Prepared for

DTE Electric Company
One Energy Plaza
Detroit, Michigan 48226

2021 ANNUAL INSPECTION REPORT VERTICAL EXTENSION LANDFILL

MONROE POWER PLANT

Monroe, Michigan

Prepared by

Geosyntec consultants

engineers | scientists | innovators

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CHE8242V

January 2022

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1. INTRODUCTION

1.1 Overview

This 2021 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants of Michigan, Inc. (Geosyntec) to provide the results of the annual inspection of the coal combustion residuals (CCR) vertical extension landfill (Landfill) at the DTE Electric Company (DTE) Monroe Power Plant disposal facility. The annual inspection has been prepared to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule published on April 17, 2015, as amended 30 July 2018 (40 CFR 257.84). Under the CCR Rule, the Landfill is an "existing landfill" per 40 CFR 257.53 and must be inspected by a qualified professional engineer on a periodic basis, not to exceed one year.

The Landfill is located about one mile southwest of the Monroe Power Plant near Monroe, Michigan, and is bounded on the east by Lake Erie and the Plant discharge canal, on the west by Interstate Highway 75 (I-75), on the south by an agricultural field, and on the north by residential properties and Plum Creek (see **Figure 1**). It is constructed on top of fly ash that was previously deposited in the Monroe Ash Basin (Ash Basin); the Ash Basin is a separate CCR surface impoundment. The combined Landfill and Ash Basin are considered the "Permitted Area".

Landfill Phase 1 construction began in August 2015. The Michigan Department of Environment, Great Lakes, And Energy (EGLE, formerly Michigan Department of Environmental Quality (MDEQ)), licensed the area for disposal via email communication on 14 October 2015, and CCR was placed in the unit beginning 16 October 2015. CCR disposal continued after 19 October 2015[1] as witnessed during subsequent annual inspections.

1.2 Purpose

The purpose of the inspection under the CCR Rule [40 CFR 257.84(b)(1)] is:

> "…to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

[1] Based on the CCR Rule, existing landfill is "…landfill that receives CCR both before and after October 19, 2015, or for which construction commenced prior to October 19, 2015 and receives CCR on or after October 19, 2015…".

(i) A review of the available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of an inspection by a qualified person, and results of previous annual inspections); and

(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit."

The purpose is accomplished through periodic visual inspection (and photo-documentation) of the Landfill, review of instrumentation monitoring data and evaluations intended to detect signs of instability, and review of construction certification documentation, and review of operating records since the 2020 annual inspection.

1.3 Report Organization

The remainder of this report is organized as follows:

- Section 2 – Review of available information: summarizes various historical documents that were reviewed as part of this inspection;
- Section 3 – Facility Description: provides information about the facility;
- Section 4 – Visual Inspection Results: summarizes visual observations recorded during the inspection of the Landfill;
- Section 5 – Instrumentation Monitoring: provides information about the instrumentation monitoring;
- Section 6 – Operation Activities: describes the operations organization and activities;
- Section 7 – Evaluation: evaluates the results of the annual inspection; and
- Section 8 – Conclusions and Certification: provides the overall conclusions of the annual inspection and certification of the AIR.

1.4 Terms of Reference

The annual visual inspection was performed by Mr. Omer Bozok, P.E. of Geosyntec, the qualified professional engineer under the CCR Rule. His resume is provided in **Appendix A**. DTE's "qualified person", who conducts the weekly inspections, accompanied Mr. Bozok.

This report was prepared by Mr. Bozok, P.E. of Geosyntec, and reviewed by Mr. John Seymour, P. E. of Geosyntec.

2. REVIEW OF AVAILABLE INFORMATION

Geosyntec reviewed the following documents for the annual inspection. These documents are summarized in the table below.

Table 1: Available Information Reviewed for Annual Inspection

Title	Prepared by	Date	Content
Run-on/Run-off Control System Plan for Coal Combustion Residuals (CCR) Disposal Facility-Monroe Fly Ash Basin Vertical Extension, Existing Landfill	AECOM	17 October 2016	Describes the Run-on and run-off control features for the vertical extension. Documenting how the plan meets the CCR Rule. Plan remains unchanged.
Fugitive Dust Plan	DTE	2019	Presents dust control measures. Plan remains unchanged.
Annual Fugitive Dust Report	DTE	November 2020	Annual report of dust control actions, any complaints, and corrective actions taken, if any. Completed pursuant to 40 CFR 257.80(c). Descriptions and Actions Taken to Control CCR Fugitive Dust.
Weekly Inspection Reports	DTE	2020-2021	Qualified person inspections from May 2020 through April 2021
2020 Annual Inspection Report	Geosyntec	January 2020	Provides the results of the 2020 annual inspection.

Table 1 (continued)

Title	Prepared by	Date	Content
Closure Plan	AECOM	April 2019	Documenting how the plan will meet the CCR Rule. Plan remains unchanged.
Post-Closure Plan	AECOM	October 2016	Documenting how the plan will meet the CCR Rule. Plan remains unchanged.
Groundwater Monitoring System Summary Report	TRC	October 2017	Information on groundwater monitoring system components and details for the Monroe Ash Basin and Vertical Extension Landfill
Groundwater Statistical Evaluation Plan	TRC	October 2017	Basis for statistical evaluation for groundwater monitoring events for the Monroe Ash Basin and Vertical Extension Landfill
Annual Groundwater Monitoring Report	TRC	January 2021	Summary of annual groundwater monitoring results for 2019 for the Monroe Ash Basin and Vertical Extension Landfill
Location Restrictions Demonstration	TRC	September 2018	Provides details of location restrictions demonstration for the Landfill
Instrumentation Monitoring and Maintenance Manual, Rev. D.	Geosyntec	January 2021	Provides details of operations, monitoring, action levels and items for the Landfill
Operations Plan Drawings, Rev. D.	Geosyntec	January 2021	Provides details of operations for the Landfill

3. FACILITY DESCRIPTION

3.1 Overall Site Description

The permitted facility description includes a 79-acre vertical extension landfill (Landfill) and a 331-acre fly ash basin (Ash Basin) for a permitted area of 410 acres. The permitted area is in Section 16, Township 7 South, Range 9 East, of Monroe Township, Michigan shown in **Figure 1**. The Landfill is a coal ash landfill, and the Ash Basin is a coal ash surface impoundment under Michigan Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994, Operating License No. 9579.

The Landfill is designated as a 79 acre "dry" disposal area located on top of an area of the Ash Basin that has been filled with CCR approximately to the originally planned final grade. The site investigation conducted in 2015 identified the fly ash below the Landfill to be approximately 50-ft deep from the preconstruction ground surface, down to an elevation of approximately 563 ft[2]. The water level in the Ash Basin is maintained at or below El. 609 ft.

The Landfill is licensed to receive bottom ash, fly ash, flue gas desulfurization (FGD) scrubber wastewater sludge, solidified with fly ash or bottom ash, synthetic gypsum, inert material, and any other waste allowed by the Rule or obtained through specific regulatory approval (Permit Modification Report, Golder, 2015).

Phase 1 of the Landfill, finished in September 2015, is the western 11-acre portion shown in **Figure 1**. Record drawings of the construction were provided in Appendix B of the 2015 Annual Inspection Report. Phase 2 cell construction was a continuation of Phase 1 construction and has been completed and the certification report was sent to the EGLE in November 2017. EGLE provided approval on 24 January 2018 for CCR disposal into Phase 2.

3.2 Design

The design was provided by Golder Associates in the Permit Modification report (16 April 2015). The components of the Landfill include:

- Prepared subgrade consisting of in-situ sluiced fly ash and general fill;

[2] Elevations in this AIR are reported in the National Geodetic Vertical Datum of 1929 (NGVD29).

- 30-inch thick pore pressure relief layer (PRL), comprised from top to bottom:
    - 24-inch thick layer of bottom ash or limestone aggregate,
    - Perforated collection piping encased in a filter fabric ("sock") within the 24-inch thick bottom ash/limestone aggregate,
    - Separation geotextile made of non-woven, needle-punched geotextile, and
    - 6-inch thick embedment layer;
- Monitoring system consisting of 12 settlement plates, 13 vibrating wire piezometers, and 6 slope inclinometers;
- Perimeter berm; and
- Perimeter collection swale.

3.3 Construction

Construction of Phase 1 was certified by David List, P.E., of Golder & Associates on September 19, 2015; the certification is contained in the Phase 1 Construction Documentation Report (Golder).

Phase 2 construction is completed, and the certification report was sent to the EGLE in November 2017. EGLE provided approval on 24 January 2018 for CCR disposal. CCR material began placement within Phase 2 in 2020.

4. VISUAL INSPECTION RESULTS

The annual inspection was completed on 7 April 2021. The completed inspection report form and photographs are presented in **Appendix B**.

In general, the following visual observations were made:

(i) Perimeter swales have a minimal slope, and standing water was observed in some areas but did not appear to impede overall ability to drain. Water was contained in the swales and levels were below the pore pressure relief pipe outlets;

(ii) A culvert was installed at the intersection of the R2 and R4 perimeter swales in the southeast corner of the Landfill. The culvert drains water from the R3 and R4 perimeter channels. The pipes were not draining at the time of the inspection;

(iii) Vegetation was present on the exterior perimeter berm slopes, but some minor erosion rills were observed; and

(iv) Many of the pore pressure relief pipes were observed to have little to some sediment build-up at the outlets, but the sediment does not appear to impede overall ability to drain. No water was observed to be draining out of the pipes.

In summary, no visual and monitoring evidence of instability or detrimental settlement was noted. The entire Landfill, including the perimeter berms and swales, are located within the interior drainage area of the Ash Basin. Any potential sediments from erosion will be deposited in the Ash Basin. Any potential run-off will be managed under the NPDES permit for the Ash Basin.

As of August 2020, Geosyntec estimated the total volume of CCRs in the Landfill above the geotextile separation embedment layer to be approximately 200,000 CY, based on data provided by DTE.

5. INSTRUMENTATION MONITORING

5.1 Slope Inclinometers

Six slope inclinometers (SIs) are present along the west and south sides of the Landfill perimeter and were constructed within the existing CCR material in the Monroe Ash Basin. The SIs are designated as FI-1 through FI-4, SI-9, and SI-10, as shown in **Figure 2**. Readings for the SIs were obtained at least monthly.

5.2 Piezometers

Thirteen piezometers (PZs) are present below the Landfill overliner at the locations shown on **Figure 2**. PZs have been incorporated into the existing continuous monitoring system established for the Monroe Ash Basin. PZ readings are collected and automatically uploaded to the Cloud system and interpreted as part of the continuous monitoring system for the Monroe Ash Basin. Readings for the PZ were obtained at least every other week (minimum of twice a month).

5.3 Settlement Plates

Settlement plates (SPs) are generally co-located with PZs as shown on **Figure 2**. The SPs are founded on the surface of the Landfill overliner. SP readings were obtained every other week, twice a month.

6. OPERATION ACTIVITIES

6.1 Operations Organization

The Landfill is operated by DTE. The responsible personnel include:

- Michael Dunlap – Energy Supply, Ash Manager, Monroe Site Operations
- Lisa Lockwood, and Amanda Kosch – DTE Environmental Management and Safety (EM&S), Monroe Power Plant, Inspections

6.2 Operation Activities

Operation details are provided in the Inspection, Monitoring, Maintenance Manual Rev. D. (Geosyntec, 2021) and Operations Plan Drawings Rev. D. (Geosyntec, 2021), together referred to as "Operations Plan". The following operation activities are described in the Operations Plan:

1. Hours of Operation
2. Site Access and Barriers
3. Traffic Routing
4. Nuisance Control
5. Temporary Storage
6. Proposed Waste Types
7. Personnel and Training
8. Recordkeeping
9. Equipment
10. Filling Operations
11. Intermediate Cover Use
12. Water

13. Bottom Ash
14. Soil Cover
15. Chemical Sprays
16. Geotextiles and Rolled Erosion Control Products
17. Intermediate Cover Use Summary
18. Ditch Maintenance

In addition, the following are specifically currently required by the CCR Rule:

- Weekly inspections by a qualified person;
- Dust control in accordance with the Fugitive Dust Control Plan;
- Annual Fugitive Dust Control Report; and
- Annual Groundwater Monitoring and Corrective Action Report.

6.3 Run-On/Run-Off Control System Plan for CCR Disposal Facility Observations

It was identified that the overall intent of the Operations Plan was being followed. Run-on and Run-off are controlled by the perimeter swale, and it appeared to be in working condition.

7. EVALUATION

7.1 Design

The design was completed by Golder in 2015 and it is documented in the 16 April 2015 Permit Modification Report and signed by a professional engineer licensed in Michigan. The design appears to be consistent with recognized and generally accepted good engineering standards, based on available information.

7.2 Construction

Construction of Phase 1 was completed in September 2015 and is documented in the September 16, 2015 Construction Documentation report, which was signed by a professional engineer licensed in Michigan. Construction is consistent with recognized and generally accepted good engineering standards, based on available information.

Construction of subsequent phases east of the completed portion was completed at the time of inspection, and the certification report was submitted to the EGLE in November 2017. EGLE provided approval on January 24, 2018 for CCR disposal. Construction is consistent with recognized and generally accepted good engineering standards, based on available information.

7.3 Maintenance

Regular maintenance activities were performed on the continuous monitoring system to keep the system in working condition.

7.4 Operations

7.4.1 Operations Plan

Operations were consistent with recognized and generally accepted good engineering standards.

7.4.2 Fugitive Dust Control Plan

A Fugitive Dust Control Plan was provided by DTE and is posted on the DTE CCR publicly accessible website. The plan was revised in 2020.

The annual fugitive dust control report for 2021 was not completed at the time of inspection, but the report from November 2019 through November 2020 was reviewed. No dusting occurred during the site inspection to assess whether the plan was being implemented. Water trucks were used to control dust on the roads. In the absence of contrary information, dust control is consistent

with recognized and generally accepted good engineering standards, based on available information and observations. Dusting appears to be managed appropriately.

7.4.3 Run-on and Run-off Control

Run-on and run-off control is maintained by the perimeter swale and perimeter berm shown in the design and as constructed. The plan is posted on the CCR website and is consistent with good engineering standards, based on available information.

7.4.4 Inspections

Weekly inspections are completed and documented by qualified persons. The qualified persons were initially trained in April 2015, and new inspectors were trained by DTE personnel. Weekly inspections for the Landfill are conducted concurrently with the Ash Basin inspections. DTE reported that there was no mention of deficiencies for the Landfill in the weekly inspections.

The inspection reports were reviewed through the end of March 2021. No indications of any significant deficiencies were identified in the weekly inspections. Inspections were consistent with recognized and generally accepted good engineering standards, based on available information.

7.4.5 Monitoring

The operations instrumentation monitoring included the measurement of piezometers, settlement plates, and inclinometers. Data was not collected between late October 2015 through early February 2016. The data from February 2016 through April 2021 was reviewed, and no significant findings were identified.

Groundwater monitoring is being implemented as part of the Monroe Ash Basin operations.

7.4.6 Annual Visual Inspection

The annual visual inspection did not identify any evidence of structural weakness or instability.

The four-foot-high perimeter berm and swale had some vegetation growth and minor erosion features were identified on the exterior slopes of the berm. However, the design approved by EGLE did not include a requirement to vegetate the berm and swale. Any potential sediments from erosion will be deposited in the Ash Basin. Any potential run-off will be managed under the NPDES permit for the Ash Basin.

8. CONCLUSIONS AND CERTIFICATION

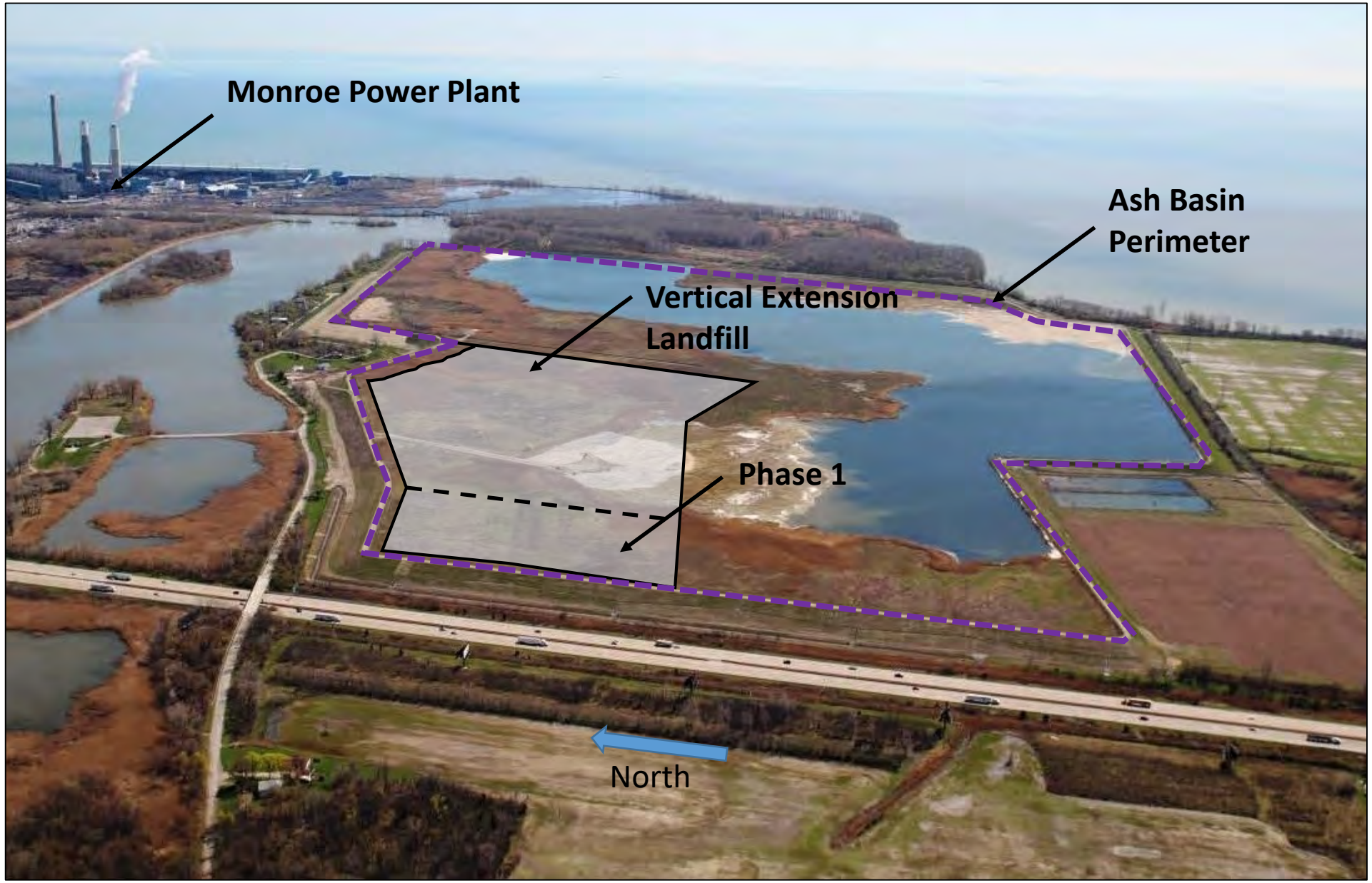
The annual visual inspection did not identify any evidence of structural weakness or instability.

Based on the annual inspection results and review of the available data, the Landfill was designed, constructed, operated and maintained consistent with recognized and generally accepted good engineering standards.

Certified by:

_____ Date January 7, 2022

Omer Bozok, P.E.
Michigan P.E. License Number 6201062700
Senior Engineer



Geosyntec Consultants

Figure 1: Site Location
Vertical Extension
Landfill
Monroe Power Plant

PERIMETER CHANNEL R1

PERIMETER CHANNEL R2

PERIMETER CHANNEL R3

PERIMETER CHANNEL R4

PHASE 1

PHASE 2

CULVERT INSTALLED IN 2020 TO ALLOW DRAINAGE FROM SOUTHERN CHANNELS INTO DISCHARGE CHANNEL

RECORD PIEZOMETER LOCATIONS

INSTRUMENT IDENTIFICATION	NORTHING	EASTING	TOP OF PORE RELIEF ELEVATION (ft-msl)
PZ-1S PZ-1D	143,132.58	13,391,553.77	615.22
PZ-2S PZ-2D	142,791.36	13,391,744.99	616.41
PZ-3S PZ-3D	142,601.23	13,391,236.06	614.71
PZ-4	142,399.11	13,392,255.75	615.42
PZ-5	142,891.20	13,392,666.26	614.76
PZ-6	142,317.97	13,393,071.44	616.26
PZ-7	142,712.44	13,393,198.77	614.87
PZ-8	141,845.96	13,393,003.18	613.93
PZ-9	141,949.20	13,393,629.57	615.37
PZ-10	142,364.59	13,393,873.25	615.47

RECORD SLOPE INCLINOMETER LOCATIONS

INSTRUMENT IDENTIFICATION	NORTHING	EASTING	ELEVATION (ft-msl)
FI-1	141,951.23	13,392,399.02	611.90
FI-2	141,360.68	13,392,909.31	612.05
FI-3	141,570.74	13,393,467.74	613.42
FI-4	141,732.21	13,393,991.01	611.64
SI-10_Top of Pipe	142,280.24	13,391,364.86	612.45
SI-9_Top of Pipe	142,989.72	13,391,192.71	611.28

RECORD DATA LOGGER LOCATIONS

DATA LOGGER	NORTHING	EASTING	G.S. ELEV. (ft-msl)
DL1	141,531.70	13,392,823.45	611.68
DL2	141,680.06	13,393,548.90	611.38
DL3	143,022.18	13,393,244.14	613.96
DL4	142,517.07	13,391,015.54	611.82

RECORD SETTLEMENT PLATE LOCATIONS

INSTRUMENT IDENTIFICATION	NORTHING	EASTING	ELEVATION (ft-msl)
SP-1	143,263.75	13,391,724.38	613.77
SP-2	142,948.78	13,391,164.48	610.94
SP-3_Top of Plate	143,124.35	13,391,551.76	615.34
SP-3_Top of Pipe	143,124.20	13,391,551.69	620.47
SP-4_Top of Plate	142,779.81	13,391,741.28	616.31
SP-4_Top of Pipe	142,779.97	13,391,741.18	621.48
SP-5_Top of Plate	142,591.55	13,391,231.59	614.76
SP-5_Top of Pipe	142,591.59	13,391,231.69	619.91
SP-6_Top of Plate	142,395.73	13,392,264.52	615.61
SP-6_Top of Pipe	142,395.73	13,392,264.52	620.65
SP-7_Top of Plate	142,887.18	13,392,678.86	615.04
SP-7_Top of Pipe	142,887.18	13,392,678.86	620.06
SP-8_Top of Plate	142,314.67	13,393,070.28	616.49
SP-8_Top of Pipe	142,314.67	13,393,070.28	621.50
SP-9_Top of Plate	142,709.21	13,393,207.63	615.03
SP-9_Top of Pipe	142,709.21	13,393,207.63	620.03
SP-10_Top of Plate	141,843.27	13,393,010.62	614.13
SP-10_Top of Pipe	141,843.27	13,393,010.62	619.16
SP-11_Top of Plate	141,946.56	13,393,636.15	615.51
SP-11_Top of Pipe	141,946.56	13,393,636.15	620.51
SP-12_Top of Plate	142,362.33	13,393,880.27	615.70
SP-12_Top of Pipe	142,362.33	13,393,880.27	620.74

SCALE 0 150 300 FEET

LEGEND

- SI-1 — PHASE 1 SLOPE INCLINOMETER
- PZ-1D / PZ-1S — PHASE 1 VIBRATING WIRE PIEZOMETER (VWP) PAIR (DEEP & SHALLOW)
- SP-1 — PHASE 1 SETTLEMENT PLATE
- PHASE 1 REMOTE (CABLED) DATA LOGGER LOCATION FOR VWP
- DATA LOGGER CABLE
- RECORD LOCATION OF DRAINAGE PIPING
- FI-1 — 2017 SLOPE INCLINOMETER
- 2017 VIBRATING WIRE PIEZOMETER (VWP) PAIR (DEEP & SHALLOW) AND SETTLEMENT PLATE
- DATA TRANSMISSION LOCATION
- CABLING OUTSIDE OVERLINER
- CABLING INSIDE OVERLINER

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT

YYYY-MM-DD	2018-01-03
PREPARED	JJS
DESIGN	AK
REVIEW	
APPROVED	

PROJECT
MONROE POWER PLANT ASH BASIN

TITLE
LANDFILL LAYOUT

PROJECT No.	CONTROL	Rev.	FIGURE
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APPENDIX A

RESUME OF OMER BOZOK, P.E. (QUALIFIED PROFESSIONAL ENGINEER)

OMER BOZOK, P.E.

Specialties

- CCR Engineering
- Geotechnical Engineering
- Construction Quality Assurance

Education

M.S., Geotechnical Engineering, University of Missouri, Columbia, Columbia, Missouri, 2009

B.S., Geological Engineering, Hacettepe University, Ankara, Turkey, 2007

Registrations and Certifications

P.E. in Michigan and Ohio

CAREER SUMMARY

Mr. Bozok is a project engineer and responsible for managing large-scale civil projects, reviewing engineering data, writing technical reports, generating/reviewing drawings, performing geotechnical analyses and design, and managing construction quality assurance (CQA) activities.

He is experienced in design, inspection, instrumentation/monitoring, and operations of coal ash facilities. Mr. Bozok managed design of four large-scale civil projects: involving (i) mitigation of a 3.5-mile long embankment, encompassing 400-acre ash basin; (ii) closure of a 300-acre ash basin and lowering of a 100-ft tall dam; (iii) closure of a 50-acre ash basin; and (iv) remediation of a 50-acre existing Superfund landfill.

KEY PROJECT EXPERIENCE

Wood River West Ash Complex Closure, Vistra Energy, East Alton, Illinois. Mr. Bozok is the project manager and the lead civil design engineer for the project that involves closure of an existing 50-acre fly ash pond, detailed dewatering design and relocation of plant discharge pipes. The project requires approximately one million CY of earthwork. The scale of the project, availability of limited on-site materials, nature of loose ash, and extent of groundwater makes it a challenging project.

Embankment Mitigation for Fly Ash Basin and CQA, DTE Energy, Monroe, Michigan. Mr. Bozok served as the project manager and the lead civil design engineer for the project that involved design and mitigation of an existing fly ash basin embankment. The embankment is 3.5-miles long and 40-ft high. Mainly, mitigation measures included flattening of the existing slopes from 2 horizontal to 1 vertical (2H:1V) slopes to 2.5H:1V with a mid-slope stormwater conveyance channel. The project was completed in five construction seasons (2009 through 2013). Mr. Bozok managed CQA activities during construction.

The project won DTE's "Best Large Project Award" under their Major Enterprise Project group. The five-year project was completed under budget, within schedule and with no safety incidents.

Settling Pond Fly Ash Removal and CQA, City of Escanaba, Escanaba, Michigan. Project included removal of fly ash from a settling pond and adjacent areas that required excavation and re-grading. Settling pond was utilized by City of Escanaba Generating Station to dispose its coal combustion residuals. Mr. Bozok designed the cleanout, assisted with contractor bids and selection, managed onsite CQA personnel on a day to day basis, reviewed daily reports, the contractor's submittals, responded to the contractor's and the owner's requests in a timely manner for the orderly execution of the work.

CQA of Plate Load Test on Slurried Fly Ash, Electric Power Research Institute, Central City, Kentucky. Mr. Bozok documented construction and testing of a plate

load test on slurried fly ash at a power plant ash disposal basin. The test was performed by applying load on a stiffened 5-ft by 5-ft test plate. The load was resisted by four micropiles drilled into bedrock. In addition, Mr. Bozok provided oversight for the field investigation that included CPTu testing, shear wave testing and soil borings.

MIG/DeWane Superfund Site Remedial Design and Construction CQA, Republic Services, Belvidere, Illinois. Mr. Bozok was the lead design engineer for closure of a Superfund site, and managed CQA activities during construction. The project involved preparing remedial design construction drawings for an existing approximately 50-acre Superfund site to upgrade an interim cap that had been installed in 1990s. Design included: (i) construction of leachate and gas collection system consisting of approximately 4,000-ft long leachate and gas collection system trench, and underground and above ground storage tanks; (ii) augmentation of the existing clay fill cover by compacting additional clay fill; and (iii) implementation of stormwater management system.

Probabilistic Slope Stability Analysis for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok served as the lead geotechnical engineer for the project. The client was considering mitigating a portion of a 3.5-miles long and 40-ft high the embankment to improve slope stability safety factor. Mr. Bozok performed probabilistic slope stability analysis to assess the global stability and recommend mitigation measures, if necessary. Mr. Bozok provided the client with a probability of failure information for the embankment and the client decided that mitigation was not necessary. This provided the client with approximately 5-million-dollar savings.

Emergency Action Plan for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok prepared an Emergency Action Plan (EAP) for a 400-acre ash basin that has 3.5-miles long, 40-ft high embankment. The Ash Basin is critically bounded on the east by Lake Erie, on the west by Interstate Highway 75 (I-75), on the north by Plum Creek, and on the south by an agricultural field. Mr. Bozok evaluated four failure scenarios at critical locations around the perimeter embankment and developed the EAP based on Federal Emergency Management Agency Guidelines for Dam Safety.

Potential Failure Mode Analysis for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok worked with the client to identify potential failure modes for a 400-acre ash basin that could cause ash release, resulting in environmental impact and potential for human life loss. Mr. Bozok facilitated meetings with client's staff including personnel from operations, maintenance, engineering and environmental group, to rank and categorize potential failure modes. Upon, identifying medium and high-risk failure modes, Mr. Bozok worked with the client to design and implement mitigation measures to lower risk levels.

Operations Plan for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok, prepared a set of operations plan drawings along with the inspection, monitoring and maintenance manual for a 400-acre fly ash basin facility. Project involved installation of a continuous monitoring and alarm system for the ash basin embankment inclinometers. Mr. Bozok directed a group of field staff and instrumentation engineers to implement the program. The operations plan provides guidelines on how to safely operate the fly ash basin, structures, provides communication procedures, and provides action criteria for surface and subsurface instrumentation.

Seep Investigation Study for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok prepared a seep investigation report for the Monroe Ash Basin embankment. The purpose of the study was to find the origin of water observed in slope indicator casings and standing water along the toe of the embankment and to recommend a mitigation approach. Mr. Bozok reviewed and evaluated the field data (including water level readings from the casings, pore pressure data from piezometers and precipitation data) and groundwater and fly ash chemical analysis results.

Stingy Run Fly Ash Reservoir Closure, American Electric Power, Cheshire, Ohio. Mr. Bozok is the project manager and the lead civil design engineer for the project that involves closure of an existing 300-acre fly ash pond and lowering of 100-ft tall dam. The project requires approximately 4 million CY of earthwork. The scale of the project, nature of loose ash, lowering of the dam, nearby highwalls, wetlands and streams make it a challenging design project and involves collaboration between different disciplines.

Use of Instrumented Test Fill to Assess Static Liquefaction of Impounded Fly Ash for Cardinal Landfill, American Electric Power, Brilliant, Ohio. Mr. Bozok assessed the potential for a fly ash subgrade to undergo static liquefaction using results from an instrumented test fill. Mr. Bozok performed time-rate settlement analyses for a flue gas desulfurization (FGD) waste landfill to be constructed over an existing fly ash pond. He evaluated the coefficient of consolidation of ash by interpreting CPTu dissipation tests and compared it against the values in the literature. Mr. Bozok used the software program SAF-TR to model the effect of ramp loading on excess pore pressure and compared it to results

from a full-scale test.

Sibley Quarry CCR Landfill Fill Plan, DTE Energy, Trenton, Michigan. Mr. Bozok was the lead civil design engineer assisting the client with phasing of landfill operations. The existing operations, site conditions and the need for landfilling 16 MCY of CCR made it a challenging project.

Engineering Correlations for Geotechnical Parameters for Ponded Fly Ash, EPRI, Palo Alto, California. Mr. Bozok was one of the principal investigators and managed the field investigation activities. The project involved performing a field plate load test at an ash basin site and preparing a report summarizing findings of the study.

Evaluation of Fly Ash Diagenesis Potential, EPRI, Palo Alto, California. Mr. Bozok was the lead principal investigator for this project. The project involved: (i) establishing a method for creating a pluviated specimen in a lab environment that reasonably represents in-situ conditions; and (ii) studying diagenesis potential of Class F fly ash and its impact on engineering characteristics.

Annual Inspection of Ash Impoundments and Landfills, DTE Energy, various locations. Mr. Bozok inspected Sibley Quarry Landfill and Monroe Ash Basin and prepared annual inspection reports per the requirements of USEPA CCR rules.

Review of Safety Factor Assessments for Various Sites, Dynegy, various locations. Mr. Bozok was a key member of a team, which reviewed safety factor assessments for various high-risk sites that were prepared by another consulting firm. The documents were prepared to meet the requirements of USEPA CCR rules and required diligent review before made available to the public.

Documentation for USEPA CCR Rules, DTE Energy, Monroe, Michigan. Mr. Bozok assisted client with meeting the documentation requirements of USEPA CCR rules. The rule requires various documentation regarding the history of construction, operations and design of various structures. He directed hydraulic capacity and safety factor assessments.

Guidance Documents for USEPA Coal Combustion Residual Rules, Electric Power Research Institute, Palo Alto, California. Mr. Bozok was a key member of the team and prepared various templates for EPRI members. Project involved preparing a series of guidance documents for utility companies that manage coal combustion residuals to meet USEPA CCR Rules. Mr. Bozok prepared templates for emergency action plans, onsite inspections and training module for inspectors.

APPENDIX B

2021 ANNUAL INSPECTION FORMS AND PHOTOS

MONROE VERTICAL EXTENSION LANDFILL
2021 ANNUAL INSPECTION FORM

Name of Landfill: Monroe Vertical Extension Landfill
Qualified Professional Engineer: Omer Bozok, P.E.
EGLE Landfill ID 397800
Date: 4/7/2021 **Time:** 12:00:00 PM
Owner: DTE Electric Company
Weather: Fair, 70s, Sunny
Operator: DTE Electric Company
Precipitation (since last inspection): 0.1
Site Conditions: Dry

I. Landfill Condition

1. Describe operations in the landfill: Disposal of bottom ash, FGD sludge
   Other:

2. Are any stormwater swales obstructed? ___ Yes x No
   If 'Yes', describe (type of debris, reason for obstruction, etc.)
   Standing water is observed in some areas; however, perimeter swales still drain.

3. Are there indications of erosion on the landfill perimeter berm? x Yes ___ No
   If 'Yes', describe what type and its condition (rill, gully, dimensions, etc.)
   Some erosion rills were observed on the exterior slope of the perimeter berm. Overall, vegetation observed on exterior slope of perimeter berms.

4. Is runoff from the landfill surface contained by the perimeter ditch or Ash Basin? x Yes ___ No
   If 'No', describe where runoff flow is not contained.
   Perimeter swales were generally observed to have standing water. Water was contained in the swales and levels are generally below the pore pressure relief pipe outlets.

5. Is runon prevented from entering the landfill area? x Yes ___ No
   If 'No', describe where runoff flow is not contained.

6. Is the underdrain collection system draining? x Yes ___ No
   Describe flow conditions. Many of the pore pressure relief pipes were observed to have some sediment build-up at the outlets (generally < 0.5 inches deep). The pipes were not draining at the time of inspection. Sediment build-up does not appear to impede flow. (Photo 3)

7. Is there any unusual settlement causing "birdbaths"? ___ Yes x No
   If 'Yes', describe.

8. Other observations around the landfill (changes since last inspection): x Yes ___ No
   If 'Yes', describe.

MONROE VERTICAL EXTENSION LANDFILL
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EGLE Landfill ID 397800 **Date:** 4/7/2021 **Time:** 12:00:00 PM

II. Repairs, Maintenance, Action Items

1. Has any routine maintenance been conducted since the last inspection? x Yes ___ No
   If 'Yes', describe. Regular maintenance has been implemented for the continuous monitoring system.

2. Have any repairs been made since the last inspection? ___ Yes x No
   If 'Yes', describe.

3. Has this inspection identified any need for repair or maintenance? ___ Yes x No
   If 'Yes', describe and state the urgency of maintenance. "Urgent" for maintenance that should be conducted as soon as possible, "Moderate" for maintenance that should be conducted within three months, and "Not Urgent" for maintenance that can be conducted within a year.

4. Are the instrumentation intact and functioning? x Yes ___ No
   If 'No', describe conditions of instrumentation.

III. Photography

Photographs can be taken of notable features. List of photographs:

	Location	Direction of Photo	Description
i.	See attached photo log		
ii.			
iii.			
iv.			
v.			
vi.			
vii.			
viii.			
ix.			
x.			

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Vertical Extension Landfill	**Site Location: Monroe, MI**

Photograph ID: 1

Date: 4/7/2021

Direction: East

Comments: View of Landfill from the top of perimeter clay embankment along the North side (Dunbar Road side).

Photograph ID: 2

Date: 4/7/2021

Direction: West

Comments: View of Landfill from the top of perimeter clay embankment along the North side (Dunbar Road side).

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Vertical Extension Landfill	**Site Location: Monroe, MI**

Photograph ID: 3

Date: 4/7/2021

Direction: -

Comments: Most pore pressure relieve system pipes were inspected. No flowing water was observed.

Photograph ID: 4

Date: 4/7/2021

Direction: South

Comments: View of Landfill from the top of perimeter clay embankment along the west side (I-75 side).

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Vertical Extension Landfill	**Site Location: Monroe, MI**

Photograph ID: 5

Date: 4/7/2021

Direction: East

Comments: View of Phase 1 from the west side of the Landfill.

Photograph ID: 6

Date: 4/7/2021

Direction: S

Comments: Vegetation on the perimeter clay embankment appeared to have denser vegetation compared to previous years.

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Vertical Extension Landfill	**Site Location: Monroe, MI**

Photograph ID: 7 **Date: 4/7/2021** **Direction: West** **Comments: View of Landfill from the top of perimeter clay embankment along the South side.**	

Photograph ID: 8 **Date: 4/7/2021** **Direction: East** **Comments: View of Landfill from the top of perimeter clay embankment along the South side.**	

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Vertical Extension Landfill	**Site Location: Monroe, MI**

Photograph ID: 9 **Date: 4/7/2021** **Direction: Northeast** **Comments: View of Landfill from the top of perimeter clay embankment along the South side.**	

Photograph ID: 10 **Date: 4/7/2021** **Direction: West** **Comments: Erosion rills were observed towards the bottom of perimeter clay embankment, along the south side of the Landfill.**	

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Vertical Extension Landfill	**Site Location: Monroe, MI**

Photograph ID: 11

Date: 4/7/2021

Direction: Northeast

Comments: View of Landfill from the top of perimeter clay embankment along the Southwest side.

Photograph ID: 12

Date: 4/7/2021

Direction: West

Comments: View of Landfill from the top of perimeter clay embankment along the East side.

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Vertical Extension Landfill	**Site Location: Monroe, MI**

Photograph ID: 13

Date: 4/7/2021

Direction: South

Comments: View of the perimeter clay embankment and the Landfill disposal area from the East side of the Landfill.

Photograph ID: 14

Date: 4/7/2021

Direction: East

Comments: View of the perimeter clay embankment and the Landfill disposal area from the North side of the Landfill.