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*Dedicated to the spreading of the Gospel of Jesus Christ to the world!*

September 22, 2010

Mr. Allan Keller, PE  
Manager Permit Section  
Bureau of Water Pollution Control  
**Illinois Environmental Protection Agency**  
1021 N. Grand Avenue East  
Springfield, IL 62794

Re. City Water, Light, and Power - 35 IAC 620 Ash Pond Assessment

Dear Mr. Keller:

In accordance with your letter dated June 24, 2010 we are pleased to submit the results of the hydrogeologic assessment of the ash pond impoundment area at the City of Springfield Municipal Utility - City Water, Light and Power.

If you have any questions about the submittal, please do not hesitate to contact me at (217) 525-6653. Thank you for your cooperation in advance.

Sincerely,



R. Michael McDermont, PE, CMRS  
President

RMM/hrm

enclosure

# Ash Pond Assessment

## INTRODUCTION

In accordance with the Illinois Environmental Protection Agency's (IEPA) request for additional information demonstrating compliance with 35 Illinois Administrative Code (IAC) 620, City Water, Light and Power (CWLP) is providing this hydrogeological assessment of the ash ponds. CWLP operates a series of ash and lime sludge clarification or settling ponds east of the power plant complex in Springfield, Illinois. The utility is owned and operated by the City of Springfield. The ponds are operated under a National Pollutant Discharge Elimination System (NPDES) Permit Number IL0024767. The ash ponds are located north of East Lake Shore Drive, just east of Interstate 55. The site is bordered on the south by Lake Springfield, on the west and north by Sugar Creek and on the east by CWLP's permitted FGDS landfill. The facility is located in the eastern half of Range 5 west, Township 15 north, Section 12 in Sangamon County, Illinois (Springfield East Quadrangle, Illinois, USGS). The setting is depicted on Figure 1.

Beyond the areas depicted on Figure 1, to the west is Interstate 55 and at a greater distance is Dirksen Parkway that parallels the interstate. Commercial property is abundant on both sides of this street and these businesses rely on potable water delivered by CWLP. There are no known water supply wells in this area. The lake is south of the ponds along with the impoundment dam. A flood plain and clay soil borrow area for the landfill is located in the area north of the ash ponds. There is City property located directly east of the ponds that includes a flood plain along with the landfill area. Residences are located further east in several subdivisions. These residences are typically served by potable water from CWLP, as the subdivisions were built in the 1970's, 1980's and 1990's.

The FGDS Disposal facility was constructed within an old river valley which is characterized by flat topography and a meandering stream. Sugar Creek flows adjacent the site. Sugar creek receives water from both surface runoff from adjacent properties, effluent from the ash pond impoundments and discharges from the Lake Springfield Spaulding Dam. Topographically, the waste disposal area is surrounded on the southeast and southwest by higher ground which appears to be bedrock outcrops. Low lying areas are located to the north and east and are within the old river valley.

The impoundment ponds include the Dallman Ash Pond that was placed in service in approximately 1976. This pond is approximately 36 acres. The pond has an average invert elevation of 527 feet MSL from the plan sheet design. Therefore the pond is approximately 27 feet deep from the top of the perimeter roadway. Both flyash and bottom ash is sluiced to the Dallman Ash Pond with raw lake water.

The Lakeside Ash Pond was placed into service prior to 1958. The Lakeside Ash Pond has been divided into three separate ponds with the East Lime Pond being 7.3 acres in size, the west lime Pond 4.2 acres and the remaining Lakeside Ash Pond consisting of 32.3 acres.

The lime ponds receive the sludge, typically composed of lime, flocculants and lake water solids from the water treatment plant clarifiers. These ponds are typically operated one at a time. The clarified supernatant from these ponds flows into the Lakeside Ash Pond.

The Lakeside power plant has been shut down and therefore bottom and fly coal combustion ash is no longer being sluiced to the Lakeside Ash Pond with raw lake water. Efforts continue to reclaim both ash as well as lime sludge from the pond areas. The lime sludge is used to correct pH on agricultural farmland in lieu of typical lime stone application.

The settled water from both the Dallman Ash Pond and Lakeside Ash Pond flow into opposite sides of the center Clarification Pond before being discharged through permitted NPDES Outfalls 004 or 006. Outfall 004 discharges the water into Sugar Creek and alternately Outfall 006 discharges the water back to Lake Springfield. The clarification pond consists of 10 acres. The maximum permitted water flow through the pond system is approximately 7.5 MGD. The clarification pond is also thought to be approximately 27 feet deep with an average invert elevation of 527 ft MSL.

The southern area of the ash ponds and dam is bounded by Lake Springfield. The lake was made by constructing an earthen Spaulding Dam across Sugar Creek. Therefore the lake and the dam are upgradient in terms of groundwater flow direction and groundwater quality.

The adjacent landfill on the east disposes of Flue Gas Desulphurization Sludge from the electric generating facility's sulfur dioxide scrubbers. The landfill is segregated into two regulated units. Unit 1 is a closed landfill regulated by the 35 Illinois Administrative Code (IAC) 807 regulations and comprises approximately 10.5 acres. Unit 2 is north of Unit 1 and consists of 22.3 acres with only 3.5 acres currently being developed to date. This landfill is regulated by the 35 IAC 811 regulations.

Much of the ash ponds and landfill were constructed in the Sugar Creek flood plain. In fact the dam was constructed of glacial till largely consisting of silty clay to clayey silt ensuring that the reconstructed earthen dam, and pond embankments, exhibit low permeability characteristics. Recompacted silty clay samples from the native soils have exhibited permeability's in the  $1 \times 10^{-7}$  to  $1 \times 10^{-9}$  cm/sec range with relative ease and reproducibility based upon construction of the landfill's liner and final cover systems. The in-place creek sediment's soil permeability's predominantly range from  $1 \times 10^{-6}$  to  $1 \times 10^{-8}$  cm/sec.

The property on which these landfill cells and ash ponds have been constructed was originally agricultural land. Based on a 1976 USGS quadrangle map and old design drawings, Sugar Creek originally meandered through the property. The creek was abandoned when the Dallman Ash Pond was constructed and was rerouted to its present position.

The landfill cells were reportedly created by constructing berms above original grade and excavating soils within the cells. The soils excavated from the cell inverts were used to construct the perimeter berms. The total area of the landfill is approximately 25 acres.

Accordingly much is known about the east side of the ash ponds based upon the regulatory required hydrogeologic studies that have been done for the landfill. The landfill has approximately 25 monitoring wells and piezometers spread over the approximate 40 acre total area. Details regarding the specific hydrogeologic investigation in this area are available from the IEPA Bureau of Land CWLP – FGDS Landfill Facility Number 1678250020. These investigations have been summarized and augmented with the 2010 field investigation on the west side of the CWLP ash ponds.

Should the Agency require these numerous hydrogeological studies these reports they can be easily supplied by us or may be reviewed from the Bureau of Land file.

#### POTABLE WATER WELLS

The Illinois State Water Survey was contacted in the past and the potable water wells in a 0.5 mile radius are provided on Figure 2. This figure was prepared by Patrick Engineering, Inc. Most of these wells are likely no longer used based upon the availability of potable water from CWLP in this increasing urbanized area. The water well records are provided in Attachment A.

#### HYDROGEOLOGICAL INVESTIGATIONS

Six subsurface investigations have been conducted in and adjacent to the three landfill cells and ash ponds. These investigations were as follows:

1. Professional Service Industries (PSI), June, 1989. This investigation consisted of five soil borings within the east section of the south cell (Cell 1).
2. Andrews Environmental Engineering (AEE), February, 1990. This investigation was performed for the center cell (Cell 2) and consisted of 13 soils borings. The drilling and soil testing was performed by PSI.
3. Andrews Environmental Engineering (AEE), March, 1990. This investigation was performed to install six monitoring wells at the facility. The drilling, soil testing and well construction was performed by PSI.
4. Patrick Engineering (PEI), July, 1992. This investigation was performed to further characterize the hydrogeology of the landfill setting. Approximately 44 soil boring and piezometers were installed by PEI.
5. Stabilize, Inc. (SI), December, 2008. This investigation installed three new monitoring wells as part of an assessment program for the landfill. The drilling, soil testing and well construction was performed by Reynolds Well Drilling.

6. City Water Light and Power (CWLP), April, 2010. This investigation was performed to install four piezometers on the west side of the ash ponds along Sugar Creek. The drilling, soil testing and well construction was performed by PSI.

The data from Investigations 1 through 4 was summarized, tabulated and consolidated for the landfill permitting process. This information is provided below. The findings from the assessment well and ash pond investigation are then provided to correlate the larger expanded project area with the landfill's hydrogeology findings.

#### **GENERALIZED STRATIGRAPHY**

The available landfill report data was carefully reviewed to determine the general site stratigraphy to define the complex site hydrogeologic conditions. Based on this review, there appears to be six major geologic units present at the site. The six units are as follows:

(1) **Fill Materials** - These materials consist of soils used for constructing the berms and the soils used for filling Sugar Creek when it was rerouted to the west. The fill materials for berms generally consisted of clayey soils. However, the materials used for filling the creek appeared to be variable ranging from silty clays to organic silty clays.

(2) **Upper Cohesive Deposit** - This unit consists of loess and alluvial silty clays to clayey silts.

(3) **Shallow Sand** - This unit, consisting of silty to clayey sand, underlies the Upper Cohesive Deposit.

(4) **Lower Cohesive Deposit** - This unit underlies Shallow Sand and consists of silty to sandy clays.

(5) **Basal Sand** - Underlying the Lower Cohesive Deposit is the Basal Sand which consists of silty to clayey sands, and sands with minor amounts of gravel.

- (6) Bedrock - Bedrock is encountered below the Basal Sand and consists of Pennsylvanian shale.

## REGIONAL GEOLOGY

A review of published regional geologic studies was conducted for the area immediately surrounding the project site. A thorough discussion of the regional geology has been presented by the Illinois State Geologic Survey (ISGS) in a report entitled "Geology for Planning in the Springfield-Decatur Region, Illinois". Based on the publications, the regional unconsolidated overburden is comprised of lacustrine and alluvial sands, silts and clays overlying Pennsylvanian shale. This stratigraphy is expected at the project site as the site is located within an old river valley between bedrock outcrops. A brief summary of the regional overburden stratigraphy, bedrock stratigraphy, groundwater resources, and groundwater use in the vicinity of the project site is provided in the following sections.

### Regional Overburden Stratigraphy

Available regional surface geology maps indicate that unconsolidated deposits in the area of the project site consist primarily of Cahokia Alluvium overlying the Equality Formation. Other soils such as loess, modern soils and glacial tills may be present. The Cahokia Alluvium and Equality Formation are reported to be alluvial silt deposits. The total thickness of the unconsolidated deposits ranges from approximately 10 to 50 feet with an average thickness of about 25 feet based on a water supply well within the area.

The Cahokia Alluvium generally consists of fine-grained silty to clayey soils. Small discontinuous lenses of sand and gravel are commonly encountered. It has been described as ranging from yellowish brown to gray to dark in color.

The Equality Formation consists primarily of silty clays which have been deposited in quiet glacial melt water lakes. It is normally massive in appearance and commonly contains localized lenses of clay and sand.

### Regional Bedrock Stratigraphy

The unconsolidated overburden deposits are underlain by Pennsylvanian shales, limestones, sandstones, and coals. Outcrops of Pennsylvanian shale are present to the west and southeast of the project site. The uppermost Pennsylvanian rocks in the region have been correlated to the Modesto Formation of the Mdeansboro Group.

The most predominant materials in the Modesto Formation are thick gray shales. The sandstone members are usually not as thick as the shales; however, there are local channel deposits which can be up to 80 feet thick. Most of the limestone and coal seams are relatively thin when compared to the shales and sandstones.

The Pennsylvanian rocks are underlain by rocks of the Mississippian, Devonian, Silurian, Ordovician and Cambrian systems. The Mississippian, Devonian, and Silurian rocks consist of limestone, dolomite, and to a lesser extent shale formations. The Ordovician Cambrian rocks are primarily dolomites and sandstones with some relatively extensive shale formations.

#### Springfield No. 5 Coal Mine

Illinois basin coal deposits typically occur in stratigraphic sequences called cyclothem, this is especially true for Pennsylvanian coal, such as those found in the Springfield No. 5. This coal may have been mined near the western half of the project site. Published data for the region indicates that the Springfield No. 5 coal is probably 5 to 7 feet thick, and is present at a depth of approximately 200 feet below the ground surface.

#### Regional Groundwater Resources

The largest groundwater yields in the Sangamon County area are obtained from large diameter wells finished in sand and gravel deposits and the upper portions of the Pennsylvanian rocks. Throughout Sangamon County, the Pennsylvanian bedrock will yield minor amount of groundwater in areas where it is fractured. Locally, sandstone lenses may also yield small amounts of water. Water supply wells are usually not extended more than 150 feet into the bedrock because the groundwater in the lower part of the Pennsylvanian rocks is highly mineralized.

#### Groundwater Use in the Vicinity of Project Site

The available water well logs from Illinois State Water Survey (ISWS) that are located within an approximate one mile radius of the project site were obtained. The locations of the wells in reference to the project area are shown in Figure 2. Copies of the logs are included in Appendix A. A review of these logs indicated the following:

(1) The water supply wells range in depth from 11.5 to 52 feet below the ground surface with an average depth of about 33 feet.

(2) The wells are drilled to the top of bedrock and obtain water from the overburden deposits and the upper few feet of the bedrock surface.

(3) The wells are typically about three feet in diameter due to the low yield of the formations in which they are completed.

#### **SITE GEOLOGY**

The results from each of the six different investigations were consistent with the results from previous investigation regarding the different hydrogeologic units present at the site. As discussed before, six distinct geologic units, namely: Fill Materials, Upper Cohesive Deposit, Shallow Sand, Lower Cohesive Deposit, Basal Sand, and Bedrock are present at the site. A more detailed description of all six units based on the available landfill data is presented in the following sections based upon the individual landfill investigations. Narrative regarding the latest ash pond investigation will be provided following the background information available for the adjacent landfill.

#### **Fill Materials**

Two types of fill materials were encountered at the site. One being the soils used to construct the containment berms and the other being soils used to abandon the creek. Based on the borings drilled through the berms, the berms were generally constructed with silty clays which were likely obtained from within the landfill cells. The borings made along the abandoned creek locations indicate that the creek fill materials consist of variable soils ranging from silty clays to silty sands. It is noted that in some locations the containment berms were constructed directly over the creek fill.

Based on the materials encountered within the creek channel, it is apparent that the creek abandonment was not performed according to current engineering practices. The Fill Materials consist of both cohesive and granular soils. The cohesive soils are characterized as silty clays to organic silty clays organics were typically encountered. In some areas, the cohesive fill materials extended down to the top of bedrock. The granular fill materials are typically poorly graded silty to clayey sands and contain organics or wood fragments. In some areas, the granular fill materials also extended down to the top of bedrock.

The landfill laboratory testing program was concentrated on the creek fill materials. The cohesive fill materials exhibit the following range of index and engineering properties: liquid limit = 34 to 46, plasticity index = 9 to 26, gravel content = 0 %, sand content = 2% to 48%, silt/clay content = 52% to 98%, dry density = 80 pcf to 104 pcf, and laboratory hydraulic conductivity ranging from  $7.6 \times 10^{-8}$  cm/sec to  $2.1 \times 10^{-5}$  cm/sec.

Cation exchange capacity (CEC) tests indicate CEC values range from 14 to 18 meq/100 gm. The granular fill materials contain 0% to 2% gravel, 55% to 65% sand and 33% to 45% silt/clay, based on sieve analyses. One laboratory hydraulic conductivity test was performed using a Shelby tube sample obtained from berm fill at location P-9D and indicate hydraulic conductivity value of  $3.3 \times 10^{-8}$  cm/sec.

#### Upper Cohesive Deposit

The Upper Cohesive Deposit (USD) consists mainly of brown, light brown, and brownish-gray silty clays and clayey silts having soft to stiff consistency. This deposit includes all eolian soils (loess) deposited near the surface, isolated pockets and lenses of fine grained silty to clayey sand at some locations and alluvial silts and silty clays. The UCD is present in all areas of the landfill footprint except in areas where Sugar Creek cut through. The UCD was encountered either at the ground surface or below the fill materials and ranged in thickness from 2.5 to 19 feet. The thickness of the UCD was impacted significantly when the landfill bottom was excavated. In addition, recent earthwork landfill cell development activities may have caused changes in the thickness of the deposit.

Laboratory tests were performed on representative soil samples obtained from this deposit to aid in classification and correlation of the UCD between boring locations. The deposit exhibits the following range of index and engineering properties: liquid limit = 23 to 33, plasticity index = 2 to 14, gravel content = 0%, sand content = 18% to 40%, silt/clay content = 60% to 85%, dry density = 99 to 103 pcf, CEC = 10 to 16.5 meq/100 gm. It is noted that one silt sample obtained from this unit was non-plastic and it is not included in the range of values. Triaxial hydraulic conductivity tests performed on undisturbed 3-inch diameter thin-walled Shelby tube samples indicates that the vertical hydraulic conductivity of this unit ranges from  $1.6 \times 10^{-8}$  cm/sec to  $5.2 \times 10^{-7}$  cm/sec.

#### Shallow Sand

The Shallow Sand underlies the UCD and consists of a brown to gray silty to clayey fine sand. It contains small lenses of silty clay and clayey silt. This unit is not continuous over the entire site. Its thickness ranges from one to three feet over most of the investigated area.

Laboratory tests performed on representative samples collected from the Shallow Sand unit during this and previous investigations indicate the Shallow Sand contains 0% gravel, 50% to 52% sand, and 48% to 50% silt/clay.

#### Lower Cohesive Deposit

The Lower Cohesive Deposit (LCD) consists of brown, gray, and brownish gray silt clays, clayey silts and clays having very soft to stiff consistency. The LCD ranges in thickness from 0 to 22 feet with an average thickness of about 15 feet. The deposit was not encountered in isolated areas along the abandoned creek, possibly due to excessive of creek bottom in these areas.

The LCD is generally overlain by the Shallow Sand and underlain by the Basal Sand. However, within the abandoned creek area, the LCDE was encountered directly below the creek fill. In some areas the Basal Sand is not present and the LCD directly overlies the bedrock.

In some areas the soils in the LCD are very similar in color and texture to the soils in the UCD. The distinction between the two deposits was based on the presence or changes in soil consistency (as measured with a calibrated hand held penetrometer) and a marked difference in moisture content. The LCD is not exposed at the ground surface in the investigated area.

The LCD exhibits the following range of index and engineering properties: liquid limit = 23 to 71, plasticity index = 3 to 39, gravel content = 0%, sand content = 8% to 48%, silt/clay content = 52% to 95%, dry density = 78 pcf to 105 pcf, and cation exchange capacity = 6 to 11 meq/100 gm. The high plasticity clays were encountered in northeast areas of Cell 3 (CB-2, P-3D, and P-4). Hydraulic conductivity of undisturbed samples ranged from  $1.3 \times 10^{-8}$  cm/sec to  $1.8 \times 10^{-6}$  cm/sec. It is noted that three samples tested from this unit showed non-plastic characteristics and these are not included in the range of values.

#### Basal Sand

In general, the lower most hydrogeologic unit in the overburden stratigraphy at the project site is the Basal Sand (BS). It consists of brown to gray colored, poorly graded, silty to clayey fine sands to well graded sands with minor amounts of fine gravel. This unit was encountered in a medium dense to dense condition. The top elevation of the Basal Sand varies from elevation 491 to 513 feet, and the thickness ranges from about 0 to 12.3 feet. The unit was not encountered in a few scattered areas possibly due to excessive erosion of creek bottom.

The Basal Sand generally overlies the bedrock surface and underlies the LCD. Pockets of very hard fine-grained silty clay to clay are present overlying the bedrock in scattered areas, and the Basal Sand is present above these pockets of clayey deposits. The origin of these pockets of clayey deposits is probably weathered bedrock. The Basal Sand generally consists of 0% to 34% gravel, 50% to 91% sand, and 6% to 44% silt/clay from the numerous landfill borings.

## Bedrock

The Bedrock at the project site consists of Pennsylvanian shales. The bedrock sediments are gray in color. The bedrock surface elevation varies from elevation 492 feet (in G-106) near the center of the project site to 558 in B-14, which is located on a bedrock outcrop near the southeast corner of Cell 1. In general, the bedrock surface slopes from both the east and west towards the center of the landfill Cells 2 and 3 in the landfill area.

Rock Quality Designation (RQD) measurements were performed on all core samples taken from the landfill area. RQD's measured from core samples collected during this investigation ranges from 80% to 100%. The RQD values indicate that the bedrock is not highly fractured. Two in situ hydraulic conductivity tests were performed to determine the hydraulic conductivity of the upper portions of the bedrock. Test results indicate the hydraulic conductivity values of the bedrock ranged from  $1.8 \times 10^{-7}$  cm/sec to  $1.3 \times 10^{-6}$  cm/sec. This shows that the bedrock encountered at the project site is relatively impermeable. There is good correlation between the lithology of the rocks tested and the hydraulic conductivity values obtained.

## SITE HYDROGEOLOGY

A thorough analysis of the available data collected during the previous investigations indicates that there are three water deposits present at the landfill. These deposits are:

- 1) Creek Fill
- 2) Shallow Sand
- 3) Basal Sand

The creek fill materials identified during the previous landfill investigations have a significant affect on the site hydrogeologic conditions. In some areas, the fill materials, consisting of either granular soils or organic silty clays, extend from existing grade to the bedrock surface and locally interconnect all three water bearing units. The Upper and Lower Cohesive Deposits are considered to act as aquitards (where present) which restrict vertical flow into the water bearing units. Bedrock is considered to act as an aquiclude.

### Creek Fill

Fill materials encountered in the landfill borings range from silty clays and organic silty clays to silty sands and clayey sands. These water level measurements indicate that groundwater flow within the creek fill materials is complicated because of the highly variable hydraulic characteristics of the fill materials and their random placement. In some areas, there appears to be direct hydraulic communication between fill materials, Shallow Sand and Basal Sand.

A total of four landfill piezometers were screened into the fill materials. Of these, one piezometer was installed into cohesive fill material and the other piezometers were installed in granular fill materials. Hydraulic conductivity of the granular fill materials based on field hydraulic conductivity tests ranged from  $6.1 \times 10^{-2}$  cm/sec. The hydraulic conductivity of the cohesive fill material, based on one slug test, ranged from  $7.1 \times 10^{-5}$  cm/sec to  $1.1 \times 10^{-4}$  cm/sec. These values represent the hydraulic conductivity in the horizontal direction.

Laboratory hydraulic conductivity test performed on landfill cohesive fill materials ranged from  $2.1 \times 10^{-3}$  cm/sec to  $3.3 \times 10^{-8}$  cm/sec. The higher hydraulic conductivity values are believed to be typical of soils which contain organic matter (e.g. wood fragments). The hydraulic conductivity values based on laboratory tests are generally considered to be representative of the coefficient of hydraulic conductivity in the vertical direction because of the sample configuration during testing. However, because of the randomness of the fill, it is more likely that the hydraulic conductivity is within the range of  $10^{-5}$  to  $10^{-4}$  cm/sec.

### Upper Cohesive Deposit

The upper Cohesive Deposit has a relatively low hydraulic conductivity in the vertical direction as determined by laboratory triaxial hydraulic conductivity tests from borings taken from the landfill investigation. The hydraulic conductivity values determined from the laboratory tests ranged from  $1.6 \times 10^{-8}$  cm/sec to  $5.2 \times 10^{-7}$  cm/sec. However, the UCD is an alluvial Deposit and it is expected that the horizontal coefficient of hydraulic conductivity will be significantly greater than the vertical coefficient. Based on test results for the Lower Cohesive Deposit (see below), it is anticipated that the horizontal hydraulic conductivity for the UCD is in the range of  $10^{-6}$  to  $10^{-5}$  cm/sec.

### Shallow Sand

Two landfill piezometers were screened in the Shallow Sand unit to provide information on piezometric levels and to perform slug tests. The hydraulic conductivity of this unit based on the slug test results is estimated to generally be within a range of  $3.6 \times 10^{-3}$  cm/sec to  $2.9 \times 10^{-2}$  cm/sec.

### Lower Cohesive Deposit

The Lower Cohesive Deposit has a relatively low hydraulic conductivity. Hydraulic conductivity in the vertical direction based on triaxial hydraulic conductivity tests range from  $1.3 \times 10^{-8}$  to  $1.8 \times 10^{-6}$  cm/sec. Hydraulic conductivity in the horizontal direction based on two slug tests performed in piezometers screened in this deposit ranges from  $4.6 \times 10^{-5}$  cm/sec to  $7.6 \times 10^{-5}$  cm/sec. This variation in the vertical and horizontal conductivity is expected due to the nature in which this soil was developed.

### Basal Sand

The Basal Sand was saturated in all locations where it was encountered. The measured hydraulic conductivity of this unit ranged from  $5.6 \times 10^{-4}$  cm/sec to  $3.6 \times 10^{-2}$  cm/sec in the landfill piezometers with the lower values associated with fine sands having larger silt/clay content. The groundwater is present under confined conditions based on the water level measurements obtained during this investigation.

Figure 3 shows the interpreted potentiometric surface within this unit on May 25, 2010. The potentiometric surface of the Basal Sand varies from elevation 541 – feet to elevation 527 – feet. The groundwater flow in the Basal Sand is towards the center of Cells 1 and 2 from the east, the west and the south directions, and discharge is towards Sugar Creek to the north.

### *Bedrock*

The bedrock at the project site consists of mainly shale with isolated thin coal layers. In situ hydraulic conductivity test (slug tests) indicated that the hydraulic conductivity for the upper portions of the bedrock range from  $1.8 \times 10^{-7}$  cm/sec to  $1.3 \times 10^{-6}$  cm/sec. There appears to be good correlation between the rock lithology and the measured values of hydraulic conductivity. The bedrock over most of the site will act as an aquiclude and prevent the downward flow of groundwater flow.

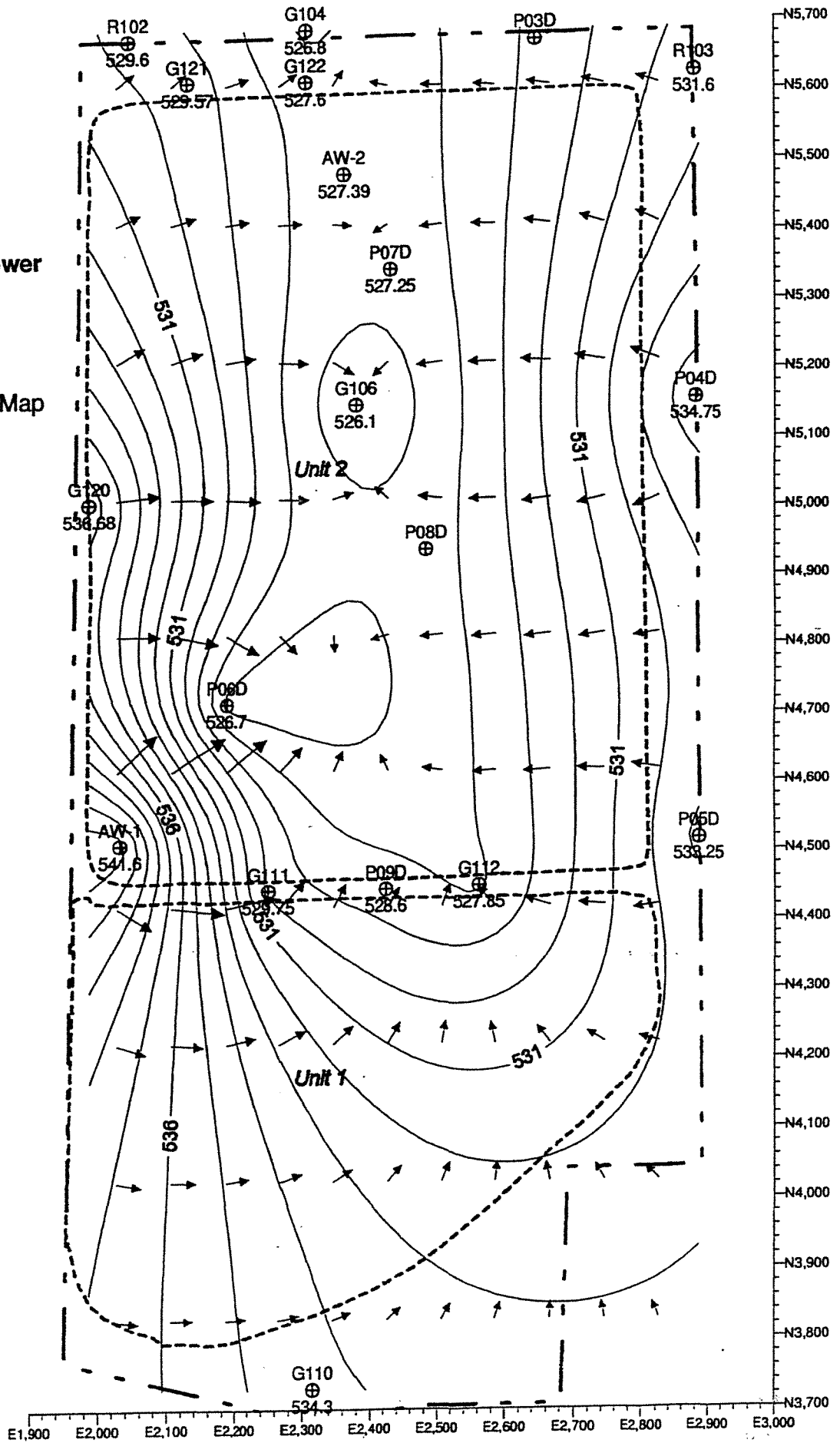
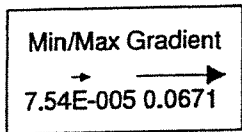
**City Water, Light & Power  
FGDS Landfill**

**Potentiometric Surface Map  
Basal Sand Unit  
2nd Quarter 2010**



Scale: 1 inch = 200 feet

Contour Interval = 1 foot



**Figure 3**  
Response to 1st RTP  
CWLP - 01709

## 2010 EXPLORATION PROGRAM

The exploration program consisted of drilling 4 borings depths ranging from 19.5 to 60 feet, installing 4 piezometers and performing 4 slug tests. The piezometers were installed to obtain groundwater level measurements and to perform slug test. The locations of all borings and piezometers are shown in the PSI report provided in Attachment B.

The goals of the exploration program were to:

1. Further delineate the six geologic units identified after reviewing the results of previous investigations on the west side of the ash pond.
2. Determine the hydraulic characteristics of the six geologic units (Fill Materials, Upper Cohesive Deposit, Shallow sand, Lower Cohesive Deposit, Basal Sand, and Bedrock).
3. Obtain representative and undisturbed soil samples for laboratory testing.
4. Obtain one round of groundwater sampling for characterization according to the 35 IAC groundwater standards.
5. Determine index and engineering properties of the different hydrogeologic strata.

All field explorations were performed under the direction of CWLP staff without benefit of an independent consultant. The contract driller maintained the daily drilling records, logged the soil samples and rock cores, selected representative samples for laboratory testing, and supervised the installation of piezometers. The field logs together with the laboratory tests were used to develop the boring logs presented in Attachment B. The borings were logged according to the Soil Description Terminology and the locally adapted version of the Unified Soil Classification System, ASTM D 2487.

### Drilling and Sampling Procedures

The borings were drilled with a Central Mine Equipment (CME) rotary drill rig mounted on an all-terrain vehicle. Boreholes were advanced utilizing either 4-1/4 inch hollow system augers to stabilize the sides of the boreholes.

The soils were sampled by driving a 2-inch O.D. standard penetration test split spoon sampler in accordance with a modified version of ASTM D 1586. Borings were sampled continuously from one foot below the ground surface to total depth. The sample method, soil type, location, and recovery for each sample interval are shown on the Boring Logs.

Representative soil samples obtained by the standard penetration method were preserved for laboratory analyses. When a break in the soil stratigraphy was logged in a split spoon sample interval, the sample was split and representative soil samples above and below the stratigraphic break were preserved. Hand held calibrated penetrometer tests were performed in the field on cohesive samples to serve as a general measure of soil consistency and to estimate unconfined compressive strengths. After sealing the jars, individual samples were labeled, boxed and transported to the PSI Laboratory for testing.

Based upon the soil borings the shallow sand is not present except in AP -4 and may have been removed as part of the realignment of sugar creek. The ash pond invert is situated in clayey silts or silty clay that act as a natural retardation to the migration of contaminants from the ash ponds. Beneath this low permeability layer is the basal sand that continues across the site and beneath the basal sand is the confining layer of shale. Boring AP-4 encountered flyash in its boring and therefore the groundwater quality from this piezometer may be suspect based upon contamination, annular space seal, etc. Figure 4 is a north south cross section showing the geology of the Borings AP-1 through AP-4 along with the ash pond data for illustrative purposes. Figure 5 contains a copy of the construction information for the Dallman Ash Pond and a portion of the clarification pond.

#### Piezometer Construction

Each piezometer consisted of a 2-inch I.D. PVC riser pipe connected to a ten feet long, slotted PVC screen. Silica sand filter pack was installed around the slotted well screen. Bentonite pellets or Volclay grout were installed above the filter pack to form a seal.

### Piezometer Development

The piezometers were developed using a one-inch I.D. and five foot long PVC bailer. Numerous piezometer casing volumes of water removed from each well to ensure that the screens were unobstructed.

### Sampling

Samples of the four piezometers on the west side of the ash ponds was done with the landfill permitted groundwater wells during the end of May and beginning of June. Samples were collected by CWLP personnel for non organic parameters of the new Ash Pond Piezometers. Sample results for AP-1, AP-2, AP-3 and AP-4, AW-3, G120 and G110 are provided in Attachment D. The Ash Pond wells were sampled for total metal concentrations in comparison to dissolved as is customary for groundwater wells. A review of site specific available data for both dissolved versus total parameters for boron and iron revealed an approximate ratio of dissolved to total concentration of 33% as indicated below and in Attachment D. Therefore the following results are note worthy in terms of the 620 standards, but are not indicative of exceedences when this correlation is used in the evaluation process.

Well ID	Potential Exceedence	Standard	Total	Dissolved
AP-1	Iron	5.0 mg/l	5.68 mg/l	
AP-2	Boron	2.0 mg/l	2.63 mg/l	
AP-3	Boron	2.0 mg/l	11.9 mg/l	
AP-3	Iron	5.0 mg/l	10.1 mg/l	
AP-4	Iron	5.0 mg/l	11.2 mg/l	
AW-3	Iron	5.0 mg/l	12 mg/l	4.23 mg/l
G-110	Iron	5.0 mg/l	6.71 mg/l	2.73 mg/l
G-120	Iron	5.0 mg/l	28.6 mg/l	19.9 mg/l

Monitoring Well G120 is down gradient from Cell 1 of the FGDS landfill and the results of the sampling there are more likely indicative of the impact of the landfill than the ash pond to the west.

## Surveying

The locations and elevations of all borings and piezometers were surveyed by CWLP personnel. The locations are expressed relative to a project grid system. The elevations of all boring and piezometers are based on U.S.G.S. mean sea level datum. A summary of the survey data is presented in Table 1.

## Water Level Measurements

Water levels were measured in all piezometers, monitoring wells, and surface water bodies present in the vicinity of the landfill and ash ponds by CWLP personnel on May 25, 2010. The depth to water in the measurements were then converted to elevations. The water elevations were plotted by Surfer and the potentiometric surface map is presented as Figure 5 for the combined landfill and ash pond piezometers.

## Slug Tests

Slug tests were performed in all piezometers installed during this investigation to provide an estimate of the hydraulic conductivity of the soils within the screened interval. Four piezometers were tested in the Basal Sand revealing a mean hydraulic conductivity of  $1.73 \times 10^{-2}$  cm/sec.

## SUMMARY

The site geology at the project area has been determined based on comprehensive subsurface investigations performed by numerous consultants. Based on these investigations, six major geologic units have been identified at the site. These units are: fill materials within the old abandoned creek channel, upper cohesive deposit, shallow sand, lower cohesive deposit, basal sand, and bedrock (shale).

Based on hydraulic conductivity testing, particle size distribution test, and water level measurements, the fill materials within the old creek channel, the shallow sand, and the basal sand are the water bearing units present at the site. Laboratory and field tests provide the range of hydraulic conductivity values for each of these units.

MONITORING WELL OR PIEZOMETER	POWER PLANT COORDINATES	GROUND ELEVATION	TOP OF CONCRETE BASE ELEV.	TOP OF PVC PIPE ELEV.	TOP OF WELL CASING
3D	N. 5672.4 E. 2644.9	530.5			
3F	N. 5672.2 E. 2651.4	530.5			
AP-1	N. 5133.5 E. 835.4	532.9		537.8	
AP-2	N. 4188.8 E. 723.8	533.2		540.3	
AP-3	N. 3808.0 E. 823.5	533.7		535.6	
AP-4	N. 2467.6 E. 1511.8	553.9		554.6	
AW-1	N. 4511.9 E. 2030.4		552.8		556.0
AW-2	N. 5480.6 E. 2361.3		526.7		529.6
AW-3	N. 5608.1 E. 1744.2		537.8		541.5
G-104	N. 5687.2 E. 2305.9	530.6		533.0	533.6
G-106	N. 5149.7 E. 2378.9		524.6	526.1	
G-121	N. 5612.8 E. 2130.0		553.7	555.6	556.0
G-110	N. 3728.6 E. 2315.7		555.2	557.2	557.5
G-112	N. 4450.9 E. 2560.6		552.6	554.8	554.9
G-113	N. 4510.0 E. 2886.0		534.9	537.7	537.8
G-120	N. 5009.4 E. 1986.9	553.1	FLUSH WITH GROUND		
G-122	N. 5613.2 E. 2305.1		552.6	554.4	554.9
P-4	N. 5156.3 E. 2880.7	536.0		539.0	
P-5D	N. 4516.7 E. 2885.0	534.9		537.7	
P-6S	N. 4725.7 E. 2191.4	524.7		527.5	
P-6D	N. 4717.0 E. 2186.8	524.7		534.2	
P-6R	N. 4708.0 E. 2181.0	524.7		531.2	
P-7S	N. 5340.0 E. 2420.0	526.2		528.5	
P-7D	N. 5345.0 E. 2430.0	526.5		528.5	
P-7R	N. 5327.0 E. 2422.0	525.6		528.7	
P-7M	N. 5337.0 E. 2432.8	526.0		528.1	
P-8S	not found				
P-8D	N. 4939.7 E. 2482.7	522.7		530.1	
P-9S	N. 4447.3 E. 2415.6	552.5		555.7	
P-9D	N. 4446.3 E. 2422.4	553.6		556.1	
R-101	N. 4049.5 E. 2863.2		544.0	546.8	547.0
R-102	N. 5673.8 E. 2043.9		535.9	539.2	539.4
R-103	N. 5625.3 E. 2878.4		536.3	538.6	538.8
R-111	N. 4437.4 E. 2249.7	554.0	FLUSH WITH GROUND		

Table 1

The fill materials and the shallow sand are not considered to be aquifers. The fill materials are variable consisting of organic, clayey and sandy soils with different hydraulic characteristics. The shallow sand consists of clayey sand and is thin and discontinuous across the site. Neither deposit could produce a sustained pumping rate such that they would be considered sources of groundwater for potable use.

The basal sand is considered the uppermost aquifer at the site. The basal sand consists of silty to clean sands to fine gravel and has a relatively high permeability. The predominant groundwater flow at the site occurs within this deposit.

The bedrock at the site generally consists of shale. In situ hydraulic conductivity tests (slug tests) had little response indicating that the shale is competent and has a low hydraulic conductivity. The bedrock will act as an aquiclude.

The sampling of the piezometers: AP - 1, AP - 2, AP - 3 AP - 4, AW - 3, G-120 and G-110 which surround the ash pond impoundment system indicate minimal exceedence of the 35 IAC 620 Class II groundwater standards. The ash ponds are located in a non-residential area with few residences. If there is any impact from inadvertent leakage of the ponds to the groundwater, it will be relatively minimal as any ash impoundment subsurface leakage will likely flow into Sugar Creek combining with that much greater water flow. Sugar Creek is the same water source that receives the effluent from the ponds after treatment of the solids and pH adjustment as well as sanitary treatment plant discharges further down stream. The clayey soils that the ash ponds are located in and constructed with should retard any migrating pollutants that might otherwise be present.

We hereby certify that the information contained herein is true to the best of our understanding based upon our experience with the City Water, Light and Power ash ponds and landfill.



R. Michael McDermont, PE, CMRS

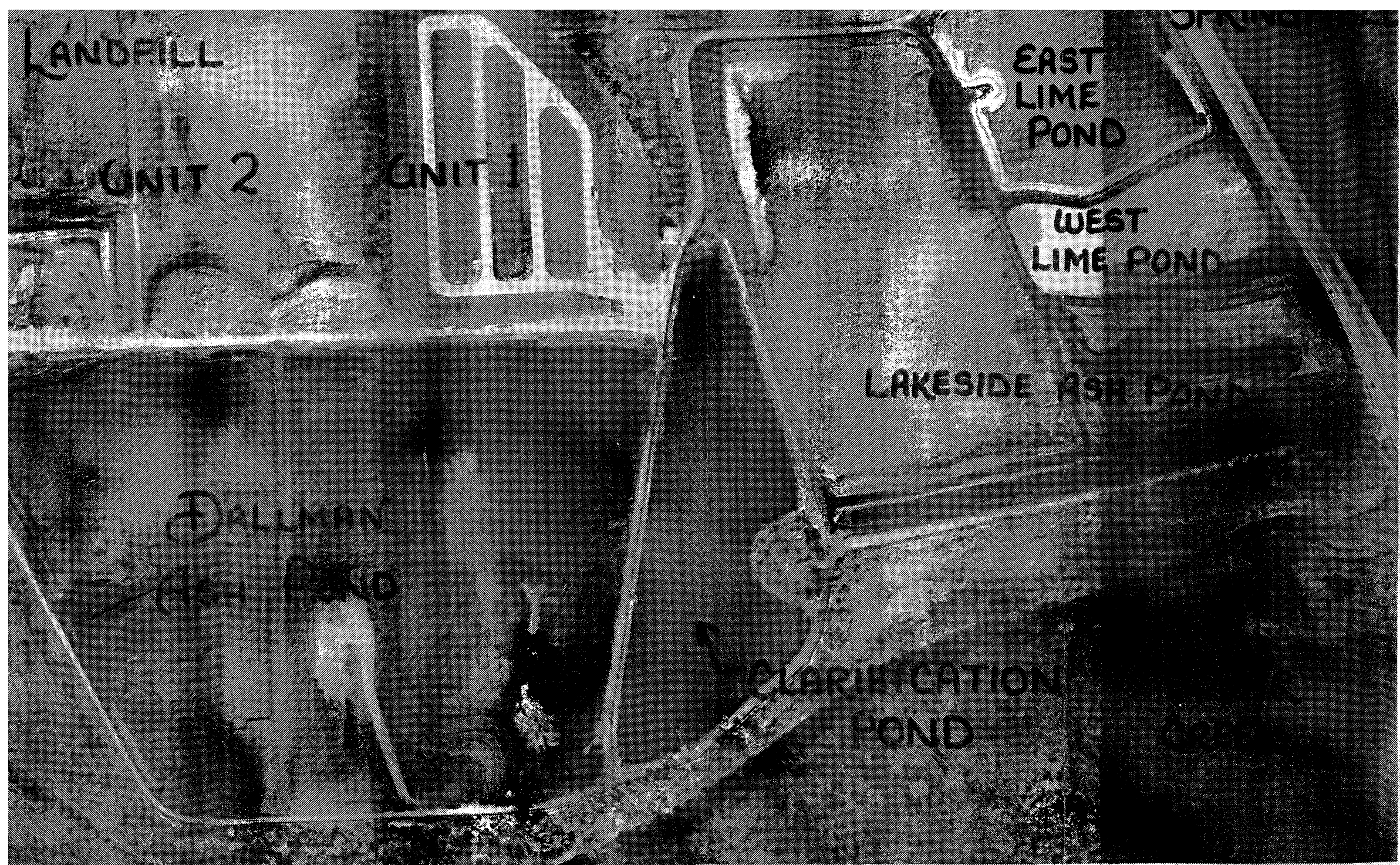
President

Stabilize, Inc.

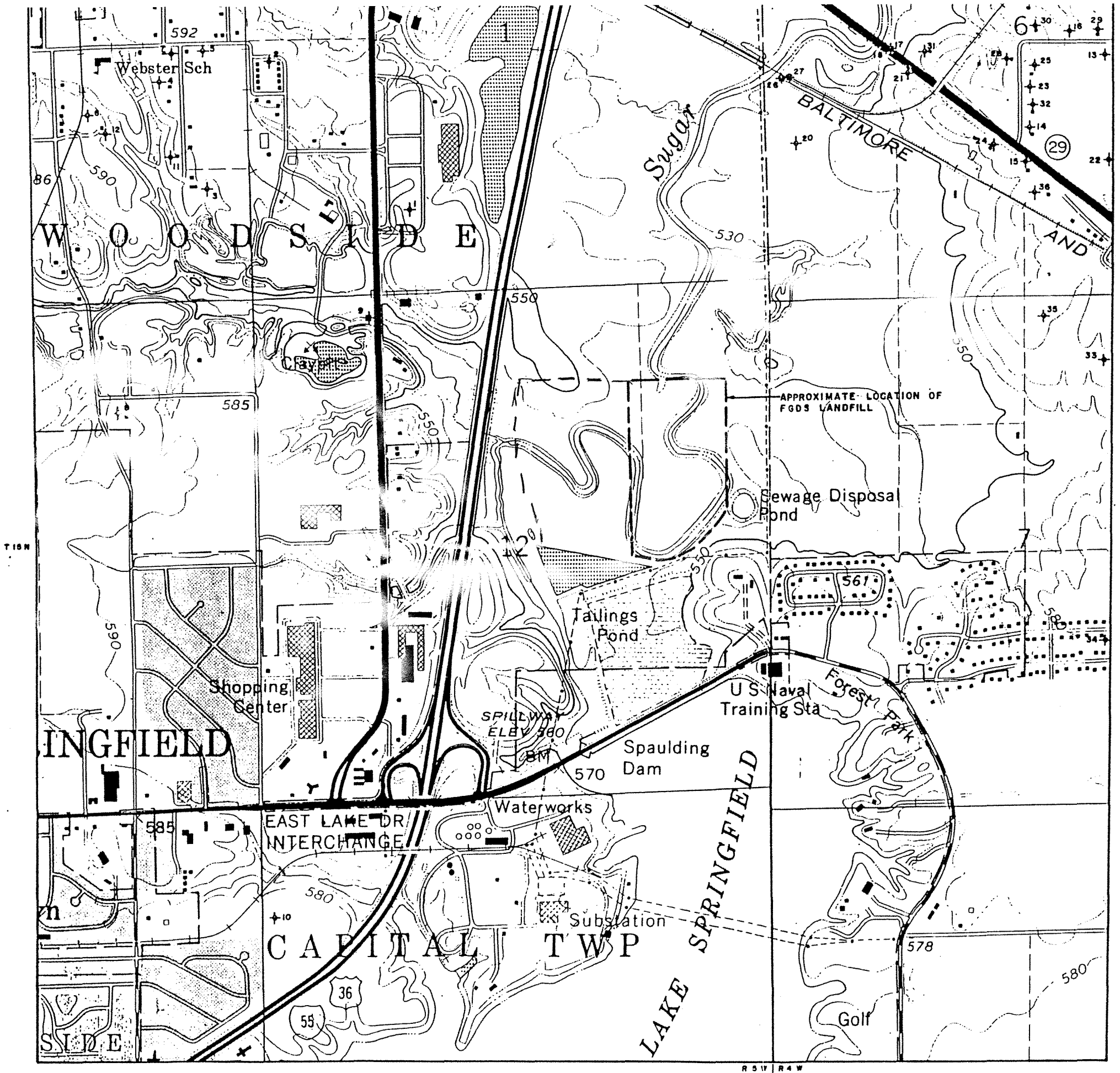


(Seal)

Expires: 11/30/2011



**FIGURE 1** Response to 1st RTP  
CWLP - 01717

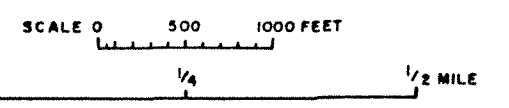


**LEGEND**

- + (WELL NO.) WATER WELL
- +26 (BORING NO.) SOIL BORING

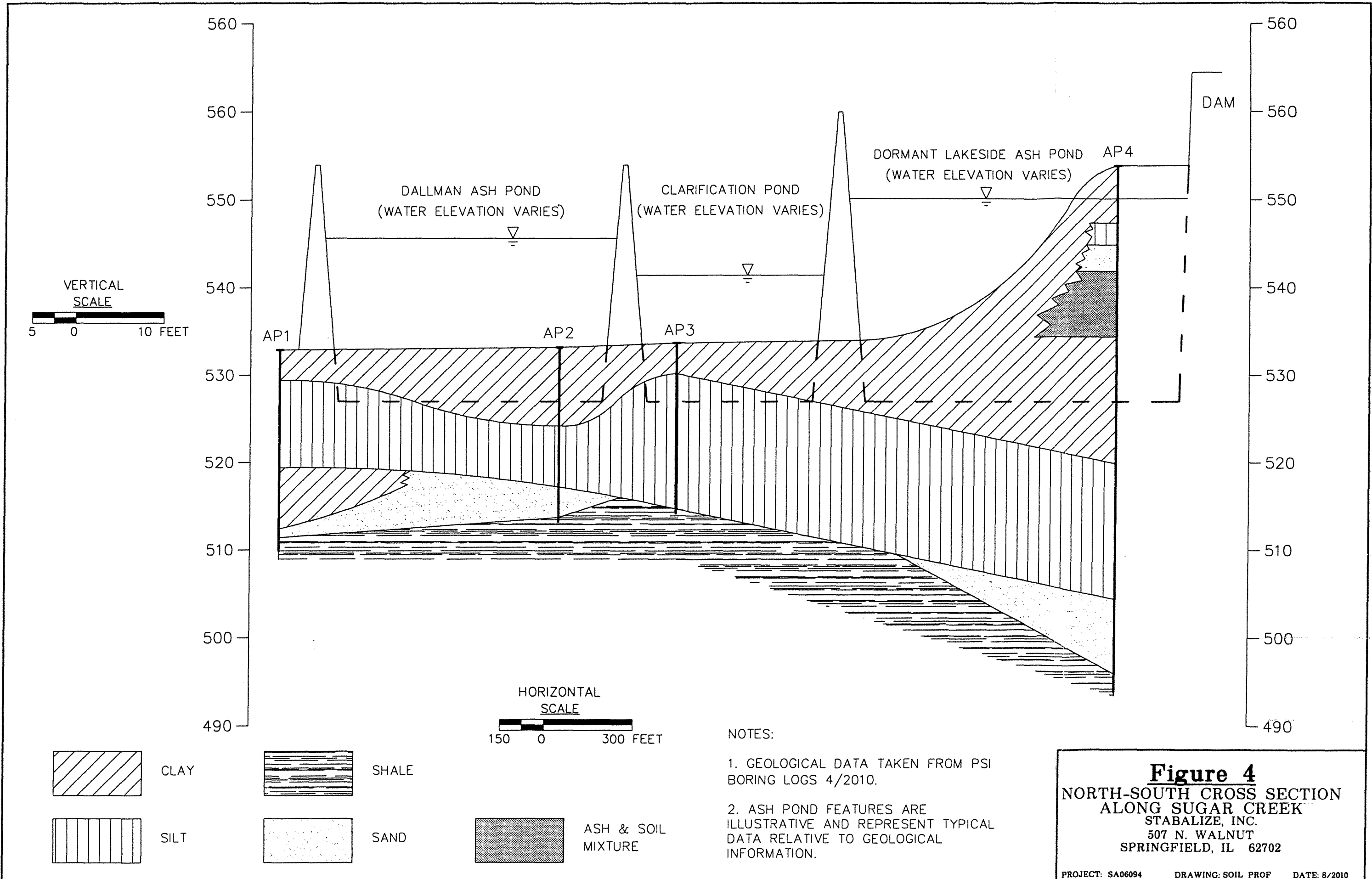
**NOTES:**

1. BASE MAP WAS COMPILED FROM THE SPRINGFIELD EAST, ILL. (1974) U.S.G.S. 7.5 MINUTE QUADRANGLE MAP.
2. ALL WELLS (AND BORINGS) IN THE VICINITY OF THE FGDS LANDFILL SITE FOR WHICH RECORDS ARE ON FILE WITH THE ILLINOIS STATE WATER SURVEY AS OF MARCH, 1993 HAVE BEEN PLOTTED.
3. THE TOPOGRAPHY WITHIN LANDFILL AREA HAS CHANGED DUE TO DISPOSAL FACILITY DEVELOPMENT BY CWLP.



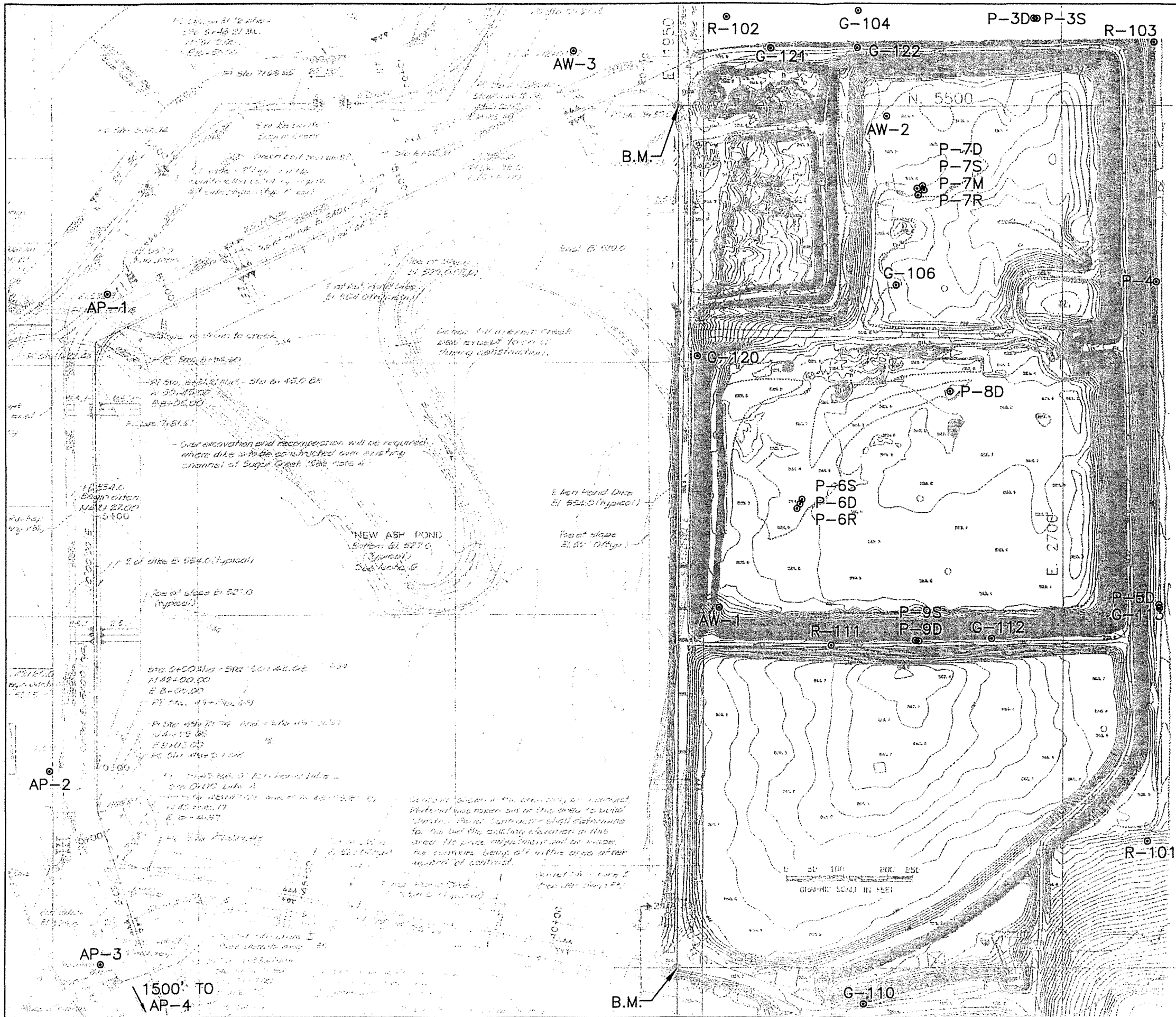
REV.	DATE	DESCRIPTION	BY	APP BY
SCALE	AS SHOWN	PROJECT	HYDROGEOLOGIC INVESTIGATION FGDS LANDFILL, SPRINGFIELD, ILL. CITY WATER, LIGHT & POWER	
DATE	MARCH, 1993	SHEET TITLE	WATER WELL LOCATION MAP	
DES BY	KRR 3/26/93			
DR BY	WRM 3/29/93			
CHE BY	KRR 3/30/93			
APP BY	JCS 4/05/93			
<b>PATRICK ENGINEERING INC.</b> Engineers • Architects • Hydrologists Geologists • Surveyors Springfield, Illinois				

**Figure 2**  
Response to 1st RTP  
CWLP - 01718



NOTES:  
 1. GEOLOGICAL DATA TAKEN FROM PSI BORING LOGS 4/2010.  
 2. ASH POND FEATURES ARE ILLUSTRATIVE AND REPRESENT TYPICAL DATA RELATIVE TO GEOLOGICAL INFORMATION.

**Figure 4**  
 NORTH-SOUTH CROSS SECTION  
 ALONG SUGAR CREEK  
 STABILIZE, INC.  
 507 N. WALNUT  
 SPRINGFIELD, IL 62702  
 PROJECT: SA06094    DRAWING: SOIL PROF    DATE: 8/2010



BENCH MARK - CONCRETE MONUMENT:  
 POWER PLANT COORDINATES  
 N. 5500 E. 1950 - ELEVATION 553.16 MSL

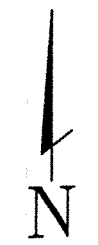
BENCH MARK - CONCRETE MONUMENT:  
 POWER PLANT COORDINATES  
 N. 3800 E. 1950 - ELEVATION 553.78 MSL

ELEVATION REFERENCES:  
 N.E. CORNER OF TOP OF CONCRETE STRUCTURE  
 AT S.E. CORNER OF ASH POND: ELEVATION  
 553.70 FEET MSL.

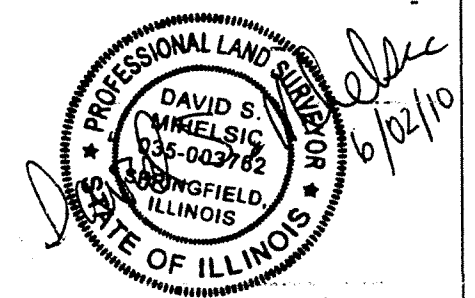
TOP OF CONCRETE STRUCTURE AT  
 NORTHEASTERLY SIDE OF LAKESIDE ASH POND  
 OPPOSITE METAL STAIRS: ELEVATION 565.03  
 FEET MSL.

NOTES:

- 1) WELL AP-4 NOT SHOWN ON MAP.
- 2) BENCH MARKS COULD NOT BE LOCATED. SURVEY DONE WITH GPS.
- 3) WELL P-8D AREA INUNDATED BY WATER, NOT SURVEYED. LOCATION UNCHANGED FROM PREVIOUS SURVEY DONE IN APRIL 2008.
- 4) WELL R-111 IS APPROXIMATELY 8' SOUTH OF PREVIOUS WELL G-111.

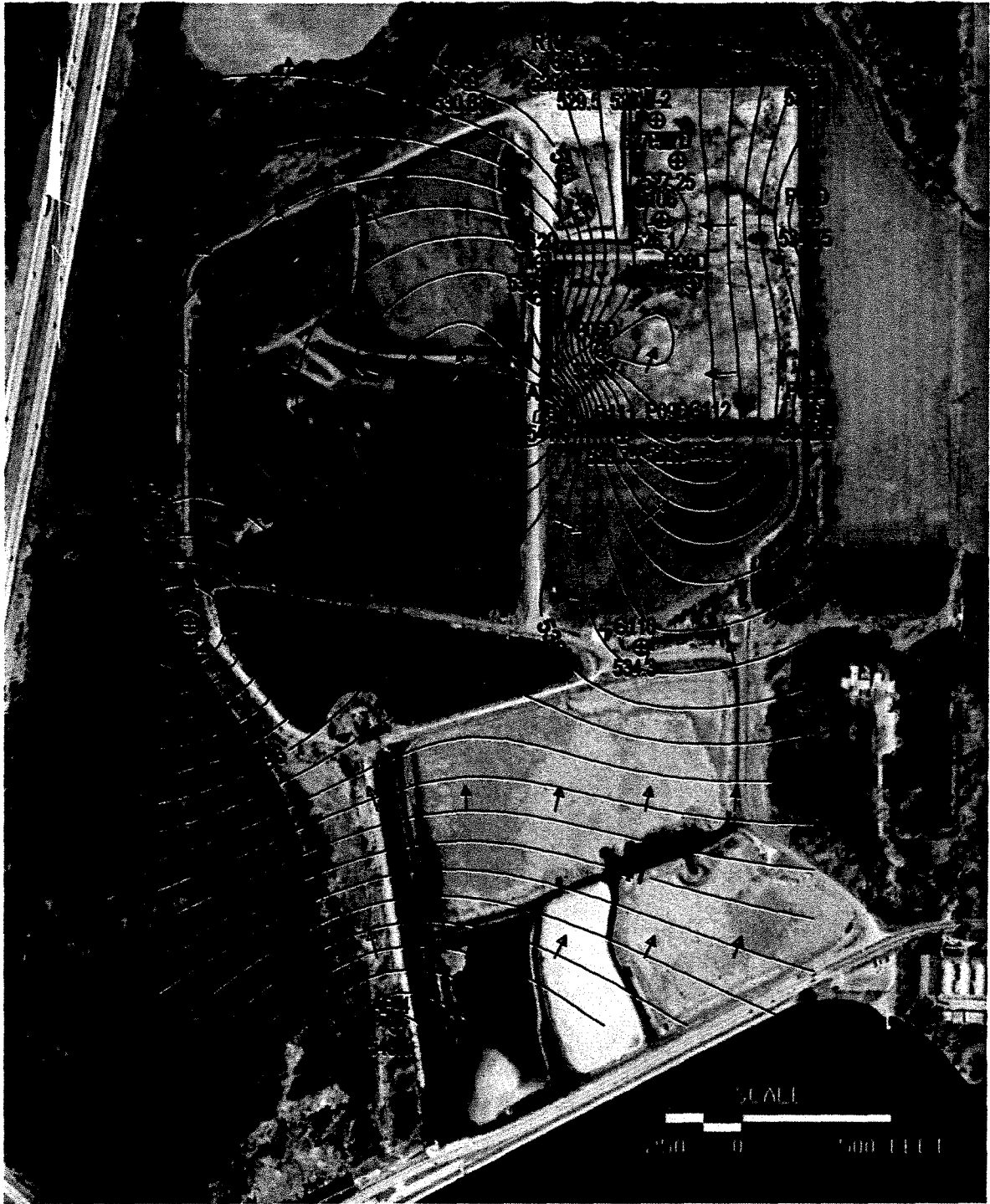


SCALE: 1"=200'



S:\row\Mihelsic\...\wells 2010

CITY WATER LIGHT & POWER SPRINGFIELD, ILLINOIS	
MONITORING WELL AND PIEZOMETER	
<b>Figure 5</b>	
DATE OF SURVEY:	MAY, 2010



821 S. DURKIN DR. • SPRINGFIELD, IL 62704 • (217) 787-2118  
 P.O. BOX 925 • CARBONDALE, IL 62903 • (618) 521-0574

ILLINOIS PROFESSIONAL DESIGN FIRM No. 184-001130  
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Figure 6  
 POTENTIOMETRIC SURFACE  
 2ND QUARTER 2010  
 CITY WATER, LIGHT & POWER  
 FGDS DEVELOPMENT LANDFILL  
 SANGAMON COUNTY, ILLINOIS

PROJECT: SA06084      DRAWING: 2Q10      DATE: 8/10

## ATTACHMENT A

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Pratt, R. Mr. Well No. \_\_\_\_\_  
 Address R. R. #7 Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014

11. Permit No. 133085 Date 06/30/87  
 12. Water from shale 13. County Sangamon

at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 1  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 5 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	11
36	CONCRETE	11	41

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	2	14
hardpan	5	19
blue clay	2	21
shale	20	41

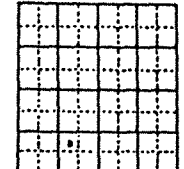
Sangamon 12-167-24552-00 01-15N-05W

OUTSIDE

	Thickness	Top	Bottom
Top soil	3	0	3
Yellow clay	15	3	18
Brown clay	1	18	19
Hard pan	5	19	24
Finished in hard pan at 19 to 24'.			
Cased with 36" Concrete from 0 to 20'.			
Static level from surface 10'.			
Tested capacity 20 gallons per minute.			
Screen none.			
Bottom set at 24'.			
S.S. #52306			
NO ENVELOPE			

COMPANY Miles and Son  
 FARM Fiskas, Raymond L.  
 DATE DRILLED 1965  
 AUTHORITY Miles and Son  
 ELEVATION  
 LOCATION 430' N line, 320' E line of NW SE SW  
 COUNTY SANGAMON

NO. 1  
 COUNTY NO. #81



1-15N-5W

PEI Assigned Log No. 1

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Tomlin, Clarence Well No. #2  
 Address Shale Bluffs Rd. Springfield IL  
 Driller Erwin, James License No. 102-2037  
 11. Permit No. 95882 Date 09/03/80  
 12. Water from clay 13. County Sangamon  
 at depth 24 to 25 ft. Sec. 1  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 5 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NW SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC	-1	10
36	CONCRETE	10	40

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
driveway, gravel	1	1
brown clay	20	21
sandy clay	3	24
gray shale	16	40

Sangamon 12-167-24103-00 01-15N-05W

PEI Assigned Log No. 2

LOG OF WATER WELL

Property owner Springfield Imports Inc Well No. 1  
 Drilled by Melvin Sarr Year 1967

Formations passed through	Thick-ness	Depth of Bottom
<u>top soil</u>	<u>2</u>	<u>2</u>
<u>clay</u>	<u>18</u>	<u>20</u>
<u>Hard pan</u>	<u>3</u>	<u>23</u>
<u>Shale</u>	<u>3</u>	<u>26</u>

Permit NF 3170  
 S.S. #54857  
 COUNTY NO. 1482  
 Received from Strat. 11-1-67

(Continue on back if necessary)  
 Finished in Shale at 23 to 26 ft.  
 Cased with 36 inch Concrete from 0 to 26 ft.  
 and \_\_\_\_\_ inch \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft.  
 Size hole below casing None inch. Static level from surf. 16 ft.  
 Tested capacity \_\_\_\_\_ gal. per min. Temperature \_\_\_\_\_ °F.  
 Water lowered to \_\_\_\_\_ ft. \_\_\_\_\_ in. in \_\_\_\_\_ hrs. \_\_\_\_\_ min.  
 Length of test \_\_\_\_\_ hrs. \_\_\_\_\_ min. Screen \_\_\_\_\_  
 Slot \_\_\_\_\_ Diam. \_\_\_\_\_ Length \_\_\_\_\_ Bottom set at \_\_\_\_\_ ft.

(Show location in Section Plat)  
 Township name Woodside Elev. \_\_\_\_\_ Sec. 1  
 Description of location lot 16 in woods Twp. 15N  
phase 16 NW 1/4 of sec. 15 N 5 W Rge. 5 W  
 Signed Melvin Sarr County Sangamon  
 SANGAMON Copy for Illinois State Geological Survey Index: 1-15N-5W

outside

LOG OF WATER WELL

Property owner H. Brazer Well No. 1

Drilled by E. C. Baker & Sons Year 1957

Formations passed through	Thick-ness	Depth of Bottom
Yellow Clay	22	22
Blue Sandy Shale	2	24

COUNTY No. 22649

[Continue on back if necessary]

Finished in \_\_\_\_\_ at \_\_\_\_\_ to \_\_\_\_\_ ft.

Cased with \_\_\_\_\_ inch \_\_\_\_\_ from 0 to \_\_\_\_\_ ft.  
and \_\_\_\_\_ inch \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft.

Size hole below casing \_\_\_\_\_ inch. Static level from surf. \_\_\_\_\_ ft.

Tested capacity \_\_\_\_\_ gal. per min. Temperature \_\_\_\_\_ °F.

Water lowered to \_\_\_\_\_ ft. in \_\_\_\_\_ hrs. \_\_\_\_\_ min.

Length of test \_\_\_\_\_ hrs. \_\_\_\_\_ min. Screen \_\_\_\_\_

Slot \_\_\_\_\_ Diam. \_\_\_\_\_ Length \_\_\_\_\_ Bottom set at \_\_\_\_\_ ft.  
(Show location in Section Plat)

Township name WOODSIDE Elev. \_\_\_\_\_ Sec. 2

Description of location 1 Mile South  
East of Springfield, Ill  
Twp. 15N  
Rge. 5W

			X

Signed F.F. & J.C. Baker County Sangamon  
SANGAMON 2-15N-5W

Copy for Illinois State Geological Survey Index:

PEI Assigned Log No. 3

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Ushman, John Well No. \_\_\_\_\_

Address R. R. #7 Springfield Ill

Driller Reynolds, Joseph R. License No. 092-6014

11. Permit No. 127235 Date 10/02/86

12. Water from sdv clay & sdv gyl 13. County Sangamon  
at depth 17 to 27 ft.

14. Screen: Diam. \_\_\_\_\_ in. Sec. 1  
Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Twp. 15 N  
Rge. 5 W  
Elev. \_\_\_\_\_


15. Casing and Liner Pipe SW NE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	10
36	CONCRETE	10	36

16. Size hole below casing: \_\_\_\_\_ in.

17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	7	19
hardpan	4	23
blue clay	3	26
sand & gravel	1	27
blue clay	9	36

Sangamon 12-167-23817-00 01-15N-05W

OUTSIDE

Property owner Frank Siciliano Well No. 1  
 Drilled by Mikes & Sons Year 66

Formations passed through	Thick-ness	Depth of Bottom
<u>yellow clay</u> Permit NF 691	<u>15</u>	<u>15</u>
<u>hard shale</u>	<u>10</u>	<u>25</u>
<u>shale</u>	<u>5</u>	<u>30</u>

COUNTY No. 1484

S.S. #53090  
 Received with samples. From R. Frame 6-7-66

Finished in shale (Continuo on back if necessary) at 25 to 30 ft.  
 Cased with 3 1/2 inch concrete from 0 to 30 ft.  
 and \_\_\_\_\_ inch \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft.

Size hole below casing 4 inch. Static level from surf. 12 ft.  
 Tested capacity \_\_\_\_\_ gal. per min. Temperature \_\_\_\_\_ °F.  
 Water lowered to \_\_\_\_\_ ft. \_\_\_\_\_ in. in \_\_\_\_\_ hrs. \_\_\_\_\_ min.  
 Length of test \_\_\_\_\_ hrs. \_\_\_\_\_ min. Screen \_\_\_\_\_

Slot \_\_\_\_\_ Diam. \_\_\_\_\_ Length \_\_\_\_\_ Bottom set at \_\_\_\_\_ ft.  
 (Show location in Section Plat)

Township name \_\_\_\_\_ Elev. \_\_\_\_\_ Sec. 2  
 Description of location 420 S 60 E Twp. 15 N  
NW NW NE SE Rge. 5 W

Signed Mikes County Sangamon  
 Copy for Illinois State Geological Survey Index: 2-15N-5W

PEI Assigned Log No. 4

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Scotty's Self-Service Strge Well No. #1  
 Address 1035 Outer Park-Suote 310 Springfield IL  
 Driller Erwin, James License No. 102-2037  
 11. Permit No. 52539 Date 09/22/76  
 12. Water from coarse sand 13. County Sangamon  
 at depth 27 to 30 ft. Sec. 2  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 5 W  
 Elev. \_\_\_\_\_


15. Casing and Liner Pipe NE NE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
<u>6</u>	<u>PVC SCH 40</u>	<u>-1</u>	<u>10</u>
<u>36</u>	<u>CONCRETE</u>	<u>10</u>	<u>40</u>

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 10 ft. below casing top which is 1 ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

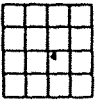
18. Formations passed through	Thickness	Bottom
<u>no record</u>	<u>40</u>	<u>40</u>

PEI Assigned Log No. 5

Sangamon 12-167-24104-00 02-15N-05W

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Snyder, Henry Well No. #1  
 Address 2640 E. Ash Springfield IL  
 Driller Erwin, James License No. 102-2037  
 11. Permit No. 118383 Date 06/14/85  
 12. Water from brown sandy clay 13. County Sangamon  
 at depth 20 to 22 ft. Sec. 2  
 14. Screen: Diam.          in. Twp. 15 N  
 Length:          ft. Slot          Rge. 5 W  
 Elev.         



15. Casing and Liner Pipe NE NE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC SCH 40	-1	10
36	CONCRETE	10	40

16. Size hole below casing:          in.  
 17. Static level          ft. below casing top which is          ft. above ground level. Pumping level          ft. when pumping at          gpm for          hours.

18. Formations passed through

Formations passed through	Thickness	Bottom
top soil	2	2
brown clay	12	14
yl sdy strks brn c	17	31
yellow clay	3	34
ylsh, gray clay	6	40
gray till	0	40

Sangamon 12-167-23620-00 02-15N-05W

PEI Assigned Log No. 7

Property owner Thomas J. Schuler Well No.           
 Drilled by Miles + Sons Year 66

Formations passed through Permit NE 708

Formations passed through	Thick-ness	Depth of Bottom
<u>Yellow Clay</u>	<u>15</u>	<u>15</u>
<u>Hard pore shale</u>	<u>10</u>	<u>25</u>
<u>shale</u>	<u>5</u>	<u>30</u>

Received 7-12-66

COUNTY No. 1485.

Finished in shale at 25 to 30 ft.  
 Cased with 36 inch Concrete from 0 to 30 ft.  
 and          inch          from          to          ft.  
 Size hole below casing 10 1/2 inch. Static level from surf. 12 ft.  
 Tested capacity          gal. per min. Temperature          °F.  
 Water lowered to          ft. in. in          hrs.          min.  
 Length of test          hrs.          min. Screen           
 Slot          Diam.          Length          Bottom set at          ft.

(Show location in Section Plat)

Township name          Elev.          Sec. 2  
 Description of location 120 S 150 W Twp. 15 N  
NE SE NW SE Rge. 5 W  
 Signed Marshall Miles County Sangamon  
 SANGAMON 2-15N-5W  
 Copy for Illinois State Geological Survey Index:

PEI Assigned Log No. 6

LOG OF WATER WELL

3

Property owner Charles A. Hinsey Well No. 1

Drilled by Spaulding & Clark Drilling Co. Year 1957

Formations passed through	Thick-ness	Depth of Bottom
Soil	3	3
Yellow clay	16	19
Yellow clay (sandy)	6	25
Blue clay	21	46
Sandstone	1	47
Shale	11	58
Coal	2	60
Underclay	3	63
Shale	2	65
Limestone	22	87
Shale	18	105

COUNTY No. 575

(Continue on back if necessary)

Finished in Limestone at 65 to 87 ft.

Cased with 3 inch Buttweld from 0 to 105 ft.

and \_\_\_\_\_ inch \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ ft.

Size hole below casing 6 inch. Static level from surf. 12 ft.

Tested capacity 4 plus gal. per min. Temperature \_\_\_\_\_ °F.

Water lowered to \_\_\_\_\_ ft. \_\_\_\_\_ in. in \_\_\_\_\_ hrs. \_\_\_\_\_ min.

Length of test \_\_\_\_\_ hrs. \_\_\_\_\_ min. Screen None

Slot \_\_\_\_\_ Diam. \_\_\_\_\_ Length \_\_\_\_\_ Bottom set at \_\_\_\_\_ ft.

(Show location in Section Plat)

Township name Woodside Elev. 599 Sec. 11

Description of location SW $\frac{1}{4}$  of SW $\frac{1}{4}$  Sec 11 Twp. 15N

X			

Rge. 5W

Signed \_\_\_\_\_ County Sangamon

SANGAMON Copy for Illinois State Geological Survey

Index: 11-15N-5W

outside

10. Property owner GEORGE HAMMONS Well No. \_\_\_\_\_  
 Address 800 S. 16TH SPRINGFIELD  
 Driller ERWIN License No. 102-203

11. Permit No. 74921 Date MAY 31, 78

12. Water from CLAY 13. County SANGAMON

at depth 16 to 19 ft.

Sec. 11

14. Screen: Diam. \_\_\_\_\_ in.

Twp. 15N

Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_

Rge. 5W

Elev. \_\_\_\_\_


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft.)	To (ft.)
<u>6"</u>	<u>SCH 40 PLASTIC</u>		<u>10</u>
<u>36"</u>	<u>CONCRETE</u>	<u>10</u>	<u>40</u>

SHOW LOCATION IN SECTION PLAT

SE  $\frac{1}{4}$   
 NW  $\frac{1}{4}$   
 NE  $\frac{1}{4}$

16. Size Hole below casing: \_\_\_\_\_ in.

17. Static level 10 ft. below casing top which is 1 (permit) above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours. Sub. pump set at 34'

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>TOP SOIL</u>	<u>2</u>	<u>2</u>
<u>BROWN CLAY</u>	<u>5</u>	<u>7</u>
<u>BROWN &amp; WHITE CLAY</u>	<u>9</u>	<u>16</u>
<u>BROWN SANDY CLAY</u>	<u>3</u>	<u>19</u>
<u>SAND ROCK</u>	<u>1</u>	<u>20</u>
<u>BROWN SHALE</u>	<u>2</u>	<u>22</u>
<u>GRAY SHALE</u>	<u>18</u>	<u>40</u>

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED James Erwin DATE 5/31/78

SANGAMON

COUNTY No. 22812

11-15N-5W

PEI Assigned Log No. 8

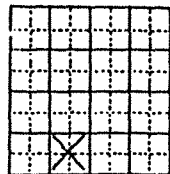
ILLINOIS GEOLOGICAL SURVEY, URBANA

ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Bridge boring #1 Section 1SB Sta. 479+54 111' Rt. Cl. Med.			
Clay, silty, black	1.5		1.5
Clay, silty, yellow-brown - stiff	4		5.5
Clay loam, silty, yellow & gray mottled - stiff	4		9.5
Clay, silty, gray-brown - medium	5		14.5
Clay, sandy, gray-brown - stiff	4.5		19
Clay till, sandy, brown - very stiff	3		22
Clay till, brown - hard	6		28
			T.D.
Copy of Highway Division log filed in Groundwater Section			
Typed by Engineering Geology Section			
NO ENVELOPE			

	Thickness	Top	Bottom
Brown silty clay, loam - frozen	1.5		1.5
Gray and brown mottled silty clay loam with some vegetation	3		4.5
Dark gray loam, organic	3		7.5
Weathered brown shale - loose fragments	3		10.5
Black shale - fissile	1		11.5
			TD
Bridge boring #1 Section 17X Station 53+80 73' Left Center Line Med.			
Copy of Highway Division Log filed in Groundwater Section			
NO ENVELOPE			

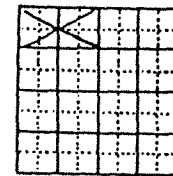
COMPANY Illinois Division of Highways  
 FARM FA 196 under GM&O RR. NO. 1  
 DATE DRILLED 11-9-64 COUNTY NO. 1487  
 AUTHORITY Log by Division of Highways  
 ELEVATION 607.0'  
 LOCATION SE 1/4 SW 1/4  
 COUNTY SANGAMON



13-15N-5W

*outside*

COMPANY Illinois Division of Highways  
 FARM FA 169 Culvert NO. B-1  
 DATE DRILLED February 4, 1966 COUNTY NO. 1486  
 AUTHORITY Log by Division of Highways  
 ELEVATION 536' G.L.  
 LOCATION N/2 NW  
 COUNTY SANGAMON



12-15N-5W 9

PEI Assigned Log No. 9

10. Property owner Richard Fontana Well No. 1  
 Address 172 E Hazel Dell - Springfield  
 Driller Miles & Sons License No. 99 503  
 11. Permit No. NE 4955 Date Sept 24/68  
 12. Water from Clair 13. County Sangamon  
 at depth 14 to 16 ft. Sec. 13  
 14. Screen: Diam 1 1/2 in. Twp. 15N  
 Length:      ft. Slot      Rge. 5W  
 Elev.     


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
36	Concrete	+1	20

SHOW LOCATION IN SECTION PLAT  
 SW NW NW  
 (permit)

16. Size Hole below casing: None in.  
 17. Static level 14 ft. below casing top which is      ft. above ground level. Pumping level      ft. when pumping at      gpm for      hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Top Soil	2	2
Yellow Clay	12	14
Brown Clay	6	20

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED M. Miles DATE Oct 17/68  
 COUNTY No. 1375  
 SANGAMON 13-15N-5W

PEI Assigned Log No. 10

ILLINOIS GEOLOGICAL SURVEY, URBANA

Strata	Thickness	Top	Bottom
Bridge boring #4 Section 15B Sta. 482+26, 111' Lt. Cl. Med.			
Clay, silty, black	1.5		1.5
Clay loam, silty, yellow-brown - medium	5		6.5
Clay loam, silty, yellow & gray mottled - stiff	2.5		9
Clay, silty, gray-brown - medium	7.5		16.5
Clay, sandy, gray & brown mottled - medium	3		19.5
Clay, gray-brown - very stiff	4.5		24
Clay till, sandy, brown - hard	4.5		28.5
Gray limestone boulder - cored	.5		29
Clay till, gray-brown	1.5		30.5
Diorite boulder - cored			
Limestone boulder - cored; 95% recovery	2.5		33
Clay till, gray	4.5		37.5
			T.D.

Typed by Engineering Geology Section

Copy of Highway Division log filed in Groundwater Section NO ENVELOPE

COMPANY Illinois Division of Highways  
 FARM FA 196 under GM&O RR. NO. 4  
 DATE DRILLED 11-10-64 COUNTY NO. 1488  
 AUTHORITY Log by Division of Highways  
 ELEVATION 605.5'  
 LOCATION SE 1/4 SW 1/4  
 COUNTY SANGAMON

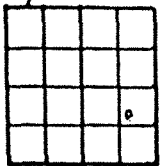

13-15N-5W

outside

Completed 9-6-70

10. Property owner ROBERT CLARK Well No. 1  
Address 1933 So 18th  
Driller FRUHA License No. 102-203  
11. Permit No. 78727 Date 8-30-70  
12. Water from CHAZ 13. County SANGAMON

at depth 25 to 26 ft. Sec. 2  
14. Screen: Diam. \_\_\_\_\_ in. Twp. 15N  
Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 5W  
Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6"	PVC SCH 40		10
36"	CONCRETE	10	45

SHOW LOCATION IN SECTION PLAT  
SW NE SE  
(permit)

16. Size Hole below casing: \_\_\_\_\_ in.  
17. Static level 20 ft. below casing top which is 1 ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours. Sub. pump set at 40'

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
BROWN CLAY	20	20
BROWN HARD PAN	4	24
SANDY CLAY	2	26
BROWN HARD PAN	4	30
SHALE - GRAY	15	45

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Jim Erwin DATE Sept 18, 70

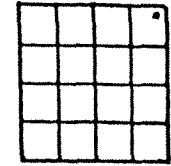
SANGAMON COUNTY No. 22807 2-15N-5W

PEI Assigned Log No. 11

Completed 4-76

10. Property owner George Cook Well No. \_\_\_\_\_  
Address SPRINGFIELD  
Driller George Cook License No. 4052-102-61  
11. Permit No. 46452 Date 4-76  
12. Water from SANDY CLAY 13. County SANGAMON

at depth 14' to \_\_\_\_\_ ft. Sec. 2  
14. Screen: Diam. \_\_\_\_\_ in. Twp. 15N  
Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 5W  
Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6"	PLASTIC	-1	-2
36"	CONCRETE	-2	-30

SHOW LOCATION IN SECTION PLAT  
NE NE NE  
(permit)

16. Size Hole below casing: \_\_\_\_\_ in.  
17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
TOP SOIL		2-
YELLOW CLAY		12-
SANDY CLAY		17
HARD PAN		24
BLUE CLAY		28
SHALE		30

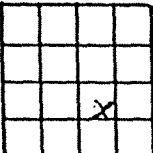
(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED George Cook DATE 4-76

SANGAMON COUNTY No. 22453 2-15N-5W

outside

10. Prop. owner Henry V. Jolley Well No. 1  
 Address 215 S Taylor St, 7th  
 Driller Mike J. Jones License No. 92-503  
 11. Permit No. NE 07143 Date Sept 26, 1969  
 12. Water from Clay 13. County Sangamon  
 at depth 29 to 30 ft. Sec. 2  
 14. Screen: Diam. 3 1/2 in. Twp. 15N  
 Length:        ft. Slot        Rge. 52W  
 Elev.       



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
36	Concrete	+1	39

16. Size Hole below casing None in.  
 17. Static level 27 ft. below casing top which is 1 ft. above ground level. Pumping level        ft. when pumping at        gpm for        hours.

18. FORMATIONS PASSED THROUGH

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
yellow clay	7.5	2.5
Sandy clay	5	30
blue clay	9	39

(CONTINUE ON SEPARATE SHEET IF NECESSARY)  
 SIGNED Murphy Mike DATE Oct 13/69  
 COMPLETION No. 1429  
 SANGAMON 2-15N-5W

PEI Assigned Log No. 12

LOG OF WATER WELL  
 Page 1  
 Property owner M. H. Clayton Well No. 1  
 Drilled by Mike & Son Year 66  
 Formations passed through Permit NF 709  

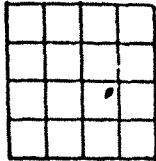
Formations passed through	Thickness	Depth of Bottom
yellow clay	15	15
hard pan	10	25
shale	5	30

 COUNTY No. 148.3  
 Received 7-12-66

[Continue on back if necessary]  
 Finished in shale at 25 to 30 ft.  
 Cased with 36 inch Concrete from 0 to 30 ft.  
 and        inch        from        to        ft.  
 Size hole below casing None inch. Static level from surf. 1F ft.  
 Tested capacity        gal. per min. Temperature        °F.  
 Water lowered to        ft. in        hrs.        min.  
 Length of test        hrs.        min. Screen         
 Slot        Diam.        Length        Bottom set at        ft.  
 (Show location in Section Plat)  
 Township name        Elev.        Sec. 2  
 Description of location 460'S 60E Twp. 15N  
22W 5E NW SW Rge. 52W  
 Signed Murphy Mike County Sangamon  
 SANGAMON Index: 2-15N-5W

outside

10. Property owner Jack Burnstine Well No. \_\_\_\_\_  
 Address 16 Wood Mill Road Sherman, IL. 62684  
 Driller Joseph R. Reynolds License No. 92-601  
 11. Permit No. 86116 Date May 29, 1979  
 12. Water from Clay Formation 13. County Sangamon  
 at depth 16 to 27 ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft.)	To (ft.)
10	Plastic	+1	-9
36	Concrete	-9	-27

SHOW LOCATION IN SECTION PLAT  
 NE NW SE  
 (permit)

16. Size Hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours. Sub. pump set at 20'

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Top Soil	0-3'	
Clay	20'	
Glacial Drift	27'	

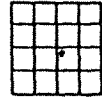
(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Joseph R. Reynolds DATE May 30, 1979  
 Cook & Reynolds Well Drilling, Inc.  
 R.R. 5 - 3300 Terminal Avenue  
 Springfield, Il. 62707  
 SANGAMON

PEI Assigned Log No. 13

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Bortmess, Ron Well No. \_\_\_\_\_  
 Address 605 South Walnut St. Rochester IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 117031 Date 03/29/85  
 12. Water from sandy clay 13. County Sangamon  
 at depth 17 to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	10
36	CONCRETE	10	32

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	7	19
hardpan	4	23
blue clay	5	28
shale	4	32
limestone	0	32

Sangamon 12-167-23577-00 06-15N-04W

PEI Assigned Log No. 14

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Cheffy, Edward Well No. \_\_\_\_\_  
 Address 1 Linden Lane Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 117670 Date 05/07/85  
 12. Water from sandy clay 13. County Sangamon  
 at depth 18 to ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	11
36	CONCRETE	11	32

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	12	14
sandy clay	5	19
hardpan	2	21
sandstone	2	23
shale	9	32
limestone	0	32

Sangamon 12-167-23602-00 06-15N-04W

PEI Assigned Log No. 15

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Chastain, George Well No. #1  
 Address 18 Apache Drive Springfield IL  
 Driller Erwin, James License No. 102-2037  
 11. Permit No. 52461 Date 09/21/76  
 12. Water from clay 13. County Sangamon  
 at depth 18 to 19 ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE SW NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC SCH 40	-1	10
36	CONCRETE	10	30

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 10 ft. below casing top which is 1 ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
no record	30	30

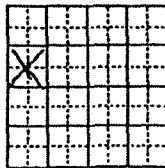
Sangamon 12-167-24055-00 06-15N-04W

PEI Assigned Log No. 16

## ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Bridge boring #1 Section 8-BR-1 Sta. 61+40 12' Rt. CL NB Ln			
Clay, yellow and gray mottled - stiff	9		9
Clay, silty, yellow and gray mottled medium	6.5		15.5
Clay, yellow and gray mottled - very stiff	4.5		20
Sandstone, shaly, light gray - 5' core-run, 80% retained	5		25 T.D.
Copy of Highway Division log filed in Groundwater Section			
Typed By Engineering Geology Section			
NO ENVELOPE			

COMPANY Illinois Division of Highways  
 FARM FA 25 over Sugar Creek no. 1  
 DATE DRILLED 9-4-63 COUNTY NO. 1472  
 AUTHORITY log by Division of Highways  
 ELEVATION 545.0'  
 LOCATION NW SW  
 COUNTY SANGAMON

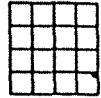


6-15N-4W

PEI Assigned Log No. 17

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Edwards, Ken Well No. \_\_\_\_\_  
 Address R. R. #7 Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014
11. Permit No. 136875 Date 11/03/87
12. Water from sandy clay 13. County Sangamon  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 6
14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE SE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	15
36	CONCRETE	15	33
24	CONCRET	31	55

16. Size hole below casing: \_\_\_\_\_ in.
17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	12	14
sandy clay	5	19
hardpan	4	23
blue clay	4	27
shale	28	55

Sangamon 12-167-24618-00 06-15N-04W

outside

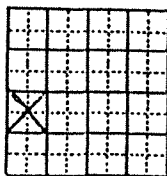
## ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Bridge boring #3 Section 8-BR-1 Sta. 59+07 Rt. CL NB Ln 22'			
Clay, silty, light brown - soft	14		14
Clay loam, sandy, brown and gray mottled. - medium	5.5		19.5
Clay loam, gray - organic, soft, with pieces of decayed wood	4		23.5
Sand, gray - medium, loose	6		29.5
Clay loam, light gray - soft	7.5		37
Clay till, light gray, angular and sharp; fragments of rock mix 1/2" - very stiff	3		40
Clay, shaly, light gray - very stiff to hard	5		45 T.D.

Typed by Engineering Geology Section  
Copy of Highway Division Log  
filed in Groundwater Section

NO ENVELOPE

COMPANY Illinois Division of Highways  
FARM FA 25 over Sugar Creek no. 3  
DATE DRILLED 9-6-63 COUNTY NO. 1474  
AUTHORITY Log by Division of Highways  
ELEVATION 541.0'  
LOCATION NW SW  
COUNTY SANGAMON



6-15N-4W

PEI Assigned Log No. 18

## ILLINOIS GEOLOGICAL SURVEY, URBANA

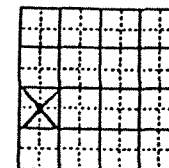
	Thickness	Top	Bottom
Bridge boring #2 Section 8-BR-1 Sta. 60+35 CL NB Ln			
Sandy loam, light brown	3		3
Clay, silty, gray and green mottled, with pieces of decayed wood - medium	7		10
Shale, gray-green - weak; stiff	6		16
Shale, light gray - very stiff; core-run, 50% retained	3		19
	2.5		21.5 T.D.

Copy of Highway Division log  
filed in Groundwater Section

Typed by Engineering Geology Section

NO ENVELOPE

COMPANY Illinois Division of Highways  
FARM FA 25 over Sugar Creek no. 2  
DATE DRILLED 9-6-63 COUNTY NO. 1473  
AUTHORITY Log by Division of Highways  
ELEVATION 519.5'  
LOCATION NW SW  
COUNTY SANGAMON



6-15N-4W

PEI Assigned Log No. 19

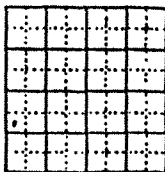
Response to 1st RTP

CWLP - 01736

Strata	Thickness	Top	Bottom
<b>GEOLOGICAL RECORD: (Sample Data)</b>			
Pennsylvanian System		50	555
Mississippian System		555	1538
Aux Vases sandstones, no show oil		610	652
Ste. Genevieve limestone		652	662
Rosiclare formation, no show of oil		662	670
Fredonia, St. Louis & Salem formations, undifferentiated.		670	902
Osage shales		902	
Keokuk-Burlington limestones, dolomites and shales of the Osage series, no shows of oil.		1066	1418
Choteau (Louisiana) limestone		1418	1422
Kinderhook shales		1422	1474
New Albany shale		1474	1538
Silurian System (Devonian Absent)		1538	1600
Dolomite, white to light gray, very fine sucrosic, tight, slightly porous, no shows of oil.			
Core #1: Recovered 25' Dolomite, white and light gray grading in part to gray-greenish, fine sucrose to dense argillaceous, slight traces of porosity, no shows of oil.		1547	1572
Drilled:		1572	1600
Dolomite, light gray-greenish, tight, non-porous, no shows of oil.		1572	1590
Limestone, dolomitic, white, to light gray, slightly fossiliferous with traces of chert, no show of oil.		1590	1600
Total Depth			1600
Casing: 8 5/8" cemented at 65'. 7 7/8" hole, 65' to T.D.			

COMPANY Otto Krachik  
 FARM Graham, Geo.  
 DATE DRILLED October 1958  
 AUTHORITY R. F. Anderson  
 ELEVATION 535' DF, Company  
 LOCATION 330' S line, 330' W line of NW SW  
 COUNTY SANGAMON

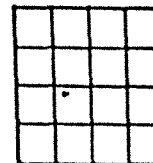
NO. 1  
 COUNTY NO. 607



6-15N-4W

PEI Assigned Log No. 20

10. Property owner JOSEPH FARRIS III Well No. \_\_\_\_\_  
 Address 2072 N 7th SPRINGFIELD  
 Driller GEORGE COOK License No. 102-61  
 11. Permit No. 31985-SHALR Date 8-8-74  
 12. Water from Formation 13. County SANGAMON  
 at depth 19 ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6"	PLASTIC	11	-10
36"	CONCRETE	-10	-40

SHOW LOCATION IN SECTION PLAT  
 300' NL, 120' WL  
 NE SW  
 (Permit)

16. Size Hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
TOP SOIL	3	3
YELLOW CLAY	12	15
HARD PAN	2	17
SHALE	23	40

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED George Cook DATE 9-74  
 COUNTY NO. 22078

SANGAMON

6-15N-4W

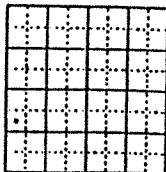
PEI Assigned Log No. 21

ILLINOIS GEOLOGICAL SURVEY, URBANA

Strata	Thickness	Top	Bottom
CORE #1 1547-1572' SILURIAN Dolomite, faint light greenish-gray, white specks, slightly chalky, mostly finely crystalline in streakd, pin head vugs in streaks	2.0		1949.0
Dolomite, light greenish-gray, white specks in streaks, a few pin head vugs scattered top 10' and calcareous bottom 4'	23.0		1572.0

COMPANY Otto Krachik  
 FARM Graham, George  
 DATE DRILLED October, 1958  
 AUTHORITY W. F. Meents  
 ELEVATION 535'DF - Company  
 LOCATION 330'S line, 330'W line, of NW SW  
 COUNTY SANGAMON

NO. 1  
 COUNTY NO. 607



6-15N-4W

PEI Assigned Log No. 20

ILLINOIS GEOLOGICAL SURVEY, URBANA

Strata	Thickness	Top	Bottom
Dry and abandoned. Plugged October 15, 1958. Coal, 365-371'. Information from Plugging Affidavit.  Electric log not run - Company Radio Active Survey not run - Company Time log filed.  S.S.F. 22858			

COUNTY Otto Krachik  
 SANGAMON

Graham, Geo. #1  
 6-15N-4W

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Hewitt, Ross Well No. \_\_\_\_\_  
 Address 2421 E. Griffiths Ave Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 124380 Date 06/06/86  
 12. Water from sandy clay 13. County Sangamon  
 at depth 19 to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rng. 42W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	13
36	CONCRETE	13	32

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

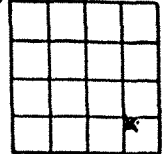
18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	7	19
hardpan	7	26
shale	6	32
limestone	0	32

Sangamon 12-167-23743-00 06-15N-04W

PEI Assigned Log No. 22

GEOLOGICAL WATER SURVEYS WATER WELL RECORD  
 Completed 7-21-88

10. Dept. Mines and Minerals permit No. NP 4429 Year 68  
 11. Property owner ELVIN HELSSINGER Well No. 1  
 Address 777 SPRINGFIELD TIL.  
 Driller MILES & SON License No. 92-503  
 12. Water from SAND 13. County SANGAMON  
 at depth 19 to 20 ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rng. 42W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft.)	To (ft.)
36	CONCRETE	-1	30

SHOW LOCATION IN SECTION PLAT  
 NW SE SE  
 (permit)

16. Size Hole below casing: 60/65 in.  
 17. Static level 15 ft. below casing top which is 1 ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
CLAY	18	18
SAND - COARSE	2	20
SANDY LOESS	10	30

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Mervin Miles DATE July 21, 86

SANGAMON 1318 6-15N-4W

OUTSIDE

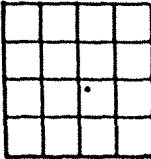
Completed 3-76

10. Property owner Charles Beck Well No. \_\_\_\_\_  
 Address 1118 1/2 W. Springfield  
 Driller Beck License No. 455-19

11. Permit No. 455-19 Date 3-10-76

12. Water from sandy clay 13. County Sangamon

at depth 12' to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6"	PLASTIC	11	12
36"	CONCRETE	12	22

SHOW LOCATION IN SECTION PLAT  
 NW NW SE  
 (permit)

16. Size Hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Top Soil		3
Yellow Clay		11
Sandy Clay		19
Hardpan Rock		24
Yellow Clay		27
Rock		27

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Doug Cook DATE 3-76

SANGAMON

COUNTY No. 22444

6-15N-4W

PEI Assigned Log No. 23

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Kutscher, Larry Well No. \_\_\_\_\_

Address 616 Woodland Ave. Springfield IL

Driller Reynolds, Joseph R. License No. 092-6014

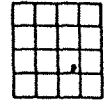
11. Permit No. 120043 Date 08/30/85

12. Water from sand 13. County Sangamon

at depth \_\_\_\_\_ to 17 ft. Sec. 6

14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N

Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

SE NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	10
36	CONCRETE	10	22

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	4	16
sand	1	17
hardpan	5	22
limestone	0	22

Sangamon

12-167-23666-00

06-15N-04W

OUTSIDE

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Sebo, Chuck Well No. \_\_\_\_\_  
 Address R. R. #7 Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014

11. Permit No. 133081 Date 06/30/87

12. Water from sandstone 13. County Sangamon  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 6

14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE NE SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	13
36	CONCRETE	13	22
24	CONCRETE	21	36

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	12	14
hardpan	8	22
sandstone	14	36

Sangamon 12-167-24549-00 06-15N-04W

PEI Assigned Log No. 24

10. Property owner STEVEN LEACH Well No. \_\_\_\_\_  
 Address R R #1 ROCHESTER  
 Driller GEORGE COOK License No. 102-61

11. Permit No. 31572 Date 7-26

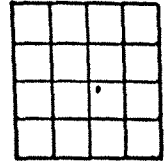
12. Water from SANDY CLAY 13. County SANGAMON  
 Formation

at depth 17 to \_\_\_\_\_ ft. Sec. 6

14. Screen: Diam. \_\_\_\_\_ in. Twp. 15N

Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4W

Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6"	PLASTIC	-1	-10
36"	CONCRETE	-10	-22

SHOW LOCATION IN SECTION PLAT

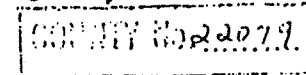
NW NW SE (Permit)

16. Size Hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
TOP SOIL	4	4
YELLOW CLAY	12	16
SANDY CLAY	3	19
HARD PAN	6	25
SAND STONE	3	28

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED George Cook DATE 8-74



SANGAMON

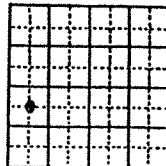
6-15:1-11W

PEI Assigned Log No. 25

ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Bridge boring #3 Section 8-B-1 Sta. 59+52 8' Rt. CL.			
Clay loam, brown - fill	9		9
Loam, sandy, brown - medium	4		13
Loam, sandy, brown - very soft	5		18
Loam, sandy, dark gray-green, organic - very soft	5		23
Clay loam, sandy, dark gray-green, organic - soft	2.5		25.5
Clay, varved, light gray - very soft	3		28.5
Loam, silty, gray-brown, organic - medium	7		35.5
Silt, gray, organic - medium	5.5		41
Clay, silty, gray - medium	2.5		43.5
Shale, light gray - stiff	9		52.5
			T.D.
Copy of Highway Division log filed in Groundwater Section Typed by Engineering Geology Section NO ENVELOPE			

COMPANY Illinois Division of Highways  
 FARM SBI-24 over Sugar Creek no. 3  
 DATE DRILLED 4-18-61 COUNTY NO. 1477  
 AUTHORITY Log by Highway Division  
 ELEVATION 536.2'  
 LOCATION NW SW  
 COUNTY SANGAMON

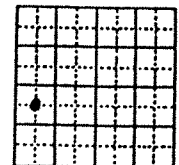


PEI Assigned Log No. 6115N-4W 26

ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Bridge boring #1 Section 8-B-1 Sta. 61+00 5' Lt. CL			
Clay loam, dark brown; fill material	6		6
Clay, yellow and gray mottled, silty; very stiff	2.5		8.5
Silt, yellow and gray mottled - medium	4.5		13
Clay, shaly, blue-green and brown layered - very stiff	2.5		15.5
Shale, sandy, red-brown - very stiff	2.5		18
Shale, sandy, blue-gray; hard; core	3		21
Shale, gray - very stiff; core	18		39
			T.D.
Copy of Highway Division log filed in Groundwater Section Typed by Engineering Geology Section NO ENVELOPE			

COMPANY Illinois Division of Highways  
 FARM SBI-24 over Sugar Creek no. 1  
 DATE DRILLED 4-11-61 COUNTY NO. 1476  
 AUTHORITY Log by Highway Division  
 ELEVATION 542.7'  
 LOCATION NW SW  
 COUNTY SANGAMON



PEI Assigned Log No. 6-15N-4W 27

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Miller, Don T. Well No. \_\_\_\_\_  
 Address R.R. Box #296 New Berlin IL  
 Driller Reynolds, Joseph R. License No. 092-6014

11. Permit No. 96725 Date 10/21/80

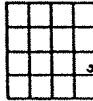
12. Water from sandy clay 13. County Sangamon

at depth 17 to \_\_\_\_\_ ft. Sec. 6

14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N

Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W

Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE NE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	10
36	CONCRETE	10	29

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	7	19
hardpan	5	24
sandstone	5	29
rock	0	29

Sangamon 12-167-24058-00 06-15N-04W

*outside*

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Luster, Orla J. Well No. #1  
 Address Apt. #400 Lincoln Towers Springfield IL

Driller Erwin, James License No. 102-2037

11. Permit No. 67185 Date 09/23/77

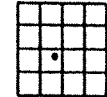
12. Water from \_\_\_\_\_ 13. County Sangamon

at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 6

14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N

Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W

Elev. \_\_\_\_\_



15. Casing and Liner Pipe NE NE SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC SCH 40	-1	10
36	CONCRETE	10	40

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
no records	40	40

Sangamon 12-167-24056-00 06-15N-04W

PEI Assigned Log No. 28

Response to 1st RTP

CWLP - 01743

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Sanderfield, Dennis Well No. #2  
 Address Springfield IL  
 Driller Erwin, James License No. 102-2037  
 11. Permit No. 89674 Date 09/18/79  
 12. Water from \_\_\_\_\_ 13. County Sangamon  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NW NW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
brown clay	18	18
brown shale	6	24
gray shale	24	48
blk slate (hd coal)	3	51
fire clay	1	52
gray shale	8	60

Sangamon 12-167-24063-00 06-15N-04W

*outside*

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Requarth, Joseph Well No. #1  
 Address 1050 W. Cathoun Springfield IL  
 Driller Erwin, James License No. 102-2037  
 11. Permit No. 93529 Date 04/25/80  
 12. Water from sandy clay 13. County Sangamon  
 at depth 14 to 16 ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE SW NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC SCH 40	-1	10
36	CONCRETE	10	31

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 10 ft. below casing top which is 1 ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	1	1
brown clay	6	7
brown & white clay	4	11
white & yellow clay	4	15
sandy brown clay	5	20
brown clay	11	31

Sangamon 12-167-24062-00 06-15N-04W

PEI Assigned Log No. 29

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Springler, Tim Well No. \_\_\_\_\_  
 Address Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 96892 Date 10/24/80  
 12. Water from sandy clay 13. County Sangamon  
 at depth 17 to     ft. Sec. 6  
 14. Screen: Diam. 15 in. Twp. 15 N  
 Length:     ft. Slot     Rge. 4 W  
 Elev.    



15. Casing and Liner Pipe SW NE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	10
36	CONCRETE	10	20

16. Size hole below casing:     in.  
 17. Static level     ft. below casing top which is     ft.  
 above ground level. Pumping level     ft. when pumping at      
 gpm for     hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	7	19
sandstone	1	20

Sangamon 12-167-24065-00 06-15N-04W

OUTSIDE

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Siciliano, Frank Well No. #1  
 Address 608 W. Highland Springfield IL  
 Driller Erwin, James License No. 102-2037  
 11. Permit No. 86808 Date 06/18/79  
 12. Water from sandy clay 13. County Sangamon  
 at depth 16 to 17 ft. Sec. 6  
 14. Screen: Diam.     in. Twp. 15 N  
 Length:     ft. Slot     Rge. 4 W  
 Elev.    



15. Casing and Liner Pipe SW SW NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC SCH 40	-1	10
36	CONCRETE	10	40

16. Size hole below casing:     in.  
 17. Static level 15 ft. below casing top which is 1 ft.  
 above ground level. Pumping level     ft. when pumping at      
 gpm for     hours.

18. Formations passed through	Thickness	Bottom
black top soil	1	1
brown clay	4	5
wh-gry c/brn yl strk	12	17
gray hardpan	4	21
gray shale	19	40

Sangamon 12-167-24064-00 06-15N-04W

PEI Assigned Log No. 30

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Vicari, Jerry Well No. \_\_\_\_\_  
 Address R.R. #10 Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 115763 Date 11/14/84  
 12. Water from sandy clay 13. County Sangamon  
 at depth 19 to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NE SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	12
36	CONCRETE	12	27

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

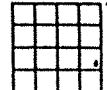
18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	12	14
sandy clay	5	19
hardpan	2	21
shale	6	27

Sangamon 12-167-24070-00 06-15N-04W

PEI Assigned Log No. 31

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Turner, Robert E. Well No. \_\_\_\_\_  
 Address R.R. #2 Rochester IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 96350 Date 09/29/80  
 12. Water from sandy clay 13. County Sangamon  
 at depth 17 to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE NE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	10
36	CONCRETE	10	31

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	7	19
sandstone	8	27
shale	4	31
limestone	0	31

Sangamon 12-167-24069-00 06-15N-04W

*outside*

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner Bradburg, Bruce Well No. \_\_\_\_\_  
 Address R. R. #7 Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 127370 Date 10/08/86  
 12. Water from sandy clay 13. County Sangamon  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 7  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	13
36	CONCRETE	13	49

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

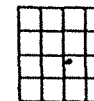
18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	12	14
sandy clay	5	19
hardpan	4	23
blue clay	8	31
shale	18	49

Sangamon 12-167-23828-00 07-15N-04W

OUTSIDE

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner Wojcicki, Ronald Well No. \_\_\_\_\_  
 Address 1743 Wildrose Dr. Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 115764 Date 11/14/84  
 12. Water from sand & gravel 13. County Sangamon  
 at depth 21 to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	10
36	CONCRETE	10	31

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	10	12
sandy clay	4	16
hardpan	5	21
sand & gravel	1	22
blue clay	9	31
rock	0	31

Sangamon 12-167-24071-00 06-15N-04W

PEI Assigned Log No. 32

Completed 6-19-68

10. Dept. Mines and Minerals permit No. W4238 Year 68  
 11. Property owner ELMER D. FECK Well No. 7  
 Address #7 SPRINGFIELD, ILLINOIS  
 Driller MILES & SON License No. 92-503  
 12. Water from HARD PAN 13. County SANGAMON  
 at depth 18 to 24 ft. Sec. 7  
 14. Screen: Diam.        in. Twp. 15N  
 Length:        ft. Slot        Rng. 42W  
 Elev.

			*

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
36	CONCRETE	0	30

SHOW LOCATION IN SECTION PLAT  
 NW NE NE  
 (permit)

16. Size Hole below casing: NONE in.  
 17. Static level 18 ft. below casing top which is 1 ft. above ground level. Pumping level        ft. when pumping at        gpm for        hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
TOP SOIL	2	2
CLAY	16	18
HARD PAN	6	24
BLUE CLAY	6	30

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Merual Miles DATE June 19 1968  
1317  
 SANGAMON 7-15N-4W

out side

10. Property owner Richard Claus Well No.         
 Address 57 Columbine  
 Driller Joe Reynolds License No. 92-601  
 11. Permit No. 163246 Date 7-6-77  
 12. Water from Sandy Clay 13. County Sang  
 at depth 15 to        ft. Sec. 7  
 14. Screen: Diam.        in. Twp. 15N  
 Length:        ft. Slot        Rge. 4W  
 Elev.


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6"	Plastic	+1	-10
36"	Concrete	-10	-52

SHOW LOCATION IN SECTION PLAT  
 SE NW NE  
 (permit)

16. Size Hole below casing:        in.  
 17. Static level        ft. below casing top which is        ft. above ground level. Pumping level        ft. when pumping at        gpm for        hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Top Soil	2	2'
Yellow Clay	16	18'
Sandy Clay	6	24'
Hard Pan	6	30'
Shale &	22	52'

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Joseph Reynolds DATE         
 SANGAMON COUNTY No. 22765 7-15N-4W

PEI Assigned Log No. 33

Completed 11-76

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Metzger, Ron Well No. \_\_\_\_\_  
 Address 4025 Pichsair Springfield IL  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 125894 Date 08/12/86  
 12. Water from sandy clay 13. County Sangamon  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 7  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_



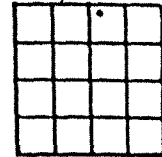
15. Casing and Liner Pipe SE NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	14
36	CONCRETE	14	50

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	15	17
sandy clay	4	21
hardpan	6	27
blue clay	2	29

10. Property owner JOHN H JARVIS Well No. \_\_\_\_\_  
 Address 2704 E JACKSON SELD  
 Driller JOSEPH REYNOLDS License No. 92-601  
 11. Permit No. 54482 Date 11-8-76  
 12. Water from SANDY CLAY 13. County \_\_\_\_\_  
 at depth 19' to \_\_\_\_\_ ft. Sec. 7  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4W  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft.)	To (ft.)
6"	PLASTIC	1'	-1'
36"	CONCRETE	-10	-43

SHOW LOCATION IN SECTION PLAT  
 NW NW NE  
 (permit)

16. Size Hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
TOP SOIL		2
YELLOW CLAY		12
SANDY CLAY		19
HARD PAN		23
BLUE CLAY		27
SHALE		42
LIMESTONE		43

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Joseph Reynolds DATE \_\_\_\_\_  
 COUNTY No. 22574  
 SANGAMON 7-15N-4W

Sangamon 12-167-23782-00 07-15N-04W

PEI Assigned Log No. 34

PEI Assigned Log No. 35

10. Property owner Robert F. Bly Well No. \_\_\_\_\_  
 Address 1916 N. 27th Springfield, Ill.  
 Driller Melvin Saxe License No. 92-503  
 11. Permit No. NC4263 Date June 24, 68  
 12. Water from Clay 13. County Sangamon  
 at depth 24 to 28 ft. Sec. 6  
 14. Screen: Diam 3 1/2 in. Twp. 15N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4W  
 Elev. \_\_\_\_\_


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft.)	To (ft.)
36	CONCRETE	11	41

SHOW LOCATION IN SECTION PLAT  
 NW NW NW  
 (permit)

16. Size Hole below casing: none in.  
 17. Static level 24 ft. below casing top which is 1 ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>Yellow Clay</u>	<u>8</u>	<u>8</u>
<u>Brown Clay</u>	<u>16</u>	<u>24</u>
<u>Sandy Clay</u>	<u>9</u>	<u>33</u>
<u>Reddish Clay</u>	<u>8</u>	<u>41</u>

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Melvin Saxe DATE June 24, 68

COUNTY No. 1354

SANGAMON

6-15N-4W

outside

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Bartel, William Well No. \_\_\_\_\_  
 Address R. R. #7 Box 171 Springfield Ill  
 Driller Reynolds, Joseph R. License No. 092-6014  
 11. Permit No. 138930 Date 12/31/87  
 12. Water from sandstone 13. County Sangamon  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 6  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 15 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 4 W  
 Elev. \_\_\_\_\_


15. Casing and Liner Pipe

NW SW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PLASTIC	-1	11
36	CONCRETE	10	29
24	CONCRETE	28	40

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
yellow clay	12	14
sandy clay	5	19
hardpan	4	23
blue clay	4	27
shale	2	29
sandstone	11	40

Sangamon

12-167-24652-00

06-15N-04W

PEI Assigned Log No. 36

**APPENDIX B**  
**BORING LOGS**

## **SUMMARY OF (INTERPRETED) GEOLOGIC DATA**

**SUMMARY OF GEOLOGIC DATA (INTERPRETED)  
FGDS LANDFILL  
SPRINGFIELD, ILLINOIS**

Boring/ Piezometer/ Monitoring Well	Coordinates		Ground Elevation	El. Top of Bedrock	El. Top of Basal Sand	Thickness of Basal Sand (ft.)	El. Top of Lower Clay (ft.)	Thickness of Lower Clay (ft.)	Top of Shallow Sand (ft.)	Thickness of Shallow Sand (ft.)	Thickness of Upper Clay (ft.)	Thickness of Fill (ft.)	Remarks
	East	North											
B-1*	2685.6	5260.5	523.2	490.2	499.2	5.0	509.2	10.0	512.8	3.6	10.4	NE	Clay overlies bedrock
B-2*	2241.0	5482.9	526.7	496.7	NE	NE	510.7	14.0	512.7	2.0	14.0	NE	
B-3*			553.0±	498.5	505.0	6.5	519.0	14.0	520.0	0.9	13.1	20.0	Located on berm Not surveyed
B-4*	2060.4	5488.2	530.1	496.6	505.6	9.0	516.1	10.5	NE	NE	14.0	NE	
B-5*	2049.3	5204.3	529.5	496.0	504.3	8.3	512.5	8.2	514.5	2.0	15.0	NE	
B-6*	2588.6	5072.9	530.8	493.3	500.8	4.5	514.8	14.0	NE	NE	11.5	NE	Clay overlies bedrock
B-7*	2684.2	4743.9	523.3	494.8	499.8	5.0	508.3	8.5	NE	1.5	2.5	12.5	
B-8*	2706.2	4565.9	523.8	494.8	501.2	6.4	513.3	12.1	NE	NE	10.5	NE	
B-9*	2506.0	4690.7	522.7	495.7	502.2	6.5	510.3	8.1	513.9	3.6	8.8	NE	
B-10*	2463.3	4589.2	523.6	498.1	499.4	1.3	516.1	16.7	NE	NE	7.5	NE	
B-11*	2391.2	4775.2	523.6	495.4	501.8	6.4	515.2	13.4	NE	NE	8.4	NE	
B-12*	2210.8	4924.2	524.9	494.9	500.4	5.5	517.4	17.0	518.9	1.5	6.0	NE	
B-13*	2275.9	4524.7	523.8	494.5	499.3	4.8	516.8	17.5	518.0	1.2	5.8	NE	

**SUMMARY OF GEOLOGIC DATA (INTERPRETED)  
FGDS LANDFILL  
SPRINGFIELD, ILLINOIS**

Boring/ Piezometer/ Monitoring Well	Coordinates		Ground Elevation	El. Top of Bedrock	El. Top of Basal Sand	Thickness of Basal Sand (ft.)	El. Top of Lower Clay (ft.)	Thickness of Lower Clay (ft.)	Top of Shallow Sand (ft.)	Thickness of Shallow Sand (ft.)	Thickness of Upper Clay (ft.)	Thickness of Fill (ft.)	Remarks
	East	North											
B-14*	2791.1	3763.9	572.7	553.7	NE	NE	NE	NE	NE	NE	12.5	NE	Bedrock outcrop
B-15*	1752.7	5579.6	536.7	516.7	NE	NE	523.7	7.0	527.7	4.0	9.0	NE	
CB-1*	2663.1	5559.1	527.3	495.0	507.3	12.3	NE	NE	NE	NE	NE	20.0	Creek
CB-2*	2700.9	5427.5	526.2	<496.7	503.7	4.5	506.2	2.5	NE	NE	NE	19.5	Creek
CB-3*	2542.3	5359.4	525.8	<495.8	498.8	2.0	513.8	15.0	NE	NE	NE	12.0	Creek
CB-4*	2490.4	5240.9	525.1	<503.1	ND	ND	513.3	>10.2	NE	NE	NE	11.8	Creek
CB-5*	2390.9	5197.4	523.4	<507.4	ND	ND	515.2	>7.8	515.6	0.4	7.8	NE	
CB-6*	2367.5	5079.8	527.0	494.5	501.0	6.5	518.0	17.0	518.8	0.8	8.2	NE	
CB-7*	2377.9	4938.0	523.8	<507.8	ND	ND	515.0	>7.2	NE	NE	8.8	NE	
CB-8*	2564.6	4862.3	522.7	<502.7	ND	ND	508.9	>6.2	NE	NE	NE	13.8	
CB-9*	2736.2	4799.8	525.5	<499.5	503.5	>4.0	509.3	5.8	NE	NE	NE	16.2	
P-1D*	1973.1	4806.1	553.4	501.4	504.4	3.0	513.9	9.5	NE	NE	NE	39.5	Located on berm
P-1S*	1973.9	4821.3	553.4	<511.4	ND	ND	514.7	>3.3	NE	NE	NE	ND	Located on berm
P-2D*	1975.9	5226.0	553.9	498.1	500.9	2.8	516.4	15.5	NE	NE	13.8	37.5	Located on berm

**SUMMARY OF GEOLOGIC DATA (INTERPRETED)  
FGDS LANDFILL  
SPRINGFIELD, ILLINOIS**

Boring/ Piezometer/ Monitoring Well	Coordinates		Ground Elevation	El. Top of Bedrock	El. Top of Basal Sand	Thickness of Basal Sand (ft.)	El. Top of Lower Clay (ft.)	Thickness of Lower Clay (ft.)	Top of Shallow Sand (ft.)	Thickness of Shallow Sand (ft.)	Thickness of Upper Clay (ft.)	Thickness of Fill (ft.)	Remarks
	East	North											
P-2S*	1976.3	5237.1	533.9	ND	ND	ND	ND	ND	NE	NE	ND	ND	Located on berm
P-3D*	2645.4	5672.5	530.5	497.0	502.5	5.5	517.0	14.5	NE	NE	NE	13.5	Creek
P-3S*	2651.4	5672.5	530.5	ND	ND	ND	518.5	>2.0	NE	NE	NE	ND	Not sampled continuously
P-4*	2880.7	5156.3	535.9	493.6	501.9	8.3	519.9	18.0	NE	NE	16.0	NE	
P-5D*	2885.0	4516.7	534.9	507.6	512.9	5.3	NE	NE	NE	NE	NE	22.0	Creek
P-5S*	2887.0	4510.7	534.9	ND	ND	ND	ND	ND	NE	NE	ND	ND	Not sampled continuously
P-6D*	2186.8	4717.0	524.8	493.3	497.3	4.0	517.3	20.0	518.3	1.0	6.5	NE	
P-6R*	2175.7	4719.5	524.8	492.3	ND	ND	ND	ND	ND	ND	ND	ND	Not sampled continuously
P-6S*	2191.4	4725.7	524.9	ND	ND	ND	517.4	>2.5	518.4	1.0	6.5	ND	Not sampled continuously
P-7D*	2432.5	5342.8	526.5	494.0	500.5	5.0	514.5	14.0	515.0	0.5	11.5	NE	Clay overlies bedrock
P-7M*	2432.8	5337.0	525.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	Not sampled continuously

**SUMMARY OF GEOLOGIC DATA (INTERPRETED)  
FGDS LANDFILL  
SPRINGFIELD, ILLINOIS**

Boring/ Piezometer/ Monitoring Well	Coordinates		Ground Elevation	El. Top of Bedrock	El. Top of Basal Sand	Thickness of Basal Sand (ft.)	El. Top of Lower Clay (ft.)	Thickness of Lower Clay (ft.)	Top of Shallow Sand (ft.)	Thickness of Shallow Sand (ft.)	Thickness of Upper Clay (ft.)	Thickness of Fill (ft.)	Remarks	
	East	North												
P-7R*	2424.5	5326.9	525.4	491.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	Not sampled continuously
P-7S*	2426.3	5337.1	526.3	ND	ND	ND	515.3	>3.0	515.8	0.5	10.5	ND	ND	Not sampled continuously
P-8D*	2482.7	4939.7	522.7	496.2	500.7	3.5	508.7	8.0	NE	NE	NE	14.0	NE	Clay overlies bedrock
P-8S*	2486.0	4933.1	522.8	ND	ND	ND	ND	ND	NE	NE	NE	ND	NE	Not sampled continuously
P-9D*	2422.4	4446.3	553.2	495.7	501.2	5.5	521.2	20.0	NE	NE	5.7	NE	NE	Located on berm
P-9S*	2415.6	4447.3	553.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE	Located on berm
B-1 thru B-6**	NA	NA	NA	These borings were made in the north-east corner of Cell No. 1. These locations were not surveyed; therefore, the data from these borings was not used to interpret site conditions.									PSI (1989)	
B-1**	NA	NA	525.4	502.4	NE	NE	NE	NE	NE	NE	NE	NE	23.0	Creek
B-2**	NA	NA	525.3	496.8	NE	NE	518.0	21.2	521.5	3.5	3.8	NE		
B-3**	NA	NA	523.8	ND	500.8	>7.0	508.8	8.0	514.8	6.0	9.0	NE		
B-4**	NA	NA	522.6	495.1	502.6	3.0	514.0	11.4	NE	NE	2.5	6.0	NE	Clay
B-5**	NA	NA	523.5	494.5	499.0	4.5	514.5	15.5	NE	NE	9.0	NE		

**SUMMARY OF GEOLOGIC DATA (INTERPRETED)  
FGDS LANDFILL  
SPRINGFIELD, ILLINOIS**

Boring/ Piezometer/ Monitoring Well	Coordinates		Ground Elevation	El. Top of Bedrock	El. Top of Basal Sand	Thickness of Basal Sand (ft.)	El. Top of Lower Clay (ft.)	Thickness of Lower Clay (ft.)	Top of Shallow Sand (ft.)	Thickness of Shallow Sand (ft.)	Thickness of Upper Clay (ft.)	Thickness of Fill (ft.)	Remarks	
	East	North												
B-6**	NA	NA	522.7	495.7	500.7	5.0	NE	NE	NE	NE	NE	22.0	Creek	
B-11**	NA	NA	522.5	496.5	501.5	5.0	NE	NE	NE	NE	NE	21.0	Creek	
B-12**	NA	NA	522.2	494.7	NE	NE	509.2	14.5	NE	NE	NE	13.0	Creek	
B-13**	NA	NA	522.2	495.2	NE	NE	512.2	17.0	NE	NE	4.0	6.0		
B-14**	NA	NA	522.3	493.8	498.3	4.5	516.3	18.0	NE	NE	6.0	NE		
B-15**	NA	NA	524.4	ND	496.4	>2.0	514.4	18.0	NE	NE	10.0	NE		
B-16**	NA	NA	523.2	495.7	497.7	2.0	508.2	10.5	NE	NE	6.0	6.0		
B-17**	NA	NA	522.5	495.5	497.5	2.0	504.5	7.0	NE	NE	NE	18.0	Creek	
R-101**	2863.2	4049.5	543.8	511.8	NE	NE	530.6	18.8	530.8	0.2	13.0	NE		
R-102**	2043.9	5673.8	535.8	499.8	500.8	1.0	522.8	22.0	NE	NE	13.0	NE		
R-103**	2878.4	5625.3	536.1	506.6	NE	NE	516.6	10.0	517.1	0.5	19.0	NE		
G-104**	2305.9	5688.6	530.7	495.7	502.7	7.0	507.6	4.9	NE	NE	NE	23.0	Creek	
G-105**	1994.6	5016.9	553.5	502.0	505.5	0.7	514.5	9.0	NE	NE	15.0	24.0		
G-106**	2378.9	5149.7	524.2	492.2	499.2	7.0	515.2	16.0	516.2	1.0	8.0	NE		
ND	=	No Data												
NE	=	Not Encountered												
NA	=	Not Available												
							*							Patrick Engineering Inc.
							**							Professional Service Industries, Inc.

**ATTACHMENT B**

August 30, 2010

City Water, Light & Power  
 Environmental Health & Safety  
 201 East Lake Shore Drive  
 Springfield, Illinois 62712

Attn: Ms. Sue Corcoran  
 Tel: 217-757-8610  
 Fax: 217-757-8615

Re: Piezometer Installation  
 CWLP Ash Ponds  
 East Lake Shore Drive  
 Springfield, Illinois  
 PSI Report No. 0020522-1 Rev. 1 Page 1 of 22 (including attachments)

Dear Ms. Corcoran:

In general accordance with your instructions, Professional Service Industries, Inc. (PSI) has completed the installation of four (4) temporary piezometers at the periphery of CWLP's ash pond area in Springfield, Illinois. Additionally, certain laboratory analysis was performed, as was in situ hydraulic conductivity (slug) testing. The piezometer locations are identified on the attached location plan. Boring depths and static water levels are shown in the table below.

	AP-1	AP-2	AP-3	AP-4
<b>Date drilled</b>	4/21/2010	4/21/2010	4/21/2010	4/20/2010
<b>Total boring depth (ft)</b>	31.5	20	19.5	60
<b>Piezometer depth from top of first casing above ground surface (ft)</b>	33.15	19.47	19.63	58.93
<b>Piezometer depth from ground surface (ft)</b>	28.34	17.18	17.91	58.31
<b>Well screen length (ft)</b>	10	10	10	10
<b>Static water level from ground surface (5/5/2010)</b>	4.81	3.89	5.16	5.95

The borings were drilled to depths ranging from approximately 17.2 to 58.3 feet below the existing ground surface, respectively. It is PSI's understanding that the purpose for these soil borings is to aid CWLP in assessing the groundwater quality outside the existing CWLP ash ponds. The general boring locations were determined and located in the field by CWLP personnel. With the approval of Ms. Corcoran, AP-2 was offset to the north of the clarifier pond drainage pipe. Depths on the attached boring logs are relative to the ground surface at each boring location.

Water level observations were made during and upon completion of the boring operations and are noted on the boring logs presented herewith. In addition, static water levels were observed

at the time of the slug testing. In relatively impervious soils, the accurate determination of the groundwater elevation may not be possible even after several days of observation. Seasonal variations, temperature and recent rainfall conditions may influence the levels of the groundwater table and volumes of water will depend on the permeability of the soils.

Soil samples were visually classification in the field for logging purposes. The limited laboratory testing program included grain size analysis. Where soil tests are reported, they have been performed in accordance with generally acceptable or applicable standards. Sieve analysis worksheets are appended. Soil samples were conveyed to CWLP upon completion of the well installation activities.

A copy of the boring logs are appended. The stratification of the soils on the log represents the soil conditions in the actual boring location. Lines of demarcation represent the approximate boundaries between the soil types, but the transition may be gradual.

On May 5, 2010, in situ rising head hydraulic conductivity (slug) testing was performed on each of the four piezometers. Testing was conducted by rapidly removing one bailer (1 liter) of groundwater from the well while recording the rate of recovery using a Solinst 3001 level logger. Hydraulic conductivity was estimated using the Hvorslev method. Based on this method, the average hydraulic conductivity was estimated at 2.50E-02. Slug test results and hydraulic conductivity calculations are appended.

PSI appreciates the opportunity to perform these services and if we can be of further service, please contact our office at (217) 544-6663.

Respectfully submitted,  
**PROFESSIONAL SERVICE INDUSTRIES, INC.**



James Gerloff, E.I.  
Branch Manager



William P. Pongracz, P.E.  
Vice President

Attachments:    Key to Symbols  
                      Boring Logs (4 pages)  
                      Piezometer Location Plan  
                      In-Situ Hydraulic Conductivity Results (6 pages)  
                      Sieve Analysis Worksheets (8 pages)

Distribution: (1) above

# PIEZOMETER LOCATION PLAN

SOURCE:

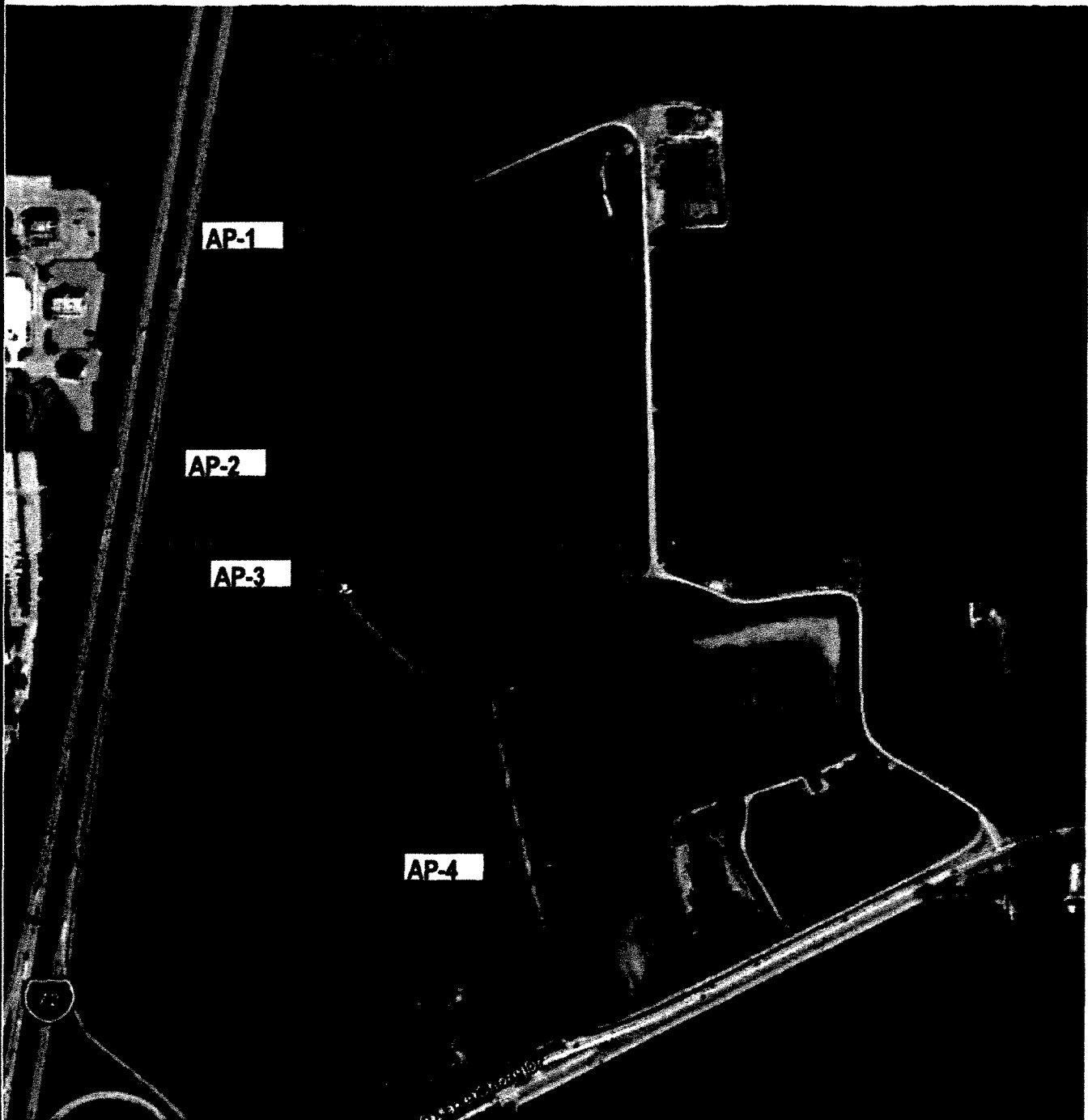
Google © 2010 / DigitalGlobe © 2010

DATE:

Nov-05

SCALE:

No Scale



**psi** Information  
*To Build On*  
**Engineering • Consulting • Testing**  
480 North Street, Springfield, Illinois 62704  
phone 217/544-6663 fax 217/544-6148

## PIEZOMETER LOCATION PLAN

PSI PROJECT No.: 0020522  
Project: Piezometer Installation  
Location: CWLP Ash Pond  
East Lake Shore Drive  
Springfield, Illinois

# KEY TO SYMBOLS



Fill (made ground)



USCS Low Plasticity Clay



USCS Silt



USCS Low Plasticity Sandy Clay



USCS Clayey Sand



USCS Well-graded Sand with Silt



USCS Poorly-graded Sand



USCS Well-graded Sand

HSA = Hollow Stem Auger

CFA = Continuous Flight Auger

SPT = Standard Penetration Test

DCP = Dynamic Cone Penetrometer

SS = Split-spoon Sampler

ST = Shelby Tube Sampler

RC = Rock Core

DD = Dry Density

LL = Liquid Limit

PL = Plastic Limit

Qu = Unconfined Compressive  
Strength

Qp = Pocket Penetrometer

RQD = Rock Quality Designation

REC'D = Rock Core Recovery Percentage

PID = Photo Ionic Detector (ppm)

MR\* = Unable to determine depth of water  
due to mud rotary drilling methods

The borings were advanced into the ground using hollow stem augers. At regular intervals throughout the boring depths, soil samples were obtained with either a 1.4-inch I.D., 2.0-inch O.D., split-spoon sampler or a 3-inch diameter Shelby tube. The split-spoon sampler was first seated 6-inches to penetrate any loose cuttings and then driven an additional foot where possible with blows of a 140 pound hammer falling 30-inches. The number of hammer blows required to drive the sampler each 6-inch increment is recorded in the field. The penetration resistance "N-value" is redesignated as the number of hammer blows required to drive the sampler the final foot and, when properly evaluated, is an index to cohesion for clays and relative density for sands. The split-spoon sampling procedures used during this exploration are in general accordance with ASTM Designation D 1586.

Relatively undisturbed Shelby tube samples were obtained by forcing a section of 3-inch diameter steel tubing into the soil at the desired sampling levels. This sampling procedure was in general accordance with ASTM Designation D 1587. Each tube, together with the encased soil, was carefully removed from the ground, sealed and transported to the laboratory for testing.



Professional Service Industries, Inc.  
480 North Street  
Springfield, Illinois 62704  
Telephone: 217/544-6663  
Fax: 217/544-6143

PSI Job No.: 0020522  
Project: Piezometer Installation  
Location: CWLP Ash Pond  
East Lake Shore Drive  
Springfield, Illinois



Professional Service Industries, Inc.  
 480 North Street  
 Springfield, Illinois 62704  
 Telephone: 217/544-6663  
 Fax: 217/544-6143

# LOG OF BORING AP-1

Sheet 1 of 1

PSI Job No.: 0020522	Drilling Method: Hollow Stem Auger	<b>WATER LEVELS</b>
Project: Piezometer Installation	Sampling Method: Split Spoon	▽ While Drilling 9 feet
Location: CWLP Ash Pond East Lake Shore Drive Springfield, Illinois	Hammer Type: CME Automatic; ETR = 86%	▼ Upon Completion N/A
	Boring Location: See attached boring location plan.	▽ Delay N/A

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	Station: N/A Offset: N/A	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks	J-Plug Well Diagram
0	0			1	18		Dark brown silty CLAY, very stiff, slightly moist	CL	7-8-9 N <sub>60</sub> =24				Concrete Cap
5	5			2	18		Dark brown clayey SILT, stiff, slightly moist	ML	5-5-5 N <sub>60</sub> =14				2" PVC Solid Riser
10	10			3	18		Gray clayey SILT, trace brown, firm, moist	ML	2-2-3 N <sub>60</sub> =7				Bentonite Seal
15	15			4	18		Gray silty CLAY, few brown sand, firm, saturated	CL	2-2-3 N <sub>60</sub> =7				
20	20			5	18		Gray sandy CLAY, stiff, saturated	CLS	1-2-2 N <sub>60</sub> =6				
25	25			6	18		Gray silty CLAY, few brown sand, firm, saturated	CL	1-2-2 N <sub>60</sub> =6				
30	30			7	18		Gray sandy CLAY, stiff, saturated	CLS	4-3-4 N <sub>60</sub> =10				
35	35			8	18		Blue-gray clayey SILT, soft to very stiff, moist to saturated	ML	3-3-4 N <sub>60</sub> =10				Sand Filter Pack
				9	18			ML	1-2-1 N <sub>60</sub> =4				0.01" PVC Slotted Well Screen
				10	18		Gray SAND with SILT, medium dense/very stiff, saturated	SW-SM	6-7-6 N <sub>60</sub> =19				
				11	6		Gray SHALE, hard, slightly moist Boring terminated at -31.5'	CL	50/6"				

Completion Depth: 35.0 ft	Sample Types:	Latitude:
Date Boring Started: 4/21/10	Auger Cutting	Longitude:
Date Boring Completed: 4/21/10	Split-Spoon	Drill Rig: ATV D50
Logged By: Rob Preuss	Rock Core	Remarks: N <sub>60</sub> denotes the normalization to 60% efficiency as described in ASTM D4633. Moistures determined by visual methods
Drilling Contractor: PSI, Inc.	Shelby Tube	
	Hand Auger	
	Texas Cone	

The stratification lines represent approximate boundaries. The transition may be gradual.



Professional Service Industries, Inc.  
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 Springfield, Illinois 62704  
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 Fax: 217/544-6143

# LOG OF BORING AP-2

Sheet 1 of 1

PSI Job No.: 0020522	Drilling Method: Hollow Stem Auger	<b>WATER LEVELS</b>
Project: Piezometer Installation	Sampling Method: Split Spoon	▽ While Drilling 9 feet
Location: CWLP Ash Pond	Hammer Type: CME Automatic; ETR = 86%	▽ Upon Completion N/A
East Lake Shore Drive	Boring Location: See attached boring location plan.	▽ Delay N/A
Springfield, Illinois		

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	Station: N/A Offset: N/A	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks	Well Diagram
0	0			1	10		Dark brown silty CLAY, some sand, stiff, slightly moist (FILL)	CL	4-4-6 N <sub>60</sub> =14				
5	5			2	8		Dark brown silty CLAY, soft to firm, moist	CL	2-2-2 N <sub>60</sub> =6				
10	10			3	6		Gray silty CLAY, soft to firm, moist	CL	1-1-2 N <sub>60</sub> =4				
15	15			4	18		Gray clayey SILT, soft to firm, saturated	CL	2-2-2 N <sub>60</sub> =6				
20	20			5	18			ML	2-1-1 N <sub>60</sub> =3				
				6	18			ML	2-1-2 N <sub>60</sub> =4				
				7	18		Light gray SAND, dense, saturated	SP	4-9-16 N <sub>60</sub> =36				
				8	14		Gray SHALE, hard, slightly moist Boring terminate at -20'	CL	19-24-50/2'				

Completion Depth: 20.0 ft	Sample Types:	Latitude:
Date Boring Started: 4/21/10	Auger Cutting	Longitude:
Date Boring Completed: 4/21/10	Split-Spoon	Drill Rig: ATV D50
Logged By: Rob Preuss	Rock Core	Remarks: N <sub>60</sub> denotes the normalization to 60% efficiency as described in ASTM D4633. Moistures determined by visual methods
Drilling Contractor: PSI, Inc.	Shelby Tube	
	Hand Auger	
	Texas Cone	

The stratification lines represent approximate boundaries. The transition may be gradual.



Professional Service Industries, Inc.  
 480 North Street  
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# LOG OF BORING AP-3

Sheet 1 of 1

PSI Job No.: 0020522	Drilling Method: Hollow Stem Auger	<b>WATER LEVELS</b>	
Project: Piezometer Installation	Sampling Method: Split Spoon	∇ While Drilling	None feet
Location: CWLP Ash Pond	Hammer Type: CME Automatic; ETR = 86%	∇ Upon Completion	N/A
East Lake Shore Drive Springfield, Illinois	Boring Location: See attached boring location plan.	∇ Delay	N/A

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	Station: N/A Offset: N/A	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks	Well Diagram
0	0			1	18		Dark brown silty CLAY, very stiff, slightly moist	CL	6-7-8 N <sub>60</sub> =21				
5	5			2	18		Gray/brown clayey SILT, soft to stiff, moist to saturated	ML	3-3-4 N <sub>60</sub> =10				
10	10			3	18			ML	1-1-1 N <sub>60</sub> =3				
10	10			4	18		Gray clayey SILT, soft to very stiff, saturated	ML	2-1-2 N <sub>60</sub> =4				
15	15			5	18			ML	2-2-4 N <sub>60</sub> =9				
15	15			6	16			ML	2-2-4 N <sub>60</sub> =9				
15	15			7	18			ML	4-4-6 N <sub>60</sub> =14				
20	20			8	10		Gray SHALE, hard, slightly moist Boring terminated at -19.5	CL	32-50/3"		>>		

Completion Depth: 20.0 ft	Sample Types:	Latitude:
Date Boring Started: 4/21/10	Auger Cutting	Longitude:
Date Boring Completed: 4/21/10	Split-Spoon	Drill Rig: ATV D50
Logged By: Rob Preuss	Rock Core	Remarks: N <sub>60</sub> denotes the normalization to 60% efficiency as described in ASTM D4633. Moistures determined by visual methods.
Drilling Contractor: PSI, Inc.	Shelby Tube	
	Hand Auger	
	Texas Cone	

The stratification lines represent approximate boundaries. The transition may be gradual.



Professional Service Industries, Inc.  
 480 North Street  
 Springfield, Illinois 62704  
 Telephone: 217/544-6663  
 Fax: 217/544-6143

# LOG OF BORING AP-4

Sheet 1 of 1

PSI Job No.: 0020522	Drilling Method: Hollow Stem Auger	<b>WATER LEVELS</b>
Project: Piezometer Installation	Sampling Method: Split Spoon	▽ While Drilling 11 feet
Location: CWLP Ash Pond East Lake Shore Drive Springfield, Illinois	Hammer Type: CME Automatic; ETR = 86%	▽ Upon Completion N/A
	Boring Location: See attached boring location plan.	▽ Delay N/A

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	Station: N/A Offset: N/A	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft X Moisture □ PL ● LL	STRENGTH, tsf ▲ Qu * Qp	Additional Remarks	Well Diagram
0	0			1	17		Brown silty CLAY, some brown sand, firm to stiff, slightly moist (FILL)	CL	4-4-3 N <sub>60</sub> =10					
5	5			2	18		Brown silty CLAY, trace roots, firm to stiff, moist (FILL)	CL	4-3-2 N <sub>60</sub> =7					
10	10			3	10		Brown SILT, trace gray, firm to stiff, moist (FILL)	ML	6-3-2 N <sub>60</sub> =7					
10	12			4	12		5" Brown SAND transitioning to Black FLY ASH at 9.4', stiff to very stiff, slightly moist (FILL)	SAND/FLY ASH	2-2-4 N <sub>60</sub> =9					
15	18			5	18			SAND/FLY ASH	2-2-2 N <sub>60</sub> =6					
15	16			6	16			SAND/FLY ASH	2-1-1 N <sub>60</sub> =3					
20	16			7	16		Black FLY ASH, some fine sub-round gravel, stiff to very stiff, moist to saturated (FILL)	FLY ASH	6-6-5 N <sub>60</sub> =16					
20	18			8	18		Gray/green (organic?) CLAY, stiff, trace fine sand, moist to saturated	FLY ASH	3-3-3 N <sub>60</sub> =9					
25	9			9	1			CL	3-3-4 N <sub>60</sub> =10					
30	10			10	18		Brown/gray silty CLAY, firm to stiff, saturated	CL	2-2-3 N <sub>60</sub> =7					
35	11			11	18		Gray SILT, stiff to very stiff, saturated	CL	3-3-4 N <sub>60</sub> =10					
40	12			12	18			ML	4-4-4 N <sub>60</sub> =11					
45	13			13	18			ML	4-4-6 N <sub>60</sub> =14					
50	14			14	18		Gray fine to coarse SAND, medium dense, saturated	SW	4-5-7 N <sub>60</sub> =17					
55	15			15	18			SW	5-5-7 N <sub>60</sub> =17					
60	16			16	1		Gray SHALE, hard, moist	CL	50/1"					
							Boring terminated at -60'							

Completion Depth: 60.0 ft	Sample Types:	Latitude:
Date Boring Started: 4/20/10	Auger Cutting	Longitude:
Date Boring Completed: 4/20/10	Split-Spoon	Drill Rig: ATV D50
Logged By: Rob Preuss	Rock Core	Remarks: N <sub>60</sub> denotes the normalization to 60% efficiency as described in ASTM D4633. Moistures determined by visual methods.
Drilling Contractor: PSI, Inc.	Shelby Tube	
	Hand Auger	
	Texas Cone	

The stratification lines represent approximate boundaries. The transition may be gradual.

**In-Situ Hydraulic Conductivity Test Analysis  
Utilizing the Hvorslev Slug Test Method<sup>1</sup>**

<b>GOVERNING EQUATION:</b>	
$K = (r^2 * \ln(L_w/R))/(2L_w T_o)$	
K is the hydraulic conductivity (cm/sec)	
r is the radius of the well casing (cm)	
R is the radius of the borehole (cm)	
$L_w$ is the length of the well screen (cm)	
$T_o$ is the time it takes for the water level to rise or fall 37% of the initial change (sec)	

**CWLP Ash Ponds, East Lake Shore Drive, Springfield, Illinois  
Hydraulic Conductivity Analysis<sup>2</sup>**

In-Situ

Test Number	Test Type	$L_w$ (ft)	$L_w$ (cm)	$T_o$ (min)	$T_o$ (sec)	K (cm/sec)
AP-4	Rising Head	10.0	304.8	0.025	1.500	7.64E-02
AP-3	Rising Head	10.0	304.8	0.083	4.980	2.30E-02
AP-2.1	Rising Head	10.0	304.8	0.150	9.000	1.27E-02
AP-2.2	Rising Head	10.0	304.8	0.167	10.020	1.14E-02
AP-1	Rising Head	10.0	304.8	1.667	100.020	1.15E-03

AVERAGE: 2.50E-02

<b>CONSTANTS</b>			
r	r	R	R
(inch)	(cm)	(inch)	(cm)
2.0	5.08	8.0	20.3

<b>HVORSLEV CALCULATIONS</b>				
Test	$L_w/R$	$\ln(L_w/R)$	$L_w T_o$	K
	(-)	(-)	(cm*sec)	(cm/sec)
AP-4	15.00	2.71	4.57E+02	7.64E-02
AP-3	15.00	2.71	1.52E+03	2.30E-02
AP-2.1	15.00	2.71	2.74E+03	1.27E-02
AP-2.2	15.00	2.71	3.05E+03	1.14E-02
AP-1	15.00	2.71	3.05E+04	1.15E-03

AP-2 AVG: 1.21E-02

**Notes:**

<sup>1</sup> Hvorslev slug test method applied as described by C.W. Fetter in Applied Hydrology (Third Edition) published by Prentice-Hall in New Jersey in 1994 on pages 247-251.

<sup>2</sup> In-situ hydraulic conductivity tests conducted on monitoring wells, MW-1 thru MW-4 on May 5, 2010.

Solinst 3001

Report generated: 5/11/2010  
Report from file: ...lrmw-4.cav

Serial number: 1032308

Unit name: Solinst 3001

Test name: AP-1 Test 1

Test defined on: 5/5/2010  
Test started on: 5/5/2010 9:20:28  
Test stopped on: 5/5/2010 9:21:41

Data gathered using Linear logging  
Time between data points: 1 Seconds.  
Number of data samples: 75

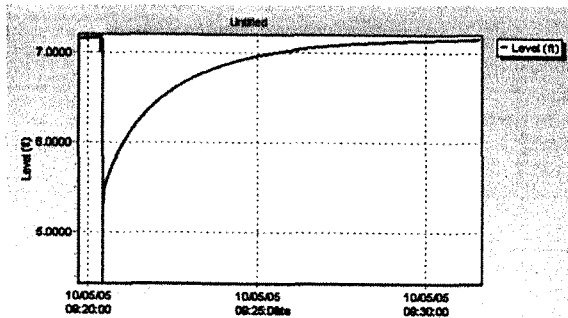
TOTAL DATA SAMPLES 75

Channel number [1]  
Measurement type: Level  
Unit: feet

Channel number [2]  
Measurement type: Temperature  
Unit: Deg C

Sensor Range:  
Specific gravity:  
Mode:  
User-defined reference\*: 33.15 Feet H2O  
Reference on: test start  
Pressure head at reference: Feet H2O

\*Well depth to top of first casing terminating above ground. Does not include above ground extensions.



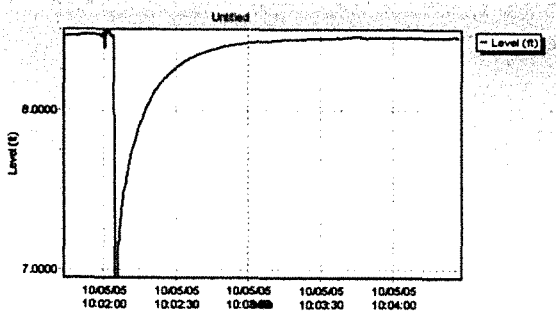
Date	Time	ET (sec)	Time (min)	Test Time (min)	Temperature	Level	Water Level Bottom of well to TOC* (ft)	Change of Static Water Level (ft)	Who
5/5/2010	9:20:27	0	0.000			11.254	7.1703	25.980	0
5/5/2010	9:20:28	1	0.017	0.000		11.252	5.298	27.852	1.8723
5/5/2010	9:20:29	2	0.033	0.017		11.254	5.392	27.751	1.7711
5/5/2010	9:20:30	3	0.050	0.033		11.254	5.458	27.692	1.7119
5/5/2010	9:20:31	4	0.067	0.050		11.257	5.485	27.662	1.6818
5/5/2010	9:20:32	5	0.083	0.067		11.255	5.519	27.631	1.6513
5/5/2010	9:20:33	6	0.100	0.083		11.258	5.542	27.608	1.6282
5/5/2010	9:20:34	7	0.117	0.100		11.257	5.568	27.584	1.6045
5/5/2010	9:20:35	8	0.133	0.117		11.258	5.591	27.558	1.5784
5/5/2010	9:20:36	9	0.150	0.133		11.257	5.607	27.543	1.5629
5/5/2010	9:20:37	10	0.167	0.150		11.257	5.623	27.526	1.5466
5/5/2010	9:20:38	11	0.183	0.167		11.258	5.643	27.508	1.528
5/5/2010	9:20:39	12	0.200	0.183		11.259	5.659	27.491	1.5108
5/5/2010	9:20:40	13	0.217	0.200		11.258	5.676	27.474	1.4943
5/5/2010	9:20:41	14	0.233	0.217		11.259	5.692	27.458	1.4781
5/5/2010	9:20:42	15	0.250	0.233		11.261	5.708	27.442	1.4619
5/5/2010	9:20:43	16	0.267	0.250		11.259	5.726	27.427	1.4477
5/5/2010	9:20:44	17	0.283	0.267		11.259	5.738	27.412	1.432
5/5/2010	9:20:45	18	0.300	0.283		11.26	5.751	27.398	1.4184
5/5/2010	9:20:46	19	0.317	0.300		11.256	5.768	27.384	1.4043
5/5/2010	9:20:47	20	0.333	0.317		11.261	5.781	27.369	1.3888
5/5/2010	9:20:48	21	0.350	0.333		11.259	5.795	27.355	1.3748
5/5/2010	9:20:49	22	0.367	0.350		11.259	5.808	27.341	1.3615
5/5/2010	9:20:50	23	0.383	0.367		11.26	5.824	27.328	1.3479
5/5/2010	9:20:51	24	0.400	0.383		11.259	5.835	27.315	1.3348
5/5/2010	9:20:52	25	0.417	0.400		11.26	5.848	27.301	1.3214
5/5/2010	9:20:53	26	0.433	0.417		11.261	5.862	27.288	1.3082
5/5/2010	9:20:54	27	0.450	0.433		11.26	5.875	27.275	1.2953
5/5/2010	9:20:55	28	0.467	0.450		11.261	5.887	27.263	1.2836
5/5/2010	9:20:56	29	0.483	0.467		11.26	5.899	27.250	1.2707
5/5/2010	9:20:57	30	0.500	0.483		11.259	5.914	27.238	1.2579
5/5/2010	9:20:58	31	0.517	0.500		11.259	5.928	27.226	1.2467
5/5/2010	9:20:59	32	0.533	0.517		11.259	5.935	27.215	1.2352
5/5/2010	9:21:00	33	0.550	0.533		11.26	5.947	27.202	1.2224
5/5/2010	9:21:01	34	0.567	0.550		11.259	5.959	27.191	1.2114
5/5/2010	9:21:02	35	0.583	0.567		11.258	5.969	27.180	1.2004
5/5/2010	9:21:03	36	0.600	0.583		11.259	5.980	27.170	1.19
5/5/2010	9:21:04	37	0.617	0.600		11.258	5.992	27.157	1.1776
5/5/2010	9:21:05	38	0.633	0.617		11.26	6.002	27.147	1.1675
5/5/2010	9:21:06	39	0.650	0.633		11.258	6.014	27.136	1.1561
5/5/2010	9:21:07	40	0.667	0.650		11.257	6.025	27.125	1.1453
5/5/2010	9:21:08	41	0.683	0.667		11.259	6.036	27.115	1.1357
5/5/2010	9:21:09	42	0.700	0.683		11.258	6.048	27.105	1.1255
5/5/2010	9:21:10	43	0.717	0.700		11.259	6.054	27.095	1.1149
5/5/2010	9:21:11	44	0.733	0.717		11.258	6.065	27.084	1.1045
5/5/2010	9:21:12	45	0.750	0.733		11.259	6.076	27.074	1.0938
5/5/2010	9:21:13	46	0.767	0.750		11.257	6.084	27.064	1.0839
5/5/2010	9:21:14	47	0.783	0.767		11.257	6.096	27.054	1.0743
5/5/2010	9:21:15	48	0.800	0.783		11.257	6.105	27.045	1.0648
5/5/2010	9:21:16	49	0.817	0.800		11.259	6.114	27.036	1.0559
5/5/2010	9:21:17	50	0.833	0.817		11.257	6.123	27.027	1.0468
5/5/2010	9:21:18	51	0.850	0.833		11.259	6.132	27.017	1.0371
5/5/2010	9:21:19	52	0.867	0.850		11.257	6.143	27.008	1.028
5/5/2010	9:21:20	53	0.883	0.867		11.256	6.151	26.999	1.019
5/5/2010	9:21:21	54	0.900	0.883		11.257	6.161	26.989	1.009
5/5/2010	9:21:22	55	0.917	0.900		11.258	6.169	26.981	1.001
5/5/2010	9:21:23	56	0.933	0.917		11.257	6.176	26.971	0.9917
5/5/2010	9:21:24	57	0.950	0.933		11.257	6.189	26.963	0.9834
5/5/2010	9:21:25	58	0.967	0.950		11.257	6.198	26.954	0.9743
5/5/2010	9:21:26	59	0.983	0.967		11.258	6.204	26.946	0.9658
5/5/2010	9:21:27	60	1.000	0.983		11.257	6.213	26.94	0.9573
5/5/2010	9:21:28	61	1.017	1.000		11.256	6.221	26.929	0.9488
5/5/2010	9:21:29	62	1.033	1.017		11.256	6.228	26.921	0.9416
5/5/2010	9:21:30	63	1.050	1.033		11.255	6.237	26.913	0.9332
5/5/2010	9:21:31	64	1.067	1.050		11.257	6.246	26.903	0.9237
5/5/2010	9:21:32	65	1.083	1.067		11.257	6.254	26.898	0.9179
5/5/2010	9:21:33	66	1.100	1.083		11.255	6.261	26.889	0.9088
5/5/2010	9:21:34	67	1.117	1.100		11.256	6.268	26.882	0.9023
5/5/2010	9:21:35	68	1.133	1.117		11.255	6.272	26.874	0.8941
5/5/2010	9:21:36	69	1.150	1.133		11.255	6.283	26.867	0.8868
5/5/2010	9:21:37	70	1.167	1.150		11.255	6.292	26.858	0.878
5/5/2010	9:21:38	71	1.183	1.167		11.256	6.299	26.852	0.8724
5/5/2010	9:21:39	72	1.200	1.183		11.256	6.305	26.845	0.865
5/5/2010	9:21:40	73	1.217	1.200		11.255	6.312	26.837	0.8577
5/5/2010	9:21:41	74	1.233	1.217		11.254	6.320	26.829	0.8495

TEST START  
SLUG REMOVED

**Solinst** 3001  
 Report generated: 5/11/2010  
 Report from file: ...lwm-3\_1.cav  
  
**Serial number:** 1032308  
**Unit name:** Solinst 3001  
**Test name:** AP-2 Test 1  
 Test defined on: 5/5/2010  
 Test started on: 5/5/2010 10:02:05  
 Test stopped on: 5/5/2010 10:02:58

**Data gathered using Linear testing**  
 Time between data points: 1 Seconds.  
 Number of data samples: 55  
  
**TOTAL DATA SAMPLES** 55  
  
**Channel number [1]**  
**Measurement type:** Level  
**Unit:** feet  
  
**Channel number [2]**  
**Measurement type:** Temperature  
**Unit:** Deg C  
**Sensor Range:**  
**Specific gravity:**  
**Mode:** TOC  
**User-defined reference\*:** 19.47 Feet H2O  
**Referenced on:** test start  
**Pressure head at reference:** Feet H2O

\*Well depth to top of first casing terminating above ground. Does not include above ground extensions.



Date	Time	ET (sec)	Time (min)	Test Time (min)	Temperature	Level	Water Level Bottom of well to TOC* (ft)	Change of Static Water Level (ft)	mhd
1	5/5/2010	10:02:04	0	0.000		11.23	8.4182	11.052	0
2	5/5/2010	10:02:05	1	0.017	0.000	11.231	8.9143	12.556	1.6039
3	5/5/2010	10:02:06	2	0.033	0.017	11.231	7.2562	12.214	1.162
4	5/5/2010	10:02:07	3	0.050	0.033	11.231	7.3727	12.097	1.0455
5	5/5/2010	10:02:08	4	0.067	0.050	11.231	7.4828	11.987	0.9354
6	5/5/2010	10:02:09	5	0.083	0.067	11.231	7.5707	11.899	0.8475
7	5/5/2010	10:02:10	6	0.100	0.083	11.231	7.6472	11.823	0.771
8	5/5/2010	10:02:11	7	0.117	0.100	11.231	7.715	11.755	0.7032
9	5/5/2010	10:02:12	8	0.133	0.117	11.232	7.7747	11.695	0.6435
10	5/5/2010	10:02:13	9	0.150	0.133	11.232	7.8285	11.642	0.5897
11	5/5/2010	10:02:14	10	0.167	0.150	11.232	7.878	11.592	0.5402
12	5/5/2010	10:02:15	11	0.183	0.167	11.231	7.9204	11.550	0.4878
13	5/5/2010	10:02:16	12	0.200	0.183	11.232	7.9625	11.508	0.4557
14	5/5/2010	10:02:17	13	0.217	0.200	11.232	8.0004	11.470	0.4178
15	5/5/2010	10:02:18	14	0.233	0.217	11.232	8.0325	11.438	0.3857
16	5/5/2010	10:02:19	15	0.250	0.233	11.232	8.0633	11.407	0.3549
17	5/5/2010	10:02:20	16	0.267	0.250	11.231	8.0906	11.379	0.3278
18	5/5/2010	10:02:21	17	0.283	0.267	11.23	8.1151	11.355	0.3031
19	5/5/2010	10:02:22	18	0.300	0.283	11.23	8.1395	11.331	0.2787
20	5/5/2010	10:02:23	19	0.317	0.300	11.23	8.1618	11.308	0.2566
21	5/5/2010	10:02:24	20	0.333	0.317	11.23	8.1805	11.280	0.2377
22	5/5/2010	10:02:25	21	0.350	0.333	11.229	8.2001	11.270	0.2181
23	5/5/2010	10:02:26	22	0.367	0.350	11.229	8.2158	11.254	0.2024
24	5/5/2010	10:02:27	23	0.383	0.367	11.229	8.2315	11.239	0.1867
25	5/5/2010	10:02:28	24	0.400	0.383	11.229	8.2454	11.225	0.1728
26	5/5/2010	10:02:29	25	0.417	0.400	11.228	8.2589	11.211	0.1593
27	5/5/2010	10:02:30	26	0.433	0.417	11.228	8.2709	11.199	0.1473
28	5/5/2010	10:02:31	27	0.450	0.433	11.227	8.2821	11.188	0.1361
29	5/5/2010	10:02:32	28	0.467	0.450	11.228	8.2931	11.177	0.1251
30	5/5/2010	10:02:33	29	0.483	0.467	11.227	8.3029	11.167	0.1153
31	5/5/2010	10:02:34	30	0.500	0.483	11.228	8.3123	11.158	0.1059
32	5/5/2010	10:02:35	31	0.517	0.500	11.226	8.3207	11.149	0.0975
33	5/5/2010	10:02:36	32	0.533	0.517	11.225	8.3292	11.141	0.089
34	5/5/2010	10:02:37	33	0.550	0.533	11.225	8.3355	11.135	0.0827
35	5/5/2010	10:02:38	34	0.567	0.550	11.224	8.3418	11.128	0.0764
36	5/5/2010	10:02:39	35	0.583	0.567	11.224	8.3491	11.121	0.0691
37	5/5/2010	10:02:40	36	0.600	0.583	11.223	8.3548	11.115	0.0634
38	5/5/2010	10:02:41	37	0.617	0.600	11.223	8.3615	11.109	0.0567
39	5/5/2010	10:02:42	38	0.633	0.617	11.223	8.3654	11.105	0.0528
40	5/5/2010	10:02:43	39	0.650	0.633	11.222	8.3729	11.097	0.0453
41	5/5/2010	10:02:44	40	0.667	0.650	11.222	8.3781	11.094	0.0421
42	5/5/2010	10:02:45	41	0.683	0.667	11.221	8.3803	11.090	0.0379
43	5/5/2010	10:02:46	42	0.700	0.683	11.221	8.385	11.085	0.0332
44	5/5/2010	10:02:47	43	0.717	0.700	11.22	8.3888	11.081	0.0294
45	5/5/2010	10:02:48	44	0.733	0.717	11.22	8.3922	11.078	0.026
46	5/5/2010	10:02:49	45	0.750	0.733	11.22	8.3959	11.074	0.0223
47	5/5/2010	10:02:50	46	0.767	0.750	11.219	8.3983	11.072	0.0199
48	5/5/2010	10:02:51	47	0.783	0.767	11.219	8.4029	11.067	0.0153
49	5/5/2010	10:02:52	48	0.800	0.783	11.218	8.4042	11.066	0.014
50	5/5/2010	10:02:53	49	0.817	0.800	11.218	8.4084	11.062	0.0098
51	5/5/2010	10:02:54	50	0.833	0.817	11.218	8.4099	11.060	0.0083
52	5/5/2010	10:02:55	51	0.850	0.833	11.218	8.4117	11.058	0.0065
53	5/5/2010	10:02:56	52	0.867	0.850	11.218	8.4145	11.056	0.0037
54	5/5/2010	10:02:57	53	0.883	0.867	11.217	8.416	11.054	0.0022
55	5/5/2010	10:02:58	54	0.900	0.883	11.216	8.4182	11.052	0

TEST START  
SLUG REMOVED

Solinet 3001

Report generated: 5/11/2010  
 Report from file: ...vmw-3\_2.csv

Serial number: 1032308  
 Unit name: Solinet 3001  
 Test name: AP-2 Test 2

Test defined on: 5/5/2010  
 Test started on: 5/5/2010 10:08:48  
 Test stopped on: 5/5/2010 10:09:43

Data gathered using Linear testing  
 Time between data points: 1 Seconds  
 Number of data samples: 57

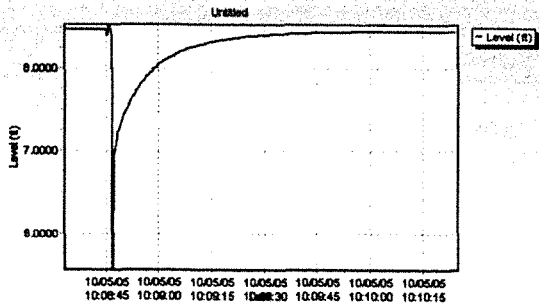
TOTAL DATA SAMPLES 57

Channel number [1]  
 Measurement type: Level  
 Unit: feet

Channel number [2]  
 Measurement type: Temperature  
 Unit: Deg C

Sensor Range:  
 Specific gravity:  
 Mode: TOC  
 User-defined reference\*: 19.47 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: Feet H2O

\*Well depth to top of first casing terminating above ground. Does not include above ground extensions.



Date	Time	ET (sec)	Time (min)	Test Time (min)	Temperature	Level	Water Level Bottom of well to TOC* (ft)	Change of Static Water Level (ft)
5/5/2010	10:08:47	0	0.000		11.111	8.4246	11.045	0
5/5/2010	10:08:48	1	0.017	0.000	11.114	8.3757	12.484	1.4489
5/5/2010	10:08:49	2	0.033	0.017	11.114	7.2067	12.263	1.2179
5/5/2010	10:08:50	3	0.050	0.033	11.116	7.3467	12.123	1.0779
5/5/2010	10:08:51	4	0.067	0.050	11.117	7.4819	12.008	0.9627
5/5/2010	10:08:52	5	0.083	0.067	11.117	7.5593	11.911	0.8653
5/5/2010	10:08:53	6	0.100	0.083	11.117	7.6431	11.827	0.7815
5/5/2010	10:08:54	7	0.117	0.100	11.118	7.7187	11.750	0.7049
5/5/2010	10:08:55	8	0.133	0.117	11.121	7.7838	11.686	0.6406
5/5/2010	10:08:56	9	0.150	0.133	11.12	7.8425	11.628	0.5821
5/5/2010	10:08:57	10	0.167	0.150	11.12	7.8942	11.576	0.5304
5/5/2010	10:08:58	11	0.183	0.167	11.123	7.9419	11.528	0.4827
5/5/2010	10:08:59	12	0.200	0.183	11.123	7.9837	11.486	0.4409
5/5/2010	10:09:00	13	0.217	0.200	11.123	8.0214	11.449	0.4032
5/5/2010	10:09:01	14	0.233	0.217	11.124	8.0533	11.417	0.3713
5/5/2010	10:09:02	15	0.250	0.233	11.124	8.0854	11.385	0.3392
5/5/2010	10:09:03	16	0.267	0.250	11.125	8.1137	11.356	0.3109
5/5/2010	10:09:04	17	0.283	0.267	11.125	8.1368	11.333	0.2878
5/5/2010	10:09:05	18	0.300	0.283	11.127	8.1636	11.306	0.261
5/5/2010	10:09:06	19	0.317	0.300	11.126	8.1829	11.287	0.2417
5/5/2010	10:09:07	20	0.333	0.317	11.127	8.2006	11.269	0.224
5/5/2010	10:09:08	21	0.350	0.333	11.127	8.2186	11.251	0.206
5/5/2010	10:09:09	22	0.367	0.350	11.126	8.2347	11.235	0.1899
5/5/2010	10:09:10	23	0.383	0.367	11.127	8.2493	11.221	0.1753
5/5/2010	10:09:11	24	0.400	0.383	11.128	8.2622	11.208	0.1624
5/5/2010	10:09:12	25	0.417	0.400	11.128	8.275	11.195	0.1496
5/5/2010	10:09:13	26	0.433	0.417	11.129	8.2863	11.184	0.1383
5/5/2010	10:09:14	27	0.450	0.433	11.129	8.2973	11.173	0.1273
5/5/2010	10:09:15	28	0.467	0.450	11.13	8.3084	11.162	0.1162
5/5/2010	10:09:16	29	0.483	0.467	11.13	8.3152	11.155	0.1094
5/5/2010	10:09:17	30	0.500	0.500	11.129	8.3253	11.145	0.0993
5/5/2010	10:09:18	31	0.517	0.500	11.13	8.3319	11.138	0.0927
5/5/2010	10:09:19	32	0.533	0.517	11.132	8.3386	11.131	0.086
5/5/2010	10:09:20	33	0.550	0.533	11.132	8.3487	11.121	0.0759
5/5/2010	10:09:21	34	0.567	0.550	11.131	8.3532	11.117	0.0714
5/5/2010	10:09:22	35	0.583	0.567	11.132	8.3595	11.111	0.0651
5/5/2010	10:09:23	36	0.600	0.583	11.132	8.3639	11.106	0.0607
5/5/2010	10:09:24	37	0.617	0.600	11.133	8.3697	11.100	0.0549
5/5/2010	10:09:25	38	0.633	0.617	11.133	8.3747	11.095	0.0499
5/5/2010	10:09:26	39	0.650	0.633	11.133	8.3806	11.089	0.044
5/5/2010	10:09:27	40	0.667	0.650	11.134	8.3842	11.086	0.0404
5/5/2010	10:09:28	41	0.683	0.667	11.134	8.3879	11.082	0.0367
5/5/2010	10:09:29	42	0.700	0.683	11.134	8.3903	11.080	0.0343
5/5/2010	10:09:30	43	0.717	0.700	11.135	8.3943	11.076	0.0303
5/5/2010	10:09:31	44	0.733	0.717	11.134	8.3975	11.073	0.0271
5/5/2010	10:09:32	45	0.750	0.733	11.135	8.3985	11.072	0.0261
5/5/2010	10:09:33	46	0.767	0.750	11.135	8.4027	11.067	0.0219
5/5/2010	10:09:34	47	0.783	0.767	11.136	8.4058	11.064	0.0188
5/5/2010	10:09:35	48	0.800	0.783	11.135	8.4085	11.062	0.0161
5/5/2010	10:09:36	49	0.817	0.800	11.136	8.4115	11.059	0.0131
5/5/2010	10:09:37	50	0.833	0.817	11.136	8.4124	11.058	0.0122
5/5/2010	10:09:38	51	0.850	0.833	11.137	8.4148	11.055	0.0098
5/5/2010	10:09:39	52	0.867	0.850	11.136	8.4159	11.054	0.0087
5/5/2010	10:09:40	53	0.883	0.867	11.138	8.4178	11.052	0.0068
5/5/2010	10:09:41	54	0.900	0.883	11.137	8.4188	11.051	0.0058
5/5/2010	10:09:42	55	0.917	0.900	11.137	8.4221	11.048	0.0025
5/5/2010	10:09:43	56	0.933	0.917	11.138	8.4239	11.048	0.0007

D/Dc

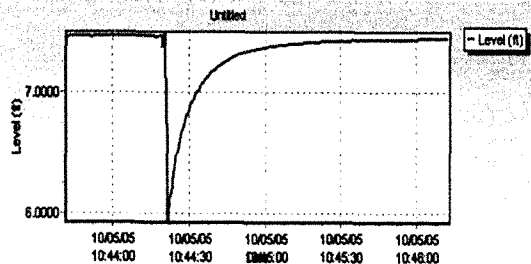
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TEST START  
 SLUG REMOVED

Serial number:	1032308	Date	Time	ET (sec)	Time (min)	Test Time (min)	Temperature	Level	Water Level Bottom of well to TOC* (ft)	Change of Static Water Level (ft)	Who
Report generated:	5/11/2010	1	5/5/2010 10:44:20	0	0.000		11.841	7.4264	12.204	0	
Report from file:	...mw-2_1.csv	2	5/5/2010 10:44:21	1	0.017	0.000	11.841	4.946	14.684	2.4804	1
Unit name:	Solinet 3001	3	5/5/2010 10:44:22	2	0.033	0.017	11.841	6.031	13.699	1.3954	0.662870553
Test name:	AP-3 Test 1	4	5/5/2010 10:44:23	3	0.050	0.033	11.841	6.214	13.399	1.195	0.481777193
Test defined on:	5/5/2010	5	5/5/2010 10:44:24	4	0.067	0.050	11.839	6.374	13.256	1.0524	0.4224286405
Test started on:	5/5/2010 10:44:21	6	5/5/2010 10:44:25	5	0.083	0.067	11.841	6.4939	13.136	0.9325	0.375947428
Test stopped on:	5/5/2010 11:46:28	7	5/5/2010 10:44:26	6	0.100	0.083	11.841	6.5966	13.034	0.8308	0.334946978
Data gathered using Linear testing		8	5/5/2010 10:44:27	7	0.117	0.100	11.84	6.6811	12.949	0.7453	0.30047873
Time between data points:	1 Seconds.	9	5/5/2010 10:44:28	8	0.133	0.117	11.841	6.7553	12.875	0.6711	0.2706612
Number of data samples:	69	10	5/5/2010 10:44:29	9	0.150	0.133	11.84	6.8204	12.810	0.606	0.244315433
TOTAL DATA SAMPLES	69	11	5/5/2010 10:44:30	10	0.167	0.150	11.837	6.8768	12.753	0.5496	0.221877168
Channel number [1]	Level	12	5/5/2010 10:44:31	11	0.183	0.167	11.839	6.9267	12.703	0.4997	0.201468442
Measurement type:	Level	13	5/5/2010 10:44:32	12	0.200	0.183	11.837	6.9731	12.657	0.4533	0.182782782
Unit	test	14	5/5/2010 10:44:33	13	0.217	0.200	11.837	7.0111	12.619	0.4153	0.167432872
Channel number [2]	Temperature	15	5/5/2010 10:44:34	14	0.233	0.217	11.839	7.0481	12.582	0.3783	0.152516723
Measurement type:	Deg C	16	5/5/2010 10:44:35	15	0.250	0.233	11.836	7.0792	12.551	0.3472	0.139977423
Unit		17	5/5/2010 10:44:36	16	0.267	0.250	11.837	7.1094	12.521	0.317	0.127601967
Sensor Range:		18	5/5/2010 10:44:37	17	0.283	0.267	11.837	7.1355	12.495	0.2909	0.117279471
Specific gravity:		19	5/5/2010 10:44:38	18	0.300	0.283	11.837	7.1579	12.472	0.2685	0.10824967
Mode:	TOC	20	5/5/2010 10:44:39	19	0.317	0.300	11.834	7.1803	12.450	0.2461	0.098217868
User-defined reference*:	19.83 Feet H2O	21	5/5/2010 10:44:40	20	0.333	0.317	11.834	7.1981	12.432	0.2283	0.082041606
Referenced on:	test start	22	5/5/2010 10:44:41	21	0.350	0.333	11.836	7.2176	12.413	0.2089	0.064220287
Pressure head at reference:	Feet H2O	23	5/5/2010 10:44:42	22	0.367	0.350	11.834	7.2342	12.396	0.1822	0.077487502
		24	5/5/2010 10:44:43	23	0.383	0.367	11.831	7.2477	12.382	0.1787	0.072044631
		25	5/5/2010 10:44:44	24	0.400	0.383	11.833	7.2613	12.369	0.1651	0.068561846
		26	5/5/2010 10:44:45	25	0.417	0.400	11.831	7.2733	12.357	0.1531	0.061723916
		27	5/5/2010 10:44:46	26	0.433	0.417	11.83	7.2842	12.346	0.1422	0.057329463
		28	5/5/2010 10:44:47	27	0.450	0.433	11.829	7.2947	12.335	0.1317	0.053056276
		29	5/5/2010 10:44:48	28	0.467	0.450	11.829	7.3038	12.328	0.1226	0.049427512
		30	5/5/2010 10:44:49	29	0.483	0.467	11.828	7.313	12.317	0.1134	0.045716433
		31	5/5/2010 10:44:50	30	0.500	0.483	11.83	7.3204	12.310	0.106	0.042735043
		32	5/5/2010 10:44:51	31	0.517	0.500	11.83	7.3277	12.302	0.0987	0.039791969
		33	5/5/2010 10:44:52	32	0.533	0.517	11.827	7.3358	12.294	0.0906	0.036526367
		34	5/5/2010 10:44:53	33	0.550	0.533	11.828	7.3408	12.289	0.0856	0.034510563
		35	5/5/2010 10:44:54	34	0.567	0.550	11.827	7.3465	12.284	0.0799	0.032212646
		36	5/5/2010 10:44:55	35	0.583	0.567	11.827	7.3529	12.277	0.0735	0.029832317
		37	5/5/2010 10:44:56	36	0.600	0.583	11.825	7.3567	12.273	0.0697	0.028100306
		38	5/5/2010 10:44:57	37	0.617	0.600	11.826	7.3618	12.268	0.0646	0.026044186
		39	5/5/2010 10:44:58	38	0.633	0.617	11.825	7.3666	12.263	0.0598	0.024106016
		40	5/5/2010 10:44:59	39	0.650	0.633	11.823	7.3705	12.260	0.0559	0.022363668
		41	5/5/2010 10:45:00	40	0.667	0.650	11.824	7.3748	12.255	0.0516	0.020803096
		42	5/5/2010 10:45:01	41	0.683	0.667	11.823	7.3783	12.252	0.0481	0.019382034
		43	5/5/2010 10:45:02	42	0.700	0.683	11.823	7.3814	12.249	0.045	0.018142236
		44	5/5/2010 10:45:03	43	0.717	0.700	11.821	7.3848	12.245	0.0416	0.016771468
		45	5/5/2010 10:45:04	44	0.733	0.717	11.82	7.3878	12.242	0.0386	0.015682006
		46	5/5/2010 10:45:05	45	0.750	0.733	11.82	7.3908	12.239	0.0356	0.014382824
		47	5/5/2010 10:45:06	46	0.767	0.750	11.819	7.3935	12.237	0.0329	0.01326399
		48	5/5/2010 10:45:07	47	0.783	0.767	11.818	7.3943	12.236	0.0321	0.012941461
		49	5/5/2010 10:45:08	48	0.800	0.783	11.817	7.3971	12.233	0.0293	0.011812611
		50	5/5/2010 10:45:09	49	0.817	0.800	11.816	7.3997	12.230	0.0287	0.010764363
		51	5/5/2010 10:45:10	50	0.833	0.817	11.819	7.4032	12.227	0.0232	0.00935533
		52	5/5/2010 10:45:11	51	0.850	0.833	11.815	7.4038	12.228	0.0228	0.009111434
		53	5/5/2010 10:45:12	52	0.867	0.850	11.817	7.4051	12.225	0.0213	0.008587328
		54	5/5/2010 10:45:13	53	0.883	0.867	11.816	7.4083	12.222	0.0181	0.00729721
		55	5/5/2010 10:45:14	54	0.900	0.883	11.815	7.4096	12.221	0.0178	0.007176282
		56	5/5/2010 10:45:15	55	0.917	0.900	11.813	7.411	12.219	0.0154	0.006209678
		57	5/5/2010 10:45:16	56	0.933	0.917	11.815	7.4116	12.218	0.0148	0.00609679
		58	5/5/2010 10:45:17	57	0.950	0.933	11.814	7.4149	12.215	0.0115	0.004636349
		59	5/5/2010 10:45:18	58	0.967	0.950	11.813	7.4155	12.215	0.0109	0.004384463
		60	5/5/2010 10:45:19	59	0.983	0.967	11.811	7.4182	12.214	0.0102	0.00411224
		61	5/5/2010 10:45:20	60	1.000	0.983	11.811	7.4176	12.212	0.0088	0.003647816
		62	5/5/2010 10:45:21	61	1.017	1.000	11.81	7.4187	12.211	0.0077	0.003104338
		63	5/5/2010 10:45:22	62	1.033	1.017	11.81	7.4192	12.211	0.0072	0.002802758
		64	5/5/2010 10:45:23	63	1.050	1.033	11.808	7.4215	12.208	0.0049	0.001975486
		65	5/5/2010 10:45:24	64	1.067	1.050	11.809	7.4218	12.208	0.0046	0.00185454
		66	5/5/2010 10:45:25	65	1.083	1.067	11.811	7.4231	12.207	0.0033	0.001330431
		67	5/5/2010 10:45:26	66	1.100	1.083	11.81	7.4244	12.206	0.002	0.000806322
		68	5/5/2010 10:45:27	67	1.117	1.100	11.809	7.424	12.206	0.0024	0.000867666
		69	5/5/2010 10:45:28	68	1.133	1.117	11.807	7.4257	12.204	0.0007	0.000282213

TEST START  
SLUG REMOVED

\*Well depth to top of first casing terminating above ground. Does not include above ground extensions.



Solinst 3001

Report generated: 5/11/2010  
 Report from file: ...MWW-1.lew

Serial number: 1032308

Unit name: Solinst 3001

Test name: AP-4

Test defined on: 5/5/2010  
 Test started on: 5/5/2010 11:25:32  
 Test stopped on: 5/5/2010 11:25:51

Data gathered using Linear testing

Time between data points: 0.5 Seconds.  
 Number of data samples: 41

TOTAL DATA SAMPLES 41

Channel number [1]  
 Measurement type: Level  
 Unit: feet

Channel number [2]  
 Measurement type: Temperature  
 Unit: Deg C

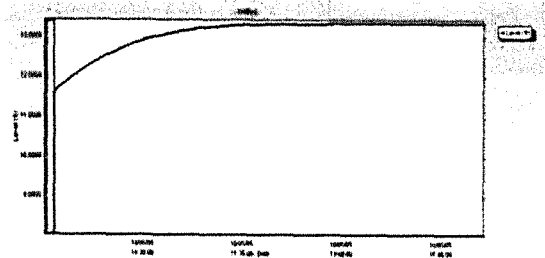
Sensor Range:  
 Specific gravity:  
 Mode: TOC  
 User-defined reference\*: 58.93 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: Feet H2O

Date	Time	ET (sec)	Time (min)	Test Time (min)	Temperature	Level	Water Level Bottom of well to TOC* (ft)	Change of Static Water Level (ft)
1	5/5/2010	11:25:31	0	0.000	12.789	13.4081	45.522	0
2	5/5/2010	11:25:31	0	0.000	12.789	11.9721	46.958	1.436
3	5/5/2010	11:25:32	0.5	0.008	12.794	8.02638	50.904	5.38172
4	5/5/2010	11:25:32	1	0.017	12.785	11.2523	47.678	2.1558
5	5/5/2010	11:25:33	1.5	0.025	12.79	11.5307	47.399	1.8774
6	5/5/2010	11:25:33	2	0.033	12.781	11.5481	47.382	1.86
7	5/5/2010	11:25:34	2.5	0.042	12.785	11.5979	47.332	1.8102
8	5/5/2010	11:25:34	3	0.050	12.778	11.5927	47.337	1.8154
9	5/5/2010	11:25:35	3.5	0.058	12.77	11.6036	47.328	1.8045
10	5/5/2010	11:25:35	4	0.067	12.771	11.6202	47.310	1.7879
11	5/5/2010	11:25:36	4.5	0.075	12.775	11.6344	47.296	1.7737
12	5/5/2010	11:25:36	5	0.083	12.766	11.6361	47.294	1.772
13	5/5/2010	11:25:37	5.5	0.092	12.771	11.6445	47.286	1.7636
14	5/5/2010	11:25:37	6	0.100	12.763	11.6514	47.279	1.7567
15	5/5/2010	11:25:38	6.5	0.108	12.767	11.6587	47.271	1.7494
16	5/5/2010	11:25:38	7	0.117	12.758	11.6626	47.267	1.7455
17	5/5/2010	11:25:39	7.5	0.125	12.762	11.669	47.261	1.7391
18	5/5/2010	11:25:39	8	0.133	12.752	11.6739	47.256	1.7342
19	5/5/2010	11:25:40	8.5	0.142	12.758	11.6794	47.251	1.7287
20	5/5/2010	11:25:40	9	0.150	12.749	11.6836	47.246	1.7245
21	5/5/2010	11:25:41	9.5	0.158	12.753	11.6884	47.242	1.7197
22	5/5/2010	11:25:41	10	0.167	12.743	11.6921	47.238	1.718
23	5/5/2010	11:25:42	10.5	0.175	12.748	11.6969	47.233	1.7112
24	5/5/2010	11:25:42	11	0.183	12.739	11.7013	47.229	1.7068
25	5/5/2010	11:25:43	11.5	0.192	12.745	11.7049	47.225	1.7032
26	5/5/2010	11:25:43	12	0.200	12.735	11.7092	47.221	1.6989
27	5/5/2010	11:25:44	12.5	0.208	12.74	11.7131	47.217	1.695
28	5/5/2010	11:25:44	13	0.217	12.731	11.7157	47.214	1.6924
29	5/5/2010	11:25:45	13.5	0.225	12.735	11.7212	47.209	1.6869
30	5/5/2010	11:25:45	14	0.233	12.726	11.7248	47.205	1.6833
31	5/5/2010	11:25:46	14.5	0.242	12.731	11.7288	47.201	1.6793
32	5/5/2010	11:25:46	15	0.250	12.722	11.7311	47.199	1.677
33	5/5/2010	11:25:47	15.5	0.258	12.727	11.7354	47.195	1.6727
34	5/5/2010	11:25:47	16	0.267	12.719	11.7394	47.191	1.6687
35	5/5/2010	11:25:48	16.5	0.275	12.723	11.743	47.187	1.6651
36	5/5/2010	11:25:48	17	0.283	12.713	11.7467	47.183	1.6614
37	5/5/2010	11:25:49	17.5	0.292	12.718	11.75	47.180	1.6581
38	5/5/2010	11:25:49	18	0.300	12.709	11.7529	47.177	1.6552
39	5/5/2010	11:25:50	18.5	0.308	12.714	11.7568	47.173	1.6513
40	5/5/2010	11:25:50	19	0.317	12.705	11.7612	47.169	1.6489
41	5/5/2010	11:25:51	19.5	0.325	12.709	11.7641	47.166	1.644

h/hc
0.400878254
0.34664758
0.345614413
0.336360666
0.3373221
0.336301725
0.332217209
0.328578648
0.329252764
0.327701924
0.328419806
0.325063363
0.324338687
0.323148476
0.322268987
0.321217009
0.320436599
0.319644681
0.318857168
0.31796528
0.317147678
0.316478747
0.315679746
0.31486507
0.314471583
0.314449976
0.312781044
0.312037787
0.311610418
0.310811413
0.310068167
0.309399225
0.308711713
0.308096528
0.307559665
0.30683499
0.306017407
0.305478646

TEST START  
 SLUG REMOVED

\*Well depth to top of first casing terminating above ground. Does not include above ground extensions.



# SIEVE ANALYSIS WORKSHEET

CLIENT: CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL  
 DATE: April 26, 2010 PSI REPORT NO. 0020522-1 Page 1 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Clayey SILT, Some Fine to Coarse Sand	SAMPLED BY: PSI
	DATE SAMPLED: 4/21/2010
SAMPLE SOURCE: AP-1, 3'-7'	TESTED BY: Don Reed
	DATE TESTED: April 26, 2010
SPECIFICATIONS: ASTM C136	NOTES/OBSERVATIONS
	NP=Not Provided to PSI

SIEVE ANALYSIS DATA/RESULTS	TEST METHOD
Original "Wet" Sample Mass (OSM) + Pan:	ASTM C136
Pan Weight:	
Original "Wet" Sample Mass (OSM):	
Total "Dry" Sample Mass (TSM) + Pan:	
Pan Weight:	
Total "Dry" Sample Mass (TSM):	
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.	
Pan Weight:	
Total "Dry" Washed Sample Mass (TWM), grams	

Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)	Percent Passing (%)	Specification
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	0.0	0.0	0.0	100.0	NP
12.5 (1/2)	0.0	0.0	0.0	100.0	NP
9.5 (3/8)	0.0	0.0	0.0	100.0	NP
6.3 (1/4)	0.4	0.4	0.1	99.9	NP
4.75 (4)	1.2	1.6	0.2	99.8	NP
2.36 (8)	3.0	4.6	0.6	99.4	NP
1.18 (16)	2.1	6.7	0.9	99.1	NP
0.6 (30)	5.3	12.0	1.7	98.3	NP
0.425 (40)	0.0	12.0	1.7	98.3	NP
0.3 (50)	7.9	19.9	2.7	97.3	NP
0.15 (100)	27.4	47.3	6.5	93.5	NP
0.075 (200)	39.3	86.6	11.9	88.1	NP
Pan					

# SIEVE ANALYSIS WORKSHEET

CLIENT: CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL

DATE: April 26, 2010 PSI REPORT NO. 0020522-1 Page 2 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Clayey SILT, Some Fine to Coarse Sand	SAMPLED BY: PSI DATE SAMPLED: 4/21/2010
SAMPLE SOURCE: AP-1, 10'-15'	TESTED BY: Don Reed DATE TESTED: April 26, 2010
SPECIFICATIONS: ASTM C136	NOTES/OBSERVATIONS NP=Not Provided to PSI

## SIEVE ANALYSIS DATA/RESULTS

## TEST METHOD

Original "Wet" Sample Mass (OSM) + Pan:	1030.6	ASTM C136
Pan Weight:	93.5	
Original "Wet" Sample Mass (OSM):	937.1	
Total "Dry" Sample Mass (TSM) + Pan:	814.4	
Pan Weight:	93.5	
Total "Dry" Sample Mass (TSM):	720.9	
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.	247.0	
Pan Weight:	93.5	
Total "Dry" Washed Sample Mass (TWM), grams	153.5	

Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)	Percent Passing (%)	Specification
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	0.0	0.0	0.0	100.0	NP
12.5 (1/2)	0.0	0.0	0.0	100.0	NP
9.5 (3/8)	0.9	0.9	0.1	99.9	NP
6.3 (1/4)	0.9	1.8	0.2	99.8	NP
4.75 (4)	3.1	4.9	0.7	99.3	NP
2.36 (8)	21.1	26.0	3.6	96.4	NP
1.18 (16)	40.7	66.7	9.3	90.7	NP
0.6 (30)	31.2	97.9	13.6	86.4	NP
0.425 (40)	0.0	97.9	13.6	86.4	NP
0.3 (50)	14.4	112.3	15.6	84.4	NP
0.15 (100)	14.7	127.0	17.6	82.4	NP
0.075 (200)	25.6	152.6	21.2	78.8	NP
Pan					

# SIEVE ANALYSIS WORKSHEET

**CLIENT:** CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL  
**DATE:** April 26, 2010 **PSI REPORT NO.** 0020522-1 Page 3 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Clayey SILT, Some Fine to Coarse Sand	SAMPLED BY: PSI
	DATE SAMPLED: 4/21/2010
SAMPLE SOURCE: AP-2, 3'-7'	TESTED BY: Don Reed
	DATE TESTED: April 26, 2010
SPECIFICATIONS: ASTM C136	NOTES/OBSERVATIONS
	NP=Not Provided to PSI

SIEVE ANALYSIS DATA/RESULTS	TEST METHOD
Original "Wet" Sample Mass (OSM) + Pan:	1706.4
Pan Weight:	90.7
Original "Wet" Sample Mass (OSM):	1615.7
Total "Dry" Sample Mass (TSM) + Pan:	1381.0
Pan Weight:	90.7
Total "Dry" Sample Mass (TSM):	1290.3
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.	420.6
Pan Weight:	90.7
Total "Dry" Washed Sample Mass (TWM), grams	329.9

Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)	Percent Passing (%)	Specification
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	0.0	0.0	0.0	100.0	NP
12.5 (1/2)	0.0	0.0	0.0	100.0	NP
9.5 (3/8)	3.5	3.5	0.3	99.7	NP
6.3 (1/4)	2.3	5.8	0.4	99.6	NP
4.75 (4)	2.7	8.5	0.7	99.3	NP
2.36 (8)	6.6	15.1	1.2	98.8	NP
1.18 (16)	7.0	22.1	1.7	98.3	NP
0.6 (30)	8.0	30.1	2.3	97.7	NP
0.425 (40)	0.0	30.1	2.3	97.7	NP
0.3 (50)	18.1	48.2	3.7	96.3	NP
0.15 (100)	119.7	167.9	13.0	87.0	NP
0.075 (200)	156.2	324.1	25.1	74.9	NP
Pan					

# SIEVE ANALYSIS WORKSHEET

CLIENT: CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL

DATE: April 26, 2010 PSI REPORT NO. 0020522-1 Page 4 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Clayey SILT, Some Fine to Coarse Sand	SAMPLED BY: PSI
	DATE SAMPLED: 4/21/2010
SAMPLE SOURCE: AP-2, 9'-16'	TESTED BY: Don Reed
	DATE TESTED: April 26, 2010
SPECIFICATIONS: ASTM C136	NOTES/OBSERVATIONS
	NP=Not Provided to PSI

SIEVE ANALYSIS DATA/RESULTS	TEST METHOD
Original "Wet" Sample Mass (OSM) + Pan:	1461.6
Pan Weight:	173.0
Original "Wet" Sample Mass (OSM):	1288.6
Total "Dry" Sample Mass (TSM) + Pan:	1178.1
Pan Weight:	173.0
Total "Dry" Sample Mass (TSM):	1005.1
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.	319.2
Pan Weight:	173.0
Total "Dry" Washed Sample Mass (TWM), grams	146.2

Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)	Percent Passing (%)	Specification
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	0.0	0.0	0.0	100.0	NP
12.5 (1/2)	0.0	0.0	0.0	100.0	NP
9.5 (3/8)	0.0	0.0	0.0	100.0	NP
6.3 (1/4)	0.8	0.8	0.1	99.9	NP
4.75 (4)	1.2	2.0	0.2	99.8	NP
2.36 (8)	1.5	3.5	0.3	99.7	NP
1.18 (16)	2.8	6.3	0.6	99.4	NP
0.6 (30)	5.7	12.0	1.2	98.8	NP
0.425 (40)	0.0	12.0	1.2	98.8	NP
0.3 (50)	7.2	19.2	1.9	98.1	NP
0.15 (100)	42.1	61.3	6.1	93.9	NP
0.075 (200)	82.8	144.1	14.3	85.7	NP
Pan					

# SIEVE ANALYSIS WORKSHEET

CLIENT: CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL

DATE: April 26, 2010 PSI REPORT NO. 0020522-1 Page 5 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Clayey SILT, Some Fine to Coarse Sand, Trace Subround Gravel	SAMPLED BY: PSI
	DATE SAMPLED: 4/21/2010
SAMPLE SOURCE: AP-3, 3'-6'	TESTED BY: Don Reed
	DATE TESTED: April 26, 2010
SPECIFICATIONS: ASTM C136	NOTES/OBSERVATIONS NP=Not Provided to PSI

SIEVE ANALYSIS DATA/RESULTS	TEST METHOD
Original "Wet" Sample Mass (OSM) + Pan:	816.4
Pan Weight:	94.6
Original "Wet" Sample Mass (OSM):	721.8
Total "Dry" Sample Mass (TSM) + Pan:	663.7
Pan Weight:	94.6
Total "Dry" Sample Mass (TSM):	569.1
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.	195.2
Pan Weight:	94.6
Total "Dry" Washed Sample Mass (TWM), grams	100.6
ASTM C136	

Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)	Percent Passing (%)	Specification
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	0.0	0.0	0.0	100.0	NP
12.5 (1/2)	0.0	0.0	0.0	100.0	NP
9.5 (3/8)	2.5	2.5	0.4	99.6	NP
6.3 (1/4)	0.4	2.9	0.5	99.5	NP
4.75 (4)	0.4	3.3	0.6	99.4	NP
2.36 (8)	1.3	4.6	0.8	99.2	NP
1.18 (16)	3.6	8.2	1.4	98.6	NP
0.6 (30)	7.6	15.8	2.8	97.2	NP
0.425 (40)	0.0	15.8	2.8	97.2	NP
0.3 (50)	10.2	26.0	4.6	95.4	NP
0.15 (100)	31.7	57.7	10.1	89.9	NP
0.075 (200)	41.5	99.2	17.4	82.6	NP
Pan					

# SIEVE ANALYSIS WORKSHEET

CLIENT: CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL

DATE: April 26, 2010 PSI REPORT NO. 0020522-1 Page 6 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Clayey SILT, Some Fine to Coarse Sand	SAMPLED BY: PSI DATE SAMPLED: 4/21/2010
SAMPLE SOURCE: AP-3, 10'-15'	TESTED BY: Don Reed DATE TESTED: April 26, 2010
SPECIFICATIONS: ASTM C136	NOTES/OBSERVATIONS NP=Not Provided to PSI

## SIEVE ANALYSIS DATA/RESULTS

## TEST METHOD

Original "Wet" Sample Mass (OSM) + Pan:	1010.5	ASTM C136
Pan Weight:	104.2	
Original "Wet" Sample Mass (OSM):	906.3	
Total "Dry" Sample Mass (TSM) + Pan:	812.2	
Pan Weight:	104.2	
Total "Dry" Sample Mass (TSM):	708.0	
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.	250.7	
Pan Weight:	104.2	
Total "Dry" Washed Sample Mass (TWM), grams	146.5	

Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)	Percent Passing (%)	Specification
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	0.0	0.0	0.0	100.0	NP
12.5 (1/2)	0.0	0.0	0.0	100.0	NP
9.5 (3/8)	0.0	0.0	0.0	100.0	NP
6.3 (1/4)	1.8	1.8	0.3	99.7	NP
4.75 (4)	0.4	2.2	0.3	99.7	NP
2.36 (8)	3.4	5.6	0.8	99.2	NP
1.18 (16)	5.5	11.1	1.6	98.4	NP
0.6 (30)	7.4	18.5	2.6	97.4	NP
0.425 (40)	0.0	18.5	2.6	97.4	NP
0.3 (50)	16.6	35.1	5.0	95.0	NP
0.15 (100)	52.0	87.1	12.3	87.7	NP
0.075 (200)	56.8	143.9	20.3	79.7	NP
Pan					

# SIEVE ANALYSIS WORKSHEET

CLIENT: CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL  
 DATE: April 26, 2010 PSI REPORT NO. 0020522-1 Page 7 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Composite of FLY ASH and Silty CLAY, With Fine to Coarse Sand, Trace Subround gravel  SAMPLE SOURCE: AP-4, 18'-23'  SPECIFICATIONS: ASTM C136	SAMPLED BY: PSI DATE SAMPLED: 4/20/2010 TESTED BY: Don Reed DATE TESTED: April 26, 2010 NOTES/OBSERVATIONS NP=Not Provided to PSI
--	--

SIEVE ANALYSIS DATA/RESULTS				TEST METHOD	
Original "Wet" Sample Mass (OSM) + Pan:		1931.9		ASTM C136	
Pan Weight:		147.6			
Original "Wet" Sample Mass (OSM):		1784.3			
Total "Dry" Sample Mass (TSM) + Pan:		1596.1			
Pan Weight:		147.6			
Total "Dry" Sample Mass (TSM):		1448.5			
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.		752.6			
Pan Weight:		147.6			
Total "Dry" Washed Sample Mass (TWM), grams		605.0			
Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)		
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	8.2	8.2	5.6	94.4	NP
12.5 (1/2)	0.0	8.2	0.6	99.4	NP
9.5 (3/8)	2.5	10.7	0.7	99.3	NP
6.3 (1/4)	12.3	23.0	1.6	98.4	NP
4.75 (4)	10.8	33.8	2.3	97.7	NP
2.36 (8)	52.2	86.0	5.9	94.1	NP
1.18 (16)	144.3	230.3	15.9	84.1	NP
0.6 (30)	132.2	362.5	25.0	75.0	NP
0.425 (40)	0.0	362.5	25.0	75.0	NP
0.3 (50)	110.4	472.9	32.6	67.4	NP
0.15 (100)	75.1	548.0	37.8	62.2	NP
0.075 (200)	53.5	601.5	41.5	58.5	NP
Pan					

# SIEVE ANALYSIS WORKSHEET

CLIENT: CWLP PROJECT: Piezometer Installation  
 Environmental Health & Safety CWLP Ash Ponds  
 Springfield, IL

DATE: April 26, 2010 PSI REPORT NO. 0020522-1 Page 8 of 8

## GENERAL SAMPLE INFORMATION

SAMPLE TYPE: Clayey SILT With Fine to Coarse Sand, Trace Subround Gravel	SAMPLED BY: PSI
	DATE SAMPLED: 4/20/2010
SAMPLE SOURCE: AP-4, 45'-55'	TESTED BY: Don Reed
	DATE TESTED: April 26, 2010
SPECIFICATIONS: ASTM C136	NOTES/OBSERVATIONS NP=Not Provided to PSI

SIEVE ANALYSIS DATA/RESULTS	TEST METHOD
Original "Wet" Sample Mass (OSM) + Pan:	1855.4
Pan Weight:	99.7
Original "Wet" Sample Mass (OSM):	1755.7
Total "Dry" Sample Mass (TSM) + Pan:	1509.0
Pan Weight:	99.7
Total "Dry" Sample Mass (TSM):	1409.3
Total "Dry" Washed Sample Mass (TWM) + Pan Wt.	584.6
Pan Weight:	99.7
Total "Dry" Washed Sample Mass (TWM), grams	484.9

Sieve Size metric (English)	Individual Weight (g)	Cumulative Weight (g)	Percent Retained (%)	Percent Passing (%)	Specification
37.5 (1 1/2)	0.0	0.0	0.0	100.0	NP
25 (1)	0.0	0.0	0.0	100.0	NP
19 (3/4)	0.0	0.0	0.0	100.0	NP
16 (5/8)	0.0	0.0	0.0	100.0	NP
12.5 (1/2)	0.0	0.0	0.0	100.0	NP
9.5 (3/8)	2.7	2.7	0.2	99.8	NP
6.3 (1/4)	6.7	9.4	0.7	99.3	NP
4.75 (4)	11.0	20.4	1.4	98.6	NP
2.36 (8)	31.4	51.8	3.7	96.3	NP
1.18 (16)	35.3	87.1	6.2	93.8	NP
0.6 (30)	55.9	143.0	10.1	89.9	NP
0.425 (40)	0.0	143.0	10.1	89.9	NP
0.3 (50)	162.8	305.8	21.7	78.3	NP
0.15 (100)	94.7	400.5	28.4	71.6	NP
0.075 (200)	82.5	483.0	34.3	65.7	NP
Pan					

## ATTACHMENT C

# RAPPS

# BORING LOG

ENGINEERING and APPLIED SCIENCE

821 SOUTH DURKIN - SPRINGFIELD IL 62704 - (217)787-2118

Site Name: FGDS Development Landfill

Boring No: AW-3

Drilling Firm: Reynolds Drilling Corp. Drilling Method: HSA

Surface Elev: 537.75

Logged By: KJM Checked By: KJM

Date Started: 12/30/08

Completed: 12/31/08

DEPTH	Material Description Classification System _____	Sampling			Tests			Comments	Well	DEPTH
		Tube No.	Type	% Rec.	OVM (ppm)	Qu t/ft PEN	Moist			
0	Dark brown clayey silt; Moist; Firm; Organic debris & plant roots									0
	Gray to brown mottled silty clay; Moist; Firm; Trace sand; Laminated; Fe oxidation stains	1		100						5
5		2		100						10
	Gray sandy clay; Moist; Firm; Finely laminated	3	5' CONTINUOUS SAMPLER	95				Wet seam @ 11.5'		15
10		4		95				Water on rods		20
	Dark gray sandy silt; Moist; Soft to firm; Some clay	5		80						25
15		6		30				No recovery 26.5'-30'		30
20										25
25										30
30									30	

Water Level \_\_\_\_\_ after \_\_\_\_\_ hrs.

Sheet 1 of 2

# RAPPS

## BORING LOG

ENGINEERING and APPLIED SCIENCE

821 SOUTH DURKIN - SPRINGFIELD IL 62704 - (217)787-2118

Site Name: FGDS Development Landfill

Boring No: AW-3

Drilling Firm: Reynolds Drilling Corp. Drilling Method: HSA

Surface Elev: 537.75

Logged By: KJM Checked By: KJM

Date Started: 12/30/08

Completed: 12/31/08

DEPTH	Material Description Classification System _____	Sampling			Tests			Comments	W e i g h t	DEPTH
		Tube No.	Type	% Rec.	QVM (ppm)	Qu t/st PEN	Moist			
30	Dark gray silt; Trace sand	7		100					30	
35	Sandy								35	
	Gray fine to medium silty sand; Wet; Gravelly @ base	8		100						
40	Gray shale						Broken shale in bit No recovery past 40'		40	
	End of Boring @ 41.83'	9		0			Refusal			
45									45	
50									50	
55									55	
60									60	

Water Level \_\_\_\_\_ after \_\_\_\_\_ hrs.

Sheet 2 of 2



Site Number: 1678250020

County: Sangamon

Site Name: FGDS Development Landfill

Well #: AW-3

State

Plane Coordinate: X Y (or) Latitude: Longitude:

Borehole #: AW-3

Surveyed by: David Mihelsic

IL Registration #: 3762

Drilling Contractor: Reynolds Drilling Corp.

Driller: Andrew Rachford

Consulting Firm: Rapps Engineering & Applied Science

Geologist: Ken Miller

Drilling Method: HSA

Drilling Fluid (Type): NA

Logged By: Ken Miller

Date Started: 12/30/08 Date Finished: 12/31/08

Report Form

Date: 5/18/09

Completed By: Ken Miller

ANNULAR SPACE DETAILS

Elevations (MSL)\* Depths (BGS) (.01ft.)

Type of Surface Seal: Cement

Type of Annular Sealant: Bentonite Chips

Installation Method: Poured

Setting Time: >24 hrs

Type of Bentonite Seal - Granular Pellet Slurry (Choose One)

Installation Method: Poured

Setting Time: 16 hrs

Type of Sand Pack: Quartz Sand

Grain Size: 50 (Sieve Size)

Installation Method: Poured

Type of Backfill Material: (if applicable)

Installation Method:

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Table with 2 columns: Material Type and Material Options (SS304, SS316, PTFE, PVC, or Other)

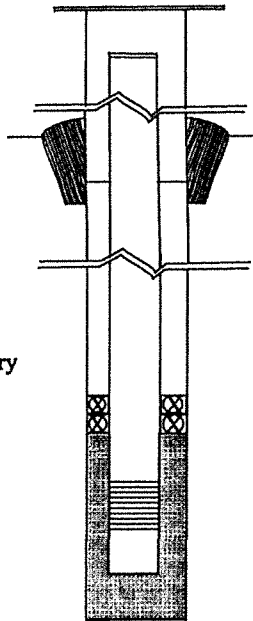


Table with 3 columns: Elevation (MSL), Depth (BGS), and Description of well components and levels.

\* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Table with 2 columns: Measurement and Value (e.g., Diameter of Borehole, ID of Riser Pipe)

\*\*Hand-Slotted Well Screens are Unacceptable

# Well Construction Report

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS  
 OF WELL COMPLETION AND SENT TO  
 THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
 DIVISION OF ENVIRONMENTAL HEALTH  
 525 WEST JEFFERSON STREET  
 SPRINGFIELD, ILLINOIS 62761

GEOLOGICAL AND WATER SURVEYS WELL RECORD

1. Type of Well - Groundwater Monitor Well
  - a. Bored  Hole Diam. 8 in. Depth 59.9 ft  
 Buried Slab: Yes  No
  - b. Driven  Drive Pipe Diam.  in. Depth  ft
  - c. Drilled  Finished in Drift  In Rock
  - d. Grout:
 

(KIND)	FROM (Ft.)	TO (Ft.)
Cement/		
Bentonite	3.0	37.0
2. Well furnishes water for human consumption? Yes  No
3. Date well drilled 07/12/93
4. Permanent pump installed? Yes  Date  No   
 Manufacturer  Type   
 Location   
 Capacity  gpm. Depth of setting  ft.
5. Well top sealed? Yes  No  Type Concrete
6. Pitless adapter installed? Yes  No N/A  
 Manufacturer  Model No.   
 How attached to casing?
7. Well disinfected? Yes  No N/A
8. Pump and equipment disinfected Yes  No N/A

9. Driller AE Exploration Corporation License No. N/A
10. Well Site Address City Water, Light & Power/FGDS Landfill
11. Property Owner CWL&P/Springfield Well No. G-110
12. Permit No. N/A Date Issued
13. Location: Site Coordinates: County Sangamon  
 N 3728.6  
 E 2315.7  
 Sec. 12  
 Twp. 15N  
 Rge. 5W


14. Water from  at depth  ft  
 to  ft

15. Casing and Liner Pipe		to <input type="checkbox"/> ft	
Diam.(in)	Kind and Weight	From (ft)	To (ft)
2	Stainless Steel 304	+2	44.5

Show location  
in section  
plat

16. Screen: Diam. 2 in, Length 120 in, Slot Size 01"
17. Size hole below casing N/A in. 18. Ground Elev. 554.5 ft msl.
19. Static level  ft below casing top which is  ft. above  
 ground level. Pumping level  ft, pumping gpm for  hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
Gray Silty Clay	0	38.8
Gray Silty Sand	38.8	45.5
Gray Clayey Sand	45.5	54.5
Gray Shale (massive)	54.5	59.5

Continue on separate sheet if necessary.

**IMPORTANT NOTICE**

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

PRESS FIRMLY WITH BLACK PEN OR TYPE  
 Do Not Use Felt Pen

Signed Brad J. Hunsberger Date 09/03/93  
 For: Andrews Environmental Engineering, Inc.  
 Response to 1st RTP



<b>Site Information:</b> Name: City Water, Light, and Power Location: Springfield, IL County: Sangamon Site No.: 1678250020 AEEI No.: 93-118		<b>Location:</b> Coord. System: Site Coordinates Northing: 3728.6 Easting: 2315.7	<b>Boring Information:</b> Boring No.: G110 Well No.: G110 Surf. Elev.: 554.5 Depth Information: Total: 59.5 Auger: 59.5 Rotary: N/A
<b>Drilling Contractor:</b> Name: AE Exploration Corp. City: Springfield, IL Equipment: CME 55		<b>Personel:</b> Geologist: B. Hunsberger Driller: M. Moore Helper (s): R. Smith	<b>Dates:</b> Start: 7/12/93 Finish: 7/12/93

Sample Type:  - Continuous Barrel  - Split Spoon  - Shelby Tube  - Core  - Blind Drill

Depth (ft.)	Sample		Blow Count	$q_u / [q_s]$ (in tsf)	% Moisture	Borehole Detail	Lithology	Description/Comments	USC	Elev. (MSL)
	Run No.	Type								
1		1A					Gravel backfill-access road.		554.5	
			3.2'	3.5			Dark gray silty CLAY, little sand and gravel, with rootlets.			
5		2A		2.75			Dark gray-black clayey SILT, some fine sand, rootlets.		549.5	
2		2B		2.8	2.5		Dark gray-black silty CLAY, soft, with rootlets, some fine sand.			
10		2C	5.0'	0.8					544.5	
		3	1.4'	0.7						
4		4A		0.5						
		5A	2.8'	0.65	3.25		Dark gray, very moist silty CLAY-clayey SILT, numerous plant and wood fragments (appears to be original grade).		539.5	
15				2.75						
		5B	4.8'	2.0	2.8					
				1.8	2.2					
20				1.8					534.5	

NOTE:  $\dot{y}$  = groundwater encountered while drilling.



<b>Site Information:</b> Name: City Water, Light, and Power Location: Springfield, IL County: Sangamon Site No.: 1678250020 AEEI No.: 93-118	<b>Location:</b> Coord. System: Site Coordinates Northing: 3728.6 Easting: 2315.7	<b>Boring Information:</b> Boring No.: G110 Well No.: G110 Surf. Elev.: 554.5 Depth Information: Total: 59.5 Auger: 59.5 Rotary: N/A Dates: Start: 7/12/93 Finish: 7/12/93
	<b>Drilling Contractor:</b> Name: AE Exploration Corp. City: Springfield, IL Equipment: CME 55	

Sample Type:  - Continuous Barrel     - Split Spoon     - Shelby Tube     - Core     - Blind Drill

Depth (ft.)	Run No.	Sample		Blow Count	Qu / [qs] (in tsf)	% Moisture	Borehole Detail	Lithology	Description/Comments	USC	Elev. (MSL)	
		Type	No.									Recov.
6			8A		1.7		Cement/Bentonite Grout  Bentonite Seal		Dark gray silty CLAY, moist, trace fine sand, little organics.	554.5		
7			8B	5.0'	1.8	Gray mottled light gray-brown silty CLAY, little fine sand, some plant roots.						528.5
			8A	2.0'	0.7							
			8B	3.0'	2.0 1.2 1.3	Gray mottled brown silty CLAY, trace fine sand, little organics.						524.5
			9A	2.2 2.2								
			9B	5.0'	2.2 2.75 1.75							
			10A	0.75 0.3								
			10	5.0'	0.2 0.2 *	Gray CLAY, very soft, some organic clay strata present. (* The clay was too soft for the pocket penetrometer).						514.5
			11A	*								

NOTE:  $\ddot{y}$  = groundwater encountered while drilling.



# Andrews Environmental Engineering, Inc.

3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

# Field Boring Log

### Site Information:

Name: City Water, Light, and Power  
Location: Springfield, IL  
County: Sangamon  
Site No.: 1678250020  
AEEI No.: 93-118

### Location:

Coord. System: Site Coordinates  
Northing: 3728.6  
Easting: 2315.7

### Boring Information:

Boring No.: G110  
Well No.: G110  
Surf. Elev.: 554.5  
Depth Information:  
Total: 59.5  
Auger: 59.5  
Rotary: N/A  
Dates:  
Start: 7/12/93  
Finish: 7/12/93

### Drilling Contractor:

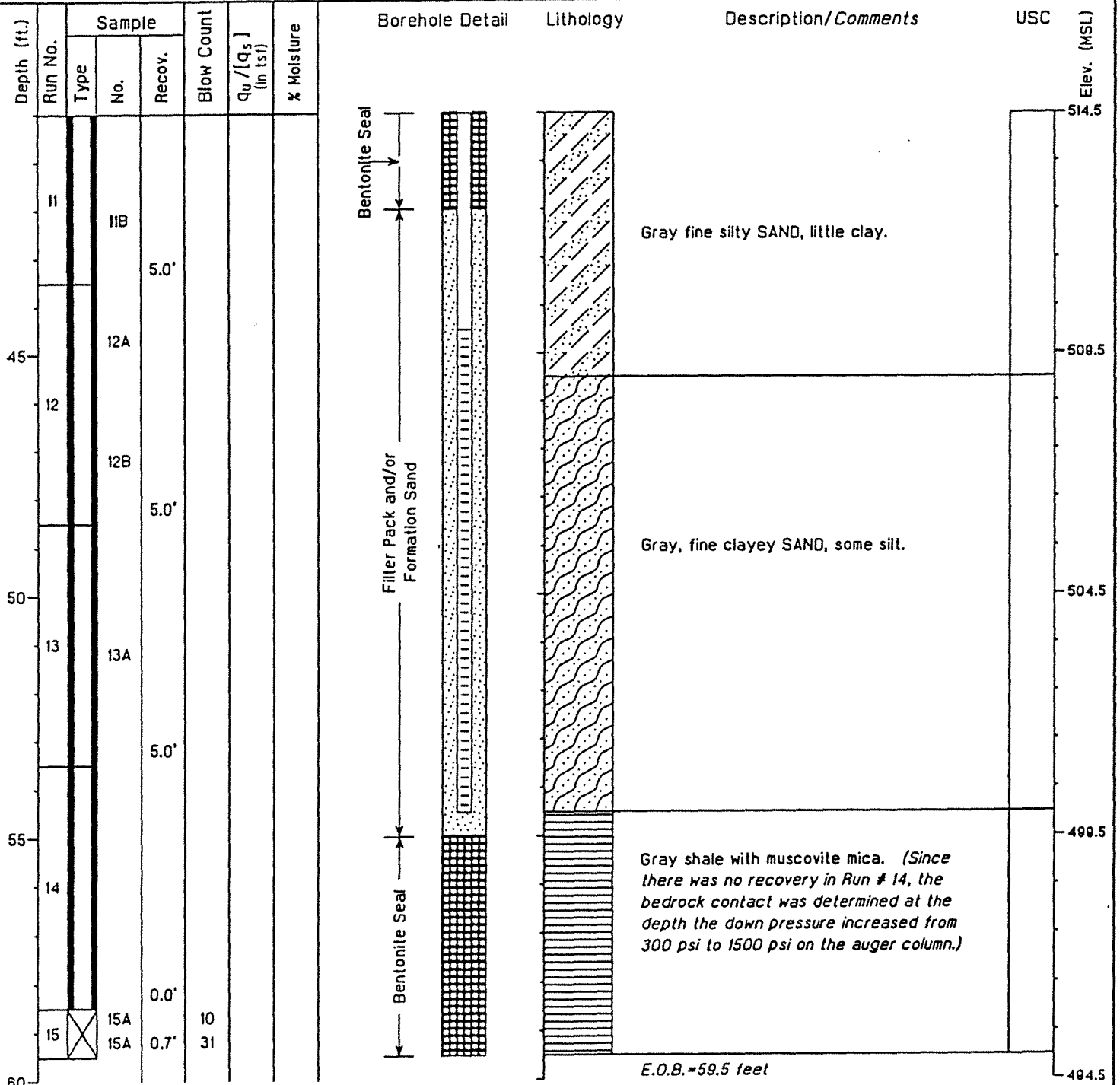
Name: AE Exploration Corp.  
City: Springfield, IL  
Equipment: CME 55

### Personnel:

Geologist: B. Hunsberger  
Driller: M. Moore  
Helper (s): R. Smith

### Sample Type:

- Continuous Barrel     - Split Spoon     - Shelby Tube     - Core     - Blind Drill



NOTE: = groundwater encountered while drilling.



Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County Sangamon Well # G-110  
 Site Name: EGDS Landfill/ City Water, Light and Power Grid Coordinate: Northing 3728.6 Easting 2315.7  
 Drilling Contractor: AE Exploration Corporation Date Drilled Start: 07/12/93  
 Driller: M. Moore Geologist: B. Hunsberger Date Completed: 07/12/93  
 Drilling Method: Hollow Stem Auger Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete  
 Type of Annular Sealant: Cement/Bentonite  
 Amount of cement: # of bags 8 lbs. per bag 94  
 Amount of bentonite: # of bags 1 lbs. per bag 50  
 Type of Bentonite Seal (Granular, Pellet): Grout

Amount of bentonite: # of Bags 1 lbs. per bag 50  
 Type of Sand Pack: #10-20 Silica Sand  
 Source of Sand: Best Environmental - Chardon, OH  
 Amount of Sand: # of bags 10 lbs. per bag 50

Well Construction Materials

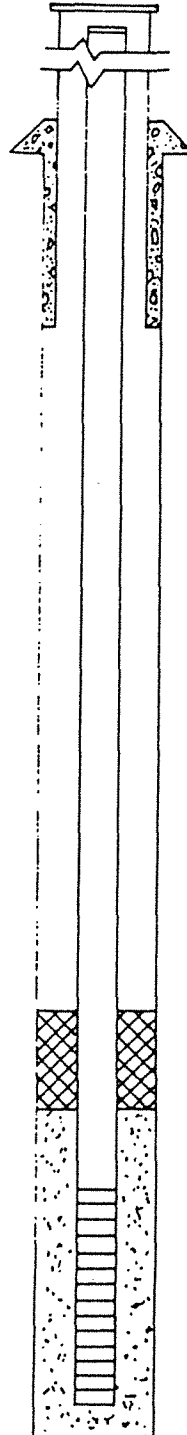
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	Flush			
Riser pipe above w.t.	304			
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	Flush			
Protective casing				Steel

Measurements to .01 ft. (where applicable)

Riser pipe length	47.11'
Protective casing length	5.0'
Screen length	10.0'
Bottom of screen to end cap	0.21
Top of screen to first joint	0.065
Total length of casing	57.11'
Screen slot size	.01"
of openings in screen	---
Diameter of borehole (in')	8.0"
D of riser pipe (in')	2.0"

Elevations - .01 ft.

557 20 MSL Top of Protective Casing  
557 11 MSL Top of Riser Pipe  
2 61 ft. Casing Stickup  
554 50 MSL Ground Surface  
3 0 ft. Top of annular sealant



37 0 ft. Top of Seal  
5 0 ft. Total Seal Interval  
42 0 ft. Top of Sand  
44 5 ft. Top of Screen  
10 0 ft. Total Screen Interval  
54 5 ft. Bottom of Screen  
59 5 ft. Bottom of Borehole

Completed by Brad Hunsberger Surveyed by: City Water, Light and Power Registration # 2098  
Rich Davis

# Professional Service Industries, Inc.

## RECORD OF SUBSURFACE EXPLORATION

Boring G-105

Project Name: Monitoring Well Installations Date of Boring: January 9, 1990

Site: CWLP Ash Disposal Facility Project No.: 020-05001

DESCRIPTION	DEPTH	SAMPLE	N	Q <sub>u</sub>	Q <sub>p</sub>	M <sub>c</sub>	REMARKS
SURFACE							
Silty clay to clayey silt, trace organics, brown (fill)	5	1-SS	20%				
	10	2-SS	35%				
Silty clay, drak grey to black, some organics	15	3-SS	25%				
	20	4-SS	100%				
Silty clay to clay, grey, mottled brown, trace sand	25	5-SS	40%				
	30	6-SS	35%				
Silty clay with sand, fine to medium, brown	35	7-SS	40%				
	40	8-SS	100%				
Silty clay, trace sand, dark grey, fine	45	9-SS	100%				

While  
 Drilling

# Professional Service Industries, Inc.

## RECORD OF SUBSURFACE EXPLORATION

Boring G-105 (Continued)

Project Name: Monitoring Well Installations Date of Boring: January 9, 1990

Site: CWLP Ash Disposal Facility Project No.: 020-05001

DESCRIPTION	DEPTH	SAMPLE	N	O <sub>u</sub>	O <sub>p</sub>	M <sub>c</sub>	REMARKS
Silty clay, some sand, fine, dark grey	45	10-SS	100Z				
48'-48.7': Grey sand, fine to medium.	50	11-SS	80Z				
Shale, grey, weathered							
End of Boring							



Site #: 1678250020 County Sangamon Well # G-105

Site Name: CWLP - Ash Disposal Facility Grid Coordinate, Northing 1641.61 Easting 610.10

Drilling Contractor: Professional Service Industries, Inc. Date Drilled Start: January 9, 1990

Driller: B. Williamson Geologist: -- Date Completed: January 16, 1990  
(Re-Drilled w/4 1/2" I.D.)

Drilling Method: Hollow Stem Auger - 3 1/2" I.D & 4 1/2" I.D Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement/Bentonite Grout

Amount of cement: # of bags 6 lbs. per bag 94

Amount of bentonite: # of bags 0.2 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Pellet

Amount of bentonite: # of Bags 0.5 lbs. per bag 50

Type of Sand Pack: Silica Sand (Marco-Sandblasting)

Source of Sand: Henry Nelch & Son Co., Springfield, IL

Amount of Sand: # of bags 1.8 lbs. per bag 100

Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			--	
Riser pipe above w.t.			2"	
Riser pipe below w.t.			2"	
Screen			2"	
Coupling joint screen to riser			--	
Protective casing				6"X5'

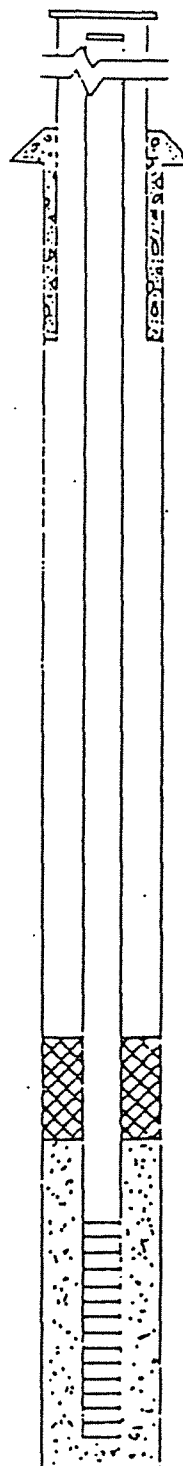
Steel

Measurements to .01 ft. (where applicable)

Riser pipe length	43.9
Protective casing length	Flush Mount
Screen length	6'
Bottom of screen to end cap	0.3'
Top of screen to first joint	0.3'
Total length of casing	49.9
Screen slot size	0.010
# of openings in screen	--
Diameter of borehole (in)	8
ID of riser pipe (in)	2

Elevations - .01 ft.

<u>553</u>	<u>49</u>	MSL Top of Protective Casing
<u>553</u>	<u>75</u>	MSL Top of Riser Pipe
	<u>+0.1</u>	ft. Casing Stuckup
<u>553</u>	<u>49</u>	MSL Ground Surface
	<u>-2.9</u>	ft. Top of annular sealant



<u>-40.5</u>	ft. Top of Seal
<u>2.0</u>	ft. Total Seal Interval
<u>-42.5</u>	ft. Top of Sand
<u>-43.8</u>	ft. Top of Screen
<u>6.0</u>	ft. Total Screen Interval
<u>-49.8</u>	ft. Bottom of Screen
<u>-53.0</u>	ft. Bottom of Borehole

Completed by: \_\_\_\_\_ Surveyed by: \_\_\_\_\_ Ill. registration # \_\_\_\_\_

## ATTACHMENT D

# ENVIRONMENTAL MONITORING AND TECHNOLOGIES, INC.



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Sue Corcoran  
City, Water, Light & Power  
201 East Lake Shore Drive  
Springfield, IL 62707

June 29, 2010

RE CWLP FGDS 2nd Quarter Groundwater

Lab Orders:  
10050637

Dear Sue Corcoran:

Enclosed are the analytical reports for the EMT Lab Order listed. Also included with this analytical report is a copy of the chain of custody associated with these samples. If you have any questions, please contact me at 847-967-6666.

Sincerely,

Joe Pavilonis  
Project Manager

Approved by,

Mitchell Ostrowski  
Laboratory Director

This Report Contains 140 pages

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

State of Illinois Chemical Analysis in Drinking Water Accredited Lab. No. 100256  
State of Wisconsin Wastewater and Hazardous Waste No. 999888890

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## Report of Laboratory Analysis

<b>CLIENT:</b> City, Water, Light & Power	<b>Client Sample ID:</b> R101
<b>Lab Order:</b> 10050637	<b>Report Date:</b> 6/29/2010
<b>Project:</b> CWLP FGDS 2nd Quarter Groundwater	<b>Collection Date:</b> 6/7/2010 7:45:00 AM
<b>Lab ID:</b> 10050637-01	<b>Matrix:</b> Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Ammonia as N</b> Method: SM4500-NH3-B-C						
Nitrogen, Ammonia (As N)	0.78	0.16	mg/L	5/27/10	58701	TTT
<b>Anions by Ion Chromatography</b> Method: SW9056						
Chloride	79.8	2.	mg/L	5/27/10	R141304	GSB
Nitrogen, Nitrate (As N)	0.2	0.2	mg/L	5/27/10	R141304	GSB
Sulfate	306.	10.	mg/L	5/27/10	R141304	GSB
<b>BOD, 5 Day, 20°C</b> Method: SM5210 B						
Biochemical Oxygen Demand	5.	2.	mg/L	5/26/10	R141432	AM2
<b>Chemical Oxygen Demand</b> Method: HACH 8000						
Chemical Oxygen Demand	< 10.	10.	mg/L	6/1/10	R141473	VT
<b>Cyanide, Dissolved</b> Method:						
Cyanide	< 0.01	0.01	mg/L	5/27/10	58666	CS2
<b>Cyanide, Total</b> Method: SW9010B/9014 BY AQUACHEM						
Cyanide	< 0.01	0.01	mg/L	5/27/10	58666	CS2
<b>Dissolved Anions by Ion Chromatography</b> Method: SW9056						
Chloride	79.5	2.	mg/L	5/26/10	R141296	GSB
Nitrogen, Nitrate (As N)	0.23	0.2	mg/L	5/26/10	R141296	GSB
Sulfate	305.	10.	mg/L	5/27/10	R141373	GSB
<b>Fluoride</b> Method: SM4500-F C						
Fluoride	< 0.5	0.5	mg/L	6/1/10	R141448	MF
<b>Hexane Extractable Materials, (FOG)</b> Method: E1664A						
Oil and Grease (HEM)	< 5.	5.	mg/L	5/27/10	R141409	TB2
<b>Organic Carbon, Total</b> Method: SM5310-C B						
Organic Carbon, Total	7.06	1.	mg/L	6/2/10	R141522	VT
<b>Phenolics, Total</b> Method: SW9065 BY AQUACHEM						
Phenolics, Total Recoverable	0.006	0.005	mg/L	5/27/10	58685	CS2
<b>Soluble Ammonia as N</b> Method: 4500-NH3-B-C						

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

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** R101  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/7/2010 7:45:00 AM  
**Lab ID:** 10050637-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Nitrogen, Ammonia (As N)	< 0.16	0.16	mg/L	5/27/10	58701	TTT
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	894.	20.	mg/L	5/26/10	R141332	IR
<b>Mercury in Groundwater, Dissolved</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58866	IG
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58863	IG
<b>Metals, Dissolved</b>		<b>Method: SW6020A / SW3005A</b>				
Arsenic	< 0.00889	0.00889	mg/L	5/26/10 16:29	58669	AG
Boron	< 0.0556	0.0556	mg/L	5/27/10	58669	AG
Cadmium	< 0.00444	0.00444	mg/L	5/26/10 16:29	58669	AG
Chromium	0.0116	0.00889	mg/L	5/26/10 16:29	58669	AG
Iron	0.406	0.0889	mg/L	5/26/10 16:29	58669	AG
Lead	< 0.00667	0.00667	mg/L	5/26/10 16:29	58669	AG
Magnesium	64.8	1.11	mg/L	5/27/10	58669	AG
Zinc	< 0.02	0.02	mg/L	5/26/10 16:29	58669	AG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Aluminum	0.664	0.05	mg/L	5/26/10 22:02	58676	AG
Antimony	< 0.006	0.006	mg/L	5/26/10 22:02	58676	AG
Arsenic	< 0.01	0.01	mg/L	5/26/10 22:02	58676	AG
Barium	0.0333	0.02	mg/L	5/26/10 22:02	58676	AG
Beryllium	< 0.003	0.003	mg/L	5/26/10 22:02	58676	AG
Boron	0.0748	0.04	mg/L	5/26/10 22:02	58676	AG
Cadmium	< 0.001	0.001	mg/L	5/26/10 22:02	58676	AG
Calcium	190.	2.5	mg/L	5/27/10	58676	AG
Chromium	< 0.07	0.07	mg/L	5/26/10 22:02	58676	AG
Cobalt	< 0.07	0.07	mg/L	5/26/10 22:02	58676	AG
Copper	< 0.06	0.06	mg/L	5/26/10 22:02	58676	AG
Iron	1.43	0.04	mg/L	5/26/10 22:02	58676	AG
Lead	< 0.005	0.005	mg/L	5/26/10 22:02	58676	AG

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** R101  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/7/2010 7:45:00 AM  
**Lab ID:** 10050637-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Magnesium	76.1	1.25	mg/L	5/27/10	58676	AG
Manganese	1.08	0.01	mg/L	5/26/10 22:02	58676	AG
Nickel	< 0.05	0.05	mg/L	5/26/10 22:02	58676	AG
Potassium	0.66	0.625	mg/L	5/26/10 22:02	58676	AG
Selenium	< 0.02	0.02	mg/L	5/26/10 22:02	58676	AG
Silver	< 0.05	0.05	mg/L	5/26/10 22:02	58676	AG
Sodium	30.6	4.5	mg/L	5/27/10	58676	AG
Thallium	< 0.002	0.002	mg/L	5/26/10 22:02	58676	AG
Vanadium	< 0.0125	0.0125	mg/L	5/26/10 22:02	58676	AG
Zinc	< 0.02	0.02	mg/L	5/26/10 22:02	58676	AG
<b>Carbamates</b>		<b>Method: E531.1</b>				
Aldicarb	< 2.	2.	C µg/L	6/7/10	R141681	LBI
Carbofuran	< 2.	2.	C µg/L	6/7/10	R141681	LBI
<b>EDB, DBCP and 123TCP by GC/ECD</b>		<b>Method: E504.1 / E504.1</b>				
1,2-Dibromo-3-chloropropane	< 0.004	0.004	C µg/L	6/2/10 13:22	58881	MNN
1,2-Dibromoethane	< 0.004	0.004	C µg/L	6/2/10 13:22	58881	MNN
<b>Endothal</b>		<b>Method: E548.1</b>				
Endothal	< 2.	2.	µg/L	6/3/10	R141835	OUT
<b>Haloacetic Acids</b>		<b>Method: E552.2 / E552.1</b>				
Dalapon	< 0.5	0.5	C µg/L	6/7/10 20:30	58894	LP
<b>Organochlorine Pesticides</b>		<b>Method: SW8081A / SW3510C</b>				
4,4'-DDT	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
Alachlor	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
Aldrin	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
Atrazine	< 0.17	0.17	µg/L	6/2/10 23:28	58653	LP
Chlordane	< 0.13	0.13	µg/L	6/2/10 23:28	58653	LP
Dieldrin	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
Endrin	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
gamma-BHC	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
Heptachlor	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
Heptachlor epoxide	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** R101  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/7/2010 7:45:00 AM  
**Lab ID:** 10050637-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Methoxychlor	< 0.01	0.01	µg/L	6/2/10 23:28	58653	LP
Simazine	< 0.17	0.17	µg/L	6/2/10 23:28	58653	LP
Toxaphene	< 0.69	0.69	µg/L	6/2/10 23:28	58653	LP

### Polychlorinated biphenyls (PCBs)

Method: SW8082 / SW3510C

Aroclor 1016	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1221	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1232	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1242	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1248	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1254	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1260	< 0.12	0.12	µg/L	5/28/10	58654	IP
PCB, Total	< 0.81	0.81	µg/L	5/28/10	58654	IP

### Semivolatile Organic Compounds GC/MS

Method: SW8270D / SW3510C

Benzo(a)pyrene	< 3.32	3.32	µg/L	6/2/10 17:55	58788	MG3
Bis(2-ethylhexyl)phthalate	< 6.64	6.64	µg/L	6/2/10 17:55	58788	MG3
Bis(chloromethyl)ether	< 13.9	13.9	C µg/L	6/2/10 17:55	58788	MG3
Butyl benzyl phthalate	< 1.33	1.33	µg/L	6/2/10 17:55	58788	MG3
Di-n-butyl phthalate	< 3.32	3.32	B µg/L	6/2/10 17:55	58788	MG3
Diethyl phthalate	< 0.13	0.13	µg/L	6/2/10 17:55	58788	MG3
Dimethyl phthalate	< 0.13	0.13	µg/L	6/2/10 17:55	58788	MG3
Isophorone	< 0.13	0.13	µg/L	6/2/10 17:55	58788	MG3
m,p-Cresol	< 1.6	1.6	µg/L	6/2/10 17:55	58788	MG3
Naphthalene	< 0.13	0.13	µg/L	6/2/10 17:55	58788	MG3
Parathion	< 3.32	3.32	C µg/L	6/2/10 17:55	58788	MG3
Phenol	< 1.12	1.12	µg/L	6/2/10 17:55	58788	MG3

### Solvent Extractable Compounds by HPLC

Method: SW8321A / SW3510C

2,4,5-TP (Silvex)	< 0.19	0.19	µg/L	6/9/10	58934	LBI
2,4-D	< 0.31	0.31	µg/L	6/9/10	58934	LBI
Dinoseb	< 0.31	0.31	µg/L	6/9/10	58934	LBI
Pentachlorophenol	< 0.26	0.26	C µg/L	6/9/10	58934	LBI
Picloram	< 0.12	0.12	C µg/L	6/9/10	58934	LBI

### Volatile Organic Compounds by GC/MS

Method: SW8260B / SW5030A

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** R101  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/7/2010 7:45:00 AM  
**Lab ID:** 10050637-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
1,1,1,2-Tetrachloroethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,1,1-Trichloroethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,1,2,2-Tetrachloroethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,1,2-Trichloroethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,1-Dichloroethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,1-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,2,3-Trichlorobenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,2,3-Trichloropropane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,2,4-Trimethylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,2-Dibromoethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,2-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,2-Dichloroethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,2-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,3,5-Trimethylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,3-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,3-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,4-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
2,2-Dichloropropane	< 0.4	0.4	C µg/L	5/26/10 20:35	58868	XN
2-Butanone	< 4.	4.	µg/L	5/26/10 20:35	58868	XN
2-Chlorotoluene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
2-Hexanone	< 4.	4.	µg/L	5/26/10 20:35	58868	XN
4-Chlorotoluene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
4-Methyl-2-pentanone	< 4.	4.	µg/L	5/26/10 20:35	58868	XN
Acetone	< 8.	8.	µg/L	5/26/10 20:35	58868	XN
Acrolein	< 4.	4.	µg/L	5/26/10 20:35	58868	XN
Acrylonitrile	< 4.	4.	µg/L	5/26/10 20:35	58868	XN
Benzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Bromobenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Bromochloromethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Bromodichloromethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Bromoform	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Bromomethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Carbon disulfide	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Carbon tetrachloride	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Chlorobenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** R101  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/7/2010 7:45:00 AM  
**Lab ID:** 10050637-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Chloroethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Chloroform	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Chloromethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
cis-1,2-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
cis-1,3-Dichloropropene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Dibromochloromethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Dibromomethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Dichlorodifluoromethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Ethylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Hexachlorobutadiene	< 0.4	0.4	C µg/L	5/26/10 20:35	58868	XN
Iodomethane	< 0.4	0.4	C µg/L	5/26/10 20:35	58868	XN
Isopropyl Toluene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Isopropylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
m,p-Xylene	< 0.8	0.8	µg/L	5/26/10 20:35	58868	XN
Methylene chloride	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
n-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
n-Propylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
o-Xylene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
sec-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Styrene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
tert-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Tetrachloroethene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Tetrahydrofuran	< 4.	4.	C µg/L	5/26/10 20:35	58868	XN
Toluene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
trans-1,2-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
trans-1,3-Dichloropropene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
trans-1,4-Dichloro-2-butene	< 2.	2.	C µg/L	6/8/10 15:03	58955	XN
Trichloroethene	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Trichlorofluoromethane	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Vinyl acetate	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
Vinyl chloride	< 0.4	0.4	µg/L	5/26/10 20:35	58868	XN
1,3-Dichloropropene, Total	< 0.8	0.8	µg/L	5/26/10 20:35	58868	XN
Xylenes, Total	< 1.2	1.2	µg/L	5/26/10 20:35	58868	XN

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** R101  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Ammonia as N</b>		<b>Method:</b>	<b>SM4500-NH3-B-C</b>			
Nitrogen, Ammonia (As N)	0.78	0.16	mg/L	5/27/10	58701	TTT
<b>Anions by Ion Chromatography</b>		<b>Method:</b>	<b>SW9056</b>			
Chloride	79.8	2.	mg/L	5/27/10	R141304	GSB
Nitrogen, Nitrate (As N)	0.2	0.2	mg/L	5/27/10	R141304	GSB
Sulfate	306.	10.	mg/L	5/27/10	R141304	GSB
<b>BOD, 5 Day, 20°C</b>		<b>Method:</b>	<b>SM5210 B</b>			
Biochemical Oxygen Demand	5.	2.	mg/L	5/26/10	R141432	AM2
<b>Chemical Oxygen Demand</b>		<b>Method:</b>	<b>HACH 8000</b>			
Chemical Oxygen Demand	< 10.	10.	mg/L	6/1/10	R141473	VT
<b>Cyanide, Dissolved</b>		<b>Method:</b>				
Cyanide	< 0.01	0.01	mg/L	5/27/10	58666	CS2
<b>Cyanide, Total</b>		<b>Method:</b>	<b>SW9010B/9014 BY AQUACHEM</b>			
Cyanide	< 0.01	0.01	mg/L	5/27/10	58666	CS2
<b>Dissolved Anions by Ion Chromatography</b>		<b>Method:</b>	<b>SW9056</b>			
Chloride	79.5	2.	mg/L	5/26/10	R141296	GSB
Nitrogen, Nitrate (As N)	0.23	0.2	mg/L	5/26/10	R141296	GSB
Sulfate	305.	10.	mg/L	5/27/10	R141373	GSB
<b>Fluoride</b>		<b>Method:</b>	<b>SM4500-F C</b>			
Fluoride	< 0.5	0.5	mg/L	6/1/10	R141448	MF
<b>Hexane Extractable Materials, (FOG)</b>		<b>Method:</b>	<b>E1664A</b>			
Oil and Grease (HEM)	< 5.	5.	mg/L	5/27/10	R141409	TB2
<b>Organic Carbon, Total</b>		<b>Method:</b>	<b>SM5310-C B</b>			
Organic Carbon, Total	7.06	1.	mg/L	6/2/10	R141522	VT
<b>Phenolics, Total</b>		<b>Method:</b>	<b>SW9065 BY AQUACHEM</b>			
Phenolics, Total Recoverable	0.006	0.005	mg/L	5/27/10	58685	CS2
<b>Soluble Ammonia as N</b>		<b>Method:</b>	<b>4500-NH3-B-C</b>			

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** R101  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-01 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Nitrogen, Ammonia (As N)	< 0.16	0.16	mg/L	5/27/10	58701	TTT
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	894.	20.	mg/L	5/26/10	R141332	IR
<b>Mercury in Groundwater, Dissolved</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58866	IG
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58863	IG
<b>Metals, Dissolved</b>		<b>Method: SW6020A / SW3005A</b>				
Arsenic	< 0.00889	0.00889	mg/L	5/26/10 16:29	58669	AG
Boron	< 0.0556	0.0556	mg/L	5/27/10	58669	AG
Cadmium	< 0.00444	0.00444	mg/L	5/26/10 16:29	58669	AG
Chromium	0.0116	0.00889	mg/L	5/26/10 16:29	58669	AG
Iron	0.406	0.0889	mg/L	5/26/10 16:29	58669	AG
Lead	< 0.00667	0.00667	mg/L	5/26/10 16:29	58669	AG
Magnesium	64.8	1.11	mg/L	5/27/10	58669	AG
Zinc	< 0.02	0.02	mg/L	5/26/10 16:29	58669	AG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Aluminum	0.664	0.05	mg/L	5/26/10 22:02	58676	AG
Antimony	< 0.006	0.006	mg/L	5/26/10 22:02	58676	AG
Arsenic	< 0.01	0.01	mg/L	5/26/10 22:02	58676	AG
Barium	0.0333	0.02	mg/L	5/26/10 22:02	58676	AG
Beryllium	< 0.003	0.003	mg/L	5/26/10 22:02	58676	AG
Boron	0.0748	0.04	mg/L	5/26/10 22:02	58676	AG
Cadmium	< 0.001	0.001	mg/L	5/26/10 22:02	58676	AG
Calcium	190.	2.5	mg/L	5/27/10	58676	AG
Chromium	< 0.07	0.07	mg/L	5/26/10 22:02	58676	AG
Cobalt	< 0.07	0.07	mg/L	5/26/10 22:02	58676	AG
Copper	< 0.06	0.06	mg/L	5/26/10 22:02	58676	AG
Iron	1.43	0.04	mg/L	5/26/10 22:02	58676	AG
Lead	< 0.005	0.005	mg/L	5/26/10 22:02	58676	AG

**Qualifiers:**

B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits

E - Estimated

R - RPD outside accepted recovery limits

H - Holding Time Exceeded

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G110  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-02 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Ammonia as N</b> <b>Method: SM4500-NH3-B-C</b>						
Nitrogen, Ammonia (As N)	4.37	0.16	mg/L	5/27/10	58701	TTT
<b>Anions by Ion Chromatography</b> <b>Method: SW9056</b>						
Chloride	5.59	2.	mg/L	5/27/10	R141304	GSB
Nitrogen, Nitrate (As N)	< 0.2	0.2	mg/L	5/27/10	R141304	GSB
Sulfate	< 5.	5.	mg/L	5/27/10	R141304	GSB
<b>BOD, 5 Day, 20°C</b> <b>Method: SM5210 B</b>						
Biochemical Oxygen Demand	5.	2.	mg/L	5/26/10	R141432	AM2
<b>Chemical Oxygen Demand</b> <b>Method: HACH 8000</b>						
Chemical Oxygen Demand	< 10.	10.	mg/L	6/1/10	R141473	VT
<b>Cyanide, Dissolved</b> <b>Method:</b>						
Cyanide	< 0.01	0.01	mg/L	5/27/10	58666	CS2
<b>Cyanide, Total</b> <b>Method: SW9010B/9014 BY AQUACHEM</b>						
Cyanide	< 0.01	0.01	mg/L	5/27/10	58666	CS2
<b>Dissolved Anions by Ion Chromatography</b> <b>Method: SW9056</b>						
Chloride	4.73	2.	mg/L	5/26/10	R141296	GSB
Nitrogen, Nitrate (As N)	< 0.2	0.2	mg/L	5/26/10	R141296	GSB
Sulfate	< 5.	5.	mg/L	5/26/10	R141296	GSB
<b>Fluoride</b> <b>Method: SM4500-F C</b>						
Fluoride	< 0.5	0.5	mg/L	6/1/10	R141448	MF
<b>Hexane Extractable Materials, (FOG)</b> <b>Method: E1664A</b>						
Oil and Grease (HEM)	< 5.	5.	mg/L	5/27/10	R141409	TB2
<b>Organic Carbon, Total</b> <b>Method: SM5310-C B</b>						
Organic Carbon, Total	9.15	1.	mg/L	6/2/10	R141522	VT
<b>Phenolics, Total</b> <b>Method: SW9065 BY AQUACHEM</b>						
Phenolics, Total Recoverable	< 0.005	0.005	mg/L	5/27/10	58685	CS2
<b>Soluble Ammonia as N</b> <b>Method: 4500-NH3-B-C</b>						

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G110  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-02 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Nitrogen, Ammonia (As N)	3.86	0.16	mg/L	5/27/10	58701	TTT
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	526.	20.	mg/L	5/26/10	R141332	IR
<b>Mercury in Groundwater, Dissolved</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58866	IG
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58863	IG
<b>Metals, Dissolved</b>		<b>Method: SW6020A / SW3005A</b>				
Arsenic	< 0.00889	0.00889	mg/L	5/26/10 16:50	58669	AG
Boron	0.0817	0.0556	mg/L	5/27/10	58669	AG
Cadmium	< 0.00444	0.00444	mg/L	5/26/10 16:50	58669	AG
Chromium	0.0265	0.00889	mg/L	5/26/10 16:50	58669	AG
Iron	2.78	0.0889	mg/L	5/26/10 16:50	58669	AG
Lead	< 0.00667	0.00667	mg/L	5/26/10 16:50	58669	AG
Magnesium	58.6	1.11	mg/L	5/27/10	58669	AG
Zinc	< 0.02	0.02	mg/L	5/26/10 16:50	58669	AG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Aluminum	0.178	0.05	mg/L	5/26/10 22:07	58676	AG
Antimony	< 0.006	0.006	mg/L	5/26/10 22:07	58676	AG
Arsenic	< 0.01	0.01	mg/L	5/26/10 22:07	58676	AG
Barium	0.18	0.02	mg/L	5/26/10 22:07	58676	AG
Beryllium	< 0.003	0.003	mg/L	5/26/10 22:07	58676	AG
Boron	0.123	0.04	mg/L	5/26/10 22:07	58676	AG
Cadmium	0.00258	0.001	mg/L	5/26/10 22:07	58676	AG
Calcium	118.	2.5	mg/L	5/27/10	58676	AG
Chromium	< 0.07	0.07	mg/L	5/26/10 22:07	58676	AG
Cobalt	< 0.07	0.07	mg/L	5/26/10 22:07	58676	AG
Copper	< 0.06	0.06	mg/L	5/26/10 22:07	58676	AG
Iron	6.71	0.04	mg/L	5/26/10 22:07	58676	AG
Lead	< 0.005	0.005	mg/L	5/26/10 22:07	58676	AG

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G110  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-02 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Magnesium	47.2	1.25	mg/L	5/27/10	58676	AG
Manganese	0.12	0.01	mg/L	5/26/10 22:07	58676	AG
Nickel	< 0.05	0.05	mg/L	5/26/10 22:07	58676	AG
Potassium	1.51	0.625	mg/L	5/26/10 22:07	58676	AG
Selenium	< 0.02	0.02	mg/L	5/26/10 22:07	58676	AG
Silver	< 0.05	0.05	mg/L	5/26/10 22:07	58676	AG
Sodium	17.3	4.5	mg/L	5/27/10	58676	AG
Thallium	< 0.002	0.002	mg/L	5/26/10 22:07	58676	AG
Vanadium	< 0.0125	0.0125	mg/L	5/26/10 22:07	58676	AG
Zinc	< 0.02	0.02	mg/L	5/26/10 22:07	58676	AG
<b>Carbamates</b>		<b>Method: E531.1</b>				
Aldicarb	< 2.	2.	C µg/L	6/7/10	R141681	LBI
Carbofuran	< 2.	2.	C µg/L	6/7/10	R141681	LBI
<b>EDB, DBCP and 123TCP by GC/ECD</b>		<b>Method: E504.1 / E504.1</b>				
1,2-Dibromo-3-chloropropane	< 0.004	0.004	C µg/L	6/2/10 13:54	58881	MNN
1,2-Dibromoethane	< 0.004	0.004	C µg/L	6/2/10 13:54	58881	MNN
<b>Endothal</b>		<b>Method: E548.1</b>				
Endothal	< 2.	2.	µg/L	6/3/10	R141835	OUT
<b>Haloacetic Acids</b>		<b>Method: E552.2 / E552.1</b>				
Dalapon	< 1.25	1.25	C µg/L	6/7/10 21:14	58894	LP
<b>Organochlorine Pesticides</b>		<b>Method: SW8081A / SW3510C</b>				
4,4'-DDT	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
Alachlor	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
Aldrin	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
Atrazine	< 0.17	0.17	µg/L	6/3/10 00:15	58653	LP
Chlordane	< 0.13	0.13	µg/L	6/3/10 00:15	58653	LP
Dieldrin	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
Endrin	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
gamma-BHC	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
Heptachlor	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
Heptachlor epoxide	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP

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C - Laboratory not accredited for this parameter

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G110  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-02 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Methoxychlor	< 0.01	0.01	µg/L	6/3/10 00:15	58653	LP
Simazine	< 0.17	0.17	µg/L	6/3/10 00:15	58653	LP
Toxaphene	< 0.7	0.7	µg/L	6/3/10 00:15	58653	LP

### Polychlorinated biphenyls (PCBs)

Method: SW8082 / SW3510C

Aroclor 1016	< 0.12	0.12	µg/L	5/28/10	58654	JP
Aroclor 1221	< 0.12	0.12	µg/L	5/28/10	58654	JP
Aroclor 1232	< 0.12	0.12	µg/L	5/28/10	58654	JP
Aroclor 1242	< 0.12	0.12	µg/L	5/28/10	58654	JP
Aroclor 1248	< 0.12	0.12	µg/L	5/28/10	58654	JP
Aroclor 1254	< 0.12	0.12	µg/L	5/28/10	58654	JP
Aroclor 1260	< 0.12	0.12	µg/L	5/28/10	58654	JP
PCB, Total	< 0.82	0.82	µg/L	5/28/10	58654	JP

### Semivolatile Organic Compounds GC/MS

Method: SW8270D / SW3510C

Benzo(a)pyrene	< 3.32	3.32	µg/L	6/2/10 18:37	58788	MG3
Bis(2-ethylhexyl)phthalate	< 6.64	6.64	µg/L	6/2/10 18:37	58788	MG3
Bis(chloromethyl)ether	< 13.9	13.9	C µg/L	6/2/10 18:37	58788	MG3
Butyl benzyl phthalate	< 1.33	1.33	µg/L	6/2/10 18:37	58788	MG3
Di-n-butyl phthalate	< 3.32	3.32	µg/L	6/2/10 18:37	58788	MG3
Diethyl phthalate	< 0.13	0.13	µg/L	6/2/10 18:37	58788	MG3
Dimethyl phthalate	< 0.13	0.13	µg/L	6/2/10 18:37	58788	MG3
Isophorone	< 0.13	0.13	µg/L	6/2/10 18:37	58788	MG3
m,p-Cresol	< 1.61	1.61	µg/L	6/2/10 18:37	58788	MG3
Naphthalene	< 0.13	0.13	µg/L	6/2/10 18:37	58788	MG3
Parathion	< 3.32	3.32	C µg/L	6/2/10 18:37	58788	MG3
Phenol	< 1.12	1.12	µg/L	6/2/10 18:37	58788	MG3

### Solvent Extractable Compounds by HPLC

Method: SW8321A / SW3510C

2,4,5-TP (Silvex)	< 0.19	0.19	µg/L	5/30/10	58755	LBI
2,4-D	< 0.31	0.31	µg/L	5/30/10	58755	LBI
Dinoseb	< 0.31	0.31	µg/L	5/30/10	58755	LBI
Pentachlorophenol	< 0.26	0.26	C µg/L	5/30/10	58755	LBI
Picloram	< 0.13	0.13	C µg/L	5/30/10	58755	LBI

### Volatile Organic Compounds by GC/MS

Method: SW8260B / SW5030A

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G110  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-02 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
1,1,1,2-Tetrachloroethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,1,1-Trichloroethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,1,2,2-Tetrachloroethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,1,2-Trichloroethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,1-Dichloroethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,1-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,2,3-Trichlorobenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,2,3-Trichloropropane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,2,4-Trimethylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,2-Dibromoethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,2-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,2-Dichloroethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,2-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,3,5-Trimethylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,3-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,3-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,4-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
2,2-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
2-Butanone	< 4.	4.	µg/L	5/26/10 21:09	58868	XN
2-Chlorotoluene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
2-Hexanone	< 4.	4.	µg/L	5/26/10 21:09	58868	XN
4-Chlorotoluene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
4-Methyl-2-pentanone	< 4.	4.	µg/L	5/26/10 21:09	58868	XN
Acetone	< 8.	8.	µg/L	5/26/10 21:09	58868	XN
Acrolein	< 4.	4.	µg/L	5/26/10 21:09	58868	XN
Acrylonitrile	< 4.	4.	µg/L	5/26/10 21:09	58868	XN
Benzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Bromobenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Bromochloromethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Bromodichloromethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Bromofom	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Bromomethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Carbon disulfide	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Carbon tetrachloride	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Chlorobenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G110  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-02 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Chloroethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Chloroform	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Chloromethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
cis-1,2-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
cis-1,3-Dichloropropene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Dibromochloromethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Dibromomethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Dichlorodifluoromethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Ethylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Hexachlorobutadiene	< 0.4	0.4	C µg/L	5/26/10 21:09	58868	XN
Iodomethane	< 0.4	0.4	C µg/L	5/26/10 21:09	58868	XN
Isopropyl Toluene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Isopropylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
m,p-Xylene	< 0.8	0.8	µg/L	5/26/10 21:09	58868	XN
Methylene chloride	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
n-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
n-Propylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
o-Xylene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
sec-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Styrene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
tert-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Tetrachloroethene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Tetrahydrofuran	< 4.	4.	C µg/L	5/26/10 21:09	58868	XN
Toluene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
trans-1,2-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
trans-1,3-Dichloropropene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
trans-1,4-Dichloro-2-butene	< 2.	2.	C µg/L	6/8/10 15:36	58955	XN
Trichloroethene	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Trichlorofluoromethane	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Vinyl acetate	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
Vinyl chloride	< 0.4	0.4	µg/L	5/26/10 21:09	58868	XN
1,3-Dichloropropene, Total	< 0.8	0.8	µg/L	5/26/10 21:09	58868	XN
Xylenes, Total	< 1.2	1.2	µg/L	5/26/10 21:09	58868	XN

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** AW-3  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/1/2010 8:00:00 AM  
**Lab ID:** 10050637-07 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Ammonia as N</b> <b>Method: SM4500-NH3-B-C</b>						
Nitrogen, Ammonia (As N)	3.92	0.8	mg/L	6/3/10	58839	TTT
<b>Anions by Ion Chromatography</b> <b>Method: SW9056</b>						
Chloride	24.4	2.	mg/L	6/2/10	R141509	MF
Nitrogen, Nitrate (As N)	< 0.5	0.5	mg/L	6/2/10	R141509	MF
Sulfate	< 5.	5.	mg/L	6/2/10	R141509	MF
<b>BOD, 5 Day, 20°C</b> <b>Method: SM5210 B</b>						
Biochemical Oxygen Demand	< 2.	2.	H mg/L	6/7/10	R141957	IR
<b>Chemical Oxygen Demand</b> <b>Method: HACH 8000</b>						
Chemical Oxygen Demand	26.8	10.	mg/L	6/7/10	R141680	VT
<b>Cyanide, Dissolved</b> <b>Method:</b>						
Cyanide	< 0.01	0.01	mg/L	6/3/10	58820	CS2
<b>Cyanide, Total</b> <b>Method: SW9010B/9014 BY AQUACHEM</b>						
Cyanide	< 0.01	0.01	mg/L	6/3/10	58820	CS2
<b>Dissolved Anions by Ion Chromatography</b> <b>Method: SW9056</b>						
Chloride	25.4	2.	mg/L	6/2/10	R141577	MF
Nitrogen, Nitrate (As N)	< 0.2	0.2	mg/L	6/2/10	R141577	MF
Sulfate	< 5.	5.	mg/L	6/2/10	R141577	MF
<b>Fluoride</b> <b>Method: SM4500-F C</b>						
Fluoride	0.59	0.5	mg/L	6/8/10	R141750	MF
<b>Hexane Extractable Materials, (FOG)</b> <b>Method: E1664A</b>						
Oil and Grease (HEM)	< 5.	5.	mg/L	6/3/10	R141649	TB2
<b>Organic Carbon, Total</b> <b>Method: SM5310-C B</b>						
Organic Carbon, Total	10.3	1.	mg/L	6/2/10	R141522	VT
<b>Phenolics, Total</b> <b>Method: SW9065 BY AQUACHEM</b>						
Phenolics, Total Recoverable	< 0.005	0.005	mg/L	6/3/10	58818	CS2
<b>Soluble Ammonia as N</b> <b>Method: 4500-NH3-B-C</b>						

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** AW-3  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/1/2010 8:00:00 AM  
**Lab ID:** 10050637-07 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Nitrogen, Ammonia (As N)	3.3	0.16	mg/L	6/3/10	58839	TTT
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	432.	20.	mg/L	6/2/10	R141593	IR
<b>ICP Metals, Groundwater Dissolved</b>		<b>Method: SW6010B / SW3005A</b>				
Magnesium	31.7	0.111	mg/L	6/9/10	58810	CS2
<b>ICP Metals, Groundwater Total</b>		<b>Method: SW6010B / SW3015</b>				
Magnesium	31.4	0.125	mg/L	6/9/10	58815	CS2
<b>Mercury in Groundwater, Dissolved</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58866	IG
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58863	IG
<b>Metals, Dissolved</b>		<b>Method: SW6020A / SW3005A</b>				
Arsenic	0.0653	0.00889	mg/L	6/7/10 19:09	58810	AG
Boron	< 0.278	0.278	mg/L	6/9/10	58810	AG
Cadmium	< 0.00444	0.00444	mg/L	6/7/10 19:09	58810	AG
Chromium	0.0182	0.00889	mg/L	6/7/10 19:09	58810	AG
Iron	4.23	0.0889	mg/L	6/7/10 19:09	58810	AG
Lead	< 0.00667	0.00667	mg/L	6/7/10 19:09	58810	AG
Zinc	< 0.02	0.02	mg/L	6/7/10 19:09	58810	AG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Aluminum	0.343	0.05	mg/L	6/7/10 20:26	58815	AG
Antimony	< 0.006	0.006	mg/L	6/7/10 20:26	58815	AG
Arsenic	0.0879	0.01	mg/L	6/7/10 20:26	58815	AG
Barium	0.186	0.02	mg/L	6/7/10 20:26	58815	AG
Beryllium	< 0.003	0.003	mg/L	6/7/10 20:26	58815	AG
Boron	< 0.2	0.2	mg/L	6/9/10	58815	AG
Cadmium	< 0.001	0.001	mg/L	6/7/10 20:26	58815	AG
Calcium	92.1	2.5	mg/L	6/7/10 17:56	58815	AG
Chromium	< 0.07	0.07	mg/L	6/7/10 20:26	58815	AG

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** AW-3  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/1/2010 8:00:00 AM  
**Lab ID:** 10050637-07 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Cobalt	< 0.07	0.07	mg/L	6/7/10 20:26	58815	AG
Copper	< 0.06	0.06	mg/L	6/7/10 20:26	58815	AG
Iron	12.	0.4	mg/L	6/7/10 17:56	58815	AG
Iron	10.9	0.04	mg/L	6/7/10 20:26	58815	AG
Lead	< 0.005	0.005	mg/L	6/7/10 20:26	58815	AG
Manganese	0.348	0.01	mg/L	6/7/10 20:26	58815	AG
Nickel	< 0.05	0.05	mg/L	6/7/10 20:26	58815	AG
Potassium	1.35	0.625	mg/L	6/7/10 20:26	58815	AG
Selenium	< 0.02	0.02	mg/L	6/7/10 20:26	58815	AG
Silver	< 0.05	0.05	mg/L	6/7/10 20:26	58815	AG
Sodium	62.1	4.5	mg/L	6/7/10 17:56	58815	AG
Thallium	< 0.002	0.002	mg/L	6/7/10 20:26	58815	AG
Vanadium	< 0.0125	0.0125	mg/L	6/7/10 20:26	58815	AG
Zinc	0.0924	0.02	mg/L	6/7/10 20:26	58815	AG
<b>Carbamates</b>		<b>Method: E531.1</b>				
Aldicarb	< 2.	2.	C µg/L	6/8/10	R141744	LBI
Carbofuran	< 2.	2.	C µg/L	6/8/10	R141744	LBI
<b>EDB, DBCP and 123TCP by GC/ECD</b>		<b>Method: E504.1 / E504.1</b>				
1,2-Dibromo-3-chloropropane	< 0.004	0.004	C µg/L	6/8/10 19:04	58941	LP
1,2-Dibromoethane	< 0.004	0.004	C µg/L	6/8/10 19:04	58941	LP
<b>Endothal</b>		<b>Method: E548.1</b>				
Endothal	< 5.	5.	µg/L	6/16/10	R142139	OUT
<b>Haloacetic Acids</b>		<b>Method: E552.2 / E552.1</b>				
Dalapon	< 1.25	1.25	C µg/L	6/8/10 00:56	58894	LP
<b>Organochlorine Pesticides</b>		<b>Method: SW8081A / SW3510C</b>				
4,4'-DDT	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
Alachlor	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
Aldrin	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
Atrazine	< 0.17	0.17	µg/L	6/8/10 17:37	58900	LP
Chlordane	< 0.13	0.13	µg/L	6/8/10 17:37	58900	LP
Dieldrin	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power      **Client Sample ID:** AW-3  
**Lab Order:** 10050637      **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater      **Collection Date:** 6/1/2010 8:00:00 AM  
**Lab ID:** 10050637-07      **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Endrin	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
gamma-BHC	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
Heptachlor	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
Heptachlor epoxide	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
Methoxychlor	< 0.01	0.01	µg/L	6/8/10 17:37	58900	LP
Simazine	< 0.17	0.17	µg/L	6/8/10 17:37	58900	LP
Toxaphene	< 0.7	0.7	µg/L	6/8/10 17:37	58900	LP
<b>Polychlorinated biphenyls (PCBs)</b>		<b>Method: SW8082 / SW3510C</b>				
Aroclor 1016	< 0.12	0.12	µg/L	6/7/10	58902	IP
Aroclor 1221	< 0.12	0.12	µg/L	6/7/10	58902	IP
Aroclor 1232	< 0.12	0.12	µg/L	6/7/10	58902	IP
Aroclor 1242	< 0.12	0.12	µg/L	6/7/10	58902	IP
Aroclor 1248	< 0.12	0.12	µg/L	6/7/10	58902	IP
Aroclor 1254	< 0.12	0.12	µg/L	6/7/10	58902	IP
Aroclor 1260	< 0.12	0.12	µg/L	6/7/10	58902	IP
PCB, Total	< 0.82	0.82	µg/L	6/7/10	58902	IP
<b>Semivolatile Organic Compounds GC/MS</b>		<b>Method: SW8270D / SW3510C</b>				
Benzo(a)pyrene	< 3.32	3.32	µg/L	6/7/10 18:17	58871	MG3
Bis(2-ethylhexyl)phthalate	< 6.63	6.63	µg/L	6/7/10 18:17	58871	MG3
Bis(chloromethyl)ether	< 13.9	13.9	C µg/L	6/7/10 18:17	58871	MG3
Butyl benzyl phthalate	< 1.33	1.33	µg/L	6/7/10 18:17	58871	MG3
Di-n-butyl phthalate	< 3.32	3.32	µg/L	6/7/10 18:17	58871	MG3
Diethyl phthalate	< 0.13	0.13	µg/L	6/7/10 18:17	58871	MG3
Dimethyl phthalate	< 0.13	0.13	µg/L	6/7/10 18:17	58871	MG3
Isophorone	< 0.13	0.13	µg/L	6/7/10 18:17	58871	MG3
m,p-Cresol	< 1.6	1.6	µg/L	6/7/10 18:17	58871	MG3
Naphthalene	< 0.13	0.13	µg/L	6/7/10 18:17	58871	MG3
Parathion	< 3.32	3.32	C µg/L	6/7/10 18:17	58871	MG3
Phenol	< 1.12	1.12	µg/L	6/7/10 18:17	58871	MG3
<b>Solvent Extractable Compounds by HPLC</b>		<b>Method: SW8321A / SW3510C</b>				
2,4,5-TP (Silvex)	< 0.19	0.19	µg/L	6/9/10	58934	LBI
2,4-D	< 0.31	0.31	µg/L	6/9/10	58934	LBI

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** AW-3  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/1/2010 8:00:00 AM  
**Lab ID:** 10050637-07 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Dinoseb	< 0.31	0.31	µg/L	6/9/10	58934	LBI
Pentachlorophenol	< 0.26	0.26	C µg/L	6/9/10	58934	LBI
Picloram	< 0.12	0.12	C µg/L	6/9/10	58934	LBI

### Volatile Organic Compounds by GC/MS

Method: SW8260B / SW5030A

1,1,1,2-Tetrachloroethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,1,1-Trichloroethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,1,2,2-Tetrachloroethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,1,2-Trichloroethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,1-Dichloroethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,1-Dichloroethene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,2,3-Trichlorobenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,2,3-Trichloropropane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,2,4-Trimethylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,2-Dibromoethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,2-Dichlorobenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,2-Dichloroethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,2-Dichloropropane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,3,5-Trimethylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,3-Dichlorobenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,3-Dichloropropane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
1,4-Dichlorobenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
2,2-Dichloropropane	< 0.4	0.4	C µg/L	6/5/10 23:23	58924	XN
2-Butanone	< 4.	4.	µg/L	6/5/10 23:23	58924	XN
2-Chlorotoluene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
2-Hexanone	< 4.	4.	µg/L	6/5/10 23:23	58924	XN
4-Chlorotoluene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
4-Methyl-2-pentanone	< 4.	4.	µg/L	6/5/10 23:23	58924	XN
Acetone	< 8.	8.	µg/L	6/5/10 23:23	58924	XN
Acrolein	< 4.	4.	µg/L	6/5/10 23:23	58924	XN
Acrylonitrile	< 4.	4.	µg/L	6/5/10 23:23	58924	XN
Benzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Bromobenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Bromochloromethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Bromodichloromethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** AW-3  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/1/2010 8:00:00 AM  
**Lab ID:** 10050637-07 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Bromofom	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Bromomethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Carbon disulfide	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Carbon tetrachloride	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Chlorobenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Chloroethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Chlorofom	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Chloromethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
cis-1,2-Dichloroethene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
cis-1,3-Dichloropropene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Dibromochloromethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Dibromomethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Dichlorodifluoromethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Ethylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Hexachlorobutadiene	< 0.4	0.4	C µg/L	6/5/10 23:23	58924	XN
Iodomethane	< 0.4	0.4	C µg/L	6/5/10 23:23	58924	XN
Isopropyl Toluene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Isopropylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
m,p-Xylene	< 0.8	0.8	µg/L	6/5/10 23:23	58924	XN
Methylene chloride	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
n-Butylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
n-Propylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
o-Xylene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
sec-Butylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Styrene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
tert-Butylbenzene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Tetrachloroethene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Tetrahydrofuran	< 4.	4.	C µg/L	6/5/10 23:23	58924	XN
Toluene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
trans-1,2-Dichloroethene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
trans-1,3-Dichloropropene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
trans-1,4-Dichloro-2-butene	< 2.	2.	C µg/L	6/12/10 17:51	59033	XN
Trichloroethene	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Trichlorofluoromethane	< 0.4	0.4	µg/L	6/5/10 23:23	58924	XN
Vinyl acetate	< 2.	2.	µg/L	6/12/10 17:51	59033	XN

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** AW-3  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 6/1/2010 8:00:00 AM  
**Lab ID:** 10050637-07 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Vinyl chloride	< 2.	2.	µg/L	6/12/10 17:51	59033	XN
1,3-Dichloropropene, Total	< 0.8	0.8	µg/L	6/5/10 23:23	58924	XN
Xylenes, Total	< 1.2	1.2	µg/L	6/5/10 23:23	58924	XN

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G120  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-09 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Ammonia as N</b>						
<b>Method: SM4500-NH3-B-C</b>						
Nitrogen, Ammonia (As N)	3.53	0.16	mg/L	6/3/10	58839	TTT
<b>Anions by Ion Chromatography</b>						
<b>Method: SW9056</b>						
Chloride	26.8	2.	mg/L	5/27/10	R141304	GSB
Nitrogen, Nitrate (As N)	< 0.2	0.2	mg/L	5/27/10	R141304	GSB
Sulfate	222.	5.	mg/L	5/27/10	R141304	GSB
<b>BOD, 5 Day, 20°C</b>						
<b>Method: SM5210 B</b>						
Biochemical Oxygen Demand	4.	2.	mg/L	5/26/10	R141432	AM2
<b>Chemical Oxygen Demand</b>						
<b>Method: HACH 8000</b>						
Chemical Oxygen Demand	13.7	10.	mg/L	6/7/10	R141680	VT
<b>Cyanide, Dissolved</b>						
<b>Method:</b>						
Cyanide	< 0.01	0.01	mg/L	5/28/10	58735	CS2
<b>Cyanide, Total</b>						
<b>Method: SW9010B/9014 BY AQUACHEM</b>						
Cyanide	< 0.01	0.01	mg/L	5/28/10	58735	CS2
<b>Dissolved Anions by Ion Chromatography</b>						
<b>Method: SW9056</b>						
Chloride	26.8	2.	mg/L	5/26/10	R141296	GSB
Nitrogen, Nitrate (As N)	< 0.2	0.2	mg/L	5/26/10	R141296	GSB
Sulfate	218.	5.	mg/L	5/26/10	R141296	GSB
<b>Fluoride</b>						
<b>Method: SM4500-F C</b>						
Fluoride	< 0.5	0.5	mg/L	6/1/10	R141448	MF
<b>Hexane Extractable Materials, (FOG)</b>						
<b>Method: E1664A</b>						
Oil and Grease (HEM)	< 5.	5.	mg/L	5/28/10	R141484	TB2
<b>Organic Carbon, Total</b>						
<b>Method: SM5310-C B</b>						
Organic Carbon, Total	7.05	1.	mg/L	6/2/10	R141522	VT
<b>Phenolics, Total</b>						
<b>Method: SW9065 BY AQUACHEM</b>						
Phenolics, Total Recoverable	0.018	0.005	mg/L	6/1/10	58758	CS2
<b>Soluble Ammonia as N</b>						
<b>Method: 4500-NH3-B-C</b>						

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G120  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-09 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Nitrogen, Ammonia (As N)	3.58	0.16	mg/L	6/1/10	58777	TTT
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	872.	20.	mg/L	5/27/10	R141385	VT
<b>Mercury in Groundwater, Dissolved</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58866	IG
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58866	IG
<b>Metals, Dissolved</b>		<b>Method: SW6020A / SW3005A</b>				
Arsenic	0.0122	0.00889	mg/L	5/26/10 17:55	58669	AG
Boron	0.64	0.556	mg/L	5/27/10	58669	AG
Cadmium	< 0.00444	0.00444	mg/L	5/26/10 17:55	58669	AG
Chromium	< 0.00889	0.00889	mg/L	5/26/10 17:55	58669	AG
Iron	19.9	0.0889	mg/L	5/26/10 17:55	58669	AG
Lead	< 0.00667	0.00667	mg/L	5/26/10 17:55	58669	AG
Magnesium	97.4	1.11	mg/L	5/27/10	58669	AG
Zinc	< 0.02	0.02	mg/L	5/26/10 17:55	58669	AG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Aluminum	2.2	0.05	mg/L	5/26/10 22:58	58676	AG
Antimony	< 0.006	0.006	mg/L	5/26/10 22:58	58676	AG
Arsenic	0.0148	0.01	mg/L	5/26/10 22:58	58676	AG
Barium	0.546	0.02	mg/L	5/26/10 22:58	58676	AG
Beryllium	< 0.003	0.003	mg/L	5/26/10 22:58	58676	AG
Boron	0.642	0.4	mg/L	5/27/10	58676	AG
Cadmium	< 0.001	0.001	mg/L	5/26/10 22:58	58676	AG
Calcium	263.	2.5	mg/L	5/27/10	58676	AG
Chromium	< 0.07	0.07	mg/L	5/26/10 22:58	58676	AG
Cobalt	< 0.07	0.07	mg/L	5/26/10 22:58	58676	AG
Copper	< 0.06	0.06	mg/L	5/26/10 22:58	58676	AG
Iron	28.6	0.04	mg/L	5/26/10 22:58	58676	AG
Lead	< 0.005	0.005	mg/L	5/26/10 22:58	58676	AG

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## Report of Laboratory Analysis

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**Lab ID:** 10050637-09 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Magnesium	110.	1.25	mg/L	5/27/10	58676	AG
Manganese	0.354	0.01	mg/L	5/26/10 22:58	58676	AG
Nickel	< 0.05	0.05	mg/L	5/26/10 22:58	58676	AG
Potassium	2.02	0.625	mg/L	5/26/10 22:58	58676	AG
Selenium	< 0.02	0.02	mg/L	5/26/10 22:58	58676	AG
Silver	< 0.05	0.05	mg/L	5/26/10 22:58	58676	AG
Sodium	52.6	4.5	mg/L	5/27/10	58676	AG
Thallium	< 0.002	0.002	mg/L	5/26/10 22:58	58676	AG
Vanadium	< 0.0125	0.0125	mg/L	5/26/10 22:58	58676	AG
Zinc	0.0214	0.02	mg/L	5/26/10 22:58	58676	AG
<b>Carbamates</b>		<b>Method: E531.1</b>				
Aldicarb	< 2.	2.	C µg/L	6/8/10	R141744	LBI
Carbofuran	< 2.	2.	C µg/L	6/8/10	R141744	LBI
<b>EDB, DBCP and 123TCP by GC/ECD</b>		<b>Method: E504.1 / E504.1</b>				
1,2-Dibromo-3-chloropropane	< 0.004	0.004	C µg/L	6/2/10 16:57	58881	MNN
1,2-Dibromoethane	< 0.004	0.004	C µg/L	6/2/10 16:57	58881	MNN
<b>Endothal</b>		<b>Method: E548.1</b>				
Endothal	< 2.	2.	µg/L	6/3/10	R141835	OUT
<b>Haloacetic Acids</b>		<b>Method: E552.2 / E552.1</b>				
Dalapon	< 1.25	1.25	C µg/L	6/8/10 02:24	58894	LP
<b>Organochlorine Pesticides</b>		<b>Method: SW8081A / SW3510C</b>				
4,4'-DDT	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
Alachlor	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
Aldrin	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
Atrazine	< 0.17	0.17	µg/L	6/3/10 04:12	58653	LP
Chlordane	< 0.13	0.13	µg/L	6/3/10 04:12	58653	LP
Dieldrin	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
Endrin	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
gamma-BHC	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
Heptachlor	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
Heptachlor epoxide	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP

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

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G120  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-09 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Methoxychlor	< 0.01	0.01	µg/L	6/3/10 04:12	58653	LP
Simazine	< 0.17	0.17	µg/L	6/3/10 04:12	58653	LP
Toxaphene	< 0.7	0.7	µg/L	6/3/10 04:12	58653	LP

### Polychlorinated biphenyls (PCBs)

Method: SW8082 / SW3510C

Aroclor 1016	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1221	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1232	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1242	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1248	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1254	< 0.12	0.12	µg/L	5/28/10	58654	IP
Aroclor 1260	< 0.12	0.12	µg/L	5/28/10	58654	IP
PCB, Total	< 0.82	0.82	µg/L	5/28/10	58654	IP

### Semivolatile Organic Compounds GC/MS

Method: SW8270D / SW3510C

Benzo(a)pyrene	< 3.33	3.33	µg/L	6/2/10 22:12	58788	MG3
Bis(2-ethylhexyl)phthalate	< 6.65	6.65	µg/L	6/2/10 22:12	58788	MG3
Bis(chloromethyl)ether	< 14.	14.	C µg/L	6/2/10 22:12	58788	MG3
Butyl benzyl phthalate	< 1.33	1.33	B µg/L	6/2/10 22:12	58788	MG3
Di-n-butyl phthalate	< 3.33	3.33	B µg/L	6/2/10 22:12	58788	MG3
Diethyl phthalate	< 0.13	0.13	µg/L	6/2/10 22:12	58788	MG3
Dimethyl phthalate	< 0.13	0.13	µg/L	6/2/10 22:12	58788	MG3
Isophorone	< 0.13	0.13	µg/L	6/2/10 22:12	58788	MG3
m,p-Cresol	< 1.61	1.61	µg/L	6/2/10 22:12	58788	MG3
Naphthalene	< 0.13	0.13	µg/L	6/2/10 22:12	58788	MG3
Parathion	< 3.33	3.33	C µg/L	6/2/10 22:12	58788	MG3
Phenol	< 1.12	1.12	µg/L	6/2/10 22:12	58788	MG3

### Solvent Extractable Compounds by HPLC

Method: SW8321A / SW3510C

2,4,5-TP (Silvex)	< 0.19	0.19	µg/L	5/30/10	58755	LBI
2,4-D	< 0.31	0.31	µg/L	5/30/10	58755	LBI
Dinoseb	< 0.32	0.32	µg/L	5/30/10	58755	LBI
Pentachlorophenol	< 0.27	0.27	C µg/L	5/30/10	58755	LBI
Picloram	< 0.13	0.13	C µg/L	5/30/10	58755	LBI

### Volatile Organic Compounds by GC/MS

Method: SW8260B / SW5030A

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

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G120  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-09 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
1,1,1,2-Tetrachloroethane	< 2.	2.	µg/L	6/8/10 17:31	59023	XN
1,1,1-Trichloroethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,1,2,2-Tetrachloroethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,1,2-Trichloroethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,1-Dichloroethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,1-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,2,3-Trichlorobenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,2,3-Trichloropropane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,2,4-Trimethylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,2-Dibromoethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,2-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,2-Dichloroethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,2-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,3,5-Trimethylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,3-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,3-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,4-Dichlorobenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
2,2-Dichloropropane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
2-Butanone	< 4.	4.	µg/L	5/26/10 23:58	58868	XN
2-Chlorotoluene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
2-Hexanone	< 4.	4.	µg/L	5/26/10 23:58	58868	XN
4-Chlorotoluene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
4-Methyl-2-pentanone	< 4.	4.	µg/L	5/26/10 23:58	58868	XN
Acetone	< 8.	8.	µg/L	5/26/10 23:58	58868	XN
Acrolein	< 4.	4.	µg/L	5/26/10 23:58	58868	XN
Acrylonitrile	< 4.	4.	µg/L	5/26/10 23:58	58868	XN
Benzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Bromobenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Bromochloromethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Bromodichloromethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Bromoform	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Bromomethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Carbon disulfide	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Carbon tetrachloride	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Chlorobenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** G120  
**Lab Order:** 10050637 **Report Date:** 6/29/2010  
**Project:** CWLP FGDS 2nd Quarter Groundwater **Collection Date:** 5/25/2010  
**Lab ID:** 10050637-09 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
Chloroethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Chloroform	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Chloromethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
cis-1,2-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
cis-1,3-Dichloropropene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Dibromochloromethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Dibromomethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Dichlorodifluoromethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Ethylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Hexachlorobutadiene	< 0.4	0.4	C µg/L	5/26/10 23:58	58868	XN
Iodomethane	< 0.4	0.4	C µg/L	5/26/10 23:58	58868	XN
Isopropyl Toluene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Isopropylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
m,p-Xylene	< 0.8	0.8	µg/L	5/26/10 23:58	58868	XN
Methylene chloride	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
n-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
n-Propylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
o-Xylene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
sec-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Styrene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
tert-Butylbenzene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Tetrachloroethene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Tetrahydrofuran	< 4.	4.	C µg/L	5/26/10 23:58	58868	XN
Toluene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
trans-1,2-Dichloroethene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
trans-1,3-Dichloropropene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
trans-1,4-Dichloro-2-butene	< 2.	2.	C µg/L	6/8/10 17:31	59023	XN
Trichloroethene	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Trichlorofluoromethane	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Vinyl acetate	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
Vinyl chloride	< 0.4	0.4	µg/L	5/26/10 23:58	58868	XN
1,3-Dichloropropene, Total	< 0.8	0.8	µg/L	5/26/10 23:58	58868	XN
Xylenes, Total	< 1.2	1.2	µg/L	5/26/10 23:58	58868	XN

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
E - Estimated R - RPD outside accepted recovery limits  
H - Holding Time Exceeded J - Analyte detected below quantitation limits  
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Sue Corcoran  
City, Water, Light & Power  
201 East Lake Shore Drive  
Springfield, IL 62707

June 30, 2010

RE CWLP Ash Pond Table 1

Lab Orders:  
10050636

Dear Sue Corcoran:

Enclosed are the analytical reports for the EMT Lab Order listed. Also included with this analytical report is a copy of the chain of custody associated with these samples. If you have any questions, please contact me at 847-967-6666.

Sincerely,

Joe Pavilonis  
Project Manager

Approved by,

Mitchell Ostrowski  
Laboratory Director

This Report Contains 12 pages

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

State of Illinois Chemical Analysis in Drinking Water Accredited Lab. No. 100256  
State of Wisconsin Wastewater and Hazardous Waste No. 999888890

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**CLIENT:** City, Water, Light & Power

**Date:** 6/30/2010

**Project:** CWLP Ash Pond Table 1

## CASE NARRATIVE

**Lab Order:** 10050636

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

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

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

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

All results are reported on a wet weight basis, unless otherwise noted. Dry weight adjusted results, reporting limits, method detection limits and dilution factors are indicated by the notation "dry" in the Units column. If present, a dilution factor will adjust the method detection limits and reporting limits.

The test results contained in this report meet all of the requirements of NELAC. Accreditation by the State of Illinois or Wisconsin is not an endorsement or a guarantee of the validity of data generated. For specific information regarding EMT's scope of accreditation, please contact your EMT project manager.

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

Analyst's initials of "OUT" indicate that the analyte was analyzed by a subcontracted laboratory.

### Method References:

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

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

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

D=ASTM, Annual Book of Standards

Batch numbers starting with a letter indicate an analytical batch while those that are exclusively numerals indicate a preparation batch.

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power  
**Lab Order:** 10050636  
**Project:** CWLP Ash Pond Table 1  
**Lab ID:** 10050636-03

**Client Sample ID:** AW3  
**Report Date:** 6/30/2010  
**Collection Date:** 6/1/2010 8:00:00 AM  
**Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Anions by Ion Chromatography</b>						
		<b>Method: SW9056</b>				
Chloride	25.5	2.	mg/L	6/2/10	R141509	MF
Nitrogen, Nitrate (As N)	< 0.5	0.5	mg/L	6/2/10	R141509	MF
Sulfate	< 5.	5.	mg/L	6/2/10	R141509	MF
<b>Cyanide, Total</b>						
		<b>Method: SW9010B/9014 BY AQUACHEM</b>				
Cyanide	< 0.01	0.01	mg/L	6/7/10	58890	CS2
<b>Fluoride</b>						
		<b>Method: SM4500-F C</b>				
Fluoride	0.52	0.5	mg/L	6/8/10	R141750	MF
<b>Total Dissolved Solids</b>						
		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	< 20.	20.	mg/L	6/2/10	R141593	IR
<b>Mercury, Total</b>						
		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/7/10	58908	IG
<b>Metals, Total.</b>						
		<b>Method: SW6020A / SW3015</b>				
Antimony	< 0.006	0.006	mg/L	6/7/10 20:36	58815	AG
Arsenic	0.0936	0.01	mg/L	6/7/10 20:36	58815	AG
Barium	0.189	0.02	mg/L	6/7/10 20:36	58815	AG
Beryllium	< 0.003	0.003	mg/L	6/7/10 20:36	58815	AG
Boron	0.251	0.2	mg/L	6/9/10	58815	AG
Cadmium	< 0.001	0.001	mg/L	6/7/10 20:36	58815	AG
Chromium	< 0.07	0.07	mg/L	6/7/10 20:36	58815	AG
Cobalt	< 0.07	0.07	mg/L	6/7/10 20:36	58815	AG
Iron	11.2	0.04	mg/L	6/7/10 20:36	58815	AG
Lead	< 0.005	0.005	mg/L	6/7/10 20:36	58815	AG
Manganese	0.349	0.01	mg/L	6/7/10 20:36	58815	AG
Nickel	< 0.05	0.05	mg/L	6/7/10 20:36	58815	AG
Selenium	< 0.02	0.02	mg/L	6/7/10 20:36	58815	AG
Silver	< 0.05	0.05	mg/L	6/7/10 20:36	58815	AG
Thallium	< 0.002	0.002	mg/L	6/7/10 20:36	58815	AG
Zinc	< 0.02	0.02	mg/L	6/7/10 20:36	58815	AG

**Qualifiers:**

B - Analyte detected in the associated Method Blank  
E - Estimated  
H - Holding Time Exceeded

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
J - Analyte detected below quantitation limits

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power  
**Lab Order:** 10050636  
**Project:** CWLP Ash Pond Table 1  
**Lab ID:** 10050636-04

**Client Sample ID:** API  
**Report Date:** 6/30/2010  
**Collection Date:** 6/1/2010 8:15:00 AM  
**Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Anions by Ion Chromatography</b>		<b>Method: SW9056</b>				
Chloride	22.7	2.	mg/L	6/2/10	R141509	MF
Nitrogen, Nitrate (As N)	2.72	0.5	mg/L	6/2/10	R141509	MF
Sulfate	47.	5.	mg/L	6/2/10	R141509	MF
<b>Cyanide, Total</b>		<b>Method: SW9010B/9014 BY AQUACHEM</b>				
Cyanide	< 0.01	0.01	mg/L	6/2/10	58804	CS2
<b>Fluoride</b>		<b>Method: SM4500-F C</b>				
Fluoride	< 0.5	0.5	mg/L	6/8/10	R141751	MF
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	240.	20.	mg/L	6/2/10	R141593	IR
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58863	IG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Antimony	< 0.006	0.006	mg/L	6/7/10 21:17	58815	AG
Arsenic	< 0.01	0.01	mg/L	6/7/10 21:17	58815	AG
Barium	0.112	0.02	mg/L	6/7/10 21:17	58815	AG
Beryllium	< 0.003	0.003	mg/L	6/7/10 21:17	58815	AG
Boron	0.301	0.2	mg/L	6/9/10	58815	AG
Cadmium	< 0.001	0.001	mg/L	6/7/10 21:17	58815	AG
Chromium	< 0.07	0.07	mg/L	6/7/10 21:17	58815	AG
Cobalt	< 0.07	0.07	mg/L	6/7/10 21:17	58815	AG
Iron	5.68	0.04	mg/L	6/7/10 21:17	58815	AG
Lead	< 0.005	0.005	mg/L	6/7/10 21:17	58815	AG
Manganese	0.27	0.01	mg/L	6/7/10 21:17	58815	AG
Nickel	< 0.05	0.05	mg/L	6/7/10 21:17	58815	AG
Selenium	< 0.02	0.02	mg/L	6/7/10 21:17	58815	AG
Silver	< 0.05	0.05	mg/L	6/7/10 21:17	58815	AG
Thallium	< 0.002	0.002	mg/L	6/7/10 21:17	58815	AG
Zinc	< 0.02	0.02	mg/L	6/7/10 21:17	58815	AG

**Qualifiers:**

B - Analyte detected in the associated Method Blank  
E - Estimated  
H - Holding Time Exceeded

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
J - Analyte detected below quantitation limits

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power **Client Sample ID:** AP2  
**Lab Order:** 10050636 **Report Date:** 6/30/2010  
**Project:** CWLP Ash Pond Table 1 **Collection Date:** 6/1/2010 8:25:00 AM  
**Lab ID:** 10050636-05 **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Anions by Ion Chromatography</b>		<b>Method: SW9056</b>				
Chloride	31.7	2.	mg/L	6/2/10	R141509	MF
Nitrogen, Nitrate (As N)	< 0.5	0.5	mg/L	6/2/10	R141509	MF
Sulfate	132.	5.	mg/L	6/2/10	R141509	MF
<b>Cyanide, Total</b>		<b>Method: SW9010B/9014 BY AQUACHEM</b>				
Cyanide	< 0.01	0.01	mg/L	6/2/10	58804	CS2
<b>Fluoride</b>		<b>Method: SM4500-F C</b>				
Fluoride	< 0.5	0.5	mg/L	6/8/10	R141751	MF
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	620.	20.	mg/L	6/2/10	R141593	IR
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58863	IG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Antimony	< 0.006	0.006	mg/L	6/7/10 21:22	58815	AG
Arsenic	< 0.01	0.01	mg/L	6/7/10 21:22	58815	AG
Barium	0.109	0.02	mg/L	6/7/10 21:22	58815	AG
Beryllium	< 0.003	0.003	mg/L	6/7/10 21:22	58815	AG
Boron	2.63	0.2	mg/L	6/9/10	58815	AG
Cadmium	< 0.001	0.001	mg/L	6/7/10 21:22	58815	AG
Chromium	< 0.07	0.07	mg/L	6/7/10 21:22	58815	AG
Cobalt	< 0.07	0.07	mg/L	6/7/10 21:22	58815	AG
Iron	2.37	0.04	mg/L	6/7/10 21:22	58815	AG
Lead	< 0.005	0.005	mg/L	6/7/10 21:22	58815	AG
Manganese	2.	0.01	mg/L	6/7/10 21:22	58815	AG
Nickel	< 0.05	0.05	mg/L	6/7/10 21:22	58815	AG
Selenium	< 0.02	0.02	mg/L	6/7/10 21:22	58815	AG
Silver	< 0.05	0.05	mg/L	6/7/10 21:22	58815	AG
Thallium	< 0.002	0.002	mg/L	6/7/10 21:22	58815	AG
Zinc	0.0216	0.02	mg/L	6/7/10 21:22	58815	AG

**Qualifiers:** B - Analyte detected in the associated Method Blank S - Spike Recovery outside accepted recovery limits  
E - Estimated R - RPD outside accepted recovery limits  
H - Holding Time Exceeded J - Analyte detected below quantitation limits

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# ENVIRONMENTAL MONITORING AND TECHNOLOGIES, INC.



8100 North Austin • Morton Grove, IL 60053-3203  
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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power  
**Lab Order:** 10050636  
**Project:** CWLP Ash Pond Table 1  
**Lab ID:** 10050636-06

**Client Sample ID:** AP3  
**Report Date:** 6/30/2010  
**Collection Date:** 6/1/2010 8:45:00 AM  
**Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Anions by Ion Chromatography</b>		<b>Method: SW9056</b>				
Chloride	87.6	2.	mg/L	6/2/10	R141509	MF
Nitrogen, Nitrate (As N)	< 0.5	0.5	mg/L	6/2/10	R141509	MF
Sulfate	319.	12.5	mg/L	6/2/10	R141509	MF
<b>Cyanide, Total</b>		<b>Method: SW9010B/9014 BY AQUACHEM</b>				
Cyanide	< 0.01	0.01	mg/L	6/2/10	58804	CS2
<b>Fluoride</b>		<b>Method: SM4500-F C</b>				
Fluoride	< 0.5	0.5	mg/L	6/8/10	R141751	MF
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	1090.	20.	mg/L	6/2/10	R141593	IR
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/7/10	58908	IG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Antimony	< 0.006	0.006	mg/L	6/7/10 21:28	58815	AG
Arsenic	0.0144	0.01	mg/L	6/7/10 21:28	58815	AG
Barium	0.135	0.02	mg/L	6/7/10 21:28	58815	AG
Beryllium	< 0.003	0.003	mg/L	6/7/10 21:28	58815	AG
Boron	11.9	0.2	mg/L	6/9/10	58815	AG
Cadmium	< 0.001	0.001	mg/L	6/7/10 21:28	58815	AG
Chromium	< 0.07	0.07	mg/L	6/7/10 21:28	58815	AG
Cobalt	< 0.07	0.07	mg/L	6/7/10 21:28	58815	AG
Iron	10.1	0.04	mg/L	6/7/10 21:28	58815	AG
Lead	< 0.005	0.005	mg/L	6/7/10 21:28	58815	AG
Manganese	9.25	0.01	mg/L	6/7/10 21:28	58815	AG
Nickel	< 0.05	0.05	mg/L	6/7/10 21:28	58815	AG
Selenium	< 0.02	0.02	mg/L	6/7/10 21:28	58815	AG
Silver	< 0.05	0.05	mg/L	6/7/10 21:28	58815	AG
Thallium	< 0.002	0.002	mg/L	6/7/10 21:28	58815	AG
Zinc	< 0.02	0.02	mg/L	6/7/10 21:28	58815	AG

**Qualifiers:** B - Analyte detected in the associated Method Blank  
E - Estimated  
H - Holding Time Exceeded  
S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
J - Analyte detected below quantitation limits

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## Report of Laboratory Analysis

**CLIENT:** City, Water, Light & Power      **Client Sample ID:** AP4  
**Lab Order:** 10050636      **Report Date:** 6/30/2010  
**Project:** CWLP Ash Pond Table 1      **Collection Date:** 6/1/2010 9:05:00 AM  
**Lab ID:** 10050636-07      **Matrix:** Groundwater

Analyses	Result	EMT Reporting Limit	Units	Date Analyzed	Batch	Analyst
<b>Anions by Ion Chromatography</b>		<b>Method: SW9056</b>				
Chloride	13.	2.	mg/L	6/2/10	R141509	MF
Nitrogen, Nitrate (As N)	< 0.5	0.5	mg/L	6/2/10	R141509	MF
Sulfate	< 5.	5.	mg/L	6/2/10	R141509	MF
<b>Cyanide, Total</b>		<b>Method: SW9010B/9014 BY AQUACHEM</b>				
Cyanide	< 0.01	0.01	mg/L	6/2/10	58804	CS2
<b>Fluoride</b>		<b>Method: SM4500-F C</b>				
Fluoride	< 0.5	0.5	mg/L	6/8/10	R141751	MF
<b>Total Dissolved Solids</b>		<b>Method: SM2540C</b>				
Total Dissolved Solids (Residue, Filterable)	522.	20.	mg/L	6/2/10	R141593	IR
<b>Mercury, Total</b>		<b>Method: SW7470A / HG PREP</b>				
Mercury	< 0.0005	0.0005	mg/L	6/4/10	58863	IG
<b>Metals, Total.</b>		<b>Method: SW6020A / SW3015</b>				
Antimony	< 0.006	0.006	mg/L	6/7/10 21:33	58815	AG
Arsenic	0.0225	0.01	mg/L	6/7/10 21:33	58815	AG
Barium	0.374	0.02	mg/L	6/7/10 21:33	58815	AG
Beryllium	< 0.003	0.003	mg/L	6/7/10 21:33	58815	AG
Boron	0.687	0.2	mg/L	6/9/10	58815	AG
Cadmium	< 0.001	0.001	mg/L	6/7/10 21:33	58815	AG
Chromium	< 0.07	0.07	mg/L	6/7/10 21:33	58815	AG
Cobalt	< 0.07	0.07	mg/L	6/7/10 21:33	58815	AG
Iron	11.2	0.04	mg/L	6/7/10 21:33	58815	AG
Lead	< 0.005	0.005	mg/L	6/7/10 21:33	58815	AG
Manganese	0.503	0.01	mg/L	6/7/10 21:33	58815	AG
Nickel	< 0.05	0.05	mg/L	6/7/10 21:33	58815	AG
Selenium	< 0.02	0.02	mg/L	6/7/10 21:33	58815	AG
Silver	< 0.05	0.05	mg/L	6/7/10 21:33	58815	AG
Thallium	< 0.002	0.002	mg/L	6/7/10 21:33	58815	AG
Zinc	< 0.02	0.02	mg/L	6/7/10 21:33	58815	AG

**Qualifiers:**

B - Analyte detected in the associated Method Blank  
E - Estimated  
H - Holding Time Exceeded

S - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
J - Analyte detected below quantitation limits

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**Chain of Custody Record**

Scheduled Sampling Date: 05/17/2010

Due Date: 05/24/2010

8100 North Austin Avenue Morton Grove, IL 60053-3203 (847) 967-6666 FAX: (847) 967-6735 www.emi.com

COC # 503747

<b>Company:</b> <u>City, Water, Light &amp; Power</u> <b>Contact:</b> <b>Address:</b> <u>201 East Lake Shore Drive</u> <u>Springfield, IL 62707</u>  <b>Phone:</b> (217) 757-8610  <b>P.O. #:</b> _____ <b>Proj. #:</b> _____ <b>Project /Location:</b> <u>CWLP Ash Pond Table 1</u>	<b>SAMPLE TYPE:</b> 0. Water                      0. Fat                      0. Liquid 0. Process Water          1. DI Water              2. Drinking Water 3. Soil                        4. Extract                5. Wastewater 6. Oil                         7. Sludge                8. Solid 9. Air                        10. Chemical Waste    11. Wipe 12. Groundwater          13. eProduct            14. Groundwater(Filter) 15. Other	<b>Analysis</b> 1. Anions by Ion Chromatography 2. Solids, Total Dissolved (TDS) 3. Fluoride by Electrode (ISE) 4. Cyanide, Total 5. ICP MS Metals, Total 6. Mercury, Groundwater Total	<b>CONTAINER TYPE:</b> P - Plastic                  V - VOC Vial              G - Glass B - Tedlar Bag            O - Other	<b>PRESERVATIVE:</b> 1. None                      2. H2SO4                3. HNO3 4. NaOH                    5. HCL                    6. MeOH 7. Zn Ace                   8. Other	<b>EMI USE ONLY</b>  <b>EMI WORKORDER</b> <u>1050436</u>
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Sample I.D.	Sample Type	Size	Container			Sampling					Preservation		Lab	1	2	3	4	5	6	7	8	9	10	Lab Sample I.D.		
			Type	No.	By	Date	Time	pH	Field	Lab																
AP1	GRAB	12	1 liter	P	1	GR	6/1/10	8:15	7.44	1																
AP1	GRAB	5	1 liter	P	1					1																
AP1	GRAB	12	500 ml	P	1					4																
AP1	GRAB	12	500 ml	P	1					3																

Relinquished By: <u>[Signature]</u>	Date: <u>6-1-10</u>	Received By: <u>[Signature]</u>	Date: <u>6-1-10</u>	<b>EMI USE ONLY</b> Check ID: <u>SPRING</u> Chain Contact: <u>Joe Parham</u> EMI Project ID: <u>CWLP Ash Pond Table 1</u> Jar Lot No.	<b>SAMPLE RECEIVED ON ICE</b> <b>TEMPERATURE</b> (Must be recorded if sampling was greater than 4 hrs prior to sample receipt)
Time: <u>9:45</u>	Time: <u>09:45</u>				
Relinquished By: <u>[Signature]</u>	Date: <u>6-1-10</u>	Received By: <u>[Signature]</u>	Date: <u>6-1-10</u>		
Time: <u>17:20</u>	Time: <u>17:20</u>				
Relinquished By: <u>[Signature]</u>	Date: <u>6-1-10</u>	Received By: <u>[Signature]</u>	Date: <u>6-1-10</u>		
Time: <u>17:20</u>	Time: <u>17:20</u>				

SPECIAL INSTRUCTIONS: TEMP 68.4°F Condo 327

5/17/2010 3:06:20 PM

Page 1



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**Chain of Custody Record**

Scheduled Sampling Date: 05/17/2010  
Due Date: 05/24/2010

8100 North Austin Avenue Morton Grove, IL 60053-3203 (847) 967-6666 FAX:(847) 967-6735 www.emt.com

COC # 503747

<b>Company:</b> <u>City, Water, Light &amp; Power</u> <b>Contact:</b> <b>Address:</b> <u>201 East Lake Shore Drive</u> <u>Springfield, IL 62707</u>  <b>Phone:</b> <u>(217) 757-8610</u>  <b>P.O. #:</b> _____ <b>Proj. #:</b> _____ <b>Project /Location:</b> <u>CWLP Ash Pond Table 1</u>		<b>SAMPLE TYPE:</b> 0. Water                    0. Fat                    0. Liquid 0. Process Water        1. DI Water            2. Drinking Water 3. Soil                      4. Extract              5. Wastewater 6. Oil                        7. Sludge                8. Solid 9. Air                        10. Chemical Waste    11. Wipe 12. Groundwater        13. eProduct            14. Groundwater(Filter) 15. Other _____	<b>Analysis</b> 1. Anions by Ion Chromatography 2. Solids, Total Dissolved (TDS) 3. Fluoride by Electrode (ISE) 4. Cyanide, Total 5. ICP MS Metals, Total 6. Mercury, Groundwater Total
<b>CONTAINER TYPE:</b> P - Plastic                V - VOC Vial            G - Glass B - Tedlar Bag            O - Other _____		<b>EMT USE ONLY</b>  <b>EMT WORKORDER</b> <u>10050430</u>	
<b>PRESERVATIVE:</b> 1. None                    2. H2SO4                3. HNO3 4. NaOH                   5. HCL                   6. MeOH 7. Zn Ace                 8. Other _____			

Sample I.D.	Sample Type	Container			Sampling				Preservation		Analysis										Lab Sample ID				
		Size	Type	No.	By	Date	Time	pH	Field	Lab	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.					
AP2	GRAB	12	1 liter	P	1	SC	6/1/10	8:25	8.9	1															
AP2	GRAB	5	1 liter	P	1					1															
AP2	GRAB	12	500 ml	P	1					4															
AP2	GRAB	12	500 ml	P	1					3															

<b>Relinquished By:</b> <u>[Signature]</u> <b>Date:</b> <u>6-1-10</u> <b>Time:</b> <u>9:45</u>	<b>Received By:</b> <u>[Signature]</u> <b>Date:</b> <u>6-1-10</u> <b>Time:</b> <u>09:45</u>	<b>EMT USE ONLY</b> <b>Client ID:</b> <u>SPRING</u> <b>Client Contact:</b> <u>See File Log</u> <b>EMT Project ID:</b> <u>CWLP Ash Pond Table 1</u> <b>Lab Lot No.</b>	<input type="checkbox"/> <b>SAMPLE RECEIVED ON ICE</b> <input checked="" type="checkbox"/> <b>TEMPERATURE</b> <small>(Must be recorded if sampling was greater than 6 hrs prior to release to report)</small>
<b>Relinquished By:</b> <u>[Signature]</u> <b>Date:</b> <u>6-1-10</u> <b>Time:</b> <u>17:20</u>	<b>Received By:</b> <u>[Signature]</u> <b>Date:</b> <u>- -</u> <b>Time:</b> <u>: :</u>		
<b>Relinquished By:</b> <u>[Signature]</u> <b>Date:</b> <u>- -</u> <b>Time:</b> <u>: :</u>	<b>Received By:</b> <u>Marshall</u> <b>Date:</b> <u>6-1-10</u> <b>Time:</b> <u>17:20</u>		

SPECIAL INSTRUCTIONS: TEMP 68.7°F Condo 742



**Chain of Custody Record**

Scheduled Sampling Date: 05/17/2010  
Due Date: 05/24/2010

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COC # 503747

<b>Company:</b> City, Water, Light & Power <b>Contact:</b> <b>Address:</b> 201 East Lake Shore Drive Springfield, IL 62707 <b>Phone:</b> (217) 757-8610 <b>P.O. #:</b> _____ <b>Proj. #:</b> _____ <b>Project /Location:</b> CWLP Ash Pond Table 1	<b>SAMPLE TYPE:</b> 0. Water 0. Fat 0. Liquid 0. Process Water 1. DI Water 2. Drinking Water 3. Soil 4. Extract 5. Wastewater 6. Oil 7. Sludge 8. Solid 9. Air 10. Chemical Waste 11. Wipe 12. Groundwater 13. eProduct 14. Groundwater(Filler) 15. Other _____ <b>CONTAINER TYPE:</b> P - Plastic V - VOC Vial G - Glass B - Tedlar Bag O - Other _____ <b>PRESERVATIVE:</b> 1. None 2. H2SO4 3. HNO3 4. NaOH 5. HCL 6. MeOH 7. Zn Ace 8. Other _____	<b>Analysis</b> 1. Anions by Ion Chromatography 2. Solids, Total Dissolved (TDS) 3. Fluoride by Electrode (ISE) 4. Cyanide, Total 5. ICP MS Metals, Total 6. Mercury, Groundwater Total	<b>EMT USE ONLY</b>  <b>EMT WORKORDER</b> 50050636
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Sample I.D.	Sample Type	Container			Sampling				Preservation		Analysis										Lab Sample I.D.						
		Size	Type	No.	By	Date	Time	pH	Field	Lab	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.							
AP3	GRAB	12	1 liter	P	1	SA	6/1/10	8:45	7.3	1																CA	
AP3	GRAB	5	1 liter	P	1					1																	HA
AP3	GRAB	12	500 ml	P	1					4																	PC
AP3	GRAB	12	500 ml	P	1					3																	

Relinquished By: <i>[Signature]</i>	Date: 6-1-10	Received By: <i>[Signature]</i>	Date: 6-1-10	<b>EMT USE ONLY</b> Client ID: SPRING Client Contact: Jim Pappas EMT Project ID: CWLP Ash Pond Table 1 Job Lot No: _____	<b>EMT SAMPLE RECEIVED ON ICE</b> <b>TEMPERATURE</b> (Must be recorded if sampling was greater than 6 hrs prior to sample return)
Relinquished By: <i>[Signature]</i>	Date: 6-1-10	Received By:	Date: - -		
Relinquished By:	Date: - -	Received By: <i>[Signature]</i>	Date: 6-1-10		
	Time: 9:45		Time: 09:45		
	Time: 17:20		Time: : :		
	Time: : :		Time: 17:20		

SPECIAL INSTRUCTIONS: TEMP 67.7°F Condo 1128

5/17/2010 3:06:20 PM



**Chain of Custody Record**

Scheduled Sampling Date: 05/17/2010  
Due Date: 05/24/2010

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**COC # 503747**

<b>Company:</b> <u>City, Water, Light &amp; Power</u> <b>Contact:</b> <b>Address:</b> <u>201 East Lake Shore Drive</u> <u>Springfield, IL 62707</u>  <b>Phone:</b> <u>(217) 757-8610</u>  <b>P.O. #:</b> _____ <b>Proj. #:</b> _____ <b>Project /Location:</b> <u>CWLP Ash Pond Table 1</u>	<b>SAMPLE TYPE:</b> 0. Water                    0. Fat                    0. Liquid 0. Process Water        1. DI Water            2. Drinking Water 3. Soil                      4. Extract              5. Wastewater 6. Oil                        7. Sludge                8. Solid 9. Air                        10. Chemical Waste    11. Wipe 12. Groundwater        13. eProduct            14. Groundwater(Filter) 15. Other	<b>Analysis</b> 1. Anions by Ion Chromatography 2. Solids, Total Dissolved (TDS) 3. Fluoride by Electrode (ISE) 4. Cyanide, Total 5. ICP MS Metals, Total 6. Mercury, Groundwater Total
	<b>CONTAINER TYPE:</b> P - Plastic                V - VOC Vial            G - Glass B - Tedlar Bag          O - Other	<b>EMT USE ONLY</b>  <b>EMT WORKORDER #</b> <u>106506310</u>
	<b>PRESERVATIVE:</b> 1. None                    2. H2SO4                3. HNO3 4. NaOH                  5. HCL                    6. MeOH 7. Zn Ace                8. Other	

Sample I.D.	Sample Type	Container Size	Container Type	No.	By	Sampling				Preservation		1	2	3	4	5	6	7	8	9	10	Lab	Sample I.D.	
						Date	Time	pH	Field	Lab														
AP4	GRAB	1 liter	P	1	[Signature]	6/1/10	9:05	6.91	1															
AP4	GRAB	1 liter	P	1	[Signature]				1															
AP4	GRAB	500 ml	P	1	[Signature]				4															
AP4	GRAB	500 ml	P	1	[Signature]				3															

Relinquished By: <u>[Signature]</u>	Date: <u>6-1-10</u>	Received By: <u>[Signature]</u>	Date: <u>6-1-10</u>	<b>EMT USE ONLY</b> Client ID: <u>SPRING</u> Client Contact: <u>Joe Pavlovic</u> EMT Project ID: <u>CWLP Ash Pond Table 1</u> Jar Lot No: _____	<b>SAMPLE RECEIVED ON ICE TEMPERATURE</b> (Must be recorded if sampling was greater than 6 hours prior to sample receipt)  <u>26</u>
Relinquished By: <u>[Signature]</u>	Date: <u>2-1-10</u>	Received By: _____	Date: _____		
Relinquished By: _____	Date: _____	Received By: _____	Date: _____		

**SPECIAL INSTRUCTIONS:** TEMP 67.9°F Condo 708



**ENVIRONMENTAL  
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TECHNOLOGIES, INC.**

### Chain of Custody Record

Scheduled Sampling Date: 05/17/2010  
Due Date: 05/24/2010

8100 North Austin Avenue Morton Grove, IL 60053-3203 (847) 967-6666 FAX: (847) 967-6735 www.emt.com

**COC # 503747**

<b>Company:</b> <u>City, Water, Light &amp; Power</u> <b>Contact:</b> <b>Address:</b> <u>201 East Lake Shore Drive</u> <u>Springfield, IL 62707</u>  <b>Phone:</b> <u>(217) 757-8610</u>  <b>P.O. #:</b> _____ <b>Proj. #:</b> _____ <b>Project /Location:</b> <u>CWLP Ash Pond Table 1</u>	<b>SAMPLE TYPE:</b> 0. Water      0. Fat      0. Liquid 0. Process Water      1. DI Water      2. Drinking Water 3. Soil      4. Extract      5. Wastewater 6. Oil      7. Sludge      8. Solid 9. Air      10. Chemical Waste      11. Wipe 12. Groundwater      13. eProduct      14. Groundwater(Filter) 15. Other _____	<b>Analysis</b> 1. Anions by Ion Chromatography 2. Solids, Total Dissolved (TDS) 3. Fluoride by Electrode (ISE) 4. Cyanide, Total 5. ICP MS Metals, Total 6. Mercury, Groundwater Total	<b>EMT USE ONLY</b>  <b>EMT WORKORDER</b> <i>10551630</i>
<b>CONTAINER TYPE:</b> P - Plastic      V - VOC Vial      G - Glass B - Tedlar Bag      O - Other _____			
<b>PRESERVATIVE:</b> 1. None      2. H2SO4      3. HNO3 4. NaOH      5. HCL      6. MeOH 7. Zn Ace      8. Other _____			

Sample I.D.	Sample Type	Container			Sampling					Preservation		Analysis										Lab Sample I.D.	
		Size	Type	No.	By	Date	Time	pH	Field	Lab	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.			
AW3	GRAB	1 liter	P	1	<i>SC</i>	<i>6/1/10</i>	<i>8:40</i>	<i>6.63</i>	1														<i>AW3</i>
AW3	GRAB	1 liter	P	1	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	1														<i>AW3</i>
AW3	GRAB	500 ml	P	1	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	4														<i>AW3</i>
AW3	GRAB	500 ml	P	1	<i>↓</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>	3														<i>AW3</i>

Relinquished By: <i>[Signature]</i>	Date: <i>6-1-10</i>	Received By: <i>[Signature]</i>	Date: <i>6-1-10</i>	<b>EMT USE ONLY</b>  Client: <b>SPRING</b> Client Contact: <b>Joe Pavlenko</b> EMT Project ID: <b>CWLP/Ash Pond Table 1</b> Lab Lot No. _____	<input checked="" type="checkbox"/> SAMPLE RECEIVED ON ICE <input type="checkbox"/> TEMPERATURE <small>(Must be recorded if sampling less than 6 hrs prior to analysis.)</small>
Time: <i>9:45</i>	Time: <i>9:45</i>				
Relinquished By: <i>[Signature]</i>	Date: <i>6-1-10</i>	Received By: _____	Date: _____		
Time: <i>17:20</i>	Time: _____				
Relinquished By: _____	Date: _____	Received By: <i>Marshall</i>	Date: <i>6/1/10</i>		
Time: _____	Time: _____	Time: <i>17:20</i>	Time: _____		

SPECIAL INSTRUCTIONS: *TEMP 71.1°F Condo 616*

5/17/2010 3:06:21 PM  
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