

December 15, 2017

Consulting
Engineers and
Scientists

GEI Project No. 1610536

Mr. Tim Muehlfeld, P.E.
WEC Business Services, LLC
333 W. Everett Street, A231
Milwaukee, Wisconsin 53203

**Re: Landfill Inspection Report for the We Energies Presque Isle Power Plant Landfill No. 3
Marquette Township, Michigan**

Dear Mr. Muehlfeld:

GEI Consultants, Inc. (GEI) is pleased to provide this landfill inspection report for the We Energies Presque Isle Power Plant (PIPP) Landfill No. 3. The inspection was completed to comply with *40 CFR 257 Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments* and specifically with *§ 257.84(b) Annual inspections by a qualified professional engineer*.

§ 257.84 Inspection Requirements for CCR Landfills

(b) Annual inspections by a qualified professional engineer.

(1) Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer 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 inspections 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.

(2) *Inspection report.* The qualified professional engineer must prepare a report following each inspection that addresses the following:

- (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.

Background

The landfill is located in the NW 1/2 of the SE 1/4 of Section 6, Township 48 North, Range 25 West, approximately 4 miles west of the power plant in Marquette Township, Marquette County, Michigan. The landfill is permitted by the Michigan Department of Environmental Quality (MDEQ) under Construction Permit No. 0400 dated February 27, 2002, and the current Operating License. Figure 1 – Site Location Figure, shows the location of the landfill relative to the power plant and the City of Marquette, Michigan. Cell 1 of Landfill No. 3 was constructed in the 2003 construction season and placed into service on October 8, 2005. Cell 2 of Landfill No. 3 was constructed during the 2007 construction season and placed into service on October 10, 2008. The perimeter slopes of Cell 1 were closed during the 2014 construction season.

GEI was retained to perform an annual inspection of the landfill in compliance with § 257.84(b) *Annual inspections by a qualified professional engineer*. The inspection was initially performed on November 16, 2017. A follow-up inspection was performed on December 1, 2017 after the snow cover melted. Copies of the site location figure, landfill inspection forms from 11/16 and 12/1, existing site conditions drawing, and inspection photo log are appended to this letter-report and constitute the entirety of the report.

Site Inspection

The landfill site inspection was initially performed on November 16, 2017, however due to significant snow cover that obscured the Cell 1 final cover, a follow up inspection was performed on December 1, 2017 after the snow cover melted. The inspection included a meeting with landfill operation personnel to discuss the daily operation of the facility including ash placement, fugitive dust control, storm water/contact water management, leachate hauling, and operation of the leachate collection and removal system; review of the leachate hauling and landfill operating records; observation of the existing site conditions including the access road and cell entrance; the Cell 1 final cover slopes, the intermediate waste slopes in Cells 1 and 2; and the storm and contact water control measures. We Energies completed a topographic survey and airspace analysis for the landfill on November 7, 2017, so at the time of the landfill inspection Landfill No. 3 contains approximately 609,600 cubic yards of CCR.

Based on review of the site and discussions with the landfill operation personnel the landfill operations are running smoothly and consistently. Ash placement in the landfill has been limited due to limited operations, beneficial use efforts for the ash that is generated, and the elimination of ash from the Marquette Board of Light and Power Shiras Steam Generating Station. Leachate hauling has been consistent with one to five truckloads per day being transported from the landfill to the power plant for treatment and disposal. The fugitive dust control measures are working well and at the time of the inspection there have been no citizen complaints received or logged for fugitive dust during 2017.

Following the meeting with the operation personnel, GEI performed a site walk and inspection of the landfill. Overall the landfill appeared to be in very good condition. The all-weather access road was in good condition. The entrance into the landfill slopes to a cattle-crossing that is used to prevent contact water from escaping the landfill cell. The cattle guard also functions as a rumble strip helping to prevent the tracking of ash out of the landfill on the wheels of the haul trucks. The storm water control ditch and containment area appear to be in good condition and properly graded for winter operations.

The perimeter slopes of Cell 1 that were closed in 2014 appeared to be in good condition. The vegetation appeared to be well established with no observed bare spots, no significant erosion, no woody vegetation, no animal burrows, and no areas of instability.

The We Energies Landfill No. 3 is a double lined landfill with a primary leachate collection system and secondary leachate detection system. The leachate collection system is a network of perforated collection pipes running east-west across the landfill within a 12-inch sand drainage layer. The pipes drain to the leachate collection sumps along the east perimeter berm of the landfill. The sump in Cell 2 gravity drains to the sump in Cell 1 where it is extracted by sump pumps installed in side slope riser pipes. The sump in Cell 1 has two extraction pumps that are individually controlled by pressure transducers installed inside each side slope riser pipes. The pumps are powered on when the leachate head level in the side slope riser reaches 36 inches and power off when the level reaches 18 inches. In the event of a pump failure a high-level alarm is activated when the sump level reaches 54 inches of leachate head. In accordance with Part 115, Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, We Energies is obligated to maintain the leachate head level to less than 12 inches on the base of the landfill, excluding the sump, that level is reached if the leachate head level in the side slope risers reaches 62.4 inches of head.

The leak detection system consists of a geocomposite drainage layer between the primary composite liner system and a secondary geomembrane liner. A secondary sump with a side slope riser pipe and leachate extraction pump is installed in each cell. On the day of the inspection the secondary pumps, P-2-1 installed in Cell 1 and P-4-1 installed in Cell 2 had not run. Head level in the primary and secondary sumps are included on the inspection forms.

Closing

On November 16, 2017 and December 1, 2017, annual inspection of the We Energies Landfill No. 3 were completed in compliance with § 257.84(b) *Annual inspections by a qualified professional engineer*. Overall the landfill is in very good condition. The landfill operators are doing a good job of placing and compacting ash as it is delivered to the site to limit erosion and prevent fugitive dust. The landfill is properly graded to prevent contact water run-off and prevent storm water run-on. The leachate system was functioning as designed and the landfill operators are keeping up with leachate hauling. Based on my observations and discussions with the landfill personnel the landfill is constructed and being operated in accordance with Construction Permit No. 0400 dated February 27, 2002; the current Operating License; the requirements of Part 115, Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; and 40 CFR 257 Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments.

The inspection was completed by John, M. Trast, P.E. I am a licensed professional engineer in the State of Michigan in accordance with Article 20 of the Occupational Code, Public Act 299 of 1980, as amended. This document has been prepared in accordance with the Michigan Administrative Rules, Department of Licensing and Regulatory Affairs, Professional Engineers – General Rules, Part 3 – Standards of Practice and Professional Conduct; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements of Part 115 of PA 451, as amended and 40 CFR 257.

If you have any questions regarding the landfill inspection or this report please contact me at 920-455-8299.

Sincerely,

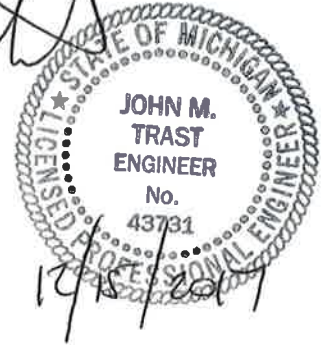
GEI CONSULTANTS, INC.



Andrew Schwoerer
Technician



John M. Trast, P.E.
Senior Consultant



Attachments:

- Figure 1 - Site Location
- Landfill Inspection Form 11/16/2017
- Landfill Inspection Form 12/01/2017
- Existing Site Conditions Drawing
- Landfill Inspection Photo Log

JXT:cah

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WE ENERGIES
MARQUETTE, MICHIGAN



PRESQUE ISLE POWER PLANT
LANDFILL #3
SITE LOCATION FIGURE

Project 1610536

November 17, 2017

Fig. 1

PIPP ASH LANDFILL #3 - ANNUAL INSPECTION

INSPECTOR: John Trast
INSPECTION DATE/TIME: 11/16/2017

WEATHER:

Temperature: 30° F
 Conditions: Overcast
 Wind: Mild
 Wind Direction:
 Precipitation: None

LEACHATE COLLECTION SYSTEM:**Load-out Facility:**

High level alarms: No
 Low level alarms: No
 Leak alarms: No
 Tank Level : 3.2 ft
 Tank Volume: 21780 gallons
 Pump: Available
 Pad Condition: Good

Sump:

Pump #1-1: Available 31.4 in Primary LCS Sump
 Pump #1-2: Available 30.5 in Primary LCS Sump
 Pump #2-1: Available 11.5 in Cell 1 Secondary
 Pump #4-1: Available 20.0 in Cell 2 Secondary
 Control Panel: Available

Note: 62.4" in P1-1 or P1-2 equates to 12" of head on base liner

Comments: Leachate collection system is in good working condition. Leachate levels are being maintained in compliance with the operating license requirements.

STABILITY/EROSION OF FINAL COVERS & WASTE SLOPES:

Final Covers: ☒
 Waste Slopes: ☒

Comments : Recent snow fall made the inspection difficult, but final cover slopes appear stable with no observed instability, no significant erosion, no woody vegetation, no animal burrows, or concerns regarding the final cover slopes. Ash Slopes appeared to be in good condition with no observed instability or significant erosion. The interior storm/contact water control ditch immediately north of the cattle crossing/access road may have minor erosion, but difficult to tell from snow. Overall everything looked really good.

Note: Check mark indicates slope appears stable and no significant erosion.

LANDFILL OPERATIONS:**Fugitive Dust Control:**

Tracking Pads : ☒
 Cattle Guards : ☒
 Access Road Clean: ☒
 Landfill Surfaces Groomed: ☒
 Airbourne Dust Visible: No
 Sign of Recent Dust Deposition: No

Stormwater Management

Exterior Ditches: ☒
 Interior Ditches: ☒
 Catch Basin: ☒
 Culverts: ☒

Comments: Landfill operations appear to be in good order, leachate levels are in at acceptable levels, leachate is being hauled to the plant for disposal, and storm water and dust control looks good.

Note: Check mark indicates that the features are acceptable.

PIPP ASH LANDFILL #3 - ANNUAL INSPECTION

INSPECTOR: John Trast
INSPECTION DATE/TIME: 12/1/2017

WEATHER:

Temperature: 30° F
 Conditions: Partly Cloudy
 Wind: Calm
 Wind Direction:
 Precipitation: None

LEACHATE COLLECTION SYSTEM:**Load-out Facility:**

High level alarms: No
 Low level alarms: No
 Leak alarms: No
 Tank Level : 5.6 ft
 Tank Volume: 46019 gallons
 Pump: Available
 Pad Condition: Good

Sump:

Pump #1-1: Available 29.4 in Primary LCS Sump
 Pump #1-2: Available 19.5 in Primary LCS Sump
 Pump #2-1: Available 11.5 in Cell 1 Secondary
 Pump #4-1: Available 19.0 in Cell 2 Secondary
 Control Panel: Available

Note: 62.4" in P1-1 or P1-2 equates to 12" of head on base liner

Comments: Leachate collection system is in good working condition. Leachate levels are being maintained in compliance with the operating license requirements.

STABILITY/EROSION OF FINAL COVERS & WASTE SLOPES:

Final Covers: ☒
 Waste Slopes: ☒

Comments : Recent snow fall has melted. The final cover slopes appear stable with no observed instability, no significant erosion, no woody vegetation, no animal burrows, or concerns regarding the final cover slopes. Ash Slopes appeared to be in good condition with no observed instability or significant erosion. The interior storm/contact water control ditch immediately north of the cattle crossing/access road was recently cleaned out to provide capacity. Overall everything looked really good.

Note: Check mark indicates slope appears stable and no significant erosion.

LANDFILL OPERATIONS:**Fugitive Dust Control:**

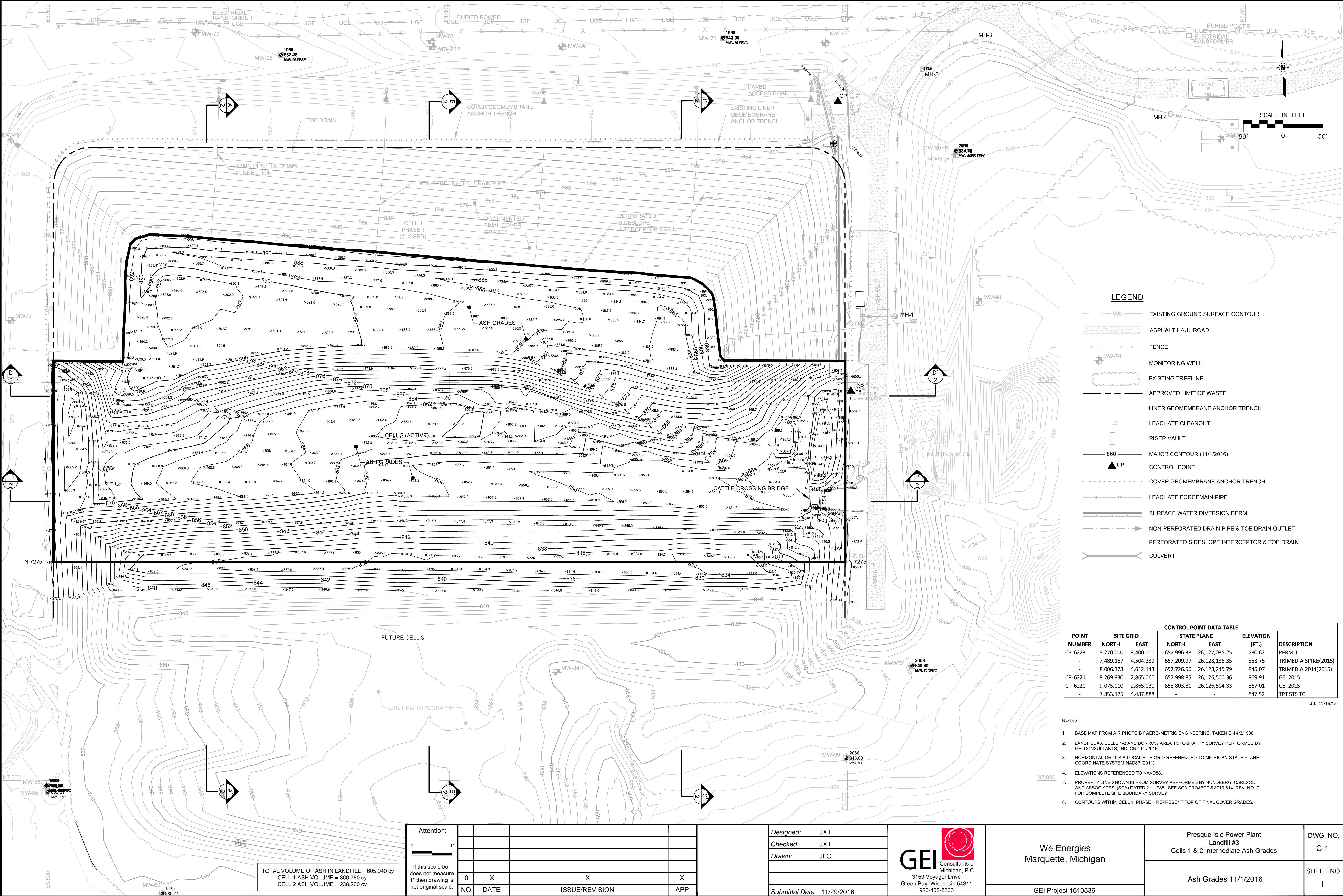
Tracking Pads : ☒
 Cattle Guards : ☒
 Access Road Clean: ☒
 Landfill Surfaces Groomed: ☒
 Airbourne Dust Visible: No
 Sign of Recent Dust Deposition: No

Stormwater Management

Exterior Ditches: ☒
 Interior Ditches: ☒
 Catch Basin: ☒
 Culverts: ☒

Comments: Landfill operations appear to be in good order, leachate levels are in at acceptable levels, leachate is being hauled to the plant for disposal, and storm water and dust control looks good.

Note: Check mark indicates that the features are acceptable.



LEGEND

- 830 EXISTING GROUND SURFACE CONTOUR
- ASPHALT HAUL ROAD
- FENCE
- MONITORING WELL
- EXISTING TREELINE
- APPROVED LIMIT OF WASTE
- LINER GEOMEMBRANE ANCHOR TRENCH
- LEACHATE CLEANOUT
- RISER VAULT
- 860 MAJOR CONTOUR (11/1/2016)
- ▲ CP CONTROL POINT
- COVER GEOMEMBRANE ANCHOR TRENCH
- FM FM LEACHATE FORCEMAIN PIPE
- SURFACE WATER DIVERSION BERM
- NON-PERFORATED DRAIN PIPE & TOE DRAIN OUTLET
- PERFORATED SIDESLOPE INTERCEPTOR & TOE DRAIN
- CULVERT

CONTROL POINT DATA TABLE						
POINT NUMBER	SITE GRID		STATE PLANE		ELEVATION (FT.)	DESCRIPTION
CP-6223	8,270.000	3,400.000	657,996.38	26,127,035.25	780.62	PERMIT
-	7,489.167	4,504.239	657,209.97	26,128,135.35	853.75	TRIMEDIA SPIKE(2015)
-	8,006.373	4,612.143	657,726.56	26,128,245.79	845.07	TRIMEDIA 2014(2015)
CP-6221	8,269.930	2,865.060	657,998.85	26,126,500.36	869.91	GEI 2015
CP-6220	9,075.010	2,865.030	658,803.81	26,126,504.33	867.01	GEI 2015
-	7,853.125	4,487.888	-	-	847.52	TPT STS TCI

dtb, 11/16/15

- NOTES:
- BASE MAP FROM AIR PHOTO BY AERO-METRIC ENGINEERING, TAKEN ON 4/3/1998.
 - LANDFILL #3, CELLS 1-2 AND BORROW AREA TOPOGRAPHY SURVEY PERFORMED BY GEI CONSULTANTS, INC. ON 11/1/2016.
 - HORIZONTAL GRID IS A LOCAL SITE GRID REFERENCED TO MICHIGAN STATE PLANE COORDINATE SYSTEM NAD83 (2011).
 - ELEVATIONS REFERENCED TO NAVD88.
 - PROPERTY LINE SHOWN IS FROM SURVEY PERFORMED BY SUNDBERG, CARLSON AND ASSOCIATES, (SCA) DATED 2-1-1998. SEE SCA PROJECT # 8710-814, REV. NO. C FOR COMPLETE SITE BOUNDARY SURVEY.
 - CONTOURS WITHIN CELL 1, PHASE 1 REPRESENT TOP OF FINAL COVER GRADES.

TOTAL VOLUME OF ASH IN LANDFILL = 605,040 cy
CELL 1 ASH VOLUME = 366,780 cy
CELL 2 ASH VOLUME = 238,260 cy

Attention:			
0 1'			
If this scale bar does not measure 1' then drawing is not original scale.			
NO.	DATE	ISSUE/REVISION	APP
0	X	X	X

Designed: JXT
Checked: JXT
Drawn: JLC
Submittal Date: 11/29/2016



We Energies
Marquette, Michigan

GEI Project 1610536

Presque Isle Power Plant
Landfill #3
Cells 1 & 2 Intermediate Ash Grades

Ash Grades 11/1/2016

DWG. NO.
C-1

SHEET NO.
1



Photo 1 – Landfill No. 3 Looking Northeast 11/07/2017.



Photo 2 – Landfill No.3 Looking Northwest 11/07/2017.



Photo 3 - Landfill No. 3 South perimeter berm looking West.



Photo 4 - Landfill No. 3 Cell Entrance looking Northwest.



Photo 5 - Landfill No. 3 Cell Entrance looking West.



Photo 6 - Entrance into Cell 2 looking north at storm water containment area.



Photo 7 – East slope of Cell 1 from the north access road.



Photo 8- North slope of Cell 1.



Photo 9 - North slope of Cell 1 looking to the west. Slope is in very good condition..



Photo 10 - West slope of Cell 1 looking North.



Photo 11 – Leachate load out facility.



Photo 12 – Leachate load out building and leachate tank risers.



Photo 13 – Cell 1 side slope riser vault.



Photo 14 – Cell 2 side slope riser vault.



Photo 15 – Cell 1 leachate pump controls.



Photo 16 – Cell 1 leachate pump controls.



Photo 17 – Cell 2 leachate pump controls.

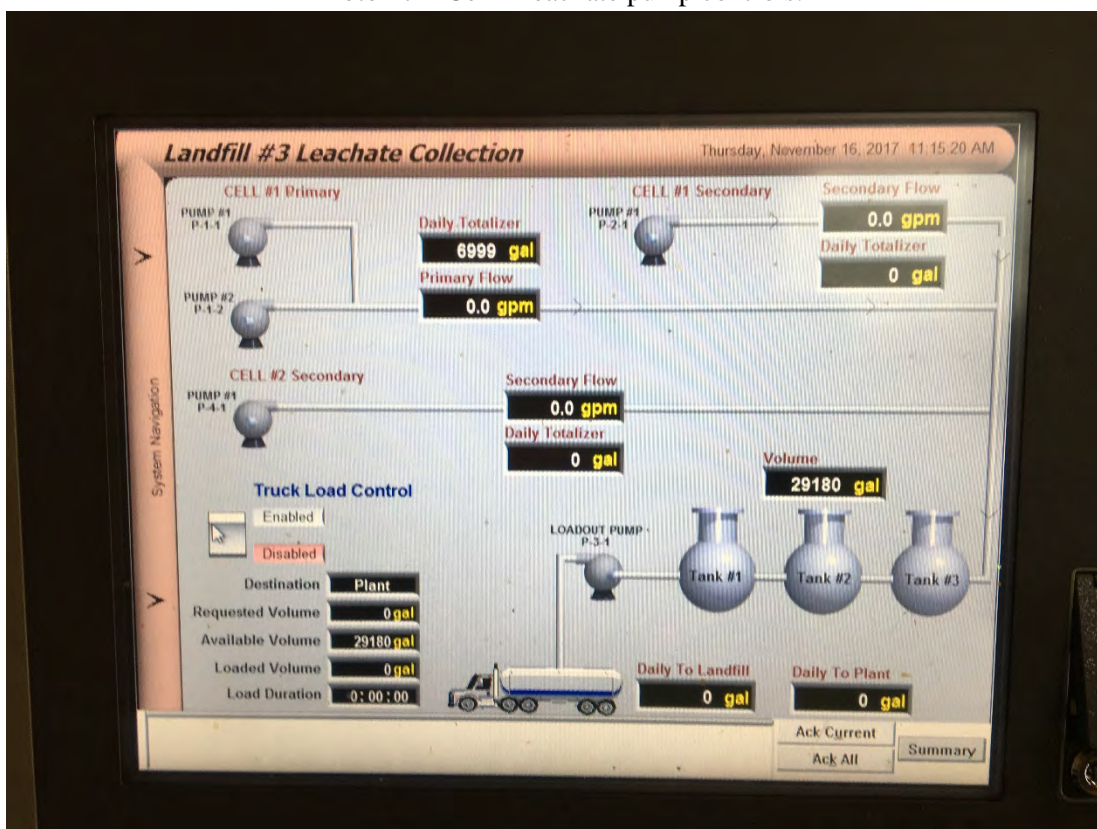


Photo 18 – Landfill No. 3 leachate collection system controls.