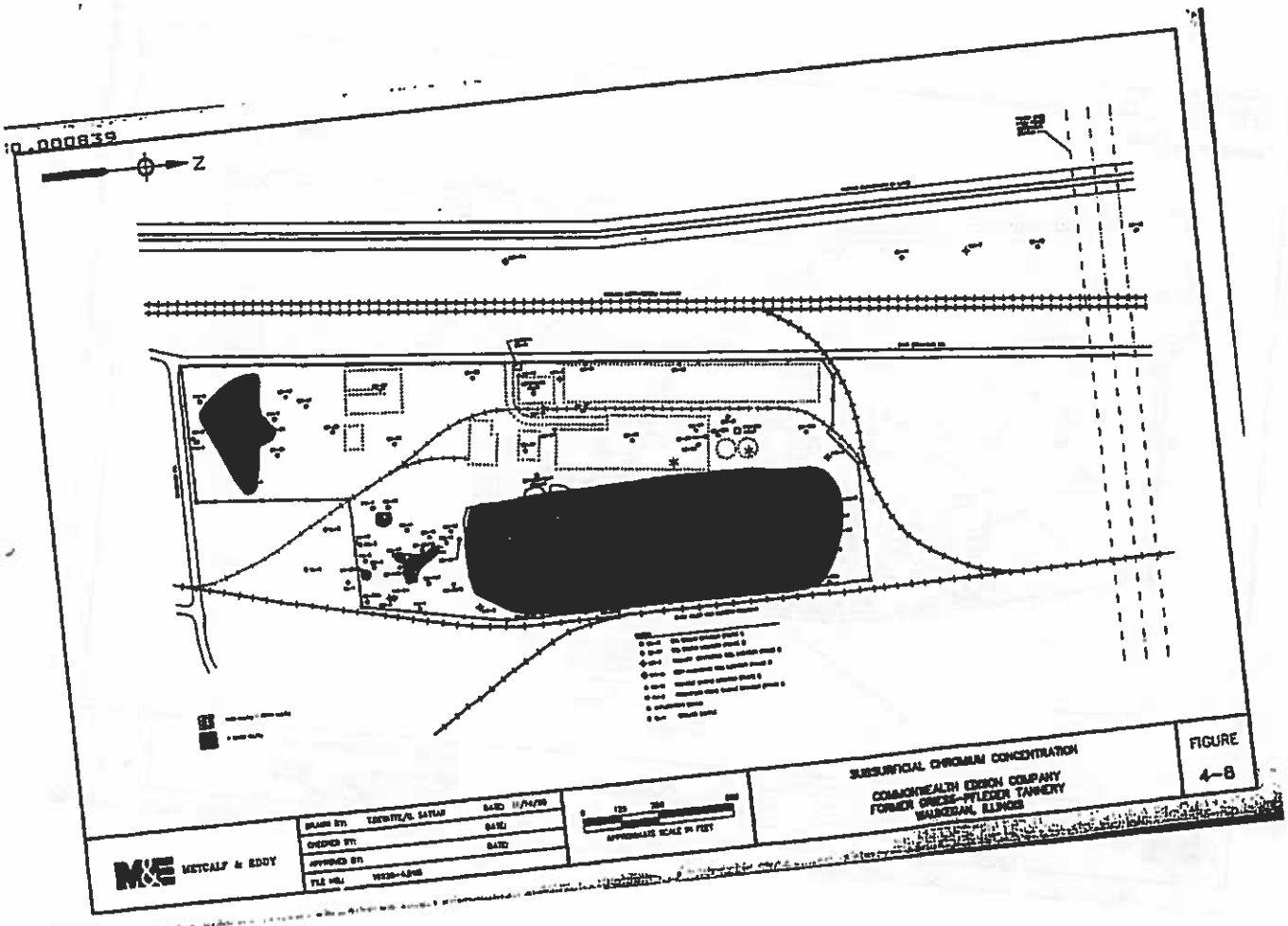

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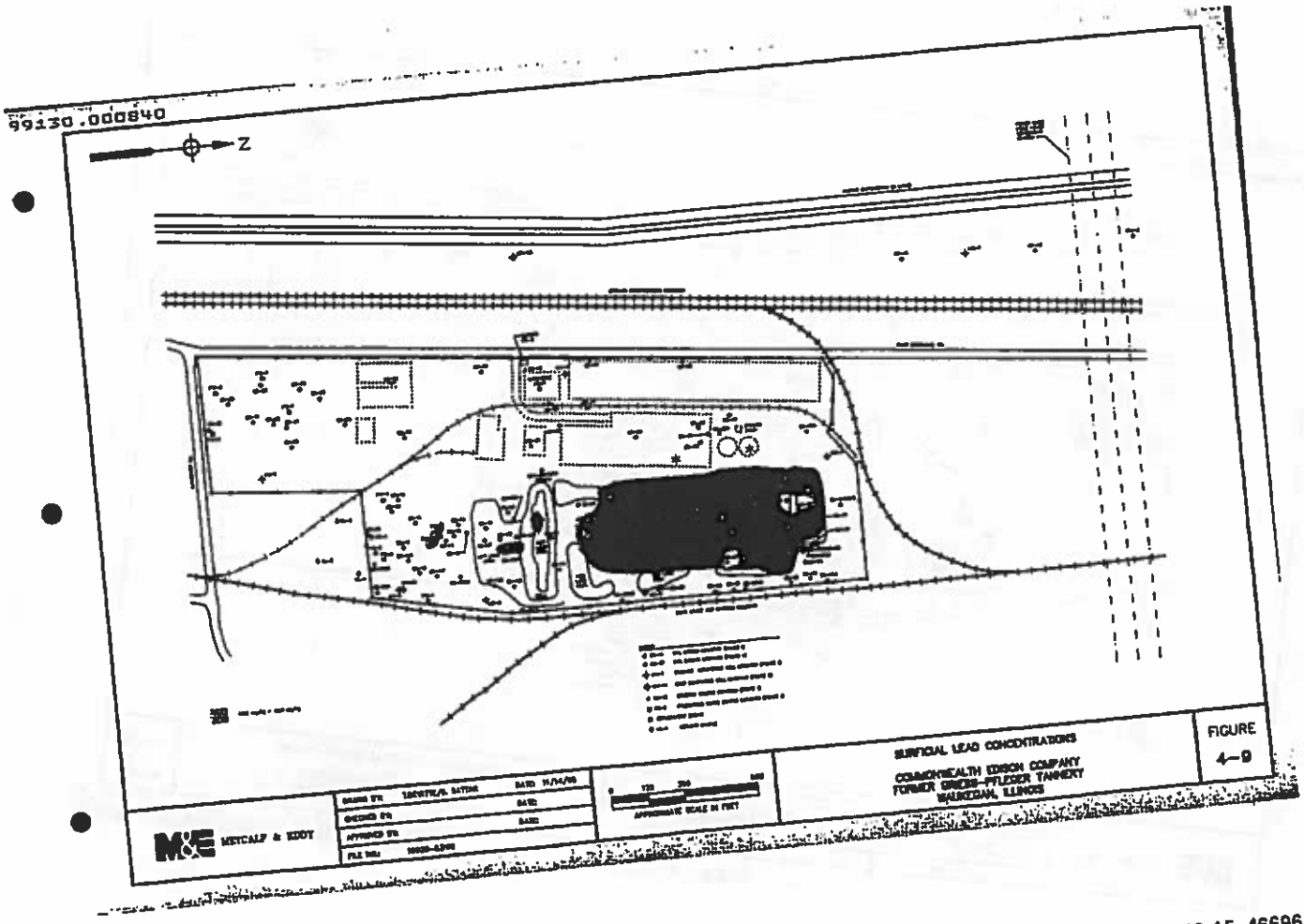

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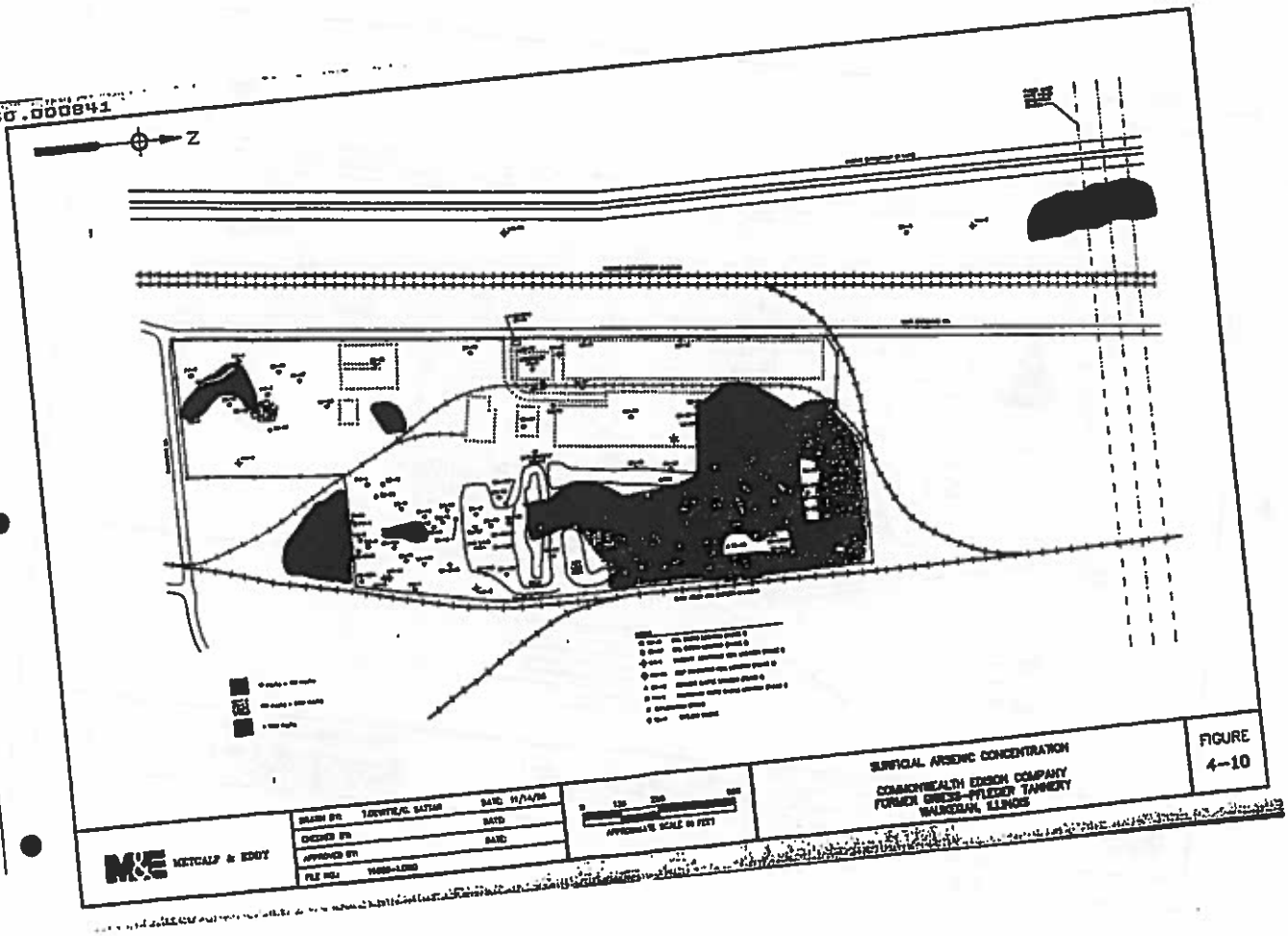

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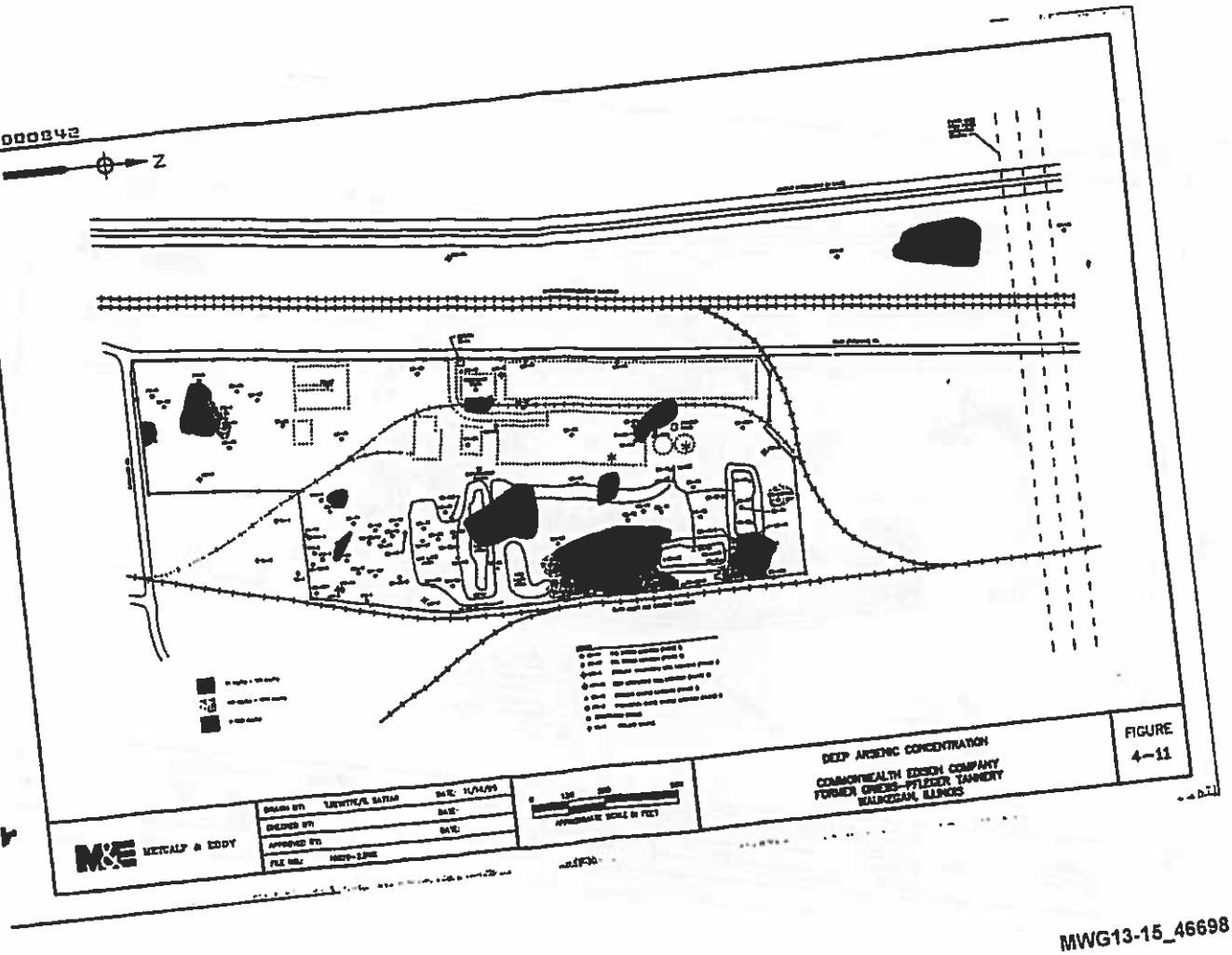


MWG13-15_46698

GEOLOGIC LOG

PROJECT: COMMONWEALTH EDISON		SHEET 1	BORING NO. MW-1
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER ROAD, WEST OF EJ&E R.R.	JOB NO. 016920		
	LOCATION: WAUKEGON	GRND. ELEV. –	TOTAL DEPTH 30.0
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 1-31-95	
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 1-31-95	
HOLE SIZE: 4.25	DRILLING METHOD: HOLLOW STEM AUGER	GRND. WATER (DEPTH/ELEV.): 2.5 B.G. /	WEATHER: CLEAR, WINDY, MID 20's F

DEPTH (FT.)	SAMPLE TYPE/NO.	SAMPLE DEPTH	SAMPLE RECOVERY	BLOW COUNT (per 6 inches)	% RECOVERY OR RQD.	PID (ppm)	SAMPLE DESCRIPTION	GRAPHIC LOG	USCS SYMBOL
	1	1-3	24	10/16/21/27	100	–	BROWN TO BLACK, SATURATED LOOSE, GRANULAR SLAG-LIKE MATERIAL (SATURATED 2.5-3' B.G.)		FILL
	SS								
	2	3-5	12	7/7/10/13	50	–	BLACK, SATURATED LOOSE GRANULAR SLAG-LIKE MATERIAL WITH SOME SAND FILL		FILL
	SS								
	3	5-7	0	29/8/17/20	0	–	NO RECOVERY		
	SS								
	4	7-9	10	15/8/8/8	42	–	GREY, SATURATED, LOOSE, FINE TO MEDIUM SAND WITH TRACE COARSE SAND, SUBROUNDED, POORLY SORTED		SW
	SS								
	5	9-11	12	15/7/8/15	50	–	GREY TO BLACK, SATURATED, LOOSE, FINE TO MEDIUM SAND (SUBROUNDED) WITH SOME C. GRAVEL AND SOME PEBBLES, POORLY SORTED		SW
	SS								
	6	11-13	24	15/7/10/35	100	–	TOP 13"-DARK GREY, SATURATED, LOOSE, F. SAND W TRACE C. SAND & TRACE PEBBLES (MODERATELY WELL SORTED) MIDDLE 4"-GRAY, SATURATED LOOSE, SUBANGULAR GRAVEL AND SLAG, PEICE OF LEATHER (2" DIA & 1/4" THICK), TOP 4"-GRAY, SATURATED, LOOSE, F. SAND W/ SOME C. SAND, MODERATELY POORLY SORTED, SUBROUNDED		SP/SW
	SS								
	7	13-15	14	17/25/50/3"	58	–	GREY, SATURATEDM SLIGHTL DENSE, F-M SAND, WITH TRACE C. SAND, POORLY SORTED, SUBROUNDED		SW
	SS								
	8	15-17	16	4/21/6/17	67	–	GREY, SATURATED, MODERATELY DENSE, F-M SAND, W/ TRACE SAND, TRACE PEBBLES, POORLY SORTED, SUBROUNDED.		SW
	SS								
	9	17-19	24	18/25/32/50	100	–	GREY, SATURATED, MODERATELY DENSE, F-M SAND, W/ TRACE C. SAND & F. GRAVEL, POORLY SORTED, SUBROUNDED.		SW
	SS								
	10	19-21	24	9/19/70/50	100	–	SAME AS ABOVE		SW
	SS								
	11	21-23	24	5/14/36/50	100	–	DARK GREY IN TOP 12" & LIGHT GREY IN BOTTOM 12", SATURATED MODERATLY DENSE, F-M SAND, W/ TRACE C. SAND AND F. GRAVEL, POORLY SORTED, SUBROUNDED.		SW
	SS								
	12	23-25	24	11/30/50/3"	100	–	GREY, SATURATED, MODERATELY DENSE, F-M SAND, W/ TRACE C. SAND & F. GRAVEL, POORLY SORTED, SUBROUNDED.		SW
	SS								
	–	–	–	–	–	–	STRAIGHT DRILL, NO SAMPLES COLLECTED		
	13	28-30	24	12/16/21/50	100	–	GRAY, DENSE, WET, SLIGHTLY PLASTIC SILTY CLAY (TOP 4") GREY SATURATED, MOD. DENSE, F-M SAND W/ TRACE F. GRAVELL, POORLY SORTED.		CL/SW
	SS								

SAMPLE TYPES
SS=SPLIT SPOON, ST=SHELBY TUBE

NOTES:
HEAVING SANDS APPARENT AT APPROX. 11' B.G. USED 4' SS SPOON TO COLLECT SAMPLE WHERE BLOWBACK WAS PREVALENT

Revised 12-2007

MWG13-15_46699

9130-000846

GEOLOGIC LOG

PROJECT: COMMONWEALTH EDISON		SHEET	BORING NO.
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER ROAD, WEST OF EJ&E R.R.	JOB NO. 016920	1	MW-1A
	LOCATION: WAUKEGON	GRND. ELEV. 97.87	TOTAL DEPTH 25'
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 2-2-95	
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 2-2-95	
HOLE SIZE: 4.25	DRILLING METHOD: HOLLOW STEM AUGER	GRND. WATER (DEPTH/ELEV.): 6.49 (TOC) / 93.30 (TOC)	WEATHER: CLEAR, COLD, MID. 20° F

DEPTH (FT.)	SAMPLE TYPE/NO.	SAMPLE DEPTH	SAMPLE RECOVERY	BLOW COUNT (per 6 inches)	% RECOVERY OR RQD.	PID (ppm)	SAMPLE DESCRIPTION	GRAPHIC LOG	CLASSIFICATION
							STRAIGHT DRILL WITH HOLLOW STEM AUGER TO 10 FT. B.G. GEOLOGY ALREADY DETERMINED FROMM ADJACENT MONITORING WELL MW-1A.		
	1 SS	10-12	18	3/10/19/20	75	4	5"-MED. GREY, WET, SUBROUNDED, VERY DENSE, M-C SAND. FAIRLY WELL SORTED W/ SILT, BOTTOM 13"-GREYISH BROWN, WET, POORLY SORTED, F-VC SAND, TRACE SMALL PEBBLES (SUBANGULAR), SOME SILT		SP-SM
	2 SS	12-14	0	35/50/4"	0	0.3	NO SAMPLE. SAMPLE WASHED FROM SPLIT SPOON.		
	3 SS	14-16	24	7/17/26/40	100	0.9	TOP 10"-MED. GREY, WET. V. DENSE, SUBROUNDED M. SAND W/ TRACE C-VC SAND, SUBANGULAR W/ SOME SILT. BOTTOM 14"- SAME AS ABOVE. COLOR CHANGE YELLOWISH BROWN. FINING DOWN TO V. FINE SAND W/ SILT.		SM
	4 SS	16-18	24	1/3/3/14	100	0.3	MED. GREY GRADING TO YELLOW BROWN, WET, MODERATELY DENSE, V. FINE SAND W/ F-M SAND, SUBROUNDED, MODERATELY WELL SORTED, SOME SILT.		SM
	5 SS	18-20	24	3/4/7/9	100	1.0	OLIVE GREY TO BROWNISH GREY, LOOSE TO MEDIUM DENSITY, V. FINE TO C. SAND W/ SILT, SUBROUNDED, TRACE VC. SAND, SUBANGULAR TRACE HAIR, ROOTS.		SM
	6 SS	20-22	24	4/4/6/11	100	-	LIGHT GREY GRADING TO A YELLOWISH BROWN, WET, LOOSE TO MEDIUM DENSITY V. FINE TO M. SUBROUNDED SAND W/ SILT, TRACE HAIR & PLANT MATERIAL, SULFUR ORGANIC SMELL.		SM
	7 SS	23-25	24	5/8/12/17	100	-	OLIVE BROWN TO BROWN, DARK GREY, DENSE, FINE TO V. FINE SUBANGULAR OR SAND W/ SILT. GRADING TO A V. FINE SAND TOWARD BOTTOM.		SM

SAMPLE TYPES
SS=SPLIT SPOON, ST=SHELBY TUBE

NOTES:

Metcalf & Eddy

GEOLOGIC LOG

PROJECT: COMMONWEALTH EDISON		SHEET 1	BORING NO. MW-5A
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER ROAD, WEST OF EJ&E R.R.	JOB NO. 016920 LOCATION: WAUKEGON	GRND. ELEV. 96.79	TOTAL DEPTH 26'
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 1-31-95	
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 1-31-95	
HOLE SIZE: 4.25	DRILLING METHOD: HOLLOW STEM AUGER	GRND. WATER (DEPTH/ELEV.): 5.61 (TOC) / 93.26 (TOC)	WEATHER: CLEAR, WINDY, MID. 20° F

DEPTH (FT.)	SAMPLE TYPE/NO.	SAMPLE DEPTH	SAMPLE RECOVERY	BLOW COUNT (per 6 inches)	% RECOVERY OR RQD.	PID (ppm)	SAMPLE DESCRIPTION	GRAPHIC LOG	CLASSIFICATION
							STRAIGHT DRILL WITH HOLLOW STEM AUGER TO 10 FT. B.G. GEOLOGIY ALREADY DETERMINED FROMM ADJACENT MONITORING WELL MW-5.		
	1 SS	10-12	12	47/70/ 27/30	50	0	GREY, SATURATED. F-M SAND W/ TRACE C. SAND, MODERATLY DENSE, POORLY SORTED, SUBROUNDED.		SW
	2 SS	12.5-14.5	12	-/7 32/50 ● 3"	50	0	GREY, SATURATED, MODERATLY DENSE, F-M SAND W/ TRACE C. SAND & TRACE F. GRAVEL. MODERATELY POORLY SORTED.		SW
	3 SS	15-17	10	10/16 21/27	42	0	SAME AS ABOVE		
	4 SS	17.5-19.5	12	7/11/ 13/18	50	-	GREY, SATURATED, MODERATELY DENSE. F-C SAND, TRACE OF F. GRAVEL. POORLY SORTED, SUBROUNDED.		SW
	5 SS	20-22	24	2/12/ 10/14	87.5	-	GREY, SATURATED, MODERATELY DENSE F-C SAND W/ TRACE F. GRAVEL, SUBROUNDED. BOTTOM 4" - GREY, SATURATED, MODERATELY DENSE. F. SAND W/ SOME MEDIUM SAND & TRACE OF GRAVEL, MODERATELY POORLY SORTED.		SW-SP
	6 SS	22.5-24.5	20	13/17/ 21/30	83	-	GREY, SATURATED, MODERATELY DENSE, POORLY SORTED. F-C SAND, SUBROUNDED.		SW

SAMPLE TYPES
SS=SPLIT SPOON, ST=SHELBY TUBE

NOTES:
DRILLED TO 26' B.G. (1 FOOT OVER 25') BECAUSE OF HEAVING SANDS. MONITORING WELL INSTALLED TO 25' B.G.

Metcalf & Eddy

99130-000848

GEOLOGIC LOG

PROJECT: COMMONWEALTH EDISON		SHEET	BORING NO.
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER ROAD, WEST OF EJ&E R.R.	JOB NO. 016920	1	MW-7A
	LOCATION: WAUKEGON	GRND. ELEV. 100.22	TOTAL DEPTH 25'
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 1-31-95	
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 2-1-95	
HOLE SIZE: 4.25	DRILLING METHOD: HOLLOW STEM AUGER	GRND. WATER (DEPTH/ELEV.): 4.81 (TOC) / 95.62 (TOC)	WEATHER: CLEAR, WINDY, MID. TO UPPER 20° F

DEPTH (FT.)	SAMPLE TYPE/NO.	SAMPLE DEPTH	SAMPLE RECOVERY	BLOW COUNT (per 6 inches)	% RECOVERY OR ROD	PID (ppm)	SAMPLE DESCRIPTION	GRAPHIC LOG	CLASSIFICATION
	1	1-3	21	3/4/6/7	87.5	0	TOP 17"-GREY TO BLACK, DAMP, SOFT SILTY SAND W/ TRACE PEBBLES, W/ FIBROUS ORGANIC MATTER (PEAT). BOTTOM 4"-TAN TO DARK BROWN, SLIGHTLY MOIST WELL SORTED, M-SAND, SOFT.		SM-PT/SP
	SS								
	2	3-5	24	1/3/4/7	100	0	TOP 9"-GREY & BLACK, DAMP SILTY SAND, SOFT, W/ ORGANIC MATERIAL (PEAT). MIDDLE 6"-GREY TO BLK, MOIST, SOFT, POORLY SORTED F-M SAND W/TRACE C. SAND. BOTTOM 9"-BLK, MOIST, SOFT, WELL SORTED M. SAND SUBROUNDED.		SM-PT/SP
	SS								
	3	5-7	24	3/3/4/6	100	0	TOP 5"-TAN, MOIST, SOFT, WELL SORTED, MEDIUM SAND, SUBROUNDED. BOTTOM 14"-BLK TO BRN, WET, SOFT, F-M SAND, MODERATELY POORLY SORTED. GRADE TO A SILTY SAND.		SP/SW-SM
	SS								
	4	7-9	10	4/10/12/3	42	0	TOP 4"-BLK,MOIST, SPONGY ORGANIC MATTER (PEAT) W/ F. SAND (SUBROUNDED). BOTTOM 6"-TAN, SATURATED, LOOSE, F-C SAND W/ F. GRAVEL AND TRACE PEBBLES; SUBROUNDED, POORLY SORTED.		PT-SP/SW
	SS								
	5	9-11	20	5/8/8/10	83	0	TAN, SATURATED, LOOSE, SOFT, F-C SAND, TRACE PEBBLES, POORLY SORTED, SUBROUNDED. 1" SOFT, BLK, SPONGY MATERIAL (PEAT), TAN, SATURATED SOFT LOOSE, F-C SAND, POORLY SORTED, SUBROUNDED.		SW/PT/SW
	SS								
	6	11-13	24	5/8/11/17	100	0	TOP 10"-TAN, SATURATED, LOOSE, POORLY SORTED, F-C SAND & F-M GRAVEL. BOTTOM 12"-BLK TO BRN, SATURATED, MODERATELY DENSE, F. SAND, WELL SORTED, SUNROUNDED.		SW/SP
	SS								
	7	13-15	19	11/17/50/4	24	0	GREY SATURATED, POORLY SORTED, F-C SAND W/ F. GRAVEL, 1" MOIST, SILTY SAND (FINE SUBROUNDED SAND). TAN, SATURATED, POORLY SORTED, LOOSE F-V C. SAND & F-M GRAVEL, SUBROUNDED.		SW/SM/SW
	SS								
	8	15-17	24	10/12/18/33	100	0	TAN, SATURATED, MODERATELY DENSE, POORLY SORTED, F-C SAND GRAVEL, PEBBLES, GRADING TO BLK-GRY, F-M SAND W/ SOME F. GRAVEL, MODERATELY POORLY SORTED, SUBROUNDED.		SW
	SS								
	9	17-19	24	15/18/22/30	100	0	GREY, SATURATED, SOFT, POORLY SORTED, F-C SAND W/ TRACE F. GRAVEL, SUBROUNDED.		SW
	SS								
	10	10-21	22	5/6/7/9/	92	0	GREY TO TAN, SATURATED F-M SAND W/ TRACE C. SAND & F. GRAVEL, SUB-RUNDED POORLY SORTED, GRADE TO COARSER MATERIALS. GREY TO TAN, SATURATED, POORLY SORTED, MODERATELY DENSE, F-C SAND W/ GRAVEL, TRACE PEBBLES.		SW
	SS								
	11	21-23	24	12/18/20/27	100	0	GREY, SATURATED, MODERATELY DENSE, POORLY SORTED, F-C SAND W/ TRACE OF GRAVEL. BOTTOM 4" V. STIFF, MOIST, SILTY CLAY W/ TRACE F. GRAVEL, SLIGHTLY TO NON - PLASTIC.		SW/CL
	SS								
	12	23-25	20	4/5/8/18	83	0	GREY, SATURATED, MODERATELY DENSE, F-C SAND W/ TRACE F. GRAVEL, BOTTOM 9" - V. STIFF, SLIGHTLY PLASTIC TO NON-PLASTIC, SLIGHTLY, MOIST, SILTY CLAY W/ TRACE -M GRAVEL		SW/CL
	SS								

SAMPLE TYPES
SS=SPLIT SPOON, ST=SHELBY TUBE

NOTES:
MONITORING WELL INSTALLED AT 24' B.G.
FLUSH MOUNT DUE TO IDOT R.O.W. SPECIFICATIONS.

Metcalf & Eddy

GEOLOGIC LOG

PROJECT: COMMONWEALTH EDISON		SHEET 1	BORING NO. MW-8
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER ROAD, WEST OF EJ&E R.R.	JOB NO. 016920		
	LOCATION: WAUKEGON	GRND. ELEV. 95.74	TOTAL DEPTH 13'
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 2-1-95	
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 2-1-95	
HOLE SIZE: 4.25	DRILLING METHOD: HOLLOW STEM AUGER	GRND. WATER (DEPTH/ELEV.): 5.60 (TOC) / 93.31 (TOC)	WEATHER: CLEAR, WINDY, MID. TO UPPER 20° F

DEPTH (FT.)	SAMPLE TYPE/NO.	SAMPLE DEPTH	SAMPLE RECOVERY	BLOW COUNT (per 6 inches)	% RECOVERY OR ROD.	PID (ppm)	SAMPLE DESCRIPTION	GRAPHIC LOG	CLASSIFICATION
	1	1-3	3	1/1/1/1	13	0.6	BROWN-OLIVE, MOIST, V. STIFF, FIBROUS MATERIAL (ALMOST LEATHERY (WORN LEATHER LOOKING) W/ SILT, BACKGROUND 1.7 ppm		FILL-ML
	SS								
	2	3-5	18	1/4/6/8	75	0.4	TOP 8"-PURPLE TO BROWN TO BLK, MOIST TO WET, FIBROUS (HAIR HIDE MATERIAL) SILT. BOTTOM 10" - TAN TO OLIVE GREEN SATURATED, MODERATELY DENSE, F-C SAND, F. GRAVEL, SOME PEBBLES, POORLY SORTED, SUBROUNDED.		FILL-ML/SW
	SS								
	3	5-7	15	5/8/11/14	62.5	0.4	TAN, SATURATED, POORLY SORTED, MODERATELY DENSE, F-C SAND, W/ F. GRAVEL, SOME PEBBLES.		SP-SW
	SS								
	4	7-9	22	10/24 30/25	92	1.4	TOP 10"-TAN, SATURATED, MODERATELY DENSE, F-M SAND WITH TRACE C. SAND, MODERATELY POORLY SORTED. TAN TO GREY, SATURATED, MODERATELY DENSE, F-M SAND, MODERATELY POORLY SORTED GRAVEL DENSE (2" THICK) AT 8.5 B.G.		SP-SW
	SS								
	5	9-11	19	9/11/18/24	79	-	GREY, SATURATED, MODERATELY DENSE, MODERATE TO POORLY SORTED, SUBROUNDED F-C SAND, BECOMING FINER IN SEQUENCE DOWNWARD (LESS COARSE MATERIAL)		SW-SP
	SS								
	6	11-13	24	15/17 23/30	100	.8	TOP 17"-TAN, SATURATED, MODERATELY DENSE, POORLY SORTED, SUBROUNDED, F-C SAND, TRACE OF GRAVEL, TRACE OF PEBBLES.		SW
	SS								

SAMPLE TYPES
SS=SPLIT SPOON, ST=SHELBY TUBE

NOTES:
END OF BORING 13'. MONITORING WELL INSTALLED TO 13' B.G.

Metcalf & Eddy

9130.000850

GEOLOGIC LOG

PROJECT: COMMONWEALTH EDISON		SHEET	BORING NO.
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER ROAD, WEST OF EJ&E R.R.	JOB NO. 016920	1	MW-9
	LOCATION: WAUKEGON	GRND. ELEV. -	TOTAL DEPTH 13'
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 2-2-95	
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 2-2-95	
HOLE SIZE: 4.25	DRILLING METHOD: HOLLOW STEM AUGER	GRND. WATER (DEPTH/ELEV.): 4.22 (TOC) / 93.86 (TOC)	WEATHER: CLEAR, WINDY, MID. TO UPPER 20° F

DEPTH (FT.)	SAMPLE TYPE/NO.	SAMPLE DEPTH	SAMPLE RECOVERY	BLOW COUNT (per 6 inches)	% RECOVERY OR RQD.	PID (ppm)	SAMPLE DESCRIPTION	GRAPHIC LOG	CLASSIFICATION
	1	1-3	17	1	71	0	BLK, DARK BRN, TAN TO OLIVE GREEN, MOIST TO WET, V. STIFF, MODERATELY PLASTIC SILTY CLAY W/ FIBROUS (HIDE) MATERIAL (SEWER-LIKE/PETROLEUM ODOR)		FILL-PT
	SS								
	2	3-5	4	15/3/1	17	0	BLK, MOIST, STIFF, V. DENSE, NON-PLASTIC SILTY CLAY TO CLAY W/ ROOT MATTER.		FILL-PT
	SS								
	3	5-7	24	1/1/1	100	0	BLK, WET, V. SOFT, SILTY CLAY W/ HAIR & HIDE MATERIAL (SEWER-SWAMP ODOR), GRADE TO GREY//BLK. V. SOFT, WET, SLIGHTLY PLASTIC, SILTY CLAY		FILL-PT
	SS								
	4	7-9	24	6/12 26/28	100	0	BLK, SATURATED, V. SOFT, SLIGHTLY PLASTIC, SILTY CLAY W/ HAIR MATERIAL. BOTTOM 8"-GREY, SATURATED, MODERATELY DENSE, MODERATELY WELL SORTED F-M SAND, (SEWER-SWAMP ODOR)		FILL-PT
	SS								
	5	9-11	24	12/12 24/28	100	0	TOP 12"-BLK, SATURATED, V. SOFT, SILTY CLAY WITH HAIR MATERIAL (SEWER-SWAMP ODOR) 2"-TAN SATURATED, MOD. DENSE, POORLY SORTED, F-M SAND W/ TRACE COARSE SAND. BOTTOM 10"-DARK GREY, SATURATED WELL SORTED, SUBROUNDED F. SAND.		FILL-PT
	SS								
	6	11-13	24	6/18 28/35	100	0	TOP 4"-DARK GREY, SATURATED, MOD. DENSE WELL SORTED F. SAND, SUB-ROUNDED. 5"-BLK, SATURATED, PLASTIC, V. SOFT, SILTY CLAY W/ HAIR MATERIAL (SEWER-SWAMP ODOR). BOTTOM 15"-GREY, SATURATED MOD. DENSE, MOD. WELL SORTED F. SAND GRADING TO COARSE TEXTURE SEQUENC - F-C SAND AND POORLY SORTED.		SP/CL-PT FILL
	SS								

SAMPLE TYPES
SS=SPLIT SPOON, ST=SHELBY TUBE

NOTES: APPROX. 50 GALLONS OF WATER WAS LOST IN THE FORMATION TO CLEAN THE INSIDE OF THE AUGERS FROM THE STICKY SILTY CLAY SO THAT THE FILTER PACK AND BENTONITE PELLETS WILL NOT BRIDGE IN THE AUGERS.

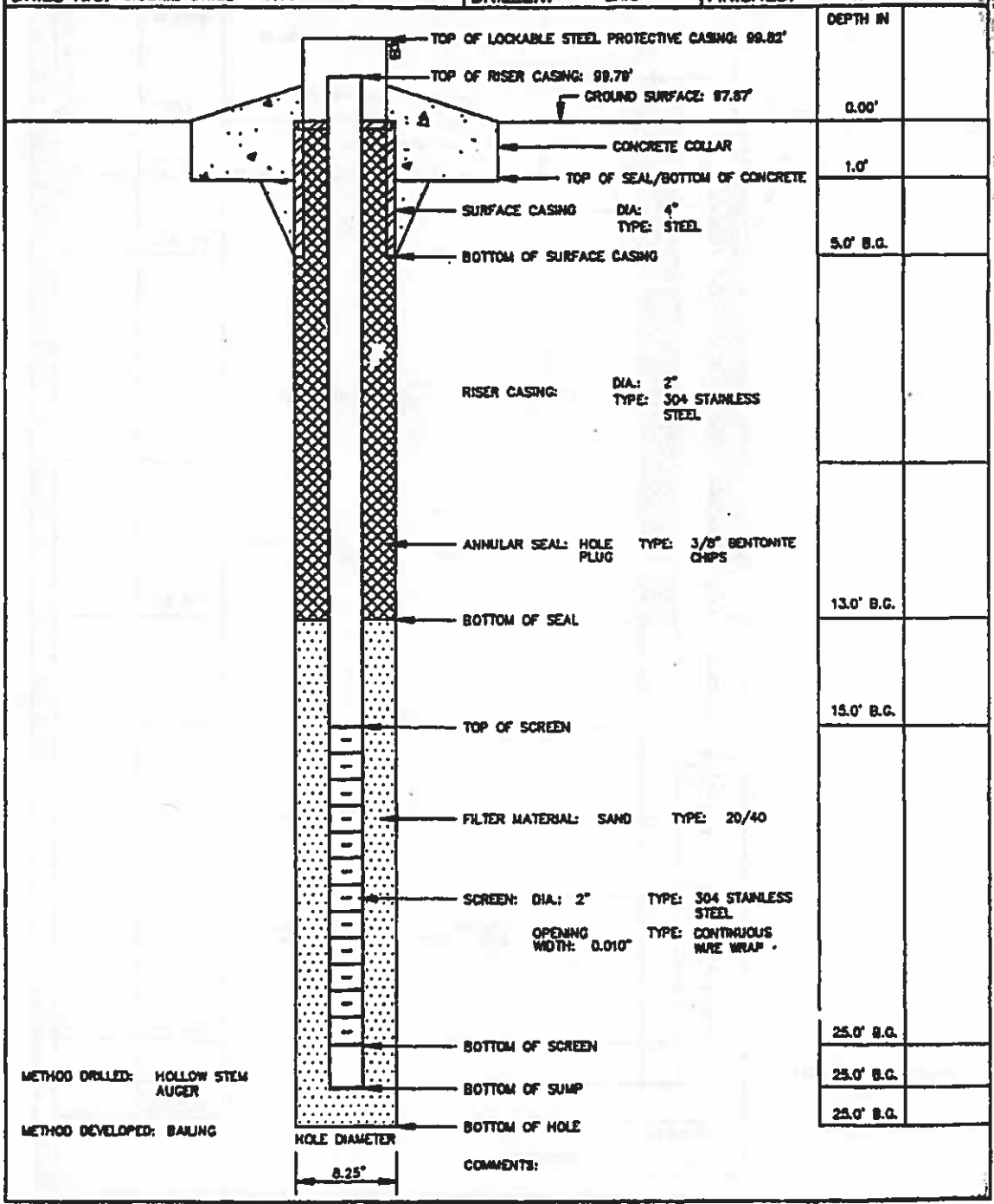
Metcalf & Eddy

MWG13-15_46704

130.000852

MONITORING WELL CONSTRUCTION LOG

PROJECT: COMMONWEALTH EDISON		WELL NO.:	MW-1A
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER RD. WEST OF EJ&E R.R.	JOB NO. 016920	GRND. WATER (DEPTH/ELEV.:	6.49 (TOC) / 93.30 (TOC)
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN:	2-2-95
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED:	2-2-95



METHOD DRILLED: HOLLOW STEM AUGER

METHOD DEVELOPED: BAILING

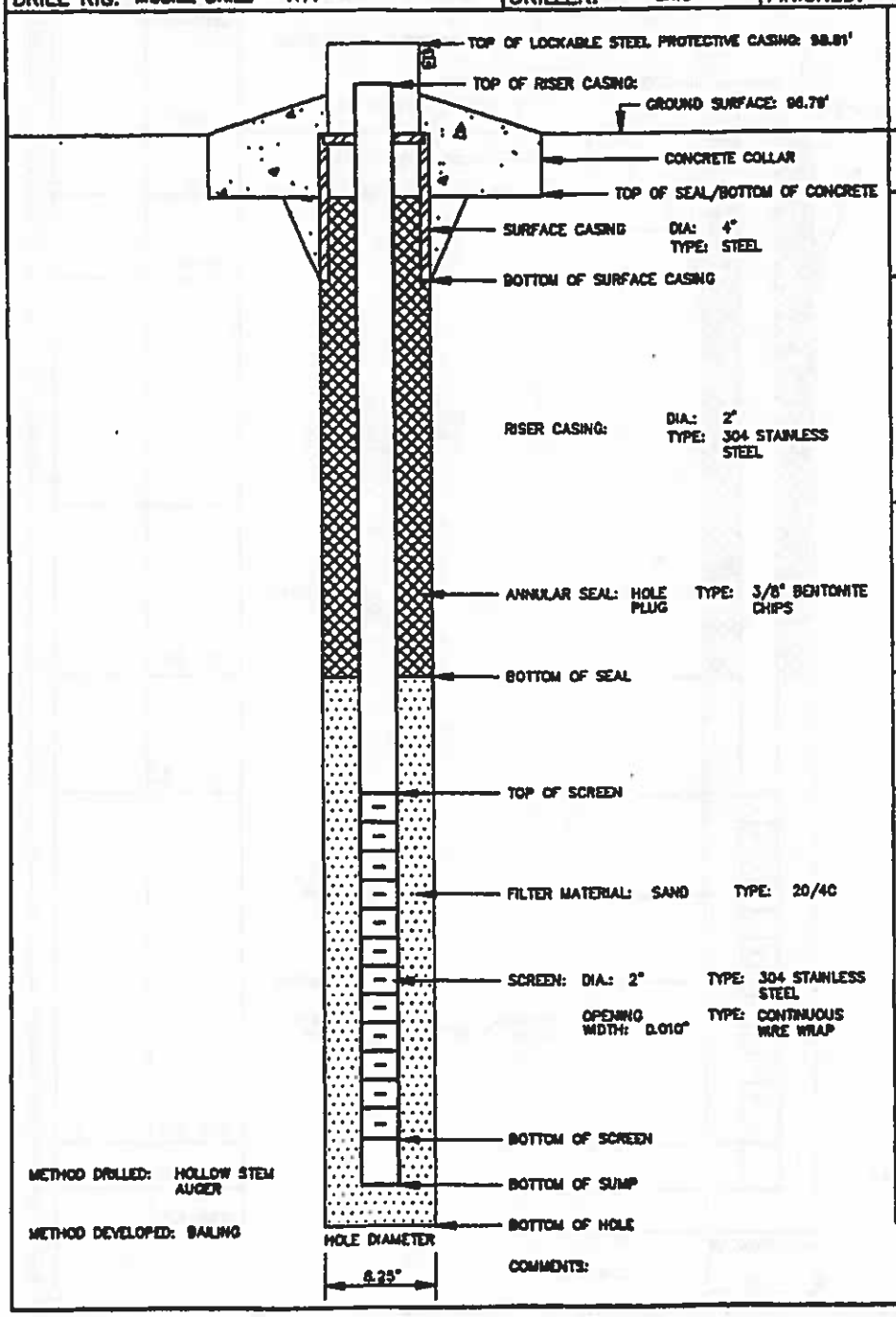
COMMENTS:

Metcalf & Eddy

MWG13-15_46705

MONITORING WELL CONSTRUCTION LOG

PROJECT: COMMONWEALTH EDISON		WELL NO.: MW-5A
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER RD. WEST OF EJ&E R.R.	JOB NO. 016920	GRND. WATER (DEPTH/ELEV.): 5.61 (TOC) / 93.28 (TOC)
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 1-31-95
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 1-31-95



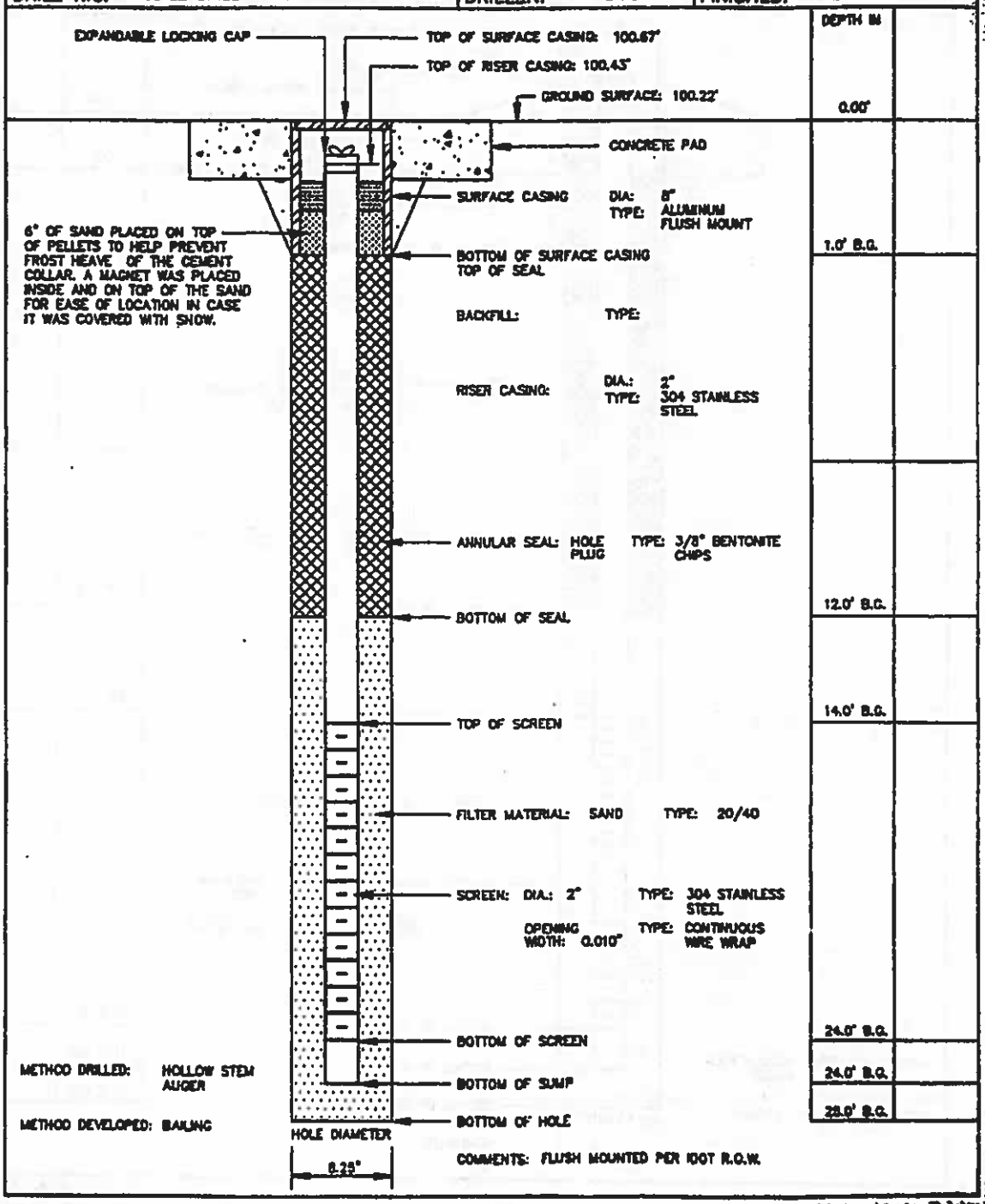
Metcalf & Eddy

MWG13-15_46706

99130.000854

MONITORING WELL CONSTRUCTION LOG

PROJECT: COMMONWEALTH EDISON		WELL NO.: MW-7A
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER RD. WEST OF EJ&E R.R.	JOB NO. 016920	GRND. WATER (DEPTH/ELEV.): 4.81 (TOC) / 95.62 (TOC)
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 2-1-95
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 2-1-95



Metcalf & Eddy

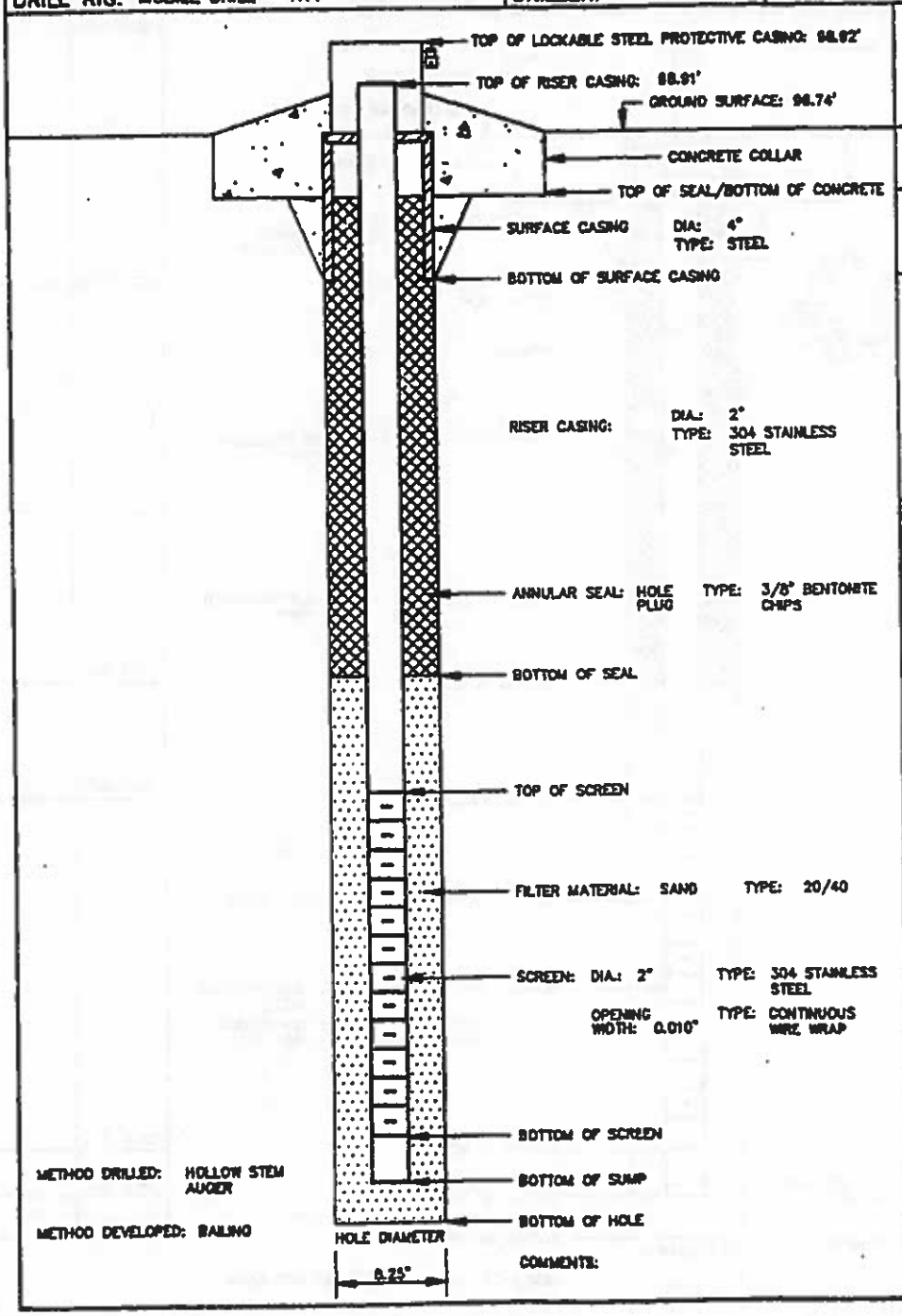
CLIENT-7A.DWG

MWG13-15_46707

1430.000055

MONITORING WELL CONSTRUCTION LOG

PROJECT: COMMONWEALTH EDISON		WELL NO.: MW-8
SITE LOCATION: NORTHEAST CORNER OF SAND AND DAHRINGER RD. WEST OF EJ&E R.R.	JOB NO. 016920	GRND. WATER (DEPTH / ELEV.): 5.8 (TOC) / 93.31' (TOC)
DRILL CONTRACTOR: WTD-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 2-1-95
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 2-1-95



METHOD DRILLED: HOLLOW STEM AUGER

METHOD DEVELOPED: BAILING

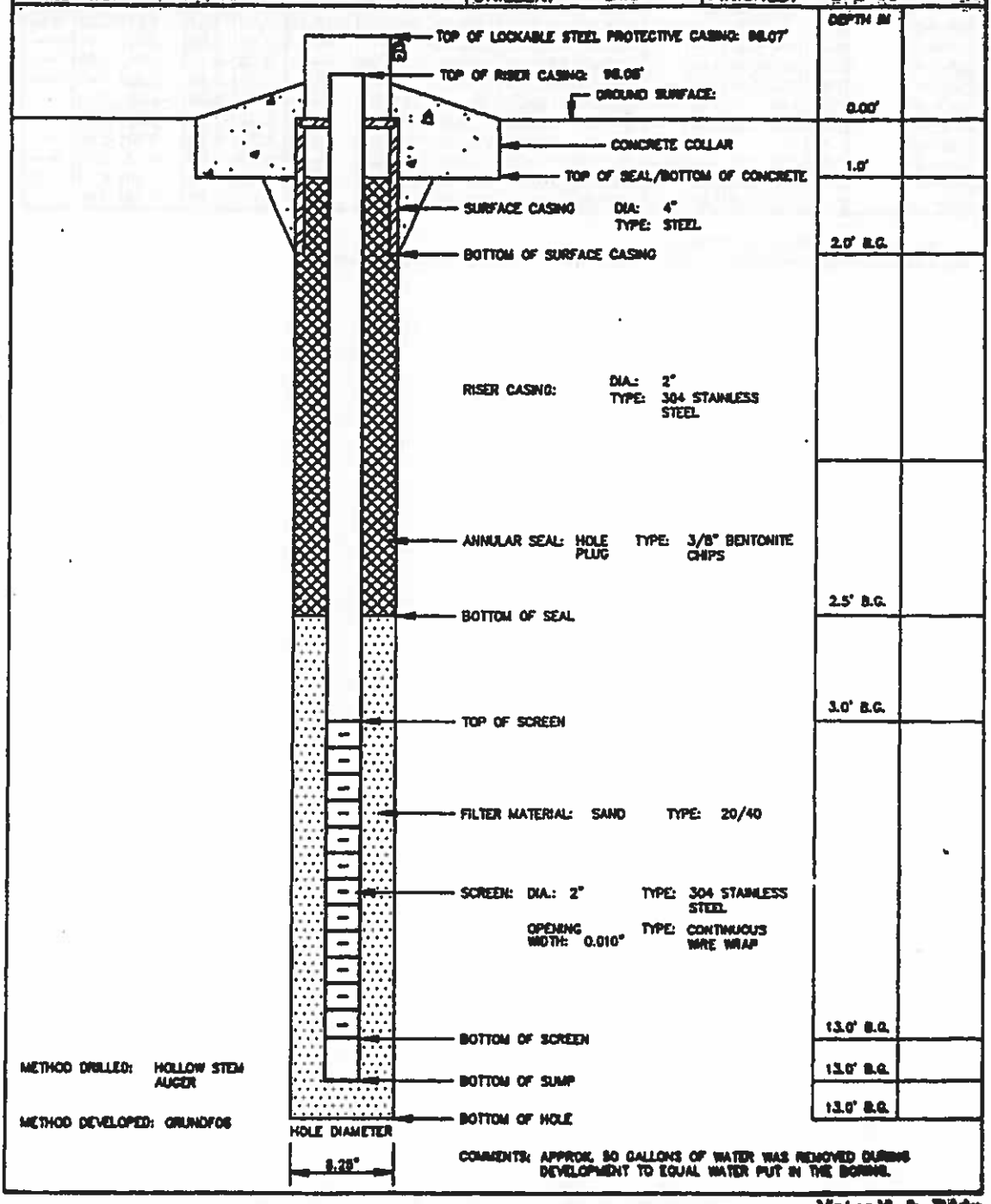
COMMENTS:

Metcalf & Eddy

MWG13-15_46708

MONITORING WELL CONSTRUCTION LOG

PROJECT: COMMONWEALTH EDISON		WELL NO.: MW-8
SITE LOCATION: NORTHEAST CORNER OF SAND AND CAMPANGER RD. WEST OF E.J.&E. R.R.	JOB NO. 016920	GRND. WATER (DEPTH/ELEV.) 4.22 (TOC) / 93.89 (TOC)
DRILL CONTRACTOR: WID-BOART LONGYEAR	ENG/GEO: STORY	BEGUN: 2-2-95
DRILL RIG: MOBILE DRILL - ATV	DRILLER: ERIC	FINISHED: 2-2-95



METHOD DRILLED: HOLLOW STEM AUGER

METHOD DEVELOPED: GRUNDFOS

COMMENTS: APPROX. 50 GALLONS OF WATER WAS REMOVED DURING DEVELOPMENT TO EQUAL WATER PUT IN THE BORING.

Metcalf & Eddy

MWG13-15_46709

COMMONWEALTH EDISON
FORMER WAUKEGAN MANUFACTURED GAS PLANT SITE
WAUKEGAN, ILLINOIS
FIELD PARAMETERS

Monitoring Well	pH					Specific Conductance					Temperature (Celsius)				
MW-1	6.48	6.57	6.54	6.72	--	1150.00	1050.00	1000.00	1150.00	--	2.50	1.50	2.00	3.00	--
MW-1A	7.11	6.90	6.85	6.81	--	900.00	850.00	900.00	900.00	--	1.50	2.00	2.00	1.50	--
MW-2	7.42	7.84	7.57	7.41	7.31	1534.00	1569.00	1563.00	1606.00	1617.00	7.10	4.44	8.61	9.00	9.20
MW-3	6.45	6.57	6.40	--	--	1300.00	1350.00	1300.00	--	--	3.50	4.00	4.00	--	--
MW-4	6.75	6.97	6.96	7.02	--	1260.00	1220.00	1240.00	1240.00	--	4.30	4.10	4.44	4.50	--
MW-5	6.52	6.56	6.67	--	--	1400.00	1160.00	1650.00	--	--	1.00	3.50	2.00	--	--
MW-5A	5.85	6.45	6.41	6.00	--	1260.00	1100.00	800.00	1300.00	--	2.90	0.00	-0.50	3.90	--
MW-6	7.30	7.29	7.27	7.30	--	1549.00	1565.00	1574.00	1590.00	--	6.44	7.30	7.28	7.89	--
MW-7	*	*	*	*	--	500.00	1100.00	1100.00	1000.00	---	2.50	5.50	7.00	5.50	--
MW-7A	7.19	7.02	6.74	--	--	700.00	700.00	700.00	650.00	--	3.50	3.00	5.00	3.00	--
MW-8	6.72	6.65	6.73	6.87	6.88	1100.00	1200.00	1250.00	1250.00	1250.00	1.00	1.00	1.00	1.00	1.00
MW-9	6.60	6.30	6.36	6.49	--	1000.00	1000.00	1000.00	1100.00	--	2.50	1.00	1.00	4.00	--

* – pH meter not working appropriately.
Measurements were taken with the Hydac digital conductivity/temperature/pH Tester.

COMMONWEALTH EDISON
FORMER GRIESS-PFLEGER TANNERY SITE
WAUKEGAN, ILLINOIS
GROUNDWATER ELEVATIONS

WELL ID	DATE	TOR ELEV. (FEET)	GRD. ELEV. (FEET)	D[illegible] (F[illegible]	CORR. WAT ELEV (FEET)
MW-1	5/24/94	99.44	97.66	[illegible]	93.76
	6/4/94	99.44	97.66	5.8[illegible]	93.62
	2/24/95	99.44	97.66	6.10	93.34
MW-1A	2/24/95	99.79	97.87	6.49	93.30
MW-2	5/24/94	101.60	98.92	7.67	93.93
	6/4/94	101.60	98.92	7.91	93.69
	2/24/95	101.60	98.92	8.08	93.52
MW-3	5/24/94	97.89	95.64	4.63	93.26
	6/4/94	97.89	95.64	4.78	93.11
	2/24/95	97.89	95.64	4.61	93.28
MW-4	5/24/94	99.69	97.61	5.60	94.09
	6/4/94	99.69	97.61	5.79	93.90
	2/24/95	99.69	97.61	5.28	94.41
MW-5	5/24/94	98.53	96.71	5.39	93.14
	6/4/94	98.53	96.71	5.50	93.03
	2/24/95	98.53	96.71	5.29	93.24
MW-5A	2/24/95	98.87	96.79	5.61	93.26
MW-6	5/24/94	98.44	96.10	4.87	93.57
	6/4/94	98.44	96.10	5.03	93.41
	2/24/95	98.44	96.10	4.84	93.60
MW-7	5/24/94	104.11	101.96	8.43	95.68
	6/4/94	104.11	101.96	8.53	95.58
	2/24/95	104.11	101.96	9.52	94.59
MW-7A	2/24/95	100.43	100.22	4.81	95.62
MW-8	2/24/95	98.91	96.74	5.60	93.31
MW-9	2/24/95	98.08	--	4.22	93.86

Groundwater Elevations are taken from top of stainless steel casing.