DTE Energy®

Prepared for

DTE Energy
One Energy Plaza
Detroit, Michigan 48226

2015 ANNUAL INSPECTION REPORT
VERTICAL EXTENSION LANDFILL

MONROE POWER PLANT

Monroe, Michigan

Prepared by

Geosyntec consultants

engineers | scientists | innovators

134 North La Salle Street, Suite 300
Chicago, Illinois 60602

CHE8242H5

January 2016

Geosyntec consultants

134 N. LaSalle Street, Suite 300
Chicago, Illinois 60602
PH 312.658.0500
FAX 312.658.0576
www.geosyntec.com

14 January 2016

Via email

Mr. Joseph Garavaglia
DTE Energy
1 Energy Center
Detroit, Michigan 48226

Subject: 2015 Annual Inspection Report
Monroe Plant Vertical Extension Landfill Annual Inspection

Dear Mr. Garavaglia:

Geosyntec Consultants (Geosyntec) is pleased to provide you with the attached final Annual Inspection Report file as a pdf. It is to be placed in the operating record and on the publicly accessible internet website on January 18, 2016 in accordance with 40 CFR 257. Please call if you have any questions.

Sincerely,

John Seymour, P.E.
Principal

Copies to: William Neal, P.E. - DTE Energy
Omer Bozok, P.E. - Geosyntec

CHE8242\2016-01-15-MonroeVerticalExtensionLandfill-AnnualInspection

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

1.1 Overview

This 2015 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants (Geosyntec) to provide the results of the annual inspection of the coal combustion residuals (CCR) vertical extension landfill (Landfill) at the DTE Energy (DTE) Monroe Power Plant disposal facility. The annual inspection has been prepared to comply with United States Environmental Protection Agency (USEPA) Coal Combustion Residuals Rule (CCR Rule) published on April 17, 2015 (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 property and Plum Creek (see **Figure 1**). It is constructed on top of fly ash that was previously deposited in the Monroe Ash Basin. The combined Landfill, Ash Basin and surrounding property owned by DTE is considered the "Site".

Landfill Phase 1 construction began in August 2015, the Michigan Department of Environmental Quality (MDEQ) licensed the area for disposal via email communication on October 14, 2015, and CCR was placed in the unit beginning October 16, 2015. CCR disposal continued after 19 October 2015[1] as witnessed during the inspection conducted on December 18, 2015. Landfill construction is ongoing and continuous for remaining phases.

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:
>
> (i) A review of 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 inspection by a qualified person, and results of previous annual inspections); and

[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…".

(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 it began receipt of CCR.

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 inspections of the Landfill
- Section 5 - Instrumentation Monitoring: presents the data from instrumentation monitoring
- Section 6 – Operation Activities: describes the operations organization and activities
- Section 7 – Evaluation: evaluates the results of the annual inspection
- Section 8 – Conclusions and Certification: provides the overall conclusions of the annual inspection

1.4 Terms of Reference

The annual visual inspection was performed by Mr. John Seymour, P.E. of Geosyntec whose qualifications as a "qualified professional engineer" under the CCR Rule are presented in Appendix A. DTE's "qualified person", who conducts the weekly inspections, accompanied Mr. Seymour.

This report was prepared by Mr. John Seymour, P.E. of Geosyntec. The peer review was completed by Mr. Omer Bozok, P.E. of Geosyntec. John Seymour, P.E. and Omer Bozok, P.E. of Geosyntec are qualified professional engineers per the requirements of §257.53 of the CCR Rule. Mr. Seymour was involved in the technical review of the ash basin permit modification and design for the vertical extension landfill on behalf of DTE. Both engineers have been heavily involved

with the Site since 2009, the initiation of the design and construction efforts for the mitigation of the ash basin embankment.

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	Year	Content
Geotechnical Site Characterization Report	Geosyntec	2012	Summary of data from various site investigation studies conducted for the initial ash basin design (1970s) below the Landfill and around the perimeter of the ash basin, and subsequent investigations through 2012.
Permit Modification (Application)- DTE Energy Monroe Power Plant Ash Basin	Golder	April 16, 2015	Application documents for the "Overliner" (Landfill) at the Ash Basin; contains Summary Report and Appendices A through H.
Engineering Drawings titled "DTE Energy Monroe Fly ash Basin Construction Permit Application Modification"	Golder	April 16, 2015	Appendix E contained in the Permit Modification Application Report (16 April 2015)
Engineering Information- DTE Energy Monroe Power Plant and Ash Basin	Golder	April 16, 2015	Appendix F contained in the Permit Modification Application Report (16 April 2015)

Title	Prepared by	Year	Content
Operations and Monitoring Plan, DTE Energy Monroe Power Plant and Ash Basin	Golder	April 16, 2015	Appendix G contained in the Permit Modification Application Report (16 April 2015)
Construction Quality Assurance Plan MPP Fly Ash Basin Overliner Construction"	Golder	April 16, 2015	Appendix H contained in the Permit Modification Application Report (16 April 2015)
Solid Waste Disposal Area Construction Permit No. 4147	MDEQ	July 31, 2015	Permit to construct the Landfill in accordance with permit application documents dated 16 April 2015.
DTE Monroe Power Plant Ash Basin – Phase 1 Construction Documentation Report	Golder Associates	September 16, 2015	Vertical Extension Landfill construction completion and construction quality assurance document.
Email License to Operate Phase 1	MDEQ	October 14, 2015	Email providing authorization to commence operations with a commitment to follow up in writing.
Fugitive Dust Plan	DTE	2015[2]	Presents dust control measures.
Weekly Inspection Reports	DTE Energy	November 11, 17, 23, 30 and December 3, 10 and 17 in 2015	Qualified person inspections
CCR disposal records (Excel spreadsheets)	Headwaters	2015	Documentation of waste tonnage placed in the CCR landfill

[2] The Fugitive Dust Plan (FDP) is not dated but DTE reported to Geosyntec that the FDP is based on an EPRI template completed in September 2015; therefore, the date is simply identified as "2015.

Title	Prepared by	Year	Content
Headwaters Letter	Headwaters	2015	Documenting the training of operations personnel per the Operating Plan

3. FACILITY DESCRIPTION

3.1 Overall Site Description

The overall site is composed of the 410 acre Ash Basin located in Section 16, Township 7 south, Range 9 east, of Monroe Township, Michigan shown on **Figure 1**. The site contains both a Type III low-hazard industrial waste Landfill and Type III Industrial Waste Surface Impoundment. The Surface Impoundment (Ash Basin), is licensed under Michigan Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 License No. 9393, issued on 12 June 2014 and expires on 12 June 2019. CCRs are placed in the Ash Basin by use of a "wet" (sluiced) disposal method. Pore water from the below the vertical extension settles in the Ash Basin and is ultimately discharged under a Michigan National Pollutant Discharge Elimination System (NPDES) permit issued by the MDEQ (Permit No. MI0001848).

The Landfill is designated as a 79 acre "dry" disposal area located on top 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 40 feet deep from preconstruction ground surface. The water level in the Ash Basin is maintained around 609 ft; the pore water elevations in the ash below the Landfill were measured to be 3 to 6[3] ft below grade in piezometers in the fly ash prior to construction.

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 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 on Figure 1. Record drawings of the construction are provided in Appendix B.

3.2 Design

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

- Perimeter Collection Swale
- Prepared subgrade consisting of in-situ sluiced fly ash and placed general fill;

[3] One reading that was out of this range was discounted as it appeared to be an erroneous reading.

- 30-inch thick pore pressure relief layer, including
    - 24- inches of bottom ash or limestone;
    - Perforated collection piping encased in a filter fabric ("sock");
    - Separation geotextile, non-woven, needle-punched geotextile
    - 6-inch embedment layer; and
- Perimeter berm.

The Landfill (Overliner) system components are described by Golder in the Construction Documentation Report (Section 5) as follows:

> "Phase 1 of the overliner is trapezoidal in shape with an overall length of approximately 880 feet generally in the north-south direction and a width that increases from approximately 530 feet generally east-west along the north, to approximately 770 feet along the south. The subgrade slopes away from a generally trending east-west centerline at a 0.5 percent grade towards the perimeter swale. Phase 1 is shown in the Record Drawings included with this report. The perimeter swale encompasses the entire perimeter of the overliner footprint. The Phase 1 subgrade occupies the western approximately 13.4 acres of the overliner. Within the permit, it was originally intended that the centerline pipe corridor would be constructed during phase 1 for the entire overliner area including the approximately 660 feet within the Phase 1 limits as well as the balance of the corridor estimated at an additional approximately 2,600 feet. However, it became clear during construction that contractor equipment access across the centerline of the overliner during the remainder to be constructed may be *(sic)* potentially damage the pipe. Thus, as verbally agreed to with the MDEQ, the centerline pipe corridor will be completed as the remainder of the overliner is constructed."
>
> <u>Perimeter Swale</u>
>
> "The perimeter swale provides the collection for the pore water relief piping drainage, and outlets the collected water to the south through one of three outfalls. The swale has a typical 12 foot wide bottom, 3 foot depth, and 3 horizontal to 1 vertical (3H:1V) side slopes. The swale is divided into four main runs, R1 along the north and west limits, R2 along the north and east limits, R3 along the west half of the south, and R4 along the east half of the south limits."

Pore Pressure Relief System

"The pore pressure relief system is constructed directly over the subgrade. The system is comprised of a 30-inch thick granular layer, a series of socked perforated collection pipes and a geotextile separation layer. The granular layer consists of on-site bottom ash and imported limestone; the piping is made up of 6-inch and 8-inch diameter socked corrugated landfill piping from ADS, and the separation layer is Geoturf N800, a non-woven 8 ounce per square yard geotextile."

Perimeter Berm

"Along the north, west, and south limits of Phase 1 there is a perimeter berm built at the outer edge and on top of the pre pressure relief layer, which provides the limits for CCR fill placement. The berm is built from on-site structural fill soils and is 29 feet wide across the bottom, 5 feet wide across the top, 4 feet high, and has three horizontal to one vertical (3H:1V) external and internal slopes."

Monitoring Equipment

"During the construction of the overliner, DTE installed monitoring equipment consistent with the equipment specified in the currently permitted Operations Plan. This equipment consisted of three settlement plates, six vibrating wire piezometers, and two slope inclinometers. The purpose of the equipment is to allow DTE to monitor the ash fill during future operations."

3.3 Construction

Construction of Phase 1 was certified as follows:

"…the components presented in this report were constructed in compliance with the facility permit, the regulations, and the CQA Plan"

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

4. VISUAL INSPECTION RESULTS

The annual inspection was completed on December 18, 2015. The completed inspection report form and photographs are presented in Appendix C.

In summary, no evidence of instability or detrimental settlement was noted. The entire Landfill, including the Perimeter Berms and Perimeter Swales are located within the drainage area of the Ash Basin. Any potential sediments from erosion will be deposited in the Ash Basin, where there is no concern of offsite migration. Any potential runoff will be managed under the NPDES permit for the Ash Basin.

The volume of CCRs in the Landfill just after the annual inspection was estimated by Geosyntec to be approximately 9,200 CY. This estimate is based on the 11,138 tons reported by Headwaters (Appendix D) and assuming a unit weight of 90 lbs/cuft.

5. INSTRUMENTATION MONITORING

5.1 Inclinometers

Inclinometer locations are shown on Figure 8 in Appendix B. Inclinometers have been read upon installation and prior to filling operations.

5.2 Piezometers

Piezometer locations are shown on Figure 8 in Appendix B. Piezometers have been read upon installation and prior to filling operations.

5.3 Settlement Plates

Settlement plate locations are shown on Figure 8 in Appendix B. Settlement plates have been read upon installation and prior to filling operations.

6. OPERATION ACTIVITIES

6.1 Operations Organization

The Landfill was initially operated by DTE but the operations were contracted to Headwaters, Inc. The responsible personnel include:

- Rodney Welliver, Manager - Power Generation Engineering Fossil Generation - Environmental & Safety Projects, Monroe Power Plant
- Lisa Hagerty, DTE Environmental, Monroe Power Plant, Inspections
- Mark Ryan, Headwaters Manager
- Jason Jolly, Headwaters Supervisor, Site operations

6.2 Operation Activities

Operations are defined in Appendix G of the Permit Modification Report (Golder 2015). Appendix G is the "Operations, Monitoring and Action Plan" ("Operations Plan"). The following operation activities are described in the Operations Plan:

1. Hours of Operation
2. Site Access and Barriers
3. Traffic Control
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

The Operations Plan was written by DTE/Golder and approved by MDEQ in the 31 July 2015 construction permit.

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

- Weekly inspections by a qualified person, and
- Dust control in accordance with a Fugitive Dust Control Plan.[4]

6.3 Observations

It was identified that the overall intent of the Operations Plan was being followed. Items 11 through 17 were not applicable at the time of the inspection.

[4] DTE reported to Geosyntec on December 22, 2015 that there is only one FDP for the combined Ash Basin and Landfill. This FDP is posted on the DTE's CCR Website.

7. EVALUATION

7.1 Design

The design was completed by Golder in 2015 and is well documented in the April 16, 2015 Permit Modification Report and signed by a professional engineer licensed in Michigan. The design is 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 well 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.

7.3 Maintenance

Maintenance had not been required as of the time of the inspection.

7.4 Operations

7.4.1 Operations Plan

The Permit Modification Report (Golder, April 16, 2015) included requirements for operations.

Operations are consistent with recognized and generally accepted good engineering standards

7.4.2 Fugitive Dust Control

A Fugitive Dust Control Plan was provided by DTE and is posted on the DTE CCR publicly accessible website. No dusting occurred during the site inspection to assess whether the plan was being implemented. In the absence of contrary information, dust control is consistent with recognized and generally accepted good engineering standards, based on available information.

7.4.3 Run on and Run off Control

Run on and run off control is maintained by the perimeter ditch and perimeter berm shown in the design and as constructed. A run on and run off control system plan is required by 40 CFR 257.83(c) by October 17, 2016. However, using current information, run on and run off controls are consistent with recognized and generally accepted good engineering standards.

7.4.4 Inspections

Weekly inspections have been completed and documented by qualified persons. The qualified persons were trained in April 2015. Weekly inspections for the Landfill were initiated on October 19th concurrent with the Ash Basin inspections although no separate inspection forms were provided for the Landfill. DTE reported that there was no mention of deficiencies for the Landfill in the weekly inspections. Written weekly inspections were initiated on November 11th. No indications of any 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 measurement of piezometers, settlement plates and inclinometers. The data from the filling period were not collected by DTE. However, minimal filling has occurred since operations began and there was no visual evidence of any instability or excessive settlement.

The CCR Rule provides minimum groundwater monitoring system requirements that must be implemented by October 2017. An evaluation regarding whether the groundwater monitoring system is consistent with recognized and generally accepted good engineering standards will be made once it is installed.

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 perimeter swale did not have any topsoil or vegetation. However, the design approved by the MDEQ did not include a requirement to vegetate the berm and swale.

It is understood by Geosyntec that the existing license for the Ash Basin has a requirement to vegetate the surface of the fly ash in the Ash Basin when it reaches final grade. Consequently, the swale should be addressed as a part of the Ash Basin operations.

Further, because the vertical extension Landfill is entirely within the confinement of the Ash Basin, a soil erosion and sediment control permit is not required, implying that vegetation of the soil slopes of the perimeter berm may not be required.

8. CONCLUSIONS AND CERTIFICATION

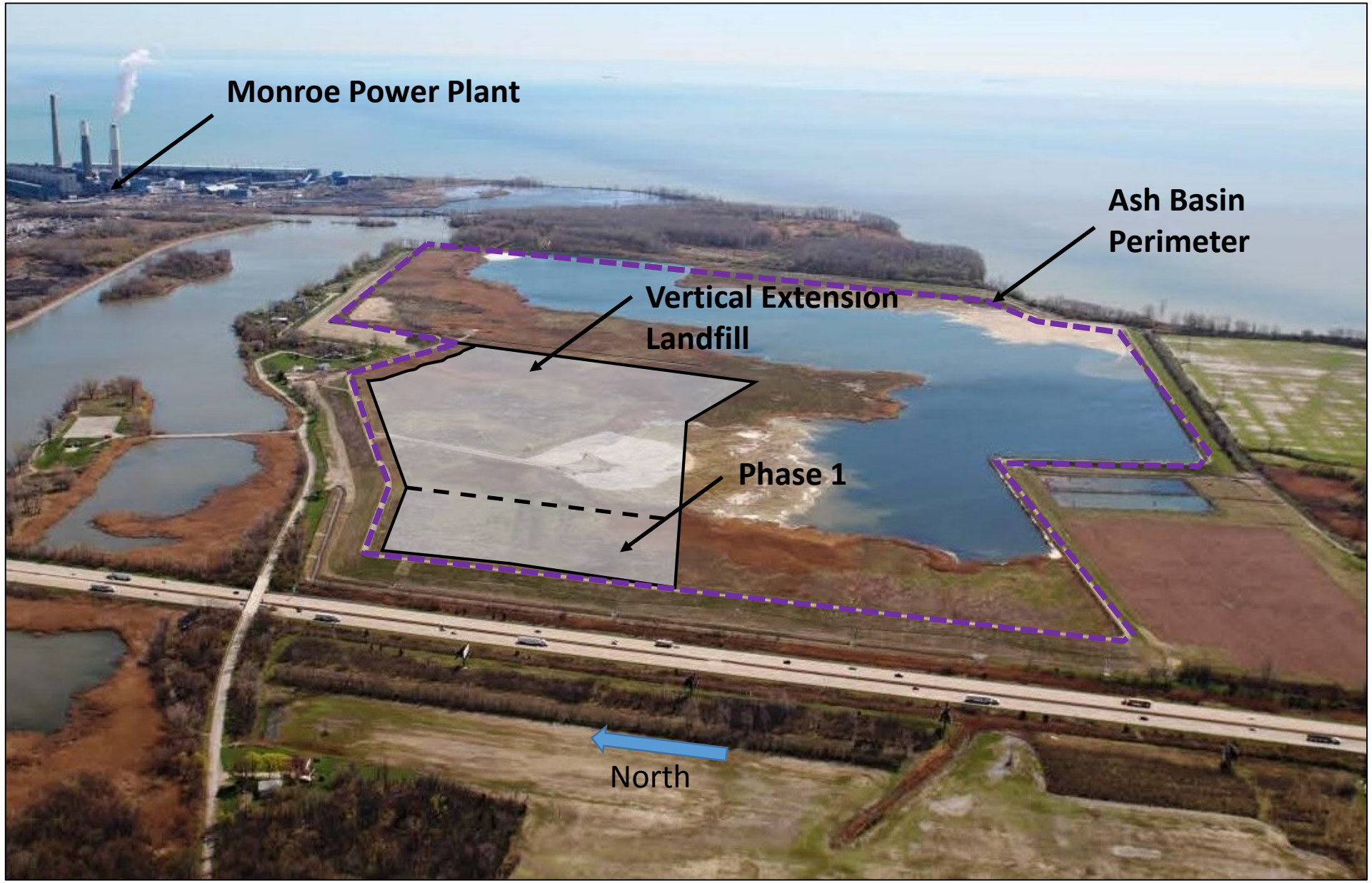
The annual visual inspection did not identify any evidence of structural weakness or instability.

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:

John Seymour Date 1/13/2016

John Seymour, P.E. Michigan License Number 620103356
Senior Principal Engineer



Geosyntec Consultants

Figure 1: Site Location
Vertical Extension
Landfill
Monroe Power Plant

APPENDIX A

Geosyntec
consultants

JOHN SEYMOUR, P.E.

coal combustion residuals management
geoenvironmental engineering
geotechnical engineering

EDUCATION

M.S., Geotechnical Engineering, University of Michigan, Ann Arbor, Michigan, 1980
B.S., Civil Engineering, Michigan Technological University, Houghton, Michigan, 1976

PROFESSIONAL REGISTRATIONS

Illinois P.E. Number 062-040562

CAREER SUMMARY

Mr. Seymour is a geotechnical engineer with over three decades of experience in the areas of waste containment, site remediation, building foundations, and construction management. He has focused on solid and hazardous waste management and remediation (solid waste/RCRA and Superfund/CERCLA) projects for over 25 years. He has provided professional services in the areas of site characterization, feasibility studies, bench/pilot studies, civil/geotechnical design, construction quality assurance (CQA), disposal facility operation and maintenance, environmental permit applications, project management, project coordination (owner's representative), and expert witness.

His focus over the past 10 years has been on coal combustion residuals management, including: facility siting studies, long term management feasibility studies, landfill design and permit applications, and pond closure design and permit applications.

He has provided coal combustion residuals (CCRs) engineering services, regarding waste management of fly ash, bottom ash and flue gas desulfurization (FGD) waste for impoundments and landfills. These services have included geotechnical and environmental evaluations of waste disposal expansions, operations and closure, disposal permit application preparation for eight U.S coal power generation clients. Overall he has provided relevant consulting engineering services for 7 CCRs impoundments and 14 CCR landfills and provided records review, evaluation and engineering scope of work development for 4 additional CCR impoundments. He has translated some of his experience into 11 technical papers and two final research guidance documents on CCR impoundments (co-investigator), and provided 9 technical presentations at conferences including at conferences focusing on CCR management. He has also provided Phase 1 dam safety surveys for the U.S. Army Corps of Engineers,

including site inspections, for five dams, and dam inspections for a large power plant cooling lake.

Highlights of Mr. Seymour's representative experience include:

Coal Combustion Residuals Project Experience

CCR Rule Compliance Assessments, *AEP, Three Plants in Ohio and Kentucky.* Mr. Seymour is the project manager to assess CCR Rule compliance for the location requirements and groundwater monitoring systems at three power plants.

Coal Combustion Residuals Rule "Templates", *Electric Power Research Institute, National.* Project Manager to complete guidance documents for: a) CCR Record Keeping and Website Reporting, b) development of weekly and annual inspection forms and guidance, c) training for the "qualified person" to conduct inspections, d) dust control template, and e) emergency action plan guidance and template.

Sibley Quarry Landfill Closure Options Feasibility Study*, DTE Energy, Trenton, Michigan.* Mr. Seymour led the effort to conduct a study of closure options under Michigan NREPA Part 115 Type III waste rules and the U.S. EPA 40 CFR 257 CCR rules. Further, he provided a CCR slope stability assessment in 2008, an assessment of CCR slope distress in 2012, and coordinated quarry wall bedrock mapping in 1996.

Monroe Power Plant Ash Disposal Basin, *DTE Energy, Monroe, MI.* Mr. Seymour is the project leader for a number of projects at this 400 acre fly ash disposal basin. Currently he is acting as the owner's representative to develop a CCR landfill on top of the existing Ash Basin. Previously, he has completed or managed: (i) preliminary engineering study for future disposal, (ii) slope stability assessment and mitigation design to address slope instability, (iii) potential failure mode analysis, (iv) seepage analysis, (v) inspection, monitoring and maintenance program manual, (vi) slope stability study for a vertical expansion, (vii) reliability analysis (also called a probability of failure slope stability analysis) of 2H: 1V slopes, (viii) construction quality assurance (CQA) for a four-year slope mitigation program; and (ix) completing an Emergency Acton Plan.

He managed an FGD gypsum disposal facility preliminary engineering study for new FGD gypsum waste that will be generated at a coal fired electrical generating station. Three options were evaluated: i) disposal at a "greenfield" site that has wetland impacts, ii) disposal over the top of a 400-acre ash pond, and iii) temporary disposal at an offsite coal ash landfill. Further, wet and dry handling options were evaluated.

Mr. Seymour was the project director and engineer of record to conduct an evaluation of slope stability of the side slopes of the earthen containment dike around the ash basin and to assess the potential for a failure due to operating issues. He designed and

implemented an inspection program for a 3.5-mile long, 45-ft (maximum) high fly ash containment dike that lead to the development of a remedy for observed sloughing that included flattening some of the slopes, rebuilding some slopes, clearing of vegetation, and relocating a county drain (creek) under the State and U.S. Army Corps of Engineers permitting process. The work was designed to occur over four construction seasons.

In 2009 he was the project director, engineer of record and construction certifying engineer for the relocation of the county drain and temporary emergency erosion mitigation on the side slopes of the ash basin embankment to prepare the site to flatten the slopes of the ash basin embankment; construction was performed in 2010. The work included completing a Clean Water Act Section 404 (filling in waters of the U.S.) permit application, a county soil erosion and sediment control permit application for relocating the drain, slope stability analysis, regrading of the area and construction documents.

In 2010, 2011 and 2012, he was the project director, engineer of record, and construction certifying engineer for flattening of 4,000 ft of the embankment slopes including relocation of a stormwater runoff pump house.

In 2013 he was the project director and construction certifying engineer for the final phase of slope mitigation that includes slope flattening and relocation of construction access ramps.

Mr. Seymour was also the project director for a study of the source of seepage observed at the toe of the embankment.

He also led the completion of a potential failure mode analysis (PFMA) for the entire ash basin disposal facility. He then assisted the owner to address high and medium priority potential failure modes that included completing a global stability assessment that utilized a reliability approach that quantified the probability of failure. He also managed the compilation of an inspection, monitoring and maintenance manual, and documented site improvements.

Coal Combustion Residuals Pond Closure Guidance Documents, *Electric Power Research Institute, nationwide.* Mr. Seymour is a co-investigator/author and project manager for the completion of two guidance documents relating to CCR pond closures. They include: (i) "Coal Combustion Residuals Ponds- Dewatering and Capping Guidance Document", and (ii) "Coal Combustion Residuals Pond Closure- Construction over Closed or Closing Ponds Guidance Document". The documents address many aspects of pond closures including slope stability, safety of working on fly ash ponds, water quality discharge permitting, groundwater remediation, cover/closure design, construction of structures on top of closed ponds, hydrologic analysis, and stormwater erosion and sediment control.

J.C. Weadock CCR Landfill Engineering Study, *Consumers Energy Company, Essexville, MI.* Mr. Seymour was the project director and engineer of record to conduct an engineering feasibility study of the long term use and closure of a 292 acre ash pond that has been converted to dry disposal. The facility manages bottom ash and fly ash and will manage flue gas desulfurization (FGD) waste. The study is examining five options for long term disposal and closure including implementing the draft CCR rules proposed by USEPA in 2010. Mr. Seymour provided project scoping and is providing project direction and will be the engineer of record for the final submittal.

General James Gavin Power Plant Fly Ash Pond Closure Design, *Cheshire, Ohio*. Mr. Seymour is the project manager for the conceptual and final design of a 300-acre fly ash disposal pond closure including designing the closure in accordance with the proposed U.S. EPA RCRA Subtitle D (solid waste landfill) regulations (2010). The pond is contained by a 145-ft high earthen dam and the ponded water must be lowered in accordance with Geosyntec's design. A conceptual design was completed followed by the final design. The conceptual design included examining several closure alternatives. The final design includes reshaping the grades of the fly ash by moving over 1,000,000 cuyd of ash and rock, lowering the dam such that no water will be retained after closure, conducting flood hydraulic and stormwater design, design of a new spillway and energy dissipater, and providing pH adjustment to treat runoff for acid mine drainage (AMD). The design includes flood studies and associated hydraulic modeling to safely pass the 100-yr, 24-hr flood event and meet NPDES discharge permit limits for TSS and pH. The PTI was completed under requirements of an NPDES permit modification. Construction documents are under preparation.

General James Gavin Power Plant CCR Landfill Design*, Cheshire, Ohio*. Mr. Seymour managed the design and the Permit to Install (PTI) application for a 46,000,000 cuyd residual waste landfill for the solid waste permit application under existing OEPA rules and incorporated relevant portions of the U.S. EPA proposed (2010) RCRA Subtitle D regulations. An engineering feasibility study was first completed to select either a Greenfield site or a site that included a lateral expansion over an adjacent fly ash pond and vertically over the existing landfill. The lateral expansion over the fly ash pond was selected. The work to complete the PTI included: a comprehensive geotechnical and hydrogeological investigation, geophysical investigation to locate underground mines, assessment of strength of all geologic and waste materials, slope stability, settlement analysis, liquefaction analysis of the ponded fly ash in the subgrade, leachate system collection and treatment design, surface water hydraulic analyses and leachate pond design for the 25-year, 24-hour storm event, preparation of a site investigation report, preparation of a hydrogeologic study report, preparation of a settlement and stability analysis report, construction and operations

information report, final closure and post closure plan, groundwater monitoring plan, the quality assurance/quality control plan including specifications and the PTI application report. The PTI application was submitted in August 2011 and included four volumes and 67 design drawings and the OEPA provided a verbal approval in October 2012.

R. Paul Smith CCB Landfill Expansion and Ash Pond Cleanout, *Allegheny Energy Supply, Berkeley County, WV***.** Mr. Seymour was the project manager and engineer of record for the design and construction quality assurance of a coal combustion byproducts landfill for a coal-fired power plant that is located in Maryland with the landfill located in adjacent West Virginia. He led the completion of an evaluation of the most economical landfill expansion approach, which considered vertical and lateral expansion options. The selected method of expansion included three elements: lateral expansion using a composite liner system, vertical expansion using a mechanically stabilized earth (MSE) retention system, and a vertical expansion over the top of the existing disposal area.

He managed the design of the landfill for the solid waste permit application and construction bid package that included the design for the cleanout of ash Pond 3. He then managed the construction quality assurance (CQA) for the construction of the Phase A portion and prepared the construction certification report obtaining approval of WVDEP of each layer (subgrade, groundwater underdrain, liner, and leachate collection layer) within 5 days of submittal of completion documentation. He most recently was the project director and engineer of record for the permit renewal application.

Cardinal Plant CCR Landfill Studies, *American Electric Power, Brilliant, Ohio.* He completed a feasibility study to assess the potential to develop a new FGD waste landfill over an existing fly ash disposal impoundment at a coal-fired power plant. The feasibility study included utilization of mine spoil as a building product for low permeability liners, examination of foundation settlement and liquefaction potential for this landfill that was to be located over 170 ft thick (maximum) layer of saturated coal ash in a “cross valley fill” that was contained by an earthen dam approximately 150-ft high.

PROFESSIONAL EXPERIENCE

Geosyntec Consultants, Chicago, IL, 2001–present
URS Corporation, Detroit, MI, 1997–2001
Woodward-Clyde Consultants (later URS), Chicago, IL and Detroit, MI, 1980-1997
Townsend and Bottum, Ann Arbor, MI, 1978-1979
Stone & Webster, Shippingport, PA, 1976-1978

Geosyntec consultants

AFFILIATIONS

American Society of Civil Engineers

Midwest Coal Ash Association

Society of American Military Engineer

REPRESENTATIVE PUBLICATIONS

15-08 "EPA's Coal Combustion Residuals Rule: Review of Applicability, Exemptions, and Technical Requirements", American Bar Association Section of Environment, Energy, and Resources, Vol. 15, No. 1, August 2015, Mike Houlihan, John Seymour, and Steven Burns

15-05 "Geotechnical Considerations for Surface Impoundment Closure to Meet the CCR Rule & Avoid Compliance and Constructability Pitfalls", Technical Short Course Teacher at the World of Coal Ash conference, Nashville, TN.

15-01 "Conditions of Coal Ash Embankments", at the U.S. Society on Dams Conference, April 2015 I Louisville, KY, John Seymour, P.E., Omer Bozok, Amanda Hughes, Ph.D., Brad Bodine, P.E.

14-05 "Coal Combustion Residuals Pond Closure, Guidance for Dewatering and Capping", EPRI Technical Report 3002001117, Palo Alto, CA, J. Seymour, W. Steier, C Li, P Sabatini, M Lodato, M. Bardol, M. Gross.

14-05 "Coal Combustion Residuals Pond Closure, Guidance for Construction Over Closed or Closing Ponds", EPRI Technical Report 3002001143, Palo Alto, CA, P. Sabatini, R. Kulasingam, J. Seymour,

13-04 "Challenges of Closing Large Fly Ash Ponds", at the World of Coal Ash Conference, Lexington, Kentucky, April 2013. Lead author and presenter.

11-05 "Advances in Design of Landfills over CCR Ponds and CCR Landfills", Proceedings from the World of Coal Ash conference, Denver, CO, John Seymour, P.E. and Michael F. Houlihan, P.E. BCEE, May 2011. Lead author and presenter.

INVITED PRESENTATIONS

He has presented the following papers or provided these presentations:

15-10 "Response to the New Coal Combustion Residuals (CCR) Rule", to the American Bar Association Energy, Environment and Resources Annual Meeting, Chicago, IL.

Geosyntec consultants

15-06 “Slope Stability Considerations under the CCR Rule” and “Inspections and Monitoring of CCR Surface Impoundments”, to the Electric Power Research Institute Program 49 Companies, Bar Harbor, ME.

15-05 “Geotechnical Considerations for Surface Impoundment Closure to Meet the CCR Rule & Avoid Compliance and Constructability Pitfalls”, Technical Short Course Teacher at the World of Coal Ash conference, Nashville, TN.

15-04 “Conditions of Coal Ash Embankments”, at the U.S. Society on Dams Conference, April 2015 I Louisville, KY, John Seymour, P.E., Omer Bozok, Amanda Hughes, Ph.D., Brad Bodine, P.E.

14-03 “CCB Wet Pond Assessment, Closure, and Redevelopment”, presentation provided to FirstEnergy, March, 2014.

13-12 “CCR Pond Closures: Major Difficulties and Solutions”, presentation to the Utility Solid Waste Activities Group, Washington, D.C., December, 2013.

13-11 “CCR Pond Closures: Major Difficulties and Solutions”, presentation and workshop for the Tennessee Valley Authority, Chattanooga, Tennessee, November 2013.

13-04 Presentation of: “Challenges of Closing Large Fly Ash Ponds”, at the World of Coal Ash Conference, Lexington, Kentucky, April 2013.

13-04 “Hot Topics Regarding Coal Combustion Residuals Management, presentation to Winston & Strawn Environmental Group, Chicago, Illinois, April 2013.

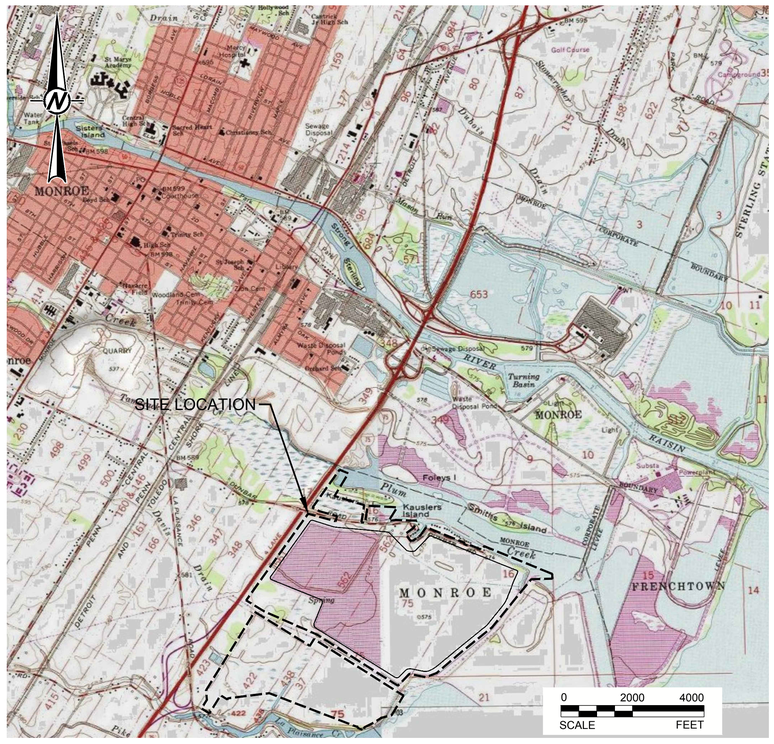
12- 08 “Landfills over CCR Ponds”, Webinar with CETCO serving over 140 participants, August 2012, repeated in September 2012.

11-05 Presentation of: “Advances in Design of Landfills over CCR Ponds and CCR Landfills”, at the World of Coal Ash conference, Denver, CO, May 2011.

09-04 “Geotechnical Design Considerations for Landfill Construction Over an Ash Pond”, World of Coal Ash, Lexington, KY, May 2009

APPENDIX B

DTE ENERGY
MONROE FLY ASH BASIN
2015 PHASE 1 RECORD DRAWINGS



Prepared for:

DTE ENERGY
One Energy Plaza
Detroit, MI 48226

Prepared by:

Golder Associates Inc.
15851 S. US 27 Suite 50
Lansing, Michigan USA 48906

INDEX OF DRAWINGS

Sheet Number	Drawing Title	Current Revision	Date
1	Title Sheet	0	
2	Legend, References and General Notes	0	
3	Site Plan	0	
4	Record Top of Subgrade Plan	0	
5	Record Pore Water Relief Piping Plan	0	
6	Record Pore Water Relief System and Berm Plan	0	
7	Construction Control / QA/QC Points	0	
8	Record Monitoring Locations for Phase 1	0	
9	General Details - Sheet 1	0	
10	General Details - Sheet 2	0	

RECORD DRAWING

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

TITLE
TITLE SHEET

PROJECT No.	CONTROL	Rev.	FIGURE
1521809B			1

LEGEND

- PROPERTY BOUNDARY
- ASH BASIN EXISTING TOPOGRAPHY (1' AND 5' CONTOURS)
- WL — WATER BOUNDARY
- FENCE LINE
- ELECTRIC TOWER
- ELECTRIC POLE
- UE — UNDERGROUND ELECTRIC LINE
- E2 — CONSUMERS ENERGY ELECTRIC LINE
- E — ITC ELECTRIC LINE
- ROW — RIGHT OF WAY
- DRAINAGE DIRECTION
- SM-55 — SAMPLE LOCATION
- DECOMMISSIONED SLURRY PIPELINES
- ACTIVE SLURRY PIPELINES
- WETLAND
- STRUCTURE (RESIDENCE, BUSINESS)
- CULVERT
- BENCHMARK LOCATION
- WL — WATER LINE
- VEHICLE CROSSING
- PROPOSED DRAINAGE CHANNEL
- PROPOSED PERFORATED, FILTER SOCKED, CORRUGATED PLASTIC PIPE (6" OR 8"Ø)
- AREA OF CLAY COVER
- 0.9 — AREA OF FILL TICK MARK
- -1.7 — AREA OF CUT TICK MARK
- 100 — CONTROL POINT
- CULVERT

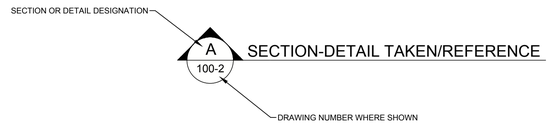
MATERIALS LEGEND

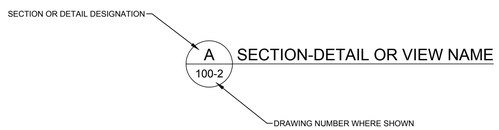
- SLUICED FLY ASH
- BOTTOM ASH OR EQUIVALENT
- 8 oz/sy GEOTEXTILE
- LOW PERMEABILITY SOILS COVER MATERIAL
- STRUCTURAL FILL
- TOPSOIL

GENERAL NOTES

1. EXISTING TOPOGRAPHY IS AN AMALGAM OF GRADES FROM 2009 BASE MAP (DRAWING 6SE-0695-070-REVB) AND AS-BUILT GRADES FROM MITIGATED SECTIONS OF THE EMBANKMENT, PROVIDED BY DTE, DRAWING CREATED BY GEOSYNTEC CONSULTANTS, DATED 02/08/2013.
2. HORIZONTAL GRID COORDINATE SYSTEM UNITS ARE IN FEET AND REFERENCED TO MICHIGAN SOUTH STATE PLANE COORDINATES SYSTEM (NAD83). ELEVATIONS ARE IN FEET AND REFERENCED TO NATIONAL GEODETIC VERTICAL DATUM (NGVD29). NGVD29 DATUM IS 1.47 FT HIGHER THAN THE PLANT DATUM.
3. AREA OF CLAY COVER ADAPTED FROM "ATTACHMENT A" OF THE DTE ELECTRIC COMPANY SOLID WASTE OPERATING LICENSE APPLICATION, DATED DECEMBER 3, 2014.

SECTION, DETAIL AND VIEW DESIGNATIONS





RECORD DRAWING

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

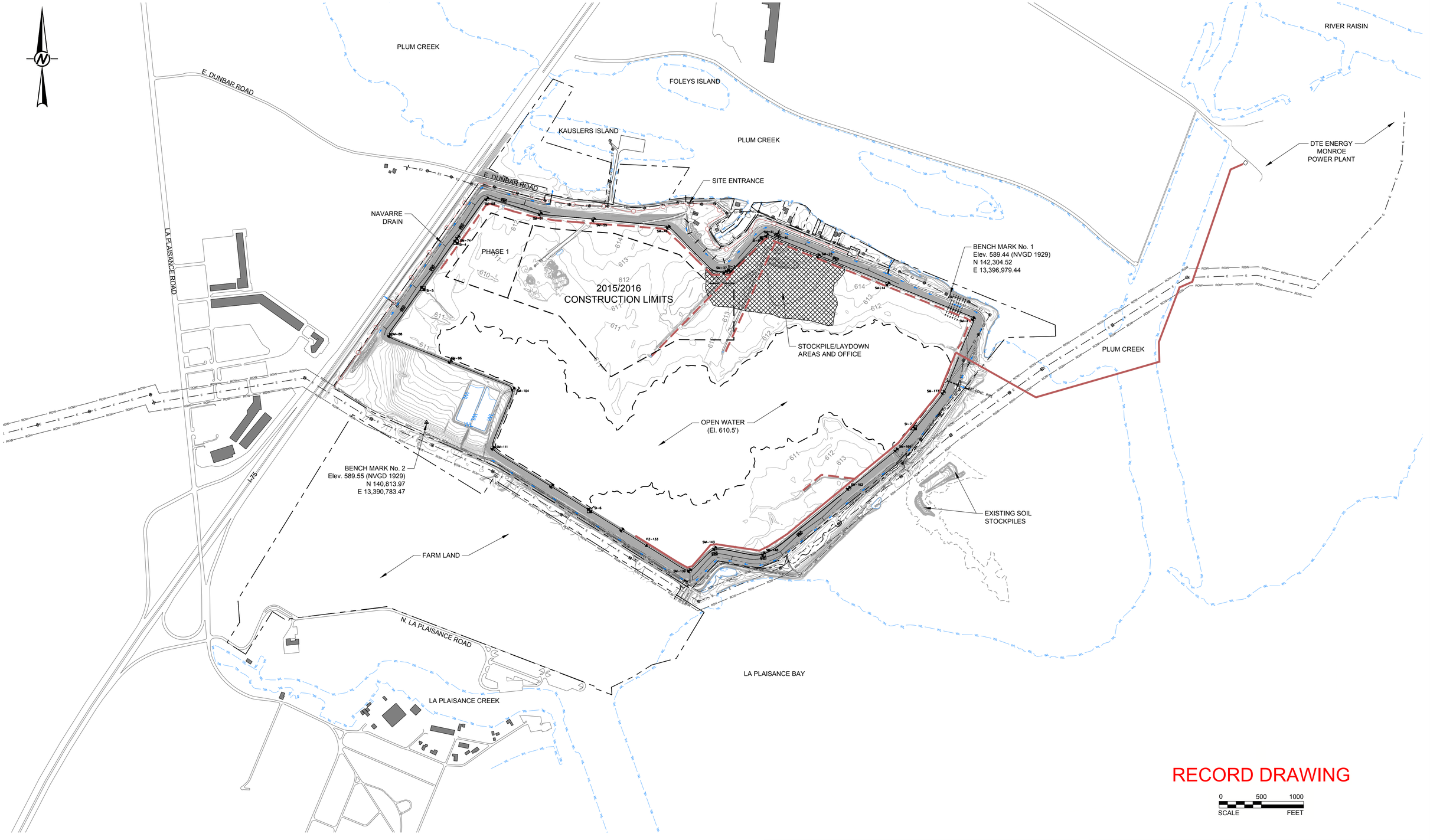
TITLE
LEGEND, REFERENCES AND GENERAL NOTES

PROJECT No.	CONTROL	Rev.	FIGURE
1521809B			2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 1in

Path: \\lansing\CAD\Projects\15x Projects\1521809B_DTE Monroe\PRODUCTION\D-As Built Drawings\ | File Name: 1521809B_D-2.dwg



RECORD DRAWING

0 500 1000
SCALE FEET

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT

Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

TITLE
SITE PLAN

PROJECT No.	CONTROL	Rev.	FIGURE
1521809B			3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

Path: \\lansing\CAD\Projects\15x-Projects\1521809B_DTE Monroe\PRODUCTION\D-As Built Drawings\ | File Name: 1521809B_D-3.dwg

E 13,390,500 E 13,391,000 E 13,391,500 E 13,392,000 E 13,392,500 E 13,393,000 E 13,393,500 E 13,394,000 E 13,394,500 E 13,395,000

N 143,500 N 143,000 N 142,500 N 142,000 N 141,500 N 141,000

SEE DETAIL 4/9

PERIMETER CHANNEL R1
SLOPES AT ≈0.05%

HIGH POINT OF PERIMETER
DRAINAGE CHANNEL,
INVERT ELEVATION 610.56 ft msl

NEW ACCESS ROAD
SEE DETAIL 2/10

ACCESS ROAD RAMP
AND CULVERT
SEE DETAIL 3/10

ACCESS ROAD

EXISTING CLAY CAP LIMITS,
REMOVED WITHIN
OVERLINER LIMITS

HIGH POINT OF PERIMETER
DRAINAGE CHANNEL R3,
INVERT ELEVATION 610.02 ft msl

PERIMETER CHANNEL R3
SLOPES AT 0.04%

PERIMETER CHANNEL R2
SLOPES AT ≈0.084%

HIGH POINT OF PERIMETER
DRAINAGE CHANNEL R4,
INVERT ELEVATION ≈610 ft msl

PERIMETER CHANNEL R4
SLOPES AT 0.04%

DISCHARGE EXTENDED
TO POND

DISCHARGE EXTENDED
TO POND

DISCHARGE EXTENDED
TO POND

0.5%

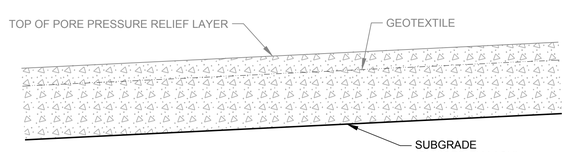
0.5%

RECORD DRAWING

0 150 300
SCALE FEET

NOTE(S)

1. ABANDONED PIPING WITHIN LIMITS OF SUBGRADE WAS REMOVED.
2. CLAY COVER WITHIN LIMITS OF SUBGRADE WAS REMOVED.



LAYER PROFILE

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

TITLE
RECORD TOP OF SUBGRADE AND SWALE PLAN

PROJECT No. 1521809B | CONTROL | Rev. | FIGURE 4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

Path: \\lansing\CAD\Projects\15x-Projects\1521809B_DTE Monroe\PRODUCTION\D-As Built Drawings\ | File Name: 1521809B_D-4.dwg

E 13,391,000
E 13,391,500
E 13,392,000
E 13,392,500
N 143,000
N 142,500
N 142,000
ACCESS ROAD RAMP AND CULVERT
ACCESS ROAD
CORRUGATED PLASTIC PIPE CENTERLINE CONNECTION SEE DETAIL 6/9
6"Ø PERFORATED, FILTER SOCKED, CORRUGATED PLASTIC PIPE SEE DETAIL 2/9
TYPICAL PIPE OUTLET SEE DETAIL 3/9
0.53% 0.54% 0.50% 0.55% 0.51% 0.47%
0.51% 0.49% 0.49% 0.50% 0.52% 0.53% 0.49% 0.51%
RECORD DRAWING
SCALE 0 80 160 FEET

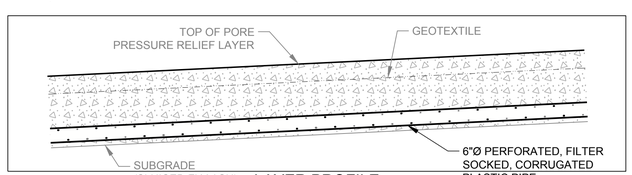
NOTE(S)

1. RECORD POINTS PROVIDED BY KemTech, HOWEVER, CERTAIN POINTS WERE UPDATED BY EAGLE EXCAVATING USING A GPS SYSTEM, FOLLOWING ADDITIONAL FIELD WORK.

LEGEND

614.96 AS BUILT 6" PIPE ELEVATION

614.96 AS BUILT 8" PIPE ELEVATION



LAYER PROFILE

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

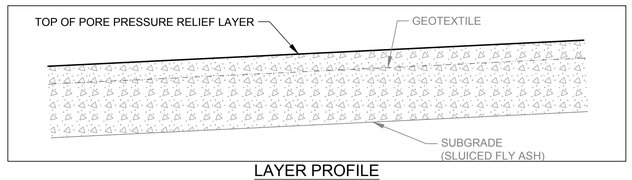
TITLE
RECORD PORE WATER RELIEF PIPING PLAN

PROJECT No. 1521809B | CONTROL | Rev. | FIGURE 5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

Path: \\planing\CAD\Projects\15x Projects\1521809B_DTE Monroe\PRODUCTION\D-As Built Drawings\ | File Name: 1521809B_D-4.dwg

E 13,391,000
E 13,391,500
E 13,392,000
E 13,392,500
E 13,393,000
N 143,000
N 142,500
N 142,000
PERIMETER CHANNEL R1
ACCESS ROAD RAMP AND CULVERT SEE DETAIL
SEE DETAILS 1/9 & 2/9
ACCESS ROAD
PERIMETER CHANNEL R3
615
615.5
616
616.5
614.5
611
0.5%
0 150 300
SCALE FEET
TOP OF BERM CONTROL POINTS
0 100 200
FEET
RECORD DRAWING



LAYER PROFILE

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

TITLE
RECORD PORE WATER RELIEF SYSTEM AND BERMPLAN

PROJECT No.	CONTROL	Rev.	FIGURE
1521809B			6

Path: \\lansing\CAD\Projects\15x-Projects\1521809B_DTE Monroe\PRODUCTION\D-As Built Drawings\ | File Name: 1521809B_D-4.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D
0 1 in

2015 SUBGRADE CONSTRUCTION CONTROL POINTS

POINT NUMBER	NORTHING	EASTING	DESIGN ELEVATION	RECORD ELEVATION	DIFFERENCE ±
1000	142,542.18	13,391,009.15	611.61	611.66	0.05
1001	142,510.58	13,391,100.12	611.60	611.52	-0.08
1002	142,475.44	13,391,200.04	611.59	611.01	-0.58
1003	142,440.88	13,391,300.16	611.58	611.54	-0.04
1004	142,400.13	13,391,416.70	611.57	611.59	0.03
1005	142,372.08	13,391,500.44	611.56	611.62	0.06
1006	142,335.77	13,391,599.85	611.55	611.09	-0.45
1007	142,300.86	13,391,699.60	611.54	611.54	0.01
1008	142,286.99	13,391,741.49	611.53	611.48	-0.05
1009	142,300.04	13,391,745.81	611.60	611.62	0.02
1010	142,399.75	13,391,499.91	611.70	611.65	-0.04
1011	142,400.22	13,391,599.98	611.85	611.85	0.00
1012	142,400.11	13,391,699.84	612.01	611.96	-0.05
1013	142,400.00	13,391,780.95	612.13	612.13	NOTE 2
1014	142,500.01	13,391,200.04	611.70	611.56	-0.15
1015	142,499.88	13,391,299.97	611.86	611.82	-0.04
1016	142,499.94	13,391,400.30	612.02	612.02	0.01
1017	142,500.19	13,391,499.46	612.17	612.23	0.06
1018	142,499.95	13,391,599.83	612.33	612.27	-0.06
1019	142,499.93	13,391,699.85	612.48	612.38	-0.10
1020	142,500.70	13,391,799.22	612.64	612.59	-0.05
1021	142,500.01	13,391,816.00	612.66	611.93	-0.73
1022	142,599.98	13,391,051.07	611.95	611.85	-0.09
1023	142,600.00	13,391,100.04	612.03	612.06	0.04
1024	142,599.83	13,391,200.02	612.18	612.12	-0.06
1025	142,599.94	13,391,299.97	612.34	612.27	-0.07
1026	142,599.82	13,391,399.96	612.49	612.48	-0.01
1027	142,599.91	13,391,499.39	612.65	612.64	0.00
1028	142,599.78	13,391,600.19	612.80	612.80	0.00
1029	142,600.14	13,391,700.04	612.96	612.92	-0.03
1030	142,600.08	13,391,800.07	613.11	612.96	-0.16
1031	142,600.08	13,391,851.09	613.19	611.96	-1.23
1032	142,699.95	13,391,123.36	612.54	612.53	-0.01
1033	142,699.82	13,391,200.05	612.66	612.56	-0.10
1034	142,700.58	13,391,300.16	612.81	612.71	-0.10
1035	142,699.99	13,391,399.95	612.97	612.94	-0.02
1036	142,699.97	13,391,500.14	613.12	613.05	-0.07
1037	142,700.17	13,391,600.21	613.28	613.28	0.00
1038	142,699.90	13,391,700.02	613.43	613.36	-0.07
1039	142,699.94	13,391,799.97	613.59	613.49	-0.10
1040	142,699.29	13,391,885.59	613.72	613.72	NOTE 2
1041	142,717.52	13,391,891.89	613.81	613.81	NOTE 2
1043	142,799.87	13,391,195.73	613.12	613.05	-0.07
1044	142,799.98	13,391,299.97	613.29	613.20	-0.08
1045	142,800.04	13,391,400.05	613.44	613.36	-0.08
1046	142,800.09	13,391,499.99	613.60	613.61	0.01
1047	142,800.01	13,391,600.01	613.75	613.69	-0.07
1048	142,799.78	13,391,699.86	613.91	613.90	-0.01
1049	142,799.47	13,391,800.90	614.06	614.05	-0.02
1050	142,767.54	13,391,899.82	614.06	614.06	NOTE 2
1051	142,800.06	13,391,900.02	613.91	613.91	NOTE 2
1052	142,811.93	13,391,924.96	613.81	613.81	NOTE 2
1053	142,799.70	13,391,962.18	613.81	613.81	NOTE 2
1054	142,900.02	13,391,268.15	613.71	613.07	-0.64
1055	142,899.45	13,391,300.58	613.76	613.79	0.03
1056	142,900.03	13,391,399.45	613.92	613.86	-0.06
1057	142,900.61	13,391,494.80	614.06	614.03	-0.04
1058	142,900.61	13,391,602.66	613.90	613.89	-0.01
1059	142,866.12	13,391,599.65	614.06	614.02	-0.05
1060	142,832.85	13,391,700.16	614.06	614.00	-0.07
1061	142,899.85	13,391,700.43	613.74	613.69	-0.06
1062	142,900.07	13,391,799.84	613.59	613.69	0.10
1063	142,900.58	13,391,899.94	613.43	613.48	0.05
1064	142,901.15	13,391,955.49	613.35	613.41	0.06
1065	142,931.20	13,391,400.87	614.06	614.02	-0.04
1066	142,960.25	13,391,310.61	614.06	614.04	-0.03
1067	142,998.74	13,391,340.72	613.83	613.85	0.02
1068	142,999.91	13,391,399.59	613.73	613.79	0.06
1069	142,999.39	13,391,500.01	613.58	613.54	-0.04
1070	142,999.20	13,391,601.45	613.42	613.43	0.01
1071	143,000.45	13,391,698.92	613.27	613.31	0.04
1072	142,999.79	13,391,800.24	613.11	613.11	0.00
1073	142,999.42	13,391,899.64	612.96	612.95	-0.01
1074	143,000.29	13,391,990.81	612.82	612.79	-0.03
1075	143,099.98	13,391,409.86	613.24	613.23	-0.01
1076	143,099.46	13,391,500.08	613.10	613.08	-0.02
1077	143,099.92	13,391,600.18	612.95	612.95	0.00
1078	143,100.13	13,391,701.08	612.79	612.82	0.03
1079	143,100.05	13,391,800.14	612.64	612.73	0.09
1080	143,100.22	13,391,900.88	612.48	612.53	0.04
1081	143,099.67	13,392,000.06	612.33	612.36	0.03
1082	143,100.20	13,392,025.55	612.29	612.28	-0.01
1083	143,113.21	13,392,030.22	612.22	612.20	-0.01
1084	143,200.32	13,391,478.96	612.66	612.72	0.06
1085	143,200.09	13,391,600.29	612.47	612.46	-0.02
1086	143,199.94	13,391,700.28	612.32	612.31	-0.01
1087	143,199.87	13,391,800.16	612.16	612.19	0.03
1088	143,199.88	13,391,843.46	612.10	612.16	0.06
1089	143,184.44	13,391,900.07	612.08	612.09	0.01
1090	143,158.76	13,392,000.31	612.05	612.03	-0.02
1091	143,147.70	13,392,034.95	612.04	612.04	0.00
1092	143,291.88	13,391,545.80	612.11	612.21	0.10
1093	143,275.58	13,391,600.00	612.11	612.11	NOTE 2
1094	143,243.10	13,391,700.09	612.11	612.11	NOTE 2
1095	143,216.53	13,391,782.68	612.11	612.07	-0.04

2015 TOP OF PORE PRESSURE RELIEF LAYER CONSTRUCTION CONTROL POINTS

POINT NUMBER	NORTHING	EASTING	DESIGN ELEVATION	Record Elevation	Difference ±
2000	142,546.20	13,391,021.66	614.15	614.10	-0.05
2001	142,518.60	13,391,100.06	614.14	614.15	0.02
2002	142,483.57	13,391,199.65	614.13	614.20	0.07
2003	142,449.03	13,391,299.92	614.12	614.14	0.02
2004	142,413.90	13,391,400.17	614.11	614.07	-0.04
2005	142,379.14	13,391,499.65	614.09	614.13	0.04
2006	142,343.88	13,391,600.04	614.08	614.06	-0.03
2007	142,309.32	13,391,700.02	614.07	614.01	-0.06
2008	142,297.72	13,391,743.78	614.07	614.05	-0.02
2009	142,320.49	13,391,737.43	614.21	614.23	0.02
2010	142,339.07	13,391,700.00	614.22	614.25	0.03
2011	142,373.75	13,391,600.26	614.23	614.23	0.01
2012	142,409.06	13,391,500.25	614.24	614.23	-0.01
2013	142,399.99	13,391,600.45	614.35	614.33	-0.02
2014	142,400.02	13,391,699.82	614.51	614.46	-0.05
2015	142,400.03	13,391,767.34	614.63	614.60	-0.03
2016	142,443.68	13,391,400.28	614.25	614.27	0.02
2017	142,478.61	13,391,300.18	614.26	614.26	0.00
2018	142,513.84	13,391,200.04	614.27	614.31	0.04
2019	142,499.82	13,391,299.81	614.36	614.32	-0.04
2020	142,500.09	13,391,399.68	614.52	614.57	0.06
2021	142,499.86	13,391,498.86	614.67	614.66	-0.01
2022	142,500.05	13,391,600.18	614.83	614.89	0.06
2023	142,499.56	13,391,699.77	614.98	614.91	-0.07
2024	142,500.18	13,391,800.00	615.14	615.17	0.03
2025	142,499.85	13,391,808.22	615.16	615.20	0.04
2026	142,548.48	13,391,100.19	614.28	614.26	-0.03
2027	142,560.42	13,391,066.90	614.28	614.22	-0.07
2028	142,599.60	13,391,060.56	614.46	614.45	-0.02
2029	142,599.89	13,391,096.41	614.52	614.53	0.01
2030	142,599.55	13,391,199.77	614.68	614.68	0.00
2031	142,600.12	13,391,300.08	614.84	614.88	0.05
2032	142,600.07	13,391,399.80	614.99	614.98	-0.01
2033	142,600.13	13,391,499.98	615.15	615.13	-0.02
2034	142,600.23	13,391,600.00	615.30	615.25	-0.05
2035	142,599.73	13,391,699.99	615.46	615.45	-0.01
2036	142,599.91	13,391,799.74	615.61	615.56	-0.05
2037	142,599.95	13,391,846.04	615.69	615.68	-0.01
2038	142,700.32	13,391,132.82	615.05	615.03	-0.02
2039	142,700.27	13,391,168.10	615.11	615.08	-0.02
2040	142,699.80	13,391,200.05	615.16	615.15	-0.01
2041	142,700.16	13,391,300.01	615.31	615.36	0.05
2042	142,699.69	13,391,400.13	615.47	615.44	-0.03
2043	142,699.74	13,391,500.15	615.62	615.68	0.06
2044	142,699.83	13,391,599.77	615.78	615.79	0.01
2045	142,700.24	13,391,700.02	615.93	615.95	0.02
2046	142,700.36	13,391,800.08	616.09	616.03	-0.06
2047	142,700.22	13,391,885.64	616.22	616.20	-0.02
2048	142,717.46	13,391,891.88	616.31	616.29	-0.02
2049	142,799.95	13,391,205.54	615.64	615.59	-0.05
2050	142,799.95	13,391,240.57	615.69	615.71	0.01
2051	142,799.88	13,391,300.34	615.79	615.82	0.04
2052	142,800.07	13,391,400.07	615.94	615.91	-0.03
2053	142,800.17	13,391,499.87	616.10	616.06	-0.04
2054	142,800.41	13,391,600.20	616.25	616.26	0.01
2055	142,799.82	13,391,700.37	616.41	616.45	0.04
2056	142,799.85	13,391,801.07	616.56	616.57	0.01
2057	142,767.53	13,391,900.05	616.56	616.58	0.02
2058	142,765.02	13,391,908.55	616.56	616.60	0.03
2059	142,800.31	13,391,900.15	616.41	616.46	0.05
2060	142,799.91	13,391,921.03	616.38	616.34	-0.04
2061	142,811.45	13,391,924.59	616.31	616.30	-0.01
2062	142,833.23	13,391,699.84	616.56	616.52	-0.04
2063	142,865.59	13,391,599.85	616.56	616.56	0.00
2064	142,899.72	13,391,277.86	616.23	616.28	0.06
2065	142,899.86	13,391,313.01	616.28	616.34	0.06
2066	142,899.84	13,391,400.20	616.42	616.43	0.01
2067	142,899.89	13,391,494.15	616.56	616.50	-0.06
2068	142,899.60	13,391,600.12	616.40	616.39	-0.01
2069	142,900.12	13,391,700.15	616.24	616.22	-0.02
2070	142,899.68	13,391,799.61	616.09	616.08	-0.01
2071	142,899.76	13,391,900.09	615.93	615.97	0.04
2072	142,899.87	13,391,955.67	615.85	615.80	-0.05
2073	142,930.54	13,391,399.94	616.56	616.57	0.01
2074	142,948.13	13,391,347.62	616.56	616.54	-0.03
2075	142,957.72	13,391,319.24	616.56	616.52	-0.04
2076	143,000.04	13,391,350.58	616.31	616.25	-0.06
2077	143,000.06	13,391,384.77	616.26	616.26	0.01
2078	143,000.15	13,391,399.93	616.23	616.26	0.02
2079	142,999.81	13,391,500.09	616.08	616.10	0.02
2080	143,000.04	13,391,599.85	615.92	615.97	0.04
2081	143,000.04	13,391,699.70	615.77	615.80	0.03
2082	143,000.02	13,391,800.17	615.61	615.67	0.06
2083	143,000.13	13,391,899.75	615.46	615.44	-0.02
2084	142,999.93	13,391,991.02	615.32	615.31	0.00
2085	143,100.01	13,391,419.33	615.73	615.70	-0.03
2086	143,100.10	13,391,454.15	615.68	615.70	0.03
2087	143,100.39	13,391,500.24	615.60	615.61	0.00
2088	143,100.26	13,391,600.02	615.45	615.44	0.00
2089	143,099.94	13,391,699.60	615.29	615.27	-0.03
2090	143,100.51	13,391,799.87	615.14	615.16	0.02
2091	143,100.04	13,391,900.23	614.98	614.99	0.01
2092	143,099.95	13,392,000.11	614.83	614.82	-0.01
2093	143,100.53	13,392,026.08	614.79	614.77	-0.02
2094	143,113.13	13,392,029.60	614.72	614.72	0.00
2095	143,141.63	13,392,034.86	614.58	614.58	0.00
2096	143,121.22	13,391,999.91	614.73	614.78	0.05
2097	143,150.43	13,391,999.62	614.59	614.64	0.05
2098	143,147.75	13,391,900.11	614.76	614.76	0.01
2099	143,176.98	13,391,900.08	614.62	614.60	-0.02
2100	143,203.58	13,391,799.79	614.65	614.72	0.07
2101	143,174.68	13,391,799.95	614.78	614.76	-0.02
2102	143,181.65	13,391,772.98	614.79	614.79	-0.01
2103	143,208.75	13,391,780.41	614.65	614.69	0.04
2104	143,199.87	13,391,700.21	614.82	614.83	0.01
2105	143,205.56	13,391,700.14	614.79	614.76	-0.03
2106	143,235.02	13,391,700.08	614.65	614.69	0.04
2107	143,200.19	13,391,599.94	614.97	615.00	0.03
2108	143,237.94	13,391,599.80	614.79	614.84	0.05
2109	143,267.38	13,391,600.01	614.65	614.64	-0.01
2110	143,200.18	13,391,523.20	615.09	615.10	0.01
2111	143,200.34	13,391,487.79	615.15	615.18	0.03
2112	143,251.50	13,391,558.87	614.79	614.78	-0.01
2113	143,284.56	13,391,547.68	614.65	614.64	-0.01

2015 TOP OF PERIMETER BERM CONSTRUCTION CONTROL POINTS

POINT NUMBER	NORTHING	EASTING	DESIGN ELEVATION	RECORD ELEVATION	DIFFERENCE ±
3000	142,308.59	13,391,736.34	618.03	616.06	NOTE 3
3001	142,313.50	13,391,738.19	618.04	615.93	NOTE 3
3002	142,337.85	13,391,653.71	618.04	618.03	-0.01
3003	142,342.79	13,391,654.95	618.05	618.10	0.05
3004	142,371.00	13,391,558.72	618.05	618.03	-0.03
3005	142,375.40	13,391,560.48	618.06	618.00	-0.06
3006	142,403.91	13,391,464.40	618.06	618.04	-0.02
3007	142,408.59	13,391,466.10	618.07	618.05	-0.02
3008	142,436.76	13,391,370.12	618.07	618.01	-0.06
3009	142,441.63	13,391,371.88	618.09	618.07	-0.01
3010	142,469.83	13,391,275.78	618.08	618.13	0.04
3011	142,474.36	13,391,277.30	618.10	618.06	-0.04
3012	142,502.78	13,391,181.30	618.09	618.08	-0.02
3013	142,507.40	13,391,182.87	618.11	618.14	0.03
3014	142,535.76	13,391,086.84	618.10	618.09	-0.01
3015	142,540.48	13,391,088.58	618.12	618.11	-0.01
3016	142,551.96	13,391,040.52	618.11	618.14	0.03
3017	142,554.47	13,391,048.26	618.13	618.11	-0.01
3018	142,598.43	13,391,074.07	618.40	618.36	-0.04
3019	142,595.52	13,391,078.32	618.38	618.35	-0.03
3020	142,679.45	13,391,132.69	618.90	618.86	-0.04
3021	142,676.49	13,391,136.73	618.89	618.90	0.01
3022	142,760.60	13,391,191.39	619.40	619.36	-0.04
3023	142,757.71	13,391,195.26	619.39	619.33	-0.06
3024	142,841.49	13,391,250.33	619.90	619.88	-0.02
3025	142,838.68	13,391,253.78	619.90	619.92	0.02
3026	142,922.24	13,391,308.74	620.40	620.42	0.01
3027	142,919.93	13,391,312.39	620.40	620.43	0.03
3028	142,988.56	13,391,355.76	620.33	620.26	-0.07
3029	142,985.04	13,391,359.95	620.33	620.29	-0.04
3030	143,004.22	13,391,366.57	620.24	620.32	0.08
3031	143,001.55	13,391,370.75	620.24	620.21	-0.03
3032	143,085.94	13,391,423.77	619.74	619.71	-0.03
3033	143,083.50	13,391,427.51	619.74	619.77	0.03
3034	143,168.49	13,391,481.10	619.24	619.23	-0.01
3035	143,165.68	13,391,485.19	619.24	619.21	-0.03
3036	143,250.60	13,391,537.48	618.74	618.67	-0.07
3037	143,247.60	13,391,542.04	618.73	618.67	-0.06
3038	143,270.83	13,391,552.02	618.61	618.60	-0.02
3039	143,265.37	13,391,553.99	618.62	618.61	-0.02
3040	143,247.12	13,391,626.14	618.61	618.57	-0.04
3041	143,242.10	13,391,625.33	618.62	618.65	0.03
3042	143,215.42	13,391,721.45	618.61	618.55	-0.07
3043	143,210.80	13,391,720.38	618.62	618.55	-0.07
3044	143,197.43	13,391,777.41	618.61	618.60	-0.01
3045	143,192.66	13,391,775.68	618.61	618.57	-0.04
3046	143,186.65	13,391,817.36	618.60	618.64	0.04
3047	143,182.40	13,391,815.86	618.60	618.65	0.05
3048	143,160.93	13,391,913.83	618.57	618.58	0.01
3049	143,156.20	13,391,912.65	618.57	618.51	-0.07
3050	143,132.45	13,392,021.50	618.54	618.53	-0.01
3051	143,127.62	13,392,021.09	618.54	618.58	0.03

2015 INVERT OF PERIMETER DITCHES CONSTRUCTION CONTROL POINTS

POINT NUMBER	NORTHING	EASTING	DESIGN ELEVATION	RECORD ELEVATION	DIFFERENCE ±
5000	142,528.09	13,391,033.99	609.97	610.02	0.04
5001	142,516.37	13,391,030.63	609.97	609.90	-0.07
5002	142,065.31	13,392,355.59	609.39	609.39	0.00
5003	142,055.25	13,392,348.69	609.39	609.32	-0.07
5004	141,354.29	13,392,964.34	609.01	608.96	-0.05
5005	141,341.34	13,392,955.82	609.03	609.00	-0.03
5006	141,340.69	13,392,968.32	609.02	609.03	0.01
5007	141,786.19	13,393,754.92	609.56	609.34	-0.22
5008	141,774.01	13,393,757.69	609.56	609.22	-0.34
5009	142114.21	13391199.99	609.94	NOTE 1	NOTE 1
5010	142119.43	13391211.30	609.94	NOTE 1	NOTE 1
5011	142158.20	13391187.38	608.99	NOTE 1	NOTE 1
5012	142162.24	13391197.85	609.00	NOTE 1	NOTE 1
5013	142,114.21	13,391,199.99	608.75	608.64	-0.11
5014	142,119.43	13,391,211.30	608.75	608.71	-0.04
5015	142,158.20	13,391,187.38	608.77	608.74	-0.03
5016	142,162.24	13,391,197.85	608.77	608.71	-0.06
5017	142,260.09	13,391,142.74	608.83	608.90	0.07
5018	142,266.52	13,391,152.11	608.83	608.85	0.02
5019	142,330.63	13,391,100.34	608.87	608.92	0.05
5020	142,337.70	13,391,110.02	608.87	608.82	-0.05
5021	142,386.88	13,391,041.66	608.92	608.96	0.04
5022	142,394.20	13,391,051.05	608.92	608.92	0.00
5023	142,483.71	13,390,981.71	608.97	608.89	-0.08
5024	142,487.02	13,390,993.74	608.97	608.99	0.02
5025	142,539.34	13,390,982.85	609.00	608.90	-0.10
5026	142,535.31	13,390,994.56	609.00	608.92	-0.08
5027	142,975.31	13,391,290.26	609.27	609.16	-0.12
5028	142,968.45	13,391,299.77	609.27	609.25	-0.02
5029	143,313.08	13,391,538.42	609.49	609.49	0.00
5030	143,301.38	13,391,541.89	609.49	609.48	-0.01
5031	143,234.85	13,391,788.22	609.62	609.72	0.10
5032	143,223.54	13,391,785.10	609.62	609.63	0.01
5033	143,167.09	13,392,041.63	609.75	609.74	-0.01
5034	143,155.51	13,392,038.79	609.75	609.76	0.00
5035	143,123.05	13,392,297.54	609.89	609.85	-0.03
5036	143,111.39	13,392,296.86	609.89	609.92	0.04
5037	143,053.12	13,393,005.83	610.25	610.31	0.06
5038	143,064.82	13,393,008.32	610.25	610.21	-0.04
5039	142,910.78	13,393,477.61	610.50	610.56	0.06
5040	142,899.46	13,393,473.95	610.50	610.51	0.01
5041	142,810.10	13,393,786.45	610.23	610.25	0.02
5042	142,800.61	13,393,778.64	610.23	610.28	0.04
5043	142,480.62	13,394,129.44	609.83	609.90	0.07
5044	142,468.52	13,394,124.36	609.83	609.80	-0.03
5045	142,477.85	13,394,433.32	609.58	609.63	0.05
5046	142,470.19	13,394,425.92	609.58	609.57	-0.01
5047	142,126.63	13,394,445.26	609.28	609.36	0.08
5048	142,126.74	13,394,433.88	609.28	609.23	-0.05
5049	141,790.96	13,394,441.55	609.00	608.29	-0.71
5050	141,790.17	13,394,429.43	609.00	608.66	-0.34
5051	141,666.42	13,394,379.20	608.88	608.58	-0.31
5052	141,669.74	13,394,368.25	608.88	608.72	-0.16
5053	141,583.43	13,394,371.60	608.81	NOTE 1	NOTE 1
5054	141,582.46	13,394,359.47	608.81	NOTE 1	NOTE 1
5055	141,498.27	13,394,393.22	608.74	NOTE 1	NOTE 1
5056	141,495.32	13,394,381.59	608.74	NOTE 1	NOTE 1

NOTE(S)

1. CERTAIN SWALE SURVEY POINTS WERE BEING OBTAINED AS OF THE WRITING OF THIS REPORT.
2. POINT 1013 SURVEYED BY EAGLE EXCAVATING USING A GPS SYSTEM, FOUND TO BE WITHIN TOLERANCE, HOWEVER NOT RECORDED; DESIGN SUBGRADE ELEVATION USED.
3. BERM CONSTRUCTION TERMINATED SHORT OF DESIGN, THEREFORE POINTS 3000 AND 3001 ARE LOWER THAN DESIGN ELEVATION.
4. SUBGRADE ELEVATIONS LOWER THAN 0.10 FEET BELOW GRADE WERE CONSIDERED ACCEPTABLE DUE TO THE BACKFILLING OF GRANULAR SOILS WITHIN THE PORE WATER RELIEF LAYER.

RECORD DRAWING

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

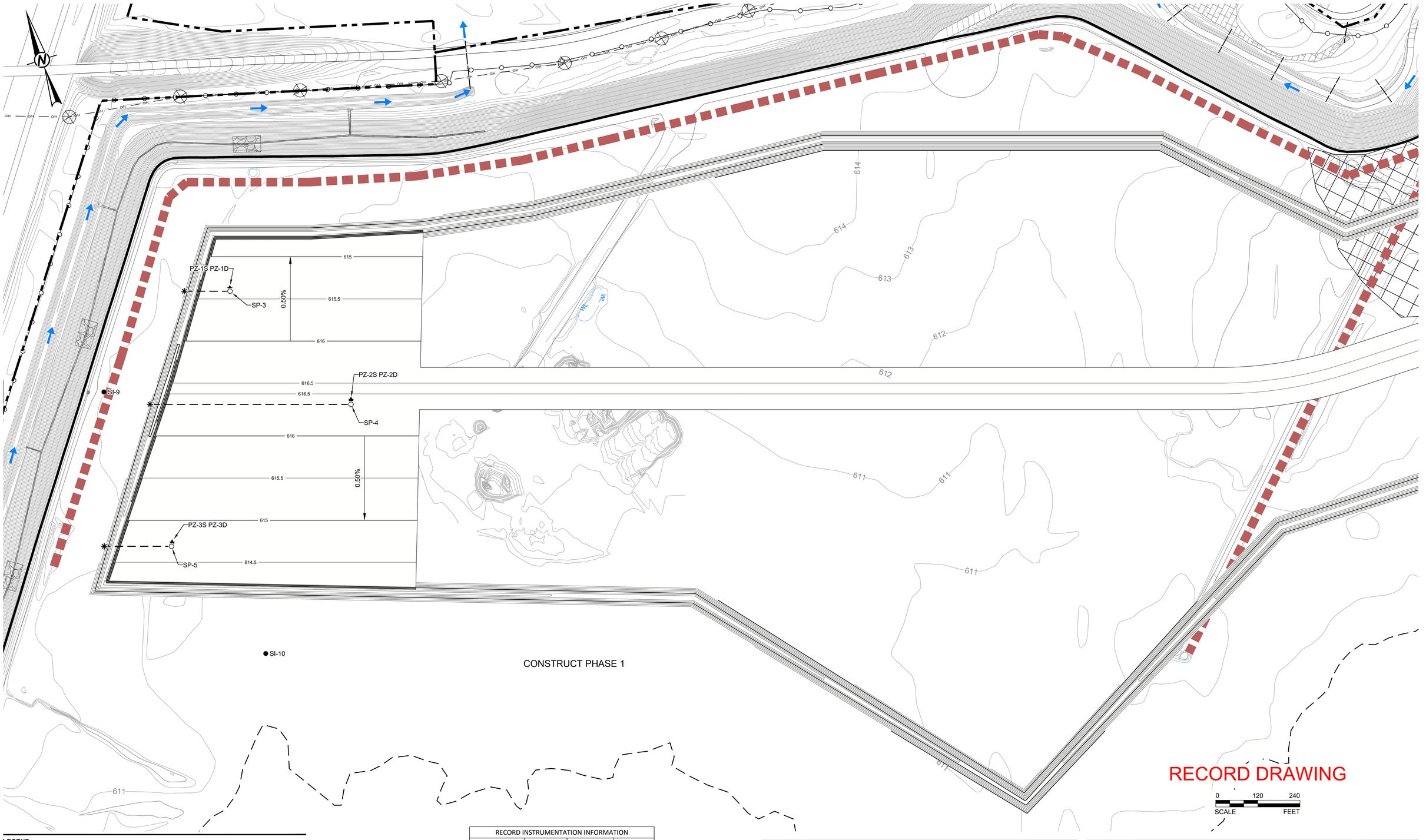
TITLE
CONSTRUCTION CONTROL / QA/QC POINTS/

PROJECT No. 1521809B | CONTROL | Rev. | FIGURE 7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

0 1in

Path: \\lansing\CAD\Projects\15x Projects\1521809B_DTE Monroe\PRODUCTION\As Built Drawings\ | File Name: 1521809B_D-4.dwg



LEGEND

● SI-1	SLOPE INCLINOMETER
▲ PZ-1D PZ-1S	VIBRATING WIRE PIEZOMETER (VWP) PAIR (DEEP & SHALLOW)
○ SP-1	SETTLEMENT PLATE
✱	REMOTE (CABLED) DATA LOGGER LOCATION FOR VWP
– – – –	DATA LOGGER CABLE

RECORD INSTRUMENTATION INFORMATION

INSTRUMENT IDENTIFICATION	NORTHING	EASTING	ELEVATION
PZ-1S PZ-1D	143,132.58	13,391,553.77	614.71
PZ-2S PZ-2D	142,791.36	13,391,744.99	615.92
PZ-3S PZ-3D	142,601.23	13,391,236.06	614.26
SI-10	142,280.24	13,391,364.86	612.45
SI-9	142,989.72	13,391,192.71	611.28
SP-3	143,124.35	13,391,551.76	615.34
SP-4	142,779.81	13,391,741.28	616.31
SP-5	142,591.55	13,391,231.59	614.76

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

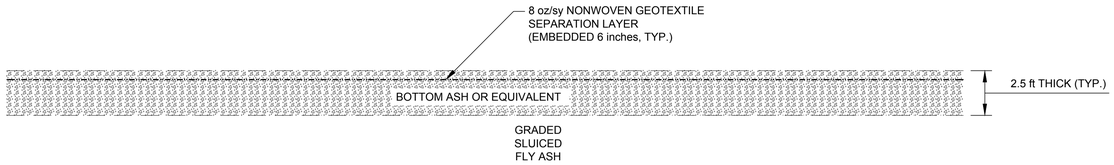
CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

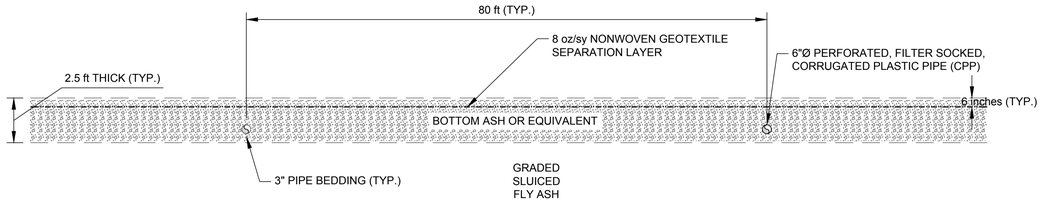
PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

TITLE
RECORD MONITORING LOCATIONS FOR PHASE 1

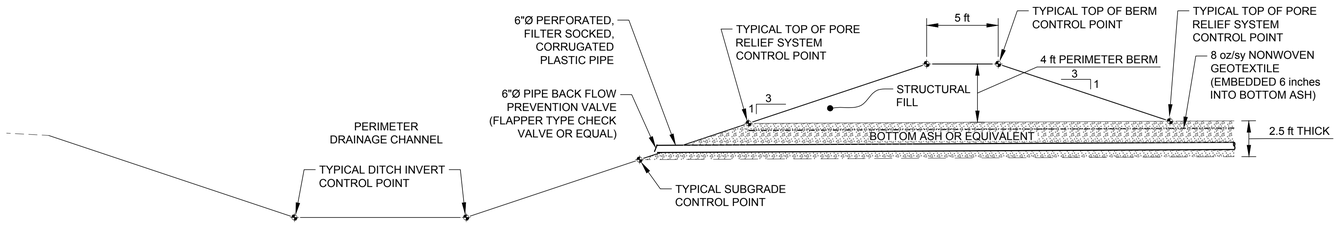
PROJECT No.	CONTROL	Rev.	FIGURE
1521809B			8



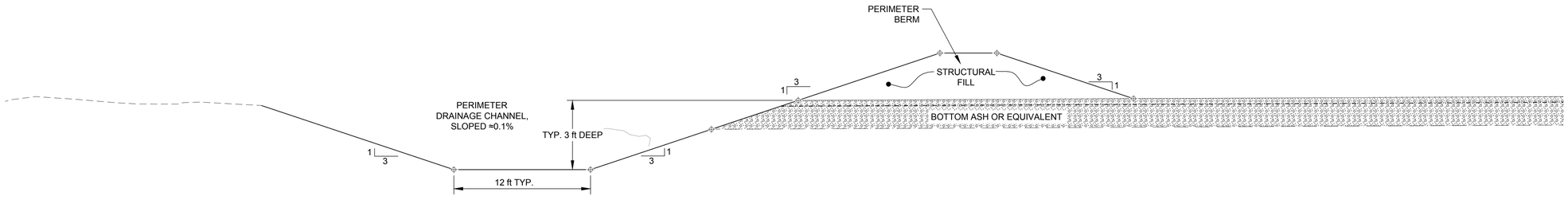
1 / 9 PORE RELIEF SYSTEM BASE LINER



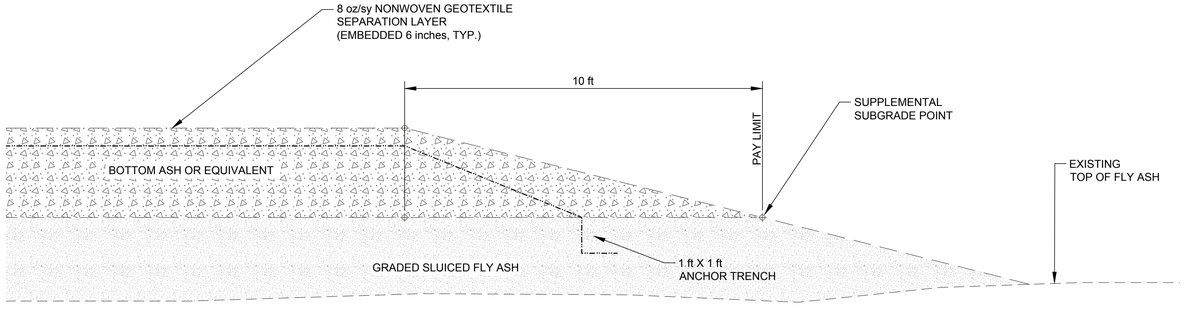
2 / 9 PORE RELIEF SYSTEM BASE LINER w/PIPES



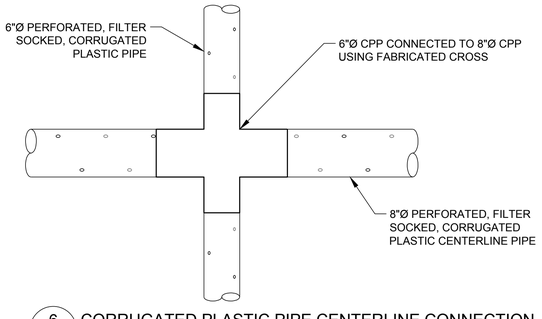
3 / 9 PERIMETER BERM WITH NORTH-SOUTH PORE RELIEF PIPING SHOWN



4 / 9 PERIMETER BERM WITHOUT PIPING



5 / 9 TYPICAL LEADING EDGE DETAIL



6 / 9 CORRUGATED PLASTIC PIPE CENTERLINE CONNECTION

RECORD DRAWING

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

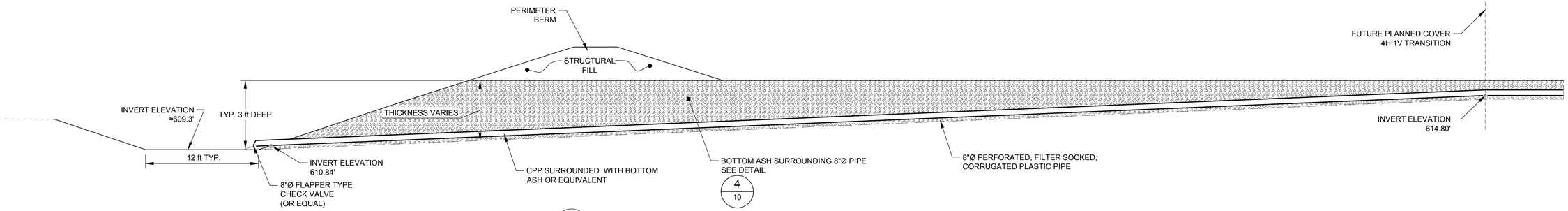
CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

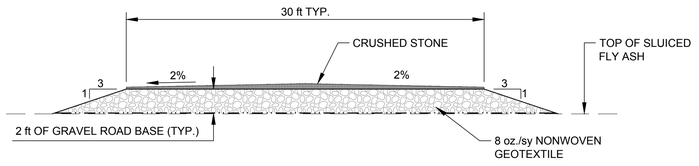
PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

TITLE
GENERAL DETAILS
SHEET 1

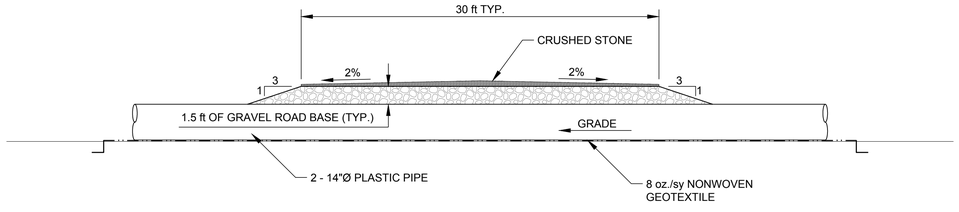
PROJECT No.	CONTROL	Rev.	FIGURE
1521809B			9



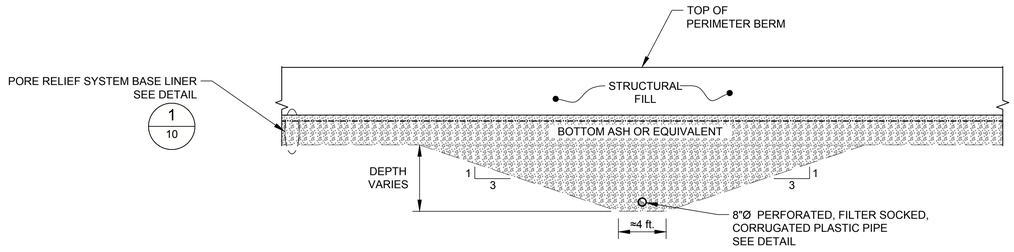
1 / 10 PERIMETER BERM WITH WESTERN CENTRAL PORE PRESSURE RELIEF PIPE SHOWN



2 / 10 TYPICAL NEW ROAD SECTION



3 / 10 TEMPORARY ACCESS ROAD RAMP AND CULVERT DETAIL



4 / 10 8"Ø PIPE TRENCH PAST 4H:1V SLOPE

RECORD DRAWING

CLIENT
DTE ENERGY
MONROE POWER PLANT
MONROE, MI

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-09-10
PREPARED	JJS
DESIGN	JJS
REVIEW	JJS
APPROVED	DML

PROJECT
MONROE POWER PLANT ASH BASIN
2015 PHASE 1 RECORD DRAWINGS

TITLE
GENERAL DETAILS
SHEET 2

PROJECT No.	CONTROL	Rev.	FIGURE
1521809B			10

APPENDIX C

DTE Energy

CCR Landfill
Weekly Inspection Report

Name of Landfill: Monroe Vertical Extension Landfill **Qualified P.E.** **John Seymour**
MDEQ Landfill ID **Date:** 12/18/2015 **Time:** 9- 11 AM
Owner: DTE Energy **Weather:** Sunny; 32 Deg; 10 mph wind
Operator: Headwaters
Site Conditions: V. Good. Relativley dry and easily accessible

I. Landfill Condition

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

2. Are any stormwater ditches obstructed? X Yes ___ No
If 'Yes', describe (type of debris, reason for obstruction, etc.) Ditches have minimal slope and pond water in some areas; does not impede overall ability to drain the 24- hour, 25-year storm.

3. Are there indications of erosion on the landfill perimeter berm? ___ Yes X No
If 'Yes', describe what type and its condition (rill, gully, dimensions, etc.)

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.

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? ___ Yes X No
Describe flow conditions. There is no water presently draining but it is expected that the underdrain layer does not have any water to drain.

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

8. Other observations around the landfill (changes since last inspection): ___ Yes X No
If 'Yes', describe. This is the first annual inspection.

DTE Energy

CCR Landfill
Weekly Inspection Report

Name of Landfill: Monroe Vertical Extension Landfill **Qualified P.E.** **John Seymour**
MDEQ Landfill ID **Date:** 12/18/2015 **Time:** 9- 11 AM

II. Repairs, Maintenance, Action Items

1. Has any routine maintenance been conducted since the last inspection? ___ Yes X No
   If 'Yes', describe.
   Note that Phase 1 is constructed and remaining phases are under construction.

2. Have any repairs been made since the last inspection? ___ Yes X No
   If 'Yes', describe.
   Note that Phase 1 is constructed and remaining phases are under construction.

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. No visible damage observed; recent readings were received.

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.			

PERIMETER CHANNEL R1
SLOPES AT ≈0.05%

P-5

P-4

612.5

613

0.5%

613.5

P-6

NEW ACCESS ROAD
SEE DETAIL
2
10

P-3

ACCESS ROAD RAMP
AND CULVERT
SEE DETAIL
3
10

614

PHASE 1 -
LICENSED

P-1

P-2

P-10

ACCESS ROAD

613

612.5

612

0.5%

P-7

P-8

HIGH POINT OF PERIMETER
DRAINAGE CHANNEL R3,
ERT ELEVATION 610.02 ft msl

P-9

611

PERIMETER CHANNEL R3
SLOPES AT 0.04%

DISCHARGE EXTENDED
TO POND

SOURCE: "RECORD TOP OF SUBGRADE AND SWALE PLAN-RECORD DRAWING", FIGURE 4, GOLDER ASSSOCIATES, 2015-09-10.

PHOTO LOCATIONS
ANNUAL INSPECTION
VERTICAL EXTENSION
LANDFILL
18 DECEMBER 2015
DTE MONROE PLANT
Monroe, Michigan
Geosyntec Consultants

DTE MONROE ASH BASIN VERTICAL EXTENSION

Photo 1: CCRs previously placed in Phase 1. East edge of Phase 1 shown from center left to center right.

Photo 2: Trucks containing CCR placing in Phase 1 and smooth drum roller compaction equipment. Stored geotextiles under white plastic cover to the left.

Photo 3: Surface water drainage pipes in the Perimeter Swale to convey runoff below the access road.

Photo 4: North Perimeter Berm near access road looking west. The perimeter swale is to the right and bottom ash is to the left in Phase 1.

Photo 5: West Perimeter Berm looking south. The perimeter swale is to the right and limestone is to the left in Phase 1.

Photo 6: View of filling operations in the background with the buried instrumentation cabling for the inclinometer and piezometers in the foreground and center. Looking east.

Photo 7: South Perimeter Berm looking east. Perimeter swale on the right and limestone base to the left.

Photo 8: View of filling operations from the south berm looking northeast.

Photo 9: View of surface water drainage swale in southeast portion of the Landfill to the east of Phase 1. The Landfill construction will be to the left but has not yet reached this area.

Photo 10: View of fly ash surface to the east of Phase 1 looking at a temporary, 550-gallon, double lined fuel tank looking southwest.

APPENDIX D

HPS
HEADWATERS PLANT SERVICES

DTE Monroe

*Total Ash - Monthly/YTD - **2015***

Material	*January Tons*	*February Tons*	*March Tons*	*April Tons*	*May Tons*	*June Tons*
FLY ASH						
BOTTOM ASH						
WWT SLUDGE						
HYDROCHEM						
TOTAL MONTHLY						

Material	*July Tons*	*August Tons*	*September Tons*	*October Tons*	*November Tons*	*December Tons*
FLY ASH				9.31	118.61	48.06
BOTTOM ASH				2,382.31	1,737.10	4,481.19
WWT SLUDGE				409.23	484.70	1,440.72
HYDROCHEM				0.00	0.00	26.87
TOTAL MONTHLY				2,800.85	2,340.41	5,996.84

Note: DTE reported on 1/8/2016 that an additional 100 tons of bottom ash placed in October.

	Year to Date - Tons
FLY ASH	175.98
BOTTOM ASH	8,600.60
WWT SLUDGE	2,334.65
HYDROCHEM	26.87
Total YTD - All Material	11,138.10

By J Seymour, Geosyntec
90 lbs/cuft
27 cuft/cuyd
2000 lbs/ton
9167 cuyd