



*Prepared for*

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# **2020 ANNUAL INSPECTION REPORT RANGE ROAD LANDFILL ASH DISPOSAL FACILITY**

**China Township, St. Clair County, Michigan**

*Prepared by*

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## 1. INTRODUCTION

### 1.1 Overview

This 2020 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants (Geosyntec) to provide the results of the annual inspection of the coal combustion residuals (CCR) Range Road Ash Disposal Facility (Landfill) located in China Township, St. Clair County, Michigan. 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 approximately one mile west of the St. Clair River between Lake Huron and Lake St. Clair. The Landfill is licensed by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), formerly the Michigan Department of Environmental Quality (MDEQ), as a Coal Ash Landfill. The property encompasses 514 acres of which 402 are designated for landfill development. The EGLE Facility ID Number is 392562 and License Number 9603.

During 2020 the Landfill accepted bottom ash, fly ash, and waste coal from the St. Clair and Belle River Power Plants. The Marysville Power Plant is included in the current license but has been decommissioned and no longer sends ash to the landfill. The Harbor Beach Power Plant is no longer operating but is transferring ash to the Landfill in accordance with the Harbor Beach Power Plant closure project. Filling operations at the site began in the 1950s and the current Operating License issued to DTE Electric Company (DTE) and defined as Number 9603 supersedes and replaces the previous license (#9395). The Landfill has had an operating license since 1966.

The Landfill has multiple operating and planned phases defined by work areas as discussed in the Landfill Development Plan, design drawings, and draft drawings and memorandums on RRLF Waste Filling Sequence. Currently nine work areas are certified closed and three active. Areas D3, G2 Phase I and F3/D3 are active as identified in Figure 1. For construction purposes, Area G2 has been subdivided into three phases. Area G2 Phases I and II have been approved for waste placement while Phase III is still under base liner construction per previous discussions with the DTE inspector. Area E was not included in a current waste filling sequence overall site plan (Draft September 26, 2017), and may not be needed depending on actual future volumes of CCR disposed of during the life of the plants. However, it is still identified in the current Operating License Number 9603, Dated May 15, 2020.

## 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
- (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 construction certification documentation, review of available operating records, and review of instrumentation monitoring data and evaluations intended to detect signs of instability.

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

#### 1.4 **Terms of Reference**

The annual visual inspection was performed by Mr. Daniel G. Bodine, P.E. of Geosyntec whose qualifications as a “qualified professional engineer” under the CCR Rule are presented in Appendix A. DTE’s “qualified person” accompanied Mr. Bodine.

This report was prepared by Mr. Daniel G. Bodine, P.E. of Geosyntec. The senior review was completed by Mr. John Seymour, P.E., of Geosyntec. He is a qualified professional engineer per the requirements of §257.53 of the CCR Rule.

## 2. REVIEW OF AVAILABLE INFORMATION

Geosyntec reviewed the documents listed in Table 1 for the 2020 annual inspection. Geosyntec is not responsible for the accuracy of the documents reviewed that have been prepared by others and has prepared this inspection report based on good engineering judgement and data review. References to TRC refer to TRC Environmental Corporation, NTH to NTH Consultants, Ltd., AECOM to AECOM and Headwaters to Headwaters Plant Services, a division of Headwaters Inc. Headwaters Inc. has been acquired by Boral. As such, forms are being used with both names.

**Table 1 Available Information Reviewed for the 2020 Annual Inspection**

Title	Prepared by	Month and Year	Content with 2020 Update Status
2019 Annual Inspection Report - Range Road Landfill Ash Disposal Facility	Geosyntec Consultants	January 2020	Results of 2019 RRLF Inspection Report on Review of Documents and Files Related to the Operating Record and Conducting a Visual Site Inspection of the Facility.
Landfill Development Plan with Plan Sheets	TRC	Final November 2013	Overall Development Plan for Landfill Including Design, Construction, Surface Water Management, Operation, Monitoring and Site Closure. The 2013 Plan Remains Unchanged for the 2020 Inspection.
Range Road Solid Waste Disposal Area Operating License Renewal Application	DTE	April 2019	Operating License Renewal Application for the Range Road Ash Disposal Facility. Not Reviewed for the 2020 Inspection as an Operating License Renewal as been Granted. See Below.
Range Road Ash Disposal Operating Number and License  Facility No. 392562 License No. 9603	EGLE	May 2020	New Solid Waste Disposal Area Operating License, Including Terms and Conditions. License is Active and Supersedes and Replaces the Previous Operating License Number 9395.
Construction Certification /Soil Verification (Area G2) Range Road Landfill	MDEQ	September 2015	MDEQ Authorization for Waste Placement in Area G2 Northern Portion (Phase 1). Waste Placement in Area G2 Phase 1 was Active During 2020 Inspection.

<b>Title</b>	<b>Prepared by</b>	<b>Month and Year</b>	<b>Content with 2020 Update Status</b>
2020 Site Plan Figure 1 of DTE Range Road Operating License Number 9603.	TRC & Part of Operating License	Figure Date April 2020	Landfill Area Site Plan Showing Locations, Designations, Status and Phasing Legend. Used as Figure 1 in Geosyntec's 2020 Annual Inspection Report (This Report)
DTE Energy Company RRLF Area G2 Phase II Base Liner Draft Construction Plans	NTH	March 2018	Area G2 Phase 2 Base Liner Construction Plans-No Change Reported for 2020.
DTE Range Road Waste Filling Sequence with RRLF Estimated Life Expectancy and Capacity Summary	NTH	April 2018	Ash Volumes & Estimated Fill Volumes for Closure for Areas G2 Phases I, II & III, and Area F3/D3. Estimated Dates for Closure Start Given. No Change Reported for 2020.
Certification of Base Liner Grades (Area G2-13.1 Acres) DEQ Review Letter	State of Michigan DEQ	September 2018	DEQ's Review Indicating Certification is Consistent with the Requirements of Part 115. This is G2 Phase II Area Reported as 13 Ac in Current Operating Permit.
Soil Erosion and Sedimentation Control Permit No. SE2017-41	St. Clair County Health Department	April 2017	Permit Issued April 10, 2017 and Expires April 10, 2019. Activity Associated with Final Cover Construction and Installation of Landfill Cap of Approximately 18 Acres and Borrow Pit of 14 Acres. County 2020 Update: Inspector Visited Site and Permit was Closed Out without Issue.
NPDES Permit No. MIR11436	State of Michigan DEQ	June 2017	Permit Authorizing Discharge of Storm Water from Construction Activities at DECO-Belle River Pit (Site Name). Permit has been Closed Out 4-10-19.
NPDES Permit No. MI0038172	State of Michigan DEQ	October 2018	Permit for discharge from the Belle River Power Plant and Blue Waters Energy Center
Surface Water Flow Figure 2 (Working Copy)	TRC	December 2015	Plan of Ditch and Surface Flow Directions, Staff Gauge & Piezometer Locations. Copy used as Reference for Ditch & Surface Flow Locations.



Title	Prepared by	Month and Year	Content with 2020 Update Status
Closure Plan for Existing CCR Unit 40CFR 257.102 (b)	AECOM	October 2016	Closure Plan Description, Inventory and Area Estimates, Schedule and PE Certification. Plan Remains Unchanged.
Post Closure Plan for Existing CCR Unit 40CFR 257.104	AECOM	October 2016	Post Closure Plan Description, Monitoring & Maintenance, Owner Operator Requirements and PE Certification. Plan Remains Unchanged.
Run-On/Run-Off Control System Plan for CCR Disposal Facility-Range Road	AECOM	October 2016	Plan to Address §257.81(c) of the USEPA CCR Final Rule. Appendices Included Historical Design Drawings and HydroCAD Analysis Output. Plan Remains Unchanged.
Groundwater Contour Maps November 2016, March 2017 and April 2017	TRC	January, April and July 2017	Groundwater Flow Directions and Elevations Outside & Inside of Slurry Wall. Perimeter Ditch Water Elevations at Staff Gauge Locations.
Area F3 Cap Material Borrow Areas	NTH	August 2016	Identifies Approx. Quantities of F3 Cap Topsoil, Clay and Inert Fill Required and Quantities of G3 Area Borrow Available.
Range Road Area F3 Final Closure – Existing Site Plan Draft - Dwg No. 6C664-158	DTE	February 2017	Drawing Showing Landfill Areas Including Future Portions of Area G that can be Used for Active Topsoil and Clay Borrow.
DTE Energy Company - Range Road Area F3 Final Closure - Drawings	NTH	March 2017	Bid Issue Cover Drawing Listing Sheet Index of 8 Drawings.
Range Road Landfill Coal Combustion Residuals Fugitive Dust Plan-Rev1	DTE	July 2019	Plan Certified by Professional Engineer to 40 CFR 257.80(b)(7) Revision 1. Plan was Updated in 2019.
DTE Electric Company – Range Road Landfill Coal Combustion Residuals Annual Fugitive Dust Reports	DTE	November 2019	Annual Fugitive Dust Control Report Pursuant to 40CFR 257.80(c). Descriptions and Actions Taken to Control CCR Fugitive Dust.

<b>Title</b>	<b>Prepared by</b>	<b>Month and Year</b>	<b>Content with 2020 Update Status</b>
CCR Groundwater Monitoring Well Locations (Working Copy)	TRC	April 2016	Plan Showing Name & Locations of Seven (7) Monitoring Wells Around Landfill.
Groundwater Potentiometric Elevation Summary Figure 7	TRC	October 2017	Groundwater Elevation Summary for the 7 Groundwater Monitoring Wells Numbers 16-01 thru 16-07.
4th Quarter 2019 and 1 <sup>st</sup> Quarter 2020 Groundwater Elevation Monitoring Tables 1 and 2 from Reports	TRC	January 2020 and April 2020	Summary Tables of Groundwater Well/Piezometer and Perimeter Ditch Staff Gauge Elevation Monitoring.
MDEQ WMRPD Q3 FY18 Inspection Report	Michigan DEQ	July 2018	2018 3 <sup>rd</sup> Quarter Inspection Report
MDEQ WMRPD Q4 FY18 Inspection Report	Michigan DEQ	September 2018	2018 4th Quarter Inspection Report Recommend Removal of Top Cover Woody Vegetation
MDEQ/EGLE MMD Q1, Q2, Q3 & Q4 FY19 Inspection Reports	Michigan DEQ	December 2018, April, June & October 2019	Facility in Compliance Reported.
DTE 2018 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> and 4 <sup>th</sup> Quarterly Comprehensive Inspection Log (s)	DTE	March, May, August and November, Respectively 2018	Inspection Condition and Notes: Final Cover for Areas, Surface Water Ditches & Signage.
DTE 2019 2 <sup>nd</sup> , 3 <sup>rd</sup> & 4 <sup>th</sup> and 2020 1 <sup>st</sup> & 2 <sup>nd</sup> Quarterly Comprehensive Inspection Log (s)	DTE	May, Aug, Nov 2019 and Jan & April 2020	Inspection Condition and Notes: Final Cover for Areas, Surface Water Ditches & Signage.

Title	Prepared by	Month and Year	Content with 2020 Update Status
2019-2020 Weekly General Inspection Log (s)	DTE	Weekly Logs May 26, 2019 thru May 31, 2020	Inspection for General Site, Waste & Nuisance Control, Final Cover, Leachate & Surface Water Control. Viewed Weekly Logs. Road Tree Blockage Cleared.
Environmental Outside Rounds Log Sheet (A Daily Inspection Log)	DTE	Not Viewed	Daily Plant Environmental Inspection Log Sheet. Record Unusual Conditions, Gate Conditions, Flow Meter Readings, etc.
Groundwater Monitoring System - Summary Report	TRC	October 2017	Summary Report Figure 2 Used for Identifying Monitoring Well Locations.
Mobil & Fixed System Equipment Training Record	Headwaters, Inc. now Boral	August 2017	Classroom, Field Discussion, Observation, Operation and Unassisted Operation Training Record for New Employee. No Updates Provided for 2019 or Winter 2020.
Landfill Contractor Construction Training Records	Headwaters, Inc. now Boral	None Provided	No New Training Records Provided for the 2020 Inspection.
Appendix D to §1910.134 (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard	Headwaters, Inc. now Boral	Sept. 9, 2017	Discussion of Respirator Use, Selection, Cleaning, Related Hazards and Respirator Labeling was Provided for the 2017 Inspection. No Updates for 2019 or 2020.
Employee Acknowledgement of Receipt of Safety Consequence Policy	Headwaters, Inc. now Boral	Sept. 9, 2017	Employee Acknowledgement of Reading, Understanding of Policy and Safety Guidelines. Copy Applicable to New Employees for 2017. No Updates for 2019 or 2020.
Copy of Construction Drawings for G2 Phase 2 Base Liner	NTH	April 23, 2018	Area G2 Phase 2 Base Line Construction Drawings. No Updates for 2020.
Partial Closure Certification (Area F3)	MDEQ	May 22, 2018	Approval Letter for Partial Closure. No Updates for 2020.

### 3. FACILITY DESCRIPTION

#### 3.1 Overall Site Description

The overall site facility property is composed of the 514 acres of which 446 are designated for landfill development. The Landfill work areas are currently divided into fourteen work areas, nine that have been identified as “Certified Closed”, three identified as “Active” and two identified as “Unconstructed”. The work areas are listed below in **Table 2** and shown in **Figure 1**. **Figure 1** is taken from the 2020 Site Plan provided in the Solid Waste Disposal Area Operating License effective April 22, 2019.

**Table 2 Site Phasing Summary – 2019-2020**

<u>Area</u>	<u>Status</u>	<u>Size (Acres)</u>	<u>Comments</u>
A	Closed	7	Certified Closed, May 17, 2002
B	Closed	102	Certified Closed prior to September 2, 1999
B1	Closed	9	Certified Closed prior to September 2, 1999
C	Closed	16	Cert. Report Approved August 25, 2009
D1	Closed	21	Cert. Report Approved August 25, 2009
D2	Closed	10	Cert. Report Approved August 25, 2009
D3	Active	3	Interim Cover Placed at Time of Inspection
E	Unconstructed	117	No Cell Construction or Waste Placed
F1	Closed	17	Cert. Report Approved January 4, 2010
F2	Closed	12	Cert. Report Approved February 28, 2013
F3	Closed	17	Closed Reported Certification Approval
F3/D3	Active	5	Active Per Operating License, April 2019
G1/G3	Unconstructed	56	No Cell Construction or Waste Placed 2019
G2	Active	<u>54</u> **(Total Permitted)	
	G2 Phase 1	(Waste Placement In Progress)	
	G2 Phase 2	(Waste Placement In Progress)	
	G2 Phase 3	(Construction In Progress)	

\*\* Acreage from DTE Renewal Permit Application

The Landfill includes perimeter ditches, roadways, a shallow perimeter slurry wall, earth berms, a 10 Acre NPDES Stormwater Detention Basin (SDB) and basin pump house. The basin has also been referred to as the sedimentation basin in some of the reviewed documents and figures. The SDB is located in the southeast corner of the property; the slurry wall, reported to be approximately

10 to 15 ft deep, surrounds the entire landfill along the property perimeter. The perimeter ditch surrounds the entire Landfill connecting and draining to the SDB (Figure 2). The pump control areas for these systems and the SDB pumping system were observed during the 2020 annual inspection.

The Landfill is a dry-handled (conditioned) CCR landfill licensed by EGLE as a Coal Ash Landfill with maximum 4 horizontal (H) to 1 vertical (V) final cover side slopes and 3 H to 1 V or flatter interim cover slopes. The current revised estimated annual total CCR disposal rate is 225,500 in-place cubic yards/year (average) based on historical CCR production rates and calculations of volumes by NTH using aerial flyovers performed in 2013 and 2017. The currently permitted areas of the Landfill are expected to handle the anticipated volume of CCR through the year 2030, consistent with the Landfill's Closure Plan.

The Landfill has a compacted in place clay liner ranging from 86 to 188 feet thick and is present beneath the entire Landfill. A thin discontinuous near-surface sand seam is present beneath the north eastern portion of the landfill; however, a slurry wall and perimeter ditch system were designed and installed to prevent any off-site flow from the sand seam.

### 3.2 **Design**

The Landfill design and operation is summarized in the Landfill Development Plan, Remedial Action Plan, Run-on/Run-off Control System Plan and the Quarterly Monitoring Reports. The key components of the Landfill include:

- Perimeter slurry wall keyed into top of 70-foot thick subbase clay layer;
- Perimeter drainage ditch capturing surface water and near surface groundwater;
- 10-Acre SDB collecting ditch water and pumping to plant;
- Two off site groundwater capture systems collecting water in the shallow sand seam;
- Final Cover installation from top to bottom that includes:
  - 6-inch thick vegetated topsoil layer (erosion layer);
  - 24-inch thick infiltration layer (select clay layer with hydraulic conductivity,  $k \leq 1 \times 10^{-7}$  cm/sec);
  - Maximum 4H to 1V side slopes;

- Minimum 1% grade top of closed areas and minimum 2% grade for areas to be closed in the future, and
  - Phasing plans and special conditions detailed in drawings, plans and license.
- Closure and Post Closure Plans

Landfill design and construction are supported by construction phasing plans, surface water management plans and details, site operation (waste placement) plans and details, and leachate and environmental monitoring plans and reporting. Additionally, landfill monitoring systems maintenance and inspection, and site closure and post closure plans with long term care procedures are covered.

### 3.3 **Construction**

The Landfill has been operating since the 1950s. The Landfill Operating License discusses the work areas (see Section 3.1), references design, construction and monitoring documents submitted by DTE and includes conditions and criteria required for the Landfill operation, phase construction and monitoring. A renewal permit, License Number 9603 effective May 15, 2020, was issued to DTE by the Michigan EGLE. Closure and Post Closure Plans in accordance with 40 CFR 257.102 (b) and 40 CFR 257.104, respectively, have been prepared with an operating record date of October 17, 2016. A permit for NPDES discharge of storm water has been issued.

The Landfill Development Plan discusses site operations in Section 4 of the plan. Included are discussions on dust control, noise control, odor control, and access and security requirements, among other operating aspects. CCR filling procedures and requirements for construction observation and documentation are also included in the development plan.

#### 4. VISUAL INSPECTION RESULTS

The annual inspection on site was completed on May 18, 2020. The annual 2020 inspection log and photographs are presented in **Appendix B**.

In summary, no evidence of landfill instability, significant perimeter slope erosion or detrimental settlement was noted. The perimeter ditch, perimeter slurry wall, and pumping of water in the SDB appeared to be working as designed and in accordance with recognized and generally accepted good engineering standards except that only one of the three pumps in the SDB pump house was in service. Since the inspection was performed, DTE has indicated that they have repaired or completed pump maintenance and that all three pumps are back in service.

The northwest groundwater capture system and collection has had its two pumps replaced in late 2017. The pumps are used to transfer the captured water to the perimeter ditch for gravity flow to the SDB. At the time of the inspection the control panel showed both pumps in auto position, switches were checked, and the DTE inspector manually operated each pump to verify their operation.

Specific results of the visual inspection are summarized below. Photographs are provided in **Appendix B**. The weather on the day of the inspection was cloudy with short periods of sun and temperatures ranging from 57° F at 0730 hrs to a high of 59° F in midafternoon. Local weather reported total precipitation (rain) of 0.67 inches for the date occurring overnight and early morning, but rain did not fall during the inspection. The ground surface in the drainage areas were wet and soggy under truck travel as typically shown in Photographs 34 and 40.

SDB: The SDB appeared in good condition. Basin slopes and intake screens are shown in Photographs 1, 2 and 4. The pump control panel is shown in Photograph 3. Pumps 1 and 2 were tagged out of service at the time of the inspection. DTE later reported that service was restored. The basin intake screen was unblocked as shown in Photograph 2.

Landfill Final Cover: Closed work area phases were inspected including slopes. Conditions appeared generally good considering agreements approved with the MDEQ allowing trees remaining along and on the downstream slope at the north end of the Landfill, predominately in historical Areas A and B. These slopes were observed from the perimeter toe and intermittently along the top of slope from the landfill cover. Photograph 16 shows typical tree growth and ground vegetation on the outside slope of the closed landfill along the north and northeast sides of the landfill. Greater detail of trees and vegetation on outside slopes was provided in the 2018 inspection. The top cover of historical areas A and B were well vegetated with occasional small woody vegetation recently cut, as typically shown in Photograph 40.



The non-historical areas, such as Areas C, D1 and D2 had no or minor woody vegetation present. These cover and slope areas are well vegetated and appear very stable. The closed and active areas locations are identified on **Figure 1** and listed in **Table 2**.

Operating maintenance activities for closed cover and slope areas (west F1 Slope) during the winter and early spring consisted of cutting down woody vegetation from the landfill perimeter slopes and final cover. No new locations of woody vegetation were observed on top of the closed landfill areas. Photographs 33, 34, 36, 38, 39 and 40 show final cover surfaces and slopes of closed landfill areas. There were no observed areas of pooled water on the top cover from the recent rain.

The final cover swales, downslope drains (down-chutes) and downslope ditches were observed as part of the final cover inspection. All observed appeared in acceptable condition.

In conclusion, the top and final slopes of the closed landfill final cover areas appeared well vegetated and are consistent with recognized and generally accepted good engineering standards.

Active Area G2: Area G2 Waste Filling Sequence has been divided into Phase 1, Phase 2 and Phase 3 for purposes of liner construction and certification. The G2 Phase 1 area ties in with Area F2. As such the temporary clay covered slope over F2 CCR waste had been removed for reuse.

New or freshly conditioned CCR waste was observed in Area G2 Phase1 and Phase 2. At the time of the inspection there was no ongoing hauling or placement activities. This is predominately because less waste is currently being produced than planned. Placement and compaction procedures of conditioned CCR closely follows the Ash Filling Procedures discussed in the Landfill Development Plan. Temporary active waste placement slopes shown in Photographs 29 and 30 appeared stable but were not graded into a uniform temporary slope condition. This is because the slopes are in active placement and grading even though no activity was occurring on the inspection date.

Perimeter Ditch System: The Perimeter Ditch System is shown on **Figure 2**. Flow through the ditch system is maintained and monitored by DTE to ensure adequate flow to the SDB. Vegetation in the ditches is well established and is routinely maintained. The plant had put together a 3-year rotation (2017-2019) ditch maintenance program where approximately 1/3 of the ditch alignment length was scheduled for removal of excessive vegetation each year. Review of the DTE 2019 and 2020 weekly and Quarterly Inspection reports indicated that ditch vegetation maintenance was completed for several portions of the perimeter ditch alignment along the northeast, north, west and southwest sides of the Landfill and along the SDB perimeter slopes. The SDB and perimeter ditch slopes that were cleared of excessive vegetation appeared stable and well maintained as shown in Photographs 4, 24, 25, 26, 27, 28 and 46. Photograph 45 shows an interior haul road and a new ditch constructed in early 2018 replacing an old ditch that previously drained water from an

onsite runoff collection pond. Ditch maintenance schedule modifications are subject to the needs of the site.

A ditch staff gauge system is used to monitor water level in the perimeter ditch. Review of the monitoring summary tables prepared by TRC for the 4<sup>th</sup> Quarter 2019 and 1<sup>st</sup> Quarter 2020 together with the completed maintenance activities indicates ditch flow is occurring in the appropriate flow direction. Photographs 8, 11, 13, 14, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 44, and 48 (includes those mentioned above) show typical ditch conditions at various staff gauge, interior and perimeter ditch, and culvert locations.

The slurry wall is located outside of the perimeter ditch and along the property boundary. Many location markers remain identifying the below ground slurry wall location.

Operation Activities Including Waste Placement: The landfill operating contractor is Boral (formerly named Headwaters). No placement or hauling activities were taking place during the inspection. The landfill field office was closed for the day.

DTE provides operation monitoring through daily log monitoring of pumping from the SDB (NPDES pond flow monitoring) and weekly and quarterly monitoring of check list items. SDB Pump operation and flow is inspected by DTE daily and weekly.

Record Keeping: At the start of the 2020 annual inspection, records of current DTE monitoring inspections and new or updated reports were obtained from the landfill engineer. Additional records exist, electronically or in project files such as the daily Environmental Outside Rounds Log Sheet but were not checked or specifically requested. The current operating license dated May 15, 2020 lists many documents that have been submitted to the EGLE by DTE as part of the landfill design, plan preparation, construction certification and documentation, surface and groundwater monitoring, and landfill operation. The records for the Landfill appear comprehensive.

## 5. INSTRUMENTATION MONITORING

### 5.1 Surface Water and Groundwater Collection

Surface water and groundwater monitoring are conducted under a monitoring plan approved by ~~the MDEQ~~ (now EGLE). The surface water that falls within the landfill waste areas and within the perimeter ditch system is collected by the ditch system and flows, for the most part by gravity, to the SDB, as shown in **Figure 2**. An exception to this is the perimeter ditch located at the northwest corner of the property where the ditch water is collected and pumped to a portion of the ditch on the north side which gravity drains to the SDB. The perimeter slurry wall installed along the property line and outside of the ditch and basin system supplements and supports surface water collection as well as contains and directs any near-surface groundwater to the perimeter ditch.

Monitoring of the ditch water collection is accomplished through ditch visual inspection and slope and bottom maintenance, review of water elevations from a series of twelve (12) ditch staff gauges (SG) and one (1) at the entrance to the SDB and implementation of monitoring plans. Reporting of the monitoring is summarized in tables prepared by TRC. Review of the ditch water levels for the staff gauges show that the water gradient flows to the SDB, with its water elevation monitored with SG-13. A discussion of details of the review is provided in report Section 7.3 on ditch maintenance.

The perimeter ditch also collects near-surface groundwater that occurs along the east side of the property where near-surface sand is located above the subsurface thick layer of clay. The slurry wall in that area, with the top elevation higher than the groundwater elevation, acts as a groundwater flow barrier and supports collection by the perimeter ditch.

### 5.2 Groundwater Elevations and Offsite Capture System Monitoring

Monitoring well and piezometer locations are shown on **Figure 2** and monitoring water depths and elevations summarized in tables prepared by TRC. Groundwater elevations and flow directions indicates that the site-wide slurry wall and perimeter ditch network continue to perform as designed to prevent shallow groundwater beneath the RRLF site from migrating off-site. DTEs visual weekly inspection monitoring logs were available and reviewed.

### 5.3 RRLF CCR Monitoring Wells

During the 2020 annual inspection locations of seven (7) groundwater monitoring wells were observed. Observations indicated that that the monitoring wells were well protected with casing caps or covers keyed and locked.

## 6. OPERATION ACTIVITIES

Operations are defined in Section 4 of the Landfill Development Plan. The following operation control measures are described in the plan:

1. Hours of Operation
2. Waste Types
3. Traffic Routing
4. Lines and Grades
5. Nuisance Control (includes Fugitive Dust Control)
6. Police and Fire Protection
7. Access Control
8. Inclement Weather Operations
9. Drainage and Erosion Control
10. Record Keeping
11. Personnel and Equipment
12. Ash Filling Procedures
13. Leachate Management
14. Environmental Monitoring

Engineering design and construction related to the Landfill design, waste type and volumes, subbase grades, site phasing, final cover, surface water management, construction observation and documentation, and final closure and long-term care are included in the Landfill Development Plan. The plan was written by DTE/TRC in November 2013 and contained the Landfill operating license valid at that time. The current Landfill operating license issued by MDEQ is dated 26 June 2014.

In addition, the following plans and inspections are currently required by the CCR Rule:

- Weekly inspections by a qualified person,
- Dust control in accordance with a Fugitive Dust Control Plan,
- Preparation and Implementation of a Run-on/Run-off Control System Plan,
- Preparation of the Closure Plan for the Existing CCR Unit, and
- Preparation of the Post-Closure Plan for the Existing CCR Unit.

These plans were available for inspection during this or previous visits and are included in the project document file. The Annual Fugitive Dust Control Report dated November 30, 2019, and 2019 and 2020 weekly inspection reports from May 26, 2019 through May 31, 2020 were reviewed.

#### 6.1 Observations

It was identified that the overall intent of the Operations Plan was being followed. Documentation that the Operations Plan was being followed in a method “...to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards” in accordance with the CCR Rule.

Operating control measure Items 1 through 9, 10, 11 & 12 (DTE records and contractor work sheet and Job Hazard Analysis (JHA) documents), 13 and 14 from above were verified during the 2020 and previous 2019 and 2018 annual inspections or with documents submitted and reviewed after those inspections. Those items appeared to be compliant with the Landfill Development Plan. There is a full-time DTE guard shack or building near the entrance of the Landfill and the Landfill is surrounded by security fencing and locked gates.

## 7. EVALUATION

### 7.1 Design

The Landfill design was completed by TRC and is well documented in the references listed in the current Landfill Solid Waste Disposal Area Operating License, dated May 15, 2020, and the Landfill Development Plan, dated November 2013.

### 7.2 Construction

Construction of final cover Phase Work Areas is being well documented in area closure documentation reports by NTH. Construction certification or documentation reports or portions of those reports were viewed during the 2015 and 2016 annual inspection for Work Areas C, D1, D2, F1 and F2 and they were signed by a professional engineer licensed in Michigan. A partial closure certification letter for Area F3, dated May 22, 2018, was prepared by MDEQ. Clay for the capping was excavated as part of subgrade excavation within portions of Area G2. No CCR hauling or construction was occurring on the date of the 2020 inspection and DTE indicated that no additional areas are ready for capping or closure certification.

### 7.3 Maintenance

Maintenance of final cover vegetation and erosion control has been identified by the DTE qualified person as an ongoing activity based on results of weekly inspections. Quarterly Comprehensive Inspection Logs lists specific comments on the status, schedule and results of maintenance activities. These listed activities reviewed included pump operation and maintenance, closure cover construction, ditch repairs and vegetation clearing, and slope and cover vegetation maintenance. Many of the activities mentioned are necessary to maintain operation and consistent flow direction of water collected by the perimeter ditch.

Tables summarizing staff gauge water elevations recorded during the 1<sup>st</sup> Quarter summary, dated March 20, 2020, indicated that the ditch flow direction is again in agreement with the stated design and flow to the SDB. However, the water level on that date at SDB Staff Gauge SG-13 was above the gauge markings.

Control of vegetation growth in the site ditches has been identified by DTE as a routine maintenance activity. DTE previously instituted a 3-year rotation ditch maintenance program where 1/3 of the perimeter ditch alignment is cleared of excessive vegetation.

Results of this inspection indicates that the ditch maintenance program is progressing according to plans or ahead of schedule. Photographs of ditch maintenance results are provided in Appendix B and were discussed in Section 4.

## 7.4 **Operations**

### **7.4.1 Operations Plan**

The Landfill Development Plan serves as DTE's main operations plan for the landfill. The plan has been discussed in previous AIRs and has again been reviewed as part of this AIR. The plan has not been revised. The landfill ash fill contractor, Boral, in 2018 made improvements in following the plan's CCR placement and compaction procedures and appears to be continuing in 2020 with the improved procedures. However, no active placement or compaction was occurring on the date of the 2020 inspection.

Records by DTE, such as Landfill weekly inspection logs were provided as part of the annual inspection information. The inspection log forms were recently updated and are consistent with recognized and generally accepted good engineering standards.

### **7.4.2 Fugitive Dust Control**

A Fugitive Dust Control Plan Rev 1, dated July 2019, was provided by DTE. Fugitive Dust Control is also discussed in the Landfill Development Plan. Annual Fugitive Dust Report, dated November 2019, was provided for review. The reports summarized CCR fugitive dust control actions, listed citizen complaints, if any, and provided discussion of any corrective actions taken for the period December 2018 through November 2019. There were no citizen complaints and no corrective actions reported for the stated current period.

During the site inspection there were no observed dust clouds or active dust control activities. There were no CCR hauling trucks or construction equipment operating. Rainfall had occurred the previous day and overnight, and the roads that the inspection team traveled were dust free. Basin water is typically used for dust control when needed and signs limiting the use of the water in areas near the construction entrances have been posted by DTE.

Dust control operations at the site are considered consistent with recognized and generally accepted good engineering standards.

### **7.4.3 Run-on and Run-off Control**

Run-on and run-off control are maintained by final cover temporary or permanent berms, the perimeter ditch system, the offsite pumping systems and the SDB pump and discharge system. The Landfill Development Plan and the Run-on and Run-off Control System Plan have not been updated since they were issued in 2013 and 2016, respectively. As reported in the 2016 AIR, the Run-on and Run-off Control System Plan appears to be consistent with recognized and generally accepted good engineering standards in accordance with the requirements of 40 CFR 257.81(c).

#### **7.4.4 Inspections**

Weekly and quarterly inspections have been ongoing and documented by qualified persons. Inspections reviewed have been discussed and are consistent with recognized and generally accepted good engineering standards, based on available information.

#### **7.4.5 Annual Visual Inspection**

This annual visual inspection did not identify any evidence of structural weakness or instability. The perimeter ditch, perimeter slurry wall, offsite capture system pumping, and collection appeared to be working as designed and in accordance with recognized and generally accepted good engineering standards. Two of the three pumps in the control house for the SDB were out-of-service at the time of the annual inspection, however, the two down pumps are reported to be back in service.



## 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 in accordance with generally accepted good engineering standards.

Certified by:

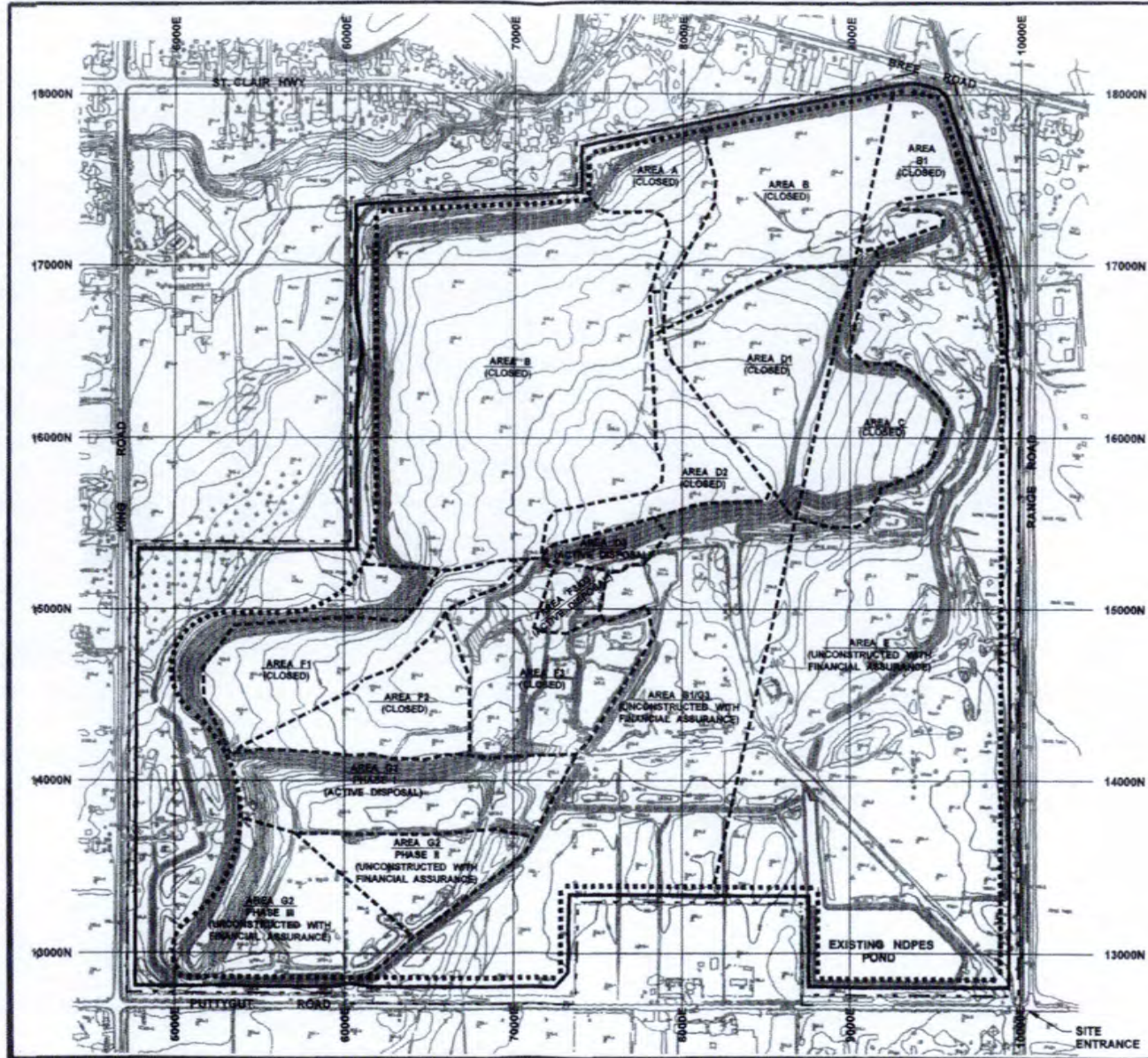
Daniel G. Bodine Date 01/09/21

Daniel G. Bodine, P.E. - Michigan P.E. No. 6201051139  
Senior Consultant

Plot Data  
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 Plot Date: Tue Apr 14 14:58:28 2020  
 Plot File: M:\DTE\St Clair Co\370029\0000\370029.0000.01.prf  
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 Levels On: 1-63

Reference Files  
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 Ref. File 3: M:\DTE\St Clair Co\370029\0000\REF\refproposed.dgn  
 Ref. File 4: M:\DTE\St Clair Co\370029\0000\REF\refx1fbr.dgn

Logical Names  
 Levels  
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 (2) 7-10,18,29,30  
 (3)  
 (4) 1-63

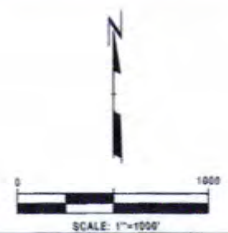


**LEGEND**

- PROPERTY BOUNDARY
- \*\*\*\*\* DESIGN LIMITS OF ASH FILL
- DISPOSAL AREA BOUNDARY
- SLURRY CUTOFF WALL
- AREA A DISPOSAL AREA A

- NOTES**
- BASE MAP DEVELOPED FROM AERIAL SURVEY PERFORMED BY KUCERA INTERNATIONAL, INC., WILLOUGHBY, OHIO. DATE FLOWN: 4/27/2013.
  - GRID SYSTEM IS ON-SITE GRID - BELLE RIVER PLANT/RANGE ROAD PROPERTY SYSTEM.

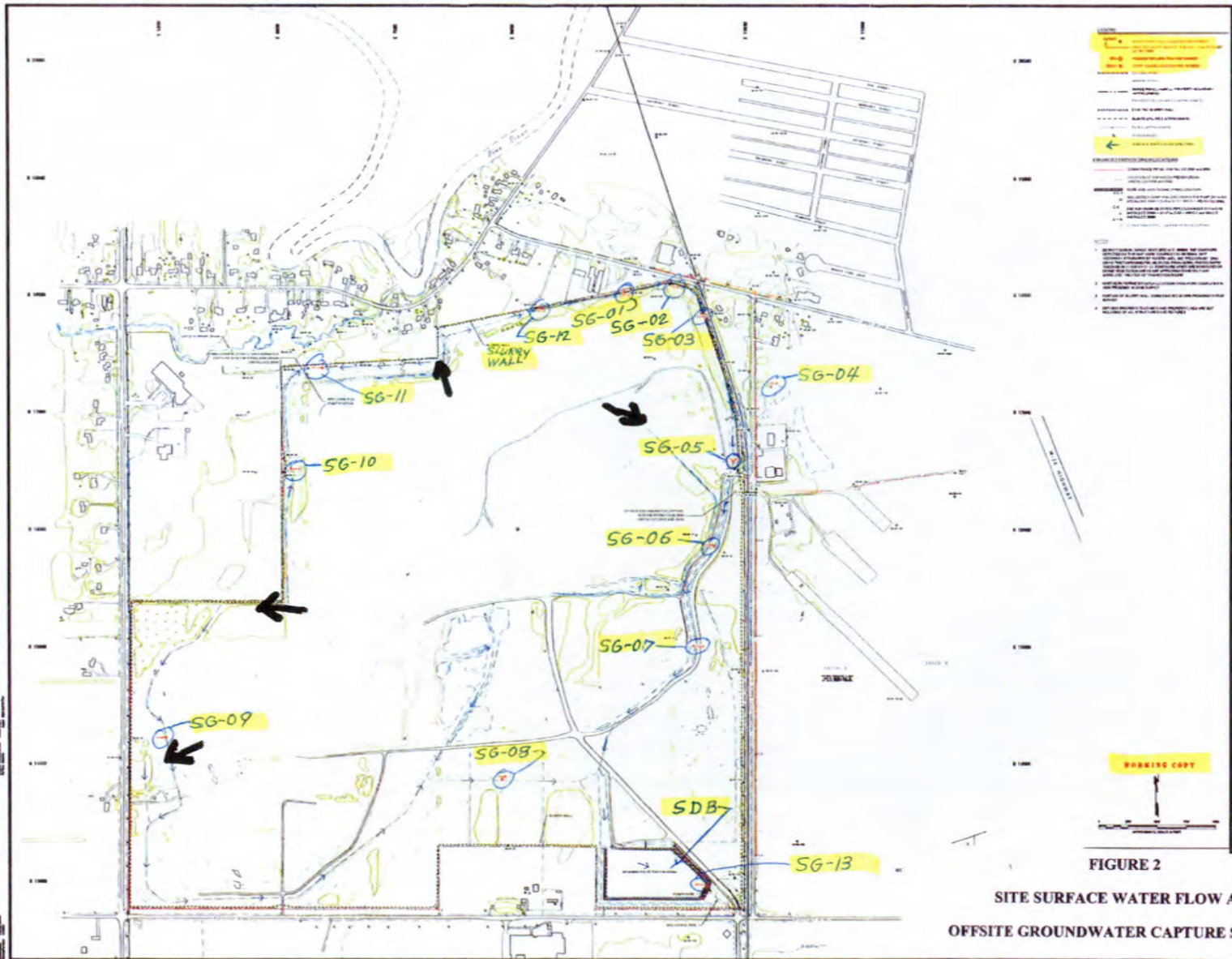
SITE PHASING LEGEND					
Area	Status	Size (Acres)	Material	Under Waste	Comments
A	Closed	7	Clay		Certified Closed May 17, 2002
B	Closed	102	Clay		Certified Closed prior to September 2, 1999
B1	Closed	9	Sand		Certified Closed prior to September 2, 1999
C	Closed	16	Sand		Certification Report Approved by MDEQ August 25, 2008
D1	Closed (slurry cover on southern slopes)	21	Clay		Certification Report Approved by MDEQ August 25, 2008
D2	Closed (slurry cover on southern slopes)	10	Clay		Certification Report Approved by MDEQ August 25, 2008
E	Unconstructed with Financial Assurance	117	Sand		Can be authorized to receive fill once a remediation plan is implemented
F1	Closed	17	Clay		Certification Report Approved by MDEQ January 4, 2010
F2	Closed	12	Clay		Certification report approved by MDEQ February 26, 2013
F3	Closed	17	Clay		Certified Closed May 22, 2018
G1	Active Disposal	3	Clay		Interim Cover Area
F3/G1	Active Disposal	5	Clay		
G1/G2	Unconstructed with Financial Assurance	66	Clay		
G2 Phase I	Active Disposal	22	Clay		
G2 Phase II	Unconstructed with Financial Assurance	13	Clay		
G2 Phase III	Unconstructed with Financial Assurance	18	Clay		



**DTE ELECTRIC COMPANY  
 RANGE ROAD LANDFILL**

**2020 SITE PLAN**

DRAWN BY:	TFiebranz
APPROVED BY:	V. BUENING
PROJECT NO.	370029.0000
FILE NO.	370029.0000.01.plt
DATE:	APRIL 2020



## **APPENDIX A**

### **Resume of the Qualified Professional Engineer**

**DANIEL G. BODINE, P.E**

**geotechnical and civil engineering  
geo-environmental engineering  
project management  
litigation support  
resident engineering  
construction management**

## **EDUCATION**

M.S., Geotechnical Engineering, Rutgers University, 1973

B.S., Civil Engineering, Rutgers University, 1970

Continuing Education Seminars

## **PROFESSIONAL REGISTRATION**

Illinois, P.E. Number 0062-047218

Ohio, P.E. Number E-61363

Nebraska, P.E. Number E-9478

Michigan, P.E. Number 6201051139

Indiana, P.E. Number 920347

South Carolina, P.E. Number 15628

Colorado, P.E. Number 47434

## **CAREER SUMMARY**

Mr. Bodine has over 50 years of experience in all aspects of civil and environmental engineering. He has worked 13 years for a large AE firm in the civil, geotechnical and site development departments on fossil and nuclear power plant facilities and the remainder time with two major geotechnical and environmental consultants. He has supervised and coordinated fossil and nuclear power plant geotechnical site investigations, foundation and landfill design, construction and post construction activities. He has also performed geotechnical design and construction monitoring work for recent projects for private, industrial, oil and chemical industry, and municipal and government clients. These projects involve design and construction for deep foundations including all types of piles and caissons, several types of barrier walls, site dewatering, insitu solidification and stabilization, runoff collection and treatment basins and landfill liners and caps. He has worked on dam projects such as the Ludington Pump Storage Project, Center Hill Dam Foundation Remediation, AEP's Stingy Run and Amos Fly Ash Dams, CCR Ash Disposal Dike and Dam Inspections, and numerous other dam safety inspections for the power industry. He has worked with attorneys related to litigation/arbitration and expert witness support related to geotechnical engineering and construction claims. Specialties include barrier wall design and construction, insitu solidification/stabilization, deep foundation design and landfill design & construction including design/build and bid package preparation.

Mr. Bodine's experience on various projects has included the following:

**Barrier Wall Technical Report**, Confidential National Research Institute. Completed report summarizing approximately 10 types of barrier walls 60-ft deep based on comparisons of their design, constructability, and installation details. Provided construction and QC/QA cost estimates.

**Casper Wyoming Barrier Wall**, Wyoming DEQ, Casper, WY. Working for the department as a slurry wall specialist providing design and construction document review and comment and attended site review meetings. Barrier wall construction of Phase 1 was completed in 2018 with Phases 2 and 3 to follow. Site was location of former refinery and review and comments were well received by the lead oil company.

**Boeing Design/Build Slurry Wall & Landfill Cap Expansion**, Remedial Construction Services, Wichita, KS. Mr. Bodine was Geosyntec's lead technical engineer supervising the preparation of design and construction plans and specifications including technical reports and documents submitted to the KDEH. Served as the technical task manager for the construction QC/QA work including preparation of the construction completion report completed in August 2010. The slurry wall and landfill cap extension, located adjacent to the Arkansas River, surrounded a closed landfill and was constructed without opening the landfill clay cover. Monitoring well water level drawdown on the down-gradient side along the river was noted by owner to drop almost immediately after completion of construction. This has been verified 1 year later, except during periods of river flooding that raises water levels outside of the wall containment.

**US Forestry Holden Mine Barrier Wall**, U.S. Forestry, Chelan, WA. Working through USF Consultant, Hart Crowser, Mr. Bodine provided specialist consulting review for design and construction of deep 70-100 ft slag & Portland cement bentonite slurry wall located along river and tailings piles at a closed copper mine in middle of a national forest. Work included review of mix design and compatibility testing, construction procedures and quality control test results. Mr. Bodine provided onsite observation and review for US Forestry and their consultant. Field work was completed in 2015.

**Wood River Refinery Sludge Basin Closure**, Shell Oil Products, USA, Wood River, IL. As PM and EOR completed an oil refinery engineering design, bid document preparation and construction engineering involving in-situ solidification and capping of over 300,000 cubic yards of oily sludge for an in place RCRA closure of a 20-acre oil refinery sludge disposal basin located in Wood River, IL. This project is unique in that there is approximately 550,000 cubic yards of sludge in the basin and that the design, permitting and construction was successfully completed saving millions of dollars over alternative closures. Design involved detailed geotechnical settlement analyses of the soils and sludge. Closure construction was completed, and certification report issued to the client and IEPA. Mr. Bodine supervised the CQA monitoring and prepared and

sealed the CQA certification report.

***Steel Facility Landfill Cap & Tar Pond Solidification***, Confidential Owner, NW IN,. Working for contractor provided CQA project management, site work and construction certification of an approximate 60-acre landfill containing two large tar ponds. Geosyntec performed onsite CQA observation, testing, documentation and preparation of the construction completion report including onsite testing of tar solidification /stabilization activities. Project substantially completed in 2014 with Construction Completion Report issued in early 2015. Report for the landfill closure was approved by agency without comment.

***BP-Amoco Refinery Sludge Basin Closure***, Amoco Corp., Whiting, IN. As EOR and lead engineer supervised design and prepared and evaluated construction bid documents for in-place closure of an oil refinery sludge disposal basin. Design included providing demolition of structural and mechanical equipment, slurry and grout cutoff wall containment, insitu solidification of the sludge, design of wells and pump control systems for surface water collection and as back-up for water level control beneath the solidified sludge. The design included a thicken RCRA type cap with HDPE and soil covers. Also managed CQA and resident engineer construction oversight for the project, including setup and operation of on-site project meetings and laboratory testing operations. The design and oversight included structural work (concrete, steel and asphalt), electrical and mechanical work (wiring, piping, pumps, motors, and controls in accordance with refinery standards) as well as geotechnical and environmental work. Closure of this project under jurisdiction of U.S. EPA Region 5 and IDEM was completed in July 1992 on schedule for Amoco Oil located in Whiting, Indiana. Test program and certification reports for these agencies were prepared under the direct supervision of Mr. Bodine. The thicken RCRA cap was designed, permitted and constructed to accommodate future structures on top of the landfill closure, prior to the widely-used Brownfield concept. Twenty-two years later new structures have been constructed and the new foundation settlement design remains consistent with the original design.

***Bofors Nobel Superfund Site***, PSDs, Muskegon, MI. Geosyntec PM and EOR responsible for design and management of barrier wall and chemical sludge lagoon cap for the Bofors-Nobel superfund project located near Muskegon, Mi. Work included field and laboratory investigation work plan, 30%, 95% and 100% design, construction bid package preparation and construction and CQA documentation and performance of barrier wall onsite. Barrier wall construction was Phase 1 of the work and is 100% complete. The wall consists of a soil-bentonite (SB) slurry wall approximately 75 to 125 ft deep and 2000 ft long. Closure cap design and construction of 10 chemical sludge lagoons (portion of Phase 2 work) was completed in 2007. Mr. Bodine was the lead geotechnical engineer for the Phase 2 work, on the Parsons team. Other consulting team

members provided team project management, conducted groundwater monitoring and treatment, designed and monitored construction of the treatment and diffuser wetlands, and phytoenhancement of the lagoon cover and surrounding area. Geosyntec assisted these team activities and provided geotechnical portions of the work.

***Design & Construction of Permeable Reactive Barrier (PRB) Slurry Wall***, Quantum Murray, LLC, Ontario, Canada. Worked as the contractor's slurry wall specialist and prepared contractor plans and technical memorandums for bench scale testing and mix design and construction quality control testing and monitoring procedures for a slurry wall that included design sheet pile control structures for the reactive material. This was for a funnel & gate PRB wall within soils and ground water impacted with radiation. Provided recommendations for onsite construction procedures and QC training of personnel performing slurry and soil-bentonite backfill mixing and testing. Project is completed, performing exceptionally well and is confidential.

***Colorado Soil-Bentonite Slurry Wall Construction***, Tri-Districts, Ft. Collins, CO. Responsible Project Manager and Lead Engineer for bid document preparation and construction of a 5400 ft long slurry wall around former sand, gravel and cobble pit. Project completed in September 2013 with both contractor construction and engineering oversight completed on schedule and under budget. A 90-day leakage test was performed by an independent consultant and exceeded all requirements by the state.

***Gavin Power Plant Residual Waste Landfill Expansion***, AEP, Cheshire, OH. Part of the project design team preparing a permit to install (PTI) package for the lateral and vertical expansion of a 58,000 cubic yards waste landfill. Performed design reviews of plans, drawings and specifications, including leachate treatment ponds and assisted in major field investigation program that had to be performed thru-out the winter months and during the holiday period. The PTI was approved and formal permit issued in early 2014. Construction packages for the landfill expansion were prepared and construction of Phases 1 and 2 have been completed.

***Detroit Edison Power Company Ash Basin Evaluation & Design Modifications***, Monroe, MI. Performed dike inspection of large ash basin to assist in evaluation of a large number of shallow slope failures. Project work included prepared construction plans and specifications for repair and reconstruction of slopes and related drainage facilities. Provided quality construction expertise for the 2009, 2010 and 2011 construction phases, all now completed. Mr. Bodine consults on designs as needed with team members on other site projects for DTE.

***Detroit Edison Power Company Ash Basin Drainage Ditch Evaluation & Design***. Managed and performed design of a large drainage ditch which is part of the Range Road Landfill existing ash basin that involved culvert alternatives including a large diameter structural pipe arch. Project completed in 2010.



***DTE Energy Range Road Landfill Annual Inspections***, St. Clair, MI. Conducted field inspection and office file review under the CCR Rule 40 CFR 257.84(b)(1) for the Range Road 418-acre landfill. The annual inspections and reports were for years 2015, 2016, 2017, 2018 and 2019.

***American Electric Power Dam Inspections***. Providing multi-year (1999-2001) independent annual dam safety inspections and reporting of dike and dam structures at 18 facilities for American Electric Power in the states of Indiana, Ohio, Kentucky, West Virginia and Virginia. Dams range from small dike containment structures to large high hazard classification dams. Internal inspections and repair recommendations for discharge pipes were also provided at 3 AEP facilities. Reports for the utility and state agencies were prepared for all facilities. Prior to this project Mr. Bodine performed dike and dam inspections of ash disposal and power plant lake facilities in the states of Illinois, Wisconsin, Indiana, Ohio, Kentucky, Colorado and Texas.

***CCR Location Restriction and Groundwater Monitoring Network Reports***. AEP, Ohio. Provided CCR facility evaluation and report preparation for Location Restriction Evaluation at two separate AEP plants. Assisted the Groundwater Monitoring Network report preparation and review for the same two plants.

***CCR Alternative Source Demonstration (ASD) and Assessment Reports***. Buckeye Power, Inc., Ohio. Part of Geosyntec's team in preparing ASD reports for an RSW landfill and assessment and monitoring report for a bottom ash disposal basin at Buckeye's Cardinal Plant. Geosyntec's ASDs monitoring work is ongoing at this plant site and other sites for other power clients.

***Indianapolis Power & Light Ash Pond Dike Inspections***, Indiana. Provided ash pond facility inspection in 2008 for three coal fired power plant sites. Prepared inspection report findings and recommendations for maintenance and for critical dike re-evaluations.

***Sylvan Lake Dam Evaluation***, RCCD, Rome City, In. Performed dam and spillway inspections and report for 2004 through 2018 at Rome City, Indiana. In 2004 Geosyntec prepared a special dam evaluation report reviewing a critical Dam safety report prepared by U.S. Army Corps of Engineers. In 2007 consulted with dam owner during periods of very heavy rainfall concerning opening of emergency flood gate, however, it was not necessary to open the gate. Attended and took part in the Emergency Action Plan table-top-exercise in 2007, 2011, 2016 and 2018. Prepared the project O&M Manual and provided owner training and annual inspection activities since 2004. Remain as Rome City's on-call engineer with respect to dam safety and inspection.

***Ash Reservoir Dam Modification***, AEP, Cheshire, OH. As part of the design and permitting work for the closure and capping of a large ash reservoir the 100 ft high dam

is being modified by reducing the dam height and providing a new discharge spillway structure for safe discharge of the 100-year and PMF storm flows. Mr. Bodine is the Engineer of Record for the dam modification with construction that is currently under construction and expected to be completed in 2020.

**Cardinal FAR 1**, AEP, Brilliant, OH. As EOR responsible for Geosyntec design and major permit document preparation for a 127 acre 18 million cubic yards FGD gypsum landfill at a power plant facility in the State of Ohio. Major portion of new landfill is to be constructed over an existing closed fly ash disposal area. Design and permit documents included detailed geotechnical settlement and stability analyses. Agency has completed review and permit was issued in April 2007. Construction of Cell 1 was completed and a minor permit modification to construct Cell 3 before Cell 2 was prepared with agency approval in 2008. Preparation of Cell 3 construction drawings was completed in 2010 and cell construction followed in 2011. Waste filling is ongoing.

**Chicago Public Building Commission (PBC)**, Chicago IL. Provided review of construction documents and prepared report on lessons learned for a new school project that involved construction dewatering, excavation and earth retention that resulted in schedule delay and some foundation redesign. Consulted on means and methods for turning around dewatering and excavation problems. With other Geosyntec team members worked on several other PBC projects related to dewatering, earth retention design and permitting, including one high profile downtown Chicago project. Other PBC projects (library & athletic field house) included preparing and reviewing foundation designs for the architect/engineer and performing foundation inspections.

**CSX Talleyrand**, CSX, Jacksonville, FL. Served as senior reviewer and in-house barrier wall consultant for design and construction of a Florida landfill slurry wall approximate 43 feet in depth. Designed and summarized the slurry wall compatibility and mix design testing program and trained others on the design and onsite for the slurry wall quality control/quality assurance testing and inspection. Site is unique because of high groundwater adjacent to a river, adjacent to a major city sewer line, and included a large portion of excavation within peat soils. Wall was completed in summer of 2011 and landfill cap late in 2011.

**CSX Richmond**, CSX, Richmond, VA. Serving as senior reviewer and in-house consultant on slurry design and permitting for 40 ft deep soil-bentonite wall at a former wood treating facility in Richmond, Virginia. Project design and review by the US EPA and VA DEQ is final. The slurry wall construction was started and completed in 2014.

**Former Camilla Wood Preserving Site**, Black & Veatch, Camilla, GA. Providing barrier wall consulting and in-house recommendations for design team on slurry wall compatibility testing and response to US EPA questions. Conventional soil-bentonite wall was selected and wall construction completed in 2013.

***O'Hare Airport Stormwater Flood Control Reservoir***, AOR, City of Chicago, IL. Provided technical review of existing reservoir design by others during construction to assist in solving design/construction problem involving slope seepage and erosion. Geosyntec provided recommendations for design changes and repairs, as well as additional monitoring to prevent slope erosion and reduce uplift pressures to acceptable factors of safety.

***O'Hare Airport Stormwater Damage Mitigation Measures***, CARE, Chicago Department of Aviation, Chicago, IL. Technical lead providing investigation, evaluation and corrective measure design of stormwater related seepage damage to an underground training area located adjacent to an existing airport utility tunnel. Designed concrete retaining wall repairs and preventative measures to collect and transfer excessive groundwater during and immediately after stormwater events from causing future similar problems.

***Rt 44 Barrier Wall***, Tauton, MA. Served as in-house consultant for an 800-foot long, 50-foot deep slurry wall installed to contain contaminants present in the saturated portion of the soil. Barrier wall was part of an overall drum removal and thermal desorption project. Provided onsite monitoring and training of others for the slurry wall quality control/quality assurance testing and inspection. Wall was completed in 2010.

***McColl Superfund Site***, CA. Served as in-house consultant and mentor for the field monitoring and site engineering of the slurry wall construction phase. Provided daily contact as needed for the two soil-bentonite slurry walls that transverse sloping topography and were tied into the final cover system.

***Home Depot Site Redevelopment***, Burbank, CA. Geosyntec provided concept and detail design, construction, operation, maintenance and monitoring of site remediation of a dual-phase extraction (DPE) and soil vapor extraction (SVE) systems at a redevelopment site. Part of the design included a 2,600 ft long, 55 ft deep soil-bentonite slurry wall. Mr. Bodine consulted on the design and led the construction quality assurance monitoring and testing of the barrier wall.

***138<sup>th</sup> Street Landfill***. Land And Lakes, Dalton, IL. Performed full time Resident Engineering and Construction Management for landfill client on an IEPA remedial action project located on the southeast side of Chicago. Project involved earthwork, slurry wall and leachate collection and transfer systems installation. Duties included review of project submittals, contractor invoices, CQA activities, preparation of progress reports, design modifications approved by the designer and preparation of the Construction Completion Report. Construction project was brought-in under budget.

***Historical Slurry Wall Design & CQA***. Provided full-time construction quality assurance activities for landfills and cooling lakes with slurry and grout cutoff walls, including preparing summary CQA reports. Cutoffs have performed exceptionally well,

some for over 40 years. Slurry wall experience includes shallow and deep Soil Bentonite and Cement Bentonite walls, specification preparation, and full time CQA/CQC activities for approximately 1.5 million square feet of wall. Recent projects involved environmental remediation and closure at landfill and disposal projects where construction dewatering, containment and site closure were involved. Another involved slurry wall design and specifications for groundwater and flood control for a 4-lane state highway project with railroad and river overpass crossings. Total slurry wall experience involves walls totaling over 25 miles long. Completed local Midwest projects with deep walls (>50 ft and <130 ft) include Schaefer Power Station in Indiana and Braidwood Nuclear Power Station in Illinois and the Bofors Nobel project mentioned above. Projects with medium depth cutoff walls (>30 ft and <50 ft) include Collins Power Station in Illinois and Amoco Oil (now BP) Refinery in Indiana. The Amoco walls (4 total) involved cement bentonite, jet grout and chemical grout barriers. Specification and CQA monitoring review for soil bentonite walls was also performed for the McColl Superfund project and a Home Depot project in California. Two of the recent slurry walls have been design/build projects where Mr. Bodine, in addition to design and project management activities, supervised the QC/QA work and certified the construction. The Amoco project is discussed in a paper listed at the end of this resume. Copy provided upon request.

***Groundwater Remediation System CM and CQA***, Shell, Kankakee, IL. Provided design and construction bid document and specification review for a bedrock groundwater interceptor trench and surface water collection basin and controls. Performed CM and CQA activities at the site and prepared a project construction certification report. Reviewed all contractor draft invoices and assisted client negotiating settlement of work claims and revised contract when project changed from non-union to union labor and operator work. Project was successfully completed and performing as intended.

***Naval Training Center and Power Plant Site***, TN & Associates, Newport, RI. Mr. Bodine has prepared designs, plans, specifications, and monitored installation and testing for numerous pile and drilled shaft construction projects. Most current pile installation and load test monitoring occurred in 2006 at Newport Naval Training Facility in Newport Rhode Island. Selected, monitored and evaluated dynamic pile testing and static load test at site of Fuel Oil Tank No. 2. Pile testing was successful and exceeded design requirements.

***DOE Fernald Onsite Disposal Facility***, Flour, Fernald, OH. Performed duties as responsible onsite Resident Engineer for construction of the leachate conveyance system and two onsite disposal facility (OSDF) cells at DOE's Fernald Environmental Management Project, located near Cincinnati, Ohio. Systems included structural, geotechnical, mechanical, electrical and environmental equipment. Duties included review of contractor submittals, preparation, review and approval of design

modifications, preparation of reports, interaction with client and contractor construction management, engineering and quality assurance personnel and project's CQC staff. Cell 1 began accepting impacted material in 1997. During 1998 Mr. Bodine performed the duties of Geosyntec's onsite Managing Engineer and Certifying Engineer during which time filling of Cell 1 with low level impacted materials and construction of Cell 2 was completed. All 8 Cells of the OSDF were completed by end of 2006 ahead of schedule.

***Willow Ranch Landfill Retaining Wall***, Land And Lakes, Romeoville, IL. Provided Construction Management assistance and Construction Quality Assurance monitoring and Engineering Certification of the installation of a geogrid tieback concrete retaining wall located at a closed landfill site. The wall consists of 700 lineal feet of panels with 3 and 4 stepped levels, constructed at a 7 percent alignment grade. One hundred and seven (107) concrete panels twenty-foot long were formed, constructed and installed on site. Construction submittals, schedules and testing for concrete and soils was provided.

***Elgin Illinois Landfill Closure***, BFI, Elgin, IL. Managed CQA monitoring and provided CQA certification of Closure of Elgin Landfill Superfund Site located in Kane County, Illinois. Closure design by US Army Corps of Engineers (US ACE) involved a soil and geosynthetic cap. Project fieldwork completed end of Nov. 2001 and the remedial construction completion report (RCCR) prepared in Dec. 2001. The US EPA and Corps without comment approved the RCCR. For the same landfill closure Mr. Bodine prepared the Operation and Maintenance Plan that involved normal landfill maintenance, long term groundwater monitoring and operation of the landfill gas management system.

***City of Janesville Wisconsin Landfill***, Provided management of project consisting of the review and evaluation of a poorly performing landfill gas system, and the design of a new dual well gas/leachate collection system. Services included field measurements, preparation of landfill permit modification and construction bid documents with contract requirements, specifications and drawings. Project began in May 2002 with construction of the new dual well collection system completed in December 2002.

***Permits***. Responsible for preparation and certification of NPDES permits, Construction permits, Joint permits, Dam safety permits, stormwater permits and plans, local permits and other agency documents for flood control projects, wastewater treatment facilities, landfills and various site remediation projects. Selected completed projects include the Meacham Grove Dam and Reservoir Flood Control Project in DuPage County Illinois and permitting activities for BASF, Amoco Chemical and Exxon Chemical.

***Boston Tunnel Construction Claim***, CAT, Boston MA. Provided expert witness support for major geotechnical construction claim. Work consisted of technical assessment of contractor claims for extra compensation for excavation of Central Artery

Tunnel. Mr. Bodine was a key member of the assessment team that resulted in full rejection of the \$25 million claim against the CA/T project.

***Scottsville Landfill Construction Claim, Scottsville, MI.*** Provided technical assessment of construction claim for new landfill construction in the State of Michigan. Assessment resulted in nearly full rejection of contractor claim for 2 to 4 million of extra compensation for earthwork construction and schedule extension.

***Unloading Dock Construction Claim, Honduras.*** Performed independent review of geotechnical foundation investigation and design for pile foundation for arbitration hearings concerning significant design-build cost extras for a large docking facility located in Central America.

***Power Plant Circulating Water Pipe Evaluations, NW IN.*** Provided confidential evaluation of two large 14-ft diameter CMP pipe collapses for an AE designer and assisted field sampling and evaluation of two other power plant CMPs for long term integrity condition evaluations.

***Foundation Site Investigation and Geotechnical Design.*** During the 1970's and 1980's coordinated site investigation and geotechnical foundation design of power plant and waste disposal structures for several fossil units between 500 MW to 750 MW in size located in the Midwest and South. Foundation and pond design included shallow and deep foundations (piles, caissons and drilled shafts) and water and waste holding ponds and dikes. The deep foundations were subject to a large range of loading conditions and conducting several large-scale load tests where necessary. One major project located along the Mississippi River in Louisiana is discussed in a paper listed at the end of this resume. Projects specific to Illinois and Indiana included those at several plants designed by Sargent & Lundy during the period.

***Safety Analysis Report Preparation.*** Supervised and prepared geotechnical foundation design criteria and geotechnical and groundwater sections of safety analysis reports (SARs) for nuclear power plants located in Illinois, Indiana, and South Korea.

***Cooling Lake and Dam Inspections.*** Conducted cooling lake and dam inspection and monitoring activities for lakes up to 3000 acres in size and over 25 miles of embankment dikes or dams. Prepared reports for submittal to client and appropriate state and federal agencies. The largest of these projects (Braidwood Nuclear Power Station Cooling Lake) involved dike construction and cutoffs constructed over and through extensive coal strip-mine spoils and over underground coal mines. Site monitoring included settlement monitoring of pre-load and dike fills over strip-mine spoils up to 120 ft thick, slope indicator movements, piezometer measurements and sampling for seepage and water quality evaluations.

***SWMU's at Argonne National Lab, Illinois.*** Performed Visual Site Inspections and Structural Integrity Assessments for a large number of Solid Waste Management Units

(SWMUs) at DOE's Argonne National Laboratory-East as part of a corrective action program under RCRA. Performed duties as the Certifying Professional Engineer.

## **PROFESSIONAL EXPERIENCE**

Geosyntec Consultants, Chicago/Oak Brook, IL, June 1996-Present  
Woodward-Clyde Consultants, Chicago, IL, March 1989-June 1996  
Sargent & Lundy Engineers, Chicago, IL, 1976-1989  
Woodward-Clyde Consultants, Clifton, NJ, 1970-1972, Chicago IL, 1973-1976

## **PROFESSIONAL AFFILIATIONS**

American Society of Civil Engineers - Life Member - Geo-Institute  
Illinois Society of Professional Engineers (ISPE)  
Deep Foundation Institute (DFI)  
ACEC: American Council of Engineering Companies  
Society of American Military Engineers  
Three Rivers Manufacturing Association (Industry Association)

## **REPRESENTATIVE PUBLICATIONS**

“Implementation of a Permeable Reactive Barrier for Treatment of Groundwater Impacted by Strontium-90”, Andrzej Przepiora, Dan Bodine, Peter Dollar and Jim Coughlin, *The 19<sup>th</sup> Pacific Basin Nuclear Conference (PBNC 2014)*, August 24-28, 2014, Vancouver, Canada.

“Analysis and Verification of Louisiana Pile Foundation Design Based on Pressuremeter Results”, D.G. Bodine and R. R. Davidson, in *The Pressuremeter and Its Marine Applications*: American Society for Testing and Materials, 1986.

“Effects of Clay Swelling on Permeability Calculations Obtained From Sealed Double Ring Infiltrometer Tests”, C. B. Avci, D. G. Bodine and E. Guler, in *The First International Congress on Environmental Geotechnics*, Edmonton, Canada; July 10-15, 1994.

“RCRA Closure of Refinery Sludge Basin Using In-situ Solidification and Containment”, D. G. Bodine and F. M. Trevino, in *The Proceedings of The Fourth Great Lakes Geotechnical/Geoenvironmental Conference: In-Situ Remediation of Contaminated Sites*, Krishna R. Reddy, Editor, University of Illinois at Chicago; May 17, 1996. Containment was by cement bentonite slurry wall and cement bentonite jet grout wall on the shore of Lake Michigan.

“Design and Permitting of a FGD Landfill Over and Existing Ash Reservoir” (2009), D.

G. Bodine, B. F. Tanyu, P. J. Sabatini, M. A. Ajlouni and D. E. Limes, Geotechnical Special Publication No. 187, Contemporary Topics in Ground Modification, Problem Soils, and Geo-Support, pp. 496-503.

“Case Study: Stability of Two Horizontal to One Vertical Embankment” (2011), Tanyu, B. F., Neal, W., Seymour, J. P., Bodine, D. G, Bozok, O., Paper presented at the ASCE Geo-Frontiers March, 2011, Dallas, Texas.



## **APPENDIX B**

**Range Road Landfill Annual Inspection Log**

**Range Road Landfill Annual Inspection Photographs**

# Detroit Edison Company Range Road Ash Disposal Facility Annual Inspection Log

Inspector: Dan Bodine, P.E., Geosyntec  
 DTE: Jason Roggenbuck Provided Documents  
 and Accompanied Field Inspection  
 Date: 18 May 2020, 7:00-4 pm

Weather: Cloudy AM, Partly Cloudy PM  
 Temperature 57°-59 F, Light Wind

Previous P.E. Annual Inspection Date: 24 May 2019

Item	Condition			Related Photo # (s)	Notes and Comments (LDP=Landfill Development Plan)
	Good	Adequate	CA Req.		
<b>General Site</b>					
1. Site Access Restricted / Attendant On-duty	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Visitor Sign in	Gates locked, except active ash haul road entrance near Guard. Additional Security and Health Checks at Plant Gate Check-In.
2. Security Fence / Gates	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gates 10, 31 & 47	Good. Main Gate not Shown, but Manned Guard Shack Across Street. Landfill Gate Lockable. All Gates had Signs.
3. Signs and Markers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5, 10,12, 31, 41, 42, 47	Signs/markers were present at most gates and entrance. Recheck Gate at Photo 24. Signage present last year and may not show.
4. Access Roads and Construction Site Roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31, 35, 36, 37, 38, 43 & 45.	All very good. Ramp up to top of landfill subject to runoff but routinely re-graded.
5. Traffic Flow and Waste Unloading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	No Haul Trucks Operating Today per DTE.
6. AST Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	41 and 42	All Appeared Good.
7. Universal Waste (properly labelled, container condition, less than one (1) year from accumulation start date)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Sources noted in previous documents reviewed.
<b>Waste and Nuisance Control</b>					
8. Ash Hauling Contractor On-site Safety/Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	Contractor Not Onsite Today and Office Closed. No Activity.
9. Ash Hauling Contractor Equipment Condition/Adequacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	No Contractor Activity Today per DTE.
10. Ash Hauling Contractor Filling Active Area to Appropriate Grade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None provided	No Contractor Activity Today per DTE.
11. Waste Condition (i.e. - waste from approved source, no recyclables, no MSW, no liquids, no hazardous wastes, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29, 30, 36 & 45	No Activity Today. Photos of Active Areas.

Detroit Edison Company  
Range Road Ash Disposal Facility  
Annual Inspection Log

Item	Condition			Related Photo # (s)	Notes and Comments (LDP=Landfill Development Plan)
	Good	Adequate	CA Req.		
12. Noise Level	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Covered in LDP. No Contractor Noise Heard During 2020 Landfill Inspection. 2019 November Annual Report Reviewed.
13. Dust Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Dust Control Plan and Annual Reports available. No complaints and no action needed. November 2019 Annual Report Reviewed.
14. Adequacy of Interim Cover and Interim Stockpile Cover	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None Provided	Closed or final cover area slopes joining active areas appeared stable. Interim Clay Stockpile Cover Vegetated.
<b>Final Cover</b>					
15. Landfill Side Slope Condition (i.e.-no seeps, no cracking, no settling, no burrows, adequate vegetation)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16, 29, 30, 35, 36 & 38	Trees on N, NE, NW sides approved to stay and did not appear to cause any observable stability problems. Small Trees and brush previously noted in past annual reports have been cut.
16. Final Cover Top Condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	33, 34, 39 & 40	Top and slope final cover areas were well vegetated. Some small woody vegetation previously present have been cut in most all areas. No observed settlement or stability conditions. Relatively flat cover designs require swales to direct potential flows to downchutes.
<b>Leachate and Surface Water Control</b>					
17. Stormwater Detention Pond Water Quality (unnatural films, foams, oils, etc.) and pump operating condition (panel, meter etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3 & 5	Quality appeared good. Two pumps tagged out of service, but reason not known. DTE inspector to Investigate. Flow meter working and Pump #3 running. Similar report for last year.
18. Stormwater Detention Pond Side Slope Condition (erosion, riprap, vegetation) and any other operating observations not in 17 above.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1,2 &4	Appeared stable and adequately vegetated & protected. WL also monitored with staff gauge, SG-13.

Detroit Edison Company  
Range Road Ash Disposal Facility  
Annual Inspection Log

Item	Condition			Related Photo # (s)	Notes and Comments (LDP=Landfill Development Plan)
	Good	Adequate	CA Req.		
19. NW Corner Lift Station Surface Water Ditch Level & Pump	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23 & 32	New pumps & sump level controls were installed in late 2017. Pumps and switches were checked (DTE person) and all appeared operating correctly. Switches remain in auto position. Run lights and Strobe light may not be working. Both pumps were checked for operation manually and confirmed operating normally.
20. NW Corner Lift Station Operating Condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23 & 32	See also Item 19 above. Both pumps operated when checked.
21. NE Off-site French Drain Operating Condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9	Control building locked and DTE Inspector did not have key.
22. NW Off-site French Drain Operating Condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Offsite, not Inspected; Covered in TRC reports. Items 19 & 20 discusses lift station and pump conditions.
23. NE/NW Off-site French Drain Outfall Water Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Not part of this CCR inspection. Covered in other reports.
24. Perimeter Slurry Wall Marker Condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	Slurry wall below Grade and Surrounds Entire Landfill at/near Property Line. Barrier to any below grade GW Flow. Markers show Alignment. Many markers remain however some may have been removed for road upgrades. Slurry Wall as-built location is reported in several reports and on file in DTE office.
25. Perimeter Ditch System (Flow & Staff Gauge Monitoring)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4, 8, 13, 14 & 17	Some flow observed and one or two videos taken. Staff gauge elevations in tables provided by DTE. Reviewed and confirmed gradient flow in system. SG-13 reported elevation 1 <sup>st</sup> Quarter data indicated high water level suggesting pumps out of service at that time.

Detroit Edison Company  
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<u>Item</u>	<u>Condition</u>			<u>Related Photo # (s)</u>	<u>Notes and Comments (LDP=Landfill Development Plan)</u>
	<u>Good</u>	<u>Adequate</u>	<u>CA Req.</u>		
26. Perimeter Ditch System (Slope & Bottom Conditions); Includes Internal Ditch if a Main Discharge to Perimeter Ditch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11, 18, 19, 20, 21, 22, 25, 26, 27, 28, 44, 46 & 48	Perimeter ditch located around entire active and closed landfill areas. Major internal ditches also drain to perimeter ditch. Runoff from landfill and runoff from the site is controlled by the ditch system and perimeter slurry wall. Flow appears to be maintained. DTE Indicates that non-woody vegetation has been approved to remain as long as flow maintained. DTE had a rotating 3-year vegetation maintenance program in effect. Maintenance is being provide, but not known if a formal rotating program still exists. Internal ponds also shown in these and other photos attached.

Doc. Title: Range Road Ash Annual Inspection Log. Form Edited with Additions by Inspection Engineer,  
Verify Original Version on Belle River Website Prior to use - UNCONTROLLED

Form Original Date:  
01/08/15

**APPENDIX B**  
**DTE Electric Company Range Road Landfill Annual Inspection 20 May 2020**



1. Storm Water Detention Basin (SWDB), S & W Sides. Slopes are Protected with Stone. No Visible Slope Erosion on All Sides. Same for N & E Sides.



2. Intake Screens at SWDB. Water from Basin is Pumped Back to Power Plant Using One or More of 3 Pumps. DTE Inspects Daily and Records.



3. Pump Control Panel. Pump #3 Running. Pumps 1 & 2 Identified as Out of Service. Wall Flow Meter (Not Shown) was Operating. Pumps were Observed.



4. Looking at North East Corner of SWDB. Slope Protected from Erosion with Stone. Staff Gauge SG-13 in Middle of Photo Just Above the Water.

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5. The 3 SDB Pumps. Pump No. 3 (Middle) was Verified as Running per Run Light.



6. Monitoring Well 16-03. Well Protected and Cap Locked. Well Protection and Capping Typical of Inspected Above Ground Monitoring Wells.



7. Monitoring Well 16-04. Well Protected and Cap Locked. Well Protection and Capping Typical of Inspected Above Ground Monitoring Wells.



8. Perimeter Ditch Staff Gauge SG-07. No Flow Noted. Water Present. Typical at Most Staff Gauges..

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9. View of Locked Control Panel Building for East Side Groundwater Offsite Collection System. Panel Not Observed. Pipe Flow to Ditch Observed.



10. Side View of Locked Gate with Signage and at Far-Left Typical Slurry Wall Location Marker. All Gates had Signage.



11. Looking at Perimeter Ditch Upstream of Culvert Under Site Road. Condition Typical of Unobstructed Flow into Culverts Along Perimeter Ditch Alignment.



12. Looking at Barrels Locating and Protecting White Markers for Underground Electric Utility.



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**DTE Electric Company Range Road Landfill Annual Inspection 20 May 2020**



13. Looking at Location of Staff Gauge SG-03. Water Present. No Visible Flow Noted.



14. Looking at Location of Staff Gauge SG-02. Water Present. No Visible Flow Noted.



15. Perimeter Fence Leaning. However, Posts Appeared Solid when Attempted to Move.



16. Typical Tree Growth Along Portions of East and North Closed Historical Landfill Areas A and B. Slopes Appeared Stable w/ No Significant Erosion.

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**DTE Electric Company Range Road Landfill Annual Inspection 20 May 2020**



17. Looking at Location of Staff Gauge SG-01. Water Present. No Visible Flow Noted.



18. Looking at Portion of Perimeter Ditch Alignment Cleared of Vegetation Last March. Little Flow Noted.



19. Another View of Portion of Perimeter Ditch Cleared of Vegetation During Routine Maintenance Activity.



20. Culvert and Riprap Downslope Where Ditch Clearing of Vegetation Had Not Recently Occurred. Flow did not Appear to be Blocked.

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**DTE Electric Company Range Road Landfill Annual Inspection 20 May 2020**



21. Looking at Perimeter Ditch North Side of Landfill. At Photo Center is Black Corrugated Pipe Likely Collecting Slope or Gully Drainage. About 6 Noted.



22. Location of Discharge Pipe from Offsite GW Capture Area. Locked Gate in Background Easily Noticed in Photo when Zoomed in.



23. Sump Where 2 New Pumps Installed 2018. Pump Operation Verified by DTE Inspector. Panel Lights Operation to be Rechecked by DTE.



24. Perimeter Ditch West Side of Landfill Opposite Area B Looking South. Small Stone Check Dam Shown. No Visible Blockage or Flow.

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25. Another View of West Side Perimeter Ditch Where Recent Vegetation Removal Has Occurred.



26. Perimeter Ditch Southwest Side. Check Dam Shown. No Ditch Blockage.



27. Another Photo of Ditch Area Where Maintenance has Occurred and Slope Grass Vegetation Growing.



28. Perimeter Ditch Along South Side Looking East.

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29. View of South Side of Active Disposal Area Slopes. Photo Taken from Outside of Active G2 Area Along the West Side Existing Berms.



30. Continuation of Photo 29 as Top of Area F2 Slope Meets Portion of Area G2 Approved for CCR Disposal.



31. Northwest Corner Fence and Locked Gate, Signs Posted.



32. Inspection Sump and Piping from Pumps Shown in Photo 23. Inspected by DTE to Confirm Pump Operations and Flow (Flow Sound Within Pipe).

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33. Typical Top of Closed Landfill Areas D and B. Recent rains made travel a little surface spongy.



34. Same as Photo 33 except truck rut shown. No surface brush vegetation shown in these photos. Recent heavy rain previous days.



35. Runoff collection pond within landfill limits. Landfill area slopes appeared stable and well vegetated.



36. Right side of runoff collection pond within landfill limits. Area F3D3 in corner where road ramps shown to top of landfill.

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37. Interior Haul Road Leading Down into Active Waste Placement Areas. Compacted Waste Supporting Haul Trucks Without Rutting.



38. Embankment Slope Well Vegetated and Maintained. Area D2 Slope Looking East from Portion of Active Area D3.



39. View of Top of Cover where Cover Drainage Swale Terminates at Exit Culvert Draining Flow to Outside of Landfill Cover.



40. View of Typical Closed Area Top of Landfill Showing Small Woody Vegetation that had been Cut. Cut Vegetation was Typically Left In-place.

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41 Second Fuel Tank that had Possible Dispensing Leak Repaired in 2019 after Inspection. Both Tanks Viewed in this Inspection and No Visible Leaks Noted.



42. Looking at First Fuel Tank and Protection Containment and Signage.



43. Newly Constructed Interior Landfill Haul Road.



44. Perimeter Ditch South Side. Some Bottom Vegetation but No Flow Blockage.



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**DTE Electric Company Range Road Landfill Annual Inspection 20 May 2020**



45. Landfill Ditch Seen from Haul Road. Active Area G2 Top Left.



46. South Side Perimeter Ditch Looking West. Small Riprap Place at Road Crossings and Around Drainage Pipe Inlets and Outlets to Prevent Blockage.



47. Monitoring Well 16-05. Property Fence and Gate Along South Side and Puttygut Road. Slurry Wall Alignment Between Well and Fence.



48. Looking at South Side Perimeter Ditch Where it Bends to the NE. Some Vegetation Present in Bottom but No Blockage Noted.