Prepared for

DTE Electric Company
One Energy Plaza
Detroit, Michigan 48226

2022 ANNUAL INSPECTION REPORT SIBLEY QUARRY LANDFILL

Trenton, Michigan

Prepared by

Geosyntec consultants
Geosyntec Consultants of Michigan

3011 West Grand Blvd, Suite 301
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CHE8242V

January 2023

Geosyntec consultants
Geosyntec Consultants of Michigan

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1. INTRODUCTION

1.1 Overview

This 2022 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants of Michigan, Inc. (Geosyntec) for DTE Electric Company's (DTE's) Sibley Quarry Landfill (Landfill). The inspection was performed to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule published on April 17, 2015, as amended July 30, 2018 (40 CFR Parts 257 and 261), August 28, 2020 (Part A Rule), and November 12, 2020 (Part B Rule). Under the CCR Rule, Sibley Quarry 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 site is located in Trenton, Michigan. The site is an inactive limestone quarry that was operated since the mid-nineteenth century and mined to more than 300 feet below ground surface (bgs) in some areas. The site is currently licensed as a coal ash landfill under the provisions of Michigan Part 115, Solid Waste Management, of the Natural Resource and Environmental Protection Act (NREPA), 1994 Public Act (PA) 451, as amended.

1.2 Purpose

The objective of the inspection is to detect indications of instability in time to allow planning, design, and implementation of appropriate mitigation measures. 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 the available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of an inspection by a qualified person, and results of previous annual inspections); and

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

The purpose is accomplished through periodic visual inspections (and photo-documentation) of the Landfill, review of the previous inspection, and discussions with site personnel about the history of the site and general operations at the Landfill. Observations from the visual inspection, document review, and discussions are summarized in an inspection report. The inspection report addresses the following under the CCR Rule [40 CFR 257.84(b)(2)]:

(i) Any changes in geometry of the structure since the previous annual inspection;

(ii) The approximate volume of CCR contained in the unit at the time of the inspection;

(iii) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and

(iv) Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

1.3 Report Organization

The remainder of this report is organized as follows:

- Section 2 - The Site History and Current Operations: provides information on the history of the Landfill and DTE's current operations.
- Section 3 - Observations from Annual Inspection: summarizes visual observations recorded during the 2022 inspection of the Landfill.
- Section 4 Evaluation of Observations: based on the inspection results, evaluates if the design, construction, operation, and maintenance of the Landfill are consistent with recognized and generally accepted good engineering standards.
- Section 5 - Conclusions: provides the overall conclusions of the annual inspection and certification of the AIR.

1.4 Terms of Reference

The annual visual inspection was performed on April 5, 2022, by Dr. Clinton Carlson, Ph.D., P.E. of Geosyntec[1], with assistance from DTE Staff.

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

[1] Clinton Carlson, Ph.D., P.E. is the qualified professional engineer per the requirements of §257.53 of the CCR Rule. He has eight years of experience with coal ash related projects. His resume is provided in Appendix B.

2. THE SITE HISTORY AND CURRENT OPERATIONS

The site originally operated as a limestone quarry beginning in the 1800s. The site was acquired by DTE in 1951 and has operated as a landfill since. Over the life of the Landfill, it received CCR from various DTE power plants, and other Midwest power plants, including Wyandotte Power Plant (mainly fly ash with some bottom ash). At the time of inspection, the Landfill was receiving CCR from DTE's Monroe and Trenton Channel Power Plants, along with inert material generated from DTE projects in Michigan. The Trenton Channel Power Plant retired in June 2022 and no longer sends CCR to the Landfill. Currently, the Landfill accepts materials generated only by DTE. The approximate disposal rate is 50,000 cubic yards (cy) of CCR and 50,000 cy of inert material per year, however this rate can vary significantly based on market conditions for beneficial use of CCR. Additionally, DTE is closing the Monroe Power Plant Bottom Ash Impoundment by removal; it is anticipated that approximately 1,000,000 tons of excavated CCR will be disposed of at the Landfill between 2021 and 2024.

There are no construction or design documents available for the original quarry. Based on a review of current and historical maps, and correspondence with DTE personnel, limestone and dolomite were mined from the site to a depth of approximately 300 feet bgs, with multiple setbacks/benches.

The current site plan is provided in Figure 1. The site is approximately 207 acres, of which approximately:

(i) 98 acres is currently licensed as an active landfill area;

(ii) 90 acres have received final cover approved by the Michigan Department of Environment, Great Lakes, and Energy (EGLE); and

(iii) the remaining 19 acres are not used for disposal.

The operations at the site consist of three main activities:

(i) placement of CCR;

(ii) continuous pumping of groundwater and stormwater; and

(iii) treatment of pumped water before discharging into the Detroit River through a National Pollutant Discharge Elimination System (NPDES) permit.

The amount of CCR disposed of in the Landfill is currently estimated to be approximately 13,260,000 cy. CCR and inert material is placed in two locations at the Landfill.

(i) Trucks place and spread CCR and inert material at the top of the active fill area north of the quarry.

(ii) Bottom ash is placed in the bottom of the quarry by trucks placing and spreading on the prepared drainage collection and filter layer. In the future, the ash conveyor system may be used to deposit bottom ash into the bottom of the quarry from the top of the quarry.

Groundwater is continuously pumped from the lowest point of the quarry to maintain a consistent groundwater level below the CCR. Therefore, the steady-state groundwater level is maintained below the lowermost area of the quarry. The pumping rate with the newly installed chimney sump and variable flow drive (VFD) sump pumps is approximately 1.5 million gallons per day (mgd) based on discussions with DTE personnel. Groundwater is pumped into two ponds located at the top of the quarry (referred to as “upper ponds”) and treated. Treated water from the upper ponds discharges into a conveyance channel. The conveyance channel is approximately one-half mile long and conveys water to settling ponds. A pump house at the southern end of the settling ponds pumps the water to the Detroit River. The water is discharged to the Detroit River, consistent with NPDES permit requirements. Water samples are collected weekly from the pump house. The water samples are tested and analytical results are compared to the limits provided in the NPDES permit.

Dust at the site is controlled in accordance with the site-specific Fugitive Dust Plan. Per the plan: (i) vehicular speed is limited to a maximum 15 mph; (ii) paved surfaces are frequently swept with wet broom equipment; and (iii) unpaved roads are wetted during landfill operations, as necessary. Unpaved roads are also treated with an acrylic cement emulsion two times per year. In addition, if available, soil is placed onto CCR upon disposal (more information is provided in Section 3). In the Annual Fugitive Dust Report dated November 18, 2022, DTE reported that there were no citizen complaints about fugitive dust.

3. OBSERVATIONS FROM ANNUAL INSPECTION

Inspection results and photographs from the annual inspection are provided in Appendix A. The key observations from the inspection are summarized below.

1) Capital improvements are being implemented at the site. The following changes have been observed at the site since the 2021 inspection:

    a. The northern slopes of the active filling area were regraded to slopes of approximately 1.5 horizontal to 1.0 vertical (1.5H:1V) to address slope stability concerns from the 2021 AIR (see Photographs 3, 5, and 7). Approximately 100,000 cy of CCR and inert materials was excavated and stockpiled in the top of the active filling area (see Photographs 4 and 6). The area and road adjacent to the north side of the stockpiled material has been approved for the expansion of the stockpile if needed (see Photograph 2).

    b. Four “rain bird” sprinklers have been installed in the top of the active fill area to aid in fugitive dust control.

    c. Construction of the drainage collection and filter layer at the bottom of the quarry has been completed (see Photographs 8-11). The drainage collection and filter layer covers the newly permitted area of the Landfill at the bottom of the quarry. The bottom of the quarry is now being used for placement of CCR.

    d. A new chimney sump and four sump pumps have been installed at the bottom of the quarry (see Photograph 12). At the time of the inspection, only two pumps were active. The other two sump pumps are being replaced due to electrical and mechanical issues. The new sump and VFD sump pumps replace the pump previously used to convey water from the quarry to the upper ponds for treatment.

    e. The crest of the outer embankment of the canal conveying water from the upper ponds to the settling ponds was raised approximately one foot near the settling ponds (see Photograph 22). The crest was raised to accommodate increased water levels observed in the canal after the new chimney sump and sump pumps were installed.

    f. Construction is ongoing to relocate the discharge pipe to the Detroit River. The pipe is being relocated to keep the pipe within the public right-of-way in the event the pipe needs to be repaired in the future.

    g. Construction of the ash conveyor system on the southeast edge of the quarry is nearly complete (see Photographs 27-29). The ash conveyor system may be used to

convey bottom ash dumped by trucks at the top of the quarry to the bottom of the quarry.

2) The disposal operations consist of stockpiling material at the top of the active filling area (see Photographs 4 and 6) and placement of bottom ash at the bottom of the quarry (see Photograph 8).

3) A pipe used to convey water for the fugitive dust control system was damaged during the regrading of the northern slopes of the active filling area (see Photograph 1). The damaged pipe was repaired after the inspection.

4) Groundwater and stormwater drain by gravity to the chimney sump at the bottom of the quarry. Drainage channels were observed along the access roads, conveying water to lower elevations to the sump at the bottom of the quarry (see Photographs 7 and 16). No stormwater management features are present on the northern slopes in the top of the active filling area (see Photographs 3-6), therefore stormwater flows over these slopes.

5) Erosion rills and gullies were observed on the CCR slopes (see Photographs 15 and 17).

6) The Landfill has a perimeter ridge that prevents surface water run-on for events up to and exceeding a 25-year, 24-hour storm as stated in the Run-on Run-off Control Plan for the Landfill.

7) The quarry bedrock side walls are fractured and groundwater inflow is observed at several locations (see Photograph 14).

8) DTE is studying algae growth in the pond at the bottom of the quarry (see Photographs 13 and 14). After the inspection, potential algae growth was addressed by placing coarse aggregate against the quarry walls to prevent ponding.

9) The new sump pumps discharge approximately 1.5 mgd to keep the groundwater elevation at or below 309 feet above mean sea level.

10) The upper ponds, conveyance channel with the modifications, and settling ponds appeared to be in good operating condition (see Photographs 18-26). Water discharging from the conveyance channel to Settling Pond #4 had a clear, light grey-blue color (see Photograph 23).

4. EVALUATION OF OBSERVATIONS

The Landfill includes a quarry to which, any eroded material, groundwater, and stormwater within flow to the bottom of and are either contained or collected in the chimney sump and pumped to the upper ponds; therefore, the side walls of the quarry act as a containment system for the Landfill. In other words, if the side walls were to fail, there would be no consequential release of CCR into areas beyond the footprint of the Landfill.

In the 2021 AIR, Geosyntec identified a potential structural weakness in the stability of the northern slopes in the top of the active filling area that could disrupt the operation and safety of the Landfill if an instability occurred. Geosyntec performed slope stability analyses and recommended DTE regrade the northern slopes to more uniform, shallower 1.5H:1V slopes and avoid ponding within 100 feet of the top of the slope. As discussed above, DTE implemented this recommendation as a capital improvement in March 2022. Other capital improvements have been implemented by DTE at the Landfill including the placement of the drainage collection and filter layer at the bottom of the quarry, the new chimney sump, and the ash conveyor system. These changes do not appear to have negatively affected the stability or operation of the Landfill.

The pipe used to convey water for the fugitive dust control system was damaged and represented a condition that could affect the operation of the Landfill; however, DTE personnel repaired the pipe after the visual inspection. No other existing structural weaknesses or existing conditions disrupting the operation and safety of the Landfill were observed during the 2022 annual inspection. However, while the following conditions identified during the 2022 annual inspection do not pose an immediate threat, they could potentially disrupt the operation and safety of the Landfill in the future if not monitored.

1) Potential rock falls at the bottom of the quarry pose a potential concern for the safety of the Landfill. DTE has addressed this safety concern within the work area by keeping personnel a minimum of 50 feet from the quarry walls with a safety berm at the 50-foot distance in the active filling areas.

2) Algae growth on the drainage collection and filter layer may lower the permeability of the layer, which would impact the operation of the system. DTE studied the potential for algae growth and identified potential mitigation measures (e.g., place coarse aggregate against the quarry side walls to block exposure to sunlight).

3) The observed erosion rills and gullies on the CCR slopes are not considered to represent a structural weakness due to the incised nature of the Landfill (i.e., eroded material is transported to the bottom of the Landfill). However, if additional rills and gullies form or existing features expand, these features have the potential to disrupt the operation and

safety of the Landfill as eroded material or slope instabilities could affect the main haul road.

After the visual inspection, DTE repaired the damaged pipe for the fugitive dust control system and placed coarse aggregate against the quarry walls to prevent ponding of water and growth of algae. Geosyntec provides the following recommendations to address observed conditions related to the quarry side walls and erosion rills on the CCR slopes.

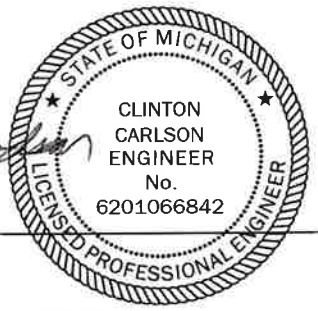
1) DTE should continue to maintain the 50-foot buffer between the quarry side walls and the active working area.

2) The CCR slopes should continue to be monitored to limit the formation of additional rills and gullies or expansion of existing rills and gullies. If these erosion features continue to develop or expand, Geosyntec recommends DTE work with a professional engineer to develop additional stormwater management measure(s).

5. CONCLUSIONS AND CERTIFICATION

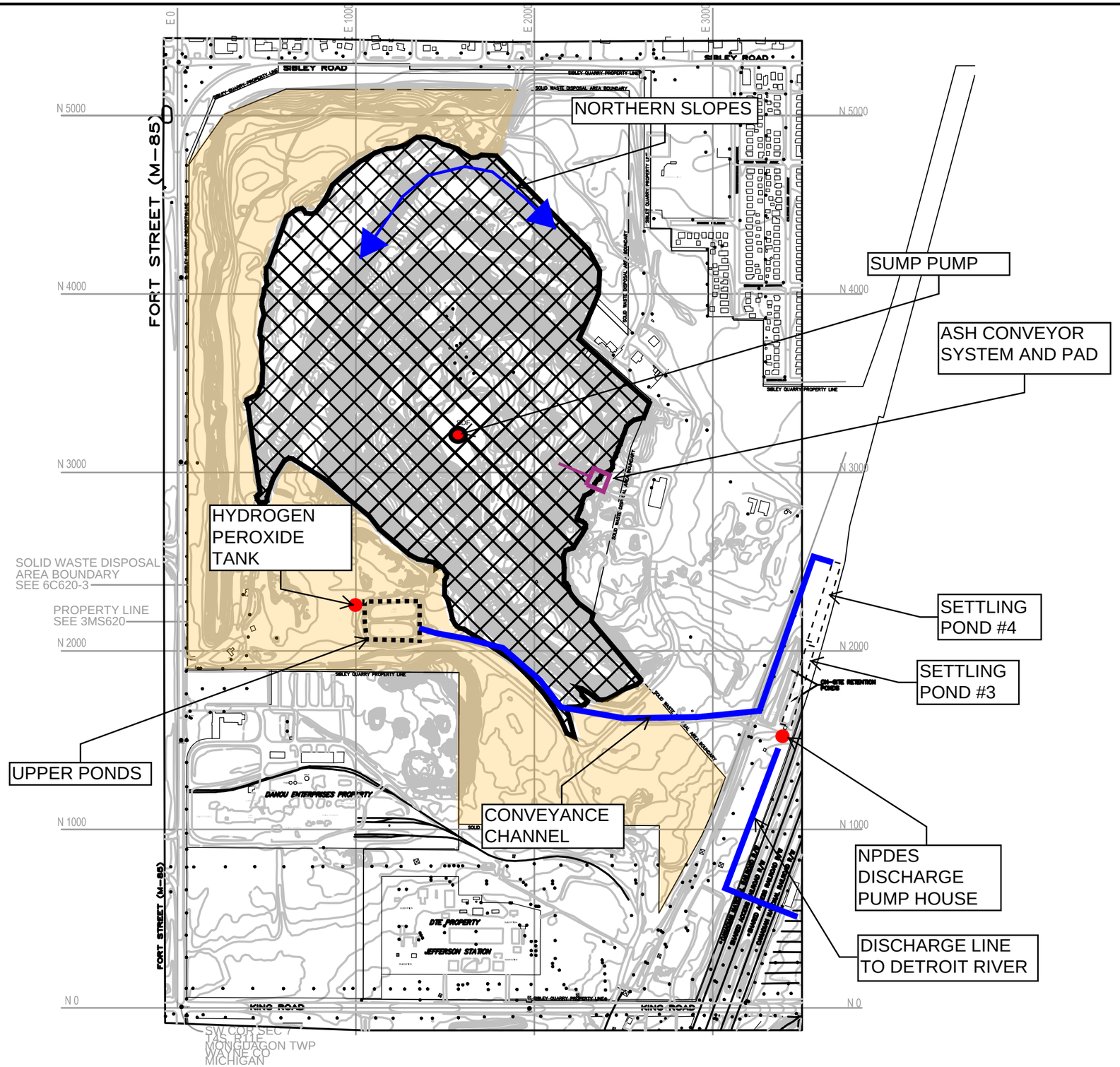
The Landfill is operated and maintained with generally accepted good engineering practices. The 2022 annual visual inspection did not identify any structural instabilities that would cause CCR to release into the areas outside the footprint of the Landfill. Geosyntec identified one existing condition and three conditions that could develop and potentially disrupt the operation and safety of the Landfill in the future, as detailed in Section 4. Two of the conditions were addressed after the annual visual inspection. Recommendations to address the other conditions are provided in Section 4 for DTE's consideration.

Certified by:



Date January 9, 2023

Clinton Carlson, Ph.D., P.E.
Michigan License Number 6201066842
Project Engineer



NOTES:

1. TOPOGRAPHIC INFORMATION GENERATED FROM AERIAL PHOTOGRAPHY DATED APRIL 27, 2013 BY KUCERA INTERNATIONAL, INC., WILLOUGHBY, OH.

LEGEND

- PERMITTED FILL AREA
- APPROXIMATE LANDFILL AREA THAT RECEIVED CLAY COVER

N

0 800' 1600'

SCALE IN FEET

SIBLEY QUARRY LANDFILL SITE PLAN

Geosyntec consultants

Geosyntec Consultants of Michigan

DETROIT, MICHIGAN

FIGURE 1

PROJECT NO: CHE8312 | JANUARY 2023

\\CHICAGO-01\DWG\D\DTE\SIBLEY QUARRY - CHE8312\FIGURE 1 FOR ANNUAL INSPECTION REPORTS

APPENDIX A

2022 Annual Inspection Forms and Photos

Sibley Quarry - CCR Landfill
2022 Annual Inspection Report

Name of CCR Landfill: Sibley Quarry Landfill **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: DTE Electric Company **Date:** 4/5/2022 **Time:** 9 am to 1030 am
Weather: Partly sunny, 50s, fog **Precipitation (past week):** 0.5 in.
Site Conditions: Some moist areas

I. Landfill Perimeter, Side Walls and Access Ramps

1. How would you describe the vegetation at the Site? (Check all that apply)

___	Recently Mowed	Other (describe):
X	Overgrown	Most of the area outside of the active filling area has a good cover of grass and
X	Good Cover	trees. There are trees on the northern cover slopes and above the quarry
___	Sparse	sidewalls. Asphalt roads are used around the trailers and truck wash. Gravel is
X	Paved	used for access roads around the rest of the site including the main haul road
X	Gravel	(switchback two).

2. Are there any areas of hydrophilic (lush, water-loving) vegetation? X Yes ___ No
If 'Yes', describe (size, location, severity, etc.)
Areas where water tends to flow through the landfill have phragmites. This vegetation is not on CCR slopes, but along drainage channels and on quarry side wall setbacks.

3. Are there any trees or other undesired vegetation? X Yes ___ No
If 'Yes', describe (type of vegetation, size, location, etc.)
There are trees of varying size on the northern cover slopes. Some trees of varying size are also present above the western and southern high walls. However, these trees do not appear to affect the existing safety and operation of the Landfill.

4. Is there an access ramp in the landfill? X Yes ___ No
If 'Yes', describe (good condition, numerous cracks, newly paved, stone uniformly distributed, etc.)
Switchback two was inspected and is in good condition with minimal rutting. There is another access road to the bottom of the quarry that can be used in an emergency.

5. Are there any depressions, ruts, or holes on the access ramp or road? ___ Yes X No
If 'Yes', describe (size, location, etc.)

6. Are there any fractures on side walls? X Yes ___ No
If 'Yes', describe (length and width, location and direction of cracking, slough, or distress, etc.)
There are bedrock fractures on the quarry sidewalls. One of concern is along the north quarry sidewall near the pond at the bottom of the quarry (Photograph 14), though safety measures are in place to keep a 50-foot buffer between the sidewalls and personnel working in the bottom of the quarry.

7. Are there wet areas that indicate seepage through the side walls? X Yes ___ No
If 'Yes', describe (size, location, etc.)
Multiple areas on the quarry sidewalls show damp conditions or natural groundwater seepage (Photograph 14).

8. Other observations, changes since last inspection:

Sibley Quarry - CCR Landfill
2022 Annual Inspection Report

Name of CCR Landfill: Sibley Quarry Landfill **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: DTE Electric Company **Date:** 4/5/2022 **Time:** 9 am to 1030 am

II. Stormwater Conveyance Structures

1. Describe what types of stormwater conveyance structures there are at the site (e.g. drop inlets, downchutes, benches, ponds, outlet structures, etc.).

Stormwater within the footprint of the Landfill drains by gravity to the chimney sump at the bottom of the quarry. Drainage channels were observed along the access roads, conveying water to lower elevations to the sump at the bottom of the quarry (Photographs 7 and 16). There is also a culvert at a low spot underneath switchback two conveying stormwater/groundwater to the sump. No stormwater management features are present on the northern slopes in the top of the active filling area (Photographs 3-6); stormwater flows on the upper northern slopes.

2. Describe the condition of stormwater structures mentioned above. (Are they in working condition? Is there any erosion in or around the structures, sings of leakage or movement, etc.?)

Stormwater structures appear to be in working order.

III. Landfill Conditions

1. Describe operations in the landfill (disposal, reclamation, general operational activities):

CCR from various DTE power plants are disposed in the landfill by stockpiling and spreading within the top of the acti filling area (Photographs 3-6). Bottom ash is disposed in the bottom of the quarry on the prepared drainage collection and filter layer. Once completed, the ash conveyor system (Photographs 27-29) may be used to convey ash to the bottom of the quarry from the top of quarry.

2. Are any stormwater controls obstructed? ___ Yes X No

If 'Yes', describe (type of debris, reason for obstruction, etc.)

3. Are there indications of erosion on the landfill slopes? X Yes ___ No

If 'Yes', describe what type and its condition (rill, gully, dimensions, etc.)

Several erosion rills and gullies were observed on the slopes (Photographs 15 and 17). Run-off flows alongside switchback two (Photographs 7 and 16) to the bottom of the quarry and the chimney sump. The erosion features do not represent an existing condition disrupting the operation and safety of the Landfill because eroded material is transported to the bottom of the Landfill within the footprint of the Landfill.

4. Is the leachate collection system functioning (describe discharge color, quantity)?

The pond located at the bottom of the quarry is considered as the leachate collection pond (Photograph 14). The upper ponds act as the leachate treatment ponds. Groundwater and CCR contact water that accumulate at the bottom of the quarry is pumped to the upper ponds for treatment (Photographs 18-20). Algae growth in the leachate collection pond is being studied. The leachate collection pond and treatment ponds appear to be in good working condition.

5. How is the leachate stored? Comment on the condition of the structure.

See Item 4.

Sibley Quarry - CCR Landfill
2022 Annual Inspection Report

Name of CCR Landfill: Sibley Quarry Landfill **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: DTE Electric Company **Date:** 4/5/2022 **Time:** 9 am to 1030 am

6. Other observations around the landfill (changes since last inspection, etc.):
The northern slopes in the top of the active filling area were recently regraded to 1.5H:1V slopes and appear to be in good condition (Photographs 3, 5, and 7).

IV. Leachate Pond Spillways

1. What types of spillways does the leachate pond have (concrete, earth, riprap, etc.)?
Principal Spillway: _____ Emergency Spillway: _____
Other: There is no spillway.

V. Repairs, Maintenance, Action Items

1. Has any routine maintenance been conducted since the last inspection? X Yes No
If 'Yes', describe.
Routine maintenance related to fugitive dust control (e.g., wetting roads and treating slopes) have been conducted since the last inspection.

2. Have any repairs been made since the last inspection? X Yes ____ No
If 'Yes', describe.
DTE is in the process of implementing capital improvements at the site. The upper northern slopes of the active filling area were regraded to 1.5H:1V (Photographs 3, 5, and 7). Four "rain bird" sprinklers have been installed for the fugitive dust control system. Construction of the drainage collection and filter layer at the bottom of the quarry has been completed (Photographs 8-11). The chimney sump and sump pumps have been installed at the bottom of the quarry (Photograph 12). Two of the four pumps are active while two are being repaired. The embankment of the conveyance channel from the upper ponds to the settling ponds was raised approximately one foot to prevent overtopping (Photograph 22). The discharge pipe from Settling Pond #3 to the Detroit River is being relocated to the public right-of-way. Construction of the ash conveyor system on the southeast edge of the quarry is nearly complete (Photographs 27-29).

3. Are there any areas of potential concern? X Yes ____ No
If 'Yes', describe.
There is a concern of potential rock falls in the bottom of the quarry (Photograph 14). DTE has addressed this safety concern within the work area by keeping a minimum of 50 feet between the quarry walls and a safety berm. If additional erosion rills and gullies develop or existing erosion features continue to expand (Photographs 15 and 17), they could potentially develop into a structural weakness or have the potential to disrupt the safety and operation of the Landfill.

4. Has this inspection identified any need for repair or maintenance? X Yes ____ 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 in a year.
Moderate - Repair damaged portion of pipe used in the fugitive dust control system (Photograph 1). [Addressed]
Not Urgent - Maintain 50-foot buffer between the quarry walls and a safety berm in the bottom of the quarry.
Not Urgent - Study algae growth in the pond at the bottom of the quarry (Photographs 13 and 14) and develop mitigation measures, if necessary. [Addressed]
Not Urgent - Monitor CCR slopes for the formation of additional or expansion of existing erosion rills and gullies (Photographs 15 and 17).

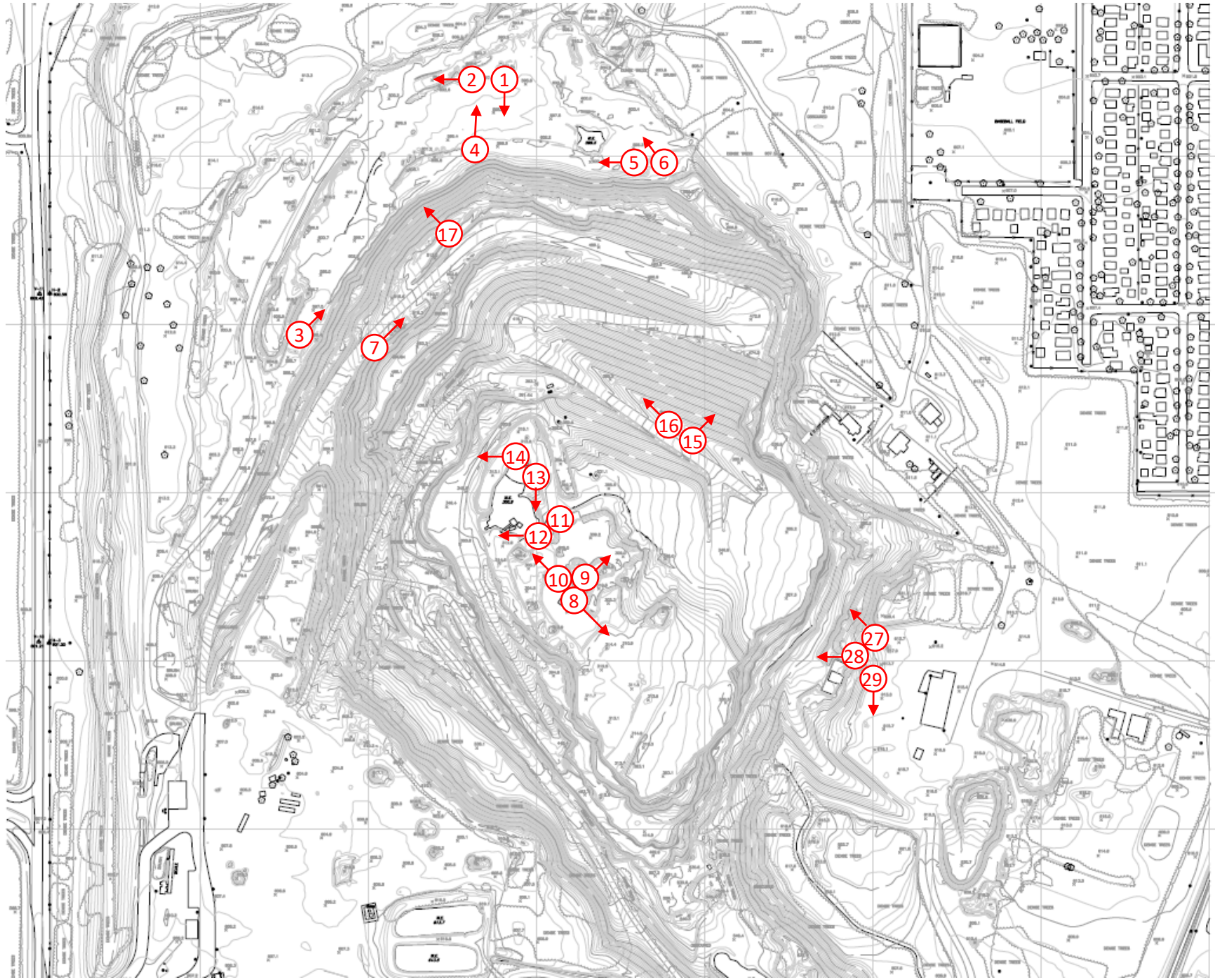
Sibley Quarry - CCR Landfill
2022 Annual Inspection Report

Name of CCR Landfill: **Sibley Quarry Landfill** **Qualified Professional Engineer:** Clinton Carlson, PhD, PE
Owner: **DTE Electric Company** **Date:** 4/5/2022 **Time:** 9 am to 1030 am

VI. Photographs

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

	Location	Direction of Photo	Description
i.	SEE THE ATTACHED PHOTO LOG.		
ii.			
iii.			
iv.			
v.			
vi.			
vii.			



1 — DIRECTION OF PHOTO / PHOTO NUMBER

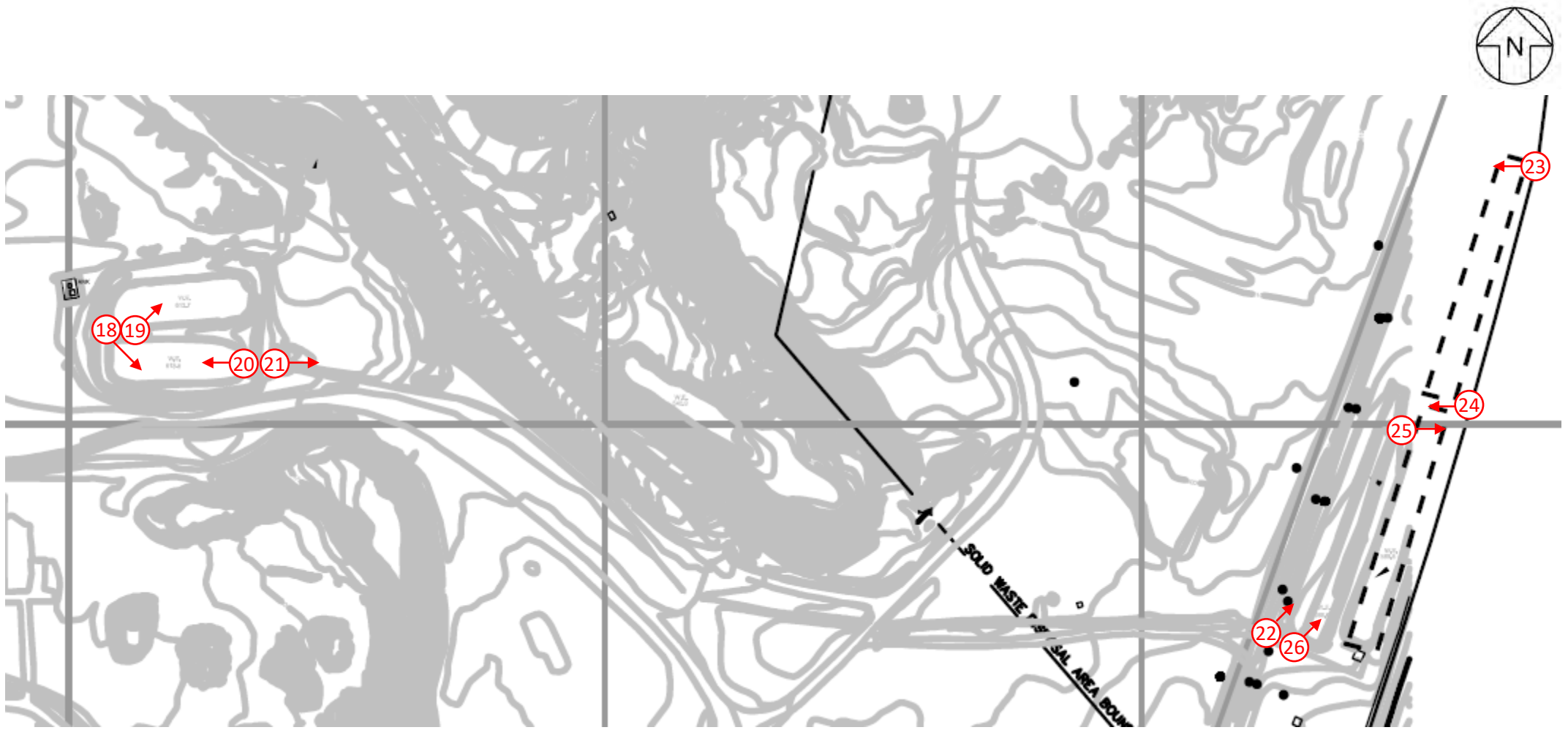
SIBLEY QUARRY
PHOTO LOG 1

Geosyntec consultants
DETROIT, MICHIGAN

FIGURE
A1

PROJECT: CHE8312

JANUARY 2023



1
DIRECTION OF PHOTO
PHOTO NUMBER

SIBLEY QUARRY
PHOTO LOG 2

Geosyntec consultants
DETROIT, MICHIGAN

FIGURE
A2

PROJECT: CHE8312

JANUARY 2023

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 1 Date: 4/5/2022 Comments: Broken pipe used to convey water for fugitive dust control system. Pipe was repaired after the visual inspection. (South)	
Photograph 2 Date: 4/5/2022 Comments: Approved area for expansion of the stockpile in the top of the active filling area. (West)	

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 3

Date: 4/5/2022

Comments: Regraded northern slopes (1.5H:1V) of the active filling area. (Northeast)

Photograph 4

Date: 4/5/2022

Comments: Stockpiled material from regrading of northern slopes in the top of the active filling area. (North)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 5

Date: 4/5/2022

Comments:
Regraded northern slopes (1.5H:1V) of the active filling area. (West)

Photograph 6

Date: 4/5/2022

Comments:
Stockpiled material from regrading of northern slopes in the top of the active filling area. (Northwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 7 Date: 4/5/2022 Comments: Regraded northern slopes (1.5H:1V) of the active filling area. Drainage channel adjacent to access road. (Northeast)	
Photograph 8 Date: 4/5/2022 Comments: Constructed drainage collection and filter layer at the bottom of the quarry. Bottom ash is now being placed in the bottom of the quarry. (Southeast)	

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 9

Date: 4/5/2022

Comments:
Constructed drainage collection and filter layer at the bottom of the quarry.
(Northeast)

Photograph 10

Date: 4/5/2022

Comments:
Constructed drainage collection and filter layer at the bottom of the quarry.
(Northwest)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 11

Date: 4/5/2022

Comments: Constructed drainage collection and filter layer at the bottom of the quarry.

Photograph 12

Date: 4/5/2022

Comments: New chimney sump and sump pumps installed at the bottom of the quarry. (West)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 13

Date: 4/5/2022

Comments: The pond at the bottom of the quarry. Algae growth in the pond was studied by DTE. Coarse aggregate was placed against the quarry walls after the inspection to prevent ponding of water and algae growth. (South)

Photograph 14

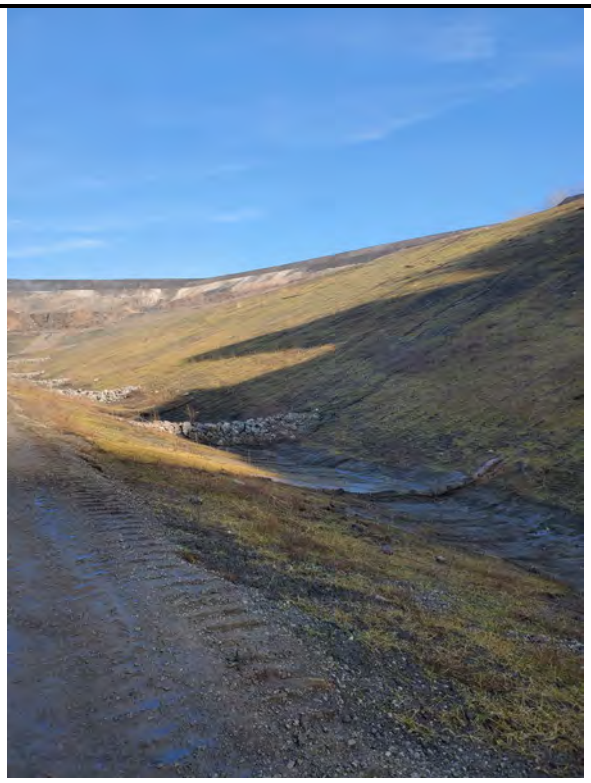
Date: 4/5/2022

Comments: The quarry bedrock side walls are fractured, and groundwater inflow is observed at several sections. Potential rock block failures could pose a safety concern (circled) but are addressed by maintaining a 50-foot safety buffer with the active working area. (West)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 15 Date: 4/5/2022 Comments: Erosion rills on northeastern CCR slopes. Erosion features should continue to be monitored. (Northeast)	
Photograph 16 Date: 4/5/2022 Comments: Drainage channel adjacent to access road. (Northwest)	

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 17 Date: 4/5/2022 Comments: Large erosion gully on the northwestern CCR slopes. Erosion features should continue to be monitored. (Northwest)	
Photograph 18 Date: 4/5/2022 Comments: Discharge into south upper pond. (Southeast)	

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 19

Date: 4/5/2022

Comments: North upper pond. Water used as supply for fugitive dust control (e.g., wheel wash, rainbirds). (Northeast)

Photograph 20

Date: 4/5/2022

Comments: South upper pond outlet to conveyance channel. (West)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 21

Date: 4/5/2022

Comments: Discharge from upper ponds into conveyance channel. (East)

Photograph 22

Date: 4/5/2022

Comments: Conveyance channel west of the settling ponds. The crest of the outer embankment was raised approximately one foot after the new chimney sump and sump pumps were installed. (North)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 23

Date: 4/5/2022

Comments: Discharge from conveyance channel into Settling Pond #4. Water had a light grey-blue color. (West)

Photograph 24

Date: 4/5/2022

Comments: Culvert connecting Settling Pond #4 to Settling Pond #3. (West)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 25

Date: 4/5/2022

Comments: Aerators in Settling Pond #3. (East)

Photograph 26

Date: 4/5/2022

Comments: Settling Pond #1. (North)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 27

Date: 4/5/2022

Comments: Overlooking quarry from the ash conveyor system pad. (Northwest)

Photograph 28

Date: 4/5/2022

Comments: Ash conveyor system that may be used to bottom ash to the bottom of the quarry. (West)

DTE ELECTRIC COMPANY

Photographic Record

Client:	DTE Electric Company	Project Number:	CHE8242V
Site Name:	Sibley Quarry Landfill	Site Location:	Trenton, MI

Photograph 29

Date: 4/5/2022

Comments: Concrete pad used by trucks to dump bottom ash to ash conveyor system. (South)

APPENDIX B

Resume of Clinton Carlson, Ph.D., P.E.
(Qualified Professional Engineer)

Clinton P. Carlson, PhD, PE

Qualifications

Dr. Carlson is a geotechnical engineer with eight years of experience on projects related to design and remediation of landfills and coal combustion residual impoundments, dam safety, and geotechnical instrumentation. He is a Project Engineer with Geosyntec and part of the firm's dams and levees practice area. His work has included managerial responsibilities for project budgets and schedules and has primarily supported federal and power clients for both small and large projects. Clinton has managed and supported projects for risk assessments, slope stability analyses, and instrumentation for landfills and dams.

Specialties

Landfill and CCR Design and Remediation
Dam Safety
Geotechnical Instrumentation

Education

PhD, Civil Engineering, University of Michigan, Ann Arbor, MI, 2014
MSE, Civil Engineering, University of Michigan, Ann Arbor, MI, 2010
BSE, Civil & Environmental Engineering, University of Michigan, Ann Arbor, MI, 2009

Licenses/Certifications

Professional Engineer: MI

Relevant Project Experience

Annual Inspections of CCR Units, Confidential Client, Southeast Michigan | Inspections of CCR units are conducted annually as part of the CCR Rule to identify any site conditions that pose a concern to the safe operation and stability of the CCR units. Project manager in charge of financials and engineer in charge of performing annual inspections for three CCR units for a client in Southeast Michigan. Prepared inspection reports to summarize observed conditions at the three CCR units. Interacted with client representatives to discuss necessary actions to address potential concerns. (Mar. 2022–Present)

Monitoring and Maintenance for CCR Units, Confidential Client, Southeast Michigan | Project manager in charge of financials and engineer in charge of overseeing inspections, monitoring, and maintenance of geotechnical instrumentation system of two CCR units for a client in Southeast Michigan. The geotechnical instrumentation system included multiple monitoring wells, settlement plates, vibrating wire piezometers, manual inclinometers, and ShapeArray inclinometers. Instrumentation data were evaluated to identify near real-time concerns for the safe operation and stability of the CCR units. Provided monthly summary reports to the client representatives and met with them to discuss the monitoring data on a bi-monthly basis. Conducted site inspections of observed conditions posing concerns for the safe operation and stability of the CCR units on at the request of the client. (Mar. 2022–Present)

Landfill Stability Evaluation, Confidential Client, Southeast US | Contacted by the client to evaluate an instability at an existing landfill including the implementation of instruments to measure and evaluate progression of instability. Project manager in charge of financials and engineer in charge of developing instrumentation plan and evaluating measurements of instrumentation. Conventional surveying stakes and an automated monitoring total station were implemented to measure progression of instability. Evaluation of measurements was used to inform the client on progression of instability and provide recommendations for implementation of mitigation measures. Weekly summary reports of instrumentation measurements were provided to the client while implementing mitigation measures. Additional support was provided to the client in discussions with the state regulator. The monitoring systems were also utilized to provide additional safety measures during the staged temporary removal of a buttress berm in order to tie-in liner systems for new landfill cells to the existing liner system. Monitoring data are currently summarized in monthly reports and provided to the client. (Aug. 2019–Present)

Landfill Design Projects for Power Company, Confidential Client, Southeast US | Engineer in charge of coordinating and performing the geotechnical analyses for the permitting and closure of multiple sites for a power company. Geotechnical analyses performed for the sites included subsurface investigation and geotechnical material properties interpretation, slope stability analyses (including veneer and liner

stability), settlement calculations for liner and cover systems, and hydrologic evaluations for liner and cover systems. The computer programs Slide and HELP were used to perform the slope stability analyses and hydrologic evaluations, respectively. (June 2015–Present)

Portsmouth Gaseous Diffusion Plant On-Site Waste Disposal Facility, Fluor-BWXT Portsmouth, Piketon, OH | The Department of Energy's Portsmouth On-Site Waste Disposal Facility is being constructed for the disposal of on-site hazardous waste materials. Engineer that aided geotechnical analyses for the design and construction of the facility. Geotechnical analyses performed during the design phase included slope stability analyses (including veneer and liner stability), settlement calculations for liner and cover systems under variable loads, and foundation design for leachate conveyance systems. During construction, performed slope stability analyses for excavation conditions and geo-structural calculations and reinforcement detailing for reinforced concrete valve houses constructed as part of a leachate transmission system and a footing for an interim transfer ramp. The computer program Slide was used to perform the slope stability analyses. (Apr. 2015–Present)

Inspections and Mitigation for CCR Landfill, Confidential Client, Southeast Michigan | Probabilistic slope stability analyses for a CCR landfill in Southeast Michigan identified unsatisfactory conditions for existing slopes that required mitigation measures. Project manager in charge of project financials and schedule and engineer in charge of developing inspection and construction plans to mitigate unsatisfactory conditions. Developed an inspection plan to identify indicators of slope instabilities and allow for safe operation conditions. The inspection plan was carried out by site personnel prior to and during construction and supported by Geosyntec. Developed a construction plan to regrade the slopes and mitigate the unsatisfactory conditions. Performed site inspections and met with client representatives and contractors during construction to verify safe working conditions and satisfactory slope conditions were achieved. (Feb. 2022–May 2022).

Probabilistic Slope Stability Assessment for CCR Landfill, Confidential Client, Southeast Michigan | Previous site inspections identified potentially unstable slopes at a CCR landfill in Southeast Michigan, so probabilistic slope stability analyses were performed to evaluate the reliability of the slope conditions given limited site information. Engineer that aided in review of probabilistic slope stability analyses and slope stability assessment report. Recommendations were developed and provided to the client to address unsatisfactory conditions for existing slopes identified in the probabilistic site response analyses. (Nov. 2021–May 2022).

Review of Slope Stability Analyses and Dewatering Plan, Confidential Client, Southeast Michigan | Contacted by client to review slope stability analyses performed by another consultant for a landfill of concern and provide comments to the client. Project manager in charge of reviewing analyses, project budget and schedule, and meeting with the client. Based on comments and meeting with the client, Geosyntec was asked to review a dewatering plan developed for the landfill and provide comments. Met with client and discussed the dewatering plan developed by the other consultant. (Nov. 2021–Apr. 2022)

Quantitative Risk Assessment for Dam in Southeast US, Confidential Client, Southeast US | The project further refines estimates of risk developed from previous potential failure mode analyses and semi-quantitative risk analyses performed for an embankment dam and its primary and auxiliary spillways located in the Southeastern U.S. Project manager in charge of financials and schedule for the Quantitative Risk Assessment (QRA) of the dam. The main objectives of the QRA are to estimate the risk, in terms of annual failure probabilities and downstream consequences, for seismic, internal erosion, and spillway hydrologic failure modes and the uncertainties associated with the risks. Actively participated in the expert elicitation process to develop risk models and meetings with the client to present the models and results of the QRA. Prepared calculation packages and reports summarizing the methods used in the QRA and the results for the client. Aided in the ground motion selection, internal erosion evaluation, and evaluation of the erodibility of the embankment soils. (May 2018–Apr. 2022)

Field Investigation of Primary Spillway for Dam in Southeast US, Confidential Client, Southeast US | Field engineer for oversight of a visual inspection and investigation of the foundation of the primary spillway slabs and control structure for a dam in the Southeast U.S. Observations from the field investigation were used to inform a QRA performed for the dam and its spillways. The visual inspection

was performed to identify vertical offsets and gaps in the joints between the slabs of the primary spillway. A field investigation consisting of shallow cores through the concrete slabs of the spillway and deep borings into competent rock below the control structure was performed to evaluate the foundation materials of the primary spillway and the presence of voids. (Jan. 2021–May 2021)

Landfill Stability Evaluation, Confidential Client, Southeast US | Contacted by the client to evaluate an instability at an existing landfill including the root cause of the instability. Project manager in charge of financials and engineer in charge of coordinating and performing slope stability analyses. Slope stability analyses were performed to evaluate the root cause of the instability and mitigation measures required to stabilize the landfill. Results of the analyses were used to support the client in discussions with the state regulator and advise the client on a path forward for stabilizing the landfill. A facility-wide stability plan was also developed based on the stability of the landfill for the existing conditions and the final planned conditions. Analyses were also performed for a staged temporary removal of a buttress berm in order to tie-in liner systems for new landfill cells to the existing liner system. Aiding in ongoing annual landfill stability assessments. (Aug. 2019–Dec. 2020)

Onondaga Lake Geotechnical Monitoring, Honeywell, Syracuse, NY | Contaminated sediments were dredged from Onondaga Lake and consolidated within geotextile tubes at an off-site landfill as part of a Superfund project. Geotechnical instrumentation systems were implemented to monitor (i) a sheetpile wall around a portion of the Lake dredged for remediation and (ii) a landfill closure comprised of geotextile tubes filled with sediments dredged from the Lake. Manager in charge of financials and engineer in charge of monitoring the instrumentation data. The monitoring systems included manual and automated inclinometers, settlement cells, vibrating wire piezometers, and surface monitoring points. (Feb. 2015–Oct. 2018)

Stability and Internal Erosion Assessment of Clear Creek Dam and Beaver Creek Dam, Tennessee Valley Authority, Bristol, TN and VA | Static and seismic stability of two earthen embankment dams in the twin cities of Bristol, TN and VA, Clear Creek Dam (BTC) and Beaver Creek Dam (BTB), were assessed along with the internal erosion for potential failure modes identified in the Potential Failure Mode Analyses (PFMA). Engineer in charge of seismic site response analyses and internal erosion evaluations for two earthen embankment dams. Performed seismic response analyses and used the results to perform the liquefaction potential evaluation. The seismic response analysis was performed using the computer program Strata. Internal erosion evaluations were performed for the critical potential failure modes identified by the project team for each dam. (Mar. 2017–Sept. 2017)

Onondaga Lake Capping and SCA Design, Honeywell, Syracuse, NY | Contaminated sediments were dredged from Onondaga Lake and consolidated within geotextile tubes at an off-site landfill as part of a Superfund project. Engineer that aided in slope stability analyses and hydrologic evaluations for: (i) a sheetpile wall around a portion of the lake dredged for remediation and (ii) a landfill closure comprised of geotextile tubes filled with sediments dredged from the lake. Stability analyses for the sheetpile wall included the internal stability (i.e., overturning and bending) of the sheetpile wall adjacent to the dredged lakebed and the global stability of the wall under the loading of an adjacent railroad line. The stability analyses of the landfill closure included the veneer stability of the liner and cover systems and the internal, interface, and global stability of the stacked geotextile tubes. The computer programs ShoringSuite, Slide, and HELP were used to perform the internal stability analyses for the sheetpile wall, global stability analyses of the wall and landfill closure, and the hydrologic evaluations, respectively. (Feb. 2015–May 2016)