

January 7, 2016

Consulting
Engineers and
Scientists

Project 128980

Mr. Tim Muehlfeld, P.E.
We Energies
333 W. Everett Street, A231
Milwaukee, Wisconsin 53203

**Re: Landfill Inspection Report for the Presque Isle Power Plant Landfill No. 3
We Energies
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 Operating License 9380 issued on April 3, 2014. 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. Due to plant operations and the beneficial use of the ash the landfill was not placed into service until 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 performed on November 30, 2015. Copies of the site location figure, landfill inspection form, existing site conditions drawing, and landfill inspection photo log are appended to this letter-report and constitute the entirety of the report.

Site Inspection

The landfill site inspection was performed on November 30, 2015, by Mr. John Trast of GEI. 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 the leachate hauling logs; review weekly inspection reports; 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 October 15, 2015, so at the time of the landfill inspection Landfill No. 3 contains approximately 597,000 cubic yards of CCR.

Based on review of the leachate hauling records, weekly inspection reports, and discussions operations personnel, the landfill operations are running smoothly and consistently. Ash placement in the landfill has been limited because of beneficial use efforts, however they do anticipate more waste filling once the construction season wraps up for the year. Leachate hauling has been fairly consistent with three to eight 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.

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 down 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. Although there was light snow cover on the ground, the vegetation appeared to be well established with no observed bear 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. At the time of the inspection the leachate levels for Pumps P-1-1 and P-1-2 were 33.7 and 24.1 inches, respectively.

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 run. The leachate head level in the leak detection sump in Cell 1 was at 20.9 inches and in Cell 2 was at 19.2 inches.

Closing

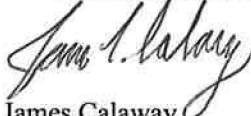
On November 30, 2015, staff from GEI completed an annual inspection of the We Energies Landfill No. 3 in compliance with § 257.84(b) *Annual inspections by a qualified professional engineer*. Overall the landfill is in very good condition. The landfill operators are doing a good job of placing and compacting 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 review of the leachate hauling records and weekly inspection reports, the landfill is constructed and being operated in accordance with Construction Permit No. 0400 dated February 27, 2002; Operating License 9380 issued on April 3, 2014; 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.



James Calaway
Senior Drafter/Designer



John M. Trast, P.E.
Senior Consultant

Attachments:

Figure 1 - Site Location
Landfill Inspection Form
Existing Site Conditions Drawing
Landfill Inspection Photo Log

JXT:cah

K:\We Energies\128980-PIPP LF3\PIPP LF3 Inspection\R128980 We_PIPP LF3_Inspection 2015_RPT_final.docx





WE ENERGIES
MARQUETTE, MICHIGAN



PRESQUE ISLE POWER PLANT
LANDFILL #3
SITE LOCATION FIGURE

Project 128980

December 16, 2015

Fig. 1

J:\Landfills\WE - Presque Isle\WE_PIPP_LF3\Dust Control Mgmt\dwg\128980001

PIPP ASH LANDFILL #3 - ANNUAL INSPECTION**INSPECTOR:** John Trast**INSPECTION DATE/TIME:** 11/30/2015**WEATHER:**

Temperature: 30 degrees 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 : 3.2 ft
 Tank Volume: 21780 gallons
 Pump: Available
 Pad Condition: Good

Sump:

Pump #1-1: Available 33.7 in Primary LCS Sump
 Pump #1-2: Available 24.1 in Primary LCS Sump
 Pump #2-1: Available 20.9 in Cell 1 Secondary
 Pump #4-1: Available 19.2 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 : 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 only observed erosion was small erosion gullies north of the cattle crossing/access road on the interior storm/contact water control ditch.

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

LANDFILL OPERATIONS:**Fugitive Dust Control:**

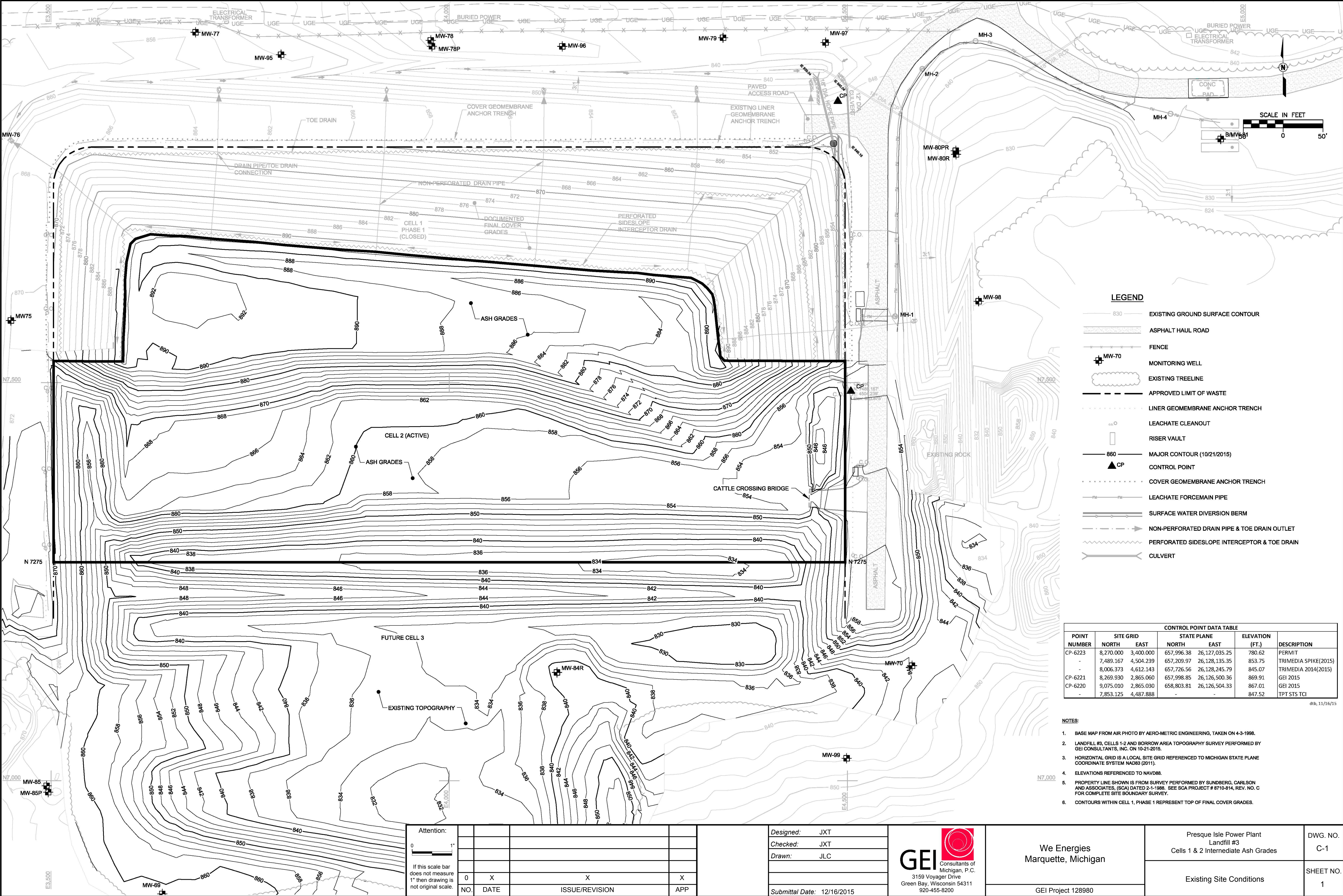
Tracking Pads : ☒
 Cattle Guards : ☒
 Access Road Clean: ☒
 Landfill Surfaces Groomed: ☒
 Airbourne Dust Visible: No
 Sign of Recent Dust Deposition: No

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**
- EXISTING GROUND SURFACE CONTOUR
 - ASPHALT HAUL ROAD
 - FENCE
 - MONITORING WELL
 - EXISTING TREELINE
 - APPROVED LIMIT OF WASTE
 - LINER GEOMEMBRANE ANCHOR TRENCH
 - LEACHATE CLEANOUT
 - RISER VAULT
 - MAJOR CONTOUR (10/21/2015)
 - CONTROL POINT
 - COVER GEOMEMBRANE ANCHOR TRENCH
 - 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

- 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 10-21-2015.
 - HORIZONTAL GRID IS A LOCAL SITE GRID REFERENCED TO MICHIGAN STATE PLANE COORDINATE SYSTEM NAD83 (2011).
 - ELEVATIONS REFERENCED TO NAVD83.
 - PROPERTY LINE SHOWN IS FROM SURVEY PERFORMED BY SUNDBERG, CARLSON AND ASSOCIATES, (SCA) DATED 2-1-1988. 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.

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

Designed: JXT
Checked: JXT
Drawn: JLC
Submittal Date: 12/16/2015



We Energies
Marquette, Michigan

GEI Project 128980

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

Existing Site Conditions

DWG. NO.
C-1

SHEET NO.
1



Photo 1- Landfill No. 3 access road and entrance to the landfill, looking north along east perimeter road.



Photo 2- Landfill No. 3 access road and Cell 1 riser vault, looking north along east perimeter road.



Photo 3- Entrance into Cell 2 looking west at cattle crossing used for storm water and track-out control.



Photo 4- Looking west at the south containment berm and operational storm water containment area. The operational storm water containment area is graded as required by the design.



Photo 5- Operational storm water containment ditch north of the entrance, with some minor erosion. The ditch appears to have adequate capacity for the upcoming winter and eventual spring runoff.



Photo 6- East slope of Cell 1 which was closed in 2014. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 7- East slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 8- East slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 9- East slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 11- East slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 10- North slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 12- - North slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 13- - North slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 14 - West slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 15- West slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 16 - West slope of Cell 1. Slope appears to be in very good condition, well vegetated, no signs of instability or erosion, no woody vegetation, and no observed animal burrows.



Photo 17- West slope and operational storm water containment ditch. The ditch is in very good condition and prepared for winter and eventual spring runoff



Photo 18- Looking east at the south containment berm and operational storm water containment area. The operational storm water containment area is graded as required by the design.



Photo 19- View of west side of Cell 2 from south.



Photo 20- View of Cell 2 from south.



Photo 21- - View of east side of Cell 2 from south..



Photo 22- Leachate load out building, loading pad, and leachate storage tanks.



Photo 23- Leachate load out building.



Photo 24 – Leachate tank risers



Photo 25- Cell 1 Side slope riser vault.



Photo 26- Cell 2 side slope riser vault.



Photo 27- Cell 1 leachate pump controls



Photo 28- Cell 1 leachate pump controls.



Photo 29- Cell 2 leachate pump controls.

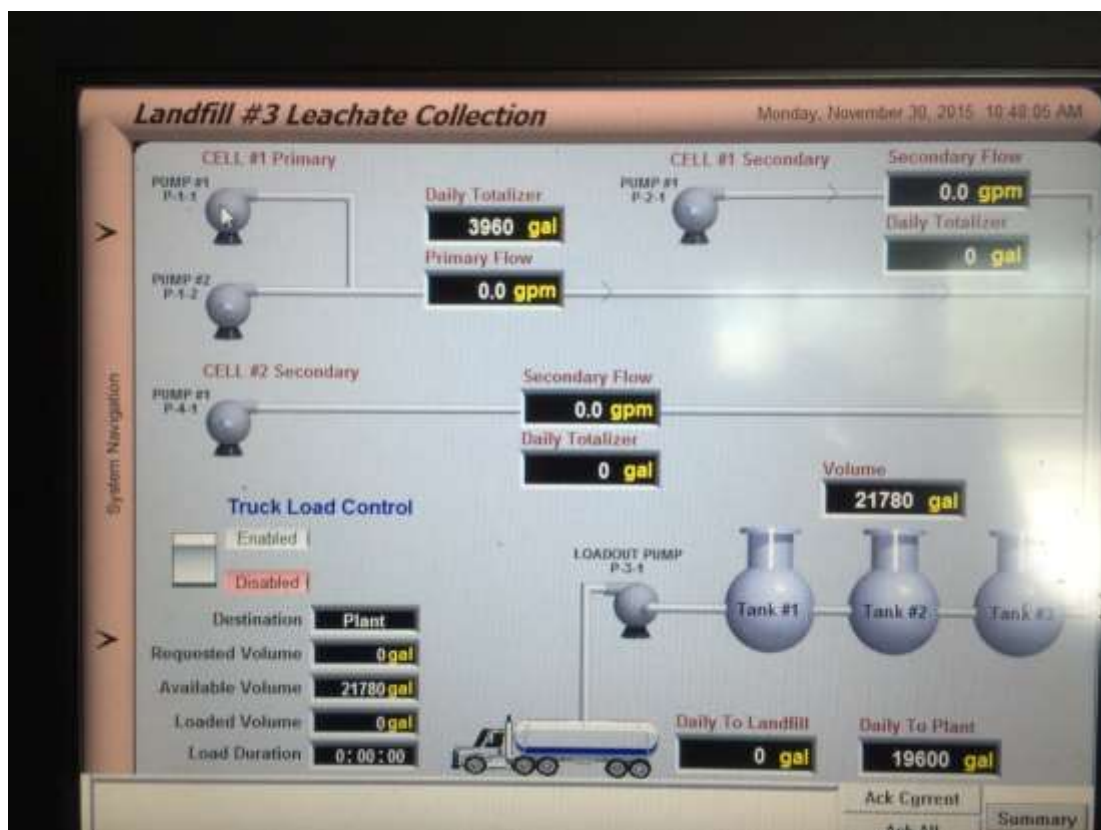


Photo 30 – Landfill No. 3 leachate collection system controls.

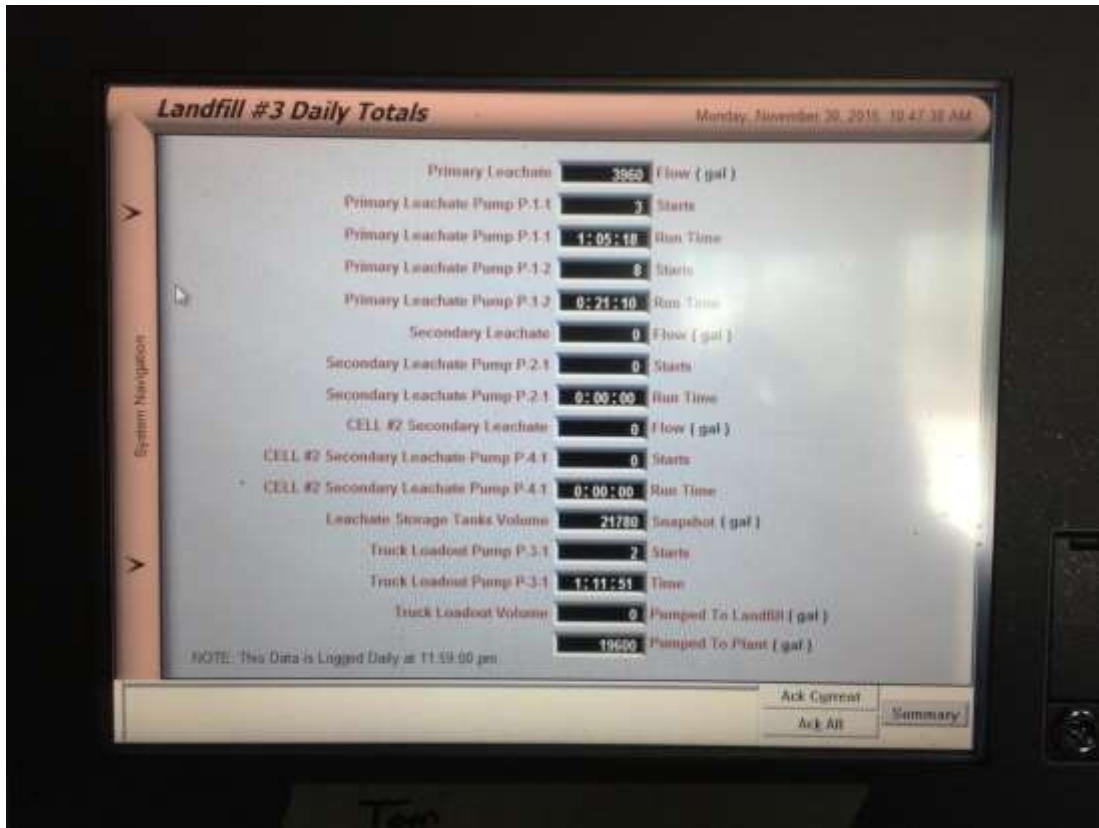


Photo 31- Landfill No. 3 leachate collection system controls.



Photo 32 - Landfill No. 3 leachate collection system controls.