City Water, Light & Power
Springfield, Illinois

CCR Surface Impoundments and
FGDS Unit 2 Landfill

Flow Path Report

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EXECUTIVE SUMMARY

This Flow Path Report is prepared in accordance with paragraphs 263 and 280 of the January 14, 2025 Consent Agreement and Final Order (CAFO). The purpose of this report is to fully characterize groundwater flow paths from the CCR surface impoundments and the FGDS Disposal Facility, evaluate potential preferential pathways including the abandoned creek beneath the Dallman Ash Pond and discontinuous shallow sand, assess the potential for contact between coal combustion residuals (CCR) and groundwater after closure, and demonstrate the absence of hydraulic communication between geologic units that could facilitate contaminant transport. This report integrates site-specific geologic, hydrogeologic, and construction data, including boring logs, well installation records, groundwater monitoring results, transducer data, hydrogeologic cross-sections, static groundwater elevations, pool elevations for Lake Springfield, the clarification pond, and Sugar Creek, and potentiometric surface maps and slug testing results for hydraulic conductivity.

Key findings include:

- The abandoned creek bed beneath the Dallman Ash Pond perimeter berms and the Unit 2 Landfill has been filled and compacted during construction, precluding it from acting as a preferential pathway. Historical aerial photographs and topographic maps (United Stated Geological Survey) do not show Sugar Creek being recently present beneath the Lakeside Ash Pond.
- Current groundwater movement is generally radial from the impoundments toward Sugar Creek, with an eastward component along the eastern portion of the site toward the FGDS Landfill, then northward toward Sugar Creek.
- The shallow sand unit, which is discontinuous, was largely removed during Dallman Ash Pond construction and Sugar Creek relocation and does not serve as a primary contaminant pathway.
- The potentiometric surfaces in the shallow sand piezometers do not reflect direct connection to the impoundments, indicating hydraulic separation, particularly along the northern periphery of the Dallman Ash Pond.
- Post-closure, CCR is not anticipated to be in contact with groundwater due to the confining properties of the lower cohesive unit.
- Construction of the impoundments did not occur below the potentiometric surfaces due to hydrogeologic properties of the sediments and complexities of building structures in wet or saturated conditions.
- Nested well group AP-15S/AP-15D is proposed to be added to the monitor well system; the Groundwater Monitoring Program will be updated accordingly.

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1. INTRODUCTION

1.1 Purpose and Scope

Pursuant to Paragraphs 263 and 280 of the CAFO, City Water, Light and Power (CWLP) agreed to prepare a Flow Path Report that includes all applicable data used to determine the groundwater flow paths for the CCR Surface Impoundments and Flue Gas Desulfurization System (FGDS) Unit 2 Landfill.

This Flow Path Report focuses on groundwater flow dynamics, geologic barriers, and potential pathways to address these items. It integrates data from historical site investigations, construction records, groundwater monitoring and recent assessments. Data collection includes semiannual monitoring and transducer deployments for groundwater level monitoring events.

1.2 Site Background

CWLP owns two existing CCR surface impoundments and a CCR landfill subject to the U.S. EPA Standards for the Disposal of Coal Combustion Residuals (40 CFR 257). The CWLP CCR surface impoundments and FGDS Unit 2 Landfill are located north and east of the former Lakeside Power Generating Station and Dallman Power Generating Station in the Eastern ½ of Section 12, Township 15 North, Range 5 West, in Springfield, Illinois (see Figure 1). The CCR surface impoundments are identified as the Lakeside Ash Pond and the Dallman Ash Pond and the CCR landfill is identified as Unit 2 of the Flue Gas Desulfurization Sludge (FGDS) Landfill (see Figure 2). Depicted in Figure 3 is the 1936 pre-CCR impoundment conditions of the CWLP facility looking to the north-northeast.

The Lakeside Ash Pond was placed into service prior to 1958 and ceased receiving ash in 2009. It has been divided into four separate ponds, three lime sludge ponds (out of service since October 13, 2023) and the settling pond consisting of approximately 35.0 acres. The Lakeside Ash Pond formerly received lime sludge from the CWLP Drinking Water Purification Plant, scrubber wastewater treatment plant clarifier blowdown and water from miscellaneous floor drains. Construction of new concrete-lined lime sludge ponds were completed and began operation simultaneously with the cessation of the use of Lakeside Ash Pond.

The Dallman Ash Pond was placed into service in 1976 and is approximately 34.5 acres. The Dallman Ash Pond formerly received fly ash and bottom ash, which were sluiced with raw lake water, industrial wastewater treatment plant clarifier blowdown and landfill leachate. CWLP ceased operating Dallman Units 31 & 32 and ceased operating Dallman Unit 33 by September 15, 2023 with all CCR/non-CCR waste streams ceased by October 13, 2023.

The FGDS Unit 2 Landfill, is an existing non-hazardous special waste landfill. Located immediately east of the Dallman Ash Pond, this is a permitted non-hazardous special waste landfill (Illinois EPA Permit No. 1995-243-LFM) for flue gas desulfurization sludge, bottom ash, fly ash, and lime sludge. The FGDS Disposal Facility consists of 40 acres with 22.3 acres of disposal area divided into two units. The south unit is identified as Unit 1 and the north unit is identified as Unit 2.

2. SURFACE IMPOUNDMENT/LANDFILL CONSTRUCTION

Prior to the area development the property on which the CCR surface impoundments and CCR landfill have been constructed was originally for agricultural/pasture purposes as well as woodlands where the Dallman Ash Pond is located. Sugar Creek historically meandered across the site, generally from the west to east with an overall flow direction to the north. Prior to the creek relocation, the creek bed was largely restricted to the northern half of the facility where the Dallman Ash Pond and Unit 2 Landfill are located. Figure 4 shows the subject area prior to development of the ponds or landfill. The upper layer of soil at the site consisted of 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. Much of the shallow soils were displaced during area development.

During the construction of the Dallman Ash Pond, the creek was abandoned and relocated west and north of the site. The Grading Plan drawing by Burns & McDonnell (Drawing No. Y29, Rev. 4, dated August 13, 1976) (Figure 5) depicts the creek realignment. Abandonment of the creek channel included the placement of different soil types, ranging from cohesive soils characterized as silty clays, to granular fill characterized as poorly graded silty to clayey sands. While the vertical hydraulic conductivity of the material that forms the bottom of the surface impoundments is generally low, soils were not compacted beneath the impoundments except for sections where the dikes of the Dallman Ash Pond were built atop the existing creek bed. No composite liner or alternative composite liner as specified in 40 CFR Part 257.70 (b) or 40 CFR Part 257.70 9 (c)(1), was used to line the bottom of either ash pond.

The Lakeside Ash Pond contains approximately 1,565,000 cubic yards (cu. yds.) of CCR including water treatment plant sludge. The Lakeside Ash Pond is primarily a diked embankment with some incising along the east perimeter. The ash pond abuts the Lake Springfield Spaulding Dam to the south and the original portion of the ash pond abuts the Unit 1 landfill and the clarification pond to the north. Open downstream slopes are present along the west dike of the original ash pond, and the vertical expansion berms, which were constructed on the east, west and north boundaries of the ash pond. The original Lakeside Ash Pond has been divided into four separate ponds since it was expanded vertically in 1988; three lime ponds and the settling pond. The vertical expansion consists of berms built on top and inside of the existing embankments. The floor of the Lakeside

Ash Pond is approximately elevation 530 feet and slopes upward in the eastern portion following the natural topography.

The Dallman Ash Pond contains approximately 1,217,000 cu. yds. of CCR. The Dallman Ash Pond is a diked embankment surface impoundment. The entire Dallman Ash Pond is partially incised. The berms for the Dallman Ash Pond were built to a height of approximately 27 feet (554 feet MSL), using slopes of 2.5H:1V for both the inner and outer slopes. The elevation of the base of the surface impoundments is approximately 525 feet MSL based on aforementioned drawing Figure 5 and borings advanced to the floor of Dallman Ash Pond. Material from the center of the ash pond was excavated and utilized in the construction of the dikes. As depicted on the Grading Plan drawing by Burns & McDonnell (Figure 5), the Dallman Ash Pond dikes were constructed on areas of the old creek bed. According to Note 4 on this drawing, the creek bed in these areas was over-excavated by at least 4 feet below the existing channel banks and bottom. These excavations were then filled in with cohesive material and compacted to at least 90 percent of maximum dry density. The Dallman Ash Pond abuts the FGDS landfills to the east and the clarification pond to the south. The only open downstream slopes are on the west and north dikes. The floor of Dallman Ash Pond slopes from approximately 530 feet MSL along the southern perimeter to approximately 525 along the northern edge.

The CWLP FGDS Development Landfill Unit 2 is located directly to the east of the Dallman Ash Pond. CWLP has owned and operated the FGDS Development Landfill since 1988. Prior to 1988, the facility was owned and operated by the private corporation Environmental Site Developers, Inc. The original design for Landfill Unit 2 designated three disposal areas identified as Cells 1, 2, and 3. In September 1993, the Illinois Environmental Protection Agency ("IEPA") approved an application seeking the separation of the active Cell 1 from the then-undeveloped Cells 2 and 3. This created Landfill Unit 1, which consists solely of the now-closed Cell 1, and Landfill Unit 2, which is comprised of Cells 2 and 3.

CWLP initiated development of Landfill Unit 2 in 1993, and IEPA issued a permit to operate Landfill Unit 2 under 35 Ill. Admin. Code Parts 811–814 on November 9, 1995. Landfill Unit 2 consists of approximately 22.3-acres of permitted disposal area separated into Cells 2 and 3. Cell 2 has not been developed and only 3.0 acres of Cell 3 has been developed. The IEPA operating permit authorizes Landfill Unit 2 to receive flue gas desulfurization ("FGD") sludge (more commonly known as gypsum), bottom ash, fly ash, lime sludge from the Water Purification Plant, FGD wastewater treatment plant sludge, and Generating Facility wastewater treatment plant sludge.

The Landfill Unit 2 was constructed with a 5 foot recompacted clay liner overlain by a leachate collection system. The leachate collection system is composed of a 12-inch sand drainage layer on the floor grades with a geocomposite drain on the western and northern 10-percent sloped floor directly on the 5 foot recompacted clay liner. A geotextile fabric is directly above the 12-inch sand drainage layer to prevent clogging of the sand. A leachate collection trench was centrally placed within the landfill running west to east over the 5 foot recompacted clay liner. The leachate collection trench is composed of a leachate collection pipe surrounded by gravel and wrapped in a geotextile fabric. The leachate collection pipe terminates into the leachate manhole riser on the east side of the landfill within the termination berm.

The lowest point of the 5 foot recompacted clay liner subgrade is approximately at an elevation of approximately 525 feet MSL and the lowest extent of the waste within the landfill is at an approximate elevation of 531 feet MSL, both near the central eastern point of the landfill near the leachate manhole riser. The remainder of the landfill is above these elevations.

3. SUBSURFACE CONDITIONS

3.1 Hydrogeologic Investigations

The subsurface conditions of the CWLP facility have been characterized through multiple subsurface investigations, including those prior to the CCR impoundment development, along the perimeter of the impoundments and including the hydrogeologic investigation at the CCR landfill located north of the Lakeside Ash Pond and east of the Dallman Ash Pond. These investigations span from June 1989 to present day. In chronological order, the investigations are:

- Professional Service Industries (PSI), June 1989. This investigation consisted of five soil borings within the east section of the south cell (Cell 1).
- Andrews Environmental Engineering, Inc., February 1990. This investigation was performed for Cell 2 and consisted of 13 soil borings. The drilling and testing were completed by PSI.
- Andrews Environmental Engineering, Inc., March 1990. This investigation was performed to install six wells at the Facility. The drilling and testing were completed by PSI.
- Patrick Engineering, Inc. (PEI), July 1992. This investigation was performed to further characterize the hydrogeology of the landfill setting.
- Stabilize, Inc., December 2008. This investigation installed three new monitoring wells as part of an assessment monitoring program for the landfill. The drilling, soil testing, and well construction were performed by Reynolds Well Drilling.
- CWLP, April 2010. This investigation was performed to install four piezometers on the west side of the CCR surface impoundments along Sugar Creek. The drilling and testing were completed by PSI.
- Stabilize, Inc., May 2011. This investigation installed four new monitoring wells to further the characterization of the CCR surface impoundments. The drilling, soil testing, and well construction were performed by PSI.

- Andrews Engineering, January 2012. This investigation was performed to replace CCR surface impoundment wells and install an additional background well. The drilling and well installation were completed by TerraDrill.
- Andrews Engineering, July 2017. This project included drilling peripheral to the Dallman Ash Pond and the installation of basal sand/bedrock interface wells at TW3E, TW3W and TW3N. TW3N is the replacement wells for AW-3 and is identified in the groundwater monitoring program as RW-3.
- Andrews Engineering, June 2019. This investigation advanced 7 direct push borings peripheral to the Dallman Ash Pond, GP-2, GP-3, GP-4, GP-5, GP-6 and GP-7 and included the installation 2 new monitoring wells (AP6 in boring GP6 and AP-7 in boring GP2) as part of an assessment program for the CCR ash impoundments.
- Andrews Engineering, February 2021. This investigation consisted of borings and construction of groundwater monitoring wells at 7 locations along the periphery of Dallman and Lakeside Ash Ponds; adjacent to Sugar Creek. These are identified as AP-8, AP-9, AP-10, AP11, AP-12, AP-13 and AP-14.
- Andrews Engineering, October 2023. This investigation consisted of 34 borings next to the impoundments and 4 next to landfill Unit 1, to investigate the CCR ash surface impoundment berm construction materials and the installation of 29 vibrating wire piezometers to characterize the stability of the berms. These are identified as B-1, B-1L, B-1LL, B-1U, B-1CCR, B-2, B-2L, B-2U, B-2CCR, B-3, B-3U, B-3CCR, B-4, B-4L, B-4U, B-4CCR, B-5, B-5L, B-5CCR, B-6, B-6L, B-6CCR, B-7, B-7L, B-7CCR, B8-L, B8-U, B-9L, B-9U, B-9CCR, B-10CCR, B-11U, B-12L, B-12U, B-13BN, B-13BS, B-13L, B-13LF. With the exception of B-4L, B-4U, B-4CCR, B-8U and B-11U, the borings were completed with vibrating wire sensors.
- Andrews Engineering, February 2024. This investigation consisted of 14 borings using a cone penetrometer adjacent to and within the Dallman and Lakeside Ash Ponds. These borings are identified as CPT-1CCR, CPT-2CCR, CPT-2L, CPT-3CCR, CPT-4CCR, CPT-4L, CPT 5CCR, CPT-6CCR, CPT-6L, CPT-7CCR, CPT-7L, CPT-10CCR, CPT-14CCR and CPT-15CCR.
- Andrews Engineering, April/May 2024. This investigation consisted of 4 borings advanced in the Dallman Ash Pond (D-1, D-2, D-3 and D-4) and 4 borings advanced in the Lakeside Ash Pond (L-1, L-3, L-4 and L-5). Wells were constructed to screen the bottom of the CCR in these borings. This investigation also included the advancement of borings T-1, T-2, T-4, T-5 and T-6 on the opposite side of Sugar Creek, west and north of the surface impoundment area and the advancement of a deep boring, B100, which was packer tested to characterize bedrock permeability.
- Hanson Professional Services, Inc. (Hanson), August 2024. This investigation consisted of a total of 12 borings, 5 through the Dallman Ash Pond (DB-01, DB-02, DB-03, DB-04 and DB-05) and 5 through the Lakeside Ash Pond (LB-01, LB-02, LB-03, LB-04 and

LB-05). Two of the Dallman Ash Pond borings were converted to piezometers (DB-04 and DB-05) and one of the borings in the Lakeside Ash Pond (LB02) was converted to a piezometer.

- Hanson, May/June 2025. This investigation consisted of 4 borings (D-06, D-07, D-08 and DW-01) completed as wells within the Dallman Ash Pond, and two of the borings, BH-01 and BH-02, were completed as wells along the berm that separates the Dallman Ash Pond from the clarification pond.
- Andrews Engineering, May 2025. This investigation consisted of the advancement of 21 borings (AP-6S, AP-6SA, AP-8S, AP-8SA, AP-15S, AP-15D, AP-16, AW-2, B2-LE, B-4E, B-6E, B-6LE, B-7E, B-7LE, G-104, G-104S, P-03D, P-03S, R-103, RW3S and T-4S) with the installation of 9 groundwater monitoring wells (AP-6SA, AP-8SA, AP-15S, AP-15D, AP-16, G-104S, P-03S, RW3S and T-4S). Seven of these borings (AW-2, B-2LE, B-4E, B-6E, B-6LE, B-7E and B-7LE) were completed to collect additional samples for characterization of the berm/foundation soils and one to verify previous boring log comments.

The investigations and related work conducted to date have provided sufficient information to characterize the site hydrogeologic conditions, including the uppermost saturated zone (i.e., basal sand) and the uppermost confining unit (i.e., bedrock). Figure 6 depicts all borings, monitoring wells/piezometers and vibrating wire locations. The site-specific geologic conditions have been refined through the advancement of additional borings during 2024 and 2025. Boring logs and well completion reports for these 2024 and 2025 investigations are included as Appendix A and Appendix B, respectively.

Data from these investigations has been used to create and refine the geologic cross-sections, with an emphasis on characterizing the primary hydrostratigraphic units. The geologic cross-sections have been updated to include information from these recent, 2024 and 2025 investigations. The revised geologic cross-sections are provided in Appendix C.

3.2 Uppermost Bedrock

The bedrock at the project site consists of Pennsylvanian aged shale that is gray in color with some coal seams. Erosion of the bedrock surface has occurred along the alluvial valley forming a south to north trough in which Sugar Creek is located. The bedrock increases in elevation to the eastern and western flanks of the bedrock trough. There appears to be a bedrock ridge which runs south southeast to north northwest at the northeast corner of the Dallman Ash Pond. At this location the bedrock elevation increases from approximately 497 feet MSL at RW3 to 527 feet MSL at GP-3, just north of Sugar Creek. Near the center of the landfill, the bedrock surface elevation varies from approximately 492 feet MSL to approximately 554 feet MSL at the southeast corner of Cell 1, boring B-14. Figure 7 depicts the bedrock surface elevations.

Rock Quality Designation (RQD) measurements were performed on core samples taken from the FGDS Landfill area. RQDs measured from core samples collected during this investigation ranges from 80% to 100%. The RQD values indicate that the bedrock exhibits minimal to no fracturing. Two in situ hydraulic conductivity tests were performed to determine the hydraulic conductivity of the upper portions of the bedrock. Test results indicate hydraulic conductivity values of 1.8 x 10^{-7} cm/sec and 1.3 x 10^{-6} cm/sec (Patrick, 1993). This shows that the bedrock encountered at the project site is a lower confining unit to the uppermost saturated zone. There is good correlation between the lithology of the rocks tested and the hydraulic conductivity values obtained. The upper bedrock beneath the impoundments is expected to exhibit the same characteristics as encountered at the landfill. RQD and slug test data for the Patrick 1989 application are included in Appendix D.

A 2024 investigation included the completion of deep boring B100. Located immediately north of the Dallman Ash Pond on adjacent to Sugar Creek the deep boring was advanced to 103.5 feet below ground surface (BGS). Bedrock at this location was encountered at 32.3 feet BGS (500.7 feet MSL). Packer testing was completed at seven intervals (i.e., 93 to 103.5 feet BGS, 82.5 to 93 feet BGS, 72 to 82.5 feet BGS, 61.5 to 72 feet BGS, and 51 to 61.5 feet BGS with the final two intervals overlapping 40.5 to 51 and 38.5 to 49 feet BGS). Test results indicate hydraulic conductivity below 482 feet MSL is less than 1 x 10^{-9} cm/sec. The results for the intervals tested above 482 feet MSL are invalid as a result of hydraulic fracturing of the bedrock and the resultant inability to establish a seal within the shallow bedrock portion of the borehole. The results confirm that bedrock below the weathered zone is relatively impermeable; however, the shallow weathered bedrock may have higher hydraulic conductivities and in direct hydraulic communication with the overlying basal sand such that the interface of the unconsolidated deposits and bedrock comprise the uppermost saturated zone. The packer test data from this investigation is included in Appendix D.

There is good correlation between the lithology of the rocks tested and the hydraulic conductivity values obtained. The upper bedrock beneath the impoundments is expected to exhibit the same characteristics as encountered at the landfill.

3.3 Surficial Deposits

The shallow stratigraphy and lithology at the CCR units include approximately 20 to 50 feet of unconsolidated sediments, dependent upon location. In ascending order (i.e., oldest to youngest) these materials are identified as basal sand, creek fill, lower cohesive deposit, shallow sand, upper cohesive deposit and fill material. For the FGDS Landfill, the hydrogeology is consistent with the adjacent impoundments, with the basal sand as the uppermost saturated zone. As described below, the uppermost unit directly beneath the CCR surface impoundment varies with the Lakeside Ash Pond resting directly on the upper cohesive deposit and the southern third of the Dallman Ash Pond resting on the upper cohesive deposit and northern two-thirds resting on the lower cohesive deposit.

The overall tendency is for the finer-grained materials (clays, silty clays and silts) to overlie the coarser-grained materials (sands and gravels). This coarsening downward is present throughout much of the site. At the majority of the borehole locations, the coarser materials rest directly on top of the weathered bedrock surface. It is this coarser material, the basal sand, which is characterized as the uppermost saturated zone.

The occurrence of the deposits discussed below are variable due to the meandering nature of Sugar Creek prior to the development of Lake Springfield and Spaulding Dam. The meandering creek has resulted in sequential erosion and deposition (scour and fill) throughout much of the creek drainage system, both laterally and vertically.

3.3.1 Basal Sand

The basal sand generally overlies the bedrock surface and underlies the lower cohesive deposit. There are some pockets of very hard, fine-grained silty clay to clay overlying bedrock in a few areas. The basal sand is present above these pockets of clayey deposits, thought to be weathered bedrock. In most locations, the basal sand is the lower-most surficial deposit. The basal sand is a gray, poorly graded, silty to clayey fine sand to well graded sand with minor amounts of fine gravel. This unit is in a medium dense to dense condition. Across the CWLP facility (includes the Dallman and Lakeside Ash Ponds), the top elevation of the basal sand varies from 486.9 feet MSL (G113) to 535.1 feet MSL (GP-3) and the thickness ranges from absent to 18.6 feet. The unit was not consistently encountered, likely due to excessive erosion of the creek bottom. The surface of the Basal Sand is depicted in Figure 8. The thickness of the Basal Sand is depicted in Figure 9.

The basal sand generally consists of 0% to 34% gravel, 50% to 91% sand, and 6% to 44% silt/clay; and exhibits a horizontal hydraulic conductivity of ranging from 1.15×10^{-3} to 7.64×10^{-2} cm/sec. The geometric mean hydraulic conductivity is 1.25×10^{-2} cm/sec. The basal sand was saturated in all locations where it was encountered (Patrick, 1993). Grain size analyses are provided in Appendix E.

Hanson conducted slug testing on the FGDS Landfill and CCR Surface Impoundment groundwater monitoring wells and the ash impoundment CCR wells during March 2025. The basal sand wells exhibited hydraulic conductivities ranging from a minimum of 4.57×10^{-5} cm/sec to a maximum of 8.84×10^{-2} cm/sec. The geometric mean hydraulic conductivity of the basal sand is 1.86×10^{-3} cm/sec. The slug test data from Hanson is provided in Appendix D.

In August 2025 Andrews Engineering performed slug testing at Basal Sand wells AP-15D, AP-16 and P-03D. The slug testing results ranged from a minimum hydraulic conductivity of 2.62×10^{-5} cm/sec to a maximum of 4.03×10^{-3} cm/sec. The geometric mean hydraulic conductivity is 2.91×10^{-4} cm/sec. This value is in general agreement with that determined from previous investigations.

3.3.2 Lower Cohesive Deposit

The lower cohesive deposit consists of brown, gray, and brownish gray silty clays, clayey silts, and clays, having very soft to stiff consistency. Across the CWLP facility, the lower cohesive deposit is as much as 27 feet thick with an average thickness of about 11 feet. The deposit was not encountered in isolated areas along the abandoned creek, possibly due to excessive erosion of the creek bottom in these areas. The northern two-thirds of the Dallman Ash Pond rests directly on top of the lower cohesive deposit. The top of the lower cohesive deposit is depicted in Figure 10. The thickness of the lower cohesive deposit is depicted in Figure 11

The soils in the lower cohesive deposit can be similar in color and texture to the soils in the upper cohesive deposit. 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 lower cohesive deposit is not exposed at the ground surface in the investigation area.

The lower cohesive deposit consists of 0% gravel, 8% to 48% sand, and 52% to 95% silt/clay; and has a low hydraulic conductivity. The vertical hydraulic conductivity ranges from 1.3×10^{-8} to 1.8×10^{-6} cm/sec (triaxial permeameter). Based on these values, the average vertical hydraulic conductivity is 9.07×10^{-7}. The horizontal hydraulic conductivity ranges from 4.6×10^{-5} to 7.6×10^{-5} cm/sec (Patrick, 1993). Grain size analyses are provided in Appendix E.

As part of the 2023 geotechnical investigations conducted by Andrews Engineering, four borings were advanced in Lakeside Ash Pond and four borings in Dallman Ash Pond to confirm the bottom elevations of each impoundment. Borings L-1, L-3, L-4 and L-5 were advanced in Lakeside Ash pond where silty/clay materials were encountered at 534.5 feet MSL, 530.5 feet MSL, 553.0 feet MSL and 530.0 feet MSL, respectively. Borings D-1, D-2, D-3 and D-4 were advanced in Dalman Ash Pond where silty/clay materials were encountered at 526.0 feet MSL, 523.0 feet MSL, 526.2 feet MSL and 529.5 feet MSL respectively. The range of hydraulic conductivities for the silty/clay materials beneath Lakeside Ash Pond are from 6.8 x 10-6 cm/sec to 8.5 x 10-8 cm/sec with a geometric mean of 2.58 x 10-7 cm/sec. The range of hydraulic conductivities for the silty/clay materials beneath Dallman Ash Pond are from 2.1 x 10-6 cm/sec to 5.1 x 10-8 cm/sec with a geometric mean of 4.53 x 10-7 cm/sec.

3.3.3 Shallow Sand

The unit identified as the shallow sand is a fluvial deposit. Where it has been encountered, it is located between the top of the lower cohesive deposit and below the upper cohesive deposit. The discontinuous nature of the shallow sand is explained by the historical meandering nature of surface water across the area of investigation. Sediment deposition within a fluvial setting varies from fine-grained silts and clays to coarser sands, with the coarser materials being deposited as the water slows. As the creek flows into the inside of a bend, velocity decreases, causing the heaviest particles, typically sands and silty sands, to settle out first. Finer sediments remain suspended longer and are deposited further along the point bar or during overbank flooding. Because coarse-grained deposition is tied to localized drops in energy, such as those found only at specific points within the meander bends or during certain flood events, these deposits tend to be discontinuous. As a result, sand and silty sand lenses are often isolated within a matrix of finer material, creating a stratigraphic sequence that reflects the variable and shifting energy conditions of the meandering system.

The shallow sand was encountered on portions of the floor of FGDS Unit 2 Landfill and along the north side, and to a limited extent, west side of the Dallman Ash Pond from the middle of the north side to the eastern edge. The shallow sand was generally encountered between 515 feet MSL and 525 feet MSL, with some instance as low as 510 feet MSL and some as high as 530 feet MSL. This wide variation in elevations points to it variable deposition nature. Where encountered it is typically only a few feet in thickness or less. However, a thickness of 6 feet was observed in the undeveloped southern portion of Unit 2 and an approximate thickness of 7 feet was observed in boring AP15 west of the Lakeside Ash Pond. It appears the shallow sand may underlie a small section of the Lakeside Ash Pond where it is separated from the bottom of the Lakeside Ash Pond by approximately 8 feet of low permeability silty clay upper cohesive deposit. The shallow sand was not found to underlie the Dallman Ash Pond or Cell 3 of the Unit 2 Landfill. The extent and surface of the shallow sand is depicted in Figure 12. The thickness of the shallow sand is depicted in Figure 13.

Hydrogeologic cross-sections (e.g., Cross-Section A-A' and B-B') depict the limited extent of the shallow sand along the northern end and west side of the Dallman Ash Pond, respectively. These cross sections depict the shallow sand encountered at and above 525 feet MSL, but not intersecting CCR in saturated zones. Cross-section A-A' depicts the shallow sand present at AP-8, GP-4, TW3W and RW3.

According to the Grading Plan drawing by Burns & McDonnell (see Figure 5), the creek relocation project varied from an elevation of 520 feet MSL at the northwest corner to 516 MSL at the northeast corner. The drawing depicts that soils along the constructed creek channel were excavated along a 4:1 horizontal to vertical slope from the center line of the creek location channel and backfilled with cohesive soils essentially isolating the presence of the sand to a narrow band adjacent to the toe of the slope of the berm. This would result in the removal of the shallow sand from the along the creek relocation area, essentially eliminating/removing the migration pathway of any fluvial sand deposits adjacent to the Dallman Ash Pond.

Along the west side of the Lakeside Ash Pond, a shallow sand appears in boring AP-15D and the B-2 series of borings used to characterize that portion of the Lakeside Ash Pond dike. A shallow sand was encountered at the location at approximately 525 feet MSL to 510 feet MSL. At this location, the bottom of the Lakeside Ash Pond is at approximately 535 feet MSL. This results in an approximate 10 foot vertical separation between the bottom of the Lakeside Ash Pond and the shallow sand at this location.

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. Two FGDS Unit 2 Landfill piezometers (P06S and P07S) were screened in the shallow sand unit to obtain potentiometric surface information and conduct field hydraulic conductivity tests. The hydraulic conductivity of this unit based on the slug test results ranges from 3.6 x 10^{-3} to 2.9 x 10^{-2} cm/sec (Patrick, 1993). Grain size analyses are provided in Appendix E.

Hanson conducted slug testing on FGDS Unit 2 Landfill wells during March 2025. The Unit 2 shallow sand wells P06S and P07S exhibited hydraulic conductivities ranging from 1.53 x 10^{-3} cm/sec to a maximum of 3.35 x 10^{-3} cm/sec. The geometric mean hydraulic conductivity of the shallow sand is 2.29 x 10^{-3} cm/sec.

In August 2025 Andrews Engineering performed slug testing of the Shallow Sand wells AP6S, AP-15S, G-104S, P-03S, R-103S, and RW3S. The slug testing results ranged from a minimum hydraulic conductivity of 4.30 x 10^{-4} cm/sec to a maximum of 2.23 x 10^{-2} cm/sec. The geometric mean hydraulic conductivity is 1.53 x 10^{-3} cm/sec. This value is in general agreement with that determined from previous investigations.

3.3.4 Upper Cohesive Deposit

The upper cohesive deposit consists of brown, light brown to brownish-gray silty clays to clayey silts having soft to stiff consistency. The unit includes loess deposits and isolated pockets of fine-grained silty to clayey sand and at some location alluvial silts and silty clays. The upper cohesive deposit is laterally adjacent to the sidewall of the CCR surface impoundment. The top of the upper cohesive deposit is depicted in Figure 14. The thickness of the upper cohesive deposit is depicted in Figure 15.

The upper cohesive deposit has a low vertical hydraulic conductivity 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 5.2 x 10^{-7} cm/sec to

1.6×10^{5} cm/sec (Patrick, 1993). It is expected that the horizontal coefficient of hydraulic conductivity is greater than the vertical coefficient. Based on test results for the lower cohesive deposit, it is anticipated that the horizontal hydraulic conductivity for the upper cohesive deposit is in the range of 10^{-6} to 10^{-5} cm/sec (Patrick, 1993).

In 2024, four borings were conducted through both the Dallman and Lakeside Ash Ponds for the purposes of characterizing the geology immediately below the impoundments. Shelby tube samples were obtained from borings D-1, D-2, D-3 and D-4 (Dallman), and L-1, L-3, L-4 and L-5 (Lakeside). The geometric mean hydraulic conductivities of four samples under Dalman Ash Pond is 4.53×10^{-7} cm/sec. The geometric mean hydraulic conductivities of four samples under Lakeside Ash Pond is 2.58×10^{-7} cm/sec. The boring logs are provided in Appendix A and the laboratory hydraulic conductivity results are provided in Appendix E.

3.3.5 Creek Fill

Creek fill is the material used to abandon the former channel of Sugar Creek. Borings conducted along the abandoned creek (i.e., CB-1 through CB-4, CB-7 through CB-9, P-5D and P-8D) indicate that the creek fill is variable, ranging from silty clays to organic clays to silty sands. In some locations the CCR surface impoundment and CCR landfill dikes were constructed over the creek channel. The Grading Plan drawing by Burns & McDonnell (see Note 4 on Figure 5) indicates that where construction of a dike was over the former Sugar Creek channel, the creek fill was over excavated at least 4 feet below the existing channel banks and bottom and then filled with cohesive material and compacted to at 90%.

The cohesive soils are characterized as silty clay to organic silty clay which contain varying quantities of fine- to medium-grained sand. Wood fragments and other organic 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 location of the creek abandonment is depicted on Figure 5.

The cohesive fill material contains 0% gravel, 2% to 48% sand, and 52% to 98% silt/clay. The vertical hydraulic conductivity ranges from 7.6×10^{-8} cm/sec to.2.1×10^{-5} cm/sec. The granular fill materials contain 0 to 2% gravel, 55% to 65% sand and 33% to 45% silt/clay. Based on one laboratory hydraulic conductivity test performed on a Shelby tube sample obtained from berm fill, the hydraulic conductivity of the granular fill material is 3.3×10^{-8} cm/sec (Patrick, 1993). Grain size analyses are provided in Appendix E.

Three landfill piezometers (P-3S, P-5S and P-8S) are screened across creek fill materials. Of these, one piezometer (P-5S) was installed across cohesive fill material (i.e., organic silty clay) and the other piezometers were installed across granular fill materials (i.e., clayey sand and silty sand). Hydraulic conductivity of the granular fill materials ranged from a minimum of 7.1 x 10^{5} cm/sec to 1.5 x 10^{-2} cm/sec with a geometric mean of 6.02 x 10^{-4} cm/sec. The hydraulic conductivity of the cohesive fill material ranged from 7.1 x 10^{-5} cm/sec to 1.1 x 10^{-4} cm/sec, and an average of 8.6 x 10^{-5} cm/sec (Patrick 1993). These values represent the hydraulic conductivity in the horizontal direction.

The horizontal 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 (Patrick, 1993).

3.4 Hydrogeologic Units

The uppermost saturated zone and underlying confining unit control groundwater movement and the potential for CCR impacted groundwater migration at the site. A description of the uppermost saturated zone and the underlying confining unit follows:

3.4.1 Intermittent Saturated Shallow Sand

The shallow sand is the uppermost saturated interval. As described above, the shallow sand is encountered intermittently between the top of the lower cohesive deposit and below the upper cohesive deposit, primarily on portions of the FGDS Unit 2 Landfill floor and along the north and west sides of the Dallman Ash Pond, from the middle of the north side to the eastern edge. It occurs at elevations generally between 515 and 525 feet MSL, with variations from 510 to 530 feet MSL, and thicknesses typically a few feet or less, though up to 6-7 feet in isolated areas at boring AP-15. The intermittent saturated shallow sand appears to be under confined, semi-confined, or unconfined conditions dependent upon location. The unit may underlie a small portion of the Lakeside Ash Pond, separated by about 8-10 feet of low-permeability silty clay, but it is absent beneath the Dallman Ash Pond or the Unit 2 Landfill. Creek relocation excavations along the Dallman Ash Pond further limited its extent by removing sands adjacent to the berm slopes, as shown in hydrogeologic cross-sections and figures depicting its surface and thickness.

The shallow sand wells include AP-6S, AP-8S, AP-15S, G-113, P-03S, P-06S North, P-07S West, P-09S West, P-103S, P-104S, RW3S and T-4S. There are three complete sets of shallow groundwater elevation data: June, 25, 2025, July 21, 2025 and August 21, 2025. The shallow groundwater elevations range from a minimum of 518.98 to 537.67 feet MSL. The average shallow groundwater elevation is 527.08 feet MSL.

As described above, the creek relocation project resulted in the excavation of soils along the constructed creek channel (i.e., west to east creek bed elevations are 520 to 516 feet MSL) along a 4:1 horizontal to vertical slope from the center line of the creek location channel. This excavation was then backfilled with cohesive soils essentially isolating the presence of the shallow sand to a narrow band adjacent to the toe of the slope of the northern berm. This would result in the removal of the shallow sand from the along the creek relocation area, essentially eliminating/removing the migration pathway of any fluvial sand deposits adjacent to the Dallman Ash Pond.

3.4.2 Uppermost Saturated Zone

The uppermost saturated zone is characterized as the basal sand overlying the shale bedrock. As indicated above, the hydraulic conductivity of the basal sand ranges from 1.15×10^{-3} to 7.64×10^{-2} cm/sec and exhibits a mean value of 1.25×10^{-2} cm/sec. The groundwater in the basal sand appears to be under semi- to confined conditions. The upper limit of the uppermost saturated zone is dependent upon the seasonally fluctuating groundwater table. The potentiometric surface of the basal sand varies from 565 feet MSL at upgradient locations (i.e., AP5), south of the Lakeside Ash Pond, to 525 feet MSL at down-gradient locations near Sugar Creek, north of the Dallman Ash Pond. As a result, the potentiometric surface is variably dependent upon the location and the seasonal variation.

Creek fill material was encountered in FGDS Unit 2 Landfill locations CB-1, CB-2, CB-3, CB-4, P-3D, P-5D, B1-89, B6-89, B11-89, B12-89, B17-89 and G-104. The creek fill materials directly overlay the basal sand at P-5D, B1-89, B6-89 and B11-89. At these locations the creek fill is a silty clay, effectively eliminating the creek fill as a flow path. Due to the highly variable hydraulic characteristics and random placement of the creek fill materials, further characterization is difficult. The creek fill material does not present a contaminant flow path from the CCR units to the basal sand. The basal sand appears to be separated from the overlying CCR units by the upper and lower cohesive deposit, and or soils recompacted under the dikes where the dikes intersected the former creek channel and where the creek realignment effectively removed the high permeability soils.

3.4.3 Lower Confining Unit

The uppermost bedrock at the project site is primarily Pennsylvanian age shale with isolated thin coal layers. The Pennsylvanian shale functions as a lower confining unit due to its low hydraulic conductivity and effective porosity. The lower confining unit represents a natural hydrogeologic barrier (i.e., aquitard) to the vertical movement of groundwater.

In situ hydraulic conductivity test (slug tests) indicate that the hydraulic conductivity for the upper portions of the bedrock range from 1.8×10^{-7} cm/sec (0.0568 m/a) to 1.3×10^{-6} cm/sec (0.410 m/a) (Patrick, 1993). 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 movement of groundwater.

3.5 Groundwater Elevations and Pool Levels

Static groundwater elevations were measured on a monthly schedule during 2025. Intermittent saturated shallow sand wells AP-6S, AP-8S, AP-15S, P-03S, P-103S, P-104S, RW3S and T-4S were installed in June 2025. The collection of groundwater elevations at these wells commenced June 2025. A summary of the groundwater elevations (in feet MSL) is provided in Table 1. This table includes all monitoring points including the adjacent surface water bodies: Lake Springfield, the clarification pond, and Sugar Creek. Also included in this table are pore water elevations for the Dallman Ash Pond and Lakeside Ash Pond wells (i.e., D and L wells, respectively).

There appears to be a slight seasonal variation in groundwater and pore water levels with higher levels generally observed during April and the lowest elevations observed during August 2025. The horizontal hydraulic gradient of the basal sand was calculated based on groundwater flow from well G-110 to well P-106. Using these wells, a horizontal hydraulic gradients was calculated for averages of the 2025 reported groundwater elevations for these wells/piezometers. As presented below, the horizontal hydraulic gradient within the basal sand exhibits an average of 0.00591 ft/ft.

Vertical hydraulic gradient were calculated for the nested groundwater monitoring well/piezometer locations AP-6/AP-6S, AP-8/AP8S, AP-15D/AP-15S, P-03D/P-03S, P-06R/P-06R/P-06S, P-07D/P-07M/P-07S, P-09D/P-09S, P-103/P-103S, P-104/P-104S, and RW3/RW3S. The vertical hydraulic gradients are summarized in Table 2. With the exception of the vertical hydraulic gradients at well pairs AP-15D/AP-15S, P-103/P-103S, P-104/P-104S and RW3/RW3S, the vertical hydraulic gradients are positive (i.e., upward). The overall upward hydraulic gradient is consistent with the characterization of the basal sand being a confined unit.

Well pairs AP-15D/AP-15S and RW3/RW3S are located along the western and northern perimeter of Dallman Ash Pond, respectively. Well pairs P-103/P-103S and P-104/P-104S are located along the northern perimeter of Unit 2. These well pairs are located along the periphery of the Dallman Ash Pond and Unit 2 in the where the shallow sand appears to be the thickest.

3.6 Potentiometric Surface Maps

Groundwater movement is controlled by recharge along topographic highs and discharge along the original stream valley. The pre-surface impoundment flow direction in the uppermost saturated zone was dominantly horizontal from the adjacent banks toward the natural convergence along Sugar Creek, which formerly drained the site. The overall groundwater movement was from south to north with local deviations. This dominant flow pattern persists under present day conditions but with localized variation introduced by the hydrologic discontinuity created upon construction of the FGDS Landfill and CCR surface impoundments.

Existing wells at the site, including wells from the FGDS Landfill, were used to derive potentiometric surface maps. As discussed, overall groundwater flow is from south to north. The east perimeter of the Lakeside Ash Pond is largely up-gradient, and the west side is downgradient to side-gradient. Excavated areas within the landfill boundary act as a groundwater sink along the east side of the Dallman Ash Pond. Groundwater generally moves northward under the Dallman Ash Pond but also moves easterly towards the FGDS Landfill and westerly towards Sugar Creek. Groundwater beneath the Lakeside Ash Pond also moves northward and westerly along Sugar Creek.

The impoundments likely influence local groundwater dynamics by increasing potentiometric pressures beneath and around their footprints. However, there are no piezometers screened in the basal sand beneath the impoundments. The increased pressures occur due to the sustained elevated water levels within the ponds during operation. This elevated head establishes an outward hydraulic gradient, promoting radial flow away from the mound toward lower-potential areas, such as nearby surface water bodies like Sugar Creek. The outward gradient is typically steeper near the impoundment boundaries due to the contrast between the artificially high heads inside the ponds and the ambient groundwater levels outside, often resulting in gradients on the order of 0.01-0.02 ft/ft as observed in site data. At this site, the elevated heads contribute to the observed eastward flow component near the FGDS Landfill and westward toward Sugar Creek, integrating with the broader south-to-north regime.

Potentiometric surface maps (derived from 2025 data, similar to Figure 3 in the 2024 Annual Report for well locations) show groundwater flow radially from the impoundments toward Sugar Creek. Contours indicate a hydraulic gradient of approximately 0.01-0.02 ft/ft, with flow directed west-northwest overall. Along the eastern portion near the FGDS Unit 2 Landfill, there is an eastward flow component toward the FGDS Unit 2 landfill, then northward toward Sugar Creek. Maps for each 2024 event confirm consistent directions, with minor fluctuations due to seasonal recharge. For the FGDS Landfill, flow is integrated into site-wide maps, with no separate potentiometric surfaces identified, but consistent with basal sand flow toward Sugar Creek. Potentiometric surface maps are provided in Appendix F.

4. EVALUATION OF PREFERENTIAL PATHWAYS

4.1 Abandoned Creek

The abandoned creek is not a contaminant migration pathway. The relocation of the creek occurred with the construction of Dallman Ash Pond (1976). Realignment of the creek channel required the over-excavation of the new channel by a minimum of 4 feet and backfilling with cohesive soils compacted to 90% maximum dry density. Construction plans, boring logs, and grain size analyses confirm low permeability of the creek fill. Cross-sections show fill materials mixed with onsite soils, removing the hydraulic connection between the abandoned creek and the basal sand. The abandoned creek does not extend under the FGDS Unit 2 Landfill, though a portion exists north of FGDS Landfill Unit 2, where the relocated creek bed has an elevation of approximately 520 to 516 feet MSL.

Based on the geologic characterization of the site the abandoned creek bed has been removed or mixed with other on-site materials, which precludes it from being a potential pathway. See Figure 12 and Figure 13 which depict the surface of the Shallow Sand and the thickness relative to the pre-relocated Sugar Creek.

4.2 Shallow Sand Unit

The shallow sand is not hydraulically connected to the CCR units and is not a contaminant migration pathway due to the confined extent along the north. The shallow sand unit (intermittent deposits above 525 feet MSL), if present, was removed within pond footprints during construction. Borings did not encounter shallow sand intersecting CCR, and there is no evidence of communication with the lower cohesive unit or basal sand. New well AP6S, paired with AP6, confirms isolation (screened in shallow sand at 525-530 feet MSL). For the FGDS Landfill, shallow sand is not a significant pathway due to landfill construction. The 2025 elevation data for shallow wells (e.g., P-103S, P-104S) shows consistent levels with no anomalous fluctuations indicating preferential flow. Slug testing in shallow units (e.g., P-06S, P-07S) yields K values around 1-3E-03 cm/s, indicating limited conductivity.

As discussed above, the over-excavation and backfilling of the former creek channel and along the creek realignment further limits the horizontal connectivity of the intermittent saturated shallow sand. The Grading Plan drawing by Burns & McDonnell (Figure 5) depicts the creek abandonment and realignment north of the Dallman Ash Pond and Unit 2. The abandonment of the creek resulted in the over-excavation of at least 4 feet under the dike below the existing channel banks and bottom (see cross-sections), followed by filling with cohesive material and compaction to at least 90%. In addition to the excavation of soils under the dikes, realignment of the creek channel required the over excavation of the new channel by a minimum of 4 feet and backfilling with cohesive soils compacted to 90% maximum dry density. Construction plans, boring logs, and grain size analyses confirm low permeability of the creek fill. Cross-sections show fill materials mixed with onsite soils, removing direct hydraulic connection between the abandoned creek and the basal sand.

Pursuant to recommendations by the EPA, a boring was advanced about midway between AP4 and AP-14 on the west side of the Lakeside Ash Pond. A shallow sand was encountered from approximately 14.5 to 21.5 feet in depth; therefore, a shallow and a deep well were installed at that location (AP-15S and AP-15D, respectively). The shallow sand is illustrated in Cross Section B-B' (Appendix C). Based in the differential in groundwater elevation from AP-15S and the liquid level in the Lakeside Ash Pond, there is no apparent direct hydraulic connection from the shallow sand to the ash pond. For purposes of monitoring the groundwater between wells AP4 and AP14, wells AP-15S and AP-15D are proposed to be added to the groundwater monitoring system.

4.3 Communication Between Basal Sand and Shallow Sand

The intermittent saturated shallow sand is not hydraulically connected to the basal sand. Boring logs and cross-sections confirm the lower cohesive unit separates the intermittent saturated shallow sand from the basal sand. Cross-sections A-A' and B-B' depict the geology along the north and west side of the Dallman Ash Pond and the west side of the Lakeside Ash Pond. Furthermore, potentiometric data indicate semi-confined conditions in the basal sand, with head differences from water table aquifers. Slug test data from the lower cohesive deposit (e.g., low conductivity approximately 10e-5 cm/s in cohesive units) supports the conclusions that the basal sand is under confined conditions.

5. GROUNDWATER ELEVATIONS RELATIVE TO CCR BASE

Both of the CCR surface impoundments, the Lakeside Ash Pond and the Dallman Ash Pond, were constructed above the static potentiometric surface. The potentiometric surface represents the total pressure within a water-bearing unit to which the water will rise in a well/piezometer that is sealed in and penetrates the water-bearing unit. Given that the basal sand is overlain by the low hydraulic conductivity lower cohesive deposit, the basal sand is semi-confined. The potentiometric surface does not represent a water table setting. The potentiometric surface can be higher than the actual presence of water since its movement is restricted by the overlying clayey deposit. Constructing the ash ponds into or below the static water level would have been impractical and not economically feasible to attempt. As depicted in Figure 3, the historical use of the Lakeside parcel was agricultural/pasture. The parcels containing the Dallman Ash Pond and the Unit 2 Landfill were previously woodlands except on the southeast corner (agricultural/pasture).

A historic topographic map from 1950 for the site is presented as Figure 4. This figure depicts the preconstruction ground surface within the area of the CWLP CCR units. Based upon this figure, the preconstruction ground surface ranged from 540 feet MSL along the southern edge of the Lakeside Ash Pond and the northern edge of the Dallman Ash Pond down to 530 feet MSL adjacent to Sugar Creek. As indicated above, the Lakeside Ash Pond and Dallman Ash Pond were constructed at or just below the pre-existing land surface. Prior to construction, Sugar Creek meandered from the southwest corner of the site, exiting at the northeast corner of the site. There is no as-built construction documentation for the Lakeside Ash Pond or for the Dallman Ash Pond. Figure 5 is the proposed grading plan for the Dallman Ash Pond. According to Figure 5, the typical elevation of the floor of the Dallman Ash Pond is approximately 527 feet MSL.

The typical surface water elevation of Sugar Creek is approximately 520 feet MSL (average for 2025 monthly elevations is 520.56) based on creek elevations obtained at the time of potentiometric surface measurements. These results indicate an approximate separation between the base of the Dallman Ash Pond and the static surface water level.

The D and L series borings/wells are located entirely within the CCR material in the Dallman Ash Pond and Lakeside Ash Pond, respectively, and serve as piezometers to measure liquid levels within the impoundments. Liquid levels in the Dallman Ash Pond (D series wells) range from approximately 546 to 550 feet MSL across 2025 monitoring events, with averages around 548-550 feet MSL (e.g., D-1 at 547.69-550.41 feet MSL, D-2 at 549.44-550.85 feet MSL, D-3 at 546.89-550.04 feet MSL, D-4 at 546.99-549.53 feet MSL). In the Lakeside Ash Pond (L series wells), liquid levels are similarly elevated, ranging from 550 to 559 feet MSL (e.g., L-1 at 550.33-551.37 feet MSL, L-3 at 550.71-551.84 feet MSL, L-4 at 558.45-559.45 feet MSL, L-5 at 549.51-551.05 feet MSL). The liquid levels are precipitation that falls within the impoundment boundaries.

These impoundment liquid levels are consistently higher than the potentiometric surfaces in adjacent monitoring wells screened in the uppermost saturated zone. For example, downgradient wells such as AP-1 (524-527 feet MSL) and AP-2 (528-529 feet MSL) exhibit hydraulic heads 20-30 feet lower than the pond levels, indicating a downward hydraulic gradient from the impoundments to the underlying aquifer. This is further substantiated by the saturated intervals encountered at the borings advanced through the dikes (i.e., B-5, B-6, B-7, B-8 and B-9 series of borings conducted in 2023). The pore water levels within the berms are closer to the potentiometric surface exhibited outside of the impoundments, and very different from the liquid levels exhibited by the piezometers within the CCR surface impoundments.

Pre-closure dewatering will lower impoundment levels within the CCR, eliminating the downward gradient. The confining lower cohesive unit (low $K < 10 \times 10^{-5}$ cm/s) limits vertical migration, confining transport to lateral flow in the basal sand. As stated previously, Sugar Creek is a gaining creek, being fed not only by any lake water from the spillway, but from the basal sand. Once dewatering in the impoundment has been completed as part of closure activities, the potentiometric surface in the basal sand is expected to decrease to levels near that of the creek, below that of bottom of the Dallman Ash Pond. Given the low hydraulic conductivity of the lower cohesive deposit between the basal sand and the bottom of the Dallman Ash Pond, a temporary increase in the potentiometric surface due to an increase in creek level will not result in fluctuation of the potentiometric surface into the ash pond. The low hydraulic conductivity will restrict vertical upward movement of groundwater thereby continuing separation of the potentiometric surface and the ash pond.

The bottom of the five-foot recompacted clay liner for the FGDS Unit 2 Landfill extended to a minimum depth of approximately 525 feet MSL; the surface of the liner is approximately 530 feet MSL. The FGDS Landfill was designed and constructed above the uppermost saturated zone. The landfill contains a leachate collection system designed to maintain the liquid level to less than one foot of head on the liner. Upon closure, the landfill will install a composite final cover. The leachate collection system will continue to operate for a minimum 30 years after closure pursuant to 35 Ill. Admin. Code Part 811.

6. RECENT ADDITION OF PIEZOMETERS

Borings were advanced and piezometers installed at these locations to further characterize the hydrogeologic conditions of the CWLP facility and to identify potential migration pathways. Completed in June 2025 the installed piezometers are:

- At the northeast corner of the FGDS Development area, paired with P-103 (designated as P-103S).
- Northeast of the Unit 2 CCR disposal area, paired with G-104 (designated as P-104S).
- At the northeast corner of the Dallman Ash Pond, paired with RW3 (designated as RW3S).
- In the shallow sand unit, paired with well AP-6 (designated as AP-6S).
- In the shallow sand unit paired with AP-8 (designated as AP8-S).
- On the far side of Sugar Creek, paired with T4 (designated T4S)
- North of well T-5 (designated AP-16).
- Between wells AP-14 and AP-4 (designated as AP-15S and AP-15D).

Wells AP-15S and AP-15D will be incorporated into the groundwater monitoring system. The remaining piezometers shall be maintained solely for the continued measurement of groundwater elevations. CWLP does not identify these piezometers as groundwater monitoring wells and does not anticipate the collection of analytical samples from these wells. The piezometer network is sufficient to provide a full characterization of the flow characteristics.

7. ANNUAL EVALUATION

This report will be evaluated annually to determine if groundwater flow paths have changed (e.g., due to climate or site modifications) or if additional wells are necessary for detecting/assessing Appendix III/IV releases. Changes will be reported in annual GWMCA Reports, with the first evaluation in August 2026.

8. CONCLUSION

This Flow Path Report provides a comprehensive characterization of groundwater flow paths at the CWLP Dallman and Lakeside Ash Ponds and FGDS Disposal Facility, in fulfillment of the requirements outlined in Section B, Paragraph 263 and Section B, Paragraph 280 of the CAFO and Attachment 1. Through integration of extensive site-specific data, including boring logs, well construction details, groundwater elevations, potentiometric maps, hydrogeologic cross-sections, and slug testing results, the analysis demonstrates that groundwater flow is predominantly radial from the impoundments toward Sugar Creek, with an eastward component influencing the FGDS area before converging northward. Hydraulic gradients average 0.01-0.02 ft/ft, with seasonal fluctuations driven by recharge, but no significant deviations or reversals observed.

The report confirms no additional preferential pathways exist: the abandoned creek bed has been over-excavated, filled, and compacted beneath the perimeter berms for the Dallman Ash Pond, exhibiting low permeability ($K=10^{-5}$ to 10^{-4} cm/s) that precludes enhanced transport; the shallow sand unit is discontinuous, largely removed during construction, and shows no connectivity to the basal sand. The shallow sand is present at AP-15 and along the exterior of the northern berm of the Dallman Ash Pond. However, the shallow sand does not appear to directly intersect with the CCR as the potentiometric surfaces in the shallow wells are indicative of groundwater elevations largely unaffected by the much higher liquid levels within the impoundment. The shallow sand appears isolated north of the pond due to excavation and relocation of Sugar Creek. Therefore, monitoring of the shallow sand along the northern perimeter is not necessary. However, it is proposed to add wells AP15S and AP-15D located west of the Lakeside Ash Pond to the impoundment groundwater monitoring program. A revision to the subject detection monitoring program will be forthcoming with the inclusion of AP-15S and AP-15D.

Vertical communication between units is de minimis, with the lower cohesive deposit acting as an effective confining layer ($K \sim 10^{-7}$ cm/sec) restricting migration to lateral flow within the confined basal sand. Borings were advanced and piezometers installed at these locations to enhance the hydrogeology understanding of the site with an emphasis on further characterization of the migration pathways at the CWLP facility. The installation of additional piezometers/monitoring wells is not necessary at this time.

These findings meet CAFO objectives by delineating flow dynamics, ruling out high-risk pathways, and supporting the Assessment of Corrective Measures through a complete hydrogeologic characterization. Annual evaluations will ensure adaptive management, with the first review scheduled for August 2026.

9. ENGINEERING CERTIFICATION

The owner or operator of a coal combustion residual (CCR) unit must obtain a certification from a qualified professional engineer that the Flow Path Report has been completed pursuant to 40 C.F.R. § 257.91(b)(1).

The engineering certification for the groundwater monitoring system follows.

10. REFERENCES

Stabilize, Inc. 2009. City Water Light and Power – 35 IAC 620 Ash Pond Assessment

Patrick Engineering, 1993. Hydrogeologic Report on Flue Gas Desulfurization Sludge Landfill.

Professional Engineer Certification – Flow Path Report

In General Accordance with 40 CFR § 257.91(b)(1) - Groundwater Flow Path

In accordance with Title 40 of the Code of Federal Regulations (40 CFR), Part 257, Subpart D, Section 257.91(b)(1) the owner or operator of a coal combustion residuals (CCR) unit must obtain certification from a qualified professional engineer verifying the accuracy of the information in the Flow Path Report.

I, Karl W. Finke, a qualified professional engineer in good standing in the State of Illinois, certify that the information provided in the Flow Path Report for the CWLP impoundments and FGDS Unit 2 Landfill is accurate.

LICENSED PROFESSIONAL ENGINEER
KARL W. FINKE
062.068571
STATE OF ILLINOIS

Signature: Karl Finke

Illinois P.E. No: 062.068571

Date: September 22, 2025

Lic. Exp: 11/30/25

TABLES

TABLE 1:
GROUNDWATER ELEVATIONS

Table 1: Groundwater Elevations
CWLP, Springfield, Illinois

Well/Location	Elev. Of Meas. Point	Grnd. Surface	Stick Up	1/27/2025			2/25/2025			3/28/2025		
				DTW from Meas. Pt	DTW from Grnd	GW Elev	DTW from Meas. Pt	DTW from Grnd	GW Elev	DTW from Meas. Pt	DTW from Grnd	GW Elev
R101	546.8	543.57	3.23	6.49	3.26	540.31	6.89	3.66	539.91	6.44	3.21	540.36
P103	537.43	534.47	2.96	9.40	6.44	528.03	9.43	6.47	528.00	9.13	6.17	528.30
P103S	537.637	535.852	1.785	NI	NI	NI	NI	NI	NI	NI	NI	NI
P104	531.79	529.15	2.64	7.98	5.34	523.81	7.91	5.27	523.88	7.86	5.22	523.93
P104S	532.669	529.742	2.927									
P106	524.79	523.24	1.55	1.55	0.00	523.24	1.96	0.41	522.83	1.55	0.00	523.24
G110	555.92	553.79	2.13	23.49	21.36	532.43	24.40	22.27	531.52	24.37	22.24	531.55
R111	552.4	552.51	-0.11	25.15	25.26	527.25	25.04	25.15	527.36	25.06	25.17	527.34
G112	553.3	550.41	2.89	27.58	24.69	525.72	28.49	25.60	524.81	27.58	24.69	525.72
G113	536.77	533.64	3.13	4.51	1.38	532.26	5.01	1.88	531.76	4.60	1.47	532.17
G120	551.74	551.78	-0.04	15.87	15.91	535.87	15.89	15.93	535.85	15.66	15.70	536.08
G121	554.33	551.81	2.52	28.14	25.62	526.19	28.25	25.73	526.08	27.93	25.41	526.40
G122	553.28	550.97	2.31	26.71	24.40	526.57	29.72	27.41	523.56	29.66	27.35	523.62
G123	553.212	550.523	2.689									
P03D	533.203	530.018	3.185									
P03S	532.75	529.985	2.765	NI	NI	NI	NI	NI	NI	NI	NI	NI
P04D	539.67	534.64	5.03	7.98	2.95	531.69	12.42	7.39	527.25	12.41	7.38	527.26
P05D	536.92	533.64	3.28	6.02	2.74	530.90	5.88	2.60	531.04	5.96	2.68	530.96
P06S North	526.83	523.96	2.87	2.87	0.00	523.96	2.87	0.00	523.96	2.91	0.04	523.92
P06D Middle	529.8	523.96	5.84	5.84	0.00	523.96	5.84	0.00	523.96	5.84	0.00	523.96
P06R South	531.2	524.7	6.5	6.50	0.00	524.70	6.50	0.00	524.70	6.50	0.00	524.70
P07S West	527.39	525.08	2.31	5.28	2.97	522.11	3.00	0.69	524.39	4.74	2.43	522.65
P07D North	528.25	525.25	3	4.44	1.44	523.81	4.49	1.49	523.76	4.48	1.48	523.77
P07M East	527.04	525.02	2.02	4.31	2.29	522.73	2.02	0.00	525.02	4.51	2.49	522.53
P09S West	554.47	550.78	3.69	29.46	25.77	525.01	29.44	25.75	525.03	29.57	25.88	524.90
P09D East	554.84	551.47	3.37	29.08	25.71	525.76	28.93	25.56	525.91	29.14	25.77	525.70
AW-1	554.42	551.24	3.18	13.33	10.15	541.09	13.45	10.27	540.97	13.31	10.13	541.11
AW-2	528.25	525.02	3.23	4.56	1.33	523.69	4.53	1.30	523.72	4.50	1.27	523.75
RW3	538.42	535.65	2.77	9.99	7.22	528.43	9.56	6.79	528.86	9.55	6.78	528.87
RW3S	538.391	535.867	2.524	NI	NI	NI	NI	NI	NI	NI	NI	NI
TW3 West	538.293	535.833	2.46	11.37	8.91	526.92	11.21	8.75	527.08	11.08	8.62	527.21
AP-1	535.37	533.1	2.27	10.94	8.67	524.43	10.79	8.52	524.58	10.40	8.13	524.97
AP-2	536.1	533.6	2.5	7.88	5.38	528.22	7.87	5.37	528.23	7.47	4.97	528.63
AP-3	535.25	532.7	2.55	9.87	7.32	525.38	9.75	7.20	525.50	9.56	7.01	525.69
AP-4	555.6	552.46	3.14	10.88	7.74	544.72	10.68	7.54	544.92	10.76	7.62	544.84
AP-5	583.9	581.6	2.3	15.38	13.08	568.52	14.98	12.68	568.92	14.73	12.43	569.17
AP6	536.796	534.155	2.641	8.57	5.93	528.23	8.56	5.92	528.24	8.21	5.57	528.59
AP6S	536.854	533.959	2.895	NI	NI	NI	NI	NI	NI	NI	NI	NI
AP7	537.89	534.99	2.9	11.86	8.96	526.03	11.92	9.02	525.97	11.47	8.57	526.42
AP8	540.3	537.2	3.1	5.51	2.41	534.79	5.51	2.41	534.79	5.10	2.00	535.20
AP8S	538.585	535.974	2.611	NI	NI	NI	NI	NI	NI	NI	NI	NI
AP9	537.2	534.3	2.9	13.13	10.23	524.07	13.29	10.39	523.91	12.62	9.72	524.58
AP10	537.5	534.4	3.1	2.98	-0.12	534.52	4.04	0.94	533.46	3.88	0.78	533.62
AP11	538.1	535.3	2.8	15.22	12.42	522.88	15.24	12.44	522.86	14.57	11.77	523.53
AP12	540.7	537.8	2.9	18.06	15.16	522.64	18.08	15.18	522.62	17.51	14.61	523.19
AP13	542	538.6	3.4	18.46	15.06	523.54	18.44	15.04	523.56	17.28	13.88	524.72
AP14	539.6	536.8	2.8	2.30	-0.50	537.30	2.39	-0.41	537.21	2.34	-0.46	537.26
AP15D	538.609	536.295	2.314	NI	NI	NI	NI	NI	NI	NI	NI	NI
AP15S	538.532	536.417	2.115	NI	NI	NI	NI	NI	NI	NI	NI	NI
AP16	539.275	536.936	2.339	NI	NI	NI	NI	NI	NI	NI	NI	NI
GP1	537.72	535.62	2.1	11.91	9.81	525.81	11.89	9.79	525.83	11.61	9.51	526.11
GP3	550.41	547.56	2.85	21.57	18.72	528.84	21.08	18.23	529.33	20.06	17.21	530.35
GP7	535.74	533.25	2.49	8.15	5.66	527.59	8.11	5.62	527.63	7.89	5.40	527.85
T1	535.65	533.65	2	13.93	11.93	521.72	13.84	11.84	521.81	12.61	10.61	523.04
T2	549.62	547.22	2.4	25.39	22.99	524.23	25.65	23.25	523.97	24.71	22.31	524.91
T4	548.94	546.56	2.38	18.66	16.28	530.28	18.41	16.03	530.53	16.94	14.56	532.00
T4S	549.044	546.754	2.29	NI	NI	NI	NI	NI	NI	NI	NI	NI
T5	540.66	538.15	2.51	8.33	5.82	532.33	7.99	5.48	532.67	6.42	3.91	534.24
T6	538.32	535.96	2.36	9.87	7.51	528.45	9.8	7.44	528.52	9.4	7.04	528.92
L1 Deep	572.31	568.96	3.35	21.75	18.40	550.56	21.96	18.61	550.35	21.98	18.63	550.33
L1 Shallow	571.09	568.861	2.229	NI	NI	NI	NI	NI	NI	20.74	18.51	550.35
LB2 Deep	570.639	568.057	2.582	NI	NI	NI	NI	NI	NI	19.61	17.03	551.03
LB2 Shallow	570.452	568.136	2.316	NI	NI	NI	NI	NI	NI	19.39	17.07	551.06
L3 Deep	565.88	563.02	2.86	15.11	12.25	550.77	15.13	12.27	550.75	15.17	12.31	550.71
L3 Shallow	565.762	562.971	2.791	NI	NI	NI	NI	NI	NI	14.96	12.17	550.80
L4	568.58	566.25	2.33	9.76	7.43	558.82	10.13	7.80	558.45	9.74	7.41	558.84
L5 Deep	568.01	565.19	2.82	18.38	15.56	549.63	18.5	15.68	549.51	18.28	15.46	549.73
L5 Shallow	567.747	565.25	2.497	NI	NI	NI	NI	NI	NI	16.97	14.47	550.78
D1 Deep	566.2	564.02	2.18	17.44	15.26	548.76	17.28	15.10	548.92	17.27	15.09	548.93
D1 Shallow	566.333	563.871	2.462	NI	NI	NI	NI	NI	NI	17.21	14.75	549.12
D2 Deep	560.93	558	2.93	11.25	8.32	549.68	10.84	7.91	550.09	10.88	7.95	550.05
D2 Shallow	560.503	557.849	2.654	NI	NI	NI	NI	NI	NI	10.20	7.55	550.30
D3 Deep	557.9	555.03	2.87	10.21	7.34	547.69	9.55	6.68	548.35	10.49	7.62	547.41
D3 Shallow	557.743	554.673	3.07	NI	NI	NI	NI	NI	NI	10.71	7.64	547.03
D4	565.61	561.8	3.81	17.64	13.83	547.97	17.65	13.84	547.96	17.22	13.41	548.39
DB04 Deep	556.298	553.706	2.592	NI	NI	NI	NI	NI	NI	8.10	5.51	548.20
DB04 Shallow	556.433	553.548	2.885	NI	NI	NI	NI	NI	NI	7.93	5.05	548.50
DB05 Deep	555.82	553.385	2.435	NI	NI	NI	NI	NI	NI	7.77	5.33	548.05
DB05 Shallow	555.912	553.563	2.349	NI	NI	NI	NI	NI	NI	7.78	5.43	548.13
DB06	553.694	552.765	0.929	NI	NI	NI	NI	NI	NI	NI	NI	NI
DB07	555.798	552.754	3.044	NI	NI	NI	NI	NI	NI	NI	NI	NI
DB08	554.332	551.8	2.532	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sugar Creek	510.44	NA	NA	9.77	NA	520.21	9.55	NA	519.99	9.8	NA	520.24
Lake Springfield	NA	NA	NA	NA	NA	559.59	NA	NA	559.58	NA	NA	559.63
Clarification Pond	553.29	NA	NA	6.6	NA	546.69	7.3	NA	545.99	7.3	NA	545.99

Notes:
NI - Not Installed
NA - Not Applicable

Table 1: Groundwater Elevations
CWLP, Springfield, Illinois

Well/Location	Elev. Of Meas. Point	Grnd. Surface	Stick Up	4/20/2025			5/29/2025			6/25/2025		
				DTW from Meas. Pt	DTW from Grnd	GW Elev	DTW from Meas. Pt	DTW from Grnd	GW Elev	DTW from Meas. Pt	DTW from Grnd	GW Elev
R101	546.8	543.57	3.23	5.19	1.96	541.61	6.88	3.65	539.92	7.12	3.89	539.68
P103	537.43	534.47	2.96		-2.96	537.43		-2.96	537.43	11.62	8.66	525.81
P103S	537.637	535.852	1.785	NI	NI	NI	NI	NI	NI	11.87	10.09	525.77
P104	531.79	529.15	2.64	7.04	4.40	524.75	7.61	4.97	524.18	8.57	5.93	523.22
P104S	532.669	529.742	2.927				NI	NI	NI	9.28	6.35	523.39
P106	524.79	523.24	1.55	1.55	0.00	523.24	1.67	0.12	523.12	1.55	0.00	523.24
G110	555.92	553.79	2.13	23.97	21.84	531.95	24.85	22.72	531.07	24.96	22.83	530.96
R111	552.4	552.51	-0.11	24.66	24.77	527.74	25.19	25.30	527.21	25.51	25.62	526.89
G112	553.3	550.41	2.89	27.27	24.38	526.03	17.54	14.65	535.76	17.77	14.88	535.53
G113	536.77	533.64	3.13	4.01	0.88	532.76	5.80	2.67	530.97	5.83	2.70	530.94
G120	551.74	551.78	-0.04	15.00	15.04	536.74	16.18	16.22	535.56	16.15	16.19	535.59
G121	554.33	551.81	2.52	27.27	24.75	527.06	28.13	25.61	526.20	27.93	25.41	526.40
G122	553.28	550.97	2.31	28.72	26.41	524.56	29.13	26.82	524.15	30.31	28.00	522.97
G123	553.212	550.523	2.689							30.26	27.57	522.95
P03D	533.203	530.018	3.185							7.82	4.64	525.38
P03S	532.75	529.985	2.765	NI	NI	NI	NI	NI	NI	9.89	7.13	522.86
P04D	539.67	534.64	5.03	12.26	7.23	527.41	13.22	8.19	526.45	13.66	8.63	526.01
P05D	536.92	533.64	3.28	5.45	2.17	531.47	6.09	2.81	530.83	6.23	2.95	530.69
P06S North	526.83	523.96	2.87	2.91	0.04	523.92	2.99	0.12	523.84	2.87	0.00	523.96
P06D Middle	529.8	523.96	5.84	5.84	0.00	523.96	6.12	0.28	523.68	5.84	0.00	523.96
P06R South	531.2	524.7	6.5	6.50	0.00	524.70	6.72	0.22	524.48	6.50	0.00	524.70
P07S West	527.39	525.08	2.31	4.14	1.83	523.25	4.89	2.58	522.50	6.71	4.40	520.68
P07D North	528.25	525.25	3	3.88	0.88	524.37	5.31	2.31	522.94	5.43	2.43	522.82
P07M East	527.04	525.02	2.02	3.46	1.44	523.58	4.37	2.35	522.67	5.55	3.53	521.49
P09S West	554.47	550.78	3.69	29.23	25.54	525.24	30.44	26.75	524.03	29.67	25.98	524.80
P09D East	554.84	551.47	3.37	28.80	25.43	526.04	29.65	26.28	525.19	29.73	26.36	525.11
AW-1	554.42	551.24	3.18	12.52	9.34	541.90	14.26	11.08	540.16	14.76	11.58	539.66
AW-2	528.25	525.02	3.23	3.72	0.49	524.53	5.35	2.12	522.90	5.44	2.21	522.81
RW3	538.42	535.65	2.77	8.94	6.17	529.48	9.27	6.50	529.15	9.85	7.08	528.57
RW3S	538.391	535.867	2.524	NI	NI	NI	NI	NI	NI	9.23	6.71	529.16
TW3 West	538.293	535.833	2.46	8.88	6.42	529.41	9.23	6.77	529.06	11.66	9.20	526.63
AP-1	535.37	533.1	2.27	8.11	5.84	527.26	9.79	7.52	525.58	10.50	8.23	524.87
AP-2	536.1	533.6	2.5	6.38	3.88	529.72	7.79	5.29	528.31	8.06	5.56	528.04
AP-3	535.25	532.7	2.55	8.39	5.84	526.86	7.67	5.12	527.58	9.32	6.77	525.93
AP-4	555.6	552.46	3.14	10.08	6.94	545.52	10.38	7.24	545.22	10.44	7.30	545.16
AP-5	583.9	581.6	2.3	13.48	11.18	570.42	14.41	12.11	569.49	14.63	12.33	569.27
AP6	536.796	534.155	2.641	7.00	4.36	529.80	7.77	5.13	529.03	8.47	5.83	528.33
AP6S	536.854	533.959	2.895	NI	NI	NI	NI	NI	NI	9.06	6.16	527.79
AP7	537.89	534.99	2.9	7.44	4.54	530.45	10.92	8.02	526.97	11.04	8.14	526.85
AP8	540.3	537.2	3.1	8.05	4.95	532.25	4.01	0.91	536.29	5.22	2.12	535.08
AP8S	538.585	535.974	2.611	NI	NI	NI	NI	NI	NI	11.45	8.84	527.14
AP9	537.2	534.3	2.9	10.18	7.28	527.02	12.86	9.96	524.34	12.80	9.90	524.40
AP10	537.5	534.4	3.1	2.94	-0.16	534.56	3.92	0.82	533.58	3.99	0.89	533.51
AP11	538.1	535.3	2.8	12.04	9.24	526.06	12.03	9.23	526.07	15.03	12.23	523.07
AP12	540.7	537.8	2.9	15.16	12.26	525.54	15.16	12.26	525.54	17.01	14.11	523.69
AP13	542	538.6	3.4	13.43	10.03	528.57	14.73	11.33	527.27	16.82	13.42	525.18
AP14	539.6	536.8	2.8	1.86	-0.94	537.74	2.72	-0.08	536.88	2.56	-0.24	537.04
AP15D	538.609	536.295	2.314	NI	NI	NI	NI	NI	NI	1.90	-0.41	536.71
AP15S	538.532	536.417	2.115	NI	NI	NI	NI	NI	NI	0.91	-1.21	537.62
AP16	539.275	536.936	2.339	NI	NI	NI	NI	NI	NI	6.95	4.61	532.33
GP1	537.72	535.62	2.1	10.80	8.70	526.92	12.88	10.78	524.84	12.32	10.22	525.40
GP3	550.41	547.56	2.85	17.91	15.06	532.50	19.64	16.79	530.77	19.54	16.69	530.87
GP7	535.74	533.25	2.49	7.32	4.83	528.42	7.46	4.97	528.28	8.14	5.65	527.60
T1	535.65	533.65	2	10.64	8.64	525.01	10.86	8.86	524.79	13.18	11.18	522.47
T2	549.62	547.22	2.4	23.23	20.83	526.39	23.83	21.43	525.79	23.92	21.52	525.70
T4	548.94	546.56	2.38	14.06	11.68	534.88	17.24	14.86	531.70	16.68	14.30	532.26
T4S	549.044	546.754	2.29	NI	NI	NI	NI	NI	NI	16.44	14.15	532.60
T5	540.66	538.15	2.51	4.28	1.77	536.38	9.14	6.63	531.52	8.49	5.98	532.17
T6	538.32	535.96	2.36	8.92	6.56	529.40	8.86	6.50	529.46	9.07	6.71	529.25
L1 Deep	572.31	568.96	3.35	20.94	17.59	551.37	21.19	17.84	551.12	20.98	17.63	551.33
L1 Shallow	571.09	568.861	2.229	19.75	17.52	551.34	19.91	17.68	551.18	19.72	17.49	551.37
LB2 Deep	570.639	568.057	2.582	18.53	15.95	552.11	18.93	16.35	551.71	18.77	16.19	551.87
LB2 Shallow	570.452	568.136	2.316	18.33	16.01	552.12	18.68	16.36	551.77	18.49	16.17	551.96
L3 Deep	565.88	563.02	2.86	14.04	11.18	551.84	14.55	11.69	551.33	14.33	11.47	551.55
L3 Shallow	565.762	562.971	2.791	13.84	11.05	551.92	14.43	11.64	551.33	14.24	11.45	551.52
L4	568.58	566.25	2.33	9.13	6.80	559.45	9.67	7.34	558.91	9.43	7.10	559.15
L5 Deep	568.01	565.19	2.82	16.96	14.14	551.05	17.96	15.14	550.05	17.72	14.90	550.29
L5 Shallow	567.747	565.25	2.497	15.29	12.79	552.46	16.46	13.96	551.29	16.36	13.86	551.39
D1 Deep	566.2	564.02	2.18	15.79	13.61	550.41	18.51	16.33	547.69	17.66	15.48	548.54
D1 Shallow	566.333	563.871	2.462	15.87	13.41	550.46	18.78	16.32	547.55	17.69	15.23	548.64
D2 Deep	560.93	558	2.93	10.08	7.15	550.85	11.49	8.56	549.44	11.36	8.43	549.57
D2 Shallow	560.503	557.849	2.654	9.74	7.09	550.76	11.14	8.49	549.36	10.68	8.03	549.82
D3 Deep	557.9	555.03	2.87	8.09	5.22	549.81	8.62	5.75	549.28	11.01	8.14	546.89
D3 Shallow	557.743	554.673	3.07	7.69	4.62	550.05	8.16	5.09	549.58	10.66	7.59	547.08
D4	565.61	561.8	3.81	16.08	12.27	549.53	18.62	14.81	546.99	17.36	13.55	548.25
DB04 Deep	556.298	553.706	2.592	6.40	3.81	549.90	6.66	4.07	549.64	7.55	4.96	548.75
DB04 Shallow	556.433	553.548	2.885	6.89	4.01	549.54	7.49	4.61	548.94	7.42	4.54	549.01
DB05 Deep	555.82	553.385	2.435	6.46	4.02	549.36	7.99	5.55	547.83	7.81	5.37	548.01
DB05 Shallow	555.912	553.563	2.349	6.42	4.07	549.49	7.85	5.50	548.06	7.84	5.49	548.07
DB06	553.694	552.765	0.929	NI	NI	NI	NI	NI	NI	NI	NI	NI
DB07	555.798	552.754	3.044	NI	NI	NI	NI	NI	NI	NI	NI	NI
DB08	554.332	551.8	2.532	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sugar Creek	510.44	NA	NA	10.31		520.75	11.06	NA	521.50	10.31	NA	520.75
Lake Springfield	NA	NA	NA	NA	NA	560.02	NA	NA	560.40	NA	NA	560.38
Clarification Pond	553.29	NA	NA	6		547.29	6.9	NA	546.39	6.4	NA	546.89

Notes:
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NA - Not Applicable

Table 1: Groundwater Elevations
CWLP, Springfield, Illinois

Well/Location	Elev. Of Meas. Point	Grnd. Surface	Stick Up	7/21/2025 DTW from Meas. Pt	7/21/2025 DTW from Grnd	7/21/2025 GW Elev	8/21/2025 DTW from Meas. Pt	8/21/2025 DTW from Grnd	8/21/2025 GW Elev
R101	546.8	543.57	3.23	6.52	3.29	540.28	8.67	5.44	538.13
P103	537.43	534.47	2.96	10.67	7.71	526.76	12.54	9.58	524.89
P103S	537.637	535.852	1.785	10.41	8.63	527.23	12.86	11.08	524.78
P104	531.79	529.15	2.64	8.12	5.48	523.67	9.90	7.26	521.89
P104S	532.669	529.742	2.927	9.16	6.23	523.51	10.26	7.33	522.41
P106	524.79	523.24	1.55	1.55	0.00	523.24	3.22	1.67	521.57
G110	555.92	553.79	2.13	24.51	22.38	531.41	25.79	23.66	530.13
R111	552.4	552.51	-0.11	24.96	25.07	527.44	26.91	27.02	525.49
G112	553.3	550.41	2.89	27.43	24.54	525.87	29.69	26.80	523.61
G113	536.77	533.64	3.13	5.03	1.90	531.74	7.23	4.10	529.54
G120	551.74	551.78	-0.04	16.16	16.20	535.58	18.03	18.07	533.71
G121	554.33	551.81	2.52	28.48	25.96	525.85	29.22	26.70	525.11
G122	553.28	550.97	2.31	29.93	27.62	523.35	31.61	29.30	521.67
G123	553.212	550.523	2.689	29.41	26.72	523.80	31.75	29.06	521.46
P03D	533.203	530.018	3.185	7.07	3.89	526.13	9.14	5.96	524.06
P03S	532.75	529.985	2.765	9.83	7.07	522.92	10.17	7.41	522.58
P04D	539.67	534.64	5.03	13.11	8.08	526.56	14.48	9.45	525.19
P05D	536.92	533.64	3.28	6.89	3.61	530.03	7.82	4.54	529.10
P06S North	526.83	523.96	2.87	2.87	0.00	523.96	5.43	2.56	521.40
P06D Middle	529.8	523.96	5.84	5.84	0.00	523.96	4.91	-0.93	524.89
P06R South	531.2	524.7	6.5	6.50	0.00	524.70	6.50	0.00	524.70
P07S West	527.39	525.08	2.31	4.80	2.49	522.59	8.41	6.10	518.98
P07D North	528.25	525.25	3	4.34	1.34	523.91	6.92	3.92	521.33
P07M East	527.04	525.02	2.02	4.04	2.02	523.00	7.14	5.12	519.90
P09S West	554.47	550.78	3.69	29.42	25.73	525.05	30.38	26.69	524.09
P09D East	554.84	551.47	3.37	29.11	25.74	525.73	31.27	27.90	523.57
AW-1	554.42	551.24	3.18	13.44	10.26	540.98	15.94	12.76	538.48
AW-2	528.25	525.02	3.23	4.41	1.18	523.84	6.87	3.64	521.38
RW3	538.42	535.65	2.77	10.49	7.72	527.93	11.05	8.28	527.37
RW3S	538.391	535.867	2.524	8.20	5.68	530.19	10.95	8.43	527.44
TW3 West	538.293	535.833	2.46	11.01	8.55	527.28	13.22	10.76	525.07
AP-1	535.37	533.1	2.27	10.13	7.86	525.24	11.53	9.26	523.84
AP-2	536.1	533.6	2.5	7.28	4.78	528.82	8.87	6.37	527.23
AP-3	535.25	532.7	2.55	9.03	6.48	526.22	9.74	7.19	525.51
AP-4	555.6	552.46	3.14	10.38	7.24	545.22	11.21	8.07	544.39
AP-5	583.9	581.6	2.3	14.94	12.64	568.96	16.90	14.60	567.00
AP6	536.796	534.155	2.641	8.93	6.29	527.87	9.58	6.94	527.22
AP6S	536.854	533.959	2.895	8.08	5.18	528.77	10.24	7.34	526.61
AP7	537.89	534.99	2.9	11.38	8.48	526.51	11.83	8.93	526.06
AP8	540.3	537.2	3.1	5.76	2.66	534.54	6.73	3.63	533.57
AP8S	538.585	535.974	2.611	8.13	5.52	530.46	13.59	10.98	525.00
AP9	537.2	534.3	2.9	12.46	9.56	524.74	14.92	12.02	522.28
AP10	537.5	534.4	3.1	4.08	0.98	533.42	5.54	2.44	531.96
AP11	538.1	535.3	2.8	10.13	7.33	527.97	15.83	13.03	522.27
AP12	540.7	537.8	2.9	17.19	14.29	523.51	18.22	15.32	522.48
AP13	542	538.6	3.4	17.46	14.06	524.54	19.14	15.74	522.86
AP14	539.6	536.8	2.8	2.37	-0.43	537.23	2.39	-0.41	537.21
AP15D	538.609	536.295	2.314	1.87	-0.44	536.74	2.54	0.23	536.07
AP15S	538.532	536.417	2.115	0.86	-1.26	537.67	1.57	-0.55	536.96
AP16	539.275	536.936	2.339	6.61	4.27	532.67	8.82	6.48	530.46
GP1	537.72	535.62	2.1	12.02	9.92	525.70	13.01	10.91	524.71
GP3	550.41	547.56	2.85	19.93	17.08	530.48	20.76	17.91	529.65
GP7	535.74	533.25	2.49	8.74	6.25	527.00	9.38	6.89	526.36
T1	535.65	533.65	2	13.48	11.48	522.17	14.93	12.93	520.72
T2	549.62	547.22	2.4	24.82	22.42	524.80	26.31	23.91	523.31
T4	548.94	546.56	2.38	16.96	14.58	531.98	18.54	16.16	530.40
T4S	549.044	546.754	2.29	16.91	14.62	532.13	16.87	14.58	532.17
T5	540.66	538.15	2.51	7.57	5.06	533.09	11.16	8.65	529.50
T6	538.32	535.96	2.36	9.34	6.98	528.98	9.77	7.41	528.55
L1 Deep	572.31	568.96	3.35	21.02	17.67	551.29	22.13	18.78	550.18
L1 Shallow	571.09	568.861	2.229	20.61	18.38	550.48	20.85	18.62	550.24
LB2 Deep	570.639	568.057	2.582	18.63	16.05	552.01	19.95	17.37	550.69
LB2 Shallow	570.452	568.136	2.316	18.40	16.08	552.05	19.71	17.39	550.74
L3 Deep	565.88	563.02	2.86	14.37	11.51	551.51	15.49	12.63	550.39
L3 Shallow	565.762	562.971	2.791	14.33	11.54	551.43	15.51	12.72	550.25
L4	568.58	566.25	2.33	9.46	7.13	559.12	11.25	8.92	557.33
L5 Deep	568.01	565.19	2.82	17.86	15.04	550.15	18.84	16.02	549.17
L5 Shallow	567.747	565.25	2.497	16.61	14.11	551.14	17.41	14.91	550.34
D1 Deep	566.2	564.02	2.18	18.08	15.90	548.12	20.11	17.93	546.09
D1 Shallow	566.333	563.871	2.462	18.34	15.88	547.99	20.06	17.60	546.27
D2 Deep	560.93	558	2.93	10.47	7.54	550.46	15.7	12.77	545.23
D2 Shallow	560.503	557.849	2.654	10.43	7.78	550.07	15.02	12.37	545.48
D3 Deep	557.9	555.03	2.87	7.86	4.99	550.04	13.67	10.80	544.23
D3 Shallow	557.743	554.673	3.07	7.34	4.27	550.40	12.97	9.90	544.77
D4	565.61	561.8	3.81	17.01	13.20	548.60	19.29	15.48	546.32
DB04 Deep	556.298	553.706	2.592	7.46	4.87	548.84	9.47	6.88	546.83
DB04 Shallow	556.433	553.548	2.885	7.44	4.56	548.99	9.40	6.52	547.03
DB05 Deep	555.82	553.385	2.435	6.31	3.87	549.51	12.04	9.60	543.78
DB05 Shallow	555.912	553.563	2.349	6.42	4.07	549.49	12.01	9.66	543.90
DB06	553.694	552.765	0.929	3.96	3.03	549.73	8.93	8.00	544.76
DB07	555.798	552.754	3.044	6.39	3.35	549.41	9.88	6.84	545.92
DB08	554.332	551.8	2.532	4.30	1.77	550.03	11.25	8.72	543.08
Sugar Creek	510.44	NA	NA	10.41	NA	520.85	9.73	NA	520.17
Lake Springfield	NA	NA	NA	NA	NA	560.26	NA	NA	559.64
Clarification Pond	553.29	NA	NA	6.9	NA	546.39	7	NA	546.29

Notes:
NI - Not Installed
NA - Not Applicable

TABLE 2:
VERTICAL HYDRAULIC GRADIENTS

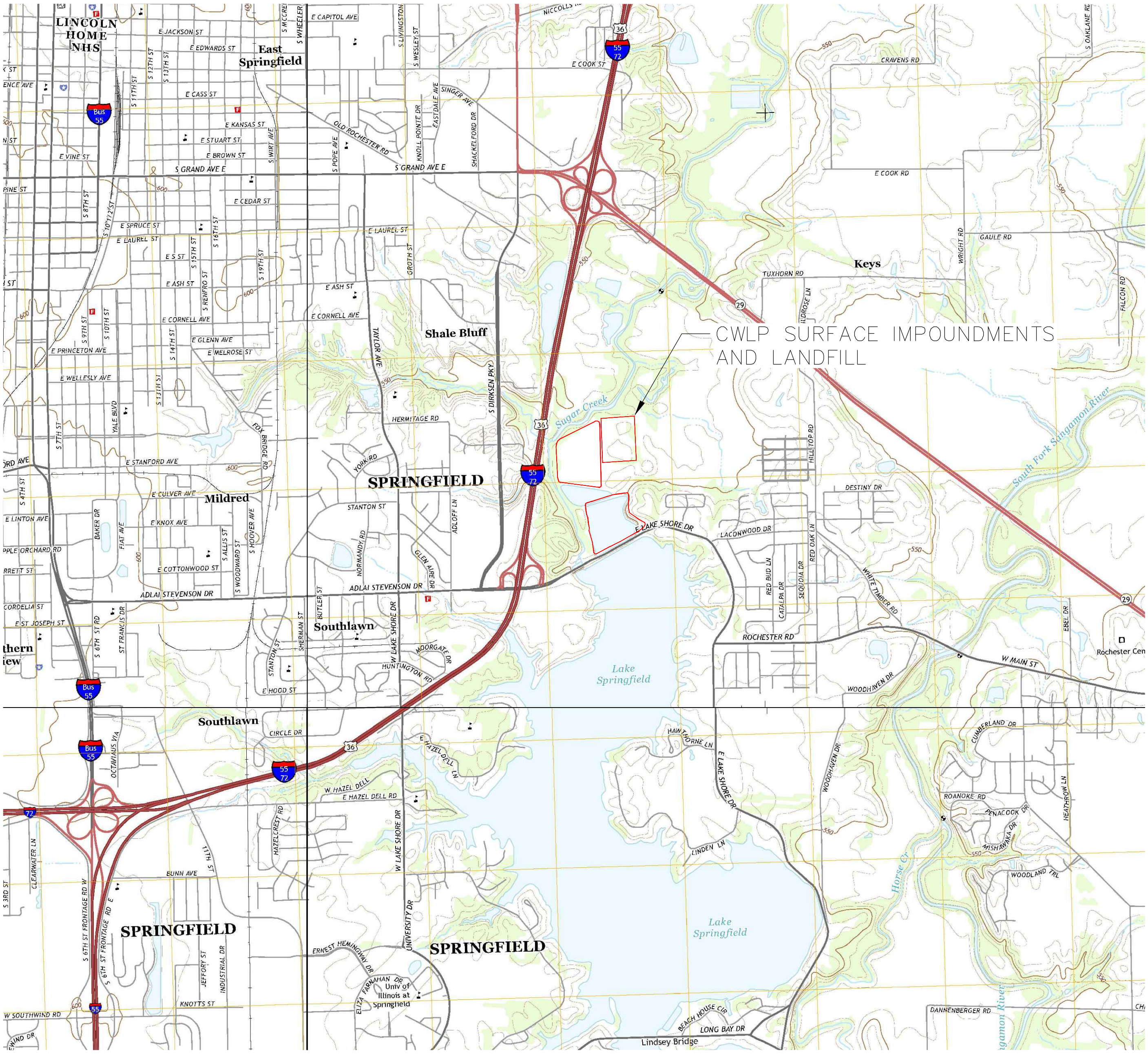
Table 2: Vertical Hydraulic Gradients
CWLP, Springfield, Illinois

Well	Easting (Site Coord)	Northing (Site Coord)	Middle of Screen (ft amsl)	GW Elev (ft amsl)	Vertical Hydraulic Gradient	Direction
AP6S	1702.3	5695.2	522.91	527.73	0.00100	Upward
AP6	1715.8	5766.6	503.755	527.80		
AP8S	1266.4	5413.4	524.61	527.53	0.304	Upward
AP8	1265.0	5420.9	503.31	534.40		
AP15S	1383.0	2925.3	517.245	537.42	-0.0859	Downward
AP15D	1383.4	2921.3	507.43	536.51		
P03S	2654.5	5671.3	520.75	522.79	0.108	Upward
P03D	2658.4	5671.1	498.75	525.19		
P06S North	2191.4	4725.7	516.65	523.62	0.0180	Upward
P06D Middle	2186.8	4717.0	495.05	524.04		
P06D Middle	2186.8	4717.0	495.05	524.04	0.0403	Upward
P06R South	2175.7	4718.1	484.05	524.67		
P07S West	2420.0	5340.0	514.35	522.14	0.0321	Upward
P07M East	2432.8	5337.0	507.85	522.62		
P07M East	2432.8	5337.0	507.85	522.62	0.0539	Upward
P07D North	2430.0	5345.0	497.45	523.34		
P09S West	2415.6	4447.3	517.85	524.77	0.0276	Upward
P09D East	2422.4	4446.3	496.95	525.38		
P103S	2654.4	5670.1	512.40	525.92	-0.0147	Downward
P103	2658.6	5670.2	506.78	525.82		
P104S	2309.8	5674.6	508.07	523.10	-0.0139	Downward
P104	2305.9	5685.0	502.05	522.93		
RW3S	1736.5	5614.9	523.59	528.93	-0.0427	Downward
RW3	1737.4	5613.3	500.87	527.96		

FIGURES

FIGURE 1:
SITE LOCATION

J:\S\Springfield CWLP\CWLP Ash Pond\DWG\2025\Site Map.dwg Tab: Layout1



N

0 | 200 | 4000 | 8000

SCALE: IN FEET

NOTE:
BACKGROUND IMAGE COURTESY OF
UNITED STATES GEOLOGICAL SURVEY.

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SITE LOCATION

PLANS PREPARED FOR

CITY, WATER, LIGHT & POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE:	SEPTEMBER 2025
PROJECT ID:	240338/0014
SHEET NUMBER:	FIG. 1

APPROVED BY: KWF | DESIGNED BY: KWF | DRAWN BY: BCK

FIGURE 2:
SITE FEATURES

LEGEND

POND/LANDFILL BOUNDARY

NOTE

1. AERIAL IMAGE FROM APRIL 7, 2024, FROM GOOGLE EARTH.

N

0 250 500 1000

SCALE: IN FEET

NO.	DATE	REVISION DESCRIPTION	BY

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APPROVED BY: BJH DESIGNED BY: BJH DRAWN BY: BCK

SITE FEATURES

PREPARED FOR
CITY, WATER, LIGHT AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025

PROJECT ID: 240227/0001

SHEET NUMBER:

FIG. 2

FIGURE 3:
HISTORIC SITE PHOTO - 1936

NOTE

SITE PHOTO DATED JULY 3, 1936

NO.	DATE	REVISION DESCRIPTION	BY

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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

SITE PHOTO

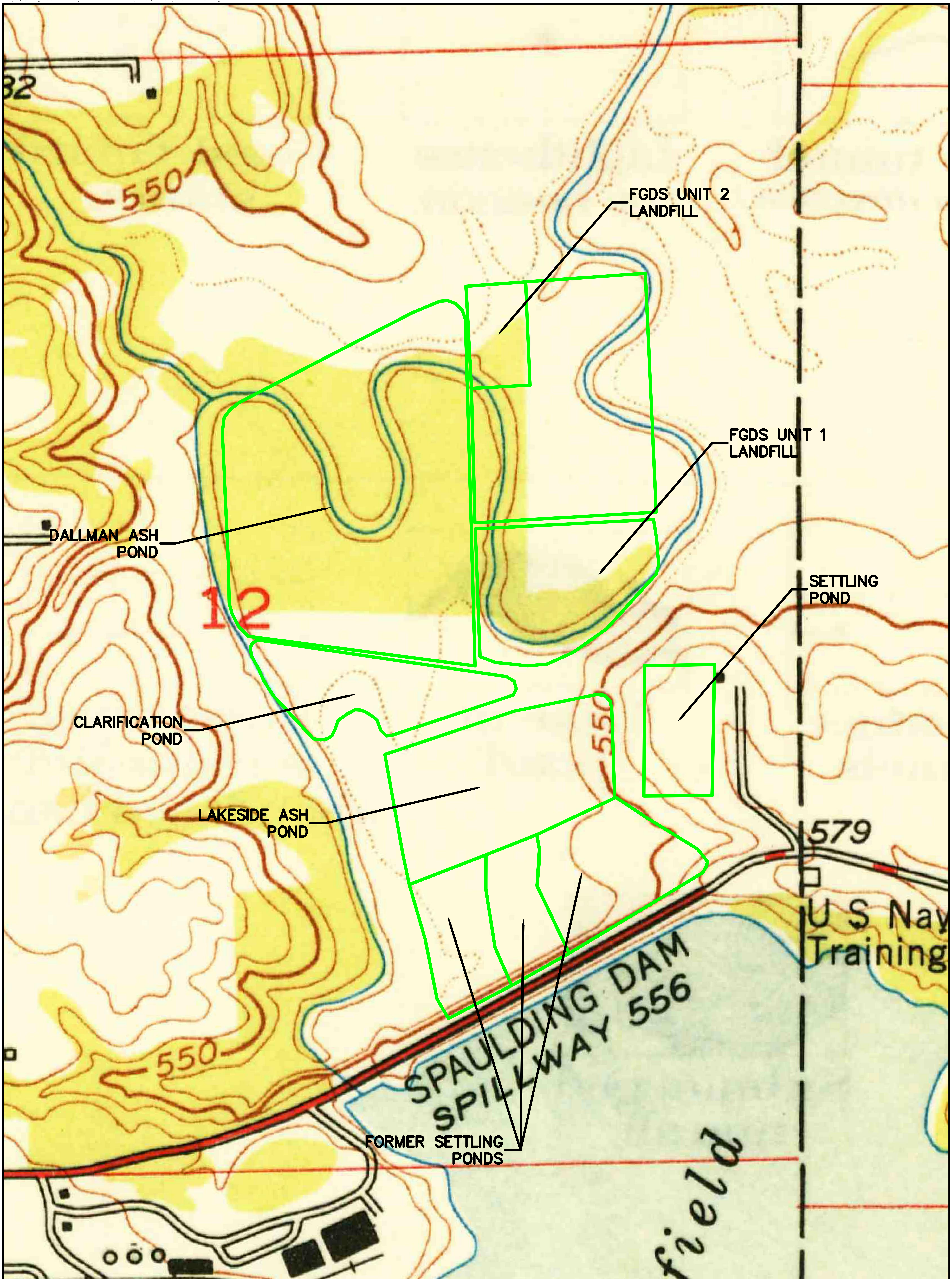
PREPARED FOR
CITY, WATER, LIGHT AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER:
FIG. 3

FIGURE 4:

HISTORIC SITE TOPOGRAPHIC MAP - 1950

Tab: FIGURE 4   Last Saved: September 15, 2025, by Ben Karpus   Plotted: Friday, September 19, 2025 4:09:01 PM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\2025\Site Photo.dwg



0 200 400 800
SCALE: IN FEET
N

NOTE

SPRINGFIELD EAST, IL HISTORICAL MAP GEOPDF 7.5X7.5 GRID 2400–SCALE 1950

FIG. 4

SHEET NUMBER:

PROJECT ID: 240338/0014

DATE: SEPTEMBER 2025

HISTORIC SITE TOPOGRAPHIC MAP – 1950

PREPARED FOR

CITY, WATER, LIGHT AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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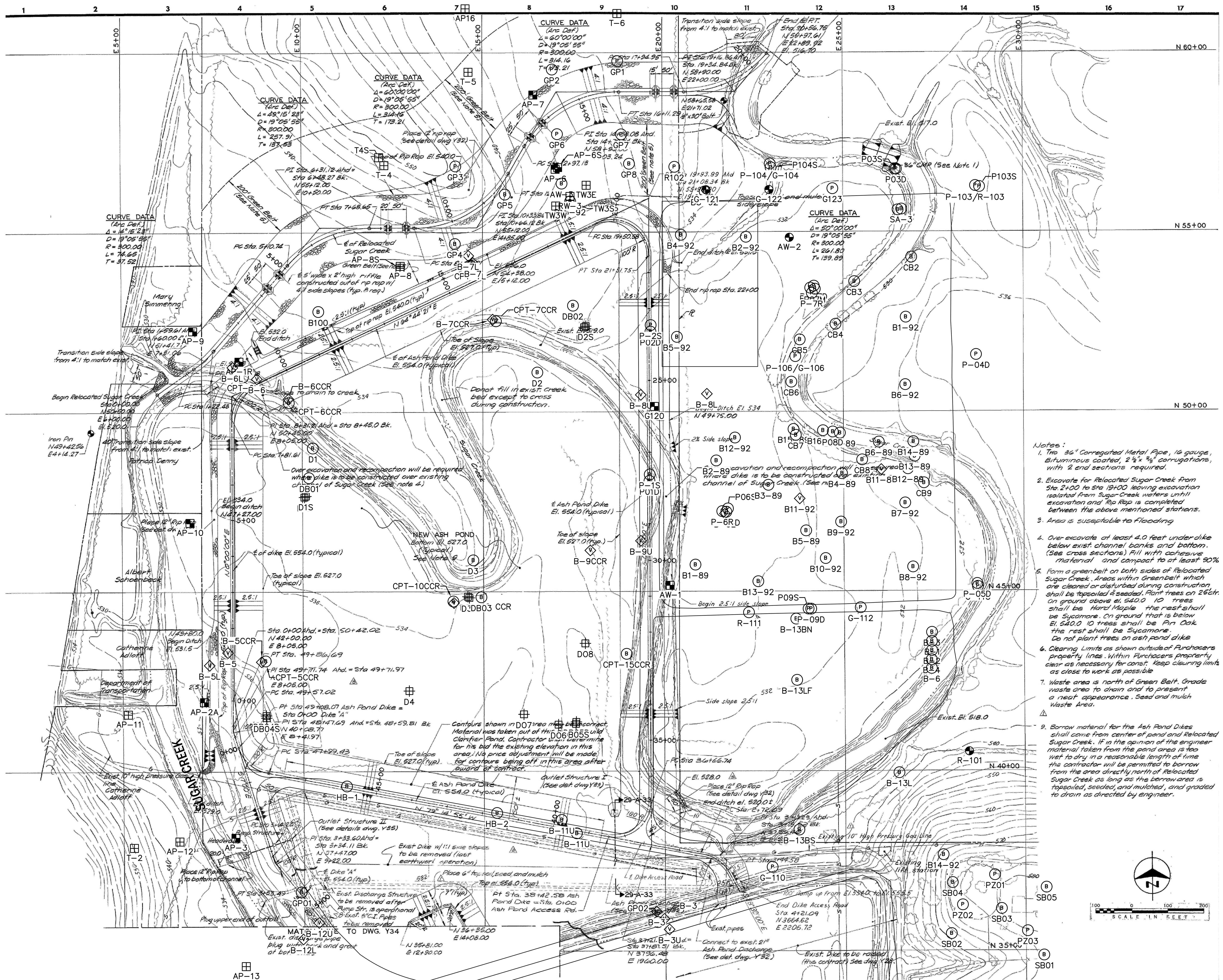
FIGURE 5:
FORMER SUGAR CREEK CHANNEL



LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE

SOURCE: GRADING PLAN – DALLMAN ASH POND, BURNS & MCDONNELL (DRAWING NO. Y29, REV. 4, DATED AUGUST 13, 1976)

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FORMER SUGAR CREEK CHANNEL

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER:
FIG. 5

FIGURE 6:

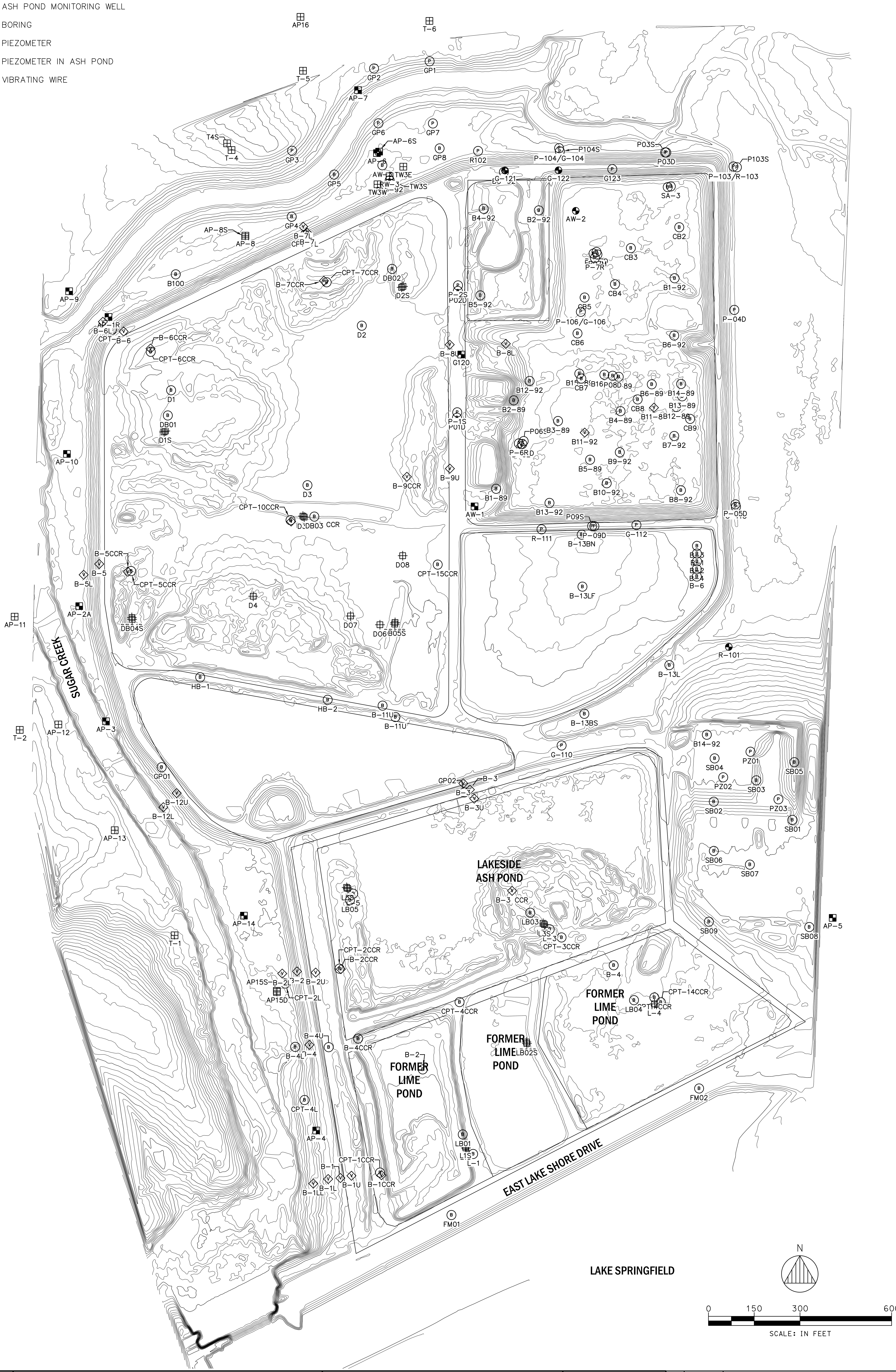
BORING AND MONITORING WELL/PIEZOMETER LOCATIONS

LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE

NOTES

1. FLIGHT DATE APRIL 2023.



BORING AND MONITORING WELL/PIEZOMETER LOCATIONS
PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

FIG. 6

SHEET NUMBER:

PROJECT ID: 24038/0014

DATE: SEPTEMBER 2025

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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

FIGURE 7:
BEDROCK SURFACE

Tab: 7 - BEDROCK SURFACE Last Saved: September 22, 2025, by Ben Karpus Plotted: Monday, September 22, 2025 2:31:26 PM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\PMAPS\2025\ISOPACH\Isopach Figures.dwg

LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 10 FEET.

BEDROCK SURFACE

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

FIG. 7

DATE: SEPTEMBER 2025

PROJECT ID: 24038/0014

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FIGURE 8:
BASAL SAND SURFACE

Tab: 8 – BASAL SAND SURFACE Last Saved: September 22, 2025, by Ben Karpus Plotted: Monday, September 22, 2025 2:31:47 PM
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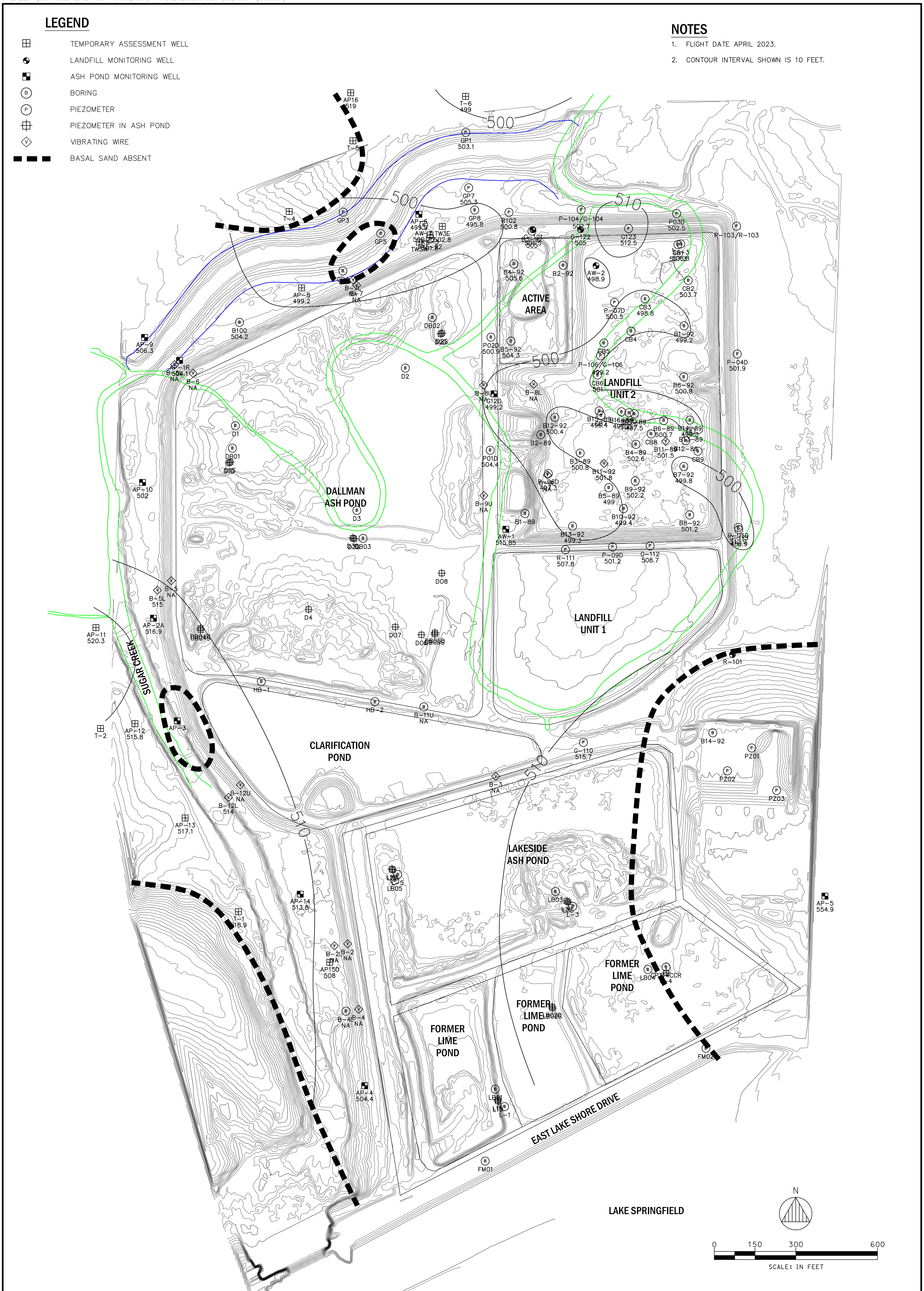

FIG. 8	SHEET NUMBER:
PROJECT ID: 24038/0014	DATE: SEPTEMBER 2025

BASAL SAND SURFACE

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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FIGURE 9:
BASAL SAND ISOPACH

Tab: 9 – BASAL SAND ISOPACH Last Saved: September 22, 2025, by Ben Karpus Plotted: Monday, September 22, 2025 2:32:03 PM
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LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE
- BASAL SAND ABSENT

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 5 FEET.

FIG. 9

SHEET NUMBER:

PROJECT ID: 240338/0014

DATE: SEPTEMBER 2025

BASAL SAND ISOPACH

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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FIGURE 10:

LOWER COHESIVE DEPOSIT SURFACE

PDF_0055

Tab: 10 - LOWER COHESIVE DEPOSIT SURFACE   Last Saved: September 22, 2025, by Ben Karpus   Plotted: Monday, September 22, 2025 3:15:06 PM
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LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE
- LOWER COHESIVE DEPOSIT ABSENT

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 5 FEET.

LOWER COHESIVE DEPOSIT SURFACE

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

SHEET NUMBER:

FIG. 10

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

FIGURE 11:

LOWER COHESIVE DEPOSIT ISOPACH

Tab: 11 – LOWER COHESIVE DEPOSIT ISOPACH Last Saved: September 22, 2025, by Ben Karpus Plotted: Monday, September 22, 2025 3:20:02 PM
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LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE
- LOWER COHESIVE DEPOSIT ABSENT

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 5 FEET.

LOWER COHESIVE DEPOSIT ISOPACH

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

FIG. 11

DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

SHEET NUMBER:

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

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FIGURE 12:
SHALLOW SAND SURFACE

PDF_0059

Tab: 12 - SHALLOW SAND SURFACE   Last Saved: September 22, 2025, by Ben Karpus   Plotted: Monday, September 22, 2025 2:33:32 PM
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LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE
- SHALLOW SAND ABSENT

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 10 FEET.

SHALLOW SAND SURFACE

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

SHEET NUMBER: FIG. 12

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

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NO.	DATE	REVISION DESCRIPTION	BY

FIGURE 13:
SHALLOW SAND ISOPACH

Tab: 13 - SHALLOW SAND ISOPACH Last Saved: September 22, 2025, by Ben Karpus Plotted: Monday, September 22, 2025 2:33:49 PM
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NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 5 FEET.

FIG. 13

DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

SHEET NUMBER:

SHALLOW SAND ISOPACH

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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SPRINGFIELD, ILLINOIS 62711-7233
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NO.	DATE	REVISION DESCRIPTION	BY

FIGURE 14:
UPPER COHESIVE DEPOSIT SURFACE

Tab: 14 - UPPER COHESIVE DEPOSIT SURFACE   Last Saved: September 22, 2025, by Ben Karpus   Plotted: Monday, September 22, 2025 2:34:04 PM
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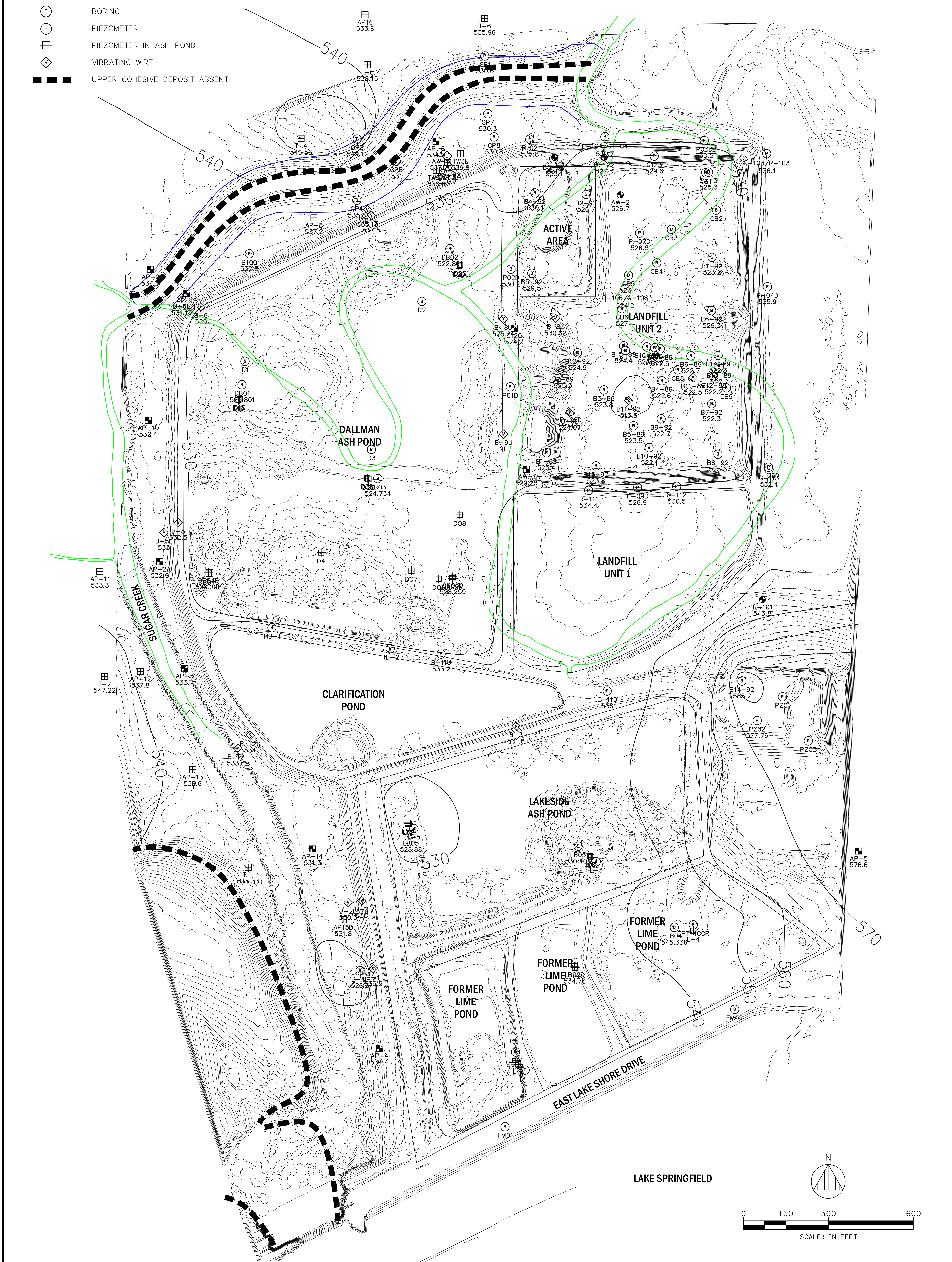
LEGEND

- TEMPORARY ASSESSMENT WELL
- LANDFILL MONITORING WELL
- ASH POND MONITORING WELL
- BORING
- PIEZOMETER
- PIEZOMETER IN ASH POND
- VIBRATING WIRE
- UPPER COHESIVE DEPOSIT ABSENT

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 10 FEET.



UPPER COHESIVE DEPOSIT SURFACE

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

FIG. 14

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER:

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334   WWW.ANDREWS-ENG.COM
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NO.	DATE	REVISION DESCRIPTION	BY

FIGURE 15:
UPPER COHESIVE DEPOSIT ISOPACH

Tab: 15 - UPPER COHESIVE DEPOSIT ISOPACH Last Saved: September 22, 2025, by Ben Karpus Plotted: Monday, September 22, 2025 2:34:19 PM
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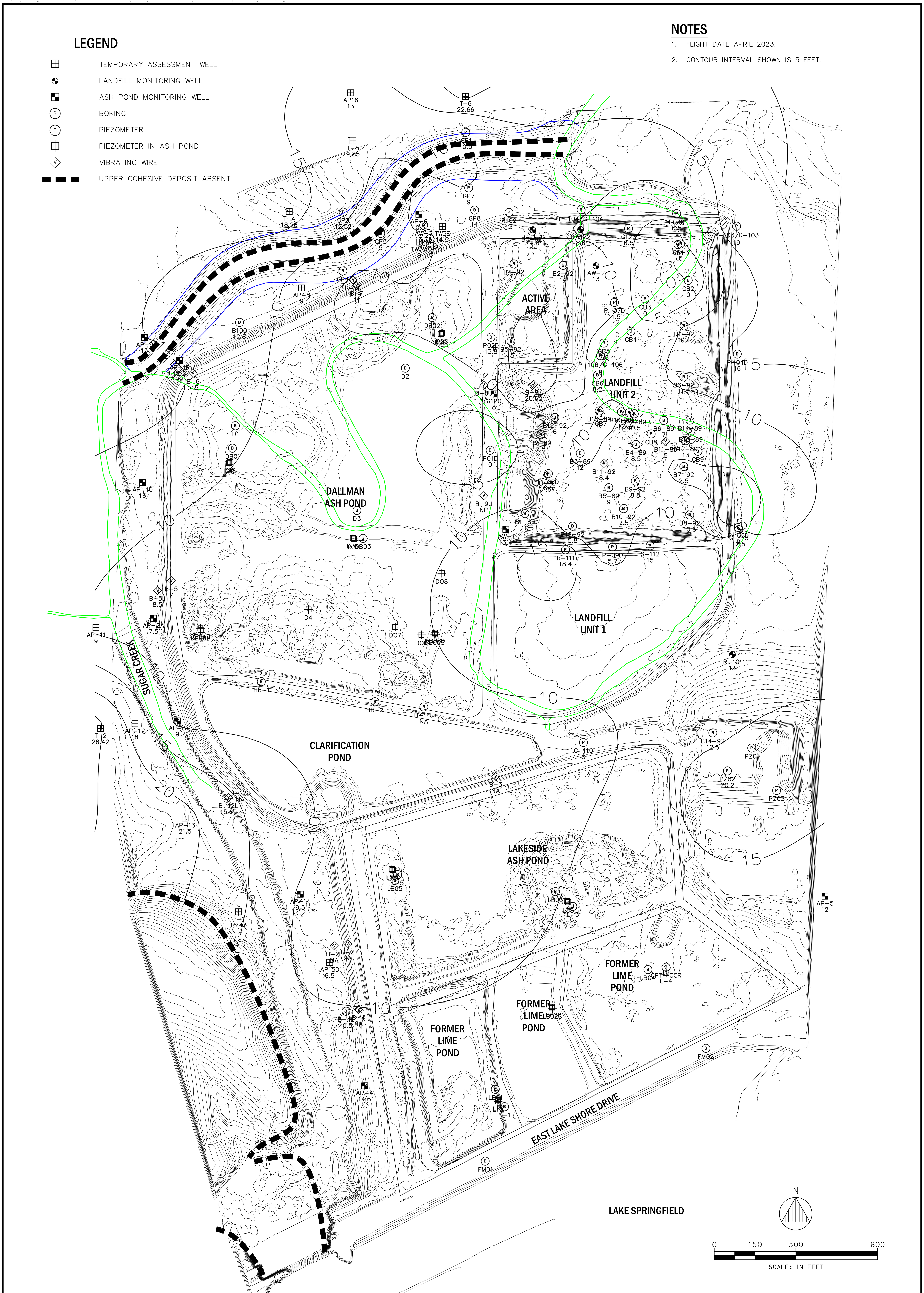

FIG. 15	DATE: SEPTEMBER 2025 PROJECT ID: 240338/0014 SHEET NUMBER:

UPPER COHESIVE DEPOSIT ISOPACH

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

APPENDICES

APPENDIX A:
BORING LOGS

APPENDIX A1:
FGDS LANDFILL UNIT 2 INVESTIGATION

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring: B-1

Project Name: FGD Sludge Facility - South Cell   Date of Boring: May 30, 1989

Site: Springfield, Illinois   Project No.: 020-95020

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, trace sand, dark grey, stiff		1-AU	--	--	--	--	
		2-SS	5	--	1.3	--	
	5	3-SS	4	--	1.0	--	
		4-SS	6	--	1.5	--	
Silty clay, trace sand, light grey, firm to stiff	10	5-SS	5	--	0.8	--	
		6-SS	4	--	0.8	--	
	15	7-SS	4	--	1.5	--	
		8-SS	4	--	1.0	--	
	20	9-SS	4	--	1.3	--	
End of boring							Dry upon completion

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-2

Project Name: FGD Sludge Facility - South Cell   Date of Boring: May 30, 1989

Site: Springfield, Illinois   Project No.: 020-95020

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE		1-AU	--	--	--	--	
Silty clay, trace sand, grey, mottled brown, firm		2-SS	8	--	0.8	--	
Silty clay, trace sand, grey, stiff	5	3-SS	9	--	1.8	--	
		4-SS	7	--	1.8	--	
	10	5-SS	2	--	--	--	
Clayey silt, trace sand, grey, stiff		6-SS	4	--	1.5	--	
	15	7-SS	4	--	1.3	--	
		8-SS	6	--	1.3	--	While drilling
	20	9-SS	7	--	1.5	--	
End of boring							

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-3

Project Name: FGD Sludge Facility - South Cell   Date of Boring: May 30, 1989

Site: Springfield, Illinois   Project No.: 020-95020

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, trace sand, grey, mottled brown, stiff		1-AU	--	--	--	--	
		2-SS	7	--	1.3	--	
	5	3-SS	4	--	1.5	--	
		4-SS	6	--	1.5	--	
	10	5-SS	4	--	1.3	--	
Clayey silt, trace sand, organics, grey, stiff		6-SS	5	--	0.8	--	
	15	7-SS	4	--	1.5	--	
		8-SS	5	--	1.0	--	While drilling
	20	9-SS	4	--	1.3		
		10-SS	--	--	1.3	--	
Sand, fine, some silt, grey, medium dense	25	11-SS	9	--	--	--	
							*Note 1
Shale, grey, very stiff (weathered)	30	12-SS	50/6"	--	3.0	--	
End of boring							

*Note 1: Blow-in sand @27.5'

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-4

Project Name: FGD Sludge Facility - South Cell   Date of Boring: May 30, 1989

Site: Springfield, Illinois   Project No.: 020-95020

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE		1-AU	--	--	--	--	
Silty clay, trace sand, organics, mottled brown, stiff		2-SS	4	--	1.7	--	
	5	3-SS	4	--	1.0	--	
Silty clay, trace sand, dark grey, stiff		4-SS	7	--	2.0	--	
Silty clay, trace sand, mottled brown, very stiff	10	5-SS	11	--	2.5	--	
Clayey silt, trace sand, grey, firm to stiff		6-SS	7	--	1.0	--	While drilling
	15	7-SS	5	--	0.8	--	
		8-SS	9	--	1.5	--	
*Note 1	20	9-SS	7	--	--	--	

End of boring

*Note 1: Silty sand, some gravel, slightly compact

City Water Light and Power
June 12, 1989
Page nine of ten

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-6

Project Name: FGD Sludge Facility - South Cell   Date of Boring: May 30, 1989

Site: Springfield, Illinois   Project No.: 020-95020

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, trace sand, brown, stiff		1-AU	--	--	--	--	
		2-SS	5	--	--	--	*Poor recovery on 2-SS
	5	3-SS	7	--	1.3	--	
Silty clay, trace sand, mottled grey, stiff		4-SS	8	--	1.5	--	
	10	5-SS	6	--	1.5	--	
Clayey silt, trace sand, grey, stiff		6-SS	6	--	1.0	--	
	15	7-SS	7	--	1.3	--	
		8-SS	7	--	1.8	--	While drilling
	20	9-SS	9	--	1.8	--	

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-1

Project Name: Subsurface Exploration   Date of Boring: September 28, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois   Project No.: 020-95039

Surface Elevation 525.36

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE						16	▽ 0 HR.
Clayey silt, trace sand, grey, mottled brown						19	
	5	1-SS (50%)				23	
	10	2-SS (20%)				16	
Silty clay, trace sand, gravel, some organics, dark brown, black		3-SS (10%)				19	
	15						
	20	4-SS (50%)				16	
		5-SS (40%0)				13	
Shale, grey							
End of Boring	25						

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-2

Project Name: Subsurface Exploration Date of Boring: September 28, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 525.28

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
*Note 1						14	
Silty clay, grey, mottled brown		1-SS (100%)				21	
Silty sand, fine to medium, brown	5					23	▽ 0 HR.
*Note 2							
Silty sand, grey, brown	10	2-SS (50%)				25	
		3-ST (30%)					
Clayey silt, trace sand, grey		4-SS (90%)					
	15	5-ST (100%)					
		6-SS (90%)				24	
						21	
Sandy silt, grey	20	7-ST (80%)					
		8-SS (90%)					
	25					18	
Shale, grey	30	9-SS (80%)					

End of Boring

*Note 1: Silty clay, grey, mottled brown, some organics

*Note 2:
6.5'-6.8': Silt, grey, mottled brown
6.8'-7.0': Silty sand, brown, grey
7.0'-7.5': Clay, trace sand, brown, grey

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-3

Project Name: Subsurface Exploration Date of Boring: September 28, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 523.83

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE						14	
Silty clay, trace sand, grey, mottled brown							▽ 0 HR.
	5	1-SS (95%)				23	
						23	
Silty dand, fine to medium, grey, brown	10	2-SS (90%)				20	
Clayey silt, trace sand, gravel						25	
Sand, trace gravel, fine to coarse, grey	15	3-SS (10%)				18	
Sandy silt, grey						19	
	20	4-SS (90%)				20	
Sand and gravel, fine to coarse, grey	25	5-SS (95%)				19	
	30	6-SS (10%)					
End of Boring							

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-4

Project Name: Subsurface Exploration Date of Boring: September 29, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 522.61

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE						14	▽ 0 HR.
Silty clay with organics, black, dark brown	5	1-SS (5%)				23	
Silty clay, trace sand, grey, mottled brown		2-SS (90%)				22	
Silty clay to clayey silt, trace sand, grey	10						
	15	3-SS (90%)				21	
	20	4-SS (100%)				24	
Sand, fine, some silt, grey							
Silty clay, some sand, grey	25	5-SS (50%)				19	
		6-SS (30%)				12	
*Note 1							
End of Boring							

*Note 1: 27'-27.5' - Sand and gravel, grey
27.5'-28' - Shale, grey

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-5

Project Name: Subsurface Exploration Date of Boring: September 30, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 523.49

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Clayey silt, some organics, sand, brown, mottled grey						19	
		1-SS (80%)					
	5	2-ST (100%)				24	
Silty clay, trace sand, grey		3-SS (95%)					
	10	4-ST (0%)					
		5-SS (100%)					
	15	6-ST (0%)				20	
		7-SS (100%)					
	20	8-ST (0%)				20	
		9-SS (80%)					
Silty sand, grey	25	10-SS	28/52			9	
Sand with gravel, medium to coarse, grey		11-SS	35/42				
Shale, grey	30	12-SS	100/½"			9	
End of Boring							

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-6 (4' S. of 500+400)

Project Name: Subsurface Exploration Date of Boring: October 3, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 522.71

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, brown, black						17	
Silty clay, grey, mottled brown	5	1-SS (75%)				31	▽ 0 HR.
Silty clay, some organics, trace sand, grey	10	2-SS (50%)				27	
		3-SS (100%)					
	15					20	
		4-SS (75%)					
	20					24	
Sand, fine to medium, grey		5-SS (90%)					
Silty sand, fine to coarse, grey	25					22	
Shale, grey (Hard Drilling)							
End of Boring							
	30						

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-11

Project Name: Subsurface Exploration Date of Boring: September 29, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 522.49

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Clayey silt, some organics, black, dark brown						18	▽ 0 HR.
	5	1-SS (5%)				22	
Silty clay, trace sand, grey		2-SS (90%)					
	10					17	
		3-SS (100%)					
	15					19	
		4-SS (25%)					
	20					18	
Silty sand, grey		5-SS (15%)				22	
Sand with gravel, grey	25	6-SS				21	
Shale, grey		7-SS	53/9.5-3"			12	
End of Boring							
	30						

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-12 (Offset 36' west)

Project Name: Subsurface Exploration Date of Boring: October 3, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 522.22

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, trace sand, grey, brown							▽ 0 HR
Silty clay, trace sand, grey		1-SS (75%)				24	
	5	2-SS (100%)				26	
Silty clay, some organics, trace sand, gravel, grey	10	3-SS (100%)				25 21	
Silty clay to clayey silt, trace sand, grey	15	4-SS (50%)				23 21	
	20	5-SS (25%)				22 22	
	25	6-SS (50%)				21	
Shale, grey						9	
End of Boring	30						

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-13

Project Name: Subsurface Exploration Date of Boring: October 3, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 522.20

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay with organics, dark grey							▽ 0 HR
		1-SS (50%)				27	
	5	2-ST (50%)				37	
Silty clay, trace sand, grey						38	
		3-SS (25%)					
Clayey silt with sand, fine, grey	10	4-ST (50%)				23	
		5-SS (100%)				20	
	15	6-ST (60%)				27	
		7-SS (100%)				21	
	20					18	
		8-SS (40%)					
						21	
	25						
						17	
Shale, grey? (Hard Drilling)							
End of Boring							

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-14

Project Name: Subsurface Exploration   Date of Boring: October 2, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois   Project No.: 020-95039

Surface Elevation 522.25

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, grey, mottled brown	5	1-SS (50%)				23	0 HR.
Silty clay to clayey silt, some sand, fine, grey	10	2-SS (15%)				20	While Drilling
	15	3-SS (75%)				18	
	20	4-SS (75%)				21	
	25	5-SS (75%)				19	
Sand with gravel, fine to coarse, grey *Hard Drilling @28.5' (Shale?)		6-SS (80%)				15	
End of Boring	30						

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-15

Project Name: Subsurface Exploration Date of Boring: October 2, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 524.35

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, trace sand, grey, mottled brown						18	▽ 0 HR.
	5	1-SS (90%)					
		2-ST (100%)					
		3-SS (90%)				20	
Silty clay to clayey silt, some sand, fine, grey	10					36	
		4-SS (100%)				25	
	15					22	
		5-SS (100%)					
	20					21	
		6-SS (95%)				20	
						20	
	25					26	
		7-SS (50%)					
Sand with gravel, medium to coarse	30					15	
End of Boring							

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-16

Project Name: Subsurface Exploration Date of Boring: October 2, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 523.15

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, mottled brown						16	▽ 0 HR.
		1-SS (75%)					
Silty clay, trace sand, dark grey, black	5						
		2-ST (30%)					
Silty clay to clayey silt, some sand, fine, grey		3-SS (100%)					
	10	4-ST (100%)					
Sand, fine to coarse, grey		5-SS (50%)					
	15					24	
Silty clay, trace sand, grey		6-ST (10%)					
		7-SS (75%)				21	
	20						
		8-SS (50%)				17	
	25						
Sand with gravel, fine to coarse, grey							
Shale, grey (Hard Drilling @27.5')	30					16	
End of Boring							

PSI A-100-9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-17 (Offset 12' south of stake)

Project Name: Subsurface Exploration Date of Boring: October 2, 1989

Site: CWLP Ash Disposal Facility, Springfield, Illinois Project No.: 020-95039

Surface Elevation 522.50

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, brown, mottled black						17	▽ 0 HR.
	5	1-SS (25%)					
		2-SS (5%)					
	10					19	
Silty clay with organics, trace sand, grey		3-SS (95%)				30	
						21	
	15	4-SS (90%)				20	
Silty clay to clayey silt, sand, grey	20						
		5-SS (80%)				21	
	25						
Sand with gravel, fine to coarse, grey							
Shale, grey						14	
End of Boring							

PSI A-100-9

PROJECT CWLP Flue Gas Desulfurization Sludge Landfill

CLIENT Andrews Environmental Engineers, Inc.

TSC

BORING SA-3 DATE STARTED 11-16-93 DATE COMPLETED 11-16-93 JOB L - 30,161

ELEVATIONS		WATER TABLE	
GROUND SURFACE	529.3	WHILE DRILLING	Drilling Fluid
END OF BORING	498.6	AT END OF BORING	Drilling Fluid
N 5560 E 2673		24 HOURS	Grouted

LENGTH RECOVERY

DISTANCE BELOW SURFACE IN FEET	SAMPLE NO.	SAMPLE TYPE	N	WC	C_u	γ DRY	DEPTH	ELEV.	SOIL DESCRIPTIONS
0									
	1	SS	10	22.1	3.0*				Very stiff dark gray and dark brown silty CLAY, little sand (CL)
					2.15				
	2	SS	9	23.5	2.0*				
							4.0	525.3	
5	3	SS	3	30.1		92.8			Soft to medium stiff gray silty CLAY, little sand, occasional wood fragments (CL)
	4	SS	3	30.5	0.50				LL = 28 PI = 13
	A			27.9	0.55	95.0			
	5	PS	Push				9.0	520.3	
	B			24.7	—				Loose gray silty SAND (SM)
10							10.0	519.3	
	6	SS	2	28.0	0.21				Soft gray silty CLAY, little sand (CL)
	7	SS	2	25.2					
							14.0	515.3	
15	8	SS	2	52.7		67.5			Soft gray ORGANIC CLAY, some sand, organic matter, wood fragments (OL) LL = 30 PI = 13
					0.40				
				54.8	–	71.4			
	9	PS	Push	84.9	–	49.0	16.0	513.3	Loose gray fine SAND, peat lens at 16.5' (SP)
	A			–	–				
							17.5	511.8	
	10B	SS	2	46.6	0.75*				Medium stiff ORGANIC CLAY, wood fragments (OL)
	C			31.6	–				
							19.0	510.3	
	A			39.6	0.37				Soft gray silty CLAY, little sand (CL)
20	11	SS	2						
	B			22.8			20.5	508.8	
	12	SS	3						Loose gray silty SAND, (clayey at top) (SM)
	13	SS	3	22.8					
25									
	14	SS	2						
							27.0	502.3	
	15	SS	17						Medium dense gray fine SAND (SP)
	A								
30	16	SS	30/0.2						
	B						30.5	498.8	SHALE
35									
40									

End of Boring at 30.7'. Sampler refusal

Cu Indicates Undrained Shear Strength - ksf
x.xx = 1/2 Unconfined compressive strength;
x.xx = Torvane Value.
x.x* = 1/2 Calibrated Penetrometer Value

DRILL RIG NO. AEX

PATRICK ENGINEERING INC.

BORING NUMBER B-1 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 5,260.5 E 2,685.6

LOGGED BY KRR
GROUND ELEVATION 523.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
523.2	0.0		Brown silty clay, trace coarse to fine sand, stiff to very stiff, medium plasticity, wet CL	AU-1 0.0-2.0		27.3	
				SS-2 2.0-4.0 24"R	2 3 3 3	25.6	
				SS-3 4.0-6.0 24"R	2 3 3 4	28.8	
				3T-4 6.0-8.0 4"R		23.0	Low recovery.
515.2	8.0		Gray silty clay, trace to little fine sand, soft, medium plasticity, wet CL 1" fine sand lense at 9.5'	SS-5 8.0-10.0 24"R	1 1 1 1	26.7	
512.8	10.4		Gray clayey sand and silt, very loose, poorly graded, saturated SC	SS-6 10.0-12.0 24"R	WOH 1 1 1	19.5	Water level at 10.0' during drilling.
				SS-7 12.0-14.0 24"R	WOH WOH WOH WOH	20.0	SS-7: Gravel = 0% Sand = 50% Silt or Clay = 50%
509.2	14.0		Gray silty clay to clayey silt, trace fine sand, very soft to soft, low to medium plasticity, moist to wet CL/CL-ML Lense of fine sand at 15.0'	SS-8 14.0-16.0 24"R	1 1 1 1	24.8	
				SS-9 16.0-18.0 24"R	WOH WOH 1 1	25.4	SS-9: LL = 25 PL = 22 PI = 3
				SS-10A B 18.0-20.0 24"R	WOH WOH 2 2	23.4	
503.7	19.5						
503.2	20.0		Gray clayey fine sand, little silt, loose,			22.8	

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 6-1/4" I.D. HSA.
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 8/1/92 ENDED 8/1/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 10.0' during drilling
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-1** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,260.5 E 2,685.6**

LOGGED BY **KRR**
GROUND ELEVATION **523.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
503.2	20.0		poorly graded, saturated SC	SS-11AB 20.0-22.0 14"R	WOH WOH WOH WOH	22.8 ○; 24.9 ○; ✳	
501.7	21.5		Gray fine sand, little silt, very loose, poorly graded, saturated SP-SM/SM				
			Gray silty clay, trace to little fine sand, soft, medium plasticity, moist CL	SS-12 22.0-24.0 2"R	WOH WOH WOH WOH	23.7 ○	Blow-in at 26.0'.
499.2	24.0		Gray coarse to fine sand, trace to little fine gravel, little silt, dense, well graded, saturated SW-SM/SM	SS-13 24.0-26.0 24"R	3 8 11 13	15.5 ○	
				SS-14 26.0-28.0 0"R			SS-14 could not be obtained due to blow-in.
			Gray fine sand, trace silt from 28.0'-29.0'	SS-15AB 28.0-30.0 20"R	7 24 76 100+/3"	14.4 ○; 14.0 ○; ✳	
494.2	29.0		Gray silty clay to clay, hard, medium to high plasticity, moist to dry CL/CH				
490.2	33.0		Gray shale, massive, excellent	PQ-16 33.0-38.0 60"R			Hard clay; drilled to 33.0'. Auger refusal at 33.0'; switched to coring. RQD = 100%
485.2	38.0		End of Boring at 38.0'.				Borehole was tremie grouted immediately after completion of drilling.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/1/92** ENDED **8/1/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 10.0' during drilling
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-2** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,482.9 E 2,241.0**

LOGGED BY **KRR**
GROUND ELEVATION **526.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
526.7	0.0		Brown mottled silty clay, trace fine sand, soft to medium stiff, medium plasticity, wet CL	AU-1 0.0-2.0		23.8	
				SS-2 2.0-4.0 20"R	3 2 2 3	24.6	
				SS-3 4.0-6.0 24"R	2 2 3 3	25.4	
				SS-4 6.0-8.0 24"R	3 3 3 3	23.7	
517.7	9.0		Gray silty clay, trace fine sand, medium stiff, medium plasticity, wet CL	3T-5 8.0-10.0 24"R			
				SS-6 10.0-12.0 24"R	1 1 2 3	25.7	
512.7	14.0		Little fine sand and trace shells in SS-7A 6" long wood in SS-7B	SS-7AB 12.0-14.0 24"R	2 2 2 3	27.3	
510.7	16.0		Gray fine sand, little to some silt, loose, poorly graded, saturated SM	SS-8 14.0-16.0 24"R	1 1 2 4	21.7	Water level at 14.0' during drilling.
508.7	18.0		Dark gray silty clay, trace fine sand, trace organics, medium stiff, medium plasticity, wet CL/OL	SS-9 16.0-18.0 24"R	2 2 2 4	36.9	
506.7	20.0		Gray silty clay, trace fine sand, stiff, medium plasticity, wet CL	SS-10 18.0-20.0 24"R	3 3 5 5	21.1	

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6 1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/29/92** ENDED **7/29/92**

REMARKS

WATER LEVEL (ft.)
▽ **14.0'** during drilling
▽ **14.2'** within augers prior to coring
▽

PATRICK ENGINEERING INC.

BORING NUMBER	B-2
SHEET	2 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 5,482.9 E 2,241.0
LOGGED BY	KRR
GROUND ELEVATION	526.7

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
506.7	20.0		Gray silty clay, trace fine sand, medium stiff, low to medium plasticity, moist to wet CL	SS-11 20.0-22.0 18"R	3 4 4 5	22.2	
				SS-12 22.0-24.0 24"R	2 2 2 2	26.8	
				SS-13 24.0-26.0 24"R	1 2 2 2	17.6	
			Clayey silt at 27.0'	3T-14 26.0-28.0 14"R			
498.7	28.0		Gray clayey silt to silt, extremely dense, dry CL-ML/ML	SS-15 28.0-30.0 24"R	2 13 23 72	9.6	
496.7	30.0		Gray shale, soft	SS-16 30.0-31.0 9"R	80 120+ /3"	12.9	Water level within augers at 14.2' prior to coring. Auger refusal at 31.0'. Switched to PQ rock coring.
				PQ-17 31.0-35.0 48"R			
491.7	35.0		End of Boring at 35.0'.				Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	6 1/4" I.D. HSA.
DRILLING EQUIPMENT	CME-55/ATV
DRILLING STARTED	7/29/92 ENDED 7/29/92

REMARKS

WATER LEVEL (ft.)

- ▽ 14.0' during drilling
- ▽ 14.2' within augers prior to coring
- ▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-3** SHEET **1** OF **3**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION

LOGGED BY **SAS**
GROUND ELEVATION **553.0**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
553.0	0.0		Brown silty clay, trace fine sand, very stiff to hard, low plasticity, dry to moist, fill CL	AU-1 0.0-2.0			
			Dark gray streaks at 3.0'	SS-2 2.0-4.0 6"R	3 4 5 8	11.8	
			Brown and dark gray from 4.0'	SS-3 4.0-6.0 12"R	5 8 5 8	12.7	
				SS-4 6.0-8.0 18"R	- - 5 8	18.3	
			Dark gray at 8.0', trace fine gravel	SS-5 8.0-10.0 16"R	3 5 6 8	18.8	
			Dark gray, trace organic	SS-6 10.0-12.0 14"R	3 7 8 8	19.5	
539.0	14.0			SS-7 12.0-14.0 12"R	3 5 6 7	17.6	
			Gray silty clay, trace fine sand, very stiff, medium plasticity, moist to wet, fill	3T-8 14.0-16.0 20"R			
				SS-9 16.0-18.0 18"R	- 13 13 15	18.8	
533.0	20.0		Dark gray, trace organics at 18.0'	SS-10 18.0-20.0 18"R	3 5 7 12	20.3	

Water Content scale: 10, 20, 30, 40, 50; Unconfined Compressive Strength scale: 1, 2, 3, 4, 5

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-75/ATV**
DRILLING STARTED **7/24/92** ENDED **7/24/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
∇ 48' during drilling
∇ 33.1' end of drilling
∇

PATRICK ENGINEERING INC.

BORING NUMBER	B-3
SHEET	2 OF 3
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION	
LOGGED BY	SAS
GROUND ELEVATION	553.0

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ 10 20 30 40 50 △ LL) / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
533.0	20.0		Light gray, mottled silty clay, trace fine sand, very stiff, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	- 3 6 7	20.3	
531.0	22.0		Brown mottled silty clay, trace fine sand, stiff, medium plasticity, wet CL	SS-12 22.0-24.0 24"R	- 3 5 7	23.3	
528.3	24.7		Light brown silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-13 24.0-26.0 24"R	1 2 3 5	27.8	
526.5	26.5		Gray silty clay, trace fine sand, stiff to hard, medium plasticity, wet CL	SS-14 26.0-28.0 24"R	- 3 5 9	27.8	
			Sand Lenses	SS-15 28.0-30.0 24"R	3 4 5 5	24.0	
				3T-16 30.0-32.0 24"R			
519.9	33.1			SS-17 32.0-34.0 24"R	1 1 2 2	24.7	
519.0	34.0		Gray sandy clay, soft, medium plasticity, moist SC				
			Dark gray to brown silty clay, trace fine sand, very soft to soft, medium plasticity, wet CL	SS-18 34.0-36.0 24"R	3 2 2 3	34.0	
				SS-19 36.0-38.0 24"R	- 1 1 2	27.3	
				3T-20 38.0-40.0 24"R		24.6	3T-20: Dry Dens.=104.2pcf k=8.2E-08 cm/s
513.0	40.0						

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME-75/ATV
DRILLING STARTED	7/24/92 ENDED 7/24/92

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ 48' during drilling
▼ 33.1' end of drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-3** SHEET **3** OF **3**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION

LOGGED BY **SAS**
GROUND ELEVATION **553.0**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
513.0	40.0		Dark gray to brown silty clay, trace fine sand, very soft to soft, medium plasticity, wet CL Sand Lense at 40.8', very soft	SS-21 40.0-42.0 16"R	WOH WOH WOH WOH	20.8	
510.7	42.3		Gray silty clay to clayey silt, little to some sand, soft to stiff, medium plasticity, moist to wet CL Sand Lense at 43.3' and 43.6'	SS-22 42.0-44.0 24"R	1 1 2 2	18.2	
				SS-23 44.0-46.0 24"R	2 4 4 3	16.9	
				3T-24 46.0-48.0 24"R			
505.0	48.0		Gray clayey fine sand, some silt, very loose, saturated SC	SS-25 48.0-50.0 12"R	WOH WOH WOH WOH	25.7	Rod weight pushed sample.
				SS-26 50.0-52.0 24"R	WOH WOH WOH WOH	20.4	
501.0	52.0		Gray fine sand, trace coarse to medium sand, trace silt, very loose, poorly graded, saturated SP/SP-SM	SS-27 52.0-54.0 3"R	WOH WOH WOH WOH		
499.0	54.0		Gray coarse to fine sand, little silt, trace fine gravel, loose, poorly graded, saturated SM	SS-26AB 54.0-56.0 9"R	2 80+/ 5"	9.5	Borehole was tremie grouted using Volclay grout immediately after drilling.
498.5	54.5		Gray shale				
498.2	54.8		End of Boring at 54.8'				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-75/ATV**
DRILLING STARTED **7/24/92** ENDED **7/24/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ **48'** during drilling
▽ **33.1'** end of drilling
▽

PATRICK ENGINEERING INC.

BORING NUMBER B-4 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 5,488.2 E 2,060.4

LOGGED BY KRR
GROUND ELEVATION 530.1

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL ☐ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
530.1	0.0		Brown mottled silty clay, trace fine sand, very stiff, medium plasticity, wet CL	AU-1 0.0-2.0		23.1	
				SS-2 2.0-4.0 24"R	5 5 5 4	22.1	
				SS-3 4.0-6.0 24"R	3 4 5 7	20.3	
				3T-4 6.0-8.0 24"R		28.0	3T-4: Dry Dens. = 99pcf K = 4.7 E--8cm/s
			Brown at 8.0'	SS-5AB 8.0-10.0 24"R	2 4 5 6	27.4, 33.5	
520.6	9.5		Gray silty clay, trace fine sand, medium stiff to stiff, medium to high plasticity, wet CL/CH	SS-6 10.0-12.0 24"R	1 2 1 1	45.4	Soft clay from 10.5' to 11.0'.
				3T-7 12.0-14.0 24"R			
516.1	14.0		Dark gray silty clay, trace fine sand, soft to medium stiff, medium plasticity, wet CL	SS-8 14.0-16.0 24"R	1 1 1 1	29.1	SS-8: LL = 32 PL = 20 PI = 12 Gravel = 0% Sand = 8% Silt or Clay = 92%
				SS-9 16.0-18.0 24"R	WOH 1 1 2	24.2	
				3T-10 18.0-20.0 24"R			
510.1	20.0						

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 7/23/92 ENDED 7/23/92

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ 31.0' during drilling.
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-4** SHEET **2 OF 2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,488.2 E 2,060.4**

LOGGED BY **KRR**
GROUND ELEVATION **530.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
510.1	20.0		Dark gray silty clay, trace fine sand, stiff, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	1 2 1 1	21.1	
				SS-12 22.0-24.0 24"R	2 2 3 4	18.9	
505.6	24.5		Gray clayey fine sand, some silt, very loose to loose, poorly graded, moist to saturated SC	SS-13 24.0-26.0 24"R	1 2 1 1	19.7	
				SS-14 26.0-28.0 24"R	1 3 2 2	17.7	SS-14: Gravel = 0% Sand = 56% Silt or Clay = 44%
				SS-15 28.0-30.0 24"R	1 1 2 2	19.6	
				SS-16 30.0-32.0 24"R	1 1 1 1	20.4	Water level at 31.0' during drilling.
498.1	32.0		Gray coarse to fine sand, trace silt, trace fine gravel, medium dense, poorly graded, saturated SP	SS-17AB 32.0-34.0 24"R	8 10 13 126	14.5	Water level was observed to rise rapidly after retrieving SS-17.
496.6	33.5		Gray siltstone/shale				
				SS-18 34.0-34.5 0"R	82 100+/- 1"		Blow-in at 34.0'
495.6	34.5		End or Boring at 34.5'.				Water level within augers at 6.0' one hour after completion of drilling. Borehole was termie grouted using Volclay grout.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/23/92** ENDED **7/23/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **31.0'** during drilling
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER	B-5
SHEET	1 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 5,204.3 E 2,049.3
LOGGED BY	KRR
GROUND ELEVATION	529.5

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
529.5	0.0		Brown silty clay, trace coarse to fine sand, soft to very stiff, low to medium plasticity, moist to wet CL	AU-1 0.0-2.0		13.4	
				SS-2 2.0-4.0 12"R	4 3 4 4	13.5	
			Mottled brown from 4.0'	SS-3 4.0-6.0 18"R	3 2 4 3	25.3	
				SS-4 6.0-8.0 20"R	3 4 4 4	22.9	
				SS-5 8.0-10.0 24"R	2 1 2 2	24.9	
			Little fine sand at 9.5'	SS-6 10.0-12.0 20"R	2 2 2 2	23.1	
517.2	12.3		Gray silty clay, trace fine sand, medium stiff, medium plasticity, wet CL	SS-7 12.0-14.0 22"R	2 1 1 2	28.3	
				3T-8 14.0-16.0 24"R			
514.5	15.0		Gray fine sand, trace coarse to medium sand, trace silt, very loose, poorly graded, saturated SP				Water level at 14.0' during drilling.
				SS-9AB 16.0-18.0 24"R	1 2 1 2	30.3	
512.5	17.0		Gray silty clay, trace fine sand, soft, medium plasticity, wet CL				
				SS-10 18.0-20.0 24"R	1 1 1 1	25.8	
509.5	20.0						

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	6-1/4" I.D. HSA
DRILLING EQUIPMENT	CME-55/ATV
DRILLING STARTED	7/24/92 ENDED 7/24/92

REMARKS

WATER LEVEL (ft.)

- ▽ 14.0' during drilling
- ▽ 6.8' after drilling
- ▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-5** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,204.3 E 2,049.3**

LOGGED BY **KRR**
GROUND ELEVATION **529.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
509.5	20.0		Gray silty clay, trace fine sand, stiff, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	3 2 2 2	26.4	
507.5	22.0		Gray clayey silt to silty clay, little fine sand, stiff, low plasticity, moist to wet CL-ML/CL	SS-12 22.0-24.0 24"R	1 2 3 2	17.4	
				SS-13AB 24.0-26.0 24"R	2 2 3 2	19.9, 20.6	
504.3	25.2		Gray clayey sand, some silt, loose, poorly graded, saturated SC Trace coarse to medium sand at 27.0'	SS-14 26.0-28.0 24"R	2 2 3 4		
501.0	28.5		Gray coarse to fine sand, little to some silt, trace fine gravel, loose to medium dense, poorly graded, saturated SP	SS-15 28.0-30.0 24"R	3 4 4 6		
				SS-16 30.0-32.0 24"R	3 3 4 4		
497.5	32.0		Gray fine sand, trace silt, loose to dense, poorly graded, saturated SP	SS-17 32.0-34.0 24"R	4 14 45 120/4"	10.2	Water level at 6.8' immediately after drilling prior to coring. Auger refusal at 34.0'. Changed to rock coring. Could not core from 34.0' to 37.0' due to problems with core barrel. RQD = 80%
496.0	33.5		Gray shale, massive, good	PQ-18 37.0-39.0 24"R			Borehole was tremie grouted using Volclay immediately after drilling.
490.5	39.0		End of Boring at 39.0'.				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/24/92** ENDED **7/24/92**

REMARKS

WATER LEVEL (ft.)
▽ **14.0'** during drilling
▼ **6.8'** after drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER B-6 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 5,072.9 E 2,588.6

LOGGED BY KRR
GROUND ELEVATION 530.8

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
530.8	0.0		Brown silty clay, trace coarse to fine sand, stiff, low plasticity, moist CL	AU-1 0.0-2.0		18.1	
				SS-2 2.0-4.0 10"R	3 4 4 4	14.8	
526.8	4.0		Dark gray silty clay, trace coarse to fine sand, stiff, medium plasticity, wet CL	SS-3 4.0-6.0 10"R	1 3 4 5	23.8	
				SS-4 6.0-8.0 24"R	2 2 2 3	23.6	
521.8	9.0			3T-5 8.0-10.0 20"R			
			Brown silty clay, trace to little fine sand, soft to medium stiff, medium plasticity, wet CL Lenses of fine sand in SS-6	SS-6 10.0-12.0 24"R		20.8	
			Lenses of fine sand in SS-7	SS-7 12.0-14.0 24"R	1 2 1 1	26.4	
				SS-8 14.0-16.0 24"R	WOH 1 1 2	25.0	
514.8	16.0		Gray silty clay, trace coarse to fine sand, soft, low to medium plasticity, wet CL	SS-9 16.0-18.0 24"R	WOH 1 1 1	29.3	
				SS-10 18.0-20.0 24"R	WOH 1 1 2	23.5	SS-10: LL = 25 PL = 20 PI = 5
510.8	20.0						

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA.
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 8/3/92 ENDED 8/3/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 22.0' during drilling.
▼ 9.0' after drilling.
▼

PATRICK ENGINEERING INC.

BORING NUMBER B-6 SHEET 2 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 5,072.9 E 2,588.6

LOGGED BY KRR
GROUND ELEVATION 530.8

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (%)	NOTES & TEST RESULTS
510.8	20.0	Gray silty clay, trace coarse to fine sand, soft, low to medium plasticity, wet, fill CL	SS-11 20.0-22.0 24"R	WOH 1 1 1	24.4	PI = 5
508.3	22.5	Gray clayey silt to clayey sand, very loose, poorly graded, saturated CL-ML/SC	SS-12 22.0-24.0 24"R	WOH WOH 1 2	20.3	Water level at 22.0' during drilling.
			SS-13 24.0-26.0 24"R	1 1 1 1	27.1	
			SS-14 26.0-28.0 24"R	1 1 1 1	24.6	SS-14 Gravel = 0% Sand = 44% Silt or clay = 56%
			SS-15 28.0-30.0 24"R	WOH 1 1 1	21.2	
500.8	30.0	Gray fine sand, trace coarse to medium sand, trace fine gravel, very loose, poorly graded, saturated SP	SS-16 30.0-32.0 24"R	1 1 1 1	25.6	
498.8	32.0	Gray coarse to fine sand, trace to little coarse to fine gravel, trace silt, medium dense to dense, well graded, saturated SW/SW-SM	SS-17 32.0-34.0 24"R	10 16 15 15	8.4	Blow-in at 32.0'.
496.3	34.5	Gray silty clay to clay, hard, medium to high plasticity, moist to dry CL/CH	SS-18 34.0-36.0 24"R	6 8 20 41	15.9	
			SS-19 36.0-38.0 14"R	40 62 100+/2"	8.9	Hard drilling. Water level at 9.0' after drilling.
493.3	37.5	Gray shale				
492.8	38.0	End of Boring at 38.0'.				Borehole was tremie grouted using Volclay grout immediately after drilling.

Water Content: PL, LL (10, 20, 30, 40, 50)
Unconfined Compressive Strength (TSF) (1, 2, 3, 4, 5)

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/3/92** ENDED **8/3/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
22.0' during drilling.
9.0' after drilling.

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PATRICK ENGINEERING INC.

BORING NUMBER **B-7** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 4,743.9 E 2,684.2**

LOGGED BY **KRR**
GROUND ELEVATION **523.3**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ --- ○ --- △ LL)	NOTES & TEST RESULTS
523.3	0.0	Brownish-gray to brown silty clay, trace coarse to fine sand, trace roots, very soft, medium plasticity, wet, fill CL	AU-1 0.0-2.0		25.9	
522.1	1.2	Gray silty clay, trace to little fine sand, very soft, medium plasticity, wet, fill CL	SS-2AB 2.0-4.0 24"R	WOH	27.3	
519.8	3.5	Gray clayey fine sand, little silt, very loose, poorly graded, saturated, fill SC	SS-3 4.0-6.0 4"R	WOH	22.8 36.7	
518.3	5.0	Gray silty clay, trace to little fine sand, very soft, mucky, medium plasticity, wet, fill. CL	SS-4 6.0-8.0 24"R	WOH	24.4	SS-4 Gravel = 0% Sand = 33% Silt or clay = 67%
			SS-5 8.0-10.0 18"R	WOH	28.1	
		Lenses of fine sand and wood fragments in SS-6.	SS-6 10.0-12.0 18"R	WOH WOH WOH 6	29.9	
510.8	12.5	Gray silty clay, trace to little fine sand, stiff, medium plasticity, wet CL	SS-7 12.0-14.0 20"R	WOH WOH 2 2	24.1	Water level at 12.0' during drilling.
			SS-8 14.0-16.0 24"R	WOH WOH 2 3	21.0	
508.3	15.0	Gray clayey silt and fine sand, loose, nonplastic, saturated CL-ML	SS-9 16.0-18.0 24"R	2 2 2 2	18.2	SS-9 Gravel = 0% Sand = 38% Silt or clay = 62%
			SS-10 18.0-20.0 24"R	1 2 1 2	20.2	
503.3	20.0					

Water Content scale: 10 20 30 40 50
Unconfined Compressive Strength (TSF) ✳: 1 2 3 4 5

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/5/92** ENDED **8/5/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ **12.0' during drilling.**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER B-7 SHEET 2 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,743.9 E 2,684.2
LOGGED BY KRR
GROUND ELEVATION 523.3

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ ○ △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
503.3	20.0		Gray clayey silt and fine sand, loose, nonplastic, saturated CL-ML/SC	SS-11 20.0-22.0 24"R	1 1 1 1	21.7	
				3T-12 22.0-24.0 20"R			Gray fine sand at bottom of Shelby tube.
499.8	23.5		Gray fine sand, trace silt, medium dense to dense, poorly graded, saturated SP	SS-13 24.0-26.0 24"R	10 14 14 22		Artesian conditions.
496.8	26.5		Gray coarse to fine sand, trace coarse to fine gravel, trace silt, loose, well graded, saturated SW	SS-14 26.0-28.0 24"R	WOH		
494.8	28.5		Gray shale, massive, good	SS-15AB 28.0-30.0 16"R	10 52 100+ /"4	12.3	Drilled to 30.0' then, switched to PQ coring.
				PQ-16 30.0-35.0 60"R			RQD = 80%
488.3	35.0		End of Boring at 35.0'.				Borehole was grouted using Volclay grout after completion of drilling.

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 6-1/4" I.D. HSA.
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 8/5/92 ENDED 8/5/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 12.0' during drilling.
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER B-8 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,565.9 E 2,706.2

LOGGED BY KRR
GROUND ELEVATION 523.8

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (%) (PL □ - - ○ - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
523.8	0.0		Brown silty clay, trace fine sand, soft, medium plasticity, wet CL	AU-1 0.0-2.0		21.0	
				SS-2 2.0-4.0 24"R	1 1 2 2	30.7	
				3T-3 4.0-6.0 24"R			
			Fine sand lenses in SS-4	SS-4 6.0-8.0 24"R	1 2 2 3	25.6	Water Level at 6.0' during drilling.
			Trace coarse to fine sand and trace coal in SS-5	SS-5 8.0-10.0 24"R	1 2 2 3	10.7	
513.3	10.5		Gray and olive silty clay to clay, trace fine sand very soft to medium stiff, medium to high plasticity, wet CL/CH	SS-6 10.0-12.0 24"R	2 3 3 4	34.2	
				3T-7 12.0-14.0 24"R			
				SS-8 14.0-16.0 24"R	1 1 1 3	44.5	
			Mucky at 16.0'	SS-9 16.0-18.0 24"R	2 1 1 1	50.2	
			Mucky at 18.0'	SS-10 18.0-20.0 24"R	WOH WOH WOH WOH	46.8	
503.8	20.0						

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/15/92** ENDED **8/15/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **6.0'** during drilling
▽
▽

PATRICK ENGINEERING INC.		
BORING NUMBER	B-8	SHEET 2 OF 2
CLIENT	City of Springfield CWLP	
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B	
LOCATION	N 4,565.9 E 2,706.2	
LOGGED BY	KRR	
GROUND ELEVATION	523.8	

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
503.8 501.8	20.0 22.0	Gray clay, trace silt, very soft, medium to high plasticity, wet CL/CH	SS-11 20.0-22.0 24"R	WOH WOH WOH WOH	58.4	
501.2 500.6	22.6 23.2	Gray silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-12ABC 22.0-24.0 24"R	WOH 5 6 15	* 34.5 12.6	
		Gray fine sand, little silt, medium to dense, poorly graded, saturated SM				
		Gray coarse to fine sand, trace coarse to fine gravel, trace to little silt, medium dense to dense, well graded, saturated SW-SM/SM	SS-13 24.0-26.0 24"R	3 11 18 22	10.3	
			SS-14 26.0-28.0 24"R	6 9 19 17	12.2	Artesian conditions.
494.8	29.0		SS-15AB 28.0-30.0 24"R	5 12 23 100+	11.4	
493.8	30.0	Gray shale, soft				
		End of Boring at 30.0'				Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME 55/ATV
DRILLING STARTED 8/15/92	ENDED 8/15/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 6.0' during drilling
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER B-9 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,690.7 E 2,506.0

LOGGED BY KRR
GROUND ELEVATION 522.7

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION
522.7	0.0	Brown silty clay, trace fine sand, soft, medium plasticity, wet CL
517.7	5.0	Brown silty clay to clayey fine sand, soft, low plasticity, wet CL/SC
516.7	6.0	Brown and tan silty clay trace coarse to fine sand, soft, medium plasticity, wet CL
515.7	7.0	Gray silty clay to clayey silt, trace fine sand, medium soft, medium plasticity, wet CL
513.9	8.8	Gray fine sand, some silt, wood fragments present, very loose, poorly graded, saturated SM
512.7	10.0	Gray clayey sand, little silt, very loose, poorly graded, saturated SC Trace shells and fine gravel at 12.0'
510.3	12.4	Gray silty clay, trace to little fine sand, soft, medium plasticity, wet CL Fine sand lenses

SAMPLE TYPE & NO.	DEPTH (FT)	RECOVERY (IN)	BLOW COUNTS	Water Content	NOTES & TEST RESULTS
AU-1	0.0-2.0			19.8	
SS-2	2.0-4.0	24"R	1, 1, 1, 2	25.6, 26.4	
SS-3AB	4.0-6.0	24"R	WOH, 1, 2, 1	24.6, 26.1	
SS-4	6.0-8.0	24"R	2, 3, 2, 4	27.7	
SS-5	8.0-10.0	24"R	WOH, 1, 1, 2	45.9	
SS-6	10.0-12.0	24"R	WOH, 1, 1, 2	22.4	
SS-7	12.0-14.0	24"R	WOH, 1, 1, 1	26.2	
SS-8	14.0-16.0	24"R	WOH, WOH, WOH, WOH	24.6	SS-8: CEC = 10.7 meq/100gm
3T-9	16.0-18.0	24"R			
SS-10	18.0-20.0	24"R	WOH, WOH, WOH, WOH	22.9	

Water Content: PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50)
Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME 55/ATV
DRILLING STARTED 8/14/92 ENDED 8/14/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 9.0' after drilling
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER B-9 SHEET 2 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,690.7 E 2,506.0
LOGGED BY KRR
GROUND ELEVATION 522.7

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
502.7 502.2	20.0 20.5		Gray silty clay, some fine sand, soft, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	WOH 1 1 2	19.8	
			Gray clayey fine sand and silt, very loose, poorly graded, saturated SC Wood fragments and trace organics present in SS-12	SS-12 22.0-24.0 24"R	WOH WOH 1 2	22.2	
498.2	24.5		Gray coarse to fine sand, trace coarse to fine gravel, trace silt, medium dense, well graded, saturated SW-SM	SS-13 24.0-26.0 24"R	WOH WOH 13 5	12.2	
				SS-14 26.0-28.0 24"R	3 4 40 73	11.8	
495.7	27.0		Gray shale				
494.7	28.0		End of Boring at 28.0'				Water level at 9.0' immediately after drilling. Borehole was tremie grouted immediately after completion of drilling.

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME 55/ATV
DRILLING STARTED 8/14/92 ENDED 8/14/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 9.0' after drilling
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-10** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,589.2 E 2,463.3**

LOGGED BY **KRR**
GROUND ELEVATION **523.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (%) PL □ - - - ○ - - - △ LL / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
523.6	0.0		Brown silty clay, trace fine sand, soft to medium stiff, medium plasticity, wet CL	AU-1 0.0-2.0		24.3	
				SS-2 2.0-4.0 24"R	2 2 2 2	24.7	
				SS-3 4.0-6.0 24"R	1 2 3 3	25.7	
				3T-4 6.0-8.0 24"R			
516.1	7.5		Gray silty clay, trace fine sand, soft, medium plasticity, wet CL				
			1" lense of fine sand at 9.0'	SS-5 8.0-10.0 24"R	WOH 1 2 2	27.2	
				SS-6 10.0-12.0 24"R	WOH 1 2 1	25.1	
				SS-7 12.0-14.0 24"R	1 1 1 1	27.2	Water level at 12.0' during drilling.
			Mucky at 14.0'	SS-8 14.0-16.0 24"R	WOH 1 1 1	24.1	
				SS-9 16.0-18.0 24"R	WOH WOH WOH 1	25.5	
				SS-10 18.0-20.0 24"R	WOH 1 1 2	23.8	
503.6	20.0						

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/15/92** ENDED **8/15/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **12.0'** during drilling
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-10** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,589.2 E 2,463.3**

LOGGED BY **KRR**
GROUND ELEVATION **523.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
503.6	20.0		Gray silty clay, trace to little fine sand, soft, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	WOH 1 1 2	23.4	
				SS-12 22.0-24.0 24"R	WOH 1 1 3	20.8	
499.4	24.2		Gray coarse to fine sand, trace coarse to fine gravel, trace silt, loose to medium dense, well graded, saturated SW-SM/SM	SS-13AB 24.0-26.0 24"R	6 7 4 4	20.0	Artesian conditions immediately after drilling.
498.1	25.5		Gray shale, soft	SS-14 26.0-27.0 ~~13"R~~	11 43 100+/1"	10.5	
			Hard at 26.5'				
496.6	27.0		End of Boring 27.0'				Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA**
DRILLING EQUIPMENT	**CME 55/ATV**
DRILLING STARTED **8/15/92**	ENDED **8/15/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **12.0' during drilling**
▽
▽

PATRICK ENGINEERING INC.	
BORING NUMBER	B-11
SHEET	1 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 4,775.2 E 2,391.2
LOGGED BY	KRR
GROUND ELEVATION	523.6

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
523.6	0.0		Brown silty clay, trace fine sand, soft to stiff, medium plasticity, wet CL	AU-1 0.0-2.0		21.4	
			Mottled at 2.0'	SS-2 2.0-4.0 24"R	2 1 2 3	21.9 ✳	
			Tan at 4.0'	SS-3 4.0-6.0 24"R	2 2 2 3	24.0 ✳	
				3T-4 6.0-8.0 22"R		✳	
515.2	8.4		Gray silty clay, trace fine sand, soft, medium plasticity, moist CL	SS-5 8.0-10.0 24"R	1 1 1 2	29.3 ✳	
				SS-6 10.0-12.0 24"R	1 2 2 2	26.8 ✳	
				3T-7 12.0-14.0 22"R		✳	
				SS-8 14.0-16.0 24"R	WOH 1 1 1	24.7 ✳	
				SS-9 16.0-18.0 24"R	WOH 1 2 2	23.7 ✳	Water level at 16.0' during drilling.
			Fine sand pockets in SS-10	SS-10 18.0-20.0 24"R	WOH 1 1 2	21.7 ✳	

Water Content scale: 10, 20, 30, 40, 50. Unconfined Compressive Strength (TSF) scale: 1, 2, 3, 4, 5.

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME 55/ATV
DRILLING STARTED	8/14/92 ENDED 8/14/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 16.0' during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-11** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,775.2 E 2,391.2**

LOGGED BY **KRR**
GROUND ELEVATION **523.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
503.6	20.0		Gray silty clay, trace to little fine sand, soft, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	1 2 2 3	18.7	
501.8	21.8		Gray fine sand and silty, loose to medium dense, poorly graded, saturated SM	SS-12AB 22.0-24.0 24"R	1 3 8 11	20.1	
500.4	23.2		Gray coarse to fine sand, little coarse to fine gravel, trace silt, medium dense, well graded, saturated SW-SM/SM	SS-13 24.0-26.0 24"R	14 13 15 15	11.2 12.7	
			Clayey at 26.0'	SS-14 26.0-28.0 24"R	5 6 16 12	9.9	
495.4	28.2		Gray shale, soft	SS-15 28.0-29.2 14"R	8 18 100+ /2"	14.0	Water level at ground surface immediately after drilling. Borehole was tremie grouted using Volclay grout immediately after completion of drilling.
494.4	29.2		End of Boring at 29.2'				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/14/92** ENDED **8/14/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **16.0'** during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER B-12 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,924.2 E 2,210.8

LOGGED BY KRR
GROUND ELEVATION 524.9

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL)	NOTES & TEST RESULTS
524.9	0.0	Brown silty clay, trace fine sand, soft, medium plasticity, wet CL	AU-1 0.0-2.0		20.7	
522.6	2.3	Brown clayey silt to silty sand, loose, poorly graded, saturated CL-ML/SM	SS-2AB 2.0-4.0 24"R	1 2 1 2	28.1, 26.3	Water level at 3.0' during drilling.
521.9	3.0	Brown and tan silty clay, trace to little fine sand, soft, medium plasticity, wet CL	SS-3 4.0-6.0 22"R	1 2 2 2	27.6	
518.9	6.0	Brown and tan clayey fine sand, little silt, very loose, poorly graded, saturated SC	SS-4 6.0-8.0 12"R	1 1 2 3	23.3	
517.4	7.5	Gray silty clay, trace fine sand, soft to medium stiff, medium plasticity, wet CL Lenses of fine sand in SS-5	SS-5 8.0-10.0 22"R	1 1 1 2	28.5	
		Trace wood fragments in SS-6	SS-6 10.0-12.0 24"R	1 2 2 2	30.1	
			3T-7 12.0-14.0 24"R			
			SS-8 14.0-16.0 24"R	1 1 1 1	24.7	
			SS-9 16.0-18.0 24"R	1 1 2 3	26.4	
			SS-10 18.0-20.0 24"R	WOH 1 1 1	25.4	

Water Content scale: 10 20 30 40 50
Unconfined Compressive Strength (TSF) ✳: 1 2 3 4 5

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D.
DRILLING EQUIPMENT CME 55/ATV
DRILLING STARTED 8/14/92 ENDED 8/14/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 3.0' during drilling
▼ 4.3' immediately after drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-12** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,924.2 E 2,210.8**

LOGGED BY **KRR**
GROUND ELEVATION **524.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content (10, 20, 30, 40, 50); Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
504.9	20.0		Gray, silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	WOH 1 1 2	✳ 23.1	
			Little to some fine sand from 23.0'	SS-12 22.0-24.0 24"R	WOH 1 1 2	22.0	
500.4	24.5		Gray fine sand, some silt, very loose, poorly graded, saturated SM	SS-13 24.0-26.0 24"R	WOH WOH 1 2	23.7	
498.9	26.0		Gray coarse to fine sand, trace to little coarse to fine gravel, trace silt, loose to medium dense, well graded, saturated SW-SM	SS-14 26.0-28.0 24"R	2 3 3 3	18.7	
				SS-15 28.0-30.0 24"R	2 3 11 11	15.9	
494.9	30.0		Gray shale, soft	SS-16 30.0-31.0 12"R	22 100+	16.9	Water level at 4.3' immediately after drilling.
493.9	31.0		End of Boring at 31.0'				Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D.**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/14/92** ENDED **8/14/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **3.0'** during drilling
▼ **4.3'** immediately after drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-13** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,524.7 E 2,275.9**

LOGGED BY **KRR**
GROUND ELEVATION **523.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
523.8	0.0		Brown silty clay, trace coarse to fine sand, soft to medium stiff, medium plasticity, wet CL	AU-1 0.0-2.0		22.0	
			Brown and tan from 2.0'	SS-2 2.0-4.0 24"R	1 2 2 3	26.0	
			Little fine sand in SS-3	SS-3 4.0-6.0 24'R	2 1 2 2	24.9	
				3T-4 6.0-8.0 24"R			Water level at 7.0' during drilling.
516.8	7.0		Gray silty clay, trace coarse to fine sand, medium stiff, medium plasticity, wet CL				
				SS-5 8.0-10.0 24"R	2 2 2 2	24.9	
				SS-6 10.0-12.0 24"R	WOH 1 2 3	30.5	
				3T-7 12.0-14.0 24"R			
509.8	14.0		Gray silty clay, trace to little fine sand, very soft to soft, medium plasticity, wet CL	SS-8 14.0-16.0 24"R	WOH 1 1 1	22.5	
				SS-9 16.0-18.0 24"R	WOH WOH WOH WOH	23.2	
				SS-10 18.0-20.0 24"R	WOH WOH 1 1	24.6	
503.8	20.0						

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/4/92** ENDED **8/4/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **7.0'** during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-13** SHEET **2 OF 2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,524.7 E 2,275.9**

LOGGED BY **KRR**
GROUND ELEVATION **523.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content (10, 20, 30, 40, 50) / Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
503.8	20.0		Gray silty clay, trace little fine sand, very soft to soft, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	WOH WOH 1 1	21.9	
				SS-12 22.0-24.0 24"R	WOH WOH 1 1	24.2	
499.3	24.5		Gray clayey fine sand, some silt, very loose, poorly graded, saturated SC	SS-13 24.0-26.0 24"R	WOH WOH 1 2	19.3	
497.8	26.0		Gray coarse to fine sand, little coarse to fine gravel, little silt, medium dense to dense, well graded, saturated SM	SS-14 26.0-28.0 24"R	4 4 12 19	14.3	SS-14: Gravel = 16% Sand = 65% Silt or clay = 19%
				SS-15AB 28.0-30.0 24"R	15 22 42 58	9.7	Artesian conditions. Water found to overflow.
494.5	29.3		Gray shale, massive, excellent			11.5	
				PQ-16 30.0-35.0 60"R			Auger refusal at 30.0'. Switched to PQ coring. RQD = 100%
488.8	35.0		End of Boring at 35.0'				Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/4/92** ENDED **8/4/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **7.0' during drilling.**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER B-14 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 3,763.9 E 2,791.1

LOGGED BY KRR
GROUND ELEVATION 572.7

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
572.7	0.0		Brown silty clay, trace fine sand, very stiff, low to medium plasticity, moist to wet CL	AU-1 0.0-2.0		17.5	
				SS-2 2.0-4.0 22"R	3 4 4 6	14.2	
			Trace coarse to medium sand, trace fine gravel from 4.0'	SS-3 4.0-6.0 24"R	4 6 9 11	20.4	
				SS-4 6.0-8.0 24"R	5 6 7 7	20.3	
				3T-5 8.0-10.0 24"R			
			Silty sand at 10.0' Little to some sand in SS-6	SS-6 10.0-12.0 24"R	4 6 6 4	12.4	
560.2	12.5		Dark gray to black organic silty clay, trace fine sand, very stiff, medium plasticity, wet OL	SS-7 12.0-14.0 24"R	4 7 9 15	40.5	
558.2	14.5		Coal	SS-8 14.0-16.0 24"R	7 18 32 34	49.8	
				SS-9 16.0-18.0 18"R	22 39 50+	22.7	SS-9 driven 18" only.
553.7	19.0		Gray shale	SS-10AB 18.0-20.0 24"R	12 10 16 18	16.4	
552.7	20.0					13.4	

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME 55/ATV
DRILLING STARTED 8/17/92 ENDED 8/17/92

REMARKS

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.	
BORING NUMBER	B-14 SHEET 2 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION	N 3,763.9 E 2,791.1

LOGGED BY KRR

GROUND ELEVATION 572.7

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
552.7	20.0		Gray shale.	SS-11 20.0-22.0 2"R	10 11 15 24		Auger refusal of 22.1'. Water was not encountered during or immediately after drilling. Borehole was grouted using Volclay grout immediately after completion of drilling.
550.7	22.0		End of Boring at 22.1'.	SS-12 22.0-22.1 2"R	100 +/2"		

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME 55/ATV
DRILLING STARTED	8/17/92 ENDED 8/17/92

REMARKS

WATER LEVEL (ft.)

∇

∇

∇

PATRICK ENGINEERING INC.

BORING NUMBER **B-15** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 5,579.6 E 1,752.7**

LOGGED BY **KRR**
GROUND ELEVATION **536.7**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (%)	NOTES & TEST RESULTS
536.7	0.0	Brown silty clay, trace coarse to fine sand, stiff, medium plasticity, wet CL	AU-1 0.0-2.0		12.1	
			SS-2 2.0-4.0 14"R	7 6 8 9	26.8	
			SS-3 4.0-6.0 24"R	4 6 6 9	25.5	
			3T-4 6.0-8.0 14"R			
		Brown and olive at 8.0'.	SS-5AB 8.0-10.0 24"R	2 2 4 5	27.0	
527.7	9.0	Brown fine sand, trace silt, loose, poorly graded, saturated SP-SM/SM				Water level at 9.0' during drilling.
			SS-6 10.0-12.0 18"R	WOH 2 2 2		
			SS-7A/B 12.0-14.0 24"R	WOH 2 2 2		
523.7	13.0	Dark gray and gray silty clay, trace organics, trace coarse to fine sand, soft, medium plasticity, wet CL/OL				
			SS-8AB 14.0-16.0 24"R	WOH 1 2 5	28.1, 25.2	
521.7	15.0	Organics present in SS-8A. Brown and olive silty clay, trace coarse to fine sand, very stiff, low plasticity, moist CL				
520.2	16.5	Brown and olive silty clay to clayey silt, trace to fine sand, hard, low plasticity, moist CL	SS-9 16.0-18.0 24"R	5 6 6 4	17.2	
		Changed to brown from 19.0'.	SS-10AB 18.0-20.0 24"R	2 7 20 32	15.3, 9.8	
516.7	20.0					

Legend: Water Content — PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50); Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/21/92** ENDED **8/21/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **9.0'** during drilling.
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-15** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 5,579.6 E 1,752.7**

LOGGED BY **KRR**
GROUND ELEVATION **536.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content: PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50); Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
516.7	20.0		Brown shale, soft.	SS-11 20.0-22.0 8"R	80 100 +/2"	9.7	
				SS-12 22.0-24.0 7"R	31 100 +/1"	7.8	
512.7	24.0						
			End of Boring at 24.5'.				Auger refusal at 24.5'. Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/21/92** ENDED **8/21/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **9.0'** during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **CB-1** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,559.1 E 2,663.1**

LOGGED BY **KRR**
GROUND ELEVATION **527.3**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL)	NOTES & TEST RESULTS
527.3	0.0	Dark gray silty clay, trace coarse to fine sand, very stiff, medium plasticity, wet, fill CL	AU-1 0.0-2.0		20.1	Grass and weeds at the surface.
			SS-2 2.0-4.0 16"R	6 4 4 5	19.2	
		Mottled at 4.0'	SS-3 4.0-6.0 20"R	3 4 8 15	30.3	
522.3	5.0	Dark gray organic silty clay, trace fine sand, trace roots and wood fragments, soft to stiff, medium plasticity, wet, fill OL				
			SS-4 6.0-8.0 24"R	1 1 2 2	30.2	
			3T-5 8.0-10.0 24"R		29.4	3T-5: Dry Den. = 94pcf qu = 0.6tsf LL = 41 PL = 23 k = 1.5 E-07 cm/s
			SS-6 10.0-12.0 18"R	1 2 2 2	29.9	
			SS-7ABC 12.0-14.0 24"R	1 1 2 2	21.2	
514.5	12.8	Gray clayey fine sand, trace coarse to medium sand, trace fine gravel, loose, poorly graded, saturated, fill SC				
513.8	13.5					
513.1	14.2	Dark gray to black organic silty clay, trace coarse to fine sand, wood fragments present, soft, medium plasticity, wet, fill OL	SS-8 14.0-16.0 24"R	1 2 1 1	35.4	
		Dark gray clayey fine sand, trace coarse to medium sand, trace organics, wood fragments present, very loose, poorly graded, saturated, fill SC	SS-9 16.0-18.0 24"R	1 1 1 1	36.3	
509.3	18.0		SS-10AB 18.0-20.0 24"R	1 1 2 1	56.2	
508.3	19.0	Gray coarse to fine sand, trace silt, trace organics, very loose, poorly graded, saturated, fill SP-SM				
507.3	20.0					

Water Content scale: 10 20 30 40 50
Unconfined Compressive Strength (TSF) ✳ scale: 1 2 3 4 5

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/23/92** ENDED **7/23/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
17.0' during drilling
15.5' after drilling

PATRICK ENGINEERING INC.

BORING NUMBER **CB-1** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,559.1 E 2,663.1**

LOGGED BY **KRR**
GROUND ELEVATION **527.3**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL 10 20 30 40 50 LL) / Unconfined Compressive Strength (TSF) (1 2 3 4 5)	NOTES & TEST RESULTS
507.3	20.0	Dark to black organic silty clay, wood fragments present, soft, medium dense, wet, fill OL	SS-11 20.0-22.0 24"R	1 1 2 1		
505.3	22.0	Gray fine sand, trace coarse to medium sand, little to some silt, very loose, poorly graded, saturated SP-SM/SM	SS-12 22.0-24.0 24"R	1 2 1 2		
		Gray silty sand, little clay, very loose, poorly graded, saturated SM	SS-13 24.0-26.0 24"R	1 1 1 2		SS-13: Gravel = 0% Sand = 69% Silt or clay = 31%
			SS-14 26.0-28.0 24"R	WOH 1 1 2		
499.3	28.0	Gray fine sand, trace coarse to medium sand, trace silt, trace coarse to fine gravel, loose, poorly graded, saturated SP/SP-SM	SS-15 28.0-30.0 24"R	WOH 1 3 5		
		Little to some silt, little coarse to medium sand in SS-16	SS-16 30.0-32.0 24"R	3 3 4 6		
495.3	32.0	Gray coarse to fine sand, trace coarse to fine gravel, dense, well graded, saturated SW	SS-17 32.0-34.0	28 100/1"	12.9	Auger refusal at 32.5'.
495.0	32.3	Gray shale				
494.8	32.5	End of Boring at 32.5'.				Borehole was tremie grouted immediately after completion of drilling.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/23/92** ENDED **7/23/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
17.0' during drilling
15.5' after drilling

PATRICK ENGINEERING INC.

BORING NUMBER CB-2 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 5,427.5 E 2,700.9

LOGGED BY KRR
GROUND ELEVATION 526.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
526.2	0.0		Brownish-gray silty clay, trace coarse to fine sand, medium stiff, medium plasticity, wet, fill CL	AU-1 0.0-2.0		21.1	
				SS-2 2.0-4.0 24"R	2 2 3 3	26.9	
522.2	4.0		Dark gray silty clay, trace to little fine sand and very soft to soft, medium plasticity, wet to saturated, fill CL	SS-3 4.0-6.0 24"R	1 1 2 2	31.6	
				3T-4 6.0-8.0 18"R			
				SS-5 8.0-10.0 24"R	WOH WOH 1 2	28.8	
				SS-6 10.0-12.0 24"R	WOH 1 1 2	28.2	Water level at 10.0' during drilling.
			Trace organics at 13.0'.	SS-7 12.0-14.0 24"R	WOH 1 2 2	20.5	
			Wood fragments in SS-8	SS-8 14.0-16.0 24"R	WOH 1 2 2	42.5	
				3T-9 16.0-18.0 20"R		37.8	3T-9: LL=34 PL=25 PI=9 Dry dens.=80pcf k=2.4 E-07 cm/s
			Organics and wood traces at 18.3'	SS-10AB 18.0-20.0 24"R	WOH	38.3	
506.7	19.5		Gray and olive silty clay to clay, trace			29.3	

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA.
DRILLING EQUIPMENT	CME-55/ATV
DRILLING STARTED 8/2/92	ENDED 8/2/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 10.0' during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER CB-2 SHEET 2 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 5,427.5 E 2,700.9

LOGGED BY KRR
GROUND ELEVATION 526.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
506.2	20.0		fine sand, soft, medium to high plasticity, moist CL/CH	SS-11 20.0-22.0 24"R	WOH 1 1 2	29.3 34.9	SS-11: LL=47 PL=22 PI=25
503.7	22.5		Gray clayey fine sand, little silt, very loose, poorly graded, saturated SC	SS-12 22.0-24.0 24"R	2 1 1 WOH	21.4	
501.7	24.5		Gray coarse to fine sand, trace fine gravel, trace to little silt, medium dense, poorly graded, saturated SP-SM/SM	SS-13 24.0-26.0 24"R 26.0-27.5	1 2 7 15		Blow-in at 24.0' water level rose to approximately 3' below ground surface.
499.2	27.0		Gray silty clay to clay, trace fine sand, hard, medium to high plasticity, dry to moist CL	SS-14 27.5-29.5 24"R	3 8 22 32	16.6	
496.7	29.5		End of Boring at 29.5'				Boring was tremie grouted using Volclay grout immediately after drilling completed.

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA.
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 8/2/92 ENDED 8/2/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 10.0' during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **CB-3** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,359.4 E 2,542.3**

LOGGED BY **KRR**
GROUND ELEVATION **525.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
525.8	0.0		Brown silty clay, trace coarse to fine sand, stiff, medium plasticity, wet, fill CL	AU-1 0.0-2.0		21.5	
				SS-2 2.0-4.0 20"R	2 2 3 4	22.7	
			Dark gray at 4.0'	SS-3 4.0-6.0 14"R	2 2 3 5	26.3	
519.8	6.0		Brown and tan clayey silt and fine sand, very loose, poorly graded, wet to saturated, fill CL-ML	SS-4 6.0-8.0 24"R	2 2 1 1	20.5	SS-4: Gravel = 0% Sand = 48% Silt or Clay = 52%
				SS-5 8.0-10.0 14"R	WOH 1 2 2	22.5	
515.5	10.3		Olive at 10.0'	SS-6AB 10.0-12.0 18"R	2 2 2 3	24.9	
			Dark gray to black organic silty clay, trace coarse to fine sand, wood fragments present, soft, medium plasticity, wet OL			33.7	
513.8	12.0		Gray clayey silt and fine sand, very loose, poorly graded, saturated CL-ML	SS-7 12.0-14.0 24"R	WOH WOH WOH WOH	23.3	
			Gray silty sand from 15.0' to 15.5'	SS-8AB 14.0-16.0 24"R	WOH 1 2 3	21.9, 22.6	Water level at 14.0' during drilling.
				SS-9 16.0-18.0 24"R	WOH 1 1 1	27.1	SS-9: Gravel = 0% Sand = 33% Silt or Clay = 67%
				SS-10 18.0-20.0 24"R	WOH WOH WOH WOH	23.5	
505.8	20.0						

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/2/92** ENDED **8/2/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **14.0'** during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **CB-3** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,359.4 E 2,542.3**

LOGGED BY **KRR**
GROUND ELEVATION **525.8**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
505.8	20.0	Gray clayey silt and fine sand, very loose, poorly graded, saturated CL-ML/SC	SS-11 20.0-22.0 24"R	WOH 1 1 2	24.6	
			SS-12 22.0-24.0 24"R	WOH WOH WOH WOH	37.0	
			SS-13 24.0-26.0 24"R	WOH 1 2 2	22.6	
498.8	27.0	Gray coarse to fine sand, trace coarse to fine gravel, trace to little silt, medium dense to dense, well graded, saturated SW-SM	SS-14 26.0-28.0 24"R	WOH WOH 12 21	8.1	
496.8	29.0	Gray silty clay to clay, trace fine sand, hard, medium to high plasticity, dry to moist CL/CH	SS-15 28.0-30.0 24"R	4 4 14 29	19.8 ✳	Water level in augers at 4.7' immediately after completion of drilling. Boring was grouted using Volclay grout after drilling completed.
495.8	30.0	End of Boring at 30.0'.				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/2/92** ENDED **8/2/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **14.0' during drilling.**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER	CB-4
SHEET	1 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 5,240.9 E 2,490.4
LOGGED BY	KRR
GROUND ELEVATION	525.1

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
525.1	0.0		Dark gray silty clay, trace coarse to fine sand, roots present, trace organics, stiff, medium plasticity, wet, fill CL	AU-1 0.0-2.0		26.3	
				SS-2 2.0-4.0 12"R	3 3 4 4	27.8	
521.1	4.0		Dark gray to black organic silty clay, trace fine sand, soft, medium to high plasticity, wet to saturated, fill OL/OH	SS-3 4.0-6.0 "R	1 2 3 4	34.4	
			Wood fragments in SS-4	SS-4 6.0-8.0 10"R	1 2 2 2	40.9	
			Wood fragments in SS-5	SS-5 8.0-10.0 4"R	WOH WOH WOH 2	35.0	SS-5 driven on wood.
			Wood fragments in SS-6A	SS-6AB 10.0-12.0 10"R	1 1 1 1	96.4	
513.3	11.8		Gray silty clay to clayey silt, trace fine sand, soft to medium stiff, low to medium plasticity, wet CL/CL-ML			31.3	
				SS-7 12.0-14.0 24"R	1 1 1 1	25.1	Sample slipped from tube. Obtained a jar sample.
				3T-8 14.0-16.0 10"R		22.8	
				3T-9 16.0-18.0 24"R		23.8	3T-9: LL=25 PL=22 PI=3 Dry dens.=103pcf k=4.3 E-07 cm/s
						23.6	
				SS-10 18.0-20.0 24"R	WOH WOH WOH 2	24.0	
505.1	20.0		1" fine sand lense at 19.5'				

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA.
DRILLING EQUIPMENT	CME-55/ATV
DRILLING STARTED	8/3/92 ENDED 8/3/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER **CB-4** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,240.9 E 2,490.4**

LOGGED BY **KRR**
GROUND ELEVATION **525.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content (10 20 30 40 50); Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
505.1	20.0		Gray silty clay to clayey silt, trace fine sand, soft, low to medium plasticity, wet. CL/CL-ML	SS-11 20.0-22.0 24"R	WOH WOH WOH 2	✳ 23.9 ○	Water was not encountered during drilling.
503.1	22.0		End of Boring at 22.0'.				Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/3/92** ENDED **8/3/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **CB-5** SHEET **1** OF **1**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,197.4 E 2,390.9**

LOGGED BY **KRR**
GROUND ELEVATION **523.4**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
523.4	0.0		Brown and dark gray silty clay, trace coarse to fine sand, medium stiff, low plasticity, moist CL	AU-1 0.0-2.0		18.7	
				SS-2 2.0-4.0 10"R	3 3 3 4	20.8	
520.4	3.0		Brown silty clay, trace fine sand, medium stiff, medium plasticity, wet CL	SS-3 4.0-6.0 20"R	2 2 2 3	24.0	
				SS-4 6.0-8.0 24"R	2 2 2 3	23.7	
515.6	7.8						
515.2	8.2		Brown silty sand, loose, poorly graded, saturated SM	SS-5AB 8.0-10.0 24"R	2 2 2 2	26.3	Water level at 8.0' during drilling.
			Brown, gray and olive silty clay, trace fine sand, stiff, medium plasticity, wet CL			24.4	
512.4	11.0			SS-6AB 10.0-12.0 24"R	2 3 2 3	28.2	
			Gray and olive silty clay, trace fine sand, stiff, medium to high plasticity, wet CL/CH				
511.4	12.0		Gray silty clay, trace fine sand, soft, medium plasticity, wet CL	3T-7 12.0-14.0 24"R		38.9	
				SS-8 14.0-16.0 24"R	1 2 2 2	25.0	
507.4	16.0		End of Boring at 16.0'.				Borehole was tremie grouted using Volclay grout immediately after drilling completed.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/3/92** ENDED **8/3/92**

REMARKS

WATER LEVEL (ft.)
∇ **8.0'** during drilling.
∇ ~~No water level after drilling.~~
∇

PATRICK ENGINEERING INC.

BORING NUMBER	CB-6
SHEET	1 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 5,079.8 E 2,367.5
LOGGED BY	KRR
GROUND ELEVATION	527.0

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. / DEPTH (FT) / RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL)	NOTES & TEST RESULTS
527.0	0.0	Dark gray silty clay, trace coarse to fine sand, roots present, low plasticity, moist CL	AU-1 0.0-2.0		16.7	
526.0	1.0	Brown and dark gray silty clay, trace coarse to fine sand, very stiff, medium plasticity, wet to saturated CL	SS-2 2.0-4.0 18"R	4 5 6 5	18.4	
		Dark gray and trace organics from 4.0'	SS-3 4.0-6.0 20"R	6 4 5 7	22.5	
			SS-4 6.0-8.0 8"R	3 2 4 4	34.0	
518.8	8.2	Gray coarse to fine sand, trace fine gravel, little silt, trace coal, very loose, well graded, saturated SM	SS-5AB 8.0-10.0 18"R	2 1 1 1	24.4	Water level at 8.0' during drilling
518.0	9.0	Gray to light gray silty clay, trace fine sand, soft to medium stiff, medium plasticity, wet CL Trace organics and little fine sand in SS-5B	SS-6 10.0-12.0 24"R	WOH 1 1 1	25.0	
			3T-7 12.0-14.0 24"R		26.4	3T-7: dry dens. = 99pcf qu = 1.4 tsf k = 5.3 E-7 cm/s
			SS-8 14.0-16.0 24"R	WOH 1 1 2	27.0	
			SS-9 16.0-18.0 24"R	WOH 1 1 1	25.1	
			SS-10 18.0-20.0 24"R	1 1 1 1	27.0	
507.0	20.0					

Water Content: PL □ - - - ○ - - - △ LL; scale 10 20 30 40 50
Unconfined Compressive Strength (TSF) ✳; scale 1 2 3 4 5

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME-55/ATV
DRILLING STARTED	7/25/92 ENDED 7/25/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 8.0' during drilling
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **CB-6** SHEET **2 OF 2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 5,079.8 E 2,367.5**

LOGGED BY **KRR**
GROUND ELEVATION **527.0**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
507.0	20.0		Gray silty clay, trace coarse to fine sand, soft, medium plasticity, wet CL	3T-11 20.0-22.0 24"R		✳	
505.5	21.5		Gray silty clay to clayey silt, trace to little fine sand, soft, low plasticity, wet CL/CL-ML	SS-12 22.0-24.0 24"R	1 1 1 1	23.6 ✳	SS-12: LL = 23 PL = 20 PI = 3
				SS-13 24.0-26.0 24"R	1 1 1 2	21.9 ✳	
501.0	26.0		Gray clayey sand, some silt, very loose, poorly graded, saturated SC	SS-14 26.0-28.0 24"R	1 1 1 1	26.1	SS-14: Gravel = 0% Sand = 62% Silt or clay = 38%
499.0	28.0		Gray fine sand, some silt, loose, poorly graded, saturated SM	SS-15 28.0-30.0 24"R	2 3 4 4	14.6	
497.8	29.2		Gray coarse to fine sand, little fine gravel, little sand, loose, poorly graded, saturated SM				
497.0	30.0			SS-16 30.0-32.0 24"R	6 6 8 8		
496.3	30.7		Gray fine sand, trace coarse to medium sand, trace silt, medium dense, poorly graded, saturated SP				
494.5	32.5		Gray coarse to fine sand, little fine gravel, trace silt, medium dense, well graded, saturated SW-SM	SS-17 32.0-34.0 8"R	13 100+ /2"	11.3	
493.0	34.0		Gray shale				
			End of Boring at 34.0'.				

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA**
DRILLING EQUIPMENT	**CME-55/ATV**
DRILLING STARTED **7/25/92**	ENDED **7/25/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ **8.0'** during drilling
▽
▼

PATRICK ENGINEERING INC.	BORING NUMBER **CB-7**	SHEET **1** OF **1**
	CLIENT	**City of Springfield CWLP**
	PROJECT & NO.	**FGDS Landfill-Hydrogeo. Invest. - 496B**
	LOCATION	**N 4,938.0 E 2,377.9**

LOGGED BY **KRR**

GROUND ELEVATION **523.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL)	NOTES & TEST RESULTS
523.8	0.0		Brown silty clay, trace fine sand, soft, medium plasticity, wet CL	AU-1 0.0-2.0		22.2	
				SS-2 2.0-4.0 10"R	2 3 3 2	28.8	
			Mottled and tan from 4.0'	SS-3 4.0-6.0 12"R	1 2 3 4	25.6	
				SS-4 6.0-8.0 20"R	2 2 3 3	25.1	
515.0	8.8		Gray silty clay, trace coarse to fine sand, stiff, medium plasticity, wet CL	SS-5 8.0-10.0 24"R	WOH 2 3 2	23.6	
			Trace fine sand only from 10.0'	3T-6 10.0-12.0 20"R			
				SS-7 12.0-14.0 24"R	WOH 1 2 2	25.9	
507.8	16.0			SS-8 14.0-16.0 24"R	1 1 2 2	26.4	Water was not encountered during or immediately after drilling. Borehole was tremie grouted using Volcaly grout immediately after drilling.
			End of Boring at 16.0'				

Water Content scale: 10, 20, 30, 40, 50. Unconfined Compressive Strength (TSF) ✳ scale: 1, 2, 3, 4, 5.

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA**
DRILLING EQUIPMENT	**CME 55/ATV**
DRILLING STARTED **8/13/92**	ENDED **8/13/92**

REMARKS

WOH = Weight of Hammer

WATER LEVEL (ft.)

▽

▽

▽

PATRICK ENGINEERING INC.

BORING NUMBER **CB-8** SHEET **1** OF **1**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 4,862.3 E 2,564.6**
LOGGED BY **KRR**
GROUND ELEVATION **522.7**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. / DEPTH (FT) / RECOVERY(IN)	BLOW COUNTS	Water Content (%)	Unconfined Compressive Strength (TSF)	NOTES & TEST RESULTS
522.7	0.0	Dark gray to black silty organic clay to clay, trace fine sand, soft, medium to high plasticity, wet to saturated, fill OL/OH	AU-1 0.0-2.0		26.7		
			SS-2 2.0-4.0 4"R	2 2 3 3	30.3	*	
			SS-3 4.0-6.0 10"R	1 2 2 1	31.4	*	SS-3: LL = 35 PL = 21 PI = 14
		Trace wood fragments in SS-4.	SS-4 6.0-8.0 4"R	1 1 1 2	29.0		
			SS-5AB 8.0-10.0 20"R	1 1 1 2	27.7 / 28.1	*	
		Trace wood fragements in SS-5B.					
512.9	9.8	Gray clayey fine sand, trace coarse to medium sand, little silt, very loose, poorly graded, moist SC	SS-6 10.0-12.0 8"R	WOH 1 1 1	23.0		
510.7	12.0	Gray silty fine sand, very loose, poorly graded, moist SM	SS-7 12.0-14.0 20"R	1 1 1 2	18.3		
508.9	13.8	Gray silty clay to clayey silt, trace coarse to fine sand, soft, medium plasticity, wet CL/CL-ML	SS-8 14.0-16.0 20"R	1 1 1 2	22.0	*	Tube pushed at 18.0' but no recovery. Then pushed split spoon. No water during drilling. W.L immediately after completion of drilling. Borehole was grouted using volclay grout immediately after drilling.
			SS-9 16.0-18.0 22"R	1 1 2 2	24.1	*	
			SS-10 18.0-20.0 20"R		22.3	*	
502.7	20.0	End of Boring at 20.0'					

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/12/92** ENDED **8/12/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)

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PATRICK ENGINEERING INC.

BORING NUMBER **CB-9** SHEET **1** OF **2**

CLIENT **City of Springfield CWLP**

PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**

LOCATION **N 4,799.8 E 2,736.2**

LOGGED BY **KRR**

GROUND ELEVATION **525.5**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (%) (PL □ - - ○ - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
525.5	0.0	Brown and dark gray silty clay, trace coarse to fine sand, roots and wood fragments present, very stiff, medium plasticity, wet, fill CL	AU-1 0.0-2.0		23.6	
			SS-2 2.0-4.0 14"R	7 8 11 12	22.1	
			SS-3 4.0-6.0 6"R	4 3 2 3	29.9	SS-3: CEC = 18.1 meq/100g
520.7	4.8	Dark gray to black organic silty clay, trace fine sand, wood fragments present, soft to medium stiff, medium plasticity, wet, fill. OL	SS-4 6.0-8.0 6"R	2 3 3 4	30.7	
			SS-5 8.0-10.0 10"R	1 2 2 2	34.2	
			SS-6AB 10.0-12.0 20"R	1 1 1 1	29.2, 20.2	
513.9	11.6	Gray fine sand, trace coarse to medium sand, little silt, trace shells, very loose, poorly graded, fill SM				
513.5	12.0	Dark gray organic silty clay, trace fine sand, wood fragments present, soft, medium plasticity, wet, saturated, fill SC	SS-7 12.0-14.0 24"R	WOH 1 2 2	29.9	
511.3	14.2	Gray clayey fine sand, little silt, very loose, poorly graded, saturated, fill SC	SS-8 14.0-16.0 18"R	WOH 1 1 1	30.3	Water level at 14.0' during drilling,
509.3	16.2	Gray silty clay, trace to little fine sand, soft, medium plasticity, wet CL	SS-9 16.0-18.0 20"R	WOH WOH 1 1	26.0	
			SS-10 18.0-20.0 22"R	WOH 1 2 2	25.2	

DRILLING CONTRACTOR **Patrick Drilling**

DRILLING METHOD **4-1/4" I.D. HSA**

DRILLING EQUIPMENT **CME 55-ATV**

DRILLING STARTED **8/13/92** ENDED **8/13/92**

REMARKS

WOH = Weight of Hammer.

WATER LEVEL (ft.)

▽ **14.0'** during drilling.

▼ **5.0'** after drilling.

▼

PATRICK ENGINEERING INC.

BORING NUMBER **CB-9** SHEET **2** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,799.8 E 2,736.2**

LOGGED BY **KRR**
GROUND ELEVATION **525.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
505.5	20.0		Gray silty clay, trace to little fine sand, medium stiff, medium plasticity, wet CL	3T-11 20.0-22.0 24"R		✳ (≈1 TSF)	
503.5	22.0		Gray silty fine sand, loose, poorly graded, saturated SM	SS-12 22.0-24.0 24"R	3 2 2 2		
501.0	24.5		Gray coarse to fine sand, trace fine gravel, trace to little silt, loose, poorly graded, saturated SP-SM/SM	SS-13 24.0-26.0 24"R	1 1 3 4	21.8 ○	Blow-in at 26.0'
499.5	26.0		End of Boring at 26.0'				Water level at 5.0' immediately after drilling.
							Borehole was tremie grouted using Volclay grout immediately after completion of drilling.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55-ATV**
DRILLING STARTED **8/13/92** ENDED **8/13/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **14.0'** during drilling
▼ **5.0'** after drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER **P-1D** SHEET **1** OF **3**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,806.1 E 1,973.1**

LOGGED BY **KRR**
GROUND ELEVATION **553.4**

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
553.4	0.0	Brown and dark gray silty clay, some coarse to fine sand, trace fine gravel, very stiff, medium plasticity, moist to wet, fill CL	AU-1 0.0-2.0		14.7	
		Trace coarse to fine sand from 2.0' Trace roots in SS-2	SS-2 2.0-4.0 14"R	1 2 3 5	19.4	
		Light olive at 4.0'	SS-3 4.0-6.0 16"R	2 4 6 10	20.5	
546.9	6.5		SS-4ABC 6.0-8.0 18"R	4 4 9 10	21.6, 22.7	
		Dark gray to black organic silty clay, trace coarse to fine sand, very stiff, medium plasticity, moist to wet, fill OL	SS-5 8.0-10.0 20"R	3 6 4 6	20.4	SS-5: LL = 46 PL = 20 PI = 26
		Mottled at 11.0'	SS-6 10.0-12.0 20"R	3 3 5 6	25.3	
541.4	12.0	Dark gray to black organic clay to silty clay, trace wood fragments and coal, trace fine sand, very stiff, medium plasticity, wet, fill OL	SS-7 12.0-14.0 24"R	2 3 5 6	26.1	
			SS-8 14.0-16.0 24"R	3 3 5 6	22.3	
			SS-9 16.0-18.0 19"R	4 5 8 8	23.8	
535.2	18.2				22.7	
534.4	19.0	Brown silty clay, trace coarse to fine sand, trace fine gravel, stiff, medium plasticity, wet, fill CL	SS-10ABC 18.0-20.0 24"R	1 2 4 5	22.0	
533.4	20.0				23.7	

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/20/92** ENDED **7/20/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
39.0' during drilling
38.0' after drilling

PATRICK ENGINEERING INC.

BORING NUMBER P-1D SHEET 2 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,806.1 E 1,973.1

LOGGED BY KRR
GROUND ELEVATION 553.4

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION
533.4	20.0	Dark gray organic silty clay, trace wood and coal fragments, stiff, medium plasticity, wet OL
		Dark gray to black organic silty clay, trace fine sand, trace wood fragments and coal, stiff, medium plasticity, wet, fill OL
		Brownish-gray, olive and black from 23.0'-23.5' and 24.0'-25.0'
		Changed to dark gray and black from 25.0'
526.4	27.0	Trace wood fragments in SS-14A
525.4	28.0	Black to dark gray organic silty clay to clayey silt, trace to little fine sand, medium dense, moist, fill OL/CL-ML
		Black to dark gray organic clay to silty clay, roots present, trace fine sand, medium stiff, medium to high plasticity, wet, fill OL/OH
		Wood fragments in SS-18
		Wood fragments in SS-19
514.9	38.5	Brownish-gray and olive clayey sand, trace fine gravel, loose, well graded, saturated SC
513.9	39.5	
513.4	40.0	

SAMPLE TYPE & NO.	DEPTH (FT)	RECOVERY (IN)	BLOW COUNTS	Water Content (%)	NOTES & TEST RESULTS
SS-11	20.0-22.0	24"R	2, 7, 7, 9	23.7, 20.7	
SS-12	22.0-24.0	24"R	2, 6, 7, 9	22.0	
SS-13AB	24.0-26.0	24"R	3, 3, 6, 7	20.9, 26.4	
SS-14AB	26.0-28.0	24"R	4, 5, 8, 8	31.6, 35.7	
SS-15	28.0-30.0	2"R	1, 2, 3, 3	72.8	Disturbed sample.
SS-16	30.0-32.0	24"R	2, 2, 2, 2	30.1	
3T-17	32.0-34.0	24"R			
SS-18	34.0-36.0	24"R	1, 3, 3, 3	35.4	
SS-19	36.0-38.0	24"R	1, 2, 3, 3	25.8, 22.4	
SS-20	38.0-40.0	24"R	2, 2, 2, 3	31.2, 22.4	Water level at 39.0' during drilling.

Water Content: PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50)
Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 7/20/92 ENDED 7/20/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 39.0' during driling
▼ 38.0' after drilling
▽

PATRICK ENGINEERING INC.

BORING NUMBER	P-1D
SHEET	3 OF 3
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 4,806.1 E 1,973.1
LOGGED BY	KRR
GROUND ELEVATION	553.4

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - -○- - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
513.4	40.0		Gray silty clay, trace fine sand, medium stiff, medium plasticity, wet CL	SS-21 40.0-42.0 24"R	WOH 1 2 2	22.1	
			Gray silty clay, trace fine sand, medium stiff, medium plasticity, wet CL Gray and olive from 42.0'	SS-22 42.0-44.0 24"R	2 3 4 4		
				SS-23 44.0-46.0 24"R	2 2 2 2	21.0	Ceased drilling on 07/20/92.
			Little fine sand in 3T-24	3T-24 46.0-48.0 24"R			Resumed drilling on 07/21/92.
				SS-25AB 48.0-50.0 24"R	1 1 3 4	21.8 20.8	SS-25B: Gravel = 0% Sand = 64% Silt or clay = 36%
504.4	49.0		Gray clayey fine sand, little silt, loose, poorly graded, saturated SC				
502.6	50.8		Gray fine sand, some silt, trace coarse to medium sand, trace coarse to fine gravel, very loose, poorly graded, saturated. SM	SS-26AB 50.0-52.0 24"R	WOH 2 2 1		
501.9	51.5						
501.4	52.0		Gray coarse to fine sand, trace silt, very loose, poorly graded, saturated SP	SS-27 52.0-52.5 7"R	41 120/1"	11.2	Auger refusal at 52.5'. Water level at 38.0' immediately after drilling.
500.9	52.5		Gray Shale End of Boring at 52.5'.				Piezometer was installed after completion of drilling. See as-built diagram P-6D for more details.

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME-55/ATV
DRILLING STARTED	7/20/92
ENDED	7/20/92

REMARKS

WOH = Weight of Hammer

WATER LEVEL (ft.)

- ▽ 39.0' during driling
- ▽ 38.0' after drilling
- ▽

PATRICK ENGINEERING INC.

BORING NUMBER P-1S SHEET 1 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,821.3 E 1,973.9

LOGGED BY KRR
GROUND ELEVATION 553.4

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
553.4	0.0		Drilled to 36.0' without sampling (See Boring Log P-1D for soil conditions from 0' to 36')				

DRILLING CONTRACTOR Patrick Drillling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 7/21/92 ENDED 7/21/92

REMARKS

WATER LEVEL (ft.)
⊻
⊻
⊻

PATRICK ENGINEERING INC.

BORING NUMBER P-1S SHEET 2 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,821.3 E 1,973.9

LOGGED BY KRR
GROUND ELEVATION 553.4

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content: PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50); Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
533.4	20.0		Drilled to 36.0' without sampling (See Boring Loag P-1D for soil conditions from 0' to 36')				
517.4	36.0						
515.4	38.0		Black to dark gray organic silty clay, trace wood fragments, trace coarse to fine sand, stiff, medium plasticity, wet, fill OL	SS-1 36.0-38.0 20"R	2 3 3 5	✳ 32.2	
514.7	38.7		Gray clayey fine sand, little silt, trace coarse to medium sand, loose, poorly graded, saturated SC	SS-2AB 38.0-40.0 24"R	2 1 2 2	✳ 18.7 23.5	Water in SS-2A SS-2A: Gravel = 2% Sand = 65% Silt or clay = 33%

DRILLING CONTRACTOR Patrick Drillling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 7/21/92 ENDED 7/21/92

REMARKS

WATER LEVEL (ft.)
⊻
⊻
⊻

PATRICK ENGINEERING INC.

BORING NUMBER **P-1S** SHEET **3** OF **3**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,821.3 E 1,973.9**

LOGGED BY **KRR**
GROUND ELEVATION **553.4**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
513.4	40.0		Gray silty clay, trace fine sand, medium stiff to stiff, medium plasticity, wet CL	SS-3 40.0-42.0 24"R	3 3 4 5	✳ 22.6 ○	No water immediately after drilling.
511.4	42.0		End of Boring at 42.0'.				Piezometer P-1S was installed after completion of drilling. Refer to as-built diagram P-1S for details.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/21/92** ENDED **7/21/92**

REMARKS

WATER LEVEL (ft.)
▽
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER P-2D SHEET 1 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 5,256.0 E 1,975.9

LOGGED BY KRR
GROUND ELEVATION 553.9

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
553.9	0.0		Brown coarse to fine sand, some silt, well graded, dry, fill SM	AU-1AB 0.0-2.0			
552.9	1.0		Dark gray to black silty clay, trace fine sand, trace organics, very stiff, low plasticity, moist, fill CL			4.8	
				SS-2 2.0-4.0 10"R	5 7 9 9	16.2; 16.7	
549.9	4.0		Mottled brown silty clay, trace coarse to fine sand, trace fine gravel, very stiff, medium plasticity, wet, fill CL	SS-3 4.0-6.0 12"R	3 4 4 6	20.7	
				SS-4 6.0-8.0 16"R	4 5 8 10	22.5	
545.9	8.0		Dark gray silty clay, trace organics, trace coarse to fine sand, very stiff, medium plasticity, wet, fill OL	SS-5 8.0-10.0 14"R	2 4 6 7	21.9	
543.9	10.0		Brown and dark gray silty clay, trace coarse to fine sand, very stiff, medium plasticity, wet, fill CL	SS-6 10.0-12.0 14"R	3 4 6 7	20.5	
			Brown and gray at 12.0'	SS-7 12.0-14.0 20"R	2 4 4 7	24.5	
			Mottled brown from 14.0'	3T-8 14.0-16.0 20"R			
				SS-9 16.0-18.0 22"R	4 6 9 10	23.9	
			Dark brown from 19.0'	SS-10 18.0-20.0 22"R	2 3 6 6	16.4	
533.9	20.0						

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/22/92** ENDED **7/22/92**

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
▽ **28.0'** during drilling
▽
▼

PATRICK ENGINEERING INC.	BORING NUMBER **P-2D**		SHEET **2** OF **3**
	CLIENT	**City of Springfield CWLP**	
	PROJECT & NO.	**FGDS Landfill - Hydrogeo Invest. - 496B**	
	LOCATION	**N 5,256.0 E 1,975.9**	

LOGGED BY **KRR**

GROUND ELEVATION **553.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
533.9	20.0		Dark brown silty clay, trace to little fine sand, very stiff, medium plasticity, wet, fill CL	SS-11 20.0-22.0 22"R	6 5 7 8	19.9	
532.9	21.0		Dark gray silty clay, trace fine sand, trace wood fragments and roots, very stiff, medium plasticity, wet, fill CL/OL	SS-12 22.0-24.0 24"R	2 3 3 5	22.7, 23.5	
530.7	23.2		Changed to brownish-gray and olive at 22.0'				
			Dark brown silty clay, trace coarse to fine sand, soft to stiff, medium plasticity, wet, fill CL	SS-13 24.0-26.0 24"R	2 2 2 3	26.4	
			Mottled from 25.0'	SS-14 26.0-28.0 24"R	2 3 4 3	26.6	
				3T-15 28.0-30.0 24"R		25.9	3T-15: Dry Dens=99.1pcf k=7.3E-07 cm/s
				SS-16 30.0-32.0 24"R	WOH 1 1 1	27.6	
			Mucky at 32.0'	SS-17 32.0-34.0 24"R	1 2 2 2	25.6	
				SS-18 34.0-36.0 24"R	1 2 2 2	24.9, 24.0	
516.9	37.0			SS-19ABC 36.0-38.0 24"R	2 2 3 4	22.5	
516.4	37.5		Brown clayey fine sand, some silt, loose, poorly graded, saturated SC			27.3	
			Dark gray silty clay, trace coarse to fine sand, trace fine gravel, trace shells, very stiff, medium plasticity, wet CL	SS-20 38.0-40.0 24"R	2 2 3 6	18.1	
513.9	40.0						

DRILLING CONTRACTOR **Patrick Drilling**	REMARKS	WATER LEVEL (ft.)
DRILLING METHOD **4-1/4" I.D. HSA**	**WOH - Weight of Hammer.**	▽ **28.0'** during drilling
DRILLING EQUIPMENT **CME-55/ATV**		▽
DRILLING STARTED **7/22/92** ENDED **7/22/92**		▼

PATRICK ENGINEERING INC.

BORING NUMBER P-2D SHEET 3 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 5,226.0 E 1,975.9

LOGGED BY KRR
GROUND ELEVATION 553.9

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
513.9	40.0	Dark gray to gray silty clay, trace fine sand, medium to stiff, medium plasticity, wet CL	SS-21 40.0-42.0 24"R	2 4 4 5	19.1	
			SS-22 42.0-44.0 24"R	2 2 2 3	25.1	
		Pockets of sand at 43.6' Light gray and olive from 44.0'	SS-23 44.0-46.0 24"R	WOH 1 3 3	22.8	
			SS-24 46.0-48.0 24"R	2 1 4 4	20.8	
		Little fine sand in SS-25 1" fine sand lense at 48.5	SS-25 48.0-50.0 24"R	1 2 2 2	22.1	
		Gray and little to some fine sand from 51.0'	SS-26 50.0-52.0 24"R	WOH	21.1	
500.9	53.0		SS-27AB 52.0-54.0 24"R	5 8 8 8	21.5	
		Gray clayey coarse to fine sand, little silt, medium dense, well graded, saturated SC			12.0	
499.9	54.0					
499.4	54.5	Gray coarse to fine sand, trace silt, medium dense, well graded, saturated SW	SS-28ABC 54.0-56.0 20"R	4 7 40 18+/2"	15.0	SS-28A: Gravel = 3% Sand = 91% Silt or clay = 6%
498.9	55.0	Gray coarse to fine sand, trace silt, medium dense, poorly graded, saturated SP/SP-SM				
498.1	55.8	Gray clayey coarse to fine sand, little silt, trace coarse to fine gravel, dense, well graded, saturated SC	SS-29 56.0-57.3 6"R	100+	9.8	Piezometer P-2D was installed after completion of drilling. Refer to as-built diagram P-2D for more details.
497.4	56.5	Gray siltstone/shale				
		End of Boring at 56.5'.				

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 7/22/92 ENDED 7/22/92

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ 28.0' during drilling
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **P-2S** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,237.1 E 1,976.3**

LOGGED BY **KRR**
GROUND ELEVATION **533.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
533.9	0.0		Drilled to 26.0' without sampling. See Boring Log P-2D for details on soils encountered from 0' to 26'				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/22/92** ENDED **7/22/92**

REMARKS

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER **P-2S** SHEET **2 OF 2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,237.1 E 1,976.3**

LOGGED BY **KRR**
GROUND ELEVATION **533.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
513.9	20.0		Drilled to 26.0' without sampling. See Boring Log P-2d for details on soils encountered from 0' to 26'				
507.9	26.0		Brown silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-1 26.0-28.0 24"R	3 3 4 5	✳ ; ○ 25.9	
				SS-2 28.0-30.0 24"R	1 1 2 3	✳ ; ○ 27.0	Piezometer P-2S was installed immediately after completion of drilling. Refer to as-built diagram P-2S for more details.
503.9	30.0		End of Boring at 30.0'.				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/22/92** ENDED **7/22/92**

REMARKS

WATER LEVEL (ft.)
▽
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **P-3D** SHEET **1 OF 2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 5,672.5 E 2,645.4**

LOGGED BY **KRR**
GROUND ELEVATION **530.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL) / Unconfined Compressive Strength (TSF) ✳	NOTES & TEST RESULTS
530.5	0.0		Brownish gray silty clay, trace coarse to fine sand, very stiff, low plasticity, moist, fill CL	AU-1 0.0-2.0		18.4	
			Dark gray and brown at 3.0', trace fine gravel and coal in SS-2	SS-2 2.0-4.0 20"R	4 5 5 7	20.1	
			Trace coal and organics in SS-3	SS-3 4.0-6.0 14"R	3 4 4 5	22.3	
524.0	6.5		Dark gray to black clayey sand to silty sand, trace organics, loose, poorly graded, saturated, fill SC/SM	SS-4 6.0-8.0 8"R	2 2 3 3	51.7	
				SS-5 8.0-10.0 0"R	WOH 1 1 1		Water level at 8.0' while drilling.
				SS-6 10.0-12.0 6"R	WOH WOH WOH WOH	45.9	
518.5	12.0		Dark gray organic silty clay, trace fine sand, wood fragments present, medium to high plasticity, wet to saturated, fill OL	SS-7AB 12.0-14.0 24"R	WOH WOH WOH 3	40.0	
517.0	13.5		Brown to brownish gray silty clay, trace coarse to fine sand, stiff to very stiff, medium to high plasticity, wet CL			28.9	
				SS-8 14.0-16.0 24"R	2 3 3 4	28.7	
				3T-9 16.0-18.0 20"R		34.5	3T-9: Dry dens=89.2 pcf k=1.3E-08 cm/s
				SS-10 18.0-20.0 24"R	WOH WOH 2 2	36.9	
510.5	20.0						

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/17/92** ENDED **8/17/92**

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
▽ **8.0'** during drilling
▼ **14.0'** after drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER P-3D SHEET 2 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 5,672.5 E 2,645.4

LOGGED BY KRR
GROUND ELEVATION 530.5

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (%)	NOTES & TEST RESULTS
510.5 509.5	20.0 21.0	Brownish-gray silty clay, trace coarse to fine sand, stiff, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	WOH WOH 2 2	44.2	
		Gray clay to silty clay, trace fine sand, very soft to soft, mucky, medium to high plasticity, wet to saturated CH	SS-12 22.0-24.0 24"R	WOH WOH WOH 1	43.6	
			SS-13 24.0-26.0 24"R	WOH WOH WOH WOH	53.7	SS-13: LL = 71 PL = 32 PI = 39
502.5	28.0		SS-14 26.0-28.0 24"R	WOH 1 1 1	59.5	
500.5	30.0	Gray silty fine sand, very loose, poorly graded, saturated SM	SS-15 28.0-30.0 24"R	WOH WOH WOH WOH		
498.5	32.0	Gray silty clay to clayey silt, little fine sand, soft, low to medium plasticity, wet CL/CL-ML	SS-16 30.0-32.0 24"R	WOH WOH 1 1	27.7	SS-17B: Gravel = 0% Sand = 58% Silt or Clay = 42%
497.5 497.0	33.0 33.5	Gray fine sand, little silt, very loose, poorly graded, saturated SM	SS-17AB 32.0-34.0 24"R	1 1 7 10	14.1 17.9	
495.5	35.0	Gray coarse to fine sand and silt, trace coarse to fine gravel, medium dense, well graded, saturated SM	SS-18 34.0-35.0 10"R	42 100/4"	11.3	Water level at 14.0' immediately after drilling. Piezometer was installed immediatley after drilling. Refer to As-Built Diagram P-3D for more details.
		Gray shale End of Boring at 35.0'				

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 8/17/92 ENDED 8/17/92

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
8.0' during drilling
14.0' after drilling

PATRICK ENGINEERING INC.	BORING NUMBER **P-3S** SHEET **1** OF **1**
	CLIENT **City of Springfield CWLP**
	PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
	LOCATION **N 5,672.5 E 2,651.4**

LOGGED BY **KRR**

GROUND ELEVATION **530.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (%) PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50) / Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
530.5	0.0		Drilled without sampling to 6.0'. Refer to Boring Log P-3D for soil conditions from 0' to 6'.				Soil conditions were consistent with soil conditions encountered in P-3D based on soil cuttings.
524.5	6.0		Brown and dark gray silty clay, trace coarse to fine sand, trace fine gravel, trace coal, trace organics, soft, medium plasticity, wet CL/OL	SS-1 6.0-8.0 14"R	2 2 2 3	23.8	
522.5	8.0		Dark gray to black silty sand, trace organics, wood fragments present, very loose, poorly graded, saturated SM	SS-2 8.0-10.0 24"R	WOH 1 1 1	58.5	
				SS-3 10.0-12.0 24"R	WOH WOH WOH WOH		SS-3: Gravel = 0% Sand = 55% Silt or Clay = 45%
518.5	12.0		Gray and olive silty clay, trace to fine sand, trace organics, soft, medium plasticity, wet CL	SS-4AB 12.0-14.0 24"R	WOH 1 2 3	27.3	Piezometer was installed immediately after drilling. Refer to As-Built Diagram P-3S for more details.
517.5	13.0					36.8	
516.5	14.0		Brown silty clay, trace to fine sand, stiff, medium plasticity, wet to saturated CL				
			End of Boring at 14.0'				

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA**
DRILLING EQUIPMENT	**CME 55/ATV**
DRILLING STARTED **8/17/92**	ENDED **8/17/92**

REMARKS

WOH = Weight of Hammer.

WATER LEVEL (ft.)

▽

▽

▽

PATRICK ENGINEERING INC.	
BORING NUMBER	**P-4** SHEET **1** OF **3**
CLIENT	**City of Springfield CWLP**
PROJECT & NO.	**FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION	**N 5,156.3 E 2,880.7**

LOGGED BY **KRR**

GROUND ELEVATION **535.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
535.9	0.0		Brown silty clay, trace coarse to fine sand, stiff to very stiff, medium plasticity, wet CL	AU-1 0.0-2.0		25.3	
				SS-2 2.0-4.0 24"R	3 4 5 5	24.6	
			Mottled from 4.0'	SS-3 4.0-6.0 20"R	2 2 3 4	29.6	
				3T-4 6.0-8.0 24"R			
				SS-5 8.0-10.0 24"R	3 3 4 8	20.5	
			Brownish gray at 10.0'	SS-6 10.0-12.0 24"R	3 4 6 10	26.5	
				SS-7 12.0-14.0 24"R	4 4 6 8	25.0	
				3T-8 14.0-16.0 24"R			
519.9	16.0		Gray clay to silty clay, trace fine sand, very soft to stiff, medium to high plasticity, wet to saturated CH/CL	SS-9 16.0-18.0 24"R	4 4 5 7	33.9	
				SS-10 18.0-20.0 24"R	1 2 2 3	40.2	

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA**
DRILLING EQUIPMENT	**CME 55/ATV**
DRILLING STARTED **8/16/92**	ENDED **8/16/92**

REMARKS

WOH = Weight of Hammer

WATER LEVEL (ft.)

34.0' during drilling

PATRICK ENGINEERING INC.

BORING NUMBER P-4 SHEET 2 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 5,156.3 E 2,880.7

LOGGED BY KRR
GROUND ELEVATION 535.9

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
515.9	20.0		Gray clay, trace silt, mucky, very soft, high plasticity, moist to wet CH	3T-11 20.0-22.0 24"R		✳	3T=11: Dry Dens.=78.2 pcf k=2.9 E-08cm/s
			Very mucky at 22.0'	SS-12 22.0-24.0 24"R	WOH WOH WOH 1	✳ 50.4	
				SS-13 24.0-26.0 24"R	WOH WOH WOH 2	✳ 34.4	
			Silty clay lenses at 26.0'	SS-14 26.0-28.0 24"R	WOH WOH WOH 1	✳ 46.6	
				SS-15 28.0-30.0 24"R	WOH WOH 1 1	✳ 52.6	
				SS-16 30.0-32.0 24"R	WOH WOH WOH 1	✳ 52.6	SS-16: LL = 67 PL = 30 PI = 37
				SS-17 32.0-34.0 24"R	WOH WOH WOH 1	✳ 52.6	
501.9	34.0		Gray coarse to fine sand, some fine gravel, trace silt, trace coal, medium dense to dense, poorly graded, saturated SW-SM	SS-18 34.0-36.0 24"R	WOH 6 11 27		Water level at 34.0' during drilling.
				SS-19 36.0-38.0 24"R	7 8 7 7		Blow-in 36.0' washed off with water. SS-19: Gravel = 23% Sand = 69% Silt or Clay = 8%
				SS-20 38.0-40.0 24"R	8 7 7 8		

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/16/92** ENDED **8/16/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
∇ **34.0'** during drilling
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER **P-4** SHEET **3** OF **3**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 5,156.3 E 2,880.7**

LOGGED BY **KRR**
GROUND ELEVATION **535.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
495.9	40.0		Gray coarse to fine sand, some fine gravel, trace silt, medium dense, well graded, saturated SW-SM	SS-21 40.0-42.0 24"R	6 7 8 8	15.1	Piezometer was installed immediately after completion of drilling. Refer to as-built diagram P-4 for more details.
493.6	42.3		Gray shale, soft	SS-22 42.0-43.0 10"R	11 100 +/4"		
492.9	43.0		End of Boring at 43.0'				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/16/92** ENDED **8/16/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ 34.0' during drilling
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER P-5D — SHEET 1 OF 2
CLIENT: City of Springfield CWLP
PROJECT & NO.: FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION: N 4,516.7 E 2,885.0

LOGGED BY: KRR
GROUND ELEVATION: 534.9

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. / DEPTH (FT) / RECOVERY (IN)	BLOW COUNTS	Water Content (%)	NOTES & TEST RESULTS
534.9	0.0	Brown silty clay, trace fine sand, soft, low plasticity, moist, fill — CL	AU-1 0.0-2.0		17.6	
532.4	2.5	Dark gray to black organic silty clay, trace coarse to fine sand, trace roots, soft to very soft, medium to high plasticity, wet to saturated, fill — OL	SS-2 2.0-4.0 20"R	3 4 6 9	21.8	
			SS-3 4.0-6.0 24"R	3 6 11 12	23.3	
			SS-4 6.0-8.0 24"R	3 4 5 5	31.8	SS-4: LL = 45 PL = 25 PI = 20
			SS-5 8.0-10.0 24"R	2 3 2 4	29.4	
			SS-6 10.0-12.0 24"R	2 3 3 2	29.7	
		Changed from organic silty clay to organic clayey silt from 12.0'.	SS-7 12.0-14.0 24"R	WOH 2 3 2	26.3	
			SS-8 14.0-16.0 22"R	1 2 2 3	31.4	
		Wood fragments in SS-9	SS-9 16.0-18.0 24"R	2 2 2 3	54.0	
514.9	20.0		SS-10 18.0-20.0 18"R	1 1 2 2	37.8	

DRILLING CONTRACTOR: Patrick Drilling
DRILLING METHOD: 4-1/4" I.D. HSA
DRILLING EQUIPMENT: CME 55/ATV
DRILLING STARTED 8/16/92 ENDED 8/16/92

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
22.0' during drilling

PATRICK ENGINEERING INC.

BORING NUMBER	**P-5D** — SHEET **2** OF **2**
CLIENT	**City of Springfield CWLP**
PROJECT & NO.	**FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION	**N 4,516.7 E 2,885.0**

LOGGED BY **KRR**

GROUND ELEVATION **534.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
514.9	20.0		Dark gray to black organic silty clay, trace coarse to fine sand, soft, medium to high plasticity, wet to saturated, fill OL	SS-11 20.0-22.0 24"R	2 2 3 4	29.1 ✳	
512.9	22.0		Little coarse to fine sand, trace fine gravel and wood fragments present in SS-11	SS-12AB 22.0-24.0 24"R	WOH 1 1 1	197.4	Water level at 22.0' during drilling.
			Gray fine sand, little to some silt, very loose, poorly graded, saturated SM				
			Wood in SS-12B	SS-13 24.0-26.0 24"R	WOH 1 3 2		
509.9	25.0		Gray coarse to fine sand, some fine gravel, little silt, loose, well graded, saturated SM	SS-14AB 26.0-28.0 24"R	1 3 5 6	16.0	SS-14A Gravel = 29% Sand = 54% Silt or clay = 17%
507.6	27.3		Gray shale, soft	SS-15 28.0-30.0 20"R	10 12 14 15	15.1	
				SS-16 30.0-32.0 22"R	16 18 22 26	15.0	Piezometer was installed immediately after completion of drilling. Refer to As-Built Diagram P-5D for more details.
502.9	32.0		End of Boring at 32.0'				

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA**
DRILLING EQUIPMENT	**CME 55/ATV**
DRILLING STARTED	**8/16/92** ENDED **8/16/92**

REMARKS

WOH = Weight of Hammer.

WATER LEVEL (ft.)

▽ **22.0'** during drilling

PATRICK ENGINEERING INC.

BORING NUMBER	P-5S	SHEET	1 OF 1
CLIENT	City of Springfield CWLP		
PROJECT & NO.	FGDS Landfill - Hydrogeo Invest. - 496B		
LOCATION	N 4,510.7 E 2,887.0		

LOGGED BY KRR
GROUND ELEVATION 534.9

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content: PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50); Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
534.9	0.0		Drilled to 8.0' without sampling. Refer to Boring Log P-5D for soil conditions from 0.0' to 8.0'.				Soil conditions are consistent with soil conditions encountered in P-5D based on soil cuttings.
526.9	8.0		Dark gray to black organic silty clay, trace fine sand, soft, medium to high plasticity, wet to saturated, fill OL	SS-1 8.0-10.0 10"R	2 2 2 3	✳ 35.2	3T-2: Dry den.=95.2 pcf k=7.6 E-08 cm/s
				3T-2 10.0-12.0 16"R		✳ 26.0	
522.9	12.0		End of Boring at 12.0'				No water was found during or immediately after drilling. Piezometer was constructed immediately after drilling. Refer to As-Built Diagram P-5S for more details.

DRILLING CONTRACTOR	Patrick Engineering
DRILLING METHOD	3-1/4" I.D. HSA
DRILLING EQUIPMENT	CME 55/ATV
DRILLING STARTED	8/16/92 ENDED 8/16/92

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER **P-6D** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,717.0 E 2,186.8**

LOGGED BY **KRR**
GROUND ELEVATION **524.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
524.8	0.0		Brown silty clay, trace to little fine sand, soft, medium plasticity, wet CL	AU-1 0.0-2.0		22.2	
			Mottled at 2.0'	SS-2 2.0-4.0 18"R	2 1 2 3	21.2 ✳	
				SS-3 4.0-6.0 20"R	1 1 2 2	21.7 ✳	
518.3	6.5		Brown, clayey, fine sand, little to some silt, loose, poorly graded, saturated SC	SS-4AB 6.0-8.0 18"R	1 2 2 2	22.0 ✳ 25.4	Water level at 6.0' during drilling.
517.3	7.5		Brown mottled silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-5 8.0-10.0 10"R	1 1 2 2	21.7 ✳	Wood fragments in SS-5.
514.8	10.0		Gray silty clay, trace fine sand, soft to medium stiff, medium plasticity, wet CL	SS-6 10.0-12.0 20"R	3 1 1 1	29.8 ✳	
				SS-7 12.0-14.0 20"R	2 2 2 2	28.3 ✳	
				SS-8 14.0-16.0 22"R	1 2 4 3	24.1 ✳	
				SS-9 16.0-18.0 24"R	2 2 2 2	24.7 ✳	
				3T-10 18.0-20.0 24"R		✳	
504.8	20.0						

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/12/92** ENDED **8/12/92**

REMARKS
WOH = Weight of Hammer

WATER LEVEL (ft.)
▽ **6.0'** during drilling
▼ **1.0'** after drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER P-6D SHEET 2 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 4,717.0 E 2,186.8

LOGGED BY KRR
GROUND ELEVATION 524.8

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
504.8	20.0		Gray silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-11 20.0-22.0 24"R	1 2 2 1	✳ 23.3	
				SS-12 22.0-24.0 24"R	WOH 1 2 1	✳ 22.7	
501.8	23.0		Little fine sand in SS-12				
			Gray clayey silt, trace fine sand, loose, wet to saturated CL-ML/ML	SS-13 24.0-26.0 24"R	2 3 4 4	18.3	
				SS-14AB 26.0-28.0 24"R	4 4 7 10	19.5 15.9	
497.3	27.5		Gray fine sand, trace coarse to medium sand, some silt, medium dense, poorly graded, saturated SM				
496.8	28.0		Gray coarse to fine sand, trace coarse to fine gravel, some silt, medium dense, well graded, saturated SM	SS-15 28.0-30.0 24"R	7 7 18 9	14.6	
				SS-16AB 30.0-32.0 22"R	13 16 17 100 +	13.2 16.9	Water level at 1.0' immediately after drilling. Piezometer was installed immediatley after completion of drilling. Refer to As-Built Diagram P-6D for more information.
493.3	31.5		Gray shale				
492.8	32.0		End of Boring at 32.0'				

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME 55/ATV
DRILLING STARTED 8/12/92 ENDED 8/12/92

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
▽ 6.0' during drilling.
▽ 1.0' after drilling.
▽

PATRICK ENGINEERING INC.

BORING NUMBER P-6S SHEET 1 OF 1
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 4,725.7 E 2,191.4

LOGGED BY KRR
GROUND ELEVATION 524.9

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - O - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
524.9	0.0		Drilled to 4.0' without sampling. Refer to Boring Log P-6D for soil conditions from 0.0' to 4.0'.				Brown silty clay based on soil cuttings up to 4.0'.
520.9	4.0		Brown silty clay, trace to little fine sand, medium stiff, medium plasticity, wet CL	3T-1 4.0-6.0 14"R		✳	SS-2A: Gravel = 0% Sand = 14% Silt or clay = 86%
518.4	6.5		Gray clayey fine sand, some silt, loose, poorly graded, saturated SC	SS-2AB 6.0-8.0 24"R	2 1 1 2	23.4, 22.6, ✳	Water level at 7.0' during drilling
517.4	7.5		Brown and tan silty clay to clayey silt, little fine sand, soft to medium stiff, medium plasticity, wet CL/CL-ML; 2" fine sand lense at 8.5'	SS-3AB 8.0-10.0 20"R	2 2 1 2	28.2, 21.0, ✳	Water level at 3.0' immediately after drilling. Piezometer was installed immediately after completion of drilling. Refer to As-Built Diagram P-6S for more details.
515.4	9.5						
514.9	10.0		Gray silty clay, trace fine sand, medium stiff, medium plasticity, wet CL			27.6	
			End of Boring at 10.0'				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/12/92** ENDED **8/12/92**

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
▽ **7.0'** during drilling.
▼ **3.0'** after drilling.
▼

PATRICK ENGINEERING INC.	
BORING NUMBER	P-6R — SHEET 1 OF 3
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 4,719.5 E 2,175.7

LOGGED BY KRR

GROUND ELEVATION 524.8

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content: PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50); Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
524.8	0.0		Drilled to top of bedrock at 32.5 feet without sampling. Refer to Boring Log P-6D for soil conditions above top of bedrock.				

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 6-1/4" I.D. HSA.
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 8/5/92 ENDED 8/6/92

REMARKS

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER P-6R SHEET 2 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION N 4,719.5 E 2,175.7

LOGGED BY KRR
GROUND ELEVATION 524.8

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
504.8	20.0		Drilled to top of bedrock at 32.5 feet without sampling. Refer to Boring Log P-6D for soil conditions above top of bedrock.				Ceased drilling at 32.5' on 8/5/92. Switched to PQ coring and cored on 8/6/92.
492.3	32.5		Gray shale, massive, excellent	PQ-1 32.5-38.5 72"R			RQD = 100%
				PQ-2 38.5-42.5 48"R			RQD = 100%

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 6-1/4" I.D. HSA.
DRILLING EQUIPMENT CME-55/ATV
DRILLING STARTED 8/5/92 ENDED 8/6/92

REMARKS

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER **P-6R** SHEET **3** OF **3**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 4,719.5 E 2,175.7**

LOGGED BY **KRR**
GROUND ELEVATION **524.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
484.8	40.0		Gray shale, massive, excellent				
482.3	42.5						
			End of Boring at 42.5'.				Piezometer P-6R was installed immediately after completion of drilling. Refer to as-built diagram P-6R for more details.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **8/5/92** ENDED **8/6/92**

REMARKS

WATER LEVEL (ft.)
∇
∇
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PATRICK ENGINEERING INC.

BORING NUMBER **P-7D** SHEET **1** OF **2**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 5,342.8 E 2,432.5**
LOGGED BY **KRR**
GROUND ELEVATION **526.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
526.5	0.0		Brown silty clay, trace fine sand, stiff to very stiff, medium plasticity, wet CL	AU-1 0.0-2.0		19.2	
			Mottled from 2.0'.	SS-2 2.0-4.0 24"R	3 3 4 5	17.6	
				SS-3 4.0-6.0 24"R	2 3 4 4	21.7	SS-3: LL=33 PL=19 PI=14
				SS-4 6.0-8.0 24"R	5 5 5 6	25.3	SS-4: CEC = 16.5 meq/100g
				3T-5 8.0-10.0 24"R		22.6	3T-5: Dry dens=101pcf k=2.0 E-07 cm/s
515.0	11.5			SS-6AB 10.0-12.0 24"R	2 1 2 2	24.8	SS-6B: Gravel = 0% Sand = 52% Silt or Clay = 48%
514.5	12.0		Brown clayey fine sand, little silt, loose, poorly graded, moist SC			23.1	
			Gray silty clay, trace fine sand, soft to stiff, low to medium plasticity, wet CL	SS-7 12.0-14.0 24"R	2 2 3 3	28.9	
				SS-8 14.0-16.0 24"R	WOH 1 1 1	26.9	SS-8: LL = 29 PL = 22 PI = 7
				SS-9 16.0-18.0 24"R	2 2 2 2	25.1	
506.5	20.0			SS-10 18.0-20.0 24"R	WOH 1 1 1	23.6	

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/30/92** ENDED **7/30/92**

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
▽ **20.0'** during drilling.
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER	**P-7D**
SHEET	**2 OF 2**
CLIENT	**City of Springfield CWLP**
PROJECT & NO.	**FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION	**N 5,342.8 E 2,432.5**
LOGGED BY	**KRR**
GROUND ELEVATION	**526.5**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - ○ - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
506.5	20.0		Gray silty clay, trace fine sand, soft, low to medium plasticity, wet CL	SS-11 20.0-22.0 24"R	WOH 1 1 1	22.6	Water level at 20.0' during drilling.
				3T-12 22.0-24.0 20"R			
502.5	24.0		Gray clayey silt, some fine sand, loose, poorly graded, saturated CL-ML	SS-13 24.0-26.0 24"R	1 2 1 3	24.3	SS-13: Gravel = 0% Sand = 34% Silt or Clay = 66%
500.5	26.0		Gray fine sand, some silt, very loose, poorly graded, saturated SM	SS-14 26.0-28.0 18"R	1 1 1 1	19.1	
				SS-15 28.0-30.0 20"R	1 1 1 3	10.9	
497.5	29.0		Gray coarse to fine sand, some coarse to fine gravel, little silt, loose, well graded, saturated SW-SM/SM				
495.5	31.0		Gray silty clay to clay, trace fine sand, very stiff to hard, medium to high plasticity, moist CL/CH	SS-16 30.0-32.0 20"R	2 2 4 11	24.2	SS-16: Gravel = 27% Sand = 59% Silt or clay = 14%
494.0	32.5		Gray shale	SS-17 32.0-34.0 15"R	28 115 200+/3"	13.3	
493.3	33.2		End of Boring at 33.2'.				Piezometer was installed immediately after completion of drilling. Refer to as-built diagram P-7D for more details.

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA.**
DRILLING EQUIPMENT	**CME-55/ATV**
DRILLING STARTED	**7/30/92**
ENDED	**7/30/92**

REMARKS

WOH - Weight of Hammer.

WATER LEVEL (ft.)

▽ **20.0'** during drilling.

▼

▼

PATRICK ENGINEERING INC.

BORING NUMBER **P-7S** SHEET **1** OF **1**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,337.1 E 2,426.3**

LOGGED BY **KRR**
GROUND ELEVATION **526.3**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
526.3	0.0		Drilled to 10.0' without sampling. Refer to Boring Log P-7D for soil conditions from 0' to 10'.				Soil conditions from 0' to 10' were consistent with the soil conditions encountered at P-7D based on soil cuttings.
516.3	10.0						
515.8	10.5		Brown mottled silty clay, trace fine sand, stiff, medium plasticity, wet CL	SS-1ABC 10.0-12.0 24"R	3 2 2 2	24.3	SS-1B: Gravel = 0% Sand = 43% Silt or Clay = 57%
515.3	11.0		Gray clayey silt to clayey sand, loose, poorly graded, moist SC/ML				
514.1	12.2		Brown silty clay, trace fine sand, stiff, medium plasticity, wet CL	SS-2 12.0-14.0 24"R	2 3 3 4	28.1	Water was not encountered during or immediately after drilling.
512.3	14.0		Gray silty clay, medium fine sand, stiff, medium plasticity, wet CL				Piezometer P-6S was installed after completion of drilling. Refer to as-built diagram P-6S for details.
			End of Boring at 14.0'.				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/30/92** ENDED **7/30/92**

REMARKS

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER **P-7M** SHEET **1** OF **1**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill-Hydrogeo. Invest. - 496B**
LOCATION **N 5,337.0 E 2,432.8**

LOGGED BY **KRR**
GROUND ELEVATION **525.9**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content (10, 20, 30, 40, 50); Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
525.9	0.0		Drilled to 16.0' without sampling. Refer to Boring Log P-6D for soil conditions from 0' to 16'.				Soil conditions from 0' to 16' were consistent with soil conditions in P-6D based on soil cuttings.
							3T-2: Dry dens. = 101pcf k = 1.5 E-07 cm/s
509.9	16.0		Gray silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-1 16.0-18.0 24"R	1 1 1 2	✳ 22.0 20.1	Piezometer P-7M was installed immediately after completion of drilling. Refer to as-built diagram P-7M for more details.
				3T-2 18.0-20.0 20"R		✳ 22.5	
505.9	20.0		End of Boring at 20.0'.				

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" I.D. HSA.**
DRILLING EQUIPMENT	**CME-55/ATV**
DRILLING STARTED	**7/30/92** ENDED **7/30/92**

REMARKS

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER	**P-7R**	SHEET	**1** OF **3**
CLIENT	**City of Springfield CWLP**		
PROJECT & NO.	**FGDS Landfill-Hydrogeo. Invest. - 496B**		
LOCATION	**N 5,326.9 E 2,424.5**		

LOGGED BY **KRR**

GROUND ELEVATION **525.4**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
525.4	0.0		Drilled to 34.0' (auger refusal) without sampling. Refer to Boring Log P-7D for soil conditions from 0' to 34'.				

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**6-1/4" I.D. HSA.**
DRILLING EQUIPMENT	**CME-55/ATV**
DRILLING STARTED **7/31/92**	ENDED **7/31/92**

REMARKS

WATER LEVEL (ft.)

▽

▽

▽

PATRICK ENGINEERING INC.

BORING NUMBER	P-7R	SHEET	2 OF 3
CLIENT	City of Springfield CWLP		
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B		
LOCATION	N 5,326.9 E 2,424.5		

LOGGED BY KRR

GROUND ELEVATION 525.4

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
505.4	20.0		Drilled to 34.0' (auger refusal) without sampling. Refer to Boring Log P-7D for soil conditions from 0' to 34'.				Soil conditions are consistent with soil conditions encountered at P-7D based on soil cuttings.
491.4	34.0		Gray shale, massive, strongly cemented, excellent	PQ-1 34.0-39.0 60"R			Changed to PQ coring from 34.0'. RQD = 100%
				PQ-2 39.0-44.0			

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **6-1/4" I.D. HSA.**
DRILLING EQUIPMENT **CME-55/ATV**
DRILLING STARTED **7/31/92** ENDED **7/31/92**

REMARKS

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.	
BORING NUMBER	P-7R
SHEET	3 OF 3
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 5,326.9 E 2,424.5
LOGGED BY	KRR
GROUND ELEVATION	525.4

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
485.4	40.0		Gray shale, massive, stongly cemented, excellent	60"R			RQD=100%
481.4	44.0						
			End of Boring at 44.0'.				Piezometer was installed immediately after completion of coring. Refer to as-built diagram P-7R for more details.

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	6-1/4" I.D. HSA.
DRILLING EQUIPMENT	CME-55/ATV
DRILLING STARTED 7/31/92	ENDED 7/31/92

REMARKS

WATER LEVEL (ft.)

∇

∇

∇

PATRICK ENGINEERING INC.

BORING NUMBER	P-8D	SHEET	1 OF 2
CLIENT	City of Springfield CWLP		
PROJECT & NO.	FGDS Landfill - Hydrogeo Invest. - 496B		
LOCATION	N 4,939.7 E 2,482.7		

LOGGED BY KRR

GROUND ELEVATION 522.7

ELEVATION	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL)	NOTES & TEST RESULTS
522.7	0.0	Brown to brownish-gray silty clay, trace fine sand, stiff, medium plasticity, wet, fill CL	AU-1 0.0-2.0		25.3	
			SS-2 2.0-4.0 8"R	2 2 3 3	19.3	
518.2	4.5	Dark gray organic silty clay, trace fine sand, wood fragments present, soft, medium plasticity, wet to saturated, fill OL	SS-3 4.0-6.0 10"R	1 2 1 1	34.3	
		Chunks of wood in SS-4	SS-4 6.0-8.0 8"R	1 2 1 1	25.3	SS-4: LL = 37 PL = 21 PI = 16
514.7	8.0	Gray silty sand, little clay, loose, poorly graded, moist, fill SM	SS-5AB 8.0-10.0 24"R	2 1 2 2	21.3	
513.9	8.8	Gray clayey sand, little silt, loose, poorly graded, moist, fill SC			27.7	
513.2	9.5	Dark gray to black organic silty clay, wood fragments present, medium to high plasticity, wet to saturated, fill OL/OH	SS-6 10.0-12.0 20"R	1 1 1 2	47.3	Water level at 10.0' during drilling.
510.5	12.2	Chunks of wood and lenses of sand in SS-6	SS-7 12.0-14.0 24"R	1 1 2 1	95.7	
		Gray silty clay, trace fine sand, soft, medium plasticity, wet CL	SS-8 14.0-16.0 24"R	1 1 1 1	24.8	
			3T-9 16.0-18.0 20"R		22.8	
			3T-10 18.0-20.0 0"R			Tube pushed but no recovery.

Water Content scale: 10 20 30 40 50
Unconfined Compressive Strength (TSF) ✳: 1 2 3 4 5

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME 55/ATV
DRILLING STARTED 8/13/92 ENDED 8/13/92

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
▽ 10.0' during drilling
▼ 8.0' after drilling
▼

PATRICK ENGINEERING INC.

BORING NUMBER **P-8D** SHEET 2 OF 2
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 4,939.7 E 2,482.7**

LOGGED BY KRR
GROUND ELEVATION 522.7

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
502.7	20.0		Gray silty clay, trace to little fine sand, soft, medium plasticity, wet CL	3T-11 20.0-22.0 14"R			
500.7	22.0		Gray silty fine sand, very loose, poorly graded, saturated SM	SS-12AB 22.0-24.0 24"R	WOH WOH WOH 13		SS-13A Gravel = 34% Sand = 50% Silt or clay = 16%
499.9	22.8		Gray coarse to fine sand and coarse to fine gravel, little silt, medium dense, well graded, saturated SW-SM/SM	SS-13AB 24.0-26.0 24"R	15 16 12 12	✳	
497.2	25.5		Gray silty clay, trace fine sand, hard, medium to high plasticity, moist CL/CH	SS-14 26.0-27.0 6"R	10 28 100+	18.2 ○ 13.8 ○	
496.2	26.5		Gray shale				
495.7	27.0		End of Boring at 27.0'				Auger refusal at 27'. Water level at 8.0' immediately after drillling. Piezometer was installed immediately after drilling. Refer to As-Built Diagram P-8D for more details.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/13/92** ENDED **8/13/92**

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
▽ **10.0'** during drilling
▽ **8.0'** after drilling
▽

PATRICK ENGINEERING INC.

BORING NUMBER **P-8S** SHEET **1** OF **1**
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 4,933.1 E 2,486.0**

LOGGED BY **KRR**
GROUND ELEVATION **522.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
522.8	0.0		Drilled to 6.0' without sampling. Refer to Boring Log P-8D for soil conditions from 0.0' to 6.0'.				
516.8	6.0		Dark gray silty clay, trace fine sand, organics and wood fragments present, soft, medium plasticity, wet, fill OL	SS-1 6.0-8.0 8"R	1 1 1 1	27.6	
514.8	8.0		Gray clayey fine sand, little silt, loose, poorly graded, moist SC	SS-2AB 8.0-10.0 14"R	1 2 1 2	24.7	
513.3	9.5		Dark gray to black organic silty clay, trace medium to fine sand, wood fragments present, soft, medium plasticity, wet to saturated OL	SS-3 10.0-12.0 16"R	1 2 1 2	89.0 41.0	SS-3: Gravel = 0% Sand = 12% Silt or clay = 26%
510.8	12.0		End of Boring at 12.0'				Water was not encountered during or immediately after drilling. Piezometer was installed after completion of drilling. Refer to As-Built Diagram P-8S for more details.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 55/ATV**
DRILLING STARTED **8/13/92** ENDED **8/13/92**

REMARKS
WOH - Weight of Hammer.

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER P-9D — SHEET 1 OF 3

CLIENT: City of Springfield CWLP

PROJECT & NO.: FGDS Landfill - Hydrogeo Invest. - 496B

LOCATION: N 4,446.3 E 2,422.4

LOGGED BY: KRR

GROUND ELEVATION: 553.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL / LL)	NOTES & TEST RESULTS
553.2	0.0		Dark brown silty clay, trace fine sand, low plasticity, moist, fill CL				
551.7	1.5			AU-1 1.0-1.5		14.8	
			Brown mottled silty clay, trace fine sand, stiff to hard, medium plasticity, moist, fill CL	SS-2 2.0-4.0 12"R	2 2 4 5	18.1	
			Trace sulfur waste				
				SS-3 4.0-6.0 12"R	3 4 5 7	16.1	
				SS-4 6.0-8.0 18"R	3 3 6 10	15.1	
				SS-5 8.0-10.0 18"R	4 5 6 8	15.4	
				SS-6 10.0-12.0 18"R	4 5 5 7	20.5	
				SS-7 12.0-14.0 4"R	2 2 4 5	16.4	
				3T-8 14.0-16.0 24"R			3T-8: Dry Den.=102.3 pcf k=1.3 E-08cm/s
				SS-9 16.0-18.0 18"R	3 4 6 6	19.5	
534.7	18.5		Dark brown silty clay, trace fine sand, very stiff, low to medium plasticity, moist to wet, fill	SS-10 18.0-20.0 12"R	4 6 9 11	18.7	
533.2	20.0						

DRILLING CONTRACTOR: Patrick Drilling

DRILLING METHOD: 4-1/4" I.D. HSA

DRILLING EQUIPMENT: CME 75

DRILLING STARTED 8/18/92 ENDED 8/18/92

REMARKS

WOH = Weight of Hammer.

WATER LEVEL (ft.)

▽ 32.5' during drilling.

PATRICK ENGINEERING INC.	
BORING NUMBER	P-9D
SHEET	2 OF 3
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION	N 4,446.3 E 2,422.4
LOGGED BY	KRR
GROUND ELEVATION	553.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - - - ○ - - - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
533.2	20.0		CL				
			Dark brown silty clay, trace fine sand, very stiff, low to medium plasticity, moist to wet, fill CL	SS-11 20.0-22.0 18"R	7 10 14 16	19.9	
				SS-12 22.0-24.0 12"R	3 3 4 8	22.7	
				SS-13 24.0-26.0 18"R	2 3 4 6	22.7	
526.9	26.3		Brown silty clay, trace fine sand, stiff, medium plasticity, wet CL	SS-14 26.0-28.0 20"R	2 3 3 4	25.0	
				SS-15 28.0-30.0 24"R	1 2k 2 3	24.6	
				SS-16 30.0-32.0 24"R	WOH WOH 2 3	25.6	
521.2	32.0		Gray silty clay, trace fine sand, medium stiff, medium plasticity, wet CL	SS-17 32.0-34.0 24"R	WOH WOH WOH WOH	28.3	Water level at 32.5 feet during drilling.
				SS-18 34.0-36.0 24"R	WOH WOH 1 3	23.9	
				SS-19 36.0-38.0 24"R	WOH WOH 1 2	26.9	
514.6	38.6		Gray silty clay to clayey silt and medium to fine sand, very soft, medium plasticity, wet	SS-20 38.0-40.0 24"R	WOH WOH 2 3	32.8	
513.2	40.0						

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME 75
DRILLING STARTED	8/18/92 ENDED 8/18/92

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ 32.5' during drilling.
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER P-9D SHEET 3 OF 3
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 4,446.3 E 2,422.4

LOGGED BY KRR
GROUND ELEVATION 553.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ 10 20 30 40 50 △ LL) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
513.2	40.0		CL/CL-ML Gray silty clay to clayey silt and medium to fine sand, very soft, medium plasticity, wet CL/CL-ML	SS-21 40.0-42.0 24"R	WOH WOH WOH 1	29.6	
				SS-22 42.0-44.0 24"R	WOH WOH WOH 2	✳ 24.1	
				SS-23 44.0-46.0 24"R	WOH WOH WOH WOH	24.9	
				SS-24 46.0-48.0 24"R	WOH WOH WOH WOH	✳ 24.4	
				SS-25 48.0-50.0 24"R	WOH WOH 1 2	✳ 21.3	
				SS-26 50.0-52.0 24"R	WOH WOH WOH WOH	✳ 20.7	SS-26: Gravel = 0% Sand = 33% Silt = 53% Clay = 14%
501.2	52.0		Gray silty sand, very loose, poorly graded, saturated SM	SS-27 52.0-54.0 24"R	WOH WOH 1 1		SS-29A Gravel = 22% Sand = 66% Silt or clay = 12%
				SS-28 54.0-56.0 24"R	WOH WOH 3 7		
497.9	55.3		Gray coarse to fine sand, some fine gravel, very loose to loose, poorly graded, saturated SP-SM/SM	SS-29AB 56.0-58.0 24"R	6 9 17 32		
495.7	57.5		Gray shale				Piezometer was installed immediately after drilling. Refer to As-built Diagram P-9D for details.
495.2	58.0		End of Boring at 58.0'				

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4-1/4" I.D. HSA**
DRILLING EQUIPMENT **CME 75**
DRILLING STARTED **8/18/92** ENDED **8/18/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽ 32.5' during drilling.
▽
▽

PATRICK ENGINEERING INC.	
BORING NUMBER	P-9S
SHEET	1 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill-Hydrogeo. Invest. - 496B
LOCATION	N 4,447.3 E 2,415.6
LOGGED BY	SAS
GROUND ELEVATION	553.1

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
553.1	0.0		Drilled to 34' without sampling. See Boring Log P-9D for details.				

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" ID HSA
DRILLING EQUIPMENT	CME 75
DRILLING STARTED	8/19/92 ENDED 8/19/92

REMARKS

WATER LEVEL (ft.)

⊻

⊻

⊻

PATRICK ENGINEERING INC.

BORING NUMBER	**P-9S** SHEET **2** OF **2**
CLIENT	**City of Springfield CWLP**
PROJECT & NO.	**FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION	**N 4,447.3 E 2,415.6**
LOGGED BY	**KRR**
GROUND ELEVATION	**553.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
533.1	20.0						
519.1	34.0		Gray silty clay, trace fine sand, medium stiff, medium plasticity, moist to wet CL	3T-1 34.0-36.0 24"R		✳ 24.1 ○	3T-1: Dry dens.=101.2 pcf k=1.3 E-06cm/s
516.1	37.0		End of Boring at 37.0'				

DRILLING CONTRACTOR	**Patrick Drilling**
DRILLING METHOD	**4-1/4" ID HSA**
DRILLING EQUIPMENT	**CME 75**
DRILLING STARTED	**8/19/92** ENDED **8/19/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER LP-1 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 4,326.5 E 2,639.9

LOGGED BY JSV
GROUND ELEVATION 564.6

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
564.6	0.0		Intermediate cover, fill				
563.6	1.0		Light gray sludge, fill				
551.6	13.0		Gray sludge, dry, fill	SS-1 13.0-15.0 19"R	4 7 8 6		
544.6	20.0						

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4" I.D. HSA
DRILLING EQUIPMENT CME-75/ATV
DRILLING STARTED 7/25/92 ENDED 7/25/92

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
▽
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **LP-1** SHEET 2 OF 2
CLIENT **City of Springfield CWLP**
PROJECT & NO. **FGDS Landfill - Hydrogeo Invest. - 496B**
LOCATION **N 4,326.5 E 2,639.9**

LOGGED BY **JSV**
GROUND ELEVATION **564.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
544.6	20.0		Dark gray sludge, saturated, fill	SS-2 20.0-22.0 22"R	6 10 7 6		
542.6	22.0						
			End of Boring at 22.0'.				Leachate piezometer was installed immediatelt after completion of drilling. Refer to as-built diagram LP-1 for details.

DRILLING CONTRACTOR **Patrick Drilling**
DRILLING METHOD **4" I.D. HSA**
DRILLING EQUIPMENT **CME-75/ATV**
DRILLING STARTED **7/25/92** ENDED **7/25/92**

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER LP-2 SHEET 1 OF 2
CLIENT City of Springfield CWLP
PROJECT & NO. FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION N 4,257.5 E 2,365.8

LOGGED BY JSV
GROUND ELEVATION 568.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
568.2	0.0		Intermediate cover, fill				
567.2	1.0		Light gray sludge, fill				
555.2	13.0		Light gray sludge, dry, fill	SS-1 13.0-15.0 15"R	9 34 60		
548.2	20.0						

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4-1/4" I.D. HSA
DRILLING EQUIPMENT CME-75/ATV
DRILLING STARTED 7/25/92 ENDED 7/25/92

REMARKS
WOH = Weight of Hammer.

WATER LEVEL (ft.)
∇
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER	LP-2
SHEET	2 OF 2
CLIENT	City of Springfield CWLP
PROJECT & NO.	FGDS Landfill - Hydrogeo Invest. - 496B
LOCATION	N 4,257.5 E 2,365.8
LOGGED BY	JSV
GROUND ELEVATION	568.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ - - - ○ - - - △ LL Water Content 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
548.2	20.0		Light gray sludge, saturated, fill	SS-2 20.0-22.0 19"R	9 10 12 26		
546.2	22.0						
			End of Boring at 22.0'.				Leachate piezometer was installed immediately after completion of drilling. Refer to as-built diagram LP-2 for more details.

DRILLING CONTRACTOR	Patrick Drilling
DRILLING METHOD	4-1/4" I.D. HSA
DRILLING EQUIPMENT	CME-75/ATV
DRILLING STARTED	7/25/92
ENDED	7/25/92

REMARKS

WOH = Weight of Hammer.

WATER LEVEL (ft.)

∇

∇

∇

APPENDIX A2:

FGDS UNIT 2 LANDFILL MONITOR WELL LOGS

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring R-101

Project Name: Monitoring Well Installations   Date of Boring: January 15, 1990

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

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
*Note 1							
Silty clay to clayey silt, light brown, light grey	5	1-SS	35%				
		2-SS	100%				
13.0'-13.2': Brown sand, fine to medium	10	3-SS	75%				While Drilling
Silty clay, grey, mottled brown	15	4-SS	100%				
Silt to clayey silt, grey, brown, some sand, fine to medium	20	5-SS	100%				
	25	6-SS	100%				
	30						
Shale, grey, brown (weathered)		7-SS	100%				
End of Boring							

*Note 1: 0"-6" Brown silty clay with organics

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring R-102

Project Name: Monitoring Will Installations Date of Boring: January 11, 1990

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

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
*Note 1							
Clayey silt, light brown, light grey	5	1-SS	100%				
Silty clay, grey, mottled brown	10	2-SS	80%				
		3-SS	100%				
Clayey silt to silt, dark grey, some sand, fine	15	4-SS	100%				
	20	5-SS	75%				While Drilling
	25	6-SS	100%				
	30	7-SS	75%				
	35						
Sand, fine to medium, grey							
Shale, grey, weathered		8-SS	100%				
End of Boring *Note 1: Dark brown silty clay with organcis							

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring R-103

Project Name: Monitoring Well Installations Date of Boring: January 13, 1990

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

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
*Note 1							
Clayey silt, light brown, light grey, with white streaks		1-SS	100%				
	5	2-SS	100%				
	10	3-SS	100%				
	15	4-SS	100%				While Drilling
19'-19.5' - Grey sand, fine							
Silty clay, some sand, fine, organics, grey	20	5-SS	100%				
(Coal fragments from 22'-29')	25	6-SS	100%				
Shale, grey, weathered	30	7-SS	100%				
End of Boring							
*Note 1: Black silty clay with organcis							

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring G-104

Project Name: Monitoring Well Installations Date of Boring: January 12, 1990

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

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Clayey silt with coal fragments, organics, mottled brown		1-SS	100%				
	5	2-SS	100%				
	10						
Silty clay, black to dark brown, some organics to 16'		3-SS	75%				
	15	4-SS	100%				While Drilling
	20						
Grey sand, fine to coarse		5-SS	60%				
Silty clay, trace sand, grey	25	6-SS	100%				
Silty sand, grey, fine to medium	30	7-SS	60%				
Shale, grey, weathered	35	8-SS	100%				
End of Boring							

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_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay to clayey silt, trace organics, brown (fill)		1-SS	20%				
	5	2-SS	35%				
	10						
Silty clay, drak grey to black, some organics		3-SS	25%				
	15						
Silty clay to clay, grey, mottled brown, trace sand		4-SS	100%				
	20	5-SS	40%				
	25						
Silty clay with sand, fine to medium, brown		6-SS	35%				
	30						▽ While Drilling
		7-SS	40%				
	35	8-SS	100%				
	40						
Silty clay, trace sand, dark grey, fine		9-SS	100%				
	45						

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	Q_u	Q_p	M_c	REMARKS
Silty clay, some sand, fine, dark grey	45						
		10-SS	100%				
48'-48.7': Grey sand, fine to medium	50						
Shale, grey, weathered		11-SS	80%				
End of Boring							

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring G-106

Project Name: Monitoring Well Installations   Date of Boring: February 23, 1990

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

DESCRIPTION	DEPTH	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Silty clay, brown, moist, trace organics		1-SS	75%			24	▽ 0 HR
	5						
Silty clay, grey, mottled brown		2-SS	100%			26	
Sand, fine to course, brown, wet							
	10						
						37	
		3-SS	100%				
Silty clay to clayey silt, grey, trace sand, fine	15					25	
						27	
		4-SS	100%				
	20						
		5-SS	100%			23	
	25						
Sand, fine to medium, trace silt, grey, wet		6-SS	70%				
	30						
		7-SS	50%				
Shale, grey, hard						9	
END OF BORING	35						

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

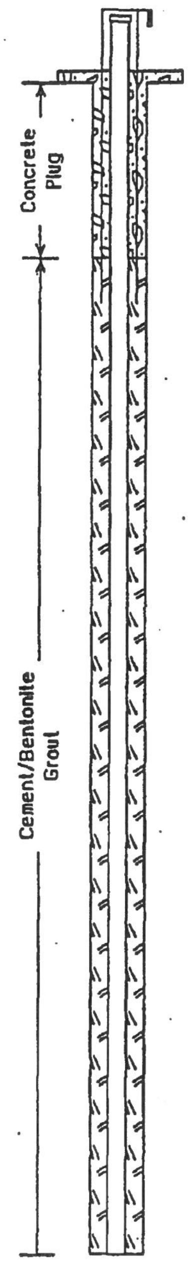
Dates:
- Start: 7/12/93
- Finish: 7/12/93

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

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

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

Depth (ft.)	Run No.	Type	Sample No.	Recov.	Blow Count	q_u/[q_s] (in tsf)	% Moisture
	1		1A	3.2'		3.5	
	2					2.75	
5			2A				
						2.8	
			2B			2.5	
			2C	5.0'		0.8	
	3						
10				1.4'			
	4					0.7	
			4A			0.5	
				2.8'		0.65	
	5		5A			3.25	
15						2.75	
						2.25	
			5B			2.0	
				4.8'		2.8	
						1.8	
	6					2.2	
20						1.8	



Lithology / Description/*Comments*	USC	Elev. (MSL)
Gravel backfill-*access road.*		554.5
Dark gray silty CLAY, little sand and gravel, with rootlets.		549.5
Dark gray-black clayey SILT, some fine sand, rootlets.		
Dark gray-black silty CLAY, soft, with rootlets, some fine sand.		544.5
Dark gray, very moist silty CLAY-clayey SILT, numerous plant and wood fragments *(appears to be original grade).*		539.5
		534.5

NOTE: $\bar{\nabla}$= groundwater encountered while drilling.

Andrews Environmental Engineering, Inc.
3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

Field Boring Log

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

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

Depth (ft.): 25, 30, 35, 40 — Elev. (MSL): 534.5, 529.5, 524.5, 519.5, 514.5

Run No.	Sample No.	Recov.	Blow Count	$q_u/[q_s]$ (in tsf)	% Moisture
6	6A			1.7	
6	6B	5.0'		1.6	
7		2.0'			
8	8A			0.7	
8	8B	3.0'		2.0, 1.2, 1.3	
9	9A			2.2, 2.2, 2.2, 2.75	
9	9B	5.0'		2.75, 1.75, 0.75	
10	10A	5.0'		0.3, 0.2, 0.2, *, *, *	
11	11A				

Borehole Detail: Cement/Bentonite Grout; Bentonite Seal

Description/*Comments*	USC
Dark gray silty CLAY, moist, trace fine sand, little organics.	
Gray mottled light gray-brown silty CLAY, little fine sand, some plant roots.	
Gray mottled brown silty CLAY, trace fine sand, little organics.	
Gray clayey SILT.	
Gray CLAY, very soft, some organic clay strata present. *(* The clay was too soft for the pocket penetrometer).*	

NOTE: ▽ = 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

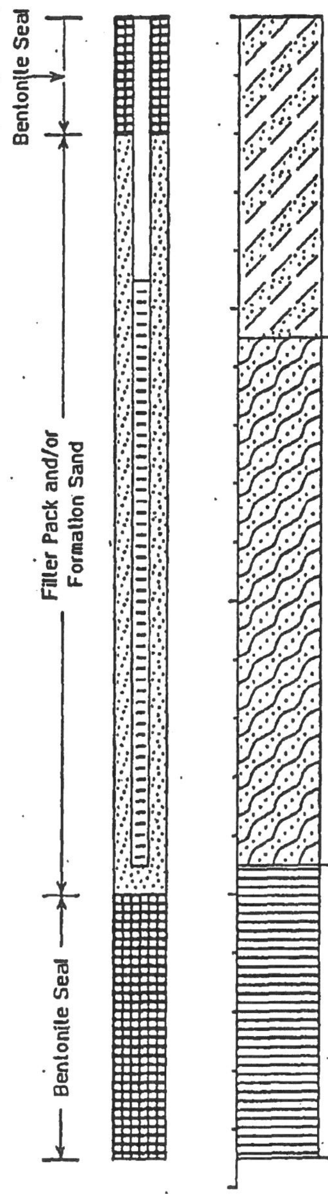
Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 55

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

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	$q_u/[q_s]$ (in tsf)	% Moisture
	11	Continuous Barrel	11B	5.0'			
45	12	Continuous Barrel	12A				
			12B	5.0'			
50	13	Continuous Barrel	13A	5.0'			
55	14	Continuous Barrel		0.0'			
	15	Split Spoon	15A		10		
			15A	0.7'	31		
60							

Borehole Detail / Lithology



Description/*Comments*	USC	Elev. (MSL)
		514.5
Gray fine silty SAND, little clay.		509.5
Gray, fine clayey SAND, some silt.		504.5
Gray shale with muscovite mica. *(Since there was no recovery in Run # 14, the bedrock contact was determined at the depth the down pressure increased from 300 psi to 1500 psi on the auger column.)*		499.5
E.O.B.=59.5 feet		494.5

NOTE: $\underline{\nabla}$ = 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 Grid
Northing: 4,445.0
Easting: 2,249.0

Boring Information:
Boring No.: G-111
Well No.: G-111
Surf. Elev.: 553.6

Depth Information:
Total: 59.60
Auger: 59.60
Rotary: 0.00

Dates:
Start: 7/20/93
Finish: 7/21/93

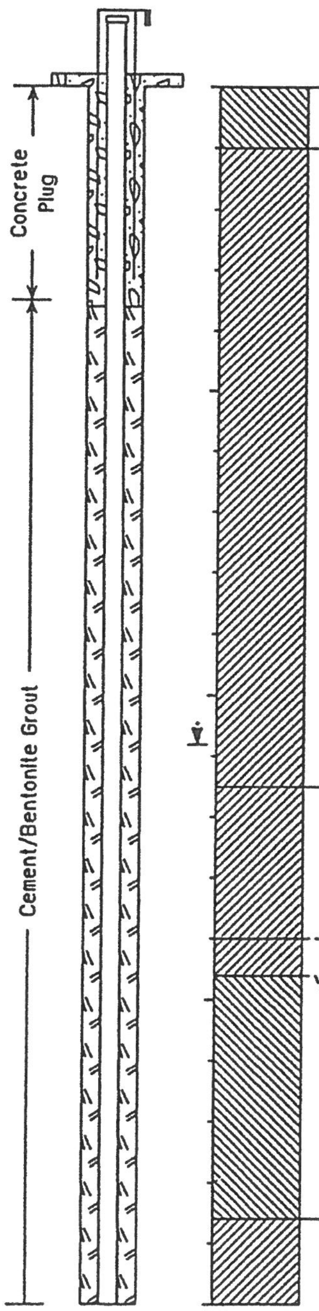
Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 45 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personel:
Geologist: R. Hasenyager
Driller: A. Weisenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	qu /[qs] (in tsf)	% Moisture
0–5	1			0.0			
5–10	2	Continuous Barrel		5.0		3.25, 4.50	
10–15	3	Continuous Barrel		5.0		[1.50], 1.75, 0.75	
15–17	4	Shelby Tube		1.3			
17–20	5	Continuous Barrel		3.0		1.75, [1.10], 1.00	

Borehole Detail / Lithology



Description/*Comments*	USC	Elev. (MSL)
Very dark brown, slightly moist, clayey SILT with roots, other organic matter, and trace sand.		553.6
Brown, soft, slightly moist, silty CLAY, with trace sand.		548.6, 543.6
Dark brown, moist, plastic, silty CLAY, with trace sand.		
Brown, moist, plastic, silty CLAY, with trace sand.		538.6
Brown mottled gray, moist, plastic, silty CLAY, With trace sand and organic matter.		
Black dry, friable, clayey SILT, with no sand or pebbles.		533.6

NOTE: ▽ = water level 13 hours after completion.
Torvane values are actual dial readings.

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 Grid
Northing: 4,445.0
Easting: 2,249.0

Boring Information:
Boring No.: G-111
Well No.: G-111
Surf. Elev.: 553.6
Depth Information:
Total: 59.60
Auger: 59.60
Rotary: 0.00
Dates:
Start: 7/20/93
Finish: 7/21/93

Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 45 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personel:
Geologist: R. Hasenyager
Driller: A. Weisenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_u/[q_s] (in tsf)	% Moisture	Description/*Comments*	Elev. (MSL)
	6	Shelby Tube		2.0		[3.40]		Brown mottled gray, moist, plastic, silty CLAY, with trace sand and organics. *Soil sample contained 1,170 ppm sulfate.*	533.6
25	7	Continuous Barrel		3.0		2.10			528.6
30	8	Continuous Barrel		5.0				▽-- *Free water during drilling* Brown, very moist, clayey SILT with some sand (fine-grained). *Very thin SAND (fine-grained) seam at 30.1'*	523.6
	9	Continuous Barrel		5.0				Brown, mottled gray, very moist, clayey SILT, with some sand (fine- grained) and trace organics.	
35	10	Shelby Tube		2.0		[0.85]		Gray, very moist, sandy SILT.	518.6
	11	Continuous Barrel		3.0		0.50		Reddish brown, moist clayey SILT, with trace organics.	
40						0.75		Gray, very moist, clayey SILT, with sand (very fine- to fine- grained). *Sandier zones at 38.2'-38.3' and 38.5'-38.8'*	513.6

Borehole Detail: Cement/Bentonite Grout

NOTE: ▼= water level 13 hours after completion.
Torvane values are actual dial readings.

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 Grid
Northing: 4,445.0
Easting: 2,249.0

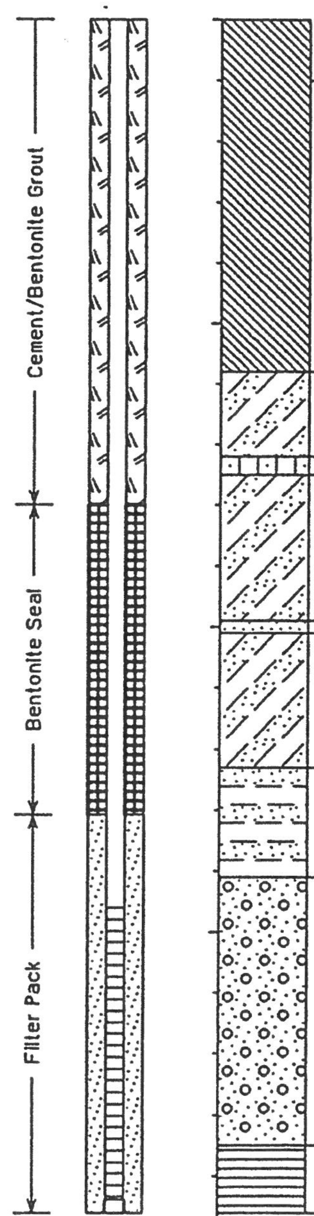
Boring Information:
Boring No.: G-111
Well No.: G-111
Surf. Elev.: 553.6
Depth Information:
Total: 59.60
Auger: 59.60
Rotary: 0.00
Dates:
Start: 7/20/93
Finish: 7/21/93

Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 45 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personel:
Geologist: R. Hasenyager
Driller: A. Weisenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_u/[q_s] (in tsf)	% Moisture
	12	Shelby Tube		2.0			
	13	Continuous Barrel		5.0		0.25 [0.35] 0.25	
45							
	14	Continuous Barrel		5.0			
50							
	15	Continuous Barrel		4.0			
55							
	16	Split Spoon		2.0	32 41 27 17		
	17	Split Spoon		1.7	6 14 12 60+		
	18						
60							



Description/*Comments*	USC	Elev. (MSL)
Roots at 39.3'		513.6
Gray, saturated, clayey SILT, with some sand (very fine-grained).		
		508.6
Gray, saturated, silty SAND (very fine- to fine-grained).		
Gray, saturated, sandy SILT.		
Gray, saturated, silty SAND (very fine- to fine-grained).		
		503.6
Gray, saturated, SAND (very fine- to fine-grained), with some silt.		
Gray, saturated, silty SAND (very fine- to fine-grained).		
Gray, very moist, interbedded clayey SILT, with some sand (very-fine grained) and silty SAND (very fine- to fine-grained).		
Gray, saturated, silty SAND (fine- to coarse-grained) and PEBBLE (very fine- to medium-grained). *Shale and sandstone fragments more abundant in lower 1.0'*		498.6
Gray, slightly moist, hard, massive, SHALE. *Bedrock*		
E.O.B. = 59.6 feet		493.6

NOTE: = water level 13 hours after completion.
Torvane values are actual dial readings.

SKS ENGINEERS, INC.
2900 N. MARTIN LUTHER KING JR. DRIVE
DECATUR, ILLINOIS 62526

SOIL BORING LOG

Page 1 of 2

Date 05/26/2009

ROUTE ________ DESCRIPTION SKS Project No. 911607 CWLP / Landfill Well Replacement LOGGED BY T. Mathias/EK/AL

SECTION N/A LOCATION Springfield, IL SEC. ____ TWP. ____ RNG. ____ PM

COUNTY Sangamon DRILLING METHOD Hollow Stem Auger HAMMER TYPE 140# Safety Hammer

STRUCT. NO. ________
Station ________

BORING NO. R111
Station ________
Offset ________
Ground Surface Elev. ____ ft

Surface Water Elev. ____ ft
Stream Bed Elev. ____ ft

Groundwater Elev.:
First Encounter ____ ft.
Upon Completion ____ ft
After ____ Hrs ____ ft.

Description	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
GRASS									
BLIND DRILLED TO 44.5 FT.									
	-5					-25			
	-10					-30			
	-15					-35			
	-20					-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

SKS ENGINEERS, INC.
2900 N. MARTIN LUTHER KING JR. DRIVE
DECATUR, ILLINOIS 62526

SOIL BORING LOG

Date 05/26/2009

ROUTE ______ DESCRIPTION SKS Project No. 911607 CWLP / Landfill Well Replacement LOGGED BY T. Mathias/EK/AL

SECTION N/A LOCATION Springfield, IL SEC. ____ TWP. ____ RNG. ____ PM

COUNTY Sangamon DRILLING METHOD Hollow Stem Auger HAMMER TYPE 140# Safety Hammer

STRUCT. NO. ______
Station ______

BORING NO. R111
Station ______
Offset ______
Ground Surface Elev. ______ ft

Surface Water Elev. ______ ft
Stream Bed Elev. ______ ft

Groundwater Elev.:
First Encounter ______ ft
Upon Completion ______ ft
After ____ Hrs ______ ft

Description	Elev. (ft)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)		DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
BLIND DRILLED TO 44.5 FT.						2" Groundwater Monitor Well Installed				
	44.5									
Gray, Saturated Sandy Silt										
	46.5									
G[illegible] Saturated, Silty Fine Sand										
	49.5									
Gray, Saturated, Silty Fine Sand										
	54.5									
Gray, Saturated, Silty Fine Sand, with Gravel										
	59.5									
END OF BORING @ 59.5 FT.										

Th[illegible] Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

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 Grid
Northing: 4,450.9
Easting: 2,560.6

Boring Information:
Boring No.: G-112
Well No.: G-112
Surf. Elev.: 552.7

Depth Information:
Total: 57.80
Auger: 57.80
Rotary: 0.00

Dates:
Start: 7/21/93
Finish: 7/23/93

Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 45 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personel:
Geologist: R. Hasenyager
Driller: A. Weisenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_u/[q_s] (in tsf)	% Moisture	Borehole Detail	Lithology / Description/*Comments*	USC	Elev. (MSL)
0	1	Continuous Barrel		0.0				Concrete Plug	Very dark brown, slightly moist, clayey SILT with roots, other organic matter, and trace sand.		552.7
									Brown, soft, slightly moist, silty CLAY, with trace sand.		
5	2	Continuous Barrel		1.3				Cement/Bentonite Grout			547.7
10	3	Continuous Barrel		5.0		1.25, 1.00			Dark brown, slightly moist, plastic, silty CLAY, with trace sand.		542.7
									Brown, moist, plastic, silty CLAY, with trace sand.		
15	4	Shelby Tube		1.7		1.75			Brown mottled gray, moist, plastic, silty CLAY, with trace sand and organic matter.		537.7
	5	Continuous Barrel		3.0		1.50, 4.25			Black, moist, friable, clayey SILT, with no sand or pebbles.		
20											532.7

NOTE: ▼ = water level 14 hours after completion.
Torvane values are actual dial readings.

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 Grid
Northing: 4,450.9
Easting: 2,560.6

Boring Information:
Boring No.: G-112
Well No.: G-112
Surf. Elev.: 552.7

Depth Information:
Total: 57.80
Auger: 57.80
Rotary: 0.00

Dates:
Start: 7/21/93
Finish: 7/23/93

Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 45 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personel:
Geologist: R. Hasenyager
Driller: A. Weisenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	No.	Recov.	Blow Count	q_u/[q_s] (in tsf)	% Moisture	Borehole Detail	Description/*Comments*	Elev. (MSL)
20	6	Continuous Barrel		5.0		4.00, 2.75, [1.00], 1.50		Cement/Bentonite Grout	Brown mottled gray, slightly moist, plastic, silty CLAY, with trace sand and organics.	532.7
25	7	Shelby Tube		2.0						527.7
	8	Continuous Barrel		3.0		0.50, 0.50			Brown mottled gray, slightly moist, plastic, silty CLAY, with trace sand and organic matter.	
30	9	Continuous Barrel		5.0		0.75, [0.38], [0.30], 0.50, 0.75			∇-- *Free water during drilling*	522.7
35	10	Continuous Barrel		5.0		[0.60], 1.25, 1.25, [0.47]			Dark gray, moist, clayey SILT, with trace sand. / Reddish brown, moist, clayey SILT, with trace organic matter. / Greenish gray, very moist, silty CLAY, with trace sand. *High-angle, dry, parting surfaces at 38.7', 39.1', and 39.5'*	517.7
40										512.7

NOTE: ∇ = water level 14 hours after completion.
Torvane values are actual dial readings.

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 Grid
Northing: 4,450.9
Easting: 2,560.6

Boring Information:
Boring No.: G-112
Well No.: G-112
Surf. Elev.: 552.7
Depth Information:
Total: 57.80
Auger: 57.80
Rotary: 0.00
Dates:
Start: 7/21/93
Finish: 7/23/93

Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 45 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personel:
Geologist: R. Hasenyager
Driller: A. Weisenhofer
Helper (s): K. Doetzel

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

Run No.	Type	Recov.	q_u/[q_s] (in tsf)
11	Continuous Barrel	3.0	0.50, 0.25 [0.10]
12	Shelby Tube	2.0	
13	Continuous Barrel	3.0	0.25, [0.22] 0.25
14	Shelby Tube	2.0	
15	Continuous Barrel	4.5	[0.35] 0.50, [0.30] 0.50, 0.50
16	Split Spoon	1.5	
17			

Depth (ft.): 45, 50, 55, 60
Elev. (MSL): 512.7, 507.7, 502.7, 497.7, 492.7

Borehole Detail: Cement/Bentonite Grout; Bentonite Seal; Filter Pack

Description/Comments:

Wood chips and small twigs at 41.4'

Gray, very moist, clayey SILT, with trace sand. *Small (2-3 mm.)* Bivalvia *and* Gastropoda *throughout bed.*

Gray, saturated, soft, sandy SILT.

Gray, saturated, silty SAND (very fine- to fine-grained).

Gray, very moist, plastic, sandy SILT.

Gray, saturated, silty SAND (very fine- to fine-grained). SAND (fine-grained) seams at 46.5' and 46.8'.

Gray, very moist, clayey SILT, with organics and trace sand. Thin SAND (fine-grained) seams at 53.7' and 53.9'. *Decreasing organic content with depth. No organics lower 0.5'.*

Gray, very moist, sandy SILT.

Gray, saturated, silty SAND (fine- to coarse-grained) and PEBBLE (very fine- to medium-grained).
Shale and sandstone fragments upper 0.3'

Gray, slightly moist, hard, massive, SHALE.
Bedrock

E.O.B. = 57.8 feet

NOTE: = water level 14 hours after completion.
Torvane values are actual dial readings.

RAPPS
ENGINEERING and APPLIED SCIENCE
821 SOUTH DURKIN – SPRINGFIELD IL 62704 – (217)787-2118

BORING LOG

Site Name: FGDS Development Landfill
Boring No: AW-1
Drilling Firm: Reynolds Drilling Corp.
Drilling Method: HSA
Surface Elev: 552.85
Logged By: KJM
Checked By: KJM
Date Started: 12/29/08
Completed: 12/30/08

DEPTH	Material Description Classification System______	Sampling: Tube No.	Sampling: Type	Sampling: % Rec.	Tests: OVM (ppm)	Tests: Qu t/sf PEN	Tests: Moist	Comments	Well	DEPTH
0	Fill (not sampled)		5' CONTINUOUS SAMPLER							0
5								Blind drilled to 15'		5
10										10
15	Gray to brown silty clay fill; Moist; Soft to firm; Sand, pebbles & coal fragments	1		100						15
20	Plant debris	2		100				Base of fill @ 23.6'		20
25	Dk. brown to gray clayey silt; Moist; Firm to hard; Laminated	3		100						25
30										30

Water Level____after____hrs.

RAPPS

ENGINEERING and APPLIED SCIENCE

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

BORING LOG

Site Name: FGDS Development Landfill
Boring No: AW-1
Drilling Firm: Reynolds Drilling Corp.
Drilling Method: HSA
Surface Elev: 552.85
Logged By: KJM
Checked By: KJM
Date Started: 12/29/08
Completed: 12/30/08

DEPTH	Material Description (Classification System:)	Tube No.	Type	% Rec.	OVM (ppm)	Qu t/sf PEN	Moist	Comments
30	Trace fine sand; Mottled							
		4	5' CONTINUOUS SAMPLER	100				Wet seam @ 32.2' Wet seam @ 33.3'
35	Softer							
	Gray fine to coarse sand; Moist to wet; Clayey and silty zones; Trace gravel	5		100				
40		6		90				
45		7		80				
50	Pebbles							
	Dark gray shale; Weathered/broken	8		25				Increased resistance
55	End of boring @ 54.34'							Refusal
60								

Water Level_____after_____hrs.

RAPPS

ENGINEERING and APPLIED SCIENCE

BORING LOG

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

Site Name: FGDS Development Landfill | Boring No: AW-2

Drilling Firm: Reynolds Drilling Corp. | Drilling Method: HSA | Surface Elev: 526.68

Logged By: KJM | Checked By: KJM | Date Started: 1/2/09 | Completed: 1/2/09

DEPTH	Material Description (Classification System ____)	Sampling: Tube No.	Sampling: Type	Sampling: % Rec.	Tests: OVM (ppm)	Tests: Qu t/sf PEN	Tests: Moist	Comments
0	Dark brown silty clay; Moist; Firm		5' CONTINUOUS SAMPLER					
		1		100				
5	Sandy							Water on bit
		2		100				
10	Lt. brown to gray mottled clayey silt; Moist; Firm; Trace sand; Fe oxidation stains							
		3		100				
	Dark gray silt; Moist; Firm							
15	Softer; Trace sand							
		4		100				Wet seam @ 19'
20	Sandy							Wet seam @ 20.7'
		5		100				
25								
	Gray fine to medium sand	6		100				
30								

Water Level_____ after_____ hrs.

RAPPS

ENGINEERING and APPLIED SCIENCE

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

BORING LOG

Site Name: FGDS Development Landfill Boring No: AW-2

Drilling Firm: Reynolds Drilling Corp. Drilling Method: HSA Surface Elev: 526.68

Logged By: KJM Checked By: KJM Date Started: 1/2/09 Completed: 1/2/09

DEPTH	Material Description (Classification System: ____)	Sampling: Tube No.	Sampling: Type	Sampling: % Rec.	Tests: OVM (ppm)	Tests: Qu t/sf PEN	Tests: Moist	Comments	Well	DEPTH
30			5' CONTINUOUS SAMPLER							30
	Gravelly @ base									
	End of Boring @ 32.22'	7		100				Refusal Broken shale in bit		
35										35
40										40
45										45
50										50
55										55
60										60

Water Level_____after_____hrs.

RAPPS
ENGINEERING and APPLIED SCIENCE

BORING LOG

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

Water Level_____after_____hrs.

RAPPS

ENGINEERING and APPLIED SCIENCE

BORING LOG

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: Tube No.	Sampling: Type	Sampling: % Rec.	Tests: OVM (ppm)	Tests: Qu t/sf PEN	Tests: Moist	Comments	Well
30	Dark gray silt; Trace sand	7	5' CONTINUOUS SAMPLER	100					
37	Sandy								
37	Gray fine to medium silty sand; Wet; Gravelly @ base	8		100					
40	Gray shale							Broken shale in bit No recovery past 40'	
41.83	End of Boring @ 41.83'	9		0				Refusal	
45									
50									
55									
60									

Water Level____after____hrs.

Andrews Environmental Engineering, Inc.
3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

Field Boring Log

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

Location:
- Coord. System: Site Grid
- Northing: 5,612.8
- Easting: 2,130.0

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
- Boring No.: B96-1
- Well No.: G-121
- Surf. Elev.: 553.80

Depth Information:
- Total: 56.70
- Auger: 56.70
- Core: 0.00

Dates:
- Start: 05/17/96
- Finish: 05/17/96

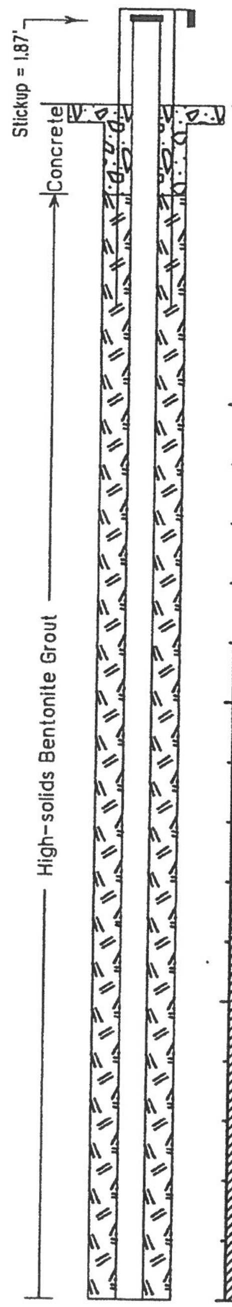
Drilling Contractor:
- Name: AE Explortation Corp.
- City: Springfield, IL
- Equipment: CME 75 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
- Geologist: R. Hasenyager
- Driller: A. Wiesenhofer
- Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Sample Recov.	Blow Count	qp [qs] (in tsf)	% Moisture
0–5	1	Continuous Barrel		5.0		2.25, 2.25, 3.25	
5–10	2	Continuous Barrel		5.0		2.75, 3.00, 2.25, 2.75, 3.00	
10–15	3	Continuous Barrel		5.0		4.5+, 3.00, 2.00, 3.50	
15–20	4	Continuous Barrel		5.0		3.25, 4.25, 4.00, 3.00	

Borehole Detail



Lithology

Description/*Comments*

- Brown with 35% dark brown mottles, dry, firm, silty CLAY, trace sand.
- Brown, moist, firm, silty CLAY, trace sand.
- Dark brown with 10% greenish blue mottles, moist, firm, silty CLAY, trace sand.
- Brown, moist, firm, silty CLAY, trace sand.
- Dark brown, moist, firm, silty CLAY, trace sand.
- Black, moist, firm, silty CLAY, trace sand.
- Dark brown, moist, firm, silty CLAY, trace sand.
- Very dark brown, dry, friable, silty CLAY, trace sand, trace roots. *topsoil*
- Brown, moist, firm, silty CLAY, trace sand.

USC

Elev. (MSL): 550, 545, 540, 535

Depth (ft.): 5, 10, 15, 20

NOTES:

Andrews Environmental Engineering, Inc.
3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light & Power – FGDS Development
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEEI No.: 93-118

Location:
Coord. System: Site Grid
Northing: 5,612.8
Easting: 2,130.0

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-1
Well No.: G-121
Surf. Elev.: 553.80
Depth Information:
Total: 56.70
Auger: 56.70
Core: 0.00
Dates:
Start: 05/17/96
Finish: 05/17/96

Drilling Contractor:
Name: AE Explortation Corp.
City: Springfield, IL
Equipment: CME 75 – 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Sample Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
						3.00	
						2.00	
	5			5.0		1.75	
						0.75	
25						<.50	
						2.50	
						2.50	
	6			5.0		2.00	
						2.50	
30						2.00	
						<.50	
						1.25	
	7			5.0		1.75	
						3.75	
35						1.00	
						<.50	
						<.50	
	8			5.0		<.50	
						<.50	
40						<.50	

Borehole Detail: High-solids Bentonite Grout

Lithology / Description/*Comments* / USC / Elev. (MSL)

Brown, moist, firm, silty CLAY, trace sand.

Brown with 40% greenish brown mottles, moist, soft, silty CLAY, trace sand, trace roots.

— 530

Greenish brown, very moist, soft, silty CLAY, trace sand.

Light brown with 15% greenish brown mottles, very moist, firm, silty CLAY, trace sand.

— 525

Light brown with 20% light gray mottles, very moist, soft, silty CLAY, trace sand.

Gray, moist, hard, silty CLAY, with sand.

— 520

Very dark brown, moist, soft, clayey SILT, trace plant fragments.

Dark gray, moist, soft, clayey SILT, trace plant fragements.
more clayey with depth

Very dark gray, moist, soft, silty CLAY, with very fine-grained sand.

— 515

NOTES:

Andrews Environmental Engineering, Inc.

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

Field Boring Log

Site Information:
Name: City Water, Light & Power – FGDS Development
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEEI No.: 93-118

Location:
Coord. System: Site Grid
Northing: 5,612.8
Easting: 2,130.0

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-1
Well No.: G-121
Surf. Elev.: 553.80

Depth Information:
Total: 56.70
Auger: 56.70
Core: 0.00

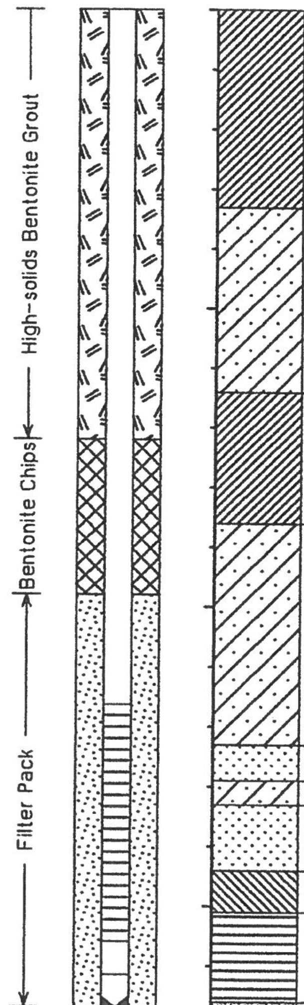
Dates:
Start: 05/17/96
Finish: 05/17/96

Drilling Contractor:
Name: AE Explortation Corp.
City: Springfield, IL
Equipment: CME 75 – 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Type	No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
	9	Continuous Barrel		5.0		1.00, 1.00, 1.50, 1.00, 1.00	
45	10	Continuous Barrel		5.0		1.00, 1.00	
50	11	Continuous Barrel	11A	5.0			
55	12	Split Spoon		1.6	31, 34, 35, 48	4.5+	
60							



Description/*Comments*	Elev. (MSL)
Very dark gray, moist, soft, silty CLAY, with very fine-grained sand.	
Very dark gray, very moist, soft to firm, sandy/silty CLAY.	510
Very dark gray, very moist, soft, silty CLAY, with very fine-grained sand.	
Very dark gray, very moist, soft to firm, sandy/silty CLAY.	505
Very dark gray, wet, soft, clayey, very fine- to fine-grained SAND.	
Dark gray, very moist, soft, sandy CLAY.	
Gray, wet, fine- to medium-grained SAND.	500
Gray, moist, firm, clayey SILT, with sand and rock fragments.	
Gray, dry, hard, SHALE.	
Gray, dry, hard, fine-grained, SANDSTONE.	
End of Boring = 56.70 feet (497.10' MSL)	495

USC

NOTES:

Andrews Environmental Engineering, Inc.
3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light & Power – FGDS Development
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEEI No.: 93-118

Location:
Coord. System: Site Grid
Northing: 5,613.2
Easting: 2,305.1

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-2
Well No.: G-122
Surf. Elev.: 552.70

Depth Information:
Total: 58.40
Auger: 58.40
Core: 0.00

Dates:
Start: 05/20/96
Finish: 05/20/96

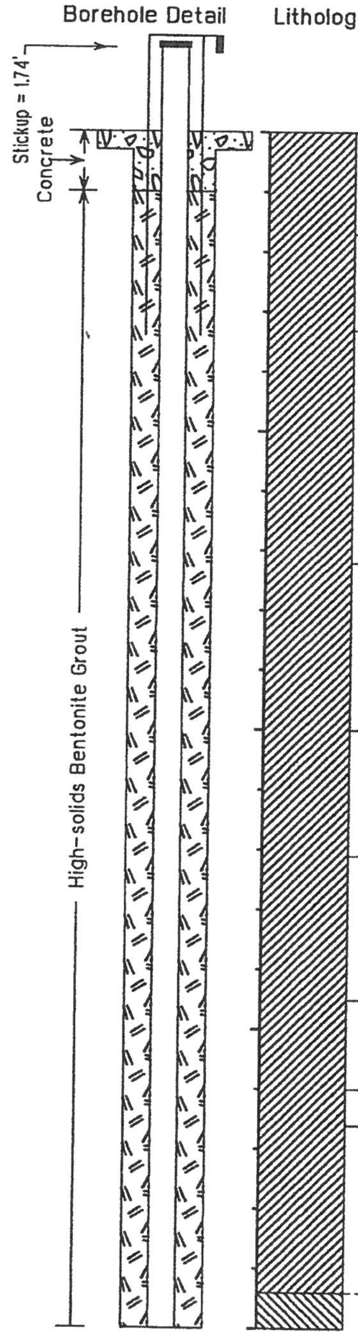
Drilling Contractor:
Name: AE Explortation Corp.
City: Springfield, IL
Equipment: CME 75 – 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_p $[q_s]$ (in tsf)	% Moisture
	1	Continuous Barrel		4.7		3.50	
						3.00	
						3.00	
						4.5+	
5	2	Continuous Barrel		5.0		3.50	
						2.50	
						3.00	
						3.00	
						4.5+	
10	3	Continuous Barrel		5.0		4.00	
						3.25	
						2.25	
						2.50	
						1.25	
15	4	Continuous Barrel		5.0		2.25	
						3.50	
						4.25	
						3.25	
						3.00	
20	5	Continuous Barrel				4.00	

Borehole Detail / Lithology



Description/Comments (USC; Elev. (MSL): 550, 545, 540, 535)

- Brown, moist, firm, silty CLAY, trace sand.
- Very dark brown, moist, firm, silty CLAY, trace sand.
- Brown, moist, hard to firm, silty CLAY, trace sand.
- Very dark brown with 40% brown mottles, moist, firm, silty CLAY, trace sand.
- Brown, moist, firm, silty CLAY, trace sand.
- Dark brown with 50% brown mottles, moist, firm, silty CLAY, trace sand.
- Very dark brown, firm, moist, silty CLAY, trace sand.
- Brown, moist, soft, silty CLAY, trace sand.
- Dark brown, moist, soft, silty CLAY, trace sand.
- Very dark brown, dry, friable, clayey SILT, trace sand.

NOTES:

Andrews Environmental Engineering, Inc.
3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light & Power – FGDS Development
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEEI No.: 93-118

Location:
Coord. System: Site Grid
Northing: 5,613.2
Easting: 2,305.1

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-2
Well No.: G-122
Surf. Elev.: 552.70
Depth Information:
Total: 58.40
Auger: 58.40
Core: 0.00
Dates:
Start: 05/20/96
Finish: 05/20/96

Drilling Contractor:
Name: AE Exploration Corp.
City: Springfield, IL
Equipment: CME 75 – 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Type	No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
	5			5.0		2.00	
						2.50	
						3.00	
						3.00	
25						2.75	
	6			5.0		2.25	
						1.00	
						<.50	
						<.50	
30						<.50	
	7			5.0		<.50	
						<.50	
						1.00	
						1.00	
35						1.00	
	8			5.0		1.50	
						<.50	
						1.25	
						1.25	
40	9					1.00	

Borehole Detail: High-solids Bentonite Grout

Lithology / Description/*Comments*

- Very dark brown, dry, friable, clayey SILT, trace sand.
- Black, dry to slightly moist, friable, clayey SILT, trace sand.
- Very dark brown, moist, firm to soft, silty CLAY, trace sand.
- Dark brown, very moist, soft, silty CLAY, trace sand.
- Brownish gray, very moist, soft, silty CLAY, trace sand.
- Gray with 25% reddish brown mottles, very moist, soft, silty CLAY, trace sand.

USC

Elev. (MSL): 530, 525, 520, 515

NOTES:

Andrews Environmental Engineering, Inc.

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

Field Boring Log

Site Information:
Name: City Water, Light & Power – FGDS Development
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEEI No.: 93-118

Location:
Coord. System: Site Grid
Northing: 5,613.2
Easting: 2,305.1

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-2
Well No.: G-122
Surf. Elev.: 552.70

Depth Information:
Total: 58.40
Auger: 58.40
Core: 0.00

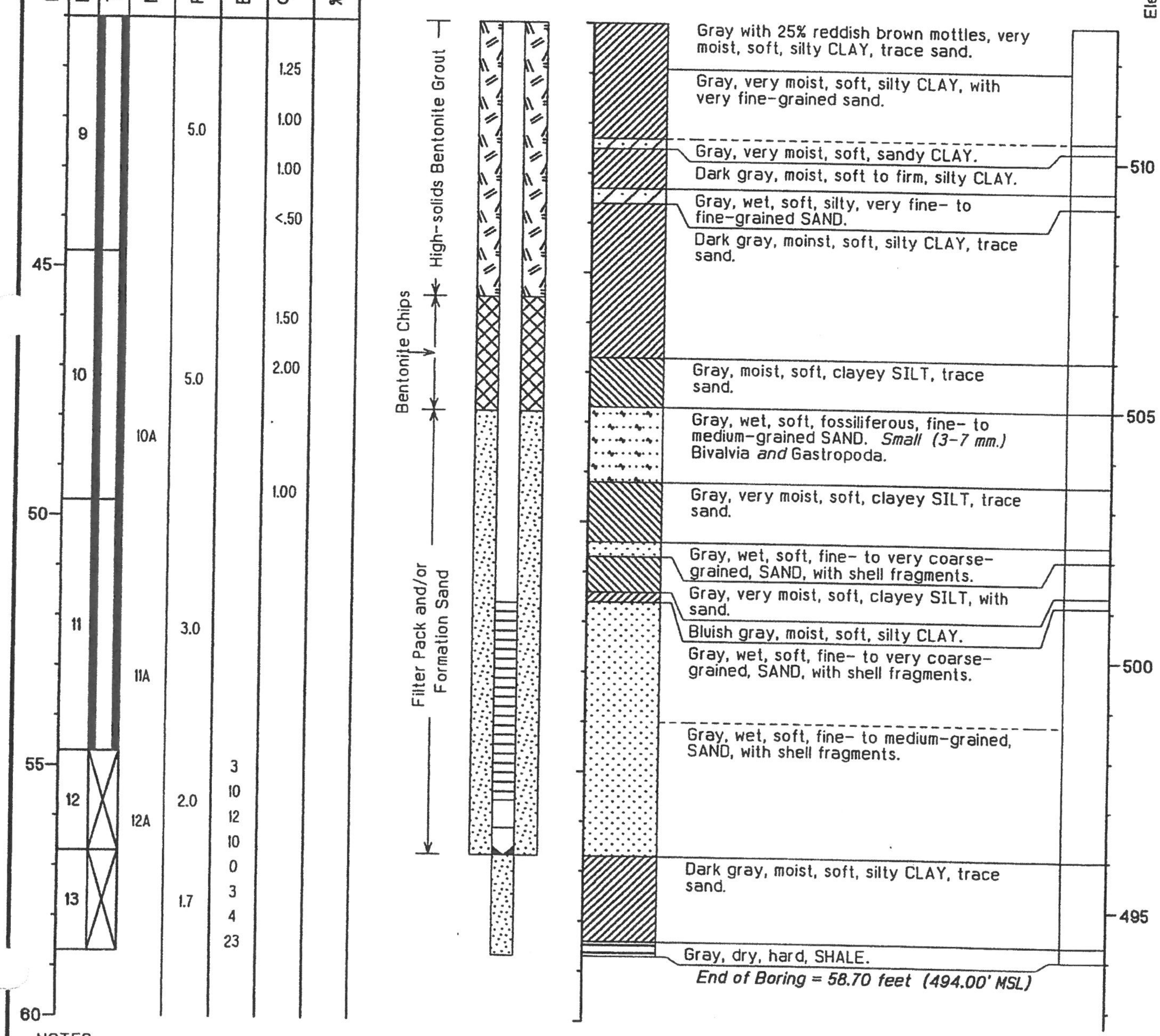
Dates:
Start: 05/20/96
Finish: 05/20/96

Drilling Contractor:
Name: AE Explortation Corp.
City: Springfield, IL
Equipment: CME 75 – 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
40–45	9	Continuous Barrel		5.0		1.25, 1.00, 1.00, <.50	
45–50	10	Continuous Barrel	10A	5.0		1.50, 2.00, 1.00	
50–55	11	Continuous Barrel	11A	3.0			
55–57	12	Split Spoon	12A	2.0	3, 10, 12, 10		
57–59	13	Split Spoon		1.7	0, 3, 4, 23		



Description/Comments (USC, Elev. (MSL))

- Gray with 25% reddish brown mottles, very moist, soft, silty CLAY, trace sand.
- Gray, very moist, soft, silty CLAY, with very fine-grained sand.
- Gray, very moist, soft, sandy CLAY.
- Dark gray, moist, soft to firm, silty CLAY.
- Gray, wet, soft, silty, very fine- to fine-grained SAND.
- Dark gray, moinst, soft, silty CLAY, trace sand.
- Gray, moist, soft, clayey SILT, trace sand.
- Gray, wet, soft, fossiliferous, fine- to medium-grained SAND. *Small (3-7 mm.)* Bivalvia *and* Gastropoda.
- Gray, very moist, soft, clayey SILT, trace sand.
- Gray, wet, soft, fine- to very coarse-grained, SAND, with shell fragments.
- Gray, very moist, soft, clayey SILT, with sand.
- Bluish gray, moist, soft, silty CLAY.
- Gray, wet, soft, fine- to very coarse-grained, SAND, with shell fragments.
- Gray, wet, soft, fine- to medium-grained, SAND, with shell fragments.
- Dark gray, moist, soft, silty CLAY, trace sand.
- Gray, dry, hard, SHALE.

End of Boring = 58.70 feet (494.00' MSL)

NOTES:

PDF_0210

Andrews Environmental Engineering, Inc.

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

Field Boring Log

Site Information:
Name: City Water, Light & Power – FGDS Development
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEEI No.: 93-118

Location:
Coord. System: Site Grid
Northing: 5,615.9
Easting: 2,481.5

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-3
Well No.: G-123
Surf. Elev.: 552.20

Depth Information:
Total: 57.80
Auger: 57.80
Core: 0.00

Dates:
Start: 05/16/96
Finish: 05/16/96

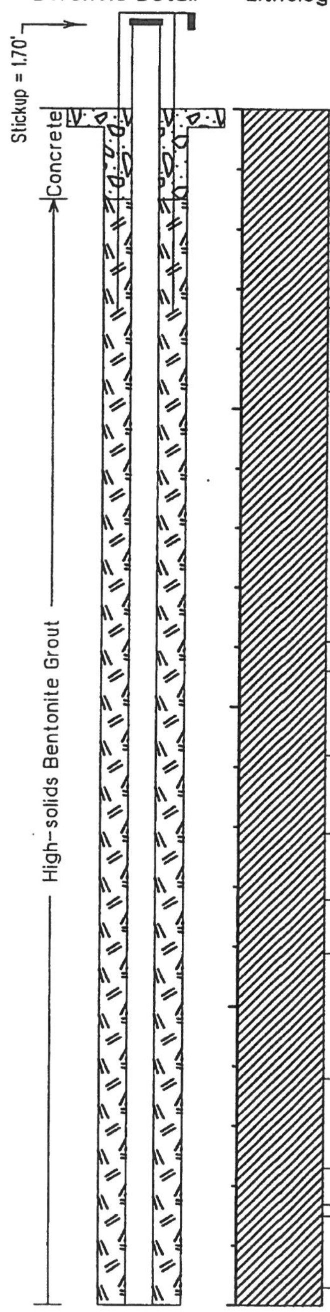
Drilling Contractor:
Name: AE Explortation Corp.
City: Springfield, IL
Equipment: CME 75 – 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Sample Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
0–5	1	Continuous Barrel		4.9		3.00, 4.00	
5–10	2	Continuous Barrel		5.0		3.00, 2.50, 2.00, 1.50	
10–15	3	Continuous Barrel		5.0		1.75, 1.75, 2.50, 2.00	
15–20	4	Continuous Barrel		5.0		3.25, 4.00, 3.75, 4.00	

Borehole Detail / Lithology



Description/*Comments*	USC
Dark brown, moist, firm, silty CLAY, trace sand.	
Brown, moist, firm, silty CLAY, trace sand.	
Dark brown, moist, firm, silty CLAY, trace sand.	
Brown with 10% dark brown mottles, moist, firm, silty CLAY, trace sand.	
Dark brown, moist, firm, silty CLAY, trace sand.	
Brown, moist, soft, silty CLAY, trace sand.	
Dark brown, moist, soft, silty CLAY, trace sand.	
Brown, moist, soft, silty CLAY, trace sand.	
Yellowish brown, moist, soft, silty CLAY, trace sand, trace fly ash.	
Dark brown with 30% greenish blue mottles, very moist, soft, silty CLAY, trace sand.	
Dark brown, very moist, soft, silty CLAY, trace sand.	
Yellowish brown, slightly moist, hard, silty CLAY, trace sand.	
Dark brown, very moist, soft, silty CLAY, trace sand.	
Yellowish brown, slightly moist, friable, silty CLAY, trace sand.	
Dark brown, moist, firm, silty CLAY, trace sand.	

Depth (ft.): 5, 10, 15, 20

Elev. (MSL): 550, 545, 540, 535

NOTES:

Andrews Environmental Engineering, Inc.
3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

Field Boring Log

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

Location:
Coord. System: Site Grid
Northing: 5,615.9
Easting: 2,481.5

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-3
Well No.: G-123
Surf. Elev.: 552.20

Depth Information:
Total: 57.80
Auger: 57.80
Core: 0.00

Dates:
Start: 05/16/96
Finish: 05/16/96

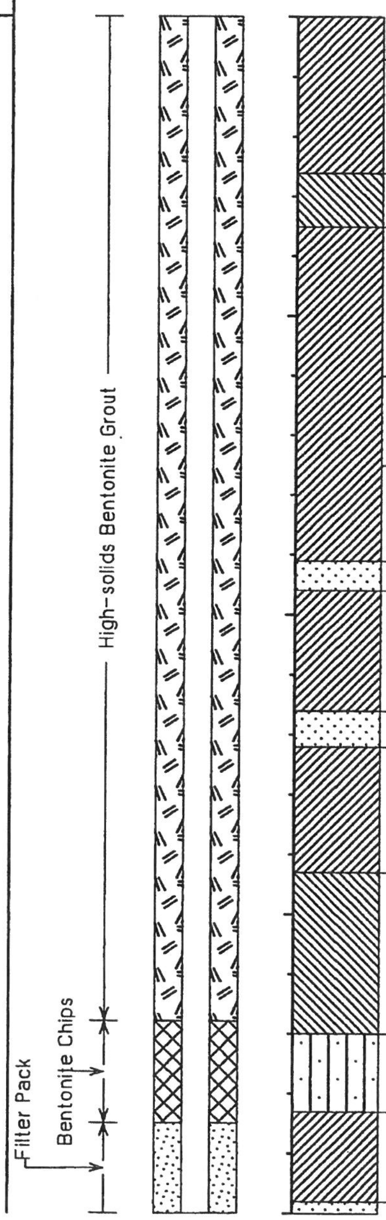
Drilling Contractor:
Name: AE Explortation Corp.
City: Springfield, IL
Equipment: CME 75 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Sample Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
	5	Continuous Barrel		5.0		3.00, 3.50, 1.25, 1.00	
25	6	Continuous Barrel		5.0		1.00, <.50, <.50, <.50, <.50	
30	7	Continuous Barrel		4.3		<.50, <.50, <.50	
35	8	Continuous Barrel		5.0		<.50, <.50	
40							

Borehole Detail | Lithology | Description/*Comments* | USC | Elev. (MSL)



Black, moist, firm, silty CLAY, trace sand, trace fly ash, trace plant fragments.

Black, moist, firm, silty CLAY, trace sand.

— 530

Black, moist, soft, clayey SILT, trace sand.

Black, moist, soft, silty CLAY, trace sand.

Dark brown, moist, soft, silty CLAY, trace sand.

— 525

Brown, very moist, soft, silty CLAY, trace sand.

Gray, very moist, soft, silty, very fine- to fine-grained SAND.

Brown, very moist, soft, silty CLAY, trace sand.

Gray, wet, soft, silty, very fine- to fine-grained SAND.

— 520

Gray, very moist, soft, silty CLAY, with sand.

Gray, very moist, soft, clayey SILT, with sand and plant fragments.

Peat layer at 35.5'-35.6'

— 515

Gray, very moist, soft, sandy SILT, trace organic matter.

Gray, very moist, soft, silty CLAY, with sand and plant fragments.

Gray, wet, fine-grained SAND.

NOTES:

Andrews Environmental Engineering, Inc.
3535 Mayflower Boulevard, Springfield, IL 62707 (217) 787-2334

Field Boring Log

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

Location:
Coord. System: Site Grid
Northing: 5,615.9
Easting: 2,481.5

Weather:
Sunny, calm, warm (hi-80's)

Boring Information:
Boring No.: B96-3
Well No.: G-123
Surf. Elev.: 552.20

Depth Information:
Total: 57.80
Auger: 57.80
Core: 0.00

Dates:
Start: 05/16/96
Finish: 05/16/96

Drilling Contractor:
Name: AE Explortation Corp.
City: Springfield, IL
Equipment: CME 75 - 4¼" HSA /w 5 foot continuous barrel sampler.

Personnel:
Geologist: R. Hasenyager
Driller: A. Wiesenhofer
Helper (s): K. Doetzel

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

Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
9	Continuous Barrel	9A	2.1			
10	Continuous Barrel	10A	3.0			
11	Continuous Barrel	11A	3.6			
12	Split Spoon		1.5	31, 34, 35, 48		
13	Split Spoon		0.8			

Depth (ft.): 45, 50, 55, 60

Borehole Detail: Filter Pack; Bentonite Chips

Elev. (MSL): 510, 505, 500, 495

Description/*Comments*

Gray, wet, fine-grained SAND.

Gray, wet, fine-grained SAND, trace plant fragments.

Gray, very moist, soft, silty CLAY, with sand.

Gray, wet, fine-grained SAND, trace *Gastropoda* fossils.

Gray, wet, very fine- to fine-grained SAND, trace coarse sand and shale fragments.

Brown, wet, medium- to very coarse-grained SAND, trace shale and sandstone fragments.

Gray, dry, hard, SHALE

Gray, dry, hard, fine-grained, SANDSTONE.

End of Boring = 57.80 feet (494.40' MSL)

NOTES:

APPENDIX A3:

IMPOUNDMENT WELL BORING LOGS

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
Project: Piezometer Installation
Location: CWLP Ash Pond
East Lake Shore Drive
Springfield, Illinois

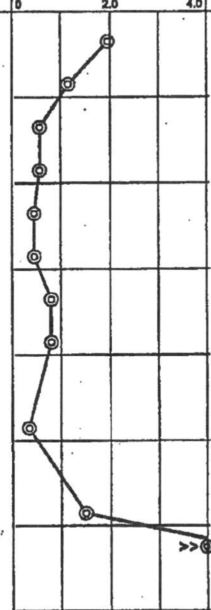
Drilling Method: Hollow Stem Auger
Sampling Method: Split Spoon
Hammer Type: CME Automatic; ETR = 86%
Boring Location: See attached boring location plan.

WATER LEVELS	
While Drilling	9 feet
Upon Completion	N/A
Delay	N/A

Station: N/A
Offset: N/A

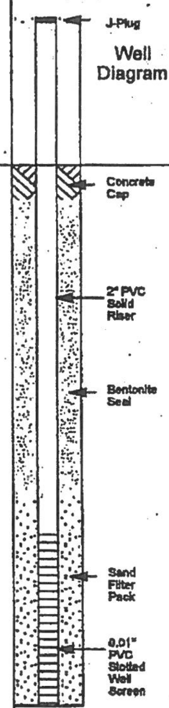
Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %
	0	1	18	Dark brown silty CLAY, very stiff, slightly moist	CL	7-8-9 N_{60}=24	
	5	2	18	Dark brown clayey SILT, stiff, slightly moist	ML	5-5-5 N_{60}=14	
		3	18	Gray clayey SILT, trace brown, firm, moist		2-2-3 N_{60}=7	
	10	4	18		ML	2-2-3 N_{60}=7	
		5	18			1-2-2 N_{60}=6	
	15	6	18	Gray silty CLAY, few brown sand, firm, saturated	CL	1-2-2 N_{60}=6	
		7	18	Gray sandy CLAY, stiff, saturated	CLS	4-3-4 N_{60}=10	
	20	8	18	Blue-gray clayey SILT, soft to very stiff, moist to saturated		3-3-4 N_{60}=10	
	25	9	18		ML	1-2-1 N_{60}=4	
	30	10	18	Gray SAND with SILT, medium dense/very stiff, saturated	SW-SM	6-7-6 N_{60}=19	
		11	6	Gray SHALE, hard, slightly moist	CL	50/6"	
				Boring terminated ay -31.5'			
	35						

STANDARD PENETRATION TEST DATA
N in blows/ft
Moisture PL LL
STRENGTH, tsf
Qu Qp



Additional Remarks

Well Diagram



Completion Depth: 35.0 ft
Date Boring Started: 4/21/10
Date Boring Completed: 4/21/10
Logged By: Rob Preuss
Drilling Contractor: PSI, Inc.

Sample Types:
Auger Cutting
Split-Spoon
Rock Core
Shelby Tube
Hand Auger
Texas Cone

Latitude:
Longitude:
Drill Rig: ATV D50
Remarks: N_{60} denotes the normalization to 60% efficiency as described in ASTM D4633. Moistures determined by visual methods

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-2

Sheet 1 of 1

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

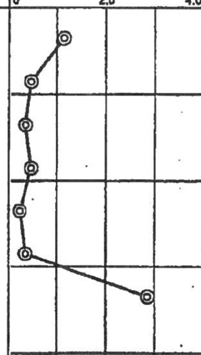
Drilling Method: Hollow Stem Auger
Sampling Method: Split Spoon
Hammer Type: CME Automatic; ETR = 86%
Boring Location: See attached boring location plan.

WATER LEVELS	
While Drilling	9 feet
Upon Completion	N/A
Delay	N/A

Station: N/A
Offset: N/A

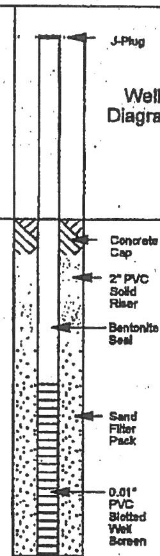
Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %
	0	Split-Spoon	1	10	Dark brown silty CLAY, some sand, stiff, slightly moist (FILL)	CL	4-4-6 N_{60}=14	
		Split-Spoon	2	8	Dark brown silty CLAY, soft to firm, moist	CL	2-2-2 N_{60}=6	
	5	Split-Spoon	3	6	Gray silty CLAY, soft to firm, moist	CL	1-1-2 N_{60}=4	
		Split-Spoon	4	18	Gray clayey SILT, soft to firm, saturated		2-2-2 N_{60}=6	
	10	Split-Spoon	5	18		ML	2-1-1 N_{60}=3	
		Split-Spoon	6	18			2-1-2 N_{60}=4	
	15	Split-Spoon	7	18	Light gray SAND, dense, saturated	SP	4-9-16 N_{60}=36	
		Split-Spoon	8	14	Gray SHALE, hard, slightly moist	CL	19-24-50/2"	
	20				Boring terminated at -20'			

STANDARD PENETRATION TEST DATA
N in blows/ft ⊙
× Moisture ▨ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0



Additional Remarks

Well Diagram



Completion Depth: 20.0 ft
Date Boring Started: 4/21/10
Date Boring Completed: 4/21/10
Logged By: Rob Preuss
Drilling Contractor: PSI, Inc.

Sample Types:
Auger Cutting
Split-Spoon
Rock Core
Shelby Tube
Hand Auger
Texas Cone

Latitude:
Longitude:
Drill Rig: ATV D50
Remarks: N_{60} denotes the normalization to 60% efficiency as described in ASTM D4633. Moistures determined by visual methods.

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-3

Sheet 1 of 1

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

Drilling Method: Hollow Stem Auger
Sampling Method: Split Spoon
Hammer Type: CME Automatic; ETR = 86%
Boring Location: See attached boring location plan.

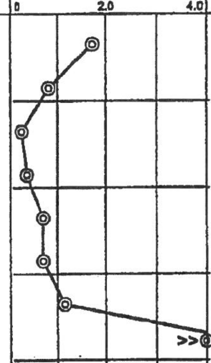
WATER LEVELS

While Drilling	None feet
Upon Completion	N/A
Delay	N/A

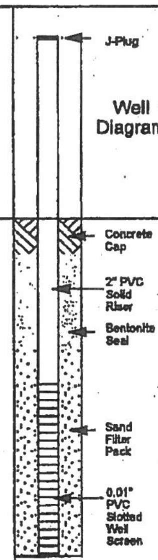
Station: N/A
Offset: N/A

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0	1	18	Dark brown silty CLAY, very stiff, slightly moist	CL	6-7-8 N_{60}=21		
		2	18	Gray/brown clayey SILT, soft to stiff, moist to saturated		3-3-4 N_{60}=10		
	5	3	18		ML	1-1-1 N_{60}=3		
		4	18	Gray clayey SILT, soft to very stiff, saturated		2-1-2 N_{60}=4		
	10	5	18			2-2-4 N_{60}=9		
		6	16		ML	2-2-4 N_{60}=9		
	15	7	18			4-4-6 N_{60}=14		
		8	10	Gray SHALE, hard, slightly moist	CL	32-50/3"		
	20			Boring terminated at -19.5				

STANDARD PENETRATION TEST DATA
N in blows/ft
× Moisture
PL
LL
0 25 50
STRENGTH, tsf
▲ Qu
✱ Qp
0 2.0 4.0



Well Diagram



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

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

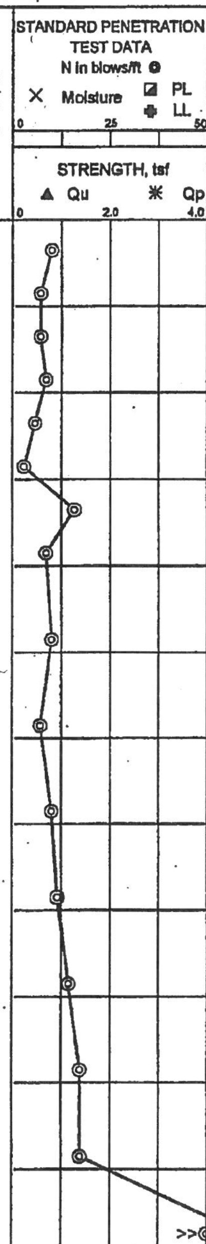
PSI Job No.: 0020522
Project: Piezometer Installation
Location: CWLP Ash Pond
East Lake Shore Drive
Springfield, Illinois

Drilling Method: Hollow Stem Auger
Sampling Method: Split Spoon
Hammer Type: CME Automatic; ETR = 86%
Boring Location: See attached boring location plan.

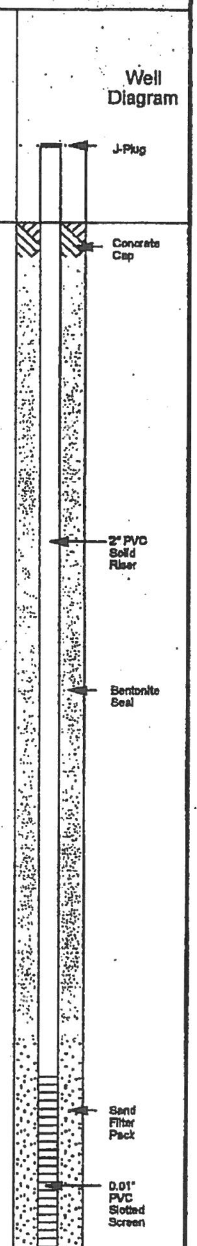
WATER LEVELS
While Drilling 11 feet
Upon Completion N/A
Delay N/A

Station: N/A
Offset: N/A

Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)
1	17	Brown silty CLAY, some brown sand, firm to stiff, slightly moist (FILL)	CL	4-4-3 N_{60}=10
2	18	Brown silty CLAY, trace roots, firm to stiff, moist (FILL)	CL	4-3-2 N_{60}=7
3	10	Brown SILT, trace gray, firm to stiff, moist (FILL)	ML	6-3-2 N_{60}=7
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_{60}=9
5	18			2-2-2 N_{60}=6
6	16			2-1-1 N_{60}=3
7	16			6-6-5 N_{60}=16
8	18	Black FLY ASH, some fine sub-round gravel, stiff to very stiff, moist to saturated (FILL)	FLY ASH	3-3-3 N_{60}=9
9	1	Gray/green (organic?) CLAY, stiff, trace fine sand, moist to saturated	CL	3-3-4 N_{60}=10
10	18	Brown/gray silty CLAY, fiorm to stiff, saturated	CL	2-2-3 N_{60}=7
11	18	Gray SILT, stiff to very stiff, saturated	ML	3-3-4 N_{60}=10
12	18			4-4-4 N_{60}=11
13	18			4-4-6 N_{60}=14
14	18			4-5-7 N_{60}=17
15	18	Gray fine to coarse SAND, medium dense, saturated	SW	5-5-7 N_{60}=17
16	1	Gray SHALE, hard, moist	CL	50/1"
		Boring terminated at -60'		



Additional Remarks



Completion Depth: 60.0 ft
Date Boring Started: 4/20/10
Date Boring Completed: 4/20/10
Logged By: Rob Preuss
Drilling Contractor: PSI, Inc.

Sample Types:
Auger Cutting
Split-Spoon
Rock Core
Shelby Tube
Hand Auger
Texas Cone

Latitude:
Longitude:
Drill Rig: ATV D50
Remarks: N_{60} denotes the normalization to 60% efficiency as described in ASTM D4633. Moistures determined by visual methods.

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

Andrews Engineering, Inc.
3300 Ginger Creek Drive, Springfield, IL 62711 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light, & Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEEI No.: 2011-127

Location:
Coord. System: Site Grid
Northing: 5132.40
Easting: 831.70

Weather:
Cloudy; 38° F; West 10-15 MPH

Boring Information:
Boring No.: AP-1R
Well No.: AP-1R
Surf. Elev.: 533.10

Depth Information:
Total: 32.50
Auger: 32.50
Core:

Dates:
Start: 1/30/2012
Finish: 1/30/2012

Drilling Contractor:
Name: Terra Drill, Inc.
City: Dupo, IL
Equipment: CME 550 with 4¼" I.D. HSA and 5' CB

Personnel:
Geologist: M. Hewitt
Driller: J. Brown
Helper (s): J. Horn

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

Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
1			NA			
2			NA			
3			NA			
4			NA			
5	Continuous Barrel					

Borehole Detail: Slickup = 2.50'; Concrete; Bentonite Grout; Bentonite Chips; Silica Sand

Depth (ft.)	Description/*Comments*	USC
0–3	Dark brown silty CLAY; very stiff; slightly moist	CL
3–6	Dark brown clayey SILT; stiff; slightly moist	ML
6–13.5	Gray clayey SILT; trace brown; firm; moist	ML
13.5–16	Gray silty CLAY; few brown sand; firm; saturated	CL
16–18.5	Gray sandy CLAY; stiff; saturated	SC
18.5–20	Blue-gray clayey SILT; soft to very stiff; moist to saturated	ML

Depth (ft.): 5, 10, 15, 20
Elev. (MSL): 530, 525, 520, 515

NOTES: AP-1R blind-drilled to 19.0 ft bgs
Geology from 0-19.0 ft bgs based on AP-1 log

Andrews Engineering, Inc.
3300 Ginger Creek Drive, Springfield, IL 62711 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light, & Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEEI No.: 2011-127

Location:
Coord. System: Site Grid
Northing: 5132.40
Easting: 831.70

Weather:
Cloudy; 38° F; West 10-15 MPH

Boring Information:
Boring No.: AP-1R
Well No.: AP-1R
Surf. Elev.: 533.10

Depth Information:
Total: 32.50
Auger: 32.50
Core:

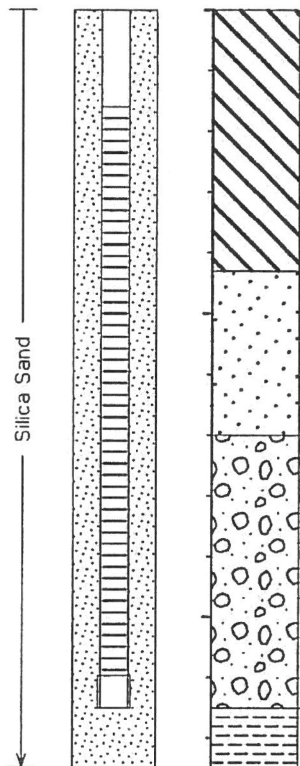
Dates:
Start: 1/30/2012
Finish: 1/30/2012

Drilling Contractor:
Name: Terra Drill, Inc.
City: Dupo, IL
Equipment: CME 550 with 4¼" I.D. HSA and 5' CB

Personnel:
Geologist: M. Hewitt
Driller: J. Brown
Helper (s): J. Horn

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

Run No.	Type	No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
5	Continuous Barrel		100%			
6	Continuous Barrel		100%			
7	Continuous Barrel		100%			



Description/*Comments*	USC
(Cont'd) Blue-gray clayey SILT; soft to very stiff; moist to saturated	ML
Gray SAND with silt; medium dense; saturated	SM
Dark gray SAND and GRAVEL; loose; saturated	SW
Dark gray SHALE; weathered; dense; moist	CL

End of Boring = 32.5 '

Depth (ft.): 25, 30, 35, 40
Elev. (MSL): 510, 505, 500, 495

NOTES: AP-1R blind-drilled to 19.0 ft bgs
Geology from 0-19.0 ft bgs based on AP-1 log

Andrews Engineering, Inc.
3300 Ginger Creek Drive, Springfield, IL 62711 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light, & Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEEI No.: 2011-127

Location:
Coord. System: Site Grid
Northing: 4184.70
Easting: 725.50

Weather:
Cloudy; 38° F; West 10-15 MPH

Boring Information:
Boring No.: AP-2R
Well No.: AP-2R
Surf. Elev.: 533.10

Depth Information:
Total: 18.50
Auger: 18.50
Core:

Dates:
Start: 1/31/2012
Finish: 1/31/2012

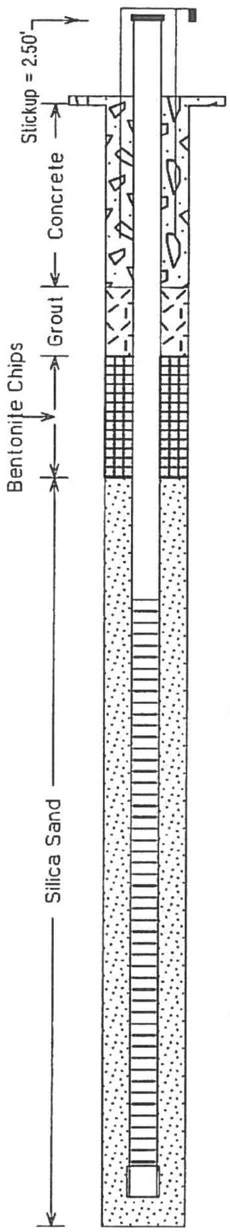
Drilling Contractor:
Name: Terra Drill, Inc.
City: Dupo, IL
Equipment: CME 550 with 4¼" I.D. HSA and 5' CB

Personnel:
Geologist: M. Hewitt
Driller: J. Brown
Helper (s): J. Horn

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

Depth (ft.)	Run No.	Type	No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture
0–5	1			NA			
5–10	2			NA			
10–15	3	Continuous Barrel		70%			
15–18.5	4	Continuous Barrel		100%			

Borehole Detail



Lithology	Description/*Comments*	USC	Elev. (MSL)
	Dark brown silty CLAY; some sand; stiff; slightly moist		
	Dark brown silty CLAY; soft to firm; moist	CL	530
	Gray silty CLAY; soft to firm; moist	CL	525
	Gray clayey SILT; very soft; moist to wet	ML	520
	Light gray SAND; dense; saturated	SP	
	Gray SHALE; hard; slightly moist	CL	515

End of Boring = 18.5 '

NOTES: AP-2R blind-drilled to 10.0 ft bgs
Geology from 0-10.0 ft bgs based on AP-1 log

Andrews Engineering, Inc.
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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 160192

Location:
Coord. System: Site Grid
Northing: 4185.2
Easting: 735.9

Weather: Sunny, 40F

Boring Information:
Boring No: AP-2A
Well No: AP-2A
Surf Elev.: 533.6

Depth Information:
Total: 19.0
Auger: 19.0
Core:

Dates:
Start: 2/16/16
Finish: 2/16/16

Drilling Contractor:
Contractor Name: Bulldog Drilling
City: Dupo, IL
Equipment: AMS Powerprobe w/ 4.25" HSA and 5' MC

Personnel:
Geologist: C. Myrvold
Driller: J. Edwards
Helper(s): Z. Strickland

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	533.6
0–9.0	1						Blind drilled to 9.0 feet. For detailed geology refer to the original log for AP-2R	530.0
9.0–13.0	2		3.2/4				Gray CLAYEY SILT; moist to wet; moderately loose	525.0
13.0–17.0	3		4.0/4					520.0
17.0–19.0	4		2.0/2				Light gray SAND; fine to medium grained; saturated; some gravel	
							Gray SHALE; weathered; hard; slightly moist	515.0
19							End of Boring = 19 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive, Springfield, IL 62711 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light, & Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEEI No.: 2011-127

Location:
Coord. System: Site Grid
Northing: 3164.10
Easting: 3203.10

Weather:
Cloudy; 38° F; West 10-15 MPH

Boring Information:
Boring No.: AP-5
Well No.: AP-5
Surf. Elev.: 581.6

Depth Information:
Total: 49.0
Auger: 49.0
Core:

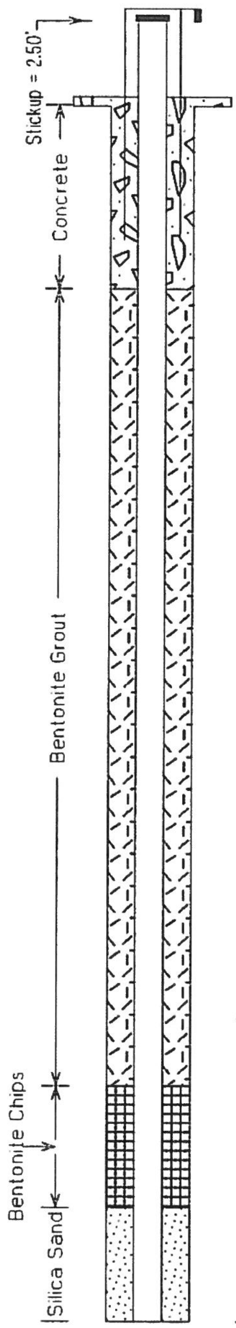
Dates:
Start: 2/1/2012
Finish: 2/1/2012

Drilling Contractor:
Name: Terra Drill, Inc.
City: Dupo, IL
Equipment: CME 550 with 4¼" I.D. HSA
5' CB and 2' SS

Personnel:
Geologist: M. Hewitt
Driller: J. Brown
Helper (s): J. Horn

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture	Description/*Comments*	USC	Elev. (MSL)
0	1	Continuous Barrel		100%				Dark yellowish brown silty CLAY; very firm; moist; some dark brown mottling; trace organics	CL	0
5	2	Continuous Barrel		76%				Olive brown clayey SILT; moderately soft; moist; some dark yellowish brown mottling grades dark yellowish brown; clay content increasing	ML	-5
10	3	Continuous Barrel		100%				Olive brown silty CLAY; very firm; moist; trace coarse sand; few iron concretions; some dark yellowish brown mottling	CL	-10
15	4	Continuous Barrel		100%				some gravel	CL	-15
								Dark yellowish brown sandy CLAY; some gravel; very soft; moist to wet	SC	
	5	Split Spoon		100%						
20								Dark yellowish brown clayey SILT with sand and gravel; firm; moist	ML-SM	-20



NOTES:

Andrews Engineering, Inc.
3300 Ginger Creek Drive, Springfield, IL 62711 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light, & Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEEI No.: 2011-127

Location:
Coord. System: Site Grid
Northing: 3164.10
Easting: 3203.10

Boring Information:
Boring No.: AP-5
Well No.: AP-5
Surf. Elev.: 581.6

Weather:
Cloudy; 38° F; West 10-15 MPH

Depth Information:
Total: 49.0
Auger: 49.0
Core:

Drilling Contractor:
Name: Terra Drill, Inc.
City: Dupo, IL
Equipment: CME 550 with 4¼" I.D. HSA
5' CB and 2' SS

Personnel:
Geologist: M. Hewitt
Driller: J. Brown
Helper (s): J. Horn

Dates:
Start: 2/1/2012
Finish: 2/1/2012

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

Depth (ft.)	Run No.	Type	No.	Recov.	Blow Count	q_p $[q_s]$ (in tsf)	% Moisture	Borehole Detail	Description/*Comments*	USC	Elev. (MSL)
	5	Split Spoon						Silica Sand	(Cont'd) Dark yellowish brown clayey SILT with sand and gravel; firm; moist	ML-SM	-20
	6	Split Spoon		100%				Silica Sand	Dark yellowish brown SAND; coarse-grained; loose; wet	SP	
25	7	Continuous Barrel		100%				Silica Sand	Yellowish gray clayey SILT with sand; trace gravel; very hard; moist	ML	-25
								Silica Sand	Gray silty SAND with clay; some gravel; soft; wet	SM	
30	8	Continuous Barrel		100%				Silica Sand / Bentonite Chips	Gray clayey SILT; some gravel; very hard; moist		-30
	9	Split Spoon		90%				Bentonite Chips			
35	10	Continuous Barrel		100%				Bentonite Chips	some shale and coal fragments	ML	-35
40	11	Continuous Barrel						Bentonite Chips	Light gray silty SAND; some gravel; trace chert; rounded; moderately firm; moist	SM	-40

NOTES:

Andrews Engineering, Inc.
3300 Ginger Creek Drive, Springfield, IL 62711 (217) 787-2334

Field Boring Log

Site Information:
Name: City Water, Light, & Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEEI No.: 2011-127

Location:
Coord. System: Site Grid
Northing: 3164.10
Easting: 3203.10

Weather:
Cloudy; 38° F; West 10-15 MPH

Boring Information:
Boring No.: AP-5
Well No.: AP-5
Surf. Elev.: 581.6

Depth Information:
Total: 49.0
Auger: 49.0
Core:

Dates:
Start: 2/1/2012
Finish: 2/1/2012

Drilling Contractor:
Name: Terra Drill, Inc.
City: Dupo, IL
Equipment: CME 550 with 4¼" I.D. HSA
5' CB and 2' SS

Personnel:
Geologist: M. Hewitt
Driller: J. Brown
Helper (s): J. Horn

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

Depth (ft.)	Run No.	Sample Type	Sample No.	Sample Recov.	Blow Count	q_p [q_s] (in tsf)	% Moisture	Borehole Detail	Lithology	Description/*Comments*	USC	Elev. (MSL)
	11	Continuous Barrel						Bentonite Chips		Dark gray silty CLAY; some gravel; some shale fragments; trace coal fragments; very firm; moist	SM / CL	-40
45	12	Continuous Barrel		100%				Bentonite Chips				-45
	13	Continuous Barrel		55%				Bentonite Chips		Gray SHALE; hard; moist	CL	
50										*End of Boring = 49.0 '*		-50
55												-55
60												-60

NOTES:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.:

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: sunny, 73 deg

Boring Information:
Boring No: TW3E
Well No: TW3E
Surf Elev.: 0

Depth Information:
Total: 40.5'
Auger: 40.5'
Core: -

Dates:
Start: 06/27/2017
Finish: 06/27/2017

Drilling Contractor:
Contractor Name: Bulldog Drilling
City: Dupo
Equipment: 4.25" HSA, CME 55, 5' Continuous Macrocore

Personnel:
Geologist: D. Ghosh
Driller: J. Gates
Helper(s): C. Clines

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0–5	1	CB	4.5/5				**CLAYEY SILT** dark brown, iron oxidation staining, moist, firm to hard, moderate cementation, with root structure	
5–10	2	CB	5.0/5				**SILT** brown to gray, iron oxidation, moist, 2" wet seam at 12', firm, moderate cementation, blocky, some clay	-5.0
10–15	3	CB	5.0/5				**SILT** gray, firm to hard, trace fine grained sand sandy 14.5-15'	-10.0
15–20	4	CB	4.5/5				**SILTY CLAY** dark gray, moist to wet, soft to firm, strong cementation, laminated, some wood fragments	-15.0
20								-20.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: TW3E Boring No: TW3E Well No: TW3E

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	5.0/5				cont: dark gray, moist to wet, soft to firm, strong cementation, laminated, some wood fragments	
26	6	CB	3.0/5				**SILTY CLAY** dark gray, till, moist to wet, soft to firm, moderate cementation, trace fine grained sand and gravel	-25
31	7	CB	4.5/5					-30
							SANDY SILT fine grained sand	-35
36	8	CB	4.0/5.5				**SILTY SAND** gray, fine to medeium grained, wet medium to coarse grained, trace fine grained, angular	
							SHALE	-40
41							End of Boring = 40.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.:

Location:
Coord. System: Site Coordinates
Northing: 5613.3
Easting: 1737.4

Weather: rain, 55 deg; sunny, 73 deg

Boring Information:
Boring No: TW3N
Well No: RW-3
Surf Elev.: 536.8

Depth Information:
Total: 41.6'
Auger: 41.6'
Core: -

Dates:
Start: 06/26/2017
Finish: 06/27/2017

Drilling Contractor:
Contractor Name: Bulldog Drilling
City: Dupo
Equipment: 4.25" HSA, CME 55, 5' Continuous Macrocore

Personnel:
Geologist: D. Ghosh
Driller: J. Gates
Helper(s): C. Clines

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	536.8
0	1	CB	3.5/5				**SILTY CLAY** dark brown, pervasive iron oxidation staining, dry (moist below 3'), firm to hard, moderate cementation, with root structure	535.0
							SILTY CLAY light tan, moist, moderate cementation, blocky	
5	2	CB	5.0/5				**SILT** brown to gray, mottling, iron oxidation staining, moist, firm, moderate cementation	530.0
10	3	CB	4.5/5				**SAND** sand lens, with silt, wet, trace clay	
							SANDY SILT brown to gray, laminated, some wood fragments, trace coarse sand, coal and roots	525.0
15	4	CB	5.0/5				**SILTY CLAY** gray, wet to moist, very soft, strong cementation, laminated, some wood fragments, trace fine sand	520.0
20							**SILTY CLAY** dark gray, wet, very soft, strong cementation, homogeneous	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: RW-3 Boring No: TW3N Well No: RW-3

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							cont: dark gray, wet, very soft, strong cementation, homogeneous	515
	5		3.0/5					
26								510
	6		4.0/5				**SILTY CLAY** dark gray, till, moist, firm to hard, trace coarse and fine gravel, trace coal	
31								505
	7		4.5/5					
							SANDY SILT	
36							**SILTY SAND** gray, fine to medium graineed, wet, trace angular gravel	500
	8		5.0/5					
							SHALE weathered	
41	9							
							End of Boring = 41.6 Feet	495

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.:

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: rain, 55 deg

Boring Information:
Boring No: TW3W
Well No: TW3W
Surf Elev.: 536.80

Depth Information:
Total: 23.8'
Auger: 23.8'
Core: -

Dates:
Start: 06/26/2017
Finish: 06/26/2017

Drilling Contractor:
Contractor Name: Bulldog Drilling
City: Dupo
Equipment: 4.25" HSA, CME 55, 5' Continuous Macrocore

Personnel:
Geologist: D. Ghosh
Driller: J. Gates
Helper(s): C. Clines

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0–5	1	CB	4.5/5				**SILTY CLAY** dark brown, dry, firm to hard, moderate cementation, root structure in upper 2 feet; high clay content, moist, soft to firm, blocky; iron oxidation spots	
5–10	2	CB	4.5/5				**SILT** brown to gray, iron oxidation pervasive, moist, soft to firm, moderate cementation, some clay; very soft	-5.0
10–15	3	CB	4.0/5				**SILTY SAND** brown, fine to medium grained sand, wet, poor cementation, moderately sorted, trace clay; **CLAYEY SAND** brown to dark gray, with gravel, coarse grained towards bottom, wet, strong cementation, poorly sorted	-10.0
15–20	4	CB	4.5/5				**SILTY CLAY** dark gray, with coal fragments, moist, very soft, strong cementation, homogeneous appearance, coal content high at 19-19.5'	-15.0
20–23.8	5	CB	2.8/3.8				**SILTY CLAY** blue gray, till, wet, soft, moderate cementation, homogeneous appearance, trace coarse sand and gravel; light tan, silty from 22-22.5'; **SANDY SHALE**	-20.0
							End of Boring = 23.8 Feet	

Notes: Borehole refusal at 23.8'.

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FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP	Coord. System:	Boring No: GP1
Location: Springfield, IL	Northing: 0	Well No: GP1
County: Sangamon	Easting: 0	Surf Elev.: 537.06
Site No.:		
AEEI No.: 180247	Weather: 65, overcast	**Depth Information:**
		Total: 40.0'
Drilling Contractor:	**Personnel:**	Auger: 40.0'
Contractor Name: Bulldog Drilling	Geologist: B. Kenning	Core: N/A
City: Dupo, IL	Driller: C. Clines	**Dates:**
Equipment: CME 55cc 4.25" HSA w/ 5' MC and 2' SS	Helper(s): D. Smith	Start: 6/14/2019
		Finish: 6/14/2019

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Sample Run No.	Sample Type	Sample Recov.	Blow Count	Lithology	Description/Comments	Elev. (MSL)
0						Ground Surface	0.0
						Brown clayey TOPSOIL.	
						Light brown to gray silty CLAY, moist, stiff.	
	1		4.2				
5							-5.0
	2		2.2				
10							-10.0
	3		4.6				
15							-15.0
						Gray clayey SILT, moist to wet, moderately stiff.	
	4		4.3				
20							-20.0
	5		4.2				
						Brown/gray silty CLAY, moist, moderately stiff, contains coal fragments.	
						Gray clayey SILT, moist to wet, moderately stiff.	
25							-25.0

Notes:

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FIELD BORING LOG

Boring Information: GP1 Boring No: GP1 Well No: GP1

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Type	Recov.	Blow Count	Lithology	Description/Comments	Elev. (MSL)
	6		3.7				
30							-30
	7		3.7			Gray SAND, fine-grained, wet, loose.	
35							-35
	8		4.1			Gray SAND, fine to medium-grained, wet, loose, trace gravel.	
						Gray SAND, medium to coarse-grained, wet, loose, trace gravel.	
40						Gray SHALE, weathered, moist, soft.	-40
						End of Boring = 40 Feet	
45							-45
50							-50

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP
Location: Springfield, IL
County: Sangamon
Site No.:
AEEI No.: 180247

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: 60, partly cloudy, light breeze

Boring Information:
Boring No: GP2
Well No: GP2 /AP-7
Surf Elev.: 425-25

Depth Information:
Total: 40.0'
Auger: 40.0'
Core: N/A

Dates:
Start: 6/14/2019
Finish: 6/14/2019

Drilling Contractor:
Contractor Name: Bulldog Drilling
City: Dupo, IL
Equipment: CME 55cc 4.25" HSA w/ 5' MC and 2' SS

Personnel:
Geologist: B. Kenning
Driller: C. Clines
Helper(s): D. Smith

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Sample Run No.	Type	Recov.	Blow Count	Lithology	Description/Comments	Elev. (MSL)
						Ground Surface	0.0
0		CB				Brown clayey TOPSOIL.	
						Brown silty CLAY, moist, stiff.	
	1	CB	3.0				
5							-5.0
	2	CB	3.5				
10							-10.0
						Brown/gray clayey SILT, moist, stiff.	
	3	CB	3.0				
15							-15.0
	4	CB	3.8				
20							-20.0
	5	CB	2.7				
25							-25.0

Notes: No signs of freewater

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FIELD BORING LOG

Boring Information: GP2 Boring No: GP2 Well No: AP-7

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Sample: Run No.	Sample: Type	Sample: Recov.	Blow Count	Lithology	Description/Comments	Elev. (MSL)
	6	CB	4.1			Gray clayey SAND, fine-grained, moist, moderately stiff.	
30							-30
	7	CB	4.1			Gray clayey SILT, moist, stiff, coal fragments at 30.4'.	
35							-35
	8	CB	3.4			Gray SHALE, weathered, slightly moist, soft.	
40						End of Boring = 40 Feet	-40
45							-45
50							-50

Notes: No signs of freewater

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FIELD BORING LOG

Site Information:
Name: CWLP
Location: Springfield
County: Sangamon
Site No.:
AEEI No.: 180247

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: 65, partly cloudy

Boring Information:
Boring No: GP3
Well No: GP3
Surf Elev.: 549.12

Depth Information:
Total: 25'
Auger: 25'
Core: N/A

Dates:
Start: 6/13/2019
Finish: 6/13/2019

Drilling Contractor:
Contractor Name: Bulldog Drilling
City: Dupo, IL
Equipment: CME 55cc 4.25 in HSA w/ 5' MC and 2' SS

Personnel:
Geologist: B. Kenning
Driller: C. Clines
Helper(s): D. Smith

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Sample Run No.	Type	Recov.	Blow Count	Lithology	Description/Comments	Elev. (MSL)
0						Ground Surface	0.0
0–0.5						Brown silty to clayey TOPSOIL, moist, stiff.	
0.5–7						Brown silty CLAY to clayey SILT, moist, stiff.	
0–5	1	CB	4.7				
5–7	2	SS	1.6	2 4 4 6			-5.0
7–9	3	SS	1.6	4 9 12 12		Light brown clayey SILT, slightly moist, stiff.	
9–11	4	SS	1.8	6 11 11 12			-10.0
11–15	5	CB	3.0			Brown clayey SAND, fine-grained, slightly moist, moderately stiff.	
15–20	6	CB	4.0			Brown silty CLAY, moist, stiff, contains coal fragments.	-15.0
						Brown clayey SAND, fine-grained, moist, moderately loose.	
20							-20.0

Notes: Macrocore refusal at 23'; Split spoon refusal at 24'; blind drilled to EOB depth of 25'

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FIELD BORING LOG

Boring Information: GP3 Boring No: GP3 Well No: GP3

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Type	Recov.	Blow Count	Lithology	Description/Comments	Elev. (MSL)
	7		2.2			Gray SHALE, weathered, slightly moist, soft.	
	8		0.7	41 50 3"			
	9		0.0				
25						End of Boring = 25 Feet	-25
30							-30
35							-35
40							-40

Notes: Macrocore refusal at 23'; Split spoon refusal at 24'; blind drilled to EOB depth of 25'

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FIELD BORING LOG

Site Information:
Name: Springfield City Water Light and Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 180247

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: 80's F, Sunny

Boring Information:
Boring No: GP4
Well No: GP4
Surf Elev.: 0

Depth Information:
Total: 38.0
Auger: 38.0
Core: N/A

Dates:
Start: 5/17/19
Finish: 5/17/19

Drilling Contractor:
Contractor Name: Bulldog Drilling, Inc.
City: Dupo, IL
Equipment: AMS PowerProbe 9500 w/ 5' MC

Personnel:
Geologist: C. Myrvold
Driller: J. Edwards
Helper(s): S. Guy

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0		CB					Gray clayey SILT, moist, loose.	
	1	CB	4.3/5				Brown/gray silty CLAY, moist, stiff.	
5	2	CB	3.7/4					-5.0
							Gray clayey SILT, moist, moderately loose.	
							Brown silty SAND, fine to medium-grained, moist, moderately tight.	
10	3	CB	4.0/4					-10.0
							Gray to dark gray silty CLAY, moist, stiff; trace to some sand.	
15	4	CB	1.3/4					-15.0
	5	CB	4.0/4					
20								-20.0

Notes:

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FIELD BORING LOG

Boring Information: GP4 Boring No: GP4 Well No: GP4

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							(cont.) Gray to dark gray silty CLAY, moist, stiff; trace to some sand.	
	6		3.1/4					
25								-25.0
	7		4.0/4					
30								-30.0
	8		3.4/4					
35	9		4.0/4					-35.0
							End of Boring = 38 Feet	
40								-40.0

Notes:

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FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP	Coord. System:	Boring No: GP5
Location: Springfield, IL	Northing: 0	Well No: GP5
County: Sangamon	Easting: 0	Surf Elev.: 0
Site No.:	Weather:	**Depth Information:**
AEEI No.: 180247		Total: 15.5'
Drilling Contractor:	**Personnel:**	Auger: 15.5'
Contractor Name: Bulldog Drilling	Geologist: C. Myrvold	Core: N/A
City: Dupo, IL	Driller: C. Clines	**Dates:**
Equipment: CME 55cc w/ 4.25" HSA and 5' MC	Helper(s): D. Smith	Start: 6/11/2019
		Finish: 6/11/2019

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Sample Run No.	Type	Recov.	Blow Count	Lithology	Description/Comments	Elev. (MSL)
						Ground Surface	0.0
0–5	1	CB	0.5		Silty clay	Brown silty CLAY, moist, stiff.	
5–9.5	2	CB	4.5		Silty clay	Brown to gray silty CLAY, moderately stiff, shows of iron oxidation.	-5.0
9.5–12	3	CB	2		Coal	Black COAL, slightly moist, soft.	-10.0
12–15.5	4	CB	3		Shale	Gray SHALE, weathered, dry, soft.	
15–15.5	5	CB	0.5				-15.0
						End of Boring = 15.5 Feet	
20							-20.0

Notes: Refusal at 15.5'; No well installation

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FIELD BORING LOG

Site Information:
Name: Springfield City Water Light and Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 180247

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: 80's F, Sunny

Boring Information:
Boring No: GP6
Well No: GP6 /AP-6
Surf Elev.: 535.40

Depth Information:
Total: 37.0
Auger: 37.0
Core: N/A

Dates:
Start: 5/17/19
Finish: 5/17/19

Drilling Contractor:
Contractor Name: Bulldog Drilling, Inc.
City: Dupo, IL
Equipment: AMS PowerProbe 9500 w/ 5' MC

Personnel:
Geologist: C. Myrvold
Driller: J. Edwards
Helper(s): S. Guy

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	0.0
		CB					Dark brown clayey silt TOPSOIL, moist, moderately loose.	
							Brown/gray silty CLAY to clayey SILT, moist, stiff.	
	1	CB	4.1/5					
5								-5.0
	2	CB	4.0/4					
10								-10.0
	3	CB	4.0/4				Brown silty SAND, fine-grained, saturated, loose.	
							Dark gray clayey SAND, fine-grained, wet to saturated, moderately loose, some silt.	
							Dark gray clayey SILT, moist, moderately stiff to stiff, some sand.	
15	4	CB	1.3/4					-15.0
	5	CB	3.0/4					
20								-20.0

Notes: refusal at 37'

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FIELD BORING LOG

Boring Information: GP6 Boring No: GP6 Well No: AP-6

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
		CB					(cont.) Dark gray clayey SILT, moist, moderately stiff to stiff, some sand.	
	6	CB	4.0/4				Dark gray silty CLAY, moist, moderately stiff, some sand.	
25								-25.0
	7	CB	4.0/4					
30								-30.0
	8	CB	2.7/4					
35	9	CB	4.0/4					-35.0
							Dark brownish gray clayey SAND, fine-grained, moist to wet, moderately loose.	
							End of Boring = 37 Feet	
40								-40.0

Notes: refusal at 37'

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FIELD BORING LOG

Site Information:
Name: Springfield City Water Light and Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 180247

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: 80's F, Sunny

Boring Information:
Boring No: GP7
Well No: GP7
Surf Elev.: 0

Depth Information:
Total: 36.5
Auger: 36.5
Core: N/A

Dates:
Start: 5/16/19
Finish: 5/16/19

Drilling Contractor:
Contractor Name: Bulldog Drilling, Inc.
City: Dupo, IL
Equipment: AMS PowerProbe 9500 w/ 5' MC

Personnel:
Geologist: C. Myrvold
Driller: J. Edwards
Helper(s): S. Guy

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	0.0
							Dark brown clayey silt TOPSOIL, moist, moderately loose.	
							Brown/gray silty CLAY to clayey SILT, moist, stiff, trace sand.	
	1	CB	4.1/5					
5								-5.0
	2	CB	4.0/4					
10								-10.0
	3	CB	4.0/4					
							Gray silty CLAY, moist, stiff.	
15	4	CB	2.7/4					-15.0
							17.0 - 18.0: Soft, saturated.	
							18.0 - 25.0: moderately loose to moderately stiff.	
	5	CB	4.0/4					
20								-20.0

Notes: Refusal at 36.50'

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: GP7 Boring No: GP7 Well No: GP7

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
		CB					(cont.) Gray silty CLAY, moist, stiff.	
	6	CB	4.0/4				23.0 - 25.0: gray to brown/gray.	
25							Dark gray silty CLAY, moist, moderately stiff; some sand.	-25.0
	7	CB	3.1/4					
							Dark gray silty SAND, fine-grained, wet, loose, some clay.	
30								-30.0
	8	CB	3.7/4					
35	9	CB	3.5/ 3.5					-35.0
							Gray to dark gray SHALE, weathered, soft, dry.	
							End of Boring = 36.5 Feet	
40								-40.0

Notes: Refusal at 36.50'

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FIELD BORING LOG

Site Information:
Name: Springfield City Water Light and Power
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 180247

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: 80's F, Sunny

Boring Information:
Boring No: GP8
Well No: GP8
Surf Elev.: 530.08

Depth Information:
Total: 42.0
Auger: 42.0
Core: N/A

Dates:
Start: 5/15/19
Finish: 5/16/19

Drilling Contractor:
Contractor Name: Bulldog Drilling, Inc.
City: Dupo, IL
Equipment: AMS PowerProbe 9500 w/ 5' MC

Personnel:
Geologist: C. Myrvold
Driller: J. Edwards
Helper(s): S. Guy

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	0.0
		CB					Dark brown clayey SILT, moist to wet, loose.	
	1	CB	2.7/4				Brown silty CLAY, moist, stiff, trace sand, black mottling.	
5	2	CB	3.3/4					-5.0
10	3	CB	4.0/4					-10.0
	4	CB	4.0/4				Gray silty CLAY, moist, moderately stiff.	
15								-15.0
	5	CB	4.0/4					
20								-20.0

Notes: Refusal at 42.00'

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: GP8 Boring No: GP8 Well No: GP8

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							(cont.) Gray silty CLAY, moist, moderately stiff.	
	6		2.2/4					
25	7		4.0/4					-25.0
30	8		4.0/4					-30.0
	9		4.0/4					
35							Dark gray clayey SAND, fine-grained, moist, moderately stiff.	-35.0
	10		4.0/4					
40								-40.0

Notes: Refusal at 42.00'

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: GP8 Boring No: GP8 Well No: GP8

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	11	CB	2.0/2					
							Gray to dark gray weathered SHALE, soft, slightly moist.	
							End of Boring = 42 Feet	
45								-45.0
50								-50.0
55								-55.0
60								-60.0

Notes: Refusal at 42.00'

ANDREWS ENGINEERING
3300 Ginger Creek Drive - 217.787.2334
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP
Location: Springfield, IL.
County: Sangamon
Site No.:
AEI No.: 200387

Location:
Coord. System:
Northing: 3401.7
Easting: 1265.0

Weather: 52F Sunny

Boring Information:
Boring No: W-9
Well No: AP-8
Surf Elev.: 537.2

Depth Information:
Total: 39.6
Auger: 4.25" HSA
Core: 5ft. Continuous Sampler

Dates:
Start: 2/25/2021
Finish: 2/25/2021

Drilling Contractor:
Contractor Name: Total Drilling Services/Skinner ltd.
City: Hindsboro, IL.
Equipment: CME 850

Personnel:
Geologist: C.M. Latham
Driller: Todd Skinner
Helper(s): A. Bruce

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	0.0
0–2	1	CB	4/5				**SILTY TOPSOIL** Dark brown, organic roots, moist, low-moderate firm.	
2–5							**SILTY CLAY** Dark brown, firm, moist. Mottling with light brown and grey silty clay. Oxidation. 3'-5'.	
5								-5.0
5–9	2	CB	5/5				**CLAYEY SILT** Grey, oxidation mottling, moist, soft. Increased oxidation at 8'	
9–10							**SAND SEAM** Fine-grained, well sorted, subrounded, saturated, soft.	
10								-10.0
10–11	3	CB	5/5				**CLAYEY SILT** Grey, oxidation, moist, soft.	
11–19							**SILTY CLAY** Light grey, moist, soft	
15	4	CB	5/5					-15.0
20								-20.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: W-9 Boring No: W-9 Well No: AP-8

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5		5/5				**CLAYEY SILT** Brown, moist, soft-firm. Organic roots at 20'. Mottling with grey clay at 23.5'	
							SILTY CLAY Grey, moist, soft.	
25	6		5/5				**SILTY CLAY** Dark grey, firm, moist. Mottled dark grey clay with blue clay at 26.5'	-25.0
							CLAY Dark grey, firm, moist. Mottled dark grey clay with blue clay at 26.5'	
30	7		5/5				**SILTY CLAY** Blue, with trace organic coal fragments, moist, soft, moderate plasticity.	-30.0
35	8		3.5/5				**CLAYEY SILT WITH SAND** Moist, poorly sorted, trace coal.	-35.0
							SAND Loose sands, saturated, poorly sorted.	
	9			60 40			**SHALE** Blue, moist, weathered, with lamination.	
40							End of Boring = 39.6 Feet	-40.0

Notes:

ANDREWS ENGINEERING
3300 Ginger Creek Drive - 217.787.2334
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP
Location: Springfield, IL.
County: Sangamon
Site No.:
AEI No.: 200387

Location:
Coord. System:
Northing: 5216.8
Easting: 703.0

Weather: 43F Sunny

Boring Information:
Boring No: W-8
Well No: AP-9
Surf Elev.: 534.3

Depth Information:
Total: 32.5ft.
Auger: 4.25". HSA
Core: 5ft. Continuous Sampler

Dates:
Start: 2/26/2021
Finish: 2/26/2021

Drilling Contractor:
Contractor Name: Total Drilling Services/Skinner ltd.
City: Hindsboro, IL.
Equipment: CME 850

Personnel:
Geologist: C.M. Latham
Driller: Todd Skinner
Helper(s): A. Bruce

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0	1	CB	5/5				**CLAYEY SILT** Dark brown, organic roots and leaves, moist, soft.	
							CLAYEY SILT Dark brown, moist, firm, slight mottling with dark grey clay.	
5	2	CB	4.5				**SILTY CLAY** Medium brown, silty clay, soft, high plasticity, moist.	-5.0
10	3	CB	4.5/5				Oxidation at 11' Moderate mottling with dark grey clay at 12 ft.	-10.0
15	4	CB	5/5				**SILTY CLAY** Dark grey, moist, soft, high plasticity.	-15.0
							CLAY Light grey clay, moist, soft, mottled with brown clay and oxidation.	
20								-20.0

Notes:

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FIELD BORING LOG

Boring Information: W-8 Boring No: W-8 Well No: AP-9

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	5/5				**SILTY CLAY** Brown, moist, firm, mottled with oxidation. Mottled with blue clay and oxidation.	
							CLAY Blue clay, moist, firm, high plasticity. Increasing silt content.	
25								-25.0
	6	CB	4.5/5				**CLAYEY SILT WITH SAND** Poorly sorted, moist. Gradation to heavier sand content; poorly sorted, moist.	
							SAND AND GRAVEL Sand and gravel with organic coal fragments; moist, poorly sorted.	
30							**SHALE** Grey, laminated, weathered, shale. Firm, Moist.	-30.0
	7	SS		30 88 4				
							End of Boring = 32.5 Feet	
35								-35.0
40								-40.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP
Location: Springfield
County: Sangamon
Site No.:
AEI No.: 200387

Location:
Coord. System:
Northing: 4684.0
Easting: 695.6

Weather: 40F Partly cloudy

Boring Information:
Boring No: W-5
Well No: AP-10
Surf Elev.: 534.4

Depth Information:
Total: 34.97
Auger: 4.25" HSA
Core: 5ft. Continous Sampler

Dates:
Start: 2/24/2021
Finish: 2/24/2021

Drilling Contractor:
Contractor Name: Total Drilling Services/Skinner ltd.
City: Hindsboro, Il.
Equipment: CME 850

Personnel:
Geologist: C.M. Latham
Driller: Todd Skinner
Helper(s): A. Bruce

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	0.0
	1	CB	2.5/5				**SILTY TOPSOIL** Dark brown, moist, very firm, hard silt in shoe.	
							SILT Medium brown, moist, very firm, hard silt in shoe.	
5	2	CB	4/4				**CLAYEY SILT** Brown, moist, soft, homogenous.	-5.0
							SILTY CLAY Brown, high plasticity, moist, very soft, homogenous. Trace sand seen in top of barrel.	
10	3	CB	5				Wet from 10'-15' Free water at 12'5"	-10.0
15	4	CB	5				**SILTY CLAY** Grey, soft, moist. Fine sands, trace gravels at 17'	-15.0
							CLAYEY SILT WITH SAND Blueish grey with trace gravel, soft, moderate sorting.	
20								-20.0

Notes:

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FIELD BORING LOG

Boring Information: W-5 Boring No: W-5 Well No: AP-10

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	5/5				**SANDY GRAVEL** Poorly sorted, sub rounded, saturated, unconsolidated sands. Poorly sorted angular gravel.	
							SILTY CLAY Blue, high plasticity, firm, moist, tight clay. Very thin sand seam, fine grained, saturated at 23' Very thin sand seam, fine grained, saturated at 29.5'	
25								-25.0
	6	CB	5/5					
30								-30.0
	7	CB	4/5				**DIAMICTON** Blue, subrounded, poorly sorted sandy clay, with angular coal up to 0.3ft. Angular gravels; poorly sorted. Trace silts, saturated. Gradation into larger gravel and sand clasts towards bottom with trace silts and no clay.	
							SHALE Grey, moist, with lamination.	
	8	SS		33 60				
35							End of Boring = 34.97 Feet	-35.0
40								-40.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 200387-0025

Location:
Coord. System:
Northing: 4150.6
Easting: 524.5

Weather: Clear 40s

Boring Information:
Boring No: W-4
Well No: AP-11
Surf Elev.: 535.30

Depth Information:
Total: 20.1
Auger: 4.25" HSA
Core: 5ft continous sampler

Dates:
Start: 2/23/2021
Finish: 2/23/2021

Drilling Contractor:
Contractor Name: Total Drilling Services/Skinner LTD
City: Hindsboro
Equipment: CME 850

Personnel:
Geologist: Scott Kangas
Driller: Todd Skinner
Helper(s): Adam Bruce

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0							**CLAYEY SILT TOPSILT** Black to dark brown, moist, soft to moderately stiff.	
	1	CB	3.5/5				**CLAYEY SILT** Dark brown, moist, stiff to hard, homogenous.	
5								-5.0
	2	CB	3.75/5				Very hard, trace fine sand, and oxidation with depth	
10								-10.0
	3	CB	5/5				**SILTY CLAY** Olive gray, moist, soft, heavily oxidated, trace fine sand that increases with depth	
15							**CLAYEY SAND** Dark Gray to reddish brown with depth, wet, soft, fine well sorted sand	-15.0
	4	CB	2.5/5				**GRAVEL AND SAND** Gray, poorly sorted up to 1" angular pieces, wet	
20								-20.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: W-4 Boring No: W-4 Well No: AP-11

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							SHALE Weathered, gray	
							End of Boring = 20.1 Feet	
25								-25.0
30								-30.0
35								-35.0
40								-40.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 200387-0025

Location:
Coord. System:
Northing: 3797.7
Easting: 667.6

Weather: Clear 40s

Boring Information:
Boring No: W-3
Well No: AP-12
Surf Elev.: 537.80

Depth Information:
Total: 27.3
Auger: 4.25" HSA
Core: 5ft continous sampler

Drilling Contractor:
Contractor Name: Total Drilling Services/Skinner LTD
City: Hindsboro, IL
Equipment: CME 850

Personnel:
Geologist: Scott Kangas
Driller: Todd Skinner
Helper(s): Adam Bruce

Dates:
Start: 2/23/2021
Finish: 2/23/2021

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	0.0
		CB					**CLAYEY SILT TOPSOIL** Dark brown, moist, soft to slightly stiff, root structures	
	1	CB	4/5				**CLAYEY SILT** Brown, moist, stiff to hard, heavily oxidated, homogenous	
5	2	CB	4/5				**SILT** Light gray, moist, firm to hard, heavily oxidated, mottling, homogenous.	-5.0
10	3	CB	5/5				**CLAYEY SILT** Brown, moist, stiff to hard, moderate oxidation Lighter in color, trace fine sand, and increase clay content with depth	-10.0
15	4	CB	4/5					-15.0
							SANDY CLAY Gray, wet, soft, fine sand, well sorted and homgenous	
20								-20.0

Notes:

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FIELD BORING LOG

Boring Information: W-3 Boring No: W-3 Well No: AP-12

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	2.5/ 2.5					
	6	CB	2/2.5				**CLAYEY SAND** Dark gray, wet, stiff, well sorted fine sand	
							GRAVEL AND SAND Gray, poorly sorted, angular to subangular, 1.5" or less in size	
25	7	CB	2.3/ 2.3				**SHALE** Gray, weathered	-25.0
							End of Boring = 27.3 Feet	
30								-30.0
35								-35.0
40								-40.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP
Location: Springfield, IL.
County: Sangamon
Site No.:
AEI No.: 200387

Location:
Coord. System:
Northing: 3451.2
Easting: 852.1

Weather: 50F Sunny

Boring Information:
Boring No: W-2
Well No: AP-13
Surf Elev.: 538.6

Depth Information:
Total: 27.6
Auger: 4.25" HSA
Core: 5ft. Continuous Sampler

Dates:
Start: 2/23/2021
Finish: 2/24/2021

Drilling Contractor:
Contractor Name: Total Drilling Services/Skinner ltd.
City: Hindsboro, IL.
Equipment: CME 850

Personnel:
Geologist: C.M. Latham
Driller: Todd Skinner
Helper(s): A. Bruce

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	
0							**SILTY TOPSOIL** Dark Brown-black, moist, soft.	0.0
							CLAYEY SILT Light brown, firm, moist.	
	1	CB	3.5					
							SILT Grey, moist, firm, homogenous.	
5							**SILT** Reddish brown, moist, firm, homogenous.	-5.0
	2	CB	4/5					
10								-10.0
							CLAYEY SILT Reddish brown, mottled with grey clay, moist, soft-firm, homogenous.	
	3	CB	5/5					
15								-15.0
	4	CB	5/5					
20								-20.0

Notes:

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FIELD BORING LOG

Boring Information: W-2 Boring No: W-2 Well No: AP-13

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	1.25/ 2.5				**SAND AND GRAVEL** Dirty olive, saturated, poorly sorted, angular.	
							SHALE Grey, weathered, with lamination.	
25								-25.0
		SS		29 60 4				
							End of Boring = 27.6 Feet	
30								-30.0
35								-35.0
40								-40.0

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP
Location: Springfield, IL
County: Sangamon
Site No.:
AEI No.: 200387

Location:
Coord. System:
Northing: 3171.5
Easting: 1275.2

Weather: 44F Partly Sunny

Boring Information:
Boring No: W-1
Well No: AP-14
Surf Elev.: 536.80

Depth Information:
Total: 27.5
Auger: 4.25" HSA
Core: 5ft Continuous Sampler

Drilling Contractor:
Contractor Name: Total Drilling Services/Skinner ltd.
City: Hindsboro, IL
Equipment: CME 850 4.25" HSA w/ 5' cont. sampler and 2'SS

Personnel:
Geologist: C.M. Latham
Driller: Todd Skinner
Helper(s): A. Bruce

Dates:
Start: 2/25/2021
Finish: 2/26/2021

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	0.0
		CB					**SILTY TOPSOIL** Dark brown, moist, soft, organic leaves	
	1	CB	3.5/5				**SILTY CLAY** Some gravel	
5							**CLAYEY SILT** Dark brown, moist, soft, organic leaves and roots, oxidation	-5.0
	2	CB	5/5				**SILTY CLAY** Medium brown, mottled with grey clay and oxidation, high plasticity, moist, firm.	
10								-10.0
	3	CB	4/5				Groundwater encountered at 14'	
15							**SILTY CLAY** Grey, moist, firm, high plasticity, oxidation	-15.0
	4	CB	5/5				21-21.5' coal fragments with undifferentiated organic materials	
20								-20.0

Notes:

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FIELD BORING LOG

Boring Information: W-1 Boring No: W-1 Well No: AP-14

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	3/5				**SILTY CLAY** Some gravel	
							SAND Coarse grained, poorly sorted, unconsolidated, saturated.	
25	6	SS	3/5	30 60 4			**SHALE** Grey, weatherd with lamination	-25.0
							End of Boring = 27.5 Feet	
30								-30.0
35								-35.0
40								-40.0

Notes:

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3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1128150.33
Easting: 2455538.81

Weather: Sunny 66 F

Boring Information:
Boring No: B1
Well No: T1
Surf Elev.: 535.33

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Dates:
Start: 05/01/2024
Finish: 05/01/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	535.3
0							Dark brown silty CLAY (topsoil); Sample CS1A	
	1		4.0/5				Dark brown silty CLAY; moist	
					0.25			
5								530.0
					0.25			
	2		5.0/5				Sample CS2 7.0-7.5'; saturated 7.5'	
							Free water 9.5'	
10								
							Light brown silty CLAY; gray mottling; Sample CS3A 11.0-11.3'	525.0
					2.0			
	3		5.0/5					
							Sample CS3B 13.0-13.5'	
					2.75			
15								
					1.75			520.0
					0.5		Sample CS4A 15.5-16.0'	
							Brown SAND and GRAVEL; fine to coarse grained; silty clay matrix	
	4		3.0/4.5					
							Gray SANDSTONE; weathered	
							Greenish gray SANDSTONE; fine grained	
20							End of Boring = 19.5 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1128803.76
Easting: 2455006.85

Weather: Sunny 66 F

Boring Information:
Boring No: B2
Well No: T2
Surf Elev.: 547.22

Depth Information:
Total: 35.0'
Auger: 35.0'
Core: -

Dates:
Start: 05/01/2024
Finish: 05/01/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	547.2
0							Dark brown silty CLAY (topsoil); Sample CS1A 0-0.5	
							Brown silty CLAY; moist; Sample CS1B 2.5-3.0	
								545.0
	1		4.3/5		3.0			
					3.0			
5								
							Brown clayey SILT; greenish gray mottling; moist	
								540.0
	2		4.0/5					
							Sample CS2A 8.0-8.5'	
					2.25			
10								
							Sample CS3A 11.0-11.5	
							Dark brown CONCRETIONS; Sample CS3B 12.1-12.3'	
	3		5.0/5				Brown silty CLAY; Sample CS3C	535.0
					1.5			
15								

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: B2 Boring No: B2 Well No: T2

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Sample CS4	
	4		5.0/5					530.0
					4.75			
20								
	5		2.0/2					
							Gray clayey SILT; brown mottling; moist; trace black organics	525.0
							Sample CS6A 23-23.5'	
	6		3.0/3		3.25			
25								
							Increasing black organics; Sample CS7A 25.5-26	
					1.25			
							Gray silty CLAY; brown mottling; moist; trace organics	
								520.0
	7		5.0/5		1.75		Sample CS7B 27.0-28.0'	
30								

Notes:

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FIELD BORING LOG

Boring Information: B2 Boring No: B2 Well No: T2

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
		CB					Sample CS8A	
		CB					Gray to brownish gray SHALE; weathered; wet; Sample CS8B	515.0
	8	CB	5.0/5				Gray SHALE; Sample CS8C 32.25-33.0'	
35							End of Boring = 35 Feet	
								510.0
40								
								505.0
45								

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1130726.70
Easting: 2455622.14

Weather: Cloudy 50 F

Boring Information:
Boring No: B4
Well No: T4
Surf Elev.: 546.56

Depth Information:
Total: 35.0'
Auger: 35.0'
Core: -

Dates:
Start: 04/26/2024
Finish: 04/26/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	546.6
0–5	1	CB	4.7/5		0.5		Brown silty CLAY; moist; organics	545.0
5–10	2	CB	5.0/5		3.5 >5		Brown clayey SILT; moist; trace organics; becoming more dense with depth	540.0
10–15	3	CB	5.0/5		0.5 0.25		Black organics; Sample CS3A Brown silty CLAY; Sample CS3B	535.0
15								

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: B4 Boring No: B4 Well No: T4

Legend: - Continuous Barrel (CB) | - Split Spoon (SS) | - Shelby Tube | - Core | - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Brown clayey SILT; moist	
					0.25			530.0
	4		3.6/5				Brown silty CLAY; moist; medium to fine coarse gravel	
					0.5			
							Gray SHALE; weathered	
							Gray SHALE; weathered; moist	
20								
								525.0
	5		3.6/5					
25							End of Boring = 25 Feet	
								520.0
30								

Notes:

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3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1130996.32
Easting: 2455852.04

Weather: Sunny 43 F

Boring Information:
Boring No: B5
Well No: T5
Surf Elev.: 538.15

Depth Information:
Total: 20.0'
Auger: 20.0'
Core: -

Dates:
Start: 04/25/2024
Finish: 04/25/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	538.2
0					0.25		Brown SILT; moist	
	1		4.6/5		2.0		Dark brown silty CLAY; moist	535.0
					2.25		Dark brown silty CLAY; brown/tan mottling; moist	
5	2		4.8/5		2.25		Olive green to brown silty CLAY; mottling; moist 8.0' Free water	530.0
10							Brown SAND; fine grained; with silt; saturated	
	3		3.8/5		>5.0		Olive green clayey SILT; brown mottling	
15							Gray SHALE; weathered	525.0

Notes:

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FIELD BORING LOG

Boring Information: B5 Boring No: B5 Well No: T5

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	4	CB	1.6/5				Black SHALE; saturated	520.0
20							End of Boring = 20 Feet	
25								515.0
30								510.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP Ash Pond Location: Springfield, Illinois County: Sangamon Site No.: AEI No.: 240227	Coord. System: Northing: 1131175.15 Easting: 2456259.47 Weather: Sunny 43 F	Boring No: B6 Well No: T6 Surf Elev.: 535.96 **Depth Information:** Total: 42.2' Auger: 42.2' Core: -
Drilling Contractor: Contractor Name: Skinner Limited City: Hindsboro, Illinois Equipment: 4 1/4" HSA 5' CSD 3"	**Personnel:** Geologist: S. Van Hook Driller: T. Skinner Helper(s): NA	**Dates:** Start: 04/25/2024 Finish: 04/25/2024

- Continuous Barrel (CB) | - Split Spoon (SS) | - Shelby Tube | - Core | - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	536.0
0							Dark brown silty CLAY (topsoil)	535.0
					1.5		Greenish brown silty CLAY; moist; trace organics	
	1	CB	4.1/5					
5							Greenish brown silty CLAY; gray mottling; trace organics	530.0
	2	CB	4.2/5		2.0			
10							Gray/brown clayey SILT; greenish mottling; moist	525.0
	3	CB	5.0/5		4.5			
							14.0' Wet	
15								

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: B6 Boring No: B6 Well No: T6

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Gray silty CLAY; trace brown mottling; organics	
								520.0
	4		5.0/5		1.75			
							18.0' Saturated	
20							Gray CLAY; saturated; soft	
					0.25			515.0
	5		5.0/5					
							Dark gray SILT; saturated	
25							Dark gray silty CLAY; saturated; small gravel	
								510.0
	6		4.7/5					
					0.5			
30								

Notes:

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FIELD BORING LOG

Boring Information: B6 Boring No: B6 Well No: T6

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Dark gray SILT; saturated; trace white clasts	
								505.0
	7	CB	5.0/5		0.5			
35								
					0.5			
								500.0
							Gray SILT to silty SAND; fine to coarse grained	
	8	CB	3.5/5					
40							Gray SHALE (bedrock)	
	9	CB	1.5/5					495.0
							End of Boring = 42.2 Feet	
45								

Notes:

APPENDIX A4:

IMPOUNDMENT GEOTECHNICAL INVESTIGATION LOGS

Andrews Engineering, Inc.
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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127408.40
Easting: 2456167.19

Weather: Rainy 62 F

Boring Information:
Boring No: B-1U
Well No: B-1U
Surf Elev.: 564.17

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Dates:
Start: 10/13/2023
Finish: 10/13/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kergel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	564.2
0	1	CB					Black CINDERS; moist; loose	
	2	SS	1.0/1.5	4 5 6	2.0		Dark brown silty CLAY; moist; stiff; some black cinders; trace organics; trace gravel	
	3	CB						560.0
5	4	SS	0.9/1.5	2 3 5	1.5			
	5	CB					Black fly ASH with CINDERS; moist to wet; moderately stiff	
	6	SS	1.0/1.5	2 6 6	1.0			
	7	CB						555.0
10	8	SS	0.8/1.5	2 5 6				
	9	CB						
	10	SS	0.8/1.5	1 2 1				
	11	CB						550.0
15	12	SS	1.4/1.5	0 1 1			Black fly ASH; wet; soft	
	13	CB					CINDERS	
							Black fly ASH; wet; soft; laminated	
	14	SS	1.1/1.5	1 2 3	0.25			
	15	CB						545.0
20							End of Boring = 19.5 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127370.68
Easting: 2456072.07

Weather: Sunny 72 F

Boring Information:
Boring No: B-1L
Well No: B-1L
Surf Elev.: 552.56

Depth Information:
Total: 24.5'
Auger: 24.5'
Core: -

Dates:
Start: 10/11/2023
Finish: 10/11/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kergel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Run No.	Recov.	Blow Count	qu/su (tsf)
1			
2	1.1/1.5	2 6 7	3.75
3			
4	1.0/1.5	3 5 4	3.5
5			
6	0.6/1.5	2 3 3	2.5
7			
8	0.6/1.5	1 4 3	2.25
9			
10	0.3/1.5	1 3 3	
11			
12	0.6/1.5	0 2 2	
13			
14	0.5/1.5	4 10 3	
15			
16	1.1/1.5	0 0 2	0.25, 0.5
17			
18	1.4/2.0		
19			2.0

Depth (ft): 0, 5, 10, 15, 20, 25
Elev. (MSL): 552.6, 550.0, 545.0, 540.0, 535.0, 530.0

Description/Comments

Ground Surface

Brown silty CLAY; moist; stiff; some dark brown mottling; few organics; trace ash fragments; trace gravel

16 mm VST@ 9.5' = 7.7, 2.4, 2.8

Brown SAND; medium to coarse grained; moist; loose

Black coal ASH fragments; wet; loose

Dark gray sandy SILT; wet; soft; trace gravel

More clayey

Dark gray CLAY; moist; soft; some organic fragments; trace gravel

20 mm VST@ 22.0' = 13.0+, 3.9, 3.9

End of Boring = 24.5 Feet

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128045.00
Easting: 2456005.51

Weather: Sunny 78 F

Boring Information:
Boring No: B-2U
Well No: B-2U
Surf Elev.: 562.33

Depth Information:
Total: 26.0'
Auger: 26.0'
Core: -

Dates:
Start: 10/12/2023
Finish: 10/12/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	562.3
0	1						Black coal ASH (cinders); moist; loose	
	2		0.4/1.5	2 5 1				560.0
	3							
5	4		0.2/1.5	1 1 2				
	5							
	6		0.8/1.5	2 4 8	2.0		Gray silty CLAY; some yellow brown mottling; some iron concretions; moist; stiff; trace gravel	555.0
	7						Black coal ASH (cinders); wet; loose	
10	8		0.4/1.5	2 5 4				
	9						Black fly ASH; wet; soft; some cinders	
	10		1.5/1.5	1 2 11	<0.25			550.0
	11							
15	12		1.0/1.5	1 0 2	<0.25		With cinders	
	13						Black coal ASH (cinders); wet; loose	
	14		0.4/1.5	3 3 4				545.0
	15							
20	16		0.5/2.0				Black fly ASH; wet; soft; 20 mm VST@ 19.5' = 3.0, 3.2, 3.8	
	17				<0.25			
	18		0.5/1.5	1 2 5			Black CINDERS; wet; loose	540.0
	19						Olive brown CLAY; moist; stiff; some organics	
25	20		0.5/1.5	0 1 2	1.25			
							End of Boring = 26 Feet	

Notes:

Andrews Engineering, Inc.
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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128015.70
Easting: 2455909.16

Weather: Sunny 65 F

Boring Information:
Boring No: B-2L
Well No: B-2L
Surf Elev.: 536.92

Depth Information:
Total: 24.5'
Auger: 24.5'
Core: -

Dates:
Start: 10/10/2023
Finish: 10/10/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)
1	CB			
2	SS	0.5/1.5	1 4 4	1.25
3	CB			
4	SS	1.3/1.5	2 2 3	1.0
5	CB			
6	Shelby Tube	1.8/2.0		2.25
7	CB			
8	SS	1.5/1.5	1 2 2	0.75
9	CB			<0.25
10	SS	1.5/1.5	0 1 1	<0.25
11	CB			
12	SS	1.0/1.5	0 0 1	<0.25
13	CB			
14	SS	1.0/1.5	0 1 1	0.25
15	CB			
16	SS	1.3/1.5	0 1 2	
17	CB			
18	SS	1.5/1.5	1 3 3	0.25
19	CB			

Depth (ft)	Description/Comments	Elev. (MSL)
0	Ground Surface	536.9
0 – 6.6	Gray/brown silty CLAY; some iron concretions; moist; stiff; some organics; some ash fragments; some gravel	535.0
6.6 – 10.5	Light gray clayey SILT; few dark yellow brown mottling; moist; firm; trace iron concretions	530.0
	20 mm VST@9.5' = 13.0, 3.2, 2.8	
10.5 – 17.3	Gray clayey SAND; wet; soft	525.0
17.3 – 19.3	Gray clayey SILT; laminated; moist to wet; soft	520.0
19.3 – 21.5	Brown SAND; medium to coarse grained; wet; loose	
21.5 – 24.5	Dark gray clayey SILT; laminated; moist; soft; organic fragments	515.0
24.5	End of Boring = 24.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP Ash Pond	Coord. System:	Boring No: B-2
Location: Springfield, Illinois	Northing: 1128026.78	Well No: B-2
County: Sangamon	Easting: 2455971.03	Surf Elev.: 554.71
Site No.:	Weather: Cloudy 62 F	**Depth Information:**
AEI No.: 220408		Total: 30.0'
Drilling Contractor:	**Personnel:**	Auger: 30.0'
Contractor Name: Geotechnics Soil & Material Testing	Geologist: S. Van Hook	Core: -
City: Hannibal, Missouri	Driller: A. Kargel	**Dates:**
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	Helper(s): M. Sick	Start: 10/06/2023
		Finish: 10/06/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Description/Comments	Elev. (MSL)
						Ground Surface	554.7
0	1	CB				Gray brown SILT; dry	
	2	SS	0.4/1.5	3 5 5	4.75		
	3	CB					
5	4	SS	0.8/1.5	3 4 6	2.5	Becoming moist	550.0
	5	CB					
	6	SS	0.7/1.5	3 4 4	2.0	Brown silty CLAY; moist	
	7	CB			2.5		
10	8	SS	0.9/1.5	2 4 4		Greenish brown silty CLAY; moist	545.0
	9	CB			1.5		
	10	SS	1.0./1.5	2 3 4			
	11	CB					
15	12	SS	1.0/1.5	1 3 5	2.0	Brown silty CLAY; moist; trace black organics; 16 mm VST@ 14.5' = 7.0, 4.3, 4.2	540.0
	13	CB					
	14	SS	1.0/1.5	1 2 4	2.0		
	15	CB					
20	16	SS	1.4/1.5	1 3 4	2.5	Brownish gray silty CLAY; black/orange inclusions; organics; moist	535.0
	17	CB					
	18	Shelby Tube	1.9/2.0				
	19	CB					
25	20	SS	1.5/1.5	1 3 4	1.0	Brownish/greenish gray silty CLAY; moist; trace brown organics; 16 mm VST@ 25.0' = 5.4, 3.2, 3.5	530.0
	21	CB					
	22	SS	1.5/1.5	0 2 2	<0.25 <0.25	Becoming trace fine grained sand	
						Orangish brown SILT; moist	
	23	CB					
30							525.0
						End of Boring = 30 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127389.92
Easting: 2456246.00

Weather: Sunny 64 F

Boring Information:
Boring No: B-1CCR
Well No: B-1CCR
Surf Elev.: 568.03

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

Dates:
Start: 10/17/2023
Finish: 10/17/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	568.0
0	1	CB					Black bottom ash and CINDERS; moist; loose	
	2	SS	0.5/1.5	5 5 2				565.0
	3	CB						
5	4	SS	0.3/1.5	1 2 3				
	5	CB					Black fly ASH; moist to wet	
	6	SS	0.8/1.5	1 3 3	1.0		Black bottom ASH; moist to wet; moderately loose	560.0
	7	CB						
10	8	SS	1.0/1.5	1 1 1				
	9	CB						
	10	SS	1.2/1.5	1 0 1				555.0
	11	CB						
15	12	SS	1.5/1.5	0 0 1	<0.25		Black fly ASH; moist to wet; moderately firm	
	13	CB					Black bottom ASH; wet; loose	
	14	SS	0.9/1.5	2 6 7				550.0
	15	CB						
20							End of Boring = 19.5 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127355.19
Easting: 2456023.58

Weather: Sunny 65 F

Boring Information:
Boring No: B-1LL
Well No: B-1LL
Surf Elev.: 542.84

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Dates:
Start: 10/10/2023
Finish: 10/10/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)
1	CB			
2	SS	0.2/1.5	6 8 8	
3	CB			
4	SS	0.2/1.5	6 5 5	
5	CB			
6	SS	0.6/1.5	4 4 5	
7	CB			2.25
8	SS	0.6/1.5	7 9 10	
9	CB			
10	SS	0.7/1.5	3 5 5	
11	CB			2.75
12	Shelby Tube	2.0/2		
13	CB			0.5
14	SS	1.4/1.5	1 2 2	0.75
15	CB			

Depth (ft)	Description/Comments
0	Ground Surface (Elev. 542.8)
0–7	Brown clayey SILT; with sand; moist; loose
7–9	Gray silty CLAY; with cinders; dark yellowish brown mottling; moist; stiff
9–12	Gray SAND; medium to coarse grained; wet; loose
12–19.5	Gray silty CLAY; with black organic varved material; few ash fragments
	16 mm VST@ 14.5' = 8.5, 3.6, 4.2
	Very soft
19.5	End of Boring = 19.5 Feet

Notes:

Andrews Engineering, Inc.
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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127375.6
Easting: 2456111.7

Weather: Sunny 62 F

Boring Information:
Boring No: B-1
Well No: B-1
Surf Elev.: 557.77

Depth Information:
Total: 29.5'
Auger: 29.5'
Core: -

Dates:
Start: 10/09/2023
Finish: 10/09/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: R. Carson
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	557.8
0	1						CINDER and GRAVEL (fill)	
	2		0.3/1.5	3 4 2				555.0
	3							
5	4		0.2/1.5	1 2 1			CINDER (fill); dry; loose	
	5						Gray silty CLAY; with cinders; dry; medium stiff	
	6		0.5/1.5	1 3 2				550.0
	7							
10	8		0.9/1.5	1 2 8	1.0		Gray silty CLAY; with gravel and sand; moist; stiff; 20 mm VST@ 9.5' = 6.0, 3.2, 4.3	
	9							
	10		0.8/1.5	0 1 3	1.0		Gray sandy CLAY; moist; medium stiff	545.0
	11						Gray SANDY LOAM	
15	12		0.9/1.5	4 18 9			Black CINDER (fill); with gravel and silty clay; wet; loose	
	13							
	14		0.2/1.5	1 1 1				540.0
	15							
20	16		1.1/1.5	1 1 3	0.3		Gray SANDY LOAM; wet; slightly stiff	
	17						Gray SILTY LOAM; wet; soft; 20 mm VST@ 51.5' = 6.7, 2.3, 2.5	
	18		1.1/1.5	0 0 3				535.0
	19							
25	20		1.8/2.0				Gray SANDY LOAM; moist	
	21				0.7			
	22		1.2/1.5	2 3 5	1.5		Gray silty CLAY; moist; stiff	530.0
	23							
30							End of Boring = 29.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128059.37
Easting: 2456087.51

Weather: Sunny 64 F

Boring Information:
Boring No: B-2CCR
Well No: B-2CCR
Surf Elev.: 566.77

Depth Information:
Total: 26.0'
Auger: 26.0'
Core: -

Dates:
Start: 10/17/2023
Finish: 10/17/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	566.8
0	1	CB					Mix of lime sludge, and fly and bottom ASH; some dark yellow brown mottling; moist; soft	565.0
	2	SS	1.3/1.5	1 1 1	0.25			
	3	CB						
5	4	SS	1.6/1.5	1 0 1			More bottom ash	
	5	CB					Lime SLUDGE; wet; soft	560.0
	6	SS	0.9/1.5	1 5 3	<0.25			
	7	CB						
10	8	SS	1.5/1.5	0 0 0	<0.25		Black fly ASH; moist; soft; some organic fragments	
	9	CB						555.0
	10	SS	1.5/1.5	0 0 0			Some bottom ash	
	11	CB						
15	12	SS	1.5/1.5	0 0 0	<0.25			
	13	CB					Black bottom ASH; wet; loose	550.0
	14	SS	0.4/1.5	1 0 1				
	15	CB						
20							End of Boring = 19.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128663.99
Easting: 2456486.97

Weather: Sunny 69 F

Boring Information:
Boring No: B-3
Well No: B-3
Surf Elev.: 554.19

Depth Information:
Total: 29.5'
Auger: 29.5'
Core: -

Dates:
Start: 10/18/2023
Finish: 10/18/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Run No.	Sample Recov.	Blow Count	qu/su (tsf)
1			
2	0.5/1.5	1 1 2	1.0
3			
4	0.9/1.5	2 2 2	
5			
6	0.8/1.5	1 2 3	2.57
7			
8	1.5/2.0		
9			1.5
10	1.0/1.5	1 3 3	1.5
11			
12	1.3/1.5	2 3 4	1.5
13			
14	1.2/1.5	1 2 5	1.25
15			
16	1.6/2.0		
17			1.75
18	1.5/1.5	1 2 4	
19			
20	1.1/1.5	0 2 2	1.25
21			0.5
22	1.2/1.5	0 2 4	2.75
23			

Depth (ft): 0, 5, 10, 15, 20, 25, 30 — Elev. (MSL): 554.2, 550.0, 545.0, 540.0, 535.0, 530.0, 525.0

Description/Comments

Ground Surface (554.2)

Dark yellowish brown silty CLAY; organic staining; moist; stiff

Brown/gray SAND; coarse grained; moist to wet; loose

Dark yellowish brown silty CLAY; organic staining; moist; stiff

16 mm VST@ 9.5' = 9.3, 5.3, 5.4

Black/gray

With dark yellow brown mottling

16 mm VST@ 19.5' = 11.8, 5.0, 5.1

Manganese oxide concretions

Dark yellowish brown silty CLAY; more silty; organic staining; moist; stiff

Yellow brownclayey SILT; some dark yellow brown mottling; laminated; some magnesium oxide concretions; moist; soft; 16 mm VST@ 24.5' = 9.1, 6.0, 5.9

Yellow brown silty CLAY; some dark yellow brown mottling; few manganese oxide concretions; moist; stiff

End of Boring = 29.5 Feet

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128634.05
Easting: 2456502.96

Weather: Sunny 64 F

Boring Information:
Boring No: B-3U
Well No: B-3U
Surf Elev.: 562.94

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Dates:
Start: 10/17/2023
Finish: 10/17/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	562.9
0	1	CB					Dark yellowish brown silty CLAY; some iron concretions; moist; stiff; trace gravel	
	2	SS	0.8/1.5	2 4 7	3.25		GYPSUM; moist; loose	560.0
	3	CB						
5	4	SS	0.5/1.5	2 2 2				
	5	CB					Olive gray silty CLAY; few dark yellow brown mottling; laminated; some bottom ash; moist; stiff; trace gravel	
	6	SS	0.7/1.5	2 4 6	1.5			555.0
	7	CB					16 mm VST@ 9.5' = 0.8, 3.9, 4.2	
10	8	Shelby Tube	1.3/2.0					
	9	CB					Bottom ASH; moist to wet; loose	
	10	SS	0.5/1.5	1 0 1			Fly ASH; wet; soft	550.0
	11	CB						
15	12	SS	1.5/1.5	0 1 0			Little bottom ASH	
	13	CB			0.5			
	14	SS	1.5/1.5	0 0 1	0.5			545.0
	15	CB			<0.25			
20							End of Boring = 19.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128336.73
Easting: 2456638.09

Weather: Sunny 65 F

Boring Information:
Boring No: B-3CCR
Well No: B-3CCR
Surf Elev.: 564.05

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Dates:
Start: 10/20/2023
Finish: 10/20/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	564.0
0	1	CB					Fly ash with bottom ASH; moist; moderately firm	
	2	SS	0.7/1.5	1 3 4	1.0			
	3	CB						560.0
5	4	SS	1.5/1.5	1 0 0	<0.25		Light gray lime SLUDGE; with rootlets; some organics; moist; soft	
	5	CB						
	6	SS	0.9/1.5	0 1 1	<0.25			
	7	CB					Fly ASH; moist to wet; soft; strong petroleum odor	555.0
10	8	SS	1.1/1.5	0 0 0	<0.25			
	9	CB					Some organic matter; strong petroleum odor	
	10	SS	1.5/1.5	0 0 0	<0.25			
	11	CB						550.0
15	12	SS	1.4/1.5	0 0 0				
	13	CB					Faint odor	
	14	SS	1.5/1.5	0 0 0				
	15	CB						545.0
20							End of Boring = 19.5 Feet	

Notes:

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3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127789.13
Easting: 2456023.78

Weather: Sunny 62 F

Boring Information:
Boring No: B-4
Well No: B-4
Surf Elev.: 555.18

Depth Information:
Total: 34.5'
Auger: 34.5'
Core: -

Dates:
Start: 10/09/2023
Finish: 10/09/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: R. Carson
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	555.2
0	1						Gray silty CLAY; with cinders; dry; stiff	
	2		0.8/1.5	3 6 6	3.3		Brown silty CLAY; dry; stiff	
	3							
5	4		0.2/1.5	4 6 5	4.0		Gray silty CLAY; with cinders	550.0
	5							
	6		0.7/1.5	2 3 4	1.0		Brown/gray silty CLAY; moist; moderately stiff; trace cinders	
	7							
10	8		0.6/1.5	1 3 4	1.0		Gray silty CLAY; moist; moderately stiff; 16 mm VST@ 9.5' = 4.4, 2.5, 2.7	545.0
	9							
	10		0.8/1.5	0 1 2	0.5		Gray silty CLAY; moist; soft	
	11							
15	12		0.9/1.5	1 2 3	1.0		Brown/gray silty CLAY; mottling; moist; soft	540.0
	13							
	14		0.6/1.5	0 2 2	1.1			
	15							
20	16		1.3/2.0				Brown silty CLAY; oxidation staining; moist; moderately stiff; 16 mm VST@ 19.5' = 2.6, 1.7, 1.7	535.0
	17				2.1			
	18		0.8/1.5	0 0 1	0.5			
	19							
25	20		0.9/1.5	0 0 1	0.2-0.5		Soft	530.0
	21							
	22		1.5/1.5	0 1 2	0.1		Brown/gray silty LOAM; wet; soft; trace sand	
	23							
30	24		1.5/1.5	0 0 0	0.1		Brown sandy LOAM; wet; very soft	525.0
	25							
	26		1.5/1.5	0 0 0	0.5		Brown/gray silty CLAY; wet; soft	
	27							
35							End of Boring = 34.5 Feet	520.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127802.23
Easting: 2456057.41

Weather: Sunny 78 F

Boring Information:
Boring No: B-4U
Well No: B-4U
Surf Elev.: 563.01

Depth Information:
Total: 29.0'
Auger: 29.0'
Core: -

Dates:
Start: 10/12/2023
Finish: 10/12/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	563.0
0	1	CB					Black CINDERS; moist; loose	
	2	SS	0.4/1.5	3 6 1				560.0
	3	CB					Black silty CLAY; with fly ash; moist; stiff; some organic fragments	
5	4	SS	0.7/1.5	1 0 1	2.75			
	5	CB					Olive gray silty CLAY; some dark yellow brown mottling; moist; stiff	
	6	SS	0.7/1.5	1 2 2	1.75		Black CINDERS; wet; loose	555.0
	7	CB						
10	8	SS	0.8/1.5	1 0 0	<0.25		Black fly ASH; wet; soft	
	9	CB						
	10	SS	1.0/1.5	2 4 3				550.0
	11	CB						
15	12	SS	0.9/1.5	0 2 2				
	13	CB						
	14	SS	1.1/1.5	1 3 6				545.0
	15	CB					Black CINDERS; wet; loose	
20	16	SS	0.7/1.5	2 3 4				
	17	CB					Light gray/black fly ASH	
	18	SS	1.2/1.5	0 0				540.0
	19	CB					Olive gray silty CLAY; some dark yellow brown mottling; moist; moderately stiff; trace organics	
25	20	SS	0.4/1.5	0 0 1	1.25			
	21	CB						
	22	Shelby Tube	1.9/2.0					535.0
					1.25		End of Boring = 29 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127732.94
Easting: 2455960.98

Weather: Sunny 65 F

Boring Information:
Boring No: B-4L
Well No: B-4L
Surf Elev.: 533.51

Depth Information:
Total: 21.5'
Auger: 21.5'
Core: -

Dates:
Start: 10/10/2023
Finish: 10/10/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	533.5
0	1	CB					Dark gray silty CLAY; some dark yellow brown mottling; some organic fragments; moist; soft; some gravel; trace coal fragments	
	2	SS	0.4/1.5	3 2 1	0.25			530.0
	3	CB						
5	4	SS	0.7/1.5	1 1 1	<0.25			
	5	CB					Grading to light gray	
	6	SS	1.4/1.5	1 2 2	0.25		Light gray silty CLAY; some dark yellow brown mottling; few iron concretions; moist; soft	525.0
	7	CB						
10	8	SS	1.5/1.5	1 1 2	0.75			
	9	CB						
	10	Shelby Tube	1.2/2.0				16 mm VST@ 12.0' = 5.6, 2.6, 2.4	520.0
	11	CB			1.75		Gray clayey SILT; some dark yellow brown mottling; trace iron concretions; laminated; moist to wet; soft	
15	12	SS	1.4/1.5	0 1 2	0.5			
	13	CB						
	14	SS	1.5/1.5	0 0 0	<0.25		Light gray silty CLAY; some dark yellow brown mottling; moist; soft	515.0
	15	CB						
20	16	Shelby Tube	0.0/2.0				Shelby tube attempted but no recovery; 20 mm VST@ 19.5' = 4.2, 1.4, 1.6	
							End of Boring = 21.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1127834.10
Easting: 2456152.87

Weather: Sunny 64 F

Boring Information:
Boring No: B-4CCR
Well No: B-4CCR
Surf Elev.: 567.59

Depth Information:
Total: 21.0'
Auger: 21.0'
Core: -

Dates:
Start: 10/17/2023
Finish: 10/17/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	567.6
0	1	CB					Dark yellow brown silty CLAY; moist; stiff; some bottom ash	
	2	SS	0.8/1.5	1 3 3	1.75			565.0
	3	CB					Dark gray fly ash with bottom ASH; moist; moderately loose	
5	4	SS	0.4/1.5	2 2 2				
	5	CB					Gray lime SLUDGE; with layers of fly ash; wet; soft; few organic fragments	
	6	SS	1.2/1.5	2 3 3	<0.25			560.0
	7	CB						
10	8	SS	1.4/1.5	0 0 0	<0.25		Black fly ASH; moist; soft; trace to some organic fragments	
	9	CB						
	10	SS	1.5/1.5	1 0 0	<0.25			555.0
	11	CB						
15	12	SS	1.5/1.5	0 0 1	<0.25		Black bottom ash with fly ASH; wet; moderately loose; some organic fragments	
	13	CB			<0.25		Black fly ash with bottom ASH; wet; moderately soft; some organic fragments	
	14	SS	0.2/1.5	0 1 1				550.0
	15	CB						
20	16	SS	0.9/1.5	0 1 3			Black bottom ASH; wet; loose	
							End of Boring = 21 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP Ash Pond Location: Springfield, Illinois County: Sangamon Site No.: AEI No.: 220408	Coord. System: Northing: 1129302.48 Easting: 2455281.11 Weather: Cloudy, 62 F	Boring No: B-5 Well No: B-5 Surf Elev.: 553.62 **Depth Information:** Total: 39.5' Auger: 39.5' Core: -
Drilling Contractor: Contractor Name: Geotechnics Soil & Material Testing City: Hannibal, Missouri Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	**Personnel:** Geologist: S. Van Hook Driller: A. Kargel Helper(s): M. Sick	**Dates:** Start: 10/06/2023 Finish: 10/06/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	553.6
0	1						Greenish brown SILT; dry	
	2		0.9/1.5	3 7 7	4.5			
	3							550.0
5	4		0.7/1.5	3 4 8	3.5		Greenish brown silty CLAY	
	5							
	6		0.5/1.5	2 2 4	2.5		Brown mottling	
	7							545.0
10	8		0.9/1.5	2 4 5	1.5			
	9							
	10		0.9/1.5	2 5 6	3.5			
	11							540.0
15	12		0.8/1.5	3 4 7			16 mm VST@15.0' = 1.3, 3.3, 3.2	
	13				3.0			
	14		0.7/1.5	2 5 6	3.5			
	15							535.0
20	16		0.9/1.5	1 5 8	4.5		Dark gray clayey SILT; moist; wood chucks	
	17							
	18		0.9/1.5	2 5 5	2.0			
	19							530.0
25	20		1.9/2.0				16 mm VST@ 24.0' = 3.7-3.8	
	21							
	22		1.3/1.5	0 1 2	0.5		Brown silty CLAY; moist	
	23							525.0
30	24		1.2/1.5	0 0 1	<0.25		Saturated	
	25							
	26		1.2/1.5	0 1 2	0.5		Brown silty CLAY; trace greenish gray and dark brown mottling	
	27							520.0
35	28		1.5/1.5	0 2 2	0.25		BroVery little silt	
	29							
	30		1.5/1.5	0 0 2				
	31							515.0
40							End of Boring = 39.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1129295.29
Easting: 2455215.62

Weather: Sunny, 87 F

Boring Information:
Boring No: B-5L
Well No: B-5L
Surf Elev.: 534.00

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Dates:
Start: 10/03/2023
Finish: 10/03/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: R. Carson
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	534.0
0	1	CB					Dark brown silty CLAY; dry; stiff	
	2	SS	0.5/1.5	4 6 5	>4.5			
	3	CB						530.0
5	4	SS	1.0/1.5	5 5 7	2.7			
	5	CB						
	6	SS	0.2/1.5	2 2 2			Soft	
	7	CB						525.0
10	8	Shelby Tube	1.6/2.0		0.5		Gray silty CLAY; soft; 20 mm VST@ 9.5' = 5.8, 2.5, 2.9	
	9	CB			0.2-0.7			
	10	SS	1.5/1.5	0 2 1			Gray CLAY; very soft	
	11	CB						520.0
15	12	SS	1.5/1.5	0 1 2	0.2-0.5			
	13	CB						
	14	SS	1.5/1.5	0 0 0	0.1		Gray sandy CLAY; very soft	
	15	CB					Gray SAND; 20 mm VST@19.0' = 7.2, 3.2, 3.2	515.0
20							End of Boring = 19.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1129333.75
Easting: 2455341.56

Weather: Sunny, 87 F

Boring Information:
Boring No: B-5CCR
Well No: B-5CCR
Surf Elev.: 552.59

Depth Information:
Total: 19.5'
Auger: 19.5'
Core: -

Dates:
Start: 10/03/2023
Finish: 10/03/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: R. Carson
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	552.6
0	1						Bottom ASH	
	2		0.9/1.5	14 12				550.0
	3				4.5		Dark gray sandy LOAM; stiff	
5	4		1.4/1.5	3 2 3	1.0		Dark gray SAND; bottom ash; wet	
	5							
	6		1.5/1.5	1 1 1	1.0		Dark gray sandy LOAM; bottom ash	545.0
	7							
10	8		0.6/1.5	1 4 6			Black SAND; bottom ash; wet	
	9							
	10		0.4/1.5	5 9 4				540.0
	11							
15	12		0.2/1.5	0 1 1			Black SAND; coarse grained; bottom ash; wet	
	13							
	14		0.2/1.5	3 2 3				535.0
	15							
20							End of Boring = 19.5 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1130094.72
Easting: 2455316.59

Weather: Mostly Cloudy, 71 F

Boring Information:
Boring No: B-6
Well No: B-6
Surf Elev.: 553.93

Depth Information:
Total: 40.0'
Auger: 40.0'
Core: -

Dates:
Start: 10/05/2023
Finish: 10/05/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: S. Van Hook
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Description/Comments	Elev. (MSL)
						Ground Surface	553.9
0	1		1.3/2.0	5 15 37 33		Dark brown SILTY (fill)	
	2		0.8/2.0	5 5 6 7	+4.5	Dark brown silty CLAY; moist	550.0
5	3						
	4		0.7/1.5	2 3 5	2.25		
	5						
	6		0.8/1.5	1 3 7	2		545.0
10	7						
	8		0.8/1.5	5 8 7		8.2 mm VST@ 9.5' = 1.3-1.4	
	9				4.0		
	10		0.9/1.5	3 4 6	4.0		540.0
15	11						
	12		1.2/1.5	2 4 6	3.0	13 mm VST@ 15.0' = 4.7-4.6	
	13						
	14		2.0/2.0				535.0
20	15		1.4/2.0	2 5 6 10	2.7		
	16		1.5/2.0	5 10 11 12	4.2	Dark greenish gray silty CLAY; moist	
	17		1.3/2.0	2 4 6 8	3.0	Gray CLAY and SAND; with coal; brown mottling	530.0
25	18		1.6/2.0	1 5 6 6	2.0	Gray silty CLAY; 6.1 mm VST@ 25.5' = 4.0-3.9	
	19		2.0/2.0	1 1 2 2	1.0	Gray clayey SILT	525.0
30	20		1.9/2.0	0 0 0 2	0.25		
	21						
	22		2.0/2.0	0 0 0 2	<0.25	Gray silty CLAY; yellow brown mottling	520.0
35	23		2.0/2.0	0 0 0 0	<0.25	Brown CLAY; mottling light brown; trace sand	
	24		1.8/2.0	0 2 2 3	1.0	Light gray clayey sandy SILT; mottling yellow brown	515.0
40	25						
						End of Boring = 40 Feet	

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1130067.17
Easting: 2455388.17

Weather: Sunny, 65 F

Boring Information:
Boring No: B-6CCR
Well No: B-6CCR
Surf Elev.: 553.32

Depth Information:
Total: 24.5'
Auger: 24.5'
Core: -

Dates:
Start: 10/20/2023
Finish: 10/20/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	553.3
0	1						Gray fly ASH; moist; friable; some gypsum; trace bottom ash	
	2		1.0/1.5	13 12				
	3						Bottom ASH; moist; loose	550.0
5	4		0.9/1.5	5 3 2				
	5							
	6		1.1/1.5	2 2 2	<0.25		Fly ASH; moist to wet; soft	545.0
	7							
10	8		1.5/1.5	1 0 0	<0.25		Fly ASH; wet; soft	
	9							
	10		0.6/1.5	0 0 0	<0.25			540.0
	11							
15	12		1.5/1.5	0 0 0	<0.25			
	13							
	14		1.5/1.5	0 0 0	<0.25			535.0
	15							
20	16		1.5/1.5	0 0 0	<0.25			
	17							
	18		1.5/1.5	0 0 0	<0.25			530.0
	19							
25							End of Boring = 24.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1130413.91
Easting: 2455917.71

Weather: Haze, 79 F

Boring Information:
Boring No: B-7
Well No: B-7
Surf Elev.: 552.56

Depth Information:
Total: 39.5'
Auger: 39.5'
Core: -

Dates:
Start: 10/04/2023
Finish: 10/04/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: R. Carson
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	552.6
0	1						Brown/gray sandy CLAY; mottling; dry; very stiff	
	2		0.6/1.5	3 5 6	>4.5			550.0
	3						Brown silty CLAY; slightly moist; very stiff	
5	4		0.5/1.5	3 4 7	2.5			
	5						BrowGray silty LOAM; slightly moist; stiff	
	6		0.7/1.5	3 4 5	2.5			545.0
	7							
10	8		0.7/1.5	2 3 6	2.4		Gray silty CLAY; 16 mm VST@ 9.5' = 13+, 5.2, 5.2	
	9						Gray silty LOAM	
	10		0.8/1.5	2 4 7	2.2			540.0
	11						Gray silty LOAMSlightly moist; fractured	
15	12		0.9/1.5	2 4 7	2.3			
	13							
	14		0.5/1.5	2 4 5	2.5		Brown sandy LOAM; moist; stiff	535.0
	15							
20	16		2.0/2.0				Brown/gray silty LOAM; mottling; moist; stiff; 16 mm VST@ 19.5' = 11.4, 6.1, 6.2	
	17				2.1			
	18		1.2/1.5	2 3 5	1.6		Brown/gray silty CLAY; mottling; moist; stiff	530.0
	19							
25	20		1.4/1.5	2 3 5	1.7			
	21						Red brown SAND; moist; loose	
	22		1.5/1.5	0 1 2	0.2		Brown sandy LOAM; wet; soft	525.0
	23						Brown/gray silty LOAM; with sand; moist; soft	
30	24		1.5/1.5	0 2 2	0.5 1.2			
	25							
	26		1.5/1.5	0 1 1	0.2			520.0
	27							
35	28		1.5/1.5	0 0 2	0.5			
	29							
	30		1.5/1.5	1 1 1	0.8		Gray SILT; very moist; soft	515.0
	31							
40							End of Boring = 39.5 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP Ash Pond	Coord. System:	Boring No: B-7CCR
Location: Springfield, Illinois	Northing: 1130310.33	Well No: B-7CCR
County: Sangamon	Easting: 2455947.06	Surf Elev.: 552.18
Site No.:		**Depth Information:**
AEI No.: 220408	Weather: Cloudy, 58 F	Total: 19.5'
Drilling Contractor:	**Personnel:**	Auger: 19.5'
Contractor Name: Geotechnics Soil & Material Testing	Geologist: M. Hewitt	Core: -
City: Hannibal, Missouri	Driller: M. Sick	**Dates:**
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	Helper(s): B. Hummel	Start: 10/19/2023
		Finish: 10/19/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	552.2
0	1	CB					Fly ash, bottom ASH and cinder (fill); moist to wet; soft	
	2	SS	1.0/1.5	3 2 2	0.25			550.0
	3	CB						
5	4	SS	1.0/1.5	0 1 1	<0.25		Bottom ASH; moist; loose	
	5	CB					Fly ASH; wet; soft	
	6	SS	0.6/1.5	0 0 0	<0.25			545.0
	7	CB						
10	8	SS	1.1/1.5	0 0 0	<0.25			
	9	CB						
	10	SS	1.5/1.5	0 0 0	<0.25			540.0
	11	CB						
15	12	SS	1.3/1.5	0 0 0	<0.25			
	13	CB						
	14	SS	1.5/1.5	0 0 0	<0.25			535.0
	15	CB						
20							End of Boring = 19.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP Ash Pond	Coord. System:	Boring No: B-8U
Location: Springfield, Illinois	Northing: 1130083.21	Well No: B-8U
County: Sangamon	Easting: 2456391.16	Surf Elev.: 551.74
Site No.:		**Depth Information:**
AEI No.: 220408	Weather: Cloudy, 58 F	Total: 33.5'
		Auger: 33.5'
Drilling Contractor:	**Personnel:**	Core: -
Contractor Name: Geotechnics Soil & Material Testing	Geologist: M. Hewitt	**Dates:**
City: Hannibal, Missouri	Driller: M. Sick	Start: 10/19/2023
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	Helper(s): B. Hummel	Finish: 10/19/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	551.7
0	1						Dark gray to brown silty CLAY; moist; moderatyely firm; some organic fragments; some bottom ash	
								550.0
	2		0.8/1.5	1 2 2	1.0			
	3							
5	4		0.9/1.5	3 5 5	4.0			
	5							545.0
	6		1.0/1.5	3 5 6	4.5			
	7							
10	8		1.8/2.0				16 mm VST@ 9.5' = 10.0, 3.8, 3.9	
	9				0.75			540.0
	10		1.1/1.5	2 2 5	1.5		Color grades to light brown; more clayey; some dark yellow brown mottling; some iron oxide modules	
	11							
15	12		0.8/1.5	2 3 5	1.5		Black/dark brown silty CLAY; moist; stiff; trace coal fragments	
	13							535.0
	14		0.9/1.5	2 4 7	3.0			
	15							
20	16		1.7/2.0		2.25		16 mm VST@ 19.5' = 11.2, 4.0, 3.8	
	17							530.0
	18		1.0/1.5	3 6 7	2.5		Trace organic fragments	
	19							
25	20		1.3/1.5	1 1 3	0.5		16 mm VST@ 24.5' = 5.8, 3.2, 3.0 More silty; some organics	
	21						Dark gray clayey SILT; moist to wet; moderately soft; some organics	525.0
	22		1.5/1.5	1 1 2	0.5			
	23							
30	24		1.3/1.5	1 1 2	0.75			
	25							520.0
	26		1.5/1.5	0 1 1	0.5			
							End of Boring = 33.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1130467.06
Easting: 2455885.37

Weather: Sunny, 85 F

Boring Information:
Boring No: B-7L
Well No: B-7L
Surf Elev.: 533.19

Depth Information:
Total: 20.0'
Auger: 20.0'
Core: -

Dates:
Start: 10/02/2023
Finish: 10/02/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: K. Finke
Driller: M. Sick
Helper(s): A. Kargel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Description/Comments	Elev. (MSL)
						Ground Surface	533.2
0	1				3.5	Gray silty CLAY; dry; very firm; trace sand	
	2		0.5/1.5	3 5 7			530.0
	3						
5	4		0.5/1.5	3 4 7	1.5	Reddish brown clayey SILT; moist; trace sand	
	5						
	6			3 3 3	1.0	Brownish red SAND; wet	525.0
	7						
10	8		0.6/1.5	W 3 2		20 mm VST@ 10.0' = 3.8, 1.2	
	9				0.25	Brownish red SAND with dark black SILT; ash	
	10		1.5/1.5	2 1 2		ASH	
	11				0.25	Gray silty CLAY; wet; soft	520.0
15	12		0.9/1.5	W W W	0.25	Gray clayey SILT; moist; soft	
	13						
	14		1.1/1.5	W W W	0		515.0
	15						
20						20 mm VST@ 20.0' = 6.7, 3.0, 3.1	
						End of Boring = 20 Feet	

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1130109.51
Easting: 2456566.64

Weather: Haze, 79 F

Boring Information:
Boring No: B-8L
Well No: B-8L
Surf Elev.: 530.62

Depth Information:
Total: 24.5'
Auger: 24.5'
Core: -

Dates:
Start: 10/04/2023
Finish: 10/04/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: R. Carson
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)
1	Blind Drill			
2	SS	0.8/1.5	4 6 7	>4.5
3	Blind Drill			
4	SS	0.2/1.5	4 3 4	
5	Blind Drill			
6	SS	1.1/1.5	1 1 1	0.1
7	Blind Drill			
8	SS	1.5/1.5	1 1 1	0.0-0.1
9	Blind Drill			
10	Shelby Tube	1.6/2.0		
11	Blind Drill			0.5
12	SS	1.4/1.5	1 1 1	0.5
13	Blind Drill			
14	SS	1.1/1.5	0 1 3	
15	Blind Drill			
16	SS	1.4/1.5	0 0 1	0.2
17	Blind Drill			
18	SS	1.5/1.5	0 0 0	0.1
19	Blind Drill			

Depth (ft)	Description/Comments	Elev. (MSL)
0	Ground Surface	530.6
0	Brown silty LOAM; dry; hard	
4.5	Brown silty CLAY; moist; stiff	525.0 (at 5.6)
	Wet; soft	
	20 mm VST@9.5' = 5.4, 3.4, 3.8	
	Wet; very soft	520.0 (at 10.6)
	Some mottling; wet; soft	
15	Brown sandy LOAM; wet; soft	
	Gray sandy LOAM; wet; soft	515.0 (at 15.6)
	Gray SAND; loose; trace clay	
20.5	Gray SILT; wet; soft	510.0 (at 20.6)
	20 mm VST@ 22.0' = 6.8, 3.4, 3.8	
	Gray sandy LOAM; wet; soft	
24.5	End of Boring = 24.5 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP Ash Pond	Coord. System:	Boring No: B-9U
Location: Springfield, Illinois	Northing: 1129690.26	Well No: B-9U
County: Sangamon	Easting: 2456402.29	Surf Elev.: 552.15
Site No.:	Weather: Cloudy, 58 F	**Depth Information:**
AEI No.: 220408		Total: 40.0'
Drilling Contractor:	**Personnel:**	Auger: 40.0'
Contractor Name: Geotechnics Soil & Material Testing	Geologist: M. Hewitt	Core: -
City: Hannibal, Missouri	Driller: M. Sick	**Dates:**
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	Helper(s): B. Hummel	Start: 10/19/2023
		Finish: 10/19/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	552.2
0	1	CB					Dark brown/gray silty CLAY; moist; stiff	
	2	SS	0.7/1.5	3 7 7	4.0			550.0
	3	CB						
5	4	SS	1.0/1.5	3 4 6	3.75			
	5	CB						
	6	SS	0.5/1.5	3 3 6	2.25		More clayey; trace bottom ash fragments	545.0
	7	CB						
10	8	ST	1.7/2.0				Yellow brown silty CLAY; moist; stiff; laminated; trace iron nodules; 16 mm VST@ 9.5' = 7.5, 4.1, 3.5	
	9	CB			1.0			540.0
	10	SS	0.8/1.5	2 4 5	2.75		Black silty CLAY; few cinders (bottom ash); moist; stiff	
	11	CB						
15	12	SS	0.8/1.5	3 5 8	3.0			
	13	CB						
	14	SS	0.7/1.5	2 4 6	2.5			535.0
	15	CB						
20	16	ST	1.9/2.0				16 mm VST@ 19.5' = 11.3, 6.0, 5.6	
	17	CB			3.25			530.0
	18	SS	0.8/1.5	2 5 7	2.25		Trace organic fragments; trace coal fragments	
	19	CB						
25	20	SS	0.9/1.5	1 4 5	2.25		16 mm VST@ 24.5' = 7.0, 3.8, 3.5	
	21	SS	1.1/2.0	2 5 6 7	2.5 0.75		Light brown silty clay to CLAY; moist; stiff; some iron oxidized nodules; trace organic fragments; rootlets; more clayey at 26.5'	525.0
	22	SS	1.2/2.0	3 4 5 6	0.75		Gray CLAY	
30	23	SS	1.5/2.0	1 2 4 5	1.0		Some dark yellow brown mottling; some iron oxidized nodules	
	24	SS	1.6/2.0	0 1 2 3	0.5		Black to dark gray clayey SILT; moist; soft; trace organic fragments	520.0
35	25	SS	1.7/2.0	0 2 3 4	0.5			
	26	SS	2.0/2.0	0 1 3 3	1.0		Dark gray clayey SILT; moist; moderately stiff; with organic fragments; some coal; glauconite the last 0.3'	515.0
	27	SS	2.0/2.0	0 1 2 4	0.75		Dark gray clayey SAND; moist; moderately stiff; trace coal fragments	
40							Dark gray sandy CLAY; moist; moderately stiff; trace coal fragments	
							End of Boring = 40 Feet	

Notes:

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FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP Ash Pond Location: Springfield, Illinois County: Sangamon Site No.: AEI No.: 220408	Coord. System: Northing: 1129680.19 Easting: 2456242.16 Weather: Sunny, 69 F	Boring No: B-9CCR Well No: B-9CCR Surf Elev.: 553.97 **Depth Information:** Total: 19.5' Auger: 19.5' Core: -
Drilling Contractor: Contractor Name: Geotechnics Soil & Material Testing City: Hannibal, Missouri Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	**Personnel:** Geologist: M. Hewitt Driller: A. Kargel Helper(s): M. Sick	**Dates:** Start: 10/18/2023 Finish: 10/18/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	554.0
0	1	CB					Bottom ASH; moist	
	2	SS	0.3/1.5	1 6 4				
	3	CB						550.0
5	4	SS	1.5/1.5	0 1 0	<0.25		Fly ASH; wet; soft	
	5	CB						
	6	SS	1.5/1.5	0 0 0	<0.25			
	7	CB						545.0
10	8	SS	1.5/1.5	0 0 0	<0.25			
	9	CB						
	10	SS	1.5/1.5	0 0 1	<0.25			
	11	CB						540.0
15	12	SS	1.5/1.5	0 0 0	<0.25			
	13	CB						
	14	SS	1.5/1.5	0 0 0	<0.25			
	15	CB						535.0
20							End of Boring = 19.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP Ash Pond	Coord. System:	Boring No: B-9L
Location: Springfield, Illinois	Northing: 1129778.29	Well No: B-9L
County: Sangamon	Easting: 2456635.89	Surf Elev.: 524.07
Site No.:	Weather: Haze, 79 F	**Depth Information:**
AEI No.: 220408		Total: 19.5'
Drilling Contractor:	**Personnel:**	Auger: 19.5'
Contractor Name: Geotechnics Soil & Material Testing	Geologist: R. Carson	Core: -
City: Hannibal, Missouri	Driller: A. Kargel	**Dates:**
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	Helper(s): M. Sick	Start: 10/04/2023
		Finish: 10/04/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Description/Comments	Elev. (MSL)
						Ground Surface	524.1
0	1	CB				Brown silty LOAM; moist; soft	
	2	SS	1.4/1.5	1 2 2	1.0 0.5		
	3	CB					520.0
5	4	SS	1.5/1.5	1 1 1	1.0 0.1		
	5	CB				Brown SAND; medium grained; moist; soft	
	6	Shelby Tube	2.0/2.0				
	7	CB					515.0
10	8	SS	1.0/1.5	0 0 1	0.1	Brown sandy CLAY; wet; soft; gray at 10.5'	
	9	CB				Gray silty CLAY; wet; soft	
	10	SS	0.9/1.5	0 1 2	0.5		
	11	CB					510.0
15	12	SS	1.5/1.5	0 0 1	0.5 0.2		
	13	CB					
	14	SS	1.5/1.5	0 0 0	0.3		
	15	CB				16 mm VST@19.5' = 5.4, 2.9, 3.1	505.0
20						End of Boring = 19.5 Feet	

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1129518.55
Easting: 2455869.56

Weather: Sunny, 65 F

Boring Information:
Boring No: B-10CCR
Well No: B-10CCR
Surf Elev.: 555.35

Depth Information:
Total: 24.5'
Auger: 24.5'
Core: -

Dates:
Start: 10/20/2023
Finish: 10/20/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	555.4
0	1						Bottom ASH; moist to wet; loose	
	2		0.8/1.5	4 5 3				
	3							
5	4		0.8/1.5	2 7 12			Moist; loose	550.0
	5							
	6		1.3/1.5	1 2 1	<0.25		Fly ASH; moist to wet; soft; some bottom ash	
	7							
10	8		1.4/1.5	1 0 1	<0.25		Trace bottom ash	545.0
	9							
	10		1.3/1.5	0 0 0	<0.25		Wet; soft	
	11						Bottom ASH; wet; loose	
15	12		1.1/1.5	4 1 2				540.0
	13						Fly ASH; wet; soft	
	14		0.9/1.5	0 0 0	<0.25			
	15							
20	16		1.5/1.5	0 0 0	<0.25			535.0
	17							
	18		1.5/1.5	0 0 0	<0.25			
	19							
25							End of Boring = 24.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128891.26
Easting: 2456234.99

Weather: Sunny, 69 F

Boring Information:
Boring No: B-11U
Well No: B-11U
Surf Elev.: 552.27

Depth Information:
Total: 29.5'
Auger: 29.5'
Core: -

Dates:
Start: 10/18/2023
Finish: 10/18/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: A. Kargel
Helper(s): M. Sick

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	552.3
0	1						Black silty CLAY; with sand and gravel; moist; moderately stiff	
	2		0.3/1.5	1 3 10/3"				550.0
	3							
5	4		0.4/1.5	1 1 2	1.25		Yellow brown silty CLAY; some dark yellow mottling; some iron oxide nodules; moist; moderately stiff	
	5							
	6		0.8/1.5	1 2 3	2.5			545.0
	7							
10	8		2.0/2.0				16 mm VST@ 9.5' = 9.2, 2.8, 2.8	
	9				2.0			
	10		1.2/1.5	2 4 5				540.0
	11				3.5		Gray	
15	12		0.9/1.5	4 7 7	2.25		Organic fragments	
	13						Dark gray clayey SILT; moist; moderately firm; some organic fragments	
	14		1.3/1.5	1 4 6	2.0			535.0
	15						Dark gray brown silty CLAY; moist; stiff; 16 mm VST@19.5' = 13+, 7.4, 7.6	
20	16		1.8/2.0					
	17				2.5			
	18		1.5/1.5	0 3 4	1.25		Yellow brown silty CLAY; some dark yellow brown mottling; iron oxide and manganese oxide concretions; moist; moderately stiff	530.0
	19						16 mm VST@ 24.5' = 4.9, 3.1, 3.1	
25	20		1.5/1.5	0 0 0	<0.25		Yellow brown clayey silt to SILT; wet; soft	
	21							
	22		1.5/1.5	0 0 0				525.0
	23							
30							End of Boring = 29.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP Ash Pond Location: Springfield, Illinois County: Sangamon Site No.: AEI No.: 220408	Coord. System: Northing: 1128504.92 Easting: 2455639.11 Weather: Sunny, 74 F	Boring No: B-12U Well No: B-12U Surf Elev.: 553.41
Drilling Contractor: Contractor Name: Geotechnics Soil & Material Testing City: Hannibal, Missouri Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	**Personnel:** Geologist: M. Hewitt Driller: M. Sick Helper(s): B. Hummel	**Depth Information:** Total: 8.5' Auger: 8.5' Core: - **Dates:** Start: 10/23/2023 Finish: 10/23/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	553.4
0	1	CB					Dark yellow brown silty CLAY; some bottom ash; moist; stiff; trace iron oxide nodules	
	2	SS	1.1/1.5	5 6 7	3.75			550.0
	3	CB						
5	4	SS	1.0/1.5	5 5 6	3.25			
	5	CB						
	6	SS	1.5/1.5	3 5 5	2.75			545.0
							End of Boring = 8.5 Feet	
10								
								540.0
15								
								535.0
20								

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: Cloudy, 72 F

Boring Information:
Boring No: B-13BN
Well No: B-13BN
Surf Elev.: 0

Depth Information:
Total: 10.5'
Auger: 10.5'
Core: -

Dates:
Start: 10/24/2023
Finish: 10/24/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0	1	CB					Light brown clayey silt to silty CLAY; moist; firm; few dark yellow brown mottling; trace iron oxide nodules	
	2	SS	1.0/1.5	3 5 6	4.25			
	3	CB						
5	4	SS	0.7/1.5	4 4 7	3.75			-5.0
	5	CB					Brown silty CLAY; moist; very firm; trace iron oxide nodules	
	6	SS	1.0/1.5	5 8 11	4.75+		16 mm VST@ 8.0' = 13+, 6.7, 6.5	
10	7		1.7/2.0		3.5			-10.0
							End of Boring = 10.5 Feet	
15								-15.0
20								-20.0

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: Cloudy, 72 F

Boring Information:
Boring No: B-13BS
Well No: B-13BS
Surf Elev.: 0

Depth Information:
Total: 10.5'
Auger: 10.5'
Core: -

Dates:
Start: 10/24/2023
Finish: 10/24/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0	1	CB					Dark brown clayey silt to silty CLAY; moist; very firm; trace iron oxide nodules; trace rootlets	
	2	SS	1.0/1.5	4 4 5	4.5+			
	3	CB						
5	4	SS	0.5/1.5	4 5 6	4.5			-5.0
	5	CB						
	6	SS	1.1/1.5	3 7 9	4.5+		Grades to dark gray; trace organics; trace rootlets; 16 mm VST@8.5' = 13+, 6.5, 5.8	
10	7	Shelby Tube	1.5/2.0		3.5			-10.0
							End of Boring = 10.5 Feet	
15								-15.0
20								-20.0

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: Cloudy, 72 F

Boring Information:
Boring No: B-13L
Well No: B-13L
Surf Elev.: 0

Depth Information:
Total: 16.0'
Auger: 16.0'
Core: -

Dates:
Start: 10/24/2023
Finish: 10/24/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0	1	CB					Dark brown clayey silt to silty CLAY; moist; very firm	
	2	SS	1.0/1.5	4 5 6	4.5+			
	3	CB						
5	4	SS	1.0/1.5	4 5 7	4.5			-5.0
	5	CB						
	6	SS	1.4/1.5	3 7 10	3.75		Some rootlets; some manganese oxide nodules	
	7	CB						
10	8	SS	1.5/1.5	4 6 10	3.5		Trace rootlets; some manganese oxide nodules	-10.0
	9	CB						
	10	SS	1.5/1.5	3 6 8	2.5		Trace rootlets; some iron oxide nodules	
	11	CB						
15	12	SS	1.3/1.5	4 4 7	2.25		Light gray silty CLAY; moist; firm; some organics; some iron staining; few iron oxide nodules	-15.0
							End of Boring = 16 Feet	
20								-20.0

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 0
Easting: 0

Weather: Sunny, 74 F

Boring Information:
Boring No: B-13LF
Well No: B-13LF
Surf Elev.: 0

Depth Information:
Total: 26.0'
Auger: 26.0'
Core: -

Dates:
Start: 10/23/2023
Finish: 10/23/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	0.0
0	1	CB					Yellow brown clayey SILT; dry; stiff	
	2	SS	0.2/1.5	5 7 5				
	3	CB					Light gray silty CLAY; moist; stiff	
5	4	SS	0.8/1.5	4 5 6	3.75			-5.0
	5	CB						
	6	SS	0.5/1.5	5 50/4"			GYPSUM; dry; loose	
	7	CB						
10	8	SS	0.3/1.5	27 50/3.5				-10.0
	9	CB						
	10	SS	0.8/1.5	35 50/5"				
	11	CB						
15	12	SS	0.7/1.5	37 50/4"				-15.0
	13	CB						
	14	SS	0.4/1.5	50/4.5				
	15	CB						
20	16	SS	1.2/1.5	13 34 50/3"	3.75		Dark yellow brown silty CLAY; moist; firm GYPSUM	-20.0
	17	CB						
	18	SS	0.6/1.5	50/5"				
	19	CB						
25	20	SS	0.4/1.5	50/5"				-25.0
							End of Boring = 26 Feet	

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 220408

Location:
Coord. System:
Northing: 1128504.92
Easting: 2455639.11

Weather: Sunny, 74 F

Boring Information:
Boring No: B-12U-
Well No: B-12U-
Surf Elev.: 553.41

Depth Information:
Total: 8.5'
Auger: 8.5'
Core: -

Dates:
Start: 10/23/2023
Finish: 10/23/2023

Drilling Contractor:
Contractor Name: Geotechnics Soil & Material Testing
City: Hannibal, Missouri
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon

Personnel:
Geologist: M. Hewitt
Driller: M. Sick
Helper(s): B. Hummel

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	553.4
0	1	Blind Drill					Dark yellow brown silty CLAY; some bottom ash; moist; stiff; some organic fragments; trace iron oxide nodules	
	2	SS	0.3/1.5	5 5 6	3.25			550.0
	3	Blind Drill						
5	4	SS	1.0/1.5	3 4 5	4.0			
	5	Blind Drill						
	6	SS	0.7/1.5	3 3 3	1.5			545.0
	7	Blind Drill						
10	8	Shelby Tube	1.5/2.0		1.5		16 mm VST@ 9.5' = 10.8, 5.0, 4.3	
	9	Blind Drill						
	10	SS	0.8/1.5	2 5 9	3.5			540.0
	11	Blind Drill						
15	12	SS	0.9/1.5	2 5 7	3.25		Light gray silty cLAY; with bottom ash; moist; stiff	
	13	Blind Drill						
	14	SS	1.0/1.5	1 4 8	4.0			535.0
	15	Blind Drill						
20	16	Shelby Tube	1.7/2.0		2.5		Yellow brown silty CLAY; moist; moderately stiff; few manganese oxide nodules; 16 mm VST@ 19.5' = 13+, 6.0, 6.0	
	17	Blind Drill						
	18	SS	1.4/1.5	1 2 3	1.5			530.0
	19	Blind Drill						
25	20	SS	1.5/1.5	1 2 4	0.75		16 mm VST@ 24.5' = 9.5, 4.0, 3.7	
	21	Blind Drill						
	22	SS	1.5/1.5	2 2 3	0.75			525.0
	23	Blind Drill						
30							End of Boring = 29.5 Feet	

Notes:

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FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP Ash Pond	Coord. System:	Boring No: B-12L
Location: Springfield, Illinois	Northing: 1128541.37	Well No: B-12L
County: Sangamon	Easting: 2455514.61	Surf Elev.: 533.69
Site No.:	Weather: Sunny, 87 F	**Depth Information:**
AEI No.: 220408		Total: 23.0'
Drilling Contractor:	**Personnel:**	Auger: 23.0'
Contractor Name: Geotechnics Soil & Material Testing	Geologist: R. Carson	Core: -
City: Hannibal, Missouri	Driller: A. Kargel	**Dates:**
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	Helper(s): M. Sick	Start: 10/03/2023
		Finish: 10/03/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)
1				
2	SS	0.4/1.5	4 8 7	
3				4
4	SS	0.6/1.5	2 5 5	
5				4.0
6	SS	1.2/1.5	2 2 3	0.7
7				
8	SS	1.2/1.5	1 2 3	
9				1.0
10	SS	1.4/1.5	1 2 3	1.2
11				
12	Shelby Tube	2.0/2.0		
13				4.5
14	SS	1.5/1.5	1 2 4	0.5
15				
16	SS	1.0/1.5	0 6 7	
17				
18	SS	1.4/1.5	5 25 50/4.5	>4.5

Depth (ft)	Description/Comments	Elev. (MSL)
0	Ground Surface	533.7
0	Brown silty CLAY; dry; very stiff	
		530.0
7.5	Brown silty CLAY; moist; soft	
		525.0
10	20 mm VST@ 10.0' = 3.8, 3.9	
	Moist; stiff	
		520.0
15.5	Gray/brown silty CLAY; mottling; stiff	
18	Gray SILT; soft	
		515.0
19.5	Brown SAND; saturated; 20 mm VST@ 19.5' = 3.8, 1.5, 1.4	
20.5	Gray sandy CLAY; moist	
22	Gray SHALE; dry; hard	
23.5	End of Boring = 23.5 Feet	510.0
25		

Notes:

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FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP Ash Pond	Coord. System:	Boring No: B-6L
Location: Springfield, Illinois	Northing: 1130126.84	Well No: B-6L
County: Sangamon	Easting: 2455243.51	Surf Elev.: 531.19
Site No.:	Weather: Sunny, 85 F	**Depth Information:**
AEI No.: 220408		Total: 23.5'
Drilling Contractor:	**Personnel:**	Auger: 23.5'
Contractor Name: Geotechnics Soil & Material Testing	Geologist: K. Finke	Core: -
City: Hannibal, Missouri	Driller: M. Sick	**Dates:**
Equipment: CME 55 w/ 3 1/4" HSA and 1.5" split spoon	Helper(s): A. Kargel	Start: 10/02/2023
		Finish: 10/02/2023

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	531.2
0	1						Grayish brown silty CLAY; moist; firm; trace sand	530.0
	2		0.5/1.5	4 7 7	1.5			
	3							
5	4		0.5/1.5	3 2 3	1.5		Reddish brown silty CLAY; moist; firm; trace sand	525.0
	5							
	6		0.1/2.0					
	7							
10	8		0.6/1.5	W 1 1			20 mm VST@ 10.0' = 5.2, 2.8, 3.0	
	9				0		Gray clayey SILT; soft; moist	520.0
	10		1.5/1.5	W 1 1	0.5		Gray/reddish brown clayey SILT; soft; moist	
	11							
15	12		0.9/1.5	1 2 2	0-0.5		Gray SILT to reddish brown SAND; fine to coarse grained; moist	515.0
	13							
	14		1.1/1.5	W W W	0.25		Gray silty clay to clayey SILT; moist; soft; some organics, wood, bark, and ash	
	15							
20	16		0.9/1.5	W 1 2	3.9		20 mm VST@ 20.0' = 7.2, 3.9	
					0.5		Gray clayey SILT; moist	510.0
	17							
	18		0.9/1.5	W W W	0.5			
							End of Boring = 23.5 Feet	

Notes:

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 5/19/2025
Finish: 5/19/2025
WEATHER: 75°F, overcast

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: BH01
Well ID: n/a
Surface Elev: 553.0 ft. MSL
Completion: 10.5 ft. BGS
Station: 1,128,975.90N
2,455,612.61E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = Dry - During drilling
▼ = Dry - At completion
▼ =

SAMPLE: Number	SAMPLE: Recov / Total (in) / *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* / N - Value / **RQD**	TESTING: Water Content (%)	TESTING: Dry Density (lb/ft^3)	TESTING: Qu (tsf) *Qp* (tsf) / Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	12/18 *67%*	SS	*6-7* *9* N=16				0–5	Very dark gray (10YR3/1), moist, stiff, GRAVEL with few ash, little clay, and trace sand. [FILL]		553–548	
	17/18 *94%*	SS	*4-7* *9* N=16				5–9	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt, trace sand, and trace ash. [FILL]		548–544	
	18/24 *75%*	SH									k = 6.9 x 10^{-7} cm/sec
	14/18 *78%*	SS	*3-3* *4* N=7				9–10.5	Yellowish brown (10YR5/6) with 10% gray (10YR5/1) mottles, moist, stiff, CLAY with some silt, trace sand and trace ash. [FILL]		544–542.5	

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: **Start:** 5/19/2025
Finish: 5/19/2025
WEATHER: 75°F, overcast

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: **Driller:** T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: BH02
Well ID: n/a
Surface Elev: 552.5 ft. MSL
Completion: 20.0 ft. BGS
Station: 1,128,919.96N
2,456,031.83E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = Dry - During drilling
▼ = Dry - At completion
▼ =

Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
							0–2.5	Very dark gray (10YR3/1), moist, stiff, GRAVEL with few ash, little clay, and trace sand. [FILL]	552	
	15/18 *83%*	SS	*3-7* *10* N=17				2.5–5	Dark brown (10YR3/3), moiste, stiff, CLAY with some silt little sand, trace gravel, and trace ash. [FILL]	550, 548	
	15/18 *83%*	SS	*3-7* *9* N=16				5–10.6	Yellowish brown (10YR5/4) with 10% gray (10YR5/1) mottles, moist, stiff, CLAY with some silt and trace sand. [FILL]	546, 544	
	9/18 *50%*	SS	*3-4* *4* N=8							
	18/18 *100%*	SS	*3-4* *5* N=9				10.6–13	Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand. [FILL]	542, 540	
	15/18 *83%*	SS	*3-4* *5* N=9				13–15	Gray (10YR5/1) with 10% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace sand. [FILL]	538	
	16/18 *89%*	SS	*3-4* *7* N=11				15–15.5	Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand. [FILL]		
	20/24 *83%*	SH					15.5–17.5	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. [FILL]	536	$k = 6.9 \times 10^{-7}$ cm/sec
	18/18 *100%*	SS	*6-7* *9* N=16				17.5–20	Black (10YR2/1), moist, medium, CLAY with some silt and trace sand. [FILL]	534	

NOTE(S):

APPENDIX A5:

IMPOUNDMENT CCR WELL LOGS

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1129934.00
Easting: 2455460.00

Weather: Cloudy 59F

Boring Information:
Boring No: D1
Well No: D1
Surf Elev.: 564.0

Depth Information:
Total: 40.5'
Auger: 40.5'
Core: -

Dates:
Start: 04/29/2024
Finish: 04/29/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	564.0
0	1	CB					Dark gray ASH (fill)	
								560.0
5	2	SS	2.0/2	WH				
	3	CB						
								555.0
10	4	SS	1.5/2	3 21 23 24				
	5	CB						
								550.0
15		SS		W				

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: D1 Boring No: D1 Well No: D1

Legend: - Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	6		1.3/2	W 1 3 W			Dark gray ASH (fill) Saturated	
	7							545.0
20	8		2.0/2	WOH				
	9							540.0
25	10		2.0/2	2 3 1 1			Groundwater sample at 25.0'	
	11							535.0
30				W				

Notes:

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3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: D1 Boring No: D1 Well No: D1

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	12	CB	2.0/2	W W 1 1				
	13	Blind Drill						530.0
35	14	CB	2.0/2	W W 1 1				
	15	CB	2.0/2	W W 3 4				
							Dark gray clayey SILT	
	16	Shelby Tube	1.9/2		1.0			525.0
40								
							End of Boring = 40.5 Feet	
								520.0
45								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1130169.00
Easting: 2456076.00

Weather: Cloudy 59F

Boring Information:
Boring No: D2
Well No: D2
Surf Elev.: 558.0

Depth Information:
Total: 37.5'
Auger: 37.5'
Core: -

Dates:
Start: 04/29/2024
Finish: 04/29/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	558.0
0	1	CB					Dark gray ASH (fill)	555.0
5	2	SS	0.0/2	WOH				
	3	CB						550.0
10	4	SS	2.0/2	WOH				
	5	CB						545.0
15		SS						

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: D2 Boring No: D2 Well No: D2

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	6		2.0/2	WOH			Dark gray ASH (fill)	
	7							540.0
20	8		2.0/2	W W 1 1			Groundwater sample at 20.0'	
	9							535.0
25	10		2.0/2	WOH				
	11							530.0
30								

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: D2 Boring No: D2 Well No: D2

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	12	CB	0.0/2	WOH				
	13	CB	0.0/2	WOH				525.0
35	14	CB	2.0/2	W W W 6				
	15	Shelby Tube	1.5/2				Gray clayey SILT; brown mottling; saturated	
							End of Boring = 37.5 Feet	520.0
40								
								515.0
45								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:	**Location:**	**Boring Information:**
Name: CWLP Ash Pond	Coord. System:	Boring No: D3
Location: Springfield, Illinois	Northing: 1129640.00	Well No: D3
County: Sangamon	Easting: 2455918.00	Surf Elev.: 554.9
Site No.:		**Depth Information:**
AEI No.: 240227	Weather: Sunny 66F	Total: 31.5'
		Auger: 31.5'
Drilling Contractor:	**Personnel:**	Core: -
Contractor Name: Skinner Limited	Geologist: S. Van Hook	**Dates:**
City: Hindsboro, Illinois	Driller: T. Skinner	Start: 04/30/2024
Equipment: 4 1/4" HSA 5' CSD 3"	Helper(s): NA	Finish: 04/30/2024

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	554.9
0	1	CB					Dark gray ASH (fill); wet	
5	2	SS	2.0/2	2 2 2 3				550.0
	3	CB						
10	4	SS	2.0/2	WH				545.0
	5	CB					Free water at 12.0'	
15		SS						540.0

Notes:

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FIELD BORING LOG

Boring Information: D3 Boring No: D3 Well No: D3

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	6		0.2/2	WH 1				
	7							
20	8		0.1/2	WH			Groundwater sample at 20.0'	535.0
	9							
25	10		0.3/2	WH				530.0
	11		2.0/2				Brown silty CLAY; greenish gray mottling; Jar Sample SS6A	
30					0.75			525.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: D3 Boring No: D3 Well No: D3

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	12	Shelby Tube	2.0/2					
							End of Boring = 31.5 Feet	
35								520.0
40								515.0
45								510.0

Notes:

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FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1129248.00
Easting: 2455777.00

Weather: Sunny 66F

Boring Information:
Boring No: D4
Well No: D4
Surf Elev.: 561.00

Depth Information:
Total: 36.5'
Auger: 36.5'
Core: -

Dates:
Start: 04/30/2024
Finish: 04/30/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	561.0
0	1	CB					Dark gray ASH (fill); dry	560.0
5	2	SS	1.2/2	W 1 2 3				555.0
	3	CB						
10	4	SS	0.5/2	WOH			Moist	550.0
	5	CB						
15		SS						

Notes:

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FIELD BORING LOG

Boring Information: D4 Boring No: D4 Well No: D4

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Wet	
	6		2.0/2	WOH				
								545.0
	7							
							Free water at 19.5'; Groundwater sample at 20.0'	
20								
	8		2.0/2	WOH				
								540.0
	9							
							Saturated	
25								
	10		2.0/2	WOH				
								535.0
	11							
30								

Notes:

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FIELD BORING LOG

Boring Information: D4 Boring No: D4 Well No: D4

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	12	CB	2.0/2					530.0
	13	CB	3.0/3	WH 2 3 2 1 1	0.75		Brown silty CLAY; greenish gray mottling	
35	14	Shelby Tube	2.0/2					525.0
							End of Boring = 36.5 Feet	
40								520.0
45								

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1127471.67
Easting: 2456542.99

Weather: Sunny 72 F

Boring Information:
Boring No: L1
Well No: L1
Surf Elev.: 568.96

Depth Information:
Total: 38.0'
Auger: 38.0'
Core: -

Dates:
Start: 05/02/2024
Finish: 05/02/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	569.0
0							Light gray SLUDGE (fill)	
	1	CB						
								565.0
5	2	SS	0.8/2	3 3 3 4				
	3	CB						
								560.0
10	4	SS	1.4/2	WOH				
	5	CB						
								555.0
15		SS		1				

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: L1 Boring No: L1 Well No: L1

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	6	SS	1.4/2	1 2 1 3			Light gray SLUDGE (fill)	
	7							550.0
20	8	SS	1.5/2	4 4 3 5			20.0' Water sample collected	
	9							545.0
25	10	SS	1.6/2	2 3 4 5				
	11							540.0
30		SS		WH				

Notes:

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FIELD BORING LOG

Boring Information: L1 Boring No: L1 Well No: L1

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	12		1.1/2	WH 1 1 2				
	13							535.0
35	14		1.5/1.5	5 6 8			Olive green silty CLAY; dark brown mottling; saturated	
	15		2.0/2		0.75			
							End of Boring = 38 Feet	530.0
40								
45								525.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: CWLP Ash Pond
Location: Springfield, Illinois
County: Sangamon
Site No.:
AEI No.: 240227

Location:
Coord. System:
Northing: 1128216.45
Easting: 2456765.72

Weather: Sunny 72 F

Boring Information:
Boring No: L3
Well No: L3
Surf Elev.: 563.02

Depth Information:
Total: 36.5'
Auger: 36.5'
Core: -

Dates:
Start: 05/02/2024
Finish: 05/02/2024

Drilling Contractor:
Contractor Name: Skinner Limited
City: Hindsboro, Illinois
Equipment: 4 1/4" HSA 5' CSD 3"

Personnel:
Geologist: S. Van Hook
Driller: T. Skinner
Helper(s): NA

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	563.0
0	1	CB					Dark gray ASH (fill)	
								560.0
5	2	SS	0.22	WH WH 1 1				
	3	CB						555.0
							9.5' Free water	
10	4	SS	2.0/2	WH				
	5	CB						550.0
15		SS						

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: L3 Boring No: L3 Well No: L3

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	6		2.0/2	WH				
	7							545.0
20	8		1.6/2	1 1 1 1			20.0' Water sample collected; saturated	
	9							540.0
25	10		1.6/2	1 1 1 1				
	11							535.0
30	12		0.8/1	WH				

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Boring Information: L3 Boring No: L3 Well No: L3

Legend: - Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	12			WH				
	13							
	14		1.5/1.5	WH 3 4 6			Brown silty CLAY; greenish gray mottling	530.0
35	15		1.8/2		0.75			
							End of Boring = 36.5 Feet	525.0
40								
								520.0
45								

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP Ash Pond	Coord. System:	Boring No: L4
Location: Springfield, Illinois	Northing: 1127968.18	Well No: L4
County: Sangamon	Easting: 2457141.08	Surf Elev.: 568.58
Site No.:		**Depth Information:**
AEI No.: 240227	Weather: Sunny 72 F	Total: 21.0'
Drilling Contractor:	**Personnel:**	Auger: 21.0'
Contractor Name: Skinner Limited	Geologist: S. Van Hook	Core: -
City: Hindsboro, Illinois	Driller: T. Skinner	**Dates:**
Equipment: 4 1/4" HSA 5' CSD 3"	Helper(s): NA	Start: 05/02/2024
		Finish: 05/02/2024

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	568.6
0	1	CB					Gray ASH (fill)	
								565.0
5	2	SS						
	3	CB						560.0
10	4	SS						
	5	CB						555.0
15								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: L4 Boring No: L4 Well No: L4

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Gray ASH (fill)	
	6	SS	1.4/2	1 1 4 6	1.0		Brown silty CLAY; gray mottling; moist	
	7	Shelby Tube	1.5/2					550.0
20	8	SS	1.5/2	6 8 10 12	4.75			
							End of Boring = 21 Feet	
25								545.0
30								540.0

Notes:

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Springfield, IL 62711

FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: CWLP Ash Pond	Coord. System:	Boring No: L5
Location: Springfield, Illinois	Northing: 1128308.56	Well No: L5
County: Sangamon	Easting: 2456118.23	Surf Elev.: 565.19
Site No.:		**Depth Information:**
AEI No.: 240227	Weather: Cloudy 61 F	Total: 39.5'
Drilling Contractor:	**Personnel:**	Auger: 39.5'
Contractor Name: Skinner Limited	Geologist: S. Van Hook	Core: -
City: Hindsboro, Illinois	Driller: T. Skinner	**Dates:**
Equipment: 4 1/4" HSA 5' CSD 3"	Helper(s): NA	Start: 05/03/2024
		Finish: 05/03/2024

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	565.2
0	1	CB					Gray silty CLAY (fill)	
5	2	SS	1.5/2				Light gray LIME SLUDGE (fill)	560.0
	3	CB						
10	4	SS	2.0/2				Dark gray to black COAL ASH (fill)	555.0
	5	CB						
15		SS						

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: L5 Boring No: L5 Well No: L5

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	6		2.0/2				16.0' Free water	
	7							
20	8		2.0/2					545.0
	9							
25	10		2.0/2					540.0
	11		3.0/3					
30								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: L5 Boring No: L5 Well No: L5

- Continuous Barrel (CB) | - Split Spoon (SS) | - Shelby Tube | - Core | - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	12		3.0/3					
	13		2.0/2				Light gray LIME SLUDGE (fill); Sample CA 32.5-35.2'	
35								530.0
	14		3.0/3		1.0		Brown silty CLAY; greenish gray mottling	
	15		2.0/2					
							End of Boring = 39.5 Feet	
40								525.0
45								

Notes:

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/13/2024
Finish: 8/13/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-01
Well ID: n/a
Surface Elev: 563.8 ft. MSL
Completion: 39.0 ft. BGS
Station: 1,129,829.03N
2,455,470.48E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 18.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1	12/18 *67%*	SPT	*1-1* *1* N=2	32.0			0–10	Ash, (Silt like), Very Soft, Dark Gray (10Y 3/1), Moist			
2	14/18 *78%*	SPT	*1-WH* *WH*	37.0							
3	18/18 *100%*	SPT	*2-4* *4* N=8	36.0							
4	12/18 *67%*	SPT	*8-11* *10* N=21	25.0			10–15	Ash, (Silt like), Medium Stiff, Dark Gray (10Y 3/1), Moist, 1 inch wet seam at 12.4			
5	12/18 *67%*	SPT	*3-6* *6* N=12	27.0							
6	12/18 *67%*	SPT	*4-4* *4* N=8	37.0			15–17	Ash, Med Grained, Loose, Black (10G 2.5/1), Moist			
7	18/18 *100%*	SPT	*WR-WR* *WR*	45.0			17–20 (▽ 18)	Ash, (Silt like), Very Soft, Dark Gray (10Y 3/1), Wet			
				52.0							

Depth scale (ft. BGS): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale (ft. MSL): 562, 560, 558, 556, 554, 552, 550, 548, 546, 544

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/13/2024
Finish: 8/13/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-01
Well ID: n/a
Surface Elev: 563.8 ft. MSL
Completion: 39.0 ft. BGS
Station: 1,129,829.03N
2,455,470.48E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 18.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
8	18/18 *100%*	SPT	*WR-WR 1*					Ash, (Silt like), Very Soft, Dark Gray (10Y 3/1), Wet *[Continued from previous page]*			
9	14/18 *78%*	SPT	*WR-WR WH*	49.0			22			542	
10	16/18 *89%*	SPT	*WH-WH WH*	85.0			24			540	
11	18/18 *100%*	SPT	*WH-WH WH*	56.0			26			538	
12	18/18 *100%*	SPT	*WH-WH WH*	39.0			28			536	
13	18/18 *100%*	SPT	*WR-WR WR*	40.0			30, 32			534, 532	
14	18/18 *100%*	SPT	*WH-WH 1*	35.0			34			530	
15	16/18 *89%*	SPT	*WR-WR WR*	41.0			36			528	
16	14/18 *78%*	SPT	*7-8 11* N=19	22.0			38	Clay, Silty, Med Stiff, Moist, Dark Greenish Gray (5G 4/1)		526	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/13/2024
Finish: 8/13/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger

FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-02
Well ID: n/a
Surface Elev: 556.9 ft. MSL
Completion: 35.5 ft. BGS
Station: 1,130,338.40N
2,456,218.17E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 10.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type
1	4/18 *22%*	SPT	*2-3* *2* N=5	33.0		
2	6/18 *33%*	SPT	*1-1* *1* N=2	20.0		
3	14/18 *78%*	SPT	*WH-WH* *WH*	53.0		
4	18/18 *100%*	SPT	*WH-WH* *WH*	53.0		
5	18/18 *100%*	SPT	*WH-WH* *WH*	37.0		
6	18/18 *100%*	SPT	*WR-WR* *WR*	31.0		
7	18/18 *100%*	SPT	*WR-WR* *WR*	52.0		
				48.0		

Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
0–7	Ash, (Silt like), Soft-Very Soft, Greenish Black (5G 2.5/1), Moist			
7–10	Ash, (Silt like), Very Soft, Dark Gray (10Y 3/1), Moist			
10–19.5 (▽ 10)	Ash, (Silt like), Very Soft, Dark Gray (10Y 3/1), Wet			
19.5–20	Ash, (Silt like), Very Soft, Bluish Black (5B 2.5/1), Wet			

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale: 556, 554, 552, 550, 548, 546, 544, 542, 540, 538

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/13/2024
Finish: 8/13/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-02
Well ID: n/a
Surface Elev: 556.9 ft. MSL
Completion: 35.5 ft. BGS
Station: 1,130,338.40N
2,456,218.17E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
= 10.00 - During Drilling
=
=

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
8	18/18 *100%*	SPT	*WR-WR WR*					Ash, (Silt like), Very Soft, Bluish Black (5B 2.5/1), Wet *[Continued from previous page]*	536	
				49.0			22			
9	18/18 *100%*	SPT	*WH-WH WH*						534	
				50.0			24		532	
10	18/18 *100%*	SPT	*WH-WH WH*				26			
				53.0					530	
11	18/18 *100%*	SPT	*WR-WR WR*				28		528	
				60.0						
12	18/18 *100%*	SPT	*WR-WR WR*				30		526	
				46.0						
13	14/18 *78%*	SPT	*WR-WR WR*				32			
				35.0					524	
14	18/18 *100%*	SPT	*WR-WR 2*							
				27.0			34			
15	18/18 *100%*	SPT	*3-4 5* N=9					Clay, Silty, Soft, Light Greenish Gray (5G 7/1) w/ brown mottling, High Plasticity, Moist	522	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/14/2024
Finish: 8/14/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-03
Well ID: n/a
Surface Elev: 554.7 ft. MSL
Completion: 31.0 ft. BGS
Station: 1,129,517.42N
2,455,963.38E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

SAMPLE			TESTING								
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1	4/18 *22%*	SPT	*1-WH WH*	13.0			0–7	Ash (Sand Like), Med Grained, Poorly Graded, Light Greenish Gray (5G 7/1), Moist			
2	18/18 *100%*	SPT	*1-1 1* N=2	26.0							
3	14/18 *78%*	SPT	*WH-WH 1*	34.0			7–19.5	Ash (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Wet, Trace Coarse Grains			
4	16/18 *89%*	SPT	*WH-1 2* N=3	48.0							
5	18/18 *100%*	SPT	*WH-WH WH*	52.0							
6	18/18 *100%*	SPT	*WH-WH WH*	51.0							
7	18/18 *100%*	SPT	*WH-WH WH*	50.0							
				47.0			19.5–	Ash (Sand Like), Fine Grained w/ trace coarse, Very Loose, Light Greenish Gray (5G 7/1), Wet			

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale: 554, 552, 550, 548, 546, 544, 542, 540, 538, 536

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/14/2024
Finish: 8/14/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-03
Well ID: n/a
Surface Elev: 554.7 ft. MSL
Completion: 31.0 ft. BGS
Station: 1,129,517.42N
2,455,963.38E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

SAMPLE: Number	SAMPLE: Recov / Total (in) *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* N - Value **RQD**	TESTING: Water Content (%)	TESTING: Dry Density (lb/ft^3)	TESTING: Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
8	18/18 *100%*	SPT	*WH-WH WH*					Ash (Sand Like), Fine Grained w/ trace coarse, Very Loose, Light Greenish Gray (5G 7/1), Wet *[Continued from previous page]*	534	
9	18/18 *100%*	SPT	*WR-WR WR*	56.0			22	Ash (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), No Plasticity, Wet	532	
10	18/18 *100%*	SPT	*WR-WR WR*	49.0			24		530	
11	18/18 *100%*	SPT	*WR-WR WR*	41.0			26, 28		528, 526	
12	18/18 *100%*	SPT	*WH-2 2* N=4	24.0			30	Clay, Silty, Soft, High Plasticity, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling	524	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/19/2024
Finish: 8/19/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger

FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-04
Well ID: DB04D
Surface Elev: 553.71 ft. MSL
Completion: 31.00 ft. BGS
Station: 1,129,163.19N
2,455,379.61E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type
1	12/18 *67%*	SPT	*14-24 36* N=60	14.0		
2	12/18 *67%*	SPT	*10-15 14* N=29	12.0		
3	14/18 *78%*	SPT	*4-7 4* N=11	30.0		
4	18/18 *100%*	SPT	*1-1 1* N=2	59.0		
5	4/18 *22%*	SPT	*1-1 2* N=3	36.0		
6	10/18 *56%*	SPT	*4-5 6* N=11	50.0		
7	18/18 *100%*	SPT	*3-4 5* N=9	49.0		
				48.0		

Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
0 – 7.5	Ash (Sand Like), Medium Grained, Poorly Graded, Greenish Black (10GY 2.5/1), Medium Dense, Moist	552, 550, 548	
7.5 – 10	Ash (Sand Like), Medium Grained, Poorly Graded, Greenish Black (10GY 2.5/1), Loose, Wet	546	
10 – 12	Ash (Silt Like) w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet	544	
12 – 15.5	Ash (Sand Like), Medium Grained, Poorly Graded, Greenish Black (10GY 2.5/1), Loose, Wet	542, 540	
15.5 – 19.5	Ash (Silt Like) w/ trace sand, Very Soft, Light Greenish Gray (5G 7/1), Wet	538, 536	
19.5 – 20	Ash (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Wet	534	

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/19/2024
Finish: 8/19/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger

FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-04
Well ID: DB04D
Surface Elev: 553.71 ft. MSL
Completion: 31.00 ft. BGS
Station: 1,129,163.19N
2,455,379.61E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
8	14/18 *78%*	SPT	*WH-WH* *WH*					Sandy @ 27			
				41.0			22			532	
9	18/18 *100%*	SPT	*WH-WH* *WH*								
							24			530	
				37.0				Ash (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Wet Sandy @ 27 *[Continued from previous page]*			
10	18/18 *100%*	SPT	*WH-WH* *WH*								
							26			528	
				44.0							
11	18/18 *100%*	SPT	*1-1* *1* N=2				28			526	
				26.0						524	
12	18/18 *100%*	SPT	*2-4* *5* N=9				30	Clay, Silty, Medium Stiff, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling			

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/15/2024
Finish: 8/15/2024
WEATHER: 85F and Rainy

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-05
Well ID: DB05D
Surface Elev: 553.24 ft. MSL
Completion: 28.50 ft. BGS
Station: 1,129,181.97N
2,456,241.37E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
							0 – 4.5	ASH (Silt Like) w/ trace fine sand, Very Soft, Greenish Black (10GY 2.5/1), Moist		552, 550	
1	18/18 *100%*	SPT	*WH-WH WH*	34.0							
2	18/18 *100%*	SPT	*WH-WH WH*	41.0			4.5 – 12	ASH (Silt Like) w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet		548, 546, 544, 542	
3	18/18 *100%*	SPT	*WH-WH WH*	44.0							
4	18/18 *100%*	SPT	*WH-WH WH*	47.0							
5	18/18 *100%*	SPT	*WH-WH WH*	53.0			12 – 19.5	ASH (Silt Like), Very Soft, Dark Greenish Gray (5GY 4/1), Wet		540, 538, 536, 534	
6	18/18 *100%*	SPT	*WH-WH WH*	52.0							
7	18/18 *100%*	SPT	*WH-WH WH*	47.0							
		SPT		41.0			19.5 –	ASH (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Wet			

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/15/2024
Finish: 8/15/2024
WEATHER: 85F and Rainy

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: DB-05
Well ID: DB05D
Surface Elev: 553.24 ft. MSL
Completion: 28.50 ft. BGS
Station: 1,129,181.97N
2,456,241.37E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

SAMPLE: Number	SAMPLE: Recov / Total (in) *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* N - Value **RQD**	TESTING: Water Content (%)	TESTING: Dry Density (lb/ft^3)	TESTING: Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
8	18/18 *100%*	SPT	*WH-WH WH*					ASH (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Wet *[Continued from previous page]*		532	
				43.0			22				
9	18/18 *100%*	SPT	*WH-WH WH*							530	
				55.0			24				
10	18/18 *100%*	SPT	*WH-WH WH*							528	
				24.0			26			526	
11	18/18 *100%*	SPT	*WH-2 4* N=6				28	Clay, Silty, Medium Stiff, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling, High Plasticity			

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/20/2024
Finish: 8/20/2024
WEATHER: 75F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-01
Well ID: n/a
Surface Elev: 568.9 ft. MSL
Completion: 35.5 ft. BGS
Station: 1,127,471.50N
2,456,543.15E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 19.50 - During Drilling
▽ =
▼ =

SAMPLE: Number	Recov / Total (in) % Recovery	Type	TESTING: Blows / 6 in N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type
1	10/18 *56%*	SPT	*5-15* *20* N=35	24.0		
2	9/18 *50%*	SPT	*4-4* *4* N=8	30.0		
3	18/18 *100%*	SPT	*WH-WH* *WH*	70.0		
4	18/18 *100%*	SPT	*WH-WH* *1*	57.0		
5	18/18 *100%*	SPT	*WH-WH* *WH*	63.0		
6	18/18 *100%*	SPT	*2-4* *2* N=6	41.0		
7	18/18 *100%*	SPT	*3-10* *15* N=25	38.0		
				36.0		

Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
0 – 4.5	Ash (Sand Like), Medium Coarse, Poorly Graded, Medium Dense, Greenish Black (10GY 2.5/1), Moist			
4.5 – 10	Lime Sludge (Silt Like), Soft, Light Greenish Gray (5G 7/1), No Plasticity, Moist			
10 – 15	Ash (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Moist 13 - 2 inch sandy wet seam			
15 – 20	Ash (Sand Like), Medium Coarse, Poorly Graded, Loose-Medium Dense, Greenish Black (10GY 2.5/1), Moist Wet @ 19.5			

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale: 568, 566, 564, 562, 560, 558, 556, 554, 552, 550

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/20/2024
Finish: 8/20/2024
WEATHER: 75F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-01
Well ID: n/a
Surface Elev: 568.9 ft. MSL
Completion: 35.5 ft. BGS
Station: 1,127,471.50N
2,456,543.15E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 19.50 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
8	18/18 *100%*	SPT	*5-5* *4* N=9					Ash (Sand Like), Medium Coarse, Poorly Graded, Loose-Medium Dense, Greenish Black (10GY 2.5/1), Moist Wet @ 19.5 *[Continued from previous page]*	548	
				105.6			22			
9	14/18 *78%*	SPT	*2-3* *2* N=5						546	
							24			
				96.0						
10	18/18 *100%*	SPT	*2-3* *4* N=7						544	
							26			
				75.0					542	
11	18/18 *100%*	SPT	*WR-1* *1* N=2				28	Ash (Silt Like) w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet		
				86.0					540	
12	18/18 *100%*	SPT	*WH-1* *1* N=2				30			
				77.0					538	
13	18/18 *100%*	SPT	*WR-WH* *1*				32			
				24.0					536	
14	18/18 *100%*	SPT	*WR-WH* *4*							
				26.0			34			
15	12/18 *67%*	SPT	*WH-3* *4* N=7					Clay, Silty, Medium Stiff, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling	534	

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/20/2024
Finish: 8/20/2024
WEATHER: 75F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-02
Well ID: LB02D
Surface Elev: 568.06 ft. MSL
Completion: 35.00 ft. BGS
Station: 1,127,826.17N
2,456,727.26E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 15.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1	13/18 *72%*	SPT	*9-16* *16* N=32	16.0			0–5.5	Ash (Sand Like), Fine Grained w/ fines, Med Dense, Greenish Black (10GY 2.5/1), Moist			
2	9/18 *50%*	SPT	*6-3* *4* N=7	14.0			5.5–7	Ash (Silt Like) w/ trace sand, Soft, Light Greenish Gray (5G 7/1), Moist, High Plasticity			
3	8/18 *44%*	SPT	*2-4* *6* N=10	15.0			7–12	Lime Sludge (Silt Like), Med Stiff, Light Greenish Gray (5G 7/1) w/ Brown Mottling, Moist, No Plasticity			
4	9/18 *50%*	SPT	*2-3* *4* N=7	18.0							
5	2/18 *11%*	SPT	*1-1* *1* N=2	15.0			12–17	Ash (Sand Like), Fine Grained w/ fines,Loose, Greenish Black (10GY 2.5/1), Moist Wet at 15			
6	14/18 *78%*	SPT	*3-4* *5* N=9	21.0							
7	9/18 *50%*	SPT	*WH-WH* *1*	82.0			17–20	Ash (Silt Like), w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet			
				99.0							

Depth scale (ft. BGS): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale (ft. MSL): 566, 564, 562, 560, 558, 556, 554, 552, 550

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/20/2024
Finish: 8/20/2024
WEATHER: 75F and Sunny

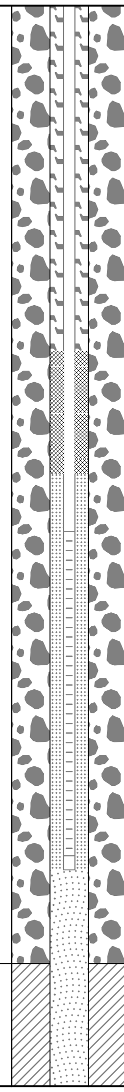
CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-02
Well ID: LB02D
Surface Elev: 568.06 ft. MSL
Completion: 35.00 ft. BGS
Station: 1,127,826.17N
2,456,727.26E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 15.00 - During Drilling
▽ =
▼ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
8	11/18 *61%*	SPT	*WH-WH WH*								
				101.4			22			546	
9	18/18 *100%*	SPT	*WH-WH WH*								
				91.0			24			544	
10	18/18 *100%*	SPT	*WH-WH 1*								
							26	Ash (Silt Like), w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet *[Continued from previous page]*		542	
				139.8							
11	18/18 *100%*	SPT	*1-1 1* N=2				28			540	
				111.1							
12	6/18 *33%*	SPT	*WR-WR WR*				30			538	
				142.9			32			536	
13	18/18 *100%*	SPT	*WR-WR 2*								
				30.0							
14	9/18 *50%*	SPT	*2-3 6* N=9				34	Clay, Silty, Medium Stiff, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling		534	



NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/19/2024
Finish: 8/19/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-03
Well ID: n/a
Surface Elev: 562.9 ft. MSL
Completion: 33.5 ft. BGS
Station: 1,128,249.84N
2,456,722.48E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 14.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
1	12/18 67%	SPT	1-1 1 N=2	28.0			0–4.5	Ash (Sand Like), Medium Coarse, Poorly Graded, Very Loose, Greenish Black (10GY 2.5/1), Moist			
2	16/18 89%	SPT	WH-WH WH	79.0			4.5–14	Ash (Silt Like) w/ Sand, Very Soft, Greenish Black (10GY 2.5/1), Moist 12.5-13 Med Coarse Sand - Wet			
3	16/18 89%	SPT	1-1 1 N=2	50.0							
4	13/18 72%	SPT	4-1 1 N=2	76.0							
5	18/18 100%	SPT	1-1 1 N=2	74.0							
6	18/18 100%	SPT	WH-WH WH	80.0			14–17 (▽ 14)	Ash (Silt Like), Layered Fine and Coarse Materials, Very Soft, Greenish Black (10GY 2.5/1), Wet			
7	18/18 100%	SPT	1-1 1 N=2	73.0			17–19.5	Lime Sludge, Very Soft, Light Greenish Gray (5G 7/1), Wet			
				74.0			19.5–20	Ash (Sand Like), Very Loose, Fine-Medium Grained, Greenish Black (10GY 2.5/1), Wet			

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale: 562, 560, 558, 556, 554, 552, 550, 548, 546, 544

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/19/2024
Finish: 8/19/2024
WEATHER: 80F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-03
Well ID: n/a
Surface Elev: 562.9 ft. MSL
Completion: 33.5 ft. BGS
Station: 1,128,249.84N
2,456,722.48E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 14.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
8	17/18 94%	SPT	1-1 1 N=2					Ash (Sand Like), Very Loose, Fine-Medium Grained, Greenish Black (10GY 2.5/1), Wet *[Continued from previous page]*	542	
9	16/18 89%	SPT	WH-WH 1	84.0			22		540	
10	18/18 100%	SPT	WH-WH WH	86.0			24	Ash (Silt Like) w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet	538	
11	18/18 100%	SPT	WH-WH WH	74.0			26, 28		536, 534	
12	18/18 100%	SPT	WR-WR WR	100.0			30		532	
13	16/18 89%	SPT	3-3 5 N=8	26.0			32	Clay, Silty, Medium Stiff, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling	530	

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/21/2024
Finish: 8/21/2024
WEATHER: 75F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-04
Well ID: n/a
Surface Elev: 566.3 ft. MSL
Completion: 22.0 ft. BGS
Station: 1,127,977.32N
2,457,073.44E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 9.50 - During Drilling
▽ =
▼ =

Number	Recov / Total (in) % Recovery	Type	Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) Qp (tsf) Failure Type
1	3/18 17%	SPT	WH-1 2 N=3	19.0		
2	6/18 33%	SPT	1-1 1 N=2	18.0		
3	14/18 78%	SPT	WH-WH WH	177.9		
4	18/18 100%	SPT	WR-WR WR	72.0		
5	18/18 100%	SPT	WR-WR WH	43.0		
6	18/18 100%	SPT	WH-WH WH	61.0		
7	6/18 33%	SPT	WR-WR WR	68.0		
8	14/18 78%	SPT	WR-WR WR	87.0		
9	18/18	SPT	WR-WR WR	60.0		

Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
0 – 4.5	Clay, Silty, Soft, High Plasticity, Light Reddish Brown (2.5YR 6/4), Moist			
4.5 – 10	Ash, (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Moist			
10 – 15.7	Ash, (Silt Like), Very Soft, Greenish Black (10GY 2.5/1), Wet			
15.7 – 20	Lime Sludge, Very Soft, Light Greenish Gray (5G 7/1), Wet			

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale: 566, 564, 562, 560, 558, 556, 554, 552, 550, 548

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/21/2024
Finish: 8/21/2024
WEATHER: 75F and Sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-04
Well ID: n/a
Surface Elev: 566.3 ft. MSL
Completion: 22.0 ft. BGS
Station: 1,127,977.32N
2,457,073.44E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 9.50 - During Drilling
▽ =
▼ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	100%			30.0				Lime Sludge, Very Soft, Light Greenish Gray (5G 7/1), Wet *[Continued from previous page]*		546	
10	18/18 *100%*	SPT	*WR-1* 2 N=3				22	Clay, Silty, Medium Stiff, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling			

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/16/2024
Finish: 8/16/2024
WEATHER: 85F and Overcast

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-05
Well ID: n/a
Surface Elev: 565.4 ft. MSL
Completion: 37.5 ft. BGS
Station: 1,128,266.90N
2,456,131.15E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 12.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
							0–5	Ash (Sand Like), Medium Grained, Poorly Graded, Very Loose, Greenish Black (10GY 2.5/1), Moist			
1	10/18 *56%*	SPT	*1-WH* *WH*								
2	18/18 *100%*	SPT	*WH-WH* *WH*								
							5–12	Lime Sludge (Silt Like), Very Soft, Light Greenish Gray (5G 7/1) w/ Brown Mottling, Moist, Medium Plasticity			
3	14/18 *78%*	SPT	*WH-WH* *WH*	47.0							
4	11/18 *61%*	SPT	*WH-WH* *WH*	92.0							
							12–19.5	Ash (Silt Like) w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet, High Plasticity			
5	14/18 *78%*	SPT	*WH-WH* *WH*	74.0							
6	18/18 *100%*	SPT	*WH-WH* *WH*	62.0							
7	18/18 *100%*	SPT	*WH-WH* *WH*	74.0							
				74.0			19.5–20	Ash (Sand Like), Medium Grained, Poorly Graded, Very Loose, Greenish Black (10GY 2.5/1), Wet			

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale: 564, 562, 560, 558, 556, 554, 552, 550, 548, 546

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 8/16/2024
Finish: 8/16/2024
WEATHER: 85F and Overcast

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-550 ATV Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: G. Tabacchi

BOREHOLE ID: LB-05
Well ID: n/a
Surface Elev: 565.4 ft. MSL
Completion: 37.5 ft. BGS
Station: 1,128,266.90N
2,456,131.15E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 12.00 - During Drilling
▽ =
▼ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
8	18/18 *100%*	SPT	*WH-WH WH*					Ash (Sand Like), Medium Grained, Poorly Graded, Very Loose, Greenish Black (10GY 2.5/1), Wet *[Continued from previous page]*	544	
9	18/18 *100%*	SPT	*WH-WH WH*	70.0			22		542	
10	18/18 *100%*	SPT	*WH-WH WH*	73.0			24		540	
11	18/18 *100%*	SPT	*WH-WH WH*	71.0			26–28	Ash (Silt Like) w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet, High Plasticity	538	
12	18/18 *100%*	SPT	*WR-WR WR*	82.0			30		536	
13	18/18 *100%*	SPT	*WR-WR WR*	86.0			32	Ash (Sand Like), Medium Grained, Poorly Graded, Very Loose, Greenish Black (10GY 2.5/1), Wet	534, 532	
14	18/18 *100%*	SPT	*WH-WH WH*	89.0			34	Ash (Silt Like) w/ trace sand, Very Soft, Greenish Black (10GY 2.5/1), Wet, High Plasticity	530	
15	16/18 *89%*	SPT	*2-4 4* N=8	28.0			36	Clay, Silty, Medium Stiff, Moist, Light Reddish Brown (2.5YR 6/4) w/ Gray Mottling	528	

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: **Start:** 6/19/2025
Finish: 6/20/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: Bucket Auger Rig
Drilling Method: Bucket Auger
FIELD STAFF: **Driller:** T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DO06
Well ID: DO06
Surface Elev: 552.77 ft. MSL
Completion: 30.30 ft. BGS
Station: 1,129,174.10N
2,456,191.27E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 2.00 - During Drilling
▼ = 4.76 - 6/23/25
▼ =

SAMPLE: Number	SAMPLE: Recov / Total (in) *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* N - Value **RQD**	TESTING: Water Content (%)	TESTING: Dry Density (lb/ft^3)	TESTING: Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
							0–20	Very dark grayish brown (10YR3/2), wet, soft, SILT with trace very fine-grained sand. (Fly Ash)		552–534	

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

Elevation scale: 552, 550, 548, 546, 544, 542, 540, 538, 536, 534

NOTE(S):

FIELD BORING LOG

HANSON

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 6/19/2025
Finish: 6/20/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: Bucket Auger Rig
Drilling Method: Bucket Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DO06
Well ID: DO06
Surface Elev: 552.77 ft. MSL
Completion: 30.30 ft. BGS
Station: 1,129,174.10N
2,456,191.27E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 2.00 - During Drilling
▼ = 4.76 - 6/23/25
▼ =

SAMPLE			TESTING								
Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
							22 24 26 28	Very dark grayish brown (10YR3/2), wet, soft, SILT with trace very fine-grained sand. (Fly Ash) *[Continued from previous page]*		532 530 528 526	
							30	Dark gray (10YR4/1), moist, medium, SILT with some clay and trace sand.		524	

End of Boring = 30.3 feet

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: **Start:** 6/19/2025
Finish: 6/19/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-850 Track Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: **Driller:** T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DO07
Well ID: DO07
Surface Elev: 552.75 ft. MSL
Completion: 27.00 ft. BGS
Station: 1,129,197.21N
2,456,094.95E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 4.00 - During Drilling
▽ = 3.72 - 6/23/25
▼ =

SAMPLE: Number	SAMPLE: Recov / Total (in) / *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* / N - Value / **RQD**	TESTING: Water Content (%)	TESTING: Dry Density (lb/ft^3)	TESTING: Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	18/18 *100%*	SS	*woh-1* *1* N=2				5–6.5	Very dark grayish brown (10YR3/2), wet, soft, SILT with trace very fine-grained sand. (Fly Ash)			
	24/24 *100%*	SS	*woh-woh* *woh-woh*				10–12				
	20/24 *83%*	SS	*woh-woh* *woh-woh*				15–17				

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 6/19/2025
Finish: 6/19/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-850 Track Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DO07
Well ID: DO07
Surface Elev: 552.75 ft. MSL
Completion: 27.00 ft. BGS
Station: 1,129,197.21N
2,456,094.95E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 4.00 - During Drilling
▼ = 3.72 - 6/23/25
▼ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	*Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	24/24 *100%*	SS	*woh-woh woh-woh*							532	
							22	Black (10YR2/1), wet, soft, SILT with trace very fine-grained sand. (Fly Ash)		530	
							24			528	
	24/24 *100%*	SS	*woh-woh 3-4*					Black (10YR2/1), wet, loose, very coarse- to medium-grained SAND with little silt. (Bottom Ash)			
							26	Yellowish brown (10YR5/6), moist, medium, SILT with some clay and trace sand.		526	

End of Boring = 27.0 feet

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 6/19/2025
Finish: 6/19/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-850 Track Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DO08
Well ID: DO08
Surface Elev: 551.80 ft. MSL
Completion: 28.27 ft. BGS
Station: 1,129,401.38N
2,456,257.44E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 1.75 - During Drilling
▼ = 3.20 - 6/23/25
▼ =

SAMPLE: Number	Recov / Total (in) / *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
	17/24 *71%*	SS	*woh-woh woh-woh*				5–7	Very dark grayish brown (10YR3/2), wet, soft, SILT with trace very fine-grained sand. (Fly Ash)		
	24/24 *100%*	SS	*woh-woh woh-1*				10–12			
	24/24 *100%*	SS	*woh-woh woh-woh*				15–17	Black (10YR2/1), wet, soft, SILT with trace very fine-grained sand. (Fly Ash) (from 15.5)		

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Elevation scale: 550, 548, 546, 544, 542, 540, 538, 536, 534, 532

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 6/19/2025
Finish: 6/19/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: CME-850 Track Drill
Drilling Method: Hollow Stem Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DO08
Well ID: DO08
Surface Elev: 551.80 ft. MSL
Completion: 28.27 ft. BGS
Station: 1,129,401.38N
2,456,257.44E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 1.75 - During Drilling
▼ = 3.20 - 6/23/25
▼ =

SAMPLE: Number	SAMPLE: Recov / Total (in) *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* N - Value **RQD**	TESTING: Water Content (%)	TESTING: Dry Density (lb/ft^3)	TESTING: Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	24/24 *100%*	SS	*woh-woh woh-woh*				22			530	
							24	Black (10YR2/1), wet, soft, SILT with trace very fine-grained sand. (Fly Ash) *[Continued from previous page]*		528	
	24/24 *100%*	SS	*woh-woh woh-woh*				26			526	
	22/24 *92%*	SS	*woh-1 2-3* N=3				28	Dark gray (10YR4/1), moist, medium, SILT with some clay and trace sand.		524	

End of Boring = 28.27 feet

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 6/19/2025
Finish: 6/20/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: Bucket Auger Rig
Drilling Method: Bucket Auger
FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DW01
Well ID: DW01
Surface Elev: 553.01 ft. MSL
Completion: 30.30 ft. BGS
Station: 1,129,174.10N
2,456,191.27E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 2.00 - During Drilling
▼ = 4.95 - 6/23/25
▼ =

SAMPLE: Number	SAMPLE: Recov / Total (in) *% Recovery*	SAMPLE: Type	TESTING: *Blows / 6 in* N - Value **RQD**	TESTING: Water Content (%)	TESTING: Dry Density (lb/ft^3)	TESTING: Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
							0–20	Very dark grayish brown (10YR3/2), wet, soft, SILT with trace very fine-grained sand. (Fly Ash)			

Depth scale (ft. BGS): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

Elevation scale (ft. MSL): 552, 550, 548, 546, 544, 542, 540, 538, 536, 534

NOTE(S):

FIELD BORING LOG

HANSON™

CLIENT: City Water, Light and Power
Site: CWLP Ash Pond Dewatering
Location: Springfield, IL
Project: 25E0006.00
DATES: Start: 6/19/2025
Finish: 6/20/2025
WEATHER: 85°F, sunny

CONTRACTOR: Skinner Limited
Rig mfg/model: Bucket Auger Rig
Drilling Method: Bucket Auger

FIELD STAFF: Driller: T. Skinner
Helper: C. Vanburen
Eng/Geo: R. Hasenyager

BOREHOLE ID: DW01
Well ID: DW01
Surface Elev: 553.01 ft. MSL
Completion: 30.30 ft. BGS
Station: 1,129,174.10N
2,456,191.27E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Springfield East
Township: Woodside
Section 12, **Tier** 15; **Range** 5

WATER LEVEL INFORMATION:
▽ = 2.00 - During Drilling
▼ = 4.95 - 6/23/25
▼ =

SAMPLE: Number	Recov / Total (in) *% Recovery*	Type	TESTING: *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft^3)	Qu (tsf) *Qp (tsf)* Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
							20–28.3 (ticks 22, 24, 26, 28)	Very dark grayish brown (10YR3/2), wet, soft, SILT with trace very fine-grained sand. (Fly Ash) *[Continued from previous page]*		532, 530, 528, 526	
							28.3–30.3 (tick 30)	Dark gray (10YR4/1), moist, medium, SILT with some clay and trace sand.		524	

End of Boring = 30.3 feet

NOTE(S):

APPENDIX A6:

FLOW PATH INVESTIGATION WELL LOGS

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Site Grid
Northing: 39.7704029
Easting: -89.59912433

Weather: Sunny, 80F

Boring Information:
Boring No: AP-6SA
Well No: AP-6S
Surf Elev.: 534

Depth Information:
Total: 14.0
Auger: 14.0
Core: 0.0

Dates:
Start: 5/13/2025
Finish: 5/13/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) | - Split Spoon (SS) | - Shelby Tube | - Core | - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
0							Ground Surface	534.0
0–5	1	CB	4.1				Grey (5/1 10YR) silty CLAY, grading to olive (6/2 5GY) with yellow (7/8 10YR) mottles	530.0
5–10	2	CB	4.2					525.0
9–11							Grey (5/1 10YR) clayey SAND, with olive (6/2 5GY) and some yellow (7/8 2.5Y) mottles	
10–14	3	CB	3.8				Dark grey (4/1 10YR) SAND, with clay, with black (2/1 10YR) mottles, organics	520.0
14							End of Boring = 14 Feet	
15								515.0
20								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.76959656
Easting: -89.60064954

Weather: Sunny, 80F

Boring Information:
Boring No: AP-8SA
Well No: AP-8S
Surf Elev.: 535.9

Depth Information:
Total: 15.0
Auger: 15.0
Core: 0.0

Dates:
Start: 5/14/2025
Finish: 5/14/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: B. Hunsberger
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) | - Split Spoon (SS) | - Shelby Tube | - Core | - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	535.9
0	1	CB	5'				Dark grey (4/1 10YR) silty CLAY, with some fine sand and organics	535.0
							Dark grey (4/1 10YR) silty CLAY, trace fine sand, moist	
							Brown (4/3 10YR) silty CLAY, little fine sand, moist	
5	2	CB	5'				Grey (5/1 10YR) clayey SILT to silty CLAY, little fine sand, very moist	530.0
							with brown (5/3 10YR) laminatations, increased stiffness	
							Grey (5/1 10YR) clayey SILT to silty CLAY, little fine sand, very moist	
							Grey (5/1 10YR) sandy CLAY, soft	
10	3	CB	5'				Grey (5/1 10YR) clayey SILT to silty CLAY, little fine sand, very moist	
							Grey (5/1 01YR) silty CLAY, little fine sand, moist, some brown bands, trace rootlets	525.0
							Grey (5/1 10YR) soft CLAY, with silt	
							Grey (5/1 01YR) silty CLAY, little fine sand, moist, some brown bands, trace rootlets	
15							Grey (5/1 10YR) soft CLAY, some silt	
							Grey (5/1 01YR) silty CLAY, little fine sand, moist, some brown bands, trace rootlets	520.0
							End of Boring = 15 Feet	
20								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.762762
Easting: -89.59991904

Weather: Sunny, 67F

Boring Information:
Boring No: AP-15D
Well No: AP-15D
Surf Elev.: 536.3

Depth Information:
Total: 30.5
Auger: 30.5
Core: 0.0

Dates:
Start: 5/12/2025
Finish: 5/12/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA, 5' CB, 3' & 2' split spoon

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	536.3
0	1	CB	3.92				Brown (5/3 10YR) clayey SILT, with organics, spongy texture, very moist	535.0
							Grey (5/1 10YR) silty CLAY, moist	
5	2	CB	4				Yellow (7/8 2.5Y) silty CLAY, with black (2/1 10YR) and olive (6/2 10Y) mottles, wet	530.0
10	3	CB	3.85				Yellow (7/8 10YR) SAND, with trace clay, olive (6/2 10Y) and dark grey (4/1 10YR) mottles, wet	
							Yellow (7/8 2.5Y) clayey SAND, very fine to fine grain size	525.0
15	4	CB	4				Yellow (7/8 2.5Y) SAND, coarse grain size, with some medium grains, saturated	520.0
20		SS		1				

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: AP-15D Boring No: AP-15D   Well No: AP-15D

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5		2.3	1 3 4 4 4 4			color grades to grey (5/1 10YR)	515.0
							Grey (5/1 10YR) clayey SAND, fine grain size, saturated	
25	6		3	wg wg wg 1 1 2				
	7		4				Light grey (7/1 10YR) CLAY, wet, high plasticity, highly adhesive	510.0
							Grey (5/1 10YR) clayey SAND, medium grain size	
30	8		0.6	wg 60\2			Grey (6/1 10YR) clayey SAND, very fine grain size	
							Dark grey (4/1 10YR) SHALE, wet	
							End of Boring = 30.5 Feet	505.0
35								500.0
40								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.76277306
Easting: -89.59992106

Weather: Sunny, 67F

Boring Information:
Boring No: AP-15S
Well No: AP-15S
Surf Elev.: 533.6

Depth Information:
Total: 24.5
Auger: 24.5
Core: 0.0

Dates:
Start: 5/12/2025
Finish: 5/12/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA, 5' CB, 3' & 2' Split spoon

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	533.6
0	1	CB	3.9				Dark (3/1 10YR) silty CLAY, with coal fragments and organics, moist	530.0
							Dark grey (3/1 10YR) CLAY, moist	
5	2	CB	4.8				Yellow (7/8 2.5Y) sandy CLAY, with olive (6/2 10Y) and grey (5/1 10YR) mottles	525.0
							Yellow (7/8 2.5 Y) clayey SAND, very moist, with olive (6/2 5GY) and grey (5/1 10YR) mottles	
10	3	CB	4.9				Yellow (7/8 2.5Y) CLAY, fine to medium grain size, wet	
							Yellow (7/8 2.5Y) clayey SAND, very moist, with olive (6/2 10Y)	520.0
15	4	SS	2.9	wg wg 2 4 5 8			Yellowish brown (5/6 10YR) SAND, fine to medium grain size, trace clay, wet	
	5	SS	1.5	wg 2 3 5				515.0
20		SS		5				

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: AP-15S Boring No: AP-15S   Well No: AP-15S

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	6		2.3	5 6 8 8 7 5			Yellowish brown (5/6 10YR) clayey SAND, very fine grain size	
							Grey (6/1 10YR) SAND, medium to coarse grain size, wet	
	7		1.8	2 2 2 2			Grey (5/1 10YR) silty CLAY, moist, with sand	
							Light grey (7/1 10YR) CLAY, firm, wet	510.0
25							End of Boring = 24.5 Feet	
30								505.0
35								500.0
40								495.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.77159212
Easting: -89.60008687

Weather: Sunny, 70F

Boring Information:
Boring No: AP-16
Well No: AP-16
Surf Elev.: 533.6

Depth Information:
Total: 23.0
Auger: 23.0
Core: 0.0

Dates:
Start: 5/20/2025
Finish: 5/20/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	533.6
0	1	CB	4.8				Light brown (6/3 7.5YR) SILT, organics	
							Grey (4/1 10YR) silty CLAY, moist, trace yellow (7/8 2.5Y) mottles	530.0
							Olive (6/4 10Y) CLAY, with some brownish yellow (6/8 10YR) mottles	
5	2	CB	4.4				color grades to (8/1 10YR) with olive (6/4 10Y) and brownish yellow (6/8 10YR) mottles, moist	
							color grades to white (8/1 10YR) clayey SILT, moist, yellowish brown (4/6 10YR) mottles	525.0
							white (8/1 N) with brown (7/6 10YR) mottles, wet	
10	3	CB	5				White (8/1 10YR) silty CLAY, moist, with brown (6/8 10YR) mottles	
							Light olive (6/3 5Y) clayey SAND, wet	
							Light bluish grey (7/1 10B) silty CLAY with yellow (7/6 10YR) mottles, moist	520.0
15	4	CB	1.8				Grey (5/1 10YR) SAND, well sorted, medium to coarse grain size, coarsening downward, trace gravel, with clay	515.0
20								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: AP-16 Boring No: AP-16 Well No: AP-16

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5		3.3				Grey (5/1 10YR) clayey SAND, well sorted, coarse to medium grain size, trace gravel	
							Black (2/1 10YR), grading to olive (6/2 5GY) clayey SHALE	
							End of Boring = 23 Feet	510.0
25								
								505.0
30								
								500.0
35								
								495.0
40								

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.77042692
Easting: -89.59572184

Weather: Sunny, 73F

Boring Information:
Boring No: P03D
Well No: P03D
Surf Elev.: 530

Depth Information:
Total: 35.0
Auger: 35.0
Core: 0.0

Dates:
Start: 5/14/2025
Finish: 5/14/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	530.0
0	1	CB	4.8				Black (2/1 10YR) SILT, with organics	
							Light grey (7/1 10YR) clayey SILT, with shale and coal fragments	
5	2	CB	4.7				Grey (4/1 10YR) clayey SILT with shale and coal fragments	525.0
							Olive (6/2 5GY) clayey SILT trace coal fragments	
10	3	CB	4.3				Dark grey (3/1 10YR) silty SAND, with trace organics, wet, medium to coarse grain size	520.0
							Light grey (7/1 10YR) silty CLAY, with (6/8 10YR) brown mottles	
15	4	CB	5				Olive (6/2 5GY) silty CLAY, with thin interbedded very fine grained sand, moist	515.0
20								510.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: P03D Boring No: P03D Well No: P03D

Legend: - Continuous Barrel (CB) | - Split Spoon (SS) | - Shelby Tube | - Core | - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	4.4				Grey (5/1 10YR) CLAY, with olive (6/2 5GY) mottles, moist, with thin sand interbedded	
25							Grey (6/1 10YR) CLAY, wet, highly plastic, very sticky	505.0
	6	CB	4.6					
							Grey (5/1 10YR) clayey SAND, medium grain size, moist	
30							Grey (4/1 10YR) SAND, medium to coarse grain size, wet	500.0
	7	CB	2.75					
							Dark grey (3/1 10YR) SHALE	
35							End of Boring = 35 Feet	495.0
40								490.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Site Grid
Northing: 39.77042711
Easting: -89.59573599

Weather: Sunny, 67F

Boring Information:
Boring No: P03S
Well No: P03S
Surf Elev.: 529.9

Depth Information:
Total: 14.0
Auger: 14.0
Core: 0.0

Dates:
Start: 5/14/2025
Finish: 5/14/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	529.9
0–5	1	CB	4.75				Dark brown (3/2 10YR) SILT, with organics, trace coal and shale	
							Light grey (7/1 10YR) clayey SILT, with brown mottles, trace gravel	
5–10	2	CB	4.6				Dark grey (3/1 10YR) clayey SILT, with coal and shale fragments	525.0
							Olive (5/3 5Y) silty CLAY, with grey (5/1 10YR) mottles, trace coal	
							Dark grey (3/1 10YR) silty SAND, wet, trace organics	520.0
10–14	3	CB	3.8				Dark grey (3/1 10YR) SAND, medium to coarse grain size, with silt, trace gravel	
							Olive (6/2 5GY) silty CLAY, moist, trace grey mottles	
							End of Boring = 14 Feet	
15								515.0
20								510.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:	Location:	Boring Information:
Name: Springfield City Water, Light, and Power Location: Springfield, IL County: Sangamon Site No.: 1678250020 AEI No.: 240338|0011	Coord. System: Site Grid Northing: 39.77040608 Easting: -89.59696106 Weather: Sunny, 80F	Boring No: P104S Well No: P104S Surf Elev.: 529.7
Drilling Contractor: Contractor Name: Skinner LTD City: Hindsburo, IL Equipment: 4.25" HSA with 5' CB and 2' Split Spoon	**Personnel:** Geologist: N. Beck Driller: T. Skinner Helper(s): C. Vonbrehens, T. Buckler	**Depth Information:** Total: 36.5 Auger: 36.5 Core: 0.0 **Dates:** Start: 5/15/2025 Finish: 5/15/2025

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	529.7
0–5	1	CB	4.4'				Brown (4/6 10YR) clayey SILT, with coal fragments, black and yellow mottles	
							grades to black	
							Grey (5/1 10YR) clayey SILT, with coal fragments, black and yellow mottles	525.0
							Dark grey (3/1 10YR) SILT	
5–10	2	CB	4.8'				Grey (5/1 10YR) silty CLAY, trace sand	
							Dark grey (4/1 10YR) CLAY, moist, trace coal fragments	520.0
10–15	3	CB	5'				Dark grey (4/1 10YR) silty CLAY, moist, trace organics and sand	515.0
15–20	4	CB	4.9'					510.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: G104S Boring No: G104S Well No: G104S

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	2.9'					
							Grey (5/1 10YR) SAND, with clay, wet, with little gravel	
	6	SS	1.6'	wg wg 1			Grey (6/1 10YR) CLAY, moist	
25							End of Boring = 25 Feet	505.0
30								500.0
35								495.0
40								490.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.77031764
Easting: -89.59489383

Weather: Sunny, 78F

Boring Information:
Boring No: R103S
Well No: R103S
Surf Elev.: 535.1

Depth Information:
Total: 30.0
Auger: 30.0
Core: 0.0

Dates:
Start: 5/19/2025
Finish: 5/19/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	535.1
0	1	CB	4.5				White (8/1 10YR) SILT, with many brown (6/4 10YR) mottles, organics, with trace sand	
5	2	CB	Full				Olive (6/2 5GY) silty CLAY, with brown (6/4 10YR) mottles, and trace black (2/1 10YR) mottles	530.0
							Light grey (7/1 10YR) grading to brown (5/4 10YR) CLAY, with silt, with (6/8 10YR) mottles, soft	
10	3	CB	Full				Light grey (7/1 10YR) clayey SILT, moist	525.0
							soft, wet	
15	4	CB	4.4				Dark grey (4/1 10YR) sandy CLAY, wet, soft, trace, with brown (5/6 10YR)	520.0
							Dark grey (4/1 10YR) SAND, wet, brown (5/7 10YR) mottles	
20								515.0

Notes:

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3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Boring Information: R103 Boring No: R103 Well No: R103

Legend: - Continuous Barrel (CB) | - Split Spoon (SS) | - Shelby Tube | - Core | - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
	5	CB	3.5				Grey (5/1 10YR) sandy CLAY, with trace gravel, coal, and shale	
							Grey (5/1 10YR) clayey SAND, with gravel	
25								510.0
	6	CB	4.1				Grey (5/1 10YR) weathered SHALE, with yellow (8/4 5Y)	
							Dark grey (3/1 10YR) SHALE, with lighter grey (5/1 10YR) bands	
30							End of Boring = 30 Feet	505.0
35								500.0
40								495.0

Notes:

Andrews Engineering, Inc.
3300 Ginger Creek Drive
Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.77018579
Easting: -89.59899292

Weather: Sunny, 80F

Boring Information:
Boring No: RW-3S
Well No: RW-3S
Surf Elev.: 535.9

Depth Information:
Total: 15.0
Auger: 15.0
Core: 0.0

Dates:
Start: 5/15/2025
Finish: 5/15/2025

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	535.9
0	1	CB	4.75				Grey (5/1 10YR) clayey SILT, with orgnics and gravel	535.0
							Greyish brown (5/2 10YR) silty CLAY, with reddish yellow (6/8 7.5YR) mottles and organics	
5	2	CB	4.0				Greenish grey (8/1 5GY) SILT, with clay, brown (5/8 10YR) mottles, trace sand near bottom	530.0
10	3	CB	3.75				Pale brown (6/3 10YR) SAND, wet	
							Greenish grey (8/1 5GY) SILT, with clay, brown (5/8 10YR) mottles, trace sand near bottom	525.0
							Pale brown (6/3 10YR)to grey (6/1 10YR) silty SAND, wet, with organics	
							Grey (6/1 10YR) clayey SAND, wet, with organics	
15							End of Boring = 15 Feet	520.0
20								

Notes:

Andrews Engineering, Inc.
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Springfield, IL 62711

FIELD BORING LOG

Site Information:
Name: Springfield City Water, Light, and Power
Location: Springfield, IL
County: Sangamon
Site No.: 1678250020
AEI No.: 240338|0011

Location:
Coord. System: Latitude & Longitude
Northing: 39.77037607
Easting: -89.60084024

Weather: Sunny, 70F

Boring Information:
Boring No: T4S
Well No: T4S
Surf Elev.: 546.8

Depth Information:
Total: 15.0
Auger: 15.0
Core: 0.0

Drilling Contractor:
Contractor Name: Skinner LTD
City: Hindsburo, IL
Equipment: 4.25" HSA with 5' CB

Personnel:
Geologist: N. Beck
Driller: T. Skinner
Helper(s): C. Vonbrehens, T. Buckler

Dates:
Start: 5/20/2025
Finish: 5/20/2025

- Continuous Barrel (CB) - Split Spoon (SS) - Shelby Tube - Core - Blind Drill

Depth (ft)	Run No.	Sample Type	Sample Recov.	Blow Count	qu/su (tsf)	Lithology	Description/Comments	Elev. (MSL)
							Ground Surface	546.8
0		CB					Dark brown (3/3 10YR) clayey SILT, moist	
	1	CB	4.75				Yellowish brown (5/8 10YR) silty CLAY, moist, with organics	545.0
5	2	CB	1.9				Pale brown (8/4 10YR) SILT, with clay, organics, trace sand, dry	540.0
	3	CB	3				hard	
10	4	CB	1.5				Pale brown (8/4 10YR) sandy SILT, with black mottles	535.0
	5	CB	0.5				Pale brown (7/3 10YR), sandy CLAY, with black mottles, organics, moist	
	6	CB	2.3				Light grey (7/2 10YR) clayey SAND, moist, with black mottles, organics, and trace gravel	
15							End of Boring = 15 Feet	530.0
20								

Notes:

APPENDIX B:
WELL CONSTRUCTION REPORTS

APPENDIX B1:
FGDS UNIT 2 LANDFILL WELL/PIEZOMETER CONSTRUCTION REPORTS

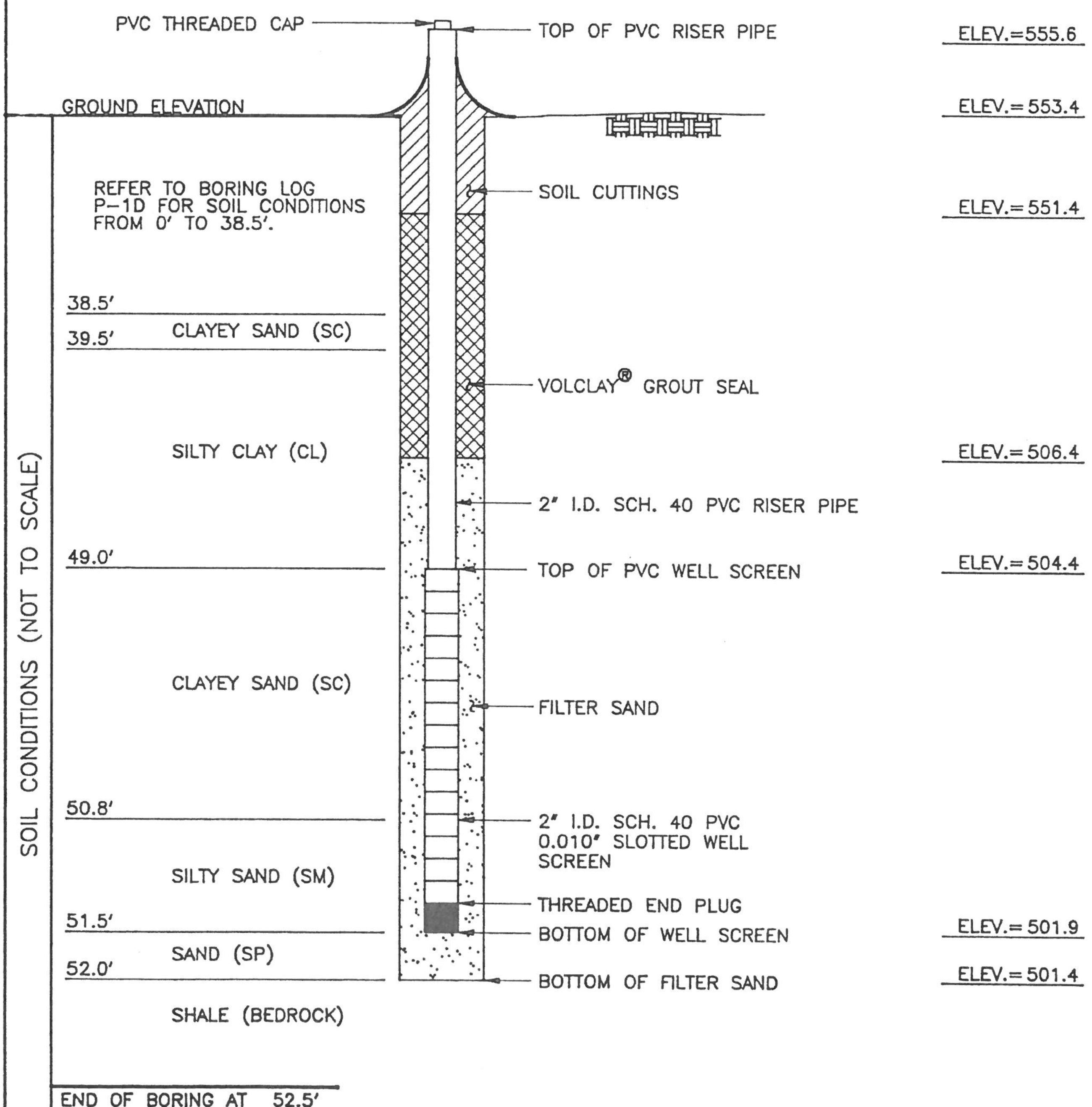
PATRICK ENGINEERING INC.

PIEZOMETER INSTALLATION REPORT

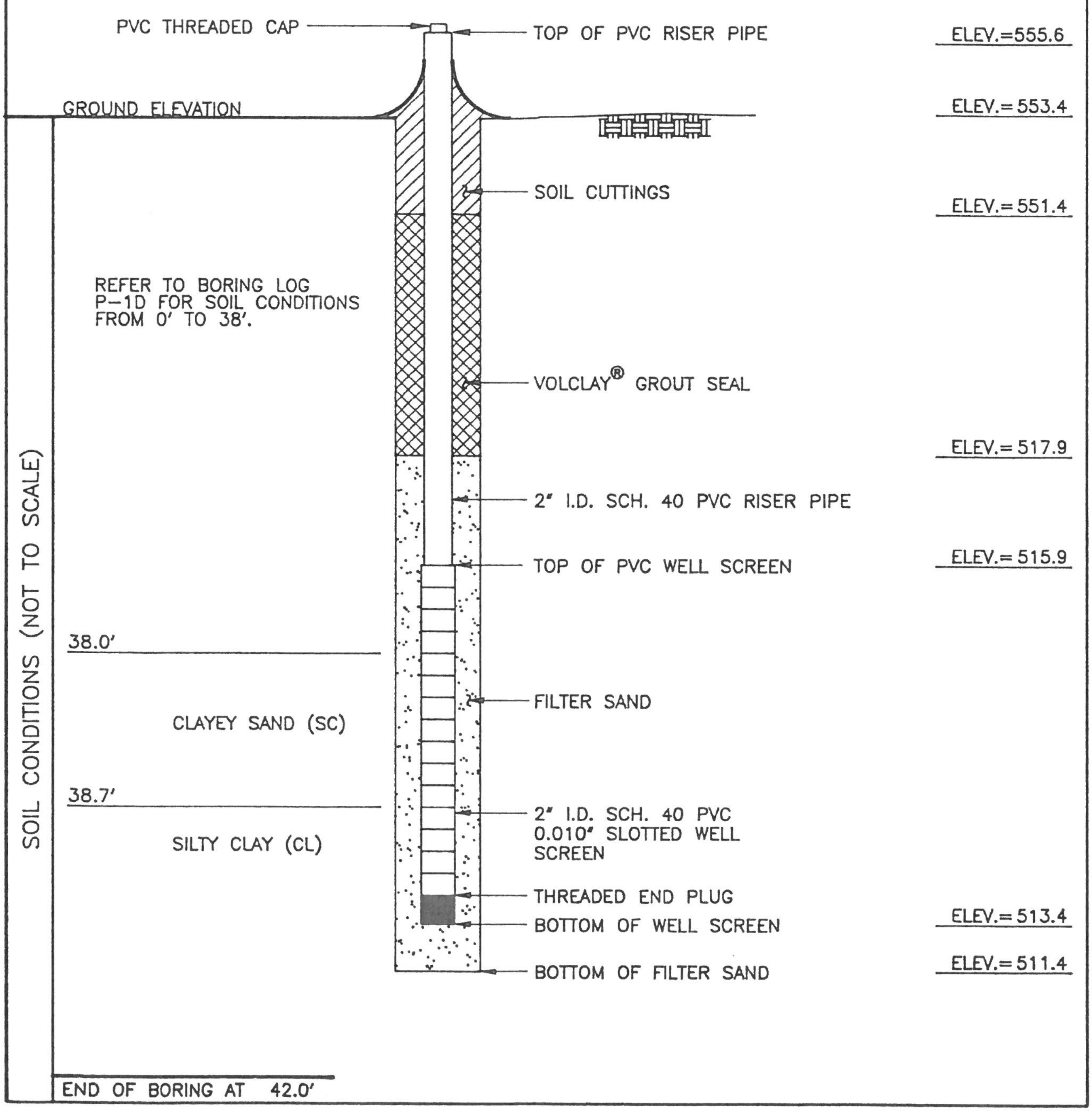
PIEZ. NO. P-1D
PROJ. NO. 496B

PROJECT FGDS LANDFILL
LOCATION SPRINGFIELD, ILLINOIS
CLIENT CWL&P
ENGINEER KRISHNA REDDY
DRILLER KEVIN SHAMWAY

BORING NO. P-1D
LOCATION N 4806.1
E 1973.1
INSTALLATION DATE 7/21/92
WEATHER CLOUDY, 70'S



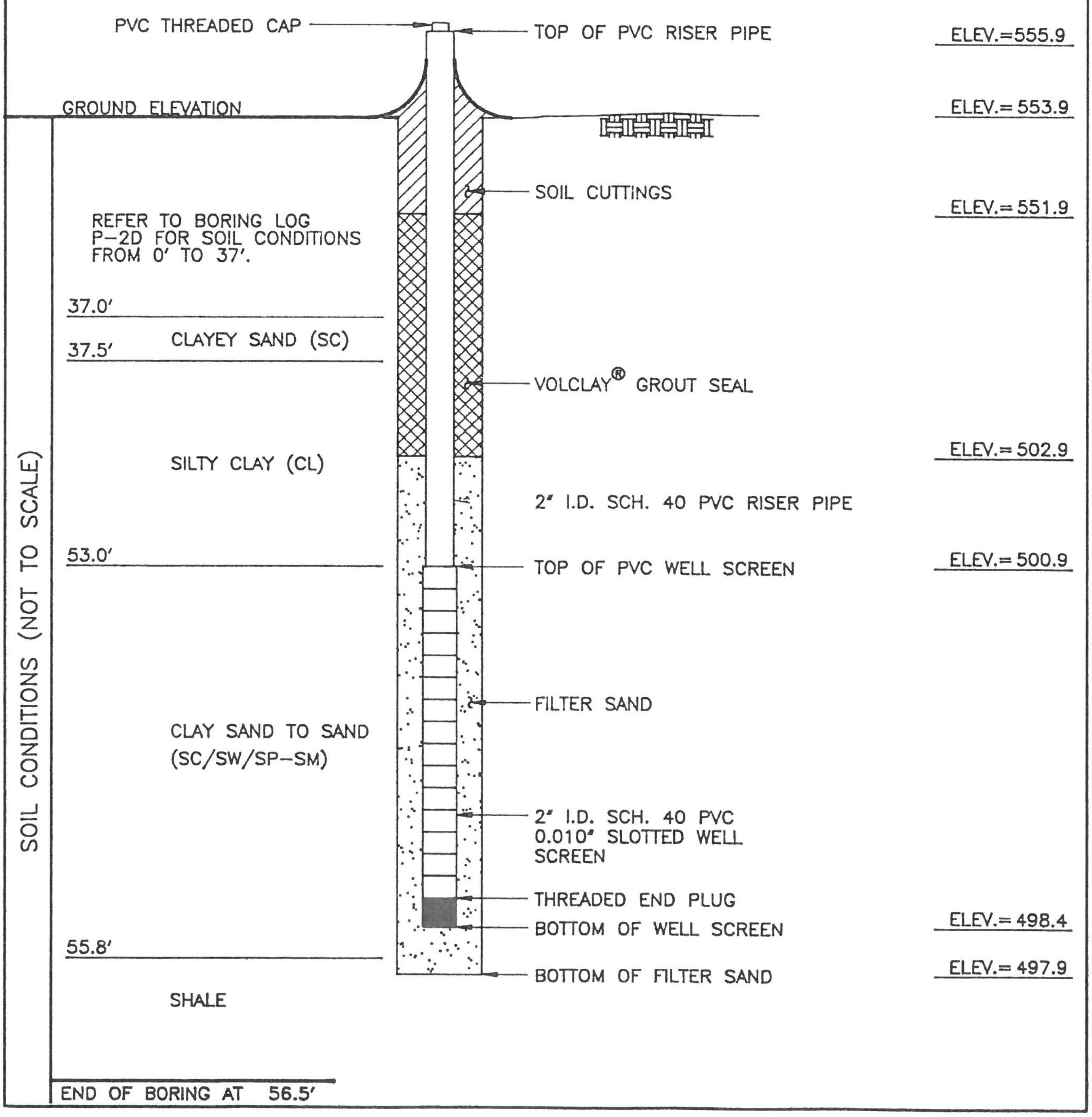
PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-1S PROJ. NO. 496B
PROJECT FGDS LANDFILL LOCATION SPRINGFIELD, ILLINOIS CLIENT CWL&P ENGINEER KRISHNA REDDY DRILLER KEVIN SHAMWAY		BORING NO. P-1S LOCATION N 4821.3 E 1973.9 INSTALLATION DATE 7/21/92 WEATHER P. CLOUDY, 70'S



ROJECTS/496/496B-001 10/13/92

PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-2D PROJ. NO. 496B

PROJECT FGDS LANDFILL	BORING NO. P-2D
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 5526.0
CLIENT CWL&P	E 1975.9
ENGINEER KRISHNA REDDY	INSTALLATION DATE 7/22/92
DRILLER KEVIN SHAMWAY	WEATHER CLOUDY, RAINY, 70'S

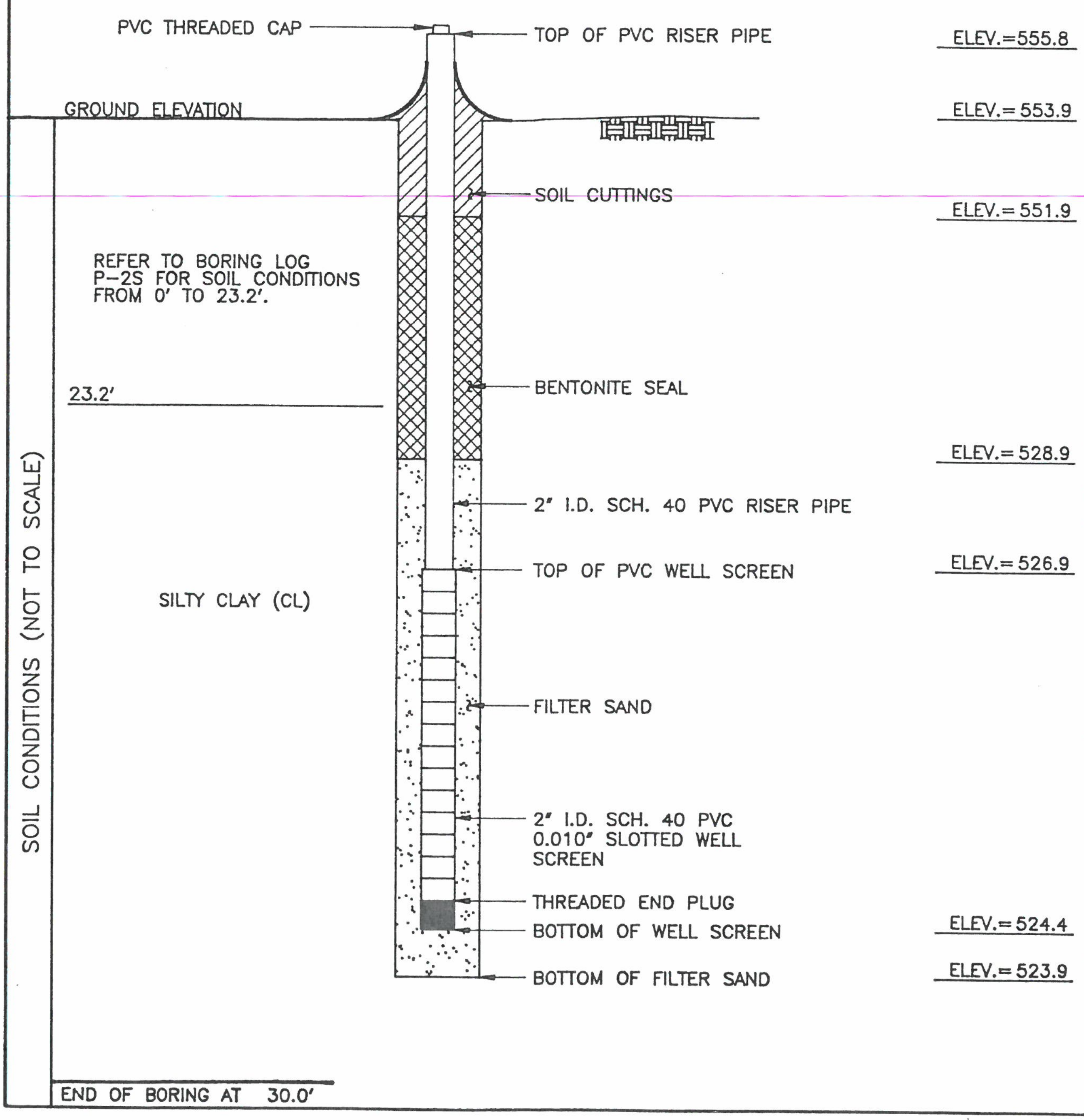


ROJECTS/496/496B-001 04/09/93

PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-2S PROJ. NO. 496B

PROJECT FGDS LANDFILL
LOCATION SPRINGFIELD, ILLINOIS
CLIENT CWL&P
ENGINEER KRISHNA REDDY
DRILLER KEVIN SHAMWAY

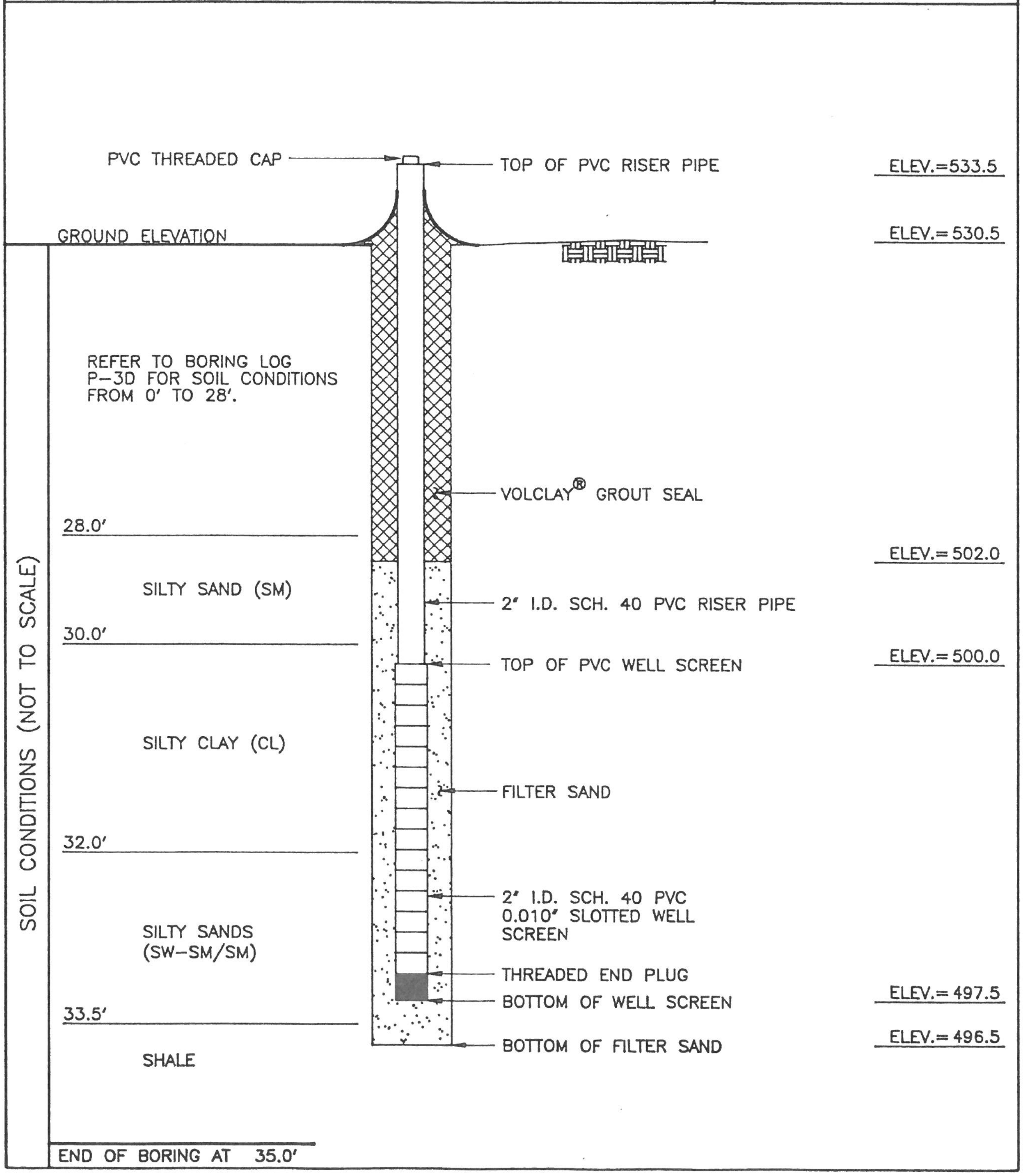
BORING NO. P-2S
LOCATION N 5237.1
E 1976.3
INSTALLATION DATE 7/22/92
WEATHER CLOUDY, RAINY, 70'S



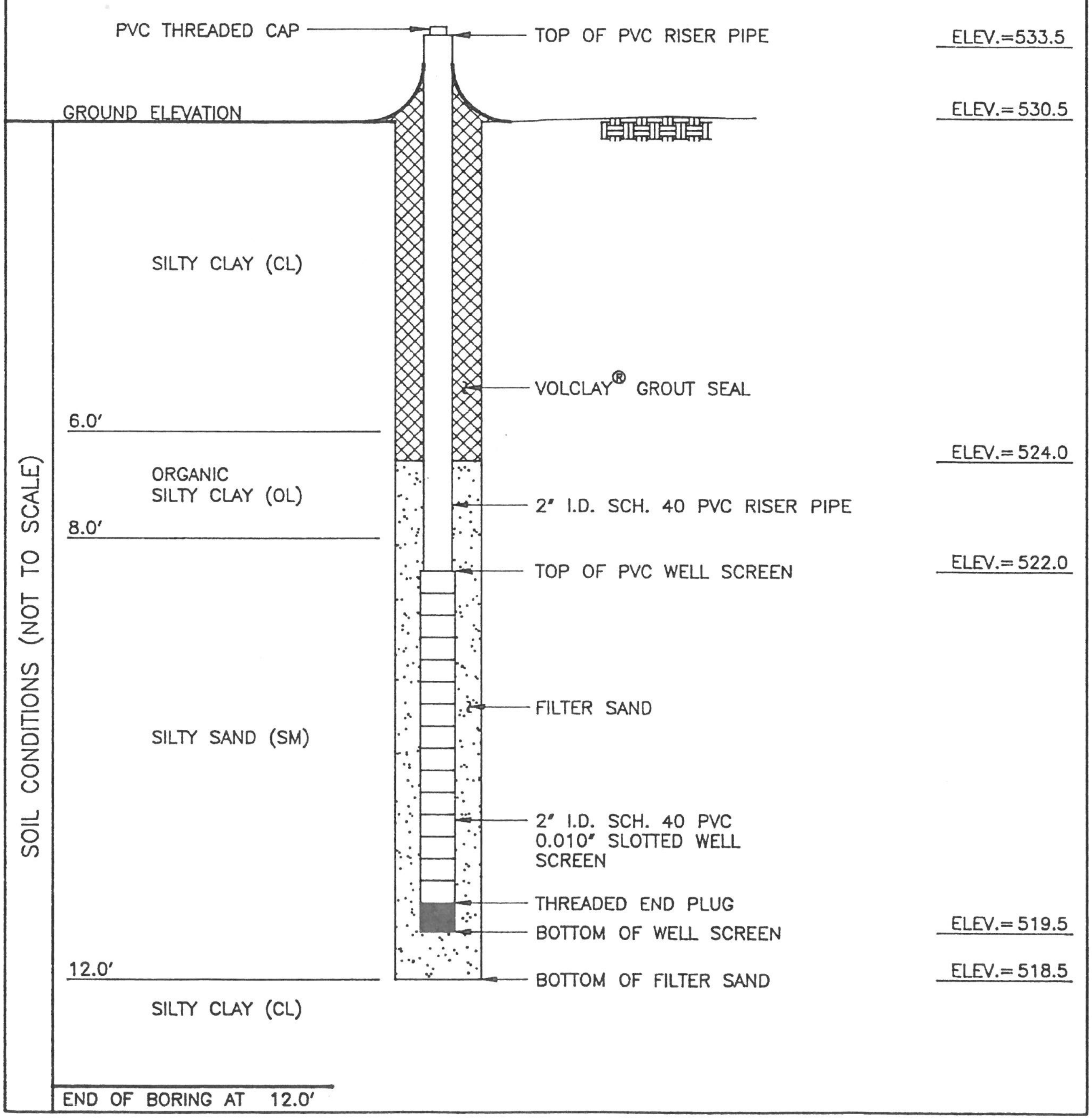
PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-3D PROJ. NO. 496B

PROJECT FGDS LANDFILL
LOCATION SPRINGFIELD, ILLINOIS
CLIENT CWL&P
ENGINEER KRISHNA REDDY
DRILLER KEVIN SHAMWAY

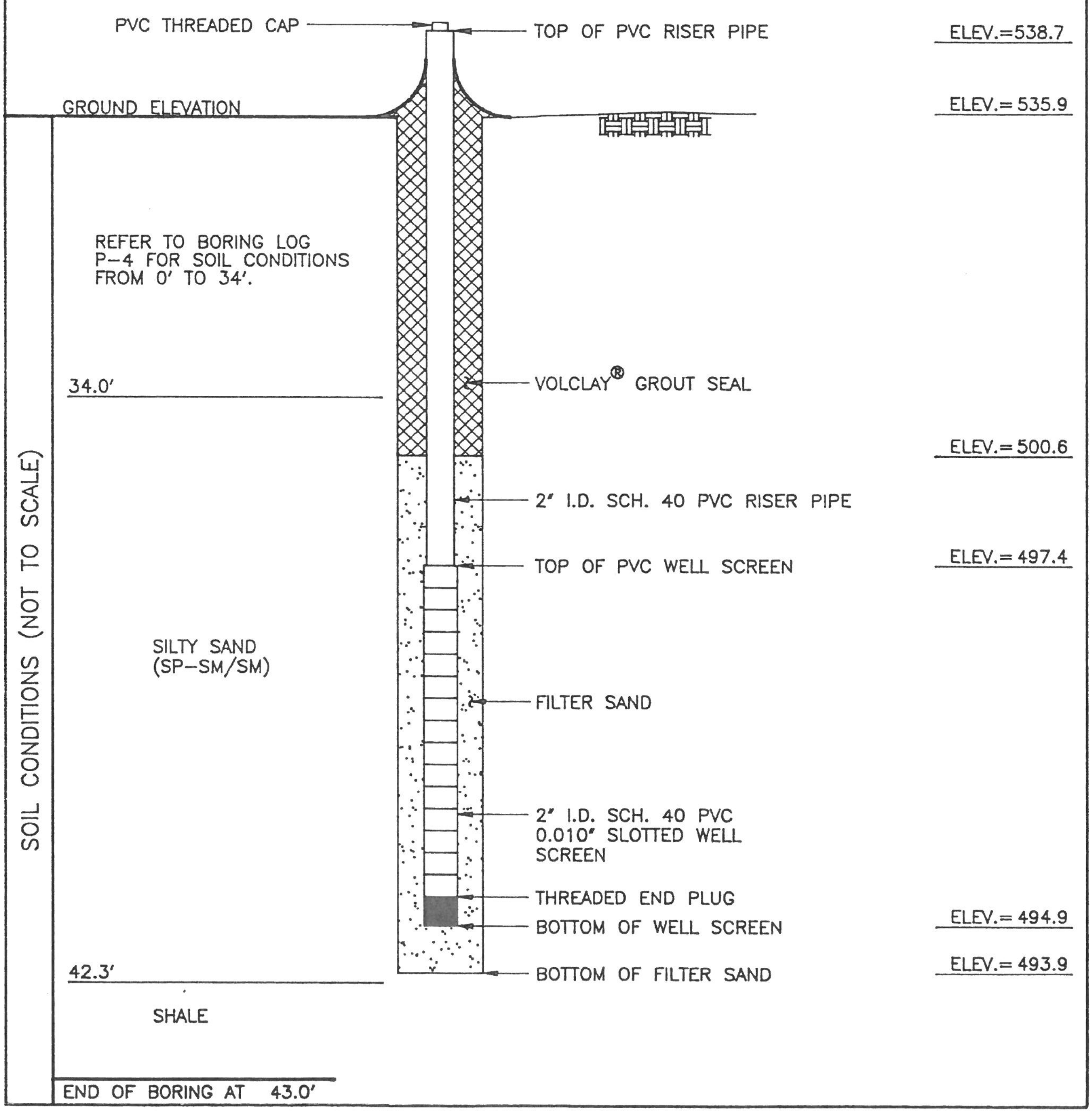
BORING NO. P-3D
LOCATION N 5672.5
E 2645.4
INSTALLATION DATE 8/17/92
WEATHER SUNNY, 70'S



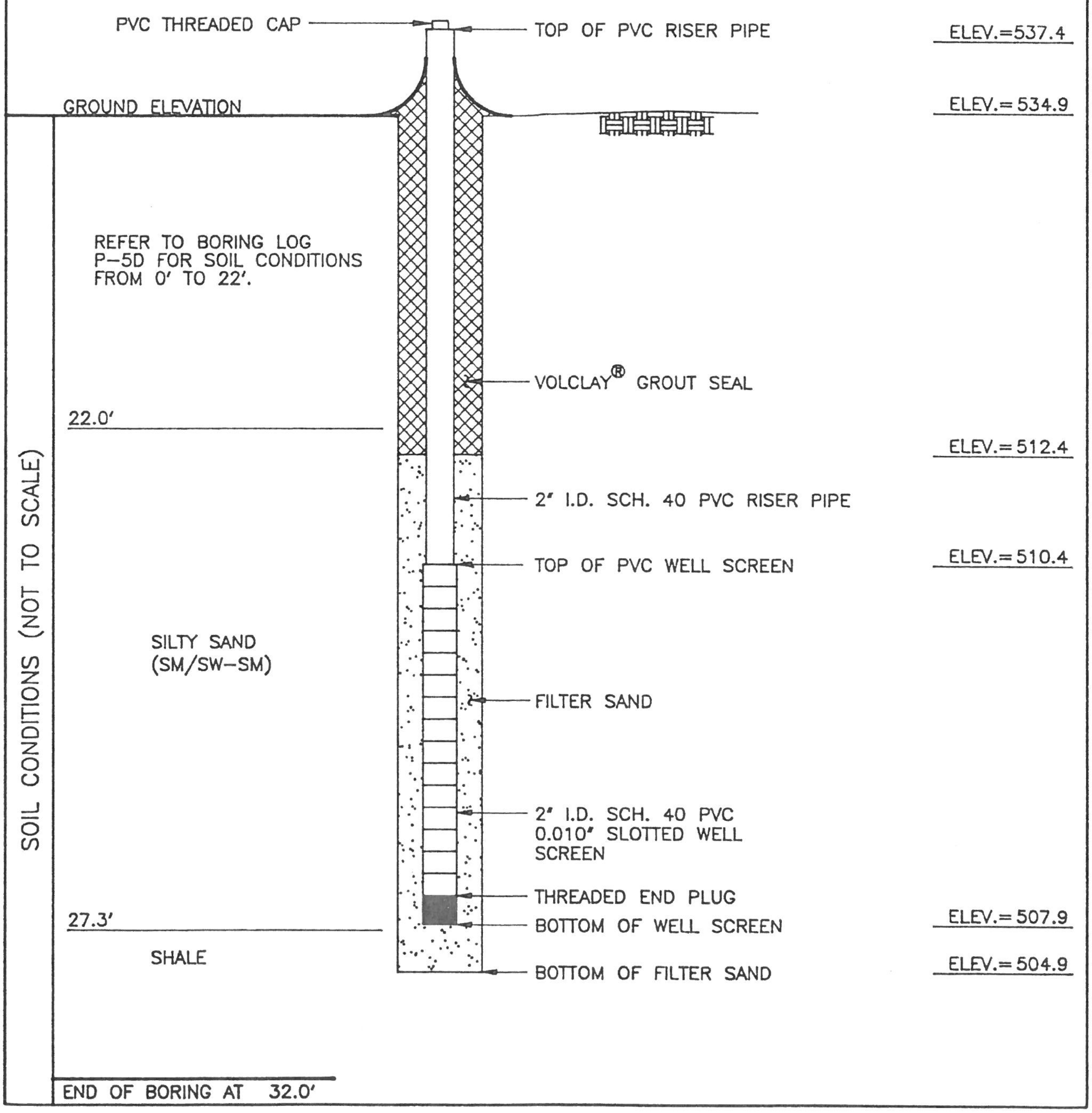
PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-3S PROJ. NO. 496B
PROJECT FGDS LANDFILL LOCATION SPRINGFIELD, ILLINOIS CLIENT CWL&P ENGINEER KRISHNA REDDY DRILLER KEVIN SHAMWAY		BORING NO. P-3S LOCATION N 5672.5 E 2651.4 INSTALLATION DATE 8/17/92 WEATHER SUNNY, 70'S



PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-4 PROJ. NO. 496B
PROJECT FGDS LANDFILL LOCATION SPRINGFIELD, ILLINOIS CLIENT CWL&P ENGINEER KRISHNA REDDY DRILLER KEVIN SHAMWAY		BORING NO. P-4 LOCATION N 5156.3 E 2880.7 INSTALLATION DATE 8/16/92 WEATHER SUNNY, 70'S

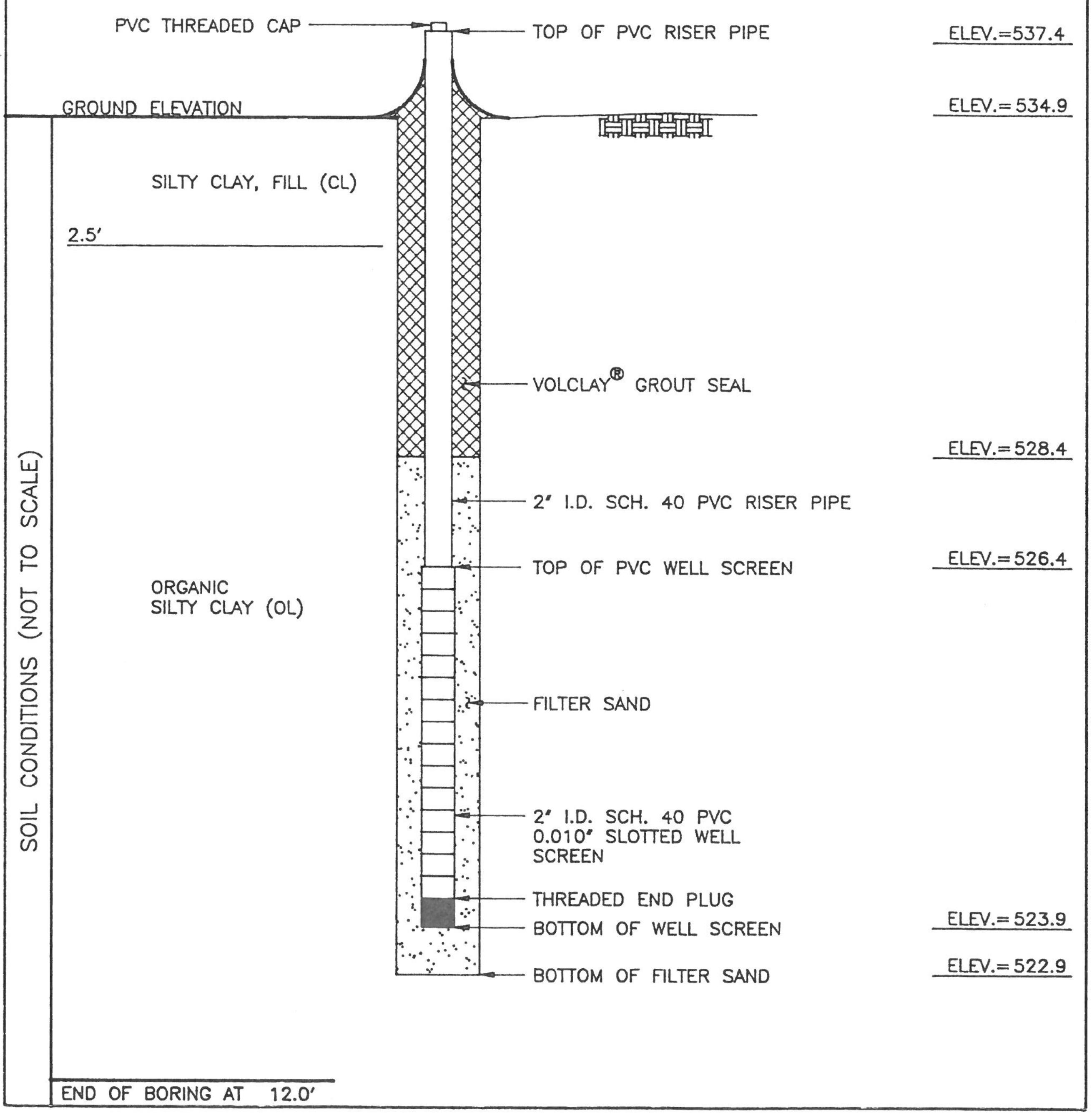


PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-5D PROJ. NO. 496B
PROJECT FGDS LANDFILL LOCATION SPRINGFIELD, ILLINOIS CLIENT CWL&P ENGINEER KRISHNA REDDY DRILLER KEVIN SHAMWAY		BORING NO. P-5D LOCATION N 4516.7 E 2885.0 INSTALLATION DATE 8/16/92 WEATHER SUNNY, 70'S



PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-5S PROJ. NO. 496B

PROJECT FGDS LANDFILL	BORING NO. P-5S
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 4510.7
CLIENT CWL&P	E 2887.0
ENGINEER KRISHNA REDDY	INSTALLATION DATE 8/16/92
DRILLER KEVIN SHAMWAY	WEATHER SUNNY, 70'S

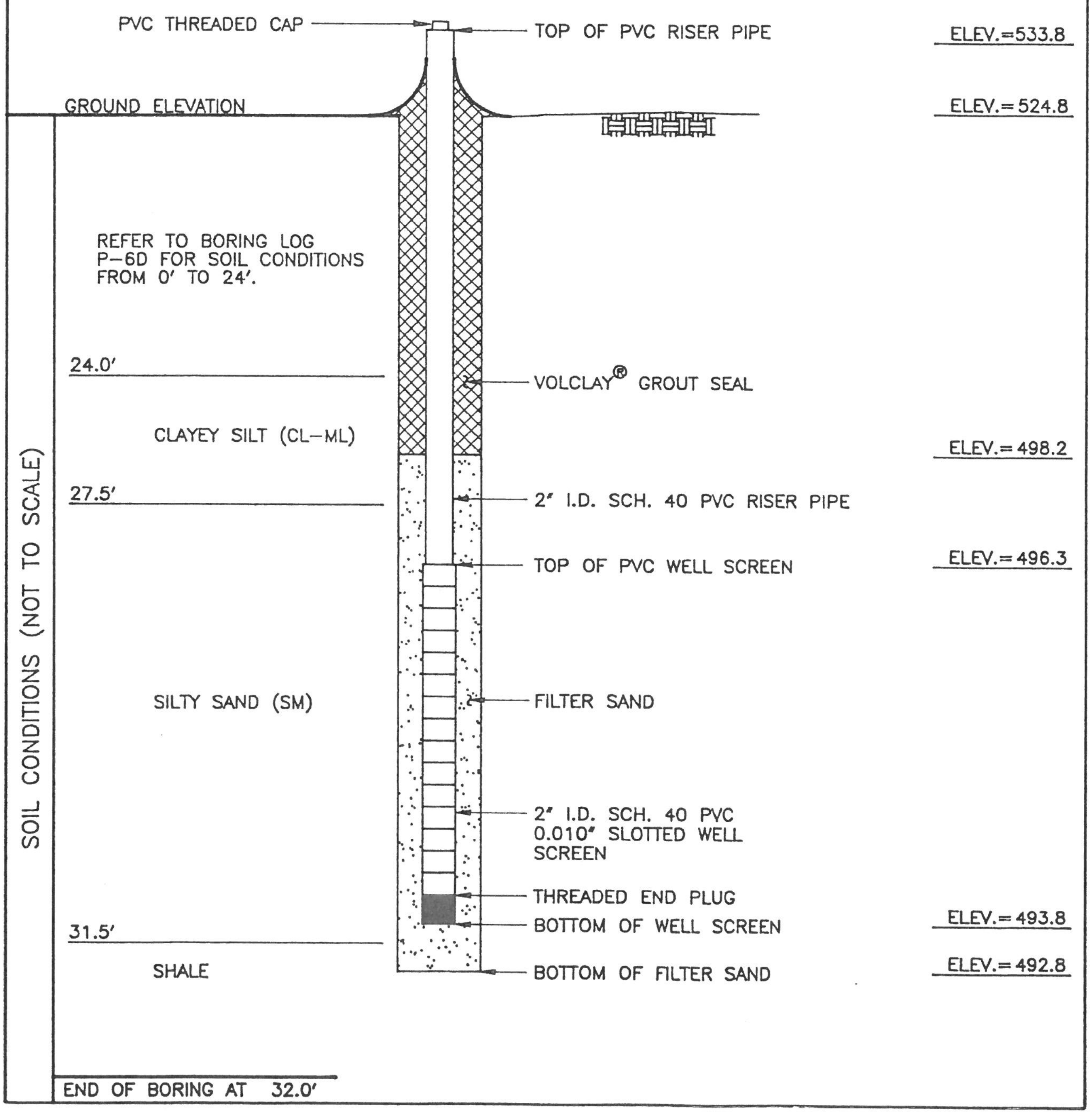


ROJECTS/496/496B-003 10/13/92

PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-6D PROJ. NO. 496B

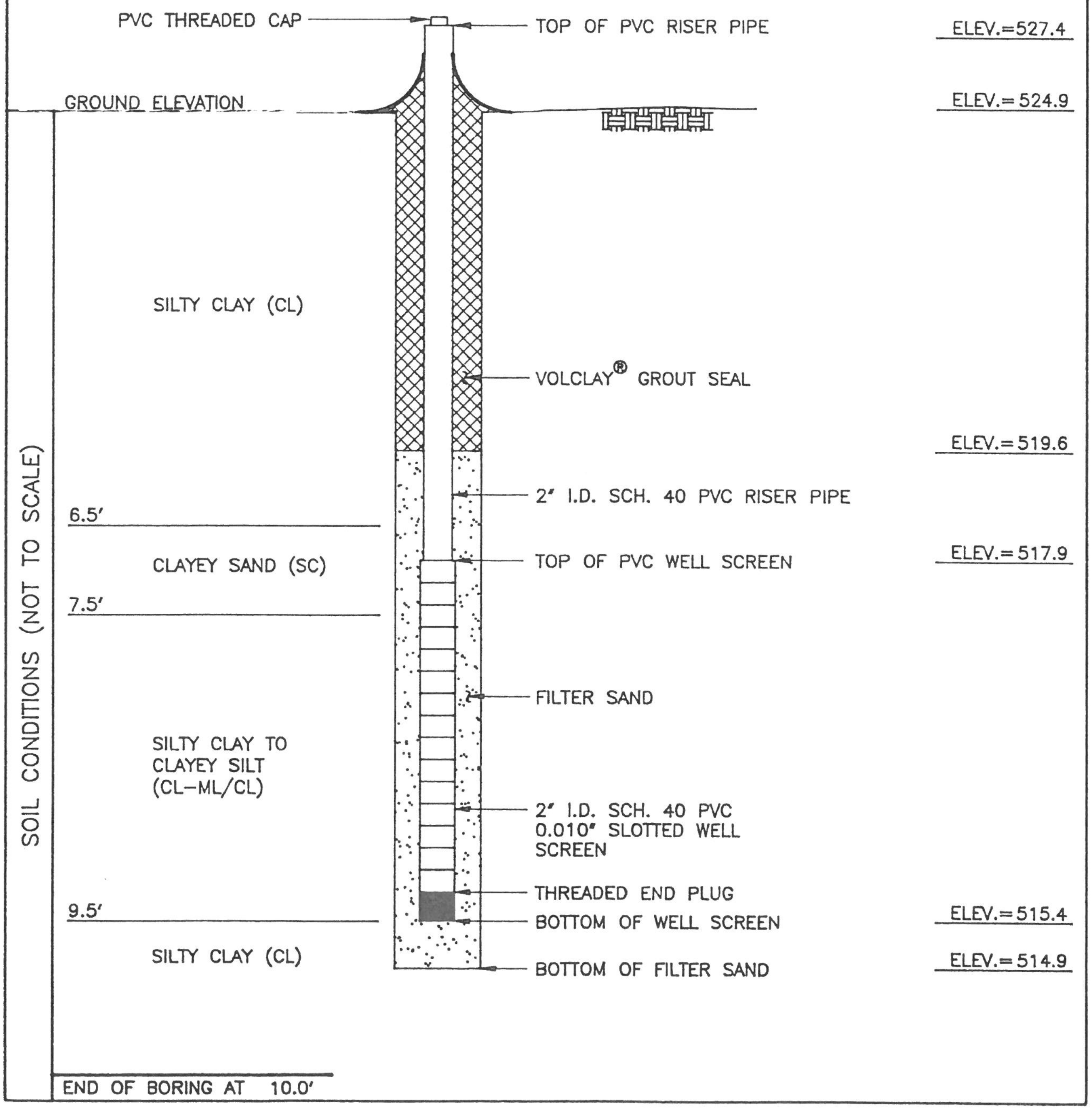
PROJECT FGDS LANDFILL
LOCATION SPRINGFIELD, ILLINOIS
CLIENT CWL&P
ENGINEER KRISHNA REDDY
DRILLER KEVIN SHAMWAY

BORING NO. P-6D
LOCATION N 4717.0
E 2186.8
INSTALLATION DATE 8/12/92
WEATHER SUNNY, 70'S



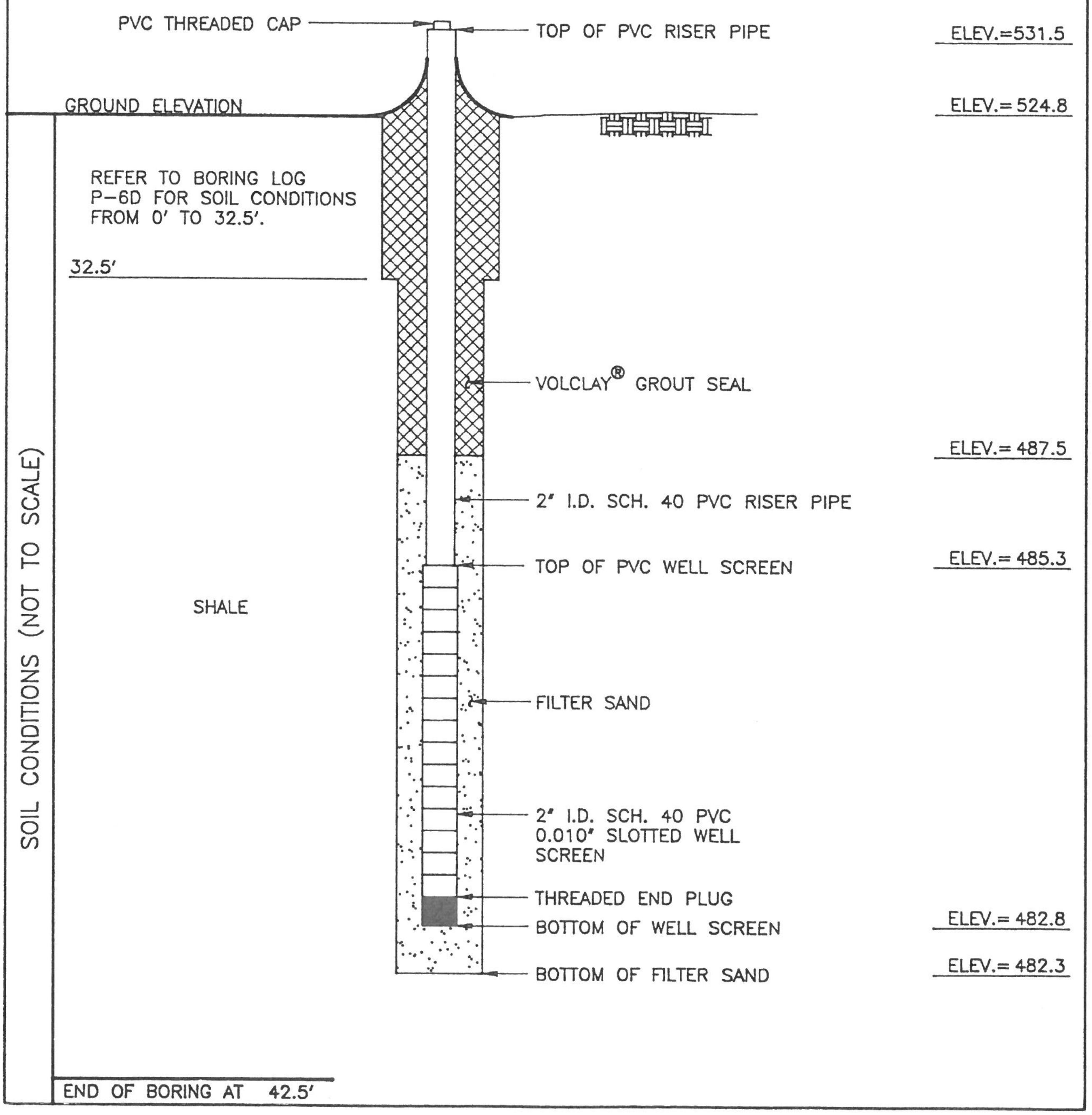
PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-6S PROJ. NO. 496B

PROJECT FGDS LANDFILL	BORING NO. P-6S
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 4725.7
CLIENT CWL&P	E 2191.4
ENGINEER KRISHNA REDDY	INSTALLATION DATE 8/12/92
DRILLER KEVIN SHAMWAY	WEATHER SUNNY, 70'S



PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-6R PROJ. NO. 496B

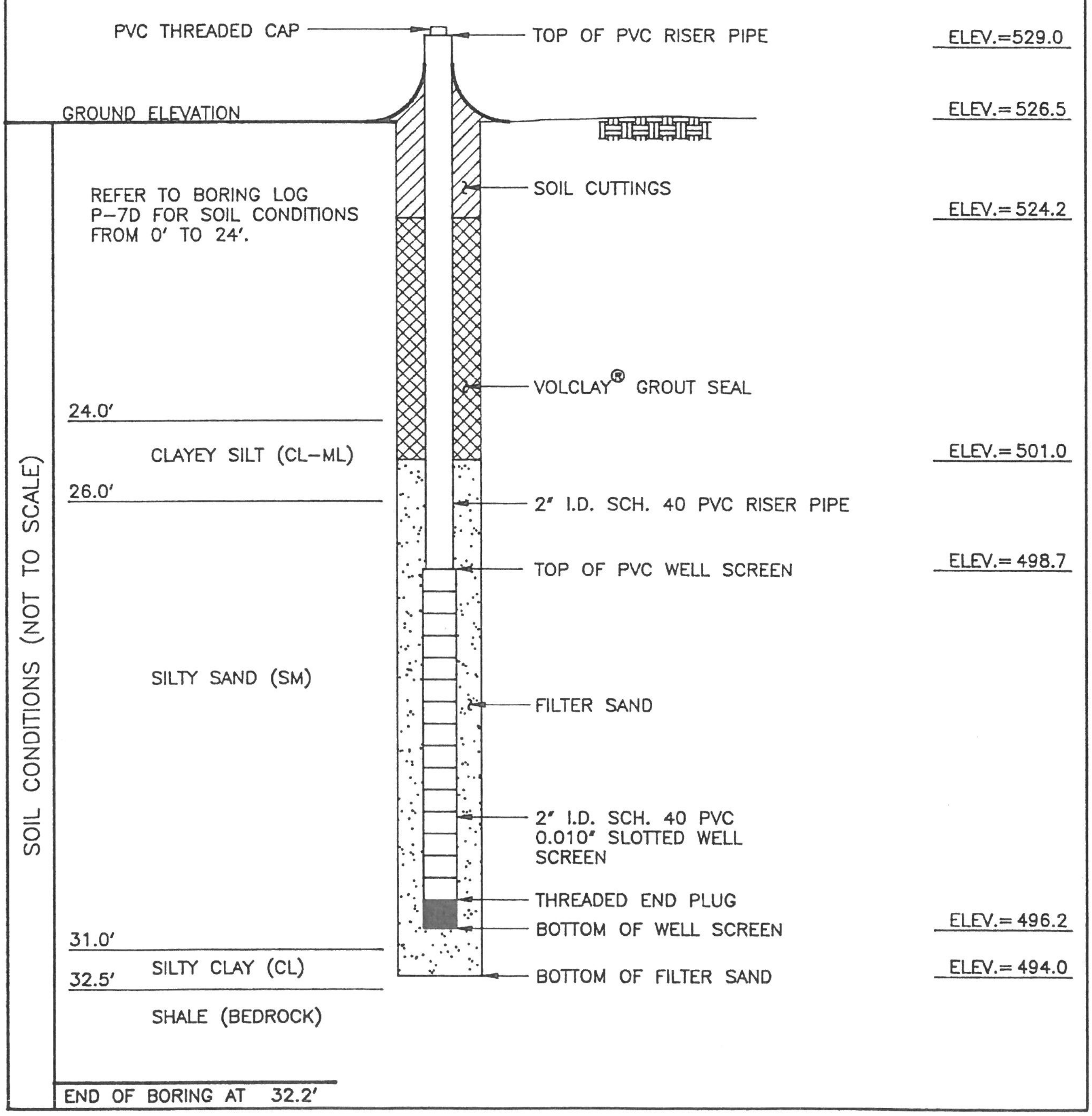
PROJECT FGDS LANDFILL	BORING NO. P-6R
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 4719.5
CLIENT CWL&P	E 2175.7
ENGINEER KRISHNA REDDY	INSTALLATION DATE 8/6/92
DRILLER KEVIN SHAMWAY	WEATHER SUNNY, 70'S



ROJECTS/496/496B-002 10/13/92

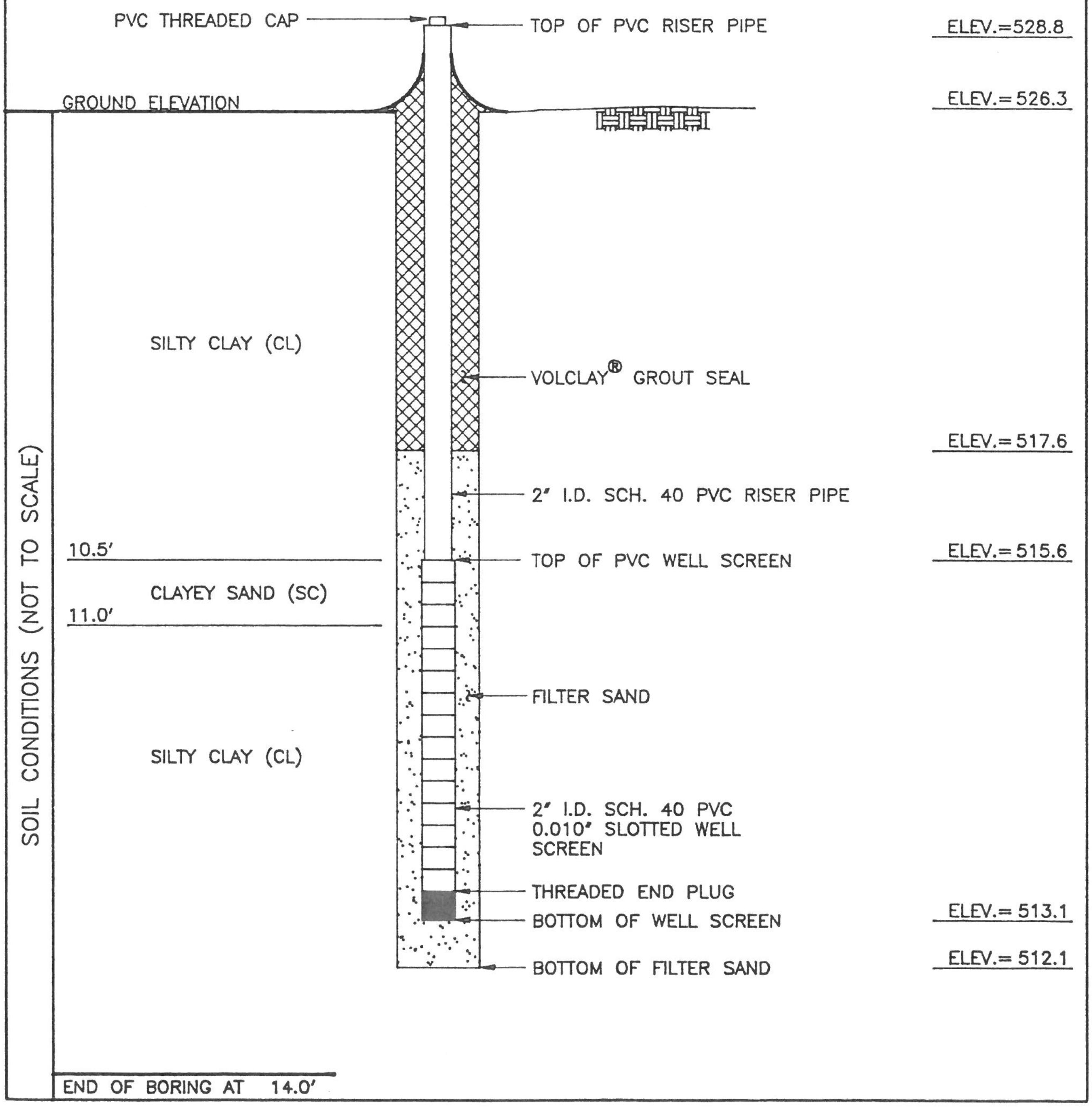
PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-7D PROJ. NO. 496B

PROJECT FGDS LANDFILL	BORING NO. P-7D
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 5345.8
CLIENT CWL&P	E 2429.5
ENGINEER KRISHNA REDDY	INSTALLATION DATE 7/30/92
DRILLER KEVIN SHAMWAY	WEATHER RAIN, WARM, 80'S



PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-7S PROJ. NO. 496B

PROJECT FGDS LANDFILL	BORING NO. P-7S
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 5337.1
CLIENT CWL&P	E 2426.3
ENGINEER KRISHNA REDDY	INSTALLATION DATE 7/30/92
DRILLER KEVIN SHAMWAY	WEATHER RAIN, WARM, 80'S

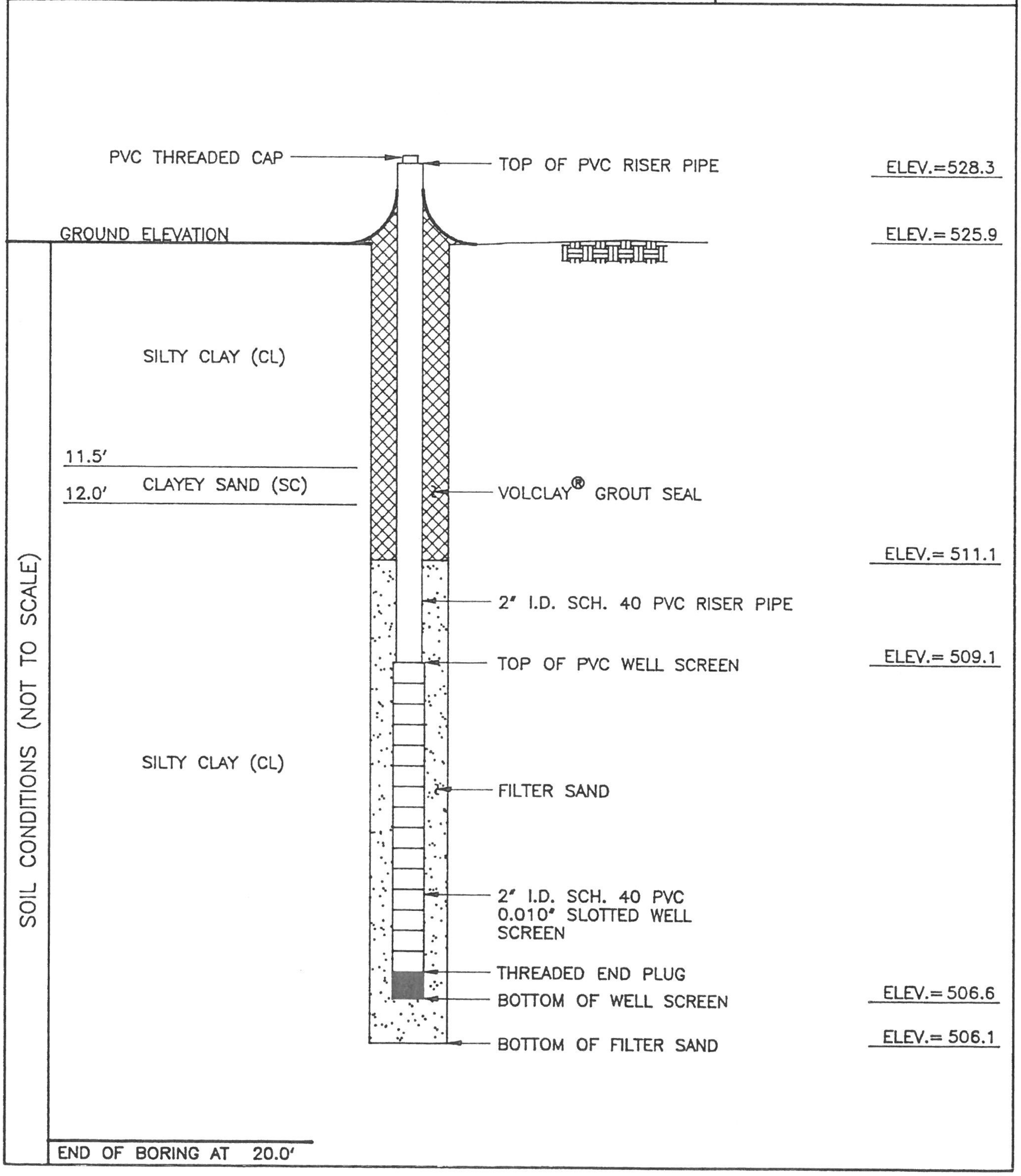


PROJECTS/496/496B-002 10/13/92

PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-7M PROJ. NO. 496B

PROJECT FGDS LANDFILL
LOCATION SPRINGFIELD, ILLINOIS
CLIENT CWL&P
ENGINEER KRISHNA REDDY
DRILLER KEVIN SHAMWAY

BORING NO. P-7M
LOCATION N 5337.0
E 2432.8
INSTALLATION DATE 7/30/92
WEATHER RAIN, WARM, 80'S



PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-7R PROJ. NO. 496B

PROJECT FGDS LANDFILL

LOCATION SPRINGFIELD, ILLINOIS

CLIENT CWL&P

ENGINEER KRISHNA REDDY

DRILLER KEVIN SHAMWAY

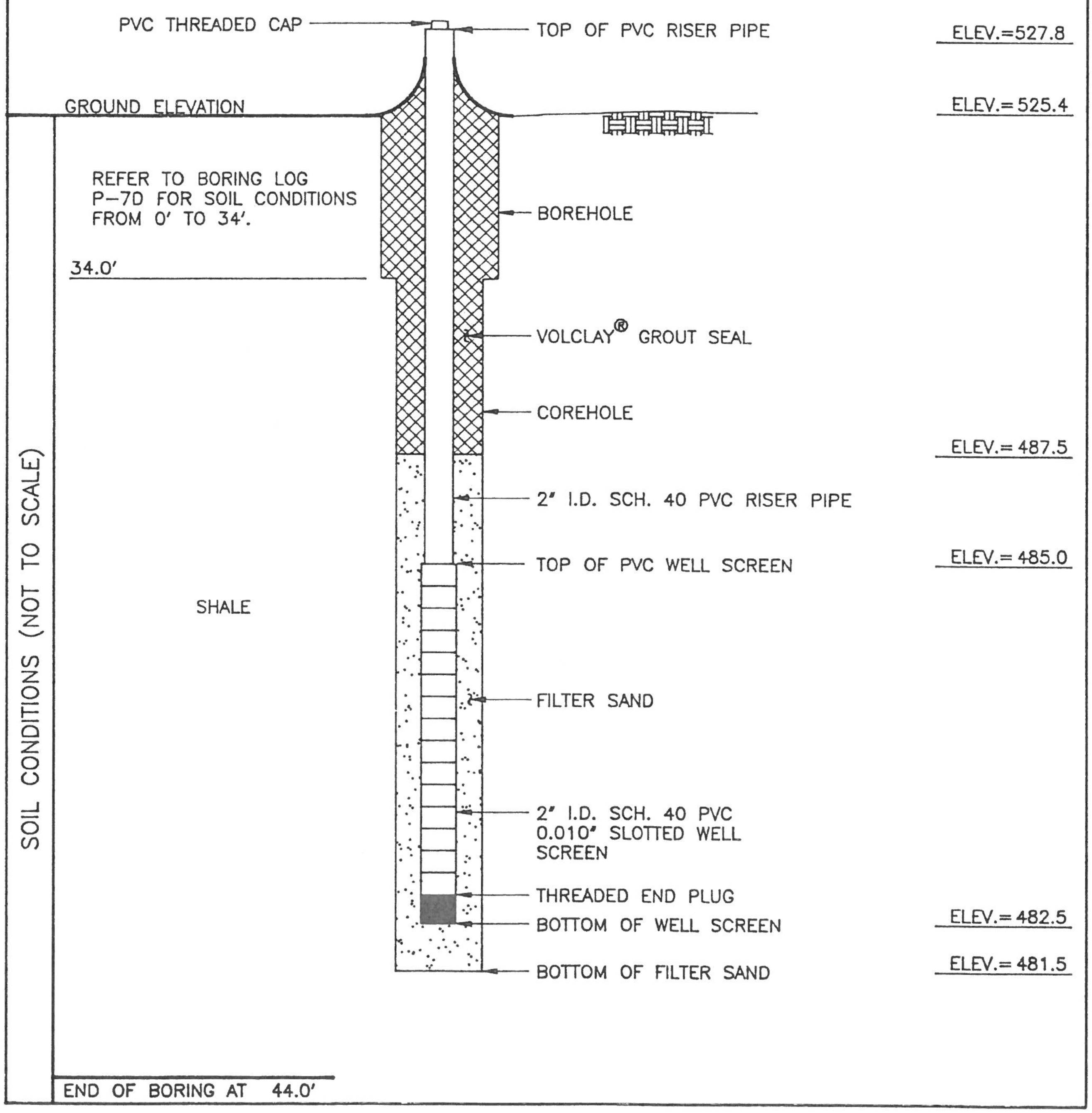
BORING NO. P-7R

LOCATION N 5326.9

E 2424.5

INSTALLATION DATE 7/31/92

WEATHER CLOUDY, DRIZZLE, 70'S



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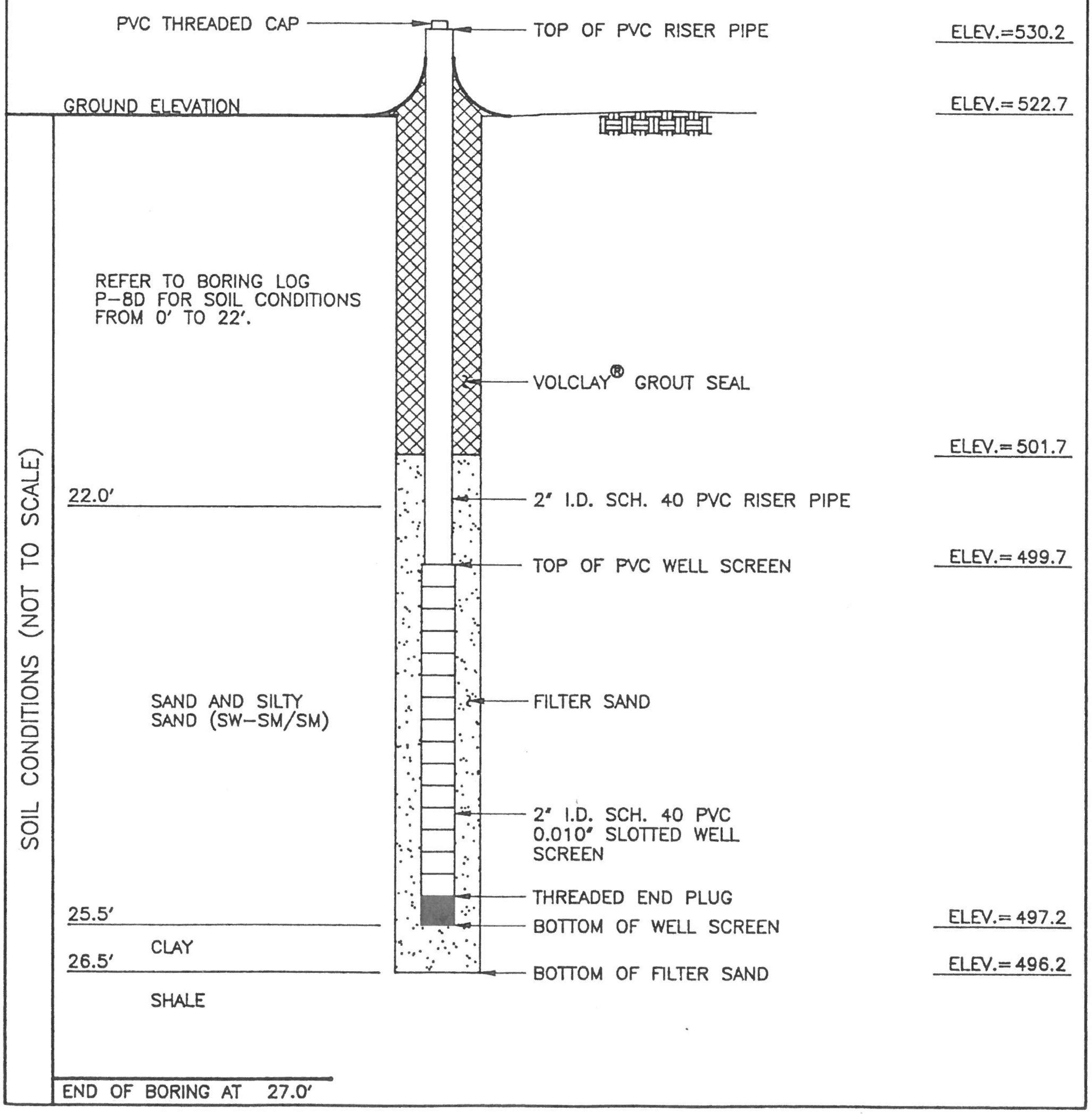
PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-8D PROJ. NO. 496B

PROJECT FGDS LANDFILL	BORING NO. P-8D
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 4939.7
CLIENT CWL&P	E 2482.7
ENGINEER KRISHNA REDDY	INSTALLATION DATE 8/13/92
DRILLER KEVIN SHAMWAY	WEATHER CLOUDY, 70'S

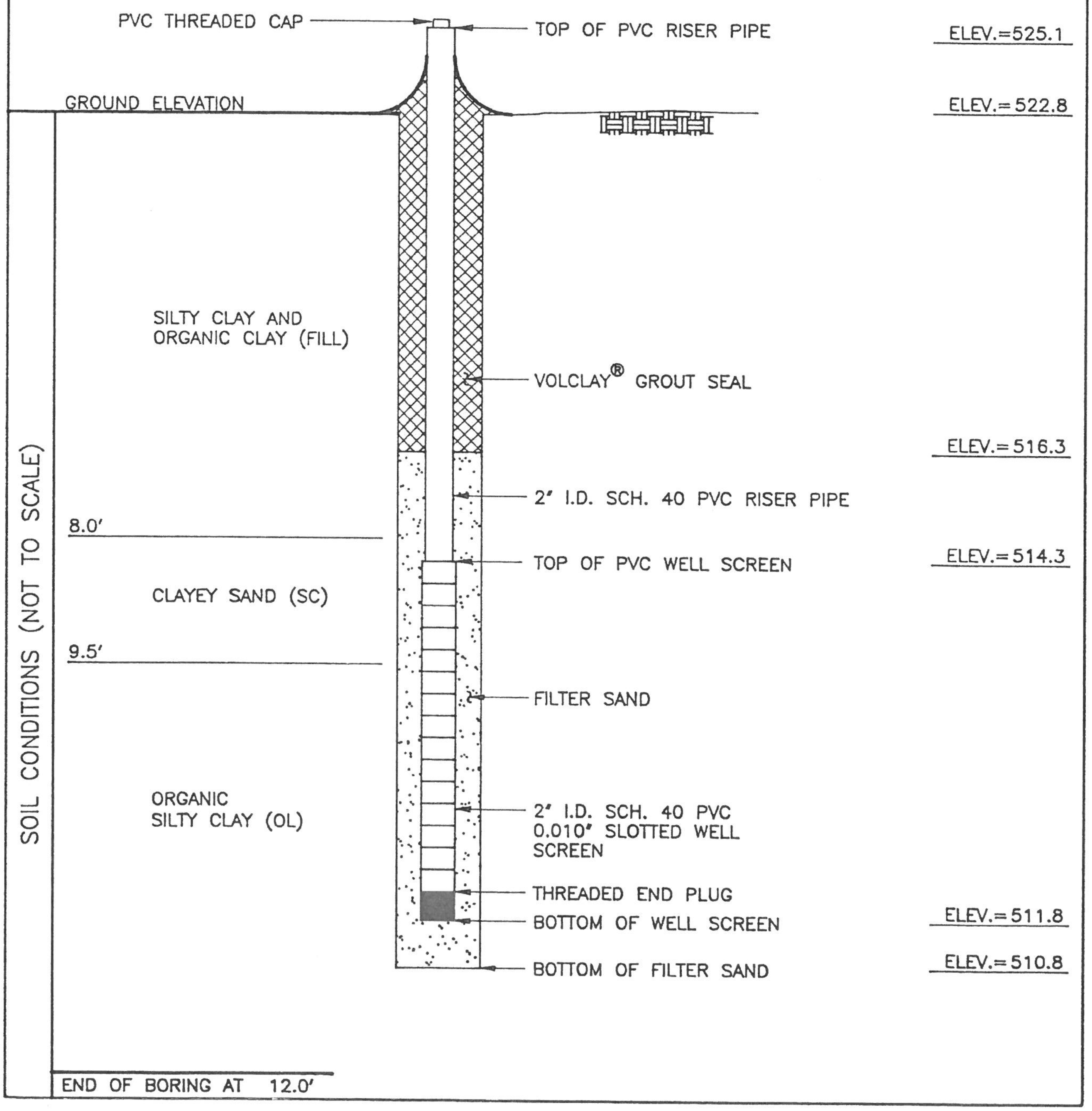


ROJECTS/496/496B-003 10/13/92

PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-8S PROJ. NO. 496B

PROJECT FGDS LANDFILL
LOCATION SPRINGFIELD, ILLINOIS
CLIENT CWL&P
ENGINEER KRISHNA REDDY
DRILLER KEVIN SHAMWAY

BORING NO. P-8S
LOCATION N 4933.1
E 2486.0
INSTALLATION DATE 8/13/92
WEATHER CLOUDY, 70'S

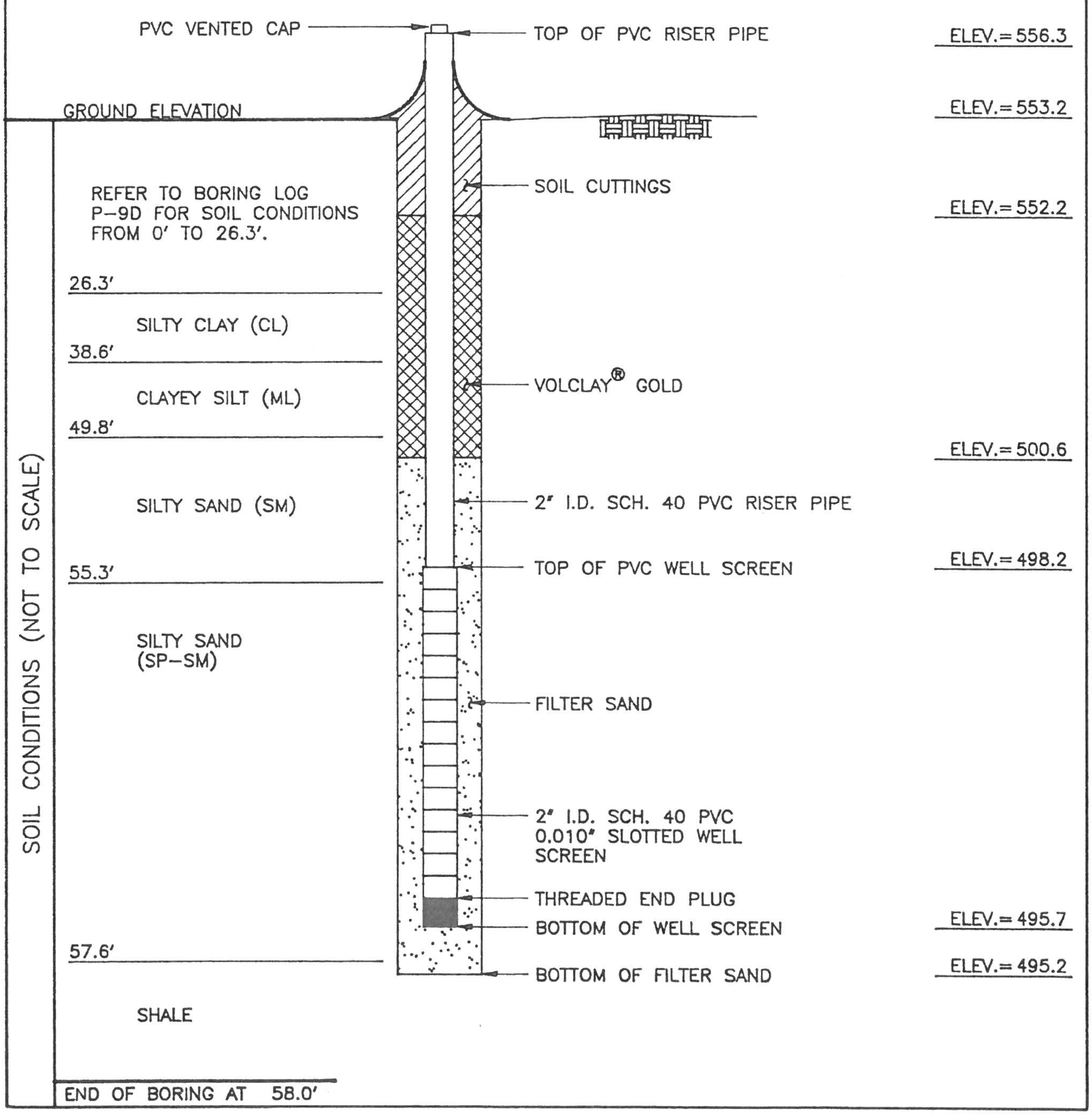


ROJECTS/496/496B-003 10/13/92

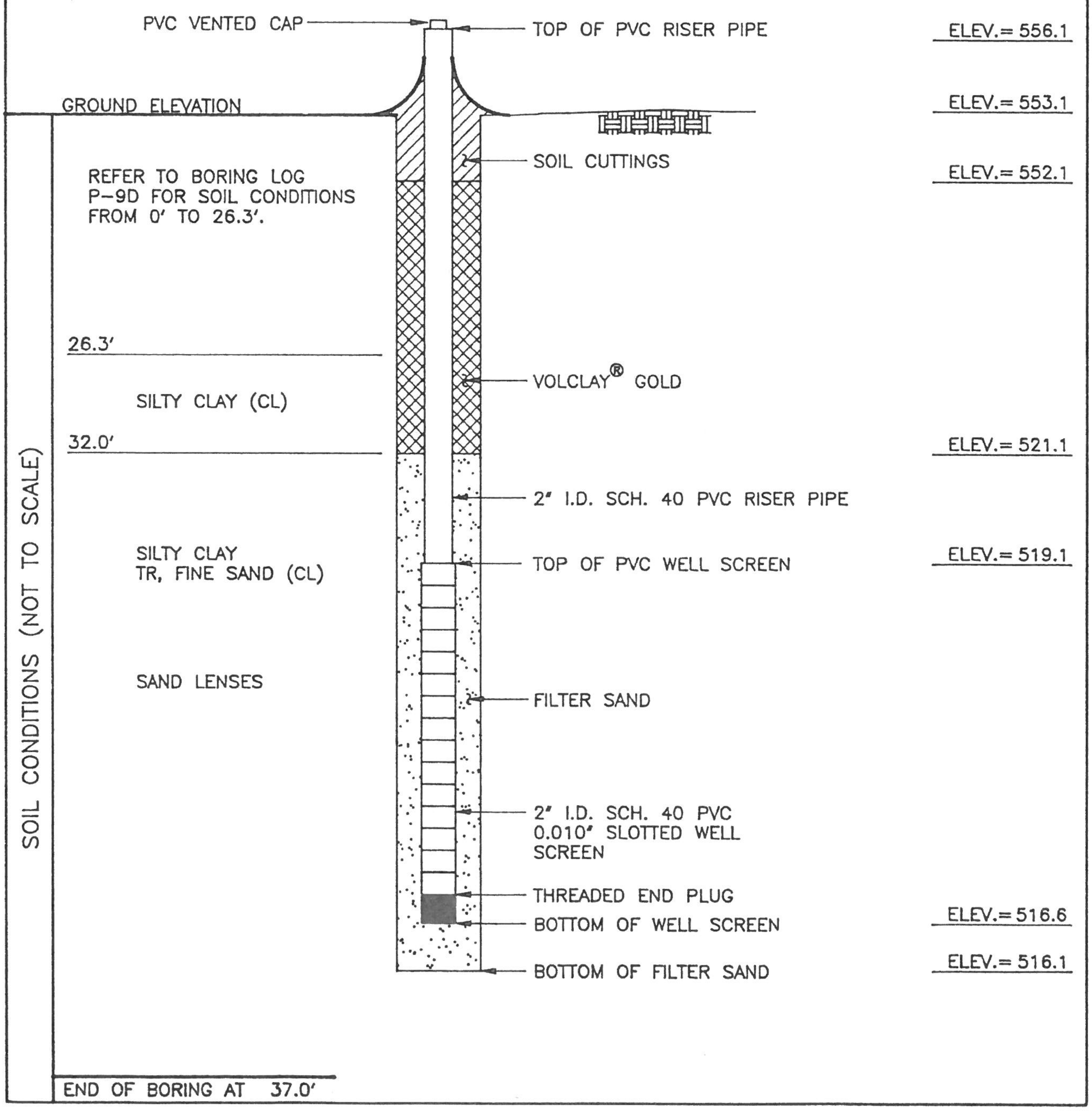
PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-9D PROJ. NO. 496B

PROJECT FGDS LANDFILL
LOCATION SPRINGFIELD, ILLINOIS
CLIENT CWL&P
ENGINEER/GEOLOGIST STEVE SCHILLING
DRILLER KEVIN SHAMWAY

BORING NO. P-9D
LOCATION N 4446.3
E 2422.4
INSTALLATION DATE 8/18/92
WEATHER PTLY CLDY, 70'S

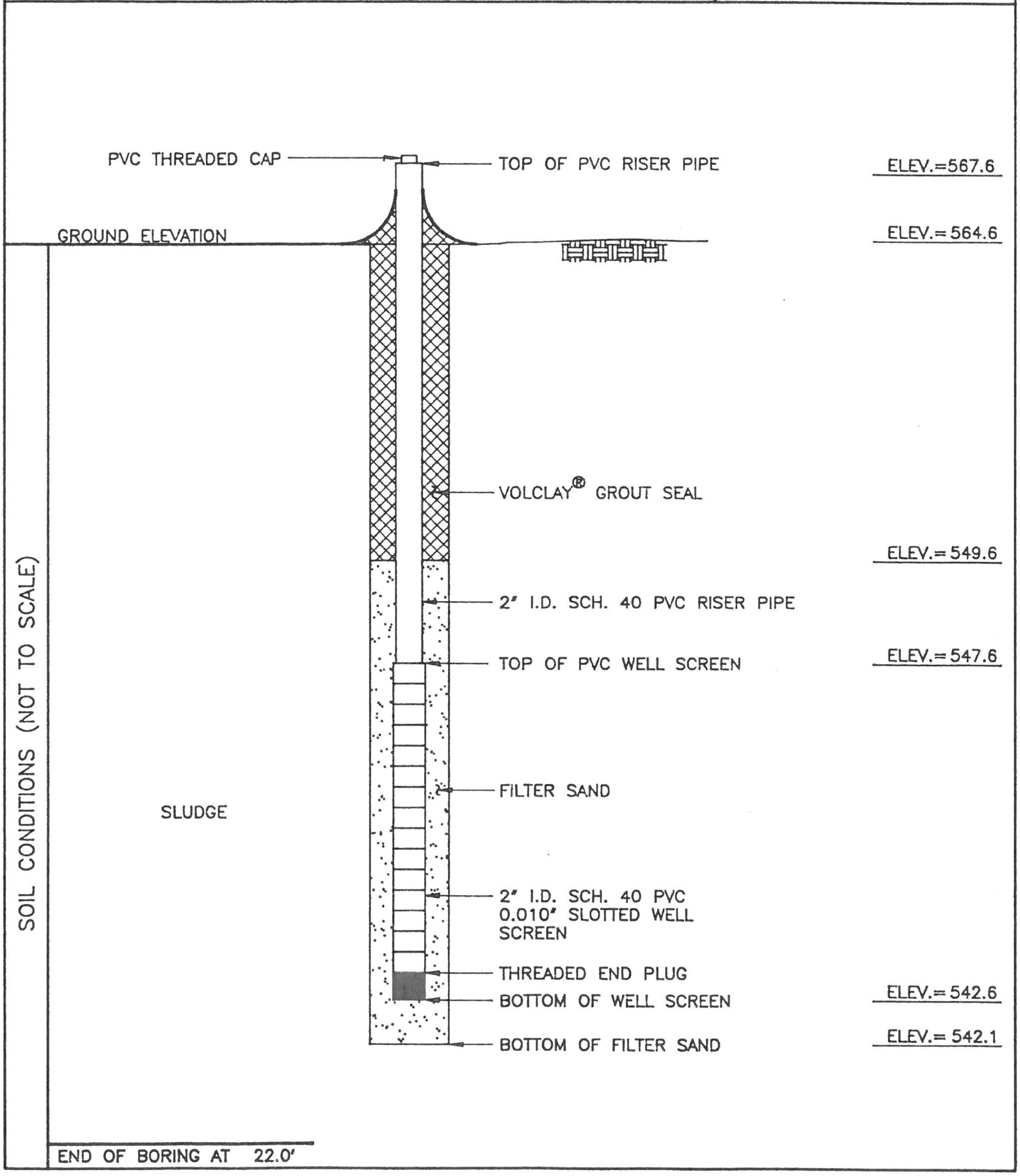


PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. P-9S PROJ. NO. 496B
PROJECT FGDS LANDFILL LOCATION SPRINGFIELD, ILLINOIS CLIENT CWL&P ENGINEER/GEOLOGIST STEVE SCHILLING DRILLER KEVIN SHAMWAY		BORING NO. P-9S LOCATION N 4447.3 E 2415.6 INSTALLATION DATE 8/19/92 WEATHER CLOUDY, 70'S

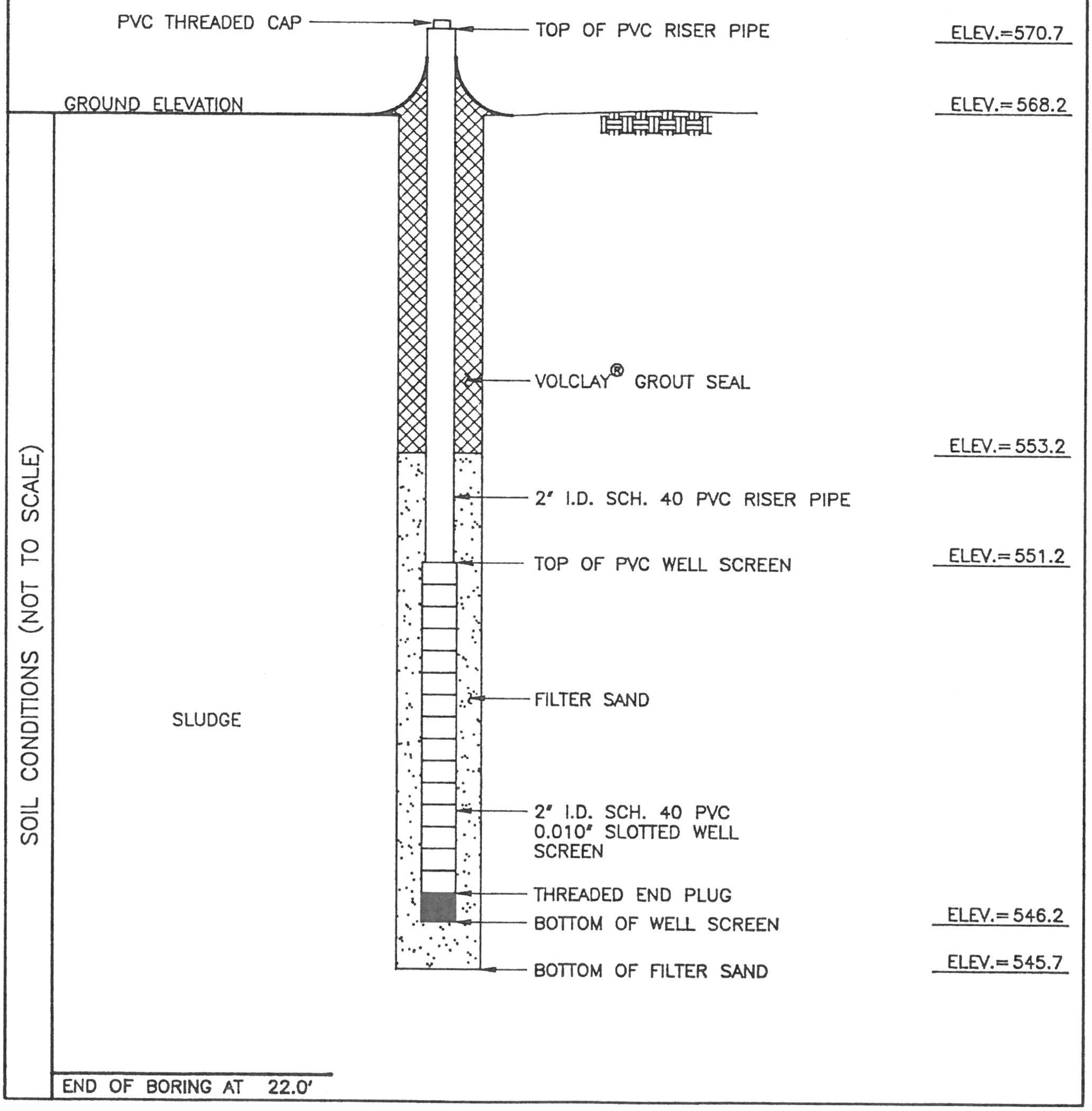


PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. LP-1 PROJ. NO. 496B

PROJECT FGDS LANDFILL	BORING NO. LP-1
LOCATION SPRINGFIELD, ILLINOIS	LOCATION N 4326.5
CLIENT CWL&P	E 2639.9
GEOLOGIST STEVE VANHOOK	INSTALLATION DATE 7/25/92
DRILLER MANUAL ROSARIO	WEATHER CLOUDY, 70'S



PATRICK ENGINEERING INC.	PIEZOMETER INSTALLATION REPORT	PIEZ. NO. LP-2 PROJ. NO. 496B
PROJECT FGDS LANDFILL LOCATION SPRINGFIELD, ILLINOIS CLIENT CWL&P GEOLOGIST STEVE VANHOOK DRILLER MANUAL ROSARIO		BORING NO. LP-2 LOCATION N 4257.5 E 2365.8 INSTALLATION DATE 7/25/92 WEATHER CLOUDY, 70'S



APPENDIX B2:

FGDS UNIT 2 LANDFILL MONITORING WELL CONSTRUCTION REPORTS

PDF_0408

Illinois Environmental Protection Agency — Well Completion Report

Site #: 1678250020 County: Sangamon Well #: R-101

Site Name: CWLP - Ash Disposal Facility Grid Coordinate: Northing 623.22 Easting 1426.13

Drilling Contractor: Professional Service Industries, Inc. Date Drilled Start: January 15, 1990

Driller: B. Williamson Geologist: -- Date Completed: January 15, 199

Drilling Method: Hollow Stem Auger - 3¼" 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 3 lbs. per bag 94

Amount of bentonite: # of bags 0.1 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Pellet

Amount of bentonite: # of Bags 0.8 lbs. per bag 50

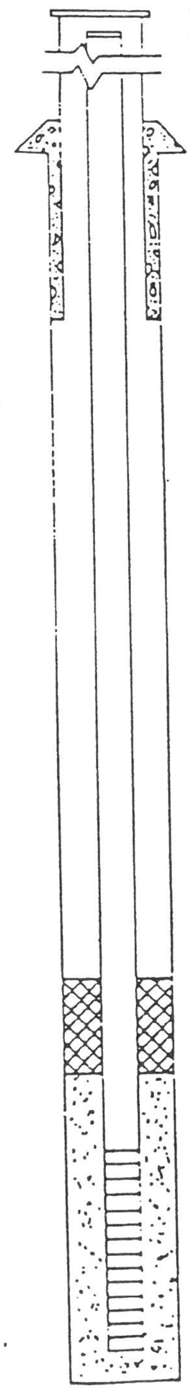
Type of Sand Pack: Silica Sand (Marco-Sandblasting)

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

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

Elevations — .01 ft.

546	83	MSL Top of Protective Casing
546	68	MSL Top of Riser Pipe
	+2.9	ft. Casing Stickup
543	78	MSL Ground Surface
	-3.1	ft. Top of annular sealant



	-21.3	ft. Top of Seal
	2.8	ft. Total Seal Interval
	-24.1	ft. Top of Sand
	-25.8	ft. Top of Screen
	6.0	ft. Total Screen Interval
	-31.8	ft. Bottom of Screen
	-34.0	ft. Bottom of Borehole

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	31.6'
Protective casing length	5'
Screen length	6'
Bottom of screen to end cap	0.3'
Top of screen to first joint	0.3'
Total length of casing	37.6'
Screen slot size	0.010
# of openings in screen	--
Diameter of borehole (in)	6
ID of riser pipe (in)	2

Completed by: ________ Surveyed by: ________ Ill. registration # ________

Illinois Environmental Protection Agency — Well Completion Report

Site #: 1678250020 County: Sangamon Well #: R-102

Site Name: CWLP - Ash Disposal Facility Grid Coordinate: Northing 2294.50 Easting 674.54

Drilling Contractor: Professional Service Industries, Inc. Date Drilled Start: January 11, 1990

Driller: B. Williamson Geologist: -- Date Completed: January 11, 19

Drilling Method: Hollow Stem Auger - 3½" 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 4 lbs. per bag 94

Amount of bentonite: # of bags 0.1 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Pellet

Amount of bentonite: # of Bags 0.7 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 2.0 lbs. per bag 100

Well Construction Materials

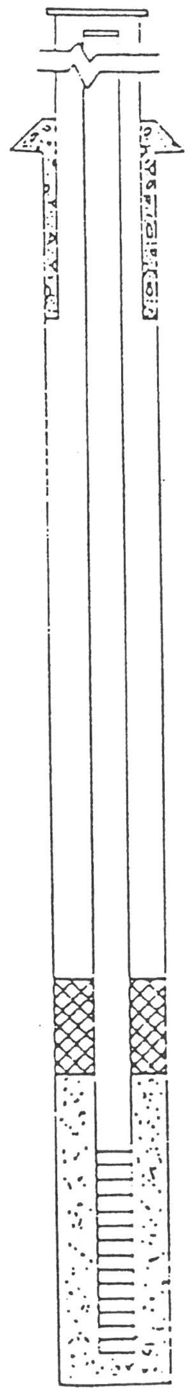
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			--	
Riser pipe above w.t.			2"	
Riser pipe below w.t.			2"	
Screen			2"	
Coupling joint screen to riser			--	
Protective casing				6"X5' Steel

Measurements

to .01 ft. (where applicable)

Riser pipe length	34.6'
Protective casing length	5'
Screen length	6'
Bottom of screen to end cap	0.3'
Top of screen to first joint	0.3'
Total length of casing	40.6'
Screen slot size	0.010
% of openings in screen	--
Diameter of borehole (in)	6
ID of riser pipe (in)	2

Elevations — .01 ft.



539 35	MSL Top of Protective Casi
539 16	MSL Top of Riser Pipe
+3.4	ft. Casing Stickup
535 76	MSL Ground Surface
-3.0	ft. Top of annular sealant
-25.5	ft. Top of Seal
2.9	ft. Total Seal Interval
-28.4	ft. Top of Sand
-31.2	ft. Top of Screen
6.0	ft. Total Screen Interval
-37.2	ft. Bottom of Screen
-38.0	ft. Bottom of Borehole

Completed by: Surveyed by: Ill. registration #

Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County: Sangamon Well #: R-103

Site Name: CWLP - Ash Disposal Facility Grid Coordinate: Northing 2208.19 Easting 1504.46

Drilling Contractor: Professional Service Industries, Inc. Date Drilled Start: January 13, 1990

Driller: B. Williamson Geologist: -- Date Completed: January 13, 19

Drilling Method: Hollow Stem Auger - 3¼" 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 3 lbs. per bag 94

Amount of bentonite: # of bags 0.1 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Pellet

Amount of bentonite: # of Bags 0.8 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 1.7 lbs. per bag 100

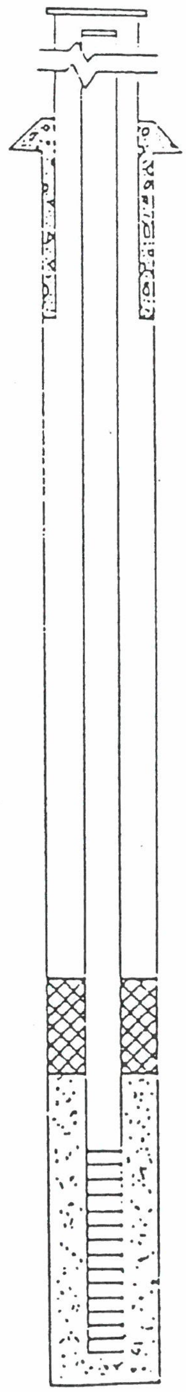
Well Construction Materials

	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	28.8'
Protective casing length	5'
Screen length	6'
Bottom of screen to end cap	0.3'
Top of screen to first joint	0.3'
Total length of casing	34.8
Screen slot size	0.010
% of openings in screen	--
Diameter of borehole (in)	6
ID of riser pipe (in)	2



Elevations — .01 ft.

538 66	MSL Top of Protective Casi
538 58	MSL Top of Riser Pipe
+2.5	ft. Casing Stickup
536 08	MSL Ground Surface
-3.2	ft. Top of annular sealant
-20.5	ft. Top of Seal
2.9	ft. Total Seal Interval
-23.4	ft. Top of Sand
-26.3	ft. Top of Screen
6.0	ft. Total Screen Interval
-32.3	ft. Bottom of Screen
-33.0	ft. Bottom of Borehole

Completed by: ______ Surveyed by: ______ Ill. registration # ______

Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County Sangamon Well # G-104

Site Name: CWLP - Ash Disposal Facility Grid Coordinate: Northing 2296.94 Easting 938.06

Drilling Contractor: Professional Service Industries, Inc. Date Drilled Start: January 12, 1990

Driller: B. Williamson Geologist: -- Date Completed: January 12, 19

Drilling Method: Hollow Stem Auger - 3½" 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 3.3 lbs. per bag 94

Amount of bentonite: # of bags 0.1 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Pellet

Amount of bentonite: # of Bags 0.6 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 1.9 lbs. per bag 100

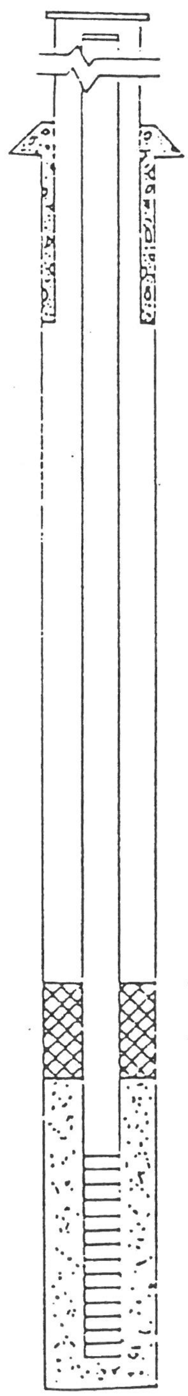
Well Construction Materials

	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	27.9'
Protective casing length	5'
Screen length	6'
Bottom of screen to end cap	0.3'
Top of screen to first joint	0.3'
Total length of casing	33.9
Screen slot size	0.010
% of openings in screen	--
Diameter of borehole (in)	6
ID of riser pipe (in)	2



Elevations — .01 ft.

533 52 MSL Top of Protective Casi

532 95 MSL Top of Riser Pipe

+2.3 ft. Casing Stickup

530 65 MSL Ground Surface

-2.8 ft. Top of annular sealant

21.5 ft. Top of Seal

2.1 ft. Total Seal Interval

-23.6 ft. Top of Sand

-25.6 ft. Top of Screen

6.0 ft. Total Screen Interval

-31.6 ft. Bottom of Screen

-36.0 ft. Bottom of Borehole

Completed by: Surveyed by: Ill. registration #

Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County Sangamon Well # G-105 / G120

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, 19 (Re-Drilled w/4¼" I.D.)

Drilling Method: Hollow Stem Auger - 3¼" I.D & 4¼" 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

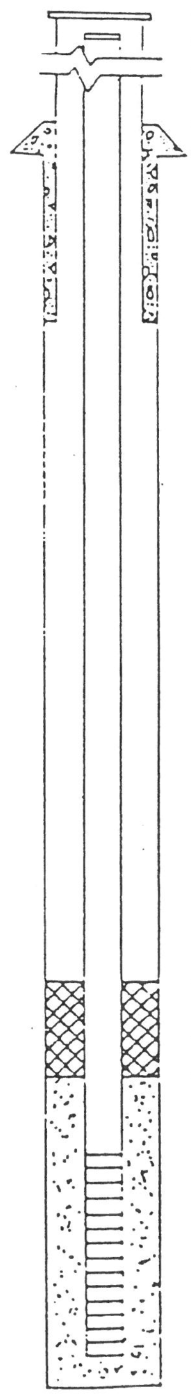
Well Construction Materials

	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.

553 49 MSL Top of Protective Cas
553 25 MSL Top of Riser Pipe
±0.1 ft. Casing Stickup
553 49 MSL Ground Surface
-2.9 ft. Top of annular sealant
-40.5 ft. Top of Seal
2.0 ft. Total Seal Interval
-42.5 ft. Top of Sand
-43.8 ft. Top of Screen
6.0 ft. Total Screen Interval
-49.8 ft. Bottom of Screen
-53.0 ft. Bottom of Borehole

Completed by: ______ Surveyed by: ______ Ill. registration # ______

Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County: Sangamon Well #: G-106

Site Name: CWLP Ash Disposal Facility Grid Coordinate: Northing 1760.44 Easting 983.64

Drilling Contractor: Professional Service Industries, Inc. Date Drilled Start: February 23, 1990

Driller: B. Williamson Geologist: -- Date Completed: February 23, 199[illegible]

Drilling Method: Hollow stem auger- 3¼" 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 4 lbs. per bag 94

Amount of bentonite: # of bags 0.1 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Pellet

Amount of bentonite: # of Bags 0.8 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 2.0 lbs. per bag 100.0

Well Construction Materials

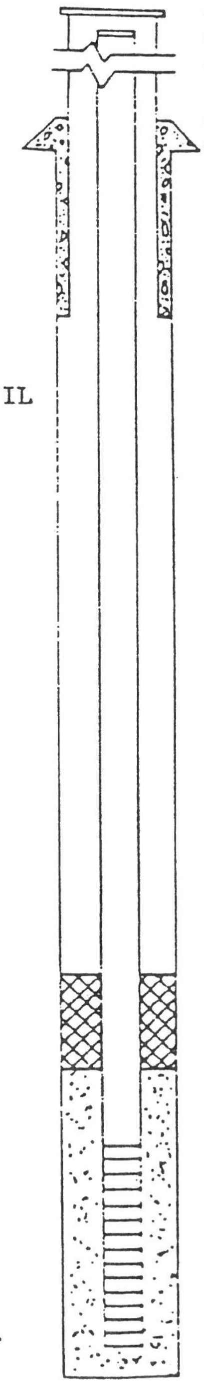
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			--	
Riser pipe above w.t.			3"	
Riser pipe below w.t.			3"	
Screen			3"	
Coupling joint screen to riser			--	
Protective casing				6"x5'

Measurements

to .01 ft. (where applicable)

Riser pipe length	31.3'
Protective casing length	5'
Screen length	8'
Bottom of screen to end cap	0.3'
Top of screen to first joint	0.3'
Total length of casing	39.3'
Screen slot size	0.010
% of openings in screen	--
Diameter of borehole (in)	6
ID of riser pipe (in)	3

Elevations — .01 ft.



525	49	MSL Top of Protective Casing
525	37	MSL Top of Riser Pipe
	1.2	ft. Casing Stickup
524	17	MSL Ground Surface
	-3.0	ft. Top of annular sealant
	-16.5	ft. Top of Seal
	5.6	ft. Total Seal Interval
	-22.1	ft. Top of Sand
	-27.0	ft. Top of Screen
	8.0	ft. Total Screen Interval
	-35.0	ft. Bottom of Screen
	-35.0	ft. Bottom of Borehole

Completed by: Surveyed by: Ill. registration #

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

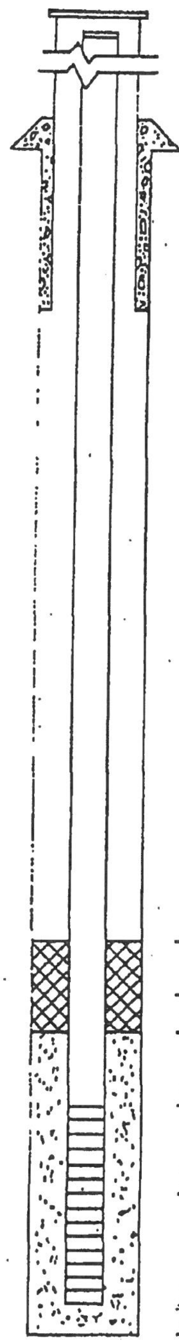
	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	Flush			
Riser pipe above w.t.	304			
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	Flush			
Protective casing				Steel

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"
ID 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 Rich Davis registration #: 2098

Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County: Sangamon Well #: G-111

Site Name: City Water, Light & Power Grid Coordinate: Northing 4445.0 Easting 2249.0

Drilling Contractor: AE Exploration Corporation Date Drilled Start: July 20, 1993

Driller: A. Weisenhofer Geologist: R. Hasenyager Date Completed: July 21, 1993

Drilling Method: Hollow Stem Auger Drilling Fluids (type): N/A

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 1/2 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Bentonite Grout

Amount of bentonite: # of Bags 1/2 lbs. per bag 50

Type of Sand Pack: Quartz sand (1020)

Source of Sand: Best Sand

Amount of Sand: # of bags 4 1/2 lbs. per bag 50

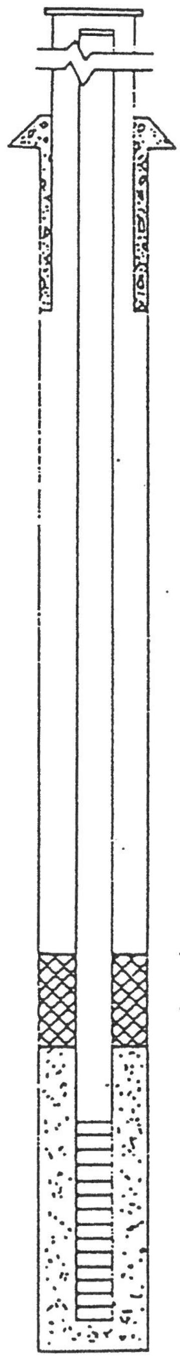
Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	304		Sch 40	
Riser pipe above w.t.			Sch 40	
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	304			
Protective casing				Steel

Measurements

to .01 ft. (where applicable)

Riser pipe length	56.55 feet
Protective casing length	5.0 feet
Screen length	4.72 feet
Bottom of screen to end cap	0.27 feet
Top of screen to first joint	0.21 feet
Total length of casing	61.75 feet
Screen slot size	0.01 inches
% of openings in screen	
Diameter of borehole (in)	8.0 inches
ID of riser pipe (in)	2.0 inches



Elevations — .01 ft.

555	.83	MSL Top of Protective Casing
555	.63	MSL Top of Riser Pipe
2	.03	ft. Casing Stickup
553	.6	MSL Ground Surface
3	.60	ft. Top of annular sealant
48	.00	ft. Top of Seal
5	.08	ft. Total Seal Interval
53	.08	ft. Top of Sand
54	.61	ft. Top of Screen
4	.72	ft. Total Screen Interval
59	.33	ft. Bottom of Screen
59	.60	ft. Bottom of Borehole

Completed by: Rhonald Haseyanger Surveyed by: CWLP Rich Davis Ill. registration #: 2098

Illinois Environmental Protection Agency **Well Completion Report**

Site Number: 1678250020 County: Sangamon

Site Name: City Water Light & Power Landfill Well #: R111

State Plane Coordinate: X E2456708.31 / Y N1129507.08 (or) Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ " Borehole #: R111

Surveyed by: ______ IL Registration #: ______

Drilling Contractor: SKS Engineers, Inc. Driller: D. Baldwin

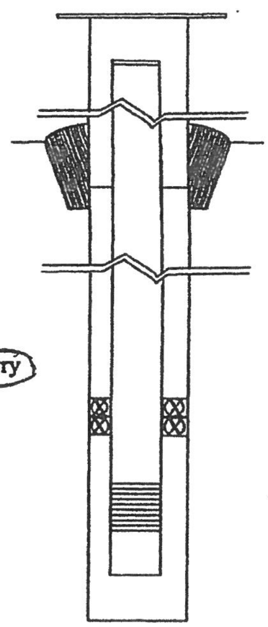
Consulting Firm: ______ Geologist: N/A

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): None

Logged By: D. Baldwin (SKS Engineers, Inc.) Date Started: 5/26/09 Date Finished: 5/29/09

Report Form Completed By: D. Baldwin Date: 7/2/09

ANNULAR SPACE DETAILS



	Elevations (MSL)*	Depths (BGS)	(.01ft.)
	552.69	0.0	Top of Protective Casing
	552.39	.30	Top of Riser Pipe
Type of Surface Seal: Concrete	552.69	0.0	Ground Surface
Type of Annular Sealant: Bentonite	549.69	3.0	Top of Annular Sealant
Installation Method: Slurry			Static Water Level (After Completion)
Setting Time:			
Type of Bentonite Seal -- Granular, Pellet, Slurry (Choose One)	549.69	3.0	Top of Seal
Installation Method: Tremie	502.59	50.1	Top of Sand Pack
Setting Time:	501.49	51.2	Top of Screen
Type of Sand Pack: Quartz Sand	495.89	56.8	Bottom of Screen
Grain Size: 1020 (Sieve Size)	495.59	57.1	Bottom of Well
Installation Method: Free Drop	495.59	57.1	Bottom of Borehole

* Referenced to a National Geodetic Datum

Type of Backfill Material: ______ (if applicable)

Installation Method: ______

CASING MEASURMENTS

Diameter of Borehole (inches)	8
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	Flush Mount
Riser Pipe Length (feet)	51.2
Bottom of Screen to End Cap (feet)	.31
Screen Length (1st slot to last slot) (feet)	4.72
Total Length of Casing (feet)	56.8
Screen Slot Size **	.010

**Hand-Slotted Well Screens are Unacceptable

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other

Well Completion Form (revised 02/06/02)

Illinois Environmental Protection Agency — Well Completion Report

Site #: 1678250020 County: Sangamon Well #: G-112

Site Name: City Water, Light & Power Grid Coordinate: Northing 4450.9 Easting 2560.6

Drilling Contractor: AE Exploration Corporation Date Drilled Start: July 21, 1993

Driller: A. Weisenhofer Geologist: R. Hasenyager Date Completed: July 23, 1993

Drilling Method: Hollow Stem Auger Drilling Fluids (type): N/A

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 1/2 lbs. per bag 50

Type of Bentonite Seal (Granular, Pellet): Bentonite Grout

Amount of bentonite: # of Bags 1/2 lbs. per bag 50

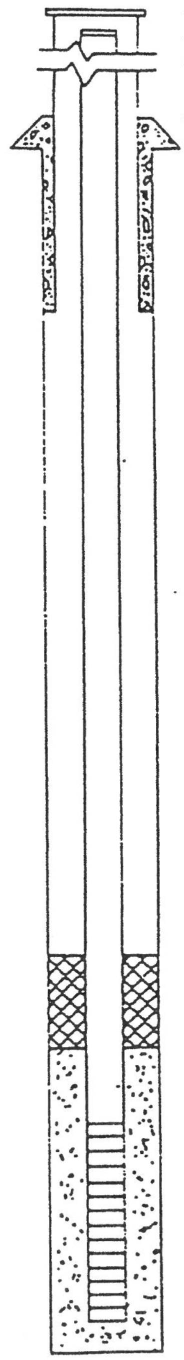
Type of Sand Pack: Quartz Sand (1020)

Source of Sand: Best Sand

Amount of Sand: # of bags 6 lbs. per bag 50

Elevations — .01 ft.

555 .06 MSL Top of Protective Casing
554 .88 MSL Top of Riser Pipe
2 .18 ft. Casing Stickup
552 .7 MSL Ground Surface
4 .10 ft. Top of annular sealant



46 .10 ft. Top of Seal
5 .07 ft. Total Seal Interval
51 .17 ft. Top of Sand
52 .78 ft. Top of Screen
4 .73 ft. Total Screen Interval
57 .51 ft. Bottom of Screen
57 .80 ft. Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint	304		Sch 40	
Riser pipe above w.t.			Sch 40	
Riser pipe below w.t.	304			
Screen	304			
Coupling joint screen to riser	304			
Protective casing				Steel

Measurements

to .01 ft. (where applicable)

Riser pipe length	54.81 feet
Protective casing length	5.0 feet
Screen length	4.73 feet
Bottom of screen to end cap	0.29 feet
Top of screen to first joint	0.21 feet
Total length of casing	60.04 feet
Screen slot size	0.01 inches
% of openings in screen	
Diameter of borehole (in)	8.0 inches
ID of riser pipe (in)	2.0 inches

Completed by: Rhonald Hasenyager Surveyed by: CWLP - Rich Davis Ill. registration # 2098

Illinois Environmental Protection Agency **Well Completion Report**

Site Number: 1678250020 County: Sangamon

Site Name: FGDS Development Landfill Well #: AW-1

State Plane Coordinate: X ____ Y ____ (or) Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ " Borehole #: AW-1

N 4512.2 E 2030.49

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: 12/29/08 Date Finished: 12/30/08

Report Form Completed By: Ken Miller Date: 5/18/09

ANNULAR SPACE DETAILS

Type of Surface Seal: Cement

Type of Annular Sealant: Bentonite Grout

Installation Method: Tremie

Setting Time: >24 hrs

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

Installation Method: Poured

Setting Time: 20 hrs

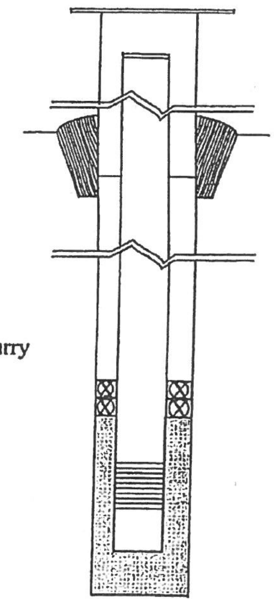
Type of Sand Pack: Quartz Sand

Grain Size: 50 (Sieve Size)

Installation Method: Poured

Type of Backfill Material: ______ (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(.01ft.)
____	____	Top of Protective Casing
555.60	-2.75	Top of Riser Pipe
552.85	0	Ground Surface
549.85	3.00	Top of Annular Sealant
____	____	Static Water Level (After Completion)
513.90	38.95	Top of Seal
510.90	41.95	Top of Sand Pack
508.90	43.95	Top of Screen
498.90	53.95	Bottom of Screen
498.51	54.34	Bottom of Well
498.51	54.34	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASURMENTS

Diameter of Borehole (inches)	8.25
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	5
Riser Pipe Length (feet)	46.70
Bottom of Screen to End Cap (feet)	0.4
Screen Length (1st slot to last slot) (feet)	10
Total Length of Casing (feet)	57.09
Screen Slot Size **	0.010

**Hand-Slotted Well Screens are Unacceptable

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other

Illinois Environmental Protection Agency **Well Completion Report**

Site Number: 1678250020 County: Sangamon

Site Name: FGDS Development Landfill Well #: AW-2

State Plane Coordinate: X ____ Y ____ (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___" Borehole #: AW-2

N 5480.91 E 2361.46

Surveyed by: David Mihelsic IL Registration #: 3762

Drilling Contractor: Reynolds Drilling Corp. Driller: Kerry Doetzel

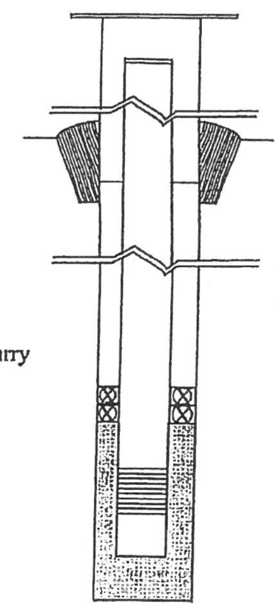
Consulting Firm: Rapps Engineering & Applied Science Geologist: Ken Miller

Drilling Method: HSA Drilling Fluid (Type): NA

Logged By: Ken Miller Date Started: 1/2/09 Date Finished: 1/2/09

Report Form Completed By: Ken Miller Date: 5/18/09

ANNULAR SPACE DETAILS



	Elevations (MSL)*	Depths (BGS)	(.01ft.)
	____	____	Top of Protective Casing
	529.98	-3.30	Top of Riser Pipe
Type of Surface Seal: Cement	526.68	0	Ground Surface
Type of Annular Sealant: Bentonite Chips	523.68	3.00	Top of Annular Sealant
Installation Method: Poured			
Setting Time: >24 hrs	____	____	Static Water Level (After Completion)
Type of Bentonite Seal - - Granular, Pellet, Slurry (Choose One)	509.86	16.82	Top of Seal
Installation Method: Poured	506.86	19.82	Top of Sand Pack
Setting Time: >24 hrs	504.86	21.82	Top of Screen
Type of Sand Pack: Quartz Sand	494.86	31.82	Bottom of Screen
Grain Size: 50 (Sieve Size)	494.46	32.22	Bottom of Well
Installation Method: Poured	494.46	32.22	Bottom of Borehole

* Referenced to a National Geodetic Datum

Type of Backfill Material: ________ (If applicable)

Installation Method: ________

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other

CASING MEASURMENTS

Diameter of Borehole (inches)	8.25
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	5
Riser Pipe Length (feet)	25.12
Bottom of Screen to End Cap (feet)	0.4
Screen Length (1st slot to last slot) (feet)	10
Total Length of Casing (feet)	35.52
Screen Slot Size **	0.010

**Hand-Slotted Well Screens are Unacceptable

Well Completion Form (revised 02/06/02)

Illinois Environmental Protection Agency **Well Completion Report**

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

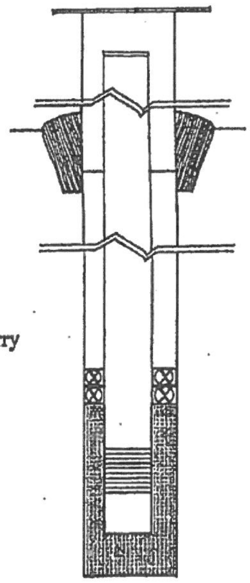
Consulting Firm: Rapps Engineering & Applied Science Geologist: Ken Miller

Drilling Method: HSA Drilling Fluid (Type): NA

Logged By: Ken Miller Date Started: 12/30/08 Date Finished: 12/31/08

Report Form Completed By: Ken Miller Date: 5/18/09

ANNULAR SPACE DETAILS



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: ________

Elevations (MSL)*	Depths (BGS)	(.01ft.)
		Top of Protective Casing
540.33	-2.58	Top of Riser Pipe
537.75	0	Ground Surface
534.75	3.00	Top of Annular Sealant
		Static Water Level (After Completion)
511.32	26.43	Top of Seal
508.32	29.43	Top of Sand Pack
506.32	31.43	Top of Screen
496.32	41.43	Bottom of Screen
495.92	41.83	Bottom of Well
495.92	41.83	Bottom of Borehole

* Referenced to a National Geodetic Datum

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other

CASING MEASURMENTS

Diameter of Borehole (inches)	8.25
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	5
Riser Pipe Length (feet)	34.01
Bottom of Screen to End Cap (feet)	0.4
Screen Length (1st slot to last slot) (feet)	10
Total Length of Casing (feet)	44.41
Screen Slot Size **	0.010

**Hand-Slotted Well Screens are Unacceptable

Well Completion Form (revised 02/06/02)

Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County: Sangamon Well #: G121

Site Name: City Water, Light & Power – FGDS Development Borehole #: B96-1

Coordinates: X 2,481.5 Y 5,615.9 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Richard Davis, City Water, Light & Power IL Registration #: LS-2098

Drilling Contractor: AE Exploration Corp. Consulting Firm: Andrews Environmental Engineering, Inc.

Driller: A. Wiesenhofer Geologist: R. Hasenyager

Drilling Method: Hollow stem auger Logged by: R. Hasenyager

Drilling Fluids (type): n/a Report Form Completed by: R. Hasenyager

Date Well Started: 05/16/96 Date Well Finished: 05/16/96 Date Form Completed: 07/12/96

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: High-solids bentonite

Installation method: Tremi

Setting time: 24+ hours

Type of bentonite seal – *Ganular*, Pellet, Slurry (circle one)

Installation method: Free drop

Setting time: 70 minutes

Type of sand pack: Quartz sand

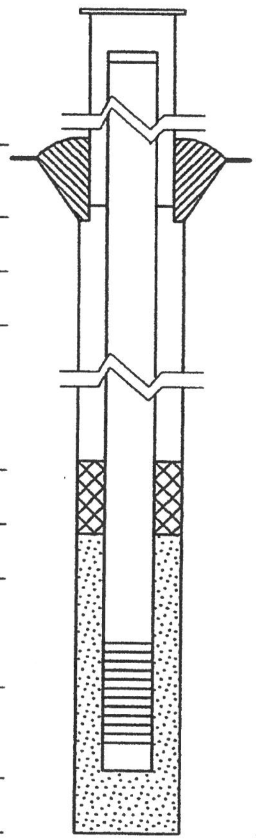
Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a

NOTES:



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
556.04	-2.24	Top of Protective Casing
555.67	-1.87	Top of Riser Pipe
553.80	.00	Ground Surface
552.30	1.50	Top of Annular Sealant
528.55	25.25	Static Water Level Measured on 5/24/96 (after completion)
506.60	47.20	Top of Seal
504.00	49.80	Top of Sandpack
501.93	51.87	Top of Screen
497.96	55.84	Bottom of Screen
496.86	56.94	Bottom of Well
497.10	56.70	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.0
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	53.74
Bottom of Screen to End Cap (ft)	1.10
Screen Length (1st slot to last slot) (ft)	3.97
Total Length of Casing (ft)	58.81
Screen Slot Size*	#10 (0.01")

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

(circle one)

Protective Casing	SS304, SS316, PTFE, PVC or *Other: Steel*
Riser Pipe Above W.T.	SS304, SS316, PTFE, *PVC* or Other:
Riser Pipe Below W.T.	SS304, SS316, PTFE, *PVC* or Other:
Screen	SS304, SS316, PTFE, *PVC* or Other:

(AE950315)

Illinois Environmental Protection Agency

Well Completion Report

Site #: 1678250020 County: Sangamon Well #: G122

Site Name: City Water, Light & Power – FGDS Development Borehole #: B96-2

Coordinates: X 2,305.1 Y 5,613.2 (or) Latitude: ° ' " Longitude: ° ' "

Surveyed by: Richard Davis, City Water, Light & Power IL Registration #: LS-2098

Drilling Contractor: AE Exploration Corp. Consulting Firm: Andrews Environmental Engineering, Inc.

Driller: A. Wiesenhofer Geologist: R. Hasenyager

Drilling Method: Hollow stem auger Logged by: R. Hasenyager

Drilling Fluids (type): n/a Report Form Completed by: R. Hasenyager

Date Well Started: 05/20/96 Date Well Finished: 05/20/96 Date Form Completed: 07/12/96

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: High-solids bentonite

Installation method: Tremi

Setting time: 24+ hours

Type of bentonite seal – *Ganular*, Pellet, Slurry (circle one)

Installation method: Free drop

Setting time: 45 minutes

Type of sand pack: Quartz sand/formation sand

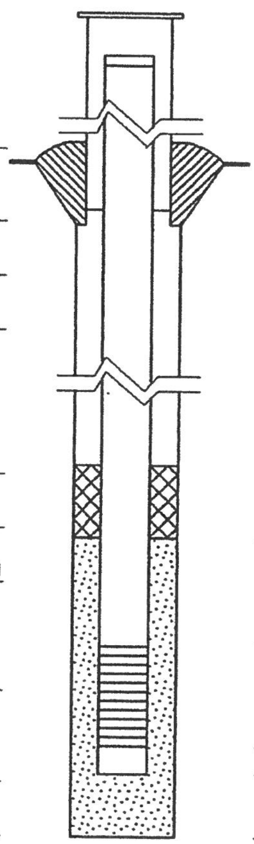
Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a

NOTES:



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
554.87	-2.17	Top of Protective Casing
554.44	-1.74	Top of Riser Pipe
552.70	.00	Ground Surface
551.70	1.00	Top of Annular Sealant
526.51	26.19	Static Water Level Measured on 5/24/96 (after completion)
507.20	45.50	Top of Seal
504.90	47.80	Top of Sandpack
501.07	51.63	Top of Screen
497.10	55.60	Bottom of Screen
496.00	56.70	Bottom of Well
494.00	58.70	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (–) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.0
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	53.37
Bottom of Screen to End Cap (ft)	1.10
Screen Length [1st slot to last slot] (ft)	3.97
Total Length of Casing (ft)	58.44
Screen Slot Size*	#10 (0.01")

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS
(circle one)

Protective Casing	SS304, SS316, PTFE, PVC or *Other: Steel*
Riser Pipe Above W.T.	SS304, SS316, PTFE, *PVC* or Other:
Riser Pipe Below W.T.	SS304, SS316, PTFE, *PVC* or Other:
Screen	SS304, SS316, PTFE, *PVC* or Other:

(AE950315)

Illinois Environmental Protection Agency — Well Completion Report

Site #: 1678250020 County: Sangamon Well #: G123

Site Name: City Water, Light & Power - FGDS Development Borehole #: B96-3

Coordinates: X 2,481.5 Y 5,615.9 (or) Latitude: ° ' " Longitude: ° ' "

Surveyed by: Richard Davis, City Water, Light & Power IL Registration #: LS-2098

Drilling Contractor: AE Exploration Corp. Consulting Firm: Andrews Environmental Engineering, Inc.

Driller: A. Wiesenhofer Geologist: Rhonald Hasenyager

Drilling Method: Hollow stem auger Logged by: Rhonald Hasenyager

Drilling Fluids (type): n/a Report Form Completed by: Rhonald Hasenyager

Date Well Started: 05/16/96 Date Well Finished: 05/16/96 Date Form Completed: 07/12/96

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: High-solids bentonite

Installation method: Tremi

Setting time: 24+ hours

Type of bentonite seal – Ganular, Pellet, Slurry (circle one)

Installation method: Free drop

Setting time: 30 minutes

Type of sand pack: Quartz sand

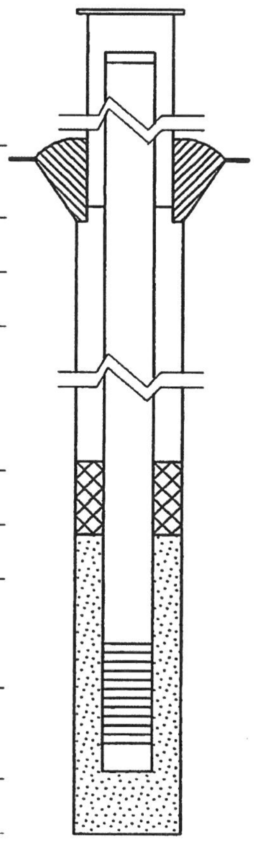
Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: Bentonite chips (if applicable)

Installation method: Free drop

NOTES:



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
554.30	-2.10	Top of Protective Casing
553.90	-1.70	Top of Riser Pipe
552.20	.00	Ground Surface
550.70	1.50	Top of Annular Sealant
526.35	25.85	Static Water Level Measured on 5/24/96 (after completion)
515.40	36.80	Top of Seal
513.70	38.50	Top of Sandpack
511.77	40.43	Top of Screen
507.81	44.39	Bottom of Screen
506.70	45.50	Bottom of Well
495.20	57.00	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.0
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	42.13
Bottom of Screen to End Cap (ft)	1.11
Screen Length [1st slot to last slot] (ft)	3.96
Total Length of Casing (ft)	47.20
Screen Slot Size*	#10 (0.01")

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS
(circle one)

Protective Casing	SS304, SS316, PTFE, PVC or *Other: Steel*
Riser Pipe Above W.T.	SS304, SS316, PTFE, *PVC* or Other:
Riser Pipe Below W.T.	SS304, SS316, PTFE, *PVC* or Other:
Screen	SS304, SS316, PTFE, *PVC* or Other:

(AE950315)

APPENDIX B3:
IMPOUNDMENT MONITORING WELL CONSTRUCTION REPORTS

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: AP-1R

Site Name: City Water, Light, & Power Borehole #: AP-1R

Coordinates: X 831.70 Y 5132.40 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: ______ IL Registration #: ______

Drilling Contractor: Terra Drill, Inc. Consulting Firm: Andrews Engineering, Inc.

Driller: J. Brown Geologist: M. Hewitt

Drilling Method: 4¼" HSA w/ 5' Continuous Barrel Logged by: M. Hewitt

Drilling Fluids (type): ______ Report Form Completed by: J. Rhoades

Date Well Started: 1/30/2012 Date Well Finished: 1/30/2012 Date Form Completed: 2/27/2012

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: 2 Hours

Type of bentonite seal: Bentonite Chips

Installation method: Free drop

Setting time: 2 Hours

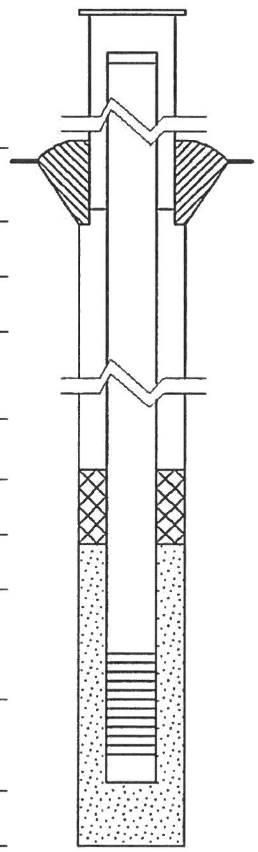
Type of sand pack: Unimin Sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: ______ (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
535.60	-2.50	Top of Protective Casing
.00	533.10	Top of Riser Pipe
533.10	.00	Ground Surface
530.10	3.00	Top of Annular Sealant
n/a	n/a	Static Water Level Measured on (after completion)
517.00	16.10	Top of Seal
513.51	19.59	Top of Sandpack
-21.59	554.69	Top of Screen
-30.97	564.07	Bottom of Screen
-31.50	564.60	Bottom of Well
500.60	32.50	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum

* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.0
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	21.59
Bottom of Screen to End Cap (ft)	.53
Screen Length [1st slot to last slot] (ft)	9.38
Total Length of Casing (ft)	31.50
Screen Slot Size*	0.01"

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	SS304, SS316, PTFE, PVC or *Other:Steel*
Riser Pipe Above W.T.	SS304, SS316, PTFE, *PVC*, or Other:
Riser Pipe Below W.T.	SS304, SS316, PTFE, *PVC*, or Other:
Screen	SS304, SS316, PTFE, *PVC*, or Other:

(AE950315)

Illinois Environmental Protection Agency — Well Completion Report

Site #: ____ County: Sangamon Well #: AP-2R

Site Name: City Water, Light, & Power Borehole #: AP-2R

Coordinates: X 725.50 Y 4184.70 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: ____ IL Registration #: ____

Drilling Contractor: Terra Drill, Inc. Consulting Firm: Andrews Engineering, Inc.

Driller: J. Brown Geologist: M. Hewitt

Drilling Method: 4¼" HSA w/ 5' Continuous Barrel Logged by: M. Hewitt

Drilling Fluids (type): ____ Report Form Completed by: J. Rhoades

Date Well Started: 1/31/2012 Date Well Finished: 1/31/2012 Date Form Completed: 2/27/2012

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: 2 Hours

Type of bentonite seal: Bentonite Chips

Installation method: Free drop

Setting time: 2 Hours

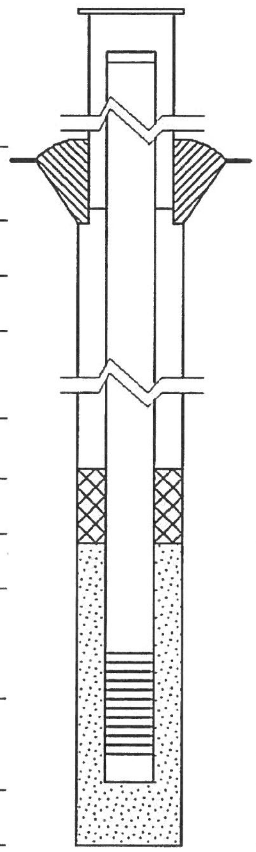
Type of sand pack: Unimin Sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: ____ (if applicable)

Installation method: ____



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
535.60	-2.50	Top of Protective Casing
536.1	533.10	Top of Riser Pipe
533.6	.00	Ground Surface
530.10	3.00	Top of Annular Sealant
n/a	n/a	Static Water Level Measured on (after completion)
528.96	4.14	Top of Seal
526.96	6.14	Top of Sandpack
-8.14	541.24	Top of Screen
-17.47	550.57	Bottom of Screen
-18.00	551.10	Bottom of Well
514.60	18.50	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.0
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	8.14
Bottom of Screen to End Cap (ft)	.53
Screen Length (1st slot to last slot) (ft)	9.33
Total Length of Casing (ft)	18.00
Screen Slot Size*	0.01"

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	SS304, SS316, PTFE, PVC or *Other:Steel*
Riser Pipe Above W.T.	SS304, SS316, PTFE, *PVC*, or Other:
Riser Pipe Below W.T.	SS304, SS316, PTFE, *PVC*, or Other:
Screen	SS304, SS316, PTFE, *PVC*, or Other:

(AE950315)

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: AP-2A

Site Name: Springfield City Water, Light, and Power Borehole #: ______

Coordinates: X 735.9 Y 4185.2 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Springfield City Water, Light, and Power IL Registration #: ______

Drilling Contractor: Bulldog Drilling, Inc. Consulting Firm: Andrews Engineering, Inc.

Driller: J. Edwards Geologist: C. Myrvold

Drilling Method: AMS Powerprobe w/ 4.25" HSA and 5' MC Logged by: C. Myrvold

Drilling Fluids (type): na Report Form Completed by: C. Myrvold

Date Well Started: 2/16/2016 Date Well Finished: 2/16/2016 Date Form Completed: 3/06/2016

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: N/A

Installation method: ______

Setting time: ______

Type of bentonite seal: Bentonite chips

Installation method: Free drop

Setting time: 24+ hours

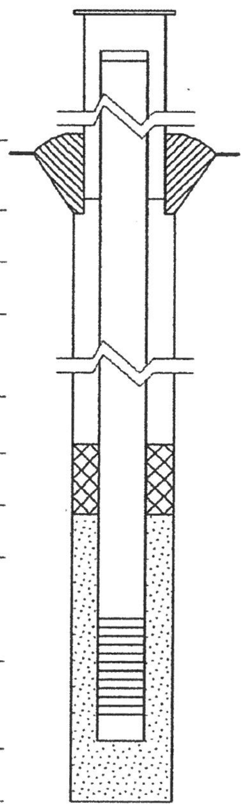
Type of sand pack: Silica sand

Grain size: 20/40 (sieve size)

Installation method: Free drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
536.50	-2.90	Top of Protective Casing
536.10	-2.50	Top of Riser Pipe
533.60	0.00	Ground Surface
	N/A	Top of Annular Sealant
		Static Water Level Measured on (after completion)
530.60	3.00	Top of Seal
527.19	6.41	Top of Sandpack
525.19	8.41	Top of Screen
515.54	18.06	Bottom of Screen
515.10	18.50	Bottom of Well
514.60	19.00	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

Notes:

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	10.91
Bottom of Screen to End Cap (ft)	0.44
Screen Length (1st slot to last slot) (ft)	9.65
Total Length of Casing (ft)	21.00
Screen Slot Size‡	#10 (0.01)

‡Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Anodized Aluminum
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: AP-5

Site Name: City Water, Light, & Power Borehole #: AP-5

Coordinates: X 3203.10 Y 3164.10 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: ______ IL Registration #: ______

Drilling Contractor: Terra Drill, Inc. Consulting Firm: Andrews Engineering, Inc.

Driller: J. Brown Geologist: M. Hewitt

Drilling Method: 4¼" HSA w/ 5' CB & 2' SS Logged by: M. Hewitt

Drilling Fluids (type): ______ Report Form Completed by: J. Rhoades

Date Well Started: 2/1/2012 Date Well Finished: 2/1/2012 Date Form Completed: 2/27/2012

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: 2 Hours

Type of bentonite seal: Bentonite Chips

Installation method: Free drop

Setting time: 2 Hours

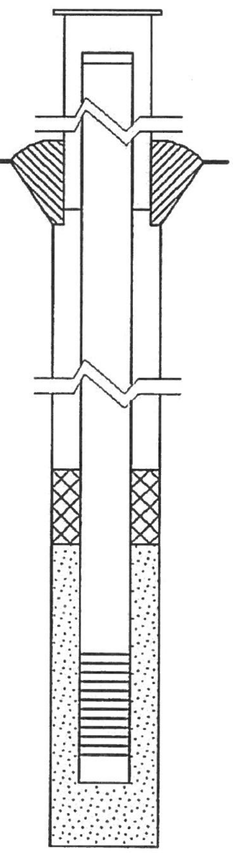
Type of sand pack: Unimin Sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: Bentonite Chips (if applicable)

Installation method: Free drop



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
584.30	-2.70	Top of Protective Casing
583.90	-2.30	Top of Riser Pipe
581.60	.00	Ground Surface
578.60	3.00	Top of Annular Sealant
n/a	n/a	Static Water Level Measured on (after completion)
565.48	16.12	Top of Seal
563.48	18.12	Top of Sandpack
563.78	17.82	Top of Screen
554.44	27.16	Bottom of Screen
553.90	27.70	Bottom of Well
551.10	30.50	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

NOTES:

•Borehole AP-5 sampled to 49.0 feet below ground surface (BGS) and backfilled with bentonite chips to 30.5 feet BGS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.0
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	20.12
Bottom of Screen to End Cap (ft)	.54
Screen Length (1st slot to last slot) (ft)	9.34
Total Length of Casing (ft)	30.00
Screen Slot Size*	0.01"

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	SS304, SS316, PTFE, PVC or *Other:Steel*
Riser Pipe Above W.T.	SS304, SS316, PTFE, *PVC*, or Other:
Riser Pipe Below W.T.	SS304, SS316, PTFE, *PVC*, or Other:
Screen	SS304, SS316, PTFE, *PVC*, or Other:

(AE950315)

Illinois Environmental Protection Agency — Well Completion Report

Site Number: ____ County: Sangamon

Site Name: City Water, Light & Power (CWLP) Ash Ponds — Well #: TW3E

State Plane Coordinate: X ____ Y ____ (or) Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ " — Borehole #: TW3E

Surveyed by: ____

IL Registration #: ____

Drilling Contractor: Bulldog Drilling, Inc.

Driller: J. Gates

Consulting Firm: Andrews Engineering, Inc.

Geologist: D. Ghosh

Drilling Method: CME 55 w/ 4.25" HSA

Drilling Fluid (Type): none

Logged By: D. Ghosh

Date Started: 6/27/17 Date Finished: 6/27/17

Report Form Completed By: M. Hewitt

Date: 9/18/17

ANNULAR SPACE DETAILS

Type of Surface Seal: Bentonite Grout

Type of Annular Sealant: Bentonite Grout

Installation Method: Tremi

Setting Time: 24 hours

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

Installation Method: Free drop

Setting Time: N/A

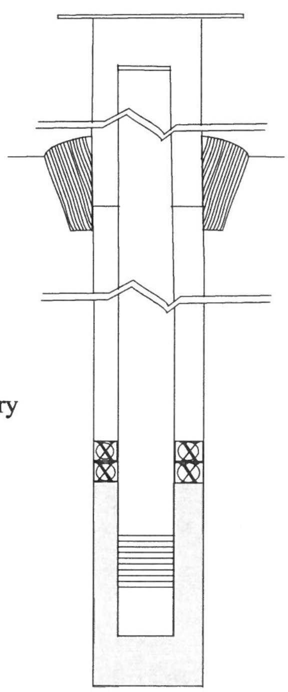
Type of Sand Pack: Silica Sand

Grain Size: 10/20 (Sieve Size)

Installation Method: Free Drop

Type of Backfill Material: None (if applicable)

Installation Method: N/A



Elevations (MSL)*	Depths (BGS)	(.01ft.)
		Top of Protective Casing
	-2.17	Top of Riser Pipe
	0	Ground Surface
	0	Top of Annular Sealant
	9.14	Static Water Level (After Completion)
	28.0	Top of Seal
	28.2	Top of Sand Pack
	30.22	Top of Screen
	39.82	Bottom of Screen
	40.5	Bottom of Well
	40.5	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASURMENTS

Diameter of Borehole (inches)	8.25
ID of Riser Pipe (inches)	2.049
Protective Casing Length (feet)	
Riser Pipe Length (feet)	32.39
Bottom of Screen to End Cap (feet)	0.68
Screen Length (1st slot to last slot) (feet)	9.6
Total Length of Casing (feet)	42.67
Screen Slot Size **	0.01

**Hand-Slotted Well Screens are Unacceptable

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other

Illinois Environmental Protection Agency **Well Completion Report**

Site Number: ______ County: Sangamon

Site Name: City Water, Light & Power (CWLP) Ash Ponds Well #: TW3N / RW-3

State Plane Coordinate: X ___ Y ___ (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___" Borehole #: TW3N

Surveyed by: ______ IL Registration #: ______

Drilling Contractor: Bulldog Drilling, Inc. Driller: J. Gates

Consulting Firm: Andrews Engineering, Inc. Geologist: D. Ghosh

Drilling Method: CME 55 w/ 4.25" HSA Drilling Fluid (Type): none

Logged By: D. Ghosh Date Started: 6/26/17 Date Finished: 6/27/17

Report Form Completed By: M. Hewitt Date: 9/18/17

ANNULAR SPACE DETAILS

Type of Surface Seal: Bentonite Grout

Type of Annular Sealant: Bentonite Grout

Installation Method: Tremi

Setting Time: 24 hours

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

Installation Method: Free drop

Setting Time: N/A

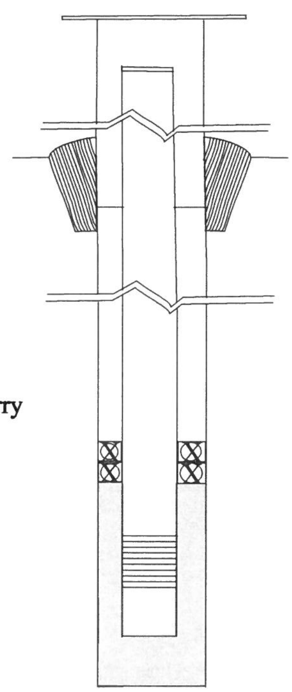
Type of Sand Pack: Silica Sand

Grain Size: 10/20 (Sieve Size)

Installation Method: Free Drop

Type of Backfill Material: None (if applicable)

Installation Method: N/A



Elevations (MSL)*	Depths (BGS)	(.01ft.)
		Top of Protective Casing
539.5	-2.5	Top of Riser Pipe
536.8	0	Ground Surface
533.8	3	Top of Annular Sealant
528.09	8.71	Static Water Level (After Completion)
509.8	27	Top of Seal
507.2	29.6	Top of Sand Pack
505.66	31.14	Top of Screen
496.08	40.72	Bottom of Screen
495.4	41.4	Bottom of Well
495.2	41.6	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASURMENTS

Diameter of Borehole (inches)	8.25
ID of Riser Pipe (inches)	2.049
Protective Casing Length (feet)	
Riser Pipe Length (feet)	33.84
Bottom of Screen to End Cap (feet)	0.68
Screen Length (1st slot to last slot) (feet)	9.58
Total Length of Casing (feet)	44.1
Screen Slot Size **	0.01

**Hand-Slotted Well Screens are Unacceptable

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other

Illinois Environmental Protection Agency — Well Completion Report

Site Number: ______ County: Sangamon

Site Name: City Water, Light & Power (CWLP) Ash Ponds

Well #: TW3W

State Plane Coordinate: X ____ Y ____ (or) Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ "

Borehole #: TW3W

Surveyed by: ______

IL Registration #: ______

Drilling Contractor: Bulldog Drilling, Inc.

Driller: J. Gates

Consulting Firm: Andrews Engineering, Inc.

Geologist: D. Ghosh

Drilling Method: CME 55 w/ 4.25" HSA

Drilling Fluid (Type): none

Logged By: D. Ghosh

Date Started: 6/26/17 Date Finished: 6/26/17

Report Form Completed By: M. Hewitt

Date: 9/18/17

ANNULAR SPACE DETAILS

Type of Surface Seal: Bentonite Grout

Type of Annular Sealant: Bentonite Grout

Installation Method: Tremi

Setting Time: 24 hours

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

Installation Method: Free drop

Setting Time: N/A

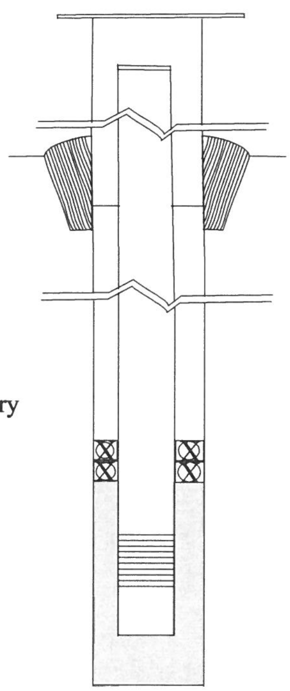
Type of Sand Pack: Silica Sand

Grain Size: 10/20 (Sieve Size)

Installation Method: Free Drop

Type of Backfill Material: None (if applicable)

Installation Method: N/A



Elevations (MSL)*	Depths (BGS)	(.01ft.)
		Top of Protective Casing
	-2.58	Top of Riser Pipe
536.80	0	Ground Surface
	0	Top of Annular Sealant
	9.32	Static Water Level (After Completion)
	9.6	Top of Seal
	11.85	Top of Sand Pack
	13.54	Top of Screen
	23.12	Bottom of Screen
	23.8	Bottom of Well
	23.8	Bottom of Borehole

* Referenced to a National Geodetic Datum

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other

CASING MEASURMENTS

Diameter of Borehole (inches)	8.25
ID of Riser Pipe (inches)	2.049
Protective Casing Length (feet)	
Riser Pipe Length (feet)	16.12
Bottom of Screen to End Cap (feet)	0.68
Screen Length (1st slot to last slot) (feet)	9.58
Total Length of Casing (feet)	26.38
Screen Slot Size **	0.01

**Hand-Slotted Well Screens are Unacceptable

Illinois Environmental Protection Agency

Well Completion Report

Site #: County: Sangamon Well #: GP1

Site Name: Springfield CWLP Ash Pond Borehole #: GP1

Coordinates: X Y (or) Latitude: ° ' " Longitude: ° ' "

Surveyed by: Andrews Engineering, Inc. IL Registration #:

Drilling Contractor: Bulldog drilling Consulting Firm: Andrews Engineering, Inc.

Driller: C. Clines Geologist: B. Kenning

Drilling Method: CME 55cc 4.25 in HSA w/ 5'MC and 2' SS Logged by: B. Kenning

Drilling Fluids (type): N/A Report Form Completed by: B. Kenning

Date Well Started: 6/14/19 Date Well Finished: 6/14/19 Date Form Completed: 7/19/2019

ANNULAR SPACE DETAILS

Type of surface seal:

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: > 24 hours

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

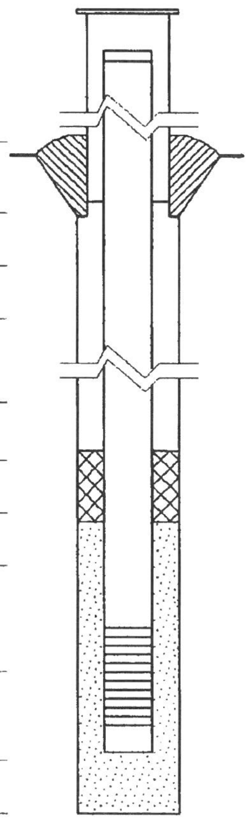
Type of sand pack: Silica Sand Pre-Pack

Grain size: 10/20 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method:



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
		Top of Protective Casing
539.44	- 2.82'	Top of Riser Pipe
537.06	0.00'	Ground Surface
534.06	3.00'	Top of Annular Sealant
		Static Water Level Measured on (after completion)
511.72	25.34'	Top of Seal
509.72	27.34'	Top of Sandpack
507.97	29.34'	Top of Screen
498.27	39.04'	Bottom of Screen
497.81	39.50'	Bottom of Well
497.06	40.00'	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	31.91
Bottom of Screen to End Cap (ft)	0.46
Screen Length (1st slot to last slot) (ft)	9.70
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: GP2 /AP-7

Site Name: Springfield CWLP Ash Pond Borehole #: GP2

Coordinates: X ______ Y ______ (or) Latitude: __° __' __" Longitude: __° __' __"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Bulldog drilling Consulting Firm: Andrews Engineering, Inc.

Driller: C. Clines Geologist: B. Kenning

Drilling Method: CME 55cc 4.25 in HSA w/ 5'MC Logged by: B. Kenning

Drilling Fluids (type): N/A Report Form Completed by: B. Kenning

Date Well Started: 6/14/19 Date Well Finished: 6/14/19 Date Form Completed: 7/19/2019

ANNULAR SPACE DETAILS

Type of surface seal: ______

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: > 24 hours

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

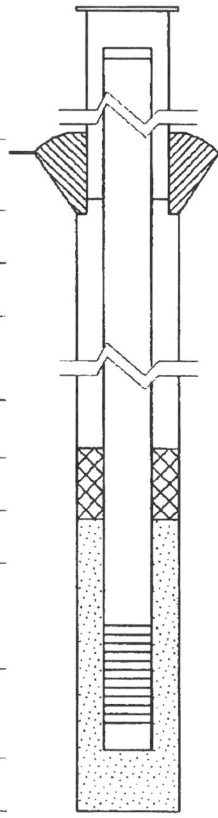
Type of sand pack: Silica Sand Pre-Pack

Grain size: 10/20 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
539.02	-2.66	Top of Riser Pipe
536.36	0.00'	Ground Surface
533.36	3.00'	Top of Annular Sealant
		Static Water Level Measured on (after completion)
511.02	24.9'	Top of Seal
509.02	24.9'	Top of Sandpack
507.46	28.9'	Top of Screen
497.76	38.6'	Bottom of Screen
497.3	39.06'	Bottom of Well
496.36	40.00'	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum

* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	31.56
Bottom of Screen to End Cap (ft)	0.46
Screen Length (1st slot to last slot) (ft)	9.70
Total Length of Casing (ft)	N/A
Screen Slot Size‡	#10 (0.01)

‡Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: GP3

Site Name: Springfield CWLP Ash Pond Borehole #: GP3

Coordinates: X ______ Y ______ (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Bulldog drilling Consulting Firm: Andrews Engineering, Inc.

Driller: C. Clines Geologist: B. Kenning

Drilling Method: CME 55cc 4.25 in HSA w/ 5'MC Logged by: B. Kenning

Drilling Fluids (type): N/A Report Form Completed by: B. Kenning

Date Well Started: 6/13/19 Date Well Finished: 6/13/19 Date Form Completed: 7/19/2019

ANNULAR SPACE DETAILS

Type of surface seal: ______

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

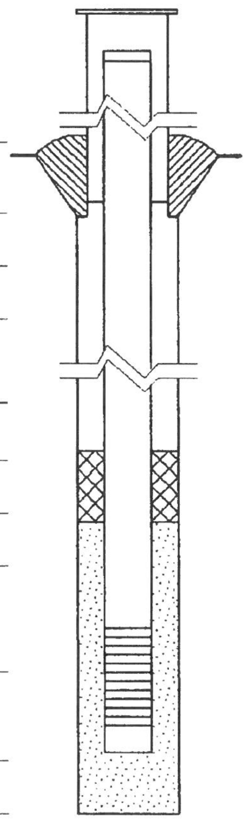
Type of sand pack: Silica Sand Pre-Pack

Grain size: 10/20 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
551.82	-2.7	Top of Riser Pipe
549.12	0.00'	Ground Surface
546.12	3.00'	Top of Annular Sealant
		Static Water Level Measured on (after completion)
549.12	3.00'	Top of Seal
532.05	17.07'	Top of Sandpack
531.49	17.63	Top of Screen
526.81	22.31	Bottom of Screen
526.26	22.86	Bottom of Well
524.32	24.80'	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum

* positive (+) values below GS, negilive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	20.33
Bottom of Screen to End Cap (ft)	0.55
Screen Length (1st slot to last slot) (ft)	4.68
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — **Well Completion Report**

Site #: ______ County: Sangamon Well #: GP4

Site Name: Springfield CWLP Ash Pond Borehole #: GP4

Coordinates: X ______ Y ______ (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Bulldog drilling Consulting Firm: Andrews Engineering, Inc.

Driller: J. Edwards Geologist: C. Myrvold

Drilling Method: CME 55cc 4.25 in HSA w/ 5'MC Logged by: C.Myrvold

Drilling Fluids (type): N/A Report Form Completed by: B. Kenning

Date Well Started: 5/17/19 Date Well Finished: 5/17/19 Date Form Completed: 7/19/2019

ANNULAR SPACE DETAILS

Type of surface seal: ______

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: > 24 hours

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

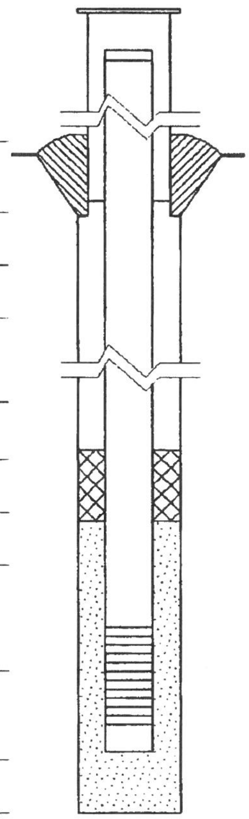
Type of sand pack: Silica Sand Pre-Pack

Grain size: 10/20 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
	- 3.00'	Top of Riser Pipe
	0.00'	Ground Surface
	3.00'	Top of Annular Sealant
		Static Water Level Measured on (after completion)
	23.43'	Top of Seal
	25.43'	Top of Sandpack
	27.43'	Top of Screen
	37.20'	Bottom of Screen
	37.50'	Bottom of Well
	38.00'	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	30.18
Bottom of Screen to End Cap (ft)	0.30
Screen Length (1st slot to last slot) (ft)	9.77
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

Illinois Environmental Protection Agency — **Well Completion Report**

Site #: ______ County: Sangamon Well #: GP6 /AP-6

Site Name: Springfield CWLP Ash Pond Borehole #: GP6

Coordinates: X ______ Y ______ (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Bulldog drilling Consulting Firm: Andrews Engineering, Inc.

Driller: J. Edwards Geologist: C. Myrvold

Drilling Method: CME 55cc 4.25 in HSA w/ 5'MC Logged by: C.Myrvold

Drilling Fluids (type): N/A Report Form Completed by: B. Kenning

Date Well Started: 5/17/19 Date Well Finished: 5/17/19 Date Form Completed: 7/19/2019

ANNULAR SPACE DETAILS

Type of surface seal: ______

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: > 24 hours

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

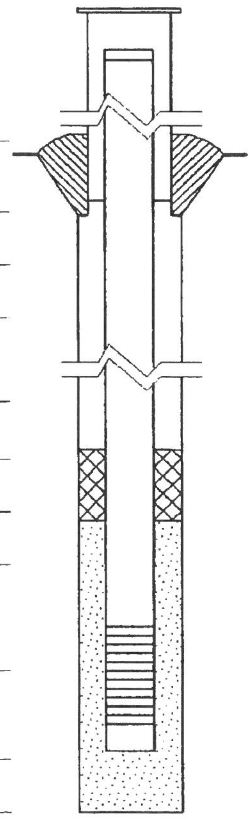
Type of sand pack: Silica Sand Pre-Pack

Grain size: 10/20 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
		Top of Protective Casing
537.82	-2.42	Top of Riser Pipe
535.4	0.00'	Ground Surface
532.4	3.00'	Top of Annular Sealant
		Static Water Level Measured on (after completion)
512.97	22.43'	Top of Seal
510.97	24.43'	Top of Sandpack
508.64	26.76'	Top of Screen
498.87	36.53'	Bottom of Screen
498.57	36.83'	Bottom of Well
498.4	37.00'	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	29.18
Bottom of Screen to End Cap (ft)	0.30
Screen Length (1st slot to last slot) (ft)	9.77
Total Length of Casing (ft)	N/A
Screen Slot Size‡	#10 (0.01)

‡ Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — **Well Completion Report**

Site #: ____ County: Sangamon Well #: GP7

Site Name: Springfield CWLP Ash Pond Borehole #: GP7

Coordinates: X ____ Y ____ (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ____

Drilling Contractor: Bulldog drilling Consulting Firm: Andrews Engineering, Inc.

Driller: J. Edwards Geologist: C. Myrvold

Drilling Method: CME 55cc 4.25 in HSA w/ 5'MC Logged by: C.Myrvold

Drilling Fluids (type): N/A Report Form Completed by: B. Kenning

Date Well Started: 5/16/2019 Date Well Finished: 5/16/2019 Date Form Completed: 7/19/2019

ANNULAR SPACE DETAILS

Type of surface seal: ____

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: > 24 hours

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

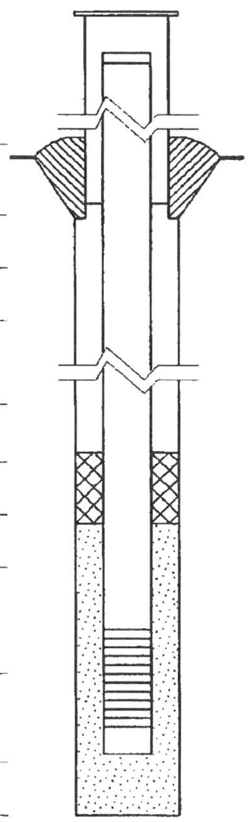
Type of sand pack: Silica Sand Pre-Pack

Grain size: 10/20 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ____



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
	- 3.08'	Top of Riser Pipe
	0.00'	Ground Surface
	3.00'	Top of Annular Sealant
		Static Water Level Measured on (after completion)
	21.93'	Top of Seal
	23.93'	Top of Sandpack
	25.93'	Top of Screen
	35.70'	Bottom of Screen
	36.00'	Bottom of Well
	36.50'	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	28.76
Bottom of Screen to End Cap (ft)	0.30
Screen Length (1st slot to last slot) (ft)	9.77
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — **Well Completion Report**

Site #: ______ County: Sangamon Well #: GP8

Site Name: Springfield CWLP Ash Pond Borehole #: GP8

Coordinates: X ______ Y ______ (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Bulldog drilling Consulting Firm: Andrews Engineering, Inc.

Driller: J. Edwards Geologist: C. Myrvold

Drilling Method: CME 55cc 4.25 in HSA w/ 5'MC Logged by: C.Myrvold

Drilling Fluids (type): N/A Report Form Completed by: B. Kenning

Date Well Started: 5/15/19 Date Well Finished: 5/16/19 Date Form Completed: 7/19/2019

ANNULAR SPACE DETAILS

Type of surface seal: ______

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: > 24 hours

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

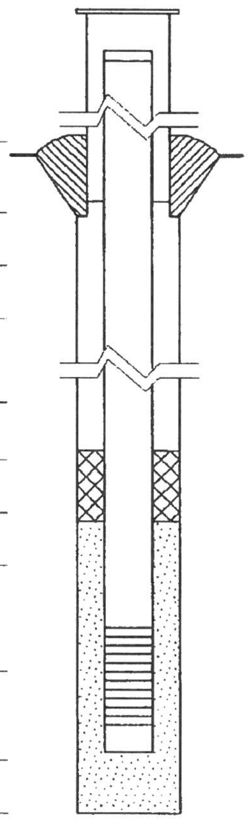
Type of sand pack: Silica Sand Pre-Pack

Grain size: 10/20 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



	ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)
Top of Protective Casing		
Top of Riser Pipe	533.12	3.00'
Ground Surface	530.08	0.00'
Top of Annular Sealant		3.00'
Static Water Level Measured on (after completion)		
Top of Seal		27.43'
Top of Sandpack		29.43'
Top of Screen		31.43'
Bottom of Screen		41.20'
Bottom of Well		41.50'
Bottom of Borehole		42.00'

* Referenced to a National Geodetic Vertical Datum

* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.50
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	34.18
Bottom of Screen to End Cap (ft)	0.30
Screen Length (1st slot to last slot) (ft)	9.77
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

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Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: AP-8

Site Name: Springfield CWLP Ash Pond Borehole #: W-9

Coordinates: X 1265.0 Y 3401.7 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Total Drilling Services/Skinner LTD. Consulting Firm: Andrews Engineering, Inc.

Driller: Todd Skinner Geologist: C. M. Latham

Drilling Method: CME 850 4.25 in HSA w/ 5'MC and 2' SS Logged by: C.M.Latham

Drilling Fluids (type): N/A Report Form Completed by: C.M. Latham

Date Well Started: 2/25/2021 Date Well Finished: 2/25/2021 Date Form Completed: 3/2/2021

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: > 24

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

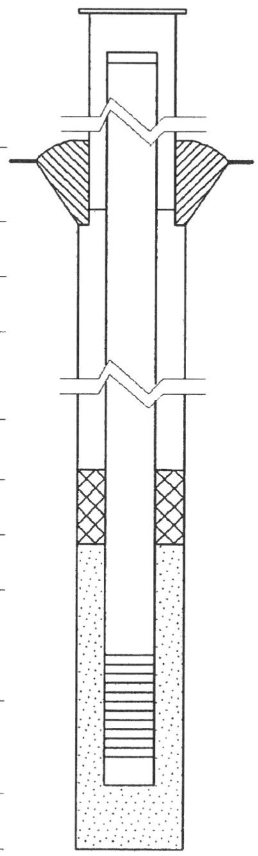
Type of sand pack: Silica Sand Pre-Pack

Grain size: 20/40 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
540.30	-3.10	Top of Protective Casing
540.30	-3.10	Top of Riser Pipe
537.20	0.00	Ground Surface
534.20	3.00	Top of Annular Sealant
530.20	7.00	Static Water Level Measured on (after completion)
	3.00	Top of Seal
510.60	26.60	Top of Sandpack
508.60	28.60	Top of Screen
498.02	39.18	Bottom of Screen
497.60	39.60	Bottom of Well
497.60	39.60	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	29.48'
Bottom of Screen to End Cap (ft)	0.42
Screen Length [1st slot to last slot] (ft)	9.70
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ____ County: Sangamon Well #: AP-9

Site Name: Springfield CWLP Ash Pond Borehole #: W-8

Coordinates: X 703.0 Y 5216.8 (or) Latitude: ° ' " Longitude: ° ' "

Surveyed by: Andrews Engineering, Inc. IL Registration #: ____

Drilling Contractor: Total Drilling Services/Skinner LTD. Consulting Firm: Andrews Engineering, Inc.

Driller: Todd Skinner Geologist: C. M. Latham

Drilling Method: CME 850 4.25 in HSA w/ 5'MC and 2' SS Logged by: C.M. Latham

Drilling Fluids (type): N/A Report Form Completed by: C.M. Latham

Date Well Started: 2/26/2021 Date Well Finished: 2/26/2021 Date Form Completed: 3/2/2021

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: > 24

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

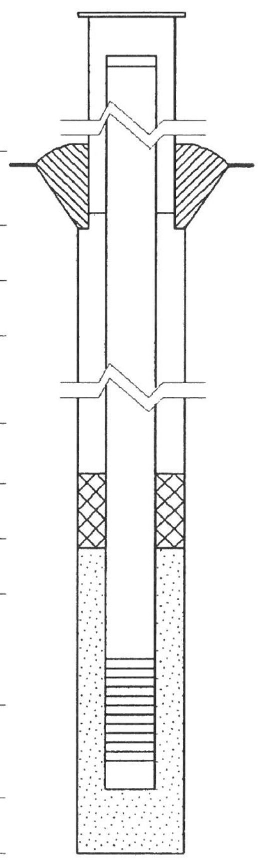
Type of sand pack: Silica Sand Pre-Pack

Grain size: 20/40 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ____



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
537.20	-2.90	Top of Protective Casing
537.20	-2.90	Top of Riser Pipe
534.30	0.00	Ground Surface
531.30	3.00	Top of Annular Sealant
525.00	9.30	Static Water Level Measured on (after completion)
	3.00	Top of Seal
514.00	20.30	Top of Sandpack
512.00	22.30	Top of Screen
502.24	32.06	Bottom of Screen
501.80	32.50	Bottom of Well
501.80	32.50	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	24.91
Bottom of Screen to End Cap (ft)	0.44
Screen Length (1st slot to last slot) (ft)	9.76
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: AP-10

Site Name: Springfield CWLP Ash Pond Borehole #: W-5

Coordinates: X 695.6 Y 4684.0 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Total Drilling Services/Skinner LTD. Consulting Firm: Andrews Engineering, Inc.

Driller: Todd Skinner Geologist: C. M. Latham

Drilling Method: CME 850 4.25 in HSA w/ 5'MC and 2' SS Logged by: C.M. Latham

Drilling Fluids (type): N/A Report Form Completed by: C.M. Latham

Date Well Started: 2/24/2021 Date Well Finished: 2/24/2021 Date Form Completed: 3/2/2021

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: > 24

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

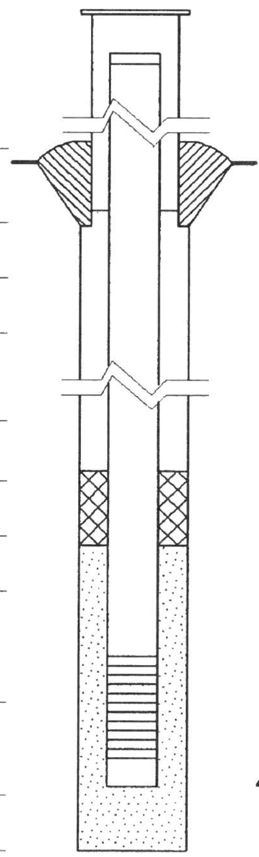
Type of sand pack: Silica Sand Pre-Pack

Grain size: 20/40 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
537.50	-3.10	Top of Protective Casing
537.50	-3.10	Top of Riser Pipe
534.40	0.00	Ground Surface
531.40	3.00	Top of Annular Sealant
528.38	6.02	Static Water Level Measured on (after completion)
531.4	3.00	Top of Seal
511.80	22.60	Top of Sandpack
509.70	24.70	Top of Screen
499.9	34.41	Bottom of Screen
499.53	34.87	Bottom of Well
499.43	34.97	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negative (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	27.8
Bottom of Screen to End Cap (ft)	0.46
Screen Length [1st slot to last slot] (ft)	9.71
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: AP-11

Site Name: Springfield CWLP Ash Pond Borehole #: W-4

Coordinates: X 524.5 Y 4150.6 (or) Latitude: __° __' __" Longitude: __° __' __"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Total Drilling Services/Skinner LTD Consulting Firm: Andrews Engineering, Inc.

Driller: Todd Skinner Geologist: S Kangas

Drilling Method: CME 850 4.25 in HSA w/ 5'MC and 2' SS Logged by: S Kangas

Drilling Fluids (type): N/A Report Form Completed by: S Kangas

Date Well Started: 2/23/2021 Date Well Finished: 2/23/2021 Date Form Completed: 3/2/2021

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: >24

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

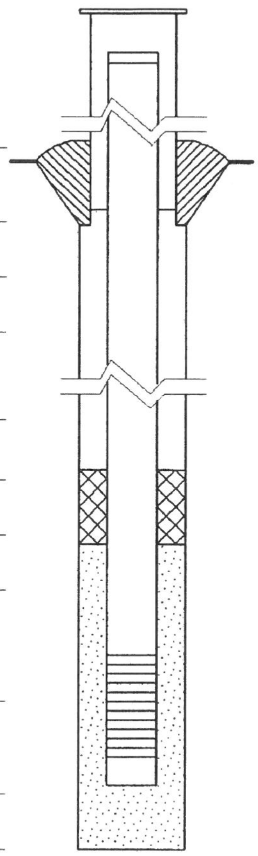
Type of sand pack: Silica Sand Pre-Pack

Grain size: 20/40 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)†	(0.01 ft)
538.10	-2.80	Top of Protective Casing
538.10	-2.80	Top of Riser Pipe
535.30	0.00	Ground Surface
531.80	3.50	Top of Annular Sealant
		Static Water Level Measured on (after completion)
531.80	3.50	Top of Seal
527.60	7.70	Top of Sandpack
525.28	10.02	Top of Screen
515.58	19.72	Bottom of Screen
515.15	20.15	Bottom of Well
515.15	20.15	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
† positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	#2
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	12.82
Bottom of Screen to End Cap (ft)	0.43
Screen Length [1st slot to last slot] (ft)	9.70
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: County: Sangamon Well #: AP-12

Site Name: Springfield CWLP Ash Pond Borehole #: W-3

Coordinates: X 667.6 Y 3797.7 (or) Latitude: ° ' " Longitude: ° ' "

Surveyed by: Andrews Engineering, Inc. IL Registration #:

Drilling Contractor: Total Drilling Services/Skinner LTD. Consulting Firm: Andrews Engineering, Inc.

Driller: Todd Skinner Geologist: C. M. Latham

Drilling Method: CME 850 4.25 in HSA w/ 5'MC and 2' SS Logged by: Scott Krangus

Drilling Fluids (type): N/A Report Form Completed by: C.M. Latham

Date Well Started: 2/23/2021 Date Well Finished: 2/24/2021 Date Form Completed: 3/2/2021

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: > 24

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

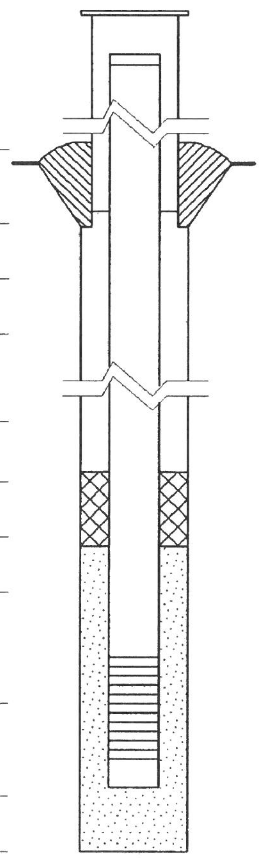
Type of sand pack: Silica Sand Pre-Pack

Grain size: 20/40 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method:



ELEVATION (MSL)*	DEPTH (BGS)+	(0.01 ft)
540.70	-2.90	Top of Protective Casing
540.60	-2.80	Top of Riser Pipe
537.80	0.00	Ground Surface
534.80	3.00	Top of Annular Sealant
		Static Water Level Measured on (after completion)
	3.00	Top of Seal
522.80	15.00	Top of Sandpack
520.80	17.00	Top of Screen
510.88	26.92	Bottom of Screen
510.30	27.50	Bottom of Well
510.50	27.30	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
+ positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	24.94
Bottom of Screen to End Cap (ft)	0.38
Screen Length [1st slot to last slot] (ft)	9.70
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: AP-13

Site Name: Springfield CWLP Ash Pond Borehole #: W-2

Coordinates: X 852.1 Y 3451.2 (or) Latitude: __° __' __" Longitude: __° __' __"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Total Drilling Services/Skinner LTD. Consulting Firm: Andrews Engineering, Inc.

Driller: Todd Skinner Geologist: C. M. Latham

Drilling Method: CME 850 4.25 in HSA w/ 5'MC and 2' SS Logged by: C.M. Latham

Drilling Fluids (type): N/A Report Form Completed by: C.M. Latham

Date Well Started: 2/24/2021 Date Well Finished: 2/24/2021 Date Form Completed: 3/2/2021

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: > 24

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

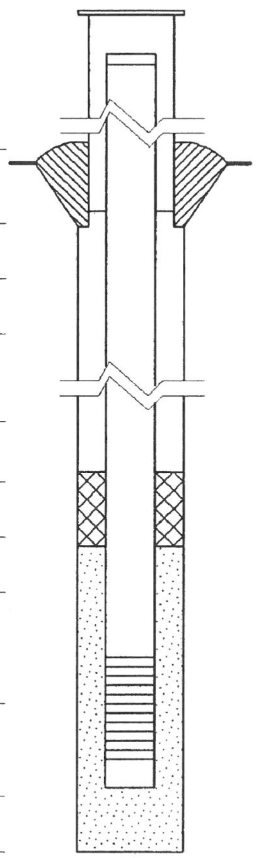
Type of sand pack: Silica Sand Pre-Pack

Grain size: 20/40 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ______



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
542.00	-3.40	Top of Protective Casing
542.00	-3.40	Top of Riser Pipe
538.60	0.00	Ground Surface
355.60	3.00	Top of Annular Sealant
532.35	6.25	Static Water Level Measured on (after completion)
	3.00	Top of Seal
524.08	14.52	Top of Sandpack
522.08	16.52	Top of Screen
511.47	27.13	Bottom of Screen
511.00	27.60	Bottom of Well
511.00	27.60	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	19.94'
Bottom of Screen to End Cap (ft)	0.47'
Screen Length (1st slot to last slot) (ft)	9.70
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ____ County: Sangamon Well #: AP-14

Site Name: Springfield CWLP Ash Pond Borehole #: W-1

Coordinates: X 1275.2 Y 3171.5 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ____

Drilling Contractor: Total Drilling Services/Skinner LTD. Consulting Firm: Andrews Engineering, Inc.

Driller: Todd Skinner Geologist: C. M. Latham

Drilling Method: CME 850 4.25 in HSA w/ 5'MC and 2' SS Logged by: C.M. Latham

Drilling Fluids (type): N/A Report Form Completed by: C.M. Latham

Date Well Started: 2/25/2021 Date Well Finished: 2/26/2021 Date Form Completed: 3/2/2021

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Chips

Installation method: Free Drop

Setting time: > 24

Type of bentonite seal: Bentonite Chips

Installation method: Free Drop

Setting time: > 24 hours

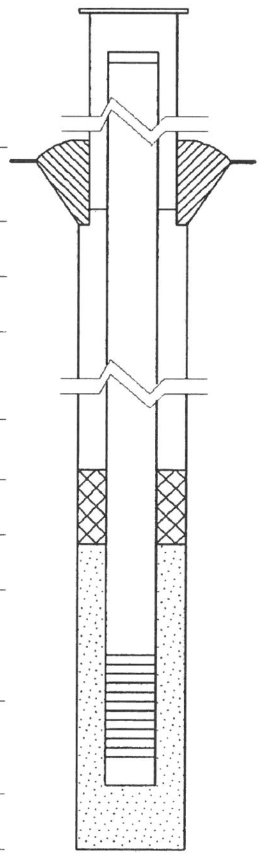
Type of sand pack: Silica Sand Pre-Pack

Grain size: 20/40 (sieve size)

Installation method: Free Drop

Type of backfill material: N/A (if applicable)

Installation method: ____



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
539.60	-2.80	Top of Protective Casing
539.60	-2.80	Top of Riser Pipe
536.80	0.00	Ground Surface
533.80	3.00	Top of Annular Sealant
534.80	2.00	Static Water Level Measured on (after completion)
	3.00	Top of Seal
521.45	15.35	Top of Sandpack
519.45	17.35	Top of Screen
509.75	27.05	Bottom of Screen
509.30	27.50	Bottom of Well
509.30	27.50	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	
Protective Casing Length (ft)	N/A
Riser Pipe Length (ft)	20.15
Bottom of Screen to End Cap (ft)	0.45
Screen Length (1st slot to last slot) (ft)	9.70
Total Length of Casing (ft)	N/A
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	N/A
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: T1

Site Name: CWLP Borehole #: B1

Coordinates: X 1128150.33 Y 2455538.81 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: Lisa Mauntel

Date Well Started: 05/01/2024 Date Well Finished: 05/01/2024 Date Form Completed: 06/06/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite chips

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

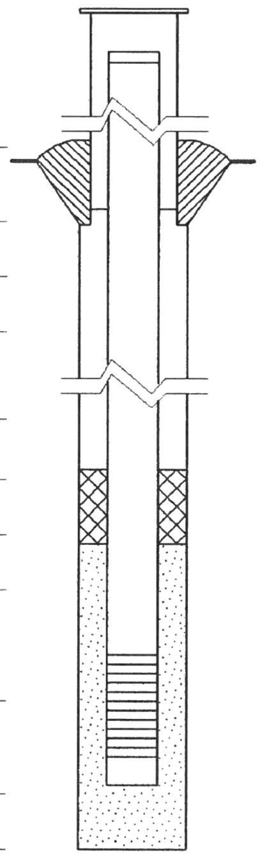
Type of sand pack: Quartz sand

Grain size: 20/40 (sieve size)

Installation method: Free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
536.10	-2.45	Top of Protective Casing
535.65	-2.00	Top of Riser Pipe
533.65	0	Ground Surface
531.83	3.50	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
529.83	5.50	Top of Seal
527.29	8.04	Top of Sandpack
525.77	9.56	Top of Screen
516.27	19.06	Bottom of Screen
515.83	19.50	Bottom of Well
515.83	19.50	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	5.00
Riser Pipe Length (ft)	9.88
Bottom of Screen to End Cap (ft)	0.44
Screen Length (1st slot to last slot) (ft)	9.50
Total Length of Casing (ft)	19.82
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Anodized Aluminum
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: T2

Site Name: CWLP Borehole #: B2

Coordinates: X 1128803.76 Y 2455006.85 (or) Latitude: __° __' __" Longitude: __° __' __"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: Lisa Mauntel

Date Well Started: 05/01/2024 Date Well Finished: 05/01/2024 Date Form Completed: 06/06/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

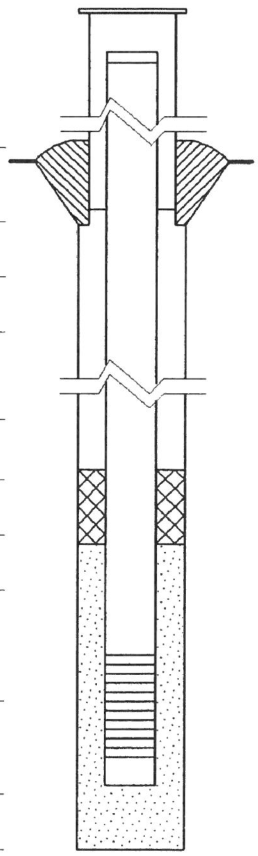
Type of sand pack: Quartz sand

Grain size: 20/40 (sieve size)

Installation method: Free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
549.86	-2.64	Top of Protective Casing
549.62	-2.4	Top of Riser Pipe
547.22	0	Ground Surface
544.22	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
526.12	21.10	Top of Seal
524.02	23.20	Top of Sandpack
522.46	24.76	Top of Screen
512.96	34.26	Bottom of Screen
512.22	35.00	Bottom of Well
512.22	35.00	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	5.00
Riser Pipe Length (ft)	27.16
Bottom of Screen to End Cap (ft)	0.44
Screen Length (1st slot to last slot) (ft)	9.50
Total Length of Casing (ft)	37.40
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Anodized Aluminum
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #:

County: Springfield

Well #: T4

Site Name: CWLP

Borehole #: B4

Coordinates: X 1130726.70 Y 2455622.14 (or) Latitude: ° ' " Longitude: ° ' "

Surveyed by: Andrews Engineering, Inc.

IL Registration #:

Drilling Contractor: Skinner Limited

Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner

Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3"

Logged by: S. Van Hook

Drilling Fluids (type): NA

Report Form Completed by: Lisa Mauntel

Date Well Started: 04/26/2024

Date Well Finished: 04/26/2024

Date Form Completed: 06/06/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

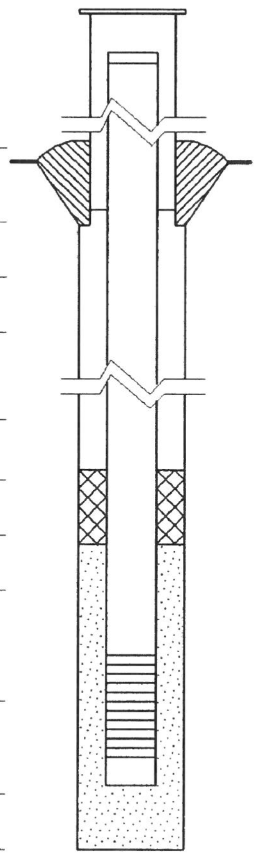
Type of sand pack: Quartz sand

Grain size: 20/40 (sieve size)

Installation method: Free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
549.43	-2.87	Top of Protective Casing
548.94	-2.38	Top of Riser Pipe
546.56	0	Ground Surface
543.56	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
534.76	11.80	Top of Seal
532.66	13.90	Top of Sandpack
531.43	15.13	Top of Screen
521.94	24.62	Bottom of Screen
521.56	25.00	Bottom of Well
521.56	25.00	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	5.00
Riser Pipe Length (ft)	17.51
Bottom of Screen to End Cap (ft)	0.44
Screen Length (1st slot to last slot) (ft)	9.49
Total Length of Casing (ft)	27.38
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Anodized Aluminum
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

PDF_0449

Illinois Environmental Protection Agency — Well Completion Report

Site #: ____ County: Springfield Well #: T5

Site Name: CWLP Borehole #: B5

Coordinates: X 1130996.32 Y 2455852.04 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ____

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: Lisa Mauntel

Date Well Started: 04/25/2024 Date Well Finished: 04/25/2024 Date Form Completed: 06/06/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

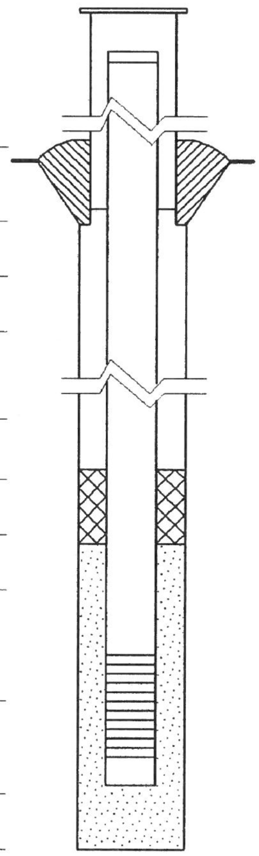
Type of sand pack: Quartz sand

Grain size: 20/40 (sieve size)

Installation method: Free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)°	DEPTH (BGS)*	(0.01 ft)
541.00	-2.85	Top of Protective Casing
540.66	-2.51	Top of Riser Pipe
538.15	0	Ground Surface
535.15	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
531.55	6.60	Top of Seal
529.35	8.80	Top of Sandpack
528.22	9.93	Top of Screen
518.72	19.43	Bottom of Screen
518.29	19.86	Bottom of Well
518.29	19.86	Bottom of Borehole

° Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	5.00
Riser Pipe Length (ft)	12.44
Bottom of Screen to End Cap (ft)	0.43
Screen Length [1st slot to last slot] (ft)	9.50
Total Length of Casing (ft)	22.37
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Anodized Aluminum
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

PDF_0450

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: T6

Site Name: CWLP Borehole #: B6

Coordinates: X 1131175.15 Y 2456259.47 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: Lisa Mauntel

Date Well Started: 04/25/2024 Date Well Finished: 04/25/2024 Date Form Completed: 06/06/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

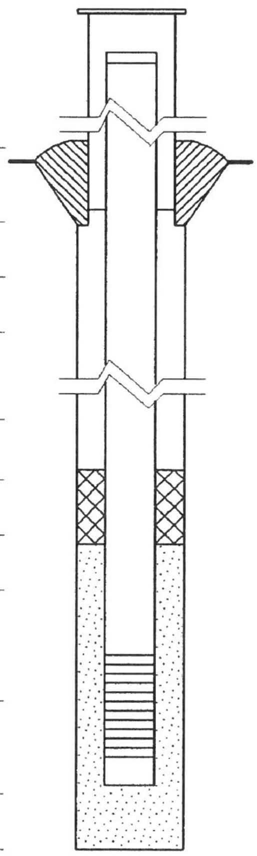
Type of sand pack: Quartz sand

Grain size: 20/40 (sieve size)

Installation method: Free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



	ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
			Top of Protective Casing
	538.32	-2.36	Top of Riser Pipe
	535.96	0	Ground Surface
	532.96	3.00	Top of Annular Sealant
		NA	Static Water Level Measured on (after completion)
	507.96	28.00	Top of Seal
	505.76	30.20	Top of Sandpack
	503.92	32.04	Top of Screen
	494.20	41.76	Bottom of Screen
	493.85	42.11	Bottom of Well
	493.85	42.11	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	5.00
Riser Pipe Length (ft)	32.85
Bottom of Screen to End Cap (ft)	0.35
Screen Length [1st slot to last slot] (ft)	9.72
Total Length of Casing (ft)	42.92
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Anodized Aluminum
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

APPENDIX B4:

CCR IMPOUNDMENT WELL CONSTRUCTION REPORTS

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: D1

Site Name: CWLP Borehole #: D1

Coordinates: X 1129774.64 Y 2455460.38 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 04/29/2024 Date Well Finished: 04/29/2024 Date Form Completed: 04/29/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

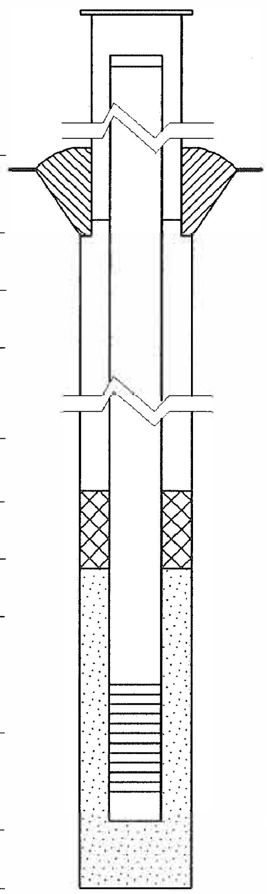
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: Free drop



ELEVATION (MSL)®	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
566.20	-2.18	Top of Riser Pipe
564.02	0	Ground Surface
561.02	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
533.72	30.3	Top of Seal
532.72	31.3	Top of Sandpack
530.75	33.27	Top of Screen
526.00	38.02	Bottom of Screen
525.52	38.5	Bottom of Well
523.52	40.5	Bottom of Borehole

® Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	35.44
Bottom of Screen to End Cap (ft)	0.48
Screen Length (1st slot to last slot) (ft)	4.75
Total Length of Casing (ft)	40.67
Screen Slot Size‡	#10 (0.01')

‡ Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: D2

Site Name: CWLP Borehole #: D2

Coordinates: X 1130279.34 Y 2456218.06 (or) Latitude: __° __' __" Longitude: __° __' __"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 04/29/2024 Date Well Finished: 04/29/2024 Date Form Completed: 04/29/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

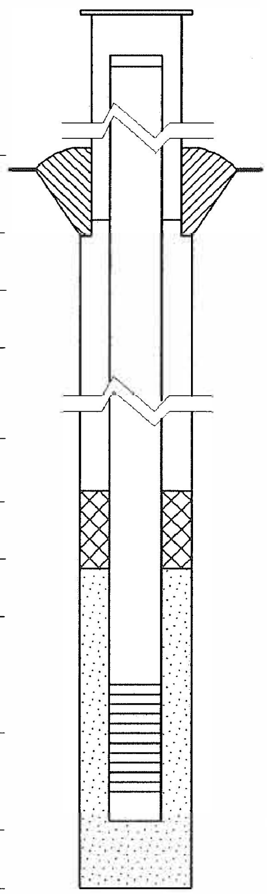
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: Free drop



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
560.93	-2.93	Top of Riser Pipe
558.00	0	Ground Surface
555.00	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
531.20	26.8	Top of Seal
528.73	27.77	Top of Sandpack
523.98	29.27	Top of Screen
523.98	34.02	Bottom of Screen
523.50	34.5	Bottom of Well
520.50	37.5	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	32.19
Bottom of Screen to End Cap (ft)	0.48
Screen Length (1st slot to last slot) (ft)	4.75
Total Length of Casing (ft)	37.42
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: D3

Site Name: CWLP Borehole #: D3

Coordinates: X 1129517.94 Y 2455925.82 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 04/30/2024 Date Well Finished: 04/30/2024 Date Form Completed: 04/30/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

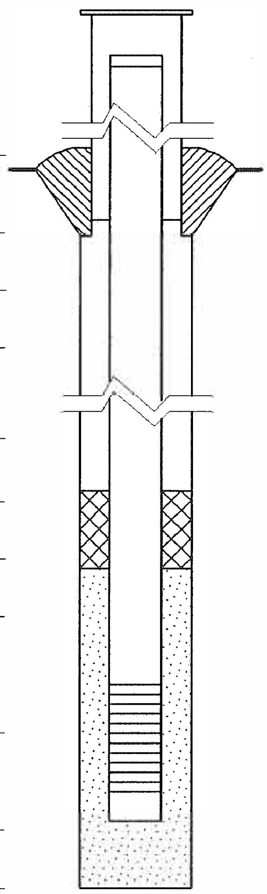
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: Free drop



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
557.90	-2.87	Top of Riser Pipe
555.03	0	Ground Surface
552.03	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
535.14	19.9	Top of Seal
533.18	21.85	Top of Sandpack
531.76	23.27	Top of Screen
527.01	28.02	Bottom of Screen
526.53	28.5	Bottom of Well
523.53	31.5	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	26.13
Bottom of Screen to End Cap (ft)	0.48
Screen Length (1st slot to last slot) (ft)	4.75
Total Length of Casing (ft)	31.36
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: D4

Site Name: CWLP Borehole #: D4

Coordinates: X 1129061.39 Y 2455862.82 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 04/30/2024 Date Well Finished: 04/30/2024 Date Form Completed: 04/30/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

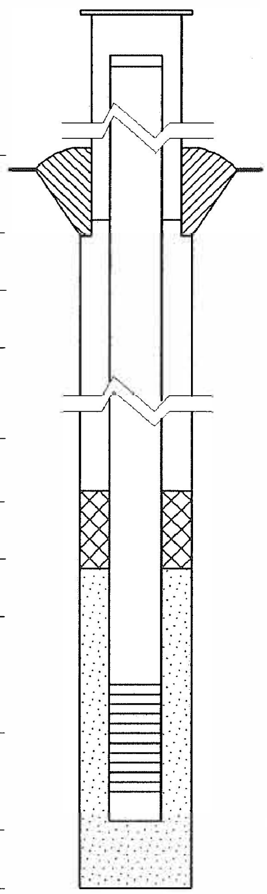
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: Free drop



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
565.61	-3.81	Top of Riser Pipe
561.80	0	Ground Surface
558.80	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
537.70	24.1	Top of Seal
536.55	25.25	Top of Sandpack
535.53	26.27	Top of Screen
530.78	31.02	Bottom of Screen
530.30	31.5	Bottom of Well
525.00	36.8	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	30.08
Bottom of Screen to End Cap (ft)	0.48
Screen Length (1st slot to last slot) (ft)	4.75
Total Length of Casing (ft)	35.31
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: L1

Site Name: CWLP Borehole #: L1

Coordinates: X 1127471.56 Y 2456542.96 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 05/02/2024 Date Well Finished: 05/02/2024 Date Form Completed: 05/02/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

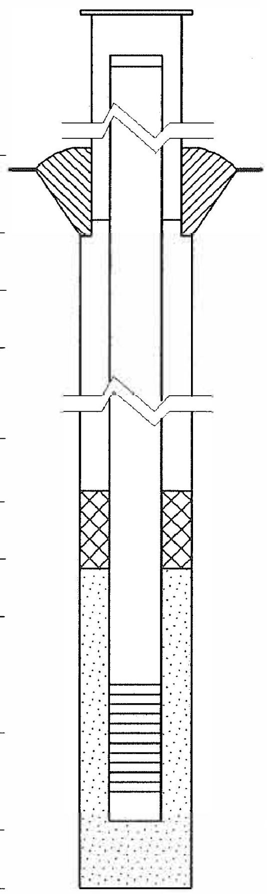
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: free drop



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
572.31	-3.35	Top of Riser Pipe
568.96	0	Ground Surface
565.96	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
543.86	25.1	Top of Seal
541.21	27.75	Top of Sandpack
539.69	29.27	Top of Screen
534.94	34.02	Bottom of Screen
534.46	34.5	Bottom of Well
530.96	38	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	32.62
Bottom of Screen to End Cap (ft)	0.48
Screen Length (1st slot to last slot) (ft)	4.75
Total Length of Casing (ft)	37.85
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: D3

Site Name: CWLP Borehole #: D3

Coordinates: X 1129517.94 Y 2455925.82 (or) Latitude: __° __' __" Longitude: __° __' __"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 04/30/2024 Date Well Finished: 04/30/2024 Date Form Completed: 04/30/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

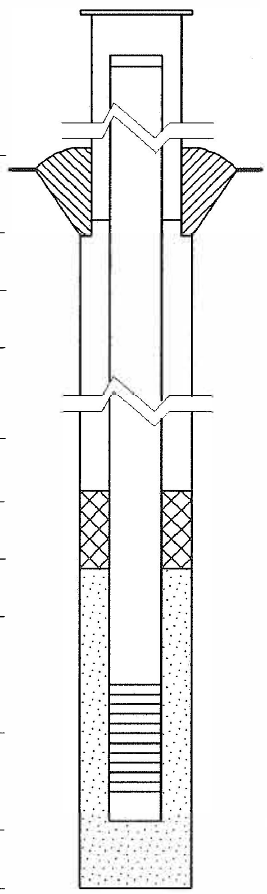
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: Free drop



ELEVATION (MSL)®	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
557.90	-2.87	Top of Riser Pipe
555.03	0	Ground Surface
552.03	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
535.14	19.9	Top of Seal
533.18	21.85	Top of Sandpack
531.76	23.27	Top of Screen
527.01	28.02	Bottom of Screen
526.53	28.5	Bottom of Well
523.53	31.5	Bottom of Borehole

® Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	26.13
Bottom of Screen to End Cap (ft)	0.48
Screen Length (1st slot to last slot) (ft)	4.75
Total Length of Casing (ft)	31.36
Screen Slot Size‡	#10 (0.01')

‡ Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: D4

Site Name: CWLP Borehole #: D4

Coordinates: X 1129061.39 Y 2455862.82 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 04/30/2024 Date Well Finished: 04/30/2024 Date Form Completed: 04/30/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

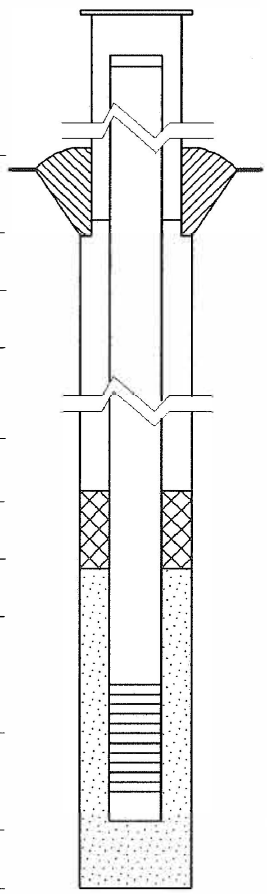
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: Free drop



ELEVATION (MSL)®	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
565.61	-3.81	Top of Riser Pipe
561.80	0	Ground Surface
558.80	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
537.70	24.1	Top of Seal
536.55	25.25	Top of Sandpack
535.53	26.27	Top of Screen
530.78	31.02	Bottom of Screen
530.30	31.5	Bottom of Well
525.00	36.8	Bottom of Borehole

® Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	30.08
Bottom of Screen to End Cap (ft)	0.48
Screen Length [1st slot to last slot] (ft)	4.75
Total Length of Casing (ft)	35.31
Screen Slot Size‡	#10 (0.01')

‡ Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Springfield Well #: L5

Site Name: CWLP Borehole #: L5

Coordinates: X 1128308.68 Y 2456118.11 (or) Latitude: ___° ___' ___" Longitude: ___° ___' ___"

Surveyed by: Andrews Engineering, Inc. IL Registration #: ______

Drilling Contractor: Skinner Limited Consulting Firm: Andrews Engineering, Inc.

Driller: T. Skinner Geologist: S. Van Hook

Drilling Method: 4 1/4" HSA 5' CSD 3" Logged by: S. Van Hook

Drilling Fluids (type): NA Report Form Completed by: S. Van Hook

Date Well Started: 05/03/2024 Date Well Finished: 05/03/2024 Date Form Completed: 05/03/2024

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: Free drop

Setting time: 24+ hours

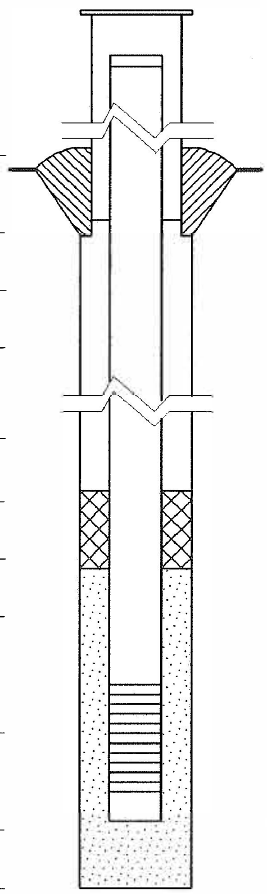
Type of sand pack: Quartz sand

Grain size: 10/20 (sieve size)

Installation method: Free drop

Type of backfill material: bentonite chips/pellets (if applicable)

Installation method: Free drop



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
		Top of Protective Casing
568.01	-2.82	Top of Riser Pipe
565.19	0	Ground Surface
562.19	3.00	Top of Annular Sealant
	NA	Static Water Level Measured on (after completion)
541.49	23.7	Top of Seal
539.39	25.8	Top of Sandpack
535.09	30.1	Top of Screen
530.39	34.8	Bottom of Screen
529.89	35.3	Bottom of Well
525.69	39.5	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.5
ID of Riser Pipe (in)	2.00
Protective Casing Length (ft)	NA
Riser Pipe Length (ft)	32.92
Bottom of Screen to End Cap (ft)	0.48
Screen Length (1st slot to last slot) (ft)	4.75
Total Length of Casing (ft)	38.12
Screen Slot Size*	#10 (0.01')

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	NA
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	PVC

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: DO06

Site Name: CWLP Ash Pond Dewatering Borehole #: DO06

State Plane Coordinate: X 2,456,191.3 Y 1,129,174.1 (or) Latitude: ______ Longitude: ______

Surveyed By: Romanotto IL Registration #: ______

Drilling Contractor: Skinner Limited Driller: T. Skinner

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Bucket Auger Drilling Fluid (Type): none

Logged By: Rhonald W. Hasenyager Date Started: 6/19/2025 Date Finished: 6/20/2025

Report Form Completed By: Rhonald W. Hasenyager Date: 7/2/2025

ANNULAR SPACE DETAILS

Type of Surface Seal: none

Type of Annular Sealant: none

Installation Method: ______

Setting Time: ______

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: ______

Setting Time: ______

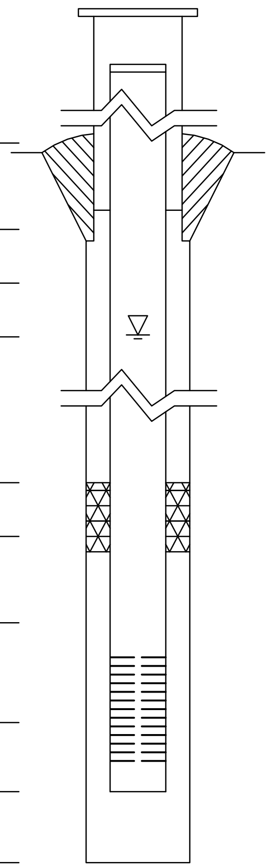
Type of Sand Pack: Sand/Gravel

Grain Size: FA4 & CA1 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
		Top of Protective Casing
553.69	-0.93	Top of Riser Pipe
552.77	0.00	Ground Surface
552.77	0.00	Top of Annular Sealant
548.00	4.77	Static Water Level (After Completion) 6/23/2025
n/a	n/a	Top of Seal
549.77	3.00	Top of Sand Pack
532.48	20.29	Top of Screen
522.84	29.93	Bottom of Screen
522.47	30.30	Bottom of Well
522.47	30.30	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	0.0
Riser Pipe Length	(feet)	21.13
Bottom of Screen to End Cap	(feet)	0.45
Screen Length (1st slot to last slot)	(feet)	9.64
Total Length of Casing	(feet)	31.22
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: None
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: DO07

Site Name: CWLP Ash Pond Dewatering Borehole #: DO07

State Plane Coordinate: X 2,456,095.0 Y 1,129,197.2 (or) Latitude: ______ Longitude: ______

Surveyed By: Romanotto IL Registration #: ______

Drilling Contractor: Skinner Limited Driller: T. Skinner

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): none

Logged By: Rhonald W. Hasenyager Date Started: 6/19/2025 Date Finished: 6/19/2025

Report Form Completed By: Rhonald W. Hasenyager Date: 7/2/2025

ANNULAR SPACE DETAILS

Type of Surface Seal: Bentonite chips

Type of Annular Sealant: Bentonite chips

Installation Method: Gravity

Setting Time: ______

Type of Bentonite Seal -- Granular Pellet Slurry (choose one) [Granular selected]

Installation Method: Gravity

Setting Time: ______

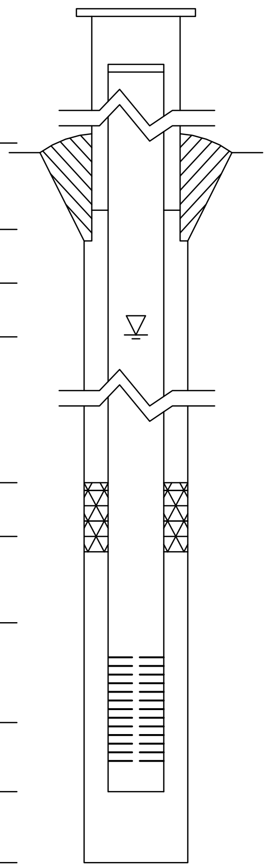
Type of Sand Pack: Silica

Grain Size: #12 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
		Top of Protective Casing
555.80	-3.04	Top of Riser Pipe
552.75	0.00	Ground Surface
552.75	0.00	Top of Annular Sealant
548.07	4.68	Static Water Level (After Completion) 6/23/2025
n/a	n/a	Top of Seal
540.05	12.70	Top of Sand Pack
538.37	14.38	Top of Screen
528.13	24.62	Bottom of Screen
527.75	25.00	Bottom of Well
525.75	27.00	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	0.0
Riser Pipe Length	(feet)	19.93
Bottom of Screen to End Cap	(feet)	0.53
Screen Length (1st slot to last slot)	(feet)	9.59
Total Length of Casing	(feet)	30.05
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: None (selected)
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC (selected)	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC (selected)	OTHER:
Screen	SS304	SS316	PTFE	PVC (selected)	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: DO08

Site Name: CWLP Ash Pond Dewatering Borehole #: DO08

State Plane Coordinate: X 2,456,257.4 Y 1,129,401.4 (or) Latitude: ______ Longitude: ______

Surveyed By: Romanotto IL Registration #: ______

Drilling Contractor: Skinner Limited Driller: T. Skinner

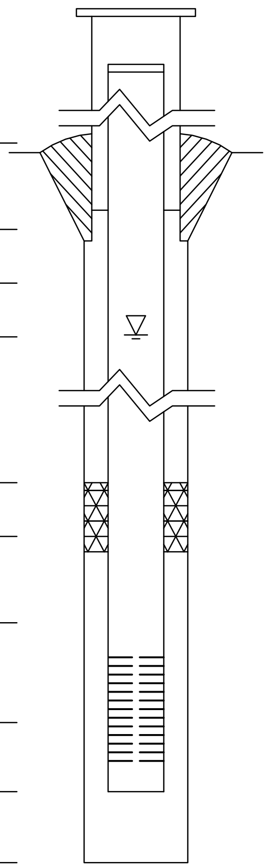
Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Hollow Stem Auger Drilling Fluid (Type): none

Logged By: Rhonald W. Hasenyager Date Started: 6/19/2025 Date Finished: 6/19/2025

Report Form Completed By: Rhonald W. Hasenyager Date: 7/2/2025

ANNULAR SPACE DETAILS



Type of Surface Seal: Bentonite chips

Type of Annular Sealant: Bentonite chips

Installation Method: Gravity

Setting Time: ______

Type of Bentonite Seal -- Granular (circled) Pellet Slurry (choose one)

Installation Method: Gravity

Setting Time: ______

Type of Sand Pack: Silica

Grain Size: #12 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______

	Elevations (MSL)*	Depths (BGS) (0.01 ft.)
Top of Protective Casing		
Top of Riser Pipe	554.33	-2.53
Ground Surface	551.80	0.00
Top of Annular Sealant	551.80	0.00
Static Water Level (After Completion) 6/23/2025	545.72	6.08
Top of Seal	n/a	n/a
Top of Sand Pack	535.90	15.90
Top of Screen	534.13	17.67
Bottom of Screen	524.13	27.67
Bottom of Well	523.53	28.27
Bottom of Borehole	523.53	28.27

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	8.0
ID of Riser Pipe	(inches)	2.0
Protective Casing Length	(feet)	0.0
Riser Pipe Length	(feet)	21.23
Bottom of Screen to End Cap	(feet)	0.55
Screen Length (1st slot to last slot)	(feet)	9.75
Total Length of Casing	(feet)	31.53
Screen Slot Size **	(inches)	0.010

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: None
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

Illinois Environmental Protection Agency — Well Completion Report

Site #: ______ County: Sangamon Well #: DW01

Site Name: CWLP Ash Pond Dewatering Borehole #: DW01

State Plane Coordinate: X 2,456,191.3 Y 1,129,174.1 (or) Latitude: ______ Longitude: ______

Surveyed By: Romanotto IL Registration #: ______

Drilling Contractor: Skinner Limited Driller: T. Skinner

Consulting Firm: Hanson Professional Services Inc. Geologist: Rhonald W. Hasenyager, LPG #196-000246

Drilling Method: Bucket Auger Drilling Fluid (Type): none

Logged By: Rhonald W. Hasenyager Date Started: 6/19/2025 Date Finished: 6/20/2025

Report Form Completed By: Rhonald W. Hasenyager Date: 7/2/2025

ANNULAR SPACE DETAILS

Type of Surface Seal: none

Type of Annular Sealant: none

Installation Method: ______

Setting Time: ______

Type of Bentonite Seal -- Granular Pellet Slurry (choose one)

Installation Method: ______

Setting Time: ______

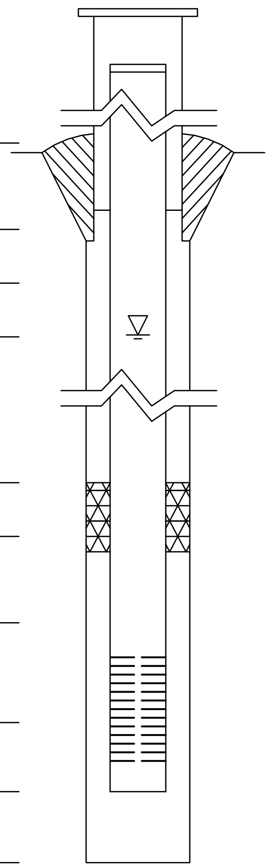
Type of Sand Pack: Sand/Gravel

Grain Size: FA4 & CA1 (sieve size)

Installation Method: Gravity

Type of Backfill Material: n/a (if applicable)

Installation Method: ______



Elevations (MSL)*	Depths (BGS)	(0.01 ft.)
		Top of Protective Casing
554.16	-1.16	Top of Riser Pipe
553.01	0.00	Ground Surface
		Top of Annular Sealant
547.58	5.43	Static Water Level (After Completion) 6/23/2025
n/a	n/a	Top of Seal
550.01	3.00	Top of Sand Pack
547.01	6.00	Top of Screen
523.31	29.70	Bottom of Screen
522.71	30.30	Bottom of Well
522.71	30.30	Bottom of Borehole

* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole	(inches)	36.0
ID of Riser Pipe	(inches)	16.5
Protective Casing Length	(feet)	0.0
Riser Pipe Length	(feet)	6.45
Bottom of Screen to End Cap	(feet)	0.00
Screen Length (1st slot to last slot)	(feet)	25.00
Total Length of Casing	(feet)	31.45
Screen Slot Size **	(inches)	

**Hand-Slotted Well Screens Are Unacceptable

WELL CONSTRUCTION MATERIALS

(Choose one type of material for each area)

Protective Casing	SS304	SS316	PTFE	PVC	OTHER: None
Riser Pipe Above W.T.	SS304	SS316	PTFE	PVC	OTHER:
Riser Pipe Below W.T.	SS304	SS316	PTFE	PVC	OTHER:
Screen	SS304	SS316	PTFE	PVC	OTHER:

APPENDIX B5:

FLOW PATH INVESTIGATION WELL CONSTRUCTION REPORTS

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: AP6S

Site Name: FGDS Development Borehole #: AP 6SA

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 13 " Longitude: -89 ° 35 ' 57 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/13/2025 Date Well Finished: 5/13/2025 Date Form Completed: 6/10/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: n/a

Installation method: ______

Setting time: ______

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 24+ hours

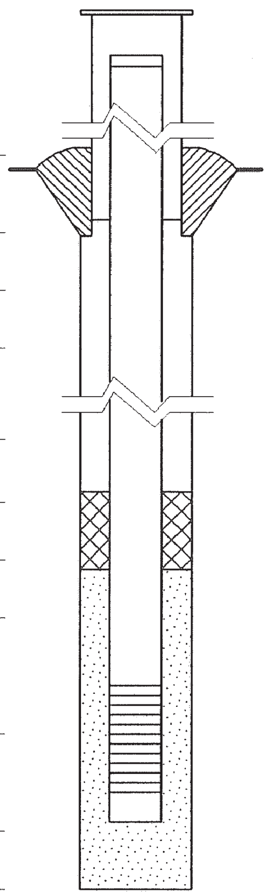
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
536.80	-2.64	Top of Protective Casing
536.47	-2.31	Top of Riser Pipe
534.16	0.0	Ground Surface
		Top of Annular Sealant
		Static Water Level Measured on (after completion)
532.16	2.0	Top of Seal
527.36	6.8	Top of Sandpack
525.26	8.9	Top of Screen
520.56	13.6	Bottom of Screen
520.16	14.0	Bottom of Well
520.16	14.0	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	11.21
Bottom of Screen to End Cap (ft)	0.4
Screen Length [1st slot to last slot] (ft)	4.7
Total Length of Casing (ft)	16.31
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: AP-8S

Site Name: FGDS Development Borehole #: AP-8SA

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 10 " Longitude: 89 ° 36 ' 2 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/14/2025 Date Well Finished: 5/14/2025 Date Form Completed: 6/9/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: n/a

Installation method: ______

Setting time: ______

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 24+ hours

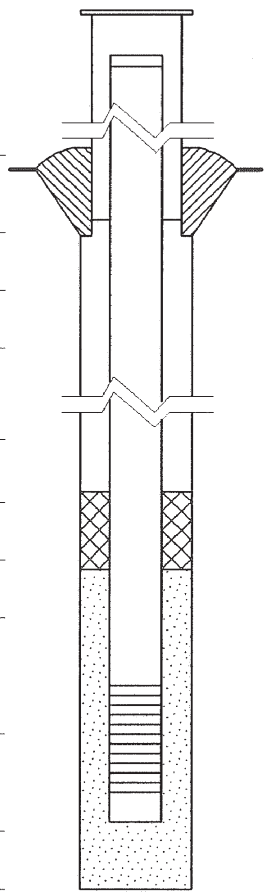
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: Sandpack (if applicable)

Installation method: free Drop



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
538.59	-2.62	Top of Protective Casing
538.53	-2.56	Top of Riser Pipe
535.97	0.0	Ground Surface
		Top of Annular Sealant
		Static Water Level Measured on (after completion)
533.97	2.0	Top of Seal
528.87	7.1	Top of Sandpack
526.96	9.01	Top of Screen
522.26	13.71	Bottom of Screen
521.86	14.11	Bottom of Well
520.97	15.0	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	11.57
Bottom of Screen to End Cap (ft)	0.4
Screen Length (1st slot to last slot) (ft)	4.7
Total Length of Casing (ft)	16.67
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: AP-15D

Site Name: FGDS Development Borehole #: AP-15D

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 45 ' 46 " Longitude: -89 ° 35 ' 59 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA, 2' split spoon, and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/12/2025 Date Well Finished: 5/12/2025 Date Form Completed: 6/3/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Tremie

Setting time: 24+ Hours

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 30+ minutes

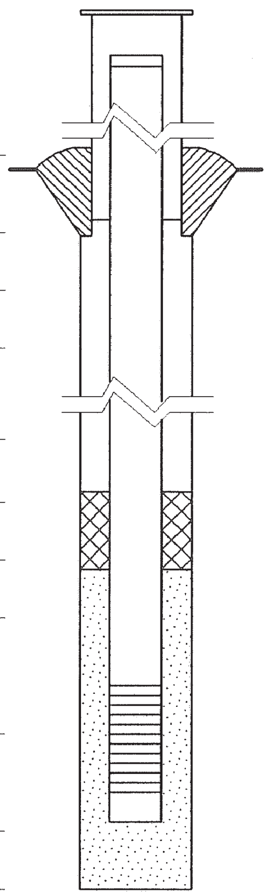
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)[a]	DEPTH (BGS)[b]	(0.01 ft)
538.79	-2.49	Top of Protective Casing
538.61	-2.31	Top of Riser Pipe
536.30	0.0	Ground Surface
534.3	2.0	Top of Annular Sealant
		Static Water Level Measured on (after completion)
512.7	23.6	Top of Seal
510.7	25.6	Top of Sandpack
508.63	27.67	Top of Screen
506.23	30.07	Bottom of Screen
505.8	30.5	Bottom of Well
504.3	30.5	Bottom of Borehole

[a] Referenced to a National Geodetic Vertical Datum
[b] positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	29.98
Bottom of Screen to End Cap (ft)	0.43
Screen Length [1st slot to last slot] (ft)	2.4
Total Length of Casing (ft)	32.81
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: AP15S

Site Name: FGDS Development Borehole #: AP15S

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 45 ' 46 " Longitude: -89 ° 35 ' 59 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/12/2025 Date Well Finished: 5/13/2025 Date Form Completed: 6/5/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite chips

Installation method: tremie

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 24+ hours

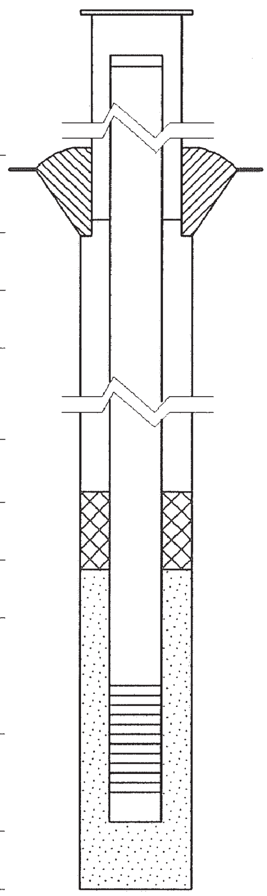
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: Quartz sand (if applicable)

Installation method: free drop



ELEVATION (MSL)[®]	DEPTH (BGS)[*]	(0.01 ft)
538.79	-2.37	Top of Protective Casing
538.53	-2.11	Top of Riser Pipe
536.42	0.0	Ground Surface
534.42	2.0	Top of Annular Sealant
		Static Water Level Measured on (after completion)
523.62	12.8	Top of Seal
521.62	14.8	Top of Sandpack
519.61	16.81	Top of Screen
514.88	21.54	Bottom of Screen
514.44	22.0	Bottom of Well
511.92	24.5	Bottom of Borehole

® Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	18.92
Bottom of Screen to End Cap (ft)	0.46
Screen Length [1st slot to last slot] (ft)	4.73
Total Length of Casing (ft)	24.11
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: AP-16

Site Name: FGDS Development Borehole #: AP-16

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 18 " Longitude: -89 ° 36 ' 0 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/20/2025 Date Well Finished: 5/20/2025 Date Form Completed: 6/6/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Hole plug

Installation method: Free drop

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 30+ minutes

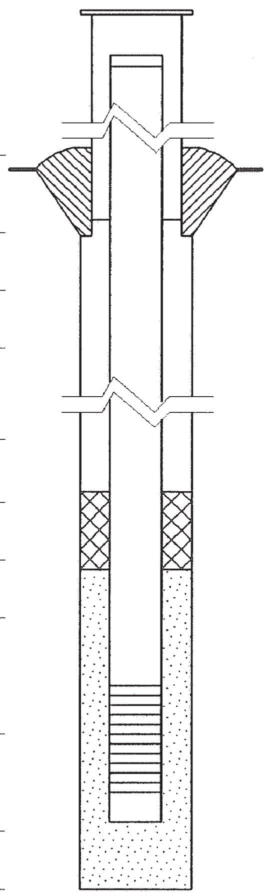
Type of sand pack: quartz sand

Grain size: 20/40 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)[®]	DEPTH (BGS)[*]	(0.01 ft)
539.45	-2.51	Top of Protective Casing
539.28	-2.34	Top of Riser Pipe
536.94	0.0	Ground Surface
534.94	2.0	Top of Annular Sealant
		Static Water Level Measured on (after completion)
525.64	11.3	Top of Seal
523.14	13.8	Top of Sandpack
519.1	17.84	Top of Screen
514.42	22.52	Bottom of Screen
513.94	23.0	Bottom of Well
513.94	23.0	Bottom of Borehole

® Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	20.18
Bottom of Screen to End Cap (ft)	0.48
Screen Length [1st slot to last slot] (ft)	4.68
Total Length of Casing (ft)	25.34
Screen Slot Size[*]	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: P03D

Site Name: FGDS Development Borehole #: P03D

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 14 " Longitude: -89 ° 35 ' 45 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/14/2025 Date Well Finished: 5/14/2025 Date Form Completed: 6/3/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite Grout

Installation method: Tremie

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 24+

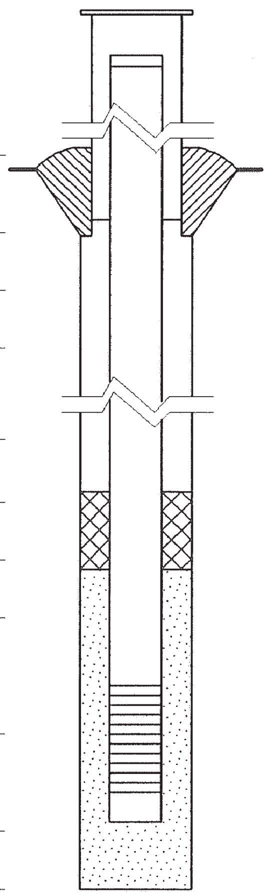
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
533.20	-3.18	Top of Protective Casing
533.04	-3.02	Top of Riser Pipe
530.02	0.0	Ground Surface
528.02	2.0	Top of Annular Sealant
		Static Water Level Measured on (after completion)
504.22	25.8	Top of Seal
502.22	27.8	Top of Sandpack
500.19	29.83	Top of Screen
495.49	34.53	Bottom of Screen
495.02	35.0	Bottom of Well
495.02	35.0	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	32.85
Bottom of Screen to End Cap (ft)	0.47
Screen Length (1st slot to last slot) (ft)	4.7
Total Length of Casing (ft)	38.02
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: P03S

Site Name: FGDS Development Borehole #: P03S

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 14 " Longitude: -89 ° 35 ' 45 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/14/2025 Date Well Finished: 5/14/2025 Date Form Completed: 6/3/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: n/a

Installation method: ______

Setting time: ______

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 24+ hours

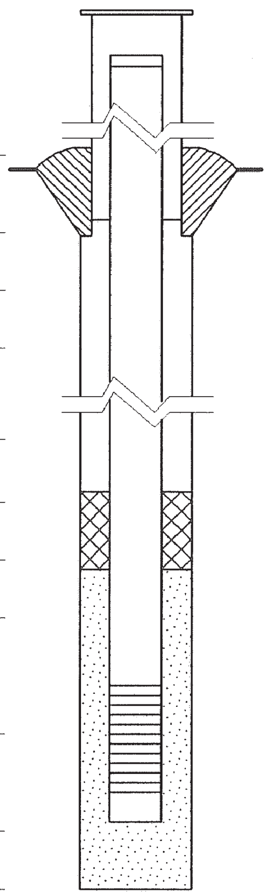
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
533.10	-3.11	Top of Protective Casing
532.75	-2.76	Top of Riser Pipe
529.99	0.0	Ground Surface
		Top of Annular Sealant
		Static Water Level Measured on (after completion)
527.99	2.0	Top of Seal
523.09	6.9	Top of Sandpack
521.01	8.98	Top of Screen
516.34	13.65	Bottom of Screen
515.99	14.0	Bottom of Well
515.99	14.0	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	11.74
Bottom of Screen to End Cap (ft)	0.35
Screen Length (1st slot to last slot) (ft)	4.67
Total Length of Casing (ft)	16.76
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: P104S

Site Name: FGDS Development Borehole #: P104S

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 13 " Longitude: -89 ° 35 ' 49 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/15/2025 Date Well Finished: 5/15/2025 Date Form Completed: 6/6/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Tremie

Setting time: 24+ Hours

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 30+ minutes

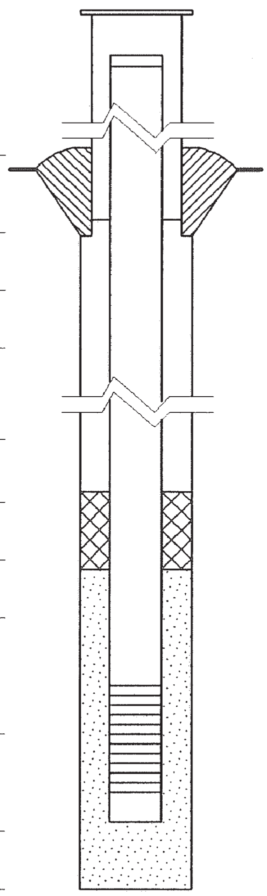
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
532.66	-2.93	Top of Protective Casing
532.27	-2.53	Top of Riser Pipe
529.74	0.0	Ground Surface
527.74	2.0	Top of Annular Sealant
		Static Water Level Measured on (after completion)
515.04	14.7	Top of Seal
512.84	16.9	Top of Sandpack
510.42	19.32	Top of Screen
505.72	24.02	Bottom of Screen
505.24	24.5	Bottom of Well
504.74	25	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	21.85
Bottom of Screen to End Cap (ft)	0.48
Screen Length [1st slot to last slot] (ft)	4.7
Total Length of Casing (ft)	27.03
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: R103S

Site Name: FGDS Development Borehole #: R103S

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 13 " Longitude: -89 ° 35 ' 42 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/19/2025 Date Well Finished: 5/19/2025 Date Form Completed: 6/3/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: Bentonite grout

Installation method: Tremie

Setting time: 24+ hours

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 30+ minutes

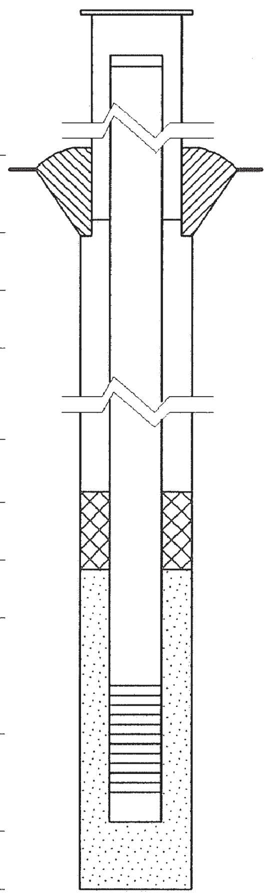
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: bentonite pellets (if applicable)

Installation method: free drop



ELEVATION (MSL)*	DEPTH (BGS)*	(0.01 ft)
537.78	-2.68	Top of Protective Casing
537.64	-2.54	Top of Riser Pipe
535.10	0.0	Ground Surface
533.10	2.0	Top of Annular Sealant
		Static Water Level Measured on (after completion)
519.60	15.5	Top of Seal
517.00	18.1	Top of Sandpack
514.73	20.37	Top of Screen
510.06	25.04	Bottom of Screen
509.60	25.5	Bottom of Well
505.10	30.0	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	22.91
Bottom of Screen to End Cap (ft)	0.46
Screen Length (1st slot to last slot) (ft)	4.67
Total Length of Casing (ft)	28.04
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: RW-3S

Site Name: FGDS Development Borehole #: RW-3S

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 13 " Longitude: -89 ° 35 ' 56 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/15/2025 Date Well Finished: 5/15/2025 Date Form Completed: 6/3/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: n/a

Installation method: ______

Setting time: ______

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 30+ minutes

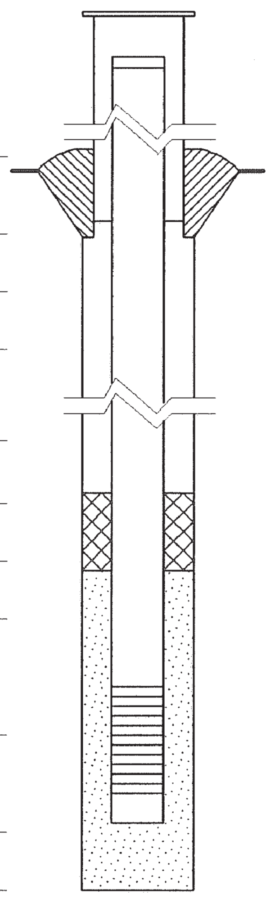
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
538.65	-2.78	Top of Protective Casing
538.39	-2.52	Top of Riser Pipe
535.87	0.0	Ground Surface
		Top of Annular Sealant
		Static Water Level Measured on (after completion)
533.87	2.0	Top of Seal
527.97	7.9	Top of Sandpack
525.94	9.93	Top of Screen
521.24	14.63	Bottom of Screen
520.87	15.0	Bottom of Well
520.87	15.0	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	12.45
Bottom of Screen to End Cap (ft)	0.37
Screen Length [1st slot to last slot] (ft)	4.7
Total Length of Casing (ft)	17.52
Screen Slot Size*	#10 (0.01)

*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

Illinois Environmental Protection Agency — Well Completion Report

Site #: 16782500020 County: Sangamon Well #: T4S

Site Name: FGDS Development Borehole #: T4S

Coordinates: X ______ Y ______ (or) Latitude: 39 ° 46 ' 13 " Longitude: -89 ° 36 ' 3 "

Surveyed by: Andrews Engineering IL Registration #: ______

Drilling Contractor: Skinner LTD Consulting Firm: Andrews Engineering

Driller: Todd Skinner Geologist: Nathan Beck

Drilling Method: 4.25 HSA and 5' CB, 2 ' split spoon Logged by: Nathan Beck

Drilling Fluids (type): n/a Report Form Completed by: Nathan Beck

Date Well Started: 5/20/2025 Date Well Finished: 5/20/2025 Date Form Completed: 6/3/2025

ANNULAR SPACE DETAILS

Type of surface seal: Concrete

Type of annular sealant: n/a

Installation method: ______

Setting time: ______

Type of bentonite seal: Bentonite pellets

Installation method: free drop

Setting time: 24+ hours

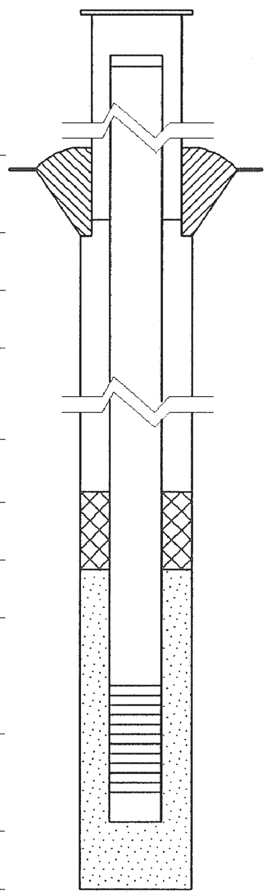
Type of sand pack: quartz sand

Grain size: 10/20 (sieve size)

Installation method: free drop

Type of backfill material: n/a (if applicable)

Installation method: n/a



ELEVATION (MSL)*	DEPTH (BGS)* (0.01 ft)	
549.25	-2.5	Top of Protective Casing
549.04	-2.29	Top of Riser Pipe
546.75	0.0	Ground Surface
		Top of Annular Sealant
		Static Water Level Measured on (after completion)
544.75	2.0	Top of Seal
538.85	7.9	Top of Sandpack
536.83	9.93	Top of Screen
532.15	14.6	Bottom of Screen
531.75	15.0	Bottom of Well
531.75	15.0	Bottom of Borehole

* Referenced to a National Geodetic Vertical Datum
* positive (+) values below GS, negitive (-) values above GS

CASING MEASUREMENTS

Diameter of Borehole (in)	8.25
ID of Riser Pipe (in)	2.0
Protective Casing Length (ft)	5.0
Riser Pipe Length (ft)	12.21
Bottom of Screen to End Cap (ft)	0.4
Screen Length [1st slot to last slot] (ft)	4.68
Total Length of Casing (ft)	17.29
Screen Slot Size*	#10 (0.01)

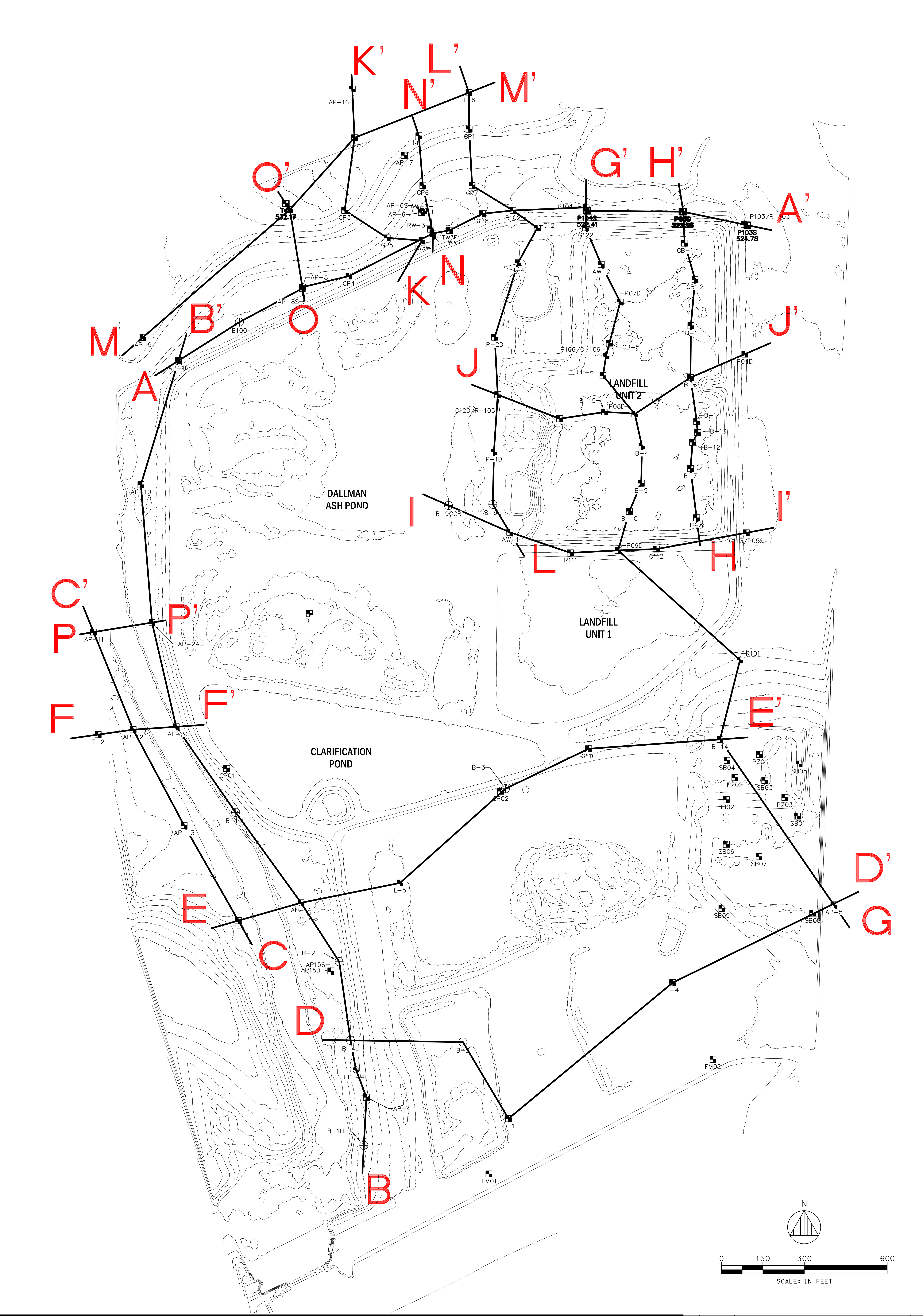
*Hand-slotted well screens are unacceptable.

WELL CONSTRUCTION MATERIALS

Protective Casing	Steel
Riser Pipe Above W.T.	PVC
Riser Pipe Below W.T.	PVC
Screen	Pre-packed screen

APPENDIX C:
GEOLOGIC CROSS SECTIONS

Tab: BORINGS IN X SECTIONS Last Saved: September 5, 2025, by Ben Karpus Plotted: Friday, September 5, 2025 10:14:40 AM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\2025\Cross Section\PROFILES.dwg



GEOLOGIC CROSS-SECTION LOCATIONS MAP

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: AUGUST 2024

PROJECT ID: 240227/0010

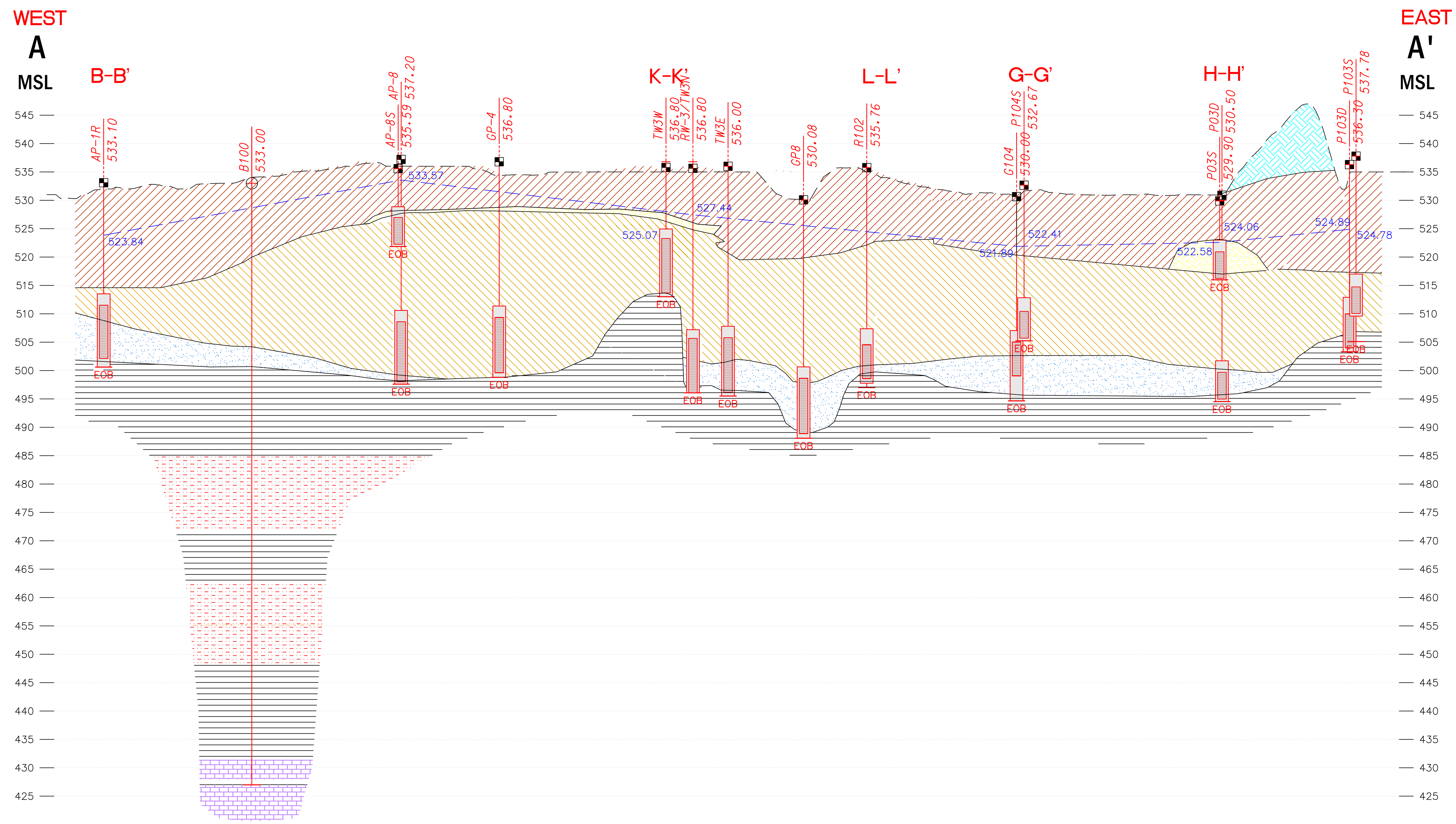
SHEET NUMBER:

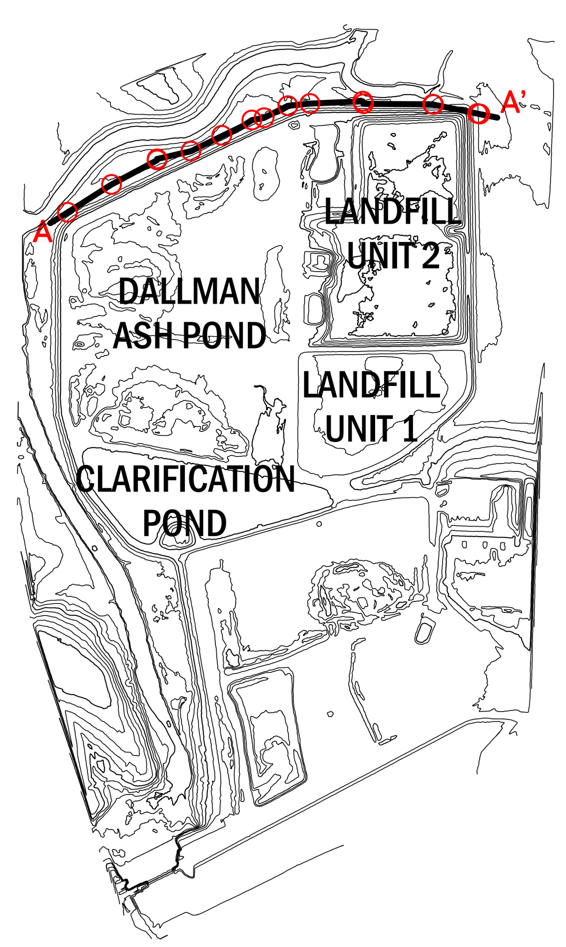
FIG. 1

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY



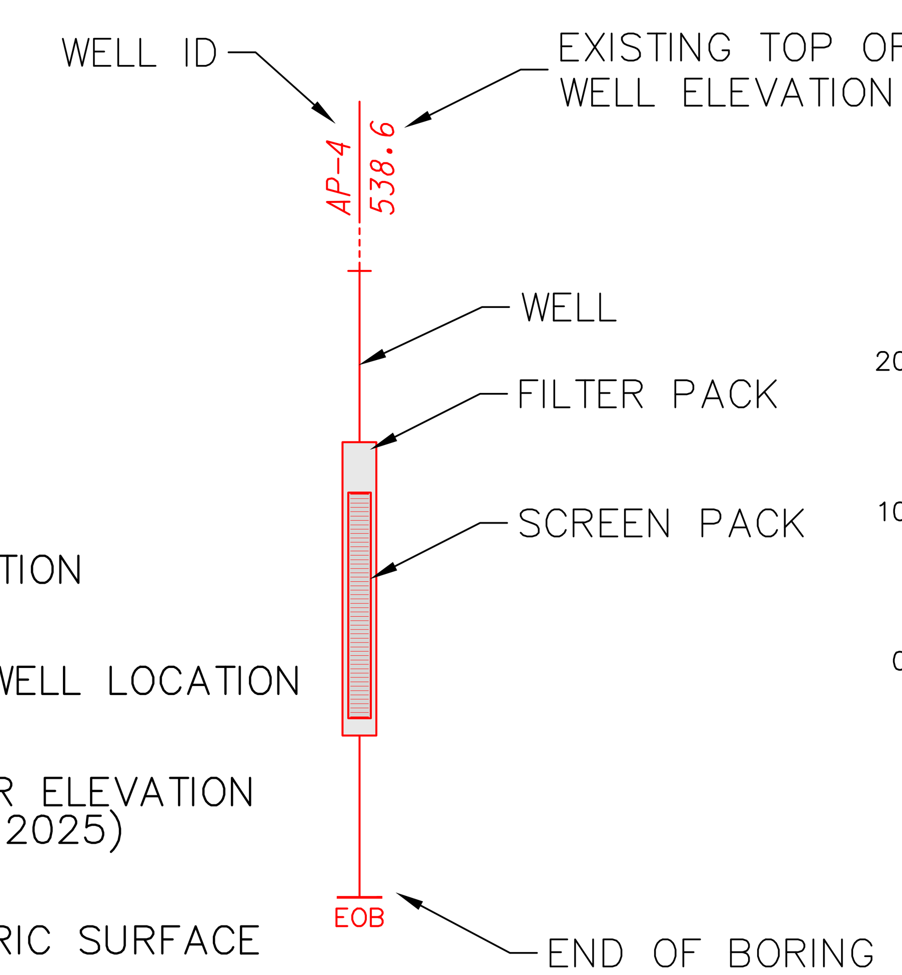


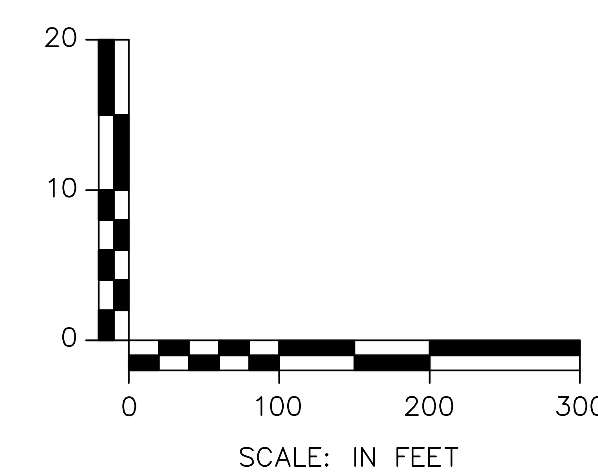
NOTES

1. DEPTH AND THICKNESS OF SUBSURFACE STRATA WERE GENERALIZED FROM AND INTERPOLATED BETWEEN BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE BORING. SEE BORING LOGS FOR DETAILED DESCRIPTION.
2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).
3. WELL/BORING SYMBOL PLACED AT SURFACE ELEVATION AT THE TIME THE BORING WAS COMPLETED.

LEGEND

FILL
UPPER COHESIVE DEPOSIT
SHALLOW SAND
LOWER COHESIVE DEPOSIT
BASAL SAND
SHALE
CLAYSTONE
SANDSTONE
LIMESTONE
BORING LOCATION
MONITORING WELL LOCATION
525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)
BASAL SAND POTENTIOMETRIC SURFACE





NO. | DATE | REVISION DESCRIPTION | BY

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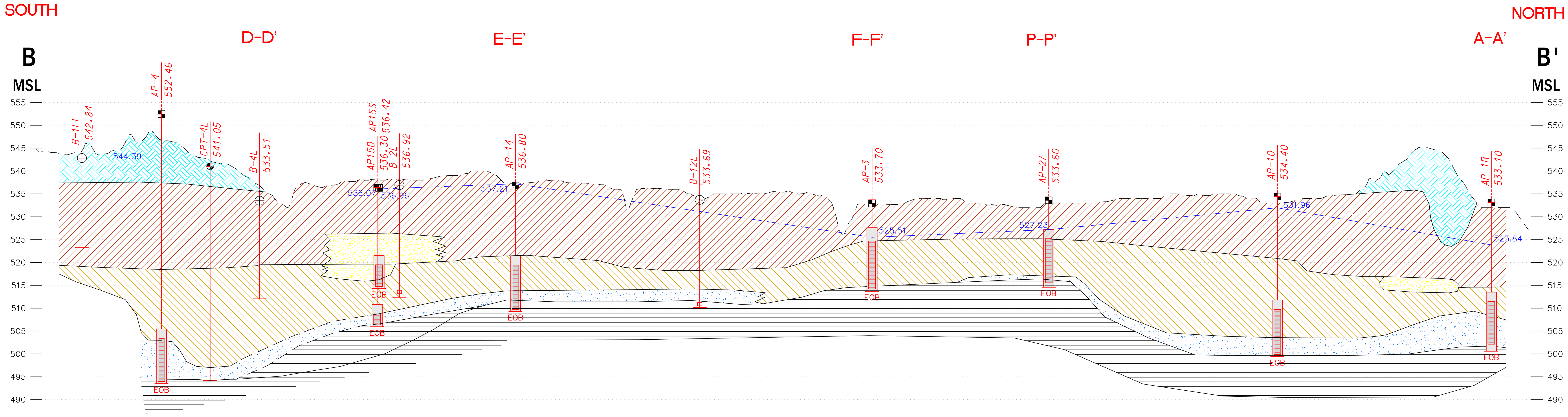
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION A-A'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER:
A-A'



LEGEND

FILL

UPPER COHESIVE DEPOSIT

LOWER COHESIVE DEPOSIT

BASAL SAND

SHALE

SHALLOW SAND

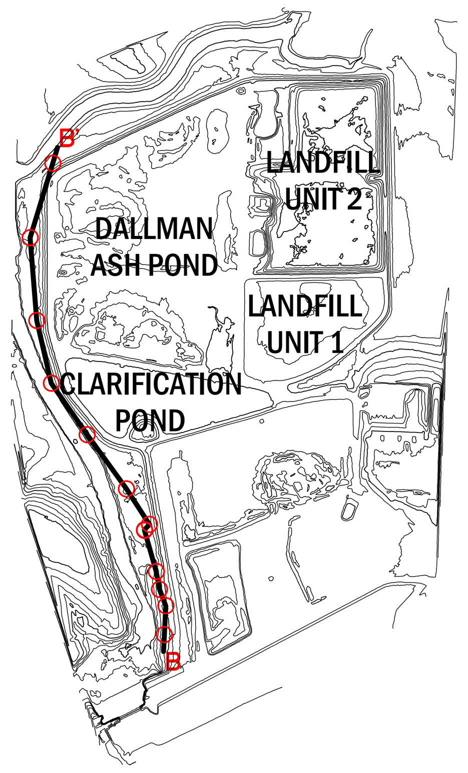
BORING LOCATION

MONITORING WELL LOCATION

CPT BORING LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE



NOTES

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2. SURFACE GENERATED FROM LIDAR DATA DERIVED FROM USGS WEBSITE (FLIGHT DATE: MAY 16, 2023).
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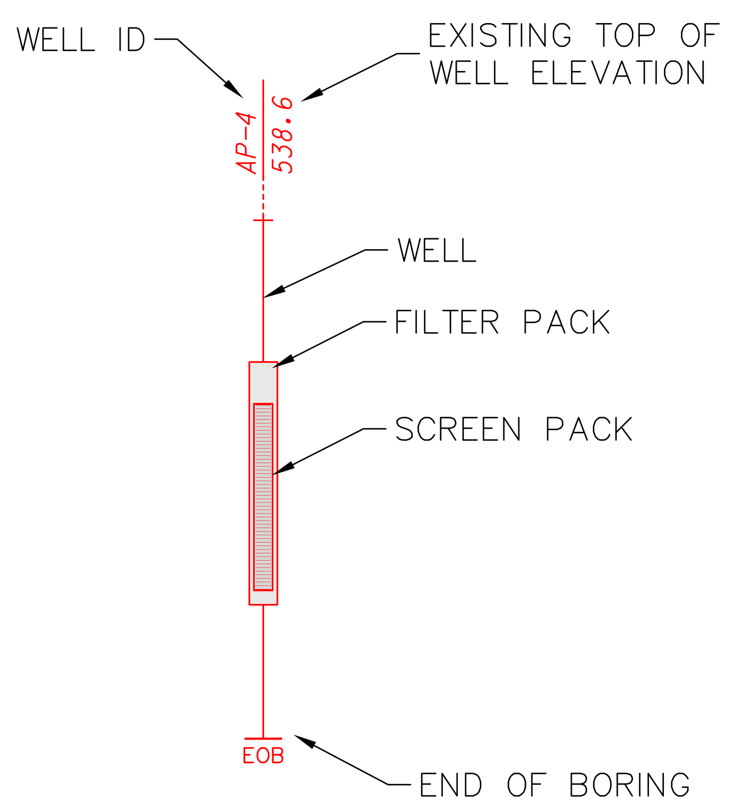

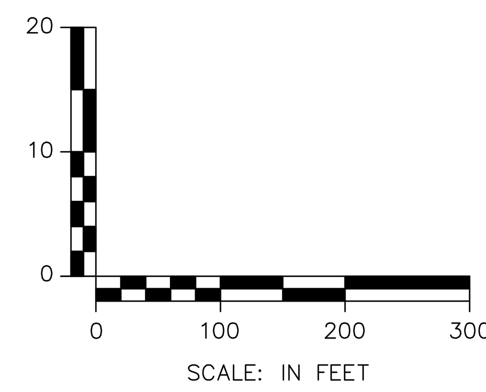

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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION B-B'

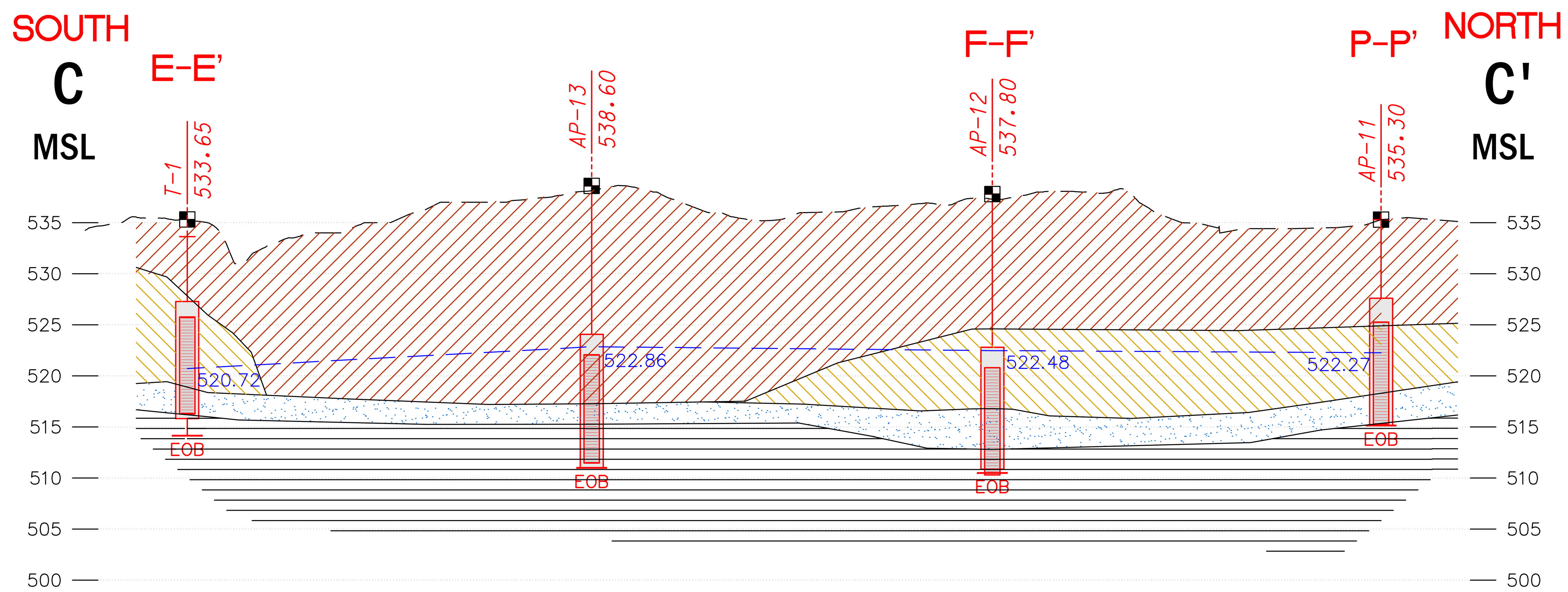
PLANS PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

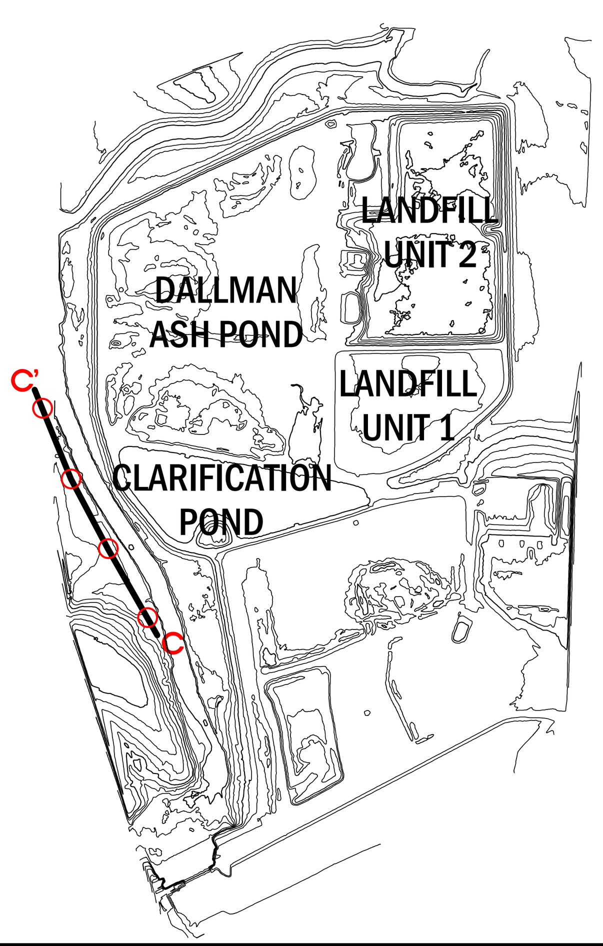
DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

SHEET NUMBER: B-B'

NO.	DATE	REVISION DESCRIPTION	BY
NO.	DATE	REVISION DESCRIPTION	BY





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3. WELL/BORING SYMBOL PLACED AT SURFACE ELEVATION AT THE TIME THE BORING WAS COMPLETED.

LEGEND

UPPER COHESIVE DEPOSIT

LOWER COHESIVE DEPOSIT

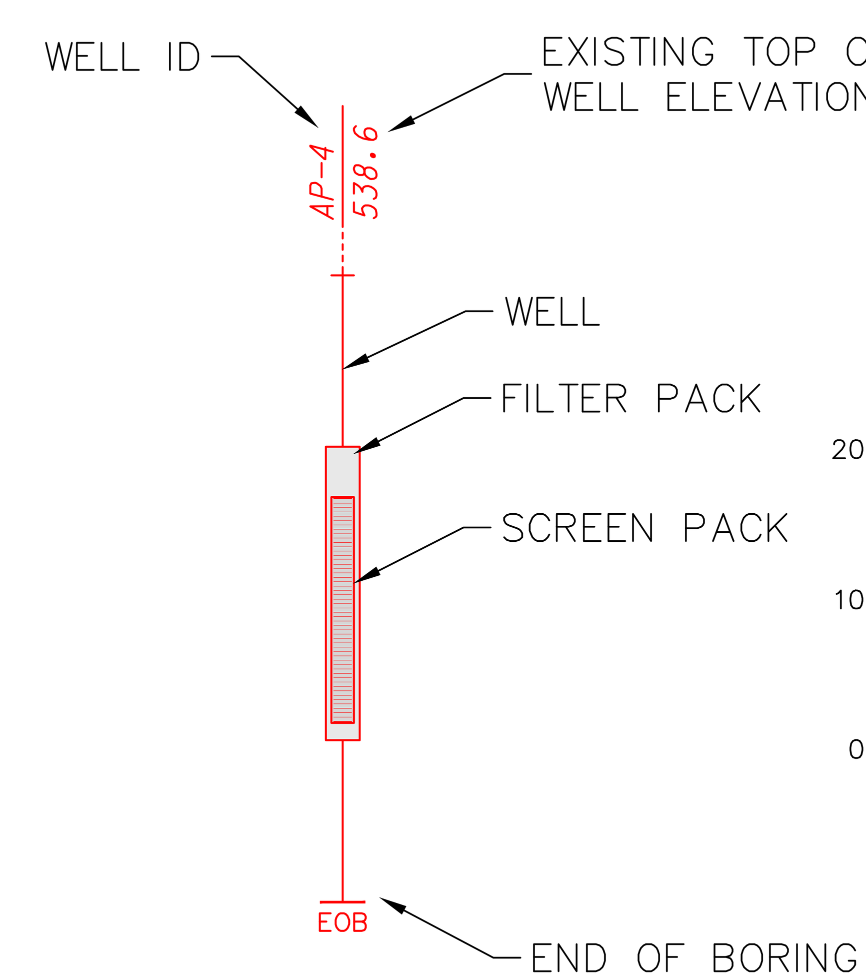
BASAL SAND

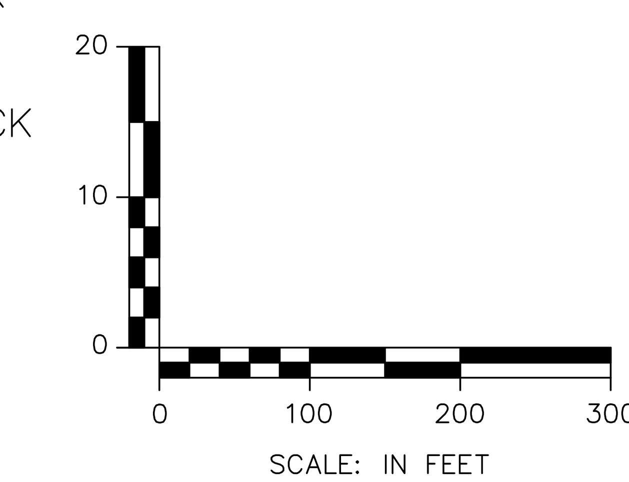
SHALE

MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE





NO. | DATE | REVISION DESCRIPTION | BY

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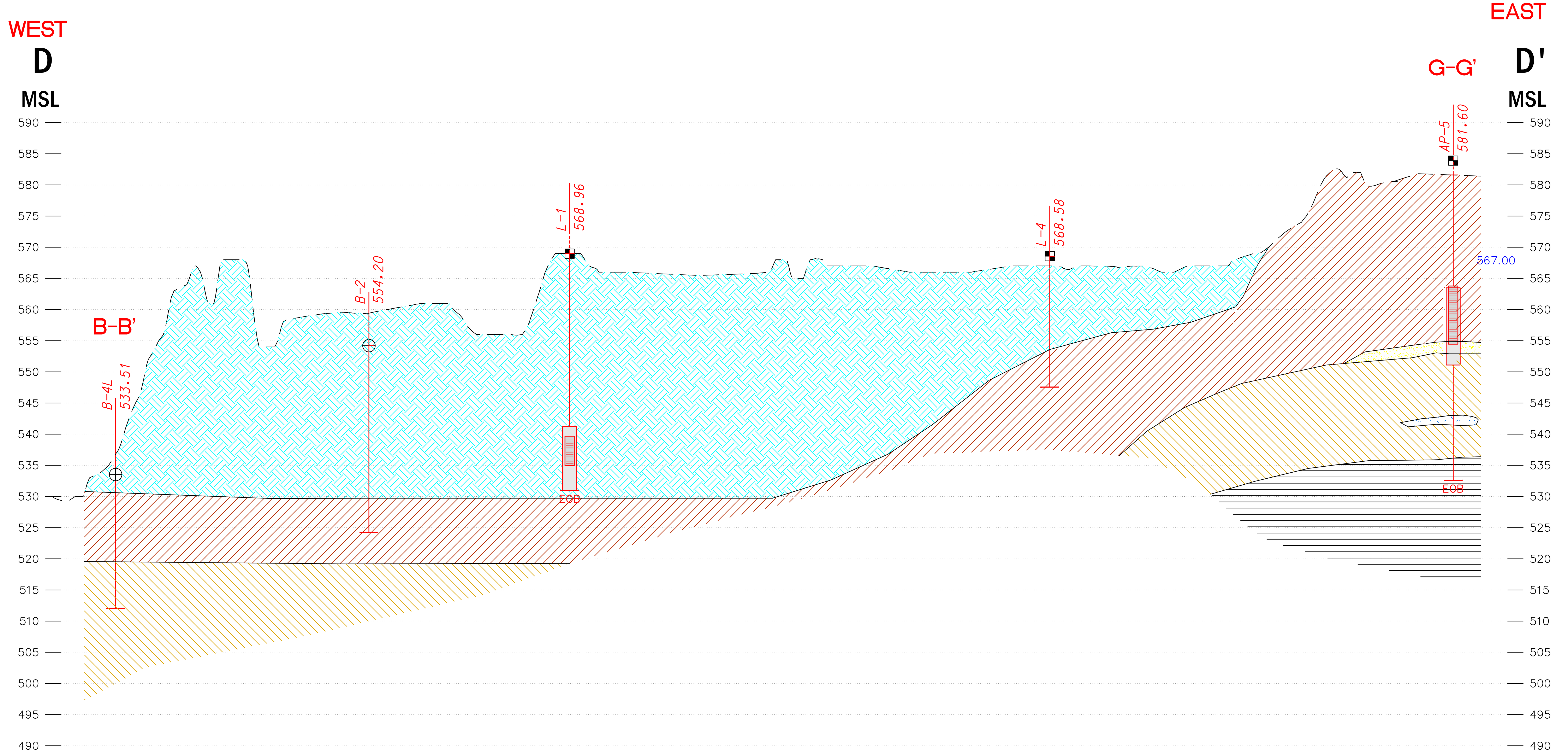
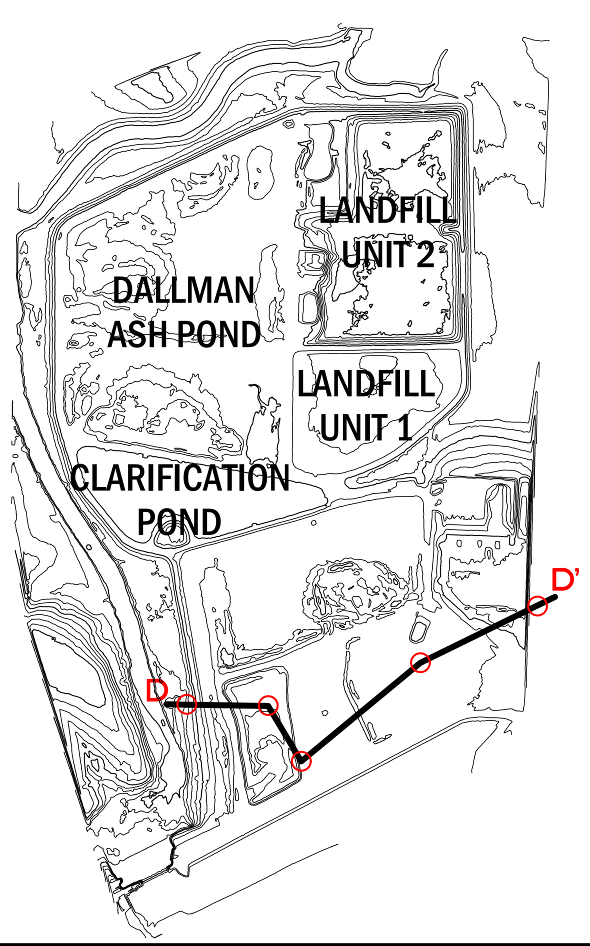
APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION C-C'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: C-C'





NOTES

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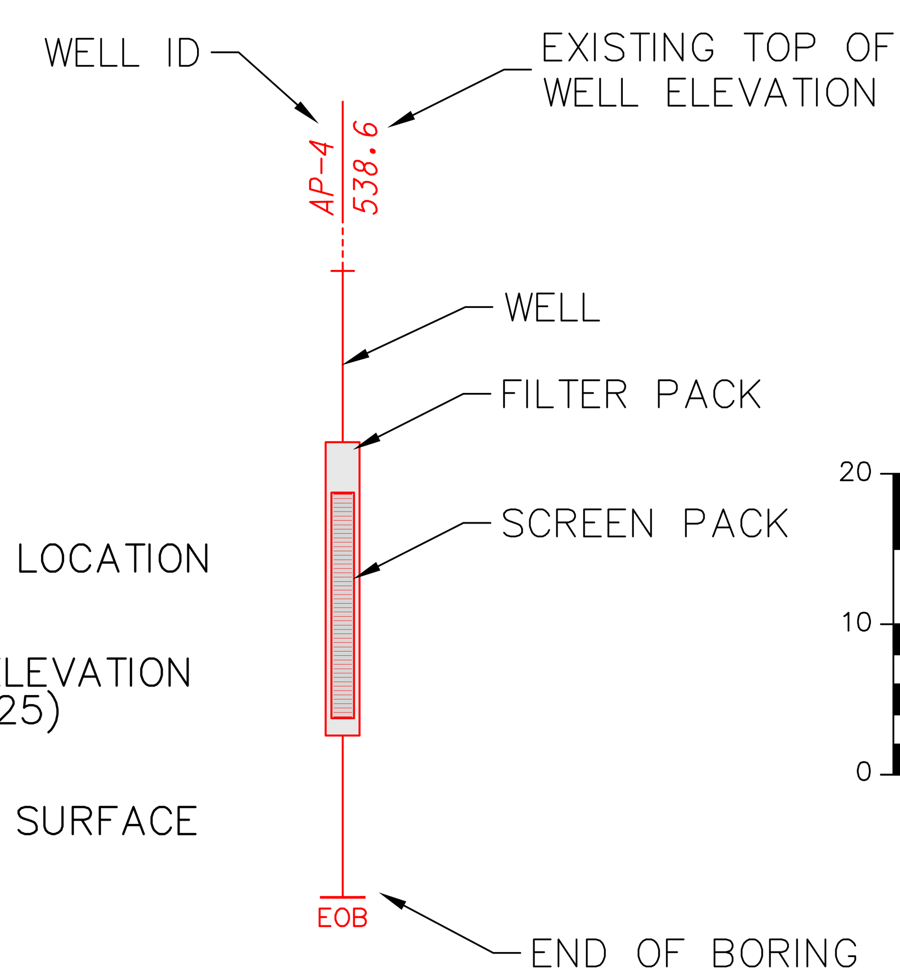
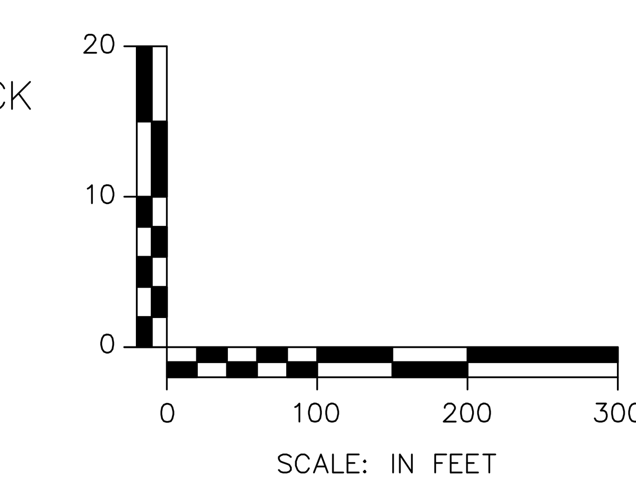
3. WELL/BORING SYMBOL PLACED AT SURFACE ELEVATION AT THE TIME THE BORING WAS COMPLETED.

LEGEND

FILL	SHALE
UPPER COHESIVE DEPOSIT	BORING LOCATION
SHALLOW SAND	MONITORING WELL LOCATION
LOWER COHESIVE DEPOSIT	525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)
BASAL SAND	BASAL SAND POTENTIOMETRIC SURFACE





NO.	DATE	REVISION DESCRIPTION	BY

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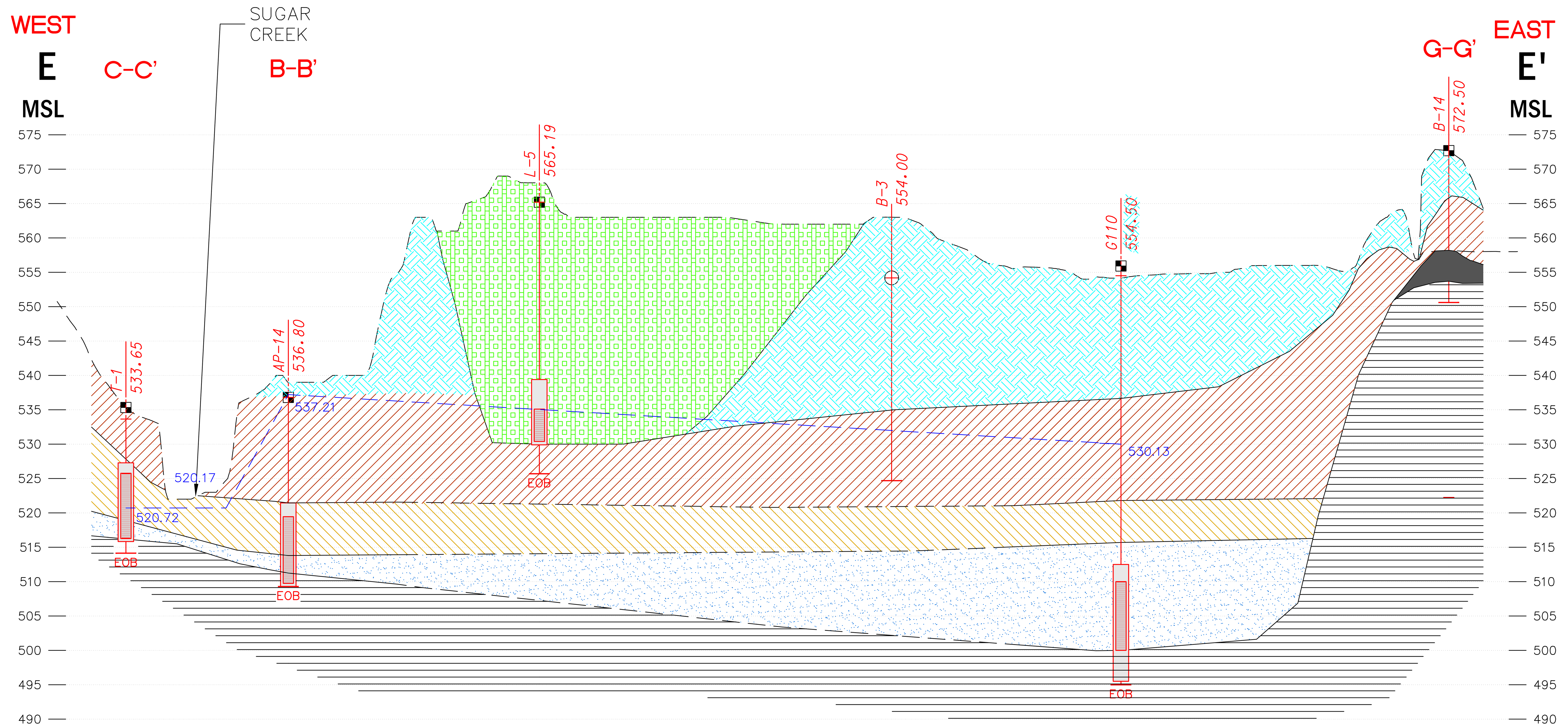
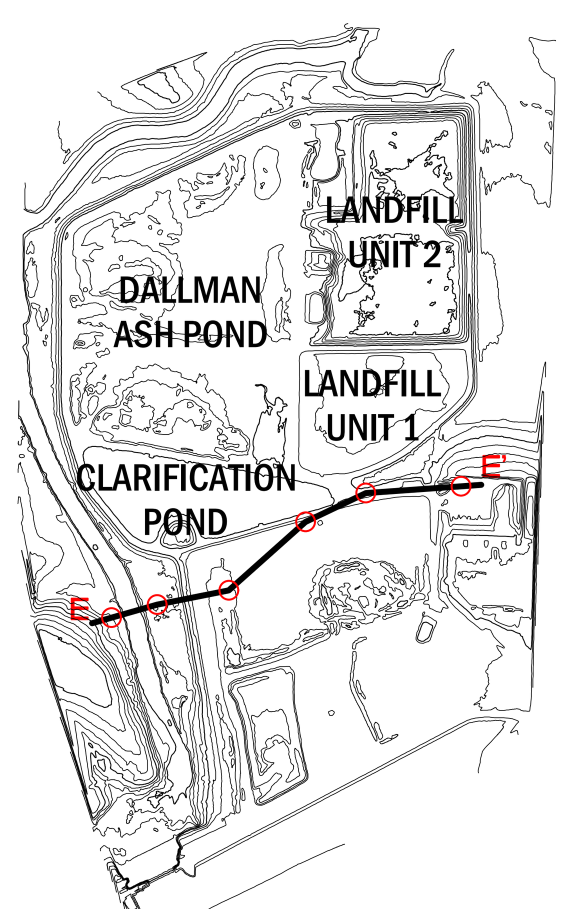
APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION D–D'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: D-D'





NOTES

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LEGEND

FILL

UPPER COHESIVE DEPOSIT

LOWER COHESIVE DEPOSIT

BASAL SAND

SHALE

CCR ASH

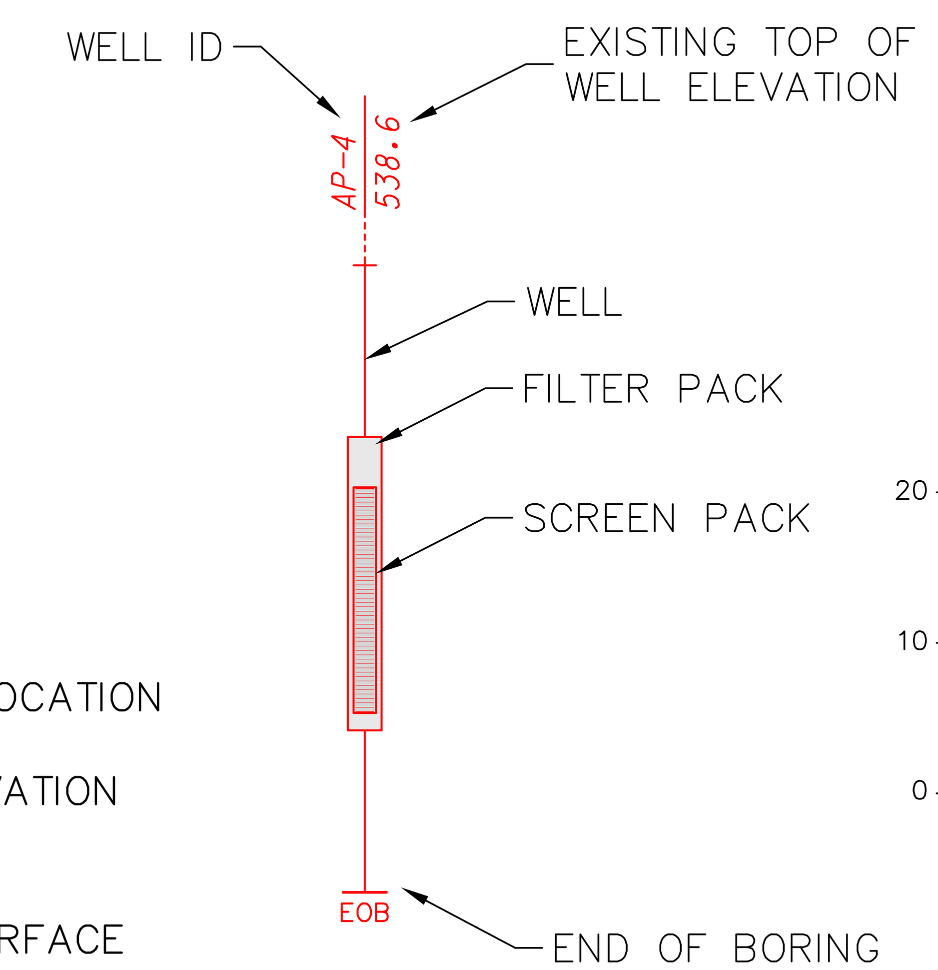
COAL

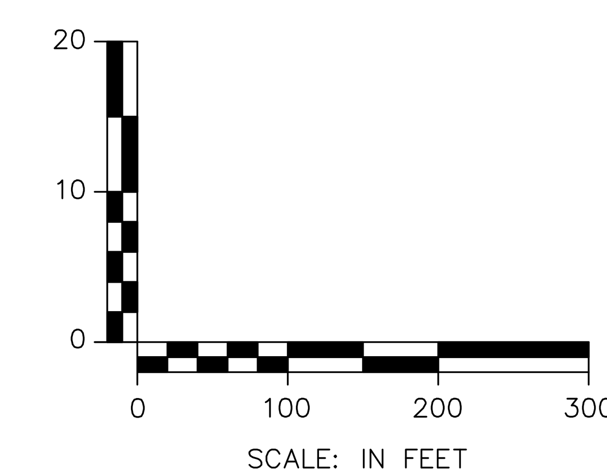
BORING LOCATION

MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE





NO.	DATE	REVISION DESCRIPTION	BY

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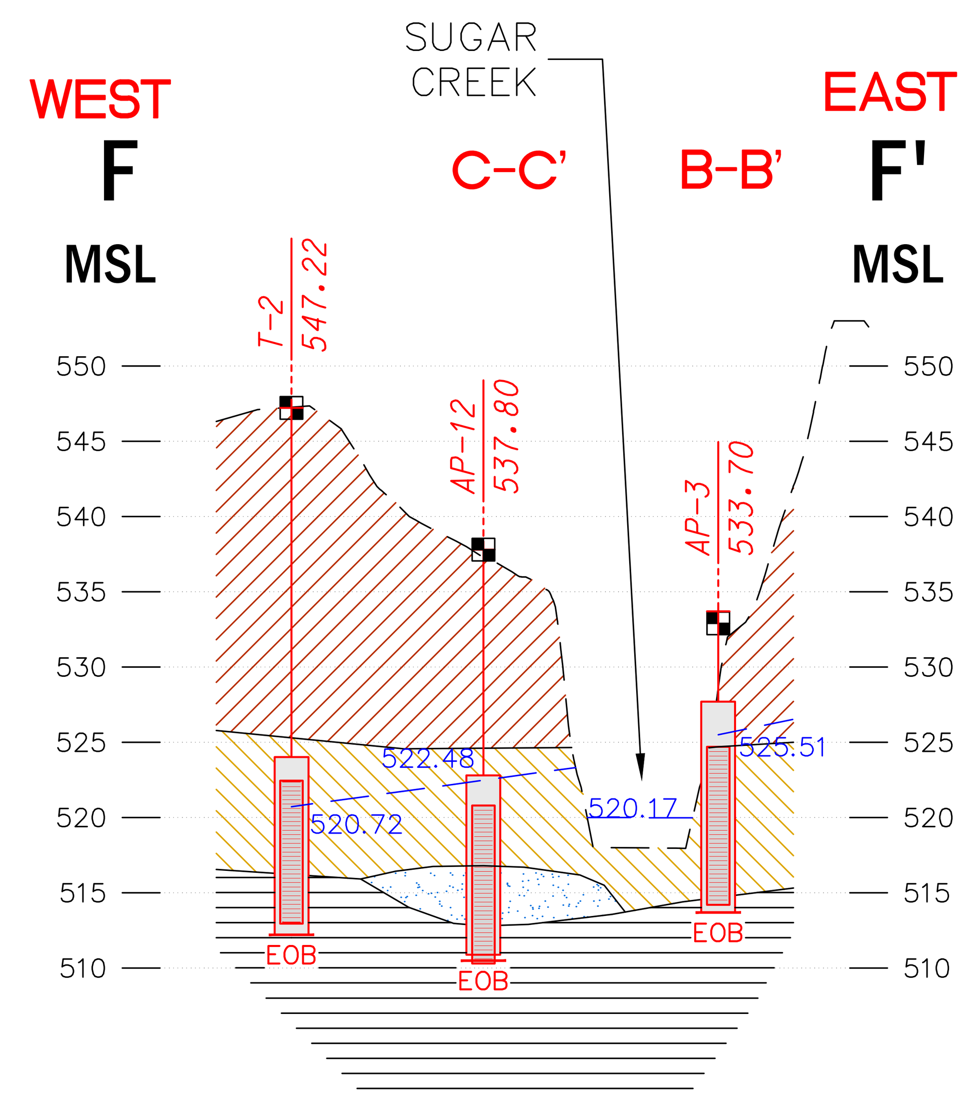
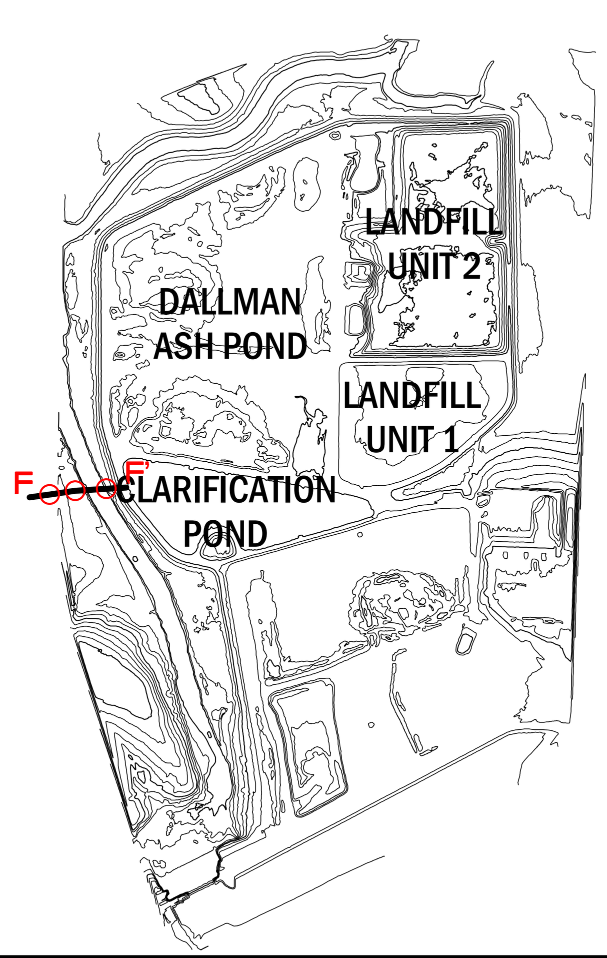
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION E-E'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: E-E'





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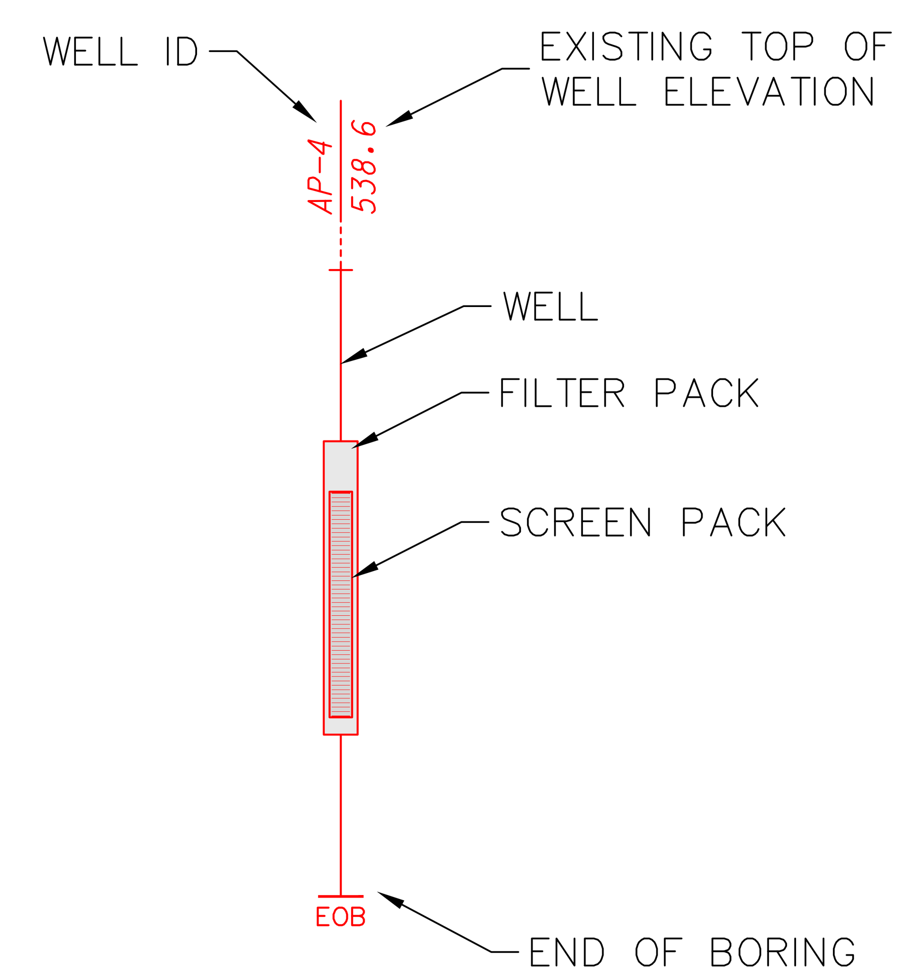
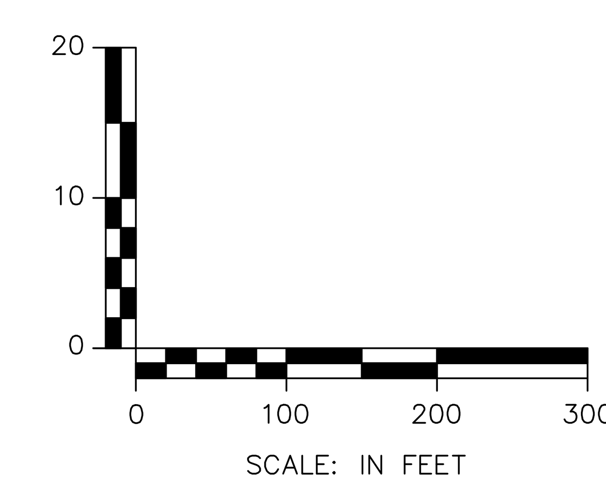
LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION
- 525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)
- BASAL SAND POTENTIOMETRIC SURFACE





NO. | DATE | REVISION DESCRIPTION | BY

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PH (217) 787-2334 WWW.ANDREWS-ENG.COM
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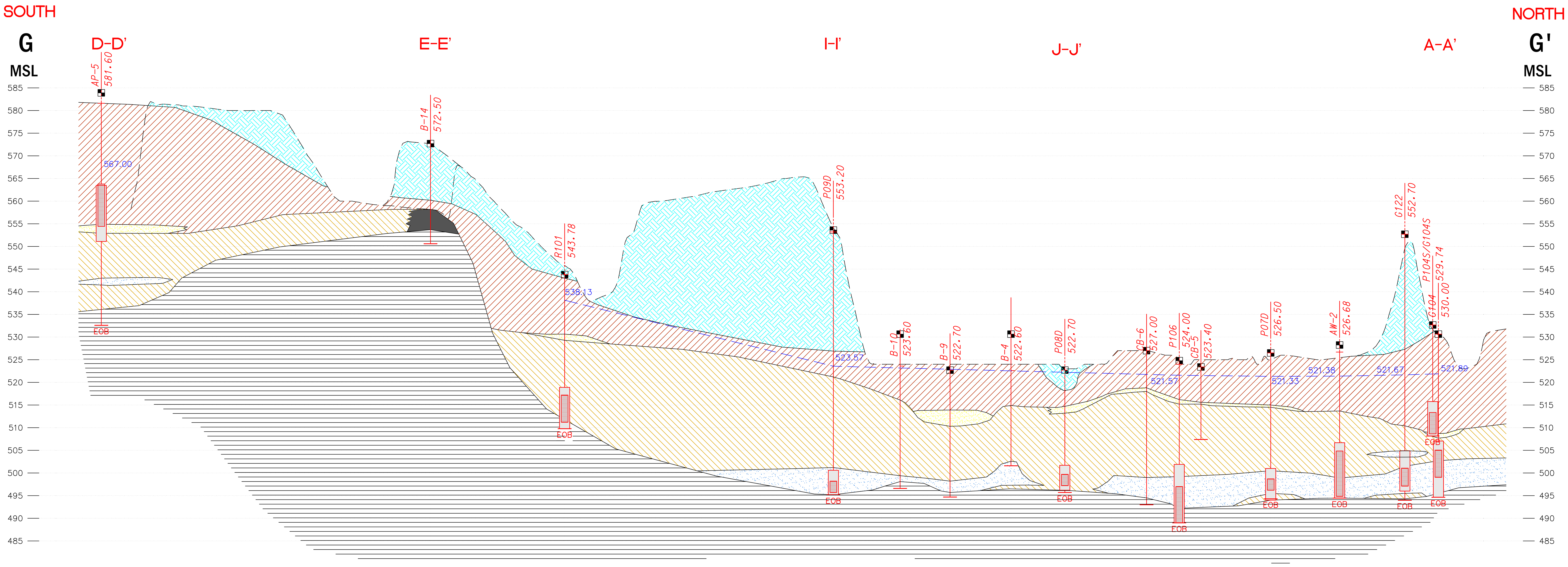
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION F-F'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: F-F'



LEGEND

FILL

UPPER COHESIVE DEPOSIT

SHALLOW SAND

LOWER COHESIVE DEPOSIT

BASAL SAND

SHALE

COAL

MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE

WELL ID

AP-4 538.6

EXISTING TOP OF WELL ELEVATION

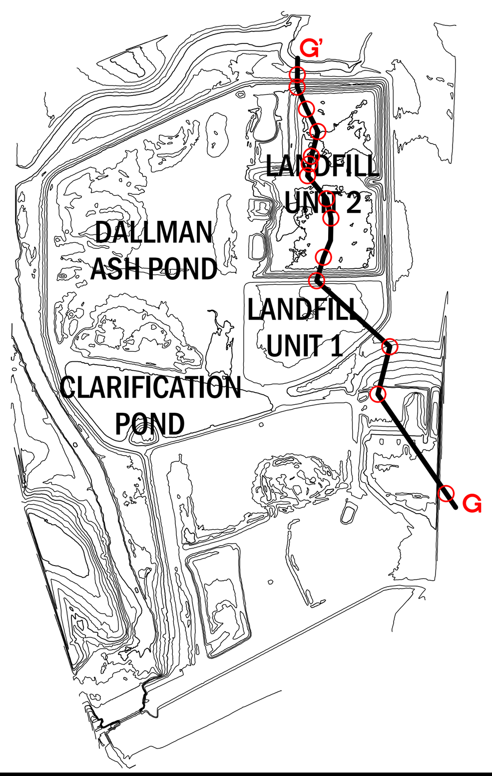
WELL

FILTER PACK

SCREEN PACK

EOB

END OF BORING



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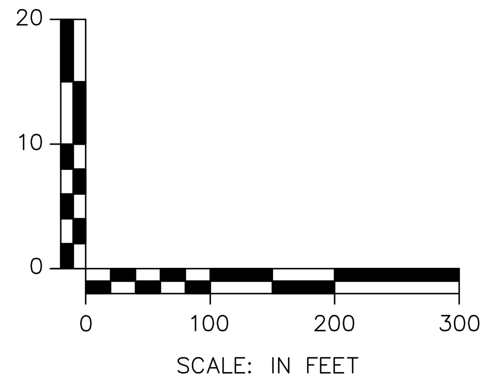

REVISION DESCRIPTION | NO. | DATE | BY

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

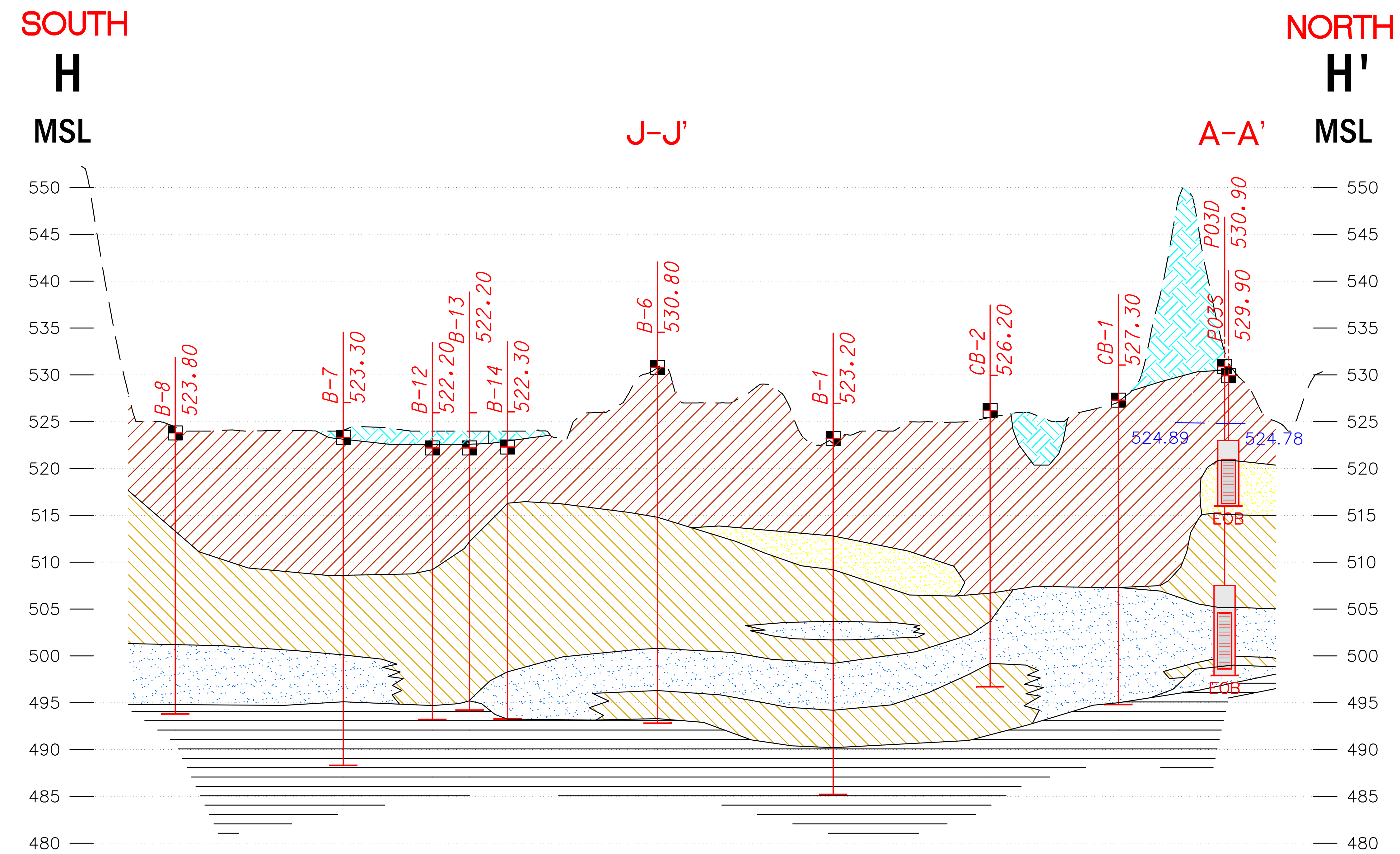
GEOLOGIC CROSS-SECTION G-G'

PLANS PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

SHEET NUMBER: G-G'



LEGEND

FILL

UPPER COHESIVE DEPOSIT

SHALLOW SAND

LOWER COHESIVE DEPOSIT

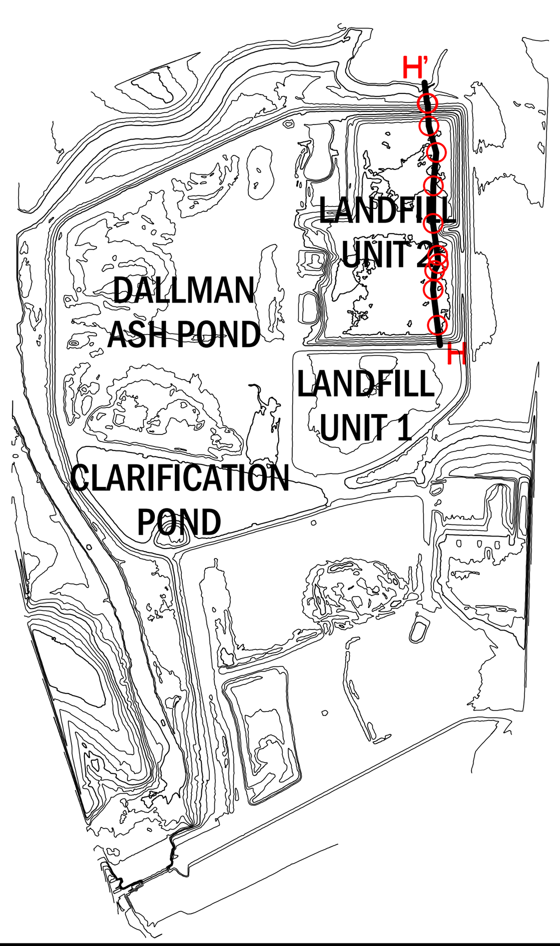
BASAL SAND

SHALE

MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE



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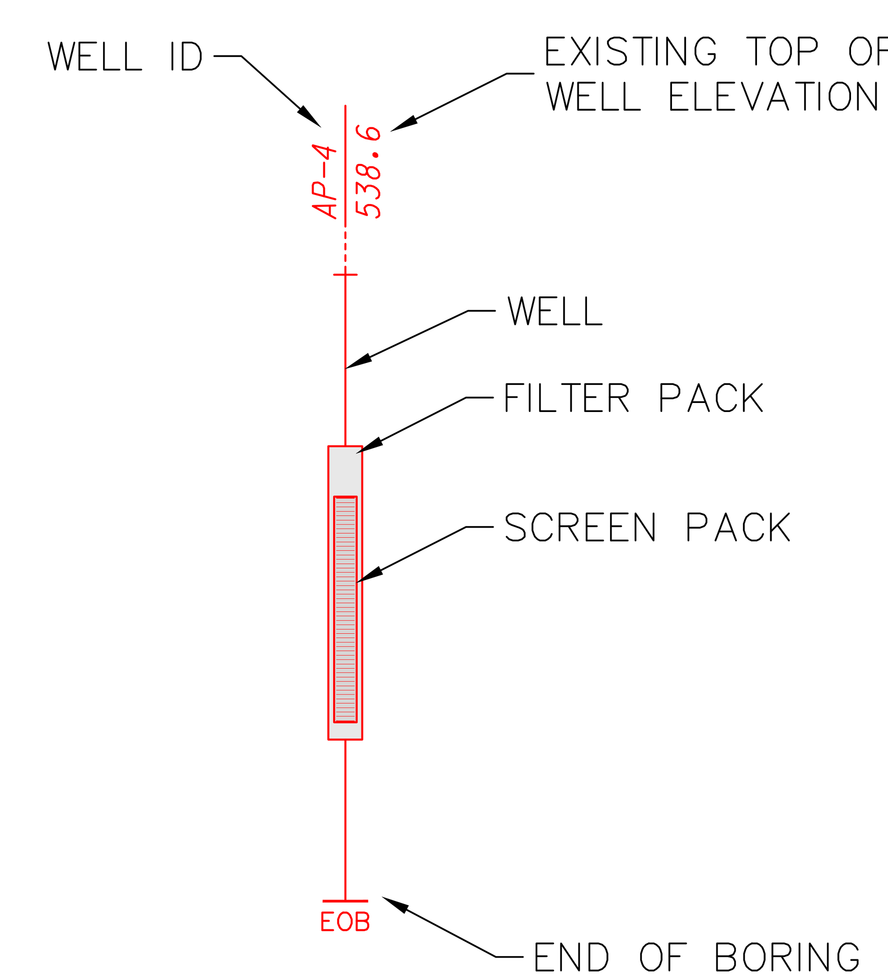
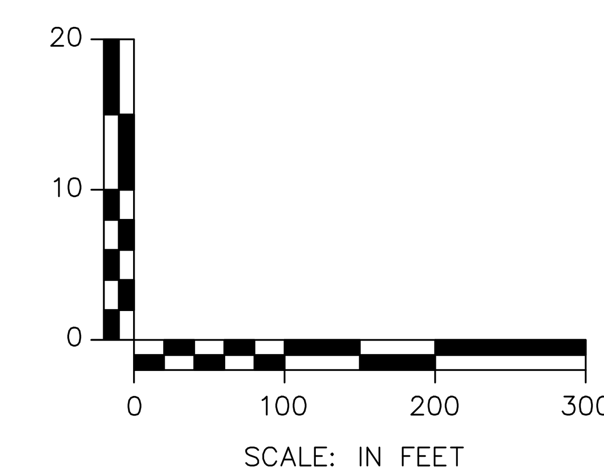




NO.	DATE	REVISION DESCRIPTION	BY

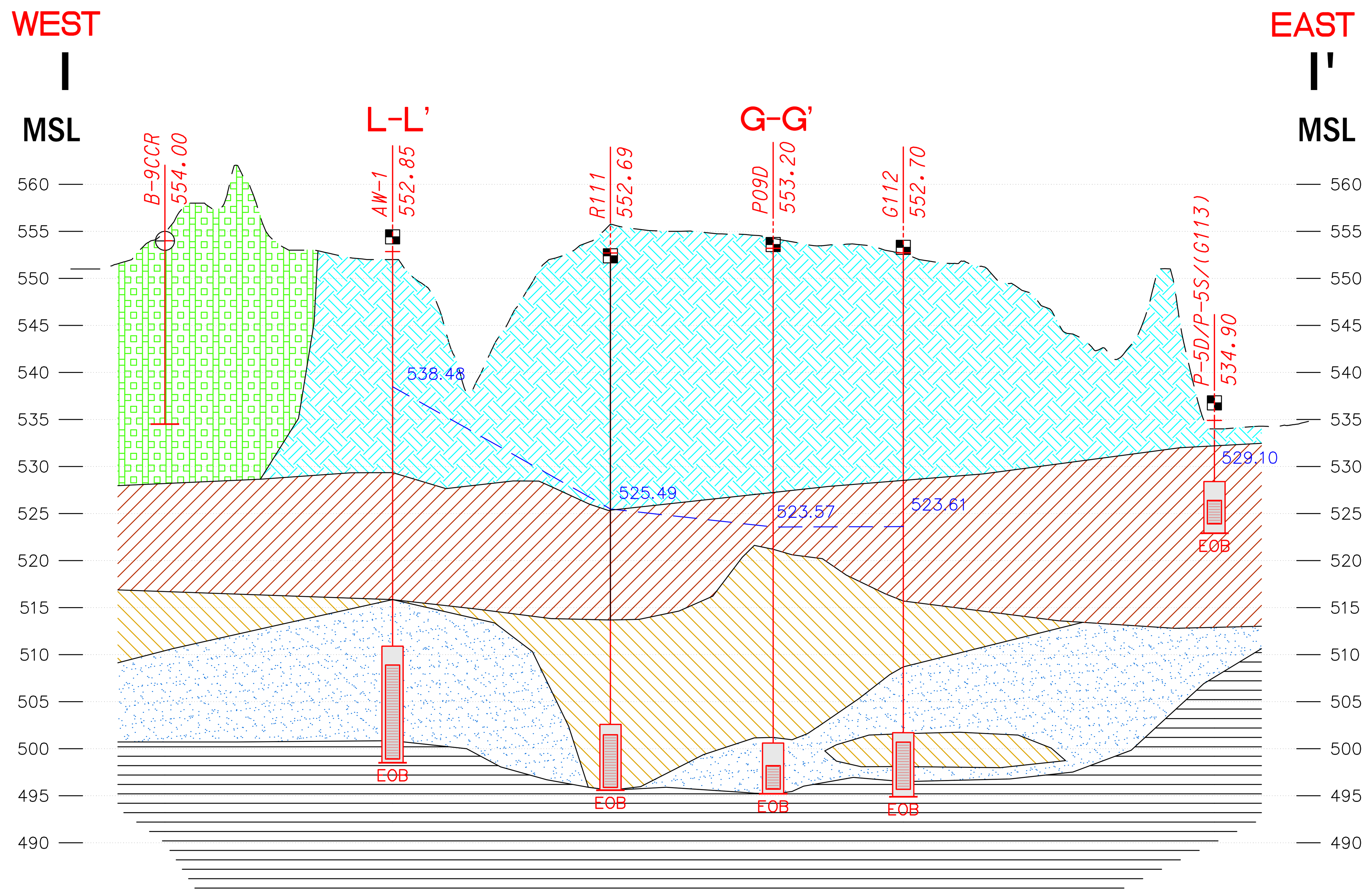
ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

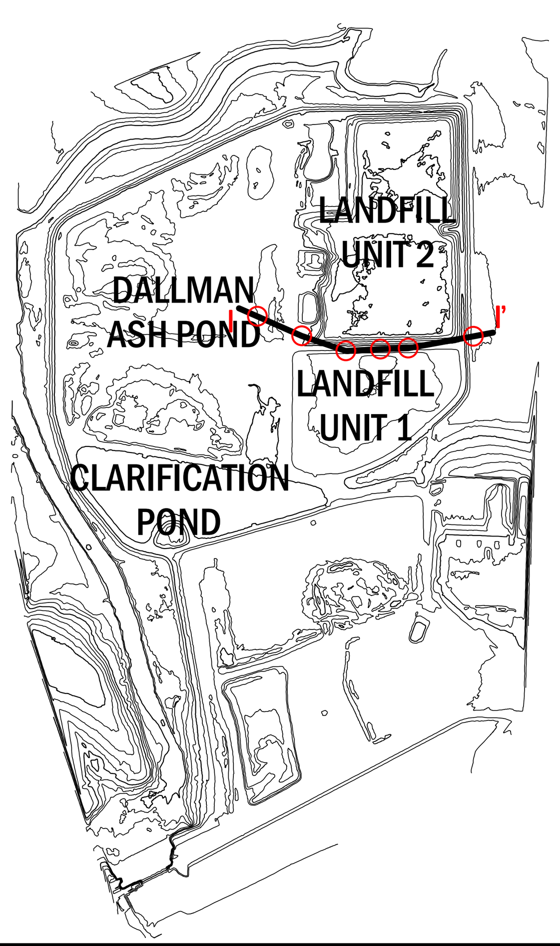
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION H-H'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: H-H'





NOTES

1. DEPTH AND THICKNESS OF SUBSURFACE STRATA WERE GENERALIZED FROM AND INTERPOLATED BETWEEN BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXISTS ONLY AT THE LOCATION OF THE BORING. SEE BORING LOGS FOR DETAILED DESCRIPTION.
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LEGEND

FILL

UPPER COHESIVE DEPOSIT

SHALLOW SAND

LOWER COHESIVE DEPOSIT

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE

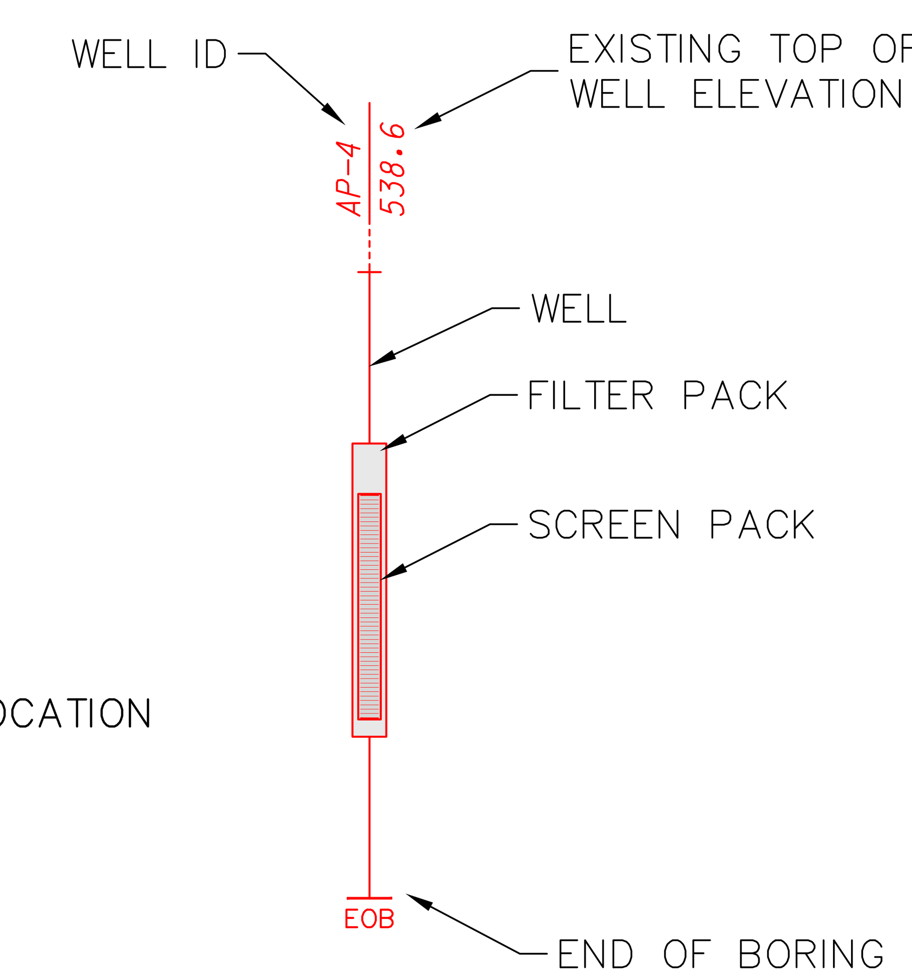
BASAL SAND

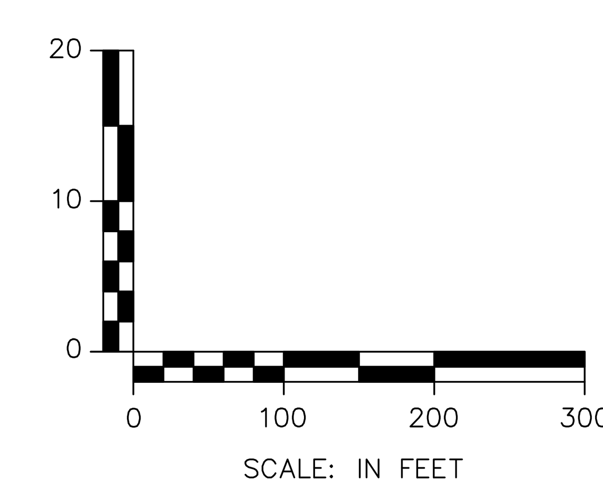
SHALE

CCR ASH

BORING LOCATION

MONITORING WELL LOCATION





NO. | DATE | REVISION DESCRIPTION | BY

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SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
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APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION I-I'

PREPARED FOR

CITY WATER, LIGHT, AND POWER

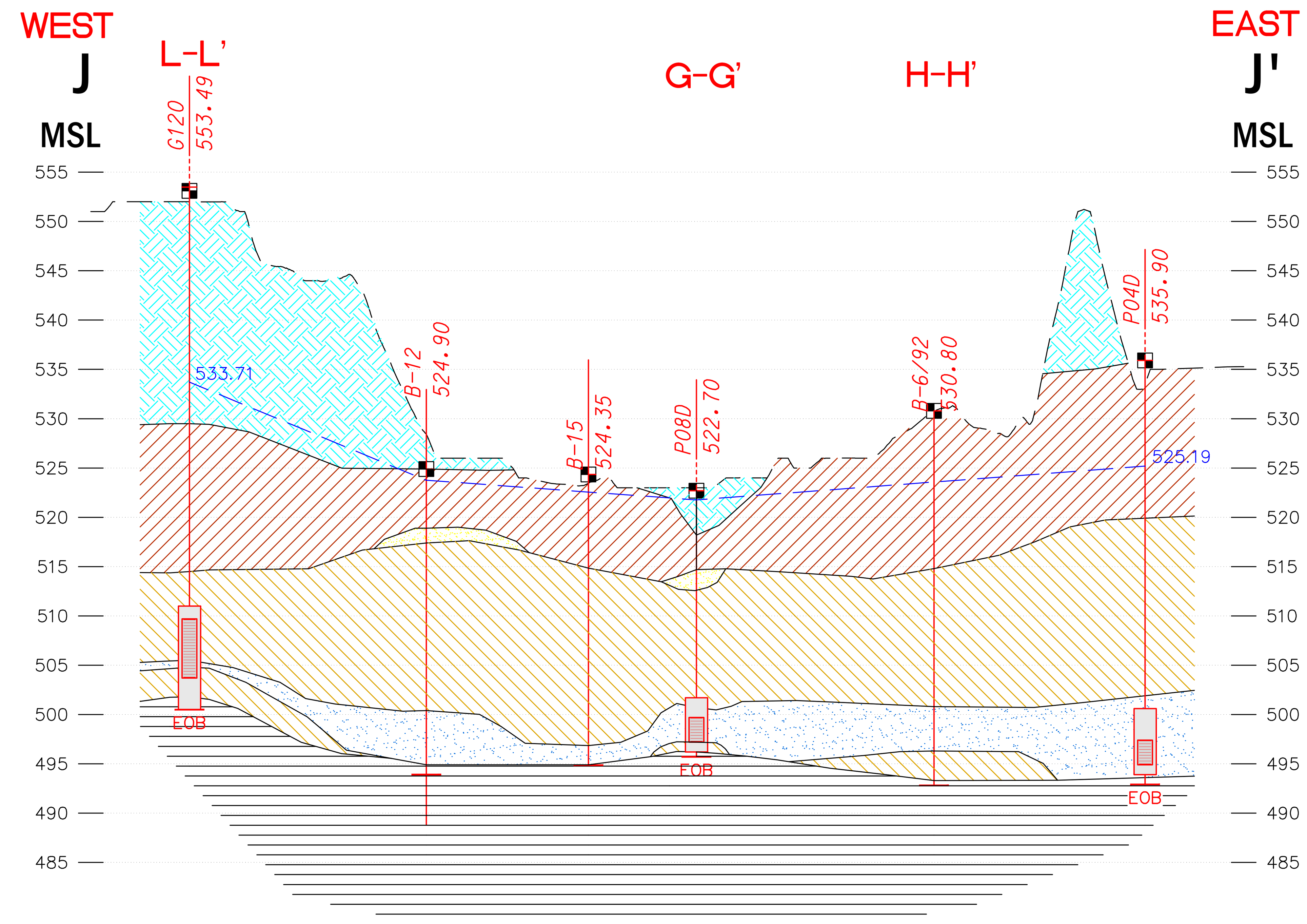
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

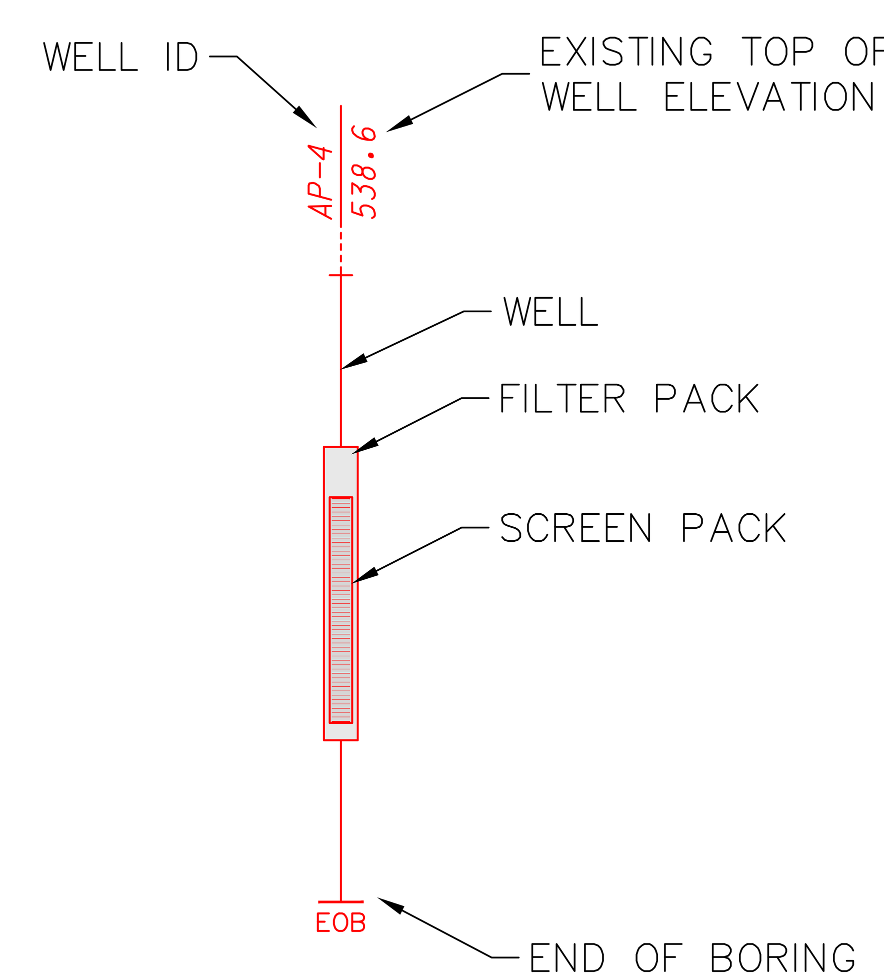
SHEET NUMBER: I-I'

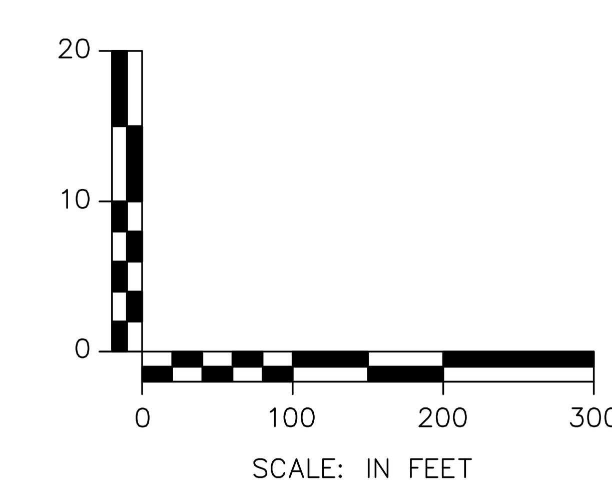
PDF_0487

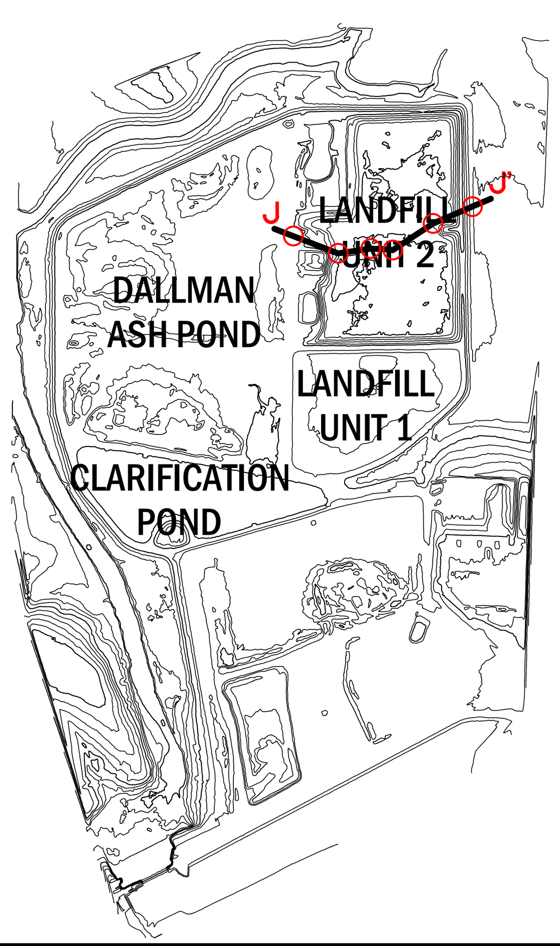


LEGEND

- FILL
- UPPER COHESIVE DEPOSIT
- SHALLOW SAND
- LOWER COHESIVE DEPOSIT
- BASAL SAND
- SHALE
- MONITORING WELL LOCATION
- 525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)
- BASAL SAND POTENTIOMETRIC SURFACE







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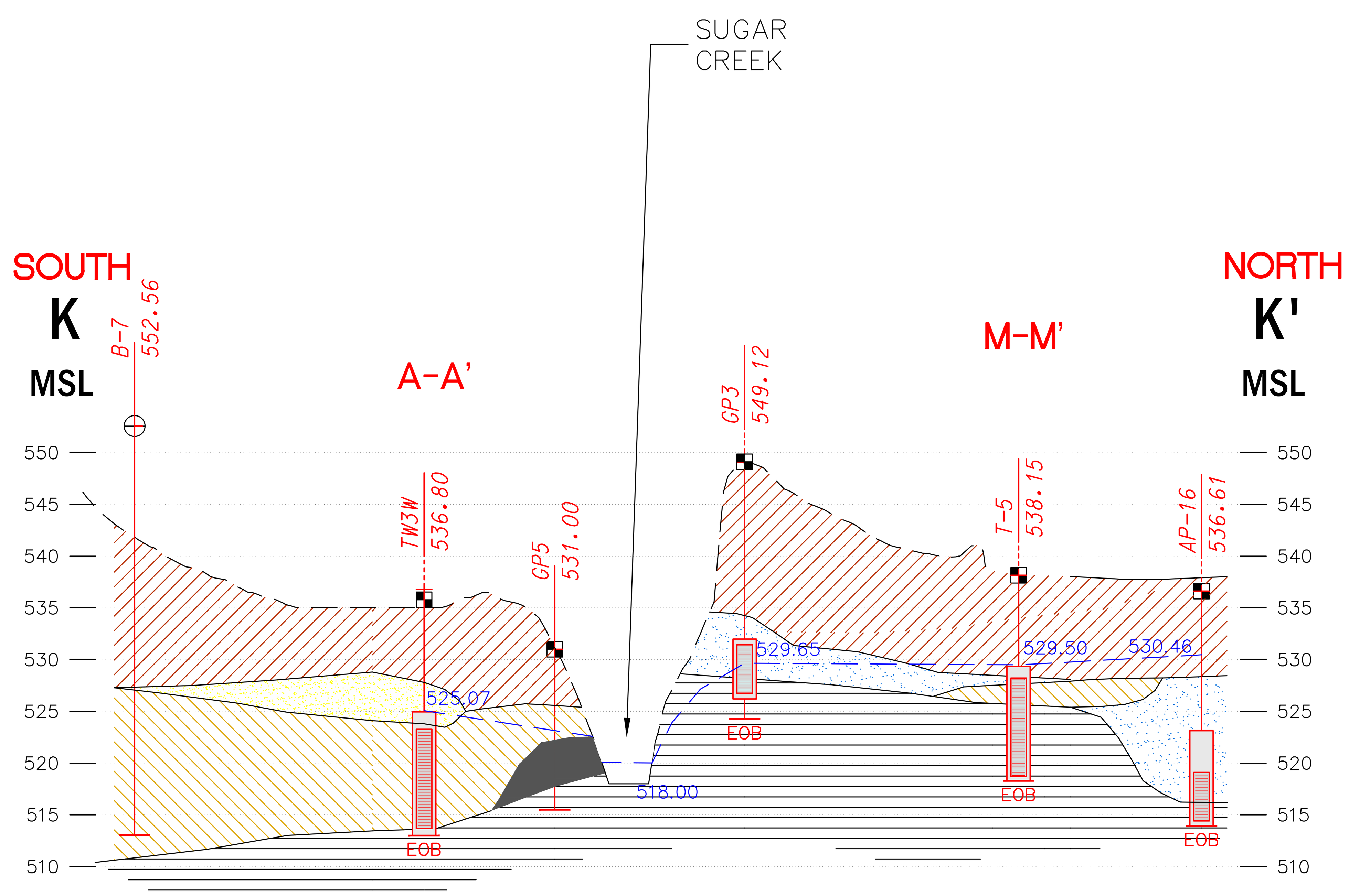
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION J-J'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER:
J-J'



LEGEND

UPPER COHESIVE DEPOSIT

LOWER COHESIVE DEPOSIT

BASAL SAND

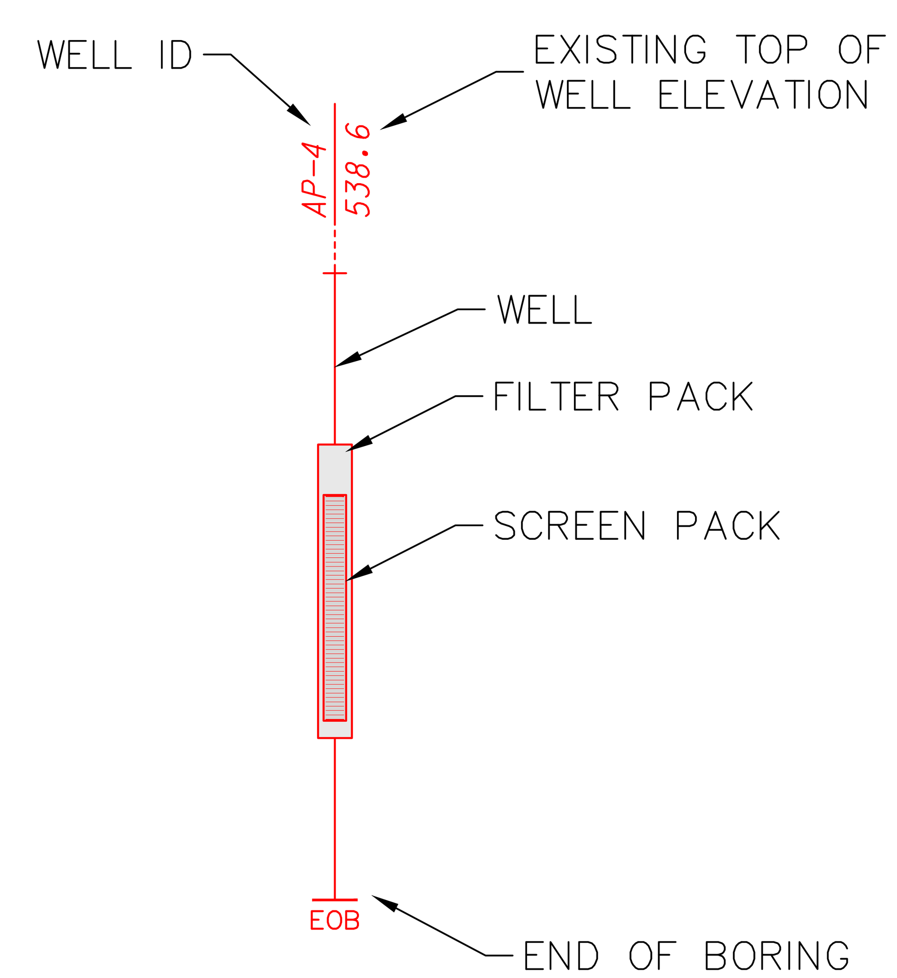
SHALE

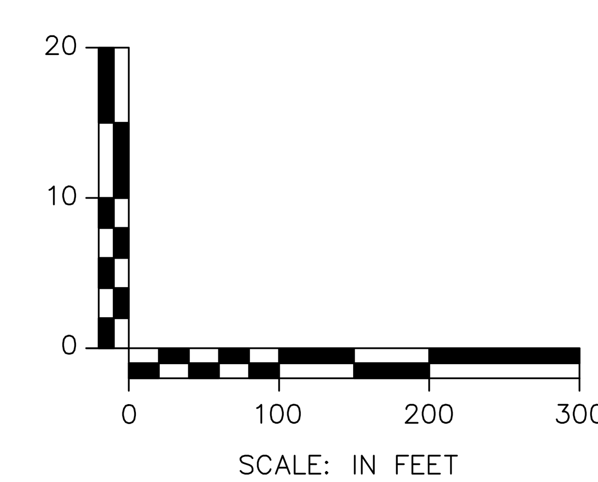
COAL

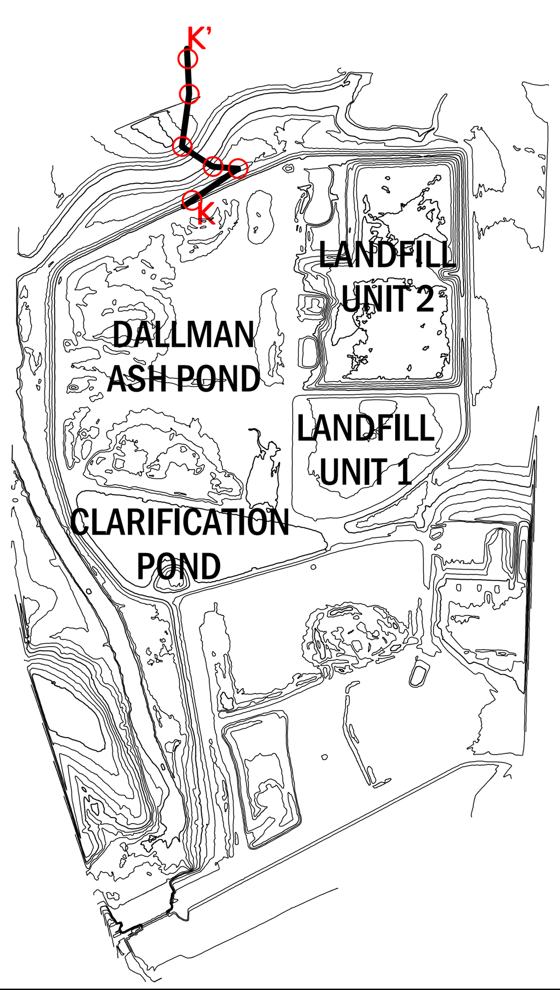
MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE







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NO. | DATE | REVISION DESCRIPTION | BY

ANDREWS ENGINEERING
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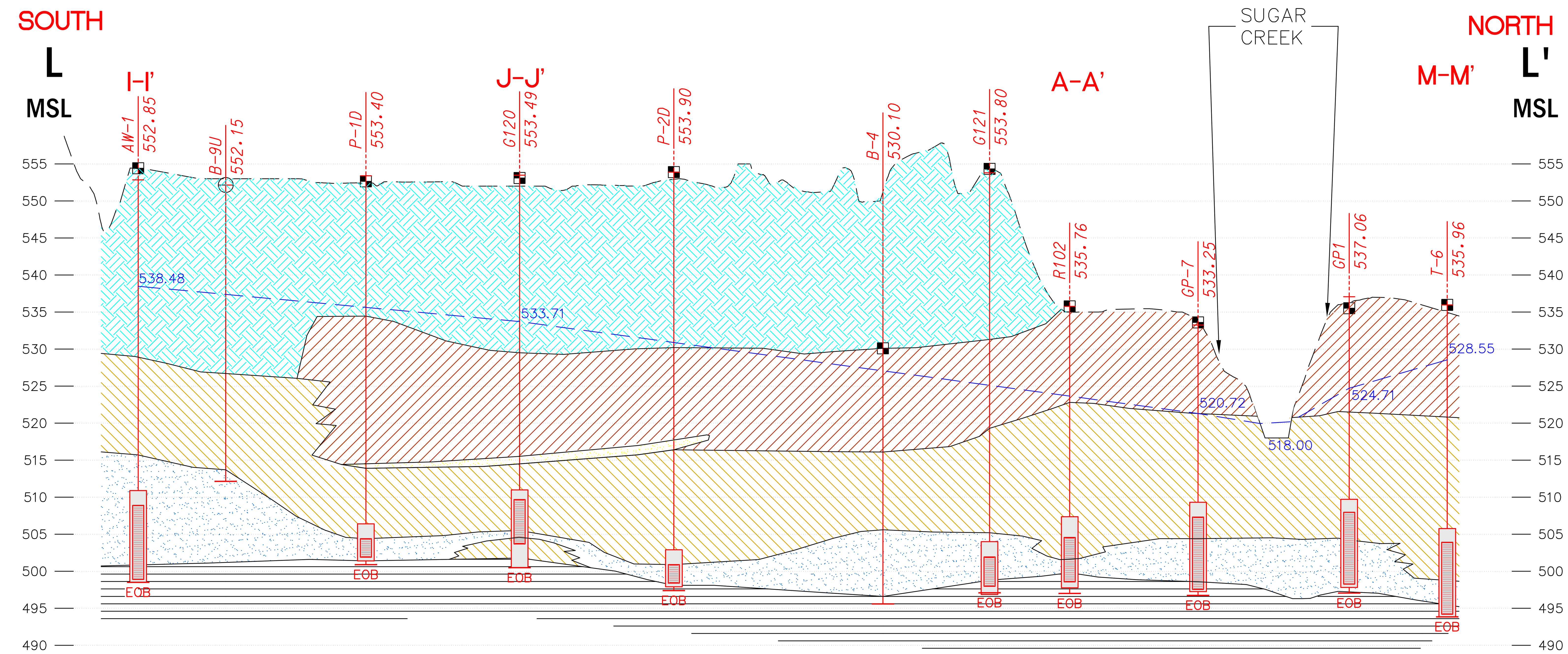
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION K-K'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: K-K'



LEGEND

FILL

UPPER COHESIVE DEPOSIT

LOWER COHESIVE DEPOSIT

BASAL SAND

SHALLOW SAND

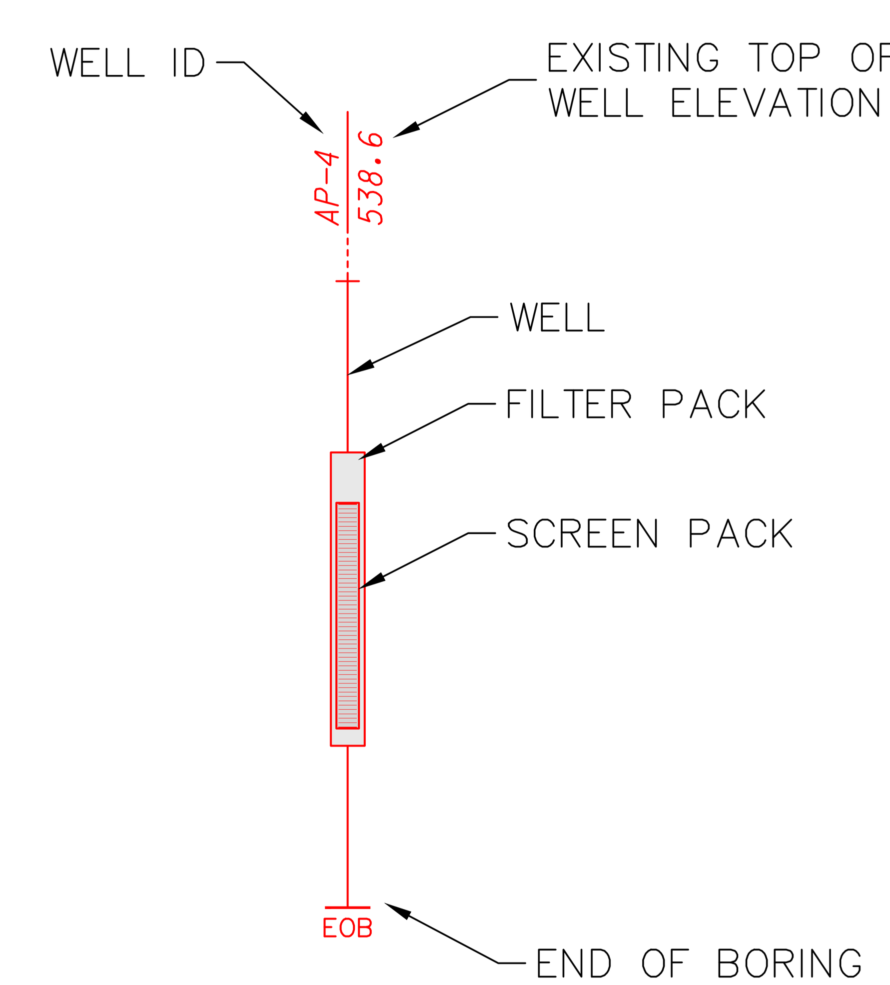
SHALE

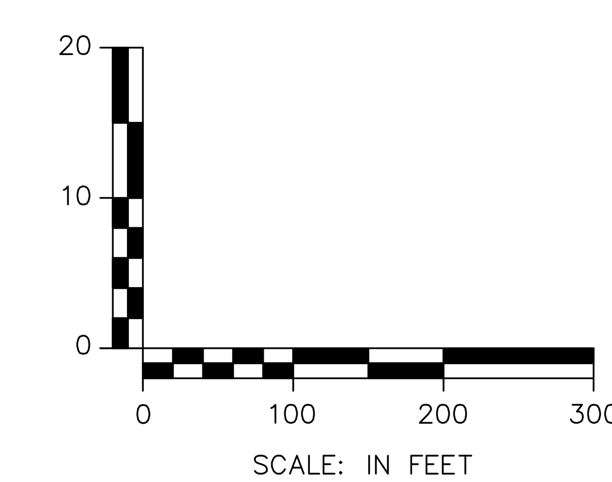
BORING LOCATION

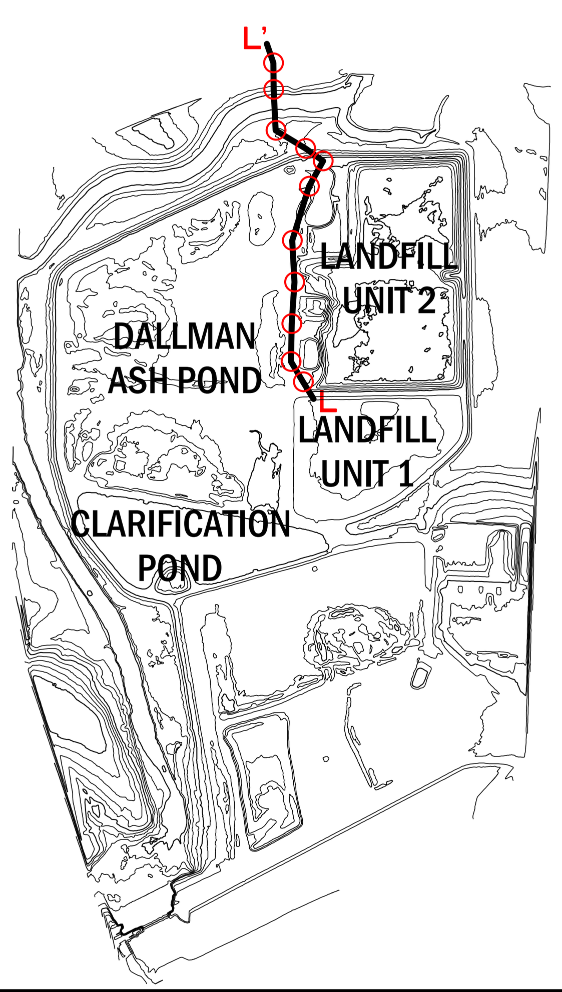
MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE







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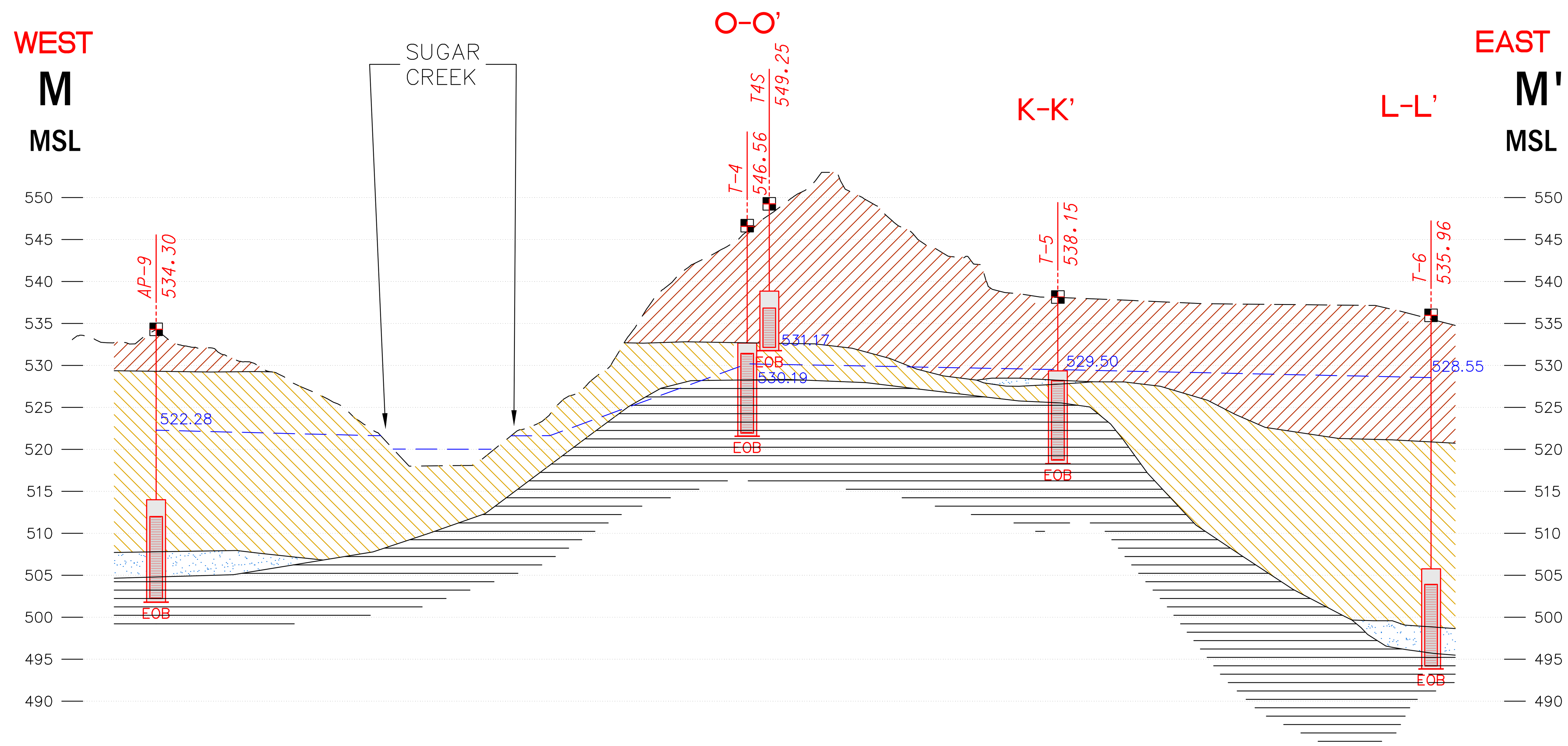
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

GEOLOGIC CROSS-SECTION L-L'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: L-L'



LEGEND

UPPER COHESIVE DEPOSIT

LOWER COHESIVE DEPOSIT

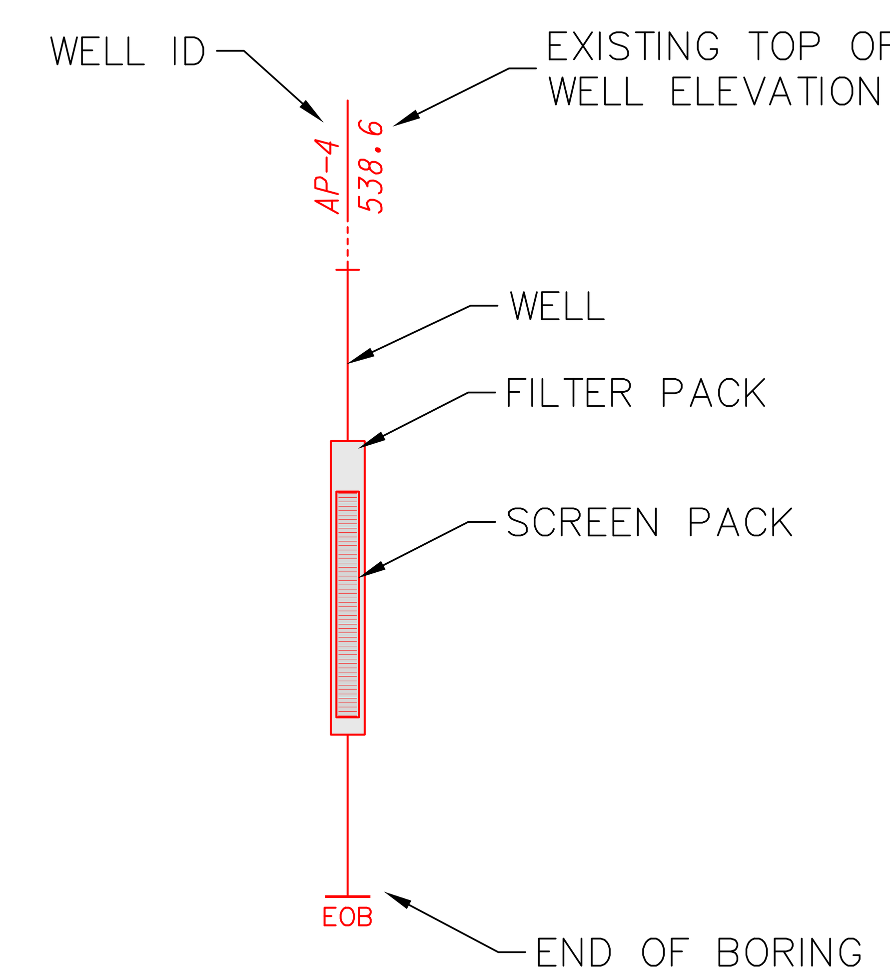
BASAL SAND

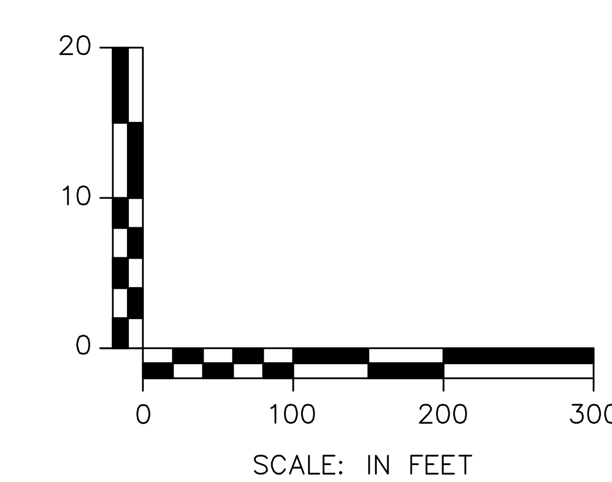
SHALE

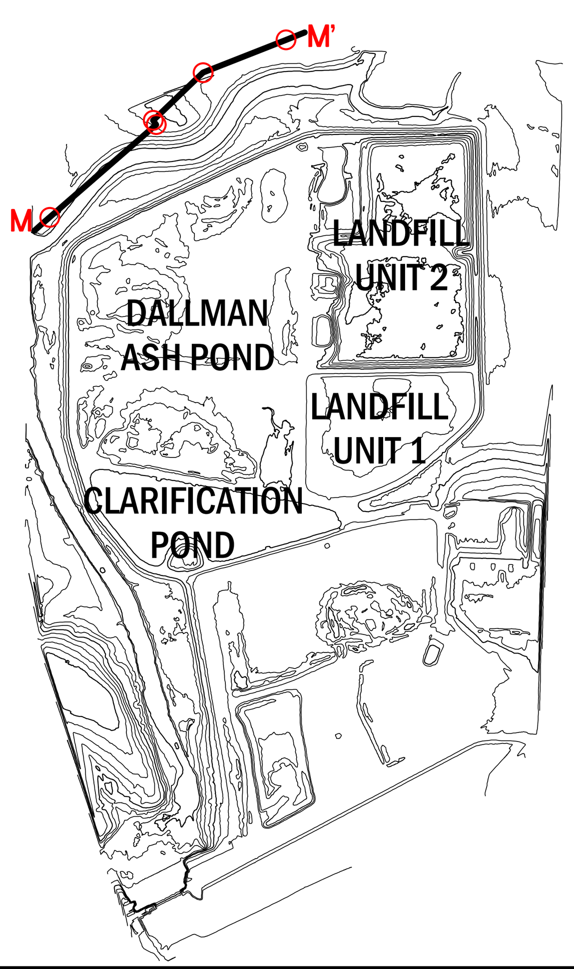
MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE







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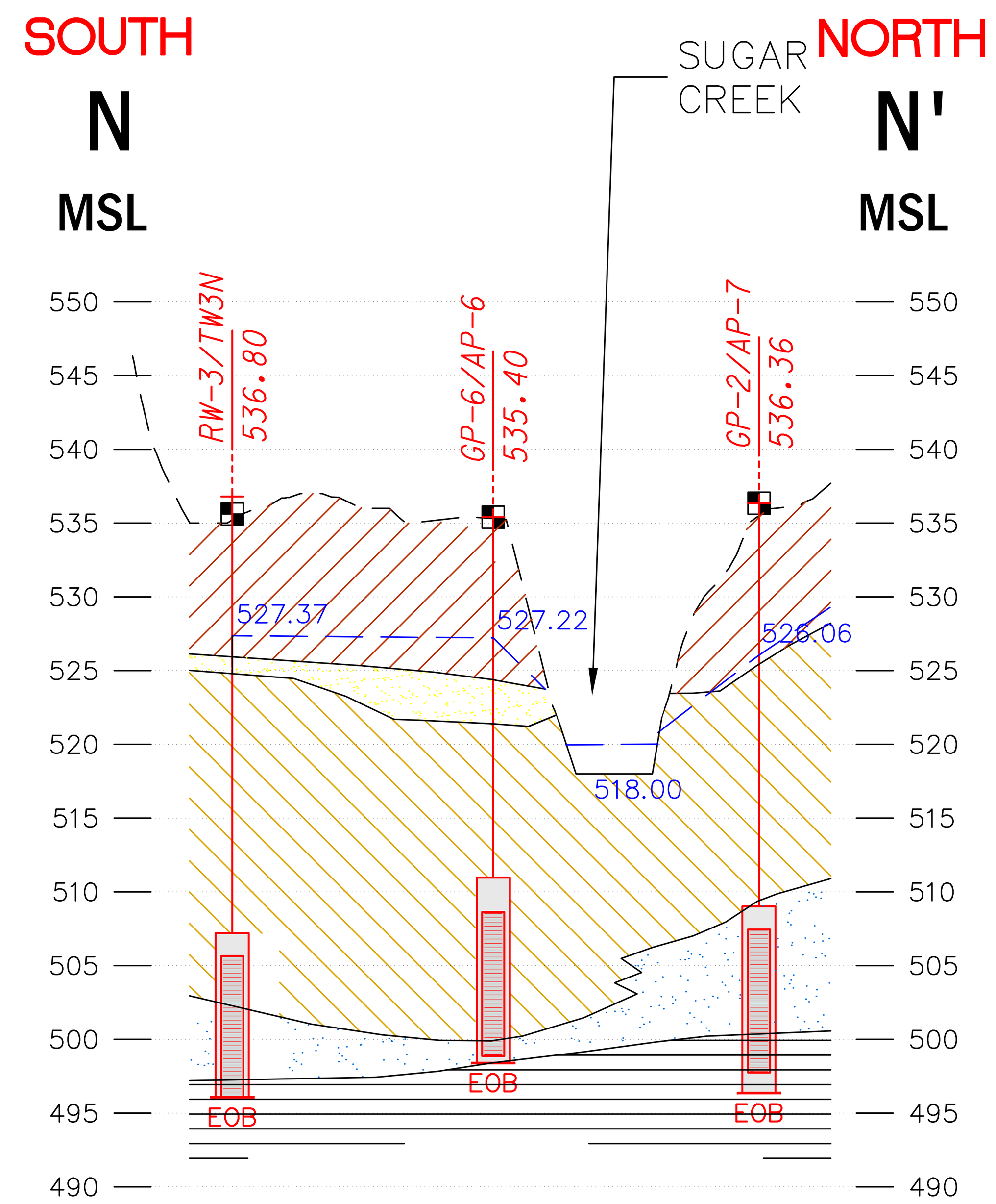
ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION M-M'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: M-M'



LEGEND

UPPER COHESIVE DEPOSIT

SHALLOW SAND

LOWER COHESIVE DEPOSIT

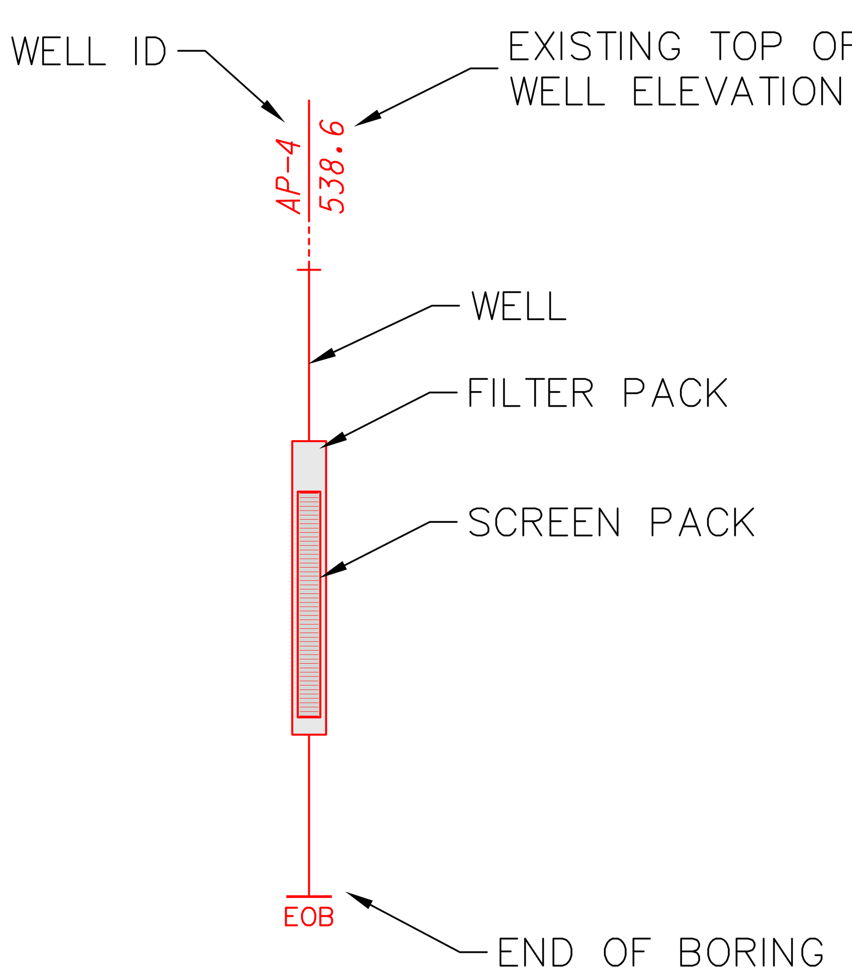
BASAL SAND

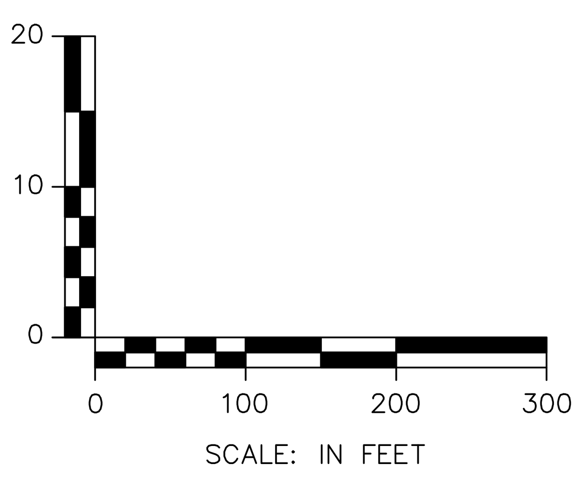
SHALE

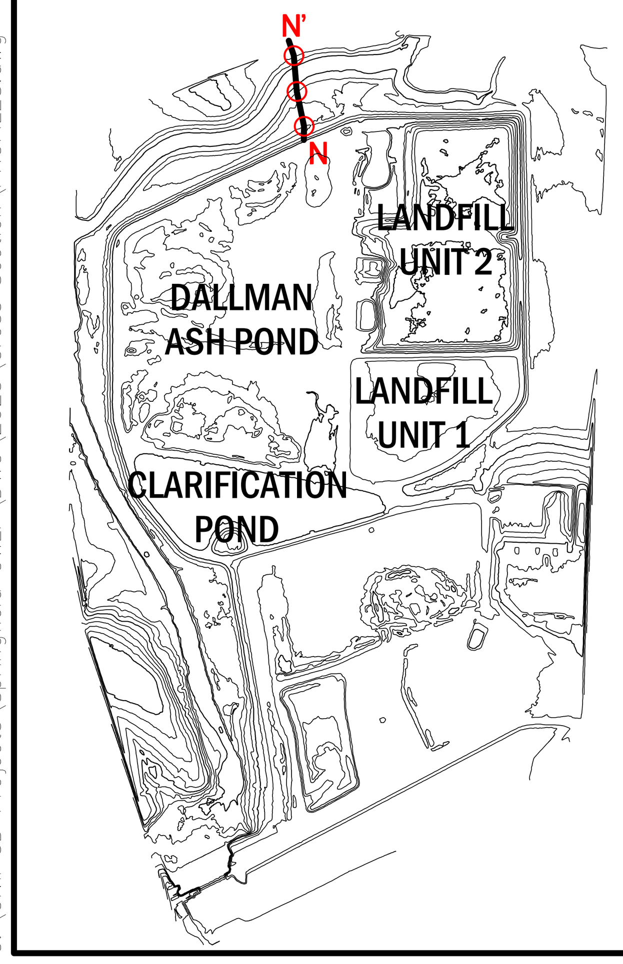
MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE







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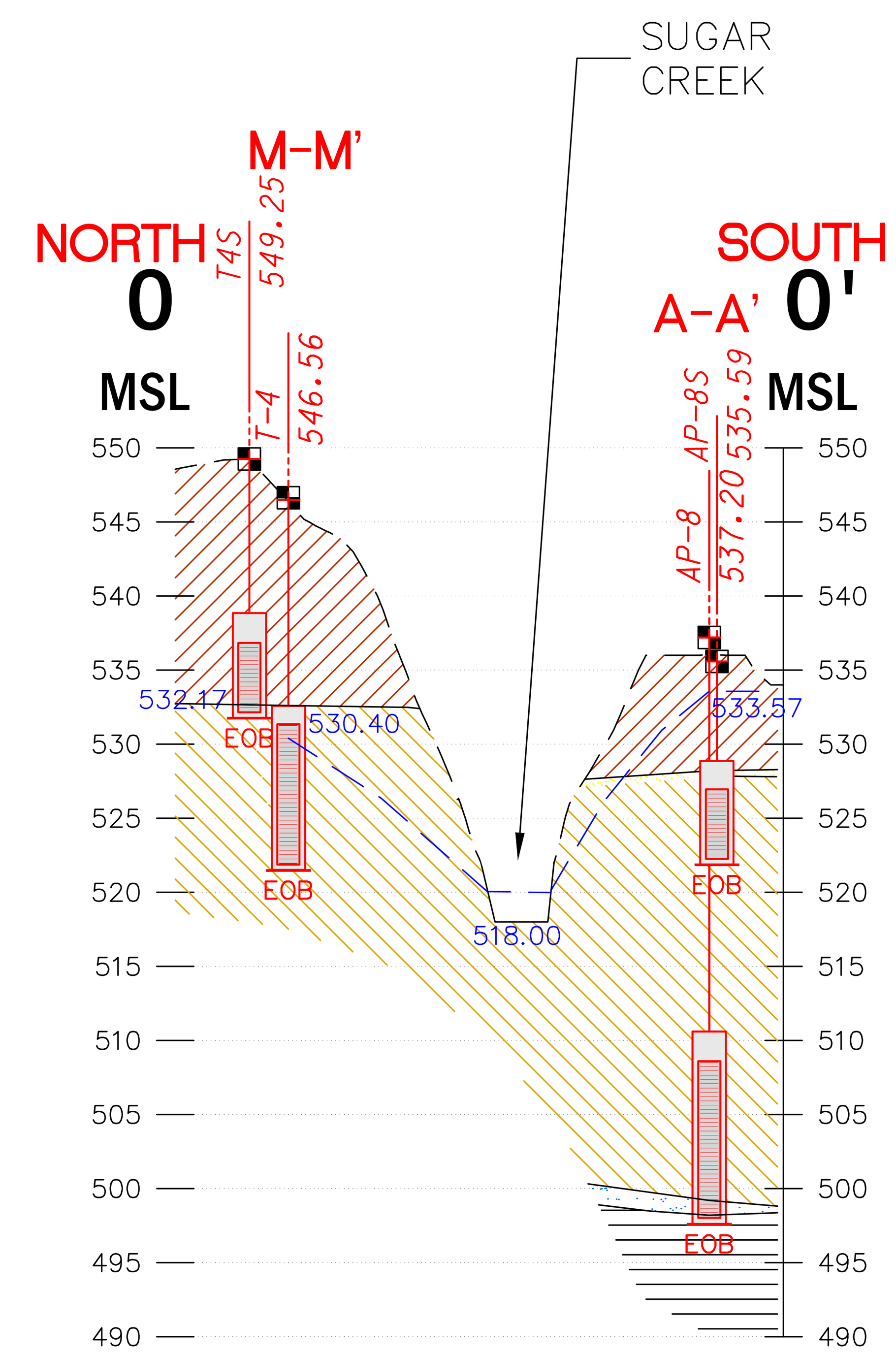
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

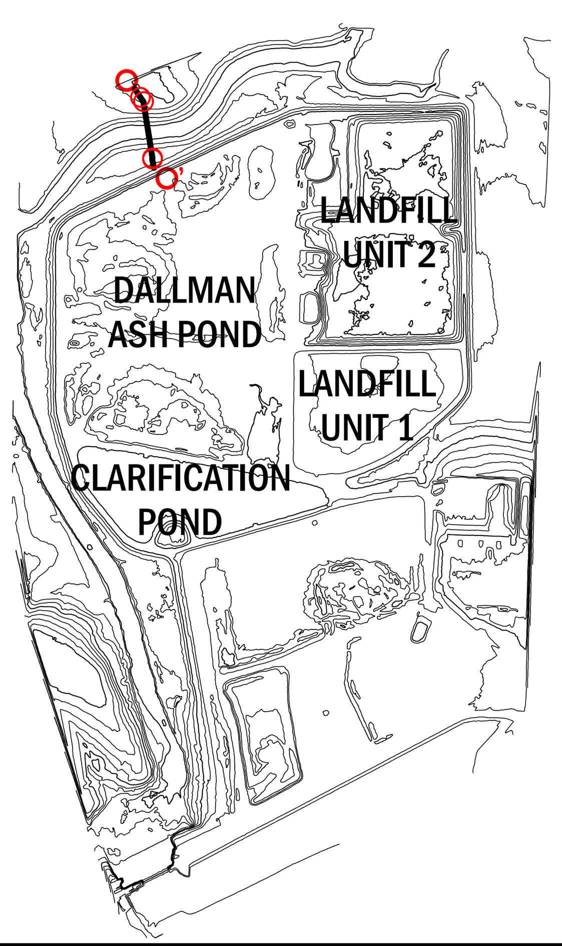
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION N-N'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: N-N'





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LEGEND

UPPER COHESIVE DEPOSIT

SHALLOW SAND

LOWER COHESIVE DEPOSIT

BASAL SAND

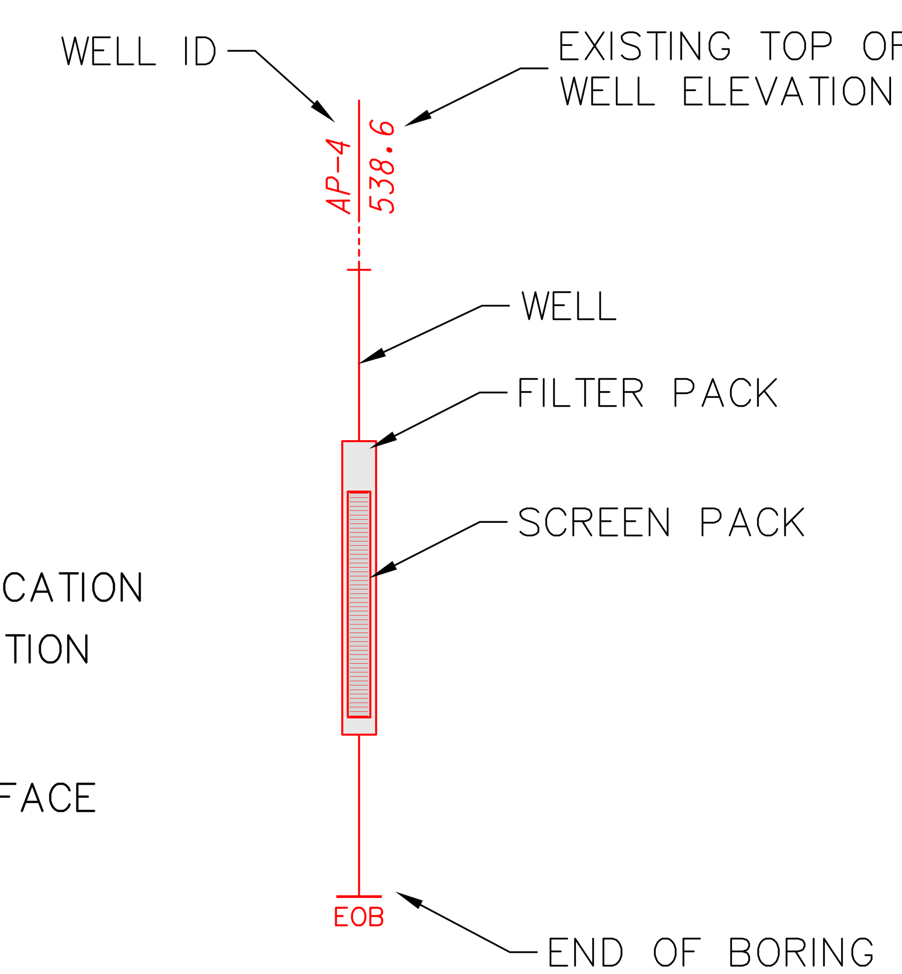
SHALE

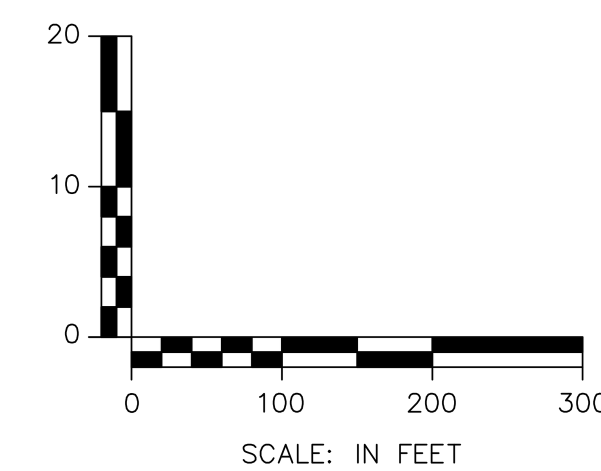
BORING LOCATION

MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE





NO.	DATE	REVISION DESCRIPTION	BY

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PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

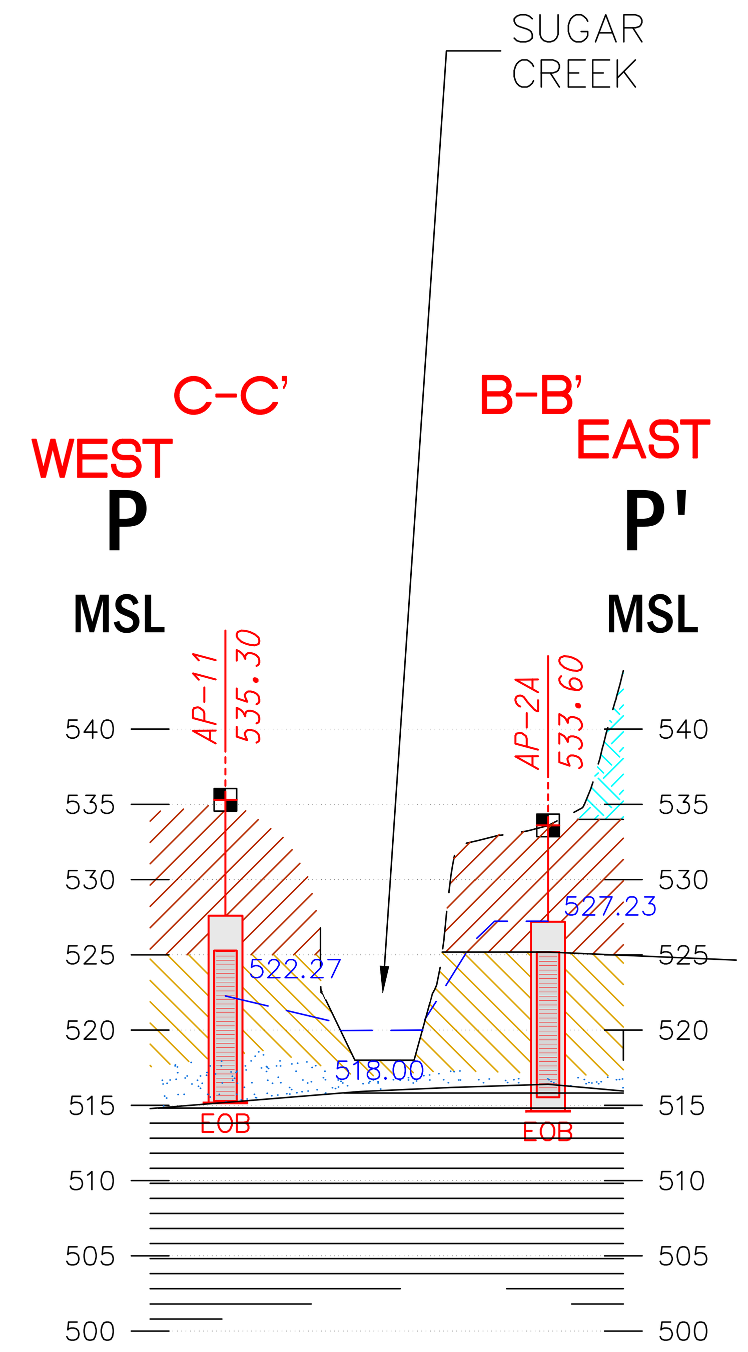
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION O-O'

PREPARED FOR
CITY WATER, LIGHT, AND POWER
SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025
PROJECT ID: 240338/0014
SHEET NUMBER: O-O'

PDF_0493



LEGEND

FILL

UPPER COHESIVE DEPOSIT

SHALLOW SAND

LOWER COHESIVE DEPOSIT

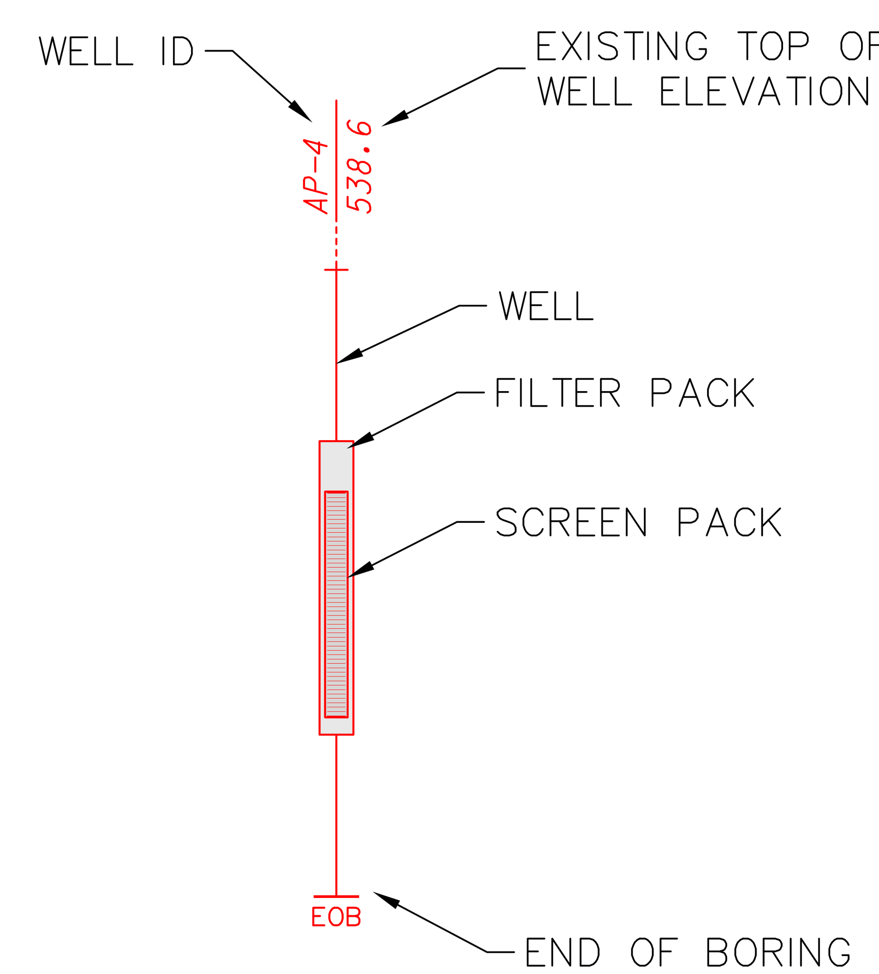
BASAL SAND

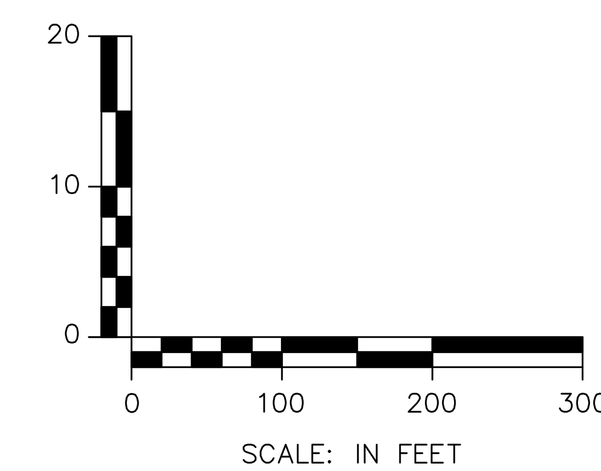
SHALE

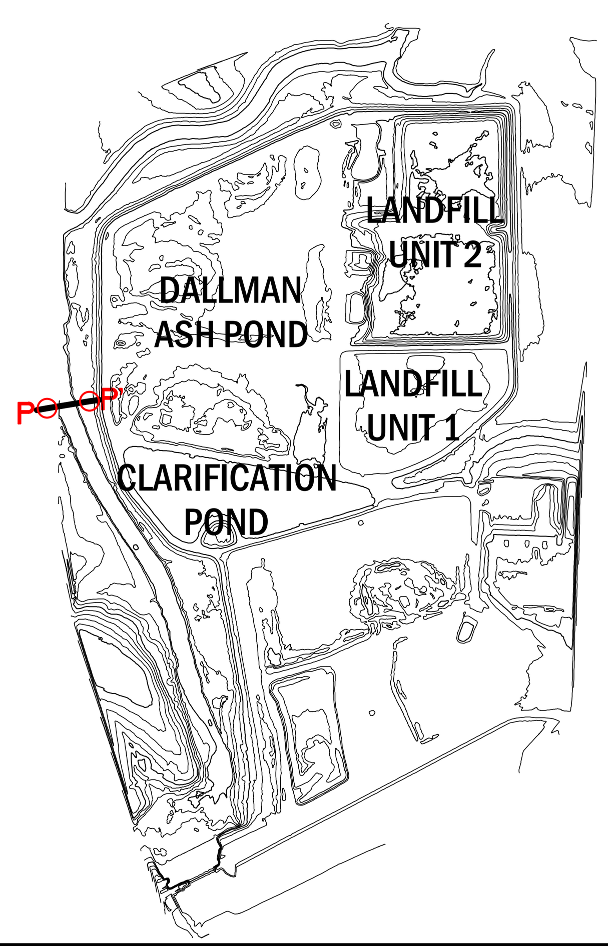
MONITORING WELL LOCATION

525.00 GROUNDWATER ELEVATION (AUGUST 21, 2025)

BASAL SAND POTENTIOMETRIC SURFACE







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PH (217) 787-2334 WWW.ANDREWS-ENG.COM
PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

GEOLOGIC CROSS-SECTION P-P'

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: SEPTEMBER 2025

PROJECT ID: 240338/0014

SHEET NUMBER: P-P'

Tab: PP Last Saved: September 23, 2025, by Mike Nguyen Plotted: Tuesday, September 23, 2025 9:52:32 AM
G:\Civil 3D Projects\Springfield CWLP\DWG\2025\Cross Section\PROFILES.dwg

APPENDIX D:

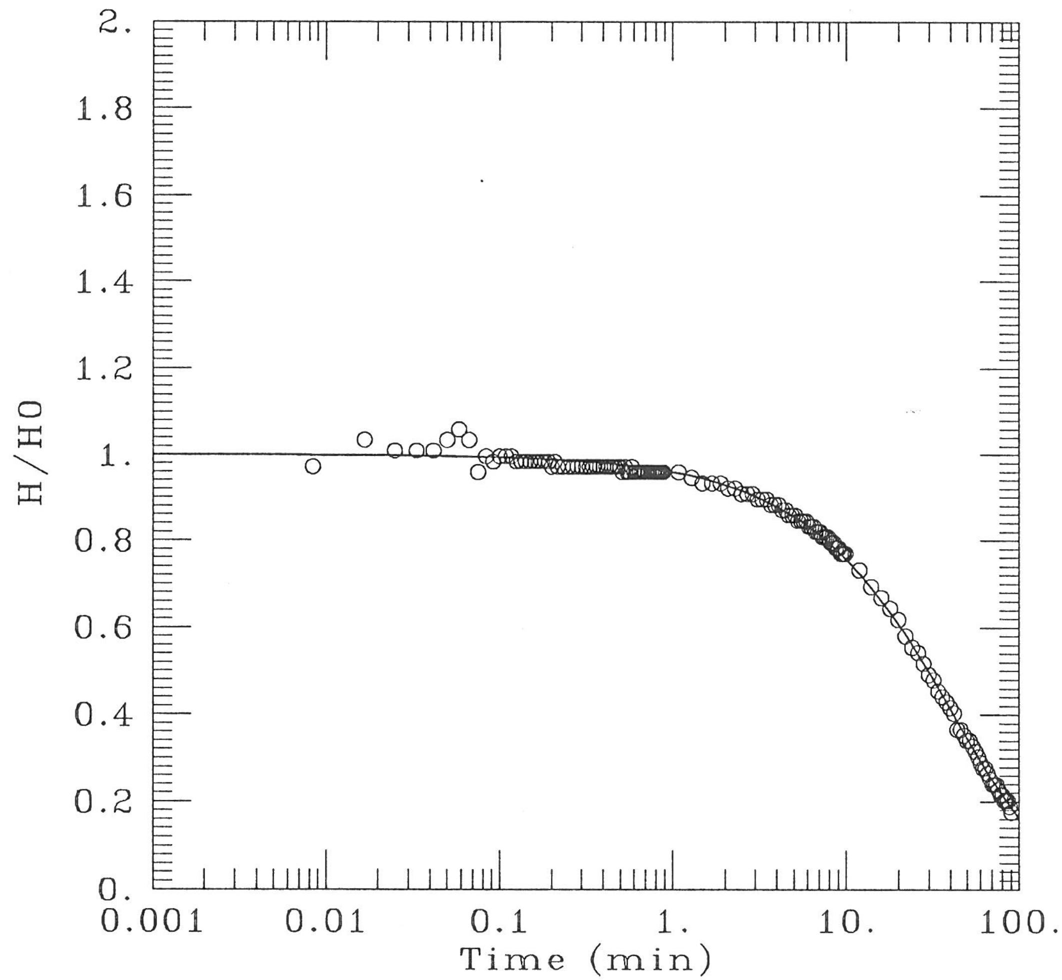
SLUG TEST/PACKER TEST DATA

SLUG TEST DATA

PATRICK ENGINEERING INC. | Client: CITY WATER, LIGHT & POWER

Project No.: 496B | Location: SPRINGFIELD, ILLINOIS

P-1S RECOVERY



DATA SET:
p-1s-r.aqt
03/13/93

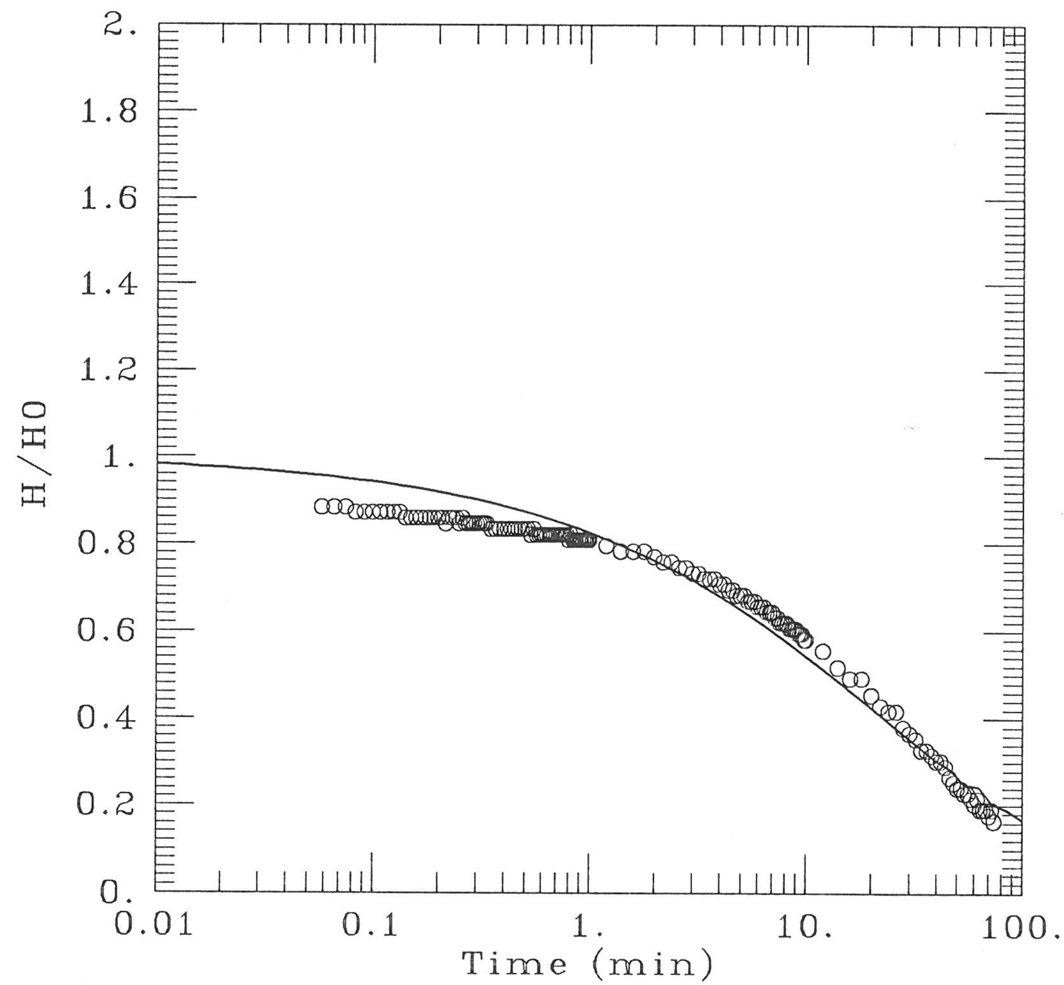
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
8/27/92

ESTIMATED PARAMETERS:
T = 0.0003291 ft^2/min
S = 3.3269E-05

TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-1S DRAWDOWN



DATA SET:
p-1s-d.aqt
03/13/93

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
8/27/92

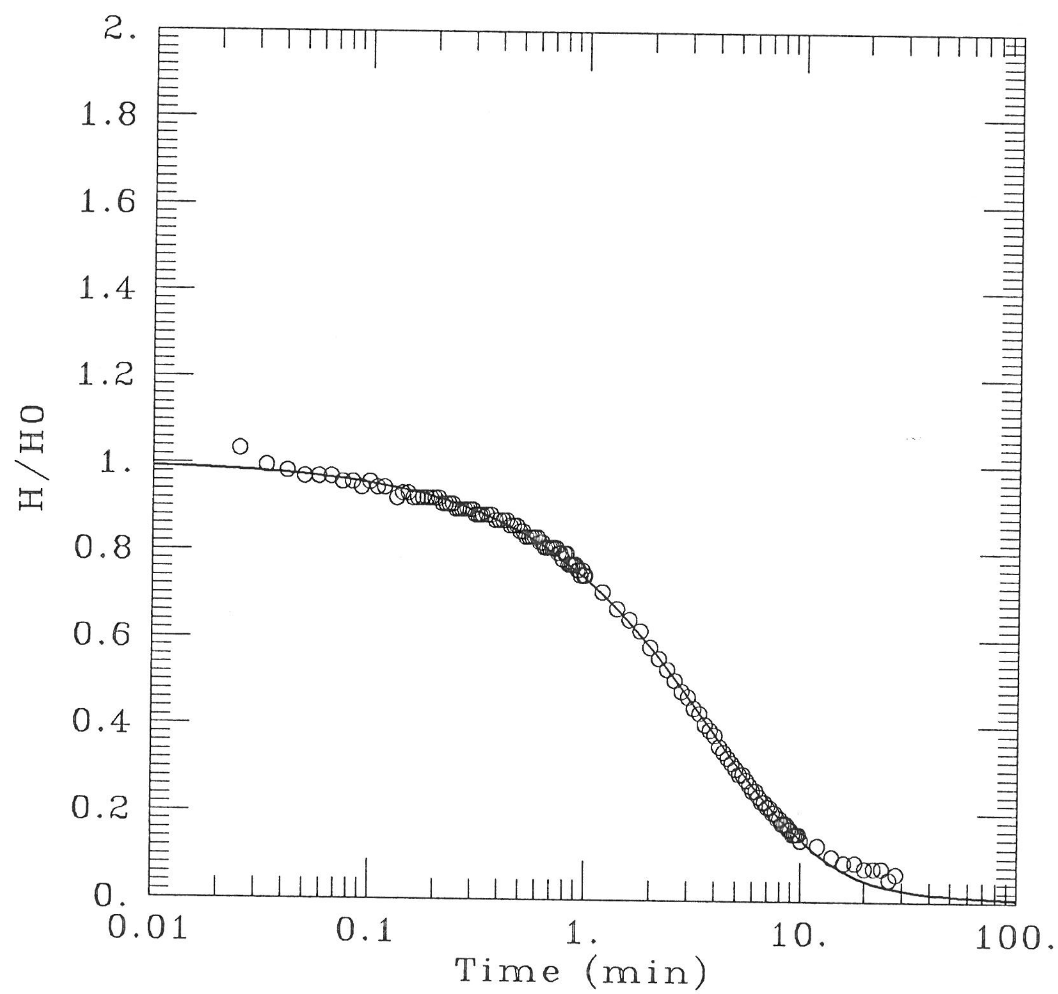
ESTIMATED PARAMETERS:
T = 8.6963E-05 ft^2/min
S = 0.03305

TEST DATA:
HO = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PDF_0497

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-1D RECOVERY



DATA SET:
P-1D-R.AQT
03/13/93

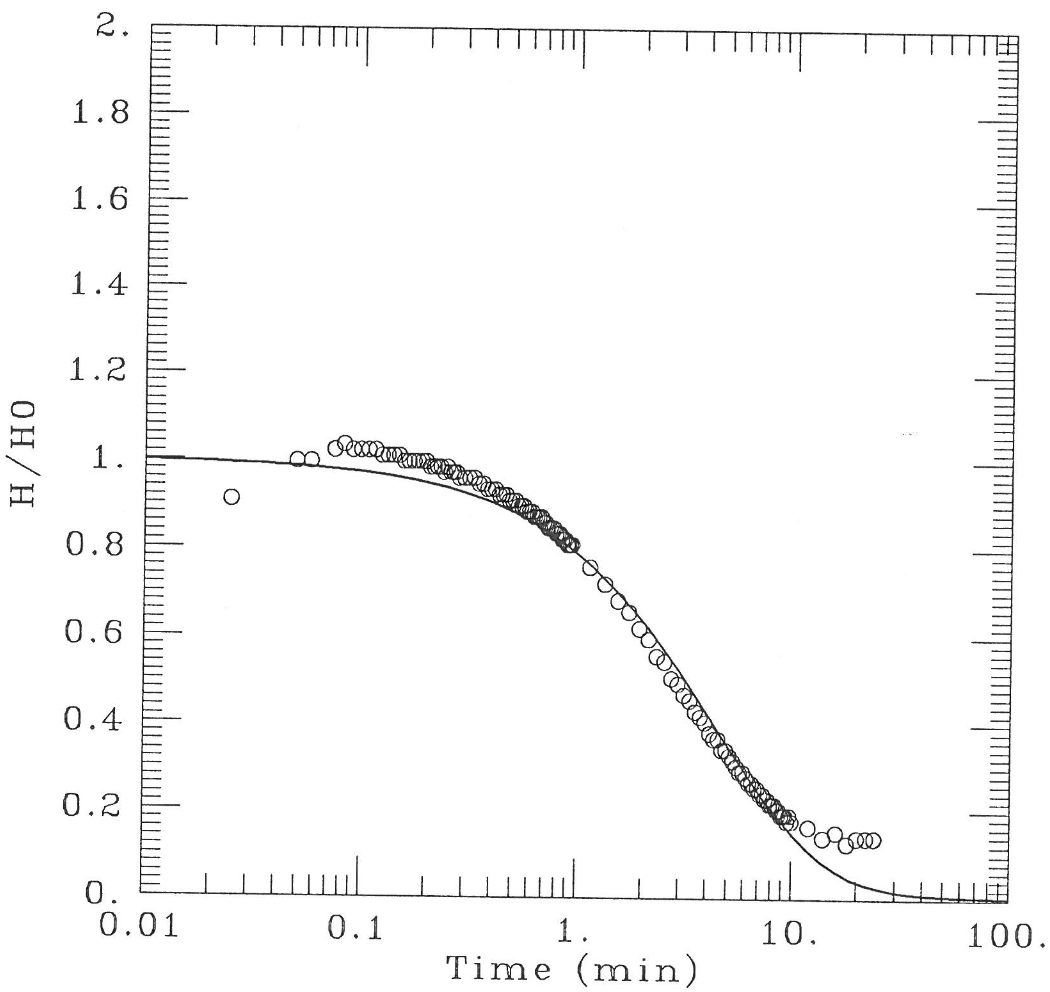
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
8/27/92

ESTIMATED PARAMETERS:
T = 0.003692 ft^2/min
S = 3.0237E-05

TEST DATA:
HO = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-1D DRAWDOWN



DATA SET:
p-1d-d.aqt
03/13/93

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
8/27/92

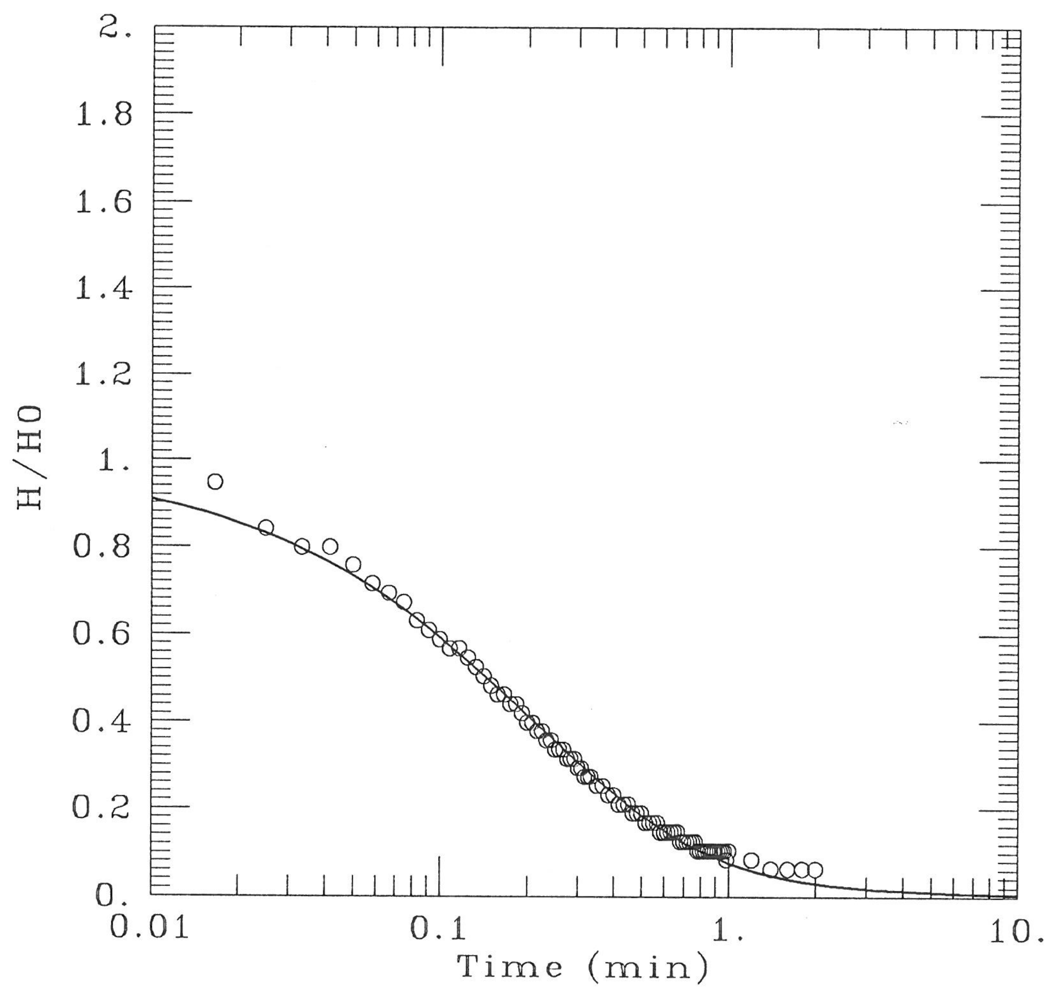
ESTIMATED PARAMETERS:
T = 0.006303 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PDF_0500

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-3S RECOVERY



DATA SET:
p-3s-r.aqt
03/13/93

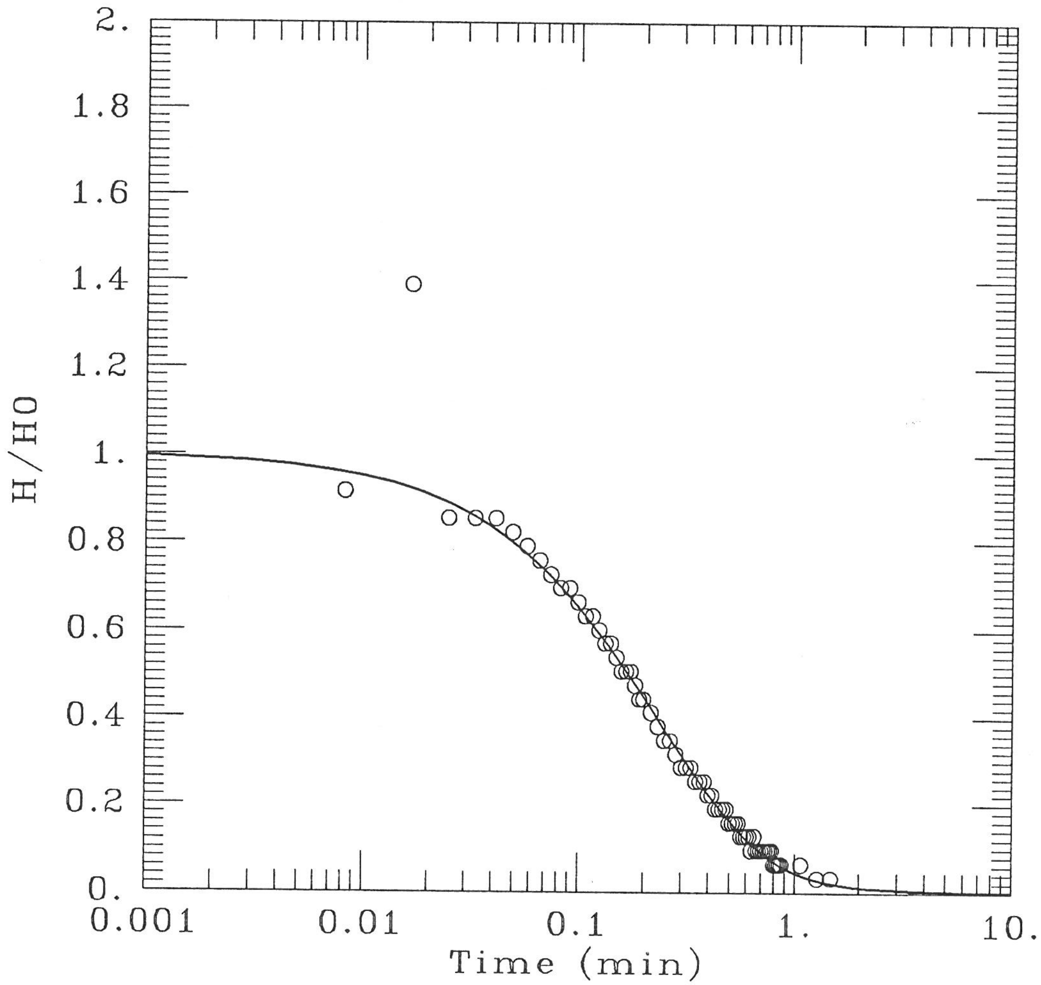
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
9/1/92

ESTIMATED PARAMETERS:
T = 0.04309 ft^2/min
S = 0.0004477

TEST DATA:
HO = 0.75 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-3S DRAWDOWN



DATA SET:
p-3s-d.aqt
03/13/93

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper et al.

TEST DATE:
9/1/92

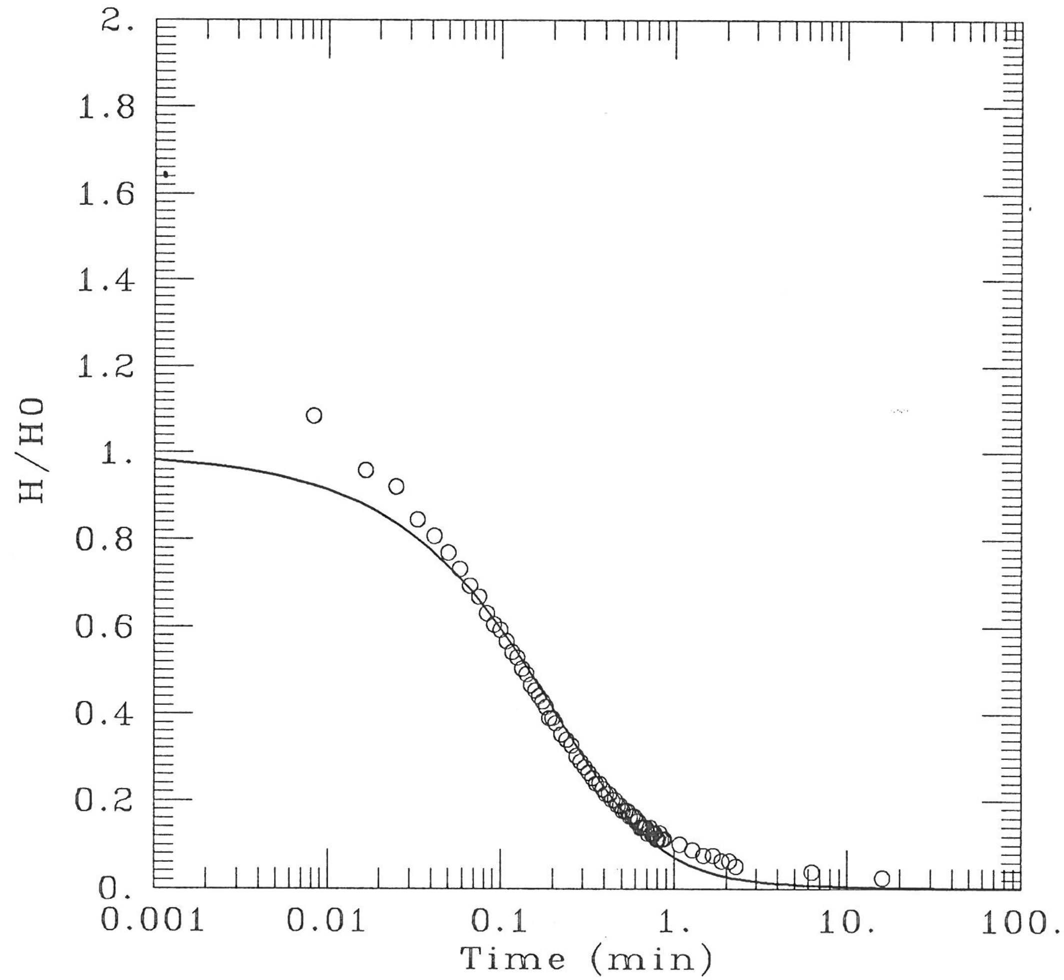
ESTIMATED PARAMETERS:
T = 0.119 ft^2/min
S = 1.E-08

TEST DATA:
HO = 0.5 ft
rc = 0.083 ft
rw = 0.344 ft

PDF_0501

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-3D RECOVERY



DATA SET:
P-3D-R.AQT
03/13/93

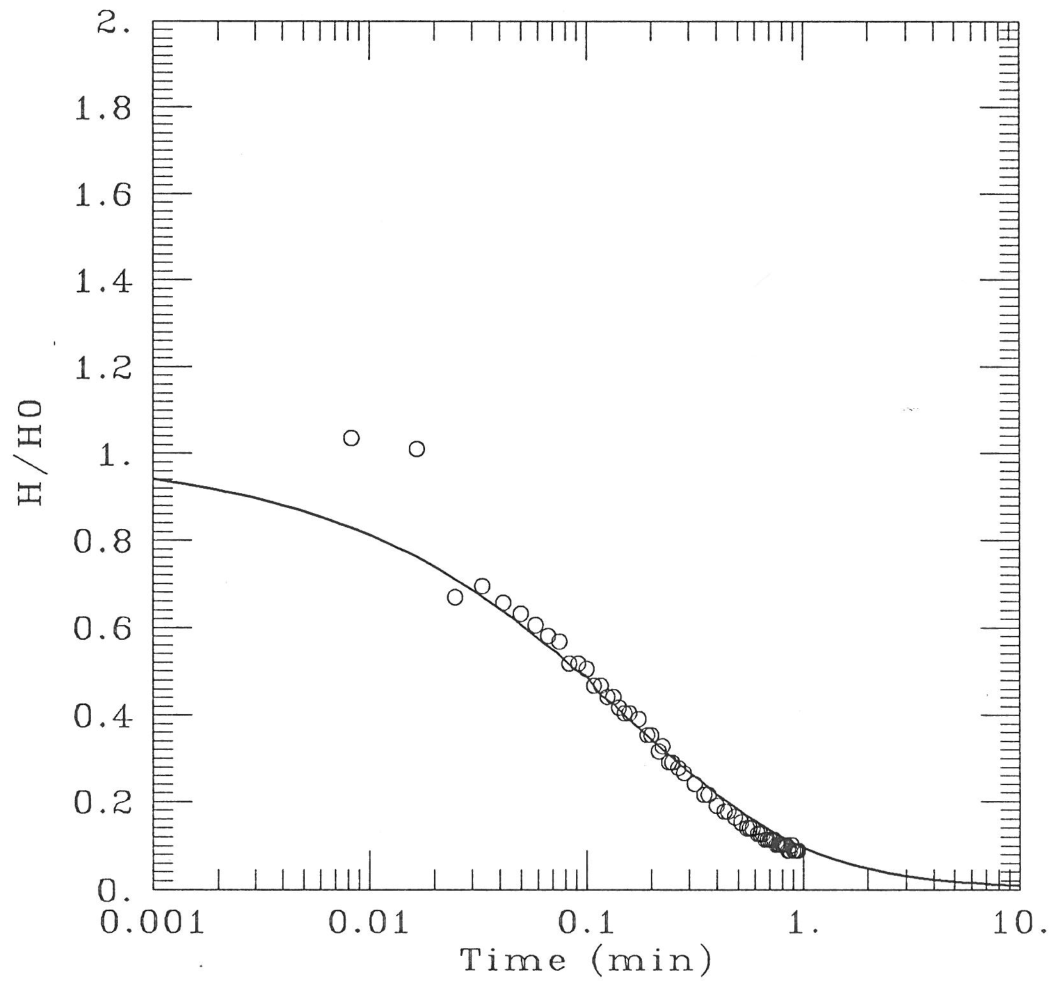
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
9/1/92

ESTIMATED PARAMETERS:
T = 0.04784 ft^2/min
S = 0.0002658

TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-3D DRAWDOWN



DATA SET:
P-3D-D.AQT
03/13/93

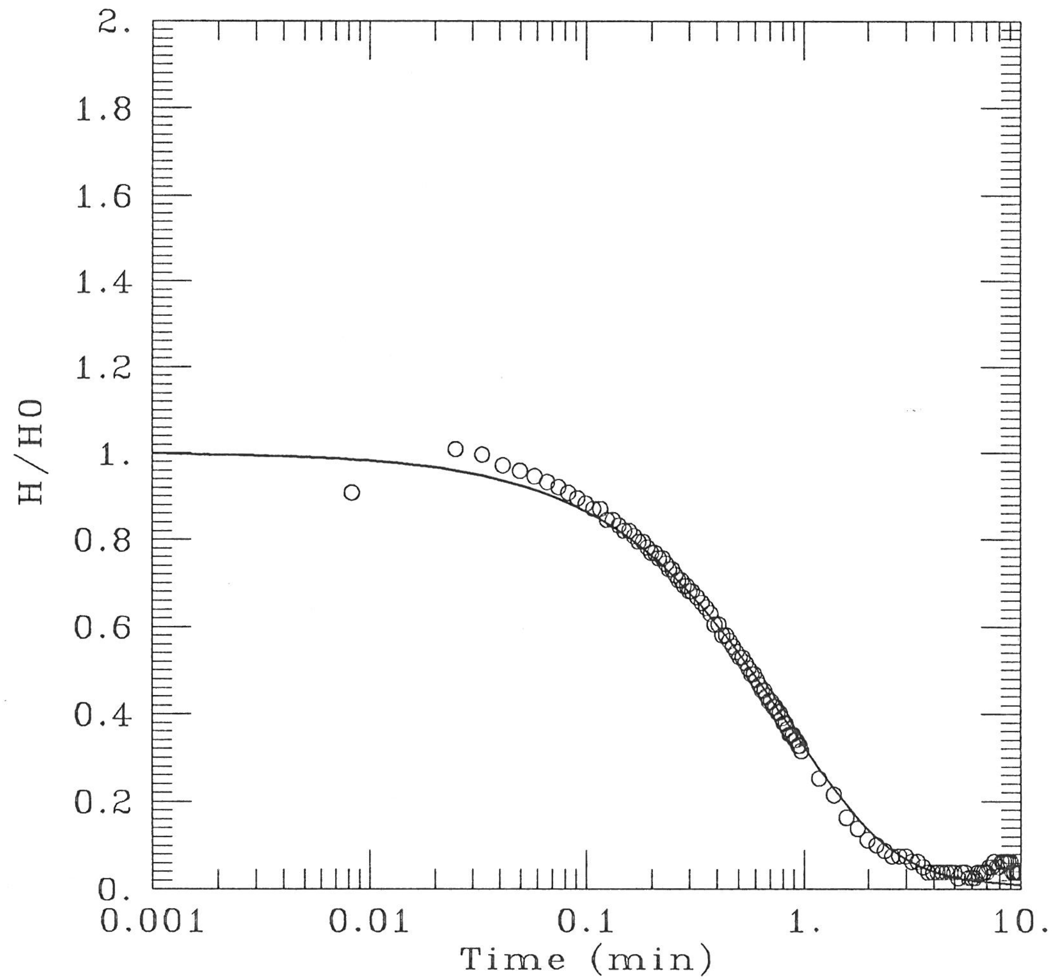
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
9/1/92

ESTIMATED PARAMETERS:
T = 0.02173 ft^2/min
S = 0.01321

TEST DATA:
HO = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-4 RECOVERY



DATA SET:
P-4-R.AQT
03/13/93

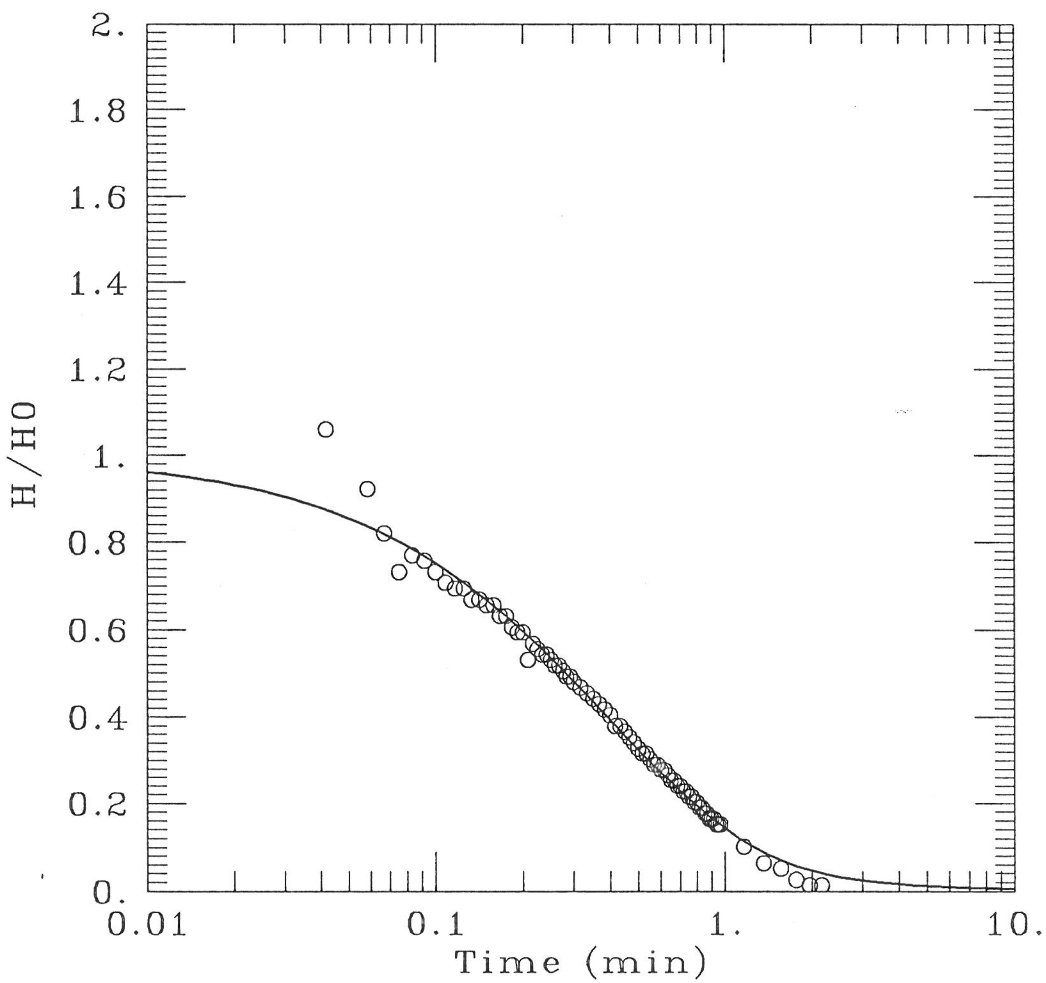
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
9/1/92

ESTIMATED PARAMETERS:
T = 0.02555 ft^2/min
S = 7.9368E-07

TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-4 DRAWDOWN



DATA SET:
P-4-D.AQT
03/13/93

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
9/1/92

ESTIMATED PARAMETERS:
T = 0.03979 ft^2/min
S = 1.1213E-05

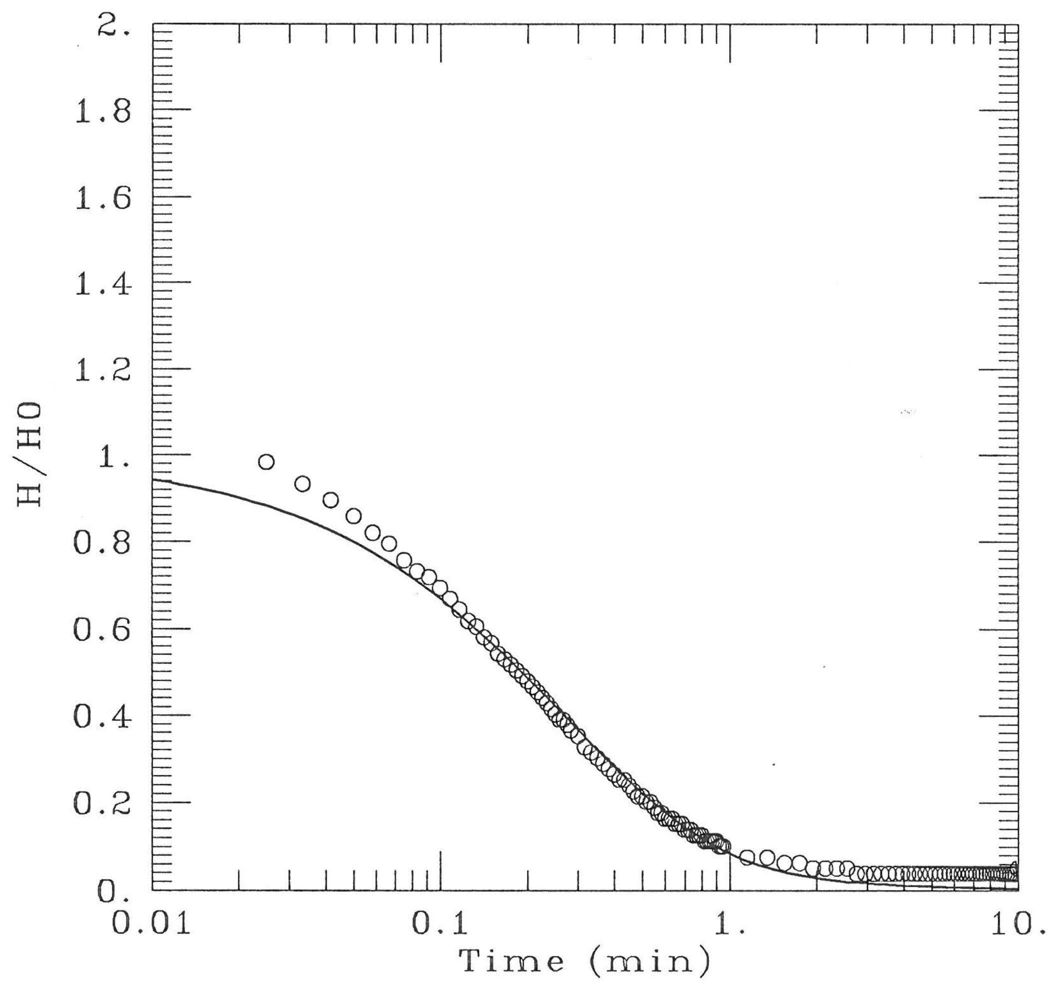
TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PDF_0505

PATRICK ENGINEERING INC. | Client: CITY WATER, LIGHT & POWER

Project No.: 496B | Location: SPRINGFIELD, ILLINOIS

P-5~~S~~D RECOVERY



DATA SET:
P-5D-R.AQT
03/14/93

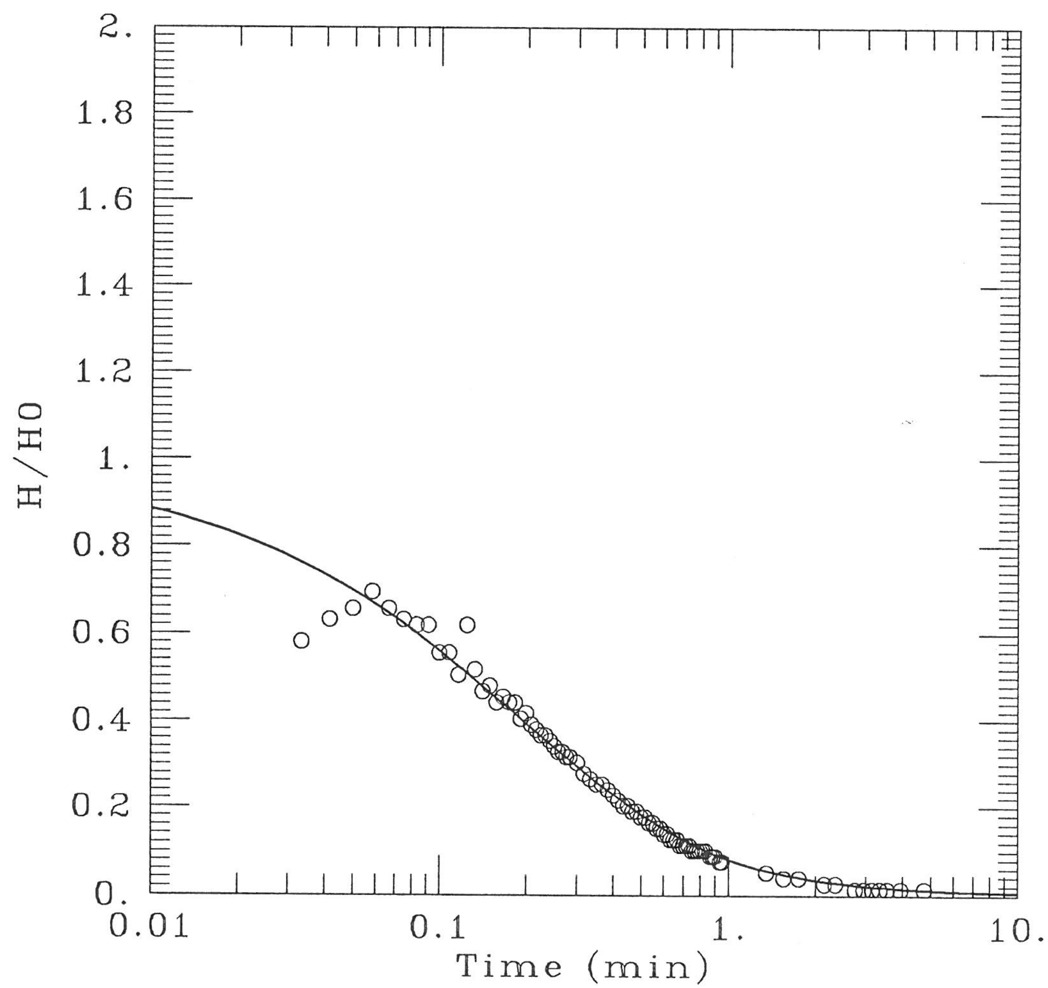
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
9/1/92

ESTIMATED PARAMETERS:
T = 0.05179 ft^2/min
S = 2.962E-05

TEST DATA:
HO = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-5D DRAWDOWN



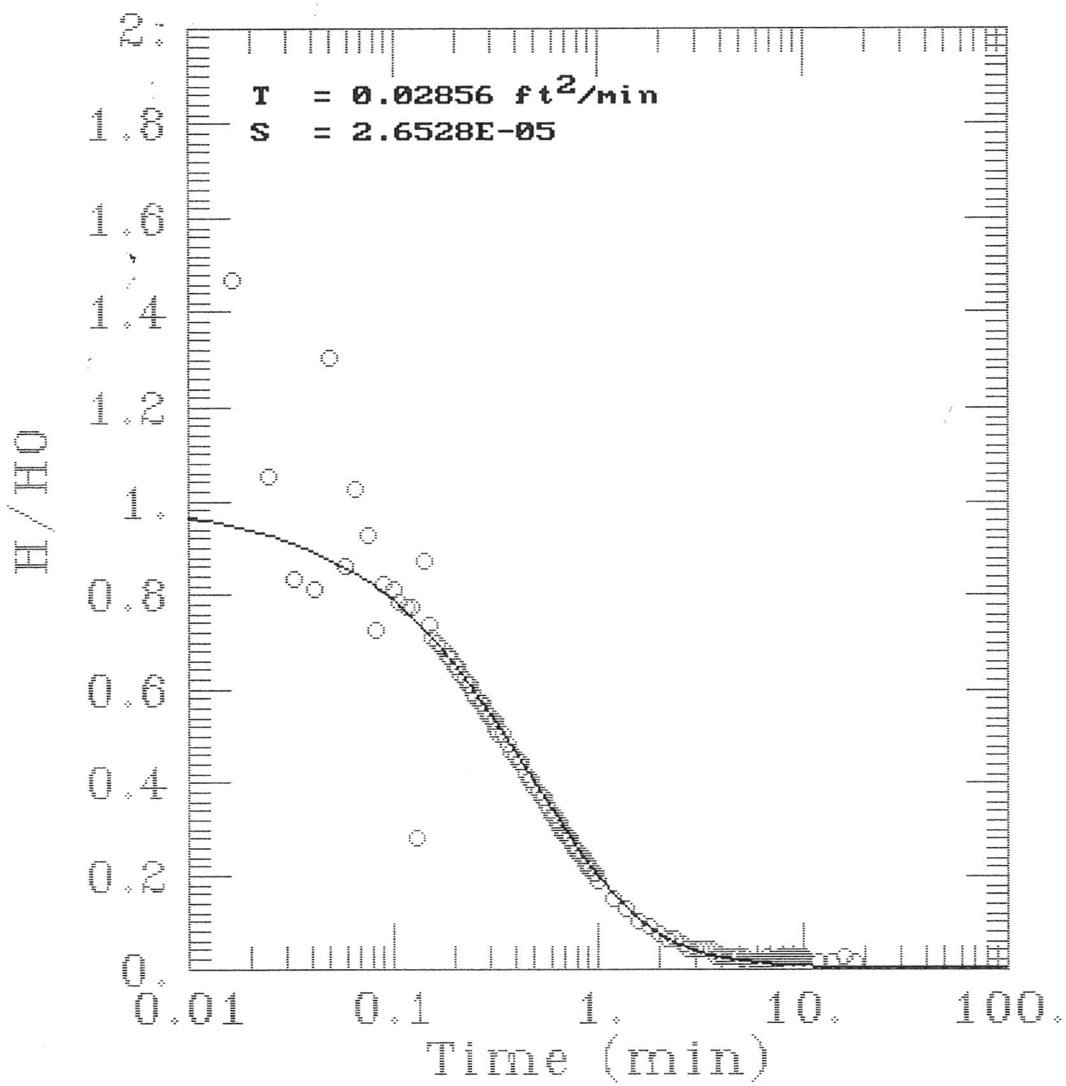
DATA SET:
P-5D-D.AQT
03/14/93

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
9/1/92

ESTIMATED PARAMETERS:
T = 0.03556 ft^2/min
S = 0.001533

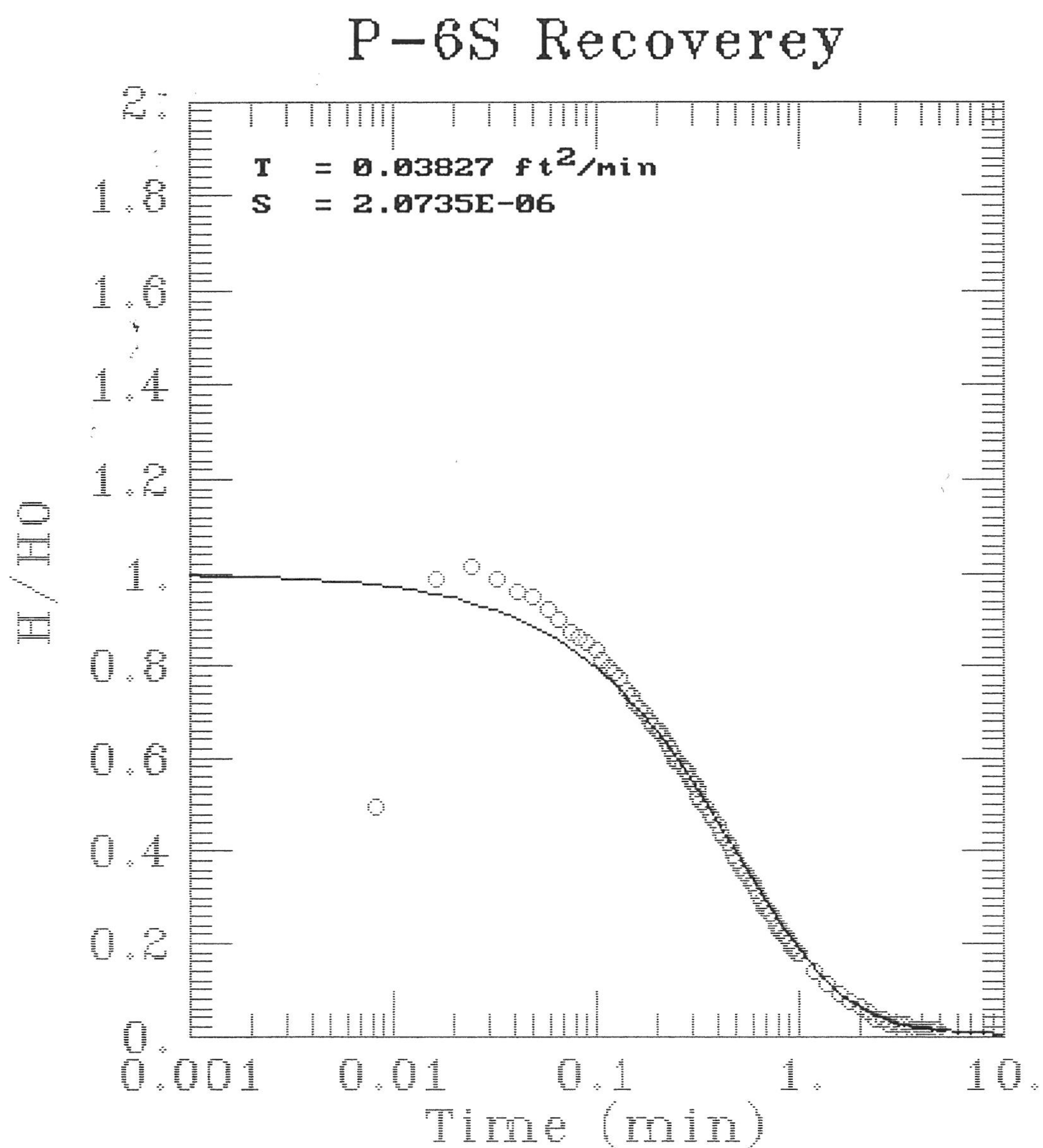
TEST DATA:
HO = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

P-6S Drawdown



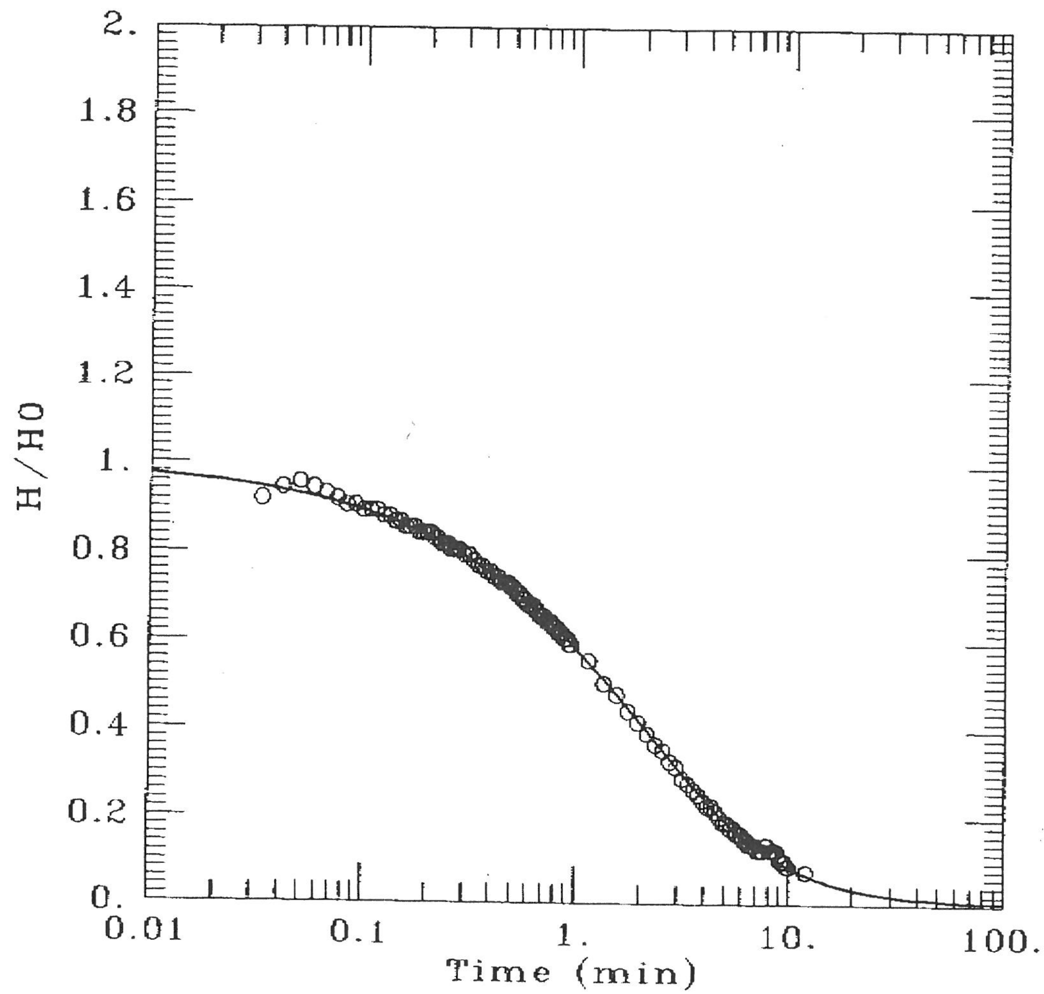
DRAFT

PDF_0508


P-6S Recoverey
T = 0.03827 ft²/min
S = 2.0735E-06
H/HO
2.
1.8
1.6
1.4
1.2
1.
0.8
0.6
0.4
0.2
0.
0.001
0.01
0.1
1.
10.
Time (min)

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-7S RECOVERY



DATA SET:
P-7S-R.AQT
03/14/93

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
10/5/92

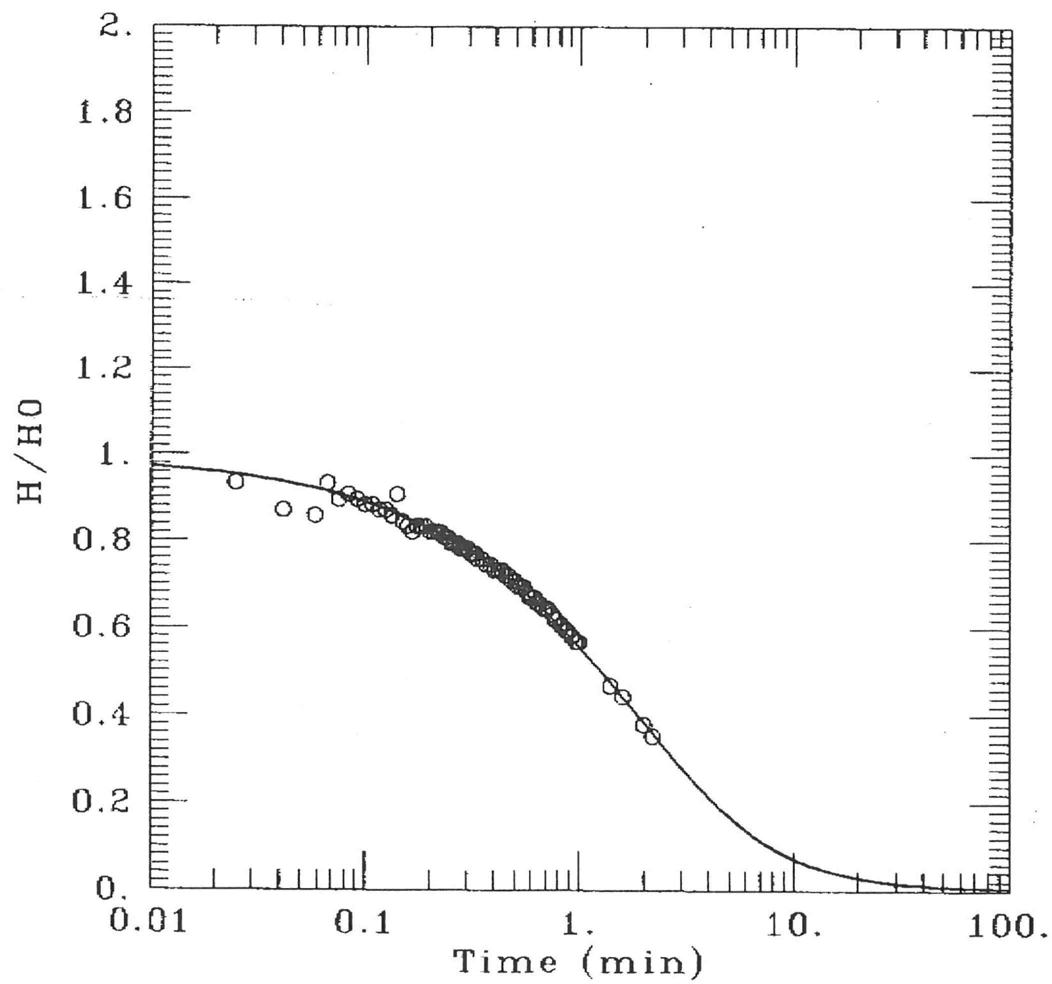
ESTIMATED PARAMETERS:
T = 0.003566 ft^2/min
S = 0.001063

TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PDF_0510

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-7S DRAWDOWN



DATA SET:
P-7S-D.AQT
03/14/93

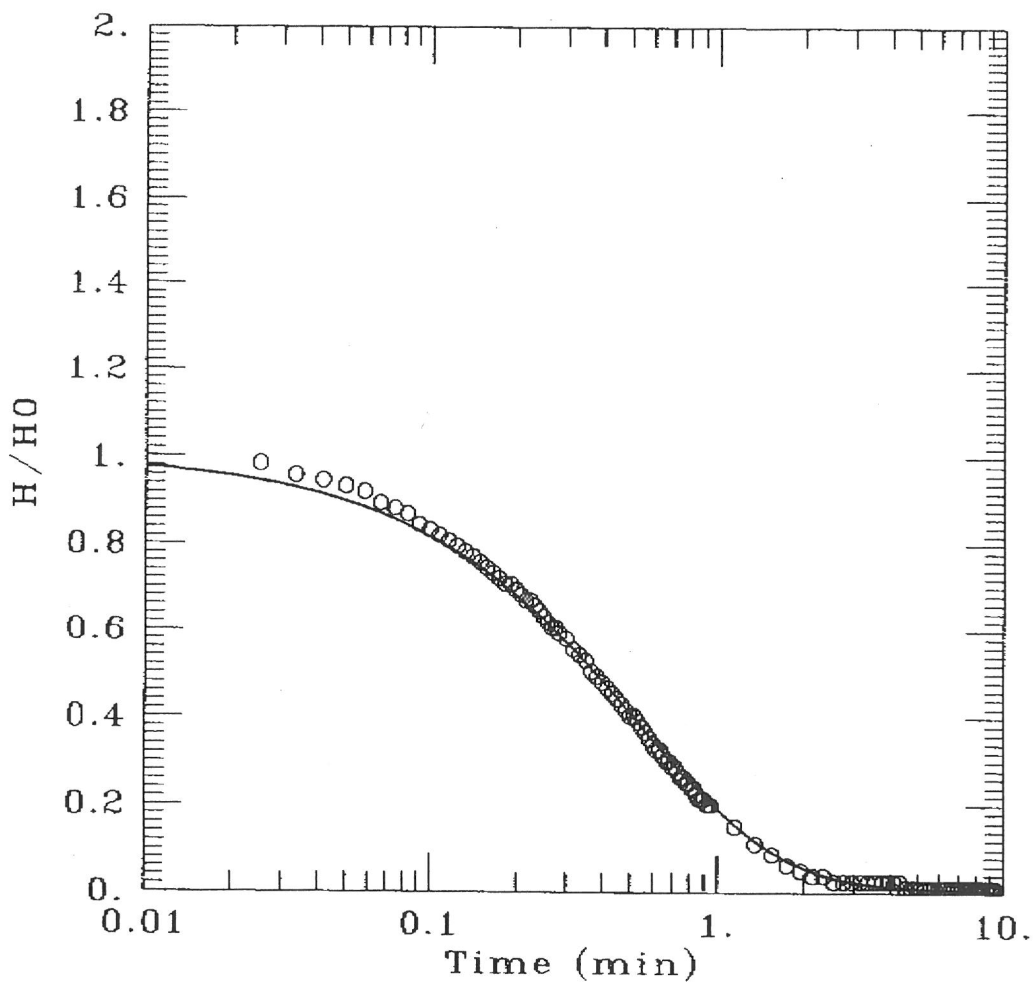
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
10/5/92

ESTIMATED PARAMETERS:
T = 0.004152 ft^2/min
S = 0.0009301

TEST DATA:
HO = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-7D RECOVERY



DATA SET:
P-7D-R.AQT
03/14/93

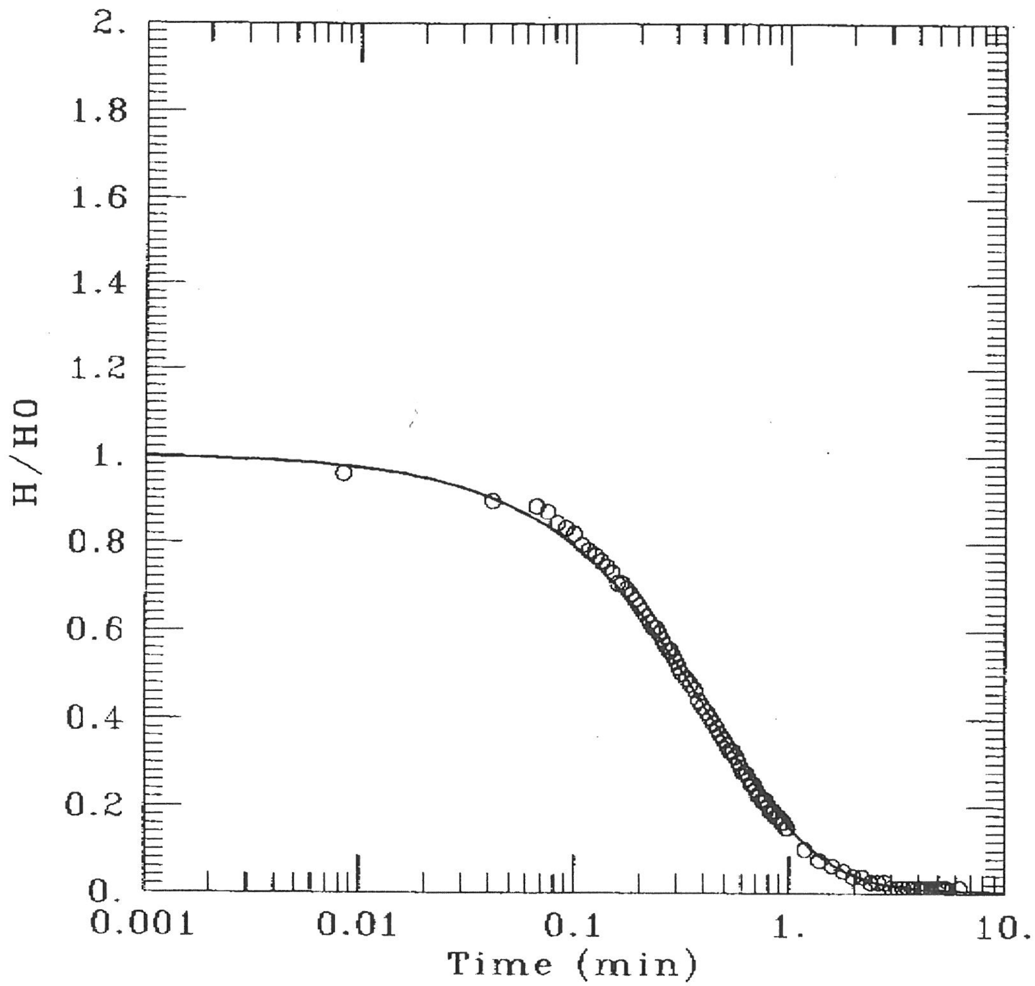
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
10/5/92

ESTIMATED PARAMETERS:
T = 0.05323 ft^2/min
S = 1.E-08

TEST DATA:
H0 = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-7D DRAWDOWN



DATA SET:
P-7D-D.AQT
03/14/93

AQUIFER TYPE:
Confined

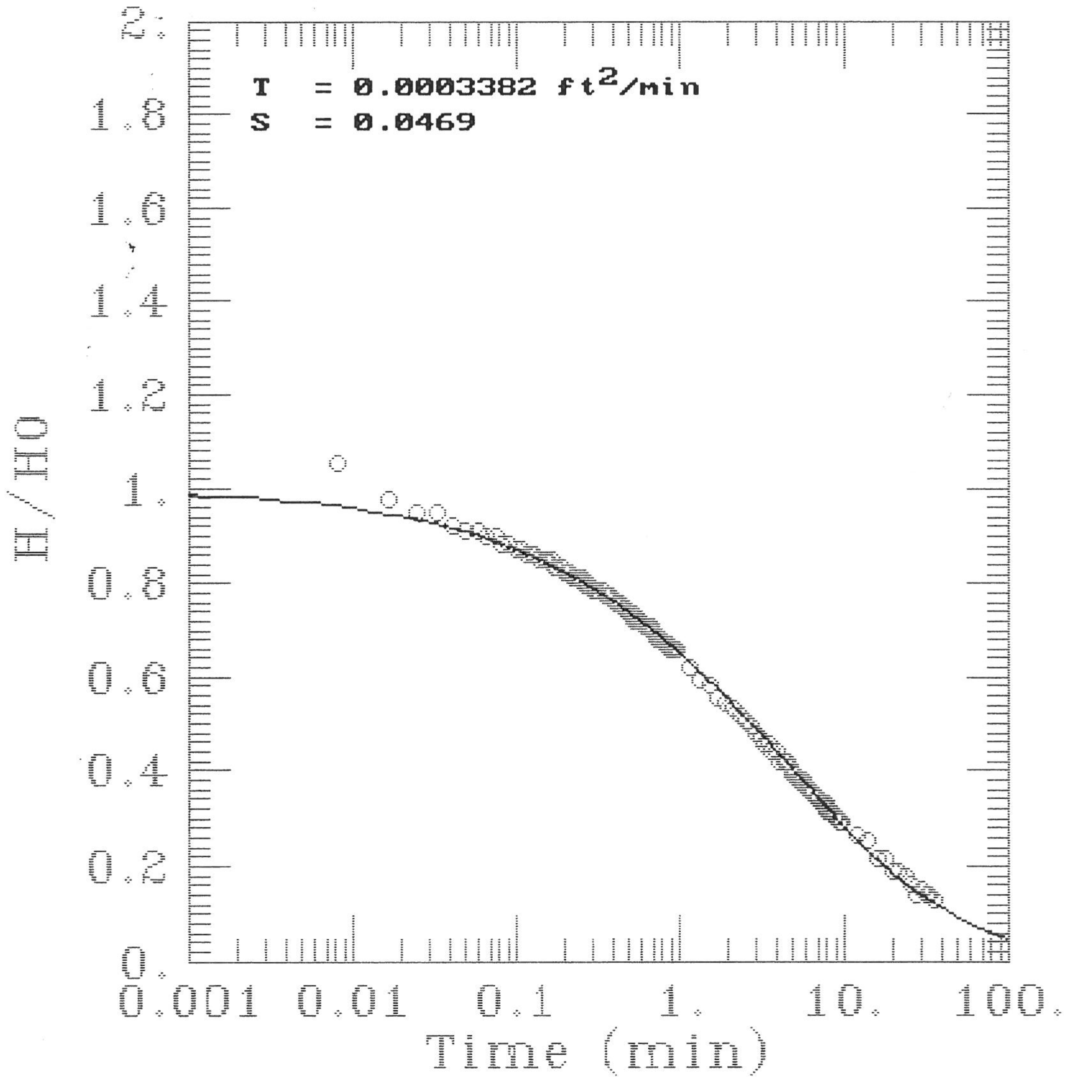
SOLUTION METHOD:
Cooper et al.

TEST DATE:
10/5/92

ESTIMATED PARAMETERS:
T = 0.06182 ft^2/min
S = 1.E-08

TEST DATA:
HO = 1.25 ft
rc = 0.083 ft
rw = 0.344 ft

P-8S Recoverey

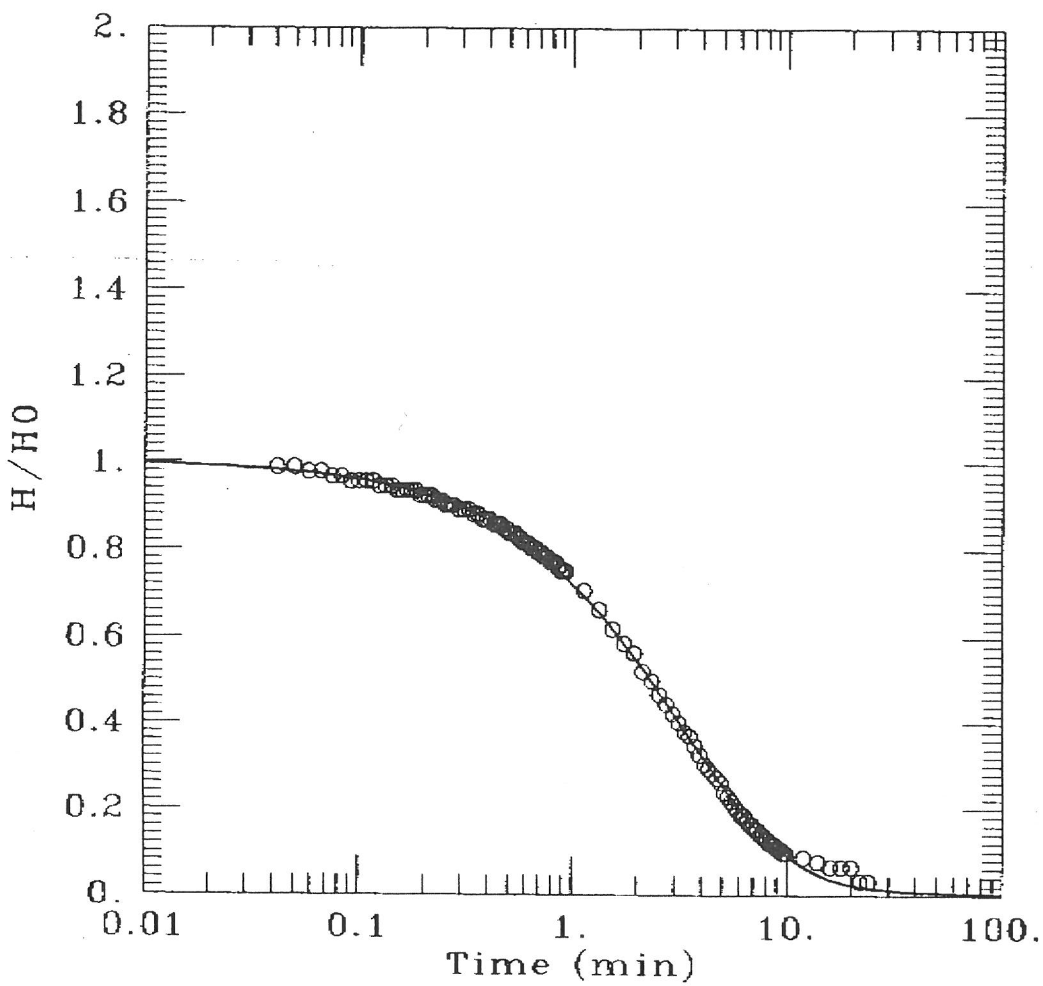


DRAFT

PATRICK ENGINEERING INC. | Client: CITY WATER, LIGHT & POWER

Project No.: 496B | Location: SPRINGFIELD, ILLINOIS

P-9D RECOVERY



DATA SET:
P-9D-R.AQT
03/14/93

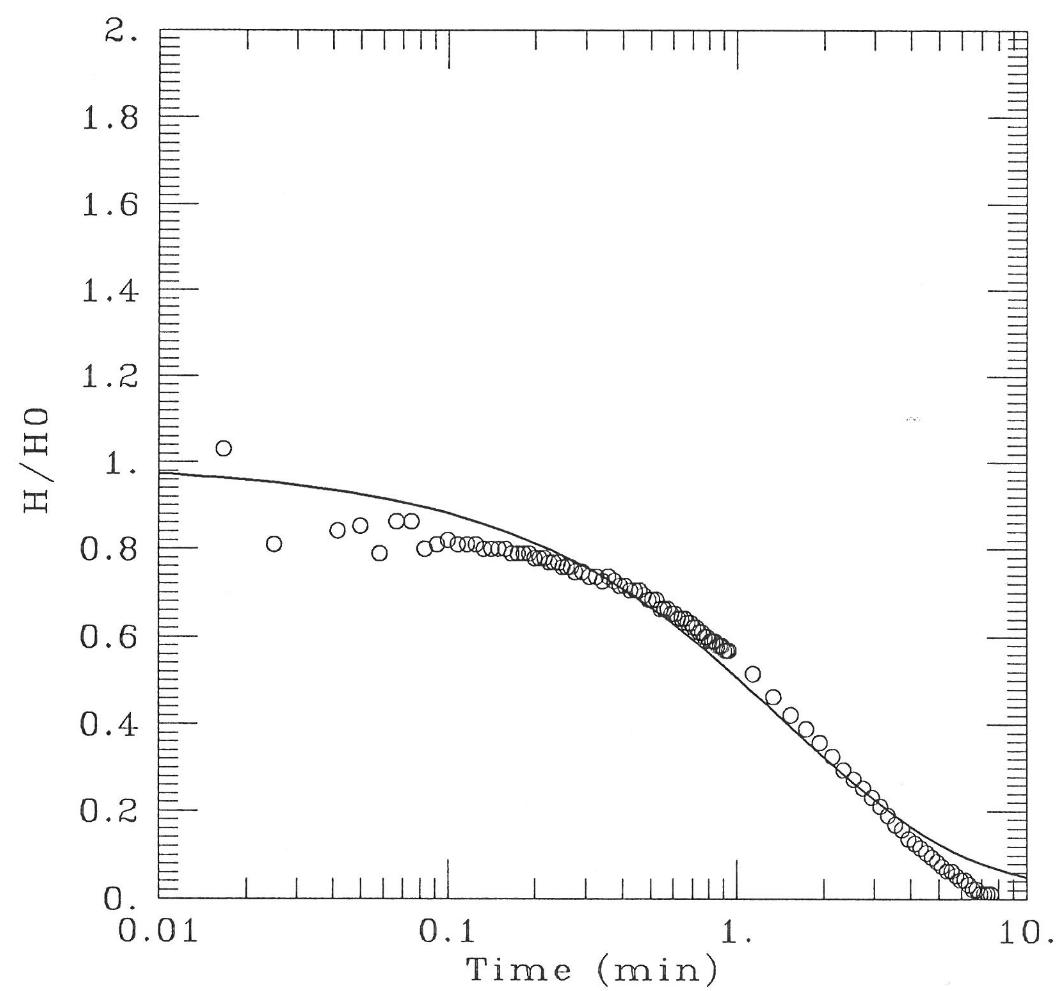
AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
8/31/92

ESTIMATED PARAMETERS:
T = 0.007133 ft^2/min
S = 1.6923E-07

TEST DATA:
H0 = 1.45 ft
rc = 0.083 ft
rw = 0.344 ft

PATRICK ENGINEERING INC.	Client: CITY WATER, LIGHT & POWER
Project No.: 496B	Location: SPRINGFIELD, ILLINOIS

P-9D DRAWDOWN



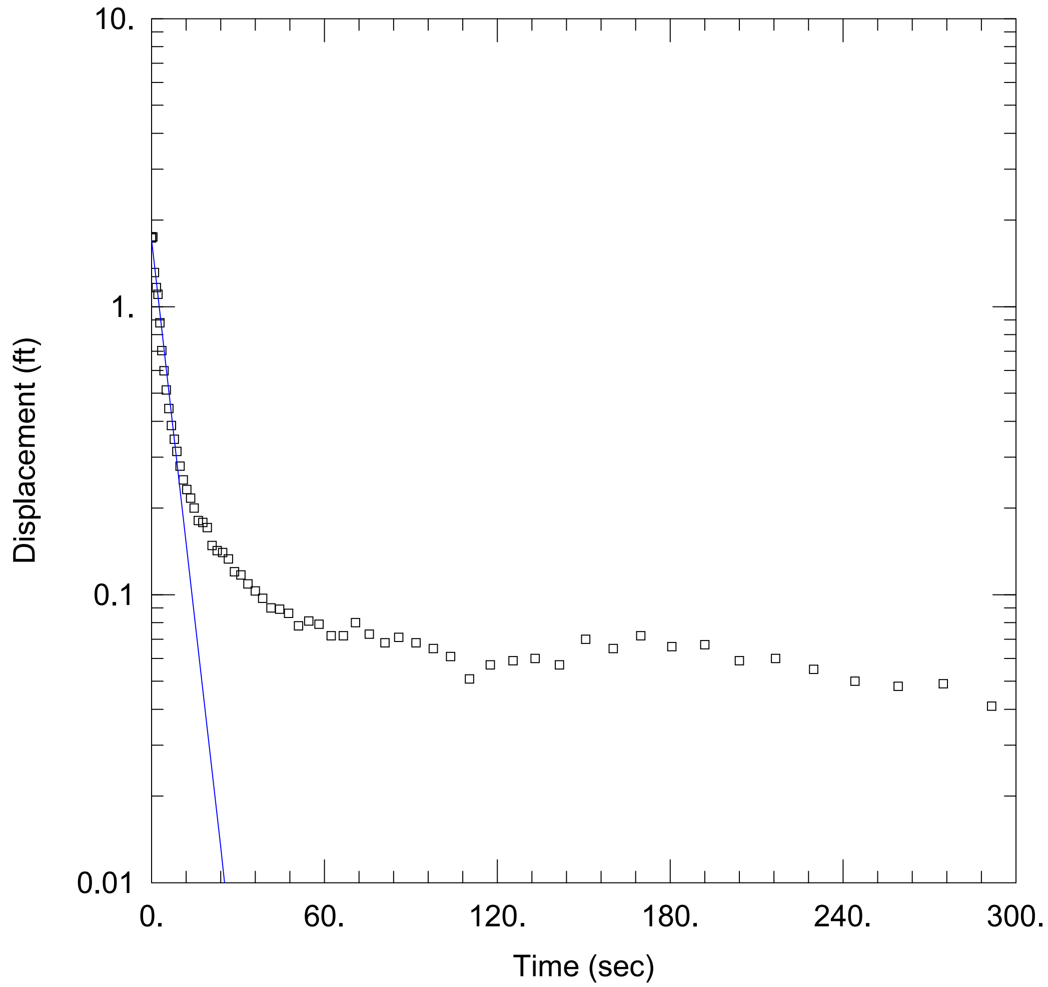
DATA SET:
P-9D-D.AQT
03/14/93

AQUIFER TYPE:
Confined
SOLUTION METHOD:
Cooper et al.
TEST DATE:
8/31/92

ESTIMATED PARAMETERS:
T = 0.005745 ft^2/min
S = 0.0005814

TEST DATA:
H0 = 1.5 ft
rc = 0.083 ft
rw = 0.344 ft

PDF_0516



P03S DRAWDOWN

Data Set: J:\...\P03S Drawdown.aqt
Date: 09/02/25 Time: 10:09:16

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: P03S
Test Date: 8-29-25

AQUIFER DATA

Saturated Thickness: 5.64 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P03S)

Initial Displacement: 1.75 ft
Total Well Penetration Depth: 5.26 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 5.62 ft
Screen Length: 4.67 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.008191 cm/sec y0 = 1.709 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\P03S\P03S Drawdown.
Title: P03S Drawdown
Date: 09/02/25
Time: 10:09:28

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-29-25
Test Well: P03S

AQUIFER DATA

Saturated Thickness: 5.64 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: P03S

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 1.75 ft
Static Water Column Height: 5.62 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.67 ft
Total Well Penetration Depth: 5.26 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.06471 ft
Gravel Pack Porosity: 0.

No. of Observations: 62

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.73	44.46	0.089
0.48	1.744	47.64	0.086
1.08	1.312	51.	0.078
1.68	1.164	54.6	0.081
2.28	1.103	58.2	0.079
2.94	0.879	62.4	0.072
3.66	0.703	66.6	0.072
4.44	0.599	70.8	0.08
5.22	0.513	75.6	0.073
6.06	0.443	81.	0.068
6.96	0.387	85.8	0.071
7.92	0.346	91.8	0.068
8.88	0.314	97.8	0.065
9.96	0.279	103.8	0.061

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
11.1	0.25	110.4	0.051
12.3	0.232	117.6	0.057
13.56	0.216	125.4	0.059
14.88	0.2	133.2	0.06
16.32	0.181	141.6	0.057
17.82	0.178	150.7	0.07
19.38	0.171	160.3	0.065
21.06	0.148	169.9	0.072
22.86	0.142	180.7	0.066
24.72	0.14	192.	0.067
26.76	0.133	204.	0.059
28.86	0.12	216.6	0.06
31.08	0.117	229.8	0.055
33.48	0.109	244.2	0.05
36.	0.103	259.2	0.048
38.64	0.097	274.8	0.049
41.46	0.09	291.6	0.041

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.962

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.008191	cm/sec
y0	1.709	ft

T = K*b = 1.408 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.008191	0.0004615	+/- 0.0009229	17.75	cm/sec
y0	1.709	0.0534	+/- 0.1068	32.01	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 1.408 cm²/sec

Parameter Correlations

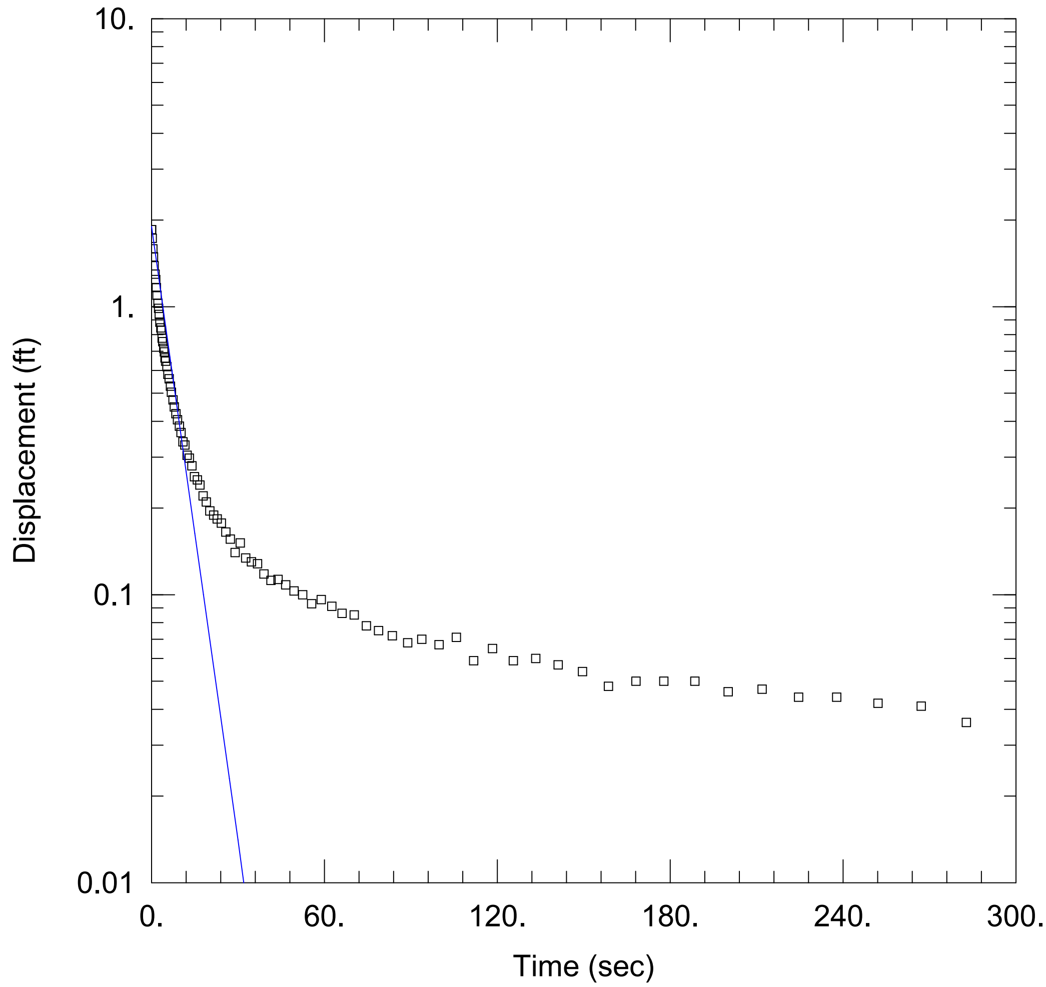
	K	y0
K	1.00	0.65

y0 0.65 1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.4385 ft^2
Variance .... 0.007309 ft^2
Std. Deviation..... 0.08549 ft
Mean.............. 0.05952 ft
No. of Residuals .. 62
No. of Estimates .. 2



P03S RECOVERY

Data Set: J:\...\P03S Recovery.aqt
Date: 09/02/25 Time: 10:08:57

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: P03S
Test Date: 8-15-25

AQUIFER DATA

Saturated Thickness: 6.91 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P03S)

Initial Displacement: 1.849 ft
Total Well Penetration Depth: 6.47 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 6.91 ft
Screen Length: 4.67 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.006843 cm/sec y0 = 1.896 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\P03S\P03S Recovery.a
Title: P03S Recovery
Date: 09/02/25
Time: 10:09:04

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-15-25
Test Well: P03S

AQUIFER DATA

Saturated Thickness: 6.91 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: P03S

X Location: 1130755.048 ft
Y Location: 2457062.359 ft

Initial Displacement: 1.849 ft
Static Water Column Height: 6.91 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.67 ft
Total Well Penetration Depth: 6.47 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.06471 ft
Gravel Pack Porosity: 0.

No. of Observations: 88

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.849	22.88	0.183
0.247	1.726	24.32	0.177
0.497	1.588	25.82	0.165
0.747	1.489	27.38	0.156
0.997	1.386	29.06	0.14
1.247	1.296	30.86	0.151
1.497	1.24	32.72	0.134
1.747	1.165	34.76	0.13
1.997	1.095	36.86	0.128
2.247	1.028	39.08	0.118
2.497	0.987	41.48	0.112
2.747	0.94	44.	0.113
2.997	0.884	46.64	0.108
3.247	0.843	49.46	0.103

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
3.497	0.829	52.46	0.1
3.747	0.778	55.64	0.093
3.997	0.755	59.	0.096
4.247	0.717	62.6	0.091
4.497	0.697	66.2	0.086
4.747	0.664	70.4	0.085
4.997	0.646	74.6	0.078
5.357	0.619	78.8	0.075
5.717	0.582	83.6	0.072
6.137	0.561	89.	0.068
6.557	0.529	93.8	0.07
6.977	0.505	99.8	0.067
7.457	0.474	105.8	0.071
7.997	0.448	111.8	0.059
8.477	0.425	118.4	0.065
9.077	0.405	125.6	0.059
9.677	0.385	133.4	0.06
10.28	0.365	141.2	0.057
10.94	0.339	149.6	0.054
11.66	0.331	158.6	0.048
12.44	0.305	168.2	0.05
13.22	0.298	177.8	0.05
14.06	0.28	188.6	0.05
14.96	0.257	200.1	0.046
15.92	0.25	212.	0.047
16.88	0.24	224.6	0.044
17.96	0.22	237.8	0.044
19.1	0.21	252.2	0.042
20.3	0.195	267.2	0.041
21.56	0.189	282.8	0.036

SOLUTION

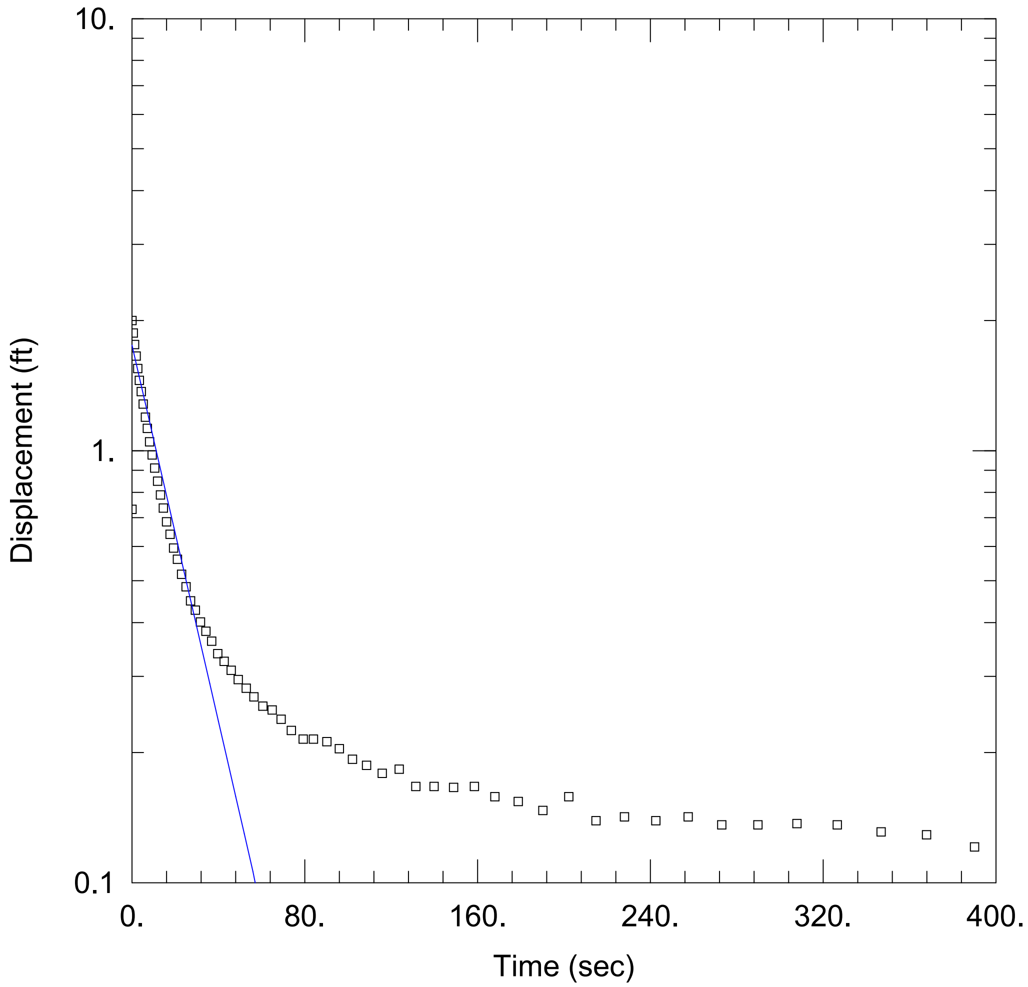
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.064

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.006843	cm/sec
y0	1.896	ft

T = K*b = 1.441 cm²/sec



P03D DRAWDOWN

Data Set: J:\...\P03D Drawdown.aqt
Date: 09/02/25
Time: 10:06:41

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: P03D
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P03D)

Initial Displacement: 0.731 ft
Total Well Penetration Depth: 29.02 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 23.25 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.00405 cm/sec
y0 = 1.754 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\P03D\P03D Drawdown.
Title: P03D Drawdown
Date: 09/02/25
Time: 10:06:51

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: P03D

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: P03D

X Location: 1130755.616 ft
Y Location: 2457066.455 ft

Initial Displacement: 0.731 ft
Static Water Column Height: 23.25 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 29.02 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07715 ft
Gravel Pack Porosity: 0.

No. of Observations: 64

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.001	56.52	0.269
0.6	1.873	60.72	0.256
1.26	1.76	64.92	0.251
1.98	1.656	69.12	0.239
2.76	1.548	73.92	0.225
3.54	1.455	79.32	0.215
4.38	1.369	84.12	0.215
5.28	1.281	90.24	0.212
6.24	1.196	96.12	0.204
7.2	1.126	102.1	0.193
8.28	1.048	108.7	0.187
9.42	0.978	115.9	0.179
10.62	0.911	123.7	0.183
11.88	0.85	131.5	0.167

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
13.2	0.789	139.9	0.167
14.64	0.736	148.9	0.166
16.14	0.684	158.5	0.167
17.7	0.64	168.1	0.158
19.38	0.595	178.9	0.154
21.18	0.56	190.3	0.147
23.04	0.517	202.3	0.158
25.08	0.484	214.9	0.139
27.18	0.449	228.1	0.142
29.4	0.427	242.5	0.139
31.8	0.401	257.5	0.142
34.32	0.382	273.1	0.136
36.96	0.362	289.9	0.136
39.78	0.339	307.9	0.137
42.78	0.325	326.5	0.136
45.96	0.31	346.9	0.131
49.32	0.295	367.9	0.129
52.92	0.282	390.1	0.121

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 4.189

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.00405	cm/sec
y0	1.754	ft

T = K*b = 0.6172 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.00405	0.0002678	+/- 0.0005353	15.12	cm/sec
y0	1.754	0.05678	+/- 0.1135	30.89	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.6172 cm²/sec

Parameter Correlations

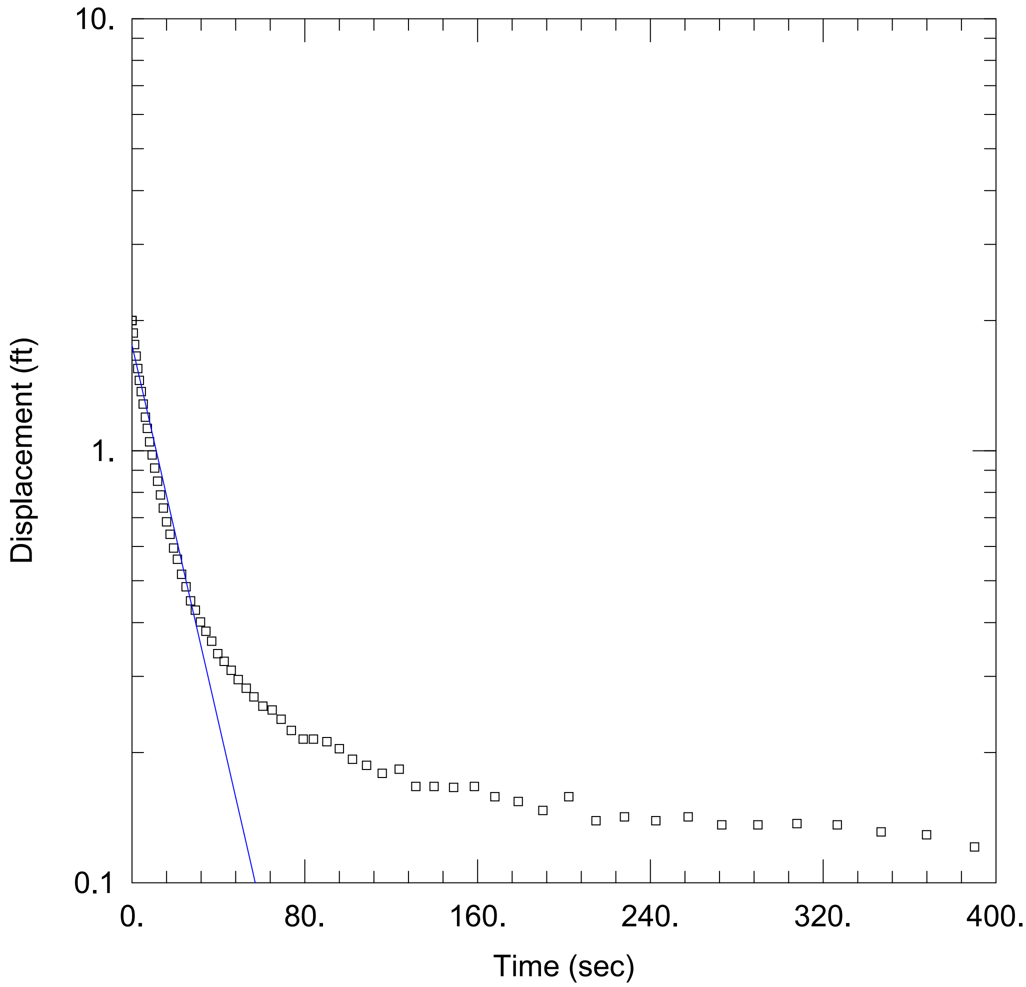
K	y0

K	1.00	0.66
y0	0.66	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 1.172 ft^2
Variance .... 0.0189 ft^2
Std. Deviation..... 0.1375 ft
Mean.............. 0.08258 ft
No. of Residuals .. 64
No. of Estimates .. 2



P03D RECOVERY

Data Set: J:\...\P03D Recovery.aqt
Date: 09/02/25
Time: 10:06:23

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: P03D
Test Date: 8-15-25

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (P03D)

Initial Displacement: 2.001 ft
Total Well Penetration Depth: 29.02 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 23.25 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.004059 cm/sec
y0 = 1.755 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\P03D\P03D Recovery.a
Title: P03D Recovery
Date: 09/02/25
Time: 10:06:33

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-15-25
Test Well: P03D

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: P03D

X Location: 1130755.347 ft
Y Location: 2457066.36 ft

Initial Displacement: 2.001 ft
Static Water Column Height: 23.25 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 29.02 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07715 ft
Gravel Pack Porosity: 0.

No. of Observations: 64

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.001	56.52	0.269
0.6	1.873	60.72	0.256
1.26	1.76	64.92	0.251
1.98	1.656	69.12	0.239
2.76	1.548	73.92	0.225
3.54	1.455	79.32	0.215
4.38	1.369	84.12	0.215
5.28	1.281	90.24	0.212
6.24	1.196	96.12	0.204
7.2	1.126	102.1	0.193
8.28	1.048	108.7	0.187
9.42	0.978	115.9	0.179
10.62	0.911	123.7	0.183
11.88	0.85	131.5	0.167

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
13.2	0.789	139.9	0.167
14.64	0.736	148.9	0.166
16.14	0.684	158.5	0.167
17.7	0.64	168.1	0.158
19.38	0.595	178.9	0.154
21.18	0.56	190.3	0.147
23.04	0.517	202.3	0.158
25.08	0.484	214.9	0.139
27.18	0.449	228.1	0.142
29.4	0.427	242.5	0.139
31.8	0.401	257.5	0.142
34.32	0.382	273.1	0.136
36.96	0.362	289.9	0.136
39.78	0.339	307.9	0.137
42.78	0.325	326.5	0.136
45.96	0.31	346.9	0.131
49.32	0.295	367.9	0.129
52.92	0.282	390.1	0.121

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 4.189

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.004059	cm/sec
y0	1.755	ft

T = K*b = 0.6186 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.004059	0.0002683	+/- 0.0005364	15.13	cm/sec
y0	1.755	0.05682	+/- 0.1136	30.89	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.6186 cm²/sec

Parameter Correlations

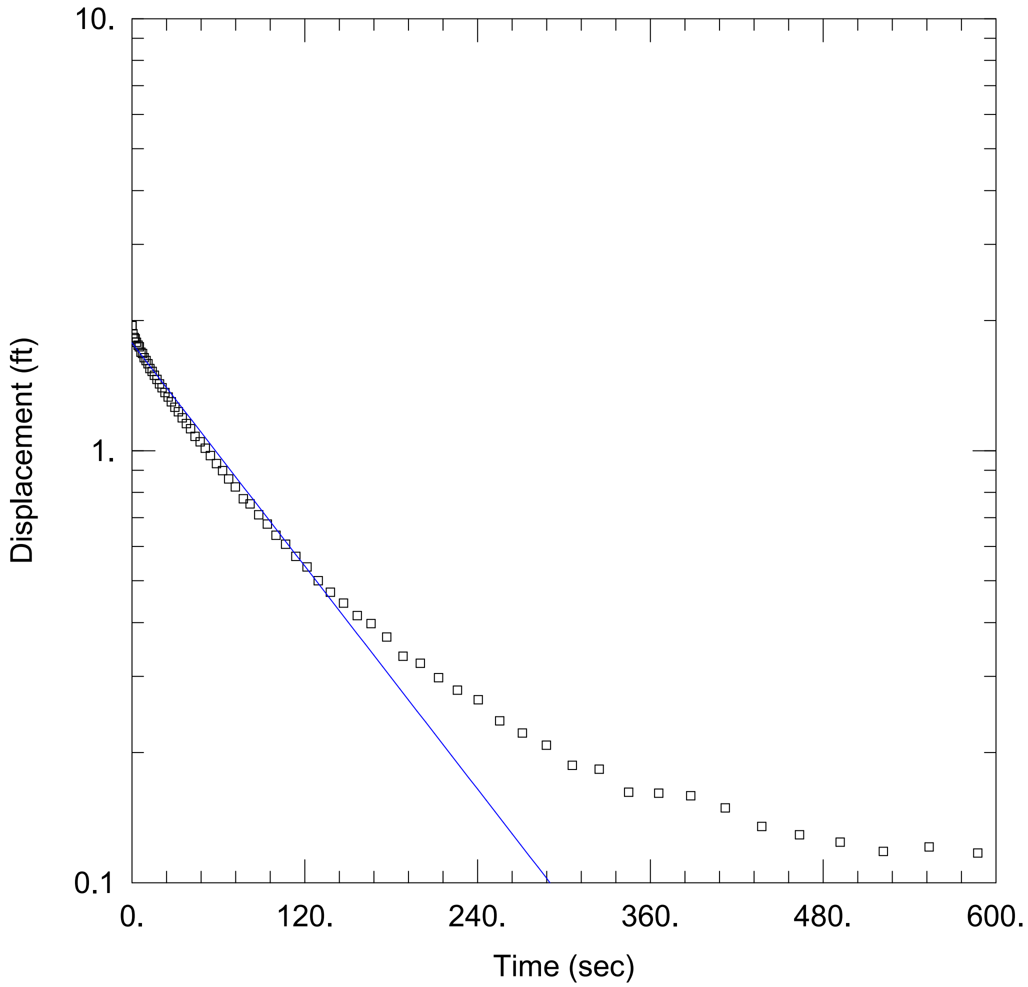
K	y0

K	1.00	0.66
y0	0.66	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 1.172 ft^2
Variance .... 0.0189 ft^2
Std. Deviation..... 0.1375 ft
Mean.............. 0.08283 ft
No. of Residuals .. 64
No. of Estimates .. 2



R103S DRAWDOWN

Data Set: J:\...\R103S Drawdown.aqt
Date: 09/02/25
Time: 10:09:55

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: R103S
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (R103S)

Initial Displacement: 1.946 ft
Static Water Column Height: 9.81 ft
Total Well Penetration Depth: 14.88 ft
Screen Length: 4.67 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0005147 cm/sec
y0 = 1.774 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\R103S\R103S Drawdov
Title: R103S Drawdown
Date: 09/02/25
Time: 10:10:04

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: R103S

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: R103S

X Location: 1130717.534 ft
Y Location: 2457299.138 ft

Initial Displacement: 1.946 ft
Static Water Column Height: 9.81 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.67 ft
Total Well Penetration Depth: 14.88 ft

No. of Observations: 68

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.946	77.34	0.773
0.78	1.866	82.14	0.753
1.56	1.827	88.14	0.71
2.4	1.816	94.14	0.676
3.3	1.782	100.1	0.637
4.26	1.755	106.7	0.607
5.22	1.738	113.9	0.569
6.3	1.691	121.7	0.538
7.44	1.677	129.5	0.5
8.64	1.64	137.9	0.47
9.9	1.615	146.9	0.444
11.22	1.588	156.5	0.415
12.66	1.55	166.1	0.398
14.16	1.524	176.9	0.37
15.72	1.494	188.3	0.334
17.4	1.462	200.3	0.322

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
19.2	1.426	212.9	0.298
21.06	1.398	226.1	0.279
23.1	1.363	240.5	0.265
25.2	1.33	255.5	0.237
27.42	1.296	271.1	0.222
29.82	1.259	287.9	0.208
32.34	1.23	305.9	0.187
34.98	1.192	324.5	0.183
37.8	1.156	344.9	0.162
40.8	1.123	365.9	0.161
43.98	1.079	388.1	0.159
47.34	1.048	412.1	0.149
50.94	1.013	437.3	0.135
54.54	0.974	463.7	0.129
58.74	0.933	491.9	0.124
62.94	0.899	521.9	0.118
67.14	0.86	553.7	0.121
71.94	0.824	587.3	0.117

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
In(Re/rw): 3.802

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0005147	cm/sec
y0	1.774	ft

T = K*b = 0.07844 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0005147	1.44E-5	+/- 2.875E-5	35.75	cm/sec
y0	1.774	0.01927	+/- 0.03848	92.05	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.07844 cm²/sec

Parameter Correlations

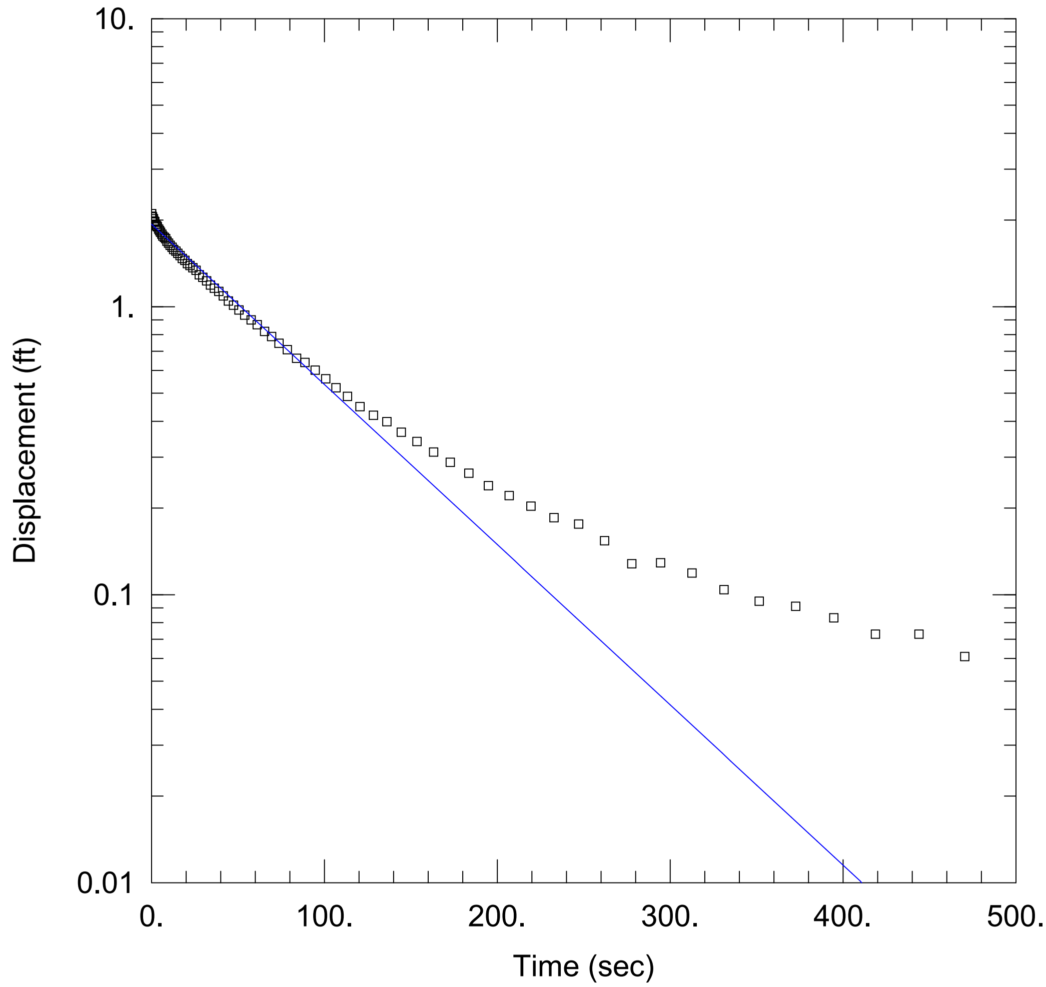
K	y0

K	1.00	0.62
y0	0.62	1.00

Residual Statistics

for weighted residuals

Sum of Squares. . . 0.3552 ft^2
Variance . . . . 0.005381 ft^2
Std. Deviation . . . . . 0.07336 ft
Mean . . . . 0.02506 ft
No. of Residuals . . 68
No. of Estimates . . 2



R103S RECOVERY

Data Set: J:\...\R103S Recovery.aqt
Date: 09/02/25 Time: 10:10:17

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: R103S
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 5. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (R103S)

Initial Displacement: 2.101 ft
Total Well Penetration Depth: 14.88 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 9.81 ft
Screen Length: 4.67 ft
Well Radius: 0.08333 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0006657 cm/sec y0 = 1.934 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\R103S\R103S Recover
Title: R103S Recovery
Date: 09/02/25
Time: 10:10:28

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: R103S

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: R103S

X Location: 1130717.534 ft
Y Location: 2457299.138 ft

Initial Displacement: 2.101 ft
Static Water Column Height: 9.81 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.67 ft
Total Well Penetration Depth: 14.88 ft

No. of Observations: 77

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.101	50.64	0.974
0.359	2.061	54.	0.934
0.72	2.049	57.6	0.899
1.14	2.016	61.2	0.865
1.559	1.985	65.4	0.821
1.979	1.971	69.6	0.787
2.46	1.934	73.8	0.746
2.999	1.908	78.6	0.708
3.479	1.892	84.	0.662
4.079	1.861	88.8	0.64
4.68	1.835	94.8	0.602
5.279	1.815	100.8	0.561
5.94	1.784	106.8	0.523
6.66	1.76	113.4	0.488
7.44	1.739	120.6	0.45
8.22	1.721	128.4	0.42

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
9.06	1.687	136.2	0.399
9.96	1.66	144.6	0.366
10.92	1.633	153.6	0.34
11.88	1.607	163.2	0.313
12.96	1.579	172.8	0.288
14.1	1.559	183.6	0.264
15.3	1.531	195.	0.239
16.56	1.503	207.	0.221
17.88	1.471	219.6	0.203
19.32	1.447	232.8	0.185
20.82	1.409	247.2	0.176
22.38	1.388	262.2	0.154
24.06	1.363	277.8	0.128
25.86	1.336	294.6	0.129
27.72	1.289	312.6	0.119
29.76	1.263	331.2	0.104
31.86	1.23	351.6	0.095
34.08	1.19	372.6	0.091
36.48	1.158	394.8	0.083
39.	1.129	418.8	0.073
41.64	1.089	444.	0.073
44.46	1.046	470.4	0.061
47.46	1.012		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.802

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0006657	cm/sec
y0	1.934	ft

T = K*b = 0.1015 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0006657	1.427E-5	+/- 2.843E-5	46.64	cm/sec
y0	1.934	0.01484	+/- 0.02955	130.3	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

$T = K*b = 0.1015\ cm^2/sec$

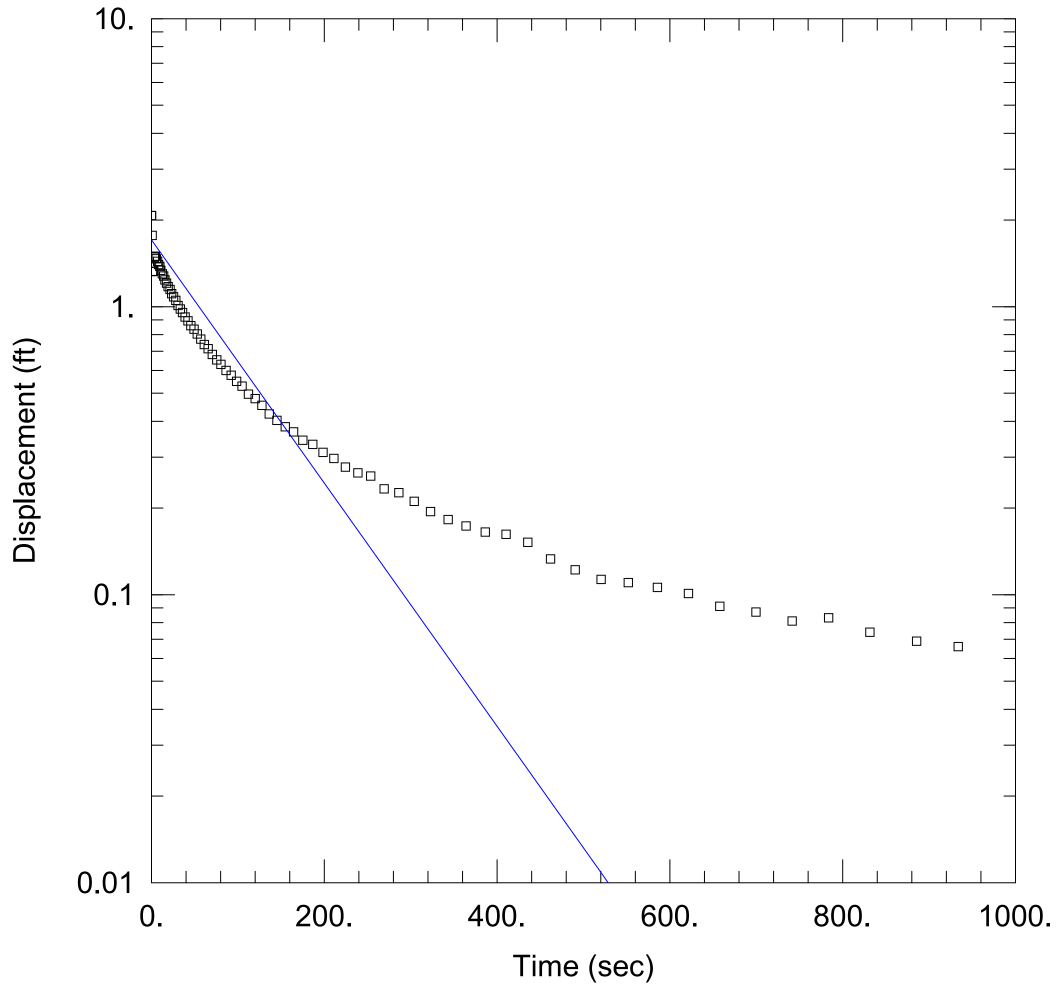
Parameter Correlations

	K	y0
K	1.00	0.60
y0	0.60	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.3124 ft^2
Variance .... 0.004165 ft^2
Std. Deviation..... 0.06454 ft
Mean.............. 0.01767 ft
No. of Residuals .. 77
No. of Estimates .. 2



G104S

Data Set: J:\...\G104S Drawdown.aqt
Date: 09/02/25
Time: 10:05:35

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: G104S
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 10.7 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (G104S)

Initial Displacement: 2.072 ft
Total Well Penetration Depth: 16.27 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 10.7 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.0005092 cm/sec
y0 = 1.707 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\G104S\G104S Drawdow
Title: G104S
Date: 09/02/25
Time: 10:05:43

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: G104S

AQUIFER DATA

Saturated Thickness: 10.7 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: G104S

X Location: 1130745.859 ft
Y Location: 2456717.96 ft

Initial Displacement: 2.072 ft
Static Water Column Height: 10.7 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 16.27 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.06471 ft
Gravel Pack Porosity: 0.

No. of Observations: 74

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.072	105.2	0.53
0.84	1.768	112.4	0.497
1.74	1.325	120.2	0.479
2.7	1.326	128.	0.454
3.66	1.486	136.4	0.424
4.74	1.498	145.4	0.403
5.88	1.465	155.	0.383
7.08	1.435	164.6	0.367
8.34	1.401	175.4	0.344
9.676	1.378	186.8	0.332
11.1	1.338	198.8	0.312
12.6	1.3	211.4	0.297
14.16	1.276	224.6	0.277
15.84	1.237	239.	0.265

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
17.64	1.207	254.	0.258
19.5	1.173	269.6	0.233
21.54	1.146	286.4	0.226
23.64	1.109	304.4	0.211
25.86	1.08	323.	0.194
28.26	1.05	343.4	0.182
30.78	1.01	364.4	0.173
33.42	0.982	386.6	0.165
36.24	0.954	410.6	0.162
39.24	0.921	435.8	0.152
42.42	0.892	462.2	0.133
45.78	0.859	490.4	0.122
49.38	0.834	520.4	0.113
52.98	0.803	552.2	0.11
57.18	0.772	585.8	0.106
61.38	0.739	621.8	0.101
65.58	0.714	657.8	0.091
70.38	0.683	699.8	0.087
75.78	0.653	741.8	0.081
80.58	0.63	783.8	0.083
86.58	0.601	831.8	0.074
92.58	0.577	885.8	0.069
98.58	0.55	933.8	0.066

SOLUTION

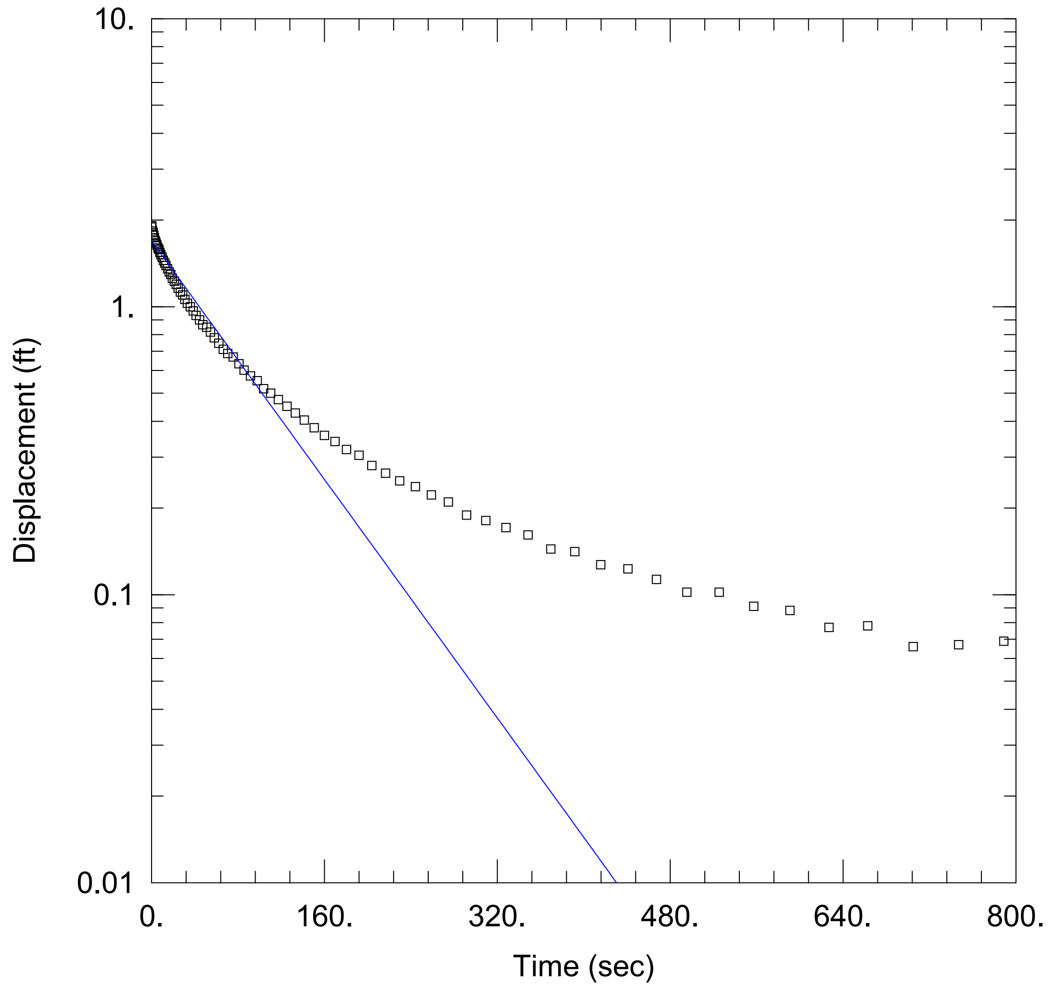
Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.856

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0005092	cm/sec
y0	1.707	ft

T = K*b = 0.1661 cm^2/sec



G104S RECOVERY

Data Set: J:\...\G104S Recovery.aqt
Date: 09/02/25 | Time: 10:05:51

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: G104S
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 5. ft | Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (G104S)

Initial Displacement: 1.906 ft
Total Well Penetration Depth: 16.27 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 10.7 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined | Solution Method: Bouwer-Rice

K = 0.0006243 cm/sec | y0 = 1.692 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\G104S\G104S Recover
Title: G104S Recovery
Date: 09/02/25
Time: 10:05:59

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: G104S

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: G104S

X Location: 1130745.859 ft
Y Location: 2456717.96 ft

Initial Displacement: 1.906 ft
Static Water Column Height: 10.7 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 16.27 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.06471 ft
Gravel Pack Porosity: 0.

No. of Observations: 79

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.906	81.	0.634
0.48	1.89	85.8	0.602
1.08	1.833	91.8	0.574
1.68	1.81	97.8	0.553
2.28	1.766	103.8	0.519
2.94	1.734	110.4	0.5
3.66	1.693	117.6	0.475
4.44	1.667	125.4	0.451
5.22	1.635	133.2	0.427
6.06	1.6	141.6	0.404
6.96	1.578	150.6	0.38
7.92	1.542	160.2	0.357
8.88	1.516	169.8	0.34
9.96	1.484	180.6	0.319

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
11.1	1.448	192.	0.305
12.3	1.417	204.	0.281
13.56	1.388	216.6	0.264
14.88	1.354	229.8	0.248
16.32	1.319	244.2	0.237
17.82	1.292	259.2	0.222
19.38	1.253	274.8	0.21
21.06	1.225	291.6	0.189
22.86	1.196	309.6	0.181
24.72	1.158	328.2	0.171
26.76	1.123	348.6	0.161
28.86	1.098	369.6	0.144
31.08	1.058	391.8	0.141
33.48	1.028	415.8	0.127
36.	0.998	441.	0.123
38.64	0.967	467.4	0.113
41.46	0.932	495.6	0.102
44.46	0.899	525.6	0.102
47.64	0.865	557.4	0.091
51.	0.847	591.	0.088
54.6	0.815	627.	0.077
58.2	0.779	663.	0.078
62.4	0.747	705.	0.066
66.6	0.71	747.	0.067
70.8	0.687	789.	0.069
75.6	0.668		

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.856

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0006243	cm/sec
y0	1.692	ft

T = K*b = 0.09514 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0006243	2.442E-5	+/- 4.862E-5	25.56	cm/sec
y0	1.692	0.02502	+/- 0.04981	67.65	ft

C.I. is approximate 95% confidence interval for parameter

t-ratio = estimate/std. error
No estimation window

T = K*b = 0.09514 cm²/sec

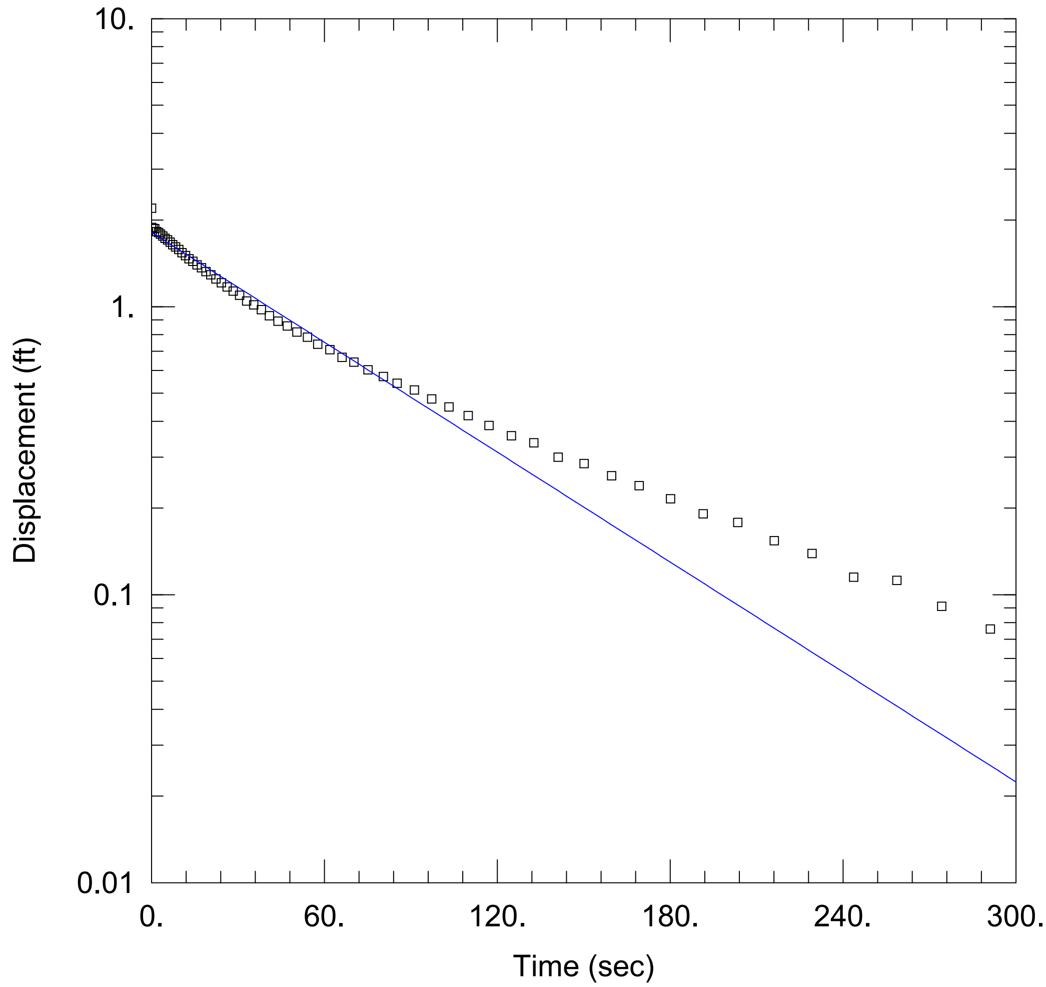
Parameter Correlations

	K	y0
K	1.00	0.62
y0	0.62	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.7656 ft^2
Variance .... 0.009943 ft^2
Std. Deviation..... 0.09971 ft
Mean.............. 0.03548 ft
No. of Residuals .. 79
No. of Estimates .. 2



RW3S DRAWDOWN

Data Set: J:\...\RW3S Drawdown.aqt
Date: 09/02/25 Time: 10:11:43

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: RW3S
Test Date: 8-19-25

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (RW3S)

Initial Displacement: 2.197 ft
Total Well Penetration Depth: 6.29 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 6.65 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0006517 cm/sec
y0 = 1.811 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\RW3S\RW3S Drawdow
Title: RW3S Drawdown
Date: 09/02/25
Time: 10:11:57

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-19-25
Test Well: RW3S

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: RW3S

X Location: 1130653.064 ft
Y Location: 2456148.635 ft

Initial Displacement: 2.197 ft
Static Water Column Height: 6.65 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 6.29 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.06471 ft
Gravel Pack Porosity: 0.

No. of Observations: 61

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.884	47.16	0.856
0.6	1.87	50.52	0.817
1.2	1.865	54.12	0.784
1.8	1.823	57.72	0.74
2.46	1.809	61.92	0.709
3.18	1.784	66.12	0.666
3.96	1.756	70.32	0.641
4.74	1.728	75.12	0.604
5.58	1.706	80.52	0.572
6.48	1.673	85.32	0.542
7.44	1.64	91.32	0.514
8.4	1.611	97.32	0.478
9.48	1.577	103.3	0.448
10.62	1.537	109.9	0.419

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
11.82	1.503	117.1	0.387
13.1	1.467	124.9	0.356
14.4	1.437	132.7	0.337
15.84	1.396	141.1	0.3
17.34	1.364	150.1	0.285
18.9	1.324	159.7	0.259
20.58	1.289	169.3	0.239
22.38	1.247	180.1	0.215
24.24	1.21	191.5	0.191
26.28	1.17	203.5	0.178
28.38	1.131	216.1	0.154
30.6	1.095	229.3	0.139
33.	1.045	243.7	0.115
35.52	1.015	258.7	0.112
38.16	0.975	274.3	0.091
40.98	0.93	291.1	0.076
43.98	0.89		

SOLUTION

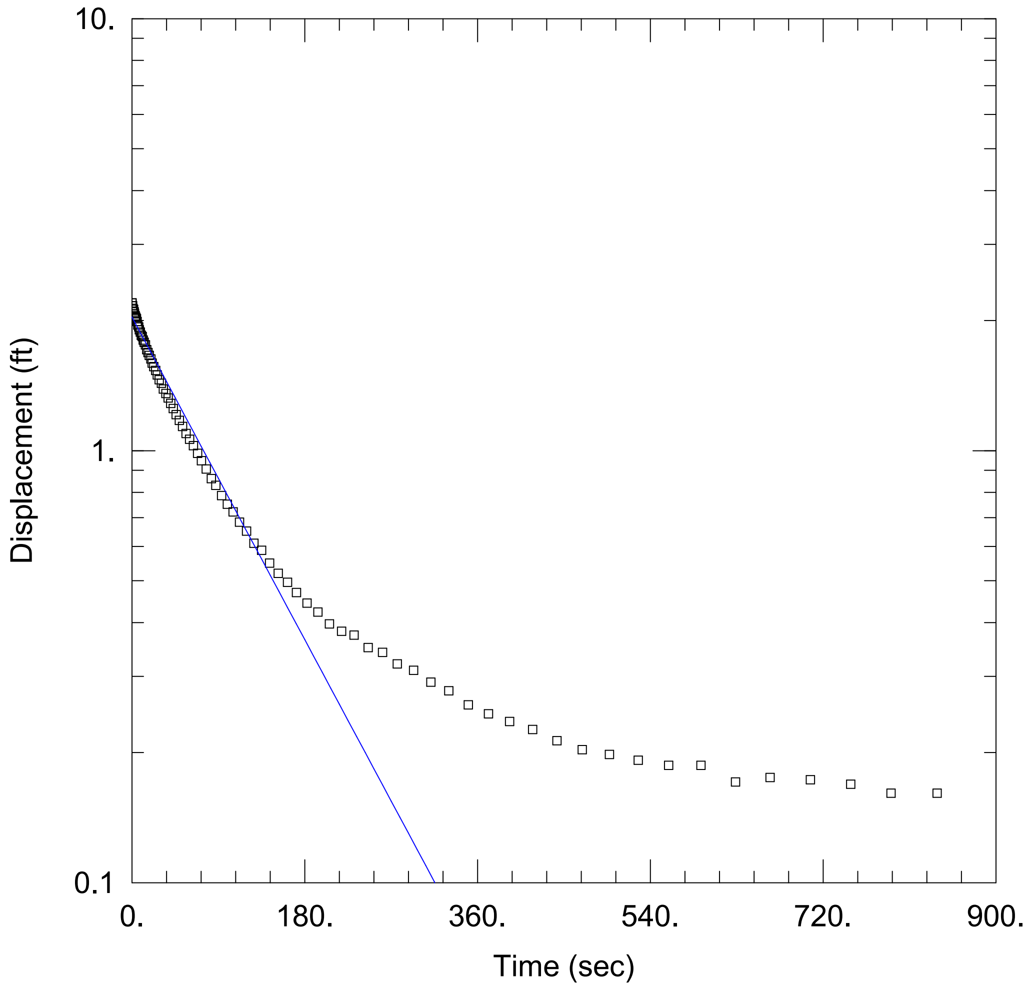
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.277

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0006517	cm/sec
y0	1.811	ft

T = K*b = 0.09932 cm²/sec



RW3S RECOVERY

Data Set: J:\...\RW3S Recovery.aqt
Date: 09/02/25 Time: 10:12:10

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: RW3S
Test Date: 8-19-25

AQUIFER DATA

Saturated Thickness: 5. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (RW3S)

Initial Displacement: 2.197 ft
Total Well Penetration Depth: 6.66 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 6.65 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0004298 cm/sec y0 = 2.038 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\RW3S\RW3S Recovery
Title: RW3S Recovery
Date: 09/02/25
Time: 10:12:18

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-19-25
Test Well: RW3S

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: RW3S

X Location: 1130652.179 ft
Y Location: 2456148.818 ft

Initial Displacement: 2.197 ft
Static Water Column Height: 6.65 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 6.66 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.06471 ft
Gravel Pack Porosity: 0.

No. of Observations: 84

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.197	72.66	0.947
0.42	2.164	77.46	0.907
0.84	2.162	82.86	0.861
1.32	2.135	87.66	0.831
1.86	2.122	93.66	0.787
2.34	2.096	99.66	0.751
2.94	2.074	105.7	0.721
3.54	2.051	112.3	0.683
4.14	2.034	119.5	0.651
4.8	2.022	127.3	0.61
5.52	1.991	135.1	0.588
6.3	1.954	143.5	0.549
7.08	1.932	152.5	0.52
7.92	1.904	162.1	0.496

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
8.82	1.882	171.7	0.469
9.78	1.85	182.5	0.444
10.74	1.838	193.9	0.423
11.82	1.804	205.9	0.397
12.96	1.78	218.5	0.382
14.16	1.757	231.7	0.374
15.42	1.713	246.1	0.35
16.74	1.686	261.1	0.341
18.18	1.661	276.7	0.321
19.68	1.63	293.5	0.31
21.24	1.595	311.5	0.291
22.92	1.566	330.1	0.278
24.72	1.532	350.5	0.258
26.58	1.497	371.5	0.246
28.62	1.46	393.7	0.236
30.72	1.431	417.7	0.226
32.94	1.389	442.9	0.213
35.34	1.357	469.3	0.203
37.86	1.325	497.5	0.198
40.5	1.287	527.5	0.192
43.32	1.252	559.3	0.187
46.32	1.211	592.9	0.187
49.5	1.175	628.9	0.171
52.86	1.138	664.9	0.175
56.46	1.096	706.9	0.173
60.06	1.062	748.9	0.169
64.26	1.027	790.9	0.161
68.46	0.986	838.9	0.161

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.313

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0004298	cm/sec
y0	2.038	ft

T = K*b = 0.0655 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0004298	1.54E-5	+/- 3.062E-5	27.92	cm/sec
y0	2.038	0.0256	+/- 0.05092	79.59	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.0655 cm²/sec

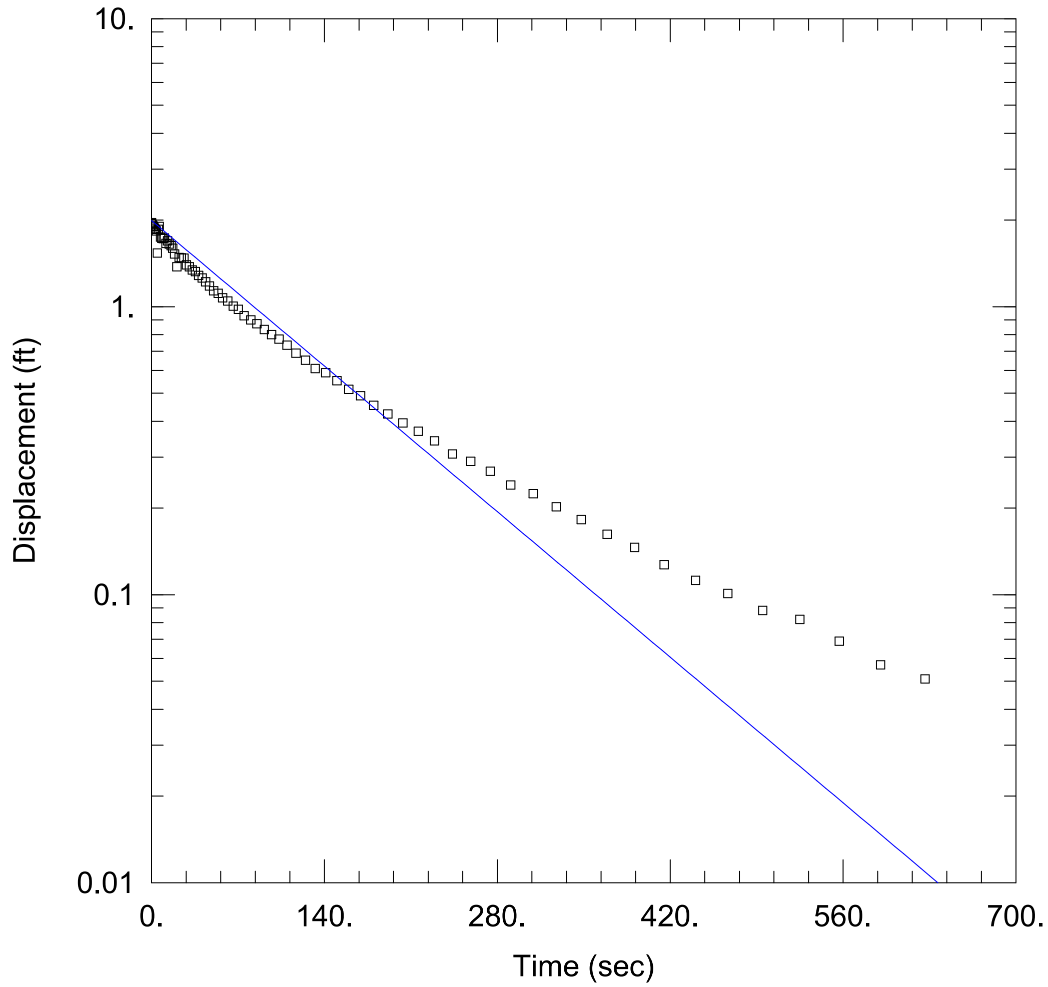
Parameter Correlations

	K	y0
K	1.00	0.60
y0	0.60	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 1.082 ft^2
Variance .... 0.0132 ft^2
Std. Deviation..... 0.1149 ft
Mean.............. 0.04488 ft
No. of Residuals .. 84
No. of Estimates .. 2



AP-6S DRAWDOWN

Data Set: J:\...\AP-6S Drawdown.aqt
Date: 09/02/25 Time: 09:54:02

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-6S
Test Date: 8-19-25

AQUIFER DATA

Saturated Thickness: 6.36 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-6S)

Initial Displacement: 1.94 ft
Total Well Penetration Depth: 5.96 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 5.933 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0004859 cm/sec
y0 = 1.99 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-6S\AP-6S Drawdow
Title: AP-6S Drawdown
Date: 09/02/25
Time: 09:54:11

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-19-25
Test Well: AP-6S

AQUIFER DATA

Saturated Thickness: 6.36 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-6S

X Location: 1130735.938 ft
Y Location: 2456104.086 ft

Initial Displacement: 1.94 ft
Static Water Column Height: 5.933 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 5.96 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07715 ft
Gravel Pack Porosity: 0.

No. of Observations: 74

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.956	70.32	0.979
0.6	1.932	75.12	0.93
1.2	1.909	80.52	0.899
1.8	1.897	85.32	0.871
2.46	1.873	91.32	0.832
3.18	1.856	97.32	0.799
3.96	1.833	103.3	0.771
4.74	1.534	109.9	0.734
5.58	1.853	117.1	0.689
6.48	1.897	124.9	0.651
7.44	1.745	132.7	0.609
8.4	1.725	141.1	0.59
9.48	1.723	150.1	0.553
10.62	1.733	159.7	0.516

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
11.82	1.659	169.3	0.49
13.08	1.693	180.1	0.454
14.4	1.648	191.5	0.424
15.84	1.63	203.5	0.395
17.34	1.597	216.1	0.369
18.9	1.522	229.3	0.342
20.58	1.374	243.7	0.308
22.38	1.482	258.7	0.29
24.24	1.477	274.3	0.268
26.28	1.473	291.1	0.24
28.38	1.396	309.1	0.224
30.6	1.375	327.7	0.202
33.	1.341	348.1	0.182
35.52	1.322	369.1	0.162
38.16	1.283	391.3	0.146
40.98	1.257	415.3	0.127
43.98	1.218	440.5	0.112
47.16	1.178	466.9	0.101
50.52	1.136	495.1	0.088
54.12	1.112	525.1	0.082
57.72	1.072	556.9	0.069
61.92	1.047	590.5	0.057
66.12	1.004	626.5	0.051

SOLUTION

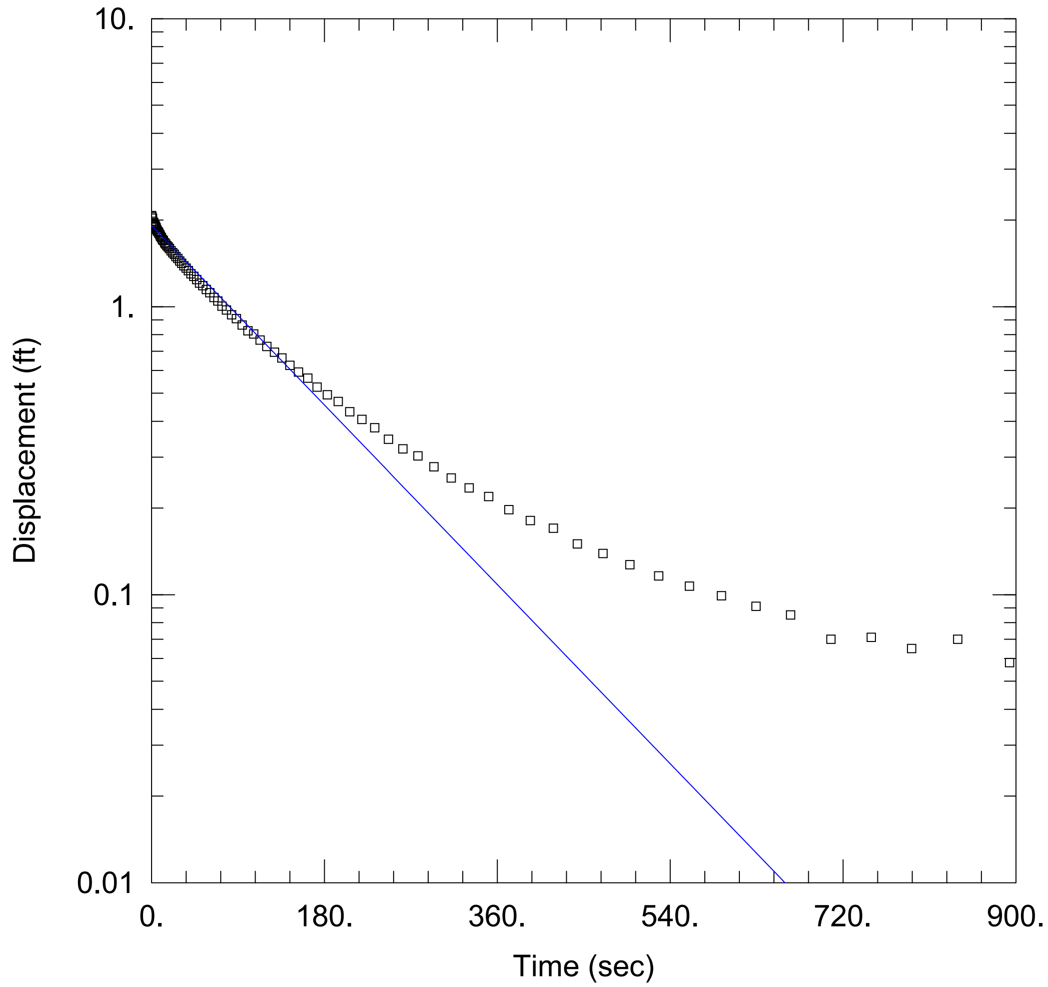
Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
In(Re/rw): 3.029

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0004859	cm/sec
y0	1.99	ft

T = K*b = 0.0942 cm²/sec



AP-6S RECOVERY

Data Set: J:\...\AP-6S Recovery.aqt
Date: 09/02/25 Time: 09:54:19

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-6S
Test Date: 8-19-25

AQUIFER DATA

Saturated Thickness: 6.36 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-6S)

Initial Displacement: 1.94 ft
Total Well Penetration Depth: 6.66 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 5.93 ft
Screen Length: 4.7 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.000509 cm/sec
y0 = 1.907 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-6S\AP-6S Recovery
Title: AP-6S Recovery
Date: 09/02/25
Time: 09:54:40

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-19-25
Test Well: AP-6S

AQUIFER DATA

Saturated Thickness: 6.36 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-6S

X Location: 1130735.938 ft
Y Location: 2456104.086 ft

Initial Displacement: 1.94 ft
Static Water Column Height: 5.93 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.7 ft
Total Well Penetration Depth: 6.66 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07715 ft
Gravel Pack Porosity: 0.

No. of Observations: 87

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.072	73.44	1.005
0.36	2.054	78.24	0.973
0.78	2.028	83.64	0.936
1.2	2.03	88.44	0.908
1.62	1.976	94.44	0.864
2.1	1.929	100.4	0.824
2.64	1.956	106.4	0.803
3.12	1.934	113.	0.766
3.72	1.912	120.2	0.728
4.32	1.895	128.	0.694
4.92	1.882	135.8	0.664
5.58	1.855	144.2	0.625
6.3	1.831	153.2	0.592
7.08	1.817	162.8	0.564

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
7.86	1.797	172.4	0.525
8.7	1.778	183.2	0.494
9.6	1.754	194.6	0.468
10.56	1.735	206.6	0.431
11.52	1.711	219.2	0.406
12.6	1.697	232.4	0.38
13.74	1.668	246.8	0.346
14.94	1.651	261.8	0.321
16.2	1.63	277.4	0.303
17.52	1.61	294.2	0.278
18.96	1.59	312.2	0.254
20.46	1.564	330.8	0.235
22.02	1.537	351.2	0.219
23.7	1.52	372.2	0.197
25.5	1.494	394.4	0.181
27.36	1.469	418.4	0.17
29.41	1.441	443.6	0.15
31.5	1.416	470.	0.139
33.72	1.386	498.2	0.127
36.12	1.361	528.2	0.116
38.64	1.332	560.	0.107
41.28	1.3	593.6	0.099
44.1	1.274	629.6	0.091
47.1	1.241	665.6	0.085
50.28	1.206	707.6	0.07
53.64	1.181	749.6	0.071
57.24	1.146	791.6	0.065
60.84	1.118	839.6	0.07
65.04	1.076	893.6	0.058
69.24	1.046		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.313

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.000509	cm/sec
y0	1.907	ft

T = K*b = 0.09868 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio

K	0.000509	1.17E-5	+/- 2.325E-5	43.52	cm/sec
y0	1.907	0.01465	+/- 0.02912	130.2	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.09868 cm²/sec

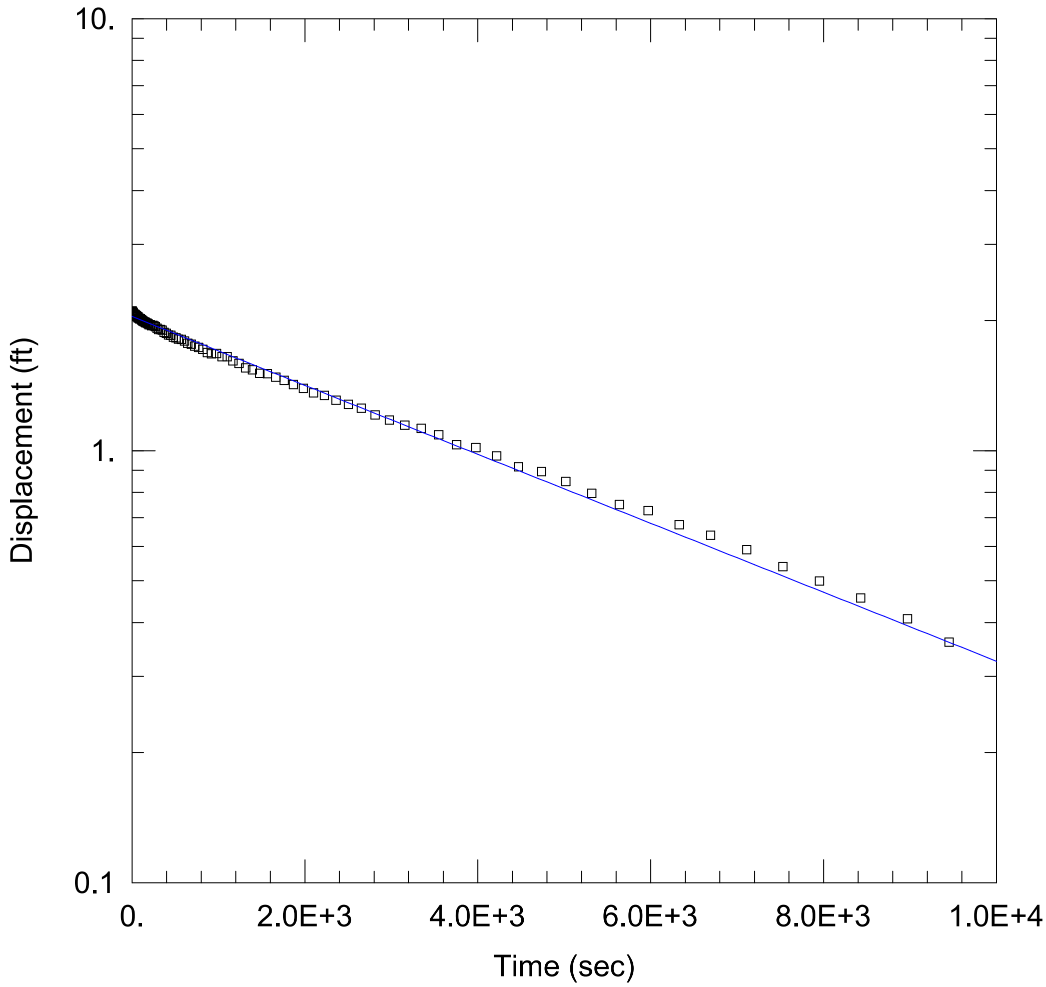
Parameter Correlations

	K	y0
K	1.00	0.58
y0	0.58	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.4247 ft^2
Variance .... 0.004996 ft^2
Std. Deviation..... 0.07068 ft
Mean.............. 0.02013 ft
No. of Residuals .. 87
No. of Estimates .. 2



AP-15D DRAWDOWN

Data Set: J:\...\AP-15D Drawdown.aqt
Date: 09/02/25
Time: 10:03:03

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-15D
Test Date: 8-19-25

AQUIFER DATA

Saturated Thickness: 2. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-15D)

Initial Displacement: 2.107 ft
Total Well Penetration Depth: 29.85 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 23.3 ft
Screen Length: 2.4 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 3.189E-5 cm/sec
y0 = 2.044 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-15D\AP-15D Drawd
Title: AP-15D Drawdown
Date: 09/02/25
Time: 10:02:54

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-19-25
Test Well: AP-15D

AQUIFER DATA

Saturated Thickness: 2. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-15D

X Location: 1127956.648 ft
Y Location: 2455904.286 ft

Initial Displacement: 2.107 ft
Static Water Column Height: 23.3 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 2.4 ft
Total Well Penetration Depth: 29.85 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07715 ft
Gravel Pack Porosity: 0.

No. of Observations: 103

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.107	507.8	1.825
1.559	2.096	539.6	1.813
3.24	2.099	573.2	1.809
5.039	2.098	609.2	1.794
6.899	2.093	645.2	1.771
8.939	2.093	687.2	1.762
11.04	2.083	729.2	1.745
13.26	2.088	771.2	1.733
15.66	2.083	819.2	1.717
18.18	2.074	873.2	1.687
20.82	2.072	921.2	1.675
23.64	2.068	981.2	1.678
26.64	2.069	1041.2	1.651
29.82	2.07	1101.2	1.649

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
33.18	2.065	1167.2	1.614
36.78	2.059	1239.2	1.592
40.38	2.061	1317.2	1.553
44.58	2.057	1395.2	1.539
48.78	2.046	1479.2	1.509
52.98	2.052	1569.2	1.508
57.78	2.044	1665.2	1.479
63.18	2.039	1761.2	1.453
67.98	2.04	1869.2	1.422
73.98	2.029	1983.2	1.394
79.98	2.027	2103.2	1.361
85.98	2.02	2229.2	1.341
92.58	2.019	2361.2	1.309
99.78	2.02	2505.2	1.279
107.6	2.009	2655.2	1.253
115.4	2.004	2811.2	1.21
123.8	1.997	2979.2	1.176
132.8	1.993	3159.2	1.145
142.4	1.988	3345.2	1.126
152.	1.984	3549.2	1.089
162.8	1.977	3759.2	1.032
174.2	1.972	3981.2	1.017
186.2	1.968	4221.2	0.972
198.8	1.957	4473.2	0.918
212.	1.957	4737.2	0.895
226.4	1.945	5019.2	0.848
241.4	1.949	5319.2	0.797
257.	1.943	5637.2	0.75
273.8	1.938	5973.2	0.726
291.8	1.92	6333.2	0.674
310.4	1.906	6693.2	0.637
330.8	1.907	7113.2	0.59
351.8	1.901	7533.2	0.539
374.	1.879	7953.2	0.499
398.	1.868	8433.2	0.456
423.2	1.854	8973.2	0.408
449.6	1.848	9453.2	0.36
477.8	1.832		

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.936

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	3.189E-5	cm/sec
y0	2.044	ft

T = K*b = 0.001944 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	3.189E-5	2.9E-7	+/- 5.754E-7	109.9	cm/sec
y0	2.044	0.004242	+/- 0.008417	481.9	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.001944 cm²/sec

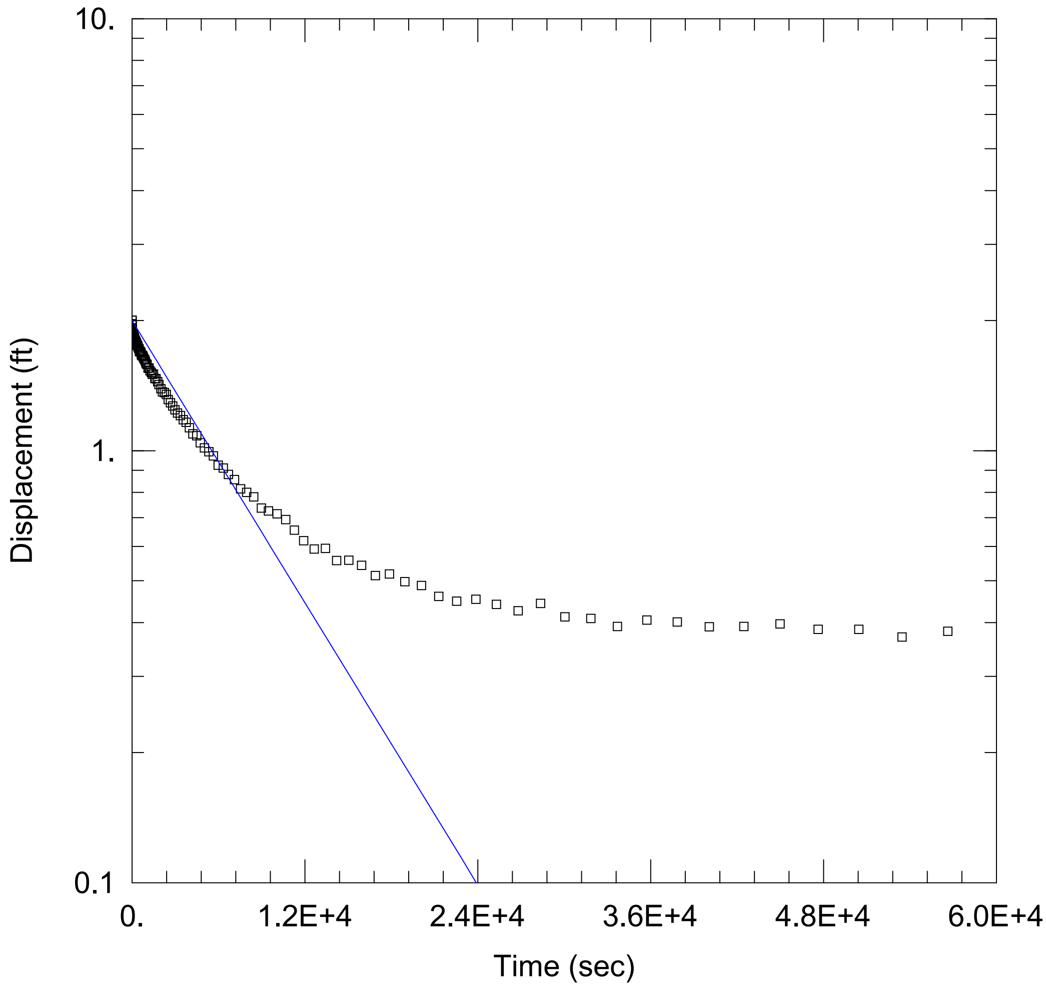
Parameter Correlations

	K	y0
K	1.00	0.50
y0	0.50	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.09811 ft^2
Variance .... 0.0009714 ft^2
Std. Deviation..... 0.03117 ft
Mean.............. 0.001176 ft
No. of Residuals .. 103
No. of Estimates .. 2



AP-15D RECOVERY

Data Set: J:\...\AP-15D Recovery.aqt
Date: 09/02/25 Time: 10:03:13

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-15D
Test Date: 8-19-25

AQUIFER DATA

Saturated Thickness: 2. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-15D)

Initial Displacement: 2.004 ft Static Water Column Height: 23.3 ft
Total Well Penetration Depth: 29.85 ft Screen Length: 2.4 ft
Casing Radius: 0.08333 ft Well Radius: 0.08333 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 2.175E-5 cm/sec y0 = 2. ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-15D\AP-15D Recove
Title: AP-15D Recovery
Date: 09/02/25
Time: 10:03:22

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-19-25
Test Well: AP-15D

AQUIFER DATA

Saturated Thickness: 2. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-15D

X Location: 1127956.057 ft
Y Location: 2455904.276 ft

Initial Displacement: 2.004 ft
Static Water Column Height: 23.3 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 2.4 ft
Total Well Penetration Depth: 29.85 ft

No. of Observations: 152

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.004	746.5	1.662
0.6	1.965	788.5	1.646
1.2	1.953	836.5	1.632
1.8	1.914	890.5	1.621
2.46	1.923	938.5	1.606
3.18	1.92	998.5	1.59
3.96	1.924	1058.5	1.584
4.741	1.915	1118.5	1.551
5.581	1.91	1184.5	1.553
6.481	1.907	1256.5	1.531
7.44	1.903	1334.5	1.518
8.4	1.908	1412.5	1.502
9.481	1.901	1496.5	1.505
10.62	1.902	1586.5	1.468
11.82	1.911	1682.5	1.467
13.08	1.897	1778.5	1.443

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
14.4	1.893	1886.5	1.423
15.84	1.894	2000.5	1.392
17.34	1.89	2120.5	1.367
18.9	1.892	2246.5	1.362
20.58	1.892	2378.5	1.35
22.38	1.89	2522.5	1.313
24.24	1.89	2672.5	1.291
26.28	1.883	2828.5	1.268
28.38	1.879	2996.5	1.243
30.6	1.88	3176.5	1.222
33.	1.88	3362.5	1.205
35.52	1.877	3566.5	1.178
38.16	1.872	3776.5	1.163
40.98	1.871	3998.5	1.13
43.98	1.868	4238.5	1.093
47.16	1.869	4490.5	1.083
50.52	1.865	4754.5	1.043
54.12	1.86	5036.5	1.015
57.72	1.868	5336.5	0.994
61.92	1.86	5654.5	0.972
66.12	1.86	5990.5	0.925
70.32	1.857	6350.5	0.912
75.12	1.848	6710.5	0.881
80.52	1.851	7130.5	0.857
85.32	1.85	7550.5	0.815
91.32	1.847	7970.5	0.8
97.32	1.841	8450.5	0.782
103.3	1.843	8990.5	0.736
109.9	1.844	9470.5	0.725
117.1	1.835	1.007E+4	0.714
124.9	1.838	1.067E+4	0.692
132.7	1.837	1.127E+4	0.654
141.1	1.829	1.193E+4	0.619
150.1	1.826	1.265E+4	0.592
159.7	1.827	1.343E+4	0.594
169.3	1.818	1.421E+4	0.557
180.1	1.809	1.505E+4	0.558
191.5	1.806	1.595E+4	0.543
203.5	1.8	1.691E+4	0.514
216.1	1.802	1.787E+4	0.518
229.3	1.8	1.895E+4	0.497
243.7	1.797	2.009E+4	0.487
258.7	1.791	2.129E+4	0.46
274.3	1.783	2.255E+4	0.448
291.1	1.777	2.387E+4	0.453
309.1	1.775	2.531E+4	0.441
327.7	1.771	2.681E+4	0.426
348.1	1.762	2.837E+4	0.443
369.1	1.752	3.005E+4	0.412
391.3	1.752	3.185E+4	0.409
415.3	1.749	3.371E+4	0.392
440.5	1.734	3.575E+4	0.405
466.9	1.723	3.785E+4	0.401

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
495.1	1.72	4.007E+4	0.391
525.1	1.696	4.247E+4	0.392
556.9	1.698	4.499E+4	0.397
590.5	1.692	4.763E+4	0.386
626.5	1.687	5.045E+4	0.386
662.5	1.668	5.345E+4	0.37
704.5	1.659	5.663E+4	0.382

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.827

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	2.175E-5	cm/sec
y0	2.	ft

T = K*b = 0.001326 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	1.576E-5	6.205E-7	+/- 1.226E-6	25.39	cm/sec
y0	1.824	0.01479	+/- 0.02922	123.3	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.0009605 cm²/sec

Parameter Correlations

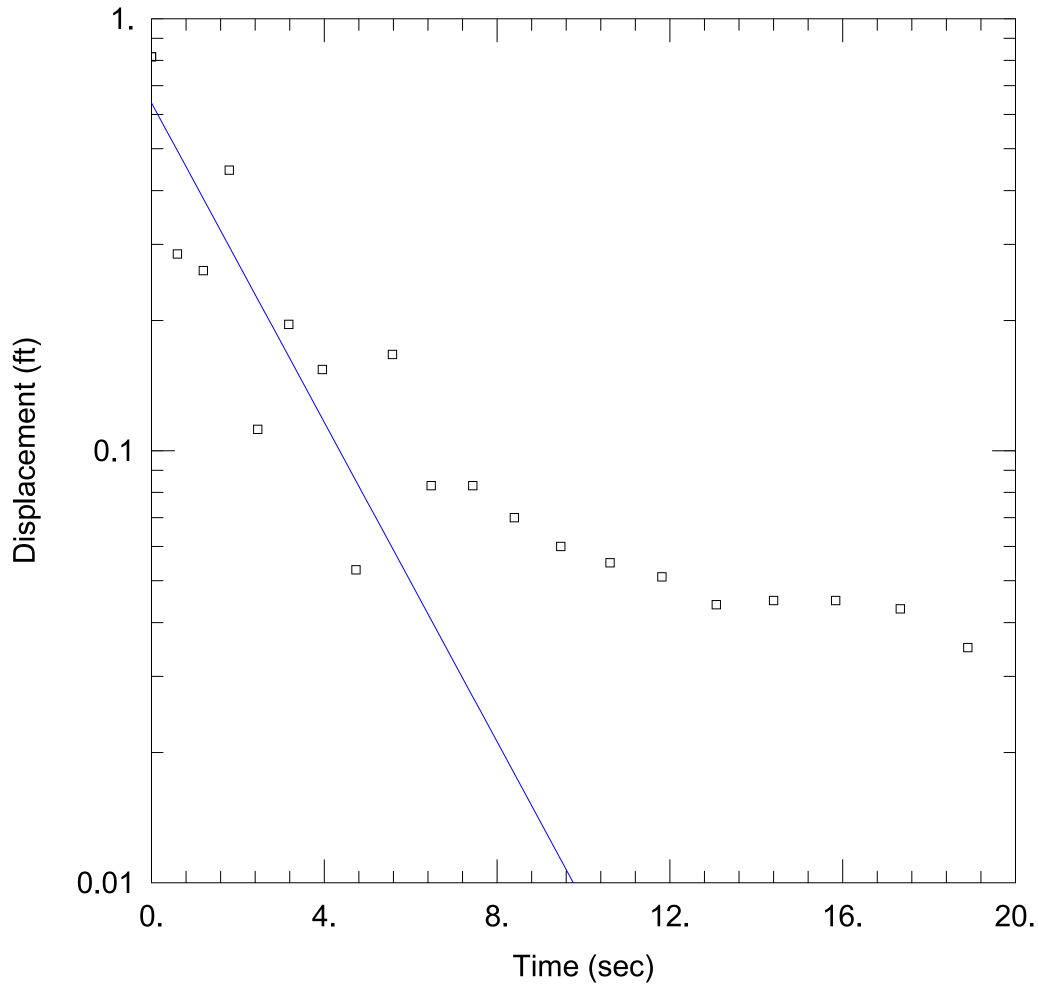
	K	y0
K	1.00	0.41
y0	0.41	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 2.758 ft^2
Variance .... 0.01838 ft^2
Std. Deviation..... 0.1356 ft
Mean.............. 0.03165 ft

No. of Residuals . . 152
No. of Estimates . . 2



AP-15S DRAWDOWN

Data Set: J:\...\AP-15S Drawdown.aqt
Date: 09/02/25
Time: 10:00:37

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-15S
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 11.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-15S)

Initial Displacement: 0.815 ft
Static Water Column Height: 16.6 ft
Total Well Penetration Depth: 22.2 ft
Screen Length: 4.73 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.03296 cm/sec
y0 = 0.6383 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-15S\AP-15S Drawd
Title: AP-15S Drawdown
Date: 09/02/25
Time: 10:00:46

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: AP-15S

AQUIFER DATA

Saturated Thickness: 11.6 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-15S

X Location: 1127960.672 ft
Y Location: 2455903.692 ft

Initial Displacement: 0.815 ft
Static Water Column Height: 16.6 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.73 ft
Total Well Penetration Depth: 22.2 ft

No. of Observations: 20

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	0.815	7.44	0.083
0.6	0.285	8.4	0.07
1.2	0.261	9.48	0.06
1.8	0.446	10.62	0.055
2.46	0.112	11.82	0.051
3.18	0.196	13.08	0.044
3.96	0.154	14.4	0.045
4.74	0.053	15.84	0.045
5.58	0.167	17.34	0.043
6.48	0.083	18.9	0.035

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice

ln(Re/rw): 4.038

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.03006	cm/sec
y0	0.6383	ft

T = K*b = 10.63 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.03296	0.006996	+/- 0.0147	4.712	cm/sec
y0	0.6383	0.0773	+/- 0.1624	8.258	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 11.66 cm²/sec

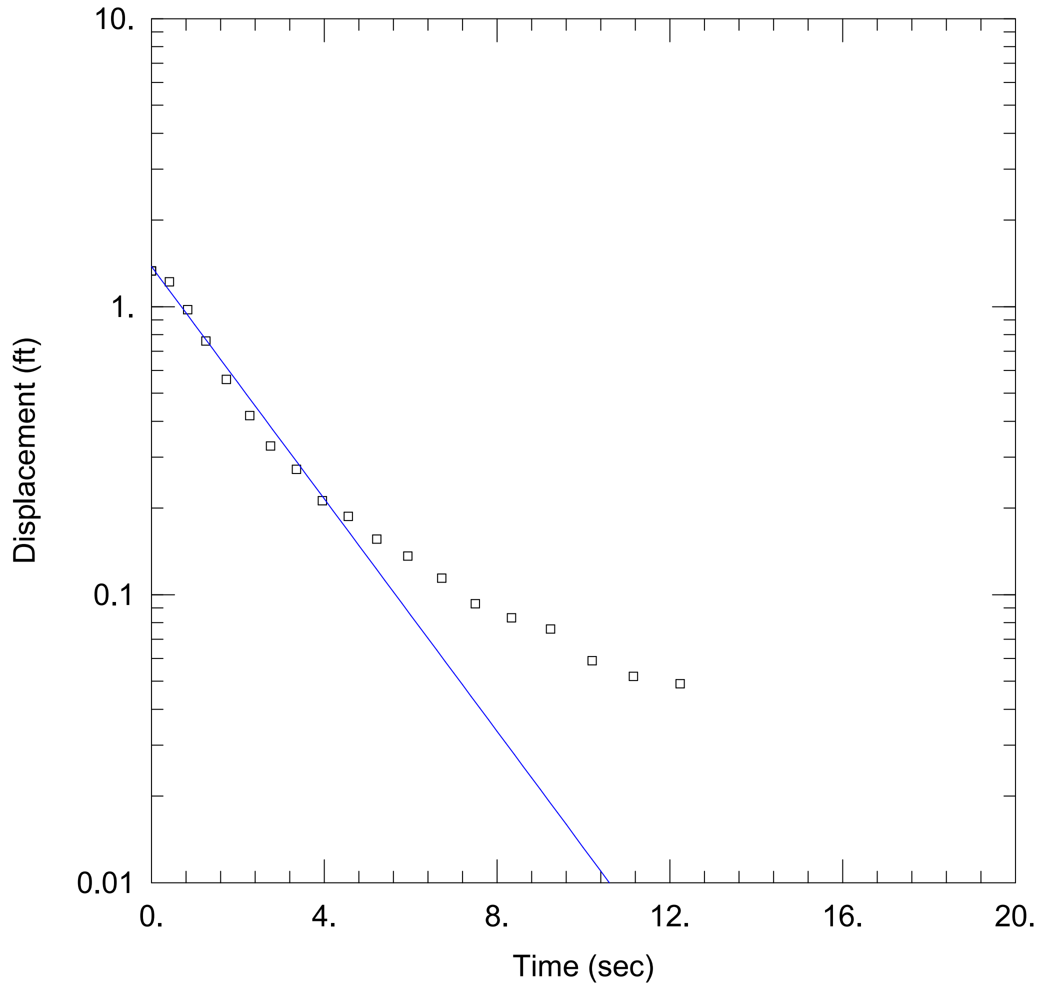
Parameter Correlations

	K	y0
K	1.00	0.61
y0	0.61	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.1628 ft^2
Variance .... 0.009046 ft^2
Std. Deviation..... 0.09511 ft
Mean.............. 0.02632 ft
No. of Residuals .. 20
No. of Estimates .. 2



AP-15S RECOVERY

Data Set: J:\...\AP-15S Recovery.aqt
Date: 09/02/25 Time: 10:00:57

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-15S
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 11.6 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-15S)

Initial Displacement: 1.331 ft
Total Well Penetration Depth: 22.2 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 16.6 ft
Screen Length: 4.73 ft
Well Radius: 0.08333 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.03597 cm/sec y0 = 1.378 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-15S\AP-15S Recove
Title: AP-15S Recovery
Date: 09/02/25
Time: 10:01:11

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: AP-15S

AQUIFER DATA

Saturated Thickness: 11.6 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-15S

X Location: 1127960.672 ft
Y Location: 2455903.692 ft

Initial Displacement: 1.331 ft
Static Water Column Height: 16.6 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 1. ft
Screen Length: 4.73 ft
Total Well Penetration Depth: 22.2 ft

No. of Observations: 19

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	1.331	5.22	0.156
0.42	1.22	5.94	0.136
0.84	0.977	6.72	0.114
1.26	0.76	7.5	0.093
1.74	0.559	8.34	0.083
2.28	0.418	9.24	0.076
2.76	0.328	10.2	0.059
3.36	0.272	11.16	0.052
3.96	0.212	12.24	0.049
4.56	0.187		

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice

ln(Re/rw): 4.038

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.03597	cm/sec
y0	1.378	ft

T = K*b = 12.72 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.03597	0.00174	+/- 0.003672	20.67	cm/sec
y0	1.378	0.03803	+/- 0.08025	36.23	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 12.72 cm²/sec

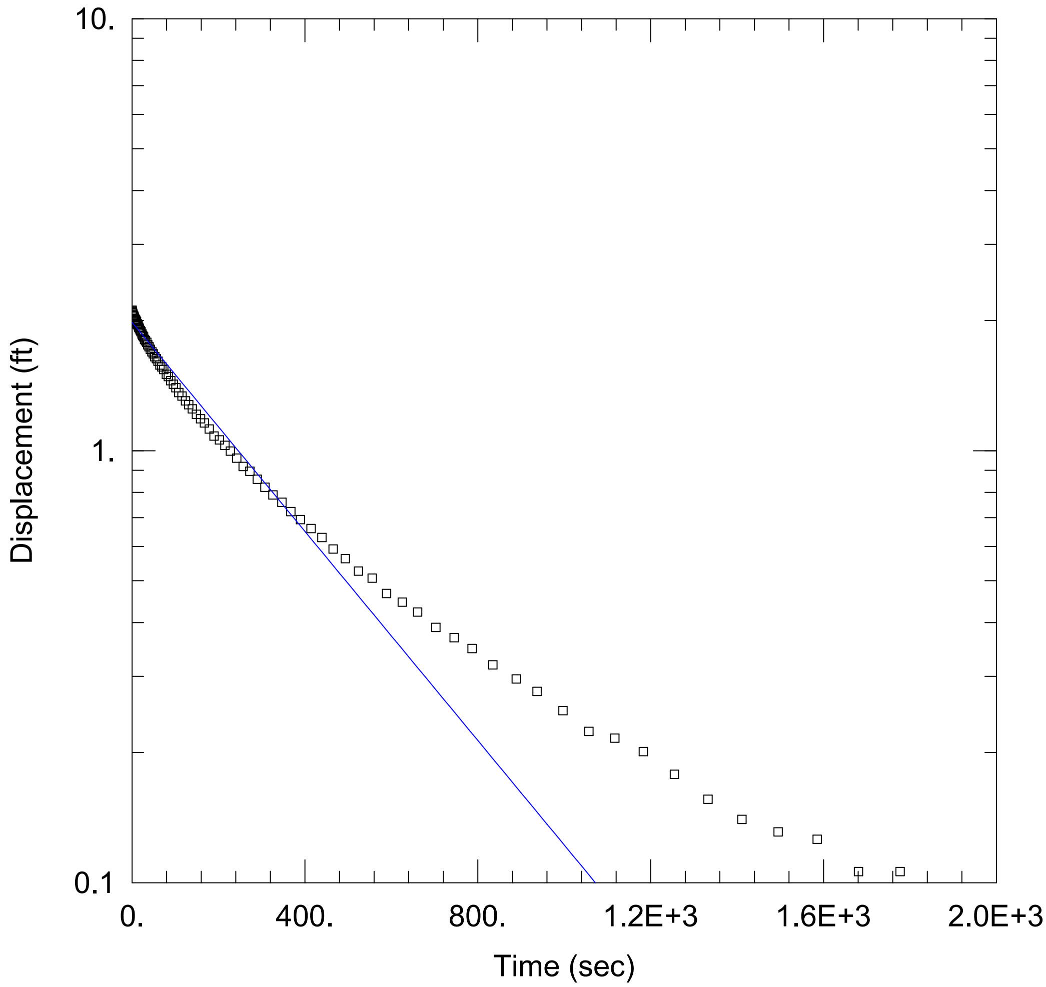
Parameter Correlations

	K	y0
K	1.00	0.63
y0	0.63	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.04332 ft^2
Variance .... 0.002548 ft^2
Std. Deviation..... 0.05048 ft
Mean.............. 0.01778 ft
No. of Residuals .. 19
No. of Estimates .. 2



AP-16 DRAWDOWN

Data Set: J:\...\AP-16 Drawdown.aqt
Date: 09/02/25
Time: 10:04:05

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-16
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 7. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-16)

Initial Displacement: 2.113 ft
Total Well Penetration Depth: 16.15 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 10.01 ft
Screen Length: 4.68 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.0002079 cm/sec
y0 = 1.981 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-16\AP-16 Drawdown
Title: AP-16 Drawdown
Date: 09/02/25
Time: 10:04:17

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: AP-16

AQUIFER DATA

Saturated Thickness: 7. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-16

X Location: 1131172.579 ft
Y Location: 2455836.828 ft

Initial Displacement: 2.113 ft
Static Water Column Height: 10.01 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.68 ft
Total Well Penetration Depth: 16.15 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07715 ft
Gravel Pack Porosity: 0.

No. of Observations: 90

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.113	131.5	1.277
0.599	2.102	139.9	1.25
1.26	2.09	148.9	1.214
1.98	2.08	158.5	1.185
2.76	2.065	168.1	1.159
3.54	2.055	178.9	1.122
4.38	2.052	190.3	1.08
5.28	2.038	202.3	1.058
6.239	2.022	214.9	1.028
7.199	2.013	228.1	0.997
8.279	2.007	242.5	0.96
9.419	1.997	257.5	0.919
10.62	1.991	273.1	0.896
11.88	1.967	289.9	0.858

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
13.2	1.961	307.9	0.823
14.64	1.946	326.5	0.789
16.14	1.929	346.9	0.759
17.7	1.915	367.9	0.722
19.38	1.898	390.1	0.692
21.18	1.884	414.1	0.66
23.04	1.862	439.3	0.629
25.08	1.845	465.7	0.592
27.18	1.835	493.9	0.562
29.4	1.81	523.9	0.526
31.8	1.797	555.7	0.507
34.32	1.78	589.3	0.467
36.96	1.757	625.3	0.446
39.78	1.739	661.3	0.423
42.78	1.715	703.3	0.39
45.96	1.692	745.3	0.369
49.32	1.674	787.3	0.348
52.92	1.649	835.3	0.319
56.52	1.634	889.3	0.296
60.72	1.612	937.3	0.277
64.92	1.579	997.3	0.25
69.12	1.561	1057.3	0.224
73.92	1.54	1117.3	0.216
79.32	1.501	1183.3	0.201
84.12	1.484	1255.3	0.178
90.12	1.452	1333.3	0.156
96.12	1.424	1411.3	0.14
102.1	1.397	1495.3	0.131
108.7	1.362	1585.3	0.126
115.9	1.338	1681.3	0.106
123.7	1.304	1777.3	0.106

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.851

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0002079	cm/sec
y0	1.981	ft

T = K*b = 0.04436 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0002079	5.116E-6	+/- 1.017E-5	40.64	cm/sec
y0	1.981	0.01501	+/- 0.02983	131.9	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.04436 cm^2/sec

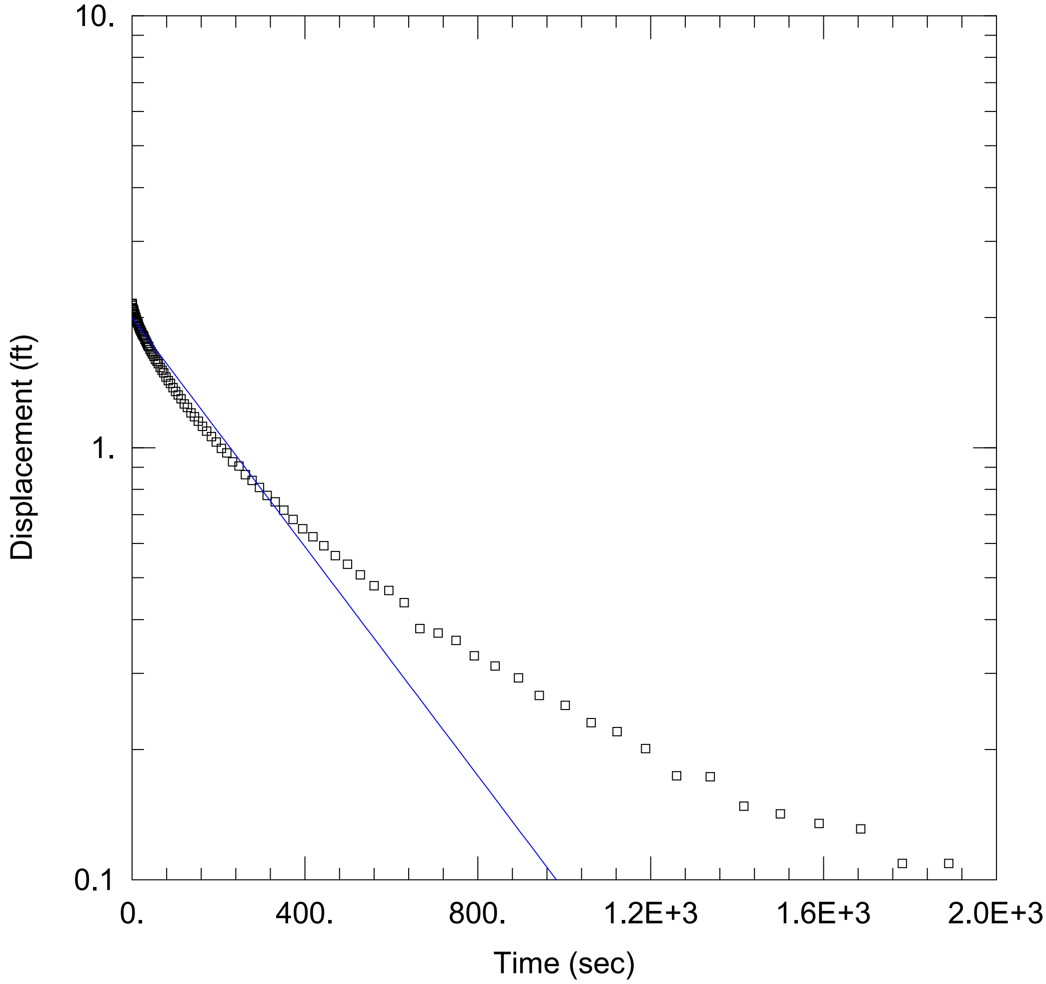
Parameter Correlations

	K	y0
K	1.00	0.56
y0	0.56	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.5863 ft^2
Variance .... 0.006662 ft^2
Std. Deviation..... 0.08162 ft
Mean.............. 0.01914 ft
No. of Residuals .. 90
No. of Estimates .. 2



AP-16 RECOVERY

Data Set: J:\...\AP-16 Recovery.aqt
Date: 09/02/25

Time: 10:04:43

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Well: AP-16
Test Date: 8-20-25

AQUIFER DATA

Saturated Thickness: 7. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (AP-16)

Initial Displacement: 2.156 ft
Total Well Penetration Depth: 16.15 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 10.01 ft
Screen Length: 4.68 ft
Well Radius: 0.08333 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.0002276 cm/sec

y0 = 1.997 ft

Data Set: J:\S\Springfield CWLP\CWLP Ash Pond\GEO\Slug Testing Data\Converted Files\AP-16\AP-16 Recovery.
Title: AP-16 Recovery
Date: 09/02/25
Time: 10:04:58

PROJECT INFORMATION

Company: Andrews Engineering
Client: CWLP
Project: 240338
Location: CWLP
Test Date: 8-20-25
Test Well: AP-16

AQUIFER DATA

Saturated Thickness: 7. ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: AP-16

X Location: 1131172.579 ft
Y Location: 2455836.828 ft

Initial Displacement: 2.156 ft
Static Water Column Height: 10.01 ft
Casing Radius: 0.08333 ft
Well Radius: 0.08333 ft
Well Skin Radius: 0.3438 ft
Screen Length: 4.68 ft
Total Well Penetration Depth: 16.15 ft
Corrected Casing Radius (Bouwer-Rice Method): 0.07715 ft
Gravel Pack Porosity: 0.

No. of Observations: 102

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
0.	2.156	101.	1.35
0.25	2.153	107.	1.325
0.609	2.136	113.6	1.296
0.97	2.133	120.8	1.263
1.389	2.11	128.6	1.239
1.809	2.103	136.4	1.203
2.229	2.097	144.8	1.179
2.71	2.091	153.8	1.151
3.249	2.086	163.4	1.12
3.729	2.079	173.	1.091
4.329	2.067	183.8	1.06
4.929	2.063	195.2	1.03
5.529	2.046	207.2	0.995
6.189	2.038	219.8	0.972

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
6.909	2.033	233.	0.927
7.689	2.012	247.4	0.907
8.47	2.004	262.4	0.866
9.31	1.997	278.	0.839
10.21	1.984	294.8	0.808
11.17	1.962	312.8	0.775
12.13	1.959	331.4	0.749
13.21	1.942	351.8	0.716
14.35	1.935	372.8	0.682
15.55	1.917	395.	0.649
16.81	1.904	419.	0.622
18.13	1.886	444.2	0.593
19.57	1.872	470.6	0.562
21.07	1.858	498.8	0.537
22.63	1.846	528.8	0.508
24.31	1.827	560.6	0.479
26.11	1.818	594.2	0.467
27.97	1.805	630.2	0.438
30.01	1.782	666.2	0.381
32.11	1.764	708.2	0.372
34.33	1.745	750.2	0.358
36.73	1.725	792.2	0.33
39.25	1.713	840.2	0.312
41.89	1.686	894.2	0.293
44.71	1.666	942.2	0.267
47.71	1.646	1002.2	0.253
50.89	1.626	1062.2	0.231
54.25	1.6	1122.2	0.22
57.85	1.584	1188.2	0.201
61.45	1.564	1260.2	0.174
65.65	1.533	1338.2	0.173
69.85	1.509	1416.2	0.148
74.05	1.488	1500.2	0.142
78.85	1.456	1590.2	0.135
84.25	1.43	1686.2	0.131
89.05	1.408	1782.2	0.109
95.05	1.377	1890.2	0.109

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Bouwer-Rice
ln(Re/rw): 3.851

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0002276	cm/sec
y0	1.997	ft

T = K*b = 0.04857 cm²/sec

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
K	0.0002276	6.531E-6	+/- 1.296E-5	34.86	cm/sec
y0	1.997	0.01632	+/- 0.03239	122.3	ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

T = K*b = 0.04857 cm²/sec

Parameter Correlations

	K	y0
K	1.00	0.53
y0	0.53	1.00

Residual Statistics

for weighted residuals

Sum of Squares... 0.9793 ft^2
Variance .... 0.009793 ft^2
Std. Deviation..... 0.09896 ft
Mean.............. 0.02408 ft
No. of Residuals .. 102
No. of Estimates .. 2

PACKER TEST DATA

Packer Test Summary Table
CWLP Ash Pond Investigation

Boring	Bottom of Top Packer (ft. BGS)	Top of Bottom Packer (ft. BGS)	Hydraulic Conductivity	Formation	Comment
B100	93	103.5	1.00E-09	shale w/ claystone, limestone interbeddings	No take
B100	93	103.5	2.69E-07	shale w/ claystone, limestone interbeddings	took .05 gallons during test
B100	93	103.5	1.00E-09	shale w/ claystone, limestone interbeddings	No take
B100	93	103.5	1.00E-09	shale w/ claystone, limestone interbeddings	No take
B100	93	103.5	1.00E-09	shale w/ claystone, limestone interbeddings	No take
B100	82.5	93	1.00E-09	shale w/ claystone interbeddings	No take, switch gauges from 0-200 psi to 0-100 psi prior to test.
B100	82.5	93	1.00E-09	shale w/ claystone interbeddings	No take
B100	82.5	93	1.00E-09	shale w/ claystone interbeddings	No take
B100	82.5	93	1.00E-09	shale w/ claystone interbeddings	No take
B100	82.5	93	1.00E-09	shale w/ claystone interbeddings	No take
B100	72	82.5	1.00E-09	shale w/ claystone interbeddings	No take
B100	72	82.5	1.00E-09	shale w/ claystone interbeddings	No take
B100	72	82.5	1.00E-09	shale w/ claystone interbeddings	No take
B100	72	82.5	1.00E-09	shale w/ claystone interbeddings	No take
B100	72	82.5	1.00E-09	shale w/ claystone interbeddings	No take
B100	61.5	72	1.00E-09	shale w/ claystone interbeddings	No take
B100	61.5	72	1.00E-09	shale w/ claystone interbeddings	No take
B100	61.5	72	2.60E-07	shale w/ claystone interbeddings	
B100	61.5	72	4.33E-07	shale w/ claystone interbeddings	
B100	61.5	72	2.60E-07	shale w/ claystone interbeddings	
B100	51	61.5	1.00E-09	shale w/ claystone interbeddings	No take
B100	51	61.5	1.00E-09	shale w/ claystone interbeddings	No take
B100	51	61.5	1.20E-06	shale w/ claystone interbeddings	pressure drpped on 60 psi test so next test terminated.
B100	40.5	51	1.28E-05	shale w/ claystone interbeddings	
B100	40.5	51	3.17E-04	shale w/ claystone interbeddings	pressure drpped on 45 psi test so next test terminated.
B100	38.5	49	3.91E-05	shale	packer blowout. Replace backer and resumed test.
B100	38.5	49	4.26E-04	shale	could only maintain 28 psi on the planned 30 psi test.

Packer Test Solution - CWLP Ash Ponds - Springfield, IL.
"Methods and procedures for defining aquifer parameters" (by John Sevee);
in Practical Handbook of Ground-Water Monitor`
Friction loss calculation using Hazen-Williams formula.
[Hf = (3.022)(v)^1.85(L) / (C)^1.85(D)^1.165]

Shale
Date: 5/23/2024
Boring B100
0.14 Radius of test hole (in ft.)
2.67 Gauge height above ground (in ft.)
4.9 Depth to Water Below Ground (in ft.) - Water level after filling boring before testing.

Test No.	Bottom of Top Packer (ft)	Top of Bottom Packer (ft)	Depth [interval midpoint] (ft)	Length of Interval (ft)	Initial Gauge Reading (gal)	End Gauge Reading (gal)	Begin Time (min)	End Time (min)	Constant flow rate Q (in gal/min)	Static Head Hs (in feet)	Gauge pressure p (in psi)	Fluid head Hp = p * 2.3 (in feet)	Friction loss Hf (in feet)	Differential head Hs+Hp+Hg-Hf (in feet)		Hydraulic Cond K (in cm/sec)	Nat Log ln(L/r)	Inv Hyp Sin sinh-1 (L/2r)	Convert Q gal/min to cu ft/sec
1a	93	103.5	98.25	10.5	2711.65	2711.65	0	15	0	93.35	15	34.5	0	130.52	≦	1.00E-09	4.32	4.32	0.00E+00
1b	93	103.5	98.25	10.5	2711.8	2711.95	0	15	0.01	93.35	30	69	4.08E-05	165.02	≦	2.69E-07	4.32	4.32	2.23E-05
1c	93	103.5	98.25	10.5	2711.9	2711.9	0	15	0	93.35	45	103.5	0	199.52	≦	1.00E-09	4.32	4.32	0.00E+00
1d	93	103.5	98.25	10.5	2711.95	2711.95	0	15	0	93.35	60	138	0	234.02	≦	1.00E-09	4.32	4.32	0.00E+00
1e	93	103.5	98.25	10.5	2711.9	2711.9	0	15	0	93.35	45	103.5	0	199.52	≦	1.00E-09	4.32	4.32	0.00E+00
														mean K (cm/sec)		5.47E-08			

Shale
Date: 5/23/2024
Boring B100
0.14 Radius of test hole (in ft.)
2.67 Gauge height above ground (in ft.)
2.4 Depth to Water Below Ground (in ft.) - Water level after filling boring before testing.

Test No.	Bottom of Top Packer (ft)	Top of Bottom Packer (ft)	Depth [interval midpoint] (ft)	Length of Interval (ft)	Initial Gauge Reading (gal)	End Gauge Reading (gal)	Begin Time (min)	End Time (min)	Constant flow rate Q (in gal/min)	Static Head Hs (in feet)	Gauge pressure p (in psi)	Fluid head Hp = p * 2.3 (in feet)	Friction loss Hf (in feet)	Differential head Hs+Hp+Hg-Hf (in feet)		Hydraulic Cond K (in cm/sec)	Nat Log ln(L/r)	Inv Hyp Sin sinh-1 (L/2r)	Convert Q gal/min to cu ft/sec
1a	82.5	93	87.75	10.5	2712.35	2712.35	0	15	0	85.35	15	34.5	0	122.52	≦	1.00E-09	4.32	4.32	0.00E+00
1b	82.5	93	87.75	10.5	2712.4	2712.4	0	15	0	85.35	30	69	0	157.02	≦	1.00E-09	4.32	4.32	0.00E+00
1c	82.5	93	87.75	10.5	2712.4	2712.4	0	15	0	85.35	45	103.5	0	191.52	≦	1.00E-09	4.32	4.32	0.00E+00
1d	82.5	93	87.75	10.5	2712.4	2712.4	0	15	0	85.35	60	138	0	226.02	≦	1.00E-09	4.32	4.32	0.00E+00
1e	82.5	93	87.75	10.5	2712.4	2712.4	0	15	0	85.35	45	103.5	0	191.52	≦	1.00E-09	4.32	4.32	0.00E+00
														mean K (cm/sec)		1.00E-09			

Packer Test Solution - CWLP Ash Ponds - Springfield, IL.
"Methods and procedures for defining aquifer parameters" (by John Sevee);
in Practical Handbook of Ground-Water Monitor`
Friction loss calculation using Hazen-Williams formula.
[Hf = (3.022)(v)^1.85(L) / (C)^1.85(D)^1.165]

Shale
Date: 5/24/2024
Boring B100
0.14 Radius of test hole (in ft.)
2.67 Gauge height above ground (in ft.)
1.2 Depth to Water Below Ground (in ft.) - Water level after filling boring before testing.

Test No.	Bottom of Top Packer (ft)	Top of Bottom Packer (ft)	Depth [interval midpoint] (ft)	Length of Interval (ft)	Initial Gauge Reading (gal)	End Gauge Reading (gal)	Begin Time (min)	End Time (min)	Constant flow rate Q (in gal/min)	Static Head Hs (in feet)	Gauge pressure p (in psi)	Fluid head Hp = p * 2.3 (in feet)	Friction loss Hf (in feet)	Differential head Hs+Hp+Hg-Hf (in feet)		Hydraulic Cond K (in cm/sec)	Nat Log ln(L/r)	Inv Hyp Sin sinh-1 (L/2r)	Convert Q gal/min to cu ft/sec
1a	72	82.5	77.25	10.5	2717.85	2717.85	0	15	0	76.05	15	34.5	0	113.22	≦	1.00E-09	4.32	4.32	0.00E+00
1b	72	82.5	77.25	10.5	2717.85	2717.85	0	15	0	76.05	30	69	0	147.72	≦	1.00E-09	4.32	4.32	0.00E+00
1c	72	82.5	77.25	10.5	2717.85	2717.85	0	15	0	76.05	45	103.5	0	182.22	≦	1.00E-09	4.32	4.32	0.00E+00
1d	72	82.5	77.25	10.5	2717.85	2717.85	0	15	0	76.05	60	138	0	216.72	≦	1.00E-09	4.32	4.32	0.00E+00
1e	72	82.5	77.25	10.5	2717.85	2717.85	0	15	0	76.05	45	103.5	0	182.22	≦	1.00E-09	4.32	4.32	0.00E+00
														mean K (cm/sec)		1.00E-09			

Shale
Date: 5/24/2024
Boring B100
0.14 Radius of test hole (in ft.)
2.67 Gauge height above ground (in ft.)
2.2 Depth to Water Below Ground (in ft.) - Water level after filling boring before testing.

Test No.	Bottom of Top Packer (ft)	Top of Bottom Packer (ft)	Depth [interval midpoint] (ft)	Length of Interval (ft)	Initial Gauge Reading (gal)	End Gauge Reading (gal)	Begin Time (min)	End Time (min)	Constant flow rate Q (in gal/min)	Static Head Hs (in feet)	Gauge pressure p (in psi)	Fluid head Hp = p * 2.3 (in feet)	Friction loss Hf (in feet)	Differential head Hs+Hp+Hg-Hf (in feet)		Hydraulic Cond K (in cm/sec)	Nat Log ln(L/r)	Inv Hyp Sin sinh-1 (L/2r)	Convert Q gal/min to cu ft/sec
1a	61.5	72	66.75	10.5	2724.05	2724.05	0	15	0	64.55	15	34.5	0	101.72	≦	1.00E-09	4.32	4.32	0.00E+00
1b	61.5	72	66.75	10.5	2724.05	2724.05	0	15	0	64.55	30	69	0	136.22	≦	1.00E-09	4.32	4.32	0.00E+00
1c	61.5	72	66.75	10.5	2724.05	2724.2	0	15	0.01	64.55	45	103.5	2.77E-05	170.72	≦	2.60E-07	4.32	4.32	2.23E-05
1d	61.5	72	66.75	10.5	2724.2	2724.5	0	15	0.02	64.55	60	138	1.00E-04	205.22	≦	4.33E-07	4.32	4.32	4.46E-05
1e	61.5	72	66.75	10.5	2724.5	2724.65	0	15	0.01	64.55	45	103.5	2.77E-05	170.72	≦	2.60E-07	4.32	4.32	2.23E-05
														mean K (cm/sec)		1.91E-07			

Packer Test Solution - CWLP Ash Ponds - Springfield, IL.
"Methods and procedures for defining aquifer parameters" (by John Sevee);
in Practical Handbook of Ground-Water Monitor`
Friction loss calculation using Hazen-Williams formula.
[Hf = (3.022)(v)^1.85(L) / (C)^1.85(D)^1.165]

Shale
Date: 5/24/2024
Boring B100
0.14 Radius of test hole (in ft.)
2.67 Gauge height above ground (in ft.)
2.1 Depth to Water Below Ground (in ft.) - Water level after filling boring before testing.

Test No.	Bottom of Top Packer (ft)	Top of Bottom Packer (ft)	Depth [interval midpoint] (ft)	Length of Interval (ft)	Initial Gauge Reading (gal)	End Gauge Reading (gal)	Begin Time (min)	End Time (min)	Constant flow rate Q (in gal/min)	Static Head Hs (in feet)	Gauge pressure p (in psi)	Fluid head Hp = p * 2.3 (in feet)	Friction loss Hf (in feet)	Differential head Hs+Hp+Hg-Hf (in feet)		Hydraulic Cond K (in cm/sec)	Nat Log ln(L/r)	Inv Hyp Sin sinh-1 (L/2r)	Convert Q gal/min to cu ft/sec
1a	51	61.5	56.25	10.5	2732	2732	0	15	0	54.15	15	34.5	0	91.32	≦	1.00E-09	4.32	4.32	0.00E+00
1b	51	61.5	56.25	10.5	2732	2732	0	15	0	54.15	30	69	0	125.82	≦	1.00E-09	4.32	4.32	0.00E+00
1c	51	61.5	56.25	10.5	2732	2732.65	0	15	0.04	54.15	45	103.5	3.52E-04	160.32	≦	1.20E-06	4.32	4.32	9.65E-05
														mean K (cm/sec)		4.01E-07			

Shale
Date: 5/24/2024
Boring B100
0.14 Radius of test hole (in ft.)
2.67 Gauge height above ground (in ft.)
1.9 Depth to Water Below Ground (in ft.) - Water level after filling boring before testing.

Test No.	Bottom of Top Packer (ft)	Top of Bottom Packer (ft)	Depth [interval midpoint] (ft)	Length of Interval (ft)	Initial Gauge Reading (gal)	End Gauge Reading (gal)	Begin Time (min)	End Time (min)	Constant flow rate Q (in gal/min)	Static Head Hs (in feet)	Gauge pressure p (in psi)	Fluid head Hp = p * 2.3 (in feet)	Friction loss Hf (in feet)	Differential head Hs+Hp+Hg-Hf (in feet)		Hydraulic Cond K (in cm/sec)	Nat Log ln(L/r)	Inv Hyp Sin sinh-1 (L/2r)	Convert Q gal/min to cu ft/sec
1a	40.5	51	45.75	10.5	2814.4	2817.9	0	15	0.23	43.65	15	34.5	0.01	80.81	≦	1.28E-05	4.32	4.32	5.20E-04
1b	40.5	51	45.75	10.5	2718.8	2837.5	0	15	7.91	43.65	30	69	4.38	110.94	≦	3.17E-04	4.32	4.32	1.76E-02
														mean K (cm/sec)		1.65E-04			

Packer Test Solution - CWLP Ash Ponds - Springfield, IL.
"Methods and procedures for defining aquifer parameters" (by John Sevee);
in Practical Handbook of Ground-Water Monitor`
Friction loss calculation using Hazen-Williams formula.
[Hf = (3.022)(v)^1.85(L) / (C)^1.85(D)^1.165]

Shale
Date: 5/24/2024
Boring B100

0.14 Radius of test hole (in ft.)
2.67 Gauge height above ground (in ft.)
1.2 Depth to Water Below Ground (in ft.) - Water level after filling boring before testing.

Test No.	Bottom of Top Packer (ft)	Top of Bottom Packer (ft)	Depth [interval midpoint] (ft)	Length of Interval (ft)	Initial Gauge Reading (gal)	End Gauge Reading (gal)	Begin Time (min)	End Time (min)	Constant flow rate Q (in gal/min)	Static Head Hs (in feet)	Gauge pressure p (in psi)	Fluid head Hp = p * 2.3 (in feet)	Friction loss Hf (in feet)	Differential head Hs+Hp+Hg-Hf (in feet)		Hydraulic Cond K (in cm/sec)	Nat Log ln(L/r)	Inv Hyp Sin sinh-1 (L/2r)	Convert Q gal/min to cu ft/sec
1a	38.5	49	43.75	10.5	2914	2924.4	0	15	0.69	41.65	15	34.5	0.05	78.77	≦	3.91E-05	4.32	4.32	1.54E-03
1b	38.5	49	43.75	10.5	2925.8	3073	0	15	9.81	41.65	28	64.4	6.23	102.49	≦	4.26E-04	4.32	4.32	2.19E-02
														mean K (cm/sec)		2.32E-04			

APPENDIX E:

LABORATORY SOILS ANALYSES

APPENDIX E1:
APPLICATION LOG NO. 1995-243

Table 4
Summary of Laboratory Test Results for Creek Fill Materials

Boring/ Piezometer	Sample Number	Depth (ft)	USCS Symbol	Moisture Content (%)	Grain Size Analysis			Atterberg Limits			Dry Density (pcf)	Unconfined Compressive Strength (tsf)	Hydraulic Conductivity (cm/sec)	Cation Exchange Capacity (meq/100 gm)
					Gravel (%)	Sand (%)	Silt or Clay (%)	LL	PL	PI				
B-7	SS-4	6.0-8.0	CL	24.4	0	33	46/21*							
CB-1	3T-5	8.0-10.0	CL	27.4				44	23	18	95.5		$1.5x10^{-7}$	
CB-1	3T-5	8.0-10.0	CL	29.4							94.4	0.6		
CB-2	3T-9	16.0-18.0	ML	37.8				34	25	9	79.6		$2.4x10^{-7}$	
CB-3	SS-4	6.0-8.0	CL-ML	20.5	0	48	52							
CB-8	SS-3	4.0-6.0	OL	31.4				35	21	14				
CB-9	SS-5	8.0-10.0	OL	34.2										18.1
P-1D	SS-5	8.0-10.0	OL	20.4				46	20	26				
P-2D	3T-15	28.0-30.0	CL	25.9							99.1		$7.3x10^{-7}$	
P-1S	SS-2A	38.0-38.7	SC**	19.3	2	65	33							
P-3S	SS-3	10.0-12.0	SM**	-	0	55	45							
P-5D	SS-4	6.0-8.0	OL	31.8				45	25	20				
P-5S	3T-2	10.0-12.0	OL	26.3							95.7		$7.6x10^{-8}$	
P-8D	SS-4	60.-8.0	OL	25.3				37	21	16				
P-8S	SS-3	10.0-12.0	OL	41.0	0	12	62/26*							
B-13***	2-ST	5.0-7.0	CL/OL	37.2	0	2	67/31*	39	23	16	83.7		$2.2x10^{-7}$	14.0
B-16***	2-ST	5.0-7.0	CL/OL	22.1	0	5	67/28*	38	28	10	104.4		$2.1x10^{-7}$	16.0
P-9D****	**3T-8**	**14.0-16.0**	**CL**	**22.7**							**102.3**		**$3.3x10^{-8}$**	

* *Represent percentages of silt and clay based on hydrometer analysis*
** *Granular Creek Fill*
*** *Based on PSI (1989) investigation*
**** *Berm Fill*

ref:hb\496b\496b-4.tbl

Table 5 Summary of Slug Test Results for Creek Fill					
Location	Soil Type Tested	USCS Classification	Calculated Hydraulic Conductivity (cm/sec)		
			Recovery Test	Drawdown Test	Average Value
P-1S	Clayey sand	SC	2.4×10^{-4}	6.1×10^{-5}	1.5×10^{-4}
P-3S	Silty sand	SM	5.6×10^{-3}	1.5×10^{-2}	1.0×10^{-2}
P-5S	Organic silty clay	OL	7.1×10^{-5}	1.1×10^{-4}	8.6×10^{-5}
P-8S	Clayey sand	SC	1.2×10^{-4}	NT	1.2×10^{-4}

Refer to Appendix D for detailed test results.
NT = Not Tested

ref:hb/496b/496b-5.tbl

Table 6
Summary of Laboratory Test Results for Upper Cohesive Deposit

Boring/ Piezometer	Sample Number	Depth (ft)	USCS Symbol	Moisture Content (%)	Grain Size Analysis			Atterberg Limits			Dry Density (pcf)	Unconfined Compressive Strength (tsf)	Hydraulic Conductivity (cm/sec)	Cation Exchange Capacity (meq/100 gm)
					Gravel (%)	Sand (%)	Silt or Clay (%)	LL	PL	PI				
B-4	3T-4	6.0 - 8.0	CL	28.0							98.7		4.7×10^{-8}	
P-6D	SS-2	2.0 - 4.0	CL	21.2				29	18	11				
P-6S	SS-2A	6.0 - 6.5	CL	23.4	0	14	86							
P-7D	SS-3	4.0 - 6.0	CL	21.7				33	19	14				
P-7D	SS-4	6.0 - 8.0	CL	25.3										16.5
P-7D	3T-5	8.0 - 10.0	CL	22.6							101.2		2.0×10^{-7}	
P-7S	SS-1B	10.5 - 11.0	CL	-	0	43	40/17*							
B-5**	2-ST	5.0 - 7.0	CL/ML	24.3	0	18	63/19*	23	21	2	100.8		1.6×10^{-8}	11.0
B-15**	2-ST	5.0 - 7.0	CL/ML	23.9	0	15	62/23*	27	19	8	102.8		5.2×10^{-7}	12.0
B-16**	4-ST	10.0 - 12.0	CL/ML	24.2	0	40	55/5*	Non-Plastic			102.1		7.6×10^{-8}	10.0

* Represent percentages of silt and clay based on hydrometer analysis.
** Based on PSI (1989) investigation.

ref:hb\496b\496b-6.tbl

Table 7 Summary of Laboratory Test Results for Shallow Sand															
Boring/ Piezometer	Sample Number	Depth (ft)	USCS Symbol	Moisture Content (%)	Grain Size Analysis			Atterberg Limits			Dry Density (pcf)	Unconfined Compressive Strength (tsf)	Hydraulic Conductivity (cm/sec)	Cation Exchange Capacity (meq/100 gm)
					Gravel (%)	Sand (%)	Silt or Clay (%)	LL	PL	PI				
B-1	SS-7	12.0 - 14.0	SC	21.8	0	50	50							
P-7D	SS-6B	11.5 - 12.0	SC	23.1	0	52	48							

ref:hb\496b\496b-7.tbl

** Represent percentages of silt and clay based on hydrometer analysis.*

Table 8

Summary of Slug Test Results for Shallow Sand

Location	Soil Type Tested	USCS Classification	Calculated Hydraulic Conductivity (cm/sec)		
			Recovery Test	Drawdown Test	Average Value
P-6S	Clayey sand	SC	2.9×10^{-2}	1.6×10^{-2}	2.2×10^{-2}
P-7S	Clayey sand	SC	3.6×10^{-3}	4.3×10^{-3}	3.9×10^{-3}

Refer to Appendix D for detailed test results
NT = Not Tested

ref:hb/496b/496b-8.tbl

Table 9
Summary of Laboratory Test Results for Lower Cohesive Deposits

Boring/ Piezometer	Sample Number	Depth (ft)	USCS Symbol	Moisture Content (%)	Grain Size Analysis			Atterberg Limits			Dry Density (pcf)	Unconfined Compressive Strength (tsf)	Hydraulic Conductivity (cm/sec)	Cation Exchange Capacity (meq/100 gm)
					Gravel (%)	Sand (%)	Silt or Clay (%)	LL	PL	PI				
B-1	SS-9	16.0 - 18.0	ML/CL-ML	36.9				25	22	3				
B-3	3T-20	38.0 - 40.0	CL	24.6							104.2		8.2×10^{-8}	
B-4	SS-8	12.0 - 14.0	CL	29.1	0	8	70/22*	32	20	12				
B-6	SS-10	18.0 - 20.0	CL-ML/CL	23.5				25	20	5				
B-6	SS-14	26.0 - 28.0	CL-ML	25.1	0	44	56							
B-7	SS-9	16.0 - 18.0	CL-ML	18.2	0	38	50/12*							
B-9	SS-8	14.0 - 16.0	CL	24.6										10.7
CB-2	SS-11	20.0 - 22.0	CL	34.9				47	22	25				
CB-3	SS-9	16.0 - 18.0	CL-ML	27.1	0	33	55/12*							
CB-4	3T-9	16.0 - 18.0	CL/CL-ML	23.9							103.3		4.3×10^{-7}	
CB-6	3T-7	12.0 - 14.0	CL	29.9							95.3		5.3×10^{-7}	
CB-6	3T-7	12.0 - 14.0	CL	26.4							99.0	1.4		
CB-6	SS-12	22.0 - 24.0	ML/CL-ML	23.6				23	20	3				
P-3D	3T-9	16.0 - 18.0	CL	34.5							89.2		1.3×10^{-8}	
P-3D	SS-13	24.0 - 26.0	CH	53.7				71	32	39				
P-4	3T-11	20.0 - 22.0	CH	40.9							78.2		2.9×10^{-8}	
P-4	SS-16	30.0 - 32.0	CH	52.6				67	30	37				
P-7D	SS-8	14.0 - 16.0	CL-ML/CL	26.9				29	22	7				
P-7D	SS-13	24.0 - 26.0	CL-ML	24.3	0	34	54/12*							
P-7M	3T-2	18.0 - 20.0	CL	22.5							101.4		1.5×10^{-7}	
P-9D	SS-26	50.0 - 52.0	CL	20.7	0	33	53/14*							
P-9S	3T-1	34.0 - 36.0	CL	24.1							101.2		1.3×10^{-6}	
B-2**	3-ST	10.0 - 12.0	CL-ML	22.9	0	32	58/10*		← Non-Plastic →		93.4		8.4×10^{-7}	9.0
B-2**	5-ST	15.0 - 17.0	CL	22.0	0	15	77/18*	30	18	12	104.9		5.1×10^{-7}	7.0
B-2**	7-ST	20.0 - 22.0	CL	23.1	0	38	50/12*		← Non-Plastic →		103.2		3.2×10^{-7}	6.0
B-13**	4-ST	10.0 - 12.0	CL-ML	21.7	0	48	42/10*		← Non-Plastic →		105.4		9.7×10^{-7}	8.0
B-13**	6-ST	15.0 - 17.0	CL-ML	24.8	0	20	62/18*		← Non-Plastic →		100.6		1.8×10^{-6}	

** Represent percentages of silt and clay based on hydrometer analysis.*

Table 10

Summary of Slug Test Results for Lower Cohesive Deposit

Location	Soil Type Tested	USCS Classification	Calculated Hydraulic Conductivity (cm/sec)		
			Recovery Test	Drawdown Test	Average Value
P-7M	Silty clay	CL	NT	7.6×10^{-5}	7.6×10^{-5}
P-9S	Silty clay	CL	NT	4.9×10^{-5}	4.9×10^{-5}

Refer to Appendix D for detailed test results
NT = Not Tested

ref:hb/496b/496b-10.tbl

Table 11
Summary of Laboratory Test Results for Basal Sand

Boring/ Piezometer	Sample Number	Depth (ft)	USCS Symbol	Moisture Content (%)	Grain Size Analysis			Atterberg Limits			Dry Density (pcf)	Unconfined Compressive Strength (tsf)	Hydraulic Conductivity (cm/sec)	Cation Exchange Capacity (meq/100 gm)
					Gravel (%)	Sand (%)	Silt or Clay (%)	LL	PL	PI				
B-4	SS-14	26.0-28.0	SC	17.6	0	56	44							
B-13	SS-14	26.0-28.0	SM	15.1	16	65	19							
CB-1	SS-13	24.0-26.0	SM	21.1	0	69	31							
CB-6	SS-14	26.0-28.0	SC	30.9	0	62	38							
P-1D	SS-25B	48.0-50.0	SC	21.1	0	64	36							
P-2D	SS-28A	54.0-54.5	SW-SM	-	3	91	6							
P-3D	SS-17B	33.0-33.5	SM	17.9	0	58	42							
P-4	SS-19	36.0-38.0	SW-SM	-	23	69	8							
P-5D	SS-14A	26.0-27.3	SM	-	29	54	17							
P-6D	SS-15	28.0-30.0	SM	14.6	23	55	22							
P-7D	SS-15	29.0-30.0	SW-SM/SM	10.9	27	59	14							
P-8D	SS-13A	24.0-25.5	SW-SM/SM	-	34	50	16							
P-9D	SS-29A	56.0-57.5	SP-SM/SM	-	22	66	12							

ref:hb\496b\496b-11.tbl

Table 12

Summary of Slug Test Results for Basal Sand

Location	Soil Type Tested	USCS Classification	Calculated Hydraulic Conductivity (cm/sec)		
			Recovery Test	Drawdown Test	Average Value
P-1D	Silty to clayey Sand to sand	SC/SM/SP	6.1×10^{-4}	1.1×10^{-3}	8.4×10^{-4}
P-3D	Silty sand	SM	1.6×10^{-2}	7.6×10^{-3}	1.2×10^{-2}
P-4	Silty sand	SP-SM/SM	2.0×10^{-3}	3.0×10^{-3}	2.5×10^{-3}
P-5D	Silty sand	SM/SW-SM	5.0×10^{-3}	3.8×10^{-3}	4.4×10^{-3}
P-6D	Silty sand	SM	3.6×10^{-2}	3.3×10^{-2}	3.4×10^{-2}
P-7D	Silty sand	SW-SM/SM	5.6×10^{-3}	6.1×10^{-3}	5.8×10^{-3}
P-8D	Silty sand to sand	SM/SW-SM	2.3×10^{-2}	3.0×10^{-2}	2.6×10^{-2}
P-9D	Silty sand	SM/SP-SM	7.2×10^{-4}	5.6×10^{-4}	6.4×10^{-4}

Refer to Appendix D for detailed test results.
NT = Not Tested

ref:hb/496b/496b-12.tbl

Table 13

Summary of Slug Test Results for Bedrock (Shale)

Location	Soil Type Tested	USCS Classification	Calculated Hydraulic Conductivity (cm/sec)		
			Recovery Test	Drawdown Test	Average Value
P-7R	Shale	-	NT	1.8×10^{-7}	1.8×10^{-7}
P-6R	Shale	-	NT	1.3×10^{-6}	1.3×10^{-6}

Refer to Appendix D for detailed test results
NT = Not Tested

ref:hb/496b/496b-13.tbl

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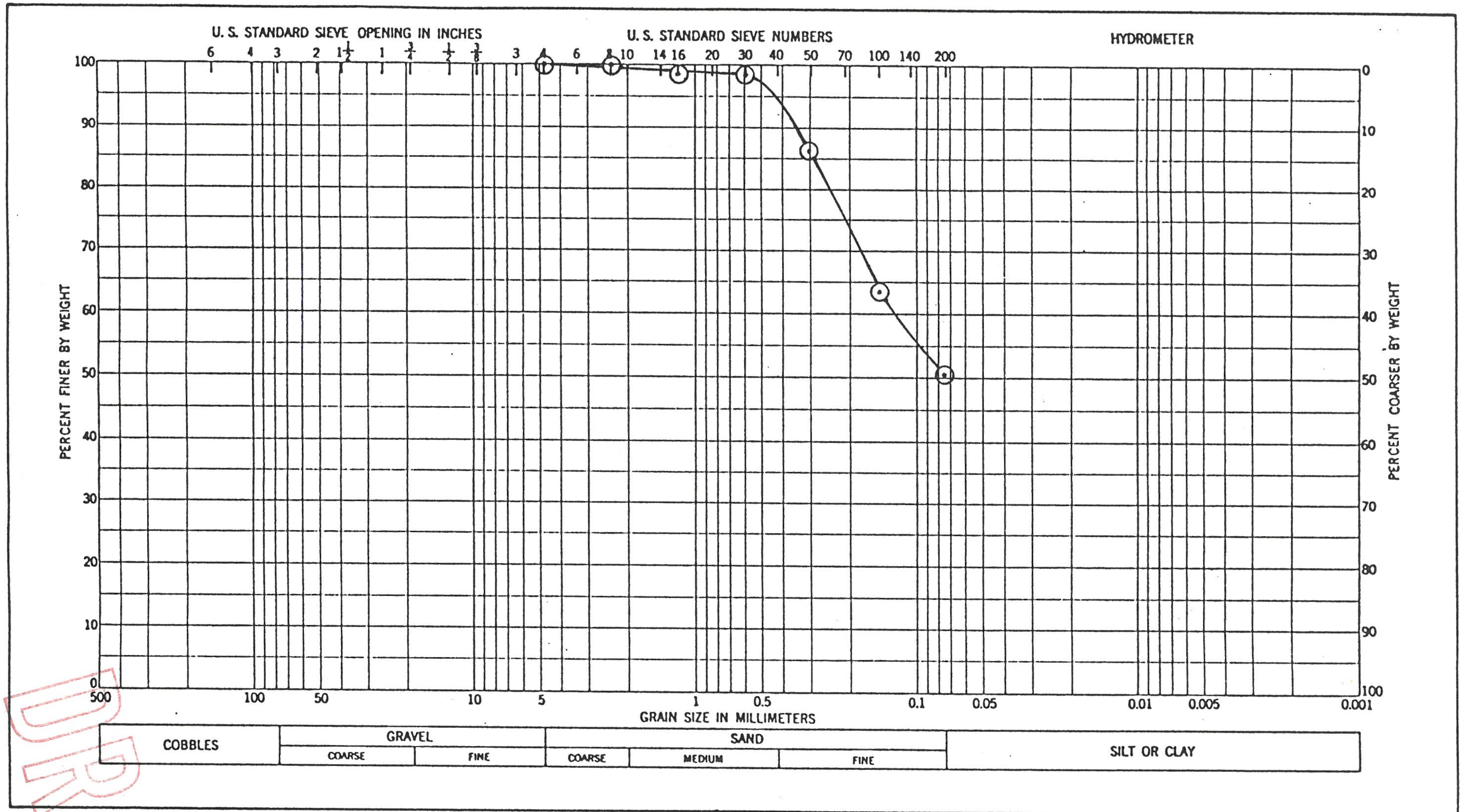

Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Remarks
B-1	12.0'-14.0'	Gray clayey sand and	20.0				
SS-7		silt					
		SC					

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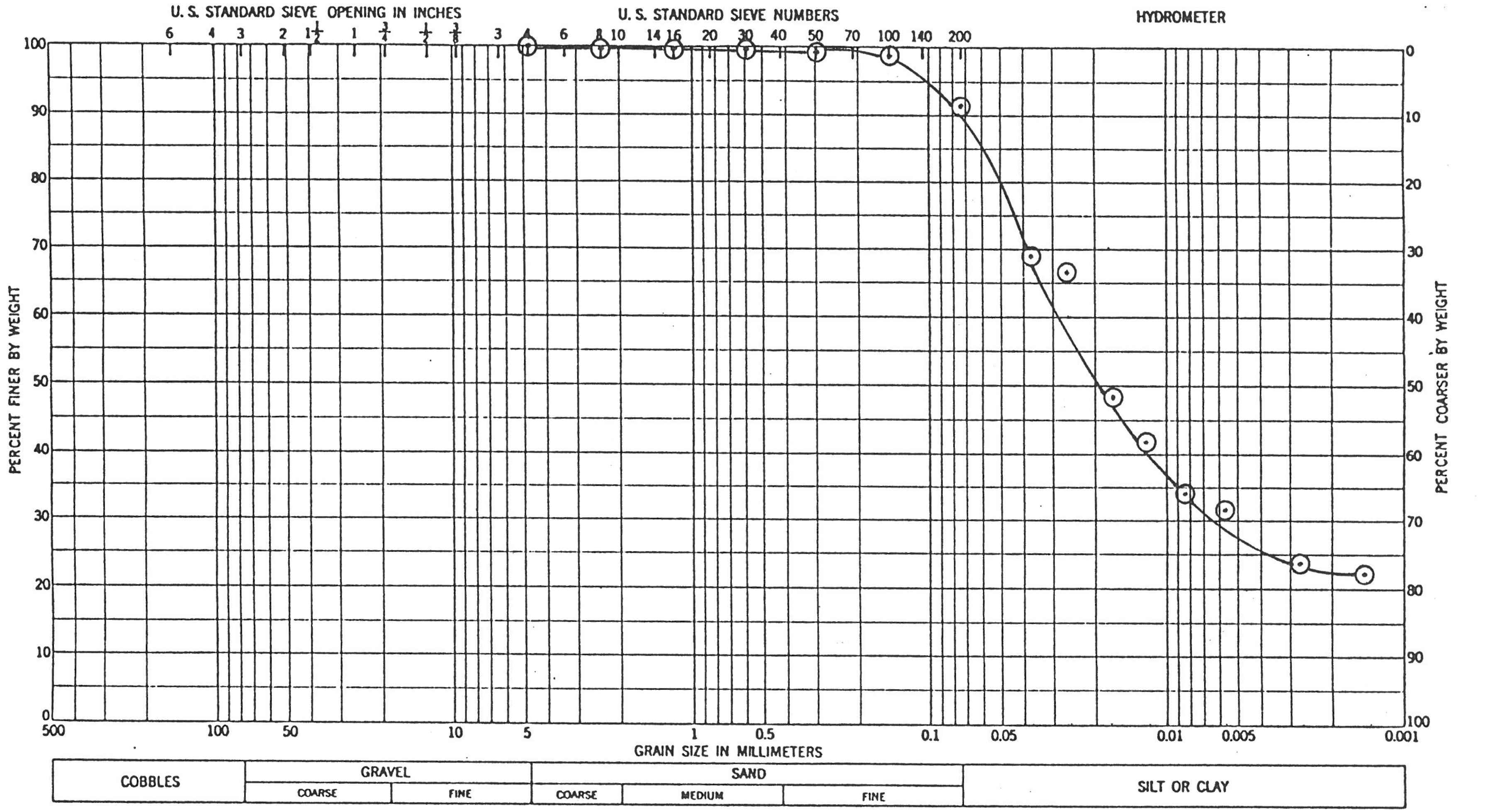

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
B-4	14.0'-16.0'	Dark gray silty clay,	29.1				
SS-8		trace fine sand					
		CL					

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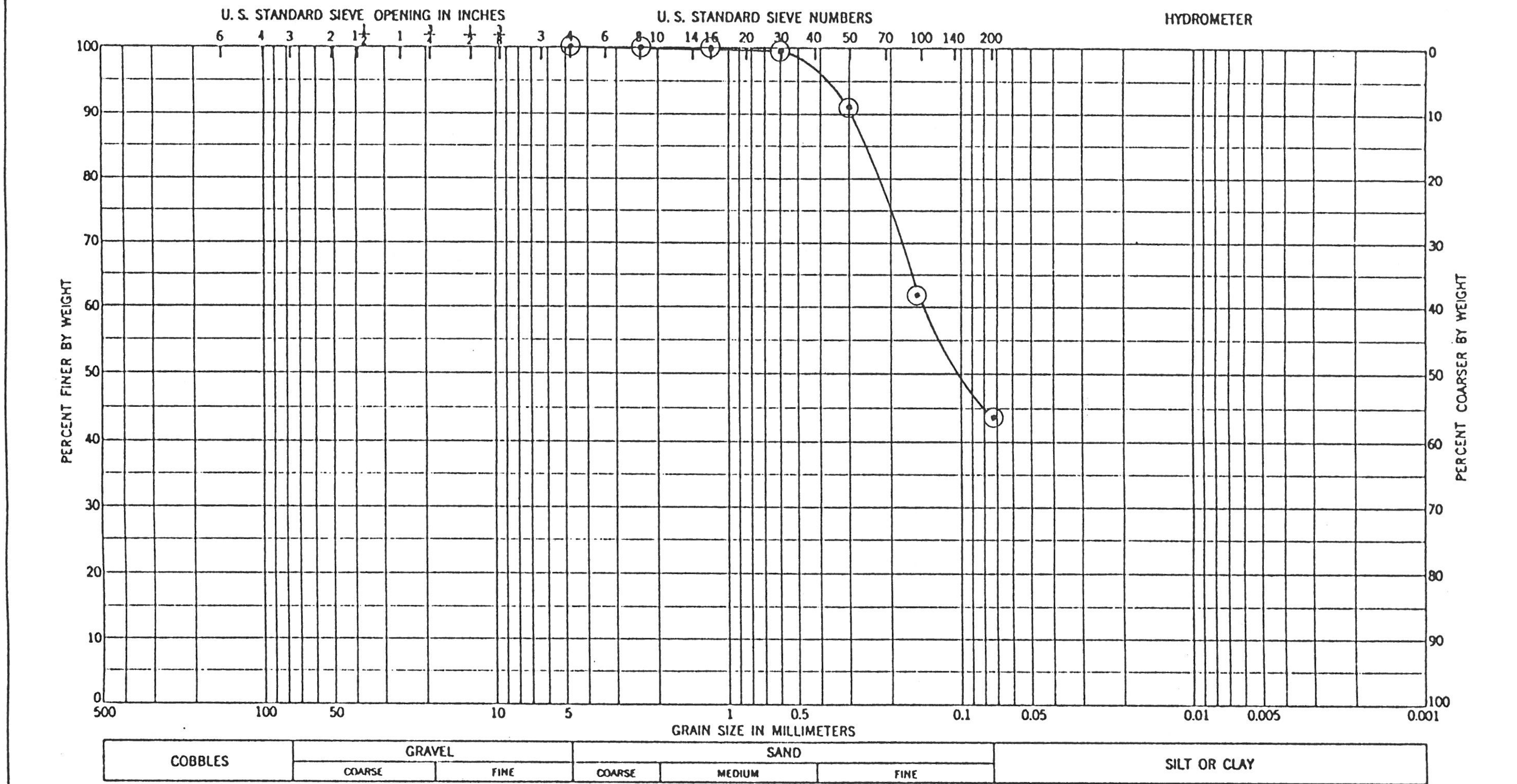

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
B-4	26.0'-28.0'	Gray clayey fine sand and	17.7				
SS-14		silt					
		SC					

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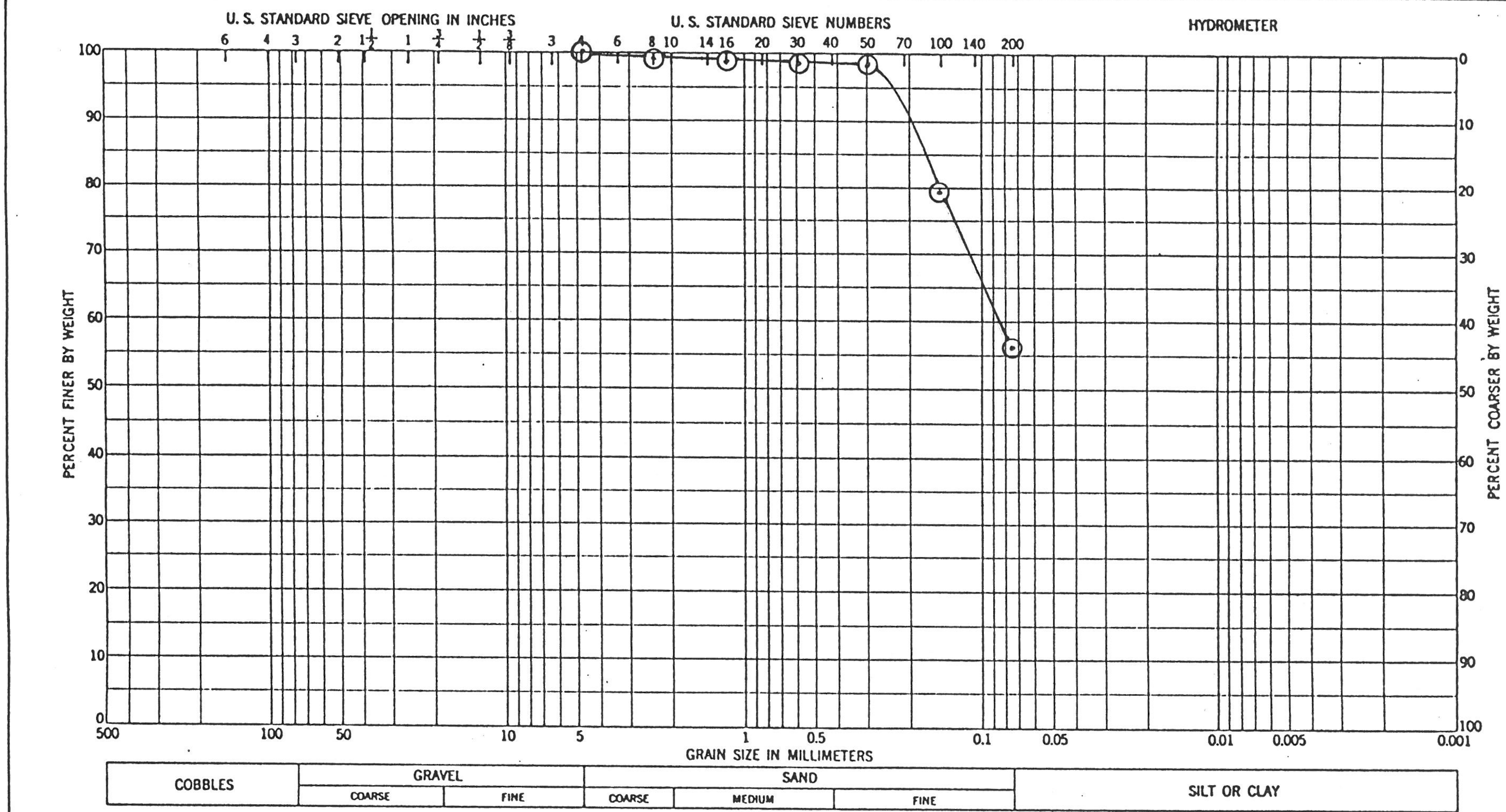

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
B-6	26.0'-28.0'	Gray clayey silt to clayey	24.6				
SS-14		sand					
		CL-ML/SC					

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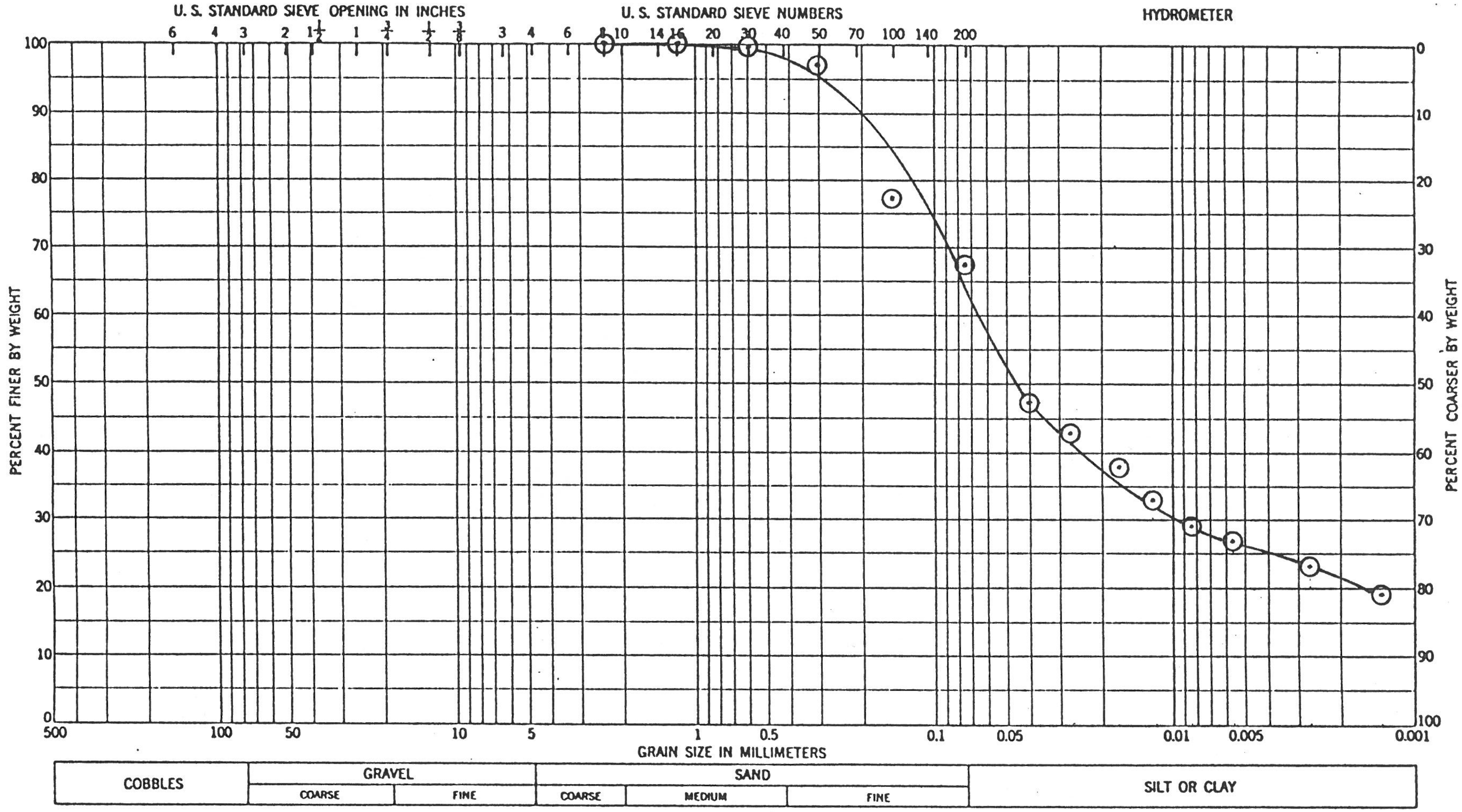

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
B-7	6.0'-8.0'	Gray silty clay and	24.4				
SS-4		medium to fine sand					
		CL					

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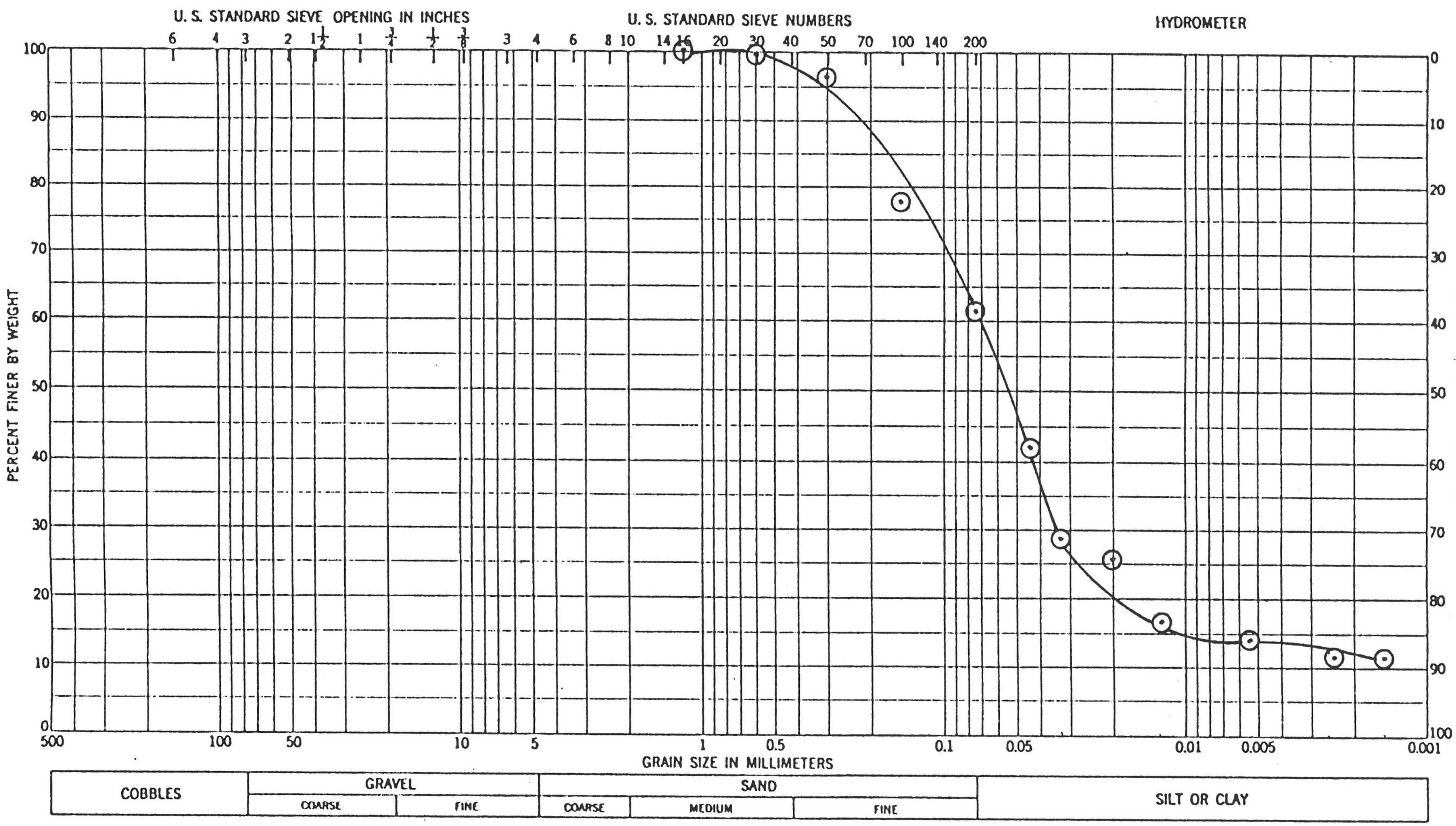

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
B-7	16.0'-18.0'	Gray clayey silt and fine	18.2				
SS-9		sand					
		CL-ML					

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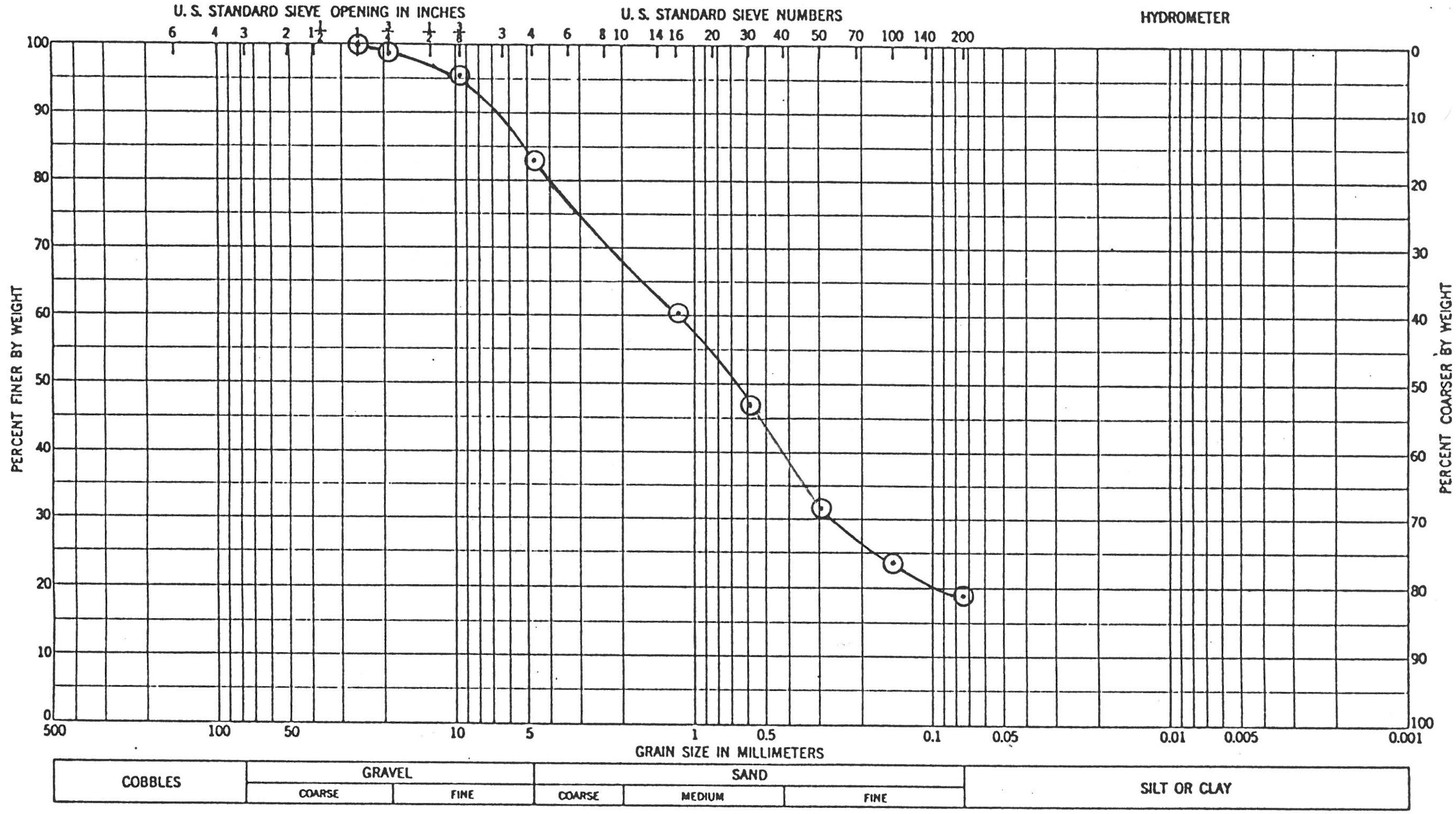

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
B-13	26.0'-28.0'	Gray coarse to fine sand,	14.3				
SS-14		little fine gravel, little					
		silt					
		SM					

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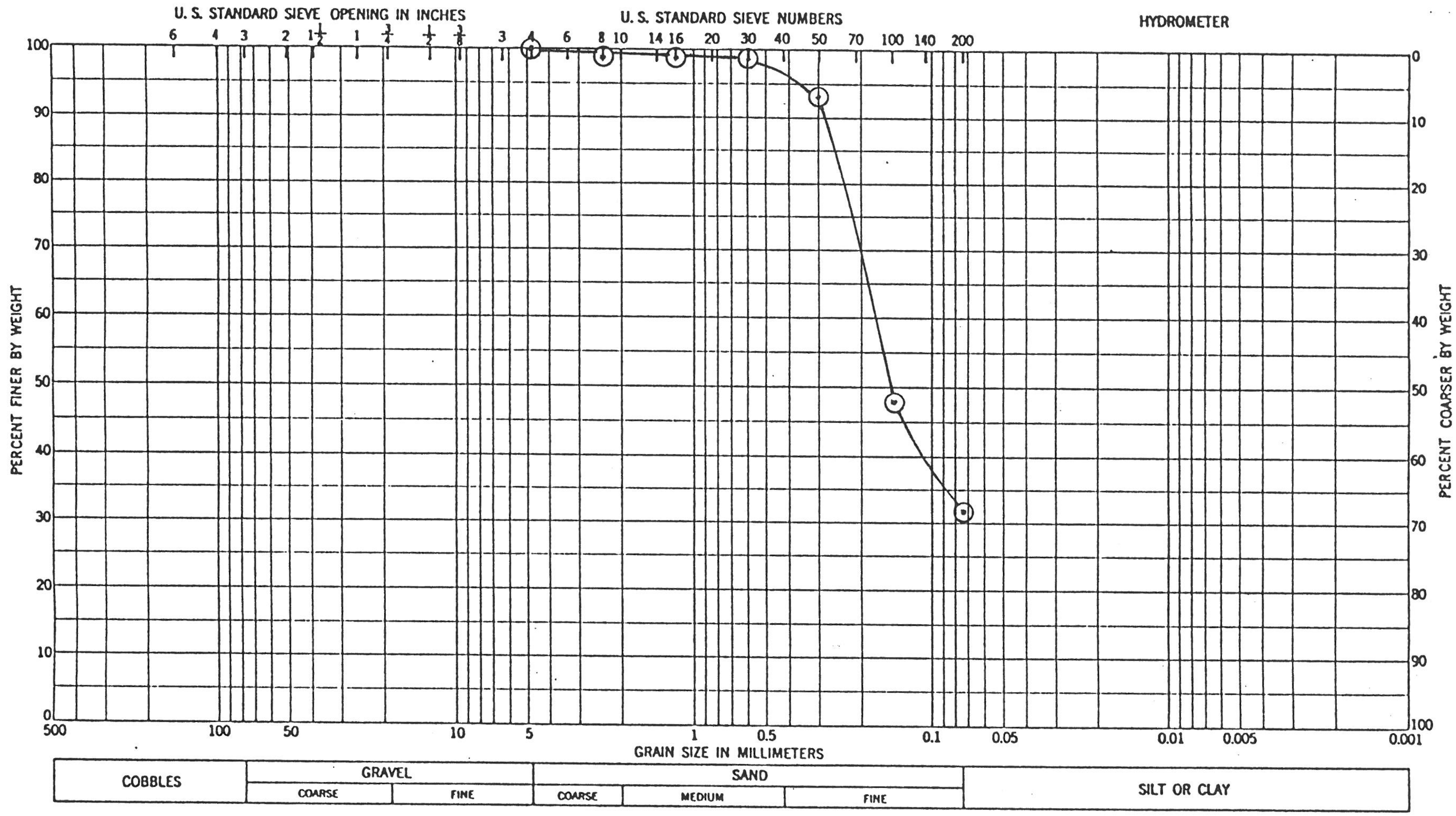

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
CB-1	24.0'-26.0'	Gray medium to fine sand	21.1				
SS-13		and clayey silt					
		SM					

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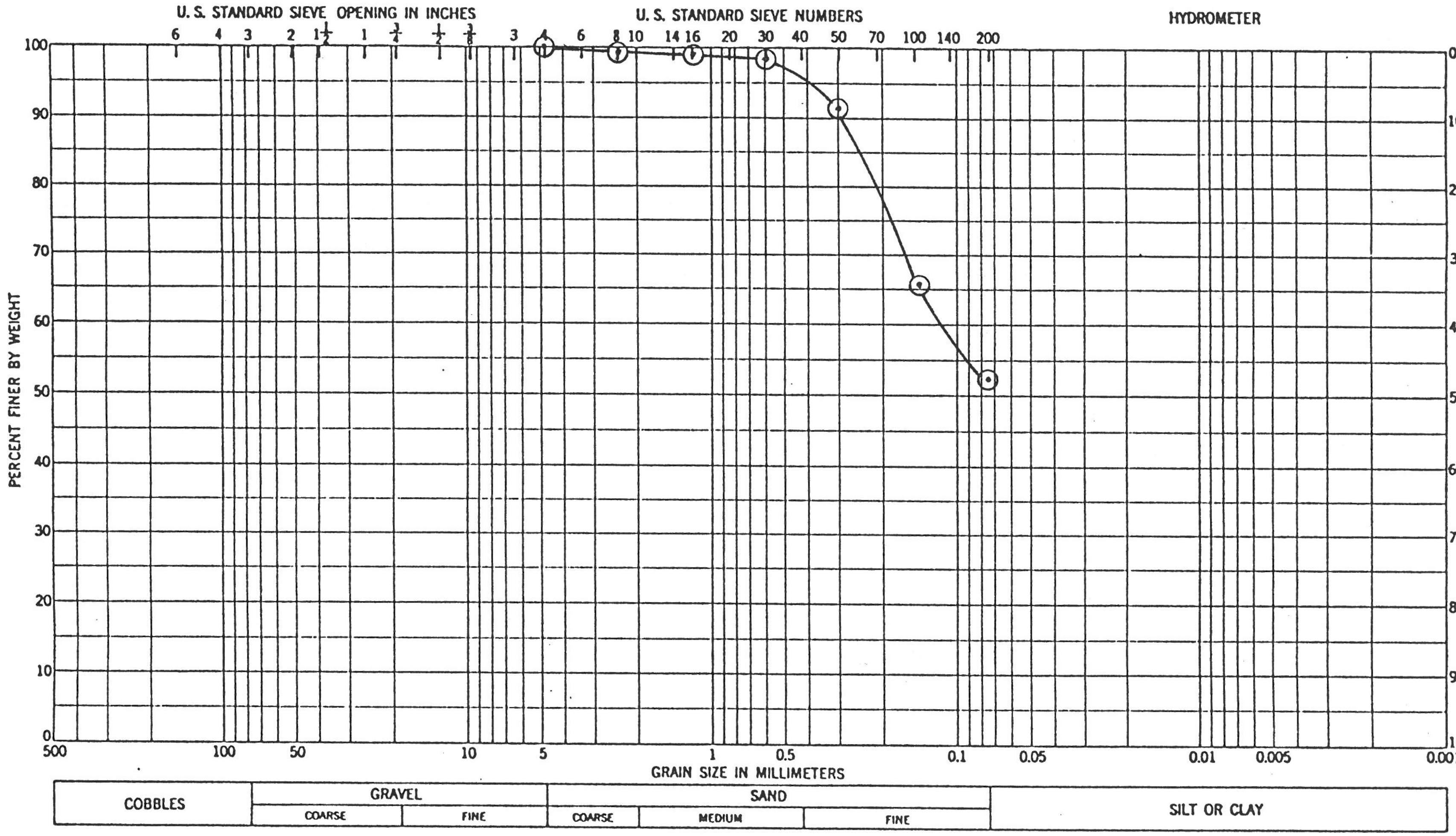

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
CB-3	6.0'-8.0'	Brown and tan clayey silt	20.5				
SS-4		and fine sand					
		CL-ML					

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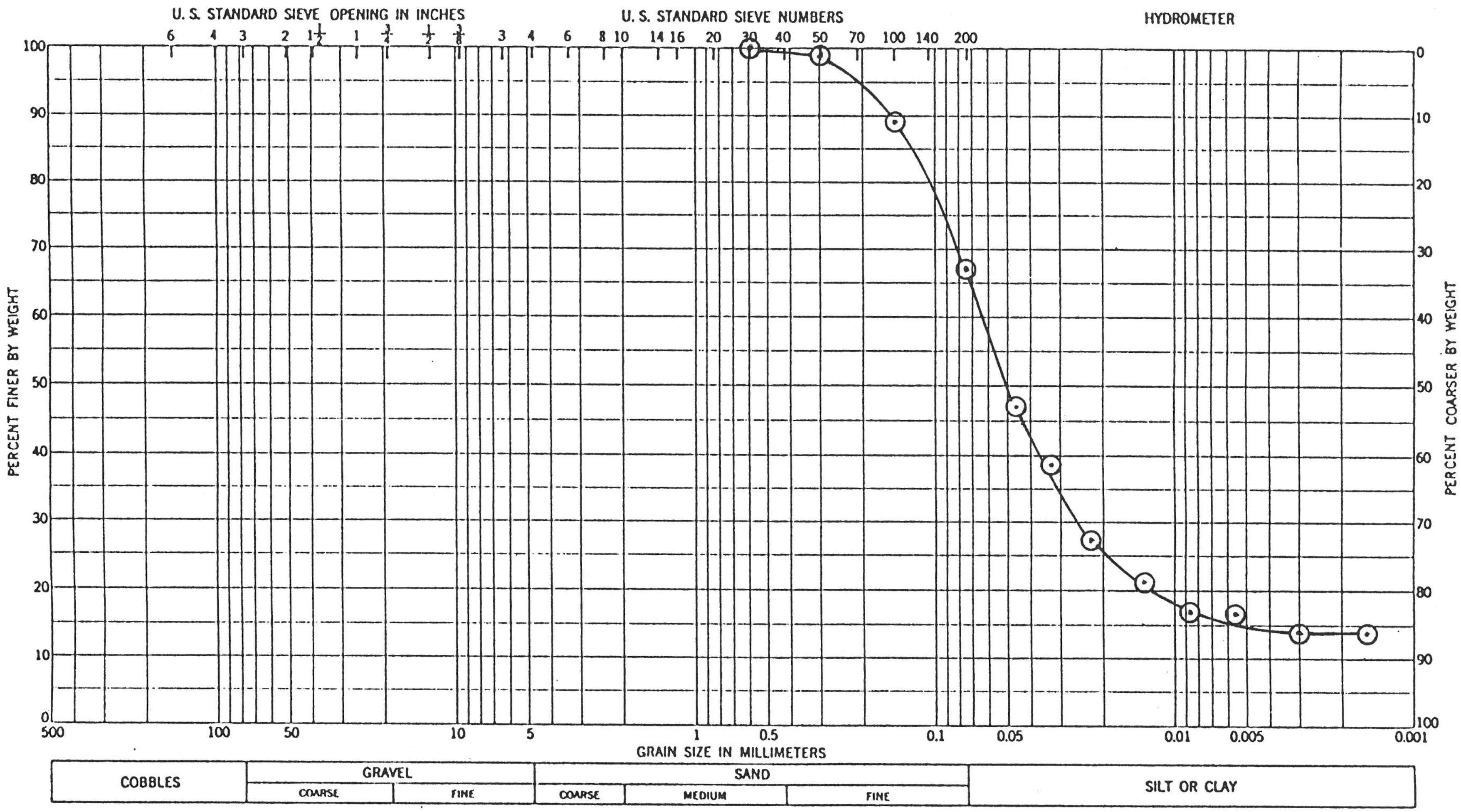

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
CB-3	16.0'-18.0'	Gray clayey silt and fine	22.6				
SS-9		sand					
		CL-ML					

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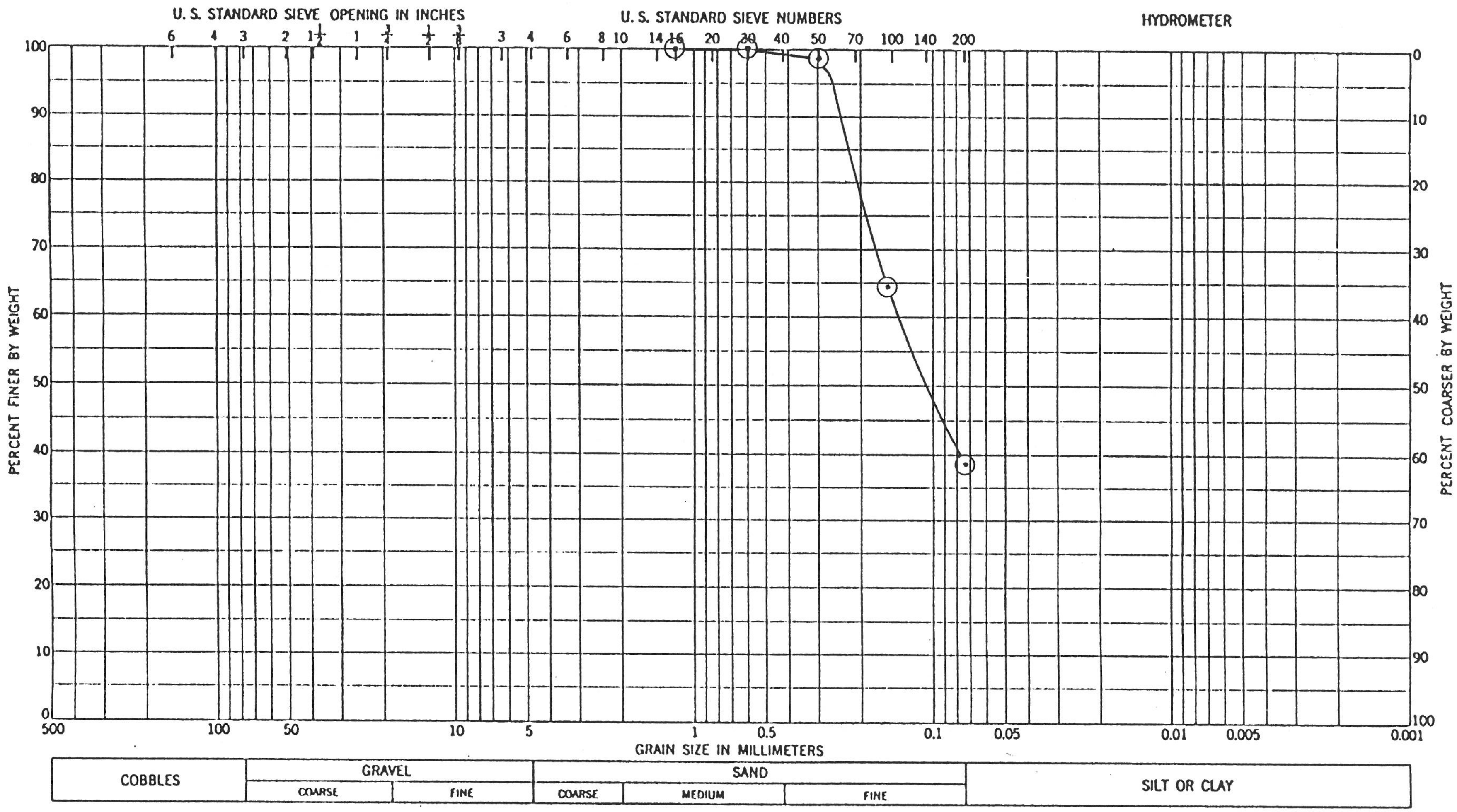

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
CB-6 SS-14	26.0'-28.0'	Gray clayey fine sand and silt SC	26.1				

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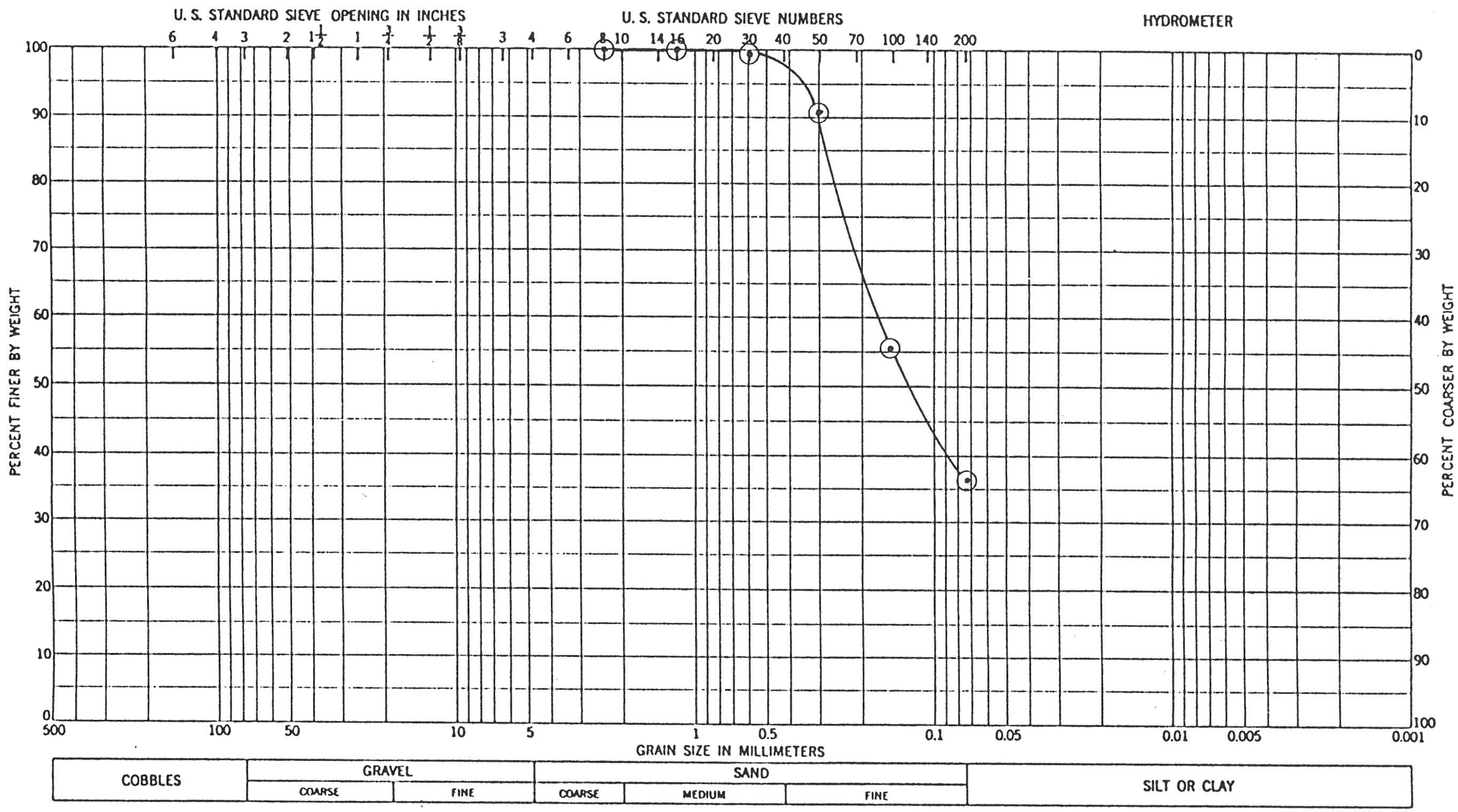

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-1D	48.0'-50.0'	Gray clayey fine sand	20.8				
SS-25B		and silt					
		SC					

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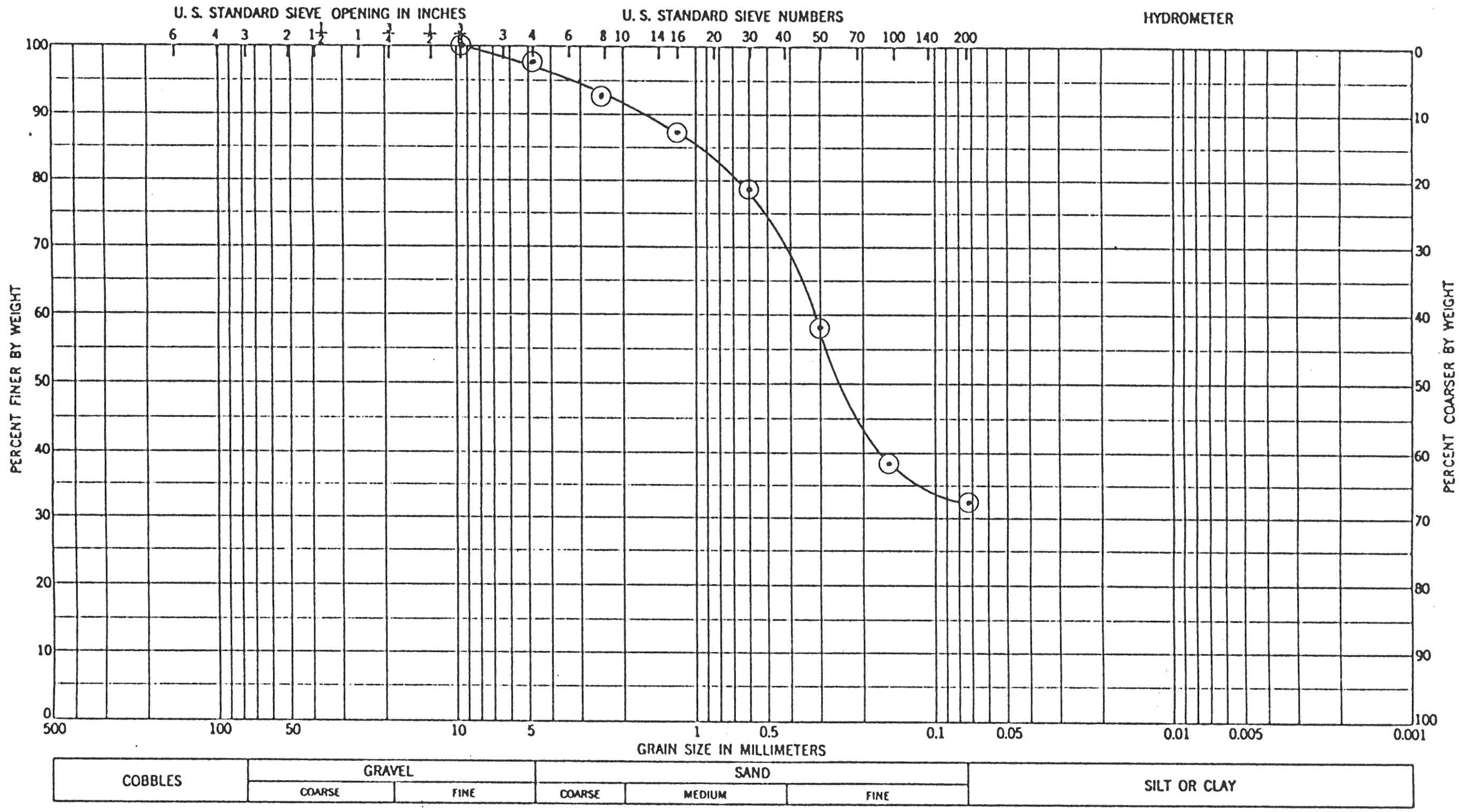

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-1S	38.0'-40.0'	Gray coarse to fine sand	18.7				
SS-2A		and silt, trace fine					
		gravel					
		SC					

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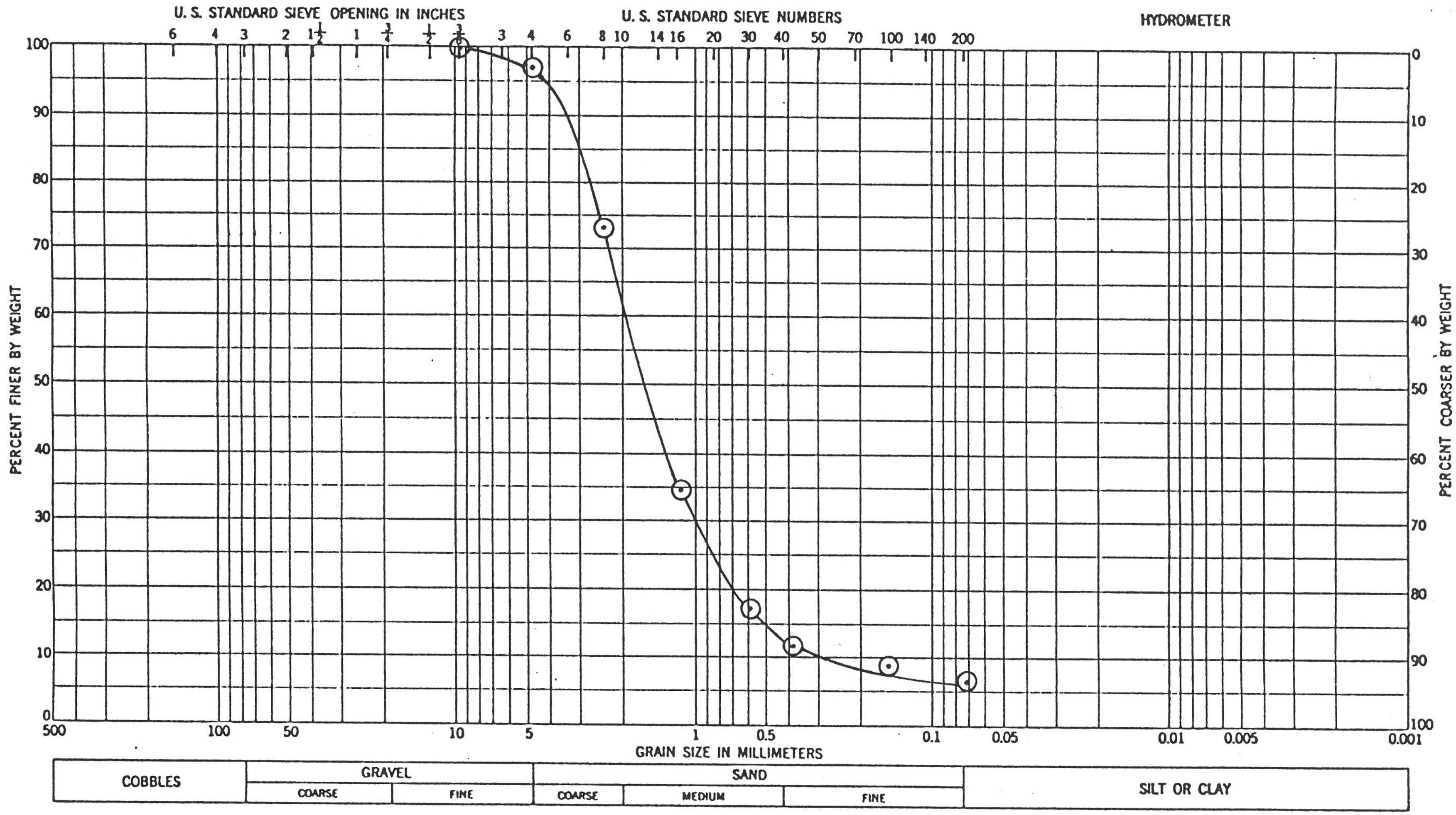

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-2D	54.0'-54.5'	Gray coarse to fine sand,	16.2				
SS-28A		trace fine gravel, trace					
		silt					
		SP-SM					

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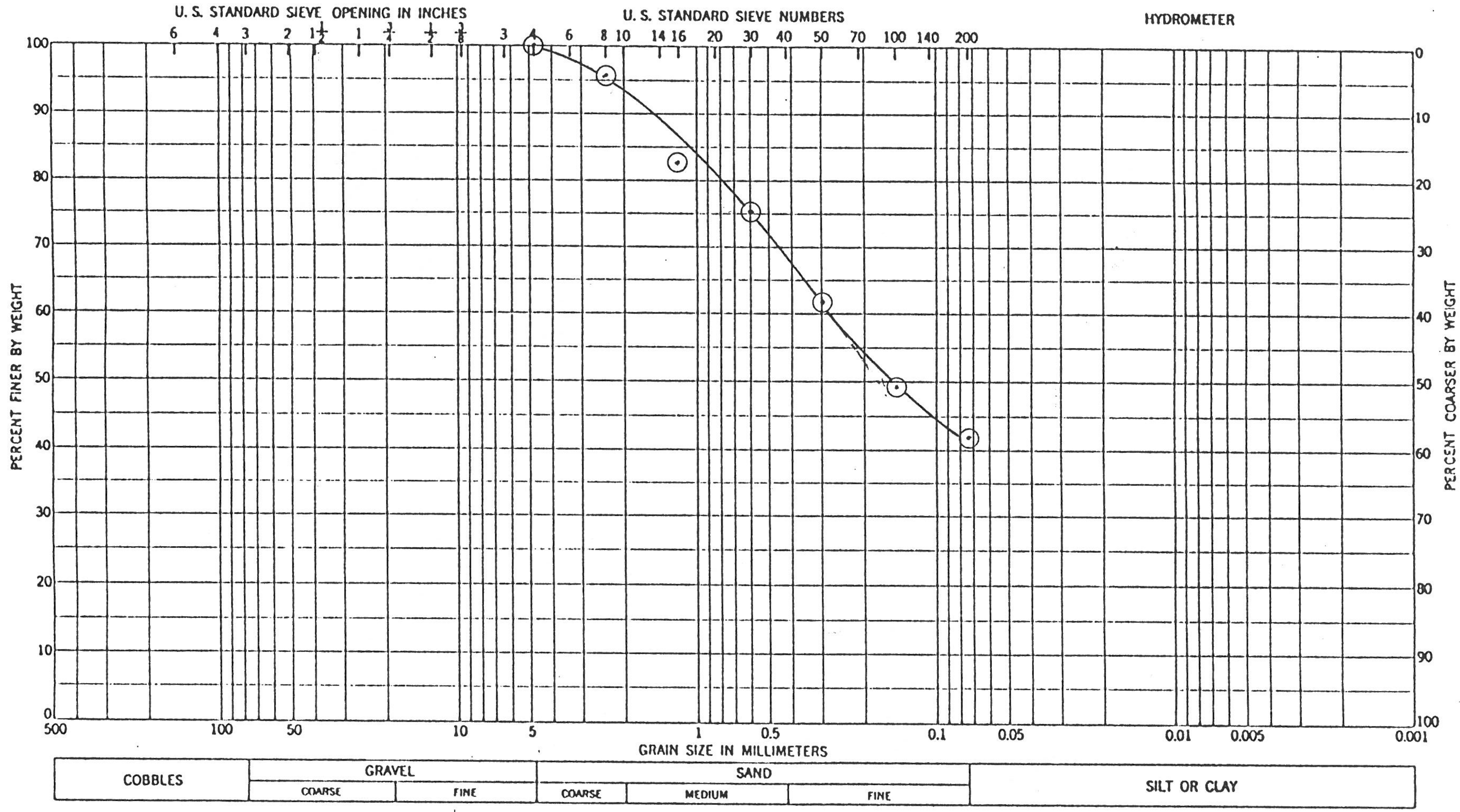

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-3D	32.0-34.0	Gray coarse to fine sand	17.9				
SS-17B		and silt.					
		SM					

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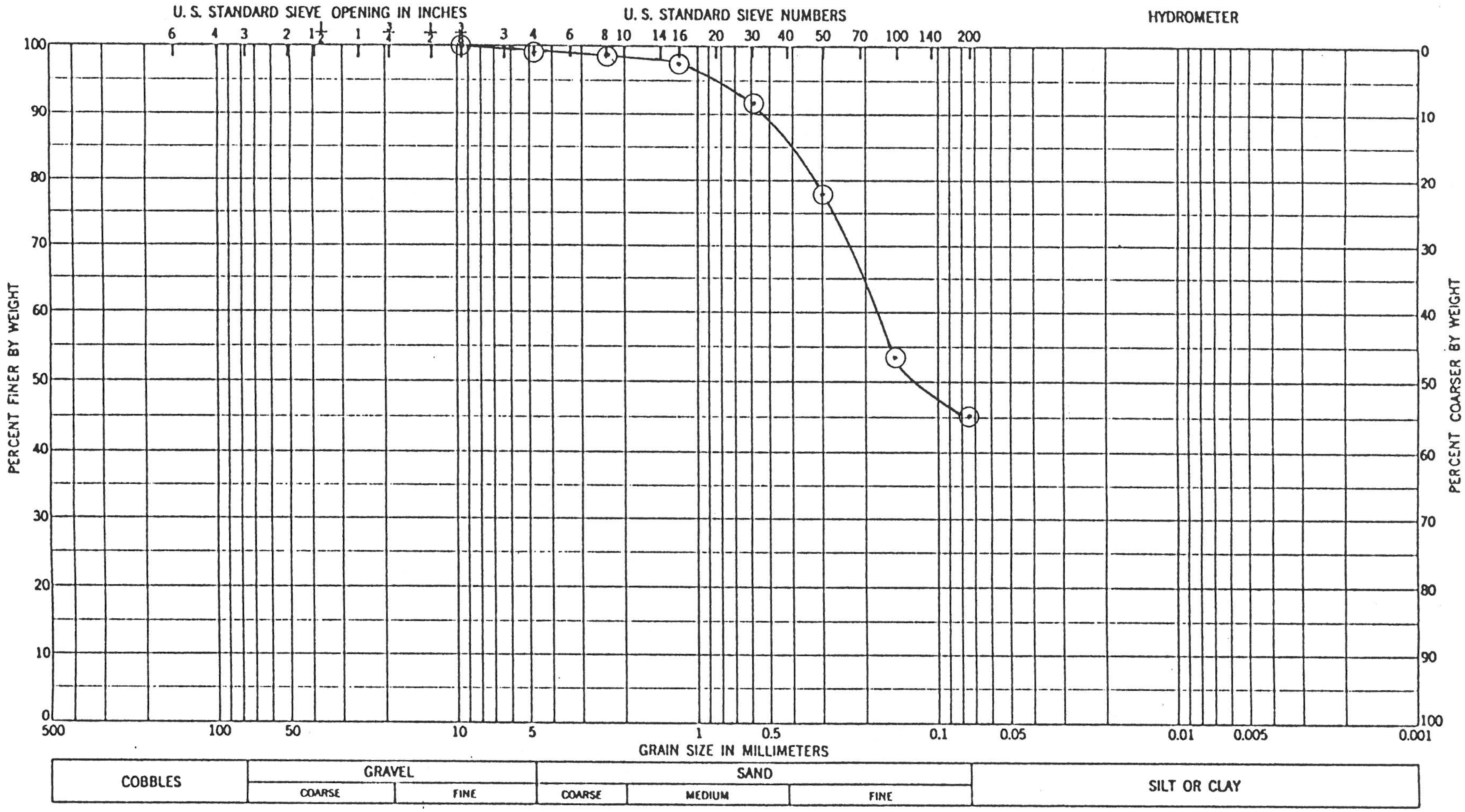

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-3S	10.0'-12.0'	Dark gray medium to fine					
SS-3		sand and silt, trace					
		coarse sand.					
		SM					

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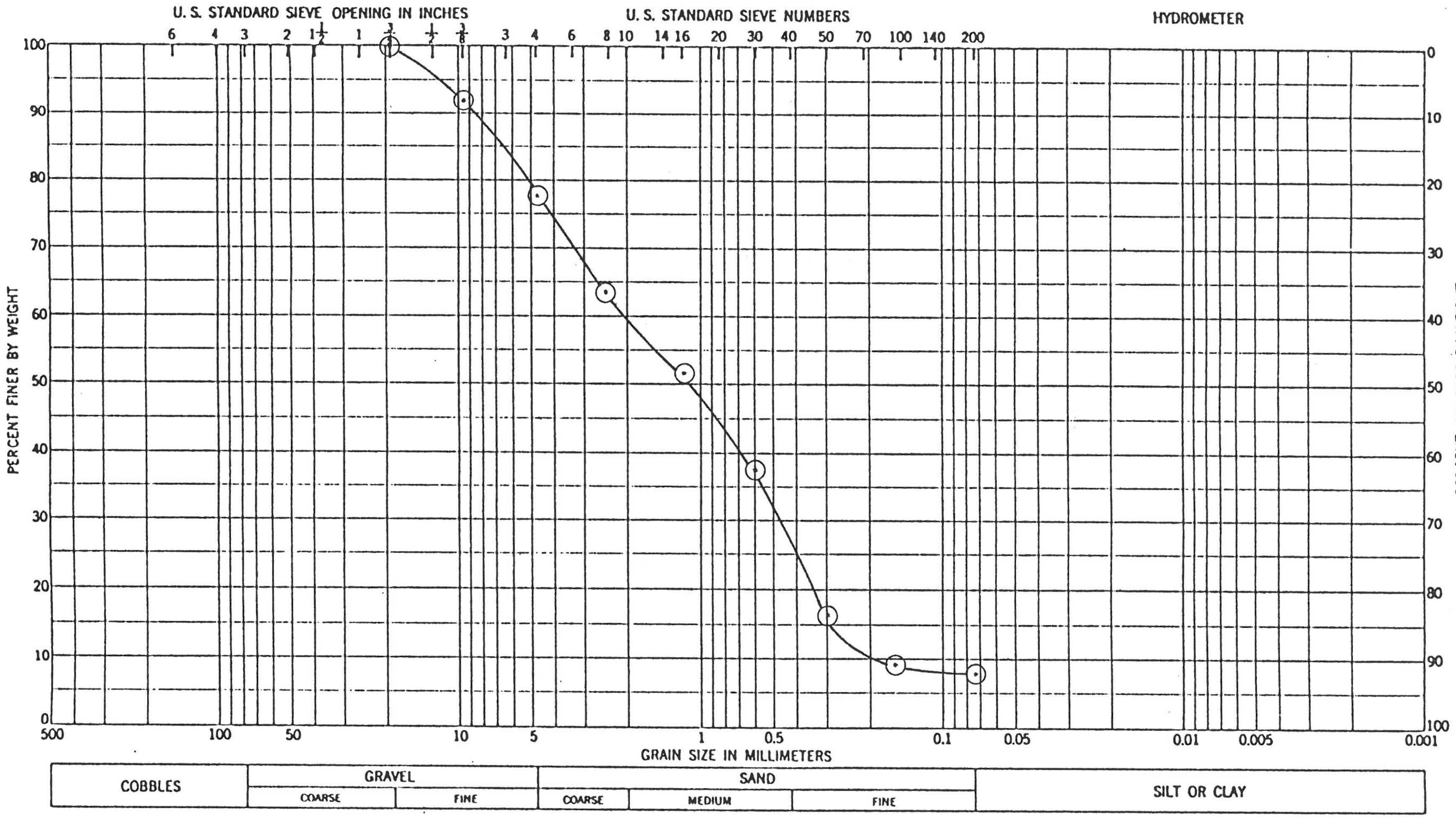

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-4	36.0'-38.0'	Gray coarse to fine					
SS-19		sand, some fine gravel,					
		trace silt					
		SW-SM					

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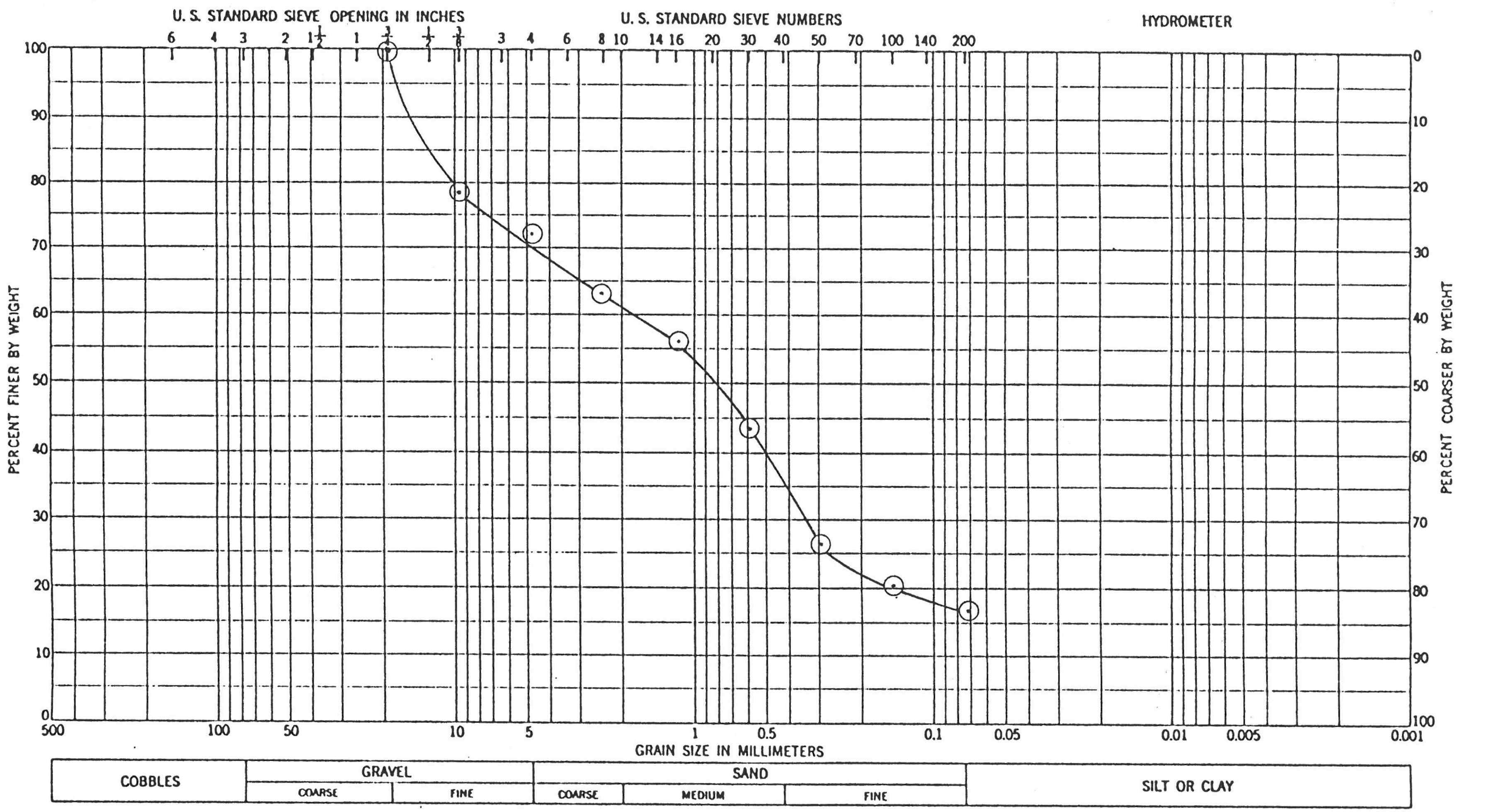

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-5D	26.0'-28.0'	Gray coarse to fine sand					
SS-14A		some fine gravel,					
		little silt.					
		SM					

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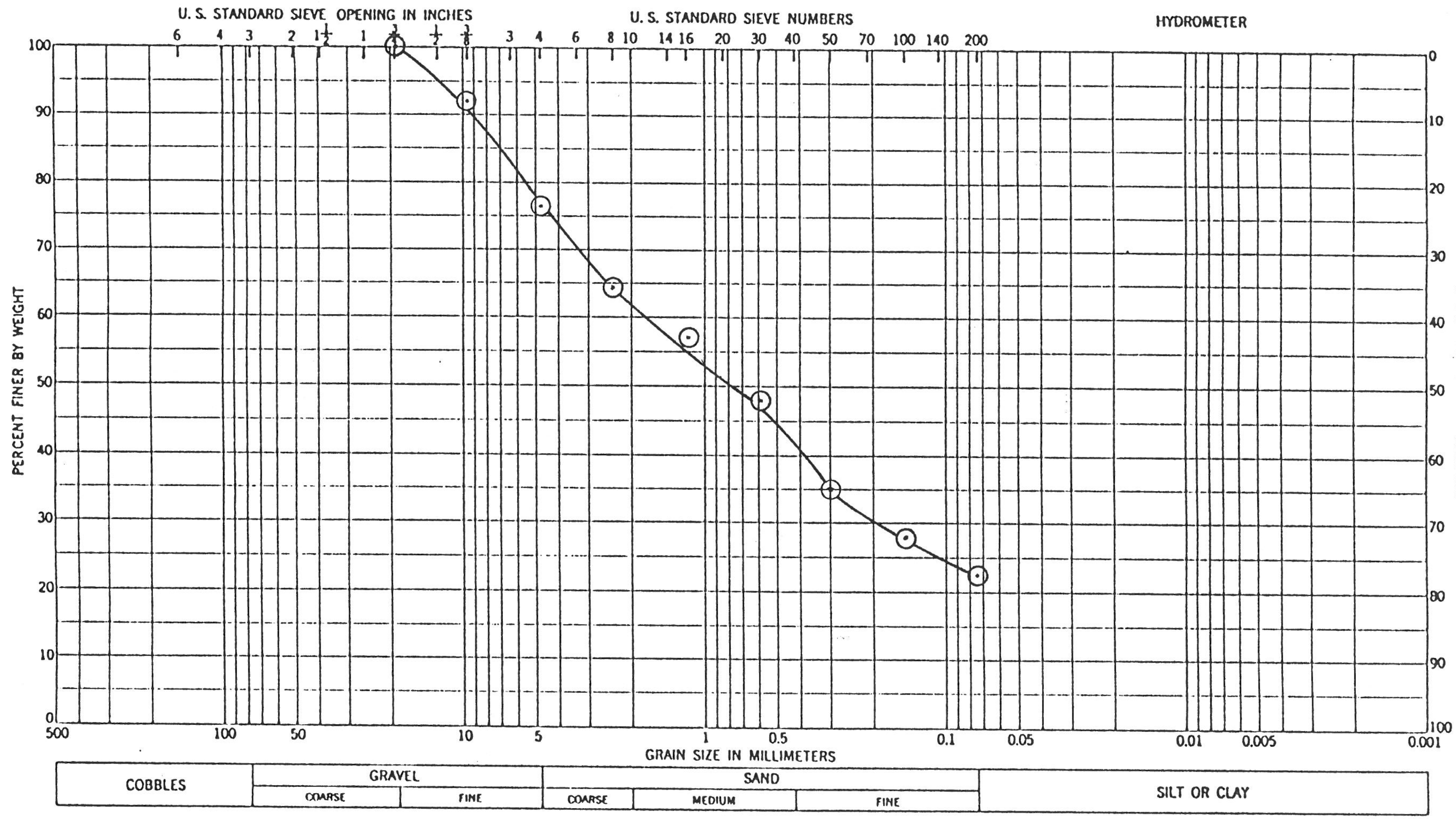

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-6D	28.0'-30.0'	Gray Coarse to fine	14.6				
SS-15		sand, some fine gravel,					
		some silt					
		SM					

CWLP FGDS Landfill
City of Springfield
PEI Project No. 496B

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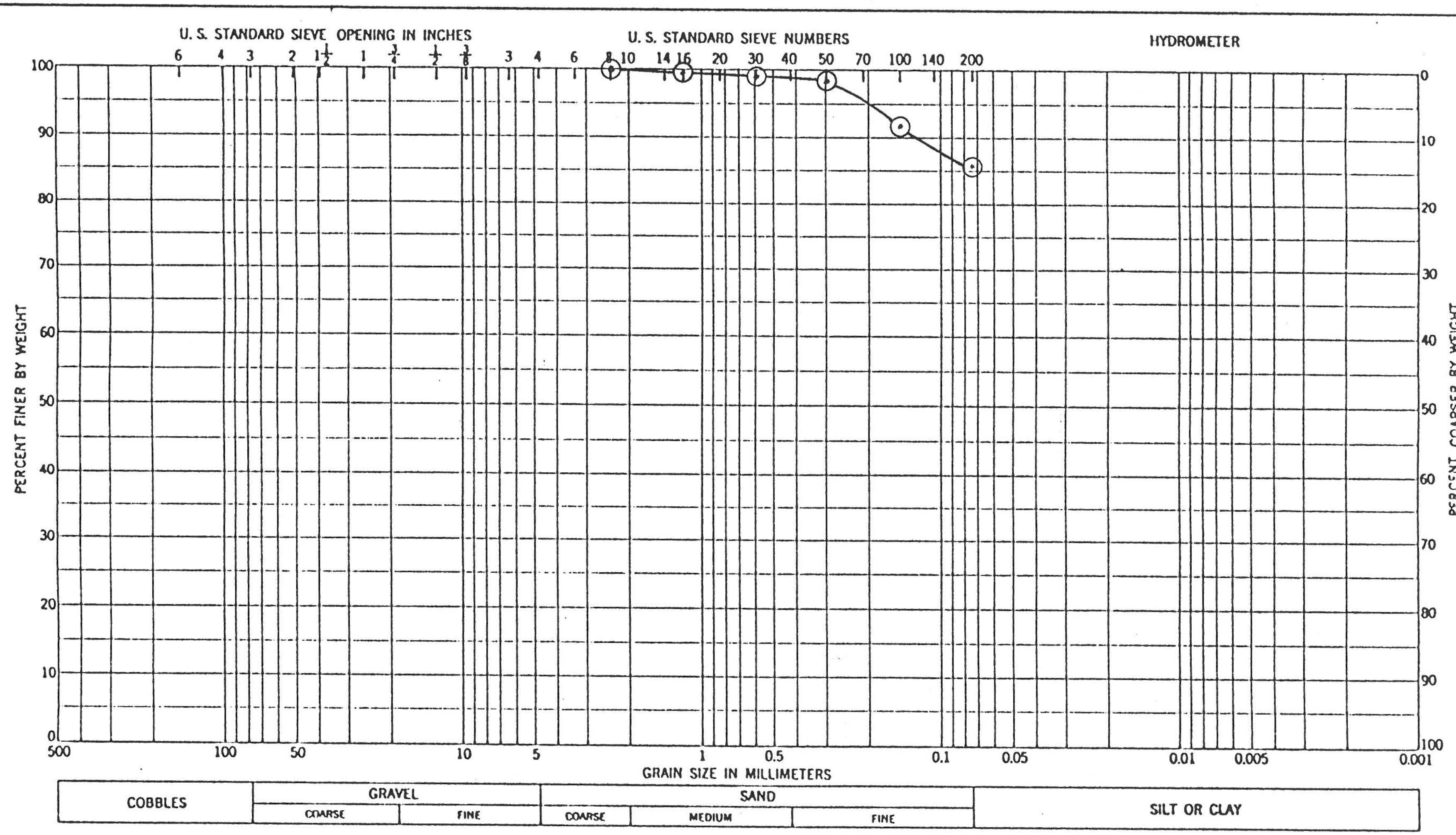
PDF_0621



Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-6S	6.0'-8.0'	Brown silty clay, little	23.4				
SS-2A		fine sand					
		CL					

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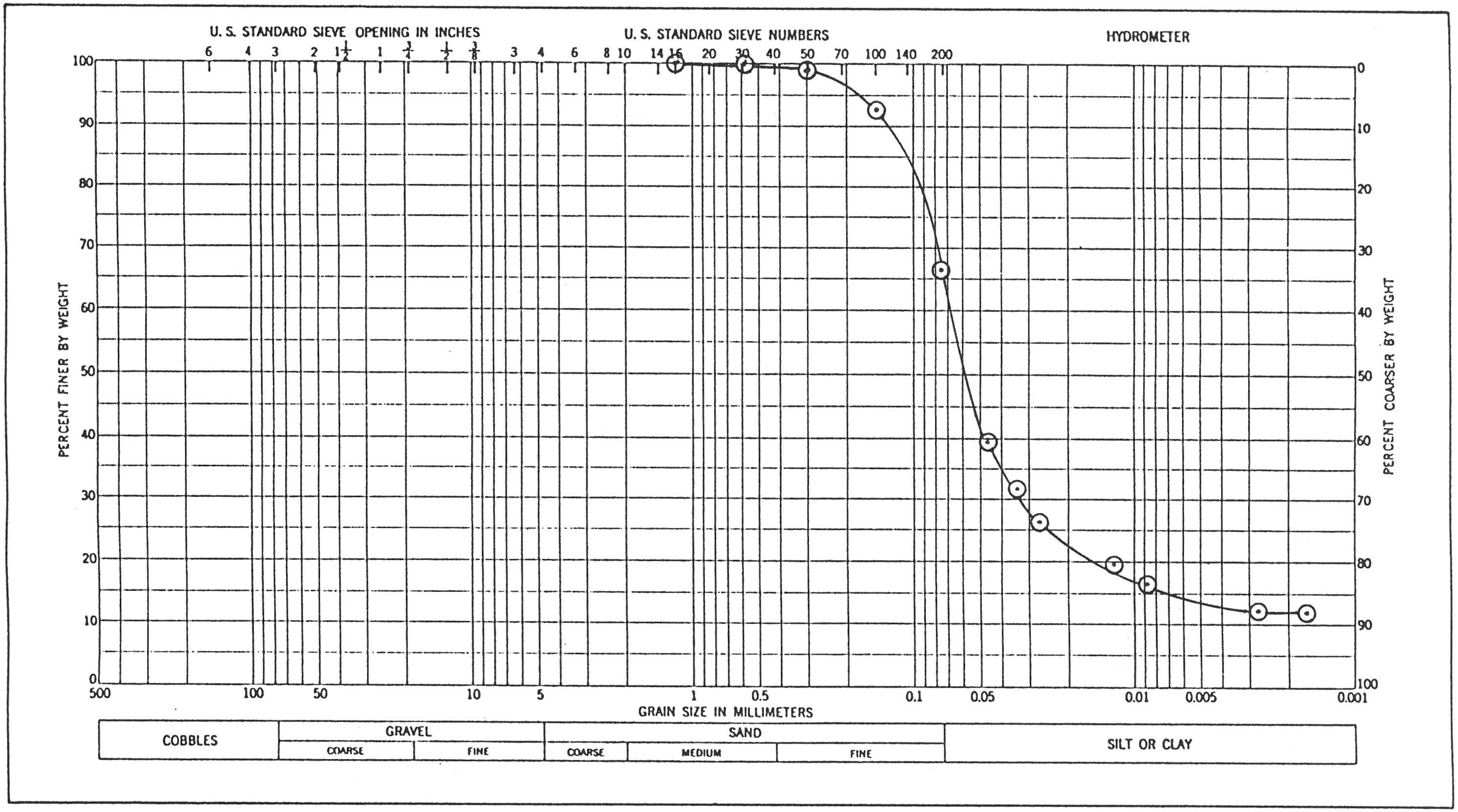

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-7D	24.0'-26.0'	Gray clayey silt and fine	24.3				
SS-13		sand					
		CL-ML					

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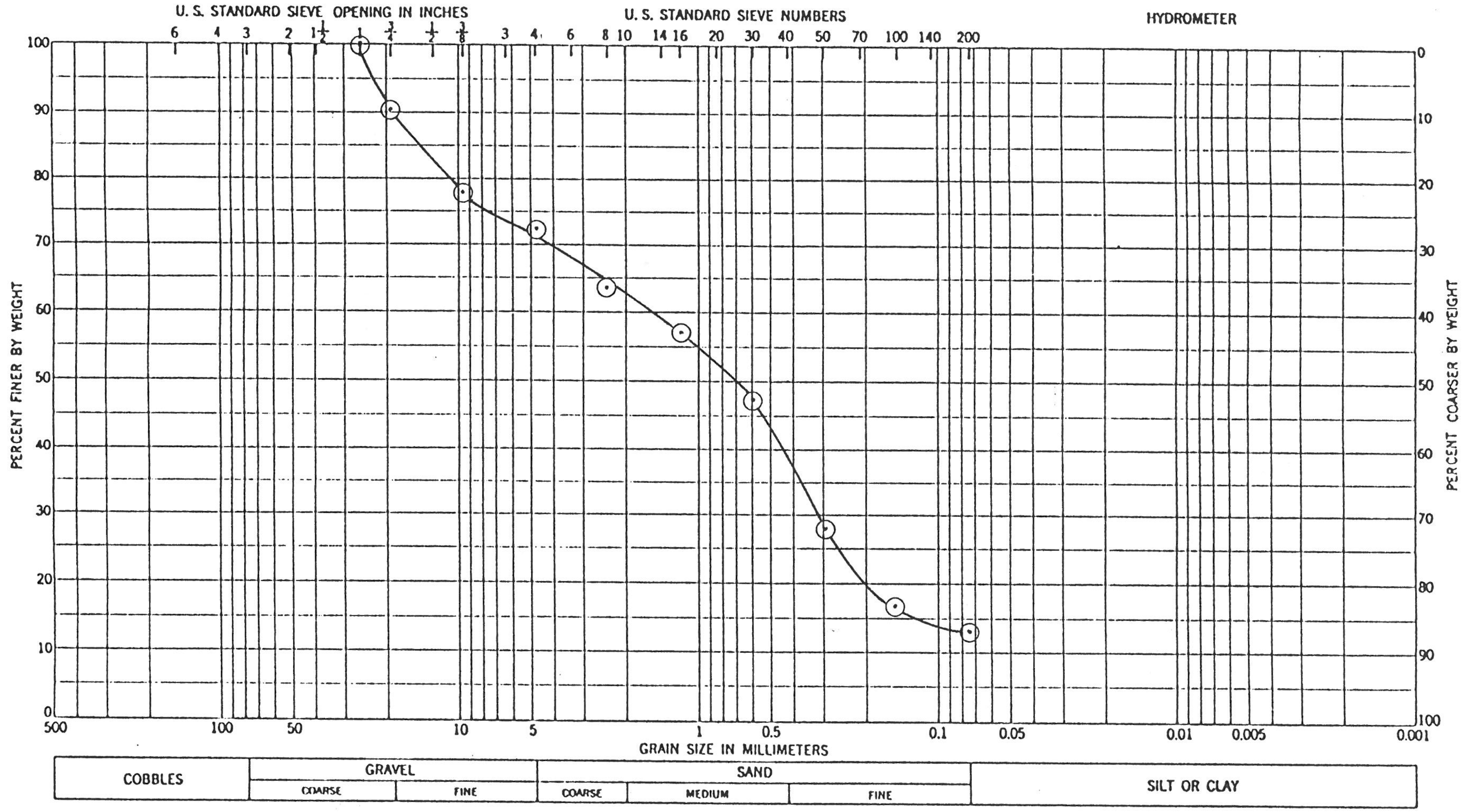

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-7D	28.0'-30.0'	Gray coarse to fine	10.9				
SS-15		sand, some coarse to					
		fine gravel, little silt.					
		SW-SM					

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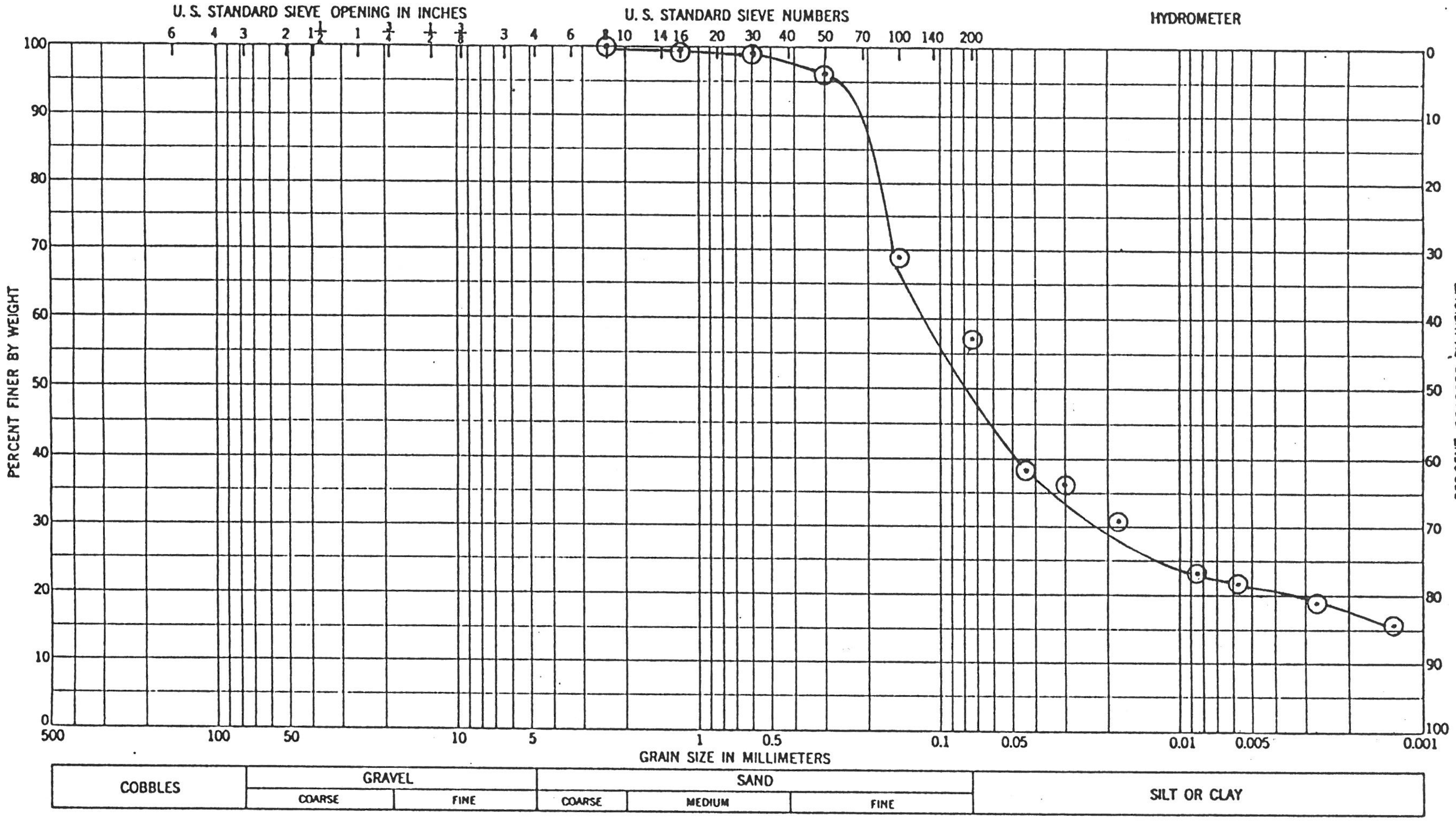

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-7S	10.5'-11.0'	Gray clayey silt to [illegible]					
SS-1B		clayey sand					
		SC/ML					

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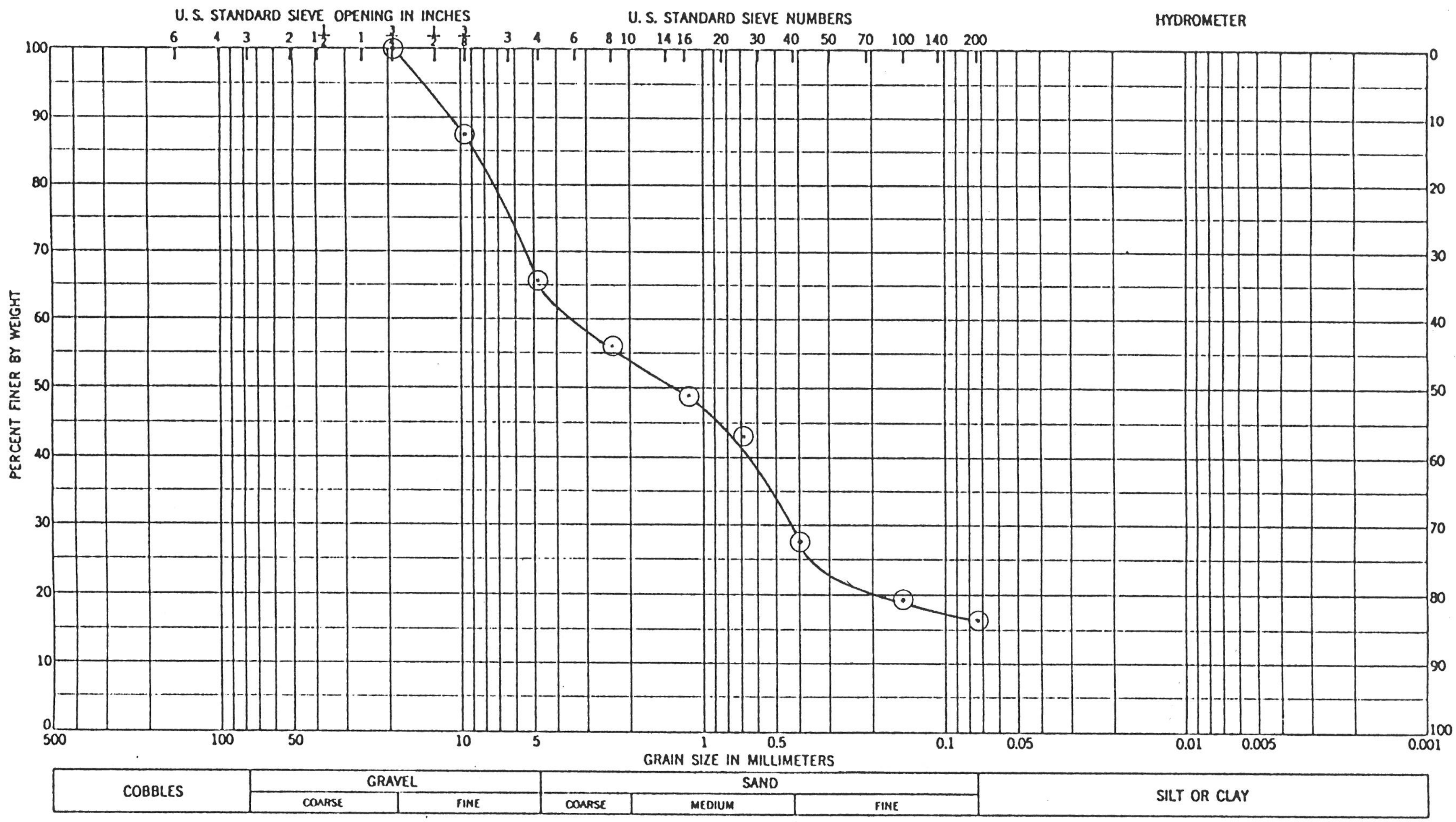

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-8D SS-13A	24.0'-26.0'	Gray coarse to fine sand and fine gravel, little silt SM					

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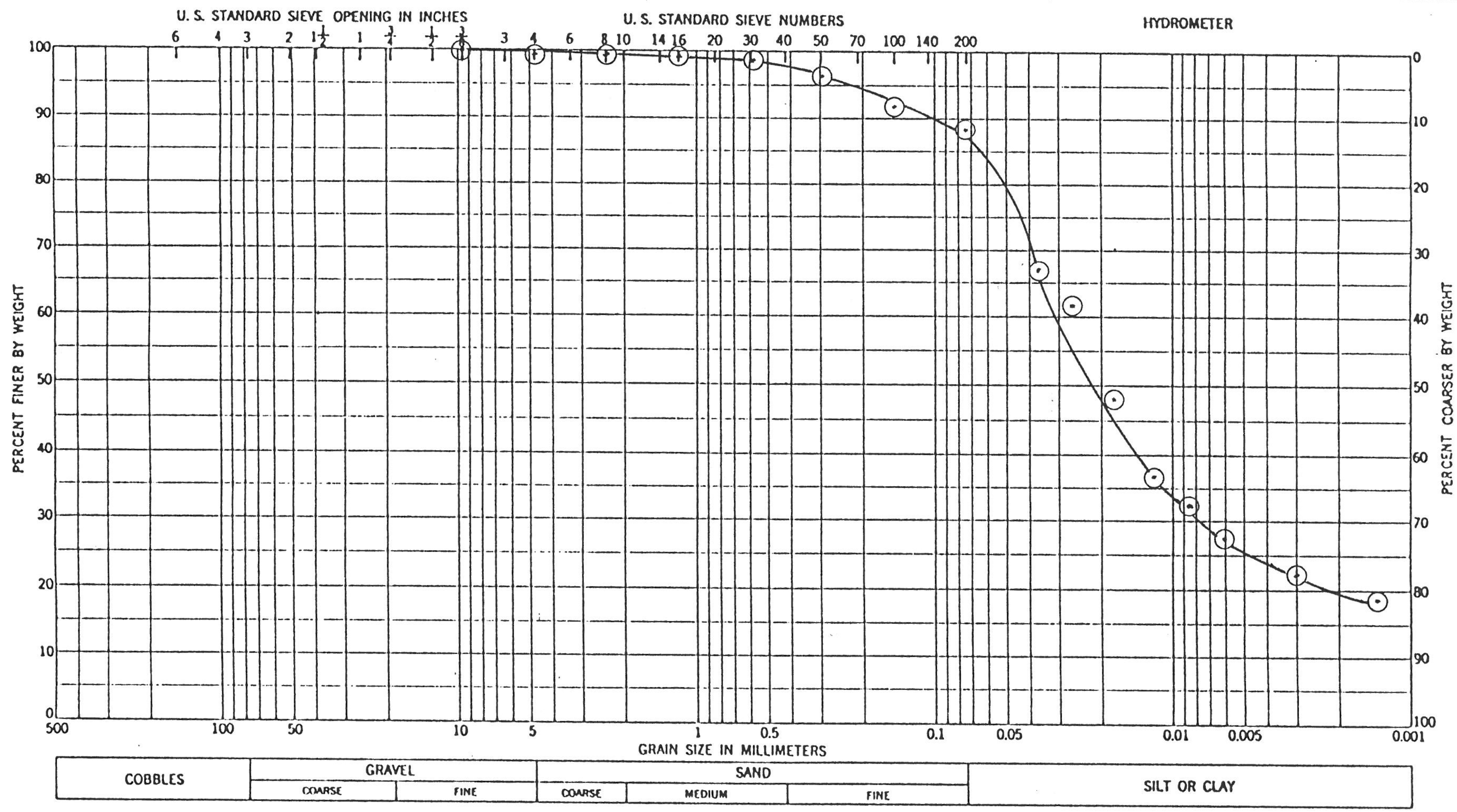

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-8S	10.0'-12.0'	Dark gray to black	41.0				
SS-3		organic silty clay,					
		little coarse to fine					
		sand, wood present					
		OL					

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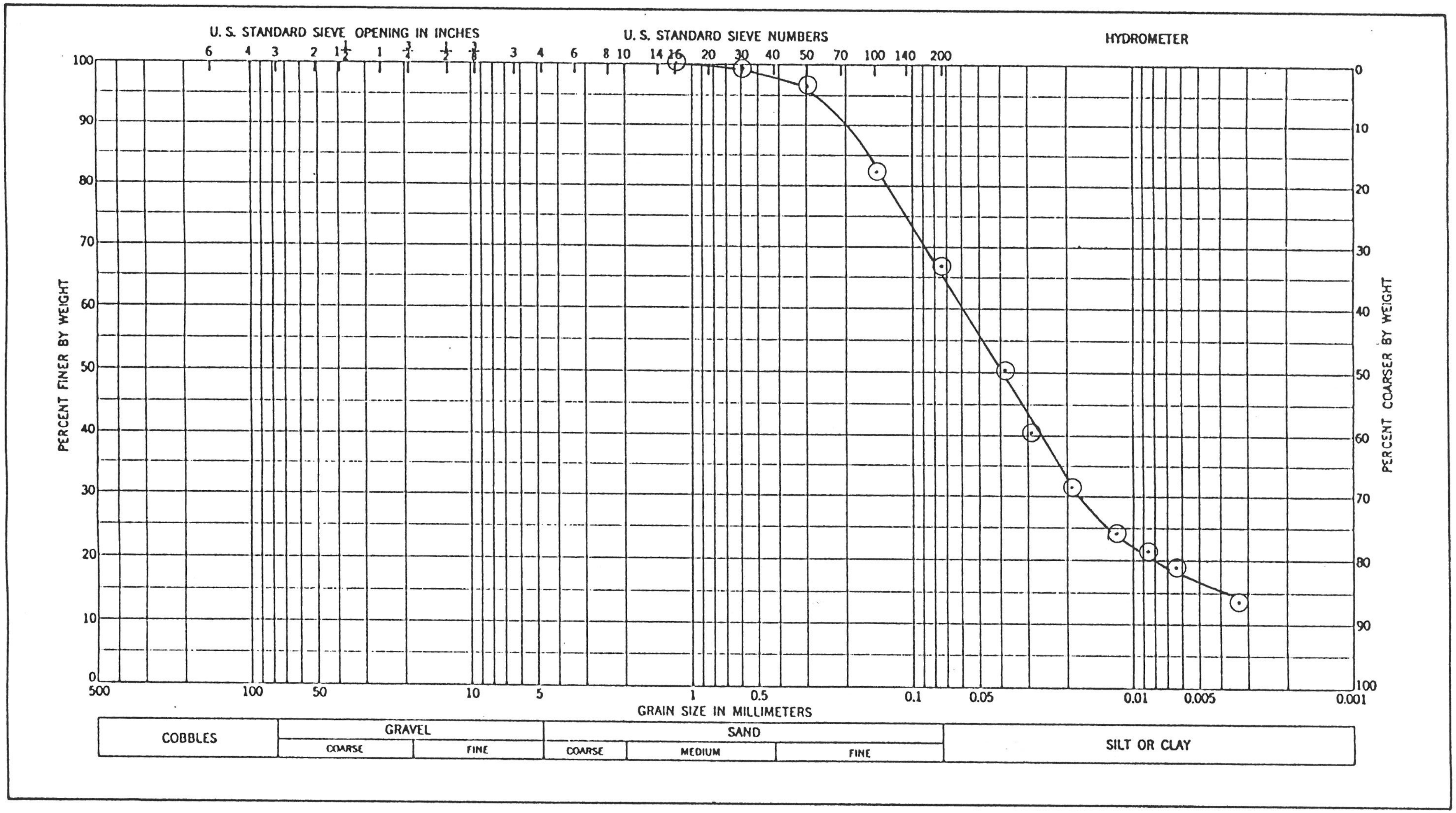

Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-9D	50.0'-52.0'	Gray clayey silt and	20.7				
SS-26		medium to fine sand					
		CL-ML					

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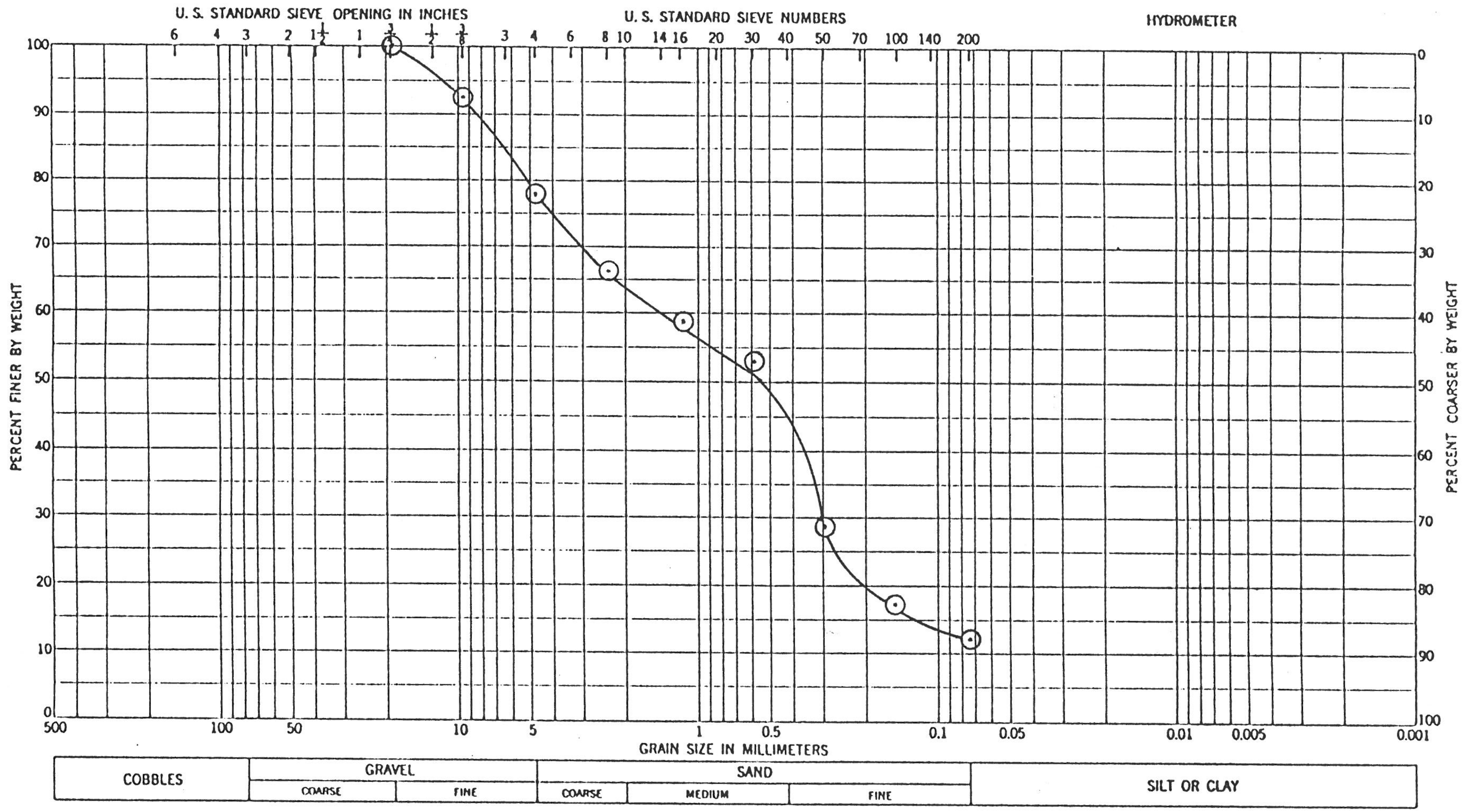
PARTICLE SIZE DISTRIBUTION

PDF_0627



Sample No.	Elev. or Depth	Classification	Nat w%	LL	PL	PI	Remarks
P-9D	56.0'-58.0'	Gray coarse to fine sand,					
SS-29A		some fine gravel, little					
		silt					
		SM					

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PARTICLE SIZE DISTRIBUTION

UNCONFINED COMPRESSIVE STRENGTHS

UNCONFINED COMPRESSION TEST

Job No. 496B Client: City of Springfield (CWLP)

Sample: CB-1 3T-5 8.0'-10.0'

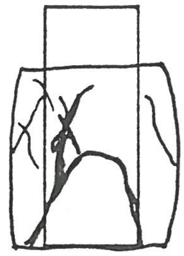
Sample Height: 5.8 in dia.: 2.8 in

Moisture content 29.4%

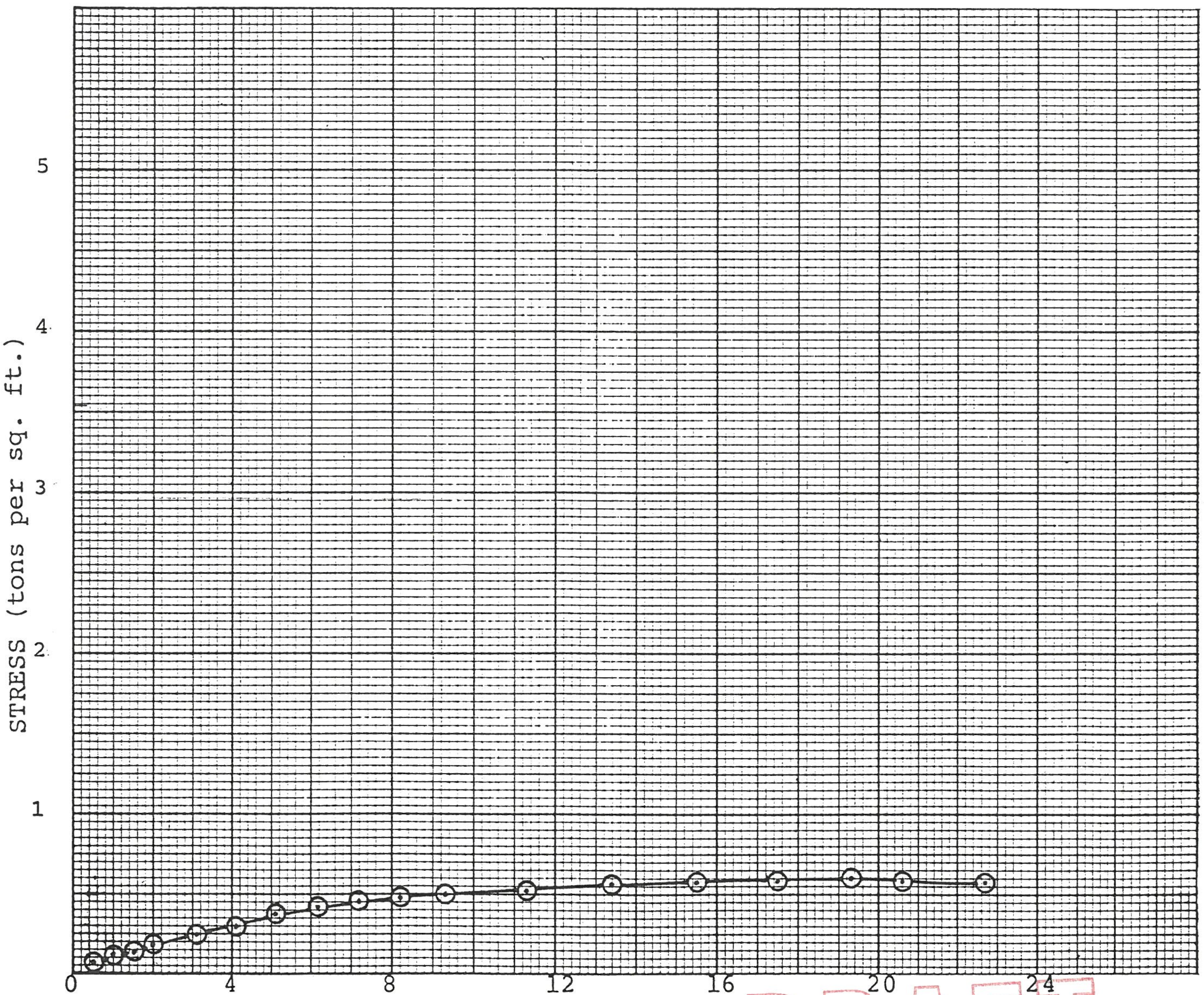
Dry density: 94.4 pcf

Max. compr. stress: 0.6 tsf @ 15.0 % strain

Remarks:



FAILURE SKETCH



DRAFT

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UNCONFINED COMPRESSION TEST

Job No. 496B Client: City of Springfield (CWLP)

Sample: CB-6, 3T-7 12.0'-14.0'

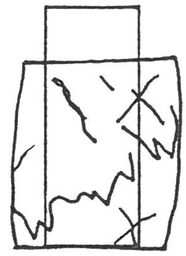
Sample Height: 5.9 in dia.: 2.8 in

Moisture content 26.4%

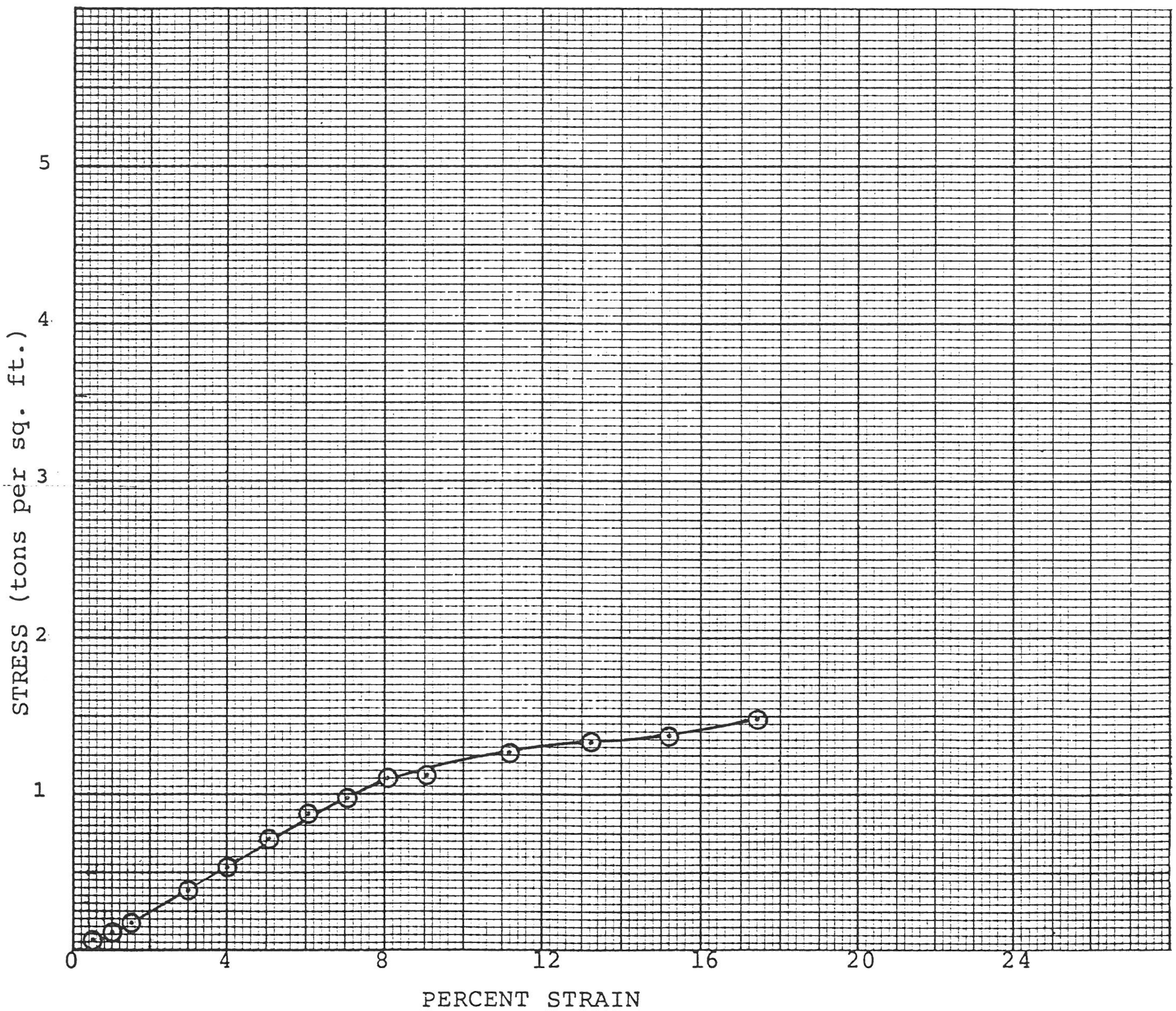
Dry density: 99.0 pcf

Max. compr. stress: 1.4 tsf @ 15.0 % strain

Remarks:



FAILURE SKETCH



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TRIAXIAL HYDRAULIC CONDUCTIVITY TEST RESULTS

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	B-3	Tare no.	136	131
Sample No.	3T-20	Tare wt. (g)	21.41	21.1
Description:	GRAY CL-ML	Wt. wet soil & tare (g)	182.00	100.55
		Wt. dry soil & tare (g)	150.26	85.82
		Moisture Content (%)	24.63	22.76

Diameter (cm)	7.07
Height (cm)	15.02
Volume (cm3)	589.7
Wet Wt. (g)	1226.70
Dry Density (pcf)	104.2
Specific Gravity	2.70
Void Ratio	0.618
Saturation (%)	108

DRAFT FOR REVIEW

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 4.7	Bottom: 3.60
Volume change (cm3):	15.0	
Consolidated volume (cm3):	574.6	
Dry weight of sample (g):	984.25	
% change each dimension:	0.00849	
Consolidated diameter (cm):	7.01	2.76 in.
Consolidated height (cm):	14.89	5.86 in.
Consolidated area (cm2):	38.6	5.98 in2
Consolidated dry density (pcf):	106.9	
Consolidated void ratio:	0.576	
Consolidated % saturation:	107	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	69.7	69.7			
Top pressure (psi):	58.2	58.2			
Bottom pressure (psi):	61.3	61.2			
Gradient:	15	14	0	0	0
Confining Pressure (psi):	9.95	10	*Error*	*Error*	*Error*
Date initial reading:	10/27/92	10/28/92			
Time initial reading:	4:53 PM	5:07 PM			
Date final reading:	10/28/92	10/29/92			
Time final reading:	8:57 AM	8:41 AM			
Initial man. rdg. (in) Top=	66.05	68.3			
Bottom=	66.1	64			
Final man. rdg. (in) Top=	67.55	69.6			
Bottom=	64.7	62.7			
Δ Top (in.)	1.5	1.3	0	0	0
Δ Bottom (in.)	1.40	1.3	0	0	0
Δ Time (hrs.)	16.07	15.57	0.00	0.00	0.00
Top "K" value (cm/sec) =	8.9E-08	8.2E-08	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	8.3E-08	8.2E-08	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 8.2E-08   Conf. Pres. (psi) = 10

DRAFT

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Coefficient of Permeability - Calculation Sheet

Tech. - JCV Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	B-4	Tare no.	log	201
Sample No.	3T-4	Tare wt. (g)	20.41	21.03
Description:		Wt. wet soil & tare (g)	103.90	154.45
		Wt. dry soil & tare (g)	85.66	126.65
		Moisture Content (%)	27.95	26.32

Diameter (cm)	7.25
Height (cm)	12.92
Volume (cm3)	533.4
Wet Wt. (g)	1079.07
Dry Density (pcf)	98.7
Specific Gravity	2.70
Void Ratio	0.708
Saturation (%)	107

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)= Top: 0.8 Bottom: 1.10

Volume change (cm3):	3.4	
Consolidated volume (cm3):	529.9	
Dry weight of sample (g):	843.33	
% change each dimension:	0.00215	
Consolidated diameter (cm):	7.23	2.85 in.
Consolidated height (cm):	12.89	5.08 in.
Consolidated area (cm2):	41.1	6.37 in2
Consolidated dry density (pcf):	99.3	
Consolidated void ratio:	0.697	
Consolidated % saturation:	102	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	60	60.1			
Top pressure (psi):	47.6	47.8			
Bottom pressure (psi):	51.4	51.4			
Gradient:	21	20	0	0	0
Confining Pressure (psi):	10.5	10.5	*Error*	*Error*	*Error*
Date initial reading:	8/28/92	8/28/92			
Time initial reading:	9:04 AM	10:02 PM			
Date final reading:	8/28/92	8/29/92			
Time final reading:	1:44 PM	8:43 PM			
Initial man. rdg. (in) Top=	64.75	66			
Bottom=	71	69.8			
Final man. rdg. (in) Top=	65.25	67.6			
Bottom=	70.5	68.2			
Δ Top (in.)	0.50	1.60	0	0	0
Δ Bottom (in.)	0.50	1.60	0	0	0
Δ Time (hrs.)	4.67	22.68	0.00	0.00	0.00
Top "K" value (cm/sec) =	6.8E-08	$\boxed{4.7E-08}$	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	6.8E-08	4.7E-08	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 4.7E-08 Conf. Pres. (psi) = 10.5

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Coefficient of Permeability - Calculation Sheet

Tech. - JCV　　Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	CB-1	Tare no.	log	225
Sample No.	3T-5	Tare wt. (g)	20.56	20.89
Description:	Vry Dk Gr Silty Clay	Wt. wet soil & tare (g)	124.71	118.38
		Wt. dry soil & tare (g)	102.32	97.34
		Moisture Content (%)	27.39	27.52

Diameter (cm)	7.20
Height (cm)	14.17
Volume (cm3)	576.9
Wet Wt. (g)	1124.63
Dry Density (pcf)	95.5
Specific Gravity	2.70
Void Ratio	0.764
Saturation (%)	97

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 6.7	Bottom: 4.30
Volume change (cm3):	19.9	
Consolidated volume (cm3):	557.0	
Dry weight of sample (g):	882.86	
% change each dimension:	0.01150	
Consolidated diameter (cm):	7.12	2.80 in.
Consolidated height (cm):	14.01	5.51 in.
Consolidated area (cm2):	39.8	6.17 in2
Consolidated dry density (pcf):	98.9	
Consolidated void ratio:	0.704	
Consolidated % saturation:	106	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	59.4	59.4			
Top pressure (psi):	47.4	47.4			
Bottom pressure (psi):	51.7	51.7			
Gradient:	22	22	0	- 0	0
Confining Pressure (psi):	9.85	9.85	*Error*	*Error*	*Error*
Date initial reading:	8/27/92	8/27/92			
Time initial reading:	9:26 AM	1:45 PM			
Date final reading:	8/27/92	8/27/92			
Time final reading:	1:45 PM	8:03 PM			
Initial man. rdg. (in) Top=	62.65	64.2			
Bottom=	68.8	67.9			
Final man. rdg. (in) Top=	64.2	65.7			
Bottom=	67.9	66.7			
Δ Top (in.)	1.55	1.5	0	0	0
Δ Bottom (in.)	0.9	1.2	0	0	0
Δ Time (hrs.)	4.32	6.30	0.00	0.00	0.00
Top "K" value (cm/sec) =	2.2E-07	1.5E-07	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	1.3E-07	1.2E-07	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 1.5E-07　　Conf. Pres. (psi) = 9.85

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	CB-2	Tare no.	log	266
Sample No.	3T-9	Tare wt. (g)	20.98	20.61
Description:		Wt. wet soil & tare (g)	110.34	86.99
		Wt. dry soil & tare (g)	85.81	69.88
		Moisture Content (%)	37.84	34.73

Diameter (cm)	7.15
Height (cm)	7.11
Volume (cm3)	285.5
Wet Wt. (g)	501.73
Dry Density (pcf)	79.6
Specific Gravity	2.70
Void Ratio	1.118
Saturation (%)	91

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 3.4	Bottom: 4.25
Volume change (cm3):	13.8	
Consolidated volume (cm3):	271.6	
Dry weight of sample (g):	364.00	
% change each dimension:	0.01616	
Consolidated diameter (cm):	7.03	2.77 in.
Consolidated height (cm):	7.00	2.75 in.
Consolidated area (cm2):	38.9	6.02 in2
Consolidated dry density (pcf):	83.6	
Consolidated void ratio:	1.015	
Consolidated % saturation:	92	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	50.1	50.1			
Top pressure (psi):	38.8	38.8			
Bottom pressure (psi):	40.6	40.6			
Gradient:	18	18	0	0	0
Confining Pressure (psi):	10.4	10.4	*Error*	*Error*	*Error*
Date initial reading:	8/27/92	8/27/92			
Time initial reading:	9:25 AM	1:40 AM			
Date final reading:	8/27/92	8/27/92			
Time final reading:	1:40 PM	7:46 AM			
Initial man. rdg. (in) Top=	65.4	66.9			
Bottom=	72.85	71.6			
Final man. rdg. (in) Top=	66.9	68.8			
Bottom=	71.6	69.9			
Δ Top (in.)	1.5	1.9	0	0	0
Δ Bottom (in.)	1.25	1.7	0	0	0
Δ Time (hrs.)	4.25	6.10	0.00	0.00	0.00
Top "K" value (cm/sec) =	2.7E-07	$\boxed{2.4E-07}$	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	2.2E-07	2.1E-07	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 2.4E-07   Conf. Pres. (psi) = 10.4

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	CB-4	Tare no.	log	228
Sample No.	3T-9	Tare wt. (g)	20.60	20.84
Description:	Dk Gr Silt	Wt. wet soil & tare (g)	111.80	75.91
		Wt. dry soil & tare (g)	94.24	65.37
		Moisture Content (%)	23.85	23.67

Diameter (cm)	7.20
Height (cm)	14.75
Volume (cm3)	600.5
Wet Wt. (g)	1231.78
Dry Density (pcf)	103.3
Specific Gravity	2.70
Void Ratio	0.630
Saturation (%)	102

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 6.2	Bottom: 5.10	
Volume change (cm3):	20.4		
Consolidated volume (cm3):	580.1		
Dry weight of sample (g):	994.61		
% change each dimension:	0.01135		
Consolidated diameter (cm):	7.12	2.80	in.
Consolidated height (cm):	14.58	5.74	in.
Consolidated area (cm2):	39.8	6.17	in2
Consolidated dry density (pcf):	107.0		
Consolidated void ratio:	0.575		
Consolidated % saturation:	111		

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	40.1	40.1	40.1		
Top pressure (psi):	28.2	28.4	28.2		
Bottom pressure (psi):	31.6	31.4	31.6		
Gradient:	16	14	16	0	0
Confining Pressure (psi):	10.2	10.2	10.2	*Error*	*Error*
Date initial reading:	8/26/92	8/26/92	8/26/92		
Time initial reading:	7:52 AM	9:58 PM	11:19 AM		
Date final reading:	8/26/92	8/27/92	8/26/92		
Time final reading:	9:58 PM	8:36 AM	9:58 PM		
Initial man. rdg. (in) Top=	59.2	66.9	61.35		
Bottom=	70.05	63	68.3		
Final man. rdg. (in) Top=	66.9	71.75	66.9		
Bottom=	63	58.15	63		
Δ Top (in.)	7.7	4.85	5.55	0	0
Δ Bottom (in.)	7.05	4.85	5.3	0	0
Δ Time (hrs.)	14.10	10.63	10.65	0.00	0.00
Top "K" value (cm/sec) =	4.5E-07	$\boxed{4.3E-07}$	4.3E-07	*Error*	*Error*
Bottom "K" value (cm/sec) =	4.1E-07	4.3E-07	4.1E-07	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 4.3E-07   Conf. Pres. (psi) = 10.2

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

			Initial WC%	Final W%
Job No.	496B			
Boring Number:	CB-6	Tare no.	log	200
Sample No.	3T-7	Tare wt. (g)	20.94	20.45
Description:	Gr. Silty Clay	Wt. wet soil & tare (g)	124.57	149.79
		Wt. dry soil & tare (g)	100.75	121.98
		Moisture Content (%)	29.85	27.39

Diameter (cm)	7.10
Height (cm)	9.09
Volume (cm3)	359.9
Wet Wt. (g)	713.69
Dry Density (pcf)	95.3
Specific Gravity	2.70
Void Ratio	0.768
Saturation (%)	105

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 4.7	Bottom: 2.65
Volume change (cm3):	13.3	
Consolidated volume (cm3):	346.6	
Dry weight of sample (g):	549.64	
% change each dimension:	0.01232	
Consolidated diameter (cm):	7.01	2.76 in.
Consolidated height (cm):	8.98	3.53 in.
Consolidated area (cm2):	38.6	5.99 in2
Consolidated dry density (pcf):	99.0	
Consolidated void ratio:	0.703	
Consolidated % saturation:	105	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	50.2	50.4	50.2		
Top pressure (psi):	38.5	38.9	38.5		
Bottom pressure (psi):	41.3	41.4	41.3		
Gradient:	22	20	22	0	0
Confining Pressure (psi):	10.3	10.25	10.3	*Error*	*Error*
Date initial reading:	8/28/92	8/28/92	8/28/92		
Time initial reading:	1:43 PM	3:33 PM	1:43 PM		
Date final reading:	8/28/92	8/28/92	8/28/92		
Time final reading:	3:33 PM	10:01 PM	10:01 PM		
Initial man. rdg. (in) Top=	62	63.9	62		
Bottom=	67.3	66	67.3		
Final man. rdg. (in) Top=	63.9	68.7	68.7		
Bottom=	66	61.55	61.55		
Δ Top (in.)	1.9	4.8	6.7	0	0
Δ Bottom (in.)	1.3	4.45	5.75	0	0
Δ Time (hrs.)	1.83	6.47	8.30	0.00	0.00
Top "K" value (cm/sec) =	6.6E-07	$\boxed{5.3E-07}$	5.1E-07	*Error*	*Error*
Bottom "K" value (cm/sec) =	4.5E-07	4.9E-07	4.4E-07	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 5.3E-07   Conf. Pres. (psi) = 10.25

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P-2D	Tare no.	105	248
Sample No.	3T-15	Tare wt. (g)	21.99	20.32
Description:	Brown CL-ML	Wt. wet soil & tare (g)	153.04	116.65
		Wt. dry soil & tare (g)	126.07	97.23
		Moisture Content (%)	25.91	25.25

Diameter (cm)	7.24
Height (cm)	15.28
Volume (cm3)	629.1
Wet Wt. (g)	1257.45
Dry Density (pcf)	99.1
Specific Gravity	2.70
Void Ratio	0.701
Saturation (%)	100

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 4.00	Bottom: 2.00
Volume change (cm3):	10.9	
Consolidated volume (cm3):	618.2	
Dry weight of sample (g):	998.67	
% change each dimension:	0.00575	
Consolidated diameter (cm):	7.20	2.83 in.
Consolidated height (cm):	15.19	5.98 in.
Consolidated area (cm2):	40.7	6.31 in2
Consolidated dry density (pcf):	100.8	
Consolidated void ratio:	0.671	
Consolidated % saturation:	102	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	59.7	59.7			
Top pressure (psi):	48	47.3			
Bottom pressure (psi):	51.7	51.1			
Gradient:	17	18	0	0	0
Confining Pressure (psi):	9.85	10.5	*Error*	*Error*	*Error*
Date initial reading:	8/3/92	8/3/92			
Time initial reading:	8:49 AM	2:39 PM			
Date final reading:	8/3/92	8/3/92			
Time final reading:	2:16 PM	4:27 PM			
Initial man. rdg. (in) Top=	63.5	68.7			
Bottom=	68	63.05			
Final man. rdg. (in) Top=	68.7	70.4			
Bottom=	63.1	61.45			
Δ Top (in.)	5.2	1.7	0	0	0
Δ Bottom (in.)	4.9	1.6	0	0	0
Δ Time (hrs.)	5.45	1.80	0.00	0.00	0.00
Top "K" value (cm/sec) =	7.4E-07	7.1E-07	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	6.9E-07	6.7E-07	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 7.3E-07*   Conf. Pres. (psi) = 10.2

*percentage of "k" values for trials 1 and 2 added for weighted composite value for 7.25 hours.

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P-3D	Tare no.	213	213
Sample No.	3T-9	Tare wt. (g)	20.63	20.63
Description:	Olive gray CL w/ silt	Wt. wet soil & tare (g)	98.59	111.47
		Wt. dry soil & tare (g)	78.58	89.49
		Moisture Content (%)	34.53	31.92

Diameter (cm)	7.20
Height (cm)	14.78
Volume (cm3)	601.8
Wet Wt. (g)	1157.82
Dry Density (pcf)	89.2
Specific Gravity	2.70
Void Ratio	0.888
Saturation (%)	105

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 2.1	Bottom: 2.25
Volume change (cm3):	7.9	
Consolidated volume (cm3):	593.9	
Dry weight of sample (g):	860.64	
% change each dimension:	0.00436	
Consolidated diameter (cm):	7.17	2.82 in.
Consolidated height (cm):	14.72	5.79 in.
Consolidated area (cm2):	40.4	6.26 in2
Consolidated dry density (pcf):	90.4	
Consolidated void ratio:	0.863	
Consolidated % saturation:	100	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	69.3	69.3			
Top pressure (psi):	57.8	57.8			
Bottom pressure (psi):	61.2	61.2			
Gradient:	16	16	0	0	0
Confining Pressure (psi):	9.8	9.8	*Error*	*Error*	*Error*
Date initial reading:	11/3/92	11/2/92			
Time initial reading:	4:25 PM	5:07 PM			
Date final reading:	11/4/92	11/3/92			
Time final reading:	8:25 AM	8:26 AM			
Initial man. rdg. (in) Top=	65.05	64.7			
Bottom=	63.75	64.1			
Final man. rdg. (in) Top=	65.3	65			
Bottom=	63.5	63.9			
Δ Top (in.)	0.25	0.30	0.00	0.00	0.00
Δ Bottom (in.)	0.25	0.20	0.00	0.00	0.00
Δ Time (hrs.)	16.00	15.32	0.00	0.00	0.00
Top "K" value (cm/sec) =	1.3E-08	1.6E-08	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	1.3E-08	1.1E-08	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 1.3E-08   Conf. Pres. (psi) = 9.8

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P-4	Tare no.	LOG	114
Sample No.	3T-11	Tare wt. (g)		21.27
Description:	GRAY CH	Wt. wet soil & tare (g)		91.69
		Wt. dry soil & tare (g)		68.22
		Moisture Content (%)	40.88	49.99

Diameter (cm)	7.26
Height (cm)	14.13
Volume (cm3)	584.9
Wet Wt. (g)	1032.84
Dry Density (pcf)	78.2
Specific Gravity	2.70
Void Ratio	1.154
Saturation (%)	96

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)= Top: 3.1 Bottom: 2.95

Volume change (cm3):	10.9	
Consolidated volume (cm3):	574.0	
Dry weight of sample (g):	733.13	
% change each dimension:	0.00624	
Consolidated diameter (cm):	7.21	2.84 in.
Consolidated height (cm):	14.04	5.53 in.
Consolidated area (cm2):	40.9	6.34 in2
Consolidated dry density (pcf):	79.7	
Consolidated void ratio:	1.114	
Consolidated % saturation:	121	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	130.9	130.5	130.9		
Top pressure (psi):	119.1	119.1	119.4		
Bottom pressure (psi):	122.6	122.5	122.7		
Gradient:	18	17	17	0	0
Confining Pressure (psi):	10.05	9.7	9.85	*Error*	*Error*
Date initial reading:	11/4/92	11/4/92	11/5/92		
Time initial reading:	8:42 AM	5:18 PM	8:55 AM		
Date final reading:	11/4/92	11/5/92	11/5/92		
Time final reading:	5:18 PM	8:55 AM	5:16 PM		
Initial man. rdg. (in) Top=	60.8	61.1	61.3		
Bottom=	61.4	61.05	60.6		
Final man. rdg. (in) Top=	61.1	61.3	61.5		
Bottom=	61.05	60.6	60.3		
Δ Top (in.)	0.30	0.20	0.20	0.00	0.00
Δ Bottom (in.)	0.35	0.45	0.30	0.00	0.00
Δ Time (hrs.)	8.60	15.62	8.35	0.00	0.00
Top "K" value (cm/sec) =	2.6E-08	9.9E-09	1.9E-08	*Error*	*Error*
Bottom "K" value (cm/sec) =	3.1E-08	2.2E-08	2.9E-08	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 2.9E-08   Conf. Pres. (psi) = 9.85

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV　Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P-5S	Tare no.	LOG	254
Sample No.	3T-2	Tare wt. (g)		20.75
Description:	VERY DK. GRAY CL	Wt. wet soil & tare (g)		96.87
		Wt. dry soil & tare (g)		81.8
		Moisture Content (%)	26.30	24.68

Diameter (cm)	7.10
Height (cm)	12.81
Volume (cm3)	507.2
Wet Wt. (g)	982.85
Dry Density (pcf)	95.7
Specific Gravity	2.70
Void Ratio	0.760
Saturation (%)	93

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 1.9	Bottom: -1.05
Volume change (cm3):	1.5	
Consolidated volume (cm3):	505.6	
Dry weight of sample (g):	778.19	
% change each dimension:	0.00101	
Consolidated diameter (cm):	7.09	2.79 in.
Consolidated height (cm):	12.80	5.04 in.
Consolidated area (cm2):	39.5	6.12 in2
Consolidated dry density (pcf):	96.0	
Consolidated void ratio:	0.754	
Consolidated % saturation:	88	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	89.9	90			
Top pressure (psi):	78.6	78.9			
Bottom pressure (psi):	81.6	81.5			
Gradient:	16	14	0	0	0
Confining Pressure (psi):	9.8	9.8	*Error*	*Error*	*Error*
Date initial reading:	11/4/92	11/4/92			
Time initial reading:	8:42 AM	5:17 PM			
Date final reading:	11/4/92	11/5/92			
Time final reading:	5:17 PM	8:56 AM			
Initial man. rdg. (in) Top=	64.25	65			
Bottom=	68.8	68			
Final man. rdg. (in) Top=	65	66.15			
Bottom=	68	66.75			
Δ Top (in.)	0.75	1.15	0.00	0.00	0.00
Δ Bottom (in.)	0.80	1.25	0.00	0.00	0.00
Δ Time (hrs.)	8.58	15.65	0.00	0.00	0.00
Top "K" value (cm/sec) =	7.2E-08	7.0E-08	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	7.7E-08	7.6E-08	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 7.6E-08　　Conf. Pres. (psi) = 9.8

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P7D	Tare no.	log	203
Sample No.	3T-5	Tare wt. (g)	20.46	20.6
Description:		Wt. wet soil & tare (g)	116.29	136.53
		Wt. dry soil & tare (g)	98.60	115.96
		Moisture Content (%)	22.64	21.57

Diameter (cm)	7.23
Height (cm)	14.13
Volume (cm3)	580.1
Wet Wt. (g)	1153.85
Dry Density (pcf)	101.2
Specific Gravity	2.70
Void Ratio	0.665
Saturation (%)	92

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 3.5	Bottom: 3.25
Volume change (cm3):	12.2	
Consolidated volume (cm3):	567.9	
Dry weight of sample (g):	940.85	
% change each dimension:	0.00702	
Consolidated diameter (cm):	7.18	2.83 in.
Consolidated height (cm):	14.03	5.52 in.
Consolidated area (cm2):	40.5	6.27 in2
Consolidated dry density (pcf):	103.4	
Consolidated void ratio:	0.630	
Consolidated % saturation:	92	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	79.6	79.6			
Top pressure (psi):	68	68			
Bottom pressure (psi):	71.7	71.7			
Gradient:	19	19	0	0	0
Confining Pressure (psi):	9.75	9.75	*Error*	*Error*	*Error*
Date initial reading:	8/31/92	8/31/92			
Time initial reading:	9:16 AM	9:16 AM			
Date final reading:	8/31/92	8/31/92			
Time final reading:	12:14 PM	5:00 PM			
Initial man. rdg. (in) Top=	66.5	66.5			
Bottom=	69.4	69.4			
Final man. rdg. (in) Top=	67.35	68.7			
Bottom=	68.55	67.2			
Δ Top (in.)	0.85	2.2	0	0	0
Δ Bottom (in.)	0.85	2.2	0	0	0
Δ Time (hrs.)	2.97	7.73	0.00	0.00	0.00
Top "K" value (cm/sec) =	2.1E-07	$\boxed{2.0E-07}$	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	2.1E-07	2.0E-07	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 2.0E-07   Conf. Pres. (psi) = 9.75

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet — Tech. - JCV — Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P-7M	Tare no.	log	265
Sample No.	3T-2	Tare wt. (g)	20.65	20.65
Description:		Wt. wet soil & tare (g)	126.92	182.16
		Wt. dry soil & tare (g)	107.43	154.42
		Moisture Content (%)	22.46	20.74

Diameter (cm)	7.35
Height (cm)	14.04
Volume (cm3)	595.7
Wet Wt. (g)	1185.50
Dry Density (pcf)	101.4
Specific Gravity	2.70
Void Ratio	0.661
Saturation (%)	92

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 6.6	Bottom: 3.15
Volume change (cm3):	17.6	
Consolidated volume (cm3):	578.1	
Dry weight of sample (g):	968.08	
% change each dimension:	0.00987	
Consolidated diameter (cm):	7.28	2.87 in.
Consolidated height (cm):	13.90	5.47 in.
Consolidated area (cm2):	41.6	6.45 in2
Consolidated dry density (pcf):	104.5	
Consolidated void ratio:	0.612	
Consolidated % saturation:	91	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	49.9	49.9			
Top pressure (psi):	38.4	38.4			
Bottom pressure (psi):	41.7	41.7			
Gradient:	17	17	0	0	0
Confining Pressure (psi):	9.85	9.85	*Error*	*Error*	*Error*
Date initial reading:	8/31/92	8/31/92			
Time initial reading:	12:13 PM	9:14 AM			
Date final reading:	8/31/92	8/31/92			
Time final reading:	4:54 PM	4:54 PM			
Initial man. rdg. (in) Top=	63.5	62.8			
Bottom=	69.35	69.8			
Final man. rdg. (in) Top=	64.3	64.3			
Bottom=	68.6	68.6			
Δ Top (in.)	0.80	1.50	0	0	0
Δ Bottom (in.)	0.75	1.20	0	0	0
Δ Time (hrs.)	4.68	7.67	0.00	0.00	0.00
Top "K" value (cm/sec) =	1.3E-07	$\boxed{1.5E-07}$	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	1.2E-07	1.2E-07	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 1.5E-07 — Conf. Pres. (psi) = 9.85

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet

Tech. - JCV   Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P-9D	Tare no.	140	227
Sample No.	3T-8	Tare wt. (g)	21.39	20.86
Description:	VERY DK. GR. CL	Wt. wet soil & tare (g)	157.72	67.52
		Wt. dry soil & tare (g)	132.45	58.86
		Moisture Content (%)	22.75	22.79

Diameter (cm)	7.11
Height (cm)	14.93
Volume (cm3)	592.8
Wet Wt. (g)	1192.37
Dry Density (pcf)	102.3
Specific Gravity	2.70
Void Ratio	0.648
Saturation (%)	95

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: 9.9	Bottom: 3.35
Volume change (cm3):	24.0	
Consolidated volume (cm3):	568.8	
Dry weight of sample (g):	971.35	
% change each dimension:	0.01348	
Consolidated diameter (cm):	7.01	2.76 in.
Consolidated height (cm):	14.73	5.80 in.
Consolidated area (cm2):	38.6	5.99 in2
Consolidated dry density (pcf):	106.6	
Consolidated void ratio:	0.581	
Consolidated % saturation:	106	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	110	110	110.3		
Top pressure (psi):	98.3	98.3	98.6		
Bottom pressure (psi):	101.6	101.6	101.8		
Gradient:	16	16	15	0	0
Confining Pressure (psi):	10.05	10.05	10.1	*Error*	*Error*
Date initial reading:	11/1/92	10/30/92	11/3/92		
Time initial reading:	12:28 PM	5:04 PM	4:27 PM		
Date final reading:	11/2/92	11/1/92	11/4/92		
Time final reading:	8:25 AM	12:28 PM	8:28 AM		
Initial man. rdg. (in) Top=	66.45	63.4	68.75		
Bottom=	64.35	65.85	62.7		
Final man. rdg. (in) Top=	67.2	66.45	69.4		
Bottom=	63.7	64.35	62.45		
Δ Top (in.)	0.75	3.05	0.65	0	0
Δ Bottom (in.)	0.65	1.5	0.25	0	0
Δ Time (hrs.)	19.95	43.40	16.02	0.00	0.00
Top "K" value (cm/sec) =	3.3E-08	6.2E-08	3.7E-08	*Error*	*Error*
Bottom "K" value (cm/sec) =	2.9E-08	3.1E-08	1.4E-08	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 3.3E-08   Conf. Pres. (psi) = 10.05

PATRICK ENGINEERING, INC.

Coefficient of Permeability - Calculation Sheet | Tech. - JCV | Check -

Job No.	496B		Initial WC%	Final W%
Boring Number:	P-9S	Tare no.	112	114
Sample No.	3T-1	Tare wt. (g)	21.81	21.24
Description:	Gray CL/CL-ML	Wt. wet soil & tare (g)	162.51	147.21
		Wt. dry soil & tare (g)	135.17	122.17
		Moisture Content (%)	24.12	24.81

Diameter (cm)	7.17
Height (cm)	14.31
Volume (cm3)	577.8
Wet Wt. (g)	1163.11
Dry Density (pcf)	101.2
Specific Gravity	2.70
Void Ratio	0.665
Saturation (%)	98

Dimensional Change During Consolidation (assuming isotropic consolidation)

Manometer change (in)=	Top: -1	Bottom: 5.70
Volume change (cm3):	8.5	
Consolidated volume (cm3):	569.3	
Dry weight of sample (g):	937.10	
% change each dimension:	0.00491	
Consolidated diameter (cm):	7.13	2.81 in.
Consolidated height (cm):	14.24	5.61 in.
Consolidated area (cm2):	40.0	6.20 in2
Consolidated dry density (pcf):	102.7	
Consolidated void ratio:	0.640	
Consolidated % saturation:	105	

	TRIAL 1	TRIAL 2	TRIAL 3	TRIAL4	TRIAL 5
Cell pressure (psi):	69.7	69.6			
Top pressure (psi):	58.3	58.8			
Bottom pressure (psi):	62.1	61.8			
Gradient:	19	15	0	0	0
Confining Pressure (psi):	9.5	9.3	*Error*	*Error*	*Error*
Date initial reading:	10/27/92	10/28/92			
Time initial reading:	12:14 PM	8:58 AM			
Date final reading:	10/27/92	10/28/92			
Time final reading:	4:51 PM	5:06 PM			
Initial man. rdg. (in) Top=	59.4	59.6			
Bottom=	71.6	71.4			
Final man. rdg. (in) Top=	67.6	71.3			
Bottom=	63.5	59.7			
Δ Top (in.)	8.2	11.7	0	0	0
Δ Bottom (in.)	8.1	11.7	0	0	0
Δ Time (hrs.)	4.62	8.13	0.00	0.00	0.00
Top "K" value (cm/sec) =	1.3E-06	$\boxed{1.3E-06}$	*Error*	*Error*	*Error*
Bottom "K" value (cm/sec) =	1.3E-06	1.3E-06	*Error*	*Error*	*Error*

PERMEABILITY VALUE (CM/SEC.) = 1.3E-06 Conf. Pres. (psi) = 9.3

NOTE: Root passing 3/4 of length from top.

PATRICK ENGINEERING, INC.

PDF_0647

CATION EXCHANGE CAPACITY TEST RESULTS

NATIONAL ENVIRONMENTAL TESTING, INC.

Bartlett Division
850 W. Bartlett Rd.
Bartlett, IL 60103
Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Krishna Redby
PATRICK ENGINEERING, INC.
346 Taft Ave.
Glen Ellyn, IL 60137

11/13/1992

NET Job Number: 92.50181

Enclosed are the Analytical Results for the following samples submitted to NET, Inc. Bartlett Division for analysis:

Project Description: 496B; Springfield

Sample Number	Sample Description	Date Taken	Date Received
186568	P-7D; SS-4; Soil		11/03/1992
186569	B-9; SS-8; Soil		11/03/1992
186570	CB-9; SS-5; Soil		11/03/1992

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please do not hesitate to call. NET has been pleased to provide these analytical services for you.

Approved By: Darla J. Kalicki

Darla J. Kalicki
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Bartlett Division
850 W. Bartlett Rd.
Bartlett , IL 60103
Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Jim Davis
PATRICK ENGINEERING, INC.
346 Taft Ave.
Glen Ellyn, IL 60137

11/13/1992

Sample No. : 186568

NET Job No.: 92.50181

Sample Description: P-7D; SS-4; Soil
496B; Springfield

Date Taken:
Time Taken:
IEPA Cert. No. 100221

Date Received: 11/03/1992
Time Received: 11:15
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Analytical Method
Solids, Total	97.3	%	11/05/1992	2540 (4)
Cation Exchange Capacity	16.5	meq/100g	11/12/1992	9080 (1)
CEC - Calcium	179.	mg/100g	11/13/1992	9080 (1)
CEC - Magnesium	71.	mg/100g	11/12/1992	9080 (1)
CEC - Sodium	2.6	mg/100g	11/12/1992	9080 (1)
CEC - Potassium	6.5	mg/100g	11/12/1992	9080 (1)

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Jim Davis
PATRICK ENGINEERING, INC.
346 Taft Ave.
Glen Ellyn, IL 60137

11/13/1992

Sample No. : 186569

NET Job No.: 92.50181

Sample Description: B-9; SS-8; Soil
496B; Springfield

Date Taken:
Time Taken:
IEPA Cert. No. 100221

Date Received: 11/03/1992
Time Received: 11:15
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Analytical Method
Solids, Total	98.3	%	11/05/1992	2540 (4)
Cation Exchange Capacity	10.7	meq/100g	11/12/1992	9080 (1)
CEC - Calcium	133.	mg/100g	11/13/1992	9080 (1)
CEC - Magnesium	35.	mg/100g	11/12/1992	9080 (1)
CEC - Sodium	1.8	mg/100g	11/12/1992	9080 (1)
CEC - Potassium	4.8	mg/100g	11/12/1992	9080 (1)

NATIONAL ENVIRONMENTAL TESTING, INC.

Bartlett Division
850 W. Bartlett Rd.
Bartlett, IL 60103
Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Jim Davis
PATRICK ENGINEERING, INC.
346 Taft Ave.
Glen Ellyn, IL 60137

11/13/1992

Sample No. : 186570

NET Job No.: 92.50181

Sample Description: CB-9; SS-5; Soil
496B; Springfield

Date Taken:
Time Taken:
IEPA Cert. No. 100221

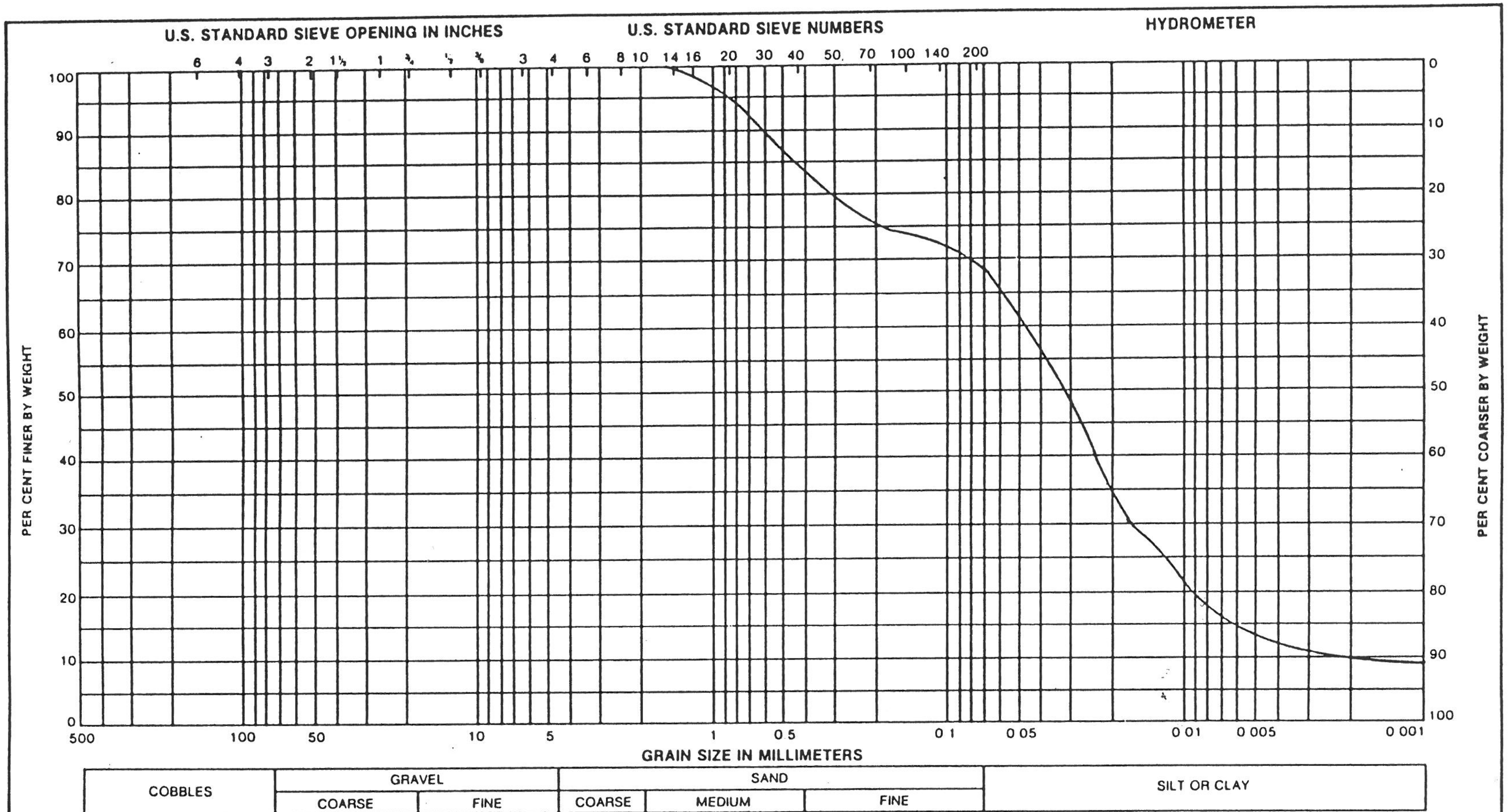
Date Received: 11/03/1992
Time Received: 11:15
WDNR Cert. No. 999447130

Parameter	Results	Units	Date of Analysis	Analytical Method
Solids, Total	97.1	%	11/05/1992	2540 (4)
Cation Exchange Capacity	18.1	meq/100g	11/12/1992	9080 (1)
CEC - Calcium	208.	mg/100g	11/13/1992	9080 (1)
CEC - Magnesium	70.	mg/100g	11/12/1992	9080 (1)
CEC - Sodium	3.3	mg/100g	11/12/1992	9080 (1)
CEC - Potassium	6.7	mg/100g	11/12/1992	9080 (1)

PDF_0652

APPENDIX D-2

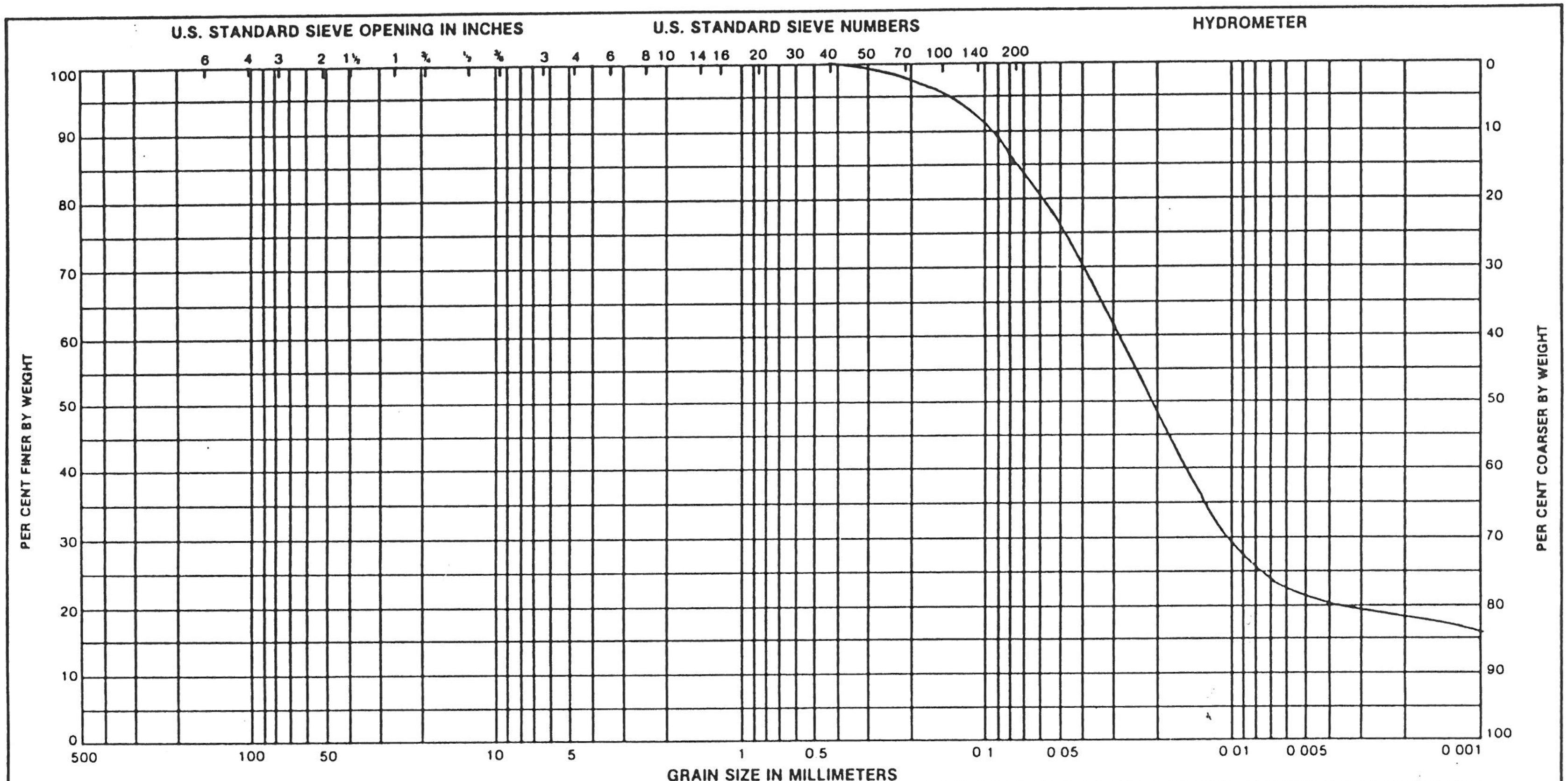
LABORATORY TESTS BY OTHERS



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-2	3-ST	10'-12'	Silty sand, grey, brown		NOT PLASTIC			Subsurface Exploration
								CWLP Ash Disposal Cell
								Springfield, Illinois

REPORT OF SOIL ANALYSIS

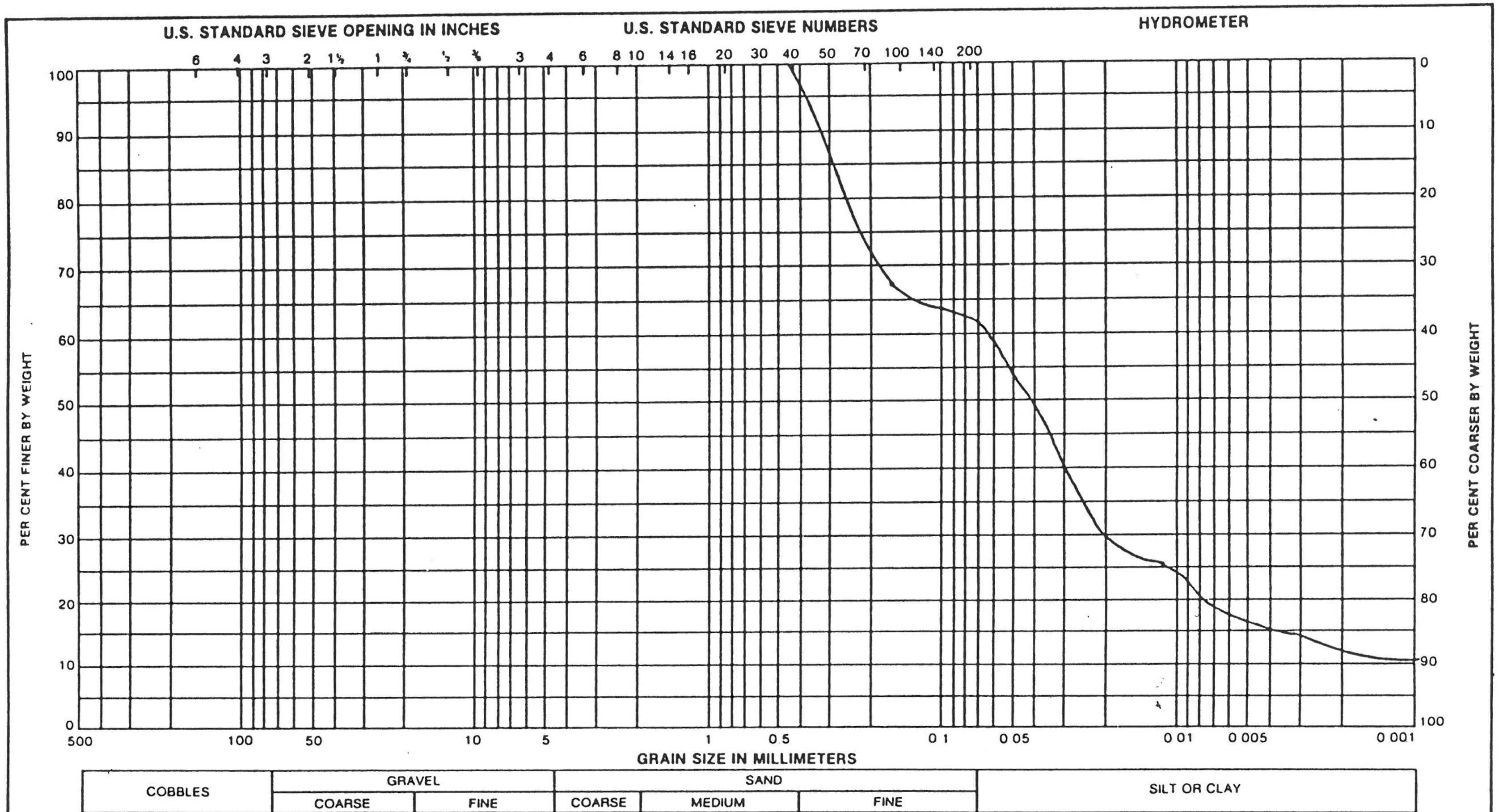
File No. 020-95039



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-2	5-ST	15'-17'	Clayey silt, trace sand, grey		30	18	12	Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

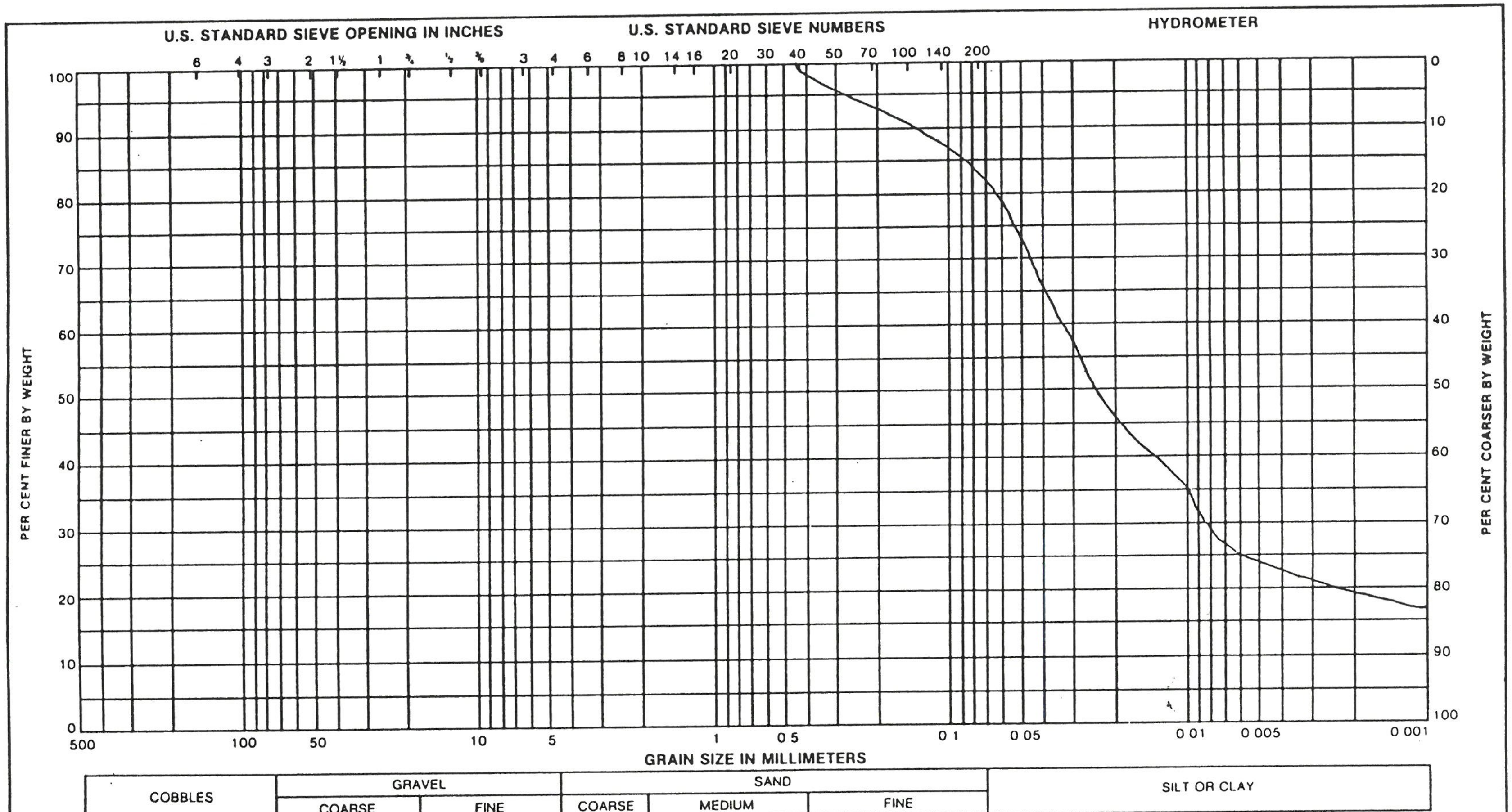
File No. 020-95039



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-2	7-ST	20-22	Sandy silt, grey		NOT PLASTIC			Subsurface Exploration
								CWLP Ash Disposal Cell
								Springfield, Illinois

REPORT OF SOIL ANALYSIS

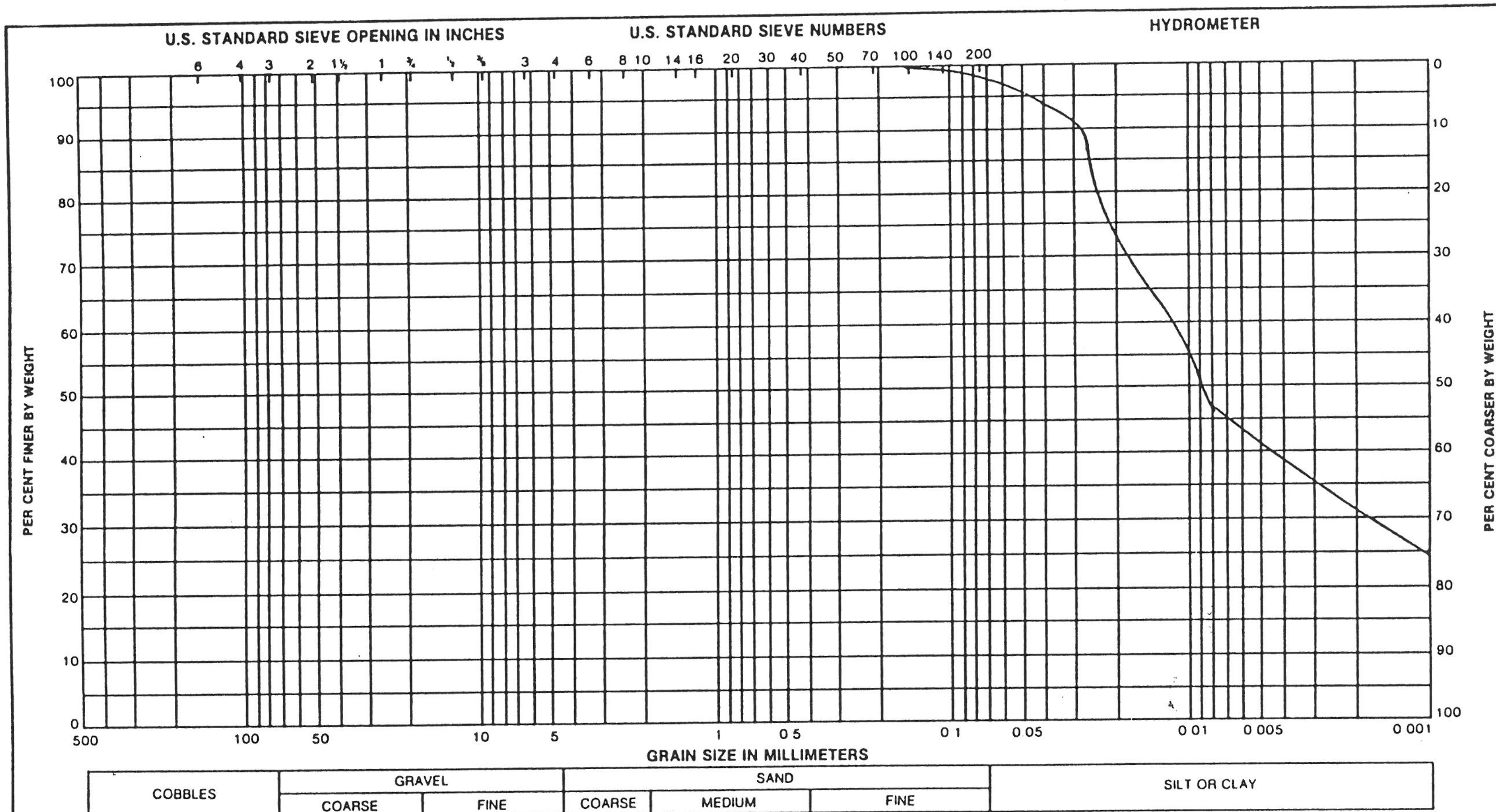
File No. 020-95039



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-5	2-ST	5'-7'	Clayey silt, some sand, brown, mottled grey	---	23	21	2	Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

File No. 020-95039

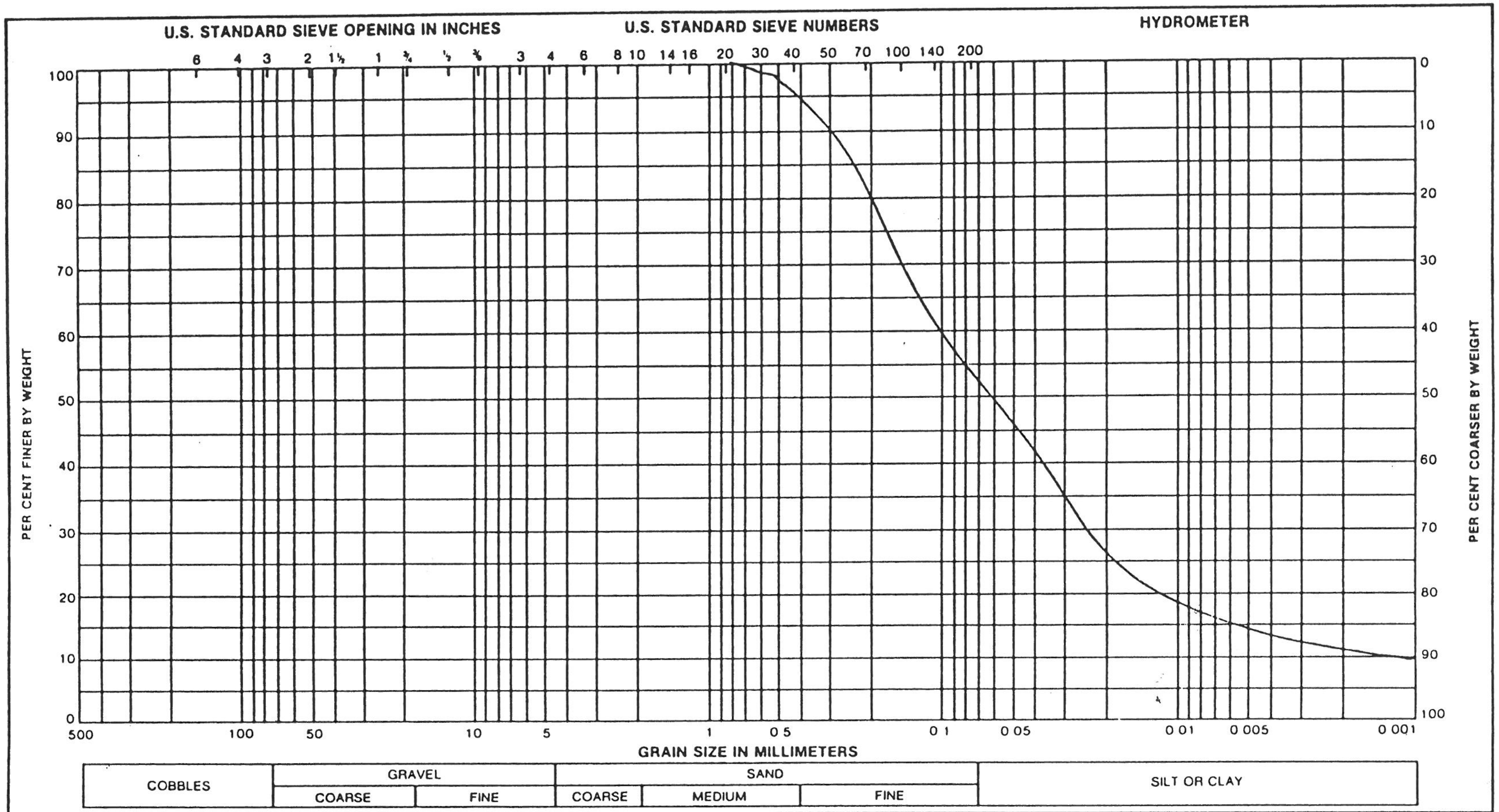


Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-13	2-ST	5'-7'	Silty clay, trace sand, grey	—	39	23	16	Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

File No. 020-95039

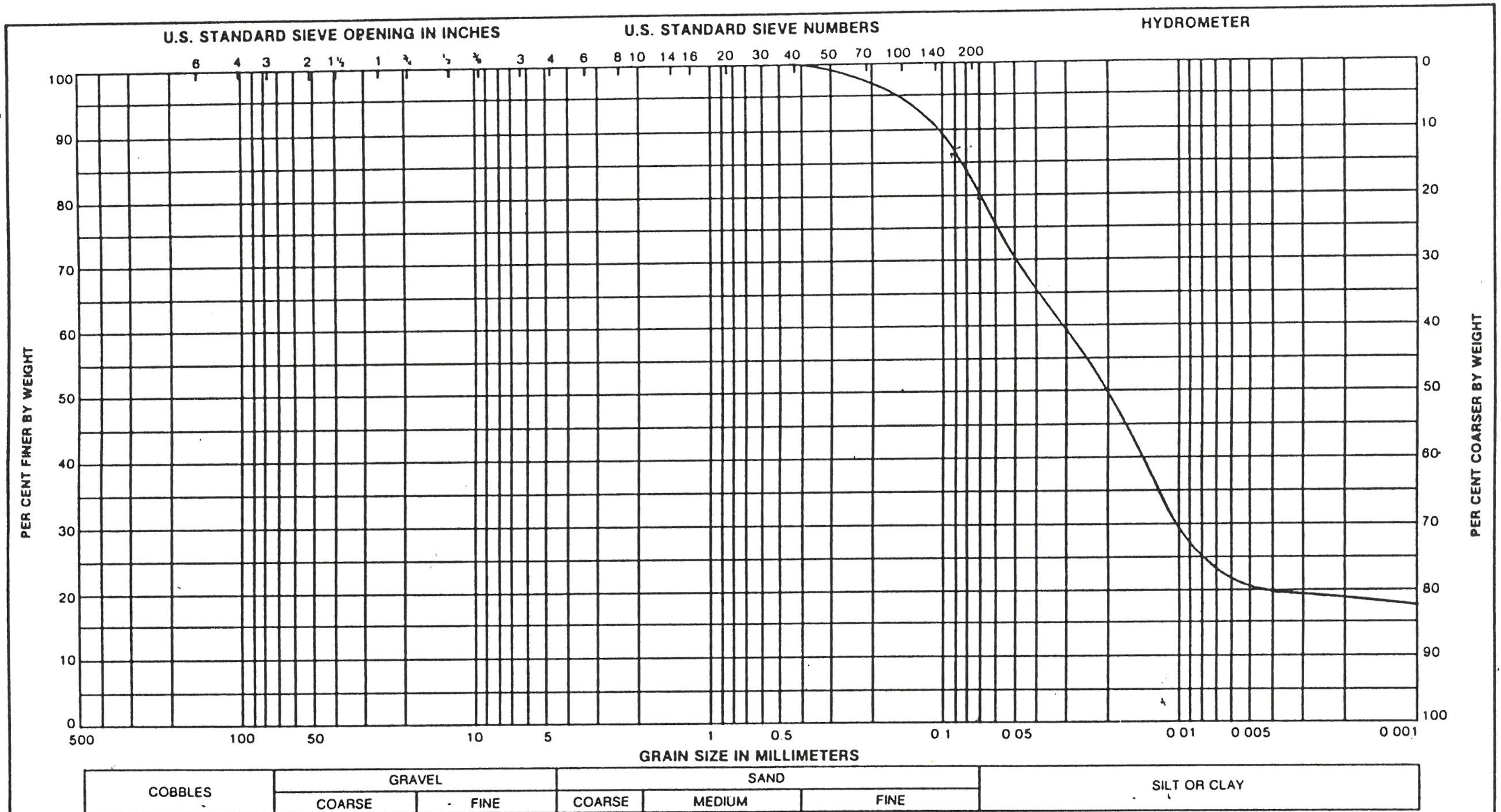
PDF_0658



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-13	4-ST	10'-12'	Clayey silt with sand, fine, grey		NOT PLASTIC			Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

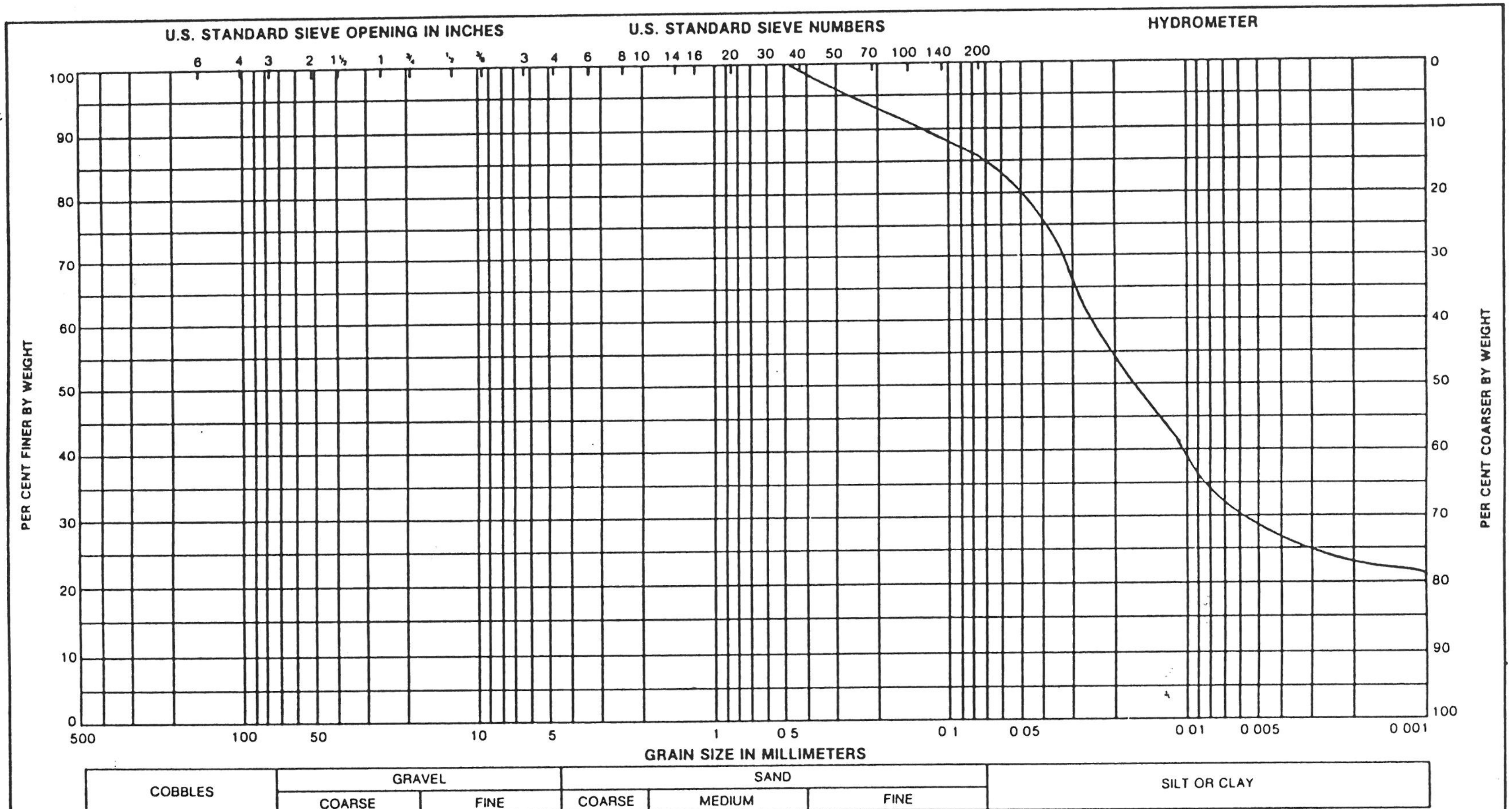
File No. 020-95039



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-13	6-ST	15'-17'	Clayey silt, some sand, grey		NOT PLASTIC			Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

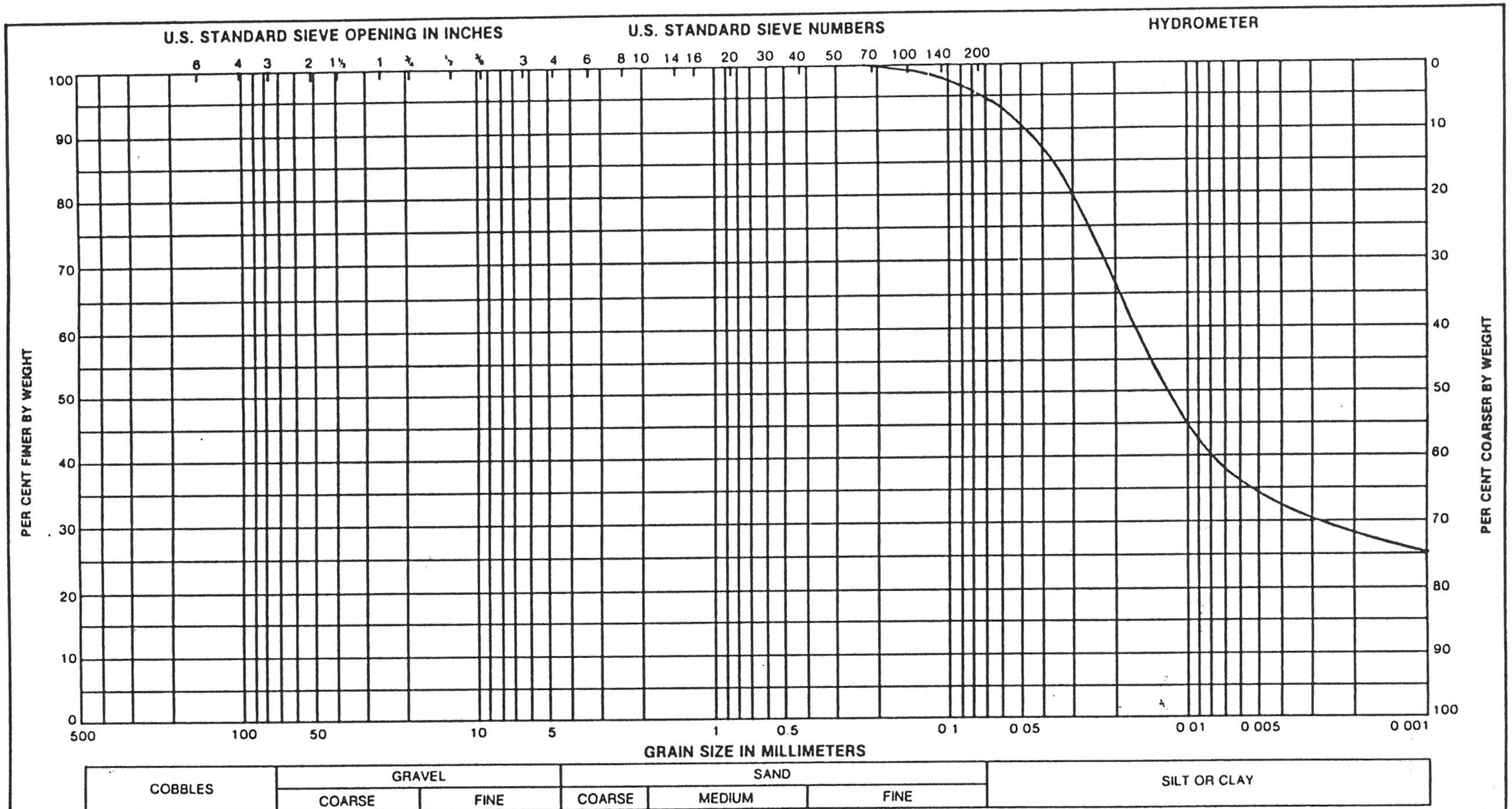
File No. 020-95039



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-15	2-ST	5'-7'	Silty clay, some sand, grey		27	19	8	Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

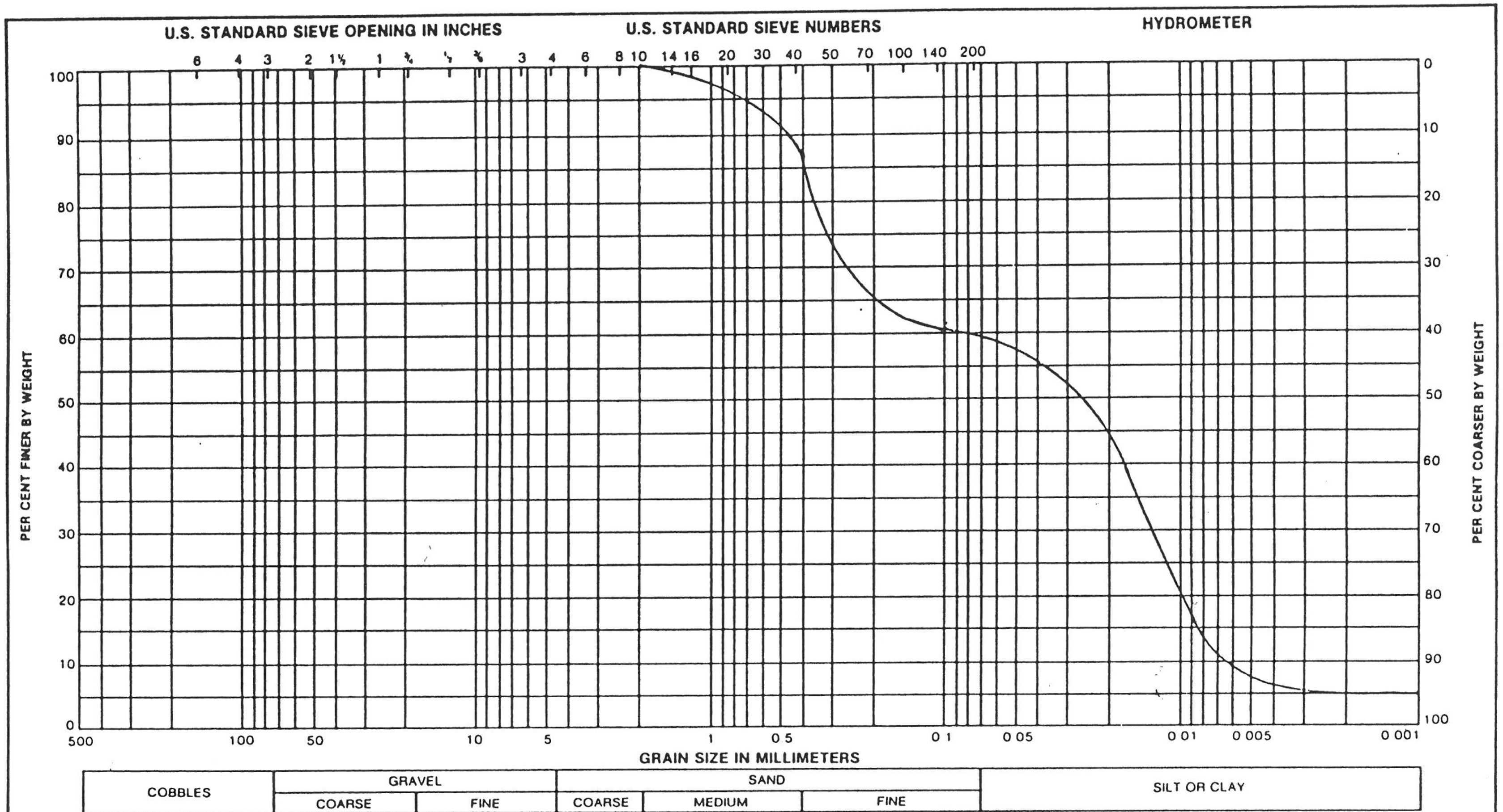
File No. 020-95039



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-16	2-ST	5'-7'	Silty clay, some sand, dark grey		38	28	10	Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

File No. 020-95039



Boring No.	Sample No.	Elev. or Depth	Classification	Nat w %	LL	PL	PI	Project
B-16	4-ST	10'-12'	Clayey silt, some sand, fine, grey		NOT PLASTIC			Subsurface Exploration CWLP Ash Disposal Cell Springfield, Illinois

REPORT OF SOIL ANALYSIS

File No. 020-95039

APPENDIX E2:

GEOTECHNICAL INVESTIGATION – 2023/2024

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Moisture Content (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
1	2.5-3	14.5								Sandy Lean Clay (CL), Yellow Brown mottled Brown, Silty, With Coal
1	5-5.5	10.1								Sandy Lean Clay (CL), Yellow Brown mottled Brown, Silty, With Coal
1	7.5-8	19.8								Sandy Lean Clay (CL), Light Brown mottled Yellow Brown, Silty
1	10-10.5	21.7								Sandy Lean Clay (CL), Light Brown/Yellow Brown mottled Gray, Silty
1	13-13.5	21.3								Sandy Lean Clay (CL), Light Brown/Yellow Brown mottled Gray, Silty
1	15.5-16	24.8								Sandy Lean Clay (CL), Light Brown mottled Gray, Silty
1	17.5-18	47.7								Sandy Lean Clay (CL), Light Gray mottled Yellow Brown, Silty
1	20.5-21	25.6								Lean Clay (CL), Gray mottled Greenish Gray, Black Oxidation, Silty
1	22.5-23	27.1								Lean Clay (CL), Gray mottled Light Gray, Silty
1 ST	24.5-26.5	27.9	127.7	99.8	0.49	85.70	65.7/20.0	30 / 17	1.23×10^{-6}	Lean Clay (CL), Gray, Silty, Trace Sand, Medium, Moist
1	28-28.5	25.5								Fat Clay (CL), Gray, Silty
1	32.5-33	26.0								Sandy Lean Clay (CL), Light Gray/Gray mottled Yellow Brown, Silty
1L	2-3.5	18.5								Fat Clay (CH), Yellow Brown mottled Brown
1L	4.5-6	21.4								Fat Clay (CH), Yellow Brown mottled Brown
1L	7-8.5	21.4								Lean Clay (CL), Yellow Brown mottled Brown, Silty
1L	9.5-11	17.7								Sandy Lean Clay (CL), Yellow Brown, Silty
1L	12-13.5	23.4								Poorly Graded Sand (SP), Dark Brown, Fine to Coarse
1L	14.5-16	19.7								Poorly Graded Sand (SP), Dark Brown, Fine to Coarse
1L	17-18.5	n/a								
1L	19.5-21	30.7								Sandy Lean Clay (CL), Light Gray mottled Yellow Brown, Silty
1L ST-18	22-24	30.7	118.9	91.0	0.57	97.60	63.0/34.6	43/21	5.84×10^{-6}	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Stiff, Moist
1LL	2-3.5	11.7								Sandy Lean Clay with Gravel (CL), Yellow Brown mottled Brown, Silty
1LL	4.5-6	13.4								Fat Clay (CH), Yellow Brown mottled Light Gray
1LL	7-8.5	20.1								Fat Clay (CH), Yellow Brown mottled Light Gray
1LL	9.5-11	17.8								Poorly Graded Sand (SP), Yellow Brown, Fine to Medium
1LL	12-13.5	22.1								Fat Clay (CH), Gray mottled Light Gray
1LL ST-12	14.5-16.5	24.7	125.2	100.4	0.26	84.40	64.5/19.9	39/21	6.02×10^{-6}	Lean Clay with Sand (CL), Gray, Silty, Medium, Moist
1LL	17-18.5	26.2								Fat Clay (CH), Light Brown, Silty
1U	2-3.5	14.6								Lean Clay (CL), Brown mottled Light Gray/Reddish Brown, Silty, With Coal
1U	4.5-6	21.0								Lean Clay (CL), Brown mottled Light Brown/Light Gray, Silty, Trace Gravel
1U	7-8.5	36.5								Silt (ML), Black, Clayey, With Coal
1U	9.5-11	6.1								Coal, Black, With Silt
1U	12-13.5	32.2								Coal, Black
1U	14.5-16	59.2								Silt (ML), Black, Clayey, With Coal
1U	17-18.5	68.6								Silt (ML), Black, With Coal and Ash
1CCR	2-3.5	10.7								Cinders, Black
1CCR	4.5-6	11.3								Cinders, Black
1CCR	7-8.5	22.2								Cinders/Ash Black
1CCR	9.5-11	21.5								Cinders/Ash Black
1CCR	12-13.5	20.1								Cinders. Black
1CCR	14.5-16	53.5								Cinders, Black, With Clayey Silt
1CCR	17-18.5	22.2								Cinders, Black

GEOTECHNICS
Soil & Material Testing

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
2	2-3.5	18.5								Fat Clay (CH), Brown mottled Light Gray
2	4.5-6	22.0								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
2	7-8.5	27.0								Fat Clay (CH), Dark Brown mottled Brown
2	9.5-11	24.9								Fat Clay (CH), Yellow Brown mottled Brown
2	12-13.5	28.4								Fat Clay (CH), Light Gray mottled yellow Brown
2	14.5-16	25.7								Fat Clay (CH), Yellow Brown mottled Light Gray, Trace Sand
2	17-18.5	27.2								Fat Clay (CH), Light Gray mottled Yellow Brown
2	19.5-21	27.2								Fat Clay (CH), Yellow Brown mottled Light Gray
2 ST	22-24	26.8	123.1	97.1	0.50	91.70	57.8/33.9	57/21	6.87×10^{-8}	Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist
2	24.5-26	24.3								Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation
2	27-27.5	21.2								Sandy Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty
2	27.5-28.5	22.4								Sandy Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty
2L	2-3.5	21.8								Fat Clay (CH), Yellow Brown mottled Light Gray/Brown
2L	4.5-6	28.9								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
2L ST 6	7-9'	25.5	126.5	100.8	0.33	87.70	74.3/13.4	27/21	8.24×10^{-6}	Silty Clay (CL-ML), Yellow Brown mottled Light Gray, Trace Sand, Medium, Moist
2L	9.5-11	22.5								Sandy Lean Clay (CL), Yellow Brown mottled Light Gray, Silty
2L	12-13.5	22.0								Sandy Lean Clay (CL), Yellow Brown mottled Brown, Silty
2L	14.5-16	23.6						20/16		Sandy Silty Clay (CL), Yellow Brown mottled Light Gray
2L	17-18.5	21.1								Sandy Lean Clay (CL), Light Brown mottled Yellow Brown/Brown, Silty
2L	19.5-21	21.4								Poorly Graded Sand (SP), Yellow Brown, Fine, With Clay Seams
2L	22-23.5	29.0								Lean Clay (CL), Light Gray, Silty
2U	2-3.5	8.1								Cinders, Dark Brown
2U	4.5-6	8.3								Cinders, Dark Brown
2U	7-8.5	20.2								Fat Clay (CH), Yellow Brown mottled Light Gray
2U	9.5-11	11.0								Cinders/Silt, Dark Brown
2U	12-13.5	65.7								Sandy Silt (ML), Dark Brown
2U	14.5-16	46.3								Sandy Silt (ML), Dark Brown
2U	17-18.5	24.6								Poorly Graded Sand (SP), Dark Brown, Fine to Coarse
2U	19.5-21	53.1								Coal, Dark Gray
2U	22-23.5	31.7								Poorly Graded Sand (SP), Dark Gray, Fine to Coarse
2U	24.5-26	27.4								Fat Clay (CH), Yellow Brown mottled Light Gray
2CCR	2-3.5	58.6								Lean Clay (CL), Light Gray mottled Yellow Brown/Brown, Silty, Trace Coal
2CCR	4.5-6	23.5								Coal, Black over Silt (ML), Light Gray, Clayey
2CCR	7-8.5	238.7								Ash, Light Gray
2CCR	9.5-11	107.7								Coal/Ash, Black
2CCR	12-13.5	86.4								Coal, Black over Silt (ML), Light Gray, Clayey
2CCR	14.5-16	54.5								Coal, Black, Clayey, With Organics
2CCR	17-18.5	86.8								Coal, Black

GEOTECHNICS
Soil & Material Testing

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
3	2-3.5	25.9								Fat Clay (CH), Brown mottled reddish Brown
3	4.5-6	20.6								Poorly Graded Sand (SP), Brown, Fine to Medium
3	7-8.5	22.2								Lean Clay (CL), Light Brown mottled Brown
3 ST 8	9.5-11.5	25.8	122.9	97.7	0.67	98.10	67.6/30.5	60/24	$8.50x10^{-9}$	Fat Clay (CH), Light Gray mottled Yellow Brown, Black Oxidation, Silty, Stiff, Moist
3	12-13.5	26.6								Fat Clay (CH), Brown mottled Light Gray/Reddish Brown
3	14.5-16	24.8								Fat Clay (CH), Brown, Reddish Oxidation
3	17-18.5	27.1								Fat Clay (CH), Light Gray mottled Yellow Brown/Brown
3 ST16	19.5-21.5	25.8	121.6	96.7	0.62	95.00	65.7/29.3	43/20	$4.27x10^{-7}$	Lean Clay (CL), Gray mottled Yellow Brown, Silty, Stiff, Moist
3	22-23.5	29.0								Fat Clay (CH), Light Gray mottled Yellow Brown, Silty
3	24.5-26	25.8								Lean Clay (CL), Light Brown mottled Yellow Brown, Black Oxidation, Silty
3	27-28.5	28.9								Fat Clay (CH), Light Brown mottled Light Gray
3U	2-3.5	16.0								Lean Clay (CL), Brown mottled Yellow Brown/Light Brown, Silty, Trace Sand
3U	4.5-6	27.7								Ash, Yellow Brown
3U	7-8.5	20.7								Lean Clay (CL), Brown mottled Light gray, With Coal
3U ST 8	9.5-11.5	21.3	122.6	101.0	0.55	81.10	65.5/15.6	38/22	$1.52x10^{-8}$	Lean Clay with Sand (CL), Yellow Brown mottled Light Gray/Gray, Silty, Stiff, Moist
3U	12-13.5	37.2								Coal, Black
3U	14.5-16	32.0								Silt (ML), Brown, Clayey
3U	17-18.5	62.6								Silt (ML), Brown, Clayey
3CCR	2-3.5	22.7								Lean Clay (CL), Brown, Silty, Trace Coal
3CCR	4.5-6	91.2								Ash, Light Gray, With Clay Seams
3CCR	7-8.5	51.6								Ash, Light Gray, With Clay Seams
3CCR	9.5-11	113.5								Coal, Black
3CCR	12-13.5	86.9								Coal, Black, With Organics/Clay Seams
3CCR	14.5-16	61.1								Coal, Black, With Clay Seams
3CCR	17-18.5	65.8								Coal, Black, With Clay Seams
4	3-3.5	16.5								Lean Clay (CL), Light Gray mottled Yellow Brown
4	5.5-6	18.2								Lean Clay (CL), Yellow Brown mottled Brown
4	7.5-8	23.6								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
4	10.5-11	26.9								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
4	12.5-13	26.6								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
4	14.5-16	26.1								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation, Trace Sand
4	17.5-18	27.4								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
4 ST	19.5-21.5	28.3	124.0	96.7	0.95	97.20	64.8/32.4	49/22	$6.53x10^{-8}$	Lean Clay (CL/CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist
4	22-22.5	30.1								Fat Clay (CH), Yellow Brown/Light Brown mottled Brown, Silty
4	25-25.5	33.4								Fat Clay (CH), Yellow Brown mottled Light Gray, Silty
4	27-27.5	22.7								Sandy Lean Clay (CL), Light Gray mottled Yellow Brown, Silty
4	30-30.5	23.5								Sandy Lean Clay (CL), Yellow Brown mottled Light Gray, Silty

GEOTECHNICS
Soil & Material Testing

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
4L	2-3.5	31.7								Lean Clay (CL), Dark Brown, Silty over Fat Clay (CH), Yellow Brown mottled Light Gray, Trace Gravel
4L	4.5-6	27.7								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
4L	7-8.5	27.3								Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation
4L	9.5-11	29.8								Fat Clay (CH), Yellow Brown mottled Light Gray, Trace Sand
4L ST10	12-14'	27.4	124.2	97.5	0.42	87.90	71.7/16.2	32/20	$9.53x10^{-7}$	Lean Clay (CL), Brown mottled Yellow Brown/Light Gray, Silty, Trace Sand, Medium, Moist
4L	14.5-16	25.7								Lean Clay with Sand (CL), Yellow Brown mottled Light gray
4L	17-18.5	27.4						31/23		Lean Clay (CL/ML), Light Gray, Silty
4U	2-3.5	6.5								Cinders, Black
4U	4.5-6	30.8								Fat Clay (CH), Yellow Brown mottled Gray, Silty
4U	7-8.5	23.0								Fat Clay (CH), Yellow Brown mottled Gray, Silty, With Cinders
4U	9.5-11	36.4								Silt (ML), Black, With Cinders
4U	12-13.5	24.5								Cinders, Black
4U	14.5-16	38.0								Cinders, Black, Silty
4U	17-18.5	24.8								Cinders, Black
4U	19.5-21	18.0								Coal, Black
4U	22-23.5	59.2								Ash, Light Gray
4U	24.5-26	28.0								Fat Clay (CH), Yellow Brown mottled Light Gray
4U ST22	27-29	26.9	125.3	98.7	0.53	97.10	69.6/27.5	62/24	$9.17x10^{-9}$	Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist
4CCR	2-3.5	21.0								Lean Clay (CL), Yellow Brown, With Brick
4CCR	4.5-6	23.0								Silt (ML), Brown, Clayey, With Clay Seams
4CCR	7-8.5	56.0								Ash, Light Gray
4CCR	9.5-11	91.3								Cinder/Ash, Black
4CCR	12-13.5	83.6								Cinder/Ash, Black
4CCR	14.5-16	59.3								Cinders/Silt, Black
4CCR	17-18.5	33.0								Cinders, Black
4CCR	19.5-21	59.5								Ash/Cinders, Black
5	2-3.5	14.8								Fat Clay (CH), Yellow Brown mottled Brown, Trace Coal
5	4.5-6	16.7								Fat Clay (CH), Yellow Brown mottled Brown, Trace Coal
5	7-8.5	13.6								Lean Clay with Sand (CL), Yellow Brown mottled Light Gray,
5	9.5-11	22.1								Fat Clay (CH), Yellow Brown mottled Light Gray, Silty
5	12-13.5	21.0								Fat Clay (CH), Yellow Brown mottled Light Gray
5	14.5-16	22.8								Fat Clay (CH), Brown mottled Yellow Brown
5	17-18.5	21.2								Lean Clay (CL), Brown mottled Light Brown
5	19.5-21	21.8								Fat Clay (CH), Brown, Silty
5	22-23.5	19.4								Sandy Lean Clay (CL), Light Gray mottled Gray/Yellow Brown
5 ST	24.5-26.5	24.3	124.0	99.8	0.25	90.20	67.3/22.9	43/22	$2.67x10^{-7}$	Lean Clay (CL), Light Gray mottled Gray/Yellow Brown, Silty, Trace Sand, Medium, Moist
5	27-28.5	25.6								Lean Clay (CL), Yellow Brown mottled Light Gray
5	29.5-31	24.5								Lean Clay (CL), Yellow Brown mottled Light Gray, Silty
5	32-33.5	24.7								Lean Clay (CL), Yellow Brown mottled Light Gray, Silty
5	34.5-36	24.6								Lean Clay (CL), Yellow Brown mottled Light Gray, Silty
5	37-38.5	23.6								Sandy Lean Clay (CL), Gray, Silty

GEOTECHNICS
Soil & Material Testing

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
5L	3-3.5	18.9								Fat Clay (CH), Brown mottled Light Brown
5L	5-6'	23.1								Fat Clay (CH), Brown mottled Yellow Brown
5L	8-8.5	22.5								Fat Clay (CH), Brown mottled Light Gray
5L ST	9.5-11	28.8	119.9	93.1	0.51	94.60	73.2/21.4	46/24	$5.18x10^{-7}$	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist
5L	13-13.5	30.1								Fat Clay (CH), Brown mottled Light Gray, Silty
5L	15.5-16	30.9								Fat Clay (CH), Brown mottled Light Gray, Silty
5L	17-17.5	28.3						39/22		Lean Clay (CL), Light Gray mottled Yellow Brown, Silty
5CCR	3-3.5	24.6								Silt with Sand (ML), Light Gray
5CCR	5.5-6	24.2								Sandy Lean Clay (CL), Gray, Silty
5CCR	7-7.5	27.8								Sandy Silt (ML), Gray
5CCR	9.5-10	13.5								Silty Sand (SM), Dark Brown, Trace Gravel
5CCR	15-15.5	9.8								Coal, Black
5CCR	17.5-18	13.9								Coal, Black
6	0-2	7.3								Clayey Sand with Gravel (SC), Brown
6	2-4'	21.3								Lean Clay (CL), Brown mottled Light Brown, Trace Sand, Fat Seams
6	5-7.5	24.0								Lean Clay (CL), Brown mottled Gray, Trace Sand, Fat Seams
6	7.5-9	20.5								Lean Clay (CL), Gray mottled Light Brown, Trace Sand/Coal
6	10-11.5	20.5								Fat Clay (CH/CL), Light Gray mottled Gray/Light Brown,
6	12.5-14	20.9								Lean Clay (CL), Brown, Silty
6	15-16.5	19.9								Lean Clay (CL), Light Gray mottled Light Brown, Silty
6 ST	17-19	21.9	128.6	105.5	0.95	90.20	61.9/28.3	34/19	$4.25x10^{-8}$	Lean Clay (CL), Gray/Greenish Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist
6	19-21	n/a								Lean Clay (CL), Brown, Silty, With Organics
6	21-23	22.0								Lean Clay (CL), Brown/Gray, Silty
6	23-25	20.6								Lean Clay with Sand (CL), Gray mottled Brown, With Coal
6	25-27	31.3								Lean Clay (CL), Gray, Silty
6	27-29	27.1								Sandy Silt (ML), Gray, Clayey
6	29-31	29.9								Silt (ML), Gray, Clayey
6	31-33	n/a								
6	33-35	28.2								Lean Clay (CL), Gray mottled Yellow Brown, Silty
6	35-37	27.1								Lean Clay (CL), Brown mottled Light Brown, Trace Sand, Fat Seams
6	37-39	21.0								Sandy Silt (ML), Light Gray mottled Yellow Brown, Clayey
6L	2.5-4	17.8								Lean Clay (CL), Brown mottled Yellow Brown, Silty
6L	5-6.5	21.5								Lean Clay (CL), Brown mottled Reddish Brown, Silty
6L ST1	7.5-9	26.6	121.9	96.3	0.44	91.60	74.1/17.5	41/23	$5.47x10^{-7}$	Lean Clay (CL), Light Gray mottled Reddish Brown, Silty, Trace Sand, Medium, Moist
6L	10-11.5	27.5								Lean Clay with Sand (CL), Brown, Silty
6L	12.5-14	23.5								Silty Clayey Sand (SC-SM), Light Gray mottled Yellow Brown
6L	15-16.5	24.9								Clayey Sand (SC), Yellow Brown mottled Light Gray
6L	17.5-19	35.9						31/19		Lean Clay (CL), Gray, Trace Organics
6L	20-21.5	21.1								Silty Clayey Sand (SC-SM), Gray
6L	22.5-24	24.0								Silty Clayey Sand (SC-SM), Light Gray mottled Light Brown

GEOTECHNICS
Soil & Material Testing

Lab Data Summary

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
6CCR	2-3.5	15.5								Ash/Cinders, Black, Clayey
6CCR	4.5-6	13.3								Ash/Cinders/Coal, Black, Clayey
6CCR	7-8.5	29.4								Ash, Gray
6CCR	9.5-11	39.1								Silt (ML), Brown mottled Light Gray
6CCR	12-13.5	44.4								Silt (ML), Light gray
6CCR	14.5-16	51.6								Silt (ML), Light Gray mottled Brown
6CCR	17-18.5	87.7								Silt (ML), Dark Brown mottled Light Brown
6CCR	19.5-21	106.5								Silt (ML), Dark Brown
6CCR	22-23.5	97.4								Silt (ML), Dark Brown mottled Brown
7	2.5-3	15.1								Sandy Lean Clay (CL), Yellow Brown mottled Light Gray
7	4.5-5	21.8								Lean Clay (CL), Light Brown/Brown mottled Yellow Brown, With Fat Clay Seams
7	7.5-8	21.1								Fat Clay (CH), Light Brown mottled Light Gray, Silty, With Lean Clay Seams
7	10-10.5	21.3								Lean Clay (CL), Light Brown mottled Brown/Light Gray, Silty
7	12-12.5	24.7								Lean Clay (CL), Brown mottled Light Brown, Silty
7	15-15.5	21.1								Lean Clay (CL), Brown mottled Yellow Brown/Light Gray, With Organics
7	17.5-18	19.5								Sandy Lean Clay (CL), Brown mottled Light Gray
7 ST	19.5-21.5	25.8	120.2	95.5	0.55	97.70	62.2/35.5	63/20	$1.71x10^{-8}$	Fat Clay (CH), Brown/ Yellow Brown mottled Light Gray, Silty, Stiff, Moist
7	23-23.5	24.4								Fat Clay (CH), Yellow Brown mottled Light Gray, Black Oxidation
7	25-25.5	26.1								Fat Clay (CH/CL), Light Gray mottled Yellow Brown
7	27.5-28	28.6								Silty Clayey Sand (SC-SM), Brown mottled Yellow Brown
7	30-30.5	30.7								Sandy Silt (ML), Light Brown, With Fat Clay Seams
7	32.5-33	38.1								Fat Clay (CH), Light Gray, With Silty Sand Seams
7	35-36.5	32.4								Silt (ML), Gray, Clayey
7	37-37.5	39.2								Silt (ML), Brown, Clayey
7CCR	2-3.5	26.5								Silt (ML), Brown, Clayey
7CCR	4.5-6	46.8								Silt (ML), Brown, Clayey, With Cinders
7CCR	7-8.5	54.9								Silt (ML), Brown, Clayey
7CCR	9.5-11	55.5								Sandy Silt (ML), Light Gray
7CCR	12-13.5	42.7								Silt (ML), Light Gray
7CCR	14.5-16	49.5								Silt (ML), Light Gray mottled Dark Brown
7CCR	17-18.5	45.8								Silty Sand (SM), Light Gray
7L	2-3.5	16.8								Fat Clay (CH), Yellow Brown mottled Light Gray
7L	4.5-6	14.6								Fat Clay (CH), Light Gray mottled Brown over Sandy Lean Clay (CL), Yellow Brown mottled Light Brown
7L	7-8.5	24.1								Sandy Lean Clay (CL), Yellow Brown mottled Brown over Poorly Graded Sand (SP), Yellow Brown, Fine, Silty
7L	9.5-11	27.3								Fat Clay (CH), Light Brown mottled Brown, Silty, Trace Sand
7L	12-13.5	37.7								Silt (ML), Brown
7L	15-16.5	29.2						33/25		Silt (ML), Brown, Trace Sand
7L	17-18.5	26.0								Fat Clay (CH/CL), Brown, Silty, Trace Sand

GEOTECHNICS
Soil & Material Testing

Lab Data Summary

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
8L	3-3.5	15.5								Fat Clay (CH), Yellow Brown mottled Light Brown
8L	5.5-6	14.1								Lean Clay (CL), Yellow Brown mottled Brown
8L	7.5-8	27.2								Lean Clay (CL), Yellow Brown mottled Light Brown/Light Gray, Silty
8L	10.5-11	27.8								Lean Clay (CL), Yellow Brown mottled Light Brown/Light Gray, Silty
8L ST5	12-14'	23.8	126.4	102.1	0.33	69.80	56.6/13.2	26/19	3.41×10^{-6}	Sandy Silty Clay (CL-ML), Yellow Brown mottled Reddish Brown/Light Gray, Medium, Moist
8L	15.5-16	29.8								Sandy Lean Clay (CL), Light Gray, Silty
8L	17.5-18	33.5								Sandy Lean Clay (CL), Light Gray, Silty, With Organics
8L	20.5-21	32.3						39/26		Silt (ML), Gray, With Lean Clay (CL) Seams
8L	22.5-23	26.7						31/21		Lean Clay (CL), Gray, Silty
8U	2-3.5	24.8								Lean Clay (CL), Brown mottled Yellow Brown, Silty
8U	4.5-6	22.4								Lean Clay (CL), Brown mottled Yellow Brown, Silty
8U	7-8.5	23.8								Lean Clay (CL), Brown mottled Yellow Brown/Light Gray, Silty
8U ST8	9.5-11.5	24.0	125.7	101.4	0.55	90.60	68.1/22.5	48/21	2.25×10^{-8}	Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist
8U	12-13.5	22.5								Fat Clay (CH), Light Gray mottled Yellow Brown
8U	14.5-16	23.9								Lean Clay (CL), Brown mottled Yellow Brown/Light Gray
8U	17-18.5	21.9								Lean Clay (CL), Brown mottled Yellow Brown Light Gray, Silty
8U ST16	19.5-21.5	25.7	127.1	101.1	0.80	95.50	79.7/15.8	45/19	9.40×10^{-9}	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Stiff, Moist
8U	22-23.5	27.8								Lean Clay (CL), Brown, Silty
8U	24.5-26	31.0								Lean Clay (CL), Brown mottled Reddish Brown, Silty
8U	27-28.5	31.7								Lean Clay (CL), Brown mottled Reddish Brown, Silty
8U	29.5-31	29.5								Lean Clay (CL), Brown mottled Reddish Brown, Silty
8U	32-33.5	29.5								Lean Clay (CL), Brown mottled Reddish Brown, Silty
9L	2-2.5	23.6								Sandy Lean Clay (CL), Light Brown mottled Light Gray
9L	4.5-5	24.6								Lean Clay with Sand (CL), Light Brown mottled Light Gray/Yellow Brown, Silty
9L ST	7-9'	28.0	126.5	98.8	0.15	79.90	65.0/14.9	26/17	2.55×10^{-6}	Lean Clay with Sand (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Soft, Moist
9L	10.5-11	55.9								Silty Clayey Sand (SC-SM), Gray, With Organics
9L	13-13.5	27.2								Sandy Silt (ML), Gray, Clayey
9L	15.5-16	28.1						33/22		Lean Clay (CL), Gray, Silty
9L	18-18.5	28.6						46/21		Lean Clay (CL), Gray, Silty

GEOTECHNICS
Soil & Material Testing

Lab Data Summary

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
9U	2-3.5	19.8								Fat Clay (CH), Yellow Brown mottled Light Gray/Brown
9U	4.5-5	20.3								Fat Clay (CH), Brown mottled Light GrayYellow Brown
9U	7-8.5	19.9								Fat Clay (CH), Yellow Brown mottled Light Gray/Gray
9U	9.5-11	n/a								
9U	12-13.5	25.5								Fat Clay (CH), Yellow Brown mottled Light Gray/Gray
9U	14.5-16	22.2								Fat Clay (CH), Gray mottled Yellow Brown
9U	17-18.5	23.6								Lean Clay with Sand (CL), Brown mottled Light Brown/Light Gray
9U ST 16	19.5-21.5	22.4	125.2	102.3	0.95	96.00	78.6/17.4	46/22	2.63×10^{-8}	Lean Clay (CL), Gray mottled Light Gray, Silty, Stiff, Moist
9U	22-23.5	21.3								Lean Clay (CL), Brown mottled Light Gray/Yellow Brown
9U	24.5-26	25.2								Fat Clay (CH), Gray mottled Yellow Brown, Trace Coal
9U	26-28	23.3								Fat Clay (CH), Yellow Brown mottled Light Brown/Light Gray
9U	28-30	28.7								Fat Clay (CH), Yellow Brown mottled Light Gray
9U	30-32	29.4								Fat Clay (CH), Yellow Brown mottled Light Gray/Gray
9U	32-34	29.5								Fat Clay (CH/CL), Gray mottled Light Gray, Silty
9U	34-36	29.7								Sandy Lean Clay (CL), Gray mottled Yellow Brown, Silty
9U	36-38	29.5								Sandy Lean Clay (CL), Gray mottled Light Gray
9U	38-40	24.6								Sandy Lean Clay (CL), Gray mottled Yellow Brown, Silty
9CCR	2-3.5	15.0								Sandy Lean Clay (CL), Gray mottled Light Brown
9CCR	4.5-5	42.3								Silt (ML), Gray mottled Light Gray
9CCR	7-8.5	64.2								Silt (ML), Gray mottled Light Gray
9CCR ST8	9.5-11.5	23.2	126.9	103.0	0.72	94.50	66.6/27.9	46/21	9.55×10^{-9}	Lean Clay (CL), Yellow Brown mottled Light Gray/Gray, Silty, Trace Sand, Stiff, Moist
9CCR	12-13.5	46.9								Silt (ML), Gray mottled Light Gray
9CCR	14.5-16	41.4								Silt (ML), Gray mottled Light Gray
9CCR	17-18.5	41.0								Silt (ML), Gray mottled Light Gray
10CCR	2-3.5	25.9								Ash/Cinders, Gray
10CCR	4.5-5	13.8								Ash/Cinders, Gray
10CCR	7-8.5	28.7								Ash, Brown/Light Gray
10CCR	9.5-11	38.2								Ash, Brown/Light Gray
10CCR	12-13.5	58.1								Ash, Brown/Light Brown
10CCR	14.5-16	27.2								Ash/Cinders, Dark Gray mottled Light Brown
10CCR	17-18.5	52.9								Ash, Brown/Gray
10CCR	19.5-21	59.5								Ash/Cinders, Gray mottled Brown
10CCR	22-23.5	58.0								Ash/Cinders, Gray mottled Brown

GEOTECHNICS
Soil & Material Testing

Lab Data Summary

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
11U	2-3.5	18.0								Sandy Lean Clay (CL), Dark Brown
11U	4.5-5	20.4								Lean Clay with Sand (CL), Yellow Brown mottled Brown
11U	7-8.5	23.5								Fat Clay (CH), Light Gray mottled Yellow Brown, Trace Sand
11U ST8	9.5-11.5	21.8	129.9	106.7	0.80	92.50	52.4/40.1	36/20	1.38×10^{-8}	Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist
11U	12-13.5	23.2								Fat Clay (CH), Yellow Brown mottled Light Gray/Gray, Trace Sand
11U	14.5-16	20.7								Lean Clay (CL), Brown mottled Yellow Brown
11U	17-18.5	28.6								Lean Clay (CL), Brown mottled Light Brown
11U ST16	19.5-21.5	25.7	123.1	97.9	0.50	95.90	66.8/29.1	48/21	3.04×10^{-7}	Lean Clay (CL), Brown mottled Yellow Brown, Silty, Stiff, Moist
11U	22-23.5	25.8								Fat Clay (CH), Yellow Brown mottled Brown
11U	24.5-26	28.3						34/21		Lean Clay (CL), Yellow Brown mottled Brown, Silty
11U	27-28.5	25.9								Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty
12L	3.5-4	14.5								Fat Clay (CH), Brown mottled Light Brown
12L	5.5-6	17.4								Fat Clay (CH), Brown mottled Light Brown/Yellow Brown
12L	8.5-9	23.2								Fat Clay (CH/CL), Yellow Brown mottled Light Gray
12L	11.5-12	24.5								Fat Clay (CH), Brown mottled Light Gray/Yellow Brown
12L	14-14.5	24.5								Lean Clay (CL), Light Gray mottled Yellow Brown/Gray
12L ST	14.5-16	23.2	127.7	103.6	0.55	87.10	71.6/15.5	30/19	9.69×10^{-7}	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist
12L	19-19.5	22.9								Lean Clay (CL), Light Gray mottled Yellow Brown
12L	20-20.5	10.0								Sandy Lean Clay (CL), Light Gray mottled Yellow Brown
12L	23-23.5	13.0								Lean Clay (CL), Light Gray mottled Yellow Brown, Silty
12U	2-3.5	19.0								Lean Clay (CL), Brown, Silty
12U	4.5-5	17.1								Lean Clay (CL), Brown mottled Light Brown/Reddish Brown, Black Oxidation, Silty
12U	7-8.5	20.0								Lean Clay (CL), Light Brown mottled Yellow Brown, Silty
12U ST8	9.5-11.5	21.8	129.5	106.2	0.75	95.20	69.6/25.6	45/22	3.13×10^{-9}	Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Stiff, Moist
12U	12-13.5	17.3								Lean Clay (CL), Brown mottled Yellow Brown/Light Gray, Silty
12U	14.5-16	15.2								Lean Clay (CL), Brown, With Lime Fines, Trace Gravel
12U	17-18.5	18.9								Lean Clay (CL), Brown, With Ash/Coal
12U ST16	19.5-21.5	21.6	123.3	101.4	0.95	96.10	73.0/23.1	42/22	1.03×10^{-8}	Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Stiff, Moist
12U	22-23.5	25.6								Lean Clay (CL), Brown mottled Reddish Brown, Silty
12U	24.5-26	25.8								Lean Clay (CL), Light Brown mottled Yellow Brown, Reddish Oxidation, Silty
12U	27-28.5	25.2								Lean Clay (CL), Light Gray mottled Yellow Brown/Light Brown, Reddish Oxidation, Silty
13L	2-3.5	15.9								Lean Clay (CL), Brown
13L	4.5-5	17.4								Lean Clay (CL), Brown
13L	7-8.5	19.3								Lean Clay (CL), Brown mottled Yellow Brown
13L	9.5-11	19.6								Lean Clay (CL), Brown mottled Yellow Brown, Silty
13L	12-13.5	23.5								Lean Clay (CL), Brown mottled Reddish Brown
13L	14.5-16	27.4								Fat Clay (CH), Light Gray mottled Yellow Brown/Brown, Black Oxidation

GEOTECHNICS
Soil & Material Testing

Lab Data Summary

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

Job #:
23-1071

Andrews Engineering
Springfield, IL Ash Ponds

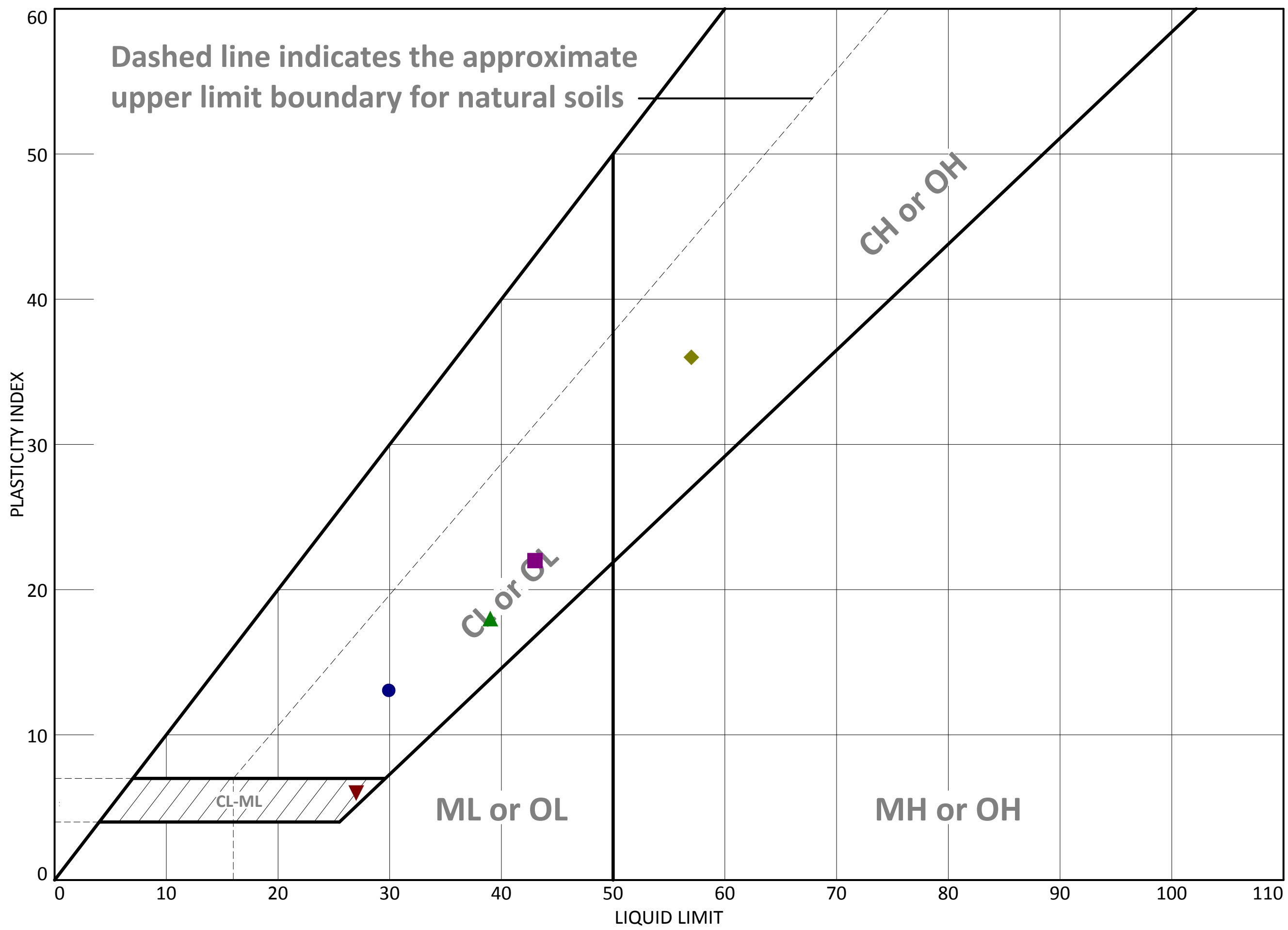
Sample No.	Depth (ft.)	Nat. Moist. (%)	Wet Density (PCF)	Dry Density (PCF)	Torvane (TSF)	Grad. -200 (%)	Silt/Clay (%)	Atterberg % (LL/PL)	Hydraulic Cond. (cm/sec)	USCS Visual Description
13BN	2-3.5	18.6								Lean Clay (CL), Light Brown mottled Reddish Brown/Light Gray, Silty
13BN	4.5-5	21.1								Lean Clay (CL), Light Brown mottled Reddish Brown
13BN	7-8.5	15.5								Lean Clay (CL), Light Brown mottled Reddish Brown, Silty
13BN ST7	8.5-10.5	18.4	132.2	111.6	0.95	90.90	74.9/16.0	34/20	8.84×10^{-9}	Lean Clay (CL), Yellow Brown, Silty, Trace Sand, Stiff, Moist
13BS	2-3.5	16.0								Lean Clay (CL), Brown mottled Reddish Brown, Silty
13BS	4.5-5	15.5								Lean Clay (CL), Brown mottled Reddish Brown, Silty
13BS	7-8.5	19.1								Lean Clay (CL), Brown mottled Light Brown/Light Gray
13BS ST7	8.5-10.5	21.1	127.5	105.3	0.95	94.90	78.6/16.3	52/25	2.32×10^{-8}	Fat Clay (CH), Gray mottled Light Gray, Silty, Trace Sand, Stiff, Moist
13LF	2-3.5	12.4								Lean Clay (CL), Brown mottled Yellow Brown, Silty
13LF	4.5-5	22.3								Lean Clay (CL), Light Brown mottled Yellow Brown/Light Gray, With Fat Seams
13LF	7-8.5	21.0								Lean Clay (CL), Light Brown mottled Yellow Brown/Light Gray, With Fat Seams, Over Light Gray Ash
13LF	9.5-11	21.4								Ash, Light Gray
13LF	12-13.5	21.1								Ash, Light Gray
13LF	14.5-16	19.1								Ash, Light Gray
13LF	17-18.5	20.9								Lean Clay (CL), Light Brown mottled Reddish Brown/Light Gray, Over Light Gray Ash
13LF	19.5-21	21.6								Ash, Yellow Brown mottled Light Gray
13LF	22-23.5	24.8								Ash, Yellow Brown
13LF	24.5-26	28.3								Ash, Yellow Brown

GEOTECHNICS
Soil & Material Testing

Lab Data Summary

* Shelby Tube Samples Colored in Yellow
* Additional Atterberg Testing Requested Colored in Red

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean Clay (CL), Gray, Silty, Trace Sand, Medium, Moist	30	17	13	98.2	85.7	CL
■	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Stiff, Moist	43	21	22	99.8	97.6	CL
▲	Lean Clay with Sand (CL), Gray, Silty, Medium, Moist	39	21	18	99.6	84.4	CL
◆	Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist	57	21	36	98.1	91.7	CH
▼	Silty Clay (CL-ML), Yellow Brown mottled Light Gray, Trace Sand, Medium, Moist	27	21	6	98.3	87.7	CL-ML

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

●**Location:** Boring 1 **Depth:** 24½-26½ ft. **Sample Number:**

■**Location:** Boring 1L **Depth:** 22-24 ft. **Sample Number:** 18

▲**Location:** Boring 1 LL **Depth:** 14½-16½ ft. **Sample Number:** 12

◆**Location:** Boring 2 **Depth:** 22-24 ft. **Sample Number:** 8

▼**Location:** Boring 2L **Depth:** 7-9 ft. **Sample Number:** 6

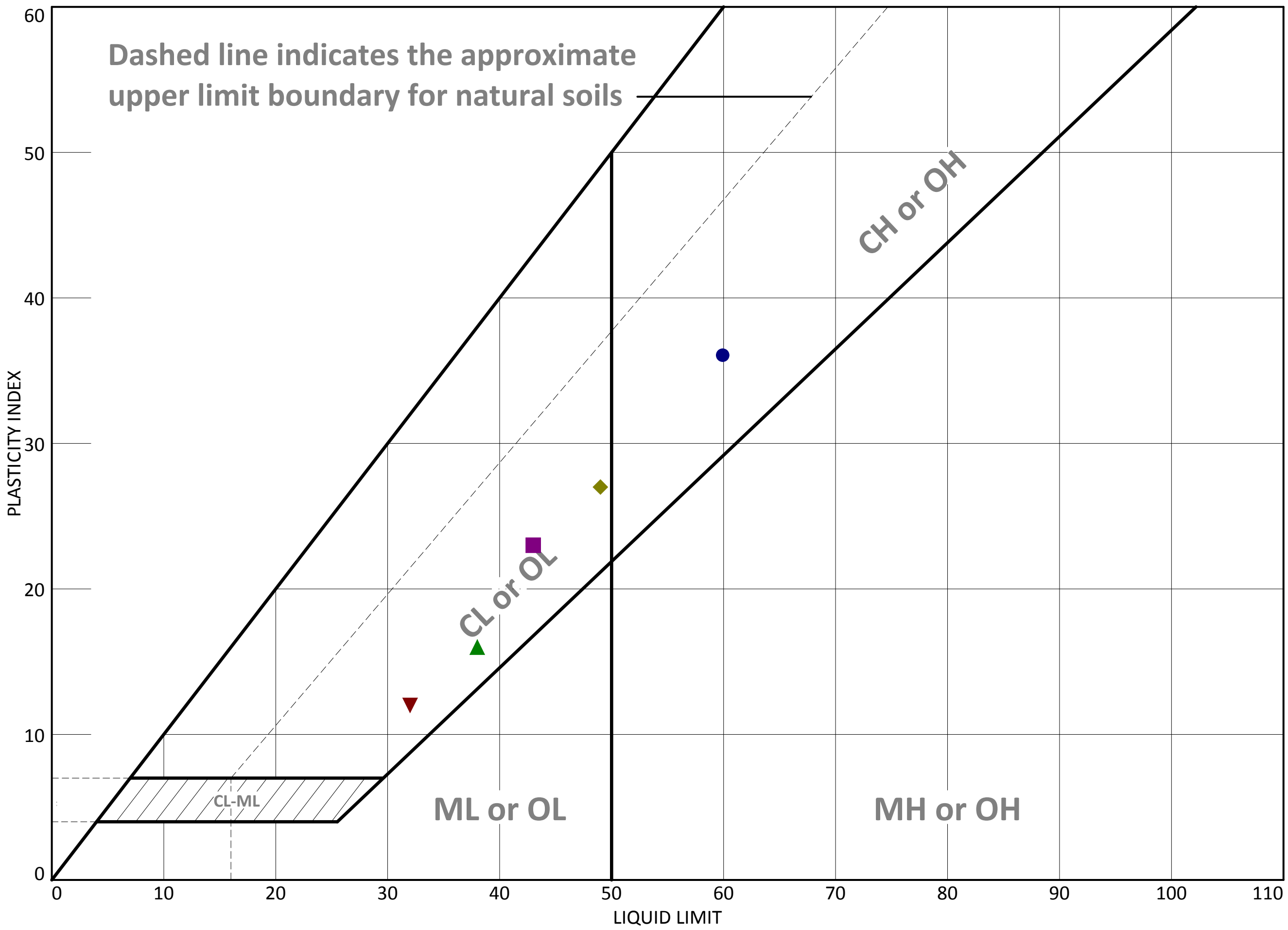
Remarks:
●Natural Moisture = 27.9%
■Natural Moisture = 30.7%
▲Natural Moisture = 24.7%
◆Natural Moisture = 26.8%
▼Natural Moisture = 25.5%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-1

Tested By: ○ DAW □ MAS △ DAW ◇ BRH ▽ DAW

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Fat Clay (CH), Light Gray mottled Yellow Brown, Black Oxidation, Silty, Stiff, Moist	60	24	36	99.3	98.1	CH
■	Lean Clay (CL), Gray mottled Yellow Brown, Silty, Stiff, Moist	43	20	23	98.5	95.0	CL
▲	Lean Clay with Sand (CL), Yellow Brown mottled Light Gray/Gray, Silty, Stiff, Moist	38	22	16	90.3	81.1	CL
◆	Lean Clay (CL/CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist	49	22	27	99.5	97.2	CL
▼	Lean Clay (CL), Brown mottled Yellow Brown/Light Gray, Silty, Trace Sand, Medium, Moist	32	20	12	97.4	87.9	CL

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

● **Location:** Boring 3 ST8 **Depth:** 9½-11½ ft. **Sample Number:** 8

■ **Location:** Boring 3 ST16 **Depth:** 19½-21½ ft. **Sample Number:** 16

▲ **Location:** Boring 3U ST8 **Depth:** 9½-11 ft. **Sample Number:** 8

◆ **Location:** Boring 4 **Depth:** 19½-21½ ft. **Sample Number:**

▼ **Location:** Boring 4L **Depth:** 12-14 ft. **Sample Number:** 10

Remarks:

● Natural Moisture = 25.8%

■ Natural Moisture = 25.8%

▲ Natural Moisture = 21.3%

◆ Natural Moisture = 28.3%

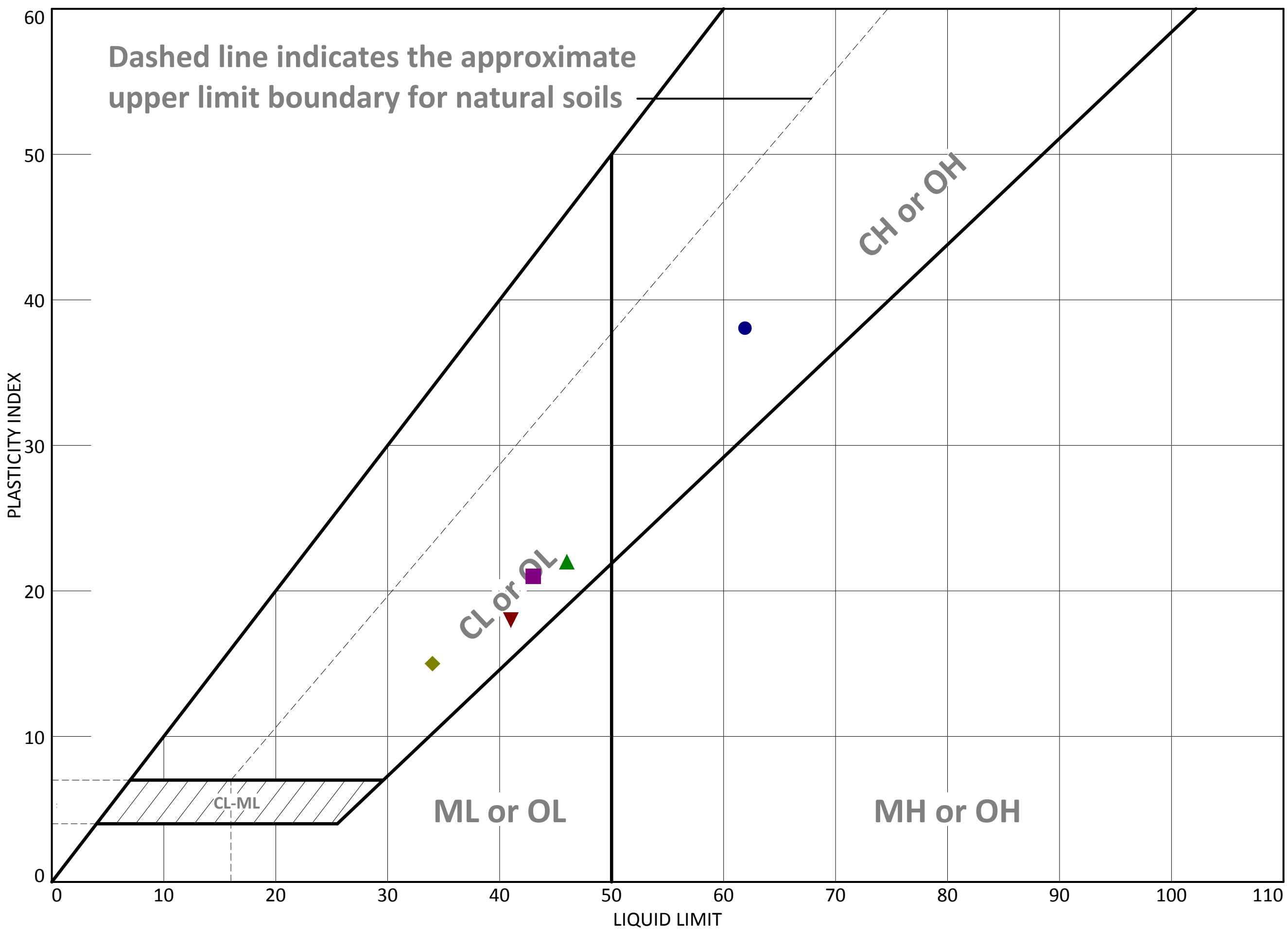
▼ Natural Moisture = 27.4%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-2

Tested By: ○ DAW □ BRH △ DAW ◇ DAW ▽ MAS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist	62	24	38	99.4	97.1	CH
■	Lean Clay (CL), Light Gray mottled Gray/Yellow Brown, Silty, Trace Sand, Medium, Moist	43	22	21	98.7	90.2	CL
▲	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist	46	24	22	98.3	94.6	CL
◆	Lean Clay (CL), Gray/Greenish Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist	34	19	15	99.0	90.2	CL
▼	Lean Clay (CL), Light Gray mottled Reddish Brown, Silty, Trace Sand, Medium, Moist	41	23	18	99.6	91.6	CL

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

●**Location:** Boring 4U **Depth:** 27-29 ft. **Sample Number:** 22
■**Location:** Boring 5 **Depth:** 24½-26½ ft. **Sample Number:** 10
▲**Location:** Boring 5L **Depth:** 9½-11 ft. **Sample Number:**
◆**Location:** Boring 6 **Depth:** 17-19 ft. **Sample Number:** 8
▼**Location:** Boring 6L **Depth:** 7½-9 ft. **Sample Number:** ST1

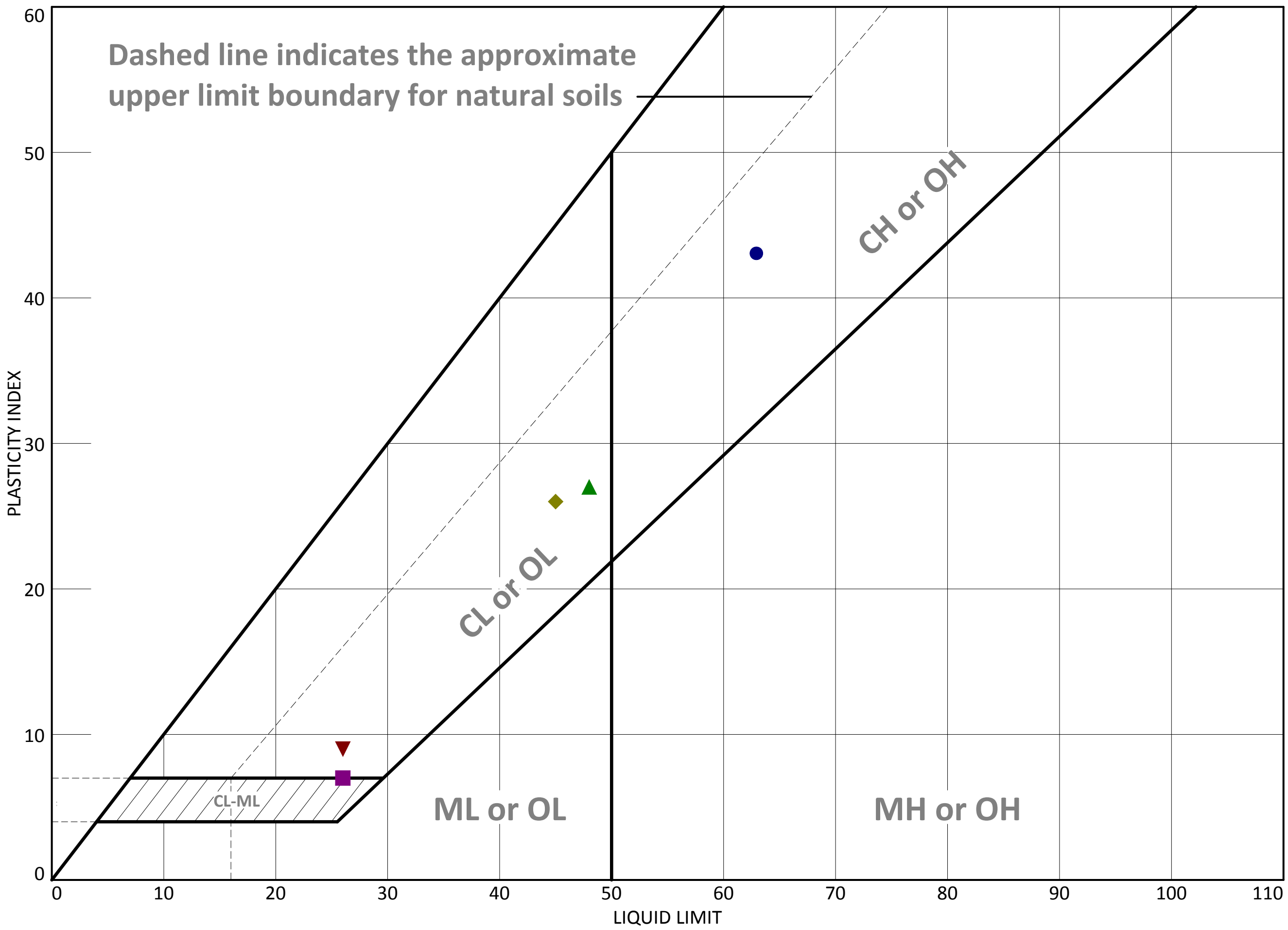
Remarks:
●Natural Moisture = 26.9%
■Natural Moisture = 24.3%
▲Natural Moisture = 28.8%
◆Natural Moisture = 21.9%
▼Natural Moisture = 26.6%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-3

Tested By: ○ MAS □ DAW △ DAW ◇ DAW ▽ BRH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Fat Clay (CH), Brown/Yellow Brown mottled Light Gray, Silty, Stiff, Moist	63	20	43	98.8	97.7	CH
■	Sandy Silty Clay (CL-ML), Yellow Brown mottled Reddish Brown/Light Gray, Medium, Moist	26	19	7	99.8	69.8	CL-ML
▲	Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist	48	21	27	96.6	90.6	CL
◆	Lean Clay (CL), Light Gray Mottled Yellow Brown, Silty, Stiff, Moist	45	19	26	99.3	95.5	CL
▼	Lean Clay with Sand (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Soft, Moist	26	17	9	98.4	79.9	CL

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

● **Location:** Boring 7 **Depth:** 19½-21½ ft. **Sample Number:** 7
■ **Location:** Boring 8L **Depth:** 12-14 ft. **Sample Number:** 5
▲ **Location:** Boring 8U ST8 **Depth:** 9½-11½ ft. **Sample Number:** 8
◆ **Location:** Boring 8U ST16 **Depth:** 19½-21½ ft. **Sample Number:** 16
▼ **Location:** Boring 9L **Depth:** 7½-9 ft. **Sample Number:**

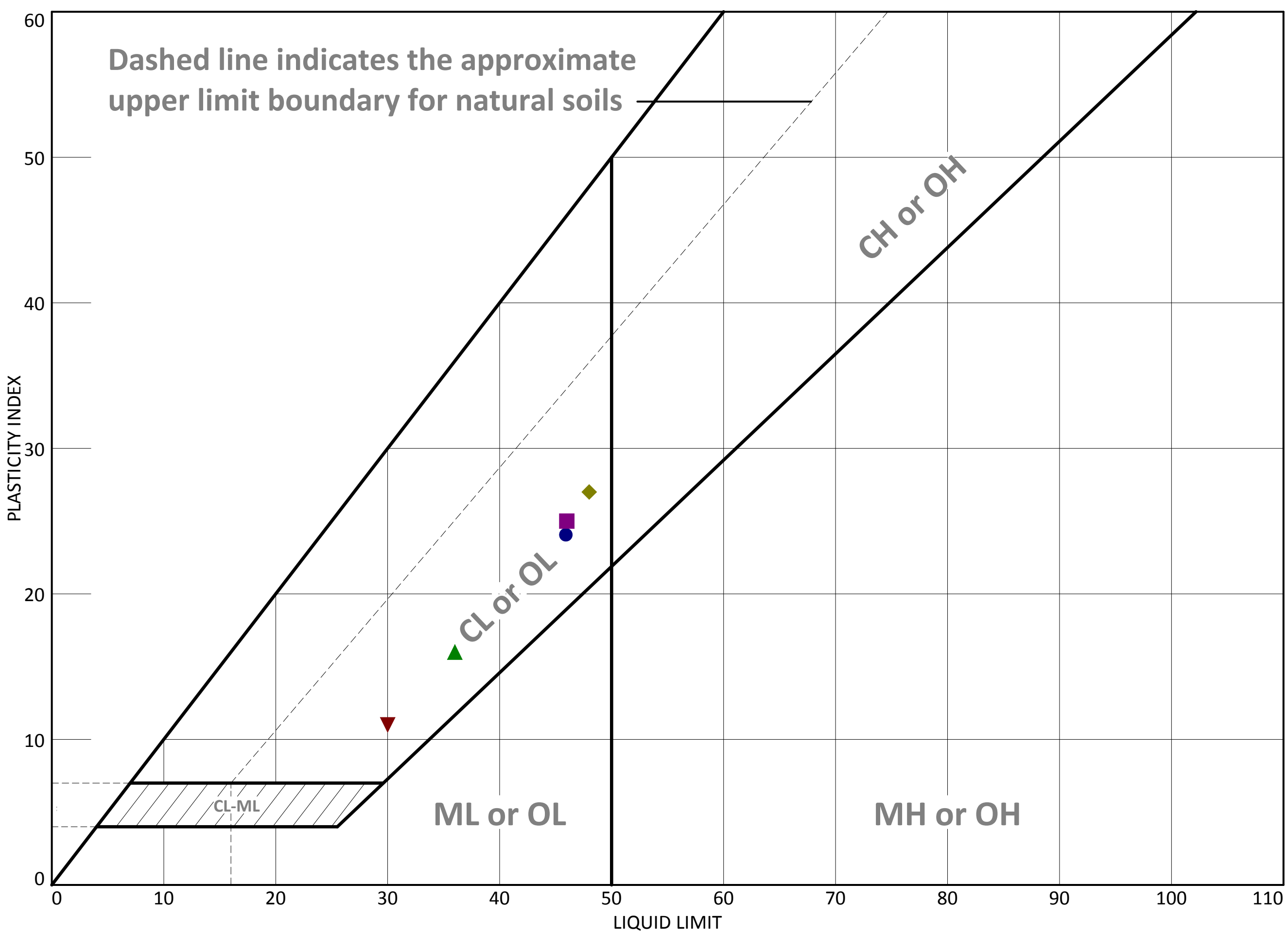
Remarks:
● Natural Moisture = 25.8%
■ Natural Moisture = 23.8%
▲ Natural Moisture = 24.0%
◆ Natural Moisture = 25.7%
▼ Natural Moisture = 28.0%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-4

Tested By: ○ DJS □ DAW △ BRH ◇ BRH ▽ DAW

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean Clay (CL), Gray mottled Light Gray, Silty, Stiff, Moist	46	22	24	99.7	96.0	CL
■	Lean Clay (CL), Yellow Brown mottled Light Gray/Gray, Silty, Trace Sand, Stiff, Moist	46	21	25	99.2	94.5	CL
▲	Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist	36	20	16	98.2	92.5	CL
◆	Lean Clay (CL), Brown mottled Yellow Brown, Silty, Stiff, Moist	48	21	27	99.2	95.9	CL
▼	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist	30	19	11	99.8	87.1	CL

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

●**Location:** Boring 9U ST16 **Depth:** 19½-21½ ft. **Sample Number:** 16
■**Location:** Boring 9 CCR ST8 **Depth:** 9½-11½ ft. **Sample Number:** 8
▲**Location:** Boring 11U ST8 **Depth:** 9½-11½ ft. **Sample Number:**
◆**Location:** Boring 11U ST16 **Depth:** 19½-21½ ft. **Sample Number:**
▼**Location:** Boring 12L **Depth:** 14½-16 ft. **Sample Number:**

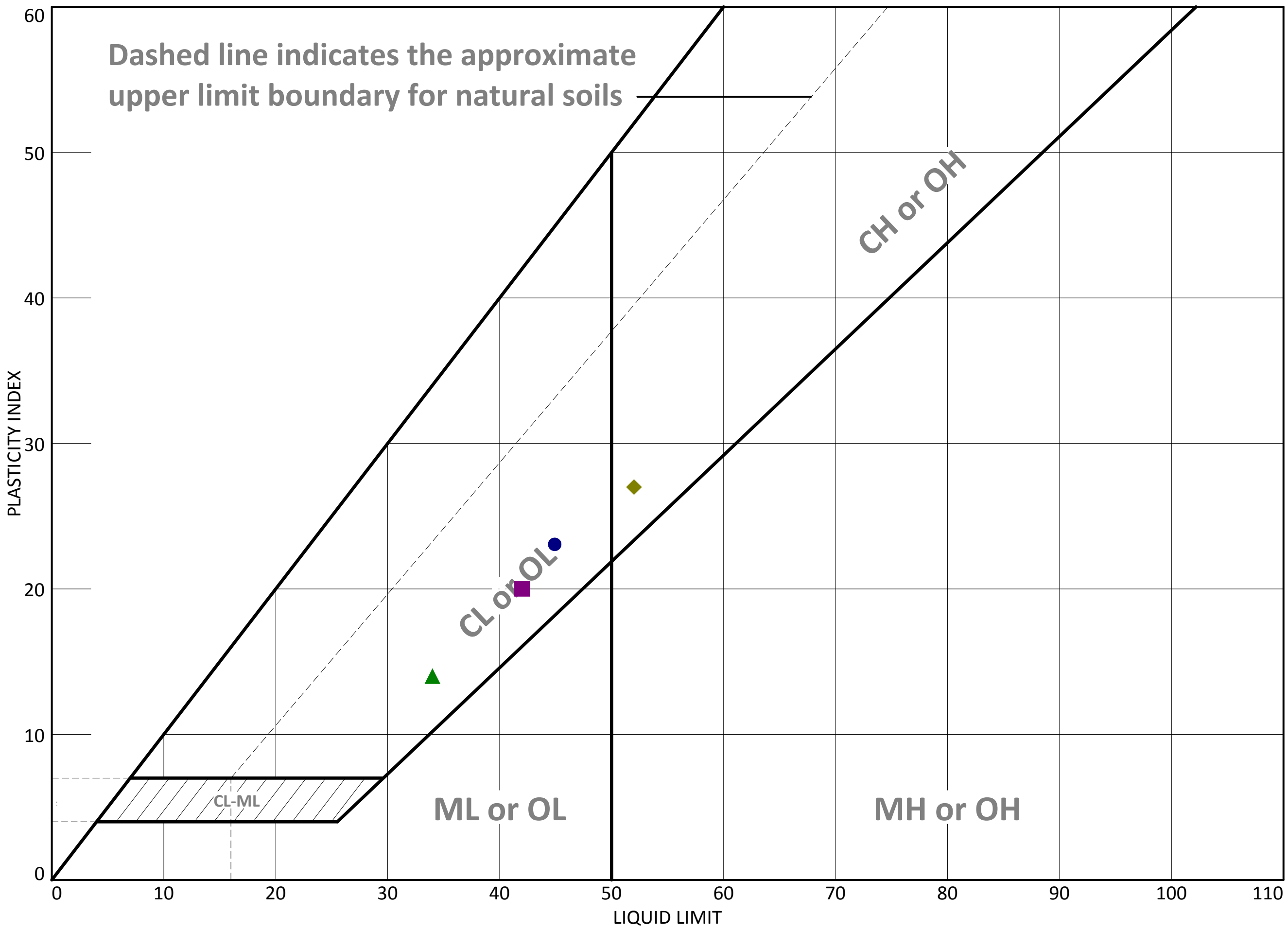
Remarks:
●Natural Moisture = 22.4%
■Natural Moisture = 23.2%
▲Natural Moisture = 21.8%
◆Natural Moisture = 25.7%
▼Natural Moisture = 23.2%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-5

Tested By: ○ NPP □ NPP △ MAS ◇ BRH ▽ DAW

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Stiff, Moist	45	22	23	99.6	95.2	CL
■	Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Stiff, Moist	42	22	20	99.3	96.1	CL
▲	Lean Clay (CL), Yellow Brown, Silty, Trace Sand, Stiff, Moist	34	20	14	99.9	90.9	CL
◆	Fat Clay (CH), Gray mottled Light Gray, Silty, Trace Sand, Stiff, Moist	52	25	27	99.3	94.9	CH

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

● **Location:** Boring 12U ST8 **Depth:** 9½-11½ ft. **Sample Number:** 8
■ **Location:** Boring 12U ST16 **Depth:** 19½-21½ ft. **Sample Number:** 16
▲ **Location:** Boring 13 BN ST7 **Depth:** 8½-10½ ft. **Sample Number:** 7
◆ **Location:** Boring 13 BS ST7 **Depth:** 8½-10½ ft. **Sample Number:** 7

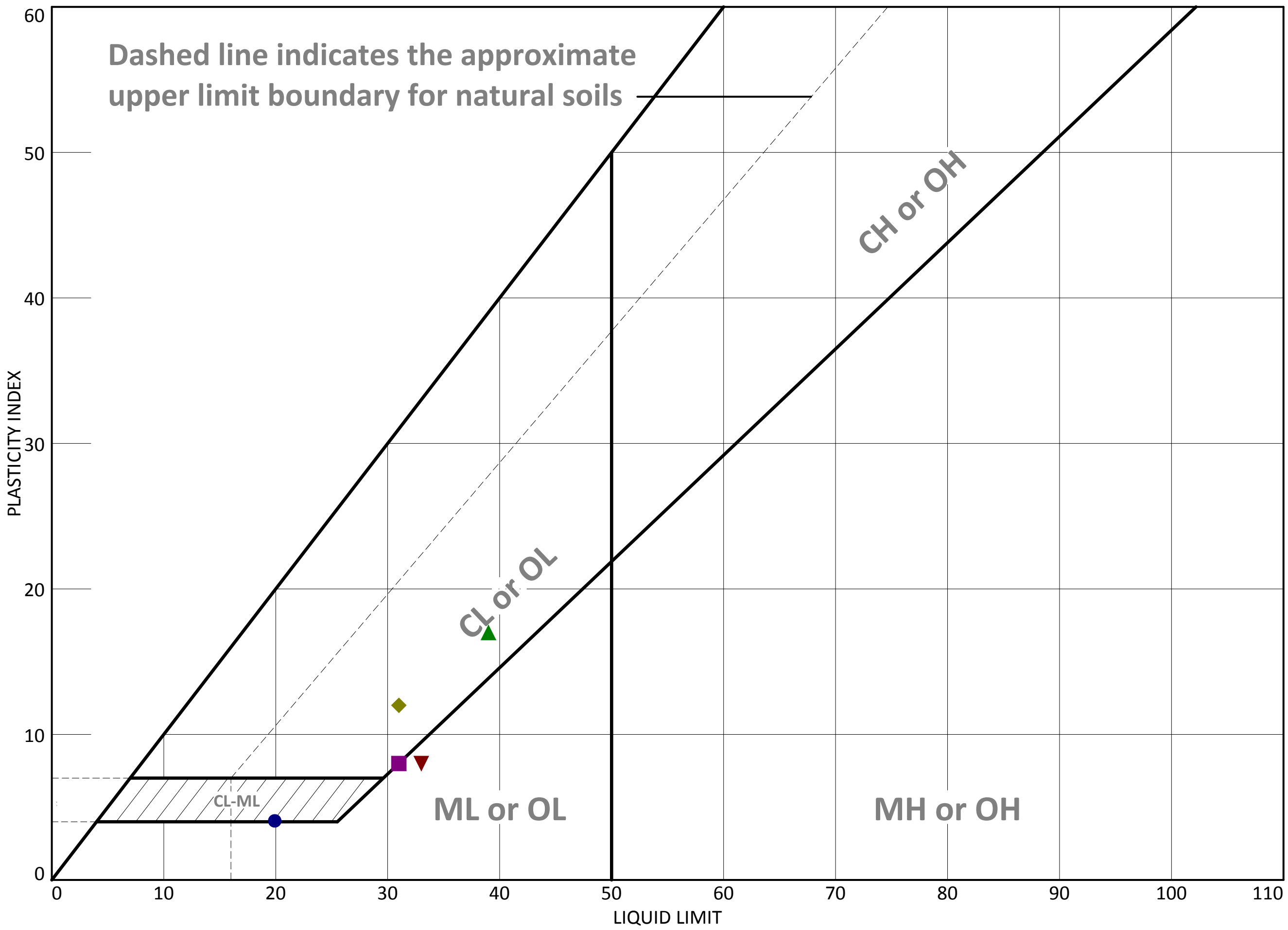
Remarks:
● Natural Moisture = 21.8%
■ Natural Moisture = 21.6%
▲ Natural Moisture = 18.4%
◆ Natural Moisture = 21.1%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-6

Tested By: ○ DAW □ DAW △ MAS ◇ MAS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Sandy Silty Clay (CL-ML), Yellow Brown mottled Light Gray, Moist	20	16	4			CL-ML
■	Lean Clay (CL/ML), Yellow Brown mottled Light Gray, Black Oxidation	31	23	8			CL
▲	Lean Clay (CL), Light Gray mottled Yellow Brown, Silty	39	22	17			CL
◆	Lean Clay (CL), Gray, Trace Organics	31	19	12			CL
▼	Silt (ML), Brown, Trace Sand	33	25	8			ML

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

●**Location:** Boring 2L **Depth:** 14½-16 **Sample Number:**

■**Location:** Boring 4L **Depth:** 17-18½ ft. **Sample Number:**

▲**Location:** Boring 5L **Depth:** 17-17½ ft. **Sample Number:**

◆**Location:** Boring 6L **Depth:** 17½-19 ft. **Sample Number:** 7

▼**Location:** Boring 7L **Depth:** 15-16½ ft. **Sample Number:** 6

Remarks:

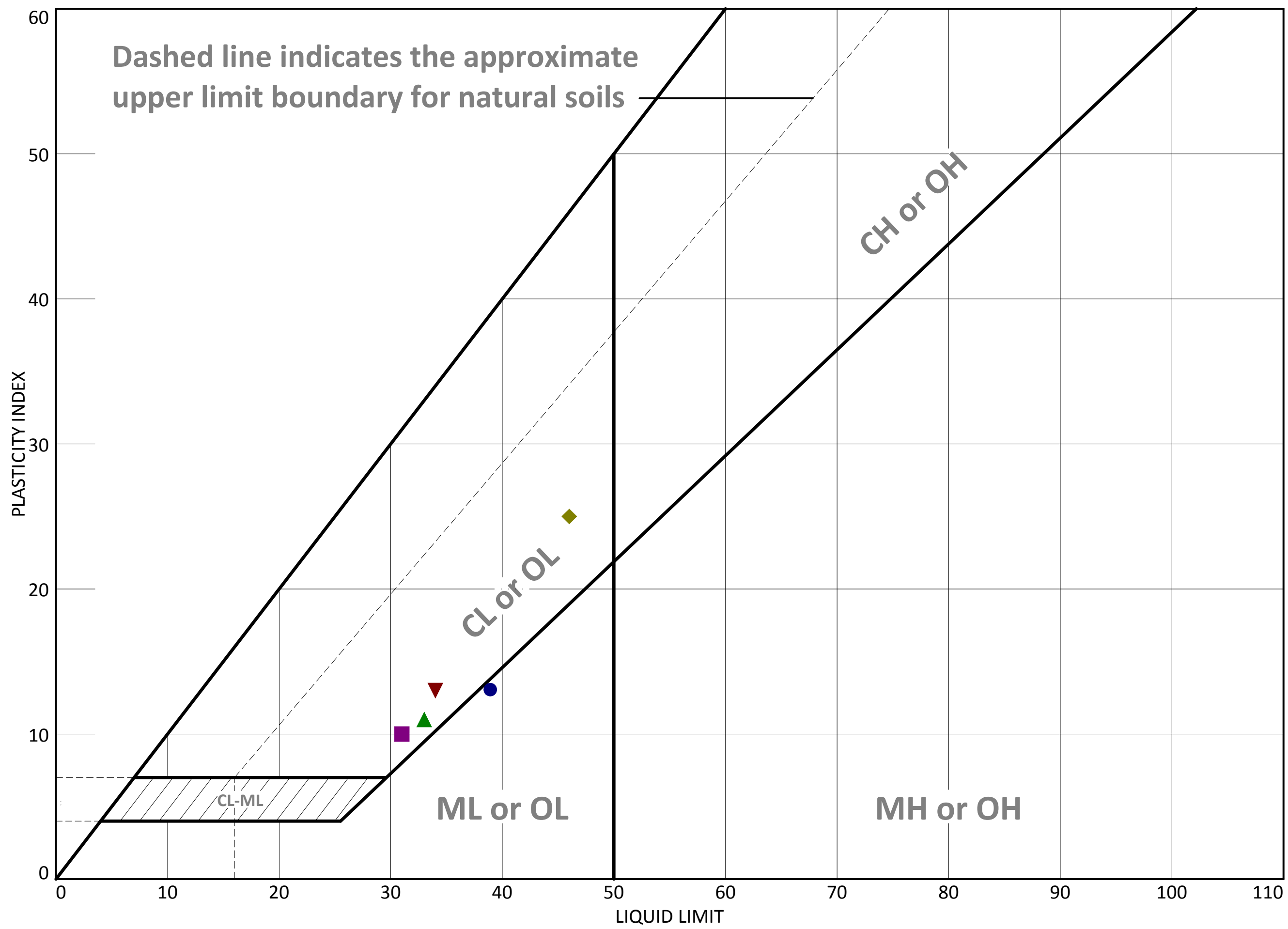
●Natural Moisture = 23.6%
■Natural Moisture = 27.4%
▲Natural Moisture = 28.3%
◆Natural Moisture = 35.9%
▼Natural Moisture = 29.2%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-7

Tested By: DAW **Checked By:** NAS

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Silt (ML), Gray, With Lean Clay (CL) Seams	39	26	13			ML
■	Lean Clay (CL), Gray, Silty	31	21	10			CL
▲	Lean Clay (CL), Gray, Silty	33	22	11			CL
◆	Lean Clay (CL), Gray, Silty	46	21	25			CL
▼	Lean Clay (CL), Yellow Brown mottled Brown, Silty	34	21	13			CL

Project No. 23-1071 **Client:** Andrews Engineering

Project: Springfield, IL Ash Ponds

●**Location:** Boring 8L **Depth:** 20½-21 ft.
■**Location:** Boring 8L **Depth:** 22½-23 ft.
▲**Location:** Boring 9L **Depth:** 15½-16 ft.
◆**Location:** Boring 9L **Depth:** 18-18½ ft.
▼**Location:** Boring 11U **Depth:** 24½-26 ft.

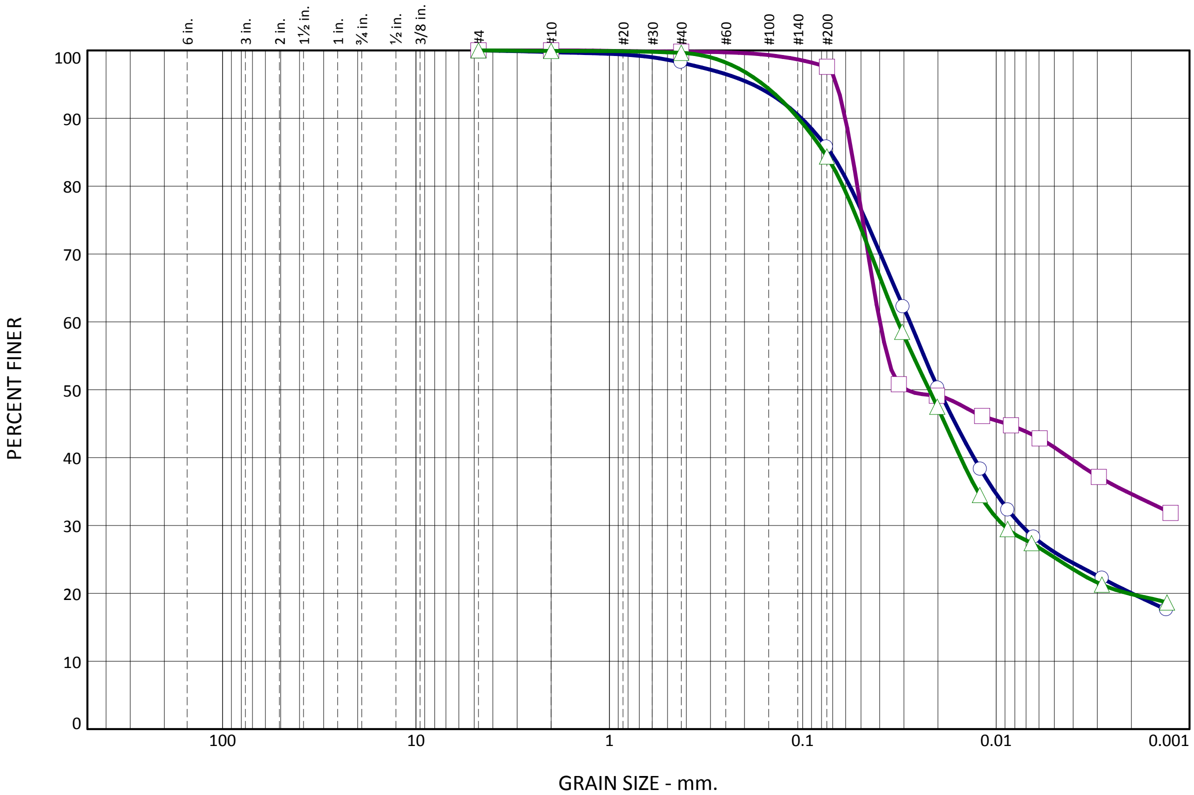
Remarks:
●Natural Moisture = 32.3%
■Natural Moisture = 26.7%
▲Natural Moisture = 28.1%
◆Natural Moisture = 28.6%
▼Natural Moisture = 28.3%

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Figure A-8

Tested By: DAW **Checked By:** NAS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	14.3	65.7	20.0	CL	30	17	13
□	0.0	0.0	2.4	63.0	34.6	CL	43	21	22
△	0.0	0.0	15.6	64.5	19.9	CL	39	21	18

SIEVE inches size	PERCENT FINER ○	□	△
	GRAIN SIZE		
D_{60}	0.0279	0.0399	0.0322
D_{30}	0.0074		0.0091
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0	100.0	100.0
#10	99.7	100.0	99.9
#40	98.2	99.8	99.6
#200	85.7	97.6	84.4

Material Description

○ Lean Clay (CL), Gray, Silty, Trace Sand, Medium, Moist

□ Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Stiff, Moist

△ Lean Clay with Sand (CL), Gray, Silty, Medium, Moist

REMARKS:

○ Natural Moisture = 27.9%

□ Natural Moisture = 30.7%

△ Natural Moisture = 24.7%

○ Location: Boring 1 Depth: 24½-26½ ft. Sample Number:

□ Location: Boring 1L Depth: 22-24 ft. Sample Number: 18

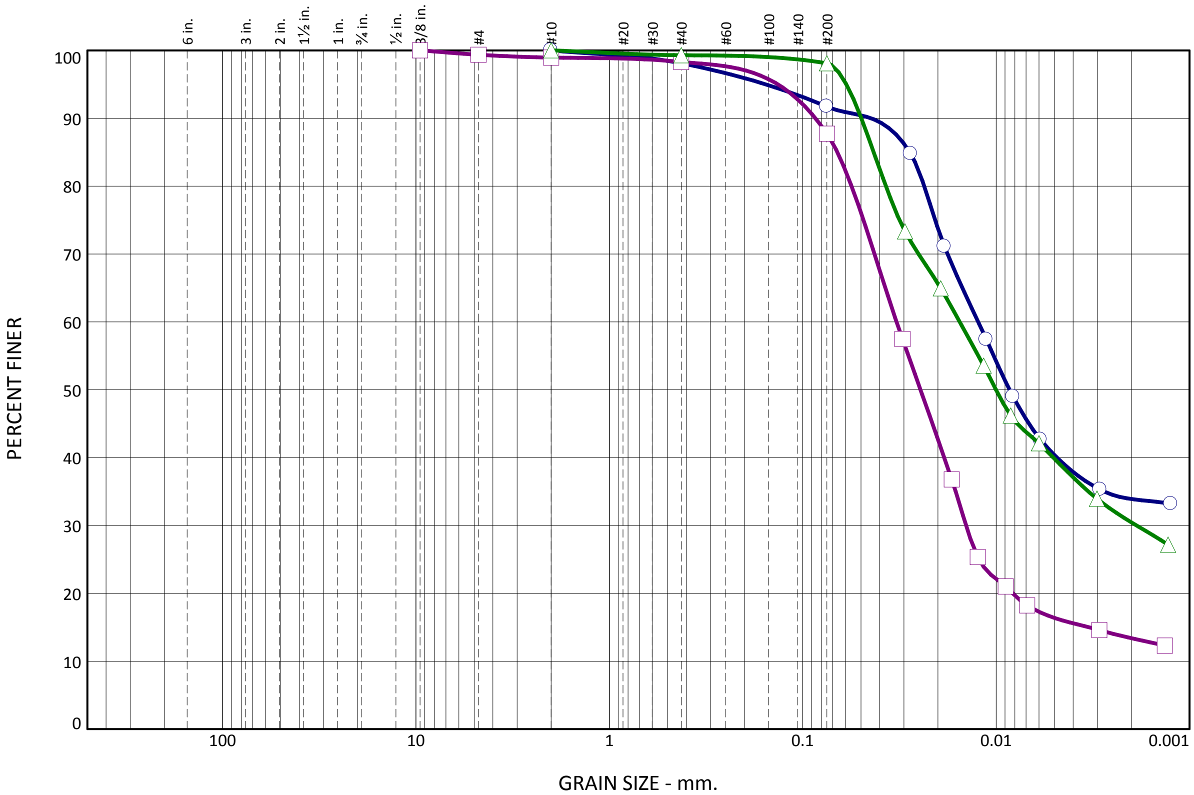
△ Location: Boring 1 LL Depth: 14½-16½ ft. Sample Number: 12

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds
Project No.: 23-1071 Figure S-1

Tested By: DAW / DJS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	8.3	57.8	33.9	CH	57	21	36
□	0.0	0.6	11.7	74.3	13.4	CL-ML	27	21	6
△	0.0	0.0	1.9	67.6	30.5	CH	60	24	36

SIEVE inches size	PERCENT FINER ○	□	△
3/8"		100.0	
GRAIN SIZE			
D_{60}	0.0124	0.0328	0.0154
D_{30}		0.0143	0.0019
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4		99.4	
#10	100.0	98.9	100.0
#40	98.1	98.3	99.3
#200	91.7	87.7	98.1

Material Description

○ Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist

□ Silty Clay (CL-ML), Yellow Brown mottled Light Gray, Trace Sand, Medium, Moist

△ Fat Clay (CH), Light Gray mottled Yellow Brown, Black Oxidation, Silty, Stiff, Moist

REMARKS:

○ Natural Moisture = 26.8%

□ Natural Moisture = 25.5%

△ Natural Moisture = 25.8%

○ Location: Boring 2 Depth: 22-24 ft. Sample Number: 8

□ Location: Boring 2L Depth: 7-9 ft. Sample Number: 6

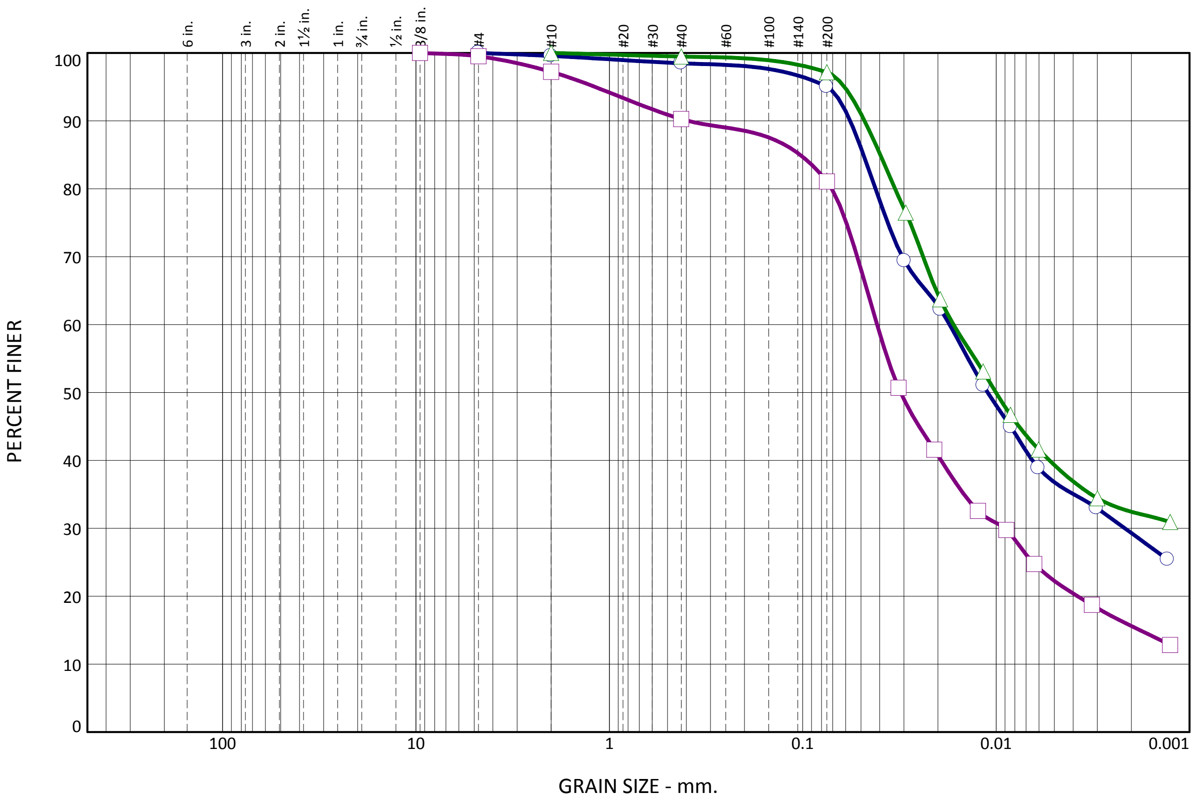
△ Location: Boring 3 ST8 Depth: 9½-11½ ft. Sample Number: 8

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds
Project No.: 23-1071 Figure S-2

Tested By: ○ DAW □ DAW / DJS △ DAW

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	5.0	65.7	29.3	CL	43	20	23
□	0.0	0.5	18.4	65.5	15.6	CL	38	22	16
△	0.0	0.0	2.8	64.8	32.4	CL	49	22	27

SIEVE inches size	PERCENT FINER ○	PERCENT FINER □	PERCENT FINER △
3/8"		100.0	
GRAIN SIZE			
D_{60}	0.0174	0.0413	0.0166
D_{30}	0.0022	0.0090	
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	PERCENT FINER □	PERCENT FINER △
#4	100.0	99.5	
#10	99.6	97.2	100.0
#40	98.5	90.3	99.5
#200	95.0	81.1	97.2

Material Description

○ Lean Clay (CL), Gray mottled Yellow Brown, Silty, Stiff, Moist

□ Lean Clay with Sand (CL), Yellow Brown mottled Light Gray/Gray, Silty, Stiff, Moist

△ Lean Clay (CL/CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist

REMARKS:

○ Natural Moisture = 25.8%

□ Natural Moisture = 21.3%

△ Natural Moisture = 28.3%

○ Location: Boring 3 ST16 Depth: 19½-21½ ft. Sample Number: 16

□ Location: Boring 3U ST8 Depth: 9½-11 ft. Sample Number: 8

△ Location: Boring 4 Depth: 19½-21½ ft. Sample Number:

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

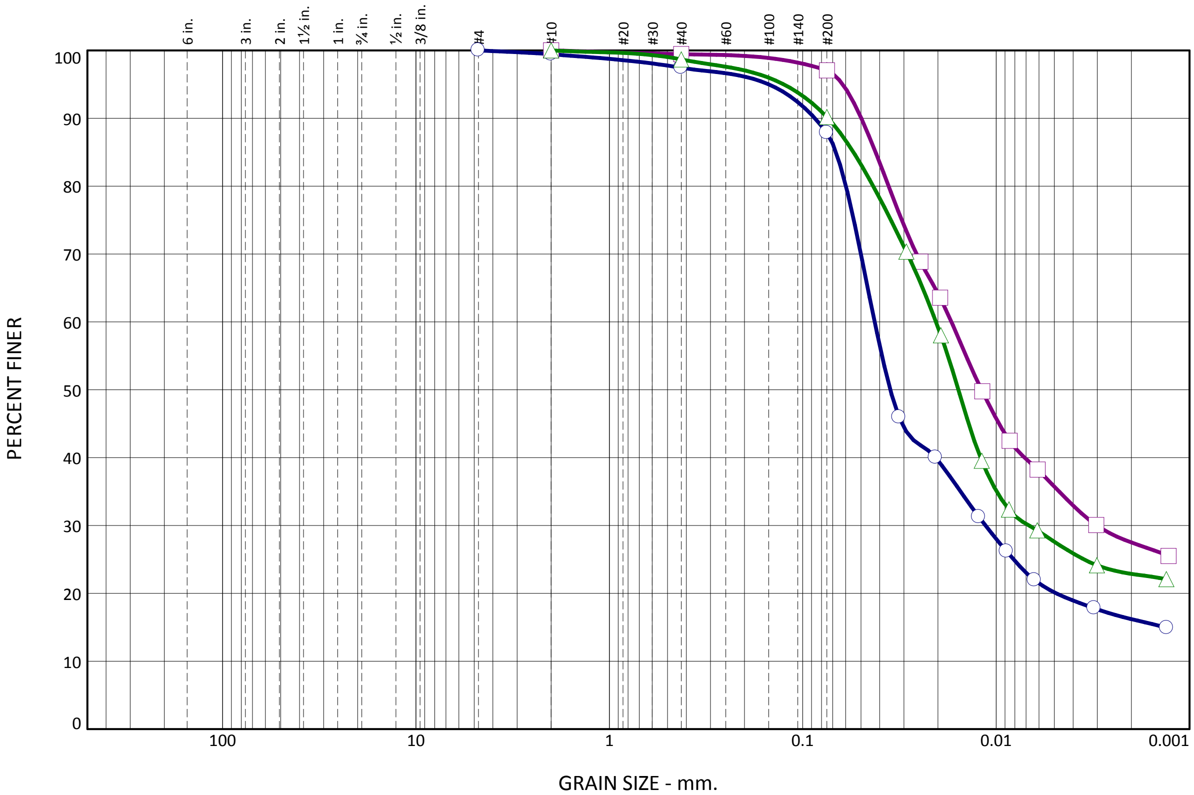
Client: Andrews Engineering

Project: Springfield, IL Ash Ponds

Project No.: 23-1071 Figure S-3

Tested By: ○ DAW □ DAW △ DAW / MAS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	12.1	71.7	16.2	CL	32	20	12
□	0.0	0.0	2.9	69.6	27.5	CH	62	24	38
△	0.0	0.0	9.8	67.3	22.9	CL	43	22	21

SIEVE inches size	PERCENT FINER ○	□	△
	GRAIN SIZE		
D_{60}	0.0425	0.0170	0.0205
D_{30}	0.0114	0.0030	0.0068
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0		
#10	99.4	100.0	100.0
#40	97.4	99.4	98.7
#200	87.9	97.1	90.2

Material Description

○ Lean Clay (CL), Brown mottled Yellow Brown/Light Gray, Silty, Trace Sand, Medium, Moist

□ Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist

△ Lean Clay (CL), Light Gray mottled Gray/ Yellow Brown, Silty, Trace Sand, Medium, Moist

REMARKS:

○ Natural Moisture = 27.4%

□ Natural Moisture = 26.9%

△ Natural Moisture = 24.3%

○ Location: Boring 4L Depth: 12-14 ft. Sample Number: 10

□ Location: Boring 4U Depth: 27-29 ft. Sample Number: 22

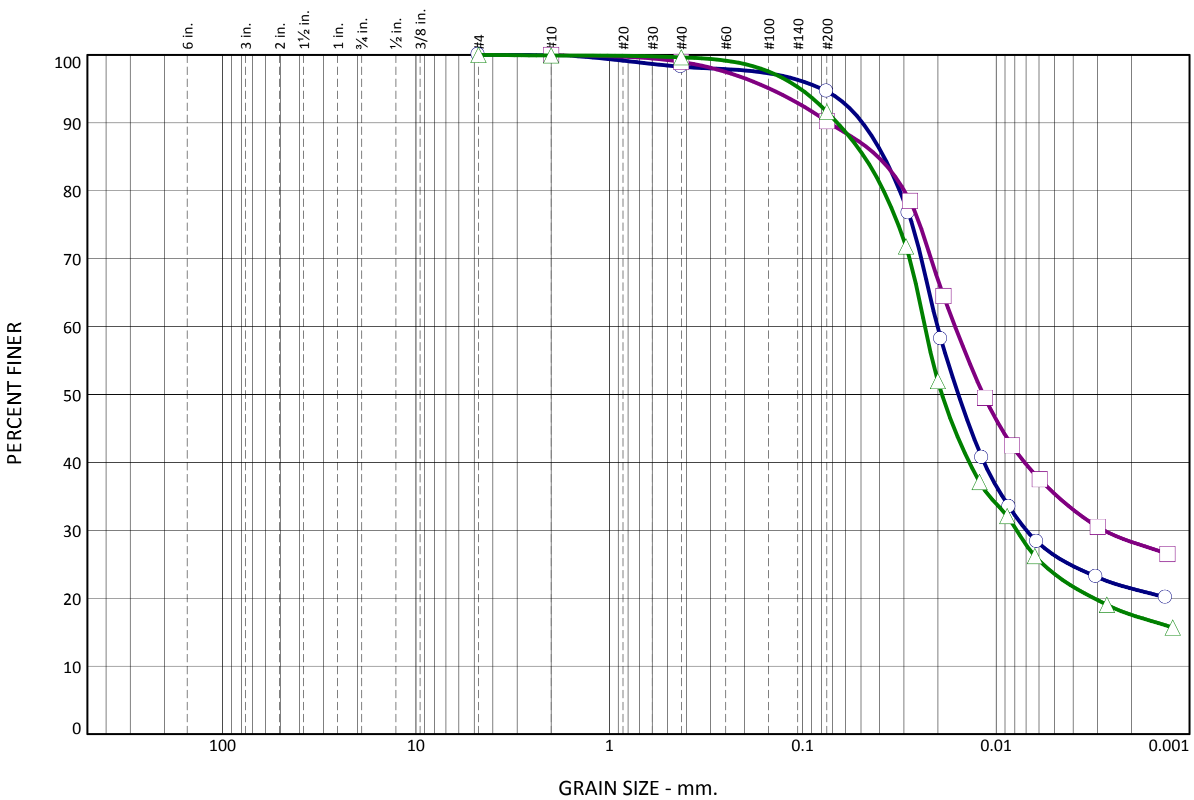
△ Location: Boring 5 Depth: 24½-26½ ft. Sample Number: 10

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds
Project No.: 23-1071 Figure S-4

Tested By: ○ DAW / DJS □ DAW / DJS △ DAW

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	5.4	73.2	21.4	CL	46	24	22
□	0.0	0.0	9.8	61.9	28.3	CL	34	19	15
△	0.0	0.0	8.4	74.1	17.5	CL	41	23	18

SIEVE inches size	PERCENT FINER ○	□	△
	GRAIN SIZE		
D_{60}	0.0201	0.0163	0.0234
D_{30}	0.0070	0.0028	0.0078
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0		100.0
#10	100.0	100.0	99.9
#40	98.3	99.0	99.6
#200	94.6	90.2	91.6

Material Description

○ Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist

□ Lean Clay (CL), Gray/Greenish Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist

△ Lean Clay (CL), Light Gray mottled Reddish Brown, Silty, Trace Sand, Medium, Moist

REMARKS:

○ Natural Moisture = 28.8%

□ Natural Moisture = 21.9%

△ Natural Moisture = 26.6%

○ Location: Boring 5L Depth: 9½-11 ft. Sample Number:

□ Location: Boring 6 Depth: 17-19 ft. Sample Number: 8

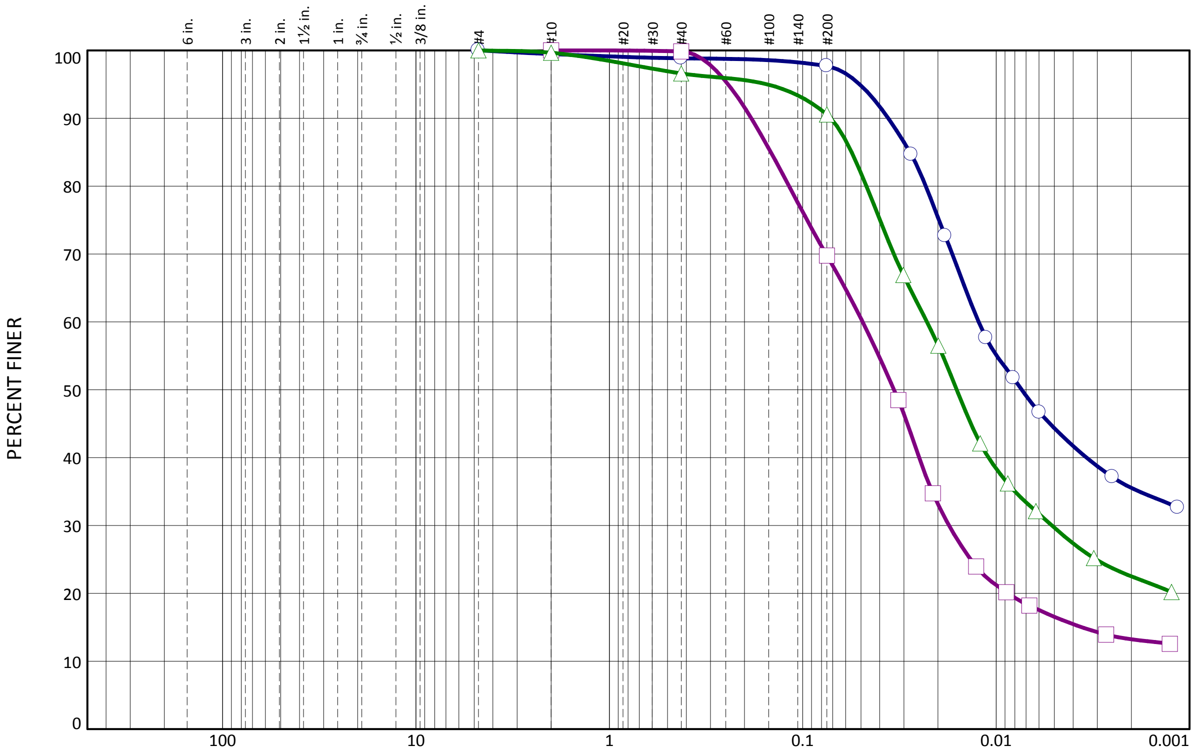
△ Location: Boring 6L Depth: 7½-9 ft. Sample Number: ST1

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds
Project No.: 23-1071 Figure S-5

Tested By: DAW **Checked By:** NAS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	2.3	62.2	35.5	CH	63	20	43
□	0.0	0.0	30.2	56.6	13.2	CL-ML	26	19	7
△	0.0	0.0	9.4	68.1	22.5	CL	48	21	27

SIEVE inches size	PERCENT FINER ○	□	△
	GRAIN SIZE		
D_{60}	0.0123	0.0491	0.0228
D_{30}		0.0175	0.0052
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0		100.0
#10	99.5	100.0	99.6
#40	98.8	99.8	96.6
#200	97.7	69.8	90.6

Material Description

○ Fat Clay (CH), Brown/Yellow Brown mottled Light Gray, Silty, Stiff, Moist

□ Sandy Silty Clay (CL-ML), Yellow Brown mottled Reddish Brown/Light Gray, Medium, Moist

△ Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist

REMARKS:

○ Natural Moisture = 25.8%

□ Natural Moisture = 23.8%

△ Natural Moisture = 24.0%

○ Location: Boring 7 Depth: 19½-21½ ft. Sample Number: 7

□ Location: Boring 8L Depth: 12-14 ft. Sample Number: 5

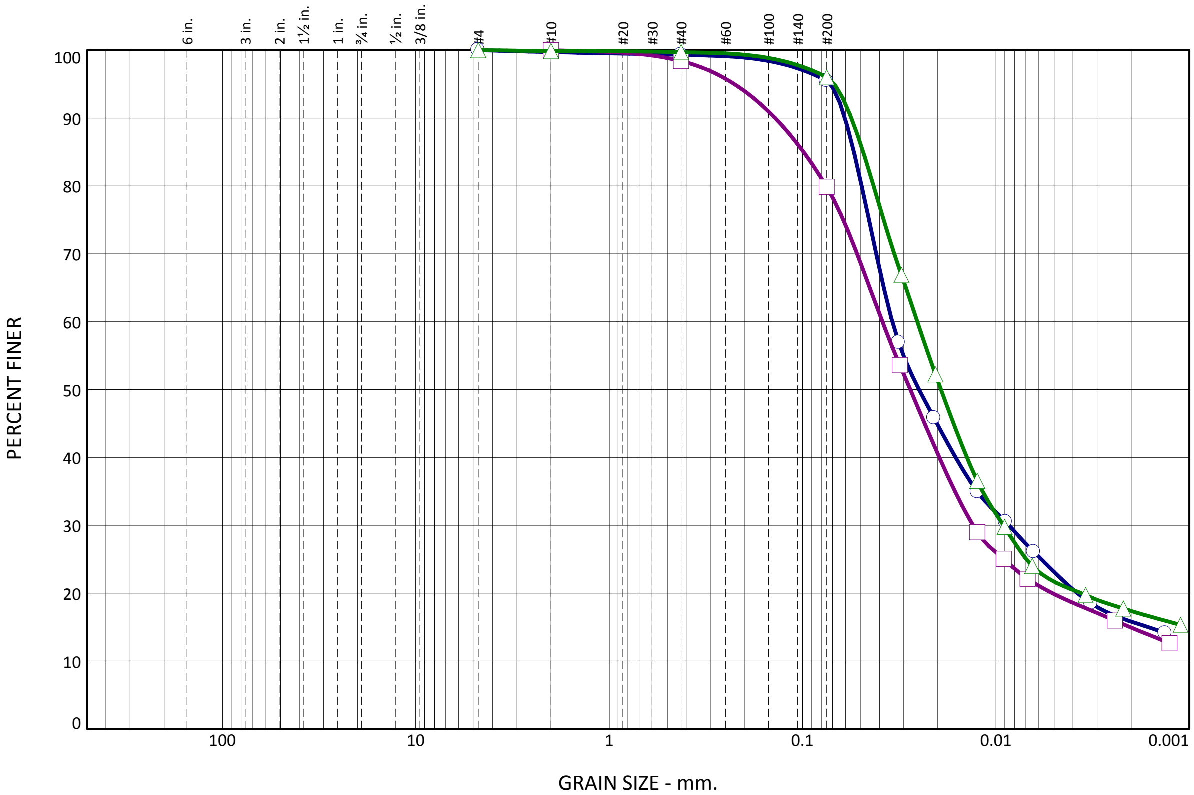
△ Location: Boring 8U ST8 Depth: 9½-11½ ft. Sample Number: 8

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds
Project No.: 23-1071 Figure S-6

Tested By: DAW **Checked By:** NAS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	4.5	79.7	15.8	CL	45	19	26
□	0.0	0.0	20.1	65.0	14.9	CL	26	17	9
△	0.0	0.0	4.0	78.6	17.4	CL	46	22	24

SIEVE inches size	PERCENT FINER ○	□	△
	GRAIN SIZE		
D_{60}	0.0343	0.0386	0.0255
D_{30}	0.0086	0.0131	0.0091
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	100.0		100.0
#10	99.7	100.0	99.9
#40	99.3	98.4	99.7
#200	95.5	79.9	96.0

Material Description

○ Lean Clay (CL), Light Gray Mottled Yellow Brown, Silty, Stiff, Moist

□ Lean Clay with Sand (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Soft, Moist

△ Lean Clay (CL), Gray mottled Light Gray, Silty, Stiff, Moist

REMARKS:

○ Natural Moisture = 25.7%

□ Natural Moisture = 28.0%

△ Natural Moisture = 22.4%

○ Location: Boring 8U ST16 Depth: 19½-21½ ft. Sample Number: 16

□ Location: Boring 9L Depth: 7½-9 ft. Sample Number:

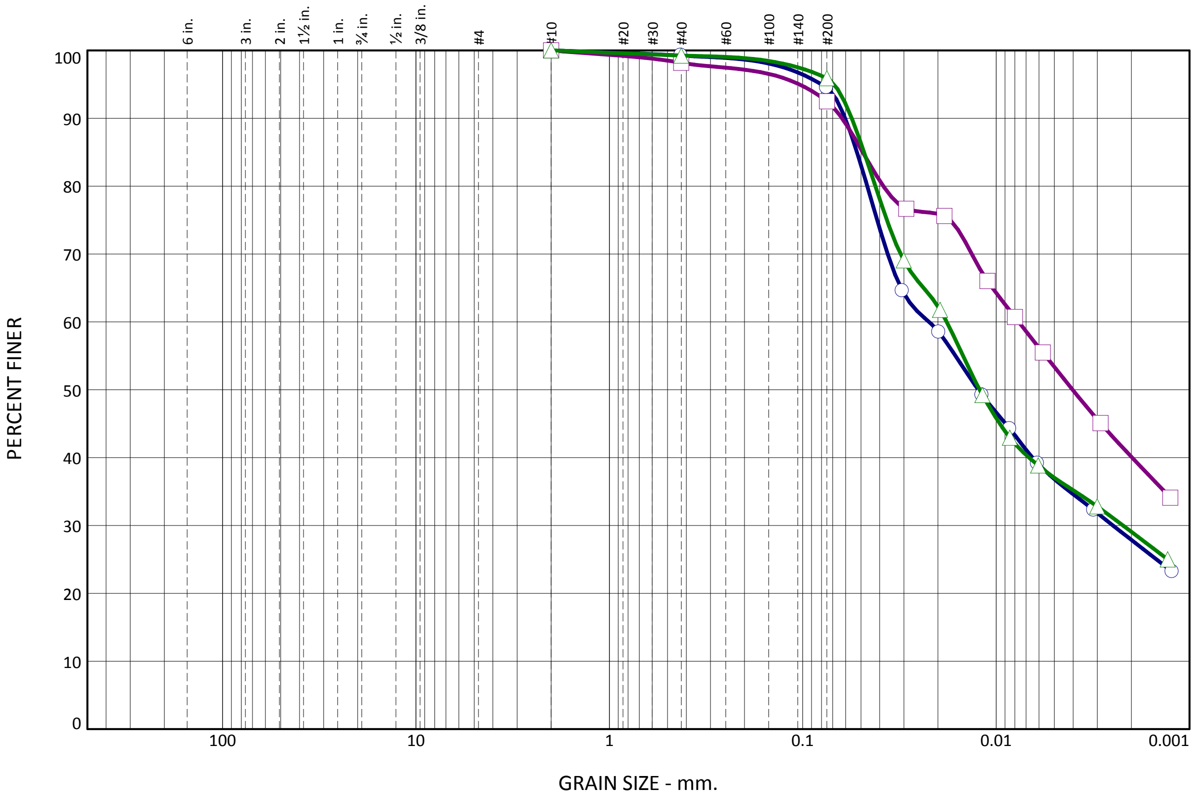
△ Location: Boring 9U ST16 Depth: 19½-21½ ft. Sample Number: 16

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds
Project No.: 23-1071 Figure S-7

Tested By: ○ DAW □ DAW △ MAS **Checked By:** NAS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	5.5	66.6	27.9	CL	46	21	25
□	0.0	0.0	7.5	52.4	40.1	CL	36	20	16
△	0.0	0.0	4.1	66.8	29.1	CL	48	21	27

SIEVE inches size	PERCENT FINER ○	□	△
GRAIN SIZE			
D_{60}	0.0222	0.0077	0.0180
D_{30}	0.0025		0.0022
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#10	100.0	100.0	100.0
#40	99.2	98.2	99.2
#200	94.5	92.5	95.9

Material Description

○ Lean Clay (CL), Yellow Brown mottled Light Gray/Gray, Silty, Trace Sand, Stiff, Moist

□ Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist

△ Lean Clay (CL), Brown mottled Yellow Brown, Silty, Stiff, Moist

REMARKS:

○ Natural Moisture = 23.2%

□ Natural Moisture = 21.8%

△ Natural Moisture = 25.7%

○ Location: Boring 9 CCR ST8 Depth: 9½-11½ ft. Sample Number: 8

□ Location: Boring 11U ST8 Depth: 9½-11½ ft. Sample Number:

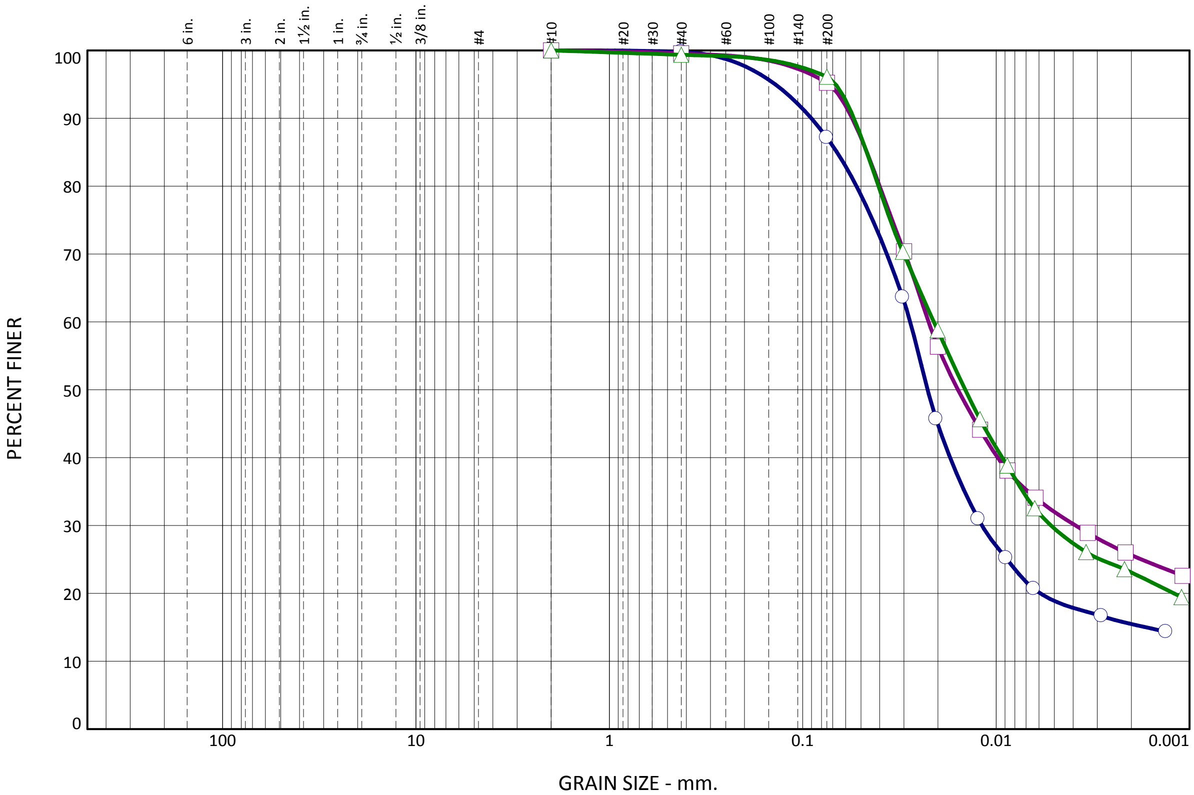
△ Location: Boring 11U ST16 Depth: 19½-21½ ft. Sample Number:

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds
Project No.: 23-1071 Figure S-8

Tested By: DAW

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	12.9	71.6	15.5	CL	30	19	11
□	0.0	0.0	4.8	69.6	25.6	CL	45	22	23
△	0.0	0.0	3.9	73.0	23.1	CL	42	22	20

SIEVE inches size	PERCENT FINER ○	□	△
	GRAIN SIZE		
D_{60}	0.0278	0.0224	0.0210
D_{30}	0.0119	0.0039	0.0052
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#10	100.0	100.0	100.0
#40	99.8	99.6	99.3
#200	87.1	95.2	96.1

Material Description

○ Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist

□ Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Stiff, Moist

△ Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Stiff, Moist

REMARKS:

○ Natural Moisture = 23.2%

□ Natural Moisture = 21.8%

△ Natural Moisture = 21.6%

○ Location: Boring 12L Depth: 14½-16 ft. Sample Number:

□ Location: Boring 12U ST8 Depth: 9½-11½ ft. Sample Number: 8

△ Location: Boring 12U ST16 Depth: 19½-21½ ft. Sample Number: 16

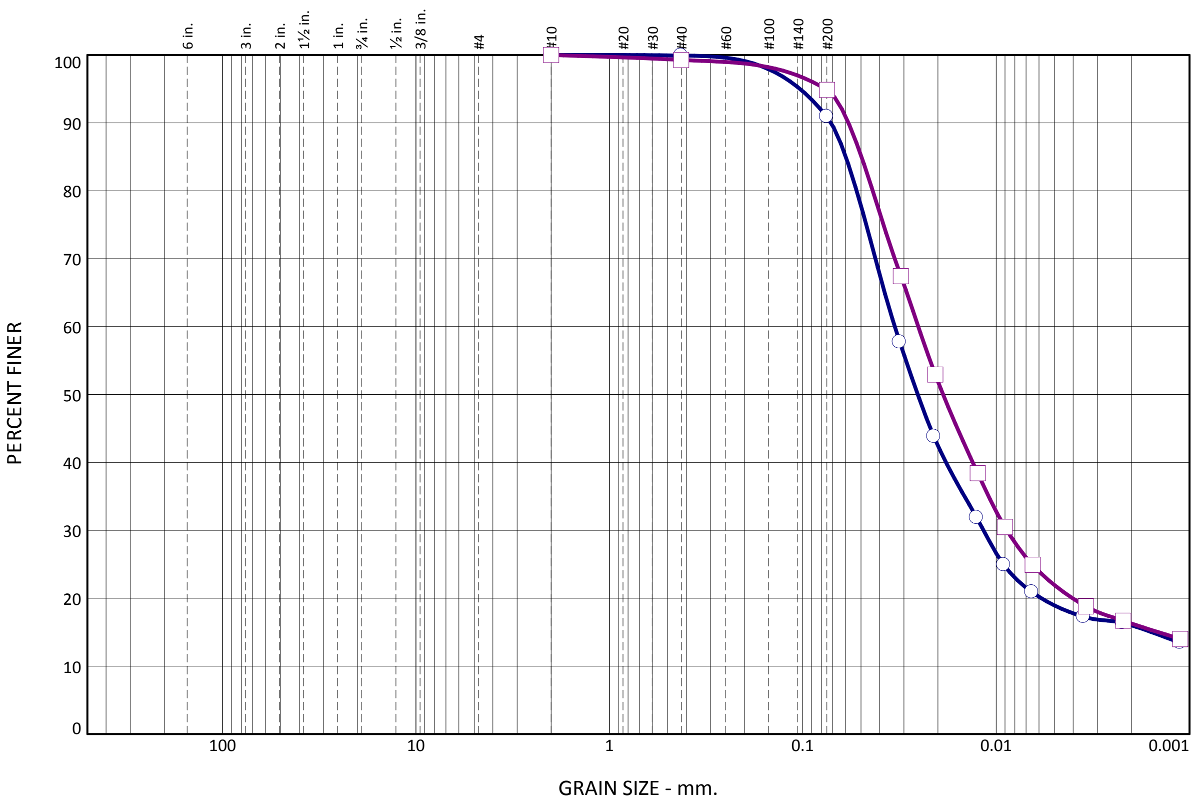
GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering
Project: Springfield, IL Ash Ponds

Project No.: 23-1071 Figure S-9

Tested By: ○ DAW □ MAS △ MAS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	9.1	74.9	16.0	CL	34	20	14
□	0.0	0.0	5.1	78.6	16.3	CH	52	25	27

SIEVE inches size	PERCENT FINER ○	□	
	GRAIN SIZE		
D_{60}	0.0335	0.0253	
D_{30}	0.0116	0.0088	
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	
#10	100.0	100.0	
#40	99.9	99.3	
#200	90.9	94.9	

Material Description

○ Lean Clay (CL), Yellow Brown, Silty, Trace Sand, Stiff, Moist

□ Fat Clay (CH), Gray mottled Light Gray, Silty, Trace Sand, Stiff, Moist

REMARKS:

○ Natural Moisture = 18.4%

□ Natural Moisture = 21.1%

○ Location: Boring 13 BN ST7 Depth: 8½-10½ ft. Sample Number: 7

□ Location: Boring 13 BS ST7 Depth: 8½-10½ ft. Sample Number: 7

GEOTECHNICS
Soil & Material Testing
4510 Paris Gravel Road - Hannibal, MO

Client: Andrews Engineering

Project: Springfield, IL Ash Ponds

Project No.: 23-1071 Figure S-10

Tested By: MAS

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Gray, Silty, Trace Sand, Medium, Moist**

LIQUID LIMIT **30** PLASTIC LIMIT **17** P.I. **13**

BORING NO. **Boring 1** SAMPLE NO.

SAMPLE TYPE **ST** DEPTH **24½-26½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **26.2%** INITIAL DRY DENSITY **100.8 P.C.F.**

FINAL WATER CONTENT **23.1%** FINAL DRY DENSITY **102.6 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
3:12:00 PM		0.200	7.214	40.438		2.89	7.04	20.750	210.9		231.650		
3:12:00 PM	3:33:00 PM	0.200	7.214	40.438	1260	5.00	4.94	-0.300	210.9	1.00	210.600	1.35E-06	1.27E-06
3:33:00 PM	3:53:00 PM	0.200	7.214	40.438	1200	6.77	3.17	-18.000	210.9	1.00	192.900	1.31E-06	1.23E-06
3:53:00 PM	4:34:00 PM	0.200	7.214	40.438	2460	9.89	0.04	-49.250	210.9	1.00	161.650	1.28E-06	1.21E-06
													1.23E-06

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 1.23 E-06 CM/SEC

REMARKS: Testing Completed 11/2/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Stiff, Moist**

LIQUID LIMIT **43** PLASTIC LIMIT **21** P.I. **22**

BORING NO. **Boring 1L** SAMPLE NO. **ST 18**

SAMPLE TYPE **ST** DEPTH **22-24 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **20.4%** INITIAL DRY DENSITY **114.0 P.C.F.**

FINAL WATER CONTENT **16.1%** FINAL DRY DENSITY **117.4 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
12:42:00 PM		0.200	7.330	41.980		4.60	5.36	3.800	70.3		74.100		
12:42:00 PM	12:50:00 PM	0.200	7.330	41.980	480	5.82	4.15	-8.350	70.3	0.99	61.950	6.51E-06	6.14E-06
12:50:00 PM	1:32:00 PM	0.200	7.330	41.980	2520	9.50	0.50	-45.000	70.3	0.99	25.300	6.21E-06	5.85E-06
1:32:00 PM	1:42:30 PM	0.200	7.330	41.980	630	9.99	0.01	-49.900	70.3	1.00	20.400	5.97E-06	5.62E-06
													5.84E-06

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 5.84 E-06 CM/SEC

REMARKS: Testing Completed 11/10/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds**
CLIENT **Andrews Engineering**
LOCATION **Springfield, IL**
SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay with Sand (CL), Gray, Silty, Medium, Moist**

LIQUID LIMIT **39**
PLASTIC LIMIT **21**
P.I. **18**

BORING NO. **Boring 1LL**
SAMPLE NO. **ST 12**

SAMPLE TYPE **ST**
DEPTH **14½-16½ ft.**

SPECIFIC GRAVITY, Gs
TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **23.8%**
INITIAL DRY DENSITY **102.1 P.C.F.**

FINAL WATER CONTENT **22.8%**
FINAL DRY DENSITY **103.9 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
2:32:00 PM		0.200	7.391	41.543		0.14	10.00	49.300	70.3		119.600		
2:32:00 PM	2:46:00 PM	0.200	7.391	41.543	840	3.35	6.78	17.150	70.3	1.00	87.450	6.63E-06	6.25E-06
2:46:00 PM	2:54:00 PM	0.200	7.391	41.543	480	4.75	5.38	3.150	70.3	1.00	73.450	6.47E-06	6.09E-06
2:54:00 PM	3:10:00 PM	0.200	7.391	41.543	960	6.82	3.31	-17.550	70.3	1.00	52.750	6.14E-06	5.78E-06
													6.02E-06

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 6.02 E-06 CM/SEC

REMARKS: Testing Completed 11/3/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

GEOTECHNICS
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Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds**
LOCATION **Springfield, IL**
CLIENT **Andrews Engineering**
SAMPLING DATE

SAMPLE DESCRIPTION **Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **57**
PLASTIC LIMIT **21** P.I. **36**

BORING NO. **Boring 2**
SAMPLE NO. **8**

SAMPLE TYPE **ST** DEPTH **22-24 ft.**

SPECIFIC GRAVITY, Gs
TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **21.5%**
INITIAL DRY DENSITY **101.8 P.C.F.**

FINAL WATER CONTENT **23.0%**
FINAL DRY DENSITY **102.1 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
6:39:00 AM		0.200	6.980	41.931		4.53	4.63	0.500	210.9		211.400		
6:39:00 AM	6:52:00 AM	0.200	6.980	41.931	780	4.60	4.56	-0.200	210.9	1.00	210.700	7.08E-08	6.67E-08
6:52:00 AM	7:30:00 AM	0.200	6.980	41.931	2280	4.81	4.34	-2.350	210.9	1.05	208.550	7.49E-08	7.05E-08
7:30:00 AM	7:48:00 AM	0.200	6.980	41.931	1080	4.90	4.24	-3.300	210.9	1.11	207.600	7.04E-08	6.63E-08
													6.87E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 6.87 E-08 CM/SEC

REMARKS: Testing Completed 10/14/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Silty Clay (CL-ML), Yellow Brown mottled Light Gray, Trace Sand, Medium, Moist**

LIQUID LIMIT **27** PLASTIC LIMIT **21** P.I. **6**

BORING NO. **Boring 2L** SAMPLE NO. **6**

SAMPLE TYPE **ST** DEPTH **7.0-9.0 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **24.7%** INITIAL DRY DENSITY **101.9 P.C.F.**

FINAL WATER CONTENT **23.5%** FINAL DRY DENSITY **103.2 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
3:28:00 PM		0.200	7.005	41.254		3.97	6.85	14.400	70.3		84.700		
3:28:00 PM	3:40:00 PM	0.200	7.005	41.254	720	6.71	4.10	-13.050	70.3	1.00	57.250	9.24E-06	8.70E-06
3:40:00 PM	3:50:00 PM	0.200	7.005	41.254	600	8.30	2.50	-29.000	70.3	1.01	41.300	9.24E-06	8.71E-06
3:50:00 PM	4:02:00 PM	0.200	7.005	41.254	720	9.47	1.33	-40.700	70.3	1.00	29.600	7.86E-06	7.40E-06
													8.24E-06

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 8.24 E-06 CM/SEC

REMARKS: Testing Completed 11/5/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Fat Clay (CH), Light Gray mottled Yellow Brown, Black Oxidation, Silty, Stiff, Moist**

LIQUID LIMIT **60** PLASTIC LIMIT **24** P.I. **36**

BORING NO. **Boring 3** SAMPLE NO. **ST 8**

SAMPLE TYPE **ST** DEPTH **9½-11½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **24.7%** INITIAL DRY DENSITY **100.2 P.C.F.**

FINAL WATER CONTENT **26.1%** FINAL DRY DENSITY **99.0 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
5:53:00 AM		0.200	7.163	42.028		1.50	7.88	31.900	210.9		242.800		
5:53:00 AM	7:13:00 AM	0.200	7.163	42.028	4800	1.56	7.82	31.300	210.9	1.00	242.200	8.79E-09	8.28E-09
7:13:00 AM	7:38:00 AM	0.200	7.163	42.028	1500	1.58	7.80	31.100	210.9	1.00	242.000	9.39E-09	8.84E-09
7:38:00 AM	8:29:00 AM	0.200	7.163	42.028	3060	1.62	7.76	30.700	210.9	1.00	241.600	9.21E-09	8.68E-09
													8.50E-09

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 8.50 E-09 CM/SEC

REMARKS: Testing Completed 11/15/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Gray mottled Yellow Brown, Silty, Stiff, Moist**

LIQUID LIMIT **43** PLASTIC LIMIT **20** P.I. **23**

BORING NO. **Boring 3** SAMPLE NO. **ST 16**

SAMPLE TYPE **ST** DEPTH **19½-21½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **25.8%** INITIAL DRY DENSITY **95.1 P.C.F.**

FINAL WATER CONTENT **29.5%** FINAL DRY DENSITY **93.0 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
12:10:00 PM		0.200	7.432	42.077		5.34	4.67	-3.350	210.9		207.550		
12:10:00 PM	12:30:00 PM	0.200	7.432	42.077	1200	6.00	4.01	-9.950	210.9	1.00	200.950	4.76E-07	4.48E-07
12:30:00 PM	12:54:00 PM	0.200	7.432	42.077	1440	6.72	3.29	-17.150	210.9	1.00	193.750	4.48E-07	4.22E-07
12:54:00 PM	1:25:00 PM	0.200	7.432	42.077	1860	7.60	2.40	-26.000	210.9	1.01	184.900	4.44E-07	4.18E-07
													4.27E-07

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 4.27 E-07 CM/SEC

REMARKS: Testing Completed 11/15/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds**
CLIENT **Andrews Engineering**

LOCATION **Springfield, IL**
SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay with Sand (CL), Yellow Brown mottled Light Gray/Gray, Silty, Stiff, Moist**

LIQUID LIMIT **38**

PLASTIC LIMIT **22** P.I. **16**

BORING NO. **Boring 3U**

SAMPLE NO. **ST 8**

SAMPLE TYPE **ST** DEPTH **9½-11 ft.**

SPECIFIC GRAVITY, Gs

TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **21.4%**

INITIAL DRY DENSITY **101.2 P.C.F.**

FINAL WATER CONTENT **21.4%**

FINAL DRY DENSITY **102.2 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
8:55:00 PM		0.200	7.483	41.834		2.21	6.92	23.550	351.5		375.050		
8:55:00 PM	7:04:00 AM	0.200	7.483	41.834	42180	3.58	5.53	9.750	351.5	1.01	361.250	1.59E-08	1.50E-08
7:04:00 AM	8:38:00 AM	0.200	7.483	41.834	5640	3.78	5.33	7.750	351.5	1.00	359.250	1.76E-08	1.66E-08
8:38:00 AM	12:03:00 PM	0.200	7.483	41.834	12300	4.18	4.92	3.700	351.5	1.03	355.200	1.65E-08	1.55E-08
													1.52E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 1.52 E-08 CM/SEC

REMARKS: Testing Completed 11/21/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL/CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist**

LIQUID LIMIT **49** PLASTIC LIMIT **22** P.I. **27**

BORING NO. **Boring 4** SAMPLE NO.

SAMPLE TYPE **ST** DEPTH **19½-21½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **25.5%** INITIAL DRY DENSITY **96.4 P.C.F.**

FINAL WATER CONTENT **23.8%** FINAL DRY DENSITY **100.0 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
7:09:00 PM		0.200	7.437	41.205		3.74	5.94	11.000	210.9		221.900		
7:09:00 PM	8:29:00 PM	0.200	7.437	41.205	4800	4.13	5.51	6.900	210.9	1.10	217.800	7.01E-08	6.61E-08
8:29:00 PM	9:00:00 PM	0.200	7.437	41.205	1860	4.30	5.34	5.200	210.9	1.00	216.100	7.60E-08	7.16E-08
9:00:00 PM	9:28:00 PM	0.200	7.437	41.205	1680	4.42	5.22	4.000	210.9	1.00	214.900	5.98E-08	5.64E-08
													6.53E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 6.53 E-08 CM/SEC

REMARKS: Testing Completed 11/5/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Brown mottled Yellow Brown/Light Gray, Silty, Trace Sand, Medium, Moist**

LIQUID LIMIT **32** PLASTIC LIMIT **20** P.I. **12**

BORING NO. **Boring 4L** SAMPLE NO. **ST 10**

SAMPLE TYPE **ST** DEPTH **12-14 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **25.7%** INITIAL DRY DENSITY **100.7 P.C.F.**

FINAL WATER CONTENT **24.6%** FINAL DRY DENSITY **101.8 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
12:16:00 PM		0.200	7.397	41.013		1.20	8.82	38.100	140.6		178.700		
12:16:00 PM	1:03:00 PM	0.200	7.397	41.013	2820	3.75	6.23	12.400	140.6	1.02	153.000	9.93E-07	9.35E-07
1:03:00 PM	2:23:00 PM	0.200	7.397	41.013	4800	7.39	2.55	-24.200	140.6	1.01	116.400	1.03E-06	9.68E-07
2:23:00 PM	3:26:00 PM	0.200	7.397	41.013	3780	9.59	0.32	-46.350	140.6	1.01	94.250	1.01E-06	9.49E-07
													9.53E-07

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 9.53 E-07 CM/SEC

REMARKS: Testing Completed 11/7/2023

TESTED BY: **BJS**

COMPUTED BY: **BJS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds**
LOCATION **Springfield, IL**
CLIENT **Andrews Engineering**
SAMPLING DATE

SAMPLE DESCRIPTION **Fat Clay (CH), Yellow Brown mottled Light Gray, Silty, Stiff, Moist**

LIQUID LIMIT **62**
PLASTIC LIMIT **24**
P.I. **38**

BORING NO. **Boring 4U**
SAMPLE NO. **ST 22**

SAMPLE TYPE **ST**
DEPTH **27-29 ft.**

SPECIFIC GRAVITY, Gs
TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **28.8%**
INITIAL DRY DENSITY **94.6 P.C.F.**

FINAL WATER CONTENT **28.1%**
FINAL DRY DENSITY **95.5 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
12:47:00 PM		0.200	7.706	42.077		2.33	6.84	22.550	210.9		233.450		
12:47:00 PM	1:08:00 PM	0.200	7.706	42.077	1260	2.35	6.82	22.350	210.9	1.00	233.250	1.25E-08	1.17E-08
1:08:00 PM	2:20:00 PM	0.200	7.706	42.077	4320	2.42	6.74	21.600	210.9	1.14	232.500	1.37E-08	1.29E-08
2:20:00 PM	4:43:00 PM	0.200	7.706	42.077	8580	2.50	6.66	20.800	210.9	1.00	231.700	7.36E-09	6.93E-09
													9.17E-09

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 9.17 E-09 CM/SEC

REMARKS: Testing Completed 11/10/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds**
LOCATION **Springfield, IL**
CLIENT **Andrews Engineering**
SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Light Gray mottled Gray/Yellow Brown, Silty, Trace Sand, Medium, Moist**

LIQUID LIMIT **43**
PLASTIC LIMIT **22**
P.I. **21**

BORING NO. **Boring 5**
SAMPLE NO. **10**

SAMPLE TYPE **ST**
DEPTH **24½-26½ ft.**

SPECIFIC GRAVITY, Gs
TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **24.5%**
INITIAL DRY DENSITY **99.8 P.C.F.**

FINAL WATER CONTENT **23.7%**
FINAL DRY DENSITY **100.3 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
1:59:00 PM		0.200	6.904	41.883		2.62	6.29	18.350	210.9		229.250		
1:59:00 PM	2:35:00 PM	0.200	6.904	41.883	2160	3.48	5.40	9.600	210.9	1.03	220.500	2.97E-07	2.80E-07
2:35:00 PM	3:06:00 PM	0.200	6.904	41.883	1860	4.16	4.69	2.650	210.9	1.04	213.550	2.84E-07	2.67E-07
3:06:00 PM	3:47:00 PM	0.200	6.904	41.883	2460	5.00	3.84	-5.800	210.9	1.01	205.100	2.71E-07	2.55E-07
													2.67E-07

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 2.67 E-07 CM/SEC

REMARKS: Testing Completed 10/17/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **46** PLASTIC LIMIT **24** P.I. **22**

BORING NO. **Boring 5L** SAMPLE NO.

SAMPLE TYPE **ST** DEPTH **9½-11 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **29.0%** INITIAL DRY DENSITY **94.4 P.C.F.**

FINAL WATER CONTENT **28.4%** FINAL DRY DENSITY **94.3 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
12:33:00 PM		0.200	7.696	40.869		0.08	9.97	49.450	210.9		260.350		
12:33:00 PM	2:12:00 PM	0.200	7.696	40.869	5940	4.13	5.77	8.200	210.9	1.04	219.100	5.47E-07	5.15E-07
2:12:00 PM	2:38:00 PM	0.200	7.696	40.869	1560	5.12	4.77	-1.750	210.9	1.01	209.150	5.61E-07	5.28E-07
2:38:00 PM	3:21:00 PM	0.200	7.696	40.869	2580	6.62	3.24	-16.900	210.9	1.02	194.000	5.49E-07	5.17E-07
													5.18E-07

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 5.18 E-07 CM/SEC

REMARKS: Testing Completed 10/16/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Gray/Greenish Gray mottled Yellow Brown, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **34** PLASTIC LIMIT **19** P.I. **15**

BORING NO. **Boring 6** SAMPLE NO. **8**

SAMPLE TYPE **ST** DEPTH **17-19 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **19.5%** INITIAL DRY DENSITY **106.8 P.C.F.**

FINAL WATER CONTENT **20.7%** FINAL DRY DENSITY **106.4 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
7:10:00 AM		0.200	8.199	42.418		3.33	6.20	14.350	210.9		225.250		
7:10:00 AM	8:01:00 AM	0.200	8.199	42.418	3060	3.49	6.04	12.750	210.9	1.00	223.650	4.50E-08	4.24E-08
8:01:00 AM	9:31:00 AM	0.200	8.199	42.418	5400	3.76	5.76	10.000	210.9	1.04	220.900	4.43E-08	4.17E-08
9:31:00 AM	10:31:00 AM	0.200	8.199	42.418	3600	3.95	5.57	8.100	210.9	1.00	219.000	4.64E-08	4.37E-08
													4.25E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 4.25 E-08 CM/SEC

REMARKS: Testing Completed 10/23/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Light Gray mottled Reddish Brown, Silty, Trace Sand, Medium, Moist**

LIQUID LIMIT **41** PLASTIC LIMIT **23** P.I. **18**

BORING NO. **Boring 6L-ST1** SAMPLE NO. **ST1**

SAMPLE TYPE **ST** DEPTH **7½-9ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **27.5%** INITIAL DRY DENSITY **95.2 P.C.F.**

FINAL WATER CONTENT **26.0%** FINAL DRY DENSITY **96.2 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
10:42:00 AM		0.200	7.625	39.301		1.80	7.77	29.850	210.9		240.750		
10:42:00 AM	11:10:00 AM	0.200	7.625	39.301	1680	2.98	6.56	17.900	210.9	1.03	228.800	5.88E-07	5.54E-07
11:10:00 AM	11:59:00 AM	0.200	7.625	39.301	2940	4.88	4.61	-1.350	210.9	1.03	209.550	5.80E-07	5.46E-07
11:59:00 AM	12:16:00 PM	0.200	7.625	39.301	1020	5.49	3.98	-7.550	210.9	1.03	203.350	5.71E-07	5.38E-07
													5.47E-07

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 5.47 E-07 CM/SEC

REMARKS: Testing Completed 10/20/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Fat Clay (CH), Brown/Yellow Brown mottled Light Gray, Silty, Stiff, Moist**

LIQUID LIMIT **63** PLASTIC LIMIT **20** P.I. **43**

BORING NO. **Boring 7** SAMPLE NO. **7**

SAMPLE TYPE **ST** DEPTH **19½-21½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **28.4%** INITIAL DRY DENSITY **95.5 P.C.F.**

FINAL WATER CONTENT **27.4%** FINAL DRY DENSITY **94.6 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
1:32:00 PM		0.200	7.478	40.869		0.20	9.40	46.000	210.9		256.900		
1:32:00 PM	3:08:00 PM	0.200	7.478	40.869	5760	0.35	9.25	44.500	210.9	1.00	255.400	1.86E-08	1.75E-08
3:08:00 PM	3:45:00 PM	0.200	7.478	40.869	2220	0.40	9.20	44.000	210.9	1.00	254.900	1.62E-08	1.52E-08
3:45:00 PM	4:16:00 PM	0.200	7.478	40.869	1860	0.45	9.15	43.500	210.9	1.00	254.400	1.93E-08	1.82E-08
													1.71E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 1.71 E-08 CM/SEC

REMARKS: Testing Completed 10/26/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Sandy Silty Clay (CL-ML), Yellow Brown mottled Reddish Brown/Light Gray, Medium, Moist**

LIQUID LIMIT **26** PLASTIC LIMIT **19** P.I. **7**

BORING NO. **Boring 8L** SAMPLE NO. **5**

SAMPLE TYPE **ST** DEPTH **12-14 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **24.0%** INITIAL DRY DENSITY **101.1 P.C.F.**

FINAL WATER CONTENT **24.7%** FINAL DRY DENSITY **101.0 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
2:24:00 PM		0.200	7.620	41.302		4.90	5.01	0.550	70.3		70.850		
2:24:00 PM	3:27:00 PM	0.200	7.620	41.302	3780	8.66	1.24	-37.100	70.3	1.00	33.200	3.70E-06	3.49E-06
3:27:00 PM	3:48:00 PM	0.200	7.620	41.302	1260	9.36	0.54	-44.100	70.3	1.00	26.200	3.47E-06	3.27E-06
3:48:00 PM	4:08:00 PM	0.200	7.620	41.302	1200	9.90	0.00	-49.500	70.3	1.00	20.800	3.55E-06	3.34E-06
													3.41E-06

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 3.41 E-06 CM/SEC

REMARKS: Testing Completed 11/7/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Yelllow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **48** PLASTIC LIMIT **21** P.I. **27**

BORING NO. **Boring 8U** SAMPLE NO. **ST 8**

SAMPLE TYPE **ST** DEPTH **9½-11½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **23.0%** INITIAL DRY DENSITY **102.4 P.C.F.**

FINAL WATER CONTENT **23.3%** FINAL DRY DENSITY **102.9 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
10:58:00 AM		0.200	7.280	41.398		5.13	4.40	-3.650	210.9		207.250		
10:58:00 AM	12:10:00 PM	0.200	7.280	41.398	4320	5.25	4.27	-4.900	210.9	1.08	206.000	2.46E-08	2.32E-08
12:10:00 PM	3:07:00 PM	0.200	7.280	41.398	10620	5.54	3.96	-7.900	210.9	1.07	203.000	2.43E-08	2.29E-08
3:07:00 PM	3:54:00 PM	0.200	7.280	41.398	2820	5.61	3.89	-8.600	210.9	1.00	202.300	2.15E-08	2.03E-08
													2.25E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 2.25 E-08 CM/SEC

REMARKS: Testing Completed 11/17/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Light Gray mottled Yellow Brown, Silty, Stiff, Moist**

LIQUID LIMIT **45** PLASTIC LIMIT **19** P.I. **26**

BORING NO. **Boring 8U** SAMPLE NO. **ST16**

SAMPLE TYPE **ST** DEPTH **19½-21½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **23.4%** INITIAL DRY DENSITY **100.9 P.C.F.**

FINAL WATER CONTENT **25.4%** FINAL DRY DENSITY **100.2 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
8:39:00 AM		0.200	7.732	41.398		1.13	7.78	33.250	210.9		244.150		
8:39:00 AM	9:05:00 AM	0.200	7.732	41.398	1560	1.15	7.76	33.050	210.9	1.00	243.950	9.81E-09	9.24E-09
9:05:00 AM	10:02:00 AM	0.200	7.732	41.398	3420	1.19	7.72	32.650	210.9	1.00	243.550	8.96E-09	8.44E-09
10:02:00 AM	12:04:00 PM	0.200	7.732	41.398	7320	1.29	7.62	31.650	210.9	1.00	242.550	1.05E-08	9.89E-09
													9.40E-09

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 9.40 E-09 CM/SEC

REMARKS: Testing Completed 11/21/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Yellow Brown mottled Light Gray/Gray, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **46** PLASTIC LIMIT **21** P.I. **25**

BORING NO. **Boring 9CCR** SAMPLE NO. **ST 8**

SAMPLE TYPE **ST** DEPTH **9½-11½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **22.9%** INITIAL DRY DENSITY **102.9 P.C.F.**

FINAL WATER CONTENT **23.2%** FINAL DRY DENSITY **103.4 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
9:05:00 AM		0.200	7.336	41.350		2.15	7.14	24.950	210.9		235.850		
9:05:00 AM	10:59:00 AM	0.200	7.336	41.350	6840	2.24	7.05	24.050	210.9	1.00	234.950	9.92E-09	9.34E-09
10:59:00 AM	12:10:00 PM	0.200	7.336	41.350	4260	2.30	6.99	23.450	210.9	1.00	234.350	1.06E-08	1.00E-08
12:10:00 PM	3:06:00 PM	0.200	7.336	41.350	10560	2.44	6.85	22.050	210.9	1.00	232.950	1.01E-08	9.48E-09
													9.55E-09

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 9.55 E-09 CM/SEC

REMARKS: Testing Completed 11/17/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay with Sand (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Soft, Moist**

LIQUID LIMIT **26** PLASTIC LIMIT **17** P.I. **9**

BORING NO. **Boring 9L** SAMPLE NO.

SAMPLE TYPE **ST** DEPTH **7½-9 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **24.3%** INITIAL DRY DENSITY **101.3 P.C.F.**

FINAL WATER CONTENT **20.1%** FINAL DRY DENSITY **106.5 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
5:24:00 PM		0.200	7.112	40.391		4.13	5.83	8.500	70.3		78.800		
5:24:00 PM	6:08:00 PM	0.200	7.112	40.391	2640	6.89	3.06	-19.150	70.3	1.00	51.150	2.88E-06	2.72E-06
6:08:00 PM	6:26:00 PM	0.200	7.112	40.391	1080	7.63	2.30	-26.650	70.3	1.03	43.650	2.59E-06	2.44E-06
6:26:00 PM	6:40:00 PM	0.200	7.112	40.391	840	8.09	1.85	-31.200	70.3	0.98	39.100	2.31E-06	2.17E-06
													2.55E-06

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 2.55 E-06 CM/SEC

REMARKS: Testing Completed 11/9/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Gray mottled Light Gray, Silty, Stiff, Moist**

LIQUID LIMIT **46** PLASTIC LIMIT **22** P.I. **24**

BORING NO. **Boring 9U** SAMPLE NO. **ST 16**

SAMPLE TYPE **ST** DEPTH **19½-21½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **23.4%** INITIAL DRY DENSITY **102.5 P.C.F.**

FINAL WATER CONTENT **23.1%** FINAL DRY DENSITY **102.7 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
3:13:00 PM		0.200	7.681	42.077		0.88	8.68	39.000	210.9		249.900		
3:13:00 PM	3:58:00 PM	0.200	7.681	42.077	2700	0.99	8.57	37.900	210.9	1.00	248.800	2.98E-08	2.81E-08
3:58:00 PM	4:25:00 PM	0.200	7.681	42.077	1620	1.06	8.50	37.200	210.9	1.00	248.100	3.17E-08	2.99E-08
4:25:00 PM	4:58:00 PM	0.200	7.681	42.077	1980	1.12	8.44	36.600	210.9	1.00	247.500	2.23E-08	2.10E-08
													2.63E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 2.63 E-08 CM/SEC

REMARKS: Testing Completed 11/22/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **36** PLASTIC LIMIT **20** P.I. **16**

BORING NO. **Boring 11U** SAMPLE NO. **ST 8**

SAMPLE TYPE **ST** DEPTH **9½-11½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **23.1%** INITIAL DRY DENSITY **104.4 P.C.F.**

FINAL WATER CONTENT **22.3%** FINAL DRY DENSITY **105.9 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
7:46:00 AM		0.200	7.244	41.834		2.04	7.38	26.700	210.9		237.600		
7:46:00 AM	8:57:00 AM	0.200	7.244	41.834	4260	2.12	7.30	25.900	210.9	1.00	236.800	1.37E-08	1.29E-08
8:57:00 AM	9:30:00 AM	0.200	7.244	41.834	1980	2.16	7.26	25.500	210.9	1.00	236.400	1.48E-08	1.39E-08
9:30:00 AM	10:41:00 AM	0.200	7.244	41.834	4260	2.25	7.17	24.600	210.9	1.00	235.500	1.55E-08	1.46E-08
													1.38E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 1.38 E-08 CM/SEC

REMARKS: Testing Completed 11/13/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Brown mottled Yellow Brown, Silty, Stiff, Moist**

LIQUID LIMIT **48** PLASTIC LIMIT **21** P.I. **27**

BORING NO. **Boring 11U** SAMPLE NO. **ST 16**

SAMPLE TYPE **ST** DEPTH **19½-21½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **25.2%** INITIAL DRY DENSITY **97.4 P.C.F.**

FINAL WATER CONTENT **26.8%** FINAL DRY DENSITY **97.3 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
12:17:00 PM		0.200	7.498	42.028		0.50	9.38	44.400	210.9		255.300		
12:17:00 PM	12:30:00 PM	0.200	7.498	42.028	780	0.84	9.02	40.900	210.9	1.06	251.800	3.16E-07	2.97E-07
12:30:00 PM	12:40:00 PM	0.200	7.498	42.028	600	1.10	8.77	38.350	210.9	0.96	249.250	3.03E-07	2.85E-07
12:40:00 PM	1:03:00 PM	0.200	7.498	42.028	1380	1.73	8.12	31.950	210.9	1.03	242.850	3.36E-07	3.17E-07
													3.04E-07

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 3.04 E-07 CM/SEC

REMARKS: Testing Completed 11/13/2023

TESTED BY: **NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Light Gray mottled Yelllow Brown, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **30** PLASTIC LIMIT **19** P.I. **11**

BORING NO. **Boring 12L** SAMPLE NO.

SAMPLE TYPE **ST** DEPTH **14½-16 ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **22.2%** INITIAL DRY DENSITY **104.3 P.C.F.**

FINAL WATER CONTENT **22.0%** FINAL DRY DENSITY **105.1 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
5:25:00 PM		0.200	7.203	41.447		5.54	3.60	-9.700	70.3		60.600		
5:25:00 PM	5:40:00 PM	0.200	7.203	41.447	900	5.83	3.30	-12.650	70.3	1.03	57.650	9.64E-07	9.08E-07
5:40:00 PM	5:52:00 PM	0.200	7.203	41.447	720	6.09	3.02	-15.350	70.3	1.08	54.950	1.16E-06	1.09E-06
5:52:00 PM	5:58:00 PM	0.200	7.203	41.447	360	6.20	2.92	-16.400	70.3	0.91	53.900	9.31E-07	8.77E-07
													9.69E-07

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 9.69 E-07 CM/SEC

REMARKS: Testing Completed 11/3/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Yellow Brown mottled Light Gray, Black Oxidation, Silty, Stiff, Moist**

LIQUID LIMIT **45** PLASTIC LIMIT **22** P.I. **23**

BORING NO. **Boring 12U** SAMPLE NO. **ST 8**

SAMPLE TYPE **ST** DEPTH **9½-11½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **20.7%** INITIAL DRY DENSITY **107.5 P.C.F.**

FINAL WATER CONTENT **21.6%** FINAL DRY DENSITY **106.3 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
8:14:00 AM		0.200	7.457	41.785		1.48	7.91	32.150	210.9		243.050		
8:14:00 AM	9:34:00 AM	0.200	7.457	41.785	4800	1.50	7.89	31.950	210.9	1.00	242.850	3.06E-09	2.88E-09
9:34:00 AM	11:39:00 AM	0.200	7.457	41.785	7500	1.54	7.85	31.550	210.9	1.00	242.450	3.92E-09	3.70E-09
11:39:00 AM	1:09:00 PM	0.200	7.457	41.785	5400	1.56	7.83	31.350	210.9	1.00	242.250	2.73E-09	2.57E-09
													3.13E-09

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 3.13 E-09 CM/SEC

REMARKS: Testing Completed 11/24/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Yellow Brown mottled Light Gray, Silty, Black Oxidation, Silty, Stiff, Moist**

LIQUID LIMIT **42** PLASTIC LIMIT **22** P.I. **20**

BORING NO. **Boring 12U** SAMPLE NO. **ST 16**

SAMPLE TYPE **ST** DEPTH **19½-21½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **22.2%** INITIAL DRY DENSITY **100.1 P.C.F.**

FINAL WATER CONTENT **26.8%** FINAL DRY DENSITY **97.3 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
6:31:00 AM		0.200	7.366	42.126		1.62	8.07	32.250	210.9		243.150		
6:31:00 AM	8:42:00 AM	0.200	7.366	42.126	7860	1.74	7.96	31.100	210.9	0.92	242.000	1.05E-08	9.93E-09
8:42:00 AM	10:53:00 AM	0.200	7.366	42.126	7860	1.86	7.84	29.900	210.9	1.00	240.800	1.11E-08	1.04E-08
10:53:00 AM	4:03:00 PM	0.200	7.366	42.126	18600	2.13	7.55	27.100	210.9	1.07	238.000	1.10E-08	1.04E-08
													1.03E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 1.03 E-08 CM/SEC

REMARKS: Testing Completed 11/25/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Lean Clay (CL), Yellow Brown, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **34** PLASTIC LIMIT **20** P.I. **14**

BORING NO. **Boring 13BN** SAMPLE NO. **ST 7**

SAMPLE TYPE **ST** DEPTH **8½-9½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **19.0%** INITIAL DRY DENSITY **109.7 P.C.F.**

FINAL WATER CONTENT **18.8%** FINAL DRY DENSITY **110.9 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
9:06:00 AM		0.200	7.219	41.785		5.27	4.64	-3.150	210.9		207.750		
9:06:00 AM	10:18:00 AM	0.200	7.219	41.785	4320	5.32	4.59	-3.650	210.9	1.00	207.250	9.64E-09	9.08E-09
10:18:00 AM	12:22:00 PM	0.200	7.219	41.785	7440	5.40	4.51	-4.450	210.9	1.00	206.450	8.98E-09	8.46E-09
12:22:00 PM	1:18:00 PM	0.200	7.219	41.785	3360	5.44	4.47	-4.850	210.9	1.00	206.050	9.97E-09	9.39E-09
													8.84E-09

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 8.84 E-09 CM/SEC

REMARKS: Testing Completed 11/27/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

Geotechnics Form No. 17-FW

PERMEABILITY TEST REPORT
ASTM D 5084-10

PROJECT No. **23-1071**

PROJECT **Andrews - Springfield, IL Ash Ponds** LOCATION **Springfield, IL**
CLIENT **Andrews Engineering** SAMPLING DATE

SAMPLE DESCRIPTION **Fat Clay (CH), Gray mottled Light Gray, Silty, Trace Sand, Stiff, Moist**

LIQUID LIMIT **52** PLASTIC LIMIT **25** P.I. **27**

BORING NO. **Boring 13BS** SAMPLE NO. **ST 7**

SAMPLE TYPE **ST** DEPTH **8½-9½ ft.**

SPECIFIC GRAVITY, Gs TEST METHOD **ASTM D 5084-10**

INITIAL WATER CONTENT **19.1%** INITIAL DRY DENSITY **109.6 P.C.F.**

FINAL WATER CONTENT **18.2%** FINAL DRY DENSITY **110.6 P.C.F.**

t_1	t_2	a	L	A	t	head	tail	h_w	h_a	dt/dh	h_a+h_w	k	k_{20}
12:54:00 PM		0.200	5.476	41.013		1.24	8.79	37.750	210.9		248.650		
12:54:00 PM	2:26:00 PM	0.200	5.476	41.013	5520	1.51	8.52	35.050	210.9	1.00	245.950	2.64E-08	2.49E-08
2:26:00 PM	4:58:00 PM	0.200	5.476	41.013	9120	1.90	8.12	31.100	210.9	1.03	242.000	2.37E-08	2.23E-08
4:58:00 PM	6:40:00 PM	0.200	5.476	41.013	6120	2.18	7.86	28.400	210.9	0.93	239.300	2.45E-08	2.31E-08
													2.32E-08

COEFFICIENT OF VERTICAL PERMEABILITY
K_{20} = 2.32 E-08 CM/SEC

REMARKS: Testing Completed 11/27/2023

TESTED BY: **BJS/NAS**

COMPUTED BY: **NAS**

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Report of Lab Test

PROJECT: CWLP

PROJECT NO: 418834

DATE OF TEST June 03, 2024

CLIENT: Andrews Engineering

REPORT NUMBER: 418834-01

ATTN: Mr. Brad Hunsberger

PAGE NO. 1/1

ITEM: **PERMEABILITY TEST RESULTS**

Sample	Moisture Content (%)		Dry Unit Weight (PCF)	Permeability (Cm./Sec.)
	Before Test	After Test		
L4 (17'-19')	37.6	31.5	89.2	1.7 x 10-8
D3 (29.5'-31.5')	27.0	26.6	98.4	2.1 x 10-6
D1 (38.5'-40.5')	23.1	22.9	105.6	5.1 x 10-8
L5 (37.5'-39.5')	23.2	22.4	103.6	6.8 x 10-6
D2 (35.5'-37.5')	25.2	25.0	98.8	2.8 x 10-7
L3 (34.5'-36.5')	24.3	30.4	94.1	8.5 x 10-8
L1 (36'-38')	26.5	25.9	98.2	4.5 x 10-7
D4 (34.5'-36.5')	27.8	23.0	99.4	1.4 x 10-6

NOTES: Test ran according to ASTM D-5084

BY: ______________________
Stephen Jacobs

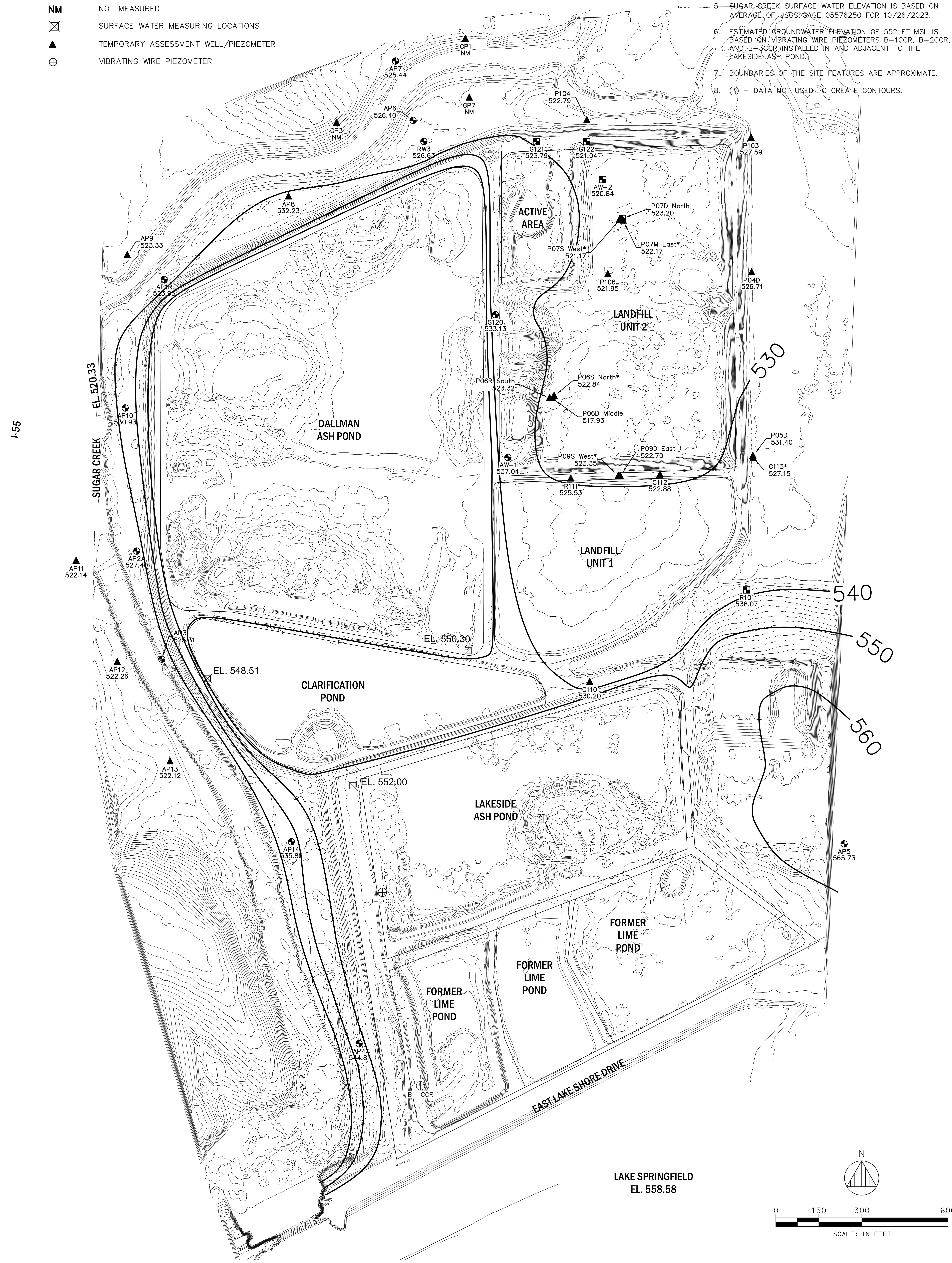
APPENDIX F:
POTENTIOMETRIC SURFACE MAPS

LEGEND

- 550 — EXISTING GROUND CONTOURS
- 540 — GROUNDWATER CONTOURS
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- NM — NOT MEASURED
- SURFACE WATER MEASURING LOCATIONS
- TEMPORARY ASSESSMENT WELL/PIEZOMETER
- VIBRATING WIRE PIEZOMETER

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 10 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 10/26/2023.
5. ~~SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 10/26/2023.~~
6. ESTIMATED GROUNDWATER ELEVATION OF 552 FT MSL IS BASED ON VIBRATING WIRE PIEZOMETERS B-1CCR, B-2CCR, AND B-3CCR INSTALLED IN AND ADJACENT TO THE LAKESIDE ASH POND.
7. BOUNDARIES OF THE SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



SHEET NUMBER:	8
PROJECT ID:	240338/0014
DATE:	APRIL 2025

POTENTIOMETRIC SURFACE MAP
4TH QUARTER 2023

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

ANDREWS ENGINEERING
3300 GINGER CREEK DRIVE
SPRINGFIELD, ILLINOIS 62711-7233
PH (217) 787-2334 WWW.ANDREWS-ENG.COM
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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

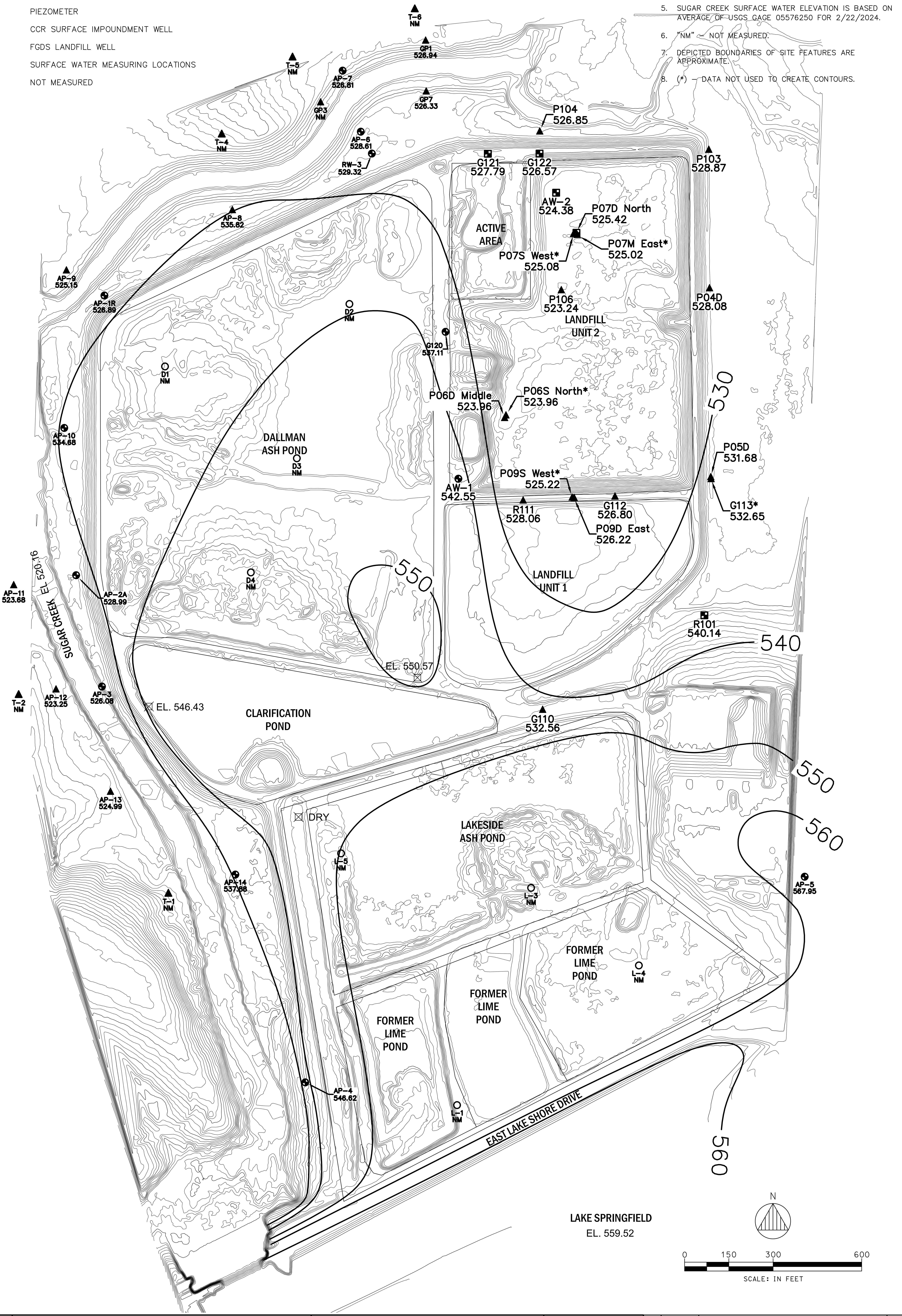
NO.	DATE	REVISION DESCRIPTION	BY

LEGEND

550	EXISTING GROUND CONTOURS
—540—	GROUNDWATER CONTOURS
▲	TEMPORARY ASSESSMENT WELL/PIEZOMETER
○	PIEZOMETER
	CCR SURFACE IMPOUNDMENT WELL
	FGDS LANDFILL WELL
☒	SURFACE WATER MEASURING LOCATIONS
NM	NOT MEASURED

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 5 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 2/22/2024.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 2/22/2024.
6. "NM" – NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



POTENTIOMETRIC SURFACE MAP 1ST QUARTER 2024	DATE: APRIL 2025
PREPARED FOR CITY WATER, LIGHT, AND POWER SPRINGFIELD, SANGAMON COUNTY, ILLINOIS	PROJECT ID: 240338/0014
	SHEET NUMBER: 6

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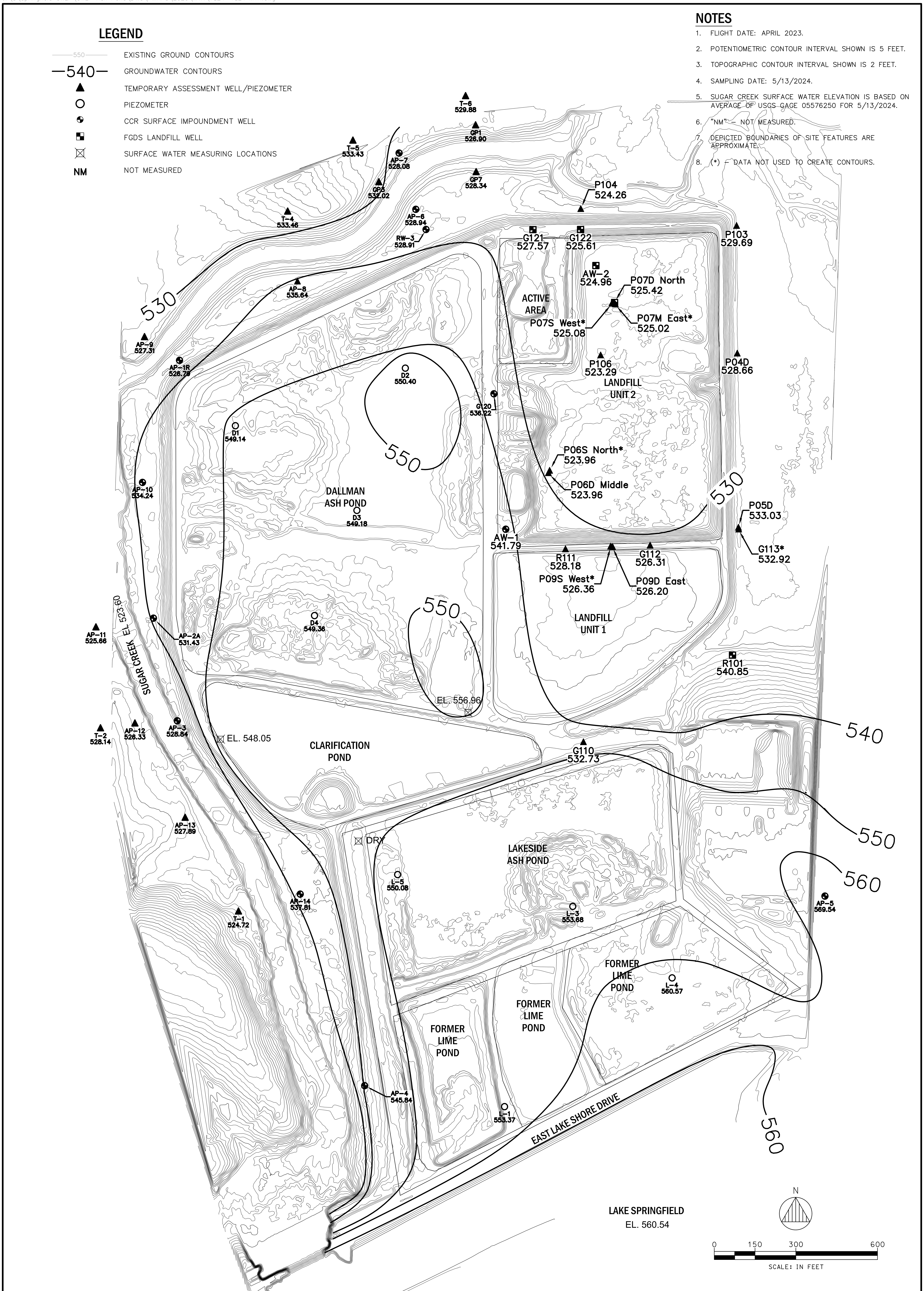
APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

Tab: 5-13-2024 Last Saved: April 28, 2025, by Ben Karpus Plotted: Monday, April 28, 2025 4:24:29 PM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\PMAPS\2025\MTH\1Q24-4Q24 MTH.dwg



SHEET NUMBER: 10	PROJECT ID: 240338/0014	DATE: APRIL 2025

POTENTIOMETRIC SURFACE MAP
2ND QUARTER 2024

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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APPROVED BY: MTH | DESIGNED BY: MTH | DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

Tab: 8-12-2024 Last Saved: April 28, 2025, by Ben Karpus Plotted: Monday, April 28, 2025 4:25:13 PM
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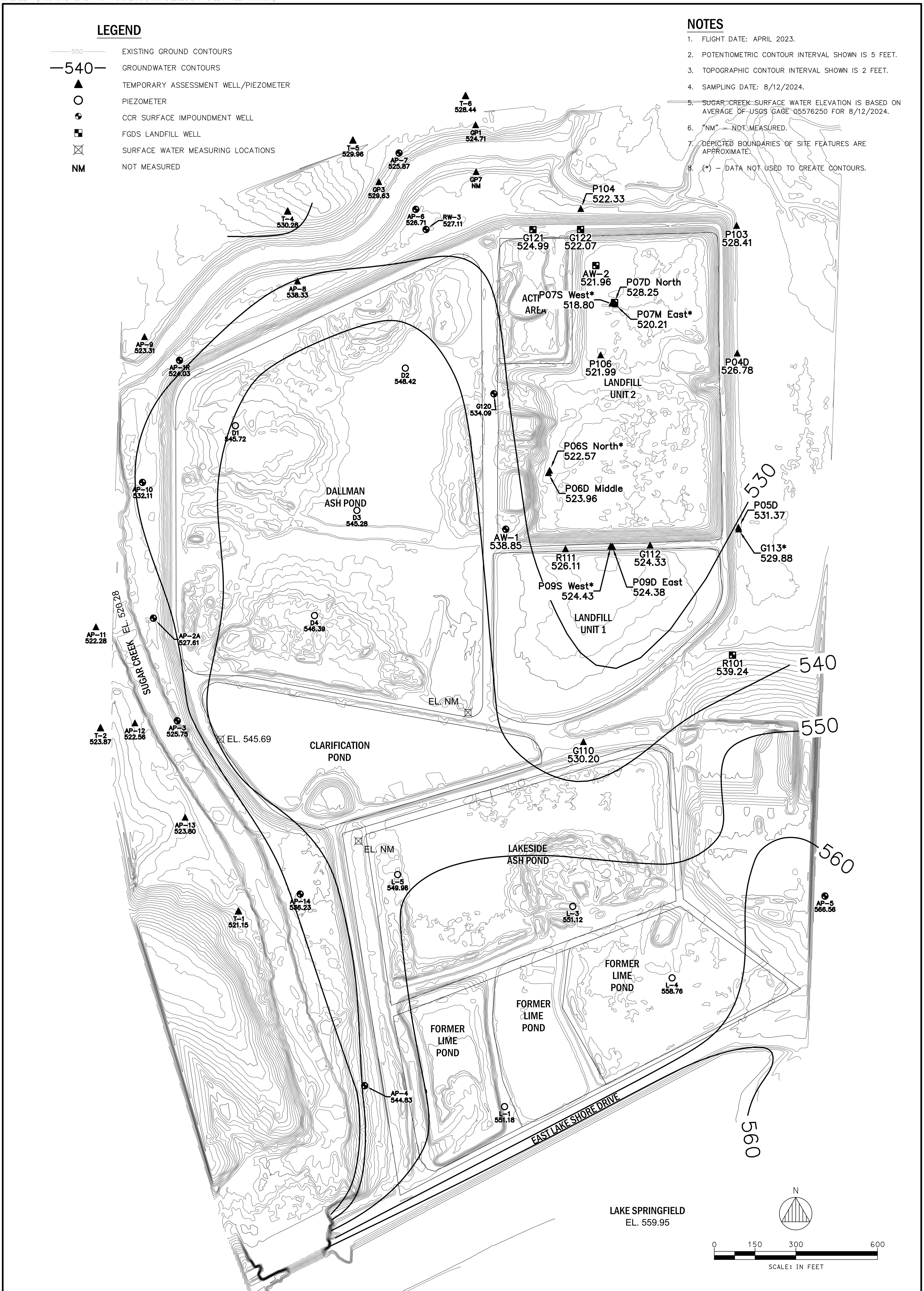
LEGEND

550	EXISTING GROUND CONTOURS
—540—	GROUNDWATER CONTOURS
▲	TEMPORARY ASSESSMENT WELL/PIEZOMETER
○	PIEZOMETER
	CCR SURFACE IMPOUNDMENT WELL
	FGDS LANDFILL WELL
⊠	SURFACE WATER MEASURING LOCATIONS
NM	NOT MEASURED

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 5 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 8/12/2024.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 8/12/2024.
6. "NM" – NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



11 (SHEET NUMBER)	PROJECT ID: 240338/0014	DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 3RD QUARTER 2024 PREPARED FOR CITY WATER, LIGHT, AND POWER SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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NO.	DATE	REVISION DESCRIPTION	BY

Tab: 11-12-2024 Last Saved: April 28, 2025, by Ben Karpus Plotted: Monday, April 28, 2025 4:25:53 PM
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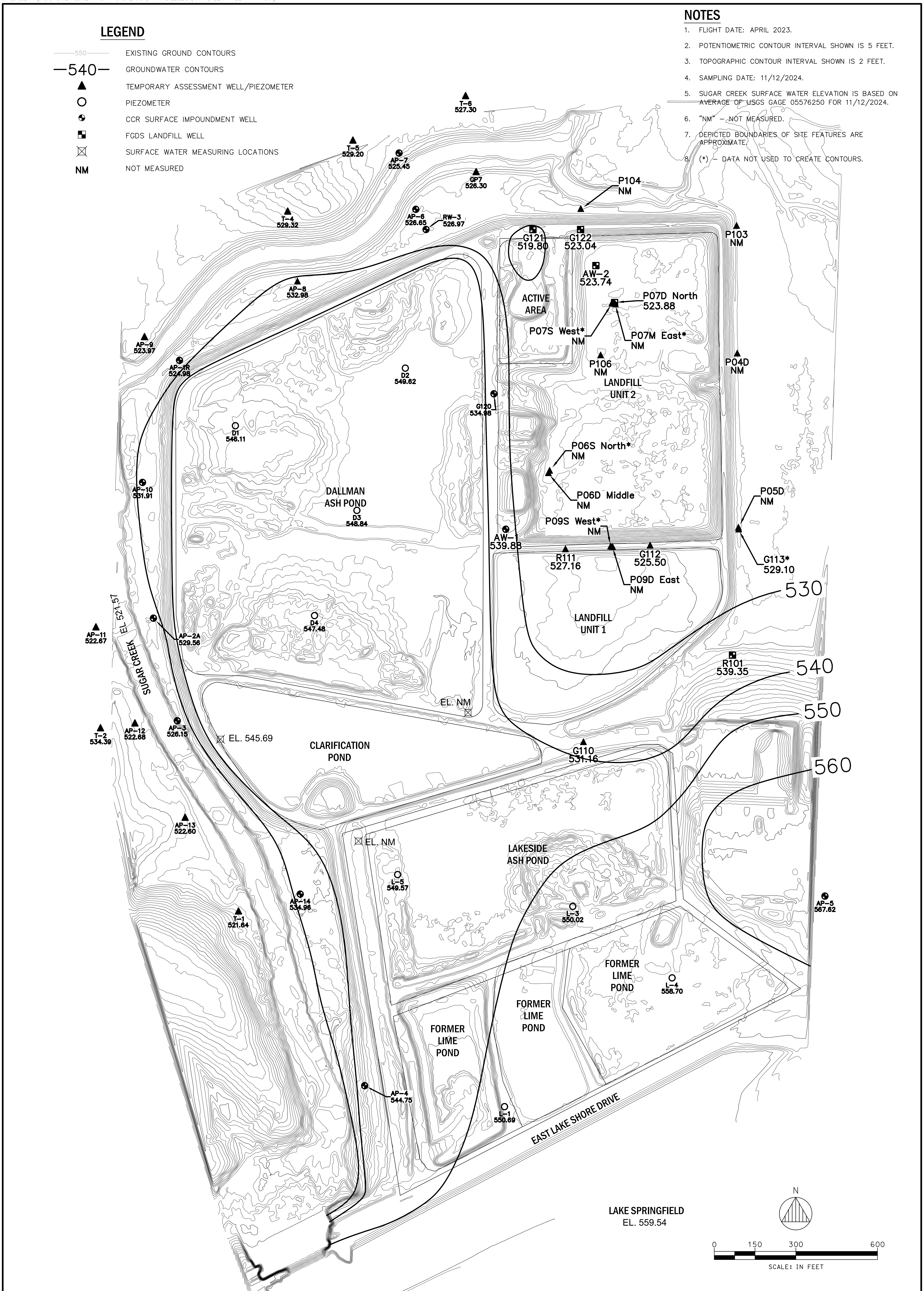
LEGEND

- 550 — EXISTING GROUND CONTOURS
- 540 — GROUNDWATER CONTOURS
- ▲ TEMPORARY ASSESSMENT WELL/PIEZOMETER
- ○ PIEZOMETER
- CCR SURFACE IMPOUNDMENT WELL
- FGDS LANDFILL WELL
- ⊠ SURFACE WATER MEASURING LOCATIONS
- NM NOT MEASURED

NOTES

1. FLIGHT DATE: APRIL 2023.
2. POTENTIOMETRIC CONTOUR INTERVAL SHOWN IS 5 FEET.
3. TOPOGRAPHIC CONTOUR INTERVAL SHOWN IS 2 FEET.
4. SAMPLING DATE: 11/12/2024.
5. SUGAR CREEK SURFACE WATER ELEVATION IS BASED ON AVERAGE OF USGS GAGE 05576250 FOR 11/12/2024.
6. "NM" – NOT MEASURED.
7. DEPICTED BOUNDARIES OF SITE FEATURES ARE APPROXIMATE.
8. (*) – DATA NOT USED TO CREATE CONTOURS.



DATE: APRIL 2025	POTENTIOMETRIC SURFACE MAP 4TH QUARTER 2024	ANDREWS ENGINEERING 3300 GINGER CREEK DRIVE SPRINGFIELD, ILLINOIS 62711-7233 PH (217) 787-2334 WWW.ANDREWS-ENG.COM PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO
PROJECT ID: 240338/0014	PREPARED FOR CITY WATER, LIGHT, AND POWER SPRINGFIELD, SANGAMON COUNTY, ILLINOIS	APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK
SHEET NUMBER: 12		

NO.	DATE	REVISION DESCRIPTION	BY

Tab: 1-27-2025 Last Saved: September 10, 2025, by Ben Karpus Plotted: Wednesday, September 10, 2025 9:11:30 AM
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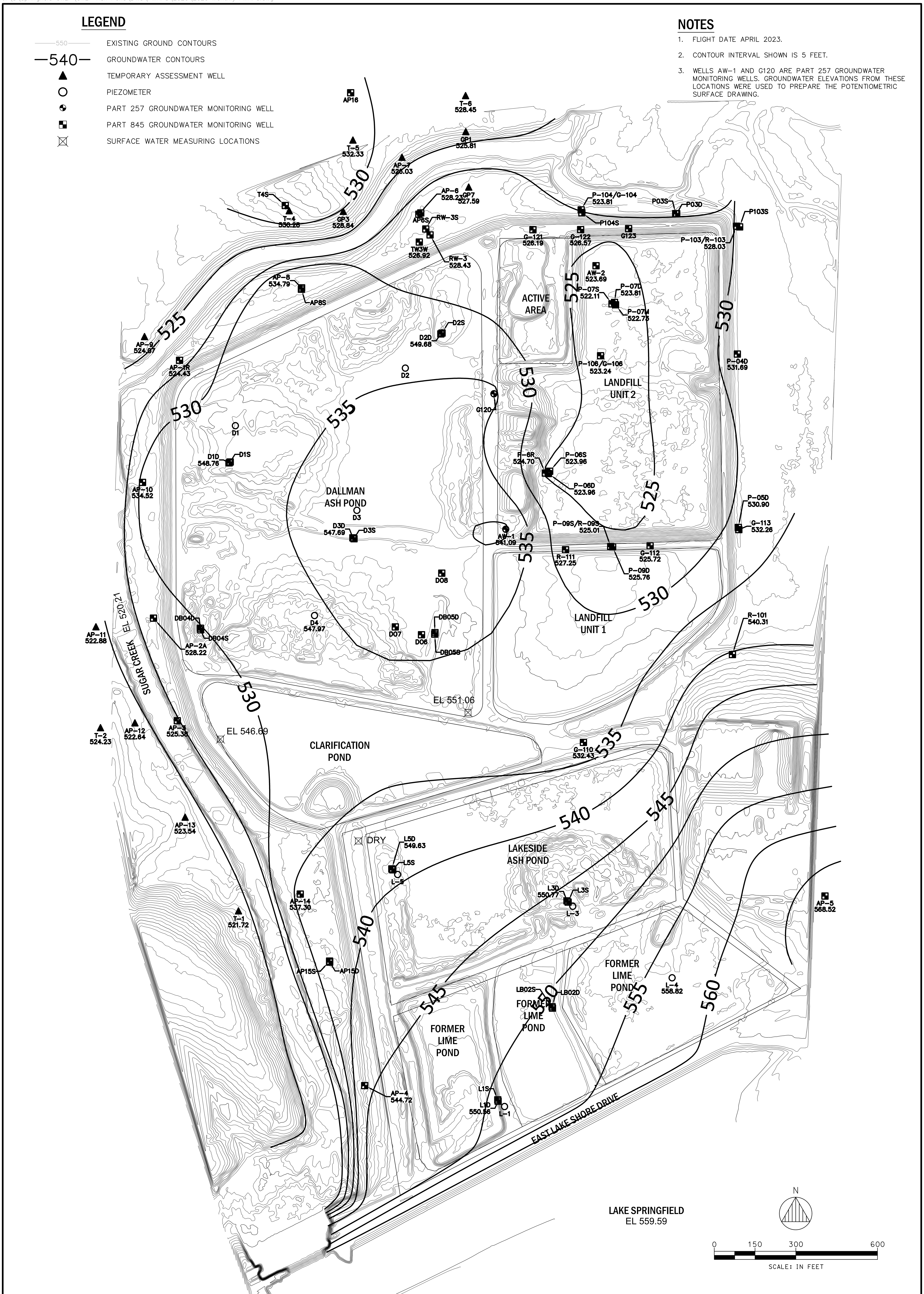

FIG. 1	SHEET NUMBER:
PROJECT ID:	24038/0014
DATE:	AUGUST 2025

POTENTIOMETRIC SURFACE MAP
JANUARY 27, 2025

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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SPRINGFIELD, ILLINOIS 62711-7233
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NO.	DATE	REVISION DESCRIPTION	BY

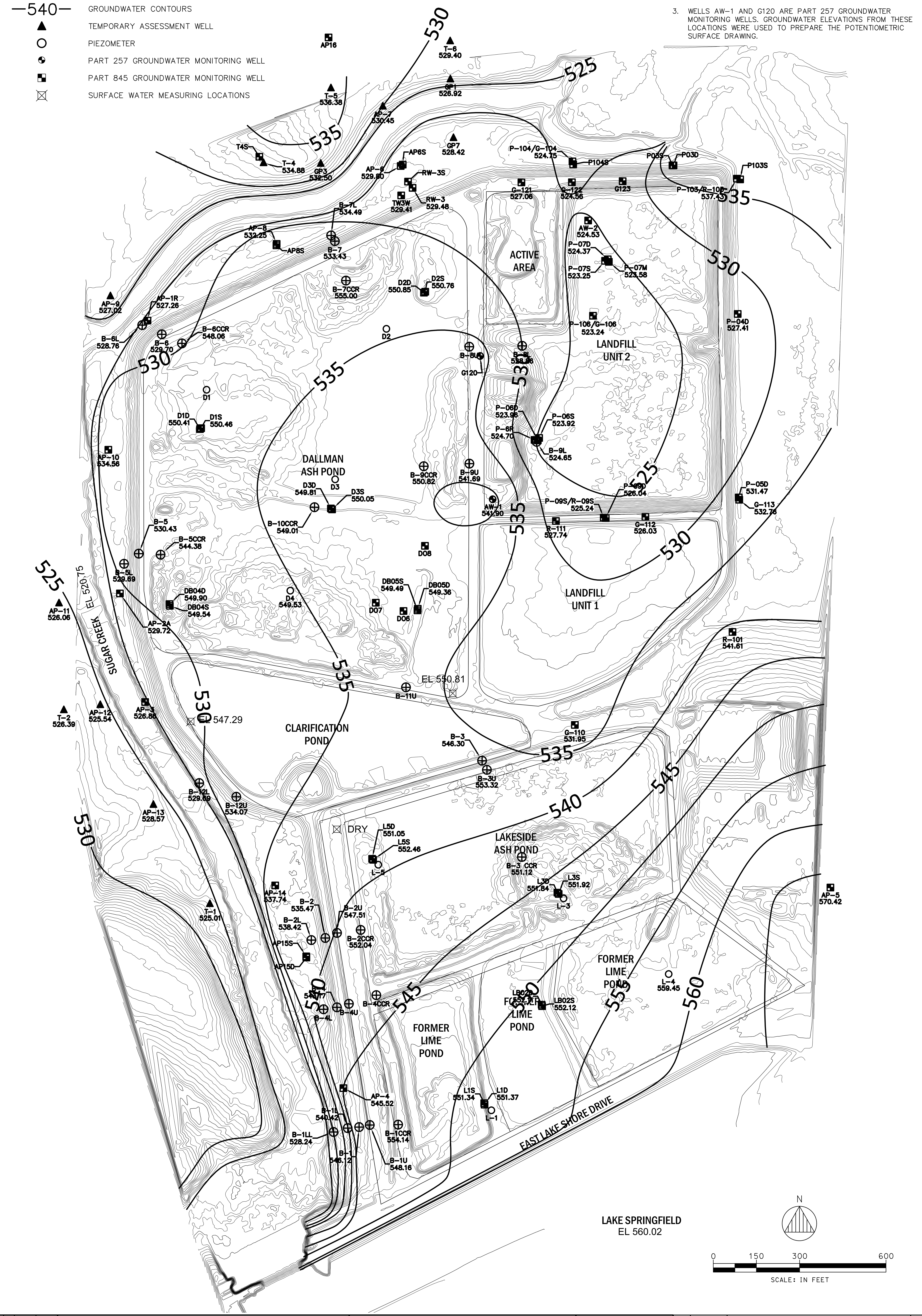
Tab: 4-20-2025 Last Saved: September 10, 2025, by Ben Karpus Plotted: Wednesday, September 10, 2025 11:54:56 AM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\PMAPS\2025\2025 Monthly PMAPS.dwg

LEGEND

- 550 — EXISTING GROUND CONTOURS
- 540 — GROUNDWATER CONTOURS
- ▲ TEMPORARY ASSESSMENT WELL
- ○ PIEZOMETER
- PART 257 GROUNDWATER MONITORING WELL
- PART 845 GROUNDWATER MONITORING WELL
- ⊠ SURFACE WATER MEASURING LOCATIONS

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 5 FEET.
3. WELLS AW-1 AND G120 ARE PART 257 GROUNDWATER MONITORING WELLS. GROUNDWATER ELEVATIONS FROM THESE LOCATIONS WERE USED TO PREPARE THE POTENTIOMETRIC SURFACE DRAWING.



LAKE SPRINGFIELD
EL 560.02

FIG. 4	SHEET NUMBER:	PROJECT ID: 240338/0014	DATE: AUGUST 2025

POTENTIOMETRIC SURFACE MAP
APRIL 20, 2025

PREPARED FOR

CITY WATER, LIGHT, AND POWER

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

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NO.	DATE	REVISION DESCRIPTION	BY

Tab: 8-21-2025 Last Saved: September 10, 2025, by Ben Karpus Plotted: Wednesday, September 10, 2025 3:11:35 PM
J:\S\Springfield CWLP\CWLP Ash Pond\DWG\PMAPS\2025\2025 Monthly PMAPS.dwg

LEGEND

550	EXISTING GROUND CONTOURS
—540—	GROUNDWATER CONTOURS
▲	TEMPORARY ASSESSMENT WELL
○	PIEZOMETER
	PART 257 GROUNDWATER MONITORING WELL
	PART 845 GROUNDWATER MONITORING WELL
⊠	SURFACE WATER MEASURING LOCATIONS

NOTES

1. FLIGHT DATE APRIL 2023.
2. CONTOUR INTERVAL SHOWN IS 5 FEET.
3. WELLS AW-1 AND G120 ARE PART 257 GROUNDWATER MONITORING WELLS. GROUNDWATER ELEVATIONS FROM THESE LOCATIONS WERE USED TO PREPARE THE POTENTIOMETRIC SURFACE DRAWING.

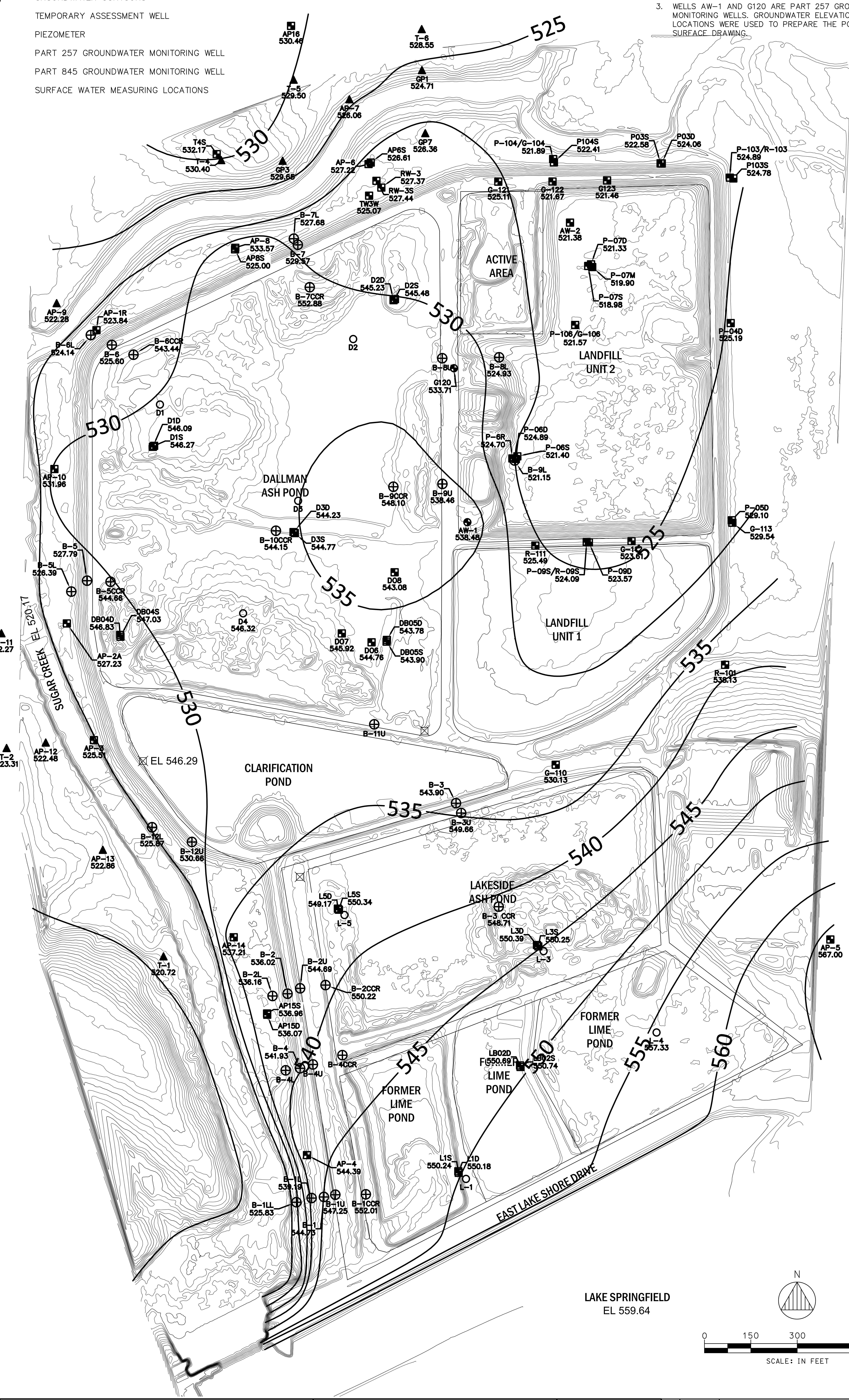

FIG. 8	SHEET NUMBER:	PROJECT ID: 240338/0014	DATE: AUGUST 2025	POTENTIOMETRIC SURFACE MAP AUGUST 21, 2025 PREPARED FOR CITY WATER, LIGHT, AND POWER SPRINGFIELD, SANGAMON COUNTY, ILLINOIS	ANDREWS ENGINEERING 3300 GINGER CREEK DRIVE SPRINGFIELD, ILLINOIS 62711-7233 PH (217) 787-2334 WWW.ANDREWS-ENG.COM PONTIAC, IL • LOMBARD, IL • INDIANAPOLIS, IN • WARRENTON, MO

APPROVED BY: MTH DESIGNED BY: MTH DRAWN BY: BCK

NO.	DATE	REVISION DESCRIPTION	BY

PDF_0731

ANDREWS ENGINEERING

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