



Submitted to
Southern Indiana
Gas & Electric Company
(SIGECO)
dba CenterPoint Energy
Indiana South (CEIS)
211 Northwest Riverside
Drive, Evansville, IN 47708

Submitted by
AECOM
13640 Briarwick Drive
Austin, Texas 78729
August 17, 2023

CCR Certification: Groundwater Monitoring Well Installation Report

40 CFR §257.91

for the

Lined CCR Pond

at the

A.B. Brown Generating Station

Revision 0

TABLE OF CONTENTS

Section	Page
1.0 INTRODUCTION.....	1
2.0 FIELD ACTIVITIES.....	1
Staking and Utility Clearances.....	1
Monitoring Well Installation Schedule.....	1
Equipment Decontamination.....	1
Drilling and Logging Methods.....	2
Borehole Water Level Gauging.....	2
Monitoring Well Construction.....	2
Monitoring Well Development.....	3
Monitoring Well Survey.....	3
Aquifer Testing.....	4
Aquifer Data Evaluation.....	4
Water Level Determination.....	4
3.0 SUMMARY AND FINDINGS.....	5
4.0 MONITORING SYSTEM CERTIFICATION.....	5
Background.....	5
Limitations.....	6
Certification.....	6

List of Figures

Figure 1 – Site Location Map

Figure 2 – Lined CCR Pond Well Location Map

Figure 3 – Lined CCR Pond Representative Potentiometric Surface Map - August 2022

List of Appendices

- A. Survey Drawing with Borehole and Monitoring Well Locations
- B. Boring and Well Construction Logs
- C. IDNR Record of Water Well Forms
- D. Aquifer Hydraulic Testing Results

1.0 INTRODUCTION

This Groundwater Monitoring Well Installation Report (Report) was developed by AECOM Technical Services, Inc. (AECOM) for the Lined Coal Combustion Residuals (CCR) Pond at the A.B. Brown Generating Station. The objective of the Plan is to provide a description of the monitoring well network developed to support CCR groundwater monitoring certified by a qualified Professional Engineer in fulfillment of compliance with federal CCR Rule 40 CFR 257.91 "Groundwater Monitoring Systems". This report identifies and describes the existing monitoring wells selected and new monitoring wells installed to support 'background' monitoring, often referred to as baseline monitoring, subsequent 'Detection' monitoring and 'Assessment' monitoring as described more fully in following sections.

The A.B. Brown Generating Station (Site) is a coal-fired electric power plant located in Posey County approximately 8 miles southeast of Evansville, Indiana (Figure 1) owned and operated by Southern Indiana Gas & Electric Company (SIGECO), dba CenterPoint Energy Indiana South (CEIS). The CCR-regulated unit ("Unit") is a lined pond approximately 1.9 acres in size located on the southern side of the Site. The location of the Unit is currently occupied by the South Side Runoff Pond (SSRP). The SSRP will be dewatered, its existing waste materials removed, and the area converted into the Lined CCR Pond. The Lined CCR Pond has been designed for the management of CCR materials and other waste waters. Construction of the pond is scheduled to be complete by September 1, 2023. The pond is scheduled to receive its first waste no later than September 1, 2023.

2.0 FIELD ACTIVITIES

This section documents the field activities performed in completing the groundwater monitoring network for the Lined CCR Pond. Existing monitoring well CCR-AP-9 (installed in 2019 by others) was identified as a downgradient monitoring well for the Lined CCR Pond. Two new soil borings (GT-1 and GT-2) and three new wells (CCR-LP-01, CCR-LP-02 and CCR-LP-BK) were installed by AECOM in December 2021. A site map showing monitoring well locations is provided in **Appendix A**.

Staking and Utility Clearances

Proposed locations for new borings and monitoring wells were reviewed with SIGECO personnel in meetings and during a field visit on October 27, 2021. Each proposed location was approved by a SIGECO representative. Non-invasive utility clearance surveys were performed at all proposed locations by Blood Hound, Inc. (Blood Hound) of Brownsburg, Indiana under subcontract to AECOM, on December 13, 2021. Each location was cleared to a depth of 5 feet below ground surface using a hand auger as a further check for the presence/absence of underground utilities

Monitoring Well Installation Schedule

Drilling and well construction services were performed by ATC, Indianapolis Indiana, under subcontract to AECOM. The Indiana Licensed Driller for the project was Gary Lauber (license #4069), who was onsite for all drilling, well construction, and well development services. Soil borings and well construction were completed between December 13 and 17, 2021.

Equipment Decontamination

Downhole drilling equipment was decontaminated by the subcontractor prior to arrival at the station and on site before initiation of drilling at the first boring location. Between boreholes the downhole tooling was decontaminated with pressurized water to remove residual soil cuttings prior to use at the next borehole. All other downhole equipment (pumps, water level indicators, etc.) was decontaminated using potable water

and a mild laboratory-grade detergent (Alconox[®] or similar) solution followed by a clean potable water rinse prior to use at each of the boreholes.

Drilling and Logging Methods

The installation and development of new monitoring wells CCR-LP-01, CCR-LP-02 and CCR-LP-BK were completed to meet the groundwater monitoring requirements of EPA's CCR Rule (40 CFR Part 257) with tasks performed by a driller, licensed in the state of Indiana with ATC Group Services Inc. The location of these monitoring wells, with respect to the Lined CCR Pond is provided on **Figure 2**.

The boreholes for the new monitoring wells were advanced to depths ranging from about 33- to 40-feet below ground surface (bgs), to allow installation of monitoring wells within the uppermost saturated zone. Each location was advanced initially to a depth of 5-feet using a hand auger to screen for buried utility obstructions. Once clear, boreholes then were advanced by the licensed driller using the hollow-stem auger drilling method. Each boring was advanced with 4.25-inch I.D. augers. Samples of unconsolidated materials were collected at 2-foot intervals, approximately, using split-barrel sampling methods, for visual-manual examination and for delineation of the unsaturated and saturated zones present at the time of advancement. The lithologic characteristics observed by the field geologist are presented in the boring logs (**Appendix B**)

Two additional soil borings identified as GT-1 and GT-2 were completed to support geotechnical evaluation of the entire thickness of the unconsolidated material (**Figure 2**). Boring GT-1 was advanced to a depth of 59.4 ft below ground surface encountering bedrock (shale) at 59.0 feet. Boring GT-2 did not encounter bedrock being advanced to a depth of 60 feet below ground surface (**Appendix B**).

Borehole Water Level Gauging

During drilling, the field geologist recorded observations of water saturation in the lithologic samples. Periodically, drilling operations would be paused and recharge (inflow of groundwater) would be measured. The depths of the wells were determined by the presence of observable water saturation within the unconsolidated samples recovered by the driller and water level indicator measurements from the top of the augers near ground surface.

Monitoring Well Construction

The installation and development of new monitoring wells is intended to meet the groundwater monitoring requirements of EPA's CCR Rule (40 CFR Part 257). Well construction details are provided in the table below and included on the boring logs provided in **Appendix B**.

Well ID	Installation Date	Well Depth (ft, bgs)	Well Casing Diameter (inches)	Borehole Diameter (inches)
CCR-AP-9	1/26/2019	35	2	8
CCR-LP-01	12/15/2021	32	2	8
CCR-LP-02	12/15/2021	32	2	8
CCR-LP-BK	12/14/2021	38	2	8

Well construction was initiated when the borehole was advanced to the desired total depth. The driller then placed a minimum 0.5 feet filter pack sand at the base of the borehole up to the design total depth of the monitoring well to be installed. A 2-inch schedule 40 polyvinyl chloride (PVC) well screen and riser pipe

were then lowered within the borehole to top of the filter pack sand screen at each location. This was followed by the placement of additional filter pack sand within the borehole annulus around the screen and riser pipe to an elevation approximately 2 feet above the screen interval. A minimum 2-foot-thick interval of bentonite chips was placed above the sand filter pack and hydrated using potable water to manufacturer recommendations to form the bentonite well seal. The borehole annulus above the bentonite seal was filled with bentonite grout slurry, to a height approximately 1 to 2 feet bgs. The new monitoring wells were completed with flush-mounted protective covers set in concrete.

A 'Record of Water Well' form (State Form 35680) as prescribed by the Indiana Department of Natural Resources (IDNR) was completed for each new monitoring well by the licensed driller, per 312 IAC 13-2-6. Completed forms were submitted to IDNR by the driller in December 2021. Completed forms are provided as **Appendix C**.

Monitoring Well Development

Newly installed wells CCR-LP-01, CCR-LP-02 and CCR-LP-BK were developed to remove fine-grained sediment entrained during well construction and to condition the filter pack around the well screen. Development was performed using a 12-volt DC submersible pump. The pump was raised and lowered repeatedly through well screen interval to surge the water column to suspend sediments accumulated in the bottom of the well during installation into the water column where they can be evacuated. Prior to commencement of development, the volume of water standing in each well was determined, based on the depth to water, total depth of the well and well diameter. Development objectives included removal of 5 to 10 well volumes of water, with determination of water quality parameters (pH, temperature, conductivity, turbidity) after removal of each well volume. Development for each monitoring well continued until successive water quality determinations were stable (within approximately +/- 0.1 standard units (SU) for pH, approximately 10% for temperature and conductivity, and turbidity readings were less than 10 nephelometric turbidity units, (NTUs)) were achieved or until at least 10 well volumes had been removed prior to discontinuing. Purge water resulting from development for each monitoring well was directed to the storm water pond. The progress of well development was tracked primarily through the monitoring of pH. The subsurface lithology present at the site included abundant fine silt and clay resulting in elevated turbidity that could not be substantially lowered during development. As a result, turbidity was not included as a primary factor for assessing progress.

The following is a summary of the volumes removed and stability of field parameters observed during well development. At monitoring well CCR-LP-01, after removal of 35 gallons of water (approximately 10 well volumes), the last two readings for pH differed by 0.07 SU, conductivity, and temperature differed by less than 5%, and the last two turbidity readings (1147 NTU and 1797 NTU) differed by about 57%. At monitoring well CCR-LP-02, after removal of 50 gallons of water (approximately 13 well volumes), the last two readings for pH differed by 0.01 SU, conductivity, and temperature values differed by about 7% or less, and the last two turbidity readings (972 NTU and 1203 NTU) differed by about 30%. At monitoring well CCR-LP-BK, after removal of approximately 55 gallons of water (approximately 10 well volumes), the last two readings for pH differed by 0.24 SU, temperature values differed by less than 10%, conductivity readings differed by about 26%, and the last two turbidity readings (4415 NTU and 7076 NTU) differed by about 60%.

Monitoring Well Survey

The location and ground surface elevation of CCR-LP-01, CCR-LP-02, CCR-LP-BK, GT-1 and GT-2 were surveyed by a licensed surveyor with Three-I Engineering Inc. on March 10, 2022. Additionally, the elevation of the top of the PVC well casing for the monitoring wells (CCR-LP-01, CCR-LP-02, CCR-LP-BK) was surveyed, along with the top of the finished well pad and the ground surface (generally lower than the pad). Horizontal coordinates for each location were established using the Indiana State Plane Coordinate System, NAD 83, Indiana West Zone. Vertical elevation of the ground surface for all five locations was measured to within +/- 0.1 ft. above mean sea level (amsl). Vertical elevation of the top of

PVC well casing for the monitoring wells (CCR-LP-01, CCR-LP-02, CCR-LP-BK) was measured to within +/- 0.01 ft. above mean sea level (amsl). Well construction and surveying data are tabulated below.

Well ID	Ground Elevation (feet)	Well Diameter (inch)	Easting	Northing	Top Of Casing (feet)	Total Depth (feet)	Screen Interval (feet)
CCR-LP-01	391.1	2	2769819.99	967357.67	390.96	32	20-32
CCR-LP-01	391.6	2	2770042.08	967356.16	391.17	32	20-32
CCR-LP-01	399.4	2	2770192.21	967726.02	398.63	38	28-38
GT1	406.4	2	2769882.32	967697.03	NA	59	NA
GT2	391.6	2	2770404.80	967362.44	NA	60	NA

Aquifer Testing

Aquifer testing was completed on March 10 and 11, 2022 at monitoring wells CCR-LP-01, CCR-LP-02 and CCR-LP-BK to assess the hydraulic characteristics of the saturated zone. Testing was performed using typical 'slug' testing methods with a mechanical slug manually deployed stressing the system and a pressure transducer-datalogger assembly operated to monitor system response. The duration of these tests was sufficient to provide a reasonable estimate of the hydraulic conductivity for each of the wells. Manual measurements were recorded on field aquifer testing forms and electronic data was removed from the transducer and used for data evaluation.

A pressure transducer was lowered into the well and set to record depth-to-water at regular intervals. Water level was displaced by a known volume by submersing a mechanical slug into the water column. Water level data were recorded while the system equilibrated ("slug in" or "falling head" test). After the water level returned to near the pre-test/ambient level, the slug was removed, and water level data were recorded while the system equilibrated ("slug out" or "rising head" test).

Aquifer Data Evaluation

Data from the slug tests were processed and analyzed using the AQTESOLV software package (Duffield, 2007), which provides type curve and straight line solutions corresponding to various conceptual models, each with their own hydrologic assumptions. Assumptions were made on a well-by-well basis to assist in selecting the appropriate solution. Some key assumptions included the following: unconfined, confined or leaky confined, presence of wellbore storage, and whether individual wells were considered fully or partially penetrating.

The estimated hydraulic conductivity values ranged from a high of 4.76×10^{-5} centimeters per second (cm/sec) at CCR-LP-02 to a low of 1.78×10^{-6} cm/sec at CCR-LP-01. A copy of the AQTESOLV pumping test analysis output for each monitoring well tested is presented as **Appendix D**.

Water Level Determination

Static water levels measured at the Lined CCR Pond monitoring wells during routine sampling events include four wells plus four additional monitoring wells located far upgradient and downgradient of the site used for other monitoring programs at the Site. Water levels are determined using a typical electric meter. Water level measurements and well elevation data are used to calculate the elevation of the static water level at each well, and the water elevation data are used to prepare a groundwater potentiometric surface map. Water level and elevation data from a representative event completed in August 2022 is presented in the table below with the associated groundwater potentiometric surface map prepared for this event shown as **Figure 3**.

	Top of Casing Elevation	August 30, 2022	Elevation
--	-------------------------	-----------------	-----------

Well ID	(feet, NAVD 88)	Depth to Water (feet)	(feet, NAVD 88)
CCR-LP-01	390.96	12.08	378.88
CCR-LP-02	391.17	9.23	381.94
CCR-LP-BK	398.63	3.95	394.68
CCR-AP-9	392.51	8.79	383.72
CCR-AP-3R	449.41	24.65	424.76
CCR-AP-5R	453.14	35.62	417.52
CCR-AP-11	376.72	14.10	362.62
Ohio River	Not Applicable	Not Applicable	343.10

3.0 SUMMARY AND FINDINGS

Five (5) borings were advanced and three (3) new groundwater monitoring wells were installed for the Lined CCR Pond groundwater monitoring program in fulfillment of compliance with 40 CFR §257.91. Three new wells, identified as CCR-LP-BK, CCR-LP-01, CCR-LP-02 plus a fourth pre-existing well, identified as CCR-AP-9, were evaluated for suitability as the groundwater monitoring network for the Lined CCR Pond unit to comply with requirements set forth in 40 CFR §257.93

All four wells were installed by a driller licensed in the state of Indiana in accordance with state regulations for monitoring wells. Hydraulic 'slug' testing completed for CCR-LP-BK, CCR-LP-01 and CCR-LP-02 estimate the hydraulic conductivity of the uppermost aquifer at the site between 1.78×10^{-6} cm/sec and 4.76×10^{-5} cm/sec.

As of this report, ten independent events including water level gauging and groundwater sampling have been successfully completed between April 2022 and May 2023. Evaluation of groundwater depth-to-water measurements obtained from each event and corresponding groundwater elevations place the top of the uppermost aquifer approximately 10 feet below ground surface on the downgradient side of the site with a localized groundwater flow southwest toward an intermittent stream channel south of and adjacent to the southern dike of the Lined CCR Pond.

The findings presented in this report support that a proposed groundwater monitoring network, comprised of monitoring wells CCR-LP-BK, CCR-LP-01, CCR-LP-02 and CCR-AP-9, will meet the groundwater monitoring network requirements set forth in 40 CFR 257.93 for the Lined CCR Pond. It is recommended the potentiometric evaluations for each monitoring well include measurement of water levels from three additional monitoring points identified as CCR-AP-3R, CCR-AP-5R and CCR-AP-11 to evaluate groundwater elevation and flow upgradient of, adjacent to and downgradient of the Lined CCR Pond.

4.0 MONITORING SYSTEM CERTIFICATION

AECOM Technical Services, Inc. ("Consultant") has been retained by Southern Indiana Gas & Electric Company (SIGECO), dba CenterPoint Energy Indiana South (CEIS) to prepare the following certification that the groundwater monitoring system for the Lined CCR Pond at the Site meets the requirements set out in 40 CFR § 257.91(f).

Background

Pursuant to 40 CFR § 257.90(b)(1), (i) owners and operators of new CCR surface impoundments must install a groundwater monitoring system as required by § 257.91 and (ii) develop a groundwater sampling

and analysis program as required by § 257.93. In addition, (iii) the owner or operator must obtain a minimum of eight independent samples for each background well as required by § 257.94(b).

40 CFR § 257.91 requires owners and operators of a CCR unit to install a groundwater monitoring system that, relying on site-specific technical information, consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of background groundwater that has not been affected by leakage from the CCR unit and accurately represent the quality of groundwater passing the waste boundary of the CCR unit.

Pursuant to 40 CFR § 257.91(f), the owner or operator must obtain a certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of 40 CFR § 257.91, including the performance standard specified in 40 CFR § 257.91(a), based on the site-specific information specified in 40 CFR § 257.91(b). If the groundwater monitoring system includes only the minimum number of downgradient monitoring wells specified in 40 CFR § 257.91(c)(1), (three wells) the certification must document the basis supporting this determination.

In support of Consultant's assessment, Consultant evaluated the groundwater monitoring system for the Lined CCR Pond to determine that sufficient information is available to make the certification required under 40 CFR § 257.91(f).

Limitations

The signature of Consultant's authorized representative on this document represents that to the best of Consultant's knowledge, information, and belief in the exercise of its professional judgment, it is Consultant's professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by Consultant are made on the basis of Consultant's experience, qualifications, and professional judgment and are not to be construed as warranties or guaranties. In addition, opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Certification

This Certification Statement documents that the groundwater monitoring system for the Lined CCR Pond at the A.B. Brown Generating Station has been designed and constructed to meet the requirements of 40 CFR § 257.91, including the performance standard specified in 40 CFR § 257.91(a), based on the site-specific information specified in 40 CFR § 257.91(b). The Lined CCR Pond is a new CCR surface

impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the specified documentation, assessments and plans for a new CCR surface impoundment be prepared no later than the first receipt of waste, which is scheduled for no later than September 1, 2023. Pursuant to that requirement, the groundwater monitoring system certification was completed and issued to SIGECO on August 17, 2023 for saving to the Operating Record.

CCR Unit: Southern Indiana Gas & Electric Company; A.B. Brown Generating Station; Lined CCR Pond

I, Jay Mokotoff, PE, being a Registered Professional Engineer in good standing in the State of Indiana, do hereby certify to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the groundwater monitoring system for the CCR unit that is the subject of this certification has been designed and constructed to meet the requirements of 40 CFR § 257.91.

Jay Mokotoff

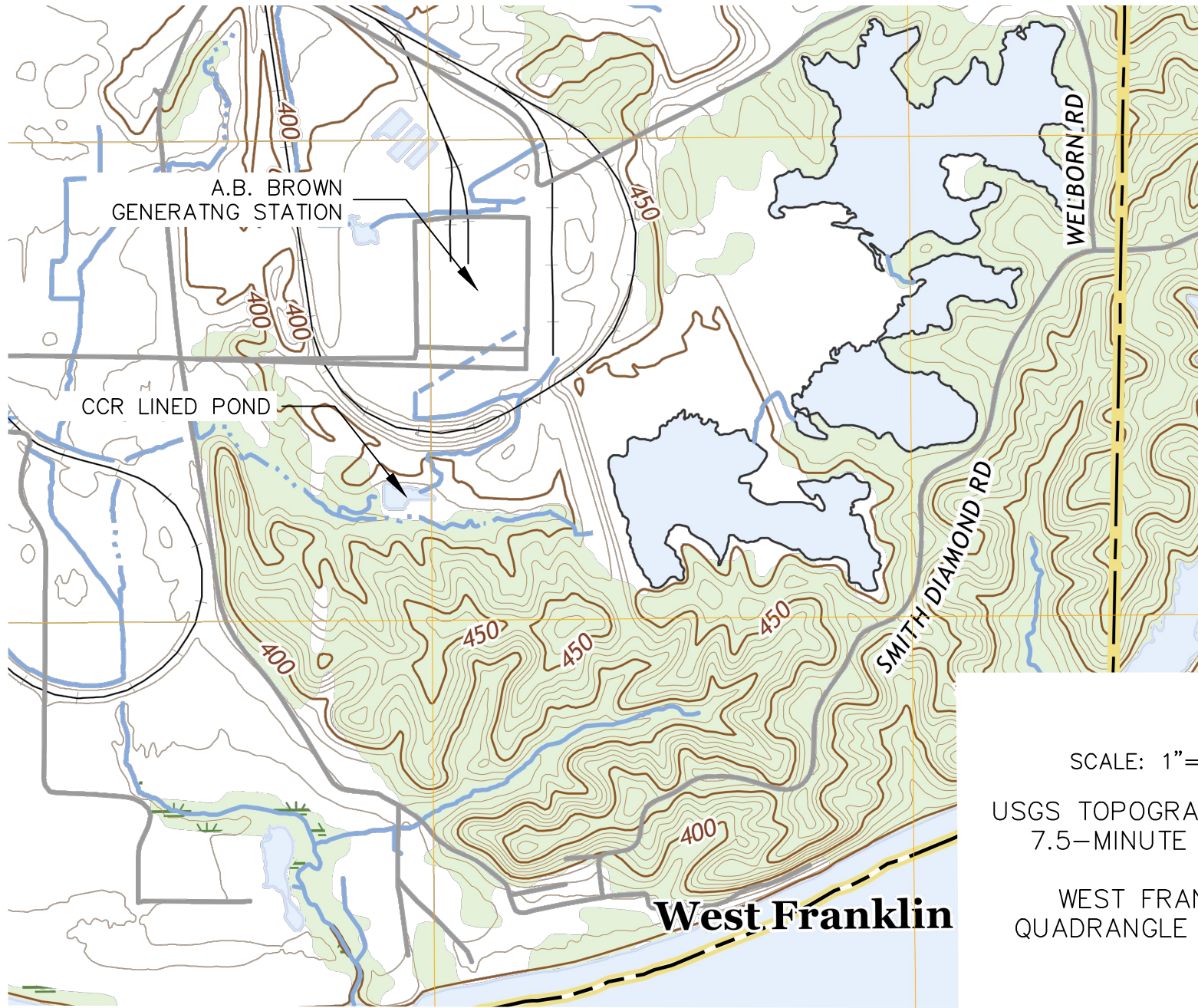
Printed Name

8/17/2023

Date



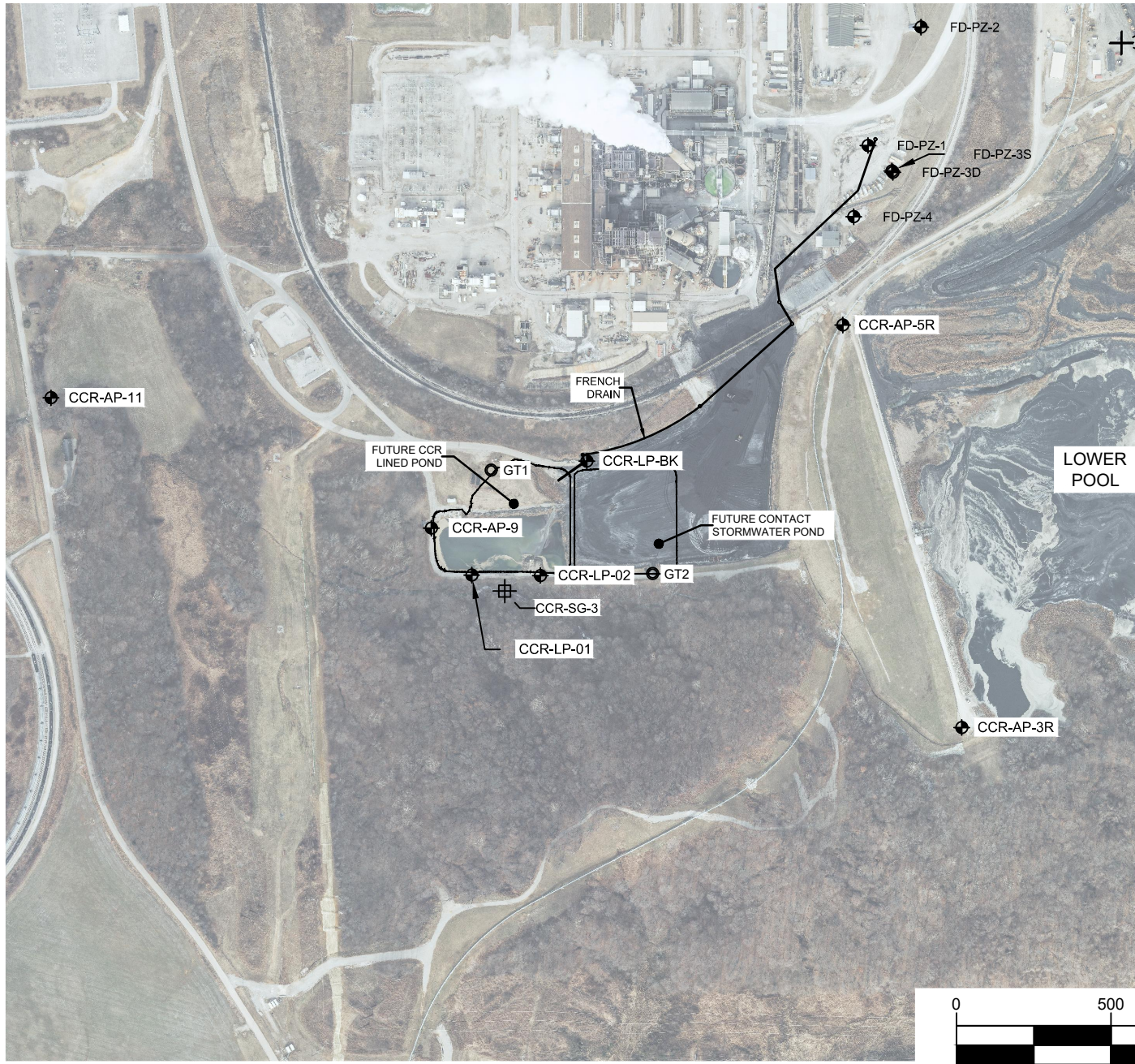
Figures



SCALE: 1" = 1000'

USGS TOPOGRAPHIC MAP
7.5-MINUTE SERIES

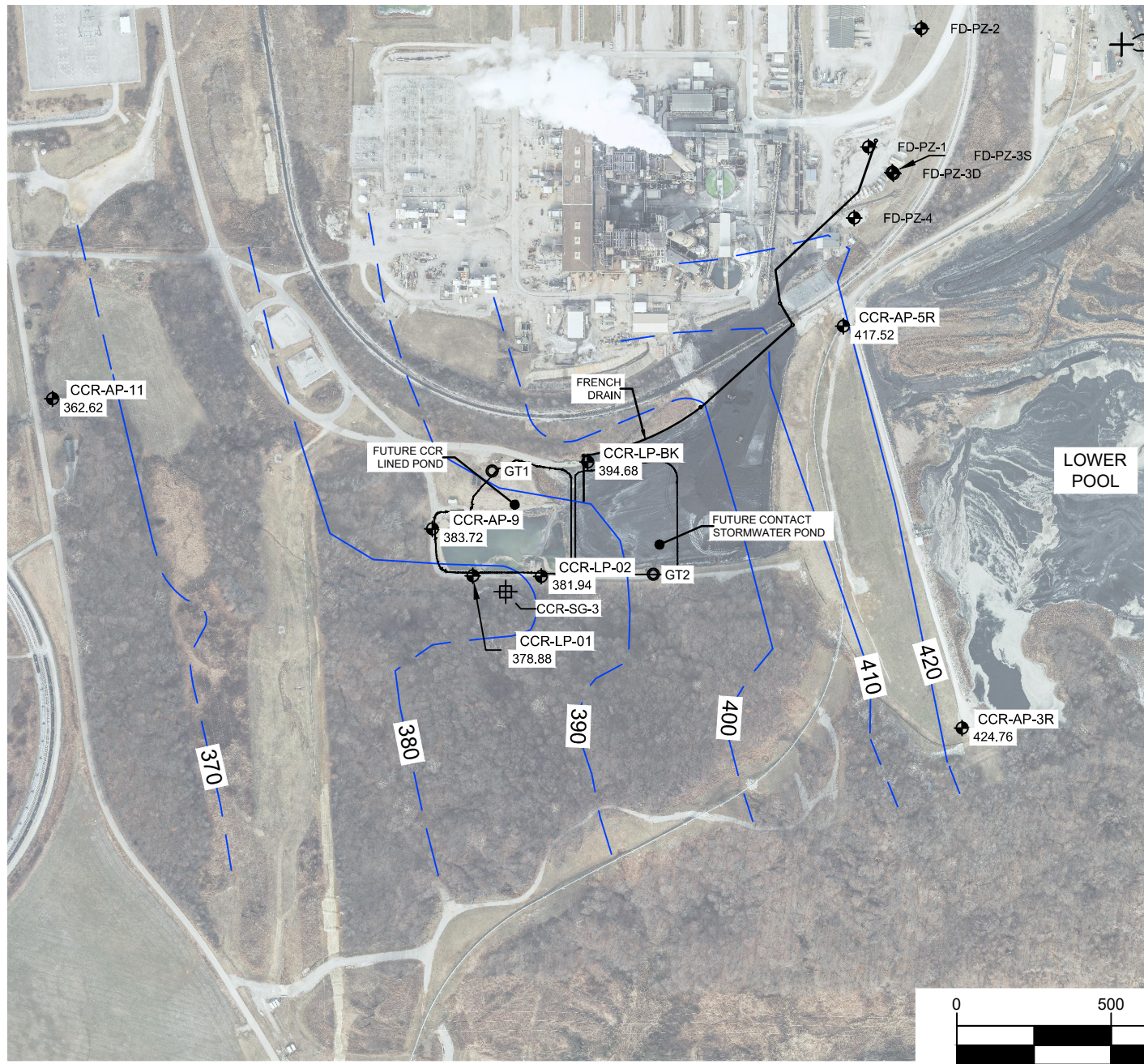
WEST FRANKLIN
QUADRANGLE INDIANA



- ◆ CCR MONITORING WELLS AND FRENCH DRAIN PIEZOMETERS
- 2021 SOIL BORING
- ⊞ STAFF GAUGE



GRAPHIC SCALE (IN FEET)



- ◆ CCR MONITORING WELLS AND FRENCH DRAIN PIEZOMETERS
- 2021 SOIL BORING
- ⊞ STAFF GAUGE

— 420 — GROUNDWATER POTENTIOMETRIC CONTOUR 10-FT INTERVAL (DASHED WHERE INFERRED)

422.04 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

NOTES:
 1. CCR LP WATER LEVELS TAKEN ON 08/30/2022.



GRAPHIC SCALE (IN FEET)

Appendix A
Survey Drawing with Borehole and Monitoring Well Locations



DATE OF AERIAL PHOTO: JANUARY 31, 2022

A.B. BROWN GENERATING STATION - PLAN VIEW
1" = 400'

LEGEND

- WELL LOCATION
- STAFF GAUGE LOCATION
- BORING LOCATION

HALEY & ALDRICH, INC. DATA TABLE

Monitoring Well #	IN State Plane West		Elevation (ft.)		IN State Plane West		Observation Date	Remarks
	Northing (US Foot)	Easting (US Foot)	NGVD29 (ft.)	NGVD29 (ft.)	Northing (US Foot)	Easting (US Foot)		
	NAD 27	NAD 27	Top of Casting	Base of Well	NAD 83	NAD 83		
CCR-AP-8	149793.38	317746.04	417.17	413.97	97020.44	2770494.88	5/30/2019	
CCR-AP-9	147282.61	316940.58	392.51	392.51	967509.62	2769689.54	5/30/2019	Flush
CCR-AP-10	146467.58	319549.96	474.34	471.46	966694.57	2772298.96	5/30/2019	
CCR-AP-11*	148852.17	319167.75	468.88	465.82	966079.21	2771916.72	5/30/2019	
CCR-AP-11*	146643.51	318653.79	450.35	450.35	966870.51	2771402.78	5/30/2019	Flush

* I = INTERMEDIATE

STAFF GAUGE DATA TABLE

ID.	NORTH	EAST	ELEVATION	DESCRIPTION
CCR-SG-2	971032.24	2769283.63	386.03	1.0' MARK OF VERTICAL STAFF GAUGE, ESTABLISHED IN FLOWLINE
CCR-SG-3**	967306.25	2769926.52	378.50	1.0' MARK OF VERTICAL STAFF GAUGE, ESTABLISHED IN FLOWLINE
CCR-SG-4	965243.95	2769953.05	369.99	MARK SET AT THE TOP OF GUARDRAIL OVER FLOWLINE OF CREEK

HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983, INDIANA WEST ZONE
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988
** SEE FRENCH DRAIN MONITORING WELL DATA TABLE FOR CURRENT CCR-SG-3 DATA

MONITORING WELL AND PIEZOMETER DATA TABLE

ID.	NORTH	EAST	RISER ELEVATION	GROUND ELEVATION	BORING SURFACE ELEVATION	WELL BORING DEPTH	WELL BOTTOM ELEVATION	DESCRIPTION	DATE SURVEYED
CCR-AP-1R	968260.66	277360.69	467.57	464.7				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	October 5, 2016
CCR-AP-2R	969078.86	2771922.60	468.13	465.4				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	October 5, 2016
CCR-AP-3R	968865.11	2771404.36	449.41	450.1				2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	October 5, 2016
CCR-PZ-1	972970.06	2772095.52	417.37	415.9				1" STAINLESS STEEL RISER, PROJECTING FROM SURFACE (NO CASING)	January 4, 2016
CCR-PZ-5	965928.39	2772500.01	486.47	484.1				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	January 4, 2016
CCR-AP-4R	966741.38	2772826.89	475.38	472.8				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	October 5, 2016
CCR-AP-5R	968165.74	2771019.65	453.14	453.2				2" PVC RISER WITHIN STEEL CASING, PROJECTING BELOW CASTING	April 15, 2021
CCR-AP-6	969932.76	2771636.75	463.57	458.9				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-AP-7R	970768.52	2771561.83	488.57	486.0				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	October 5, 2016
CCR-LF-1	970812.18	2771247.76	435.63	432.8				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-LF-2	970681.32	2772050.05	473.00	470.1				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-LF-3	970949.70	2771338.97	484.75	482.0				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-LF-4	972512.24	2772876.63	478.85	476.6				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-LF-5	972228.16	2772003.91	430.41	427.5				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-LF-6	972269.53	2771046.15	412.05	409.2				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-BK-1R	974083.30	2770919.35	483.39	480.1				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	October 5, 2016
CCR-BK-2	972854.33	2769728.14	430.60	427.5				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	April 12, 2016
CCR-SP-1	970981.89	2770030.26	403.51	403.9				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	May 6, 2016
CCR-SP-2	970887.25	2769939.51	403.23	403.6				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	May 6, 2016
CCR-SP-3	970735.02	2770027.64	403.57	403.9				2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	May 6, 2016
CCR-AP-2IR	969076.29	2771920.00	465.79	465.8				2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	November 16, 2021

HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983, INDIANA WEST ZONE
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988

FRENCH DRAIN MONITORING WELL DATA TABLE

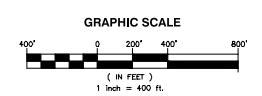
ID.	NORTHING	EASTING	RISER ELEVATION	BASE ELEVATION	SURVEY POINT	DESCRIPTION	DATE SURVEYED
FD-PZ-1	968746.38	2771101.58	418.93	418.94	51446	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	May 22, 2020
FD-PZ-2	969128.98	2771272.40	423.37	423.34	51448	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	May 22, 2020
CCR-AP-11	967930.60	2768459.21	376.72	373.64	51447	2" PVC RISER WITHIN STEEL CASING, PROJECTING FROM SURFACE	May 22, 2020
HA-PP-1	967323.16	2769934.70	381.82	381.12	50000	1" IRON PIPE WITH RUBBER CAP, PROJECTING FROM SURFACE	Aug. 27, 2020
HA-PP-2	967290.63	2769922.20	381.51	380.87	50002	1" IRON PIPE WITH RUBBER CAP, PROJECTING FROM SURFACE	Aug. 27, 2020
CCR-SG-3	967305.94	2769926.76	378.17 @ 1.50' MARK	SEE DESCRIPTION	50001	HEAVY SILT AROUND STAFF GAUGE - ELEV. 378.67' SURVEYED @ 1.00' MARK	Aug. 27, 2020
FD-PZ-3D	968659.62	2771181.92	420.30	420.67	60013	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	April 23, 2021
FD-PZ-35	968663.70	2771178.58	420.09	420.45	60015	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	April 23, 2021
FD-PZ-4	968516.03	2771055.46	419.19	419.74	60011	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	April 23, 2021

DATUM: NAD83/NAVD88

2022 MONITORING WELL AND BORING DATA TABLE

ID.	NORTHING	EASTING	RISER ELEVATION	CASING ELEVATION	GROUND ELEVATION	DESCRIPTION	DATE SURVEYED
CCR-LP-01	967357.67	2769819.99	390.96	391.3	391.1	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	March 10, 2022
CCR-LP-02	967356.16	2770042.08	391.17	391.8	391.6	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	March 10, 2022
CCR-LP-8KG	967726.02	2770192.21	398.63	399.2	399.4	2" PVC RISER WITHIN STEEL CASING, FLUSH WITH SURFACE	March 10, 2022
GT1	967697.03	2769882.32			406.4	BORING LOCATION	March 10, 2022
GT2	967362.44	2770404.80			391.6	BORING LOCATION	March 10, 2022

DATUM: NAD83/NAVD88



NOTES:
1. FIELD DATA WAS MEASURED ON THE NORTH AMERICAN DATUM OF 1983, INDIANA WEST ZONE (NAD 83) AND THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

THREE i DESIGN
ENGINEERING + ARCHITECTURE
2425 W. INDIANA ST., EVANSVILLE, IN 47712
WWW.THREEDIIGN.COM (E) 21 423-6800
THREE i DESIGN JOB NUMBER: 16167A

VECTREN
Not just power. Possibility.
A.B. Brown Generating Station
8511 Welborn Road
Mt. Vernon, IN 47620

REV	DATE	REVISION	BY	CHK	APP
5	3/11/22	ADDED 2022 WELLS & BORINGS	DMJ	WRG	CTK
4	11/19/21	ADDED WELL CCR-AP-2IR	KCM	WRG	TRP
3	5/18/21	ADDED AP5R AND H8A AND FR DRAIN DATA TABLES	WRG	WRG	TRP
2	10/7/16	REVISED WELLS AP1R, AP2R, AP3R, AP4R, AP7R, BK1R	LCV	WRG	BOR
1	5/10/16	ADDED WELLS SP1, 2 & 3	LCV	WRG	ACS
0	4/15/16	IUSSED FOR RECORD	JZW	WRG	ACS

MONITORING WELLS, PIEZOMETERS AND STAFF GAUGE DATA

CONTRACT/P.O. NO.:	
OWNER NO.:	
VENDOR APPR.:	DATE: 4/15/16
DATE:	
DRAWN BY: JZW	DATE: 4/15/16
CHKD BY: WRG	DATE: 4/15/16
DATE: 4/15/16	SCALE: 1" = 400'

DRAWING NO. **ABBO-17-G-025**
1 OF 1 SHEETS

Appendix B
Boring and Well Construction Logs

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Well CCR-LP-01

Sheet 1 of 2

Date(s) Drilled	12/15/21	Logged By	S. Studley	Checked By	K. Maroju
Drilling Method	Hand Auger/Hollow Stem Auger	Drill Bit Size/Type	8" HSA	Total Depth of Borehole	35.0 feet
Drill Rig Type	Mobile B57 Truck Mount	Drilling Contractor	ATC Group Services	Riser Elevation	390.60 ft
Borehole Backfill	Bentonite chips, grout	Sampling Method(s)	Hand Auger/Split Spoon	Hammer Data	140 lbs/30" Drop Auto
Coordinate Location	N 967358 E 2769820 (ft)	Groundwater Level(s)	Encountered at 23.5' ATD		

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:15 AM

Elevation, feet	Depth, feet	SAMPLES				Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/ft OR CORE% RQD	Recovery, %				
390	0					GRAVEL	0.0	Flush Mount Cover	
		HA 1-5			100	Soft, moist, light yellowish brown SILT (ML)	1.0	Bentonite grout	
385	5						6.0		
		SS-1	4	4	93	Stiff, moist, dark greenish gray SILT (ML), trace wood fragments	1.5		
			4	5		becomes yellowish brown	1.0		
			5			becomes olive gray	1.25		
		SS-2	2	2	73		1.25		
			2	4			3.0		
380	10								
		SS-3	2	1	90	becomes with black organics	2.25		
			1	2		becomes soft and with wood fragments	2.0		
			2				0.75		
375	15						13.5		
		SS-4	1	2	80	Soft, moist, olive gray lean CLAY (CL), trace black organics	1.25		
			2	2		becomes stiff with olive brown mottling	1.0		
		ST-1			100	becomes soft and dark yellowish brown with sand		Bentonite chips	
370	20						19.5		
		SS-5	WOH	WOH	90	becomes olive gray	0.25		
			WOH			becomes very soft and gray with yellowish brown mottling	0.25		
			WOH					Fine Filter Pack Sand (19' to 20')	
						Very soft, wet, gray SILT (ML), with yellowish brown mottling, trace organics		Coarse #4 Filter Pack Sand (20' to 33.5')	
365	25						23.5	Screen	
		SS-6	0	1	90	Stiff, moist, dark gray SILT (ML), trace sand, trace wood fragments	1.25		
			1	2			0.5		
			2				1.0		
360	30								
		SS-7	1	2	90	becomes with organics	1.0		
			2				1.0		
			2				0.75		

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Well CCR-LP-01

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES					Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)				
360	30									
355	35	SS-8	2 2 2	90	1.25 1.0 0.75	355.6	End of Boring at 35' bgs	35.0	EOB 33.5' - Augers, split spoon advanced to 35', natural collapse	
350	40									
345	45									
340	50									
335	55									
330	60									
65										

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:15 AM

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Well CCR-LP-02

Sheet 1 of 2

Date(s) Drilled	12/15/21	Logged By	S. Studley	Checked By	K. Maroju
Drilling Method	Hand Auger/Hollow Stem Auger	Drill Bit Size/Type	8" HSA	Total Depth of Borehole	35.0 feet
Drill Rig Type	Mobile B57 Truck Mount	Drilling Contractor	ATC Group Services	Riser Elevation	391.17 ft
Borehole Backfill	Benotnite chips, grout	Sampling Method(s)	Hand Auger/Split Spoon	Hammer Data	140 lbs/30" Drop Auto
Coordinate Location	N 967356 E 2770042 (ft)	Groundwater Level(s)	Encountered at 17.5' ATD		

Elevation, feet	Depth, feet	SAMPLES				Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/ft ³ OR CORE% RQD	Recovery, %				
0							391.2 GRAVEL	0.0	Flush Mount Cover
390		HA 1-5			100		390.2 Soft, moist, dark yellowish brown SILT (ML) with gravel becomes yellowish brown becomes light brownish gray becomes stiff, brown	1.0	Bentonite grout
5									
385		SS-1	5	3	65	1.75	385.2 Stiff, moist, dark greenish gray SILT (ML), with shale fragments and black organics	6.0	
			4			1.5	becomes soft		
10		SS-2	1	1	67	1.5			
			2				becomes stiff		
380		SS-3	2	1	95	1.0			
			2			1.25			
						0.75			
15		SS-4	WOH		90	.025	376.7 Soft, moist to wet, dark gray SILT (ML)	14.5	
			WOH				Soft, moist, yellowish brown lean CLAY (CL)	15.0	3' medium bentonite chips
375							becomes light brownish gray		
20		SS-5	1	1	100	0.25	371.7 Medium stiff, moist to wet, light brownish gray SILT (ML)	19.5	Fine Filter Pack Sand (19' to 20')
			2			0.75			Coarse #4 Filter Pack Sand (20' to 33.5')
370									Screen
25		SS-6	1	1	95	1.0	367.7 Medium stiff, wet, very dark gray SILT (ML), trace clay with wood fragments and fibers	23.5	
			1			0.75			
			1			0.5			
365									
30		SS-7	1	1	100	0.5	361.2	30.0	
			1			0.25			

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:17 AM

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Well CCR-LP-02

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES					Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)				
360	30	ST-1					Medium stiff, moist, very dark gray brown, SILT (ML) becomes very soft	51.9	LL=40 PL=31 PI=9 %G=0 %S=1.5 %M=90.2 %C=8.3	
355	35	SS-8	1 3	93	1.0 0.75	356.2	End of Boring at 35' bgs	35.0	Auger ends at 33.5', split spoon pushed to 35', natural collapse	
350	40									
345	45									
340	50									
335	55									
330	60									
65										

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:17 AM

Project: AB Brown Generating Station

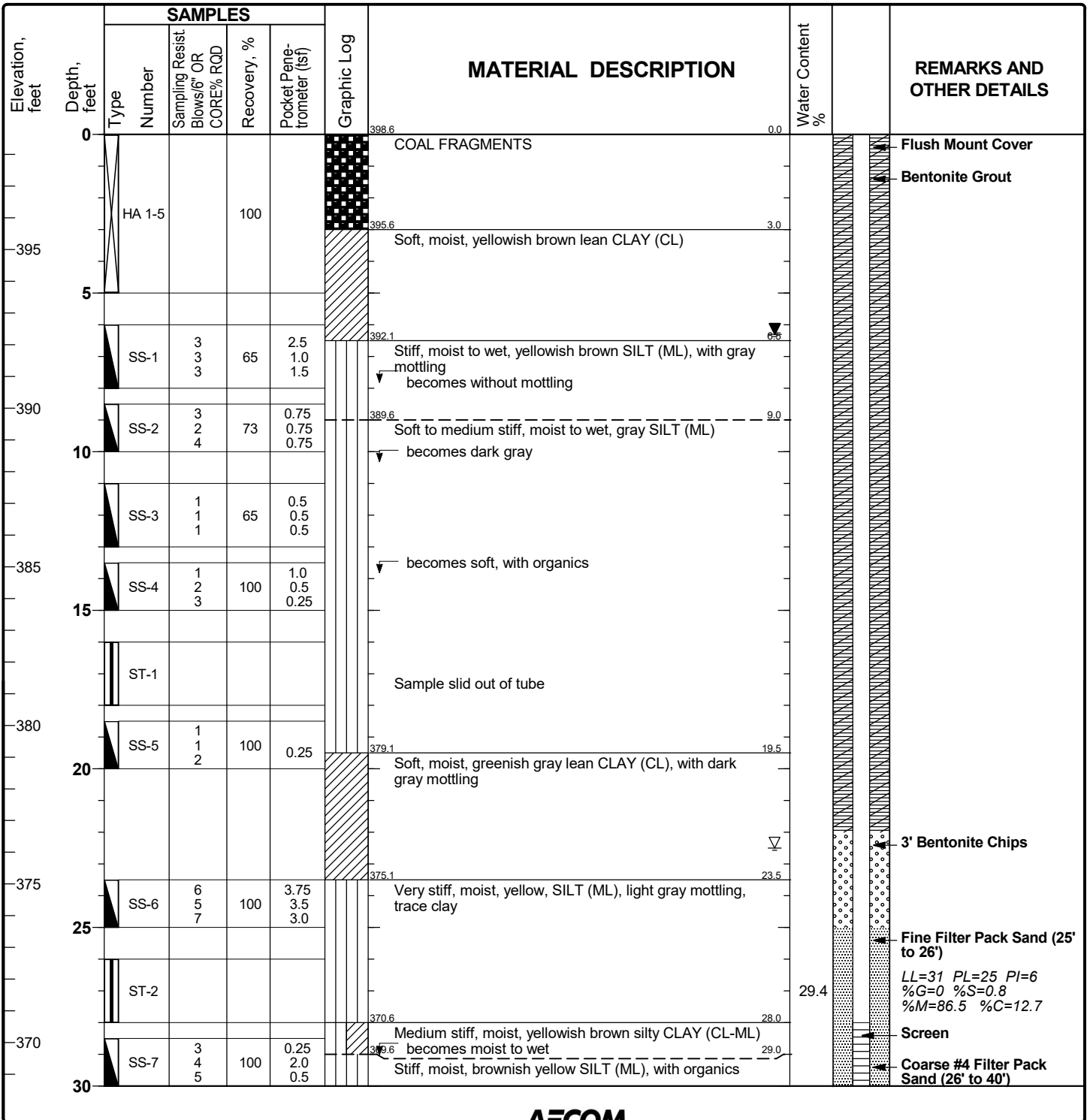
Project Location: Evansville, IN

Project Number: 60583533

Log of Well CCR-LP-BK

Sheet 1 of 2

Date(s) Drilled	12/14/21	Logged By	S. Studley	Checked By	K. Maraju
Drilling Method	Hand Auger/Hollow Stem Auger	Drill Bit Size/Type	8" HSA	Total Depth of Borehole	40.0 feet
Drill Rig Type	Mobile B57 Truck Mount	Drilling Contractor	ATC Group Services	Riser Elevation	398.63 ft
Borehole Backfill	Bentonite chips, grout	Sampling Method(s)	Hand Auger/Split Spoon	Hammer Data	140 lbs/30" Drop Auto
Coordinate Location	N 967726 E 2770192 (ft)	Groundwater Level(s)	Encountered at 22.5' ATD, 6.3' bgs on 12/14		



Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:19 AM

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Well CCR-LP-BK

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES				Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %				
30		SS-7			100				
365									
35		SS-8	8 11 16		100	3.0 3.25 4.5	SHALE [HEAVILY WEATHERED] Hard, dry to moist, yellowish brown SILTSTONE Soft, moist, yellowish brown silty CLAY (CL-ML)		
360									
40		SS-9	50/3"			0.5 3.0 3.5	SHALE [COMPLETELY WEATHERED]		
							End of Boring at 40' bgs		
355									
45									
350									
50									
345									
55									
340									
60									
335									
65									

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:19 AM



TEST BORING REPORT

Boring No. CCR-AP-9

Project Nature and Extent, A. B. Brown Generating Station
 Client Southern Indiana Gas & Electric Company
 Contractor ATC

File No. 129420-018
 Sheet No. 1 of 2
 Start January 26, 2019
 Finish January 26, 2019
 Driller J. Mitchner
 H&A Rep. J. Yonts

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S		Rig Make & Model: Diedrich D-50 Turbo
Inside Diameter (in.)	4.25	1 3/8		Bit Type: Cutting Head
Hammer Weight (lb)	-	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: -

Elevation
 Datum
 Location See Plan

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size [†] , structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel		Sand			Field Test					
								% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength	
0							Gravel roadway											
3.5	6	S1	3.5	ML		3.5	Medium stiff, brown clayey SILT (ML), mps 1 mm, stratified, no odor, moist			5	5	90						
4.1	8	20	5.5	CL		4.1	Stiff, dark brown and gray CLAY (CL), mps < 0.075 mm, stratified, no odor, moist					100						
4.8	9			ML		4.8	Stiff, dark brown and gray CLAY (CL), mps < 0.075 mm, stratified, no odor, moist											
5.1	9			CL		5.1	Medium stiff, brown clayey SILT (ML), mps 1 mm, stratified, no odor, moist											
8.5						8.5	Stiff, dark brown and gray CLAY (CL), mps < 0.075 mm, stratified, no odor, moist											
8.5	1	S2	8.5	CL		8.5	Very soft, black CLAY (CL), no structure, strong sulfur-like odor, wet, possibly coal run-off						100					
10.5	1	24	10.5															
13.9						13.9	Similar to above											
13.9	1	S3	13.5	CL		13.9	Soft, yellow-brown to brown, fat CLAY (CL), mps < 0.075 mm, no structure, no odor, wet						100					
15.5	2	24	15.5	CL														
18.5						18.5	Soft, yellow-brown SILT (ML), mps 1 mm, stratified, no odor, wet					10	90					
18.5	2	S4	18.5	ML		18.5	Soft, yellow-brown SILT (ML), mps 1 mm, stratified, no odor, wet											
20.5	4	18	20.5	SM		20.5	Medium stiff, red-brown silty SAND (SM), mps 15 mm, no structure, no odor, wet	5	10	30	25	30						
20.0	2			ML		20.0	Soft, gray sandy SILT (ML), mps < 2.0 mm, stratified, no odor, wet					25	75					
20.0	2																	
23.5																		
23.5	WOH	S5	23.5	ML			Similar to above except brown wood noted at 24.1 ft, occasional sandy SILT (ML) layers < 1 in. thick					10	90					
25.5	WOH	24	25.5															

Water Level Data				Sample ID		Well Diagram		Summary	
Date	Time	Elapsed Time (hr.)	Depth (ft) to:			O - Open End Rod	T - Thin Wall Tube	U - Undisturbed Sample	S - Split Spoon Sample
			Bottom of Casing	Bottom of Hole	Water				

Field Tests: Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High
 Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High V - Very High

[†]Note: Maximum particle size is determined by direct observation within the limitations of sampler size.
 Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-09 REV 132892_HA-LIB09.GLB HA-TB-CORE-WELL-07-2 W FENCE.GDT G:\129420 VECTRENPROJECT DATA\FIELD DATA\04_GINTAB BROWN2019_0328_HA_L&E_ABBROWN_D1.GPJ Jul 16, 19



TEST BORING REPORT

Boring No. CCR-AP-9

File No. 129420-018
Sheet No. 2 of 2

H&A-TEST BORING-09 REV 132892_HA-LIB09.GLB HA-TB-CORE-WELL-07-2 W FENCE.GDT G:\129420 VECTREN\PROJECT DATA\FIELD DATA\04_GINTYAB BROWN\2019_0328_HA_L_N&E ABBROWN_D1.GPJ Jul 16, 19

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size [†] , structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel		Sand			Field Test						
								% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength		
25	1																		
	WOH 2 3 2	S6 24	28.5 30.5	ML			Similar to S5					5	95						
30																			
	WOH WOH WOH WOH	S7 24	33.5 35.5	ML/ CL		33.5	Soft, gray sandy silty CLAY (ML/CL), mps < 2.0 mm, stratified, no odor, wet					10	20						
35						35.5	BOTTOM OF EXPLORATION 35.5 FT												

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. CCR-AP-9

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Boring GT-1

Sheet 1 of 2

Date(s) Drilled	12/13/21	Logged By	S. Studley	Checked By	K. Maroju
Drilling Method	Hand Auger/Hollow Stem Auger	Drill Bit Size/Type	8" HSA	Total Depth of Borehole	59.4 feet
Drill Rig Type	Mobile B57 Truck Mount	Drilling Contractor	ATC Group Services	Surface Elevation	406.40 ft
Borehole Backfill	Bentonite chips, grout	Sampling Method(s)	Hand Auger/Split Spoon	Hammer Data	140 lbs/30" Drop Auto
Coordinate Location	N 967697 E 2769882 (ft)	Groundwater Level(s)	Encountered at 18' ATD, 18.5' bgs on 12/14, 13.02' bgs on 12/15, 12.46' bgs on 12/16		

Elevation, feet	Depth, feet	SAMPLES					Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/ft OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)				
0	0	HA 1-5			100		406.4 Soft, moist, light yellowish brown silty CLAY (CL-ML), with gravel becomes brownish yellow becomes dark grayish brown becomes olive brown with few coal fragments	0.0		
405	5						becomes medium stiff and brownish yellow			
400		SS-1	4 2 3			0.75 0.5 0.25				
395	10	SS-2	2 1 1				397.9 Soft, moist, brownish yellow SILT (ML)			
390		SS-3	2 1 2			0.25				
385	15	SS-4	2 1 1			1.5 0.1 0.75				
380	20	SS-5	2 2 2			0.5 0.5 0.5	387.9 Soft, moist to wet, brownish yellow SILT (ML) becomes gray			
375	25	SS-6	1 0 0	95		0.25	382.9 382.4 Soft, wet, brownish yellow lean CLAY (CL) Very soft, wet, dark gray SILT (ML) 381.4 Medium stiff, moist, greenish gray silty CLAY (CL-ML)			
370		ST-1			45					
365	30	SS-7	3 4 4		93	0.25 1.0 0.75				

LL=22 PL=17 PI=5
%G=0 %S=7.8
%M=80.3 %C=11.9

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Boring GT-1

Sheet 2 of 2

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:21 AM

Elevation, feet	Depth, feet	SAMPLES				Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %				
30		SS-7			93				
375									
						373.4	Soft, moist, dark gray lean CLAY (CL)	33.0	
		ST-2			100			19.7	
35						371.4	Very stiff, moist, greenish gray lean CLAY (CL), mottled brownish yellow	35.0	
		SS-8	4 5 6		93	1.75 2.25 1.5	Medium stiff, moist, brownish yellow SILT (ML)	36.0	
370									
						367.9	Soft, wet, gray SILT (ML)	38.5	
		SS-9	2 2 2		100	0.5 0.5 0.5	Soft, moist, brownish yellow silty CLAY (CL-ML)	39.0	
40									
365									
						362.9	Soft, wet, brownish yellow SILT (ML)	43.5	
		SS-10	2 3 4		100	0.25 2.0	becomes stiff, moist and gray brown		
45									
360									
						357.9	Very soft, wet, dark gray lean CLAY (CL)	48.5	
		SS-11	4 6 7		100	0.25 0.25 3.5	becomes very dense, moist and dark brown with gravel		
50									
355									
		SS-12	5 6 7		100	1.0 2.5 2.0	becomes soft becomes very stiff and mottled light gray		
55									
350									
		SS-13	30 50/4"			0.5 0.75 3.5	Medium stiff, brown to light gray SILT (ML), with sand	58.5 59.0 59.4	
60							SHALE [COMPLETELY WEATHERED]		
							End of Boring at 59.4' bgs		
65									

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Boring GT-2

Sheet 1 of 2

Date(s) Drilled	12/14/21	Logged By	S. Studley	Checked By	K. Maraju
Drilling Method	Hand Auger/Hollow Stem Auger	Drill Bit Size/Type	8" HSA	Total Depth of Borehole	60.0 feet
Drill Rig Type	Mobile B57 Truck Mount	Drilling Contractor	ATC Group Services	Surface Elevation	391.60 ft
Borehole Backfill	Bentonite chips, grout	Sampling Method(s)	Hand Auger/Split Spoon	Hammer Data	140 lbs/30" Drop Auto
Coordinate Location	N 967362 E 2770405 (ft)	Groundwater Level(s)	Encountered at 37.5' ATD, 10.5' bgs on 12/15		

Elevation, feet	Depth, feet	SAMPLES					Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)				
0							GRAVEL	0.0		
390		HA 1-5			100		Stiff, moist, yellowish brown lean CLAY (CL) [FILL] becomes mottled	3.0		
5								6.0		
385		SS-1	4 4 5	65	2.0 1.5 1.5		Medium stiff, moist, grayish brown SILT (ML), mottled greenish brown, non-plastic	6.0		
10		SS-2	4 4 5	60	1.0 1.75 1.75		becomes mottled gray			
380		SS-3	4 4 4	65	1.0 3.25 2.5					
15		SS-4	4 5 5	100	1.0 2.5 2.5		Very stiff, moist, light brownish gray SILT (ML), mottled yellowish brown	13.5		
375		ST-1					becomes moist to wet, dark gray		Only 3" recovery in Shelby Tube	
20		SS-5	2 2 2	75	2.25 0.75 0.75		No recovery			
370		ST-2		13						
25		SS-6	2 3 3	100	0.5 1.25 1.25					
365		ST-3							Over compacted Shelby Tube	
30		ST-4		91			Soft, moist, olive gray lean CLAY (CL)	27.0	24.4	
		SS-7		100					LL=24 PL=15 PI=9 %G=0 %S=18.1 %M=65.7 %C=16.2	

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:22 AM

Project: AB Brown Generating Station

Project Location: Evansville, IN

Project Number: 60583533

Log of Boring GT-2

Sheet 2 of 2

Report: GEO_CR_WELL; File C:\USERS\RACHEL_SUTOR\NAIONEDRIVE - AECOM\DESKTOP\AB BROWN LINED POND.GPJ; 5/24/2023 9:34:22 AM

Elevation, feet	Depth, feet	SAMPLES					Graphic Log	MATERIAL DESCRIPTION	Water Content %	REMARKS AND OTHER DETAILS
		Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)				
30	360	SS-7	1 2 4	100	0.5					
							358.1			
35	355	SS-8	2 2 2	100	0.75 0.75					
40	350	SS-9	2 2 2	100	0.5 0.25 0.25					
							352.6	becomes with organics		
45	345	SS-10	0 1 2	100	0.5					
50	340	SS-11	1 3 2	100	0.5 1.25 0.5					
							343.1			
55	335	SS-12	2 2 3	100	1.25 0.5					
60	330	SS-13	4 8 11	100	2.5 3.5					
							331.6	becomes dark greenish gray		
65										

Sand seam at 54.5'

End of Boring at 60' bgs

Appendix C
IDNR Record of Water Well Forms



RECORD OF WATER WELL
State Form 35680 (R5 / 9-04)

Driller--Mail complete record in 30 days to:
INDIANA DEPT. OF NATURAL RESOURCES
Division of Water
402 W. Washington St., Rm. W264
Indianapolis, IN 46204-2641
(877) 928-3755 toll-free or (317) 232-4160

County Permit Number
DNR Variance Number
Include if applicable

Fill in completely

WELL LOCATION

County where drilled POSEY	Civil township name MARRS	Township number (N-S) 7S	Range number (E-W) 12W	Section 13
--------------------------------------	-------------------------------------	------------------------------------	----------------------------------	----------------------

Driving directions to the well location (include trip origin, street & road names, intersecting roads, and compass directions). Show well address below and subdivision in box at lower right. There is space for a map on the reverse side.
From Indianapolis take I-70 West to US 41 South to SR 62 West. From SR 62, turn South on West Franklin Rd. and then bear left on to Welborn Rd, and follow to Vectren's AB Brown Generating Station.

UTM Northing	37.90242 N
UTM Easting	87.71749 W
Datum	<input type="checkbox"/> NAD 27 <input type="checkbox"/> NAD 83
GPS used	
Subdivision name & lot number (if applicable)	

Well address: **8511 Welborn Rd, Mt. Vernon, IN 47620**

If drilled for water supply, this well is: First well on property Replacement well Additional well on property Dry hole

OWNER - CONTRACTOR

Well owner--name VECTREN	Telephone number (812) 464-4793
------------------------------------	---

Address (number and street, city, state, ZIP code)
P.O. BOX 209, EVANSVILLE, IN 47702

Environmental Consultant--name AECOM	Address (number and street, city, state, ZIP code) 13355 Noel Road Suite 400 Dallas, TX 75240	Telephone number (972) 788-1000
--	---	---

Drilling contractor--name ATC GROUP SERVICES	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256	Telephone number (317) 849-4990
--	---	---

Equipment operator--name G.LAUBER	License number of operator 4069	Date of well completion 12/15/21
---	---	--

CONSTRUCTION DETAILS

WELL LOG

Use of well <input type="checkbox"/> Home <input type="checkbox"/> Public supply <input type="checkbox"/> Industrial / Commercial <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input checked="" type="checkbox"/> Monitoring / Environ. <input type="checkbox"/> Test Hole Other: _____	Drilling method <input type="checkbox"/> Rotary <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Jet <input type="checkbox"/> Bucket / Bore <input checked="" type="checkbox"/> Auger (including HSA) <input type="checkbox"/> Direct Push Other: _____	Type of pump <input type="checkbox"/> Submersible <input type="checkbox"/> Shallow-well jet <input type="checkbox"/> Deep-well jet <input checked="" type="checkbox"/> No pump installed Other: _____	FORMATIONS: Type of material		From (feet)	To (feet)
			CCR-LP-01 Grey Silty Clay		0.0	35.0

Total depth of well (feet) 32	Borehole diameter (in.) 8	Gravel pack inserted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Casing length (feet) 22	Casing diameter (in.) 2	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel Other: _____
Screen length (feet) 10	Screen diameter (in.) 2	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel Other: _____
Screen slot size 0.01	Water quality (clear, odor, etc.)	

WELL CAPACITY TEST

Test method <input type="checkbox"/> Air <input type="checkbox"/> Bailing <input type="checkbox"/> Pumping	Static level below surface 23.5 feet	Gallons per min.	Hours tested	Drawdown (change in level) feet
---	--	------------------	--------------	------------------------------------

GROUTING

WELL ABANDONMENT

Grout material BENTONITE	Grout depth from to 19 1	Sealing material	Depth filled from to
Installation method TREMIE & POUR	No. of bags used 1.5	Installation method	No. of bags used

Additional space for well log and comments on reverse side

I hereby swear or affirm, under the penalties for perjury, that the information submitted herewith is, to the best of my knowledge and belief, true, accurate, and complete.	Signature of drilling contractor or authorized representative <i>Zach Vaughan</i>	MUST BE SIGNED OR STAMPED	Date 1/19/22
--	--	---------------------------	------------------------



RECORD OF WATER WELL
State Form 35680 (R5 / 9-04)

Driller-Mail complete record in 30 days to:
INDIANA DEPT. OF NATURAL RESOURCES
Division of Water
402 W. Washington St., Rm. W264
Indianapolis, IN 46204-2641
(877) 928-3755 toll-free or (317) 232-4160

County Permit Number
DNR Variance Number

Include if applicable

Fill in completely

WELL LOCATION

County where drilled POSEY	Civil township name MARRS	Township number (N-S) 7S	Range number (E-W) 12W	Section 13
Driving directions to the well location (include trip origin, street & road names, intersecting roads, and compass directions). Show well address below and subdivision in box at lower right. There is space for a map on the reverse side. From Indianapolis take I-70 West to US 41 South to SR 62 West. From SR 62, turn South on West Franklin Rd. and then bear left on to Welborn Rd, and follow to Vectren's AB Brown Generating Station.			UTM Northing 37.90244 N	UTM Easting 87.71651 W
Well address: 8511 Welborn Rd, Mt. Vernon, IN 47620			Datum <input type="checkbox"/> NAD 27 <input type="checkbox"/> NAD 83	GPS used
If drilled for water supply, this well is: <input type="checkbox"/> First well on property <input type="checkbox"/> Replacement well <input type="checkbox"/> Additional well on property <input type="checkbox"/> Dry hole			Subdivision name & lot number (if applicable)	

OWNER - CONTRACTOR

Well owner--name VECTREN	Telephone number (812) 464-4793
Address (number and street, city, state, ZIP code) P.O. BOX 209, EVANSVILLE, IN 47702	
Environmental Consultant--name AECOM	Address (number and street, city, state, ZIP code) 13355 Noel Road Suite 400 Dallas, TX 75240
Drilling contractor--name ATC GROUP SERVICES	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256
Equipment operator--name G.LAUBER	License number of operator 4069
	Date of well completion 12/14/21

CONSTRUCTION DETAILS

WELL LOG

Use of well <input type="checkbox"/> Home <input type="checkbox"/> Public supply <input type="checkbox"/> Industrial / Commercial <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input checked="" type="checkbox"/> Monitoring / Environ. <input type="checkbox"/> Test Hole Other: _____	Drilling method <input type="checkbox"/> Rotary <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Jet <input type="checkbox"/> Bucket / Bore <input checked="" type="checkbox"/> Auger (including HSA) <input type="checkbox"/> Direct Push Other: _____	Type of pump <input type="checkbox"/> Submersible <input type="checkbox"/> Shallow-well jet <input type="checkbox"/> Deep-well jet <input checked="" type="checkbox"/> No pump installed Other: _____	FORMATIONS: Type of material	From (feet)	To (feet)
Total depth of well (feet) 32	Borehole diameter (in.) 8	Gravel pack inserted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	CCR-LP-02		
Casing length (feet) 22	Casing diameter (in.) 2	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Grey Silty Clay	0.0	35.0
Screen length (feet) 10	Screen diameter (in.) 2	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel			
Screen slot size 0.01	Water quality (clear, odor, etc.)				

WELL CAPACITY TEST

Test method <input type="checkbox"/> Air <input type="checkbox"/> Bailing <input type="checkbox"/> Pumping	Static level below surface 17.5 feet	Gallons per min.	Hours tested	Drawdown (change in level) feet
---	--	------------------	--------------	------------------------------------

GROUTING

WELL ABANDONMENT

Grout material BENTONITE	Grout depth from to 19 1	Sealing material	Depth filled from to
Installation method TREMIE & POUR	No. of bags used 1.5	Installation method	No. of bags used

Additional space for well log and comments on reverse side

I hereby swear or affirm, under the penalties for perjury, that the information submitted herewith is, to the best of my knowledge and belief, true, accurate, and complete.	Signature of drilling contractor or authorized representative Zach Vaughan	Date 1/19/22
--	--	------------------------

**RECORD OF WATER WELL**

State Form 35680 (R5 / 9-04)

Driller--Mail complete record in 30 days to:
 INDIANA DEPT. OF NATURAL RESOURCES
 Division of Water
 402 W. Washington St., Rm. W264
 Indianapolis, IN 46204-2641
 (877) 928-3755 toll-free or (317) 232-4160

County Permit Number

DNR Variance Number

Include if applicable

Fill in completely

WELL LOCATION

County where drilled POSEY	Civil township name MARRS	Township number (N-S) 7S	Range number (E-W) 12W	Section 13
Driving directions to the well location (include trip origin, street & road names, intersecting roads, and compass directions). Show well address below and subdivision in box at lower right. There is space for a map on the reverse side. From Indianapolis take I-70 West to US 41 South to SR 62 West. From SR 62, turn South on West Franklin Rd. and then bear left on to Welborn Rd, and follow to Vectren's AB Brown Generating Station.			UTM Northing 37.90343 N	UTM Easting 87.71607 W
Well address: 8511 Welborn Rd, Mt. Vernon, IN 47620			Datum <input type="checkbox"/> NAD 27 <input type="checkbox"/> NAD 83	GPS used
Subdivision name & lot number (if applicable)				
If drilled for water supply, this well is: <input type="checkbox"/> First well on property <input type="checkbox"/> Replacement well <input type="checkbox"/> Additional well on property <input type="checkbox"/> Dry hole				

OWNER - CONTRACTOR

Well owner--name VECTREN	Telephone number (812) 464-4793
Address (number and street, city, state, ZIP code) P.O. BOX 209, EVANSVILLE, IN 47702	
Environmental Consultant--name AECOM	Address (number and street, city, state, ZIP code) 13355 Noel Road Suite 400 Dallas, TX 75240
Drilling contractor--name ATC GROUP SERVICES	Address (number and street, city, state, ZIP code) 7988 CENTERPOINT DR., INDIANAPOLIS, IN 46256
Equipment operator--name G.LAUBER	License number of operator 4069
	Date of well completion 12/14/21

CONSTRUCTION DETAILS**WELL LOG**

Use of well <input type="checkbox"/> Home <input type="checkbox"/> Public supply <input type="checkbox"/> Industrial / Commercial <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input checked="" type="checkbox"/> Monitoring / Environ. <input type="checkbox"/> Test Hole Other: _____	Drilling method <input type="checkbox"/> Rotary <input type="checkbox"/> Reverse Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Jet <input type="checkbox"/> Bucket / Bore <input checked="" type="checkbox"/> Auger (including HSA) <input type="checkbox"/> Direct Push Other: _____	Type of pump <input type="checkbox"/> Submersible <input type="checkbox"/> Shallow-well jet <input type="checkbox"/> Deep-well jet <input checked="" type="checkbox"/> No pump installed Other: _____	FORMATIONS: Type of material	From (feet)	To (feet)
Total depth of well (feet) 38	Borehole diameter (in.) 8	Gravel pack inserted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	CCR-LP-BK		
Casing length (feet) 28	Casing diameter (in.) 2	Casing material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Brown Silty Clay	0.0	15.0
Screen length (feet) 10	Screen diameter (in.) 2	Screen material <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Steel	Grey Silty Clay	15.0	40.0
Screen slot size 0.01	Water quality (clear, odor, etc.)				

WELL CAPACITY TEST

Test method <input type="checkbox"/> Air <input type="checkbox"/> Bailing <input type="checkbox"/> Pumping	Static level below surface 22.5 feet	Gallons per min.	Hours tested	Drawdown (change in level) feet
---	--	------------------	--------------	------------------------------------

GROUTING**WELL ABANDONMENT**

Grout material BENTONITE	Grout depth from to 25 1	Sealing material	Depth filled from to
Installation method TREMIE & POUR	No. of bags used 1.5	Installation method	No. of bags used

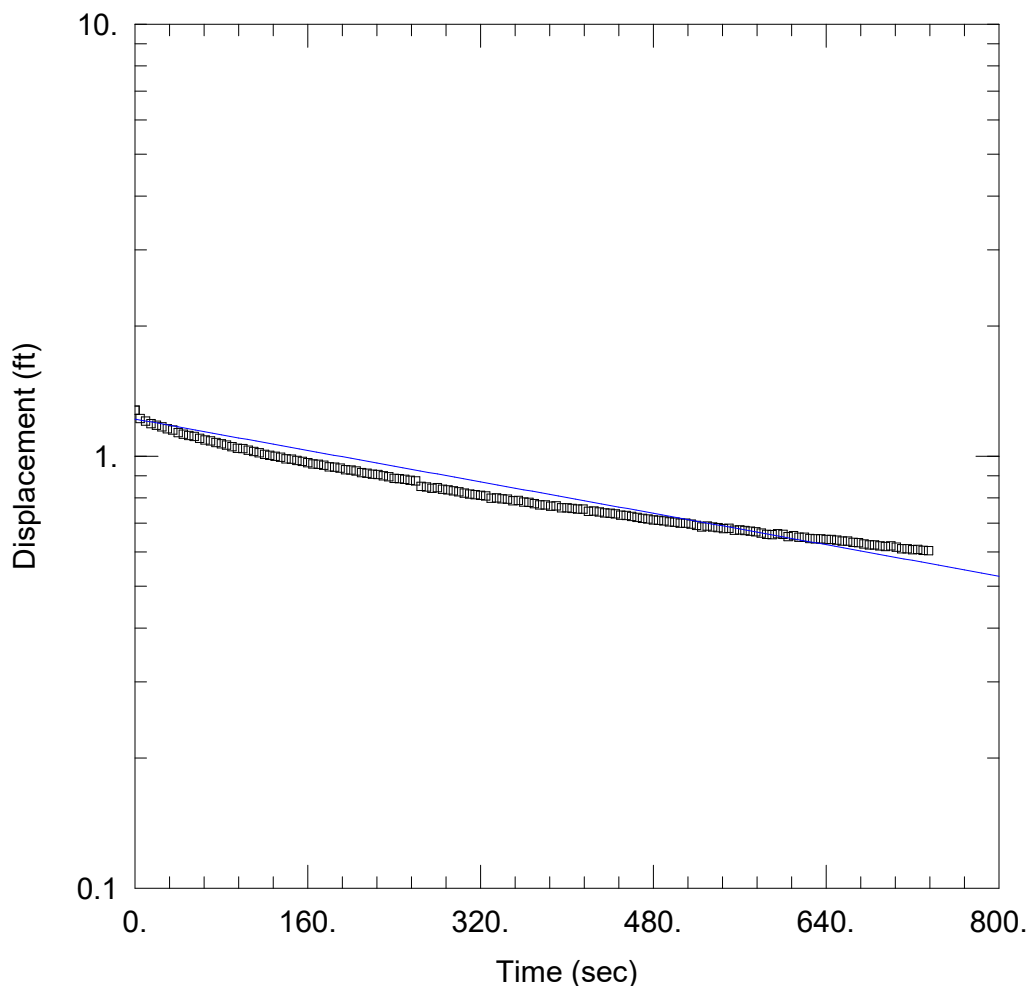
Additional space for well log and comments on reverse side

I hereby swear or affirm, under the penalties for perjury, that the information submitted herewith is, to the best of my knowledge and belief, true, accurate, and complete.	Signature of drilling contractor or authorized representative Zach Vaughan	MUST BE SIGNED OR STAMPED	Date 1/19/22
--	--	---------------------------	------------------------

Appendix D
Aquifer Hydraulic Testing Results

AB Brown Hydraulic Testing K-Values (cm/sec)				
March 2022				
Well ID	Test 1*	Test 2*	Average	Solution Method
CCR-LP-01	--	1.78E-06	--	Bouwer-Rice
CCR-LP-02	4.51E-05	4.76E-05	4.64E-05	Springer-Gelhar
CCR-LP-BK	--	4.15E-06	--	Bouwer-Rice

*Test 1 is indicative of a "slug in" test, whereas Test 2 is a "slug out" test



WELL TEST ANALYSIS

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\CCR-LP-BK.aqt
 Date: 04/08/22 Time: 12:48:53

PROJECT INFORMATION

Company: AECOM
 Client: AB Brown
 Project: 60583533
 Location: AB Brown
 Test Well: CCR-LP-BK
 Test Date: 3/10/22

AQUIFER DATA

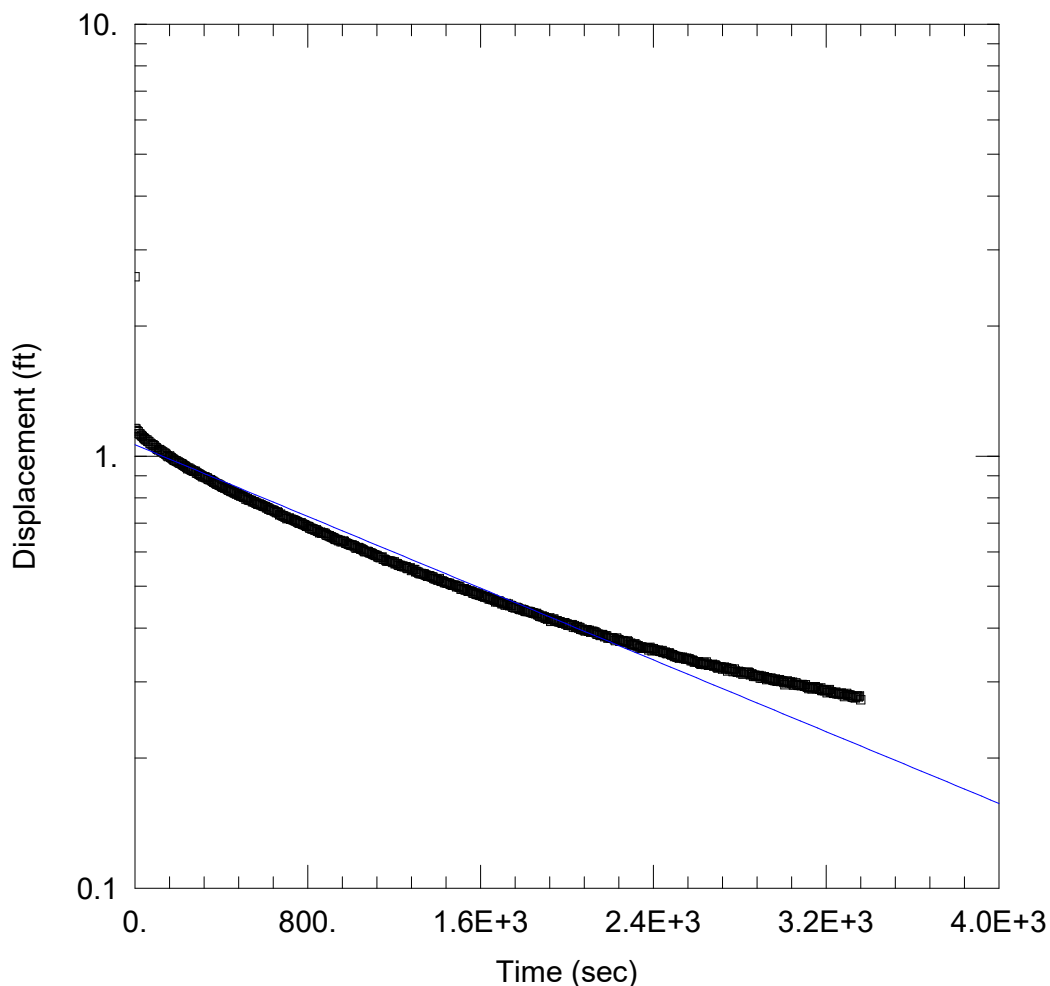
Saturated Thickness: 32.59 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.278 ft Static Water Column Height: 32.59 ft
 Total Well Penetration Depth: 35.09 ft Screen Length: 12.5 ft
 Casing Radius: 0.167 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bower-Rice
 K = 3.966E-6 ft/sec $y_0 =$ 1.219 ft



CCR-LP-01

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\CCR-LP-01.aqt

Date: 04/08/22

Time: 11:48:56

PROJECT INFORMATION

Company: AECOM

Client: AB Brown

Project: 60583533

Location: AB Brown

Test Well: CCR-LP-01

Test Date: 3/11/22

AQUIFER DATA

Saturated Thickness: 25.95 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 2.599 ft

Static Water Column Height: 25.95 ft

Total Well Penetration Depth: 25.95 ft

Screen Length: 12. ft

Casing Radius: 0.167 ft

Well Radius: 0.33 ft

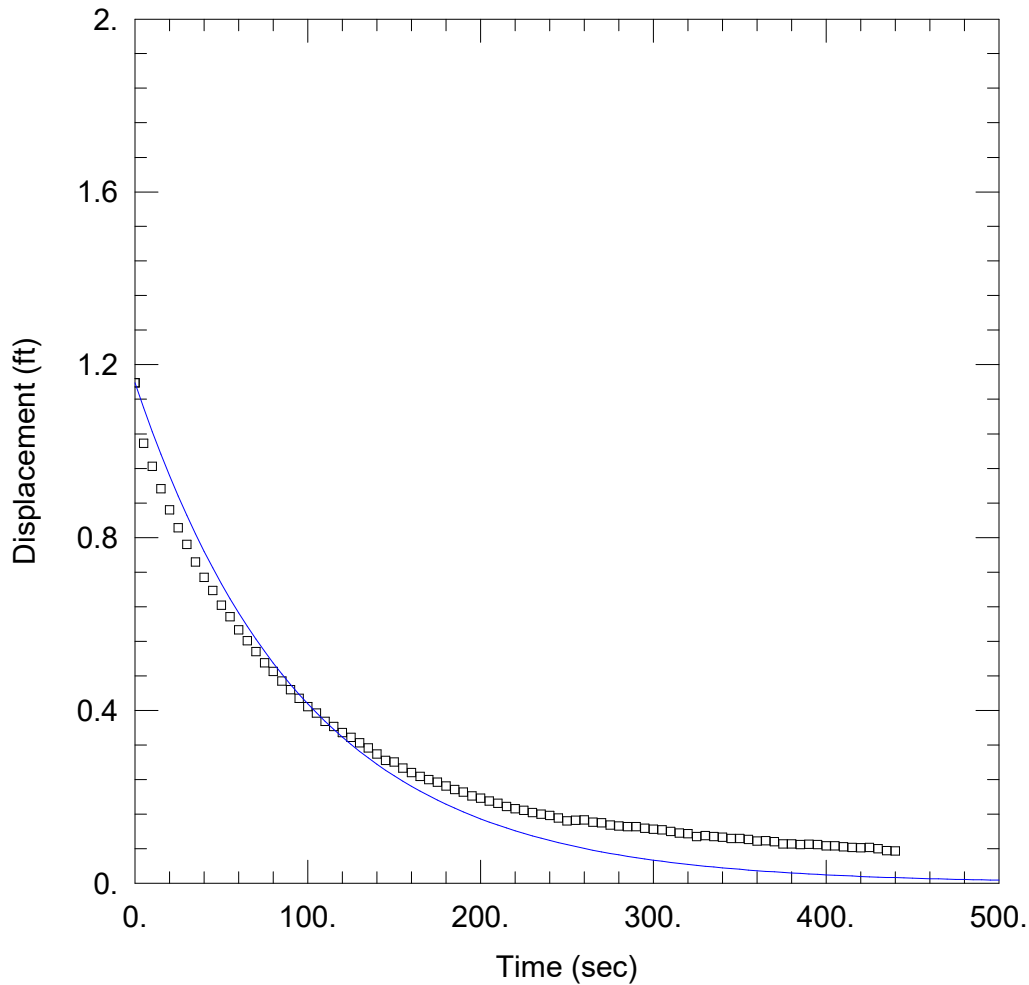
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

K = 1.781E-6 ft/sec

y0 = 1.063 ft



CCR-LP-02 SLUG IN

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\CCR-LP-02 Slug In.aqt
 Date: 04/08/22 Time: 11:13:52

PROJECT INFORMATION

Company: AECOM
 Client: AB Brown
 Project: 60583533
 Location: AB Brown
 Test Well: CCR-LP-02
 Test Date: 3/11/22

AQUIFER DATA

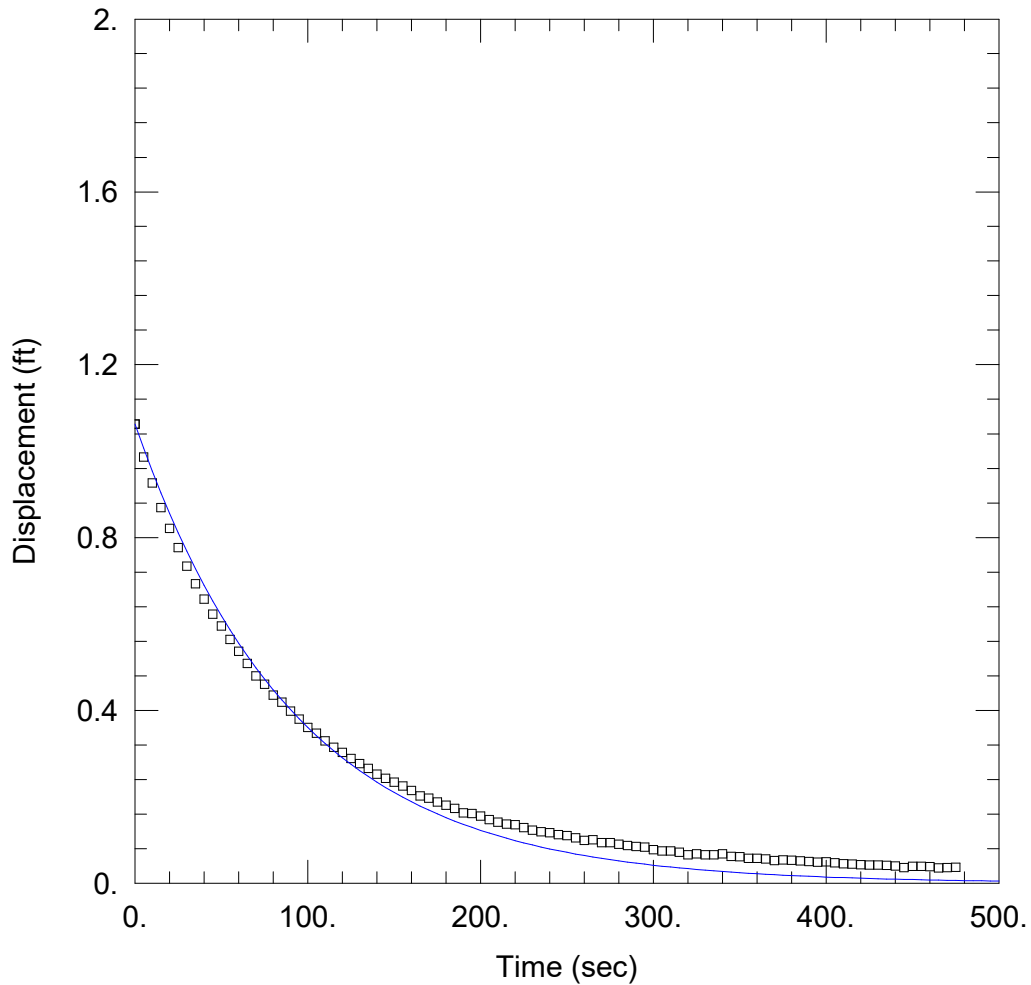
Saturated Thickness: 26.05 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (CCR-LP-02)

Initial Displacement: 1.158 ft Static Water Column Height: 26.05 ft
 Total Well Penetration Depth: 26.05 ft Screen Length: 10. ft
 Casing Radius: 0.167 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Springer-Gelhar
 K = 4.514E-5 ft/sec Le = 17.36 ft



SLUG OUT

Data Set: C:\Program Files (x86)\HydroSOLVE\AQTESOLV Pro 4.0\CCR-LP-02 Slug Out.aqt
 Date: 04/08/22 Time: 11:26:21

PROJECT INFORMATION

Company: AECOM
 Client: AB Brown
 Project: 60583533
 Location: AB Brown
 Test Well: CCR-LP-02
 Test Date: 3/11/22

AQUIFER DATA

Saturated Thickness: 26.05 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (CCR-LP-02 Slug OUT)

Initial Displacement: 1.063 ft Static Water Column Height: 26.05 ft
 Total Well Penetration Depth: 26.05 ft Screen Length: 10. ft
 Casing Radius: 0.167 ft Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Springer-Gelhar
 K = 4.757E-5 ft/sec Le = 17.33 ft