Douglas Road Landfill Superfund Site
Operations and Maintenance (O&M) Report Revision 1.0
4th Quarter 2019
Mishawaka, Indiana
Patriot Project No. 16-1731-04E

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Prepared For
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FOURTH QUARTER 2019
OPERATION AND MAINTENANCE REPORT
DOUGLAS ROAD LANDFILL SUPERFUND SITE
MISHAWAKA, INDIANA
PATRIOT PROJECT NO. 16-1731-04E

1.0 INTRODUCTION

Patriot Engineering and Environmental, Inc. (Patriot) was retained by the Indiana Department of Environmental Management (IDEM) to oversee and implement activities related to post-closure operations and maintenance of the Douglas Road Landfill (DRL) Superfund Site located in Mishawaka, St. Joseph County, Indiana (Site). Figure 1 depicts the Site's location and general features. This report provides information about ongoing operation and maintenance (O&M) activities conducted at the Site for the reporting period of October 1, 2019 through December 31, 2019 (Fourth Quarter 2019).

In mid-June 2017, Patriot took over O&M responsibility at the Site. O&M activities conducted this quarter included: inspection and air compliance monitoring of the landfill gas collection system and monitoring probes; compliance sampling and analysis of the exhaust from the landfill gas extraction system, monthly inspections of the perimeter fencing and site security, two monthly inspections, one detailed inspections of the landfill cap and drainage system, and an annual inspection and sampling of the groundwater well network.

Inspection reports documenting these operational tasks are provided as Attachment 1.

2.0 LANDFILL GAS COLLECTION SYSTEM

2.1 Monitoring Tasks

The Landfill Gas (LFG) collection system consists of a vacuum extraction blower with associated process piping, valves, and controls (Blower System), equipment shed, and 15 landfill gas (LG) vent wells: LG-1 through LG-15.

Monitoring tasks conducted this quarter on the LFG collection system included monthly inspections, checking the integrity of the equipment shed, quarterly gas compliance monitoring on the LG vent wells, and quarterly effluent vapor sampling from the blower discharge.

The vent wells are monitored on a quarterly basis for methane, carbon dioxide, and oxygen (measured in percent). The Fourth Quarter 2019 data was collected on December 11, 2019 using an RKI Eagle 2 direct reading multiple gas meter. Fourth Quarter 2019 readings can be found in Attachment 2 and are discussed further in Section 2.3.

The LFG collection system monitoring is conducted to evaluate trends in the LFG gas generation rate and to aid in determining if adjustments are needed in either the Blower System or Vent Wells to maximize gas removal and capture. Historical LFG vent well readings can be found in Table 1.

A quarterly effluent vapor sample from the blower discharge was collected on December 11, 2019 using a Summa® canister and an 8-hour regulator and submitted to Pace National (former ESC) in Mount Juliet, Tennessee for volatile organic compound (VOC) analysis per the Environmental Protection Agency (EPA) Method TO-15. The sampling was conducted to evaluate organic Hazardous Air Pollutants (HAPs) discharges to the atmosphere. Current HAPs discharge amounts can be found in Table 2 and are discussed further in Section 2.3.

2.2 Maintenance Tasks

No maintenance/repair activities were conducted during this reporting period.

2.3 System Evaluation

Methane was detected in all 15 LG wells in December 2019. Methane concentrations ranged from 1 to 100% of the lower explosive level (LEL). The highest methane concentrations were 100% of the LEL in LG-6 and LG-13 and greater than 50% of the LEL in LG-4 and LG-7 (78% and 97%, respectfully).

The quarterly Blower System effluent sample results (Attachment 3), were used to estimate the HAPs emitted, in pounds per quarter (lbs./qtr.). The laboratory data was reviewed and validated following IDEM data validation guidelines and was determined to be acceptable for use with qualification. The data validation memorandum is provided in Attachment 4.

An air emission calculator was created in an Excel spreadsheet, using the ideal gas law to convert parts per billion (ppb) and flow (Q) to pounds emitted per quarter. The formula uses the molecular weight of each detected compound and the respective concentrations of those compounds to calculate the mass of each compound emitted. The result (in pounds per quarter) is obtained by multiplying this number by the discharge rate of the extraction system blower. For all calculations, a discharge rate of 90 standard cubic feet per minute (SCFM) was used. This number is derived from the blower curve supplied by Carbonair Environmental Systems, Inc. as provided in the O&M Manual and represents the discharge rate of the blower based on actual vacuum readings.

Using the above referenced formula, approximately 16.20 pounds (0.008 tons) of VOCs were emitted during the Fourth Quarter 2019, including a total of approximately 12.45 pounds (0.006 Tons) of HAPs. N-Hexane was the single greatest individual HAP emitted, totaling approximately 5.35 pounds (0.0024 tons). The results indicate a lower emission rate compared to the previous sampling event conducted on September 30, 2019. At that time, the total HAPs emitted was reported to be approximately 80.76

pounds (0.040 tons), with n-Hexane having the greatest concentration reported at 43.81 pounds (0.02 tons).

Using an annual average, it does not appear that emissions will exceed the major source thresholds specified in 326 IAC 2-7-1(22) of 10 tons (20,000 pounds) per year of a single HAP, as defined under Section 112(b) of the Clean Air Act (CAA), and 25 tons (50,000 pounds) per year of any combination of HAPs for the calendar year.

3.0 LANDFILL GAS MONITORING SYSTEM

3.1 Monitoring Tasks

The LFG monitoring network consists of 18 perimeter LFG monitoring probes, GM-1 through GM-18. The monitoring probes are inspected monthly for integrity and monitored quarterly monitoring for methane, carbon dioxide, and oxygen levels (measured in percent). Quarterly gas monitoring was conducted on December 11, 2019 using an RKI Eagle 2 direct reading multiple gas meter. Monitoring is conducted to evaluate trends in gas migration and to document compliance with state and federal regulations.

Results are also used to determine if adjustments are needed in the LFG Collection System to maximize gas capture and ensure the safety of the surrounding properties. Results of monitoring activities from this quarter can be found in Attachment 2 and are discussed further in Section 3.3 below.

3.2 Maintenance Tasks

No maintenance/repair activities were required during this reporting period.

3.3 System Evaluation

Methane monitoring results for the GM probes during the reporting period were at or near 0%, which is below the site-specific action level of 5% methane by volume. This is consistent with historical data, for all probes, which historically have been at or near 0%. All methane readings from the GM Probes can be seen on Form DRL-5 included in Attachment 2.

4.0 LANDFILL COVER SYSTEM AND PERIMETER CONTROLS

4.1 Monitoring Tasks

The Landfill Cover System consists of a cap over the landfill, perimeter storm water ditches and associated drainage structures, a perimeter access road, and perimeter fencing with an entrance gate. Landfill cap, drainage system, access road, and fencing

inspection activities were performed at the Site throughout this reporting period. Inspections were conducted monthly to ensure the landfill cover system was intact, free of debris, nuisance plants/animals, and erosion/settlement, and otherwise functioning properly. In addition, a detailed quarterly cap inspection was conducted on December 11, 2019.

4.2 Maintenance Tasks

Routine maintenance activities were performed throughout this quarter including removal and disposal of trash and debris found on the cap and along the fence line. In addition, debris from the storm water drop inlets located within the perimeter drainage ditches was removed as needed throughout the quarter. During the December 2019 inspection, minor damage to the perimeter fencing was observed along the east side of the property. This area will be monitored closely for further damage.

Vegetation on the perimeter gravel road was noted previously in the year. The north, east and south portions of the perimeter road may need more gravel applied to help prevent vegetative growth. Patriot will obtain costs for adding more gravel to perimeter road. Additionally, costs will be obtained for spraying the vegetation on the road as part of the maintenance beginning in the spring of 2020.

The presence of nuisance animals, such as moles and groundhogs were not encountered; therefore, Patriot did not trap any nuisance animals during this quarter. However, during the December inspection, an animal burrow was noted near landfill gas collection point LG-3. The burrow was filled with soil and will be monitored to see if it is reopened. If necessary, trapping will be conducted throughout the following quarter to remove any nuisance animals.

4.3 System Evaluation

A detailed cap inspection was conducted on December 11, 2019. During the December inspection of the LG points, it was noted that some of the LFG connectors have leaks and are showing signs of aging. Upon further investigation, there are no apparent visible cracks or deterioration in any of the flex hoses; there is however, the presence of moisture below the point where the flex hoses connect to the risers suggesting there may be small air leaks where moisture is escaping. Patriot recommends having the flex hoses at all 15 LG points replaced when the weather gets warmer (April or early May). Additionally, an animal burrow was noted near LG-3 and was filled in with soil during the inspection. The Landfill Cover System has remained in good condition. A copy of the inspection report is included in Attachment 2.

5.0 GROUNDWATER EXTRACTION SYSTEM

5.1 Monitoring Tasks

The Groundwater Extraction System (GES) consists of five extraction wells (EXT), EXT-1 through EXT-5, equipped with submersible groundwater pumps and connected to

process piping, valves and controls. All the EXTs are connected via manifold and the piping runs underground to the Site's constructed wetlands treatment system.

The groundwater extraction system was shut down on February 4, 2015 as directed by IDEM; therefore, no inspections were conducted this quarter. It is anticipated the system will remain shut down indefinitely.

5.2 Maintenance Tasks

No maintenance activities were performed on the GES during the quarter since it was not operational.

5.3 System Evaluation

The GES was not in operation during the quarter.

6.0 CONSTRUCTED WETLANDS TREATMENT SYSTEM

6.1 Monitoring Tasks

The Wetlands Treatment System consists of four cells, of which three are lined, surface-flow wetlands that total 8.8 acres and the fourth is a 1.8-acre, unlined infiltration basin. GES discharge as well as precipitation for the entire 30-acre Site is directed into the wetland system. All wetland treated water was designed to be discharged back into the environment via two mechanisms; 1) through the wetland system's infiltration basin, and/or 2) into the City of Mishawaka storm sewer system that discharges into a filter strip near Juday Creek. Since the GES was shut down on February 4, 2015, no samples were collected this quarter.

6.2 Maintenance Tasks

The system was not operational during the quarter.

6.3 System Evaluation

The system was not operational during the quarter.

7.0 MONITORING WELL NETWORK

An annual groundwater sampling event, which included inspecting and sampling the monitoring well network, was performed on November 18 - 19, 2019. The groundwater samples were analyzed for volatile organic compounds (VOCs), lead, iron, and arsenic. Details of this sampling event were provided to the IDEM in the *Annual Groundwater Report, Fall Event- Fourth Quarter 2019* (Patriot, December 16, 2019) which was submitted to IDEM under a separate cover. Findings from this event are summarized below.

Twenty-five out of the thirty-six groundwater wells within the monitoring well network were inspected and sampled during the Fall event. This was the fourth round of

sampling that Patriot conducted since assuming O&M contact responsibility in June 2017 and the sole annual event of 2019.

The monitoring well network appears to be in good condition given the age of the wells (20+ years old). The groundwater flow direction was determined to be toward the southwest which is consistent with historical results.

Vinyl chloride was reported in well MW-16S at a concentration of 1.12 ug/L, which is slightly above the Site Closure Goal of 1.0 ug/l. All other VOCs were non-detect for this round of sampling. Prior sampling events indicated that no other VOCs have been detected in the monitoring well network since at least 2013.

The Site Closure Goal for arsenic was exceeded in two wells (MW-06SR and MW-16S) at concentrations of 10.6 to 27.4 ug/l. These concentrations also exceed the EPA's Maximum Contaminant Level (MCL) for arsenic, which is set at 10 ug/l. One of these wells, MW-16S is located off-site, approximately ½ mile southwest of the landfill's property line.

Lead was detected in an off-site well, ½ mile southwest of the landfill in MW-16S at 11.8 ug/l. No Site-specific Closure Goal have been established for lead; however, the lead concentration reported in the well is below the MCL of 15 ug/l.

The Site Closure Goal for iron was exceeded in twelve wells this quarter, with twenty-four wells exceeding the secondary maximum contaminant level (SMCL).

8.0 CONCLUSIONS

O&M activities were completed for the Fourth Quarter 2019 which covers the period from October 1, 2019 through December 31, 2019. Activities conducted this quarter included; operation, maintenance and monitoring of the gas collection system, landfill cover and perimeter controls, and compliance air and groundwater sampling.

The Site remains in compliance with the CAA, as no exceedances of air emissions or gas migration was encountered during the quarterly monitoring events. Approximately 12.45 pounds (0.006 tons) of HAPs were emitted this quarter. As with previous quarters, n-Hexane was the single greatest HAP emitted, reported at approximately 5.35 pounds (0.002 tons). The results indicate a lower emission rate than the previous sampling event conducted on September 30, 2019.

Methane was detected in all 15 LG wells during this reporting period. Methane concentrations ranged from 1 to 100% of the lower explosive level (LEL). The highest methane concentrations were 100% of the LEL in LG-6 and LG-13, and above 50% in LG-4 and LG-7.

The landfill cover remains in generally good condition.

VOC concentrations in the groundwater were non-detect for this round of sampling, except for vinyl chloride reported in one well, MW-16S at a concentration of 1.12 ug/l, which is slightly above the Site Closure Goal of 1.0 ug/l. Arsenic was detected in two wells above the Site Closure Goal and the MCL, which is set at 10 ug/l. Lead was detected in an off-site well, MW-16S, ½ mile southwest of the landfill. Although no site-specific Closure Goal has been established for lead, the concentration is below the MCL of 15 ug/l. The Site Closure Goal for iron (1,000 ug/l) was exceeded in twelve wells this quarter, with twenty-four wells exceeding the SMCL (300 ug/l).

If you have any additional questions or comment, please contact Kendra Gutowski at (317) 576-8058 or kgrossman@patrioteng.com.

Respectfully submitted,

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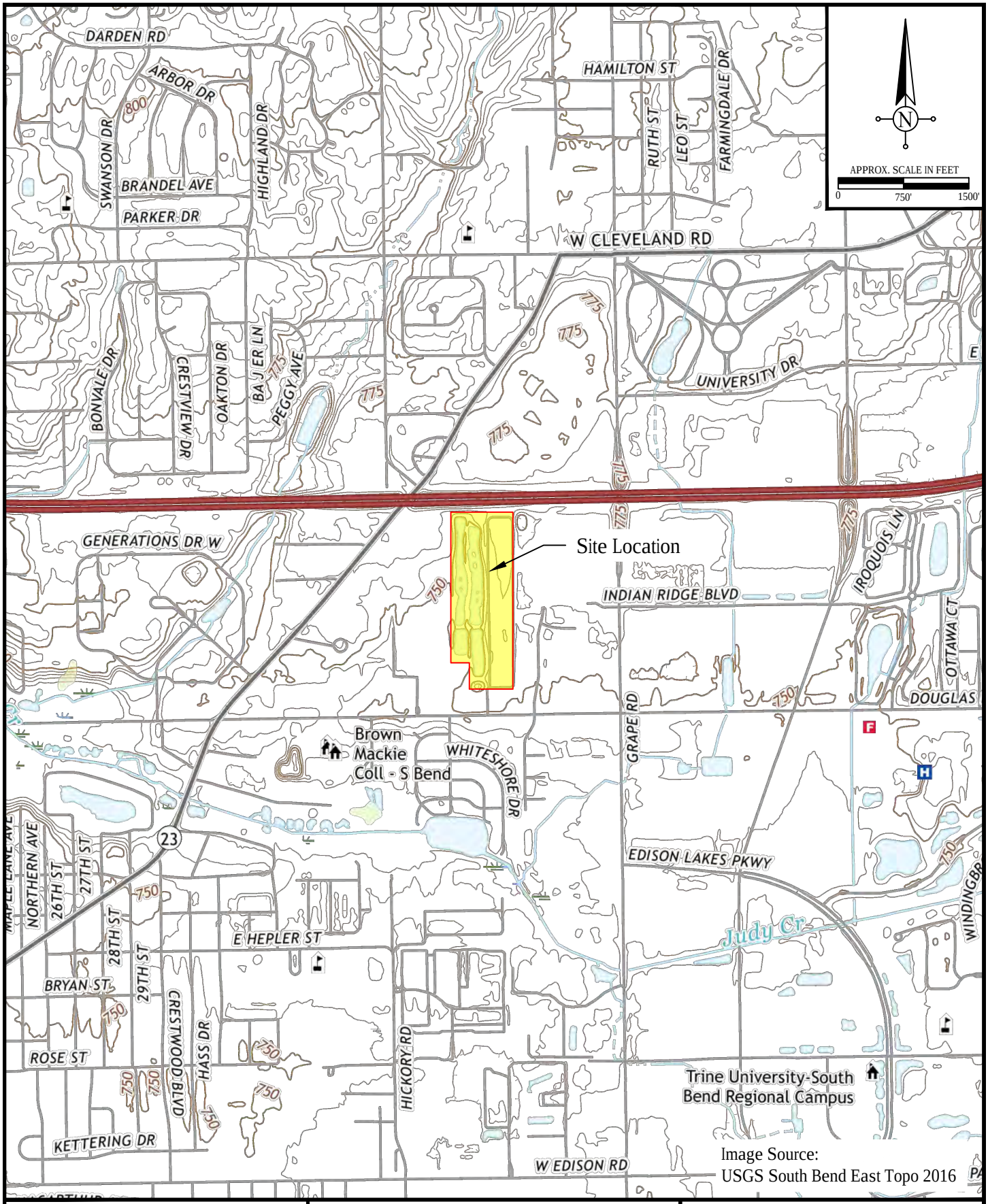

Patriot Engineering & Environmental, Inc.

Project: Douglas Road Landfill Superfund Site
St. Joseph County
Mishawaka, Indiana

	Drawn By: J. DuMond
Project Number:16-1731-04	Approved: CJ Eastman
Date: September 19, 2017	DWG: 16-1731-04_site

Figure 1

Site Vicinity Map

Tables

Table 1 - Historical LFG Collector Vent Well Readings
Table 2 - HAPs Discharge Summary

Table 1
Historical LFG Collector Vent Well Readings
Third Quarter 2019- Operation and Maintenance Report
Douglas Road Landfill Superfund Site
Mishawaka, Indiana

Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-1	11/24/2007	0	4	14.7	Closed
	2/23/2008	0	9.2	7.9	Closed
	10/3/2009	0.1	4.3	14.9	Open for test & then closed 50%
	2/20/2010	0.1	15	5.9	Open for test & then closed 75%
	7/10/2010	0.3	12.7	7.3	Open for test & then closed 75%
	9/18/2010	0	10.5	9.5	Open for test & then closed
	12/4/2010	0	4.5	14.2	Open for test & then closed 50%
	3/19/2011	0	19.5	0.9	Open for test & then closed 75%
	6/11/2011	0	12.5	6.7	Open for test & then closed 75%
	9/17/2011	0	13.5	5.1	Open for test & then closed 75%
	12/10/2011	0	14.7	5.8	Open for test & then closed
	3/10/2012	0	16.8	4.5	Open for test & then closed
	6/23/2012	0	5.9	12.1	Open for test & then closed 75%
	9/15/2012	0	11.9	7.5	Open for test & then closed 75%
	12/8/2012	0	10.1	7.5	Open for test & then closed 50%
	3/16/2013	0	12.1	5.5	Open for test & then closed 75%
	6/8/2013	0	14.5	4.1	Open for test & then closed 50%
	5/3/2014	0	18.2	3.5	Open for test & then closed 100%
	9/20/201	0	2.8	3.5	Open for test & then closed 25%
	11/27/2014	0	2.2	3.1	Open for test & then closed 25%
	3/21/2015	3.6	8.1	8.1	Open for test & then closed 25%
	6/27/2015	0	4.6	3.1	Open for test & then closed 25%
	9/26/2015	0	3	14.5	Open for test & then closed 50%
	11/22/2015	0	3.5	16.5	Open for test & then closed 50%
	2/27/2016	0	2.8	13.2	Open 100% & then closed 75%
	9/26/2017	0	20.6	0	Open for test & then closed 100%
	12/1/2017	0	21.3	0	Valve open for test and closed
	3/6/2018	0	20.5	0	Valve open for test and closed
	6/26/2018	0	21.3	0	Valve open for test and closed
	9/27/2018	0	20.9	0	Valve open for test and closed
	11/28/2018	0	20.9	0	Valve open for test and closed
	3/22/2019	0	20.9	0	
	6/11/2019	0	20.5	0	
	12/11/2019	0.1	17.7	3.6	
LG-2	11/24/2007	0	17.3	3.6	Closed
	2/23/2008	0	19.3	1.6	Closed
	10/3/2009	0	17	3.8	Open for test & then closed
	2/20/2010	0	20.7	1.2	Open for test & then closed
	7/10/2010	0	18.4	6.1	Open for test & then closed
	9/18/2010	0	18	2.6	Open for test & then closed
	12/4/2010	0	17	3.4	Open for test & then closed
	3/19/2011	0	19.5	0.9	Open
	6/11/2011	0	19.4	0.8	Open for test & then closed
	9/17/2011	0	19.7	0.5	Open for test & then closed
	12/10/2011	0	19.9	1.6	Open for test & then closed
	3/10/2012	0	20.7	0.1	Open for test & then closed
	6/23/2012	0	17.5	2	Open for test & then closed
	9/15/2012	0	17.1	2.9	Open for test & then closed
	12/8/2012	0	16.1	2.9	Open for test & then closed
	3/16/2013	0	18.1	4.9	Open for test & then closed
	6/8/2013	0	17.9	4.1	Open for test & then closed
	5/3/2014	0	20.5	1.4	Open for test & then closed 100%
	9/20/2014	0	16.5	1.4	Open for test & then closed 100%
	11/272014	0	16.5	1.4	Open for test & then closed 100%
	3/21/2015	0	15	2.9	Open for test & then closed 100%
	6/27/2015	0	16	3	Open for test & then closed 100%
	9/26/2015	0	17	3.4	Open for test & then closed 100%
	11/22/2015	0	19	1.5	Open for test & then closed 100%
	2/27/2016	0	16.8	4.2	Open for test & then closed 100%
	9/26/2017	0	20.8	0	Open for test & then closed 100%
	12/1/2017	0	21.4	0	Valve open for test and closed
	3/16/2018	0	20	0	Valve open for test and closed
	6/26/2018	0	21.4	0	Valve open for test and closed
	9/27/2018	0	20.7	0.6	Valve open for test and closed
	11/28/2018	0	20.3	1	Valve open for test and closed
	3/22/2019	0	20.3	0	
	6/11/2019	0	20.5	0	
	12/11/2019	0.1	19.9	1.2	

Table 1
Historical LFG Collector Vent Well Readings
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Mishawaka, Indiana

Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-3	11/24/2007	2.1	5.7	13.5	Open
	2/23/2008	1.2	6.5	10	Open
	10/3/2009	1.3	5.4	12.5	Open
	2/20/2010	0.6	7.8	11.2	Open
	7/10/2010	1.4	6.8	12.4	Open
	9/18/2010	1.3	3.8	13.8	Open
	12/4/2010	1.3	6.4	12.6	Open
	3/19/2011	1.1	7.7	10.3	Open for test & then closed
	6/11/2011	0.9	6.3	11.5	Open
	9/17/2011	1.2	5.5	12.6	Open
	12/10/2011	1.1	7.2	10.8	Open
	3/10/2012	0.8	8.6	10.1	Open
	6/23/2012	0.8	7.6	10.9	Open
	9/15/2012	1.5	5.8	10.9	Open
	12/8/2012	1.3	8.2	10.8	Open
	3/16/2013	0.9	9.5	9.4	Open
	6/8/2013	0.5	8	9.7	Open
	5/3/2014	1.2	9.5	10.4	Valve open 100%
	9/20/2014	0.7	7.5	10.9	Valve open 75%
	11/27/2014	1.2	6.4	12.1	Valve open 75%
	3/21/2015	5.4	14.1	12.1	Valve open 75%
	6/27/2015	0.9	7	13.4	Valve open 75%
	9/26/2015	0.6	8.4	9.8	Valve open 75%
	11/22/2015	0.6	7.9	10.8	Open for test & then closed 100%
	2/27/2016	0.5	0.9	13.4	Open 100% & then closed 50%
	9/26/2017	0	20.6	0	Open for test & then closed 100%
	12/1/2017	0	21.3	0	Valve open for test and closed
	3/16/2018	0	21.3	0	Valve open for test and closed
	6/26/2018	0	21.3	0	Valve open for test and closed
	9/27/2018	7	14.4	4.9	Valve open for test and closed
	11/28/2018	5	18	4.7	Valve open for test and closed
	3/22/2019	5	19	5	
	6/11/2019	5	20	5	
	12/11/2019	1.3	7.2	11.3	
LG-4	11/24/2007	20	0.7	19.6	Open
	2/23/2008	10.8	1.6	15.7	Open
	10/3/2009	16.4	0	20.1	Open
	2/20/2010	6.2	0.9	17	Open
	7/10/2010	0.5	11.3	18.4	Open
	9/18/2010	0	7.3	10.5	Open
	12/4/2010	12.7	0	18.4	Open
	3/19/2011	10.1	1.2	15.8	Open
	6/11/2011	11.7	1.1	17.7	Open
	9/17/2011	5	0	15.3	Open
	12/10/2011	8.5	0.9	16.9	Open
	3/10/2012	8.1	1.4	16	Open
	6/23/2012	7	1	18	Open
	9/15/2012	11.5	0.2	18.4	Open
	12/8/2012	10.6	0.6	17	Open
	3/16/2013	7.5	4	16.2	Open
	6/8/2013	6.7	1.5	16	Open
	5/3/2014	14	1.4	18.1	Valve open 100%
	9/20/2014	8.1	1	17.3	Valve open 100%
	11/27/2014	8.2	1	17.3	Valve open 100%
	3/21/2015	8.6	0.9	17.1	Valve open 100%
	6/27/2015	2.4	5.1	13.4	Valve open 100%
	9/26/2015	5	1.3	17	Valve open 100%
	11/22/2015	3.9	1.2	16.5	Valve open 100%
	2/27/2016	4.9	2.7	13.8	Valve open 100%
	9/26/2017	0	20.6	0	Open for test & then closed 100%
	12/1/2017	0	21.5	0	Valve open for test and closed
	3/16/2018	0	21	0	Valve open for test and closed
	6/26/2018	0.1	21.5	0	Valve open for test and closed
	9/27/2018	11	18.2	2.1	Valve open for test and closed
	11/28/2018	15	19.5	3.5	Valve open for test and closed
	3/22/2019	5	20	5	
	6/11/2019	0	20.6	0	
	12/11/2019	4	4.9	13.3	

Table 1
Historical LFG Collector Vent Well Readings
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Mishawaka, Indiana

Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-5	11/24/2007	1.7	9	11	Closed
	2/23/2008	1.2	11.6	7.2	Closed
	10/3/2009	0.6	9.2	10.4	Open for test & then closed 50%
	2/20/2010	0.3	13.2	6.6	Open for test & then closed 50%
	9/18/2010	9.1	0.9	18.2	Open
	12/4/2010	0	11.1	8.5	Open
	3/19/2011	0.1	12.2	6.4	Open for test & then closed 50%
	6/11/2011	0.1	10.6	7.8	Open for test & then closed 50%
	9/17/2011	0.2	9.7	7.3	Valve open for test and closed
	12/10/2011	0	12.6	6.7	Open for test & then closed 50%
	3/10/2012	0.1	1.4	5.7	Open for test & then closed 50%
	6/23/2012	0	12.4	6.9	Open for test & then closed 50%
	9/15/2012	0.2	10.4	9.7	Open for test & then closed 50%
	12/8/2012	0.2	12.4	6.8	Open
	3/16/2013	0.2	13.8	5.8	Open
	6/8/2013	0	12.4	5.7	Open 50%
	5/3/2014	0.1	14.4	6.2	Valve open 50%
	9/20/2014	0	11.6	7.9	Valve open 50%
	11/27/2014	0	13.1	6.8	Valve open 50%
	3/21/2015	1.2	13.1	6.8	Valve open 50%
	6/27/2015	13.2	6.7	6.8	Valve open 50%
	9/26/2015	0	13	6	Open % Test Closed 50%
	11/22/2015	0.1	13.2	7.2	Open % Test Closed 50%
	2/27/2016	0	11.3	8.4	Open 100% Test Closed 75%
	9/26/2017	0	20.5	0	Open 100% Test Closed 75%
	12/1/2017	0	21.5	0	Valve open for test and closed
	3/16/2018	0	21.5	0	Valve open for test and closed
	6/26/2018	0	21.5	0	Valve open for test and closed
	9/27/2018	0	20.9	0	Valve open for test and closed
	11/28/2018	0	19.9	0.1	Valve open for test and closed
	3/22/2019	0	19.9	0.1	
	6/11/2019	0	19.9	0	
	12/11/2019	0.5	10.8	8.3	
LG-6	11/24/2007	24.7	4.2	21	Open
	2/23/2008	13.4	4.3	16	Open
	10/3/2009	0	0	0	no vacuum present
	2/20/2010	3.7	2.9	15.9	Open
	7/10/2010	8.3	2.2	17.7	Open
	9/18/2010	9.8	1.3	18.2	Open
	12/4/2010	11.6	1.9	17.8	Open
	3/19/2011	10.6	3.2	14.5	Open
	6/11/2011	10.9	2.5	15.8	Open
	9/17/2011	11.7	0.8	17.9	Open
	12/10/2011	9.6	2.8	15.9	Open
	3/10/2012	8.7	2.7	14.3	Open
	6/23/2012	5.7	2.9	16	Open
	9/15/2012	11.8	1.3	18.2	Open
	12/8/2012	10	3.3	15.9	Open
	3/16/2013	6.1	5.7	13.3	Open
	6/8/2013	5.2	3.8	13.6	Open
	5/3/2014	12.4	4.6	15.5	Valve open 100%
	9/20/2014	8	3	15.6	Valve open 100%
	11/27//2014	9.1	2.7	16.6	Valve open 100%
	3/21/2015	9.3	2.4	16.6	Valve open 100%
	6/27/2015	3.1	5	12.3	Valve open 100%
	9/26/201	4.2	3.2	15.6	Valve open 100%
	11/22/2015	5.5	3.9	16.1	Valve open 100%
	2/27/2016	6.1	5.6	12.9	Valve open 100%
	9/26/2017	0	20.4	0	Valve open 100%
	12/1/2017	0	21.4	0	Valve open for test and closed
	3/16/2018	0	20	0.1	Valve open for test and closed
	6/26/2018	0	21.4	0	Valve open for test and closed
	9/27/2018	2	20.9	0	Valve open for test and closed
	11/28/2018	2	20.9	0	Valve open for test and closed
	3/22/2019	2	20.9	2	
	6/11/2019	2	20.9	2	
	12/11/2019	8.1	3.8	15.4	

Table 1
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Douglas Road Landfill Superfund Site
Mishawaka, Indiana

Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-7	11/24/2007	2.2	0.3	16.7	Open
	2/23/2008	17.4	0.7	15.9	Open
	10/3/2009	0	2.3	15.6	Open
	2/20/2010	5.7	0	17.7	Open
	7/10/2010	0.2	3.9	14.7	Open
	9/18/2010	1.9	1.8	17.4	Open
	12/4/2010	0.5	0.8	16.9	Open
	3/19/2011	1	0.4	14.7	Open
	6/11/2011	3.1	0.8	17.1	Open
	9/17/2011	0.2	4.3	16.1	Open
	12/10/2011	0	4.6	13	Open
	3/10/2012	0	6.1	11.3	Open
	6/23/2012	0	3	15.5	Open
	9/15/2012	0.4	3.4	14.9	Open
	12/8/2012	0.1	3.6	14.2	Open
	3/16/2013	0.1	7.5	10.4	Open
	6/8/2013	0	4.9	12	Open
	5/3/2014	14.8	0.3	18.1	Valve open 100%
	9/20/2014	11.2	0.7	11.3	Valve open 100%
	11/27/2014	9.7	0.2	16.7	Valve open 100%
	3/21/2015	9.7	0.3	18.7	Valve open 100%
	6/27/2015	10	8.7	18.7	Valve open 100%
	9/26/2015	0.6	0.8	17	Valve open 100%
	11/22/2015	5.4	8.5	11.2	Valve open 100%
	2/27/2016	9.6	0	15.6	Valve open 100%
	9/26/2017	0	20.3	0	Valve open 100%
	12/1/2017	0	21.3	0	Valve open for test and closed
	3/16/2018	0	20	0.1	Valve open for test and closed
	6/26/2018	0	21.3	0	Valve open for test and closed
	9/27/2018	2	16.6	0	Valve open for test and closed
	11/28/2018	2	18.2	0	Valve open for test and closed
	3/22/2019	2	19.9	0	
	6/11/2019	0	20.5	0	
	12/11/2019	3.1	12.9	6.1	
LG-8	11/24/2007	0.8	1.1	16.3	Open
	2/23/2008	0.2	12.5	5.9	Open
	10/3/2009	0	2.2	15.8	Open
	2/20/2010	0	14.6	15.5	Open for test & then closed 50%
	7/10/2010	0.2	4.1	14.7	Open for test & then closed 50%
	9/18/2010	0.5	0.9	17.9	Open
	12/4/2010	0.4	0.8	16.8	Open
	3/19/2011	0.2	2.8	13.4	Open
	6/11/2011	0.5	2.1	15.4	Open
	9/17/2011	0.4	1.3	17.9	Open
	12/10/2011	0	3.9	13.4	Open
	3/10/2012	0	6.3	11.3	Open
	6/23/2012	0	2.7	15.9	Open
	9/15/2012	0.5	0.6	17.6	Open
	12/8/2012	0.1	3.2	14.4	Open
	3/16/2013	0.1	7.4	10.4	Open
	6/8/2013	0	5.3	11.6	Open
	5/3/2014	0	15.7	5	Valve open 50%
	9/20/2014	0	12.3	6.9	Valve open 50%
	11/27/2014	0	13.1	6.4	Valve open 50%
	3/21/2015	0.7	12.1	9.4	Valve open 50%
	6/27/2015	0	10.3	8.4	Valve open 50%
	9/26/2015	0.2	2.5	15.3	Open for test & then closed 50%
	11/22/2015	0.2	12.5	8.9	Open 100% & then closed 100%
	2/27/2016	0	18	5.2	Open 100% & then closed 100%
	9/26/2017	0	20.2	0	Open 100% & then closed 100%
	12/1/2017	0	21.2	0	Valve open for test and closed
	3/16/2018	0	20.5	0.1	Valve open for test and closed
	6/26/2018	0	21.2	0	Valve open for test and closed
	9/27/2018	2	16.6	2.3	Valve open for test and closed
	11/28/2018	2	18.2	2.3	Valve open for test and closed
	3/22/2019	2	18.2	2	
	6/11/2019	2	20.5	2	
	12/11/2019	0.1	6.8	11	

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Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-9	11/24/2007	3.6	2.7	15.8	Open
	2/23/2008	2.3	3.5	12.5	Open
	10/3/2009	2.6	1.6	16.6	Open
	2/20/2010	0.7	4.9	14.1	Open
	7/10/2010	1.6	3.4	15.7	Open
	9/18/2010	2.7	1.4	17.3	Open
	12/4/2010	3.7	2.9	16.8	Open
	3/19/2011	3.6	4.2	14.2	Open
	6/11/2011	2.7	3.7	15.5	Open
	9/17/2011	3.9	2.3	18	Open
	12/10/2011	12.7	3.8	14.4	Open
	3/10/2012	2.1	3.6	13.6	Open
	6/23/2012	2	3.9	15.3	Open
	9/15/2012	3.9	2.6	16.5	Open
	12/8/2012	3.2	4.3	14.9	Open
	3/16/2013	2.1	4.9	13.5	Open
	6/8/2013	1.4	4.5	12.9	Open
	5/3/2014	2.7	6	14.5	Valve open 100%
	9/20/2014	1.6	4.5	14.6	Valve open 100%
	11/27/2014	1.7	4.9	13.7	Valve open 100%
	3/21/2015	2.6	3.9	15.7	Valve open 100%
	6/27/2015	0.9	6.1	11.8	Valve open 100%
	9/26/2015	1.2	4.7	13.8	Valve open 100%
	11/22/2015	1	2.9	13.9	Valve open 100%
	2/27/2016	2.6	4.3	12.4	Valve open 100%
	9/26/2017	0	20.2	0	Valve open 100%
	12/1/2017	0	21.4	0	Valve open for test and closed
	3/16/2018	0	20.1	0.1	Valve open for test and closed
	6/26/2018	0	21.4	0	Valve open for test and closed
	9/27/2018	0	20.9	0	Valve open for test and closed
	11/28/2018	0	20.9	0	Valve open for test and closed
	3/22/2019	0	20.9	0	
	6/11/2019	0	20.1	0.1	
	12/11/2019	1.7	3.9	13.7	
LG-10	11/24/2007	3.5	4.3	16.7	Open
	2/23/2008	0.1	12.3	7.1	Closed
	10/3/2009	3.7	9.6	11.4	Open for test & then closed 50%
	2/20/2010	1.2	11.3	8.7	Open for test & then closed 50%
	7/10/2010	0.2	19	1.2	Open for test & then closed 75%
	9/18/2010	4	5.1	11.4	Open
	12/4/2010	5.2	5.4	14.9	Open
	3/19/2011	4.5	10.6	8.6	Open for test & then closed 75%
	6/11/2011	3.3	9.7	9.6	Open
	9/17/2011	4.6	8.6	13	Open
	12/10/2011	5.8	4.2	14.9	Open
	3/10/2012	3.7	7.4	11.8	Open
	6/23/2012	1.2	15.1	4.1	Open 50%
	9/15/2012	4	7.6	14.6	Open
	12/8/2012	6.1	5.6	14.4	Open
	3/16/2013	2.5	13.6	8	Open
	6/8/2013	1.5	14.2	13.8	Open
	5/3/2014	3	11.8	18.7	Valve open 100%
	9/20/2014	2.1	8.5	13.1	Valve open 100%
	11/27/2014	3	4.7	14.4	Valve open 100%
	3/21/2015	3.9	3.7	16.1	Valve open 100%
	6/27/2015	1	7.1	11.9	Valve open 100%
	9/26/2015	0.2	11	9	Valve open 100%
	11/22/2015	0	23	0.1	No vacuum present/Valve open 100%
	2/27/2016	3.2	0	16.4	Valve open 100%
	9/26/2017	0	19.9	0	Open for test & then closed 100%
	12/1/2017	0	21.5	0	Valve open for test and closed
	3/16/2018	0	21.2	0	Valve open for test and closed
	6/26/2018	0	21.5	0	Valve open for test and closed
	9/27/2018	0	19	1.2	Valve open for test and closed
	11/28/2018	0	19	1.2	Valve open for test and closed
	3/22/2019	0	19	0	
	6/11/2019	0	19	1.2	
	12/11/2019	1.9	3.1	14.1	

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Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-11	11/24/2007	1.1	5.7	13.7	Closed
	2/23/2008	1.1	1.7	13	Closed
	10/3/2009	0.4	6.5	13.1	Open for test & then closed 50%
	2/20/2010	0	12.7	7.6	Open for test & then closed 50%
	7/10/2010	0.1	6.6	11.6	Open for test & then closed 75%
	9/18/2010	0.1	0.2	19.2	Open
	12/4/2010	0	6.7	12.9	Open
	3/19/2011	0	16.3	3.2	Open
	6/11/2011	0	17.4	2	Open for test & then closed 75%
	9/17/2011	0	6.5	2	Open for test & then closed 50%
	12/10/2011	0.2	12.2	7.7	Open for test & then closed 50%
	3/10/2012	0	18.4	3.3	Open for test & then closed 50%
	6/23/2012	0.1	11.7	6.3	Open for test & then closed 50%
	9/15/2012	0	15.4	47.5	Open for test & then closed 75%
	12/8/2012	0	18.7	10.2	Open for test & then closed 50%
	3/16/2013	0.1	16.5	4.1	Open for test & then closed 50%
	6/8/2013	0.7	11.1	7.2	Open for test & then closed 50%
	5/3/2014	0.3	8.7	11.7	Valve open for test and closed 50%
	9/20/2014	0.2	10.3	8.8	Valve open for test and closed 50%
	11/27/2014	0.2	14.5	5.9	Valve open for test and closed 50%
	3/21/2015	2.6	10.9	8.6	Valve open for test and closed 50%
	6/27/2015	0.1	7.1	11.9	Valve open for test and closed 50%
	9/26/2015	0.2	4.9	13.5	Open for test & then closed 100%
	11/22/2015	0.3	2.2	15.5	Valve open 100%
	2/27/2016	0	10.6	8.9	Valve closed 75%
	9/26/2017	0	20.1	0	Valve open 100%
	12/1/2017	0	21.3	0	Valve open for test and closed
	3/16/2018	0	21.3	0	Valve open for test and closed
	6/26/2018	0	21.3	0	Valve open for test and closed
	9/27/2018	0	18.4	3.3	Valve open for test and closed
	11/28/2018	2	18.2	2.3	Valve open for test and closed
	3/22/2019	2	19	2	
	6/11/2019	2	19.9	2	
	12/11/2019	0.4	7.6	11.1	
LG-12	11/24/2007	18.1	0.8	21	Open
	2/23/2008	11.2	0.8	16.3	Closed
	10/3/2009	6.1	0.3	18.7	Open (valve broken)
	2/20/2010	2.5	2.3	16.7	Open (valve broken)
	7/10/2010	4.3	1.5	17.9	Open (valve broken)
	9/18/2010	5.2	2.5	18.3	Open
	12/4/2010	4.5	3.8	16.4	Open
	3/19/2011	4.3	3	15.1	Open
	6/11/2011	3.6	2.4	16.2	Open
	9/17/2011	3.9	3.2	16.8	Open
	12/10/2011	3.8	2.6	15.8	Open
	3/10/2012	2.6	3	14.6	Open
	6/23/2012	2.5	4	13.7	Open
	9/15/2012	4.5	2.3	17.8	Open
	12/8/2012	4.2	3.3	15.6	Open
	3/16/2013	3	4.2	15	Open
	6/8/2013	0	19	0	Open 25%
	5/3/2014	4.9	3.7	16.5	Valve open 100%
	9/20/2014	4.3	2.1	17	Valve open 100%
	11/27/2014	2.6	8.5	11.6	Valve open 100%
	3/21/2015	3.9	4.8	13.8	Valve open 100%
	6/27/2015	0.1	5.6	12.4	Valve open 100%
	9/26/2015	2.9	4.1	15.9	Valve open 100%
	11/22/2015	1.9	4	15.2	Valve open 100%
	2/27/2016	3.6	1.4	14.7	Valve open 100%
	9/26/2017	0	19.8	0	Valve open 100%
	12/1/2017	0	21.5	0	Valve open for test and closed
	3/16/2018	0	21.3	0	Valve open for test and closed
	6/26/2018	0	21.5	0	Valve open for test and closed
	9/27/2018	0	19.8	1.3	Valve open for test and closed
	11/28/2018	0	19.9	1.4	Valve open for test and closed
	3/22/2019	0	19.9	0	
	6/11/2019	0	19.9	1.4	
	12/11/2019	2.3	4.4	14.1	

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Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-13	11/24/2007	11	0.8	10.6	Open
	2/23/2008	7	0.4	16	Open
	10/3/2009	3.8	0	20.4	Open
	2/20/2010	3	0	17.6	Open
	7/10/2010	0	0	0	No vacuum present
	9/18/2010	4.3	0.2	22.4	Open
	12/4/2010	9.8	0.1	21.7	Open
	3/19/2011	2.5	1.5	15.9	Open for test & then closed 50%
	6/11/2011	1.6	1	16.7	Open
	9/17/2011	3.6	0	18.5	Open
	12/10/2011	3	1.1	17	Open
	3/10/2012	1.5	14.6	1.5	Open
	6/23/2012	2.4	1	16.6	Open
	9/15/2012	4.1	0.1	20.2	Open
	12/8/2012	5	0.6	17.4	Open
	3/16/2013	1.5	2.2	15.1	Open
	6/8/2013	1.4	1.7	15.4	Open
	5/3/2014	2.5	0	18	Valve open 100%
	9/20/2014	8.4	0.4	20.1	Valve open 100%
	11/27/2014	8.1	0.1	18.8	Valve open 100%
	3/21/2015	8.3	0.1	20.8	Valve open 100%
	6/27/2015	1.7	5.6	12.4	Valve open 100%
	9/26/2015	2.6	1	18	Valve open 100%
	11/22/2015	2.1	0.6	17.3	Valve open 100%
	2/27/2016	3.4	0	15.3	Valve open 100%
	9/26/2017	0	20	0	Valve open 100%
	12/1/2017	0	20.5	0	Valve open for test and closed
	3/16/2018	0	0.2	0	Valve open for test and closed
	6/26/2018	0	20	0	Valve open for test and closed
	9/27/2018	0	6.8	11.8	Valve open for test and closed
	11/28/2018	4	14.7	3.9	Valve open for test and closed
	3/22/2019	3	14.5	3	
	6/11/2019	3	15.5	3	
	12/11/2019	5.2	0	18.4	
LG-14	11/24/2007	10.6	0.9	20.4	Open
	2/23/2008	6.3	0	15.6	Open
	10/3/2009	3.9	0	20	Open
	2/20/2010	2.9	0	17.4	Open
	7/10/2010	0	0.1	0	No vacuum present
	9/18/2010	1.3	5.7	21.1	Open
	12/4/2010	0	12	15	Open
	3/19/2011	0	10.7	7.1	Open for test & then closed 50%
	6/11/2011	0	6.4	8.1	Open for test & then closed 75%
	9/17/2011	0	12.1	12.8	Open for test & then closed 75%
	12/10/2011	0	14.7	8.2	Open for test & then closed 75%
	3/10/2012	0	11.3	6.2	Open for test & then closed 50%
	6/23/2012	0.1	0.8	7.2	Open for test & then closed 75%
	9/15/2012	0.1	10.4	16.3	Open for test & then closed 75%
	12/8/2012	0.1	13.5	9.5	Open for test & then closed 75%
	3/16/2013	0.1	12.9	6.3	Open for test & then closed 75%
	6/8/2013	0	0	5.5	Open for test & then closed 75%
	5/3/2014	2.5	0	18.1	Valve open 100%
	9/20/2014	2.5	7.7	18.1	Valve open 100%
	11/29/2014	0	6.2	17.6	Valve open 100%
	3/21/2015	2.1	9.7	14.6	Valve open 100%
	6/27/2015	0	11	8.8	Valve open 100%
	11/22/2015	0	0.3	9.7	Open 100% & test closed 50%
	2/27/2016	0	20	13.6	Open 100% & test closed 50%
	9/26/2017	0	21.2	0	Valve open 100%
	12/1/2017	0	21.3	0	Valve open for test and closed
	3/16/2018	0	21.3	0	Valve open for test and closed
	6/26/2018	0	21.2	0	Valve open for test and closed
	9/27/2018	4	14.7	3.9	Valve open for test and closed
	11/28/2018	3	14.3	4.9	Valve open for test and closed
	3/22/2019	3	14.5	3	
	6/11/2019	2	19.9	2	
	12/11/2019	0.1	8.9	10.9	

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Designation	Date	%CH4	%O2	%CO2	Valve Position
LG-15	11/24/2007	NM	NM	NM	Closed
	2/23/2008	NM	0	NM	Closed
	10/3/2009	4	0	20.3	Open
	2/20/2010	3	0	17.6	Open
	9/18/2010	3.5	0	19.1	Open
	12/4/2010	1.6	3.6	19.4	Open
	3/19/2011	0.1	4	12.4	Open
	6/11/2011	0	7.9	12.7	Open
	9/17/2011	1.7	3.5	10.3	Open
	12/10/2012	0	6.4	14.3	Open
	3/10/2012	0	4	10.7	Open
	6/23/2012	0.1	0	12.9	Open
	9/15/2012	0.6	3.1	19.1	Open
	12/8/2012	0.2	7.6	15.7	Open
	3/16/2013	0.1	6.9	10.6	Open
	6/8/2013	0	0	10.2	Open
	5/3/2014	2.6	0.4	18.1	Valve open 100%
	9/20/2014	1.7	9.5	18.9	Valve open 100%
	11/27/2014	1.5	1.4	10.1	Valve open 100%
	3/21/2015	1.7	1.8	16.2	Valve open 100%
	6/27/2015	0.7	5.6	11.4	Valve open 100%
	9/26/2015	0	3.9	0	Valve open 100%
	11/22/2015	1.9	0	14.1	Valve open 100%
	2/27/2016	0.5	20	15	Valve open 100%
	9/26/2017	0	21.3	0	Valve open 100%
	12/1/2017	0	21.3	0	Valve open for test and closed
	3/16/2018	0	21.3	0	Valve open for test and closed
	6/26/2018	0	21.4	0	Valve open for test and closed
	9/27/2018	2	8.9	9.6	Valve open for test and closed
	11/28/2018	0	19.9	0.1	Valve open for test and closed
	3/22/2019	0	19.9	0	
	6/11/2019	0	20	0.1	
	12/11/2019	0.6	0	17.6	

Table 2
HAPs Discharge Summary
Fourth Quarter 2018- Operation and Maintenance Report
Douglas Road Landfill Superfund Site
Mishawaka, Indiana

Formula: ER = Q*C*MW*0000001581 where:

ER = Emission rate (lb/hr)
Q = Flow rate (scfm)
C = Concentration (ppmV)
MW = Molecular weight (g/mol)

					HAPs	
Compound	C (ppbv)	C (ppmv)	MW (g/mol)	Q (scfm)	ER (lb/hr)	ER (lb/qtr)
Acetone	142	0.142	58.1	90	1E-04	0.26
Benzene	322	0.322	78.1	90	4E-04	0.78
Carbon disulfide	0	0	76.1	90	0E+00	0.00
Chloroethane	0	0	64.5	90	0E+00	0.00
Chloromethane	0	0	50.5	90	0E+00	0.00
Cyclohexane	0	0	84.2	90	0E+00	0.00
1,1-Dichloroethane	0	0	98.0	90	0E+00	0.00
1,1-Dichloroethene	0	0	96.9	90	0E+00	0.00
trans-1,2-Dichloroethene	0	0	96.9	90	0E+00	0.00
Ethanol	226	0.226	46.1	90	1E-04	0.32
Ethylbenzene	486	0.486	106.2	90	7E-04	1.61
4-Ethylbenzene	74.4	0.0744	120	90	1E-04	0.28
Trichlorofluoromethane	0	0	137.4	90	0E+00	0.00
Dichlorodifluoromethane	0	0	120.92	90	0E+00	0.00
Heptane	721	0.721	100.2	90	1E-03	2.25
n-Hexane	1990	1.99	86.2	90	2E-03	5.35
Isopropylbenzene	24.1	0.0241	120.2	90	4E-05	0.09
Methylene Chloride	0	0	84.9	90	0E+00	0.00
2-Butanone (MEK)	0	0	72.1	90	0E+00	0.00
Propene	0	0	42.1	90	0E+00	0.00
Tetrachloroethylene	0	0	166	90	0E+00	0.00
Toluene	86.1	0.0861	92.1	90	1E-04	0.25
1,1,1-Trichloroethane	0	0	133	90	0E+00	0.00
Trichloroethylene	0	0	131	90	0E+00	0.00
1,2,4-Trimethylbenzene	150	0.15	120	90	3E-04	0.56
1,3,5-Trimethylbenzene	19.6	0.0196	120	90	3E-05	0.07
2,2,4-Trimethylpentane	982	0.982	114.2	90	2E-03	3.50
Vinyl Chloride	0	0	62.5	90	0E+00	0.00
m&p-Xylene	266	0.266	106	90	4E-04	0.88
o-Xylene	0	0	106	90	0E+00	0.00
			Total Emissions (lbs)		**0.007**	**16.20**
			Total Emissions (tons)		**0.000004**	**0.008**

Attachment 1

PM Performed Field Tasks (DRL-11)

PATRIOT ENGINEERING

FORM: DRL-11
PM Performed Field Tasks
Douglas Road Landfill (DRL) Superfund Site
Patriot Project No. 16-1731-04E

Employee Steve Sittler	**Week ending: November 1, 2019**							
Project #: 16-1731-04E	**10/28**							**Total**
Tasks and Description	**Mon**	**Tue**	**Wed**	**Thrs**	**Fri**	**Sat**	**Sun**	**Hours**
B.1 – Site Security & Fence Inspections (1 x per month) Form DRL-1	1							1
B.2 – Perimeter Security Fence/Post/Barbed Wire – All Repair (as needed)								
B.3 – Perimeter Fence Veg Control & Removal (Yearly Event)								
C.1 – Landfill Cap & Drainage System Inspections (2 x per month) Form DRL-3								
C.2 – Detailed Landfill Cap/Cover Inspections (Quarterly) Form DRL-3								
C.3.1 – Mow Southern Half of Drainage Ditches, Landfill Cap and Perimeter (Spring Quarter)								
C.3.2 – Mow other Half, of Drainage Ditches, Landfill Cap and Perimeter (Fall Quarter)								
C.3.3 – Mow All Perimeter Areas of Wetland Treatment System (Spring Quarter)								
C.4 – Vegetative Growth Control on Access Road and Drainage Ditches Ditch (Yearly Event)								
C.5 – Nuisance Animal Control (as needed, up to 10 events)								
D.1 – Landfill Gas System Inspections (2 x per month) Form DRL-2	2							2
D.2 – Landfill Gas System Maintenance and Repairs (as needed)								
D.3.1 – Landfill Gas System Building Painting and Sealing (one event)								
D.3.2 – Landfill Gas System Building Maintenance and Repair (two events)								
E.1 – Landfill Compliance Monitoring (Quarterly) Form DRL- 4 and DRL-5								
E.2 – Landfill Compliance Sampling – Collect 8-hr Air Exhaust Samples (Quarterly)								
F.1 – Groundwater Monitoring Network Inspection and Maintenance (1Q and 3Q/ Year) Form DRL-7								
F.2 – Groundwater Monitoring Water Level Measurement and Sampling (1Q and 3Q/ Year) Form DRL-8								
F.5.1 – Monitoring Well Redevelopment (up to 4 wells)								
F.5.2 – Monitoring Well Abandonment (up to 4 wells)								
G.1 – Utility Support Services (up to 8 events)								
G.2 – Utility Systems Repair & Maintenance (up to 8 events)								
Total by Day:	3							3

PATRIOT ENGINEERING

FORM: DRL-11
PM Performed Field Tasks
Douglas Road Landfill (DRL) Superfund Site
Patriot Project No. 16-1731-04E

Employee Steve Sittler	**Week ending: November 24, 2019**							
Project #: 16-1731-04E	**11/18**							**Total**
Tasks and Description	**Mon**	**Tue**	**Wed**	**Thrs**	**Fri**	**Sat**	**Sun**	**Hours**
B.1 – Site Security & Fence Inspections (1 x per month) Form DRL-1	1							1
B.2 – Perimeter Security Fence/Post/Barbed Wire – All Repair (as needed)								
B.3 – Perimeter Fence Veg Control & Removal (Yearly Event)								
C.1 – Landfill Cap & Drainage System Inspections (2 x per month) Form DRL-3								
C.2 – Detailed Landfill Cap/Cover Inspections (Quarterly) Form DRL-3								
C.3.1 – Mow Southern Half of Drainage Ditches, Landfill Cap and Perimeter (Spring Quarter)								
C.3.2 – Mow other Half, of Drainage Ditches, Landfill Cap and Perimeter (Fall Quarter)								
C.3.3 – Mow All Perimeter Areas of Wetland Treatment System (Spring Quarter)								
C.4 – Vegetative Growth Control on Access Road and Drainage Ditches Ditch (Yearly Event)								
C.5 – Nuisance Animal Control (as needed, up to 10 events)								
D.1 – Landfill Gas System Inspections (2 x per month) Form DRL-2	2							2
D.2 – Landfill Gas System Maintenance and Repairs (as needed)								
D.3.1 – Landfill Gas System Building Painting and Sealing (one event)								
D.3.2 – Landfill Gas System Building Maintenance and Repair (two events)								
E.1 – Landfill Compliance Monitoring (Quarterly) Form DRL- 4 and DRL-5								
E.2 – Landfill Compliance Sampling – Collect 8-hr Air Exhaust Samples (Quarterly)								
F.1 – Groundwater Monitoring Network Inspection and Maintenance (1Q and 3Q/ Year) Form DRL-7								
F.2 – Groundwater Monitoring Water Level Measurement and Sampling (1Q and 3Q/ Year) Form DRL-8								
F.5.1 – Monitoring Well Redevelopment (up to 4 wells)								
F.5.2 – Monitoring Well Abandonment (up to 4 wells)								
G.1 – Utility Support Services (up to 8 events)								
G.2 – Utility Systems Repair & Maintenance (up to 8 events)								
Total by Day:	3							3

PATRIOT ENGINEERING

FORM: DRL-11
PM Performed Field Tasks
Douglas Road Landfill (DRL) Superfund Site
Patriot Project No. 16-1731-04E

Employee Kendra Gutowski	**Week ending:** November 24, 2019							
Project #: 16-1731-04E	11/18	11/19						**Total**
Tasks and Description	**Mon**	**Tue**	**Wed**	**Thrs**	**Fri**	**Sat**	**Sun**	**Hours**
B.1 – Site Security & Fence Inspections (1 x per month) Form DRL-1								
B.2 – Perimeter Security Fence/Post/Barbed Wire – All Repair (as needed)								
B.3 – Perimeter Fence Veg Control & Removal (Yearly Event)								
C.1 – Landfill Cap & Drainage System Inspections (2 x per month) Form DRL-3								
C.2 – Detailed Landfill Cap/Cover Inspections (Quarterly) Form DRL-3								
C.3.1 – Mow Southern Half of Drainage Ditches, Landfill Cap and Perimeter (Spring Quarter)								
C.3.2 – Mow other Half, of Drainage Ditches, Landfill Cap and Perimeter (Fall Quarter)								
C.3.3 – Mow All Perimeter Areas of Wetland Treatment System (Spring Quarter)								
C.4 – Vegetative Growth Control on Access Road and Drainage Ditches Ditch (Yearly Event)								
C.5 – Nuisance Animal Control (as needed, up to 10 events)								
D.1 – Landfill Gas System Inspections (2 x per month) Form DRL-2								
D.2 – Landfill Gas System Maintenance and Repairs (as needed)								
D.3.1 – Landfill Gas System Building Painting and Sealing (one event)								
D.3.2 – Landfill Gas System Building Maintenance and Repair (two events)								
E.1 – Landfill Compliance Monitoring (Quarterly) Form DRL- 4 and DRL-5								
E.2 – Landfill Compliance Sampling – Collect 8-hr Air Exhaust Samples (Quarterly)								
F.1 – Groundwater Monitoring Network Inspection and Maintenance (1Q and 3Q/ Year) Form DRL-7								
F.2 – Groundwater Monitoring Water Level Measurement and Sampling (1Q and 3Q/ Year) Form DRL-8	12	11						23
F.5.1 – Monitoring Well Redevelopment (up to 4 wells)								
F.5.2 – Monitoring Well Abandonment (up to 4 wells)								
G.1 – Utility Support Services (up to 8 events)								
G.2 – Utility Systems Repair & Maintenance (up to 8 events)								
Total by Day:	12	11						23

PATRIOT ENGINEERING

FORM: DRL-11
PM Performed Field Tasks
Douglas Road Landfill (DRL) Superfund Site
Patriot Project No. 16-1731-04E

Employee Vishal Shah	**Week ending:** November 24, 2019							
Project #: 16-1731-04E	11/18	11/19						**Total**
Tasks and Description	**Mon**	**Tue**	**Wed**	**Thrs**	**Fri**	**Sat**	**Sun**	**Hours**
B.1 – Site Security & Fence Inspections (1 x per month) Form DRL-1								
B.2 – Perimeter Security Fence/Post/Barbed Wire – All Repair (as needed)								
B.3 – Perimeter Fence Veg Control & Removal (Yearly Event)								
C.1 – Landfill Cap & Drainage System Inspections (2 x per month) Form DRL-3								
C.2 – Detailed Landfill Cap/Cover Inspections (Quarterly) Form DRL-3								
C.3.1 – Mow Southern Half of Drainage Ditches, Landfill Cap and Perimeter (Spring Quarter)								
C.3.2 – Mow other Half, of Drainage Ditches, Landfill Cap and Perimeter (Fall Quarter)								
C.3.3 – Mow All Perimeter Areas of Wetland Treatment System (Spring Quarter)								
C.4 – Vegetative Growth Control on Access Road and Drainage Ditches Ditch (Yearly Event)								
C.5 – Nuisance Animal Control (as needed, up to 10 events)								
D.1 – Landfill Gas System Inspections (2 x per month) Form DRL-2								
D.2 – Landfill Gas System Maintenance and Repairs (as needed)								
D.3.1 – Landfill Gas System Building Painting and Sealing (one event)								
D.3.2 – Landfill Gas System Building Maintenance and Repair (two events)								
E.1 – Landfill Compliance Monitoring (Quarterly) Form DRL- 4 and DRL-5								
E.2 – Landfill Compliance Sampling – Collect 8-hr Air Exhaust Samples (Quarterly)								
F.1 – Groundwater Monitoring Network Inspection and Maintenance (1Q and 3Q/ Year) Form DRL-7								
F.2 – Groundwater Monitoring Water Level Measurement and Sampling (1Q and 3Q/ Year) Form DRL-8	12	11						23
F.5.1 – Monitoring Well Redevelopment (up to 4 wells)								
F.5.2 – Monitoring Well Abandonment (up to 4 wells)								
G.1 – Utility Support Services (up to 8 events)								
G.2 – Utility Systems Repair & Maintenance (up to 8 events)								
Total by Day:	12	11						23

PATRIOT ENGINEERING

FORM: DRL-11
PM Performed Field Tasks
Douglas Road Landfill (DRL) Superfund Site
Patriot Project No. 16-1731-04E

Employee	**Week ending:**							
Project #:			12/11/19					**Total**
Tasks and Description	**Mon**	**Tue**	**Wed**	**Thrs**	**Fri**	**Sat**	**Sun**	**Hours**
B.1 – Site Security & Fence Inspections (1 x per month) Form DRL-1			0.75					0.75
B.2 – Perimeter Security Fence/Post/Barbed Wire – All Repair (as needed)								
B.3 – Perimeter Fence Veg Control & Removal (Yearly Event)								
C.1 – Landfill Cap & Drainage System Inspections (2 x per month) Form DRL-3								
C.2 – Detailed Landfill Cap/Cover Inspections (Quarterly) Form DRL-3			4.25					4.25
C.3.1 – Mow Southern Half of Drainage Ditches, Landfill Cap and Perimeter (Spring Quarter)								
C.3.2 – Mow other Half, of Drainage Ditches, Landfill Cap and Perimeter (Fall Quarter)								
C.3.3 – Mow All Perimeter Areas of Wetland Treatment System (Spring Quarter)								
C.4 – Vegetative Growth Control on Access Road and Drainage Ditches Ditch (Yearly Event)								
C.5 – Nuisance Animal Control (as needed, up to 10 events)								
D.1 – Landfill Gas System Inspections (2 x per month) Form DRL-2			1					1
D.2 – Landfill Gas System Maintenance and Repairs (as needed)								
D.3.1 – Landfill Gas System Building Painting and Sealing (one event)								
D.3.2 – Landfill Gas System Building Maintenance and Repair (two events)								
E.1 – Landfill Compliance Monitoring (Quarterly) Form DRL- 4 and DRL-5			4					4
E.2 – Landfill Compliance Sampling – Collect 8-hr Air Exhaust Samples (Quarterly)			1					1
F.1 – Groundwater Monitoring Network Inspection and Maintenance (1Q and 3Q/ Year) Form DRL-7								
F.2 – Groundwater Monitoring Water Level Measurement and Sampling (1Q and 3Q/ Year) Form DRL-8								
F.5.1 – Monitoring Well Redevelopment (up to 4 wells)								
F.5.2 – Monitoring Well Abandonment (up to 4 wells)								
G.1 – Utility Support Services (up to 8 events)								
G.2 – Utility Systems Repair & Maintenance (up to 8 events)								
Total by Day:			11					11

Attachment 2

Monthly Fence Inspections (DRL-1)
Monthly Landfill Cap and Drainage System Inspection (DRL-2)
Monthly Landfill Gas System Inspection (DRL-2)
Quarterly Landfill Cap/Cover Inspection (DRL-3)

Form DRL-1
Douglas Road Landfill Superfund Site
Site Security and Fence Perimeter Inspections
Monthly Inspection Checklist (Task B.1)
Patriot Project Number 16-1731-04E

Inspection Date: 10-28-19

Weather	(Sunny)	Partly Cloudy	Overcast	Rain	Snow
Temperature	32° or below	33° - 50°	(51° - 70°)	71° - 90°	90° or above
Winds	(5 - 20 mph)	20 - 40 mph	40 - 60 mph	60 mph +	
Humidity	Dry	Medium	(Humid)		

Inspection Preformed By: S. SITTLER
Title: SR. PROJECT MANAGER
Company: PATRIOT ENGINEERING
Additional Attendees: —

Photos Taken: Yes ☐ No ☒

Site Security and Fence Perimeter Inspections (Task B.1)

- Are the perimeter fence and gates in satisfactory conditions and free of debris in and around the foot of the fence? Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Are locks on the gate and shed functioning properly? Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Are there any signs of vandalism, forced entry, or breaching of the fence or shed?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

PATRIOT ENGINEERING

Form DRL-2
Douglas Road Landfill Superfund Site
Landfill Cap & Drainage System Inspections (Task C.1)
and Landfill Gas System Inspections (Task D.1)
Twice a Month Inspection Checklist
Patriot Project Number 16-1731-04E

Inspection Date: 10-28-19

Weather	(Sunny)	Partly Cloudy	Overcast	Rain	Snow
Temperature	32° or below	33° - 50°	(51° - 70°)	71° - 90°	90° or above
Winds	(5 - 20 mph)	20 - 40 mph	40 - 60 mph	60 mph +	
Humidity	Dry	Medium	(Humid)		

Inspection Preformed By: S. SITTLER
Title: SR. PROJECT MANAGER
Company: PATRIOT ENGINEERING
Additional Attendees: —

Photos Taken: Yes ☐ No ☒

Landfill Cap Cover and Perimeter Drainage Ditch Inspections (Task C.1)

- Are there any holes, burrows, or other disturbances of the cap by animals or trespassers (especially any break 1.5 ft or more in depth)?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

- Are there any depressions, general or localize, or evidence of standing water?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

PATRIOT ENGINEERING

- Are there any signs of abnormal or excessive erosion within the main areas of the cap?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

- Is there a lack of vegetation due to either natural or manmade causes?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

- Are the storm drains within the perimeter ditch and the perimeter ditch itself free of debris?

  Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Is there excessive standing water (greater than 20%) in the perimeter ditch?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

Landfill Gas System Inspections (Task D.1)

Landfill Gas Collection System

- Are the vent wells in satisfactory condition? Note any signs of aging such as cracking and/or discoloration and any obstructions.

Yes ☒ No ☐

Notes and/or Recommendations for Actions:

- Are there any depressions or other signs of surface material eroding into the collector trenches, such as cracks in the soil overlying the trench?

Yes ☐ No ☒

Notes and/or Recommendations for Actions:

- Verify operations of rotron blower, check for any abnormal sounds and collect readings from all gauges.

Yes ☒ No ☐

Notes and/or Recommendations for Actions:

Blower Gauge @ NM " H_2O KO Tank Gauge @ NM " H_2O

- Drain the moisture separator if there is more than 6" of liquid present and pull and clean or replace air filter element as necessary.

Yes ☐ No ☒

Notes and/or Recommendations for Actions:

Landfill Gas Monitoring System

- Are the monitoring probes in satisfactory condition? Note any signs of aging such as cracking and/or discoloration and any obstructions.

Yes ☒ No ☐

Notes and/or Recommendations for Actions:

- Are there any signs of subsidence around the monitoring probes?

Yes ☐ No ☒

Notes and/or Recommendations for Actions:

Form DRL-1
Douglas Road Landfill Superfund Site
Site Security and Fence Perimeter Inspections
Monthly Inspection Checklist (Task B.1)
Patriot Project Number 16-1731-04E

Inspection Date: 11-18-2019

Weather	Sunny	Partly Cloudy	Overcast	Rain	Snow
Temperature	32° or below	33° - 50°	51° - 70°	71° - 90°	90° or above
Winds	5 - 20 mph	20 - 40 mph	40 - 60 mph	60 mph +	
Humidity	Dry	Medium	Humid		

Inspection Preformed By: STEVE SITTLER
Title: SR. PROJECT MANAGER
Company: PATRIOT ENGINEERING
Additional Attendees: KENDRA GUTKOWSKI; VISHAL SHAH - PATRIOT

Photos Taken: Yes ☐ No ☒

Site Security and Fence Perimeter Inspections (Task B.1)

- Are the perimeter fence and gates in satisfactory conditions and free of debris in and around the foot of the fence? Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Are locks on the gate and shed functioning properly? Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Are there any signs of vandalism, forced entry, or breaching of the fence or shed?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

PATRIOT ENGINEERING

Form DRL-2
Douglas Road Landfill Superfund Site
Landfill Cap & Drainage System Inspections (Task C.1)
and Landfill Gas System Inspections (Task D.1)
Twice a Month Inspection Checklist
Patriot Project Number 16-1731-04E

Inspection Date: 11-18-2019

Weather	Sunny	Partly Cloudy	Overcast	Rain	Snow
Temperature	32° or below	33° - 50°	51° - 70°	71° - 90°	90° or above
Winds	5 - 20 mph	20 - 40 mph	40 - 60 mph	60 mph +	
Humidity	Dry	Medium	Humid		

Inspection Preformed By: STEVE SITTLER
Title: SR. PROJECT MANAGER
Company: PATRIOT ENGINEERING
Additional Attendees: KENDRA GUTKOWSKI, VISHAL SHAH - PATRIOT

Photos Taken: Yes ☐ No ☒

Landfill Cap Cover and Perimeter Drainage Ditch Inspections (Task C.1)

- Are there any holes, burrows, or other disturbances of the cap by animals or trespassers (especially any break 1.5 ft or more in depth)?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

- Are there any depressions, general or localize, or evidence of standing water?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

PATRIOT ENGINEERING

- Are there any signs of abnormal or excessive erosion within the main areas of the cap?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

- Is there a lack of vegetation due to either natural or manmade causes?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

- Are the storm drains within the perimeter ditch and the perimeter ditch itself free of debris?

  Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Is there excessive standing water (greater than 20%) in the perimeter ditch?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

Landfill Gas System Inspections (Task D.1)

Landfill Gas Collection System

- Are the vent wells in satisfactory condition? Note any signs of aging such as cracking and/or discoloration and any obstructions.

  Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Are there any depressions or other signs of surface material eroding into the collector trenches, such as cracks in the soil overlying the trench?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

- Verify operations of rotron blower, check for any abnormal sounds and collect readings from all gauges.

  Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

  Blower Gauge @ -26 " H_2O KO Tank Gauge @ -6 " H_2O

- Drain the moisture separator if there is more than 6" of liquid present and pull and clean or replace air filter element as necessary.

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:

Landfill Gas Monitoring System

- Are the monitoring probes in satisfactory condition? Note any signs of aging such as cracking and/or discoloration and any obstructions.

Yes ☒ No ☐

Notes and/or Recommendations for Actions:

- Are there any signs of subsidence around the monitoring probes?

Yes ☐ No ☒

Notes and/or Recommendations for Actions:

Form DRL-1
Douglas Road Landfill Superfund Site
Site Security and Fence Perimeter Inspections
Monthly Inspection Checklist (Task B.1)
Patriot Project Number 16-1731-04E

Inspection Date: 12/11/19

Weather	Sunny	Partly Cloudy	Overcast	Rain	Snow
Temperature	32° or below	33° - 50°	51° - 70°	71° - 90°	90° or above
Winds	5 - 20 mph	20 - 40 mph	40 - 60 mph	60 mph +	
Humidity	Dry	Medium	Humid		

Inspection Preformed By: Mack Runyon

Title: Project Manager

Company: Patriot Engineering

Additional Attendees: No

Photos Taken: Yes ☒ No ☐

Site Security and Fence Perimeter Inspections (Task B.1)

- Are the perimeter fence and gates in satisfactory conditions and free of debris in and around the foot of the fence? Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Are locks on the gate and shed functioning properly? Yes ☒ No ☐

  Notes and/or Recommendations for Actions:

- Are there any signs of vandalism, forced entry, or breaching of the fence or shed?

  Yes ☐ No ☒

  Notes and/or Recommendations for Actions:
  There are no signs of forced entry however there are two damaged fence posts along East side of property.

PATRIOT ENGINEERING

Form DRL-3
Douglas Road Landfill Superfund Site
Detail Landfill Cap/Cover Inspection (Task C.2)
Quarterly Inspection Checklist
Patriot Project Number 16-1731-04E

Inspection Date: 12/11/19

Weather	Sunny	Partly Cloudy	Overcast	Rain	Snow
Temperature	32° or below	33° - 50°	51° - 70°	71° - 90°	90° or above
Winds	5 - 20 mph	20 - 40 mph	40 - 60 mph	60 mph +	
Humidity	Dry	Medium	Humid		

Inspection Preformed By: Mack Runyon
Title: Project Manager
Company: Patriot Engineering
Additional Attendees: No

Photos Taken: Yes ☒ No ☐

General Conclusions on the Condition of the Landfill Cap:
When walking the Site no significant Settling was observed. An animal ~~burrow~~ burrow was found at LG-3 and was filled in with Soil using a shovel. Some minor damage to the fencing was observed along the East Side of the property. There did not appear to be excessive vegetation.

Report Prepared By:

(Signature): Mack Runyon Date: 12/11/19

PATRIOT ENGINEERING

Landfill Cap and Vegetation (Task C.2)

The landfill cap should be inspected by traversing the entire site and observing the surface of the cap. The final design grading and topography of the landfill cap is shown in Sheets 9 & 10, Appendix B of the O&M Manual. Items to note include:

Are there any depressions, general or localize or evidence of standing water? Yes ☐ No ☒

Are there any holes, burrows, or other disturbances of the cap by animals or trespassers (especially any breach 2.5 feet or more in depth)? Yes ☒ No ☐

burrow was backfilled

Has adequate maintenance been performed (e.g. should mowing frequency be increased or decreased)? Yes ☒ No ☐

Have previously recommended repairs been made? Yes ☒ No ☒

Is there a lack of vegetation due to either natural or manmade activities? Yes ☐ No ☒

Are there any signs of abnormal or excessive erosion on the main areas of the cap?

Yes ☐ No ☒

Notes and/or Recommendations for Actions:

Landfill Gas Venting System (Task C.2)

The landfill gas venting system should be inspected when the landfill cap and vegetation are inspected. Observations should be included in the quarterly inspection report. The landfill gas venting system consist of a series of shallow gas collector trenches (about 5 feet deep) within the middle portion of the landfill. The collector trenches contain 6-inch diameter corrugated and perforated horizontal HDPE gas collection pipes that have been backfilled with coarse aggregate. The 6-inch diameter HDPE gas collection pipes are connected to 6-inch diameter vertical polyvinyl chloride (PVC) gas vents that extend about 7 feet above the final landfill grade. The locations of the collector trenches and PVC gas vents are shown in the O&M Manual. Typical sections through collector and interceptor trenches and the PVC gas vent details are also shown. Inspection of the system should include walking the ground surface along the length of the collector and interceptor trenches and observing PVC gas vents. Items to note include:

Are the PVC gas vents in satisfactory condition? Yes ☒ No ☐

Are there any signs on the PVC gas vents that show aging such as cracking, and/or discoloration? Yes ☒ No ☒

Landfill Gas Collectors appear to be aging, some of the connections appeared to have leaks

Are there any obstructions around the vent caps? Yes ☐ No ☒

Are there any depressions or other signs of surface material eroding into the collector trenches, such as cracks in the soil overlying the trench? Yes ☐ No ☒

Notes and/or Recommendations for Actions:

Other Items (Task C.2)

The perimeter of the landfill is fenced for security purposes. The fence and each of the three gates should be inspected and observations should be included in the quarterly inspection report. Items to include:

Are the perimeter fence and gates in satisfactory condition? Yes ☒ No ☐

Are all locks functioning properly? Yes ☒ No ☐

Are there signs of vandalism, forced entry, or breaching of the fence? Yes ☐ No ☒

Is there any evidence of debris collection in or around the foot of the fence? Yes ☐ No ☒

Are the gravel paths graded and free of vegetation? Yes ☒ No ☐

Notes and/or Recommendations for Actions:

Attachment 3

Landfill Gas (LG) Vent Wells and Gas Monitoring (GM) Probes Results

PATRIOT ENGINEERING

FORM: DRL-4
DOUGLAS ROAD LANDFILL
LANDFILL GAS COLLECTOR READINGS

Technician: Macklin Runyon Date: 12/11/19

Weather: Ambient Temperature: 23-30 Degrees F

Atmospheric Pressure: 29.64 inHG

General Conditions: Light Snow Early Afternoon, Mostly Cloudy

Instrument: Landtec GEM 2000 Serial No.: GMO 19200H

Location	Time	CH_4 (%)	Oxygen (%)	CO_2 (%)	CH_4 (% LEL)	Notes:
LG-1	11:20	00.1	17.7	03.6	001	
LG-2	11:25	00.1	19.9	01.2	001	
LG-3	11:30	01.3	07.2	11.3	028	Animal Burrow
LG-4	11:35	04.0	04.9	13.3	078	
LG-5	11:40	00.5	10.8	08.3	010	
LG-6	11:45	08.1	03.8	15.4	100	
LG-7	11:50	03.1	12.9	06.1	097	
LG-8	11:55	00.1	06.8	11.0	002	
LG-9	12:00	01.7	03.9	13.7	033	
LG-10	12:05	01.9	03.1	14.1	038	
LG-11	12:10	00.4	07.6	11.1	008	
LG-12	12:15	02.3	04.4	14.1	044	
LG-13	12:20	05.2	00.0	18.4	100	
LG-14	12:25	00.1	08.9	10.9	002	
LG-15	12:30	00.6	00.0	17.6	011	
INSIDE OF SHED	12:40	00.0	21.1	00.0	000	

Macklin Runyon
Signature of Technician

12/11/19
Date

NOTES:

PATRIOT ENGINEERING

FORM: DRL-5
DOUGLAS ROAD LANDFILL
LANDFILL GAS MONITORING PROBE READINGS

Technician: Macklin Runyon Date: 12/11/19

Weather: Ambient Temperature: 23-30 Degrees F

Atmospheric Pressure: 29.64 inHG

General Conditions: Light Snow Early Afternoon, Mostly Cloudy

Instrument: Landtec GEM 2000 Serial No.: GMO 19200H

Location	Time	CH_4 (%)	Oxygen (%)	CO_2 (%)	CH_4 (% LEL)	Notes:
GM-1	11:00	00.1	12.9	06.6	00.1	
GM -2	10:55	00.1	17.4	04.4	00.1	
GM -3	10:50	00.1	19.1	02.4	00.1	
GM -4	10:45	00.1	18.8	00.3	00.1	
GM -5	10:40	00.1	20.9	00.1	00.1	
GM -6	10:35	00.1	20.8	00.3	00.1	
GM -7	10:30	00.0	20.7	00.1	00.0	
GM -8	10:25	00.0	20.5	00.3	00.0	
GM -9	10:20	00.0	20.3	00.3	00.0	
GM -10	10:15	00.2	19.8	00.4	00.3	Flow Valve Missing
GM -11	10:10	00.0	20.2	00.2	00.0	
GM -12	10:05	00.0	20.0	00.2	00.0	
GM -13	10:00	00.0	19.9	00.3	00.0	
GM -14	9:55	00.2	19.7	00.3	00.3	
GM -15	9:50	00.1	19.7	00.3	00.1	
GM -16	9:45	00.1	19.1	00.2	00.1	
GM -17	9:40	00.1	19.6	01.0	00.1	
GM -18	11:05	00.1	20.4	00.2	00.1	

Macklin Runyon 12/11/19

Signature of Technician Date

NOTES:

Attachment 4

Landfill Gas Effluent Analytical Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 19, 2019

Patriot Engineering - Ft. Wayne

Sample Delivery Group:	L1170901
Samples Received:	12/14/2019
Project Number:	19-1219-01E MTR
Description:	Douglas Landfill
Site:	MISHAWAKA, IN
Report To:	Kendra Grossman Gutowski 6150 E. 75th Street Indianapolis, IN 46250

Entire Report Reviewed By:

Jason Romer
Project Manager

TABLE OF CONTENTS

AIR EXHAUST L1170901-01 Air

			Collected by	Collected date/time	Received date/time	
			Mack Rvnyan	12/11/19 17:10	12/14/19 09:00	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1398635	80	12/18/19 15:06	12/18/19 15:06	CAW	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	100	238	142	337		80	WG1398635
Allyl chloride	107-05-1	76.53	16.0	50.1	ND	ND		80	WG1398635
Benzene	71-43-2	78.10	16.0	51.1	322	1030		80	WG1398635
Benzyl Chloride	100-44-7	127	16.0	83.1	ND	ND		80	WG1398635
Bromodichloromethane	75-27-4	164	16.0	107	ND	ND		80	WG1398635
Bromoform	75-25-2	253	48.0	497	ND	ND		80	WG1398635
Bromomethane	74-83-9	94.90	16.0	62.1	ND	ND		80	WG1398635
1,3-Butadiene	106-99-0	54.10	160	354	ND	ND		80	WG1398635
Carbon disulfide	75-15-0	76.10	16.0	49.8	ND	ND		80	WG1398635
Carbon tetrachloride	56-23-5	154	16.0	101	ND	ND		80	WG1398635
Chlorobenzene	108-90-7	113	16.0	73.9	ND	ND		80	WG1398635
Chloroethane	75-00-3	64.50	16.0	42.2	ND	ND		80	WG1398635
Chloroform	67-66-3	119	16.0	77.9	ND	ND		80	WG1398635
Chloromethane	74-87-3	50.50	16.0	33.0	ND	ND		80	WG1398635
2-Chlorotoluene	95-49-8	126	16.0	82.5	ND	ND		80	WG1398635
Cyclohexane	110-82-7	84.20	16.0	55.1	ND	ND		80	WG1398635
Dibromochloromethane	124-48-1	208	16.0	136	ND	ND		80	WG1398635
1,2-Dibromoethane	106-93-4	188	16.0	123	ND	ND		80	WG1398635
1,2-Dichlorobenzene	95-50-1	147	16.0	96.2	ND	ND		80	WG1398635
1,3-Dichlorobenzene	541-73-1	147	16.0	96.2	ND	ND		80	WG1398635
1,4-Dichlorobenzene	106-46-7	147	16.0	96.2	ND	ND		80	WG1398635
1,2-Dichloroethane	107-06-2	99	16.0	64.8	ND	ND		80	WG1398635
1,1-Dichloroethane	75-34-3	98	16.0	64.1	ND	ND		80	WG1398635
1,1-Dichloroethene	75-35-4	96.90	16.0	63.4	ND	ND		80	WG1398635
cis-1,2-Dichloroethene	156-59-2	96.90	16.0	63.4	ND	ND		80	WG1398635
trans-1,2-Dichloroethene	156-60-5	96.90	16.0	63.4	ND	ND		80	WG1398635
1,2-Dichloropropane	78-87-5	113	16.0	73.9	ND	ND		80	WG1398635
cis-1,3-Dichloropropene	10061-01-5	111	16.0	72.6	ND	ND		80	WG1398635
trans-1,3-Dichloropropene	10061-02-6	111	16.0	72.6	ND	ND		80	WG1398635
1,4-Dioxane	123-91-1	88.10	16.0	57.7	ND	ND		80	WG1398635
Ethanol	64-17-5	46.10	50.4	95.0	226	426	J3	80	WG1398635
Ethylbenzene	100-41-4	106	16.0	69.4	486	2110		80	WG1398635
4-Ethyltoluene	622-96-8	120	16.0	78.5	74.4	365		80	WG1398635
Trichlorofluoromethane	75-69-4	137.40	16.0	89.9	ND	ND		80	WG1398635
Dichlorodifluoromethane	75-71-8	120.92	16.0	79.1	ND	ND		80	WG1398635
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	16.0	123	ND	ND		80	WG1398635
1,2-Dichlorotetrafluoroethane	76-14-2	171	16.0	112	ND	ND		80	WG1398635
Heptane	142-82-5	100	16.0	65.4	721	2950		80	WG1398635
Hexachloro-1,3-butadiene	87-68-3	261	50.4	538	ND	ND		80	WG1398635
n-Hexane	110-54-3	86.20	16.0	56.4	1990	7020		80	WG1398635
Isopropylbenzene	98-82-8	120.20	16.0	78.7	24.1	118		80	WG1398635
Methylene Chloride	75-09-2	84.90	16.0	55.6	ND	ND		80	WG1398635
Methyl Butyl Ketone	591-78-6	100	100	409	ND	ND		80	WG1398635
2-Butanone (MEK)	78-93-3	72.10	100	295	ND	ND		80	WG1398635
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	100	409	ND	ND		80	WG1398635
Methyl methacrylate	80-62-6	100.12	16.0	65.5	ND	ND		80	WG1398635
MTBE	1634-04-4	88.10	16.0	57.7	ND	ND		80	WG1398635
Naphthalene	91-20-3	128	50.4	264	ND	ND		80	WG1398635
2-Propanol	67-63-0	60.10	100	246	2410	5920		80	WG1398635
Propene	115-07-1	42.10	32.0	55.1	ND	ND		80	WG1398635
Styrene	100-42-5	104	16.0	68.1	ND	ND		80	WG1398635
1,1,2,2-Tetrachloroethane	79-34-5	168	16.0	110	ND	ND		80	WG1398635
Tetrachloroethylene	127-18-4	166	16.0	109	ND	ND		80	WG1398635
Tetrahydrofuran	109-99-9	72.10	16.0	47.2	ND	ND		80	WG1398635
Toluene	108-88-3	92.10	16.0	60.3	86.1	324		80	WG1398635
1,2,4-Trichlorobenzene	120-82-1	181	50.4	373	ND	ND		80	WG1398635

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	16.0	87.0	ND	ND		80	WG1398635
1,1,2-Trichloroethane	79-00-5	133	16.0	87.0	ND	ND		80	WG1398635
Trichloroethylene	79-01-6	131	16.0	85.7	ND	ND		80	WG1398635
1,2,4-Trimethylbenzene	95-63-6	120	16.0	78.5	150	736		80	WG1398635
1,3,5-Trimethylbenzene	108-67-8	120	16.0	78.5	19.6	96.2		80	WG1398635
2,2,4-Trimethylpentane	540-84-1	114.22	16.0	74.7	982	4590		80	WG1398635
Vinyl chloride	75-01-4	62.50	16.0	40.9	ND	ND		80	WG1398635
Vinyl Bromide	593-60-2	106.95	16.0	70.0	ND	ND		80	WG1398635
Vinyl acetate	108-05-4	86.10	16.0	56.3	ND	ND		80	WG1398635
m&p-Xylene	1330-20-7	106	32.0	139	266	1150		80	WG1398635
o-Xylene	95-47-6	106	16.0	69.4	ND	ND		80	WG1398635
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*89.4*				WG1398635

Method Blank (MB)

(MB) R3483779-3 12/18/19 11:26

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	0.0799	J	0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	0.0613	J	0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	U		0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3483779-3 12/18/19 11:26

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	U		0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	U		0.154	0.630
2-Propanol	0.264	J	0.0882	1.25
Propene	0.161	J	0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
(S) 1,4-Bromofluorobenzene	*85.4*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3483779-1 12/18/19 10:00 • (LCSD) R3483779-2 12/18/19 10:44

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	5.14	3.73	137	99.5	55.0-148		J3	31.8	25
Propene	3.75	3.69	4.31	98.4	115	64.0-144			15.5	25
Dichlorodifluoromethane	3.75	4.21	4.75	112	127	64.0-139			12.1	25
1,2-Dichlorotetrafluoroethane	3.75	4.38	4.66	117	124	70.0-130			6.19	25
Chloromethane	3.75	4.08	4.56	109	122	70.0-130			11.1	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3483779-1 12/18/19 10:00 • (LCSD) R3483779-2 12/18/19 10:44

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Vinyl chloride	3.75	4.24	4.71	113	126	70.0-130			10.5	25
1,3-Butadiene	3.75	4.18	4.52	111	121	70.0-130			7.82	25
Bromomethane	3.75	4.65	4.19	124	112	70.0-130			10.4	25
Chloroethane	3.75	4.87	4.27	130	114	70.0-130			13.1	25
Trichlorofluoromethane	3.75	4.74	4.49	126	120	70.0-130			5.42	25
1,1,2-Trichlorotrifluoroethane	3.75	4.59	4.73	122	126	70.0-130			3.00	25
1,1-Dichloroethene	3.75	4.47	4.69	119	125	70.0-130			4.80	25
1,1-Dichloroethane	3.75	4.39	4.62	117	123	70.0-130			5.11	25
Acetone	3.75	4.59	4.72	122	126	70.0-130			2.79	25
2-Propanol	3.75	3.93	4.17	105	111	70.0-139			5.93	25
Carbon disulfide	3.75	4.35	4.58	116	122	70.0-130			5.15	25
Methylene Chloride	3.75	4.37	4.52	117	121	70.0-130			3.37	25
MTBE	3.75	4.25	4.39	113	117	70.0-130			3.24	25
trans-1,2-Dichloroethene	3.75	4.38	4.59	117	122	70.0-130			4.68	25
n-Hexane	3.75	4.57	4.60	122	123	70.0-130			0.654	25
Vinyl acetate	3.75	3.74	3.66	99.7	97.6	70.0-130			2.16	25
Methyl Ethyl Ketone	3.75	4.18	4.31	111	115	70.0-130			3.06	25
cis-1,2-Dichloroethene	3.75	4.16	4.29	111	114	70.0-130			3.08	25
Chloroform	3.75	4.44	4.52	118	121	70.0-130			1.79	25
Cyclohexane	3.75	4.40	4.53	117	121	70.0-130			2.91	25
1,1,1-Trichloroethane	3.75	4.42	4.51	118	120	70.0-130			2.02	25
Carbon tetrachloride	3.75	4.42	4.46	118	119	70.0-130			0.901	25
Benzene	3.75	4.50	4.67	120	125	70.0-130			3.71	25
1,2-Dichloroethane	3.75	4.46	4.62	119	123	70.0-130			3.52	25
Heptane	3.75	3.75	3.83	100	102	70.0-130			2.11	25
Trichloroethylene	3.75	4.53	4.60	121	123	70.0-130			1.53	25
1,2-Dichloropropane	3.75	4.56	4.56	122	122	70.0-130			0.000	25
1,4-Dioxane	3.75	4.00	4.59	107	122	70.0-140			13.7	25
Bromodichloromethane	3.75	4.46	4.60	119	123	70.0-130			3.09	25
cis-1,3-Dichloropropene	3.75	4.38	4.51	117	120	70.0-130			2.92	25
4-Methyl-2-pentanone (MIBK)	3.75	4.00	4.60	107	123	70.0-139			14.0	25
Toluene	3.75	4.35	4.49	116	120	70.0-130			3.17	25
trans-1,3-Dichloropropene	3.75	4.26	4.48	114	119	70.0-130			5.03	25
1,1,2-Trichloroethane	3.75	4.32	4.54	115	121	70.0-130			4.97	25
Tetrachloroethylene	3.75	4.40	4.58	117	122	70.0-130			4.01	25
Methyl Butyl Ketone	3.75	3.75	4.37	100	117	70.0-149			15.3	25
Dibromochloromethane	3.75	4.38	4.61	117	123	70.0-130			5.12	25
1,2-Dibromoethane	3.75	4.36	4.58	116	122	70.0-130			4.92	25
Chlorobenzene	3.75	4.39	4.65	117	124	70.0-130			5.75	25
Ethylbenzene	3.75	4.45	4.54	119	121	70.0-130			2.00	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3483779-1 12/18/19 10:00 • (LCSD) R3483779-2 12/18/19 10:44

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
m&p-Xylene	7.50	8.94	9.40	119	125	70.0-130			5.02	25
o-Xylene	3.75	4.37	4.60	117	123	70.0-130			5.13	25
Styrene	3.75	4.49	4.72	120	126	70.0-130			4.99	25
Bromoform	3.75	4.41	4.69	118	125	70.0-130			6.15	25
1,1,2,2-Tetrachloroethane	3.75	4.32	4.57	115	122	70.0-130			5.62	25
4-Ethyltoluene	3.75	4.28	4.60	114	123	70.0-130			7.21	25
1,3,5-Trimethylbenzene	3.75	4.27	4.88	114	130	70.0-130			13.3	25
1,2,4-Trimethylbenzene	3.75	4.23	4.66	113	124	70.0-130			9.67	25
1,3-Dichlorobenzene	3.75	4.29	4.74	114	126	70.0-130			9.97	25
1,4-Dichlorobenzene	3.75	4.48	4.87	119	130	70.0-130			8.34	25
Benzyl Chloride	3.75	4.09	4.58	109	122	70.0-152			11.3	25
1,2-Dichlorobenzene	3.75	4.28	4.73	114	126	70.0-130			9.99	25
1,2,4-Trichlorobenzene	3.75	3.83	4.27	102	114	70.0-160			10.9	25
Hexachloro-1,3-butadiene	3.75	4.30	4.87	115	130	70.0-151			12.4	25
Naphthalene	3.75	3.97	4.53	106	121	70.0-159			13.2	25
Allyl Chloride	3.75	4.55	4.43	121	118	70.0-130			2.67	25
2-Chlorotoluene	3.75	4.30	4.67	115	125	70.0-130			8.25	25
Methyl Methacrylate	3.75	3.67	4.01	97.9	107	70.0-130			8.85	25
Tetrahydrofuran	3.75	4.11	4.35	110	116	70.0-137			5.67	25
2,2,4-Trimethylpentane	3.75	4.44	4.54	118	121	70.0-130			2.23	25
Vinyl Bromide	3.75	4.89	4.39	130	117	70.0-130			10.8	25
Isopropylbenzene	3.75	4.32	4.64	115	124	70.0-130			7.14	25
(S) 1,4-Bromofluorobenzene				*91.4*	*96.1*	*60.0-140*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

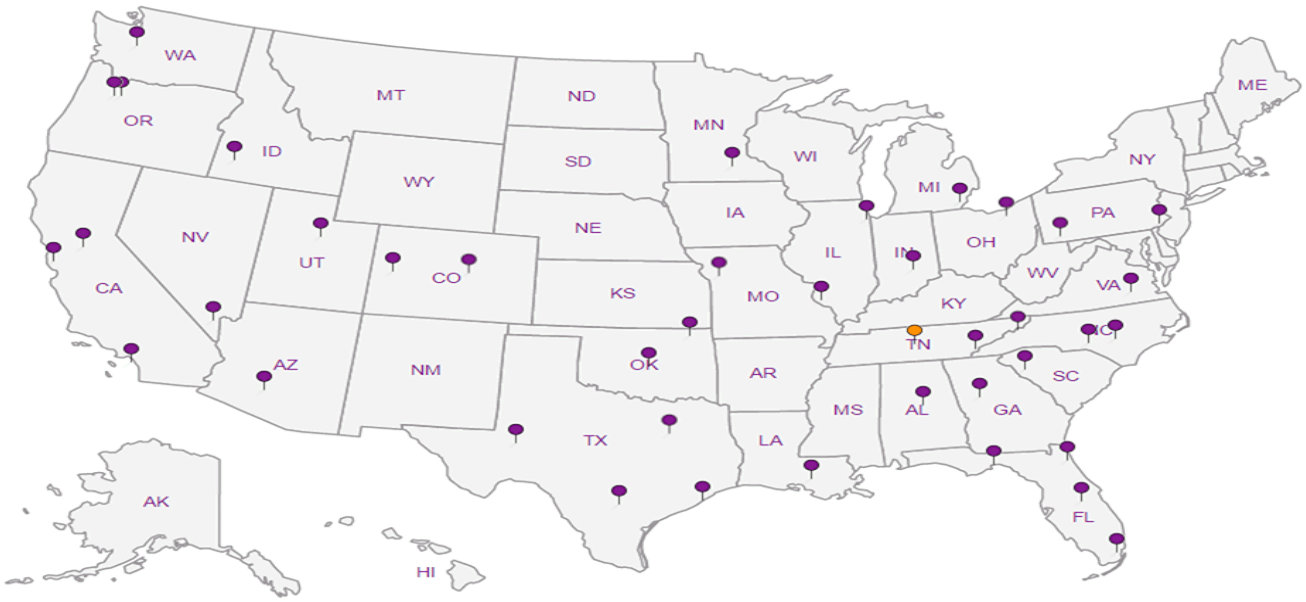
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Patriot Engineering - Ft. Wayne

6150 E. 75th Street
Indianapolis, IN 46250

Billing Information:
Attn: Accounts Payable
6150 E. 75 Street
Indianapolis, IN 46250

Report to: Kendra Grossman Gutowski

Email To: kgrossman@patrioteng.com

Project Description: Douglas Landfill

City/State Collected: South Bend, IN

Please Circle: PT MT CT (ET)

Phone: 317-558-5060
Fax: 260-490-2071

Client Project # 19-1219-01E ~~[illegible]~~ MTR

Lab Project # PATENGFW-DOUGLAS LF

Collected by (print): Mack Runyan

Site/Facility ID # MISHAWAKA, IN

P.O. #

Collected by (signature): Mack Runyan

Immediately Packed on Ice N X Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: Normal

Analysis / Container / Preservative: TO-15 Summa Full List

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1170401

Tab F018

Acct. PATENGFW

Template: T133757

Prelogin: P745646

PM: 873 - Heather J Wagner

PB: CSG 12/09/19

Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TO-15 Summa Full List	Remarks	Sample # (lab only)
Air Exhaust	Comp	Air		12/11/19	9:30-17:10	1	X		-01

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Can # 5613 Flow # 10080

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking # 1411 1748 7460

Sample Receipt Checklist

COC Seal Present/Intact:	NP Y N
COC Signed/Accurate:	Y N
Bottles arrive intact:	Y N
Correct bottles used:	Y N
Sufficient volume sent:	Y N
If Applicable	
VOA Zero Headspace:	Y N
Preservation Correct/Checked:	Y N
RAD Screen <0.5 mR/hr:	Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Mack Runyan	12/13/19	13:55			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C AMB	Bottles Received: 1
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 12/14	Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Attachment 5

Landfill Gas Effluent Data Validation Memorandum

January 9, 2020

RE: Validation of Analytical Results for the
Douglas Road Landfill Superfund Site #7500008

The analytical results for the effluent vapor sample collected on December 11, 2019 have been validated by Patriot Engineering and Environmental, Inc. (Patriot) according to the criteria contained in Section 1.5 of the project specific Quality Assurance Project Plan (QAPP) dated June 24, 2016 and the Sampling and Analysis Plan (SAP) dated September 12, 2016. Quality Assurance/Quality Control (QA/QC) data quality objectives (DQO) were evaluated in terms of precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Reasons that the data are qualified are explained below.

GENERAL COMMENTS

The purpose of the effluent vapor sampling was to evaluate trends in the landfill gas collection system (LFG) vapor generation rates and to evaluate the discharge of organic Hazardous Air Pollutants (HAPs) to the atmosphere. One quarterly effluent vapor sample from the LFG blower exhaust was collected on December 11, 2019 using a batch-certified 6-liter Summa® canister. The sample, identified as "Exhaust Air", was shipped to Pace Analytical National Pace) via commercial courier and was received on December 14, 2019 and was analyzed on December 18, 2019. The sample was analyzed for volatile organic compounds (VOCs) by Air Method, Toxic Organics-15 (TO-15) using Gas Chromatography/Mass Spectrometry (GC/MS). The analytical results are presented in report package L1170901 that covers one investigative sample and laboratory QC samples. The sample aliquot was diluted by a dilution factor of 80x prior to analysis.

Chain-of-Custody Documentation and Receipt by Laboratory

COC documentation accompanied the sample from collection by Patriot through receipt by Pace. The chain-of-custody was accurately filled out and signed. A Pace representative signed the chain-of-custody documentation and completed a sample receipt checklist. The sample receipt checklist documented that the sample container arrived intact, the correct sample container was used, and sufficient volume of sample was sent. The Login Confirmation Report prepared by Pace did not note any problems with the samples upon receipt.

Laboratory Case Narrative

The sample was received and analyzed within the method specified holding times. Where applicable, all reported Method Detection Limits (MDL) or Limits of Detection (LOD) and

Reported Detection Limits (RDL) or Limits of Quantitation (LOQ) values had been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control were within established criteria except where properly qualified within the sample results.

PRECISION

Field Precision

Field precision is assessed through the collection and analysis of field duplicates by calculating the relative percent difference (RPD) between the analytes detected in the field sample and the duplicate sample. No duplicate sample was submitted for analysis; therefore, a relative percent difference (RPD) cannot be calculated to determine the field precision.

Laboratory Precision

Precision of the laboratory analyses is evaluated based upon the results of the laboratory matrix spike/matrix spike duplicate (MS/MSD) analyses and the results of laboratory control sample (LCS) spike and laboratory control duplicate sample (LCDS) spike analysis. An RPD of 25% or above was set as the advisory limit by the laboratory. Precision is reported as a relative percent difference (RPD) between the spike sample and the duplicate spike sample. No MS/MSD sample was submitted for analyses; therefore, an RPD cannot be calculated to determine the laboratory precision for the sample. The laboratory analyzed a batch LCS spike and LCDS spike for the sample run that included the Exhaust Air sample. All RPDs were within the laboratory specified RPD except for ethanol, which was qualified as a J3 (the associated batch QC was outside the established quality control range for precision). Ethanol was also detected in the Exhaust Air sample and was also qualitied as a J3

ACCURACY

Field Accuracy

Trip blanks are used to assess field accuracy. The trip blank samples provide a measure of potential cross contamination of samples by VOCs during shipment and handling. A trip blank was not submitted during this sampling event; therefore, potential cross-contamination cannot be evaluated.

Laboratory Accuracy

Laboratory accuracy was assessed by determining percent recoveries of surrogate compounds from the analysis of investigative samples, LCS, and LCDS. Surrogate recovery of 1,4-bromofluorobenzene was within acceptable limits in the Exhaust Air sample, the method blank, and LCS.

Method blanks are used to assess potential for contamination from laboratory instruments or procedures. The laboratory analyzed one method blank along with the Exhaust Air sample. Acetone, benzyl chloride, 2-propanol and propene were detected in the method blank and qualified as a "J" (the identification of the analyte is acceptable, the reported value is an estimate. All other target analytes were below detection limits in the method blank contamination.

REPRESENTATIVENESS

Representativeness is dependent upon the proper design of the sampling program and is accomplished by ensuring that the QAPP, the SAP, and standard procedures are followed. The goal is to have all samples and measurements representative of the media sampled. A review of field sheets and the chain-of-custody indicates that proper sampling protocols were followed during the sampling event.

COMPLETENESS OF DATA SET

Completeness is defined as the total number of usable results (results that were not rejected during data validation) divided by the total results reported by the laboratory. The field completeness goal stated in the QAPP is to have 90% of all samples be valid data. Completeness was assessed by comparing the number of valid (usable) sample results to the total possible number of results within a specific sample matrix or analysis. It was determined that that all of the sample results were valid. Therefore, the results reported by the laboratory were 100% complete.

COMPARABILITY

The data collected during this sampling event is deemed comparable to historical data. The current sampling event was based on similar objectives, standardized methods, and set remedial goals. The same target analytes were reported as with histroical results. Seventeen of the 30 target analytes with reported concentrations from the 3rd quarter were not detected during this round of sampling. Four target analytes, including 1,1-dichloroethane, trichlorofluoromethane, 2-propanol, and 2,2,4-trimethylpentane had concentrations higher than the reported concentrations for the 3rd quarter. All other concentrations were similar or below the 3rd quarter reported concentrations.

SENSITIVITY

The quantitation limits for the sample data were reviewed to ensure that the sensitivity of the analyses was sufficient to achieve the Site Closure Goal. The laboratory reporting limits are based on the MDLs adjusted for sample size and dilution. The laboratory reported using an 80X dilution for the sample and the RDLs adjusted for dilution ranged from 33.0 to 538 micrograms per cubic meter (ug/m^3). The majority of the adjusted RDLs are greater than the RDLs outlined in Appendix C, Table 2 of the QAPP.

CONCLUSIONS

The data review process involved evaluating sample receipt, holding times, laboratory duplicate results, laboratory spike and spike duplicate results, laboratory control sample results, and surrogate recoveries. After evaluating these parameters, an overall assessment with respect to the quantitative and qualitative data quality assurance parameters of accuracy, precision, completeness, comparability, and representativeness was formulated. Based on the evaluation, it has been determined that the results are acceptable for use with qualification. Although sample dilution resulted in laboratory RDLs outside of the RLs outlined in the QAPP, the data are still acceptable for the stated purpose of evaluating trends in the LFG vapor generation rates and evaluating the discharge of organic HAPs to the atmosphere.

Patriot Engineering and Environmental, Inc.

Kendra Gutowski
Staff Engineer
Environmental Division

Michael F. Casper, LPG
Principal
Chief Environmental Consultant