Bottom Ash Basin Closure Certification Report

River Rouge Power Plant Bottom Ash Basin Coal Combustion Residual Unit

November 2020, Revised February 2021

Prepared For:

DTE Electric Company

Prepared By:

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1.0 Introduction

1.1 Closure Overview and Objectives

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule), as amended. The CCR Rule, which became effective on October 19, 2015, applies to the DTE Electric Company (DTE Electric) River Rouge Power Plant (RRPP) Bottom Ash Basin (BAB). As documented in the October 17, 2016 *Initial Written Closure Plan for a CCR Impoundment - DTE Energy River Rouge Power Plant Bottom Ash Basin* submitted in accordance with §257.102(b) and updated on July 15, 2020, DTE was proceeding to close the RRPP BAB by CCR removal and offsite disposal including decontamination of the unit in accordance with self-implementing requirements of the CCR Rule. This approach was chosen because CCR removal and offsite disposal was considered the most conservative and viable source material management option for the site, offering a high level of long-term performance and reliability.

On behalf of DTE Electric, TRC Engineers Michigan, Inc.(TRC), the engineering entity of TRC, prepared a closure work plan (TRC, May 15, 2020) to demonstrate how closure will be achieved in accordance with the CCR Rule and to request agreement from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on DTE Electric's plan to remove CCR from the RRPP BAB CCR unit to achieve closure. EGLE approved the closure work plan on June 2, 2020 with the stipulation that post-dredging confirmatory sample cores be collected at a frequency equal to the pre-dredge assessment sample collections.

Initiation of closure of the BAB was driven by DTE Electric's plan to comply with the CCR Rule. The RRPP ceased operating as a coal-fired plant in mid-2020 and will operate in the future utilizing only recycled industrial gas to produce electricity. Therefore, CCR is no longer generated at the RRPP and CCR no longer discharges into the former BAB. The CCR Rule states that all waste streams discharging into a CCR impoundment that is subject to forced closure must cease, and closure of the CCR unit must be initiated by April 11, 2021[1]. DTE Electric initiated closure ahead of the specified deadline due to cessation of coal burning.

DTE Electric commenced closure construction activities on June 29, 2020 and completed the removal of CCR from the BAB on September 21, 2020. On behalf of DTE Electric, TRC has prepared this closure certification to demonstrate how the BAB closure was achieved in accordance with the §257.102(c) and Michigan's Natural Resources and Environmental Protection Act (NREPA) Part 115 Solid Waste Management Statute (Part 115) 324.11519b (9). This document provides a description of the following:

- CCR removal procedures;
- Verification of CCR removal; and,

[1] The deadline was revised for all unlined CCR surface impoundments and surface impoundments that fail the aquifer location restriction to initiate closure or retrofit to April 11, 2021; this date replaced the former October 31, 2020 deadline per finalization of EPA's Holistic Approach to Closure Part A: Deadline To Initiate Closure, effective September 28, 2020.

- Post-removal performance monitoring.

1.2 Site Overview and Description of CCR Units

The DTE Electric RRPP is located at 1 Belanger Park Drive, within the City of River Rouge in Wayne County, Michigan. The RRPP, including the BAB CCR unit, was originally constructed in the early 1950s on the southern shore of the Rouge River Short Cut Canal and along the west bank of the Detroit River in River Rouge, Michigan. The former BAB, located immediately north of the RRPP and south of the Rouge River Short Cut Canal (Figure 1), was a physical sedimentation basin utilized as an incised CCR surface impoundment that formerly received sluiced bottom ash and other process effluent from the RRPP throughout its operational life.

In 1998, sheet piling was placed around the perimeter of the incised impoundment and the sheets were pushed to a depth of approximately 30 feet below ground surface (ft bgs) into native clay soil. Sluiced ash from the power plant was first pumped to two decanting hydrobin structures; the decanted bottom ash transport water gravity drained to the eastern end of the BAB where it combined with other process flow effluent pumped from the power plant. Discharge water from the former BAB over tops an overflow weir and flows into a weir box structure before draining to a below-grade pump station on the west side of the former BAB.

The remaining pump station contains two sets of centrifugal pumps; one set of pumps recirculates the water back into the plant for reuse, and the other set of pumps discharges the water to a surface water outfall in the overflow canal. The water combines with other site storm and process water effluent authorized via a National Pollution Discharge Elimination System (NPDES) permit, and/or to the combined sewer to the Wayne County Downriver Wastewater Treatment Plant (WWTP) via an Industrial Pretreatment Program (IPP) permit. Settled CCR materials that escaped the hydrobin ash separation process were periodically dredged from the basin throughout its operational lifetime and disposed offsite.

DTE Electric is proactively managing the potential groundwater migration pathway at the RRPP BAB CCR unit using a groundwater extraction system. This operates as an interim response, and consists of 11 groundwater extraction wells installed around the RRPP former BAB.. The groundwater extraction system was constructed during January and February 2018, and has been operational and effectively capturing the affected groundwater in the vicinity of the RRPP former BAB since operation began in early March 2018.

1.3 Regulatory Background

As documented in the January 31, 2018 Annual Groundwater Monitoring Report for the River Rouge Power Plant (TRC, January 2018), covering calendar year 2017 activities, DTE Electric noted that boron, fluoride, and pH were observed within groundwater at downgradient monitoring well(s) with statistically significant increases (SSIs) above background limits. Therefore, DTE Electric initiated an assessment monitoring program for the RRPP BAB CCR unit pursuant to §257.95 of the CCR Rule that included sampling and analyzing groundwater within the groundwater monitoring system for all constituents listed in Appendix IV.

As an interim and proactive measure, DTE Electric has been operating a groundwater collection

system since March 2, 2018 to mitigate potential risk of migration of water from the BAB. The installed collection system continues to hydraulically control groundwater flow within the vicinity of the RRPP BAB CCR unit. Groundwater flow from the entire former BAB perimeter is now directed inward toward the extraction wells. DTE Electric intends to address the CCR-affected groundwater by continuing to operate the already-in-place interim groundwater collection system. However, evaluation of the final remedy will continue post-removal of CCR from the former BAB.

As detailed in the 2018 Annual Report (2018 Annual Groundwater Monitoring Report), statistically significant groundwater concentrations were reported above the groundwater protection standards (GWPSs) for Appendix IV constituents arsenic and lithium. Due to the detections of arsenic and lithium at concentrations above their respective GWPSs, an Assessment of Corrective Measures (ACM) was completed on April 14, 2019. Selection of the final remedy is still being evaluated while continuing to operate the interim groundwater extraction system installed and operated since 2018. A Federal CCR Rule - Notice of Alternative Closure per §257.103(b) was completed on December 16, 2019. This Notice set the time frame for shut-down of the RRPP coal-fired boiler(s) in May 2020, cessation of use of the RRPP BAB for CCR management by approximately July 2020, and the initiation of RRPP BAB CCR unit closure by August 31, 2020[2] (TRC, December 2019). CCR removal was completed within the timeframes specified in the Notice of Alternative Closure, and certified prior to December 28, 2020 in accordance with NREPA Part 115 324.11519b(6) and 324.11519b(8). Therefore, the RRPP BAB CCR unit will not be licensed under Part 115 as the former BAB will no longer be a CCR impoundment on or after December 28, 2020.

[2] The August 31, 2020 deadline was proposed within the EPA's December 2, 2019, Holistic Approach to Closure Part A: Deadline to Initiate Closure. The deadline to initiate closure or retrofit has since been revised for all unlined CCR surface impoundments and surface impoundments that fail the aquifer location restriction to April 11, 2021; this date replaced the former October 31, 2020 deadline per finalization of EPA's Holistic Approach to Closure Part A: Deadline to Initiate Closure (Part A), effective September 28, 2020. In addition, under Part A the process to secure an alternative closure was changed adding §257.103(f)(2) as what would now apply to the RRPP BAB CCR unit.

2.0 Closure by Removal

As presented in Section 1.1, DTE Electric closed the RRPP former BAB by CCR removal and offsite disposal including decontamination of the unit in accordance with self-implementing requirements of the CCR Rule and the EGLE approved closure work plan (TRC, May 15, 2020). A summary of the closure approach and removal documentation is contained herein.

2.1 Summary of Closure Approach

The RRPP BAB was closed by removal of CCR based on proposed design grades and confirmatory sampling; these design grades were based on clearly visible demarcation of CCR and underlying native materials witnessed during pre-construction soil borings.

Specific closure operations involved: (i) CCR removal by wet dredging within the BAB, (ii) removal or decontamination of any areas affected by releases of CCR, (iii) demolition/abandonment/decontamination of associated non-earthen features, and (iv) regrading to final desired grades using borrow soil for fill (in progress).

The lateral boundaries of the BAB are defined by the sheet piling placed around the perimeter of the impoundment. Approximate area of the BAB is 40,000 square feet (SF). The pre-construction site conditions are shown on Figure 2.

Dredging of CCR reached approximate depths of 4 to 12 feet below the pre-construction bathymetric surface within the BAB. Proposed excavation bottom elevation contours and final elevation contours are provided on Figure 3 and a generalized cross-section is provided on Figure 4.

DTE Electric removed the CCR materials through wet excavation (dredging) within the BAB utilizing a combination of mechanical and hydro-excavation methodologies. Due to the physical properties of the CCR observed during construction, the initial mechanical removal approach was modified during construction to a hydro-excavation approach to achieve complete removal of CCR.

2.2 CCR Removal and Documentation

The following section summarizes the removal criteria development and CCR removal and documentation procedures completed. Descriptions of activities to remove CCR and document adequate removal are provided herein.

2.2.1 Removal Criteria Development

DTE Electric closed the former BAB based on the removal criteria described herein and with agreement from EGLE. DTE Electric had a bathymetric survey completed (October 2019), and had confirmatory drilling performed with visual assessments of collected samples (February 2020) to define the horizontal and vertical extent of CCR within the BAB in support of final closure design efforts. Pre-construction bathymetry of CCR within the BAB is depicted on Figure 2. Table 1 summarizes the observed results of the pre-construction confirmatory borings, and locations of borings are shown on Figures 2 and 3. Pre-Construction boring logs of each pre-

construction boring within the BAB is included in Appendix A. Pre-Construction confirmatory drilling included:

- Advancement of ten (10) soil borings until native materials were encountered utilizing a pontoon based Vibra-Core sampler rig to collect soil samples and determine the thickness of CCR within the BAB;
- Collection of samples at each boring location logged according to the unified soil classification system (USCS) and visually evaluated for the presence of CCR; and
- Soil cores were retained for future comparison to post-excavation conditions.

The confirmatory drilling identified CCR extending to a depth of 4 to 11 feet below the existing bathymetric surface within the BAB at a submerged depth of approximately 2 to 14 feet below the water surface depending on location within the BAB. Generally, the submerged depth to CCR and depth to native material was greater on the eastern end of the BAB where routine dredging was performed.

Clear visible demarcation between CCR and underlying native materials was noted in the confirmatory soil boring cores as documented in the boring logs (Appendix A). Native material consisted of silt and sand of distinctly different color and grain size gradation compared to CCR disposed within the BAB and this material difference served as strong visually-identifiable evidence for dredging limits within the BAB.

Therefore, based on the confirmatory drilling results, CCR removal criteria included 1) over excavation of CCR based on pre-excavation CCR design grades; and 2) visual confirmation as described in Section 2.2.3.

2.2.2 CCR Removal Procedures

DTE Electric's selected contractor, Barton Malow Company (BMC) performed the following tasks from June 22, 2020 to September 21, 2020 to effectively remove CCR from the BAB:

- Completed mobilization of construction facilities, material, equipment, and personnel necessary to perform work;
- Installed erosion controls and completed site preparation including the installation of silt fence, silt curtains, and access road improvements required to transport removed CCR to the ash dewatering pad (Figure 2). Site preparation activities were completed from June 22 to June 26, 2020. Full-depth silt curtains were deployed at four locations and maintained throughout the duration of construction at multiple locations within the BAB to ensure compliance with existing NPDES/POTW limits and to control redistribution of CCR during dredging efforts (Figure 3);
- Performed water management activities, which included:
  - Abandonment of CCR process-related inlet pipes at process units. Five CCR process-related inlet pipes were abandoned via physical disconnection of above-grade piping at each process unit to create a physical break. Prior to basin dredging, all remaining below-grade piping leading to the BAB was cleaned via jetting by K2 Industrial to remove residual fluids, solids, and sludges and then abandoned-in-place by filling with

grout and capping at the former BAB discharge point. Locations of abandoned pipes are shown on Figure 3 ;

- Maintained remaining process/storm water inlet pipes and flow streams throughout the duration of CCR removal activities from BAB. Process flow entering the basin continued to be routed to the existing pump station on the western end of the basin and through the existing NPDES outfall following water treatment. As an additional measure to ensure compliance with existing NPDES/POTW limits, the height of the overflow weir at the discharge weir box was temporarily raised by installing a metal plate (e.g., "stop logs") and all process flow through the BAB was by-passed and treated prior to entering the weir box structure. BMC utilized a 400 gallon per minute (GPM) water treatment system, consisting of an open top weir tank, sand filtration, and an interchangeable bag filtration system, to treat water during the excavation and backfilling activities within the BAB. The water treatment system was activated prior to water levels exceeding the height of the installed metal plate at the overflow weir, and then once treated, the treated water was routed directly to the weir box structure and below-grade pump station for discharge. NPDES exceedances were not observed during construction activities.

- Removed approximately 11,674 cubic yards of CCR materials via wet excavation (dredging) within the BAB utilizing a combination of mechanical and hydro-excavation methodologies. Excavation goals were achieved once all CCR plus an additional six-inches of underlying soil were removed. Concrete pads were identified within the confines of the former BAB which were decontaminated and left in place. Final elevation contours and the locations of concrete pads are provided on Figure 3 and a generalized cross-section is provided on Figure 4.

  - From June 29, 2020 to July 29, 2020, BMC removed the bulk of CCR materials from BAB via mechanical excavation. BMC's selected subcontractor, Dean Marine and Excavating, Inc. (DME), performed mechanical dredging in the BAB using a hydraulic long reach excavator with a clamshell bucket. For areas that could not be reached from shore, the excavator was placed on a 30-foot by 60-foot sectional barge in the western portion of the basin. Once the material was drained through the clamshell bucket, the dredging material was placed directly into modified off road dump trucks with sealed gates and transported to the existing on-site concrete dewatering/decant pad located west of the BAB. Material dewatered via gravity with water released from the dredged material routed to NPDES Outfall 001E. To improve material stabilization on the decanting pad and to prepare the material for off-site disposal, approximately 296 tons of portland cement was utilized. A total of 10,217 tons of dewatered/stabilized material was transported and disposed of at Sibley Quarry Landfill as part of mechanical removal efforts. During mechanical removal, BMC also removed CCR residuals from all sheet pile cavities/arches and concrete pads remaining within the BAB.

  - From August 11, 2020 to September 21, the remaining fine particulate CCR material residing within the BAB was removed via hydraulic excavation. BMC's selected subcontractor, DME, performed hydraulic dredging in the BAB using a hydraulic dredge attachment (Dragflow HY85A Hydraulic Pump) secured to the GPS-equipped PC300 long reach excavator. For areas that could not be reached from shore, the excavator was placed on a 30-foot by 60-foot sectional barge in the western portion of the basin. As part of the hydraulic dredging scope, an approximately 100-foot by 130-

foot geotube staging area was constructed approximately 450-feet west of the BAB (Figure 1). The geotube staging area was constructed with a sand base, 10-mil sealed visqueen liner, and 2 to 3-foot tall containment berms. Temporary 6-inch diameter high density polyethylene (HDPE) intake and return water lines were installed from the hydraulic dredge equipment to the geotube staging area. Decanted water collected in the containment area was pumped back to the BAB via the temporary HDPE return line. The BAB was separated into halves during hydraulic dredging by the previously installed turbidity curtains in addition to the permanent center weir structure. Focused dredging on each half was performed until CCR removal was complete. The concrete pads were decontaminated using the hydraulic dredging equipment. Generally, a total of two passes was required on each half of the basin to remove remaining CCR. Final bathymetric surveying and confirmatory sampling was completed as documented in Section 2.2.3. Following solidification within the geotubes, a total of 4,138 tons of material from the hydraulic dredging operations was transported and disposed at Sibley Quarry Landfill.

- Completed site restoration activities, which includes completing final grading around the BAB to restore areas to pre-construction grades and placing a stone surface (MDOT 21AA) over disturbed areas and/or dedicated access drives. Silt fence will be removed after closure of the county-issued soil erosion and sedimentation control (SESC) permit anticipated for the construction phase of this project; and
- Demobilization of construction facilities and equipment from the Site.

2.2.3 Documentation of CCR Removal

DTE Electric completed the following CCR removal documentation protocol to satisfy the requirements within §257.102(c):

1. As specified in the closure work plan (TRC, May 2020), the primary documentation of CCR removal is by comparing final excavation grades to design grades. Bathymetric survey(s) were completed on August 31, 2020 and September 23, 2020 for the eastern half and western half, respectively. Elevations are based on North American Vertical Datum of 1988 (NAVD88) datum, and coordinates are based on the state plane coordinate system. Proposed excavation grades and as-built excavation grades are displayed on Figure 3 and the generalized cross-section shown on Figure 4. After completion of the two post-removal surveys, TRC reviewed survey documentation and confirmed that design grades were achieved, with exception of the noted concrete pads in the bottom of the basin that were decontaminated as documented in Section 2.2.2;
2. After excavation, confirmatory sample cores of the sediment bottom within the basin were collected and examined as secondary documentation of CCR removal. Visual inspection of the core samples was used to augment the post-dredging bathymetric surveys as part of the overall CCR removal verification approach. The presence/absence of CCR in sample cores was based primarily on color and gradation and compared to the retained pre-construction sample cores collected in February 2020. Table 1 summarizes the observed results of the post-construction confirmatory borings and locations of borings are shown on Figures 2 and 3. Post-Construction boring logs of each post-construction boring within the BAB is included in Appendix A. Post-Construction confirmatory drilling included:
   - Advanced soil borings utilizing a pontoon based Macro-Core® tooling sampling tube to verify that the performance criteria of no visual measurable thickness of CCR was

present at the ten (10) verification soil core boring locations in the basin. At select locations, a small amount of CCR was observed in initial post-construction borings that resulted in further hydraulic dredging to remove CCR. A final confirmation boring, specifically samples listed as "POST 2", were collected to demonstrate that CCR was removed. Confirmatory drilling was completed on August 29, 2020 and September 21, 2020 for the eastern and western halves of the BAB, respectively;

- Collection of samples at each boring location logged according to the unified soil classification system (USCS); and,
- Visually evaluated for the presence of CCR which confirmed that the hydraulic dredging successfully completed the removal of the CCR material from the BAB.

2.3 Post-Removal Monitoring

DTE Electric intends to address the CCR-affected groundwater by continuing to operate the already-in-place interim groundwater collection system, however, evaluation of the final remedy will continue post-removal of CCR from the BAB per §257.96 and §257.97 and NREPA Part 115 324.11519c. If the groundwater collection system is selected as part of the final remedy, the system will be operated until the risk of migration of CCR constituents from the RRPP BAB CCR unit to receptors is effectively mitigated and groundwater data demonstrate that groundwater concentrations of Appendix IV constituents are below the relevant GWPSs for three consecutive years of semiannual groundwater monitoring in accordance with §257.98(c).

DTE Electric will continue semiannual assessment monitoring as specified in §257.95 and annual nature and extent monitoring will continue for the RRPP BAB CCR unit per §257.95(g)(1). Groundwater monitoring will be performed in accordance with the existing Quality Assurance Project Plan – DTE Electric Company River Rouge Power Plant Bottom Ash Basin (the QAPP) (TRC, July 2016; revised August 2017) and statistically evaluated per the Groundwater Statistical Evaluation Plan – DTE Electric Company River Rouge Power Plant Coal Combustion Residual Bottom Ash Basin (Stats Plan) (TRC, October 2017).

3.0 Summary

This report presents the summary of removal procedures, documentation, bathymetric survey data, and confirmatory soil core data collected to verify that CCR was removed from the RRPP BAB. TRC reviewed survey documentation and confirmed that design grades were achieved, with exception of the noted concrete pads in the bottom of the basin that were decontaminated as documented in Section 2.2.2. TRC also completed confirmatory sampling of the sediment bottom within the basin as secondary documentation which confirmed that the hydraulic dredging successfully completed the removal of the CCR material from the BAB. Based on the results of field observations and data collection, removal activities were completed to close the RRPP BAB by CCR removal and offsite disposal in accordance with the requirements within §257.102(c) and NREPA Part 115 324.11519b (9), the EGLE approved *Bottom Ash Basin Closure Work Plan (*TRC, May 2020), and within the closure timeframe, with certification of closure prior to December 28, 2020 in accordance with NREPA Part 115 (324.11519b(6) and 324.11519b(8)).

4.0 Report Certification

I, the undersigned Michigan Professional Engineer, hereby certify that I am familiar with the technical requirements of Title 40 Code of Federal Regulations Part 257 Subpart D (§257). I also certify that it is my professional opinion that, to the best of my knowledge, information, and belief, that the information in this report is in accordance with current good and accepted engineering practice(s) and standard(s) and that CCR was removed from the RRPP BAB in accordance with the requirements of §257.102(c) and NREPA Part 115 324.11519b (9).

For the purpose of this document, “certify” and “certification” shall be interpreted and construed to be a “statement of professional opinion.” The certification is understood and intended to be an expression of my professional opinion as a Michigan Licensed Professional Engineer, based upon knowledge, information, and belief. The statement(s) of professional opinion are not and shall not be interpreted or construed to be a guarantee or a warranty of the analysis herein.

Name	License Expiration Date	
David B. McKenzie, P.E.	October 31, 2021	
Company	Date	
TRC Engineers Michigan, Inc.	February 1, 2021	

5.0 References

DTE Electric Company. October 17, 2016. Closure Plan for Existing CCR Surface Impoundment Per 40 CFR 257.102(b) – DTE Energy River Rouge Power Plant Ash Basin, 1 Belanger Park Dr., River Rouge, MI 48218.

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USEPA. July 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435).

USEPA. April 2018. Barnes Johnson (Office of Resource Conservation and Recovery) to James Roewer (c/o Edison Electric Institute) and Douglas Green, Margaret Fawal (Venable LLP). Re: Coal Combustion Residuals Rule Groundwater Monitoring Requirements. April 30, 2018. United States Environmental Protection Agency, Washington, D.C. 20460. Office of Solid Waste and Emergency Response, now the Office of Land and Emergency Management.

Tables

TABLE 1
SEDIMENT BORING RESULTS
DTE ELECTRIC COMPANY
RIVER ROUGE POWER PLANT BOTTOM ASH BASIN CLOSURE

Type	Sample ID	Basin Location	Northing	Easting	Date	Depth to Sediment (ft)	Total Core Thickness (ft)	CCR Thickness (ft)	Native Material Thickness (ft)	Native Material Elev. (ft)
Pre-Construction	SB-20-13	East	284777.2925	13463084.48	2/18/2020	10.9	7	7	0	559.3
Pre-Construction	SB-20-14	East	284794.0316	13462999.79	2/18/2020	12.8	6.5	3	3.5	563.0
Pre-Construction	SB-20-15	East	284843.856	13462955.67	2/18/2020	13.0	6.5	5	0.5	559.3
Pre-Construction	SB-20-16	East	284859.9735	13462831.48	2/18/2020	7.2	12.5	11.5	1	554.1
Pre-Construction	SB-20-17	East	284912.1527	13462825.37	2/18/2020	14.0	5.5	5.5	0	557.1
Pre-Construction	SB-20-18	West	285063.0671	13462740.54	2/18/2020	2.5	11.5	9	2.5	565.8
Pre-Construction	SB-20-19	West	285058.9901	13462684.06	2/18/2020	7.0	10	7	3	564.6
Pre-Construction	SB-20-20	West	285004.3734	13462713.28	2/18/2020	6.7	10.5	8	2.5	564.4
Pre-Construction	SB-20-21	West	284939.7125	13462726.68	2/18/2020	10.0	6.5	5.25	1.25	566.5
Pre-Construction	SB-20-22	West	284940.2677	13462783.4	2/18/2020	8.0	8.5	8	0.5	563.3
Confirmation Boring	SB-20-13-POST	East	284777.2925	13463084.48	8/29/2020	20.3	10 inches	0	10 inches	557.8
Confirmation Boring	SB-20-14-POST	East	284794.0316	13462999.79	8/29/2020	16.9	5 inches	0	5 inches	561.1
Confirmation Boring	SB-20-15-POST 2	East	284843.856	13462955.67	8/29/2020	19.9	19 inches	0	19 inches	558.1
Confirmation Boring	SB-20-16-POST 2	East	284859.9735	13462831.48	8/29/2020	24.4	21 inches	0	21 inches	553.6
Confirmation Boring	SB-20-17-POST	East	284912.1527	13462825.37	8/29/2020	21.5	18 inches	0	18 inches	556.5
Confirmation Boring	SB-20-18-POST	West	285063.0671	13462740.54	9/21/2020	12.9	18 inches	0	18 inches	563.5
Confirmation Boring	SB-20-19-POST	West	285058.9901	13462684.06	9/21/2020	13.9	24 inches	0	24 inches	562.5
Confirmation Boring	SB-20-20-POST 2	West	285004.3734	13462713.28	9/21/2020	13.7	18 inches	0	18 inches	562.7
Confirmation Boring	SB-20-21-POST 2	West	284939.7125	13462726.68	9/21/2020	15.3	7 inches	0	7 inches	561.1
Confirmation Boring	SB-20-22-POST 2	West	284940.2677	13462783.4	9/21/2020	15.9	12 inches	0	12 inches	560.5

Notes:

1. Northing and Easting are reported as Michigan State Plane Coordinates.
2. Elevations are reported in feet relative to the North American Vertical Datum of 1988.

NA - not applicable
NM - not measured

Figures

LEGEND

— — — — —	GROUNDWATER EXTRACTION SYSTEM PIPE AND CONDUIT TRENCH
☐	EXTRACTION WELL VAULT
▨	ELECTRICAL PULL BOX
⊡⊡	CLEANOUT (TWO-WAY)
⊡	CLEANOUT (ONE-WAY)
——x——	FENCE
— — — — —	MISCELLANEOUS PIPING
= = =	DRAIN PIPE
◐	UPPERMOST AQUIFER MONITORING WELL
◐	UPPERMOST AQUIFER MONITORING WELL
◉	MONITORING POINT
⌖	BEDROCK MONITORING WELL
⊕	PERCHED MONITORING WELL
⊕	PERCHED MONITORING WELL
●	BAB CLOSURE CONFIRMATORY BORING WITHIN BASIN (FEBRUARY 2020)
— — — — — — — —	GEOTUBE MANAGEMENT AREA
—— E ——	ELECTRIC LINE
— — — — — — — —	DRAINS / ASH LINE
—— GAS ——	GAS LINE
—— GAS ——	GAS LINE ABANDONED OR NO LONGER PRESENT
—— SAN ——	SANITARY SEWER LINE
—— W ——	WATER LINE
▨	RIPRAP
570	EXISTING BASIN BOTTOM CONTOUR (SEE NOTE 3)

NOTES

1. BASE MAP AND TOPOGRAPHIC CONTOURS OBTAINED FROM "DTE RIVER ROUGE POWER PLANT- BOTTOM ASH BASIN HYDRAULIC ANALYSIS", FIGURES 1 AND 3 (NTH CONSULTANTS, LTD., DATED 2016).
2. BMJ EXTRACTION WELL AS-BUILT SURVEY PERFORMED ON 12/27/2017, AND 3/28/2018.
3. BMJ BATHYMETRIC SURVEY OF BASIN PERFORMED ON 10/07/2019.

PROJECT:
DTE ELECTRIC COMPANY
RIVER ROUGE ELECTRIC GENERATING POWER PLANT
1 BELANGER PARK DRIVE
RIVER ROUGE, MICHIGAN

TITLE:
SITE LAYOUT

DRAWN BY:	S. HAMWAY	PROJ. NO.:	358707.0002.0000
CHECKED BY:	S. PAWLUKIEWICZ	**FIGURE 1**	
APPROVED BY:	V. BUENING		
DATE:	NOVEMBER 2020		

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108
Phone: 734.971.7080
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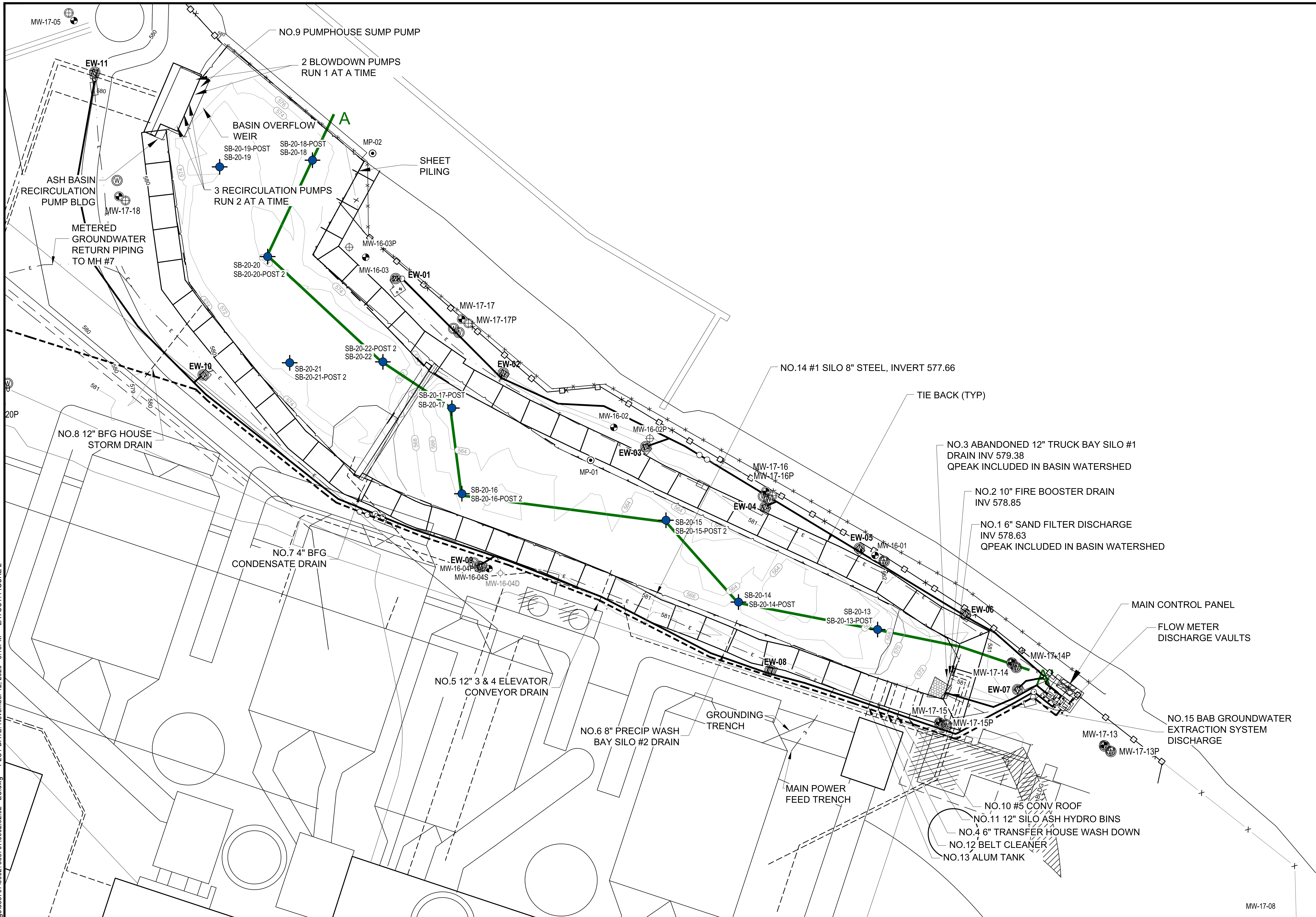
FILE NO.: 358707.0002.02.01 - SL.dwg

22x34 --- USER: ABleecker --- ATTACHED XREFS: BMJ Bathymetric Survey, 2019-10-10; Site Features - EX --- ATTACHED IMAGES:
DRAWING NAME: J:\DTE\River Rouge\358707\0002\ 358707.0002.02.01 - SL.dwg --- PLOT DATE: November 12, 2020 - 3:17PM --- LAYOUT: FIGURE 1

Version: 2017-10-21



LEGEND

- GROUNDWATER EXTRACTION SYSTEM PIPE AND CONDUIT TRENCH
- EXTRACTION WELL VAULT
- ELECTRICAL PULL BOX
- CLEANOUT (TWO-WAY)
- CLEANOUT (ONE-WAY)
- FENCE
- MISCELLANEOUS PIPING
- TIE BACK (TYP)
- SHEET PILING
- DRAIN PIPE
- UPPERMOST AQUIFER MONITORING WELL
- UPPERMOST AQUIFER MONITORING WELL
- MONITORING POINT
- BEDROCK MONITORING WELL
- PERCHED MONITORING WELL
- PERCHED MONITORING WELL
- BAB CLOSURE CONFIRMATORY BORING WITHIN BASIN (FEBRUARY 2020)
- E — ELECTRIC LINE
- DRAINS / ASH LINE
- GAS — GAS LINE
- GAS — GAS LINE ABANDONED OR NO LONGER PRESENT
- SAN — SANITARY SEWER LINE
- W — WATER LINE
- RIPRAP
- 570 — PRE-DREDGE BASIN BOTTOM CONTOUR (SEE NOTE 3)
- CROSS-SECTION A-A'

NOTES

1. BASE MAP AND TOPOGRAPHIC CONTOURS OBTAINED FROM "DTE RIVER ROUGE POWER PLANT- BOTTOM ASH BASIN HYDRAULIC ANALYSIS", FIGURES 1 AND 3 (NTH CONSULTANTS, LTD., DATED 2016).
2. BMJ EXTRACTION WELL AS-BUILT SURVEY PERFORMED ON 12/27/2017, AND 3/28/2018.
3. BMJ BATHYMETRIC SURVEY OF BASIN PERFORMED ON 10/07/2019.

N

0 30 60 90 120

SCALE IN FEET

PROJECT:	DTE ELECTRIC COMPANY RIVER ROUGE ELECTRIC GENERATING POWER PLANT 1 BELANGER PARK DRIVE RIVER ROUGE, MICHIGAN
TITLE:	PRE-CONSTRUCTION CONDITIONS
DRAWN BY:	S. HAMWAY
PROJ. NO.:	358707.0002.0000
CHECKED BY:	S. PAWLUKIEWICZ
APPROVED BY:	V. BUENING
DATE:	NOVEMBER 2020
	FIGURE 2
FILE NO.:	358707.0002.02.02 - EC.dwg

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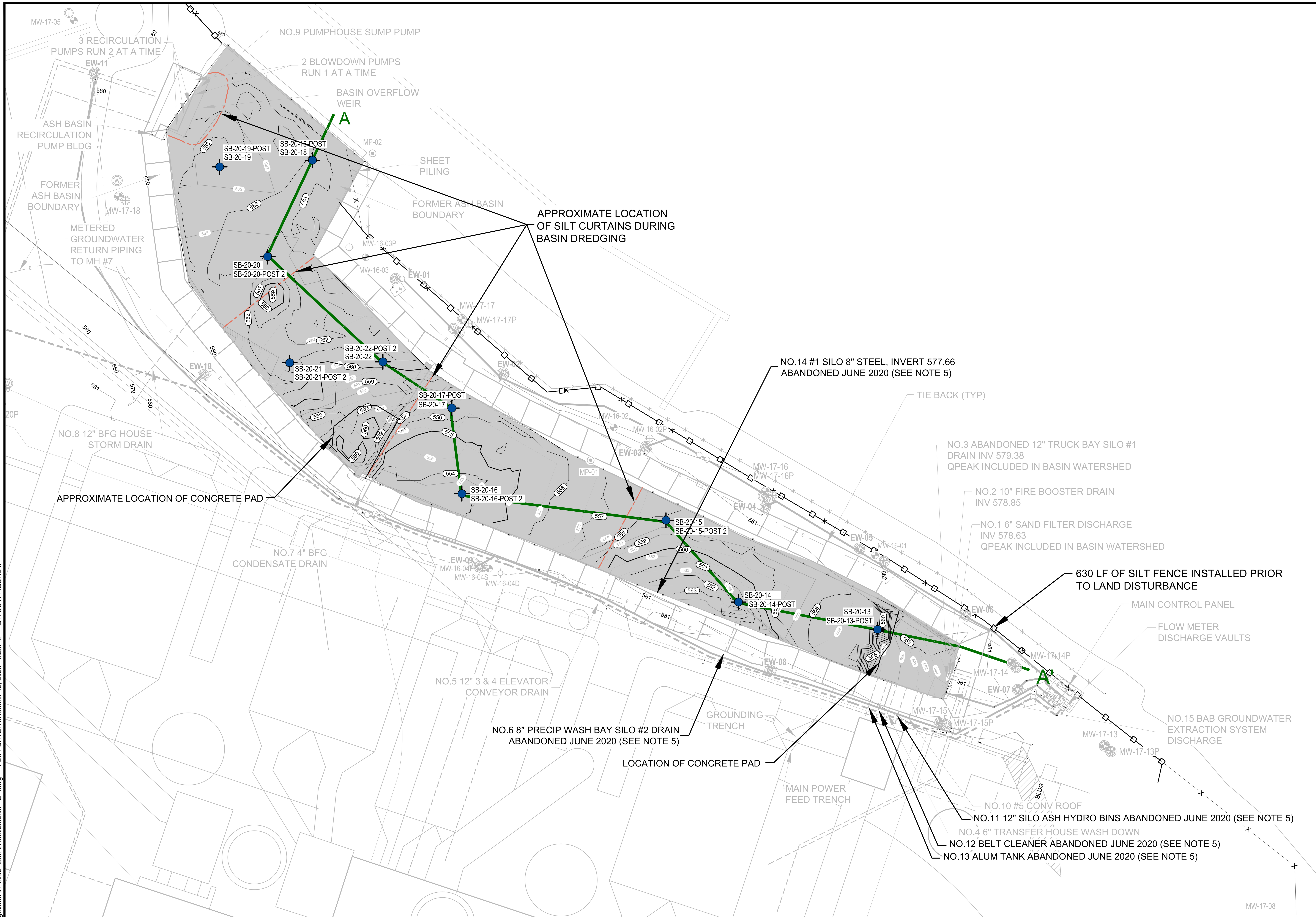
DRAWING NAME: J:\DTE\River Rouge\358707\0002\ 358707.0002.02.02 - EC.dwg — PLOT DATE: November 12, 2020 - 3:18PM — LAYOUT: FIGURE 2



LEGEND

- GROUNDWATER EXTRACTION SYSTEM PIPE AND CONDUIT TRENCH
- EXTRACTION WELL VAULT
- ELECTRICAL PULL BOX
- CLEANOUT (TWO-WAY)
- CLEANOUT (ONE-WAY)
- FENCE
- MISCELLANEOUS PIPING
- DRAIN PIPE
- UPPERMOST AQUIFER MONITORING WELL
- UPPERMOST AQUIFER MONITORING WELL
- MONITORING POINT
- BEDROCK MONITORING WELL
- PERCHED MONITORING WELL
- PERCHED MONITORING WELL
- SB-20-16 — BAB CLOSURE CONFIRMATORY BORING WITHIN BASIN (FEBRUARY 2020)
- SB-20-16-POST 2 — BAB CLOSURE POST -DREDGE CONFIRMATORY BORING (AUGUST 28 AND SEPTEMBER 21, 2020)
- X — SILT FENCE
- E — ELECTRIC LINE
- DRAINS / ASH LINE
- GAS — GAS LINE
- GAS — GAS LINE ABANDONED OR NO LONGER PRESENT
- SAN — SANITARY SEWER LINE
- W — WATER LINE
- RIPRAP
- 570 — PROPOSED EXCAVATION CONTOUR
- 570 — AS-BUILT EXCAVATION CONTOUR (SEE NOTE 4)
- EXCAVATION AREA
- CROSS-SECTION A-A'

NOTES

1. BASE MAP AND TOPOGRAPHIC CONTOURS OBTAINED FROM "DTE RIVER ROUGE POWER PLANT- BOTTOM ASH BASIN HYDRAULIC ANALYSIS", FIGURES 1 AND 3 (NTH CONSULTANTS, LTD., DATED 2016).
2. BMJ EXTRACTION WELL AS-BUILT SURVEY PERFORMED ON 12/27/2017, AND 3/28/2018.
3. BMJ BATHYMETRIC SURVEY OF BASIN PERFORMED ON 10/07/2019.
4. AS-BUILT BATHYMETRIC SURVEY OF BASIN PERFORMED ON 08/31/20 (EAST HALF) AND 09/23/20 (WEST HALF) BY YOUNG CONSULTING LTDM INC.
5. COAL COMBUSTION RESIDUALS (CCR) PROCESS-RELATED INLET PIPES ABANDONED AT PROCESS UNITS BY PHYSICAL BREAK. CONTRACTOR ABANDONED-IN-PLACE BELOW=GRADE PIPING TO BASIN. ALL ABANDONED CCR PROCESS-RELATED PIPES WERE CLEANED VIA JETTING TO REMOVE ANY RESIDUAL FLUIDS, SOLIDS, AND SLUDGES PRIOR TO GROUTING/CAPPING OUTLET POINT.

PROJECT: **DTE ELECTRIC COMPANY**
RIVER ROUGE ELECTRIC GENERATING POWER PLANT
1 BELANGER PARK DRIVE
RIVER ROUGE, MICHIGAN

TITLE:

AS-BUILT EXCAVATION SITE PLAN

DRAWN BY:	S. HAMWAY	PROJ. NO.:	358707.0002.0000
CHECKED BY:	S. PAWLUKIEWICZ		**FIGURE 3**
APPROVED BY:	V. BUENING		
DATE:	NOVEMBER 2020		

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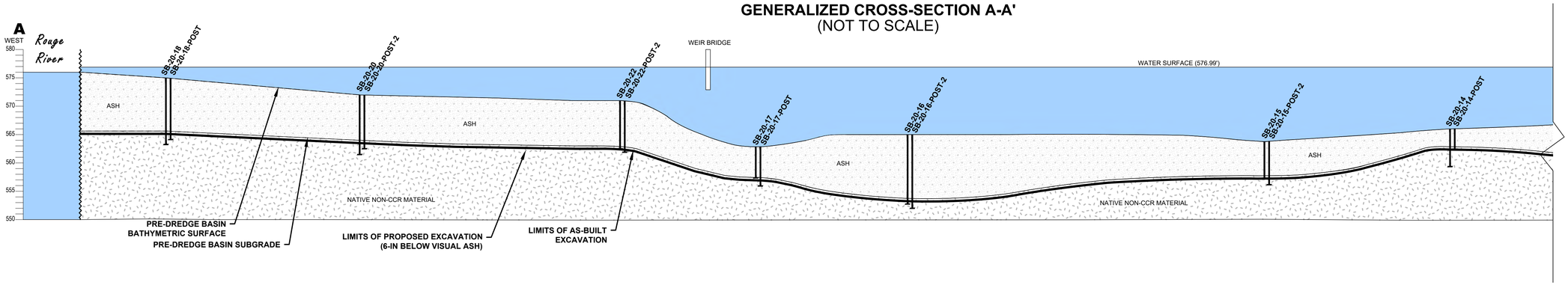
FILE NO.: 358707.0002.02.03 - EP.dwg

22x34 — USER: ABeecker — ATTACHED XREFS: Site Features - EX, PR-Basin Surface, DME As-Built Survey — ATTACHED IMAGES:
DRAWING NAME: J:\DTE\River Rouge\358707\0002\ 358707.0002.02.03 - EP.dwg — PLOT DATE: November 12, 2020 - 3:20PM — LAYOUT: FIGURE 3
Version: 2017-10-21

GENERALIZED CROSS-SECTION A-A'
(NOT TO SCALE)

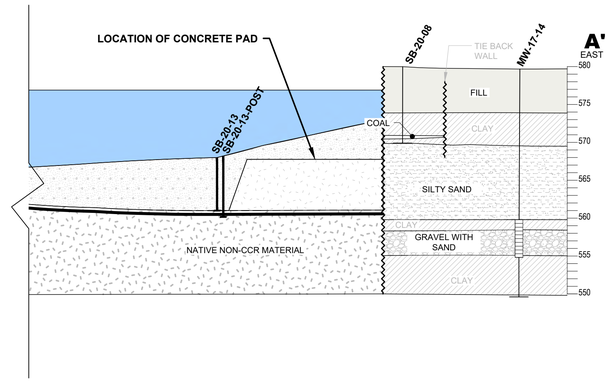


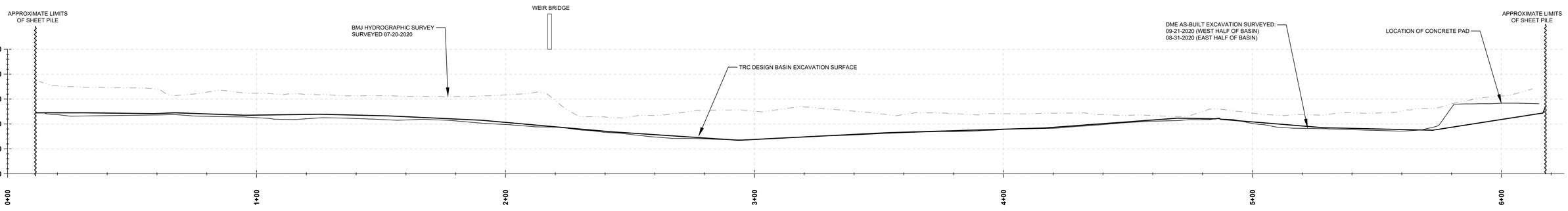
Lithology Key

- FILL
- SILTY SAND
- CLAY
- GRAVEL WITH SAND
- ASH
- COAL
- NATIVE NON-CCR MATERIAL
- PEAT
- WATER

LEGEND

- STRATEGRAPHIC BOUNDARY (DASHED WHERE INFERRED)
- MONITORING WELL / BORING
- WELL SCREEN INTERVAL
- END OF BORING
- SHEET PILING





BASIN SURVEY CROSS SECTION A-A'

PROFILE SCALE:
HORIZONTAL 0 20 SCALE: 1" = 20'
VERTICAL 0 20 SCALE: 1" = 20'

VERTICAL EXAGGERATED = 1X

PROJECT:	DTE ELECTRIC COMPANY RIVER ROUGE ELECTRIC GENERATING POWER PLANT 1 BELANGER PARK DRIVE RIVER ROUGE, MICHIGAN
TITLE:	GENERALIZED CROSS-SECTION A-A'
DRAWN BY:	S. HAMWAY
CHECKED BY:	S. PAWLUKIEWICZ
APPROVED BY:	V. BUENING
DATE:	NOVEMBER 2020
PROJ. NO.:	358707.0002.0000
	FIGURE 4

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FILE NO.: 358707.0002.02.XS.dwg

Appendix A
Soil Boring Logs

SOIL BORING LOG

BORING NO. SB-20-13

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	18.0	4

Boring Location:	Personnel	Drilling Equipment:
Interior of basin, 55 feet from east end of basin, 15 feet from north shore of basin.	Logged By - Jake Krenz Driller - Dave Mokma	Vibra Core

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to sediment from water surface approximately 10 feet.			Water surface elevation is 576.9 feet.
			2				
			4				
			6				
			8				
1 CS	40		10	**ASH** Mostly coal ash, black (10YR 2/1), wet, loose.			566.3 feet.
			12				
			14				
			16				
			18	Slag present in the bottom of the sample. End of boring at 18.0 feet below the water surface.			Native Material Elevation is 559.3 feet.
			20				
			22				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

Signature:

Firm: TRC 1540 Eisenhower Place
Ann Arbor, MI 48108

734-971-7080 Phone
734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-13 Post

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	8/29/2020	8/29/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	20.1	3

Boring Location: Same location as SB-20-13.

Personnel
Logged By - Jake Krenz
Driller - Dave Mokma

Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:
River Rouge	Wayne	Michigan

Water Level Observations:
While Drilling: Date/Time Depth (ft bgs)
After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to native material from water surface is 20.25 feet.			Water surface elevation is 578.0 feet.
			2				
			4				
			6				
			8				
			10				
			12				
			14				
			16				
			18				
			20				
1 UNDIST	100			**CLAY** mostly clay, low to medium plasticity, gray (10YR 5/1), saturated, soft.	CL		Native Material Elevation is 557.8 feet.
				GRAVEL WITH SAND mostly medium gravel, some medium to coarse sand, brown (10YR 5/3), saturated, loose.	GW		
			22	End of Boring 10 inches below the bottom of the basin.			

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

Signature:

Firm: TRC 1540 Eisenhower Place
Ann Arbor, MI 48108
734-971-7080 Phone
734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-14

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	19.5	4

Boring Location: Interior of basin, 135 feet from east end of basin, 15 feet from south shore of basin.

Personnel
Logged By - Jake Krenz
Driller - Dave Mokma

Drilling Equipment: Vibra Core

Civil Town/City/or Village:	County:	State:
River Rouge	Wayne	Michigan

Water Level Observations:
While Drilling: Date/Time Depth (ft bgs)
After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to sediment from water surface is approximately 11 feet.			Water surface elevation is 576.9 feet.
1 CS	90		10	**ASH** Mostly coal ash, black (10YR 2/1), wet, loose.			566.0 feet.
			14	**SAND** Mostly fine to medium sand, gray (10YR 5/1), wet, medium dense.	SP		Native Material Elevation is 563.0 feet.
			16	**CLAYEY SAND** Mostly fine to medium sand, little to some clay, low plasticity, gray (10YR 5/1), moist to wet, soft to medium stiff.	CL		
			18	End of boring at 17.03 feet below the water surface.			
			20				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

Signature:

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Ann Arbor, MI 48108
734-971-7080 Phone
734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-14 Post

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	8/29/2020	8/29/2020	367565.0002.0000

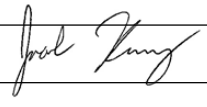
Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	16.3	3

Boring Location: Same location as SB-20-14.	Personnel: Logged By - Jake Krenz; Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations: While Drilling: Date/Time / Depth (ft bgs); After Drilling: Date/Time / Depth (ft bgs)
River Rouge	Wayne	Michigan	

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to native material from water surface is 16.88 feet.			Water surface elevation is 578.0 feet.
			2				
			4				
			6				
			8				
			10				
			12				
			14				
			16				
1 UNDIST	97		17	**CLAY** mostly clay, medium plasticity, gray (10YR 5/1), moist to saturated, soft.	CL		Native Material Elevation is 561.1 feet.
			18	**GRAVEL WITH SAND** mostly medium gravel, some coarse sand, brown (10YR 5/3), saturated, loose.	GP		
				End of boring at 5 inches below the bottom of the basin.			
			20				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

Signature: 

Firm: TRC 1540 Eisenhower Place, Ann Arbor, MI 48108 734-971-7080 Phone 734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-15

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	19.5	4

Boring Location:	Personnel	Drilling Equipment:
Interior of basin, 195 from east end of basin, 10 feet from north shore of basin.	Logged By - Jake Krenz Driller - Dave Mokma	Vibra Core

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
				Water Depth to sediment from water surface approximately 13 feet.			Water surface elevation is 576.9 feet.
			5				
1 CS	90		10				
				ASH Mostly coal ash, black (10YR 2/1), wet, loose.			564.3 feet.
			15				
				GRAVEL WITH SAND Mostly gravel, little to some medium to coarse sand, dark gray, (10YR 4/1), wet, loose.	GP		Native Material Elevation is 559.3 feet.
			20	End of boring 19.3 feet below the water surface.			

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

Signature:

Firm: TRC 1540 Eisenhower Place
Ann Arbor, MI 48108

734-971-7080 Phone
734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-15 Post 2

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	8/29/2020	8/29/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	20.5	

Boring Location: Same location as SB-20-15.	Personnel Logged By - Jake Krenz Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
				Water Depth to native material from water surface is 19.95 feet.			Water surface elevation is 578.0 feet.
			5				
			10				
			15				
			20	**GRAVEL WITH SAND** mostly medium gravel, some medium to coarse sand, dark gray (10YR 4/3), saturated, loose.	GW		Native Material Elevation is 558.1 feet.
1 UNDIST	100			**CLAY** mostly clay, low to medium plasticity, brown (10YR 5/3), saturated, soft.	CL		
				End of boring at 19 inches below the bottom of the basin.			

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

Signature:

Firm: TRC 1540 Eisenhower Place
Ann Arbor, MI 48108

734-971-7080 Phone
734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-16

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	19.5	4

Boring Location:	Personnel	Drilling Equipment:
Interior of basin, 60 feet east of weir bridge, 15 feet from south shore of basin.	Logged By - Jake Krenz Driller - Dave Mokma	Vibra Core

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
				Water Depth to sediment from water surface approximately 11 feet.			Water surface elevation is 576.9 feet.
			5				
1 CS	55		10				
				ASH Mostly coal ash, black (10YR 2/1), wet, loose.			565.6
			15				
				SAND Mostly fine to medium sand, gray (10YR 5/1), moist to wet, loose, shell fragments present.	SP		Native Material Elevation is 554.1 feet.
			20	End of boring 19.5 feet below the water surface.			
			25				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

Signature:

Firm: TRC 1540 Eisenhower Place
Ann Arbor, MI 48108

734-971-7080 Phone
734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-16 Post 2

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	8/29/2020	8/29/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	25.1	3

Boring Location: Same location as SB-20-16.

Personnel
Logged By - Jake Krenz
Driller - Dave Mokma

Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:
River Rouge	Wayne	Michigan

Water Level Observations:
While Drilling: Date/Time Depth (ft bgs)
After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
				Water Depth to native material from water surface is 24.33 feet.			Water surface elevation is 578.0 feet.
			5				
			10				
			15				
			20				
1 UNDIST	100		25	**SAND** mostly fine to medium sand, gray (10YR 5/1), saturated, loose.	SP		Native Material Elevation is 553.6 feet.
				CLAY mostly clay, low to medium plasticity, gray (10YR 5/1), saturated, soft.	CL		
				End of boring at 21 inches below the bottom of the basin.			

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

Signature:

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Ann Arbor, MI 48108
734-971-7080 Phone
734-971-9022 Fax

SOIL BORING LOG

BORING NO. SB-20-17

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	19.5	4

Boring Location:	Personnel	Drilling Equipment:
Interior of basin, 30 feet east of bridge weir, 15 feet from north shore of basin.	Logged By - Jake Krenz Driller - Dave Mokma	Vibra Core

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
				Water Depth to sediment from water surface approximately 14 feet.			Water surface elevation is 576.9 feet.
1 CS	70		5 10				
			15	**ASH** Mostly coal ash, black (10YR 2/1), wet, loose.			562.6 feet.
			20	End of boring 19.5 feet below the water surface.			Native Material Elevation is 557.1 feet. Evidence of sand at the bottom of the sampler.

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

Signature:

Firm: TRC 1540 Eisenhower Place
Ann Arbor, MI 48108

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SOIL BORING LOG

BORING NO. SB-20-17 Post

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	8/29/2020	8/29/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	22.0	3

Boring Location: Same location as SB-20-17.	Personnel Logged By - Jake Krenz Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
				Water Depth to native material from water surface is 21.5 feet.			Water surface elevation is 578.0 feet.
			5				
			10				
			15				
			20				
1 UNDIST	100			**CLAY** mostly clay, low to medium plasticity, brown (10YR 5/3), saturated, soft.	CL		Native Material Elevation is 556.5 feet.
				End of boring at 1.5 feet below the bottom of the basin.			

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

Signature: Jake Krenz

Firm: TRC 1540 Eisenhower Place
Ann Arbor, MI 48108

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SOIL BORING LOG

BORING NO. SB-20-18

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	14.0	4

Boring Location:	Personnel	Drilling Equipment:
Interior of basin, 60 feet east of pump house, 30 feet south of river.	Logged By - Jake Krenz Driller - Dave Mokma	Vibra Core

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to sediment from water surface is approximately 2 feet.			Water surface elevation is 576.9 feet.
			2				
1 CS	65		4	**ASH** Mostly coal ash, black (10YR 2/1), wet, loose.			574.8 feet.
			6				
			8				
			10				
			12	**SILTY CLAY** Mostly clay, little to some silt, low plasticity, gray (10YR 5/1), wet, very soft.	CL-ML		Native Material Elevation is 565.8 feet.
			14	**SILTY SAND** Mostly fine sand, little silt, gray (10YR 5/1), wet, loose.	ML		
				End of boring 14.0 feet below the water surface.			
			16				
			18				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

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SOIL BORING LOG

BORING NO. SB-20-18 Post

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	9/21/2020	9/21/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	15.0	3

Boring Location: Same location as SB-20-18.	Personnel: Logged By - Jake Krenz; Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations: While Drilling: Date/Time / Depth (ft bgs); After Drilling: Date/Time / Depth (ft bgs)
River Rouge	Wayne	Michigan	

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to native material from water surface is 12.92 feet.			Water surface elevation is 576.4 feet.
			2				
			4				
			6				
			8				
			10				
			12				
1 UNDIST	100		14	**CLAY** mostly clay, low to medium plasticity, gray (10YR 5/1), saturated, soft.	CL		Native Material Elevation is 563.5 feet.
				SANDY CLAY mostly clay, some fine sand, low plasticity, gray (10YR 5/1), saturated, soft.	CL		
				End of boring at 18 inches below the bottom of the basin.			
			16				
			18				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

Signature:

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SOIL BORING LOG

BORING NO. SB-20-19

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	17.0	4

Boring Location: Interior of basin, 60 feet south of river, 30 feet from northwest sheet piling.

Personnel
Logged By - Jake Krenz
Driller - Dave Mokma

Drilling Equipment: Vibra Core

Civil Town/City/or Village:	County:	State:
River Rouge	Wayne	Michigan

Water Level Observations:
While Drilling: Date/Time Depth (ft bgs)
After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to sediment from water surface approximately 5 feet.			Water surface elevation is 576.9 feet.
			2				
			4				
			6	**ASH** Mostly coal ash, black (10YR 2/1), wet, loose.			571.6 feet.
1 CS	90		8				
			10				
			12				
			14	**SAND** Mostly fine sand, gray (10YR 5/1), wet, loose.	SP		Native Material Elevation is 564.6 feet.
			16	**SANDY CLAY** mostly clay, little to some fine to medium sand, low plasticity, brown (10YR 5/3), moist soft.	ML		
			18	End of boring 17.0 feet below the water surface.			

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

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SOIL BORING LOG

BORING NO. SB-20-19 Post

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	9/21/2020	9/21/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	16.6	3

Boring Location: Same location as SB-20-19.	Personnel Logged By - Jake Krenz Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to native material from water surface is 13.95 feet.			Water surface elevation is 576.4 feet.
			2				
			4				
			6				
			8				
			10				
			12				
			14				Native Material Elevation is 562.5 feet.
1 UNDIST	100			**CLAY** mostly clay, low plasticity, dark gray (10YR 4/3), saturated, very soft.	CL		
			16	**SANDY CLAY** mostly clay, little to some fine to medium sand, low plasticity, brown (10YR 5/3), moist soft.	CL		
				End of boring at 24 inches below the bottom of the basin.			
			18				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

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SOIL BORING LOG

BORING NO. SB-20-20

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	17.5	4

Boring Location: Interior of basin, approximate middle of west side of basin.	Personnel Logged By - Jake Krenz Driller - Dave Mokma	Drilling Equipment: Vibra Core

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to sediment from water surface approximately 5 feet.			Water surface elevation is 576.9 feet.
			2				
			4				
			6	**ASH** Mostly coal ash, black (10YR 2/1), wet, loose.			572.4
1 CS	75		8				
			10				
			12				
			14				
			16	**SANDY SILT** Mostly silt, little to some fine sand, trace to few clay, gray (10YR 5/1), wet, loose.	ML		Native Material Elevation is 564.4 feet.
			18	End of boring 17.2 feet below the water surface.			

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

Signature:

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SOIL BORING LOG

BORING NO. SB-20-20 Post 2

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	9/21/2020	9/21/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	15.8	3

Boring Location: Same location as SB-20-20.	Personnel Logged By - Jake Krenz Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to native material from water surface is 13.68 feet.			Water surface elevation is 576.4 feet.
			2				
			4				
			6				
			8				
			10				
			12				
1 UNDIST	100		14	**CLAY** mostly clay, low to medium plasticity, gray (10YR 5/1), saturated, soft.	CL		Native Material Elevation is 562.7 feet.
				SAND mostly fine to medium sand, gray (10YR 5/1), saturated, loose.	SP		
			16	End of boring at 18 inches below the bottom of the basin.			
			18				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

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SOIL BORING LOG

BORING NO. SB-20-21

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	16.5	4

Boring Location: Interior of basin, 65 west of weir bridge, 15 feet from south shore of basin.

Personnel
Logged By - Jake Krenz
Driller - Dave Mokma

Drilling Equipment: Vibra Core

Civil Town/City/or Village:	County:	State:
River Rouge	Wayne	Michigan

Water Level Observations:
While Drilling: Date/Time Depth (ft bgs)
After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
				Water Depth to sediment from water surface is approximately 5 feet.			Water surface elevation is 576.9 feet.
			2				
			4				
				ASH Mostly coal ash, black (10YR 2/1), wet, loose.			571.7 feet.
1 CS	100		6				
			8				
			10				
			12				
			14				
				SAND Mostly fine to medium sand, gray (10YR 5/1), wet, loose.	SP		Native Material Elevation is 566.5 feet.
			16	**SANDY SILT** Mostly silt, little to some fine sand, trace to few clay, gray (10YR 5/1), wet, loose.	ML		
				End of boring 16.5 feet below the water surface.			
			18				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

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SOIL BORING LOG

BORING NO. SB-20-21 Post 2

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	9/21/2020	9/21/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	16.5	3

Boring Location: Same location as SB-20-21.	Personnel Logged By - Jake Krenz Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to native material from water surface is 15.30 feet.			Water surface elevation is 576.4 feet.
			2				
			4				
			6				
			8				
			10				
			12				
			14				
1 UNDIST	101		16	**SAND** mostly fine to medium sand, gray (10YR 5/1), saturated, loose.	SP		Native Material Elevation is 561.1 feet.
				End of boring at 7 inches below the bottom of the basin.			
			18				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

Signature:

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SOIL BORING LOG

BORING NO. SB-20-22

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	2/18/2020	2/18/2020	358707.0001

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Vibra Core	---	---	16.5	4

Boring Location: Interior of basin, 30 feet west of weir bridge, 15 feet from north shore of basin.

Personnel
Logged By - Jake Krenz
Driller - Dave Mokma

Drilling Equipment: Vibra Core

Civil Town/City/or Village:	County:	State:
River Rouge	Wayne	Michigan

Water Level Observations:
While Drilling: Date/Time Depth (ft bgs)
After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to sediment from water surface is approximately 5 feet.			Water surface elevation is 576.9 feet.
			2				
			4				
			6	**ASH** Mostly coal ash, black (10YR 2/1), wet, loose.			571.3
1 CS	90		8				
			10				
			12				
			14				
			16	**SAND** Mostly fine sand, trace to few silt, trace to few clay, gray (10YR 5/1), wet, loose.	SP		Native Material Elevation is 563.3 feet.
				End of boring 16.5 feet below the water surface.			
			18				
			20				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 358707.0001 2/1/21

Signature:

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SOIL BORING LOG

BORING NO. SB-20-22 Post 2

Facility/Project Name:	Date Drilling Started:	Date Drilling Completed:	Project Number:
DTE Electric Company Bottom Ash Basin Closure	9/21/2020	9/21/2020	367565.0002.0000

Drilling Firm:	Drilling Method:	Surface Elev. (ft)	TOC Elevation (ft)	Total Depth (ft bgs)	Borehole Dia. (in)
Job Site Services	Direct Push	---	---	17.5	3

Boring Location: Same location as SB-20-22.	Personnel Logged By - Jake Krenz Driller - Dave Mokma	Drilling Equipment: Hand Installed

Civil Town/City/or Village:	County:	State:	Water Level Observations:
River Rouge	Wayne	Michigan	While Drilling: Date/Time Depth (ft bgs) After Drilling: Date/Time Depth (ft bgs)

SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
			0	**Water** Depth to native material from water surface is 15.88 feet.			Water surface elevation is 576.4 feet.
			2				
			4				
			6				
			8				
			10				
			12				
			14				
1 UNDIST	100		16	**CLAY** mostly clay, trace fine sand, low plasticity, very dark gray (10YR 4/1), saturated, very soft.	CL		Native Material Elevation is 560.5 feet.
				SAND mostly fine sand, trace to few clay, gray (10YR 5/1), saturated, loose to medium dense.	SP		
			18	**CLAY** mostly clay, low to medium plasticity, gray (10 YR 5/1), moist, soft to medium stiff.	CL		
				End of boring at 12 inches below the bottom of the basin.			
			20				

SOIL BORING WELL CONSTRUCTION LOG DTE EC RRPP BAB CLOSURE CONFIRMATORY BORINGS(1).GPJ 367565.0002.0000 2/1/21

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