US EPA RECORDS CENTER REGION 5
536634

October 11, 2016

Reference No. 032504-15

Mr. Howard Caine
United States Environmental Protection Agency
Region V (SR-6J)
77 W. Jackson Boulevard
Chicago, Illinois
60604

Dear Mr. Caine:

Re: Progress Report No. 136
Groundwater and Landfill RD/RA
Reporting Period: July 1 through September 30, 2016
Rasmussen Landfill (Site), Livingston Co., Michigan

1. Introduction

This Progress Report is submitted in accordance with Paragraph 26 of the Consent Decree, Civil Action No. 92 40071. This report summarizes the activities performed during the reporting period and describes the activities to continue or which are scheduled to start during the next reporting period.

2. Activities Performed During this Reporting Period

2.1 Operation and Maintenance

The quarterly round of groundwater elevations were measured on September 1, 2016. The corresponding groundwater contour map is provided on Figure 1.

GHD collected quarterly groundwater samples on August 6, and September 1, 2, 4, 5, 6, and 7, 2016, consistent with the Groundwater Remediation Monitoring Program. The results from these samples are discussed below.

2.2 Reports

Quarterly Progress Report No. 135 was submitted to USEPA and Michigan Department of Environmental Quality (MDEQ) on July 8, 2016.

The 2015 Groundwater Investigation (GHD 2016) report was submitted to USEPA and MDEQ on July 13, 2016.

GHD
651 Colby Drive Waterloo Ontario N2V 1C2 Canada
T 519 884 0510 **F** 519 884 0525 **W** www.ghd.com

REGISTERED COMPANY FOR
ISO 9001
ENGINEERING DESIGN

3. Summary of Findings

Third Quarter 2016 Groundwater Quality Monitoring

The results of the third quarter 2016 sampling are provided in Tables 1 through 4. Figure 2 is a Site location map showing the wells included in the quarterly Groundwater Remediation Monitoring Program and the annual Landfill Monitoring Program.

During the third quarter 2016 sampling, six of the 29 monitoring wells sampled had Compounds of Concern (COCs) at concentrations above Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria (RDWCC).

Specifically, the six monitoring wells with COCs exceeding RDWCC are:

CRA-RA-22	3.3 µg/L vinyl chloride
CRA-RA-24	4.9 µg/L vinyl chloride
CRA-RA-26S	78 µg/L trichloroethene
CRA-RA-27	9.1 µg/L vinyl chloride
CRA-RA-30	3.3 µg/L vinyl chloride
CRA-RA-33	2.8 µg/L vinyl chloride

There were five monitoring wells that had COCs above RDWCC during the second quarter 2016 sampling event. The vinyl chloride detected in the sample from monitoring well CRA-RA-33 during the third quarter of 2016 was 2.8 µg/L, up from 1.5 µg/L in the second quarter 2016.

GHD collected the annual Rasmussen residential water well sample in the third quarter 2016. No COCs were detected.

Lower Aquifer monitoring well RA-MW-47 serves as a sentry well for the Lower Aquifer. An annual groundwater sample was collected from RA-MW-47 during the third quarter 2016 sampling. No COCs were detected in the groundwater sample collected from this well.

COC Contours

The Rasmussen Site Remediation Group (RSRG) provides contour maps of current COC distribution following completion of the third quarter sampling. GHD prepared an update of COC distribution based on data collected in 2015 in Progress Report No. 132 (CRA, October 2015). The 2015 COC plume map is provided on Figure 3. Figure 4 provides a COC plume map based on the data collected in 2016. There were minor changes in the concentration of COCs in 2016 as compared to 2015, as follows:

Vinyl Chloride

Monitoring Well	Q3 2015 Result (µg/L)	Q3 2016 Result (µg/L)
CRA-RA-22	5.6	3.3
CRA-RA-24	5.1	4.9
CRA-RA-27	10	9.1
CRA-RA-30	2.7	3.3
CRA-RA-33	2.4	2.8
CRA-RA-35	1.7/1.8[(D)]	1.1
81-4	1.8	1.6

[(D)] – duplicate sample

The concentration of vinyl chloride at 81-4, CRA-RA-22, CRA-RA-24, CRA-RA-27 and CRA-RA-35 decreased slightly in 2015, while concentrations of vinyl chloride increased slightly at CRA-RA-30 and CRA-RA-33.

Trichloroethene

Monitoring Well	Q3 2015 Result (µg/L)	Q3 2016 Result (µg/L)
CRA-RA-23D	3.4	2.1
CRA-RA-26S	70	78

The trichloroethene concentrations decreased slightly in the groundwater samples collected from CRA-RA-23D and increased slightly in the groundwater samples collected from CRA-RA-26S.

Trend Analysis

GHD completed trend analysis for benzene, trichloroethene and vinyl chloride groundwater data from monitoring wells included in the Groundwater Remediation Monitoring Program and the Annual Landfill Monitoring Program. Statistical analysis of concentration trends over the last eight quarterly monitoring events was completed using the Mann-Kendall Trend Test to provide insight into recent changes in COC concentrations. Tables 6 through 8 provide a summary of the trend analyses. No increasing trends were observed.

A total of 99 data sets (3 parameters x 33 wells) were analyzed. Eighty four data sets (85%) did not include detectable concentrations and another five data sets (5 %) included more than 50% non-detects. These data sets are not suitable for trends analysis. Of the remaining 10 data sets, seven exhibited no trend and three data sets were decreasing, as follows:

Compound	Well
Benzene	CRA-RA-33
Trichloroethene	CRA-RA-23D
Vinyl Chloride	CRA-RA-35

Trend analysis indicated that benzene, trichloroethene, and vinyl chloride concentrations have remained stable or decreased over the last two years at all monitoring points analyzed.

4. Problems Encountered

August 25, 2016

During the weekly inspection, it was discovered that three of the four main solenoid valves in the AirSep unit (oxygen concentrator) were not functioning. Waste air could not be vented and oxygen concentrations was drastically reduced.

September 1, 2016

During a system check it was discovered that one of the oil hoses on the air compressor was leaking. Ingersoll Rand was contacted for a service call. The leak was not severe enough to shut down the system.

September 26, 2016

It was noted that oil was being lost from the compressor and the source of the leak could not be located. Ingersoll Rand was contacted for a service call.

5. Corrective Measures to Rectify Problems

August 25, 2016

It was discovered that the problem with the solenoid valves on the AirSep unit was that one of the power wires that links together all of the solenoid valves had broken. After shutting down the unit, a new wire connector was installed on the broken wire. After reenergizing the unit, all solenoids were functioning as designed.

September 2, 2016

Ingersoll Rand arrived on Site to replace all of the compressor hoses on September 2, 2016. All hoses were replaced because they had reached the end of their recommended performance life. The

compressor was restarted the afternoon of September 2, 2016 with a system downtime of approximately four hours.

September 27, 2016

Ingersoll Rand arrived on Site the morning of September 27, 2016. After several hours of trouble shooting, it was discovered that an oil scavenge valve had malfunctioned and oil from the compressor separator was blowing into the process air. Due to the age of the compressor, this scavenge valve is no longer produced. Ingersoll Rand obtained a replacement scavenge valve from a unit waiting to be scrapped. The compressor was repaired and running again on the afternoon of September 27, 2016.

6. Contacts and Significant Correspondence with Public Representatives

Communication	Date	Subject of Correspondence/Discussion
Quarterly Report	July 8, 2016	Report No. 135 submitted to H. Caine (USEPA) and K. Krawczyk (MDEQ).
2015 Groundwater Investigation	July 13, 2016	Report on downgradient wells submitted to H. Caine (USEPA) and K. Krawczyk (MDEQ).
emails	August 30 – September 8, 2016	Correspondence regarding scheduling a Site visit by H. Caine (USEPA) and K. Krawczyk (MDEQ).
emails	September 13 – September 27, 2016	Correspondence between S. Nadeau (Honigman), H. Caine (USEPA) and L. Kirby-Miles (USEPA) regarding financial assurance.

7. Planned Upcoming Activities/Schedule

Activities planned for the fourth quarter of 2016 include:

- Continue the operation of ozone sparging system
- Continue to monitor for the presence of ozone at each sparge vault
- The fourth quarter groundwater sampling event is scheduled for the week of November 21, 2016
- The wells to be sampled in the fourth quarter of 2016 are listed in Table 5

Should you have any questions on the above, please do not hesitate to contact the undersigned.

Yours truly,

GHD

Bart Bartholomy

AJD/cb/48

Encl.

cc: Mike Stoelton, JCI
Chuck Pinter, Ford
Karyllan Dodson Mack, BASF
Michael Simpson
Steven Nadeau, Honigman

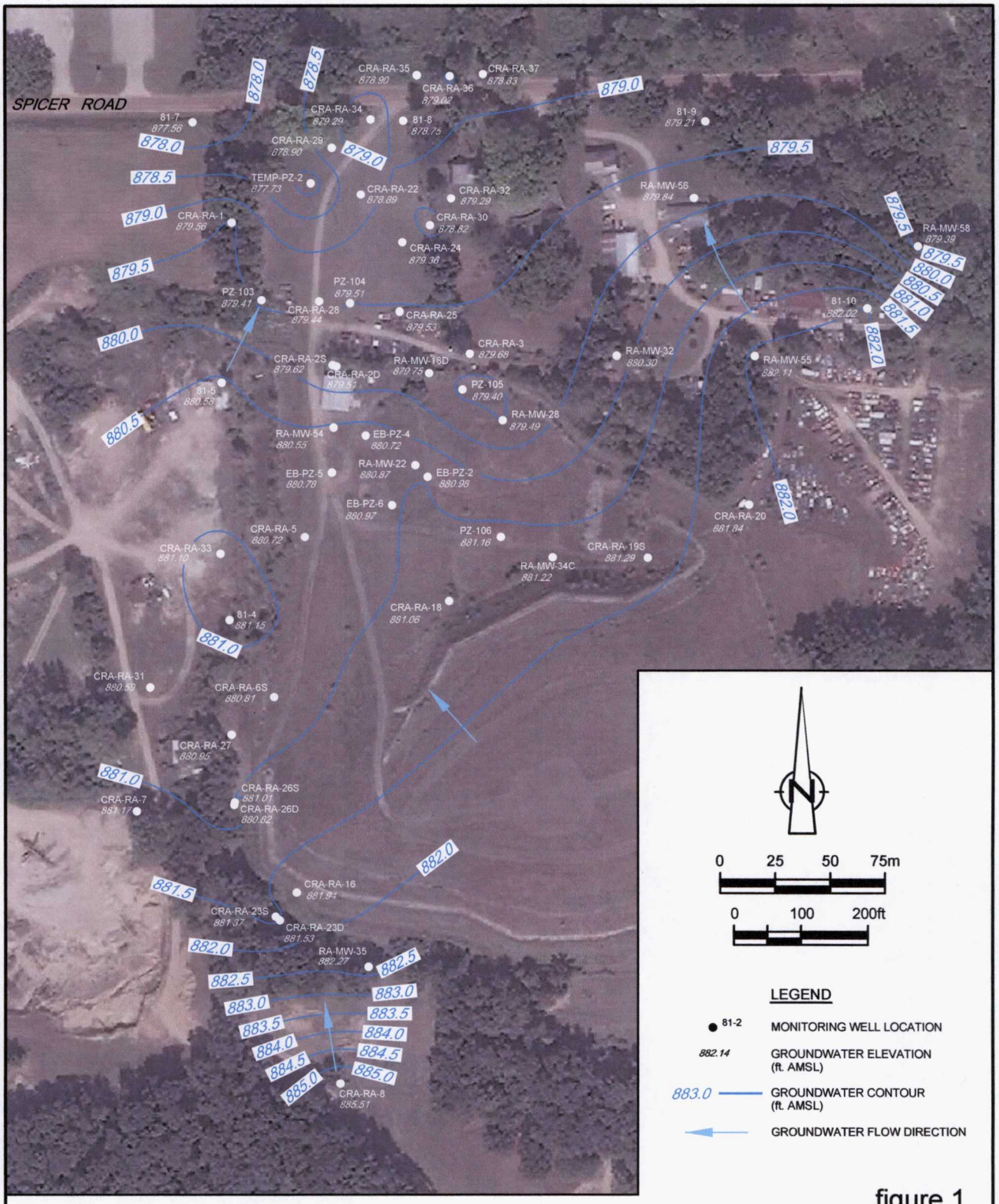


figure 1

GROUNDWATER ELEVATION CONTOURS (UPPER AQUIFER)
SEPTEMBER 2016
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

GHD

32504-15(CAIN048)GN-WA001 SEP 30, 2016

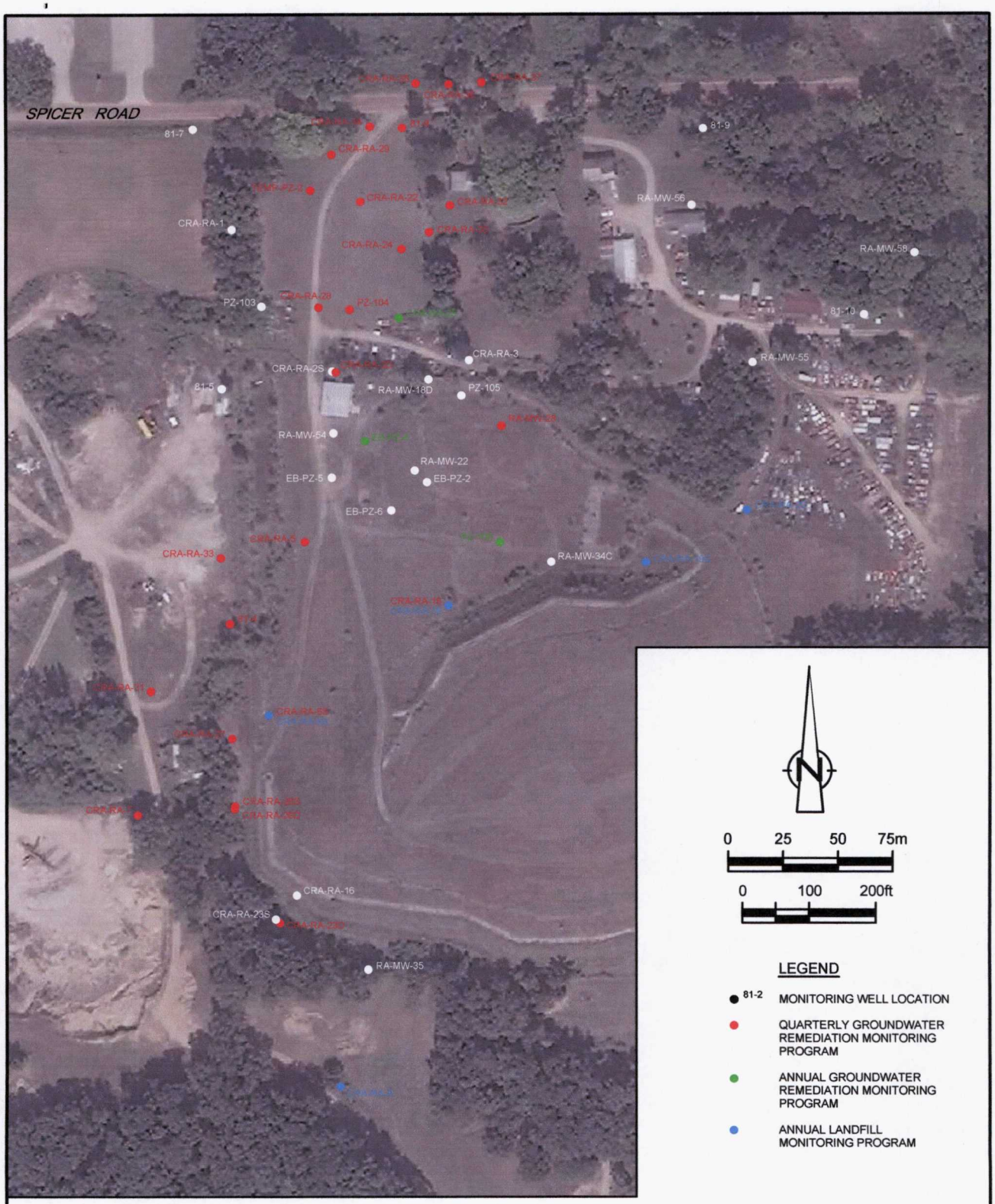
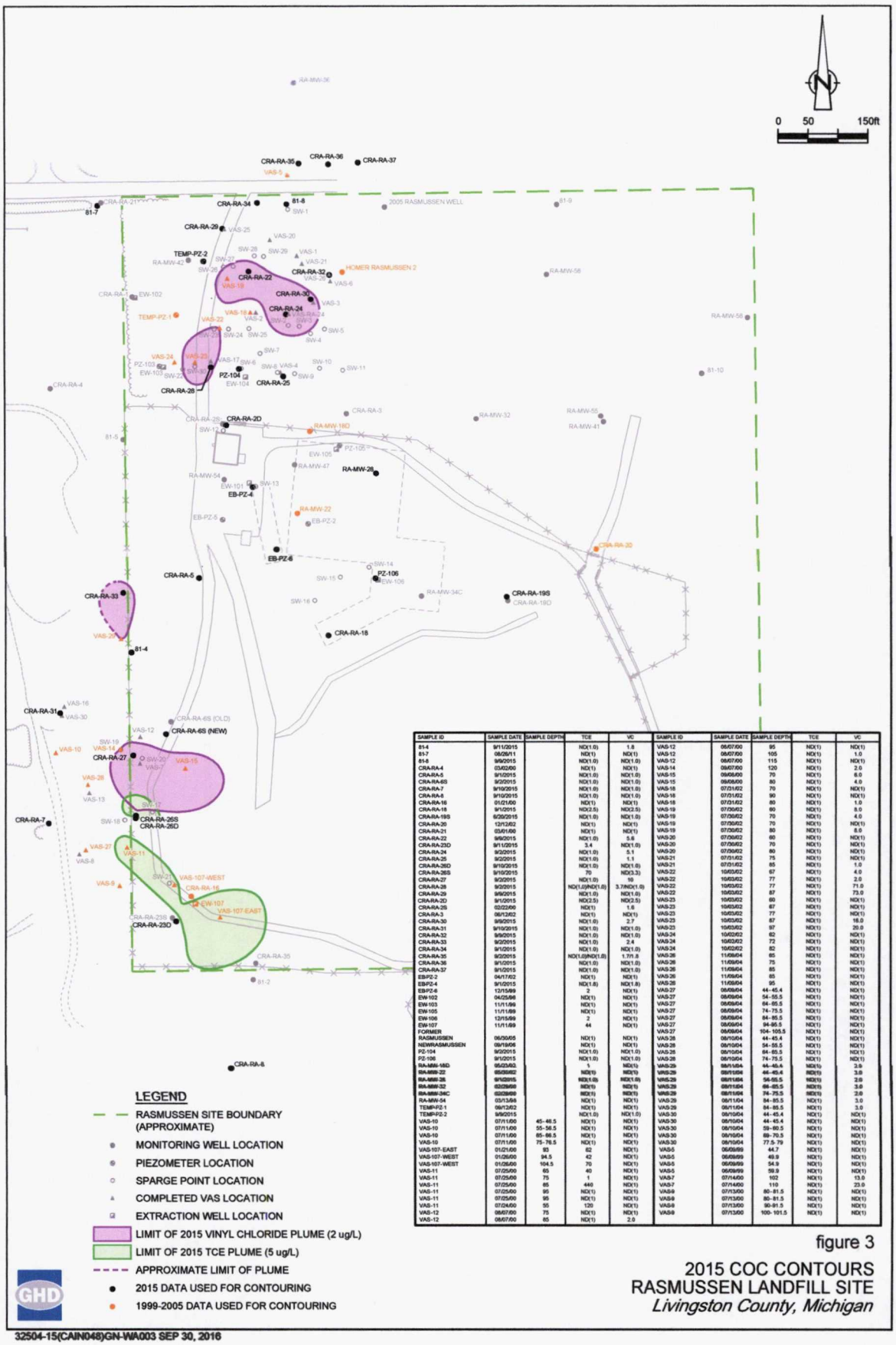


figure 2

2016 GROUNDWATER MONITORING PROGRAMS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN048)GN-WA002 SEP 30, 2016



SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC	SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC
81-4	9/11/2015		ND(1.0)	1.8	VAS-12	06/07/00	95	ND(1)	ND(1)
81-7	08/26/11		ND(1)	ND(1)	VAS-12	08/07/00	105	ND(1)	1.0
81-8	9/9/2015		ND(1.0)	ND(1.0)	VAS-12	08/07/00	115	ND(1)	ND(1)
CRA-RA-4	03/02/00		ND(1)	ND(1)	VAS-14	08/07/00	120	ND(1)	2.0
CRA-RA-5	9/1/2015		ND(1.0)	ND(1.0)	VAS-15	09/08/00	70	ND(1)	8.0
CRA-RA-6S	9/3/2015		ND(1.0)	ND(1.0)	VAS-15	09/08/00	80	ND(1)	4.0
CRA-RA-7	9/10/2015		ND(1.0)	ND(1.0)	VAS-18	07/31/02	70	ND(1)	ND(1)
CRA-RA-8	9/10/2015		ND(1.0)	ND(1.0)	VAS-18	07/31/02	90	ND(1)	ND(1)
CRA-RA-16	01/21/00		ND(1)	ND(1)	VAS-18	07/31/02	80	ND(1)	1.0
CRA-RA-18	9/1/2015		ND(2.5)	ND(2.5)	VAS-19	07/30/02	60	ND(1)	8.0
CRA-RA-19S	8/20/2015		ND(1.0)	ND(1.0)	VAS-19	07/30/02	70	ND(1)	4.0
CRA-RA-20	12/12/02		ND(1)	ND(1)	VAS-19	07/30/02	70	ND(1)	ND(1)
CRA-RA-21	03/01/00		ND(1)	ND(1)	VAS-19	07/30/02	80	ND(1)	8.0
CRA-RA-22	9/9/2015		ND(1.0)	3.6	VAS-20	07/30/02	60	ND(1)	ND(1)
CRA-RA-23D	9/11/2015		3.4	ND(1.0)	VAS-20	07/30/02	70	ND(1)	ND(1)
CRA-RA-24	9/2/2015		ND(1.0)	5.1	VAS-20	07/30/02	80	ND(1)	ND(1)
CRA-RA-25	9/2/2015		ND(1.0)	1.1	VAS-21	07/31/02	75	ND(1)	ND(1)
CRA-RA-26D	9/10/2015		ND(1.0)	ND(1.0)	VAS-21	07/31/02	85	ND(1)	1.0
CRA-RA-26S	9/10/2015		70	ND(3.3)	VAS-22	10/03/02	67	ND(1)	4.0
CRA-RA-27	9/2/2015		ND(1.0)	10	VAS-22	10/03/02	77	ND(1)	2.0
CRA-RA-28	9/3/2015		ND(1.0)[ND(1.0)	3.7/ND(1.0)	VAS-22	10/03/02	77	ND(1)	71.0
CRA-RA-29	9/9/2015		ND(1.0)	ND(1.0)	VAS-22	10/03/02	87	ND(1)	73.0
CRA-RA-2D	9/1/2015		ND(2.5)	ND(2.5)	VAS-23	10/03/02	60	ND(1)	ND(1)
CRA-RA-2S	02/22/00		ND(1)	1.6	VAS-23	10/03/02	67	ND(1)	ND(1)
CRA-RA-3	06/12/02		ND(1)	ND(1)	VAS-23	10/03/02	77	ND(1)	ND(1)
CRA-RA-30	9/9/2015		ND(1.0)	2.7	VAS-23	10/03/02	87	ND(1)	16.0
CRA-RA-31	9/10/2015		ND(1.0)	ND(1.0)	VAS-23	10/03/02	97	ND(1)	20.0
CRA-RA-32	9/9/2015		ND(1.0)	ND(1.0)	VAS-24	10/02/02	62	ND(1)	ND(1)
CRA-RA-33	9/2/2015		ND(1.0)	2.4	VAS-24	10/02/02	72	ND(1)	ND(1)
CRA-RA-34	9/1/2015		ND(1.0)	ND(1.0)	VAS-24	10/02/02	82	ND(1)	ND(1)
CRA-RA-35	9/3/2015		ND(1.0)[ND(1.0)	1.7/1.8	VAS-26	11/09/04	65	ND(1)	ND(1)
CRA-RA-36	9/1/2015		ND(1.0)	ND(1.0)	VAS-26	11/09/04	75	ND(1)	ND(1)
CRA-RA-37	9/1/2015		ND(1.0)	ND(1.0)	VAS-26	11/09/04	85	ND(1)	ND(1)
EBPZ-2	04/17/02		ND(1)	ND(1)	VAS-26	11/09/04	85	ND(1)	ND(1)
EBPZ-4	9/1/2015		ND(1.8)	ND(1.8)	VAS-26	11/09/04	95	ND(1)	ND(1)
EBPZ-6	12/15/99		2	ND(1)	VAS-27	08/09/04	44- 45.4	ND(1)	ND(1)
EW-102	04/25/96		ND(1)	ND(1)	VAS-27	08/09/04	54- 55.5	ND(1)	ND(1)
EW-103	11/11/99		ND(1)	ND(1)	VAS-27	08/09/04	64- 65.5	ND(1)	ND(1)
EW-105	11/11/99		ND(1)	ND(1)	VAS-27	08/09/04	74- 75.5	ND(1)	ND(1)
EW-106	12/15/99		2	ND(1)	VAS-27	08/09/04	84- 85.5	ND(1)	ND(1)
EW-107	11/11/99		44	ND(1)	VAS-27	08/09/04	94-95.5	ND(1)	ND(1)
FORMER					VAS-27	08/09/04	104- 105.5	ND(1)	ND(1)
RASMUSSEN	06/30/05		ND(1)	ND(1)	VAS-28	08/10/04	44- 45.4	ND(1)	ND(1)
NEWRASMUSSEN	09/19/06		ND(1)	ND(1)	VAS-28	08/10/04	54- 55.5	ND(1)	ND(1)
PZ-104	9/3/2015		ND(1.0)	ND(1.0)	VAS-28	08/10/04	64- 65.5	ND(1)	ND(1)
PZ-106	9/1/2015		ND(1.0)	ND(1.0)	VAS-28	08/10/04	74- 75.5	ND(1)	ND(1)
RA-MW-18D	05/23/02		1	ND(1)	VAS-29	08/11/04	44- 45.4	ND(1)	3.0
RA-MW-22	05/30/02		ND(1)	ND(1)	VAS-29	08/11/04	46- 45.4	ND(1)	3.0
RA-MW-26	9/15/2015		ND(1.0)	ND(1.0)	VAS-29	08/11/04	54-55.5	ND(1)	2.0
RA-MW-32	02/28/99		ND(1)	ND(1)	VAS-29	08/11/04	64-65.5	ND(1)	3.0
RA-MW-34C	02/28/99		ND(1)	ND(1)	VAS-29	08/11/04	74- 75.5	ND(1)	2.0
RA-MW-54	03/13/98		ND(1)	ND(1)	VAS-29	08/11/04	84- 85.5	ND(1)	3.0
TEMP-PZ-1	06/12/02		ND(1)	ND(1)	VAS-29	08/11/04	94- 85.5	ND(1)	3.0
TEMP-PZ-2	9/9/2015		ND(1.0)	ND(1.0)	VAS-30	08/10/04	44- 45.4	ND(1)	ND(1)
VAS-10	07/11/00	45- 46.5	ND(1)	ND(1)	VAS-30	08/10/04	44- 45.4	ND(1)	ND(1)
VAS-10	07/11/00	55- 56.5	ND(1)	ND(1)	VAS-30	08/10/04	59- 60.5	ND(1)	ND(1)
VAS-10	07/11/00	65- 66.5	ND(1)	ND(1)	VAS-30	08/10/04	69- 70.5	ND(1)	ND(1)
VAS-10	07/11/00	75- 76.5	ND(1)	ND(1)	VAS-30	08/10/04	77.5- 79	ND(1)	ND(1)
VAS-107-EAST	01/21/00	93	82	ND(1)	VAS-5	06/09/99	44.7	ND(1)	ND(1)
VAS-107-WEST	01/26/00	94.5	42	ND(1)	VAS-5	06/09/99	49.9	ND(1)	ND(1)
VAS-107-WEST	01/26/00	104.5	70	ND(1)	VAS-5	06/09/99	54.9	ND(1)	ND(1)
VAS-11	07/25/00	65	40	ND(1)	VAS-5	06/09/99	59.9	ND(1)	ND(1)
VAS-11	07/25/00	75	1	ND(1)	VAS-7	07/14/00	102	ND(1)	13.0
VAS-11	07/25/00	85	440	ND(1)	VAS-7	07/14/00	110	ND(1)	23.0
VAS-11	07/25/00	95	ND(1)	ND(1)	VAS-9	07/13/00	80- 81.5	ND(1)	ND(1)
VAS-11	07/25/00	95	ND(1)	ND(1)	VAS-9	07/13/00	80- 81.5	ND(1)	ND(1)
VAS-11	07/24/00	55	120	ND(1)	VAS-9	07/13/00	90-91.5	ND(1)	ND(1)
VAS-12	06/07/00	75	ND(1)	ND(1)	VAS-9	07/13/00	100- 101.5	ND(1)	ND(1)
VAS-12	06/07/00	85	ND(1)	2.0					

figure 3

2015 COC CONTOURS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN048)GN-WA003 SEP 30, 2016

SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC	SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC
81-4	9/7/2016		ND(1.0)	1.6	VAS-12	08/07/00	95	ND(1)	ND(1)
81-7	08/28/11		ND(1)	ND(1)	VAS-12	08/07/00	105	ND(1)	1.0
81-8	9/2/2016		ND(1.0)	ND(1.0)	VAS-12	08/07/00	115	ND(1)	ND(1)
CRA-RA-4	03/02/00		ND(1)	ND(1)	VAS-14	08/07/00	120	ND(1)	2.0
CRA-RA-5	9/6/2016		ND(1.0)	ND(1.0)	VAS-15	09/08/00	70	ND(1)	8.0
CRA-RA-6S	9/2/2016		ND(1.0)	ND(1.0)	VAS-15	09/08/00	80	ND(1)	4.0
CRA-RA-7	9/4/2016		ND(1.0)	ND(1.0)	VAS-18	07/31/02	70	ND(1)	ND(1)
CRA-RA-8	9/11/2016		ND(1.0)	ND(1.0)	VAS-18	07/31/02	90	ND(1)	ND(1)
CRA-RA-18	01/21/00		ND(1)	ND(1)	VAS-18	07/31/02	90	ND(1)	1.0
CRA-RA-18	9/4/2016		ND(2.0)	ND(2.0)	VAS-19	07/30/02	60	ND(1)	8.0
CRA-RA-19S	6/12/2016		ND(1.0)	ND(1.0)	VAS-19	07/30/02	70	ND(1)	4.0
CRA-RA-20	12/12/02		ND(1)	ND(1)	VAS-19	07/30/02	70	ND(1)	ND(1)
CRA-RA-21	03/01/00		ND(1)	ND(1)	VAS-19	07/30/02	80	ND(1)	8.0
CRA-RA-22	9/3/2016		ND(1.0)	3.3	VAS-20	07/30/02	60	ND(1)	ND(1)
CRA-RA-23D	9/7/2016		2.1	ND(1.0)	VAS-20	07/30/02	70	ND(1)	ND(1)
CRA-RA-24	9/1/2016		ND(1.0)	4.9	VAS-20	07/30/02	80	ND(1)	ND(1)
CRA-RA-25	9/1/2016		ND(1.0)	ND(1.0)	VAS-21	07/31/02	75	ND(1)	ND(1)
CRA-RA-26D	9/7/2016		ND(1.0)	ND(1.0)	VAS-21	07/31/02	85	ND(1)	1.0
CRA-RA-26S	9/7/2016		78	ND(3.3)	VAS-22	10/03/02	67	ND(1)	4.0
CRA-RA-27	9/6/2016		ND(1.0)	9.1	VAS-22	10/03/02	77	ND(1)	2.0
CRA-RA-28	9/1/2016		ND(1.0)	ND(1.0)	VAS-22	10/03/02	77	ND(1)	71.0
CRA-RA-29	9/3/2016		ND(1.0)	ND(1.0)	VAS-22	10/03/02	87	ND(1)	73.0
CRA-RA-2D	9/3/2016		ND(2.9)	ND(2.9)	VAS-23	10/03/02	60	ND(1)	ND(1)
CRA-RA-25	02/22/00		ND(1)	1.6	VAS-23	10/03/02	67	ND(1)	ND(1)
CRA-RA-3	06/12/02		ND(1)	ND(1)	VAS-23	10/03/02	77	ND(1)	ND(1)
CRA-RA-30	9/3/2016		ND(1.0)	3.3	VAS-23	10/03/02	87	ND(1)	16.0
CRA-RA-31	9/4/2016		ND(1.0)	ND(1.0)	VAS-23	10/03/02	97	ND(1)	20.0
CRA-RA-32	9/1/2016		ND(1.0)	ND(1.0)	VAS-24	10/02/02	62	ND(1)	ND(1)
CRA-RA-33	9/6/2016		ND(1.0)	2.8	VAS-24	10/02/02	72	ND(1)	ND(1)
CRA-RA-34	9/6/2016		ND(1.0)	ND(1.0)	VAS-24	10/02/02	82	ND(1)	ND(1)
CRA-RA-35	9/6/2016		ND(1.0)	1.1	VAS-26	11/09/04	65	ND(1)	ND(1)
CRA-RA-36	9/6/2016		ND(1.0)	ND(1.0)	VAS-26	11/09/04	75	ND(1)	ND(1)
CRA-RA-37	9/6/2016		ND(1.0)	ND(1.0)	VAS-26	11/09/04	85	ND(1)	ND(1)
EB-PZ-2	04/17/02		ND(1)	ND(1)	VAS-26	11/09/04	85	ND(1)	ND(1)
EB-PZ-4	9/5/2016		ND(1.0)	ND(1.0)	VAS-26	11/09/04	95	ND(1)	ND(1)
EB-PZ-6	12/15/99		2	ND(1)	VAS-27	08/09/04	44- 45.4	ND(1)	ND(1)
EW-102	04/25/96		ND(1)	ND(1)	VAS-27	08/09/04	54- 55.5	ND(1)	ND(1)
EW-103	11/11/99		ND(1)	ND(1)	VAS-27	08/09/04	64- 65.5	ND(1)	ND(1)
EW-105	11/11/99		ND(1)	ND(1)	VAS-27	08/09/04	74- 75.5	ND(1)	ND(1)
EW-106	12/15/99		2	ND(1)	VAS-27	08/09/04	84- 85.5	ND(1)	ND(1)
EW-107	11/11/99		44	ND(1)	VAS-27	08/09/04	94-95.5	ND(1)	ND(1)
FORMER					VAS-27	08/09/04	104- 105.5	ND(1)	ND(1)
RASMUSSEN	06/30/05		ND(1)	ND(1)	VAS-28	08/10/04	44- 45.4	ND(1)	ND(1)
NEWRASMUSSEN	09/19/06		ND(1)	ND(1)	VAS-28	08/10/04	54- 55.5	ND(1)	ND(1)
PZ-104	9/1/2016		ND(1.0)	ND(1.0)	VAS-28	08/10/04	64- 65.5	ND(1)	ND(1)
PZ-106	9/4/2016		ND(1.0)	ND(1.0)	VAS-28	08/10/04	74- 75.5	ND(1)	ND(1)
RA-MW-18D	05/23/02		1	ND(1)	VAS-29	08/11/04	44- 45.4	ND(1)	2.0
RA-MW-22	05/30/02		ND(1)	ND(1)	VAS-29	08/11/04	44- 45.4	ND(1)	3.0
RA-MW-28	9/5/2016		ND(1.0)	ND(1.0)	VAS-29	08/11/04	54-55.5	ND(1)	2.0
RA-MW-32	02/28/00		ND(1)	ND(1)	VAS-29	08/11/04	64- 65.5	ND(1)	3.0
RA-MW-34C	02/28/00		ND(1)	ND(1)	VAS-29	08/11/04	74- 75.5	ND(1)	2.0
RA-MW-54	03/13/98		ND(1)	ND(1)	VAS-29	08/11/04	84- 85.5	ND(1)	3.0
TEMP-PZ-1	09/12/02		ND(1)	ND(1)	VAS-29	08/11/04	84- 85.5	ND(1)	3.0
TEMP-PZ-2	9/2/2016		ND(1.0)	ND(1.0)	VAS-30	08/10/04	44- 45.4	ND(1)	ND(1)
VAS-10	07/11/00	45- 46.5	ND(1)	ND(1)	VAS-30	08/10/04	44- 45.4	ND(1)	ND(1)
VAS-10	07/11/00	55- 56.5	ND(1)	ND(1)	VAS-30	08/10/04	59- 60.5	ND(1)	ND(1)
VAS-10	07/11/00	65- 66.5	ND(1)	ND(1)	VAS-30	08/10/04	69- 70.5	ND(1)	ND(1)
VAS-10	07/11/00	75- 76.5	ND(1)	ND(1)	VAS-30	08/10/04	77.5- 79	ND(1)	ND(1)
VAS-107-EAST	01/21/00	93	62	ND(1)	VAS-5	06/09/99	44.7	ND(1)	ND(1)
VAS-107-WEST	01/26/00	94.5	42	ND(1)	VAS-5	06/09/99	49.9	ND(1)	ND(1)
VAS-107-WEST	01/26/00	104.5	70	ND(1)	VAS-5	06/09/99	54.9	ND(1)	ND(1)
VAS-11	07/25/00	65	40	ND(1)	VAS-5	06/09/99	59.9	ND(1)	ND(1)
VAS-11	07/25/00	75	1	ND(1)	VAS-7	07/14/00	102	ND(1)	13.0
VAS-11	07/25/00	85	440	ND(1)	VAS-7	07/14/00	110	ND(1)	23.0
VAS-11	07/25/00	95	ND(1)	ND(1)	VAS-9	07/13/00	80- 81.5	ND(1)	ND(1)
VAS-11	07/25/00	95	ND(1)	ND(1)	VAS-9	07/13/00	80- 81.5	ND(1)	ND(1)
VAS-11	07/24/00	55	120	ND(1)	VAS-9	07/13/00	90-91.5	ND(1)	ND(1)
VAS-12	08/07/00	75	ND(1)	ND(1)	VAS-9	07/13/00	100- 101.5	ND(1)	ND(1)
VAS-12	08/07/00	85	ND(1)	2.0					

LEGEND

- RASMUSSEN SITE BOUNDARY (APPROXIMATE)
- MONITORING WELL LOCATION
- PIEZOMETER LOCATION
- SPARGE POINT LOCATION
- COMPLETED VAS LOCATION
- EXTRACTION WELL LOCATION
- LIMIT OF 2015 VINYL CHLORIDE PLUME (2 ug/L)
- LIMIT OF 2015 TCE PLUME (5 ug/L)
- APPROXIMATE LIMIT OF PLUME
- 2015 DATA USED FOR CONTOURING
- 1999-2005 DATA USED FOR CONTOURING

figure 4

2016 COC CONTOURS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN048)GN-WA004 OCT 11, 2016

Table 1

Analytical Results - Northern Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	700	5	2	280
CRA-RA-22	GW-SR-1944	12/8/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.0	ND(1.0)
CRA-RA-22	GW-SR-1967	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	4.7	ND(1.0)
CRA-RA-22	GW-SR-1968	3/11/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	4.7	ND(1.0)
CRA-RA-22	GW-SR-1989	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.2	ND(1.0)
CRA-RA-22	GW-SR-2015	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
			Change					Up 1 µg/L							Up 0.1 µg/L	
CRA-RA-24	GW-SR-1941	12/8/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.6)	ND(1.0)	ND(1.0)	6.9	ND(1.0)
CRA-RA-24	GW-SR-1964	3/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	8.0	ND(1.0)
CRA-RA-24	GW-SR-1986	6/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-24	GW-SR-2012	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
			Change												Stable	
CRA-RA-25	GW-SR-1826	9/2/2014		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-25	GW-SR-1921	9/2/2015		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-25	GW-SR-2011	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Stable											
CRA-RA-28	GW-SR-1939	12/8/2015		ND(1.0)	2.9	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-1962	3/10/2016		ND(1.0)	2.7	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-1984	6/8/2016		ND(1.0)	3.2	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2009	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Down 0.2 µg/L											
CRA-RA-29	GW-SR-1946	12/8/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-1970	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-1991	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	12	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-2018	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change					Down 2 µg/L								
CRA-RA-30	GW-SR-1942	12/8/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.8	ND(1.0)
CRA-RA-30	GW-SR-1965	3/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.8	ND(1.0)
CRA-RA-30	GW-SR-1987	6/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
CRA-RA-30	GW-SR-2014	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
			Change												Up 0.5 µg/L	
CRA-RA-32	GW-SR-1943	12/8/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-1966	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-1988	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2013	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-34	GW-DT-006	11/25/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-DT-003	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-001	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	8/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-02	8/8/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-35	GW-DT-003	11/25/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.8	ND(1.0)
CRA-RA-35	GW-DT-004	11/25/2015	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
CRA-RA-35	GW-DT-005	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.9	ND(1.0)
CRA-RA-35	GW-DT-008	3/8/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.8	ND(1.0)
CRA-RA-35	GW-BW-04	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)
CRA-RA-35	GW-BW-04	6/6/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)
CRA-RA-35	GW-BW-05	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
			Change												Down 0.2 µg/L	
CRA-RA-36	GW-DT-002	11/25/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-DT-002	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-003	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-04	8/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-37	GW-DT-001	11/25/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-DT-001	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-02	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-03	8/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
PZ-104	GW-SR-1940	12/8/2015		ND(1.0)	3.3	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
PZ-104	GW-SR-1963	3/10/2016		ND(1.0)	3.2	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-1985	6/8/2016		ND(1.0)	2.9	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2010	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Up 0.1 µg/L											
TEMP-PZ-2	GW-SR-1945	12/8/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-1969	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-1990	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2017	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change					Down 1 µg/L								
81-8	GW-SR-1947	12/9/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-1948	12/9/2015	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-1971	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-1992	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2016	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 2

Analytical Results - PDSLD Area Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-2D	GW-SR-1938	12/8/2015		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	70	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
CRA-RA-2D	GW-SR-1961	3/10/2016		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	78	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-2D	GW-SR-1983	6/8/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	61	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
CRA-RA-2D	GW-SR-2008	9/1/2016		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	68	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
			Change							Up 7 µg/L						
CRA-RA-18	GW-SR-1954	12/11/2015		67	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
CRA-RA-18	GW-SR-1972	3/14/2016		82	ND(4.0)	ND(40)	ND(40)	ND(40)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)
CRA-RA-18	GW-SR-1997	6/10/2016		87	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
CRA-RA-18	GW-SR-2022	9/4/2016		79	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
			Change	Down 8 µg/L												
EB-PZ-4	GW-SR-1657	12/4/2012		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	39	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	4.0	ND(2.0)
EB-PZ-4	GW-SR-1729	8/27/2013		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	41	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	2.2	ND(1.4)
EB-PZ-4	GW-SR-1827	9/2/2014		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	43	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)
EB-PZ-4	GW-SR-1911	9/1/2015		ND(1.8)	ND(1.8)	ND(10)	ND(10)	ND(10)	ND(1.8)	46	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)
EB-PZ-4	GW-SR-2026	9/5/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	46	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable						
PZ-106	GW-SR-1731	8/27/2013		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1732	8/27/2013	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1828	9/2/2014		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1912	9/1/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-2023	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
RA-MW-28	GW-SR-1953	12/11/2015		8.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-1973	3/14/2016		8.2	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-1996	6/10/2016		8.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2025	9/5/2016		7.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 1.0 µg/L												

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/l

Table 3

Analytical Results - Southern Vinyl Chloride Plume
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units RDWCC(1)	µg/L 200	µg/L 70 (2)	µg/L 13,000	µg/L 1,800	µg/L 730	µg/L 5	µg/L 100	µg/L 74	µg/L 5	µg/L 790	µg/L 5	µg/L 2	µg/L 280
CRA-RA-5	GW-SR-1951	12/9/2015		19	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-1974	3/14/2016		18	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-1995	6/9/2016		23	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2027	9/6/2016		19	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 4 µg/L												
CRA-RA-6S	GW-SR-1952	12/9/2015		1.7	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-1975	3/14/2016		2.0	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-1993	6/9/2016		1.8 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J
CRA-RA-6S	GW-SR-1994	6/9/2016	*Duplicate*	1.9 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J
CRA-RA-6S	GW-SR-2028	9/6/2016		2.2	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Up 0.25 µg/L												
CRA-RA-7	GW-SR-1950	12/9/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-1979	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2000	6/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2021	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-27	GW-SR-1955	12/11/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	11	ND(1.0)
CRA-RA-27	GW-SR-1976	3/14/2016		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	10	ND(1.0)
CRA-RA-27	GW-SR-1977	3/14/2016	*Duplicate*	ND(1.0)	1.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	10	ND(1.0)
CRA-RA-27	GW-SR-2029	9/6/2016		ND(1.0)	1.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	9.1	ND(1.0)
			Change		Up 0.5 µg/L										Down 0.9 µg/L	
CRA-RA-31	GW-SR-1949	12/9/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-1978	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-1999	6/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2019	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2020	9/4/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-33	GW-DT-004	9/2/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	2.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.4	ND(1.0)
CRA-RA-33	GW-DT-006	11/25/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.8	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
CRA-RA-33	GW-DT-004	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.1	ND(1.0)
CRA-RA-33	GW-BW-06	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.5	ND(1.0)
CRA-RA-33	GW-BW-06	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
									Down 0.1 µg/L						Up 1.3 µg/L	
81-4	GW-SR-1959	12/14/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.3	ND(1.0)
81-4	GW-SR-1960	12/14/2015	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.2	ND(1.0)
81-4	GW-SR-1983	3/16/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.8	ND(1.0)
81-4	GW-SR-1998	6/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.5	ND(1.0)
81-4	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
81-4	GW-SR-2034	9/7/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
			Change												Up 0.1 µg/L	

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 4

Analytical Results - Southern TCE Plume
Rasmussen Landfill Site
Livingston County, Michigan

				Volatile Organics												
			Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Location	**Sample ID**	**Date Sampled**	RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-23D	GW-SR-1838	9/11/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.4	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-1861	12/14/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-1982	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.6	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2007	6/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.2	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2032	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.1	ND(1.0)	ND(1.0)
			Change											Down 0.1 µg/L		
CRA-RA-26D	GW-SR-1957	12/14/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-1981	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2006	6/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-26S	GW-SR-1956	12/14/2015		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	78	ND(2.5)	ND(2.5)
CRA-RA-26S	GW-SR-1980	3/15/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	81	ND(2.5)	ND(2.5)
CRA-RA-26S	GW-SR-2005	6/13/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	80	ND(2.5)	ND(2.5)
CRA-RA-26S	GW-SR-2030	9/7/2016		ND(2.5)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	78	ND(3.3)	ND(3.3)
			Change											Down 2 µg/L		

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 5

Bezene Concentration vs. Time Trend Tests Results
for Current Monitoring Data (Last 8 Data Points)
Rasmussen Landfill Site
Livingston County, Michigan

	Benzene					
			Mann-Kendall Trend test			
Well	Number of Samples	Percent Non-Detect	Statistic	Probability	2016 Conclusion	2015 Concusion
81-4	8	100%	–	–	No detected results	No detected results
81-8	8	100%	–	–	No detected results	No detected results
CRA-RA-2D	8	100%	–	–	No detected results	No detected results
CRA-RA-5	8	100%	–	–	No detected results	No detected results
CRA-RA-6S	8	100%	–	–	No detected results	No detected results
CRA-RA-7	8	100%	–	–	No detected results	No detected results
CRA-RA-8	8	100%	–	–	No detected results	No detected results
CRA-RA-18	8	100%	–	–	No detected results	No detected results
CRA-RA-19S	8	100%	–	–	No detected results	No detected results
CRA-RA-22	8	100%	–	–	No detected results	No detected results
CRA-RA-23D	8	100%	–	–	No detected results	No detected results
CRA-RA-24	8	100%	–	–	No detected results	No detected results
CRA-RA-25	8	88%	–	–	Over 50% non-detects	Over 50% non-detects
CRA-RA-26D	8	100%	–	–	No detected results	No detected results
CRA-RA-26S	8	100%	–	–	No detected results	No detected results
CRA-RA-27	8	100%	–	–	No detected results	No detected results
CRA-RA-28	8	100%	–	–	No detected results	No detected results
CRA-RA-29	8	100%	–	–	No detected results	No detected results
CRA-RA-30	8	100%	–	–	No detected results	No detected results
CRA-RA-31	8	100%	–	–	No detected results	No detected results
CRA-RA-32	8	100%	–	–	No detected results	No detected results
CRA-RA-33	4	0%	-6	0.084	**Decreasing Trend**	Insufficient data
CRA-RA-34	4	100%	–	–	No detected results	Insufficient data
CRA-RA-35	5	100%	–	–	No detected results	Insufficient data
CRA-RA-36	4	100%	–	–	No detected results	Insufficient data
CRA-RA-37	4	100%	–	–	No detected results	Insufficient data
EB-PZ-4	8	100%	–	–	No detected results	No detected results
PZ-104	8	100%	–	–	No detected results	No detected results
PZ-106	8	100%	–	–	No detected results	No detected results
RA-MW-28	8	100%	–	–	No detected results	No detected results
RA-MW-47	8	100%	–	–	No detected results	No detected results
Stanley Rasmusser	8	100%	–	–	No detected results	No detected results
TEMP-PZ-2	8	100%	–	–	No detected results	No detected results

Notes:

Mann-Kendall Test Statistic: sum of the signs of all possible pair-wise data comparisons.
Probability of Significance: for 95 percent confidence, a P-value equal to or below 0.05 is required.
A 90 percent confidence was used for datasets with 4 observations. A P-value equal to or below 0.1 is required.

Table 6

Trichloroethene Concentration vs. Time Trend Tests Results
for Current Monitoring Data (Last 8 Data Points)
Rasmussen Landfill Site
Livingston County, Michigan

			Trichloroethene			
			Mann-Kendall Trend test			
Well	Number of Samples	Percent Non-Detect	Statistic	Probability	2016 Conclusion	2015 Concusion
81-4	8	100%	--	--	No detected results	No detected results
81-8	8	100%	--	--	No detected results	No detected results
CRA-RA-2D	8	100%	--		No detected results	No detected results
CRA-RA-5	8	100%	--	--	No detected results	No detected results
CRA-RA-6S	8	100%	--	--	No detected results	No detected results
CRA-RA-7	8	100%	--	--	No detected results	No detected results
CRA-RA-8	8	100%	--	--	No detected results	No detected results
CRA-RA-18	8	100%	--	--	No detected results	No detected results
CRA-RA-19S	8	100%	--	--	No detected results	No detected results
CRA-RA-22	8	100%	--	--	No detected results	No detected results
CRA-RA-23D	8	0%	-19	0.025	**Decreasing Trend**	No trend identified
CRA-RA-24	8	100%	--	--	No detected results	No detected results
CRA-RA-25	8	100%	--	--	No detected results	No detected results
CRA-RA-26D	8	100%	--	--	No detected results	No detected results
CRA-RA-26S	8	0%	-14	0.108	No trend identified	No trend identified
CRA-RA-27	8	100%	--	--	No detected results	No detected results
CRA-RA-28	8	100%	--	--	No detected results	No detected results
CRA-RA-29	8	100%	--	--	No detected results	No detected results
CRA-RA-30	8	100%	--	--	No detected results	No detected results
CRA-RA-31	8	100%	--	--	No detected results	No detected results
CRA-RA-32	8	100%	--	--	No detected results	No detected results
CRA-RA-33	5	100%	--	--	No detected results	Insufficient data
CRA-RA-34	5	100%	--	--	No detected results	Insufficient data
CRA-RA-35	6	100%	--	--	No detected results	Insufficient data
CRA-RA-36	5	100%	--	--	No detected results	Insufficient data
CRA-RA-37	5	100%	--	--	No detected results	Insufficient data
EB-PZ-4	8	100%	--	--	No detected results	No detected results
PZ-104	8	100%	--	--	No detected results	No detected results
PZ-106	8	100%	--	--	No detected results	No detected results
RA-MW-28	8	100%	--	--	No detected results	No detected results
RA-MW-47	8	100%	--	--	No detected results	No detected results
Stanley Rasmusser	8	100%	--	--	No detected results	No detected results
TEMP-PZ-2	8	100%	--	--	No detected results	No detected results

Notes:
Mann-Kendall Test Statistic: sum of the signs of all possible pair-wise data comparisons.
Probability of Significance: for 95 percent confidence, a P-value equal to or below 0.05 is required.

Table 7

Vinyl Chloride Concentration vs. Time Trend Tests Results
for Current Monitoring Data (Last 8 Data Points)
Rasmussen Landfill Site
Livingston County, Michigan

			Vinyl Chloride			
			Mann-Kendall Trend test			
Well	Number of Samples	Percent Non-Detect	Statistic	Probability	2016 Conclusion	2015 Concusion
81-4	8	0%	-7	0.451	No trend identified	No trend identified
81-8	8	100%	--	--	No detected results	No detected results
CRA-RA-2D	8	100%	--	--	No detected results	No detected results
CRA-RA-5	8	100%	--	--	No detected results	No detected results
CRA-RA-6S	8	100%	--	--	No detected results	No detected results
CRA-RA-7	8	100%	--	--	No detected results	No detected results
CRA-RA-8	8	100%	--	--	No detected results	No detected results
CRA-RA-18	8	100%	--	--	No detected results	No detected results
CRA-RA-19S	8	100%	--	--	No detected results	No detected results
CRA-RA-22	8	0%	-11	0.212	No trend identified	**Decreasing Trend**
CRA-RA-23D	8	100%	--	--	No detected results	No detected results
CRA-RA-24	8	0%	-14	0.102	No trend identified	No trend identified
CRA-RA-25	8	75%	--	--	Over 50% non-detects	Over 50% non-detects
CRA-RA-26D	8	100%	--	--	No detected results	No detected results
CRA-RA-26S	8	100%	--	--	No detected results	No detected results
CRA-RA-27	8	0%	-2	0.902	No trend identified	No trend identified
CRA-RA-28	8	88%	--	--	Over 50% non-detects	Over 50% non-detects
CRA-RA-29	8	100%	--	--	No detected results	No detected results
CRA-RA-30	8	0%	-6	0.530	No trend identified	**Decreasing Trend**
CRA-RA-31	8	100%	--	--	No detected results	No detected results
CRA-RA-32	8	100%	--	--	No detected results	No detected results
CRA-RA-33	5	0%	0	1.000	No trend identified	Insufficient data
CRA-RA-34	5	100%	--	--	No detected results	Insufficient data
CRA-RA-35	6	0%	-12	0.035	**Decreasing Trend**	Insufficient data
CRA-RA-36	5	100%	--	--	No detected results	Insufficient data
CRA-RA-37	5	100%	--	--	No detected results	Insufficient data
EB-PZ-4	8	63%	--	--	Over 50% non-detects	Over 50% non-detects
PZ-104	8	88%	--	--	Over 50% non-detects	Over 50% non-detects
PZ-106	8	100%	--	--	No detected results	No detected results
RA-MW-28	8	100%	--	--	No detected results	No detected results
RA-MW-47	8	100%	--	--	No detected results	No detected results
Stanley Rasmusser	8	100%	--	--	No detected results	No detected results
TEMP-PZ-2	8	100%	--	--	No detected results	No detected results

Notes:

Mann-Kendall Test Statistic: sum of the signs of all possible pair-wise data comparisons.
Probability of Significance: for 95 percent confidence, a P-value equal to or below 0.05 is required.

Table 8

2016 Groundwater Sampling Program
Rasmussen Landfill Site
Livingston County, Michigan

Quarterly Sampling - VOCs	Annual Landfill Monitoring Program - VOCs, SVOCs & Metals	Additional Annual Samples - VOCs
	(2nd Quarter)	*(3rd Quarter)*
81-4	CRA-RA-6S (included in quarterly sampling)	CRA-RA-25
81-8	CRA-RA-8	EB-PZ-4
CRA-RA-2D	CRA-RA-18 (included in quarterly sampling)	PZ-106
CRA-RA-5	CRA-RA-19S	RA-MW-47
CRA-RA-6S	CRA-RA-20	Rasmussen Water Supply Well
CRA-RA-7		
CRA-RA-18		
CRA-RA-22		
CRA-RA-23D		
CRA-RA-24		
CRA-RA-26D		
CRA-RA-26S		
CRA-RA-27		
CRA-RA-28		
CRA-RA-29		
CRA-RA-30		
CRA-RA-31		
CRA-RA-32		
CRA-RA-33		
CRA-RA-34		
CRA-RA-35		
CRA-RA-36		
CRA-RA-37		
PZ-104		
RA-MW-28		
TEMP-PZ-2		

SPARGE WELL PRESSURE READINGS
RASMUSSEN SITE
CRA PROJECT #32504

DATE:	JULY 22ND & 28TH, 2016		DATE:	AUG. 25, 26 & 31		DATE:	SEPT. 19, 20, 23 & 27	
WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL
SW-1	0.7	8	SW-1	0.8	9	SW-1	0.7	9
SW-2	0.8	8	SW-2	0.8	8	SW-2	0.8	9
SW-3	0.8	15	SW-3	0.7	14	SW-3	0.7	15
SW-4	0.8	14	SW-4	0.8	14	SW-4	0.8	15
SW-5	0.7	14	SW-5	0.8	14	SW-5	0.8	14
SW-6	0.7	15	SW-6	0.7	15	SW-6	0.8	15
SW-7	0.8	15	SW-7	0.7	15	SW-7	0.8	15
SW-8	–	–	SW-8	–	–	SW-8	–	–
SW-9	–	–	SW-9	–	–	SW-9	–	–
SW-10	–	–	SW-10	–	–	SW-10	–	–
SW-11	–	–	SW-11	–	–	SW-11	–	–
SW-12	0.7	15	SW-12	0.8	15	SW-12	0.8	15
SW-13	0.8	2	SW-13	0.7	2	SW-13	0.8	2
SW-14	–	–	SW-14	–	–	SW-14	–	–
SW-15	–	–	SW-15	–	–	SW-15	–	–
SW-16	–	–	SW-16	–	–	SW-16	–	–
SW-17	0.7	18	SW-17	0.8	18	SW-17	0.8	18
SW-18	0.7	18	SW-18	0.8	18	SW-18	0.8	19
SW-19	0.8	18	SW-19	0.7	19	SW-19	0.8	19
SW-20	0.7	19	SW-20	0.8	18	SW-20	0.8	18
SW-21	–	–	SW-21	–	–	SW-21	–	–
SW-22	0.8	14	SW-22	0.7	15	SW-22	0.8	13
SW-23	0.8	14	SW-23	0.8	14	SW-23	0.8	15
SW-24	0.7	15	SW-24	0.8	16	SW-24	0.8	16
SW-25	0.7	15	SW-25	0.8	16	SW-25	0.7	15
SW-26	0.8	5	SW-26	0.8	6	SW-26	0.7	5
SW-27	0.7	7	SW-27	0.8	8	SW-27	0.8	7
SW-28	0.8	6	SW-28	0.7	6	SW-28	0.8	6
SW-29	0.8	7	SW-29	0.8	8	SW-29	0.7	7
SW-30	–	–	SW-30	–	–	SW-30	–	–

Rasmussen 32504

Ozone Sparge System Inspection

DATE	July 8, 2016	July 15, 2016	July 22, 2016	July 28, 2016	Aug. 2, 2016
OPERATOR SIGNATURE	A. Rapai	A. Rapai	A. Rapai	A. Rapai	A. Rapai

Air Compressor					
Output Pressure psi	110	110	110	110	110
Temperature F	–	–	–	–	–
Run Time hours	109247.0	109414	109581	109726	109846

Air Sep					
Receiver Pressure psi	54	52	52	55	55
Feed Air Pressure psi	110	110	110	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	109247.0	109413.7	109581.1	109725.6	109846.2

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	34	36	35	37	35
Regulator #2 psi	24	25	21	22	21
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	3	3	1	1	2
Zone Time hours	2	2	1/2	1/2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments: Compressor P.M. on Aug. 2nd - Changed Oil, Separator & All Filters.
Ingersoll Rand on site to Diagnose Compressor Oil Loss on Sept. 27.

Rasmussen 32504

Ozone Sparge System Inspection

DATE	Aug. 12, 2016	Aug. 16, 2016	Aug. 25, 2016	Sept. 2, 2016	Sept. 8, 2016
OPERATOR SIGNATURE	J. York	L Rapai	L Rapai	L Rapai	L. Rapai

Air Compressor					
Output Pressure psi	110	110	110	110	110
Temperature F	–	–	–	–	
Run Time hours			110393	110570	110711

Air Sep					
Receiver Pressure psi	55	56	58	54	58
Feed Air Pressure psi	110	110	110	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours			110393.3	110569.6	110711.5

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	34	35	38	37
Regulator #2 psi	22	22	22	22	22
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	1	2	2	1	1
Zone Time hours	1/2	1/2	1/2	1/2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments: Aug. 25, Found Problem with Airsep - Repaired Broken Wire Controling Solenoid Valves.
Ingersoll Rand on site Sept 2nd to Replace All Hoses on Compressor.

Rasmussen 32504

Ozone Sparge System Inspection

DATE	SEPT. 14, 2016	SEPT. 23, 2016	SEPT. 30, 2016		
OPERATOR SIGNATURE	L. Rapai	L. Rapai	L. Rapai		

Air Compressor					
Output Pressure psi	110	110	110		
Temperature F					
Run Time hours	110841	111059	111228		

Air Sep					
Receiver Pressure psi	58	58	58		
Feed Air Pressure psi	110	110	110		
Cycle Pressure psi	70	70	70		
Holding Tank Pressure psi	42	42	42		
Run Time hours	110841.4	111059.2	111227.7		

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN		

Ozone Generator					
Oxygen Supply, LPM	7	7	7		
% O3 capacity	45	45	45		
Regulator #1 psi	36	35	40		
Regulator #2 psi	24	22	25		
Alarm Reading ppm, O3	—	—	—		
Zone On	1	3	3		
Zone Time hours	1/2	2	2		

Distribution Panel					
CFM	0.8	0.8	0.8		
O3 Feed Conc. Ppm O3					

Comments:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPPAI **Signature:** Steve Rappai

Date: FRIDAY, JULY 8, 2016
Time: 3:00 PM

Weather Conditions: CLEAR 90°, CHANCE OF SEVERE STORMS

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: STRESSED - HEAT & NO RAIN.

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: THURSDAY, JULY 28, 2016
Time: 11:30 AM

Weather Conditions: CLEAR, HUMID 81°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: STRESSED BY HEAT & LACK OF RAIN

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: AUG. 2, 2016
Time: 10:00

Weather Conditions: 75° CLEAR

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: STRESSED - VERY DRY

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: AUG. 25, 2016
Time: 12:30 PM

Weather Conditions: CLOUDY 75°, HUMID

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: GOOD

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: TUESDAY, SEPT. 6, 2016
Time: 2:00PM

Weather Conditions: HAZY SUN, 92°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: GOOD

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: SEPTEMBER 27, 2016
Time: 11:00 AM

Weather Conditions: CLEAR 65°

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: GOOD

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

9/1/2016 32504-25

TASK: QUARTERLY WATER LEVELS

GHD: STEVE RAPAI

WEATHER: PARTLY CLOUDY, HIGH 75°

H&S: LEVEL D

WELL ID	LEVEL
81-4	30.67
81-5	35.19
81-7	48.75
81-8	44.44
81-9	16.79
81-10	33.29
RA-1	69.95
RA-2D	56.80
RA-2S	56.53
RA-3	53.67
RA-5	55.77
RA-6S	60.22
RA-7	33.30
RA-8	17.38
RA-16	59.20
RA-18	42.51
RA-18D	57.07
RA-19D	51.05
RA-19S	48.45

32504-25 9/1/2016

WELL ID	LEVEL
RA-20	58.45
RA-22	54.79
RA-23D	33.53
RA-23S	33.82
RA-24	57.68
RA-25	55.08
RA-26D	50.87
RA-26S	50.76
RA-27	62.54
RA-28	55.37
RA-29	46.90
RA-30	59.27
RA-31	33.09
RA-32	35.85
RA-33	33.25
RA-34	42.68
RA-35	32.88
RA-36	37.25
RA-37	37.02
MW-22	43.07
MW-28	43.43
MW-32	58.06
MW-34C	42.58
MW-35	24.65

32504-25 9/1/2016

WELL ID	LEVEL
MW-41	48.04
MW-42	64.18
MW-47	54.27
MW-54	56.75
MW-55	37.54
MW-56	34.55
MW-58	21.99
EB-PZ-2	41.13
EB-PZ-4	54.28
EB-PZ-5	66.01
EB-PZ-6	55.72
PZ-103	57.86
PZ-104	55.89
PZ-105	52.64
PZ-106	40.12
TEMP-PZ-2	54.70

32504 9/1/2016

TASK: BEGIN 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: PARTLY CLOUDY 65°, HIGH 75°

H&S: LEVEL D

CALIBRATION OF FLOW CELL NF 7716 (IN-SITU): pH=4.00, COND.=4.49, D.O.=7.52, TEMP=25.91°C. CAL OF TURB METER=0.0

SAMPLE OF CRA-RA-2D

TIME	pH	COND.	TURB.	D.O.	TEMP.
1015	7.07	1.79	21	3.17	13.56
1030	6.13	1.78	7	0.26	12.69
1035	6.66	1.75	1.97	0.07	12.08
1040	6.75	1.76	1.91	0.05	12.05
1045	6.83	1.75	1.55	0.04	11.94
1050	6.88	1.76	1.36	0.04	11.94
1055	6.89	1.75	1.34	0.04	11.94
1100	6.89	1.75	1.31	0.04	11.94

SAMPLED @ 1101 ID: GW-32504-090116-SR-2008

SAMPLE OF CRA-RA-2B

1110	6.97	0.84	2.85	0.29	12.08
1125	6.95	0.85		0.04	11.82
1130	6.96	0.87	1.33	0.04	11.89

CONTINUED ON NEXT PAGE

9/1/16 32504

SAMPLE OF CRA-RA-28 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1135	6.96	0.86	1.33	0.04	11.89
1140	6.97	0.86	1.29	0.04	11.90
1145	6.97	0.87	1.37	0.04	11.90
1150	6.97	0.87	1.35	0.04	11.90

SAMPLED @ 1151 ID: GW-32504-090116-SR-2009

SAMPLE OF PZ-104

1210	7.45	1.24	3.11	2.12	12.54
1230	7.03	1.29	2.76	0.11	11.95
1235	7.01	1.30	2.30	0.10	11.94
1240	6.99	1.31	2.21	0.09	11.89
1245	6.99	1.32	2.07	0.09	11.85
1250	6.98	1.32	1.99	0.08	11.84
1255	6.98	1.32	1.96	0.08	11.84

SAMPLED @ 1256 ID: GW-32504-090116-SR-2010

SAMPLE OF CRA-RA-25

1315	7.25	0.69	7.04	0.83	12.63
1330	7.04	0.84	2.79	0.21	12.13
1335	7.02	0.85	2.65	0.27	12.50
1340	7.03	0.85	2.41	0.24	12.71
1345	7.02	0.86	2.34	0.23	12.72
1350	7.02	0.86	2.33	0.24	12.72

SAMPLED @ 1351 ID: GW-32504-090116-SR-2011

32504-25 9/1/2016

SAMPLE OF CRA-RA-24

TIME	pH	COND.	TURB.	D.O.	TEMP.
1405	7.03	1.02	2.28	0.17	12.03
1420	6.97	1.03	1.09	0.04	12.06
1430	6.97	1.03	0.53	0.03	11.84
1435	6.97	1.03	0.49	0.03	11.85
1440	6.97	1.03	0.45	0.03	11.85

SAMPLED @ 1441 ID: GW-32504-090116-SR-2012

SAMPLE OF CRA-RA-32

1455	7.12	0.87	7.91	0.08	12.03
1510	7.05	0.89	0.92	0.03	11.59
1515	7.05	0.89	0.87	0.03	11.50
1520	7.05	0.89	0.72	0.03	11.47
1525	7.05	0.88	0.66	0.03	11.50
1530	7.05	0.89	0.62	0.03	11.51
1535	7.05	0.89	0.60	0.03	11.51

SAMPLED @ 1536 ID: GW-32504-090116-SR-2013

SAMPLES PACKED IN COOLER WITH ICE.

9/2/2016 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: SUN 64°, HIGH 75

H&S: LEVEL D

CALIBRATION OF IN-STU FLOW CELL NF07716: pH=4.00, COND.=4.49, D.O.=7.44, TEMP.=22.31. CALIBRATE TURB. METER DEE06911: TURB.=0.0

SAMPLE OF CRA-RA-30

HAD TO CLEANOUT WELL - ANTS NEST. PURGED WELL FOR A WHILE TO CLEAN DIRT & DEBRIS FROM AIR & WATER LINES.

TIME	pH	COND.	TURB.	D.O.	TEMP.
0930	6.47	1.05	27.2	0.03	11.78
0950	6.79	1.06	4.41	0.03	11.72
0955	6.84	1.06	3.85	0.03	11.67
1000	6.88	1.06	2.05	0.03	11.66
1005	6.90	1.06	1.97	0.03	11.66
1010	6.92	1.06	1.61	0.03	11.66
1015	6.94	1.06	1.47	0.03	11.67
1020	6.94	1.06	1.32	0.03	11.68
1025	6.94	1.06	1.29	0.03	11.68

SAMPLED @ 1026 ID: GW-32504-090216-SR-2014

32504-25 9/2/2016

SAMPLE OF CRA-RA-22

TIME	pH	COND.	TURB.	D.O.	TEMP.
1035	6.95	1.15	4.17	0.22	11.89
1055	6.90	1.12	2.21	0.56	11.89
1100	6.91	1.12	2.30	0.44	11.94
1105	6.91	1.12	2.09	0.42	11.94
1110	6.91	1.12	1.99	0.42	11.94

SAMPLED @ 1111 ID: GW-32504-090216-SR-2015

SAMPLE OF 81-8

1125	7.21	0.66	7.12	17.54	12.24
1145	7.36	0.60	2.17	37.00	11.97
1150	7.38	0.60	1.55	34.25	12.01
1155	7.39	0.59	0.92	39.47	12.09
1200	7.40	0.59	0.87	35.84	12.10
1205	7.40	0.59	0.85	39.19	12.10

SAMPLED @ 1206 ID: GW-32504-090216-SR-2016

SAMPLE OF TEMP-PZ-2

1215	7.08	1.80	1.74	0.81	1235
1235	6.98	1.98	1.23	0.28	1249
1240	6.97	2.02	1.57	0.23	12.44
1245	6.97	2.03	2.13	0.19	12.37
1250	6.96	2.04	1.89	0.17	12.23

SAMPLE OF TEMP-PZ-2 CONTINUED ON NEXT PAGE.

9/2/2016 32504.25

SAMPLE OF TEMP.PZ.2 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1255	6.96	2.04	1.76	0.16	12.28
1300	6.96	2.04	1.62	0.14	12.29
1305	6.96	2.04	1.54	0.15	12.29

SAMPLED @ 1306 ID:GW.32504.090216.SR.2017

SAMPLE OF CRA.RA.29

1315	7.12	1.13	1.37	6.68	17.30
1335	7.03	1.01	0.88	10.71	15.66
1340	7.03	1.02	0.83	10.67	15.71
1345	7.03	1.02	0.71	10.65	15.58
1350	7.02	1.02	0.69	10.64	15.62
1355	7.02	1.02	0.67	10.64	15.60

SAMPLED @ 1356 ID:GW.32504.090216.SR.2018

SAMPLES PACKED IN COOLER WITH ICE FOR DROP OFF @ TEST AMERICA, BRIGHTON, MICHIGAN.

32504.25 9/4/2016

TASK: CONTINUE 1/4LY SAMPLE EVENT

GW: STEVE RAPAI

WEATHER: SUN 62°, HIGH 80

H&S: LEVEL D

CALIBRATION OF IN-SITU FLOW CELL NF07716: pH=4.00, COND.=4.49, D.O.=7.19, TEMP=22.04. CALIBRATION OF TURB. METER DEE 06911: TURB=0.0NTU

SAMPLE OF CRA.RA.31

TIME	pH	COND.	TURB.	D.O.	TEMP.
1000	6.41	1.01	1.86	3.23	12.27
1020	6.62	0.58	0.94	0.21	11.30
1025	6.74	0.58	0.89	0.21	11.34
1030	6.85	0.58	0.37	0.21	11.30
1035	6.95	0.58	0.31	0.22	11.35
1040	7.00	0.58	0.30	0.22	11.37
1045	7.04	0.58	0.31	0.22	11.39
1050	7.05	0.58	0.31	0.23	11.38
1055	7.05	0.58	0.29	0.23	1139

SAMPLED @ 1056 ID:GW.32504.090416.SR.2019

SAMPLED @ 1100 ID:GW.32504.090416.SR.2020

9/4/2016 32504-25

SAMPLE OF CRA-RA-7

TIME	pH	COND.	TURB.	D.O.	TEMP.
1110	7.28	0.37	2.87	4.92	11.17
1120	7.35	0.37	1.41	5.47	11.03
1130	7.44	0.37	0.97	5.64	10.97
1135	7.45	0.37	0.88	5.65	10.96
1140	7.46	0.37	0.82	5.65	10.96
1145	7.46	0.37	0.77	5.66	10.96

SAMPLED @ 1146 ID: GW-32504-090416-SR-2021

SAMPLE OF CRA-RA-18

1155	6.98	1.71	1.87	6.65	12.13
1215	6.83	1.71	0.56	6.17	12.08
1220	6.83	1.71	0.48	6.17	11.75
1225	6.82	1.72	0.44	6.17	12.07
1230	6.82	1.72	0.39	6.12	12.19
1235	6.82	1.71	0.35	6.13	12.20
1240	6.82	1.71	0.33	6.13	12.19

SAMPLED @ 1241 ID: GW-32504-090416-SR-2022

SAMPLE OF PZ-106

1255	6.95	1.28	147	0.05	12.82

ALLOWED WELL TO PURGE BECAUSE OF HIGH TURB.

1225	6.84	1.20	7.94	0.92	12.31

CONTINUED ON NEXT PAGE

32504-25 9/4/2016

SAMPLE OF PZ-106

TIME	pH	COND.	TURB.	D.O.	TEMP.
1335	6.82	1.24	5.48	0.66	12.03
1345	6.81	1.26	5.42	0.39	12.37
1355	6.81	1.28	4.85	0.04	12.41
1400	6.81	1.28	4.79	0.03	12.42
1405	6.81	1.28	4.71	0.03	12.42

SAMPLED @ 1406 ID: GW-32504-090416-SR-2023

9/5/2016 32504.25

TASK: CONTINUE 1/4LY SAMPLE

GHD: STEVE RAPAI

WEATHER: SUN 62°, HIGH 85°

H&S: LEVEL D

CALIBRATION OF IN-SITU FLOW CELL NF07716: pH=4.00, COND.=4.49, D.O.=7.49, TEMP=23.01. CALIBRATION OF TURB METER DEE 06911: TURB=0.0 NTU

SAMPLE OF RA-MW-47

TIME	pH	COND.	TURB.	D.O.	TEMP.
1045	7.57	0.77	13.1	0.20	12.45
1105	7.47	0.80	8.29	0.10	12.20
1115	7.45	0.52	1.65	0.19	12.38
1120	7.49	0.82	1.24	0.11	12.40
1125	7.52	0.80	0.99	0.12	12.49
1135	7.51	0.82	0.70	0.11	12.40
1140	7.51	0.82	0.61	0.11	12.40

SAMPLED @ 1141 ID: GW-32504-090516-SR-2024

SAMPLE OF RA-MW-28

1155	7.44	0.78	2.68	2.13	12.31
1215	7.14	0.79	1.01	3.25	12.03
1220	7.11	0.79	0.75	3.31	12.03

CONTINUED ON NEXT PAGE

32504.25 9/5/2016

SAMPLE OF RA-MW-28 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1225	7.10	0.79	0.81	3.35	12.00
1230	7.08	0.79	0.74	3.37	12.03
1235	7.08	0.79	0.72	3.39	12.03
1240	7.08	0.79	0.68	3.39	12.03

SAMPLED @ 1241 ID: GW-32504-090516-SR-2025

SAMPLE OF EB-PZ-4

1250	7.30	0.75	63.7	0.70	13.10
1310	7.31	0.75	7.93	3.27	12.79
1315	7.31	0.75	5.44	3.38	12.90
1320	7.31	0.75	4.25	3.40	12.95
1325	7.31	0.75	3.91	3.41	12.90
1330	7.31	0.75	3.62	3.40	12.90

SAMPLE OF 1331 ID: GW-32504-090516-SR-2026

SAMPLES PACKED IN COOLER WITH ICE.

9/06/2016 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: SUN 70°, HIGH 94°

H&S: LEVEL D

CALIBRATION OF IN-SITU FLOW CELL NF07716: pH=4.00, COND.=4.49, D.O.=7.92 TEMP=24.24. CALIBRATION OF TURB METER DEE 06911 = 0.0 NTU

SAMPLE OF CRA-RA-5

TIME	pH	COND.	TURB.	D.O.	TEMP.
1255	7.60	1.25	1.62	0.30	12.80
1315	7.03	1.21	0.43	0.08	12.86
1320	6.99	1.21	0.39	0.23	12.35
1325	6.96	1.21	0.34	0.30	12.86
1330	6.94	1.21	0.31	0.39	12.87
1335	6.94	1.21	0.31	0.38	12.87
1340	6.94	1.21	0.29	0.38	12.86

SAMPLED @ 1341 ID: GW-32504-090616-SR-2027

SAMPLE OF CRA-RA-6S

1350	6.96	1.11	2.18	1.22	14.75
1410	6.78	1.11	0.72	0.46	14.54
1415	6.78	1.10	0.67	0.45	14.26

SAMPLE INFO CONTINUED ON NEXT PAGE

32504-25 9/6/2016

SAMPLE OF CRA-RA-6S (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1420	6.78	1.11	0.42	0.44	14.36
1425	6.77	1.10	0.42	0.44	14.36
1430	6.77	1.10	0.40	0.44	14.35

SAMPLED @ 1431 ID: GW-32504-090616-SR-2028

SAMPLE OF CRA-RA-27

1445	7.02	1.75	11.8	0.37	12.83
1505	6.82	1.80	2.77	0.12	12.31
1510	6.81	1.80	2.51	0.10	12.26
1515	6.81	1.81	1.99	0.10	12.31
1520	6.81	1.80	1.75	0.09	12.30
1525	6.81	1.80	1.62	0.09	12.31

SAMPLED @ 1526 ID: GW-32504-090616-SR-2029

SAMPLES PACKED IN COOLER WITH ICE FOR GHD DROP OFF @ TEST AMERICA, BRIGHTON, MICHIGAN.

9/7/2016 32504-25

TASK: COLLECTION OF 1/4LY SAMPLES

GHD: STEVE RAPAI

WEATHER: 74° SUN, HIGH 92°, HEAT ADVISORY

H&S: LEVEL D

CALIBRATION OF IN-SITU FLOWCELL NF07716: pH=4.00, COND.=4.49, D.O.=8.05, TEMP=24.2°C. CALIBRATION OF TURB. METER DEE06911: TURB.=0.0 NTU

SAMPLE OF CRA-RA-26S

TIME	pH	COND.	TURB.	D.O.	TEMP
1005	7.63	1.25	1.27	5.42	12.58
1025	6.93	1.29	0.70	5.39	12.12
1030	6.87	1.30	0.60	7.78	12.17
1035	6.87	1.30	0.54	5.27	12.08
1040	6.85	1.31	0.39	5.23	11.98
1045	6.84	1.32	0.33	5.24	12.01
1050	6.83	1.32	0.29	5.23	12.02
1055	6.83	1.32	0.29	5.24	12.01

SAMPLED @ 1056 ID: GW-32504-090716-SR-2030

SAMPLE OF CRA-RA-26D

1100	6.86	1.63	13.4	0.62	12.08
1120	6.84	1.61	2.22	0.31	11.94

CONTINUED ON NEXT PAGE

32504-25 9/7/2016

SAMPLE OF CRA-RA-26D (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1125	6.84	1.65	1.87	0.38	11.89
1130	6.84	1.65	1.62	0.21	11.92
1135	6.84	1.64	1.39	0.08	11.95
1140	6.84	1.65	0.94	0.04	11.89
1145	6.84	1.64	0.82	0.04	11.90
1150	6.84	1.64	0.79	0.04	11.90

SAMPLED @ 1151 ID: GW-32504-090716-SR-2031

SAMPLE OF CRA-RA-23D

BEGAN TO PURGE WELL @ 1215 BUT FLOW CELL IS NOT FUNCTIONING.

1245	7.12	0.72	0.83	1.73	11.18
1250	7.12	0.71	0.75	2.93	11.22
1255	7.12	0.72	0.60	2.93	11.23
1300	7.12	0.72	0.56	2.94	11.23

SAMPLED @ 1301 ID: GW-32504-090716-SR-2032

SAMPLE OF 81-4

1335	7.28	1.35	7.62	0.09	13.08
1355	6.91	1.27	3.44	4.26	12.03
1400	6.87	1.22	2.95	6.96	12.08
1405	6.86	1.20	2.71	6.98	12.07

CONTINUED ON NEXT PAGE

9/7/2016 32504-25

SAMPLE OF 81-4 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1410	6.85	1.15	2.21	7.45	12.03
1415	6.85	1.14	2.09	7.42	12.03
1420	6.85	1.15	2.03	7.44	12.03

SAMPLED @ 1421 ID:GW-32504-090716-SR-2033

SAMPLED @ 1425 ID:GW-32504-090716-SR-2034

SWA FOR SEVERAL LINES OF THUNDERSTORMS APPROACHING FROM THE WEST.

SAMPLES ARE PACKED IN COOLER WITH ICE.

9/8/2016 32504-25

TASK: FIN

GHD: STEVE RAPAI

WEATHER: CLOUDY, HUMID, 82°

H&S: LEVEL D

SAMPLE OF RASMUSSEN RESIDENTIAL WELL. ALLOWED WELL TO PURGE AT OUTSIDE SPIGOT FOR OVER 1/2 HOUR.

SAMPLED @ 1420 ID:GW-32504-090816-SR-2035 MS/MSD

SAMPLES PACKED IN COOLER WITH ICE FOR DROP OFF @ TEST AMERICA, BRIGHTON.

January 10, 2017 Reference No. 032504-15

Mr. Howard Caine
United States Environmental Protection Agency
Region V (SR-6J)
77 W. Jackson Boulevard
Chicago, Illinois
60604

Dear Mr. Caine:

Re: Progress Report No. 137
Groundwater and Landfill RD/RA
Reporting Period: October 1 through December 31, 2016
Rasmussen Landfill (Site), Livingston Co., Michigan

1. Introduction

This Progress Report is submitted in accordance with Paragraph 26 of the Consent Decree, Civil Action No. 92 40071. This report summarizes the activities performed during the reporting period and describes the activities to continue or which are scheduled to start during the next reporting period.

2. Activities Performed During this Reporting Period

2.1 Operation and Maintenance

The quarterly round of groundwater elevations were measured on December 9, 2016. The corresponding groundwater contour map is provided on Figure 1.

GHD collected quarterly groundwater samples on November 3, 16, 17, 18, 21, and 28, 2016, consistent with the Groundwater Remediation Monitoring Program. The results from these samples are discussed below.

2.2 Reports

Quarterly Progress Report No. 136 was submitted to USEPA and Michigan Department of Environmental Quality (MDEQ) on October 11, 2016.

3. Summary of Findings

The results of the fourth quarter 2016 sampling are provided in Tables 1 through 4. Figure 2 is a Site location map showing the wells included in the quarterly Groundwater Remediation Monitoring Program and the annual Landfill Monitoring Program.

During the fourth quarter 2016 sampling, six of the 29 monitoring wells sampled had Compounds of Concern (COCs) at concentrations above Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria (RDWCC).

Specifically, the six monitoring wells with COCs exceeding RDWCC are:

CRA-RA-22	**4.9 µg/L vinyl chloride**
CRA-RA-24	4.8 µg/L vinyl chloride
CRA-RA-26S	**76 µg/L trichloroethene**
CRA-RA-27	8.6 µg/L vinyl chloride
CRA-RA-30	3.6 µg/L vinyl chloride
CRA-RA-33	4.4 µg/L vinyl chloride

These same six monitoring wells had COCs above RDWCC during the third quarter 2016 sampling event.

4. Problems Encountered

On Tuesday, November 15, 2016, two problems with the treatment system were observed. First, **compressed air was venting through the compressor automatic drain valve, resulting in very low system** pressure. Second, it was observed that Zone One on the distribution panel was not functioning.

On the afternoon of Thursday, November 17, 2016, it was observed that the AirSep (oxygen concentrator) unit was not functioning properly and system pressures were extremely low.

5. Corrective Measures to Rectify Problems

On Tuesday, November 15, 2016, the compressor automatic drain valve malfunctioned and was continuously venting air. After de-energizing the compressor and bleeding off all compressed air, the **automatic drain valve was taken apart for troubleshooting. Some debris and sludge was cleaned from the** unit and all working parts were inspected. After reassembly and reenergizing the compressor, the venting issue continued. After shutting down the system again, a ball valve was installed on the drain portion of **the automatic valve. As a short-term solution, GHD will manually drain the compressor tank of any condensation during all site visits. The RSRG will purchase and install a new compressor in early 2017 as** the current compressor is over 15 years old and the manufacturer is no longer making parts for it. This will address the drain malfunction.

On Tuesday, November 15, 2016, GHD observed that Zone One on the distribution panel was not functioning. The solenoid valve controlling this zone was taken apart and rebuilt. The repair resulted in **Zone One being returned to full functionality.**

On the afternoon of November 17, 2016, low system pressures were observed on the AirSep (oxygen concentrator) unit. GHD de-energized the unit and began troubleshooting the problem. A broken wire supplying power to one of the solenoid valves was discovered. GHD installed a new wire connector and the unit was reenergized and began to function properly.

6. Contacts and Significant Correspondence with Public Representatives

Communication	Date	Subject of Correspondence/Discussion
emails	October 3 & 12, 2016	Emails between B. Bartholomy (GHD) and H. Caine (USEPA) regarding a Site visit.
Quarterly Report	October 11, 2016	Report No. 136 submitted to H. Caine (USEPA) and K. Krawczyk (MDEQ).
meeting	November 4, 2016	Site visit attended by B. Bartholomy (GHD), S. Rapai and H. Caine (USEPA).
emails	December 22, 2016	Two emails between L. Kirby-Miles, B. Ermisch (MDEQ), H. Caine (USEPA) and S.Nadeau (Honigman) regarding the survey map and legal description for the Restrictive Covenant exhibits.

7. Planned Upcoming Activities/Schedule

Activities planned for the first quarter of 2017 include:

- Procure new compressor for the ozone sparging system and coordinate installation with the supplier.
- Continue the operation of ozone sparging system.
- Continue to monitor for the presence of ozone at each sparge vault.
- The first quarter 2017 groundwater sampling event is scheduled for the week of March 6, 2017.
- The wells to be sampled in the first quarter of 2017 are listed in Table 5.

Should you have any questions on the above, please do not hesitate to contact the undersigned.

Yours truly,

GHD

for Steven Rapain

Bart Bartholomy

AJD/cb/49

Encl.

cc: Mike Stoelton, JCI
Chuck Pinter, Ford
Karyllan Dodson Mack, BASF
Michael Simpson
Steven Nadeau, Honigman

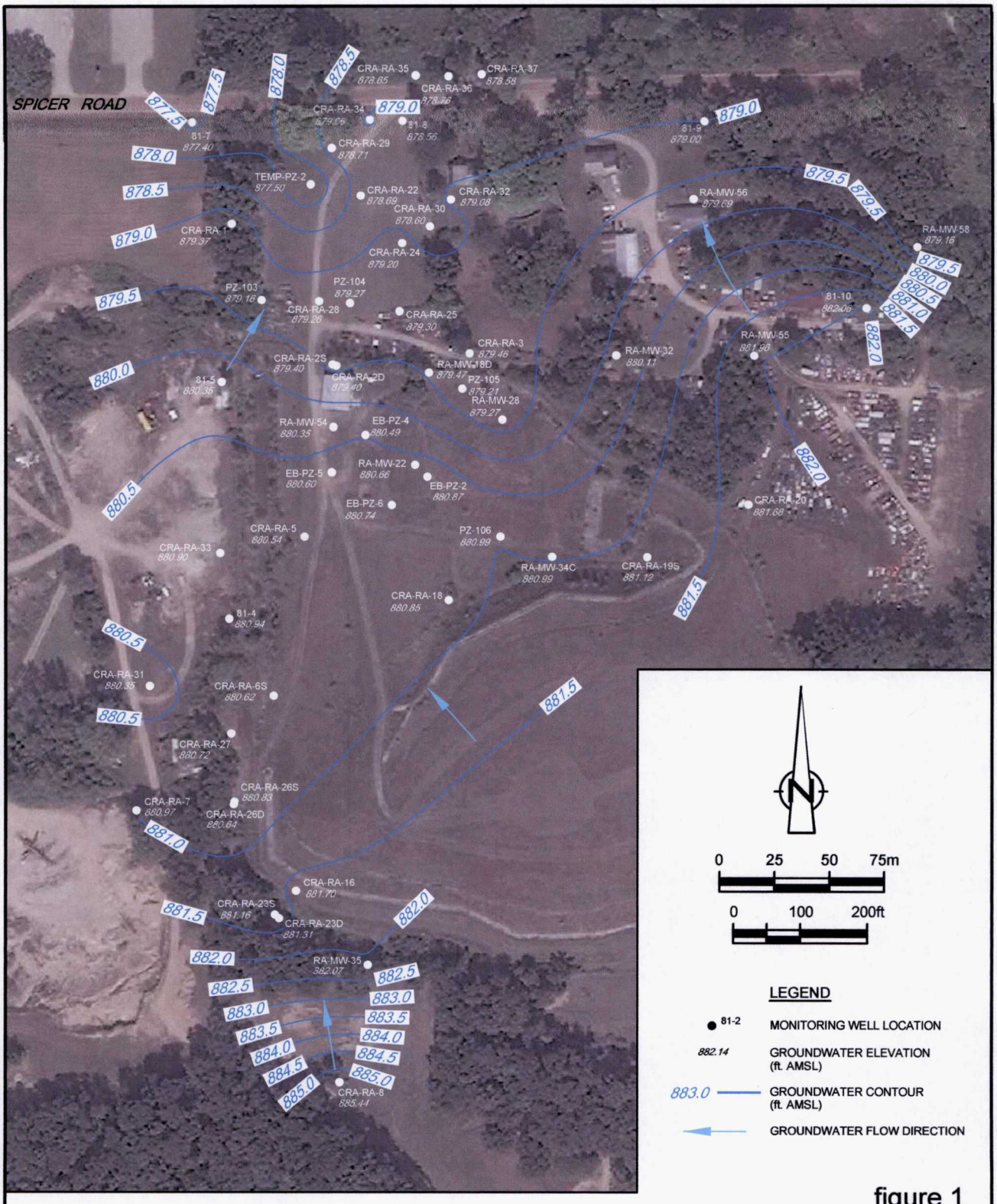


figure 1

GROUNDWATER ELEVATION CONTOURS (UPPER AQUIFER)
DECEMBER 2016
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

GHD

32504-15(CAIN049)GN-WA001 JAN 5, 2017

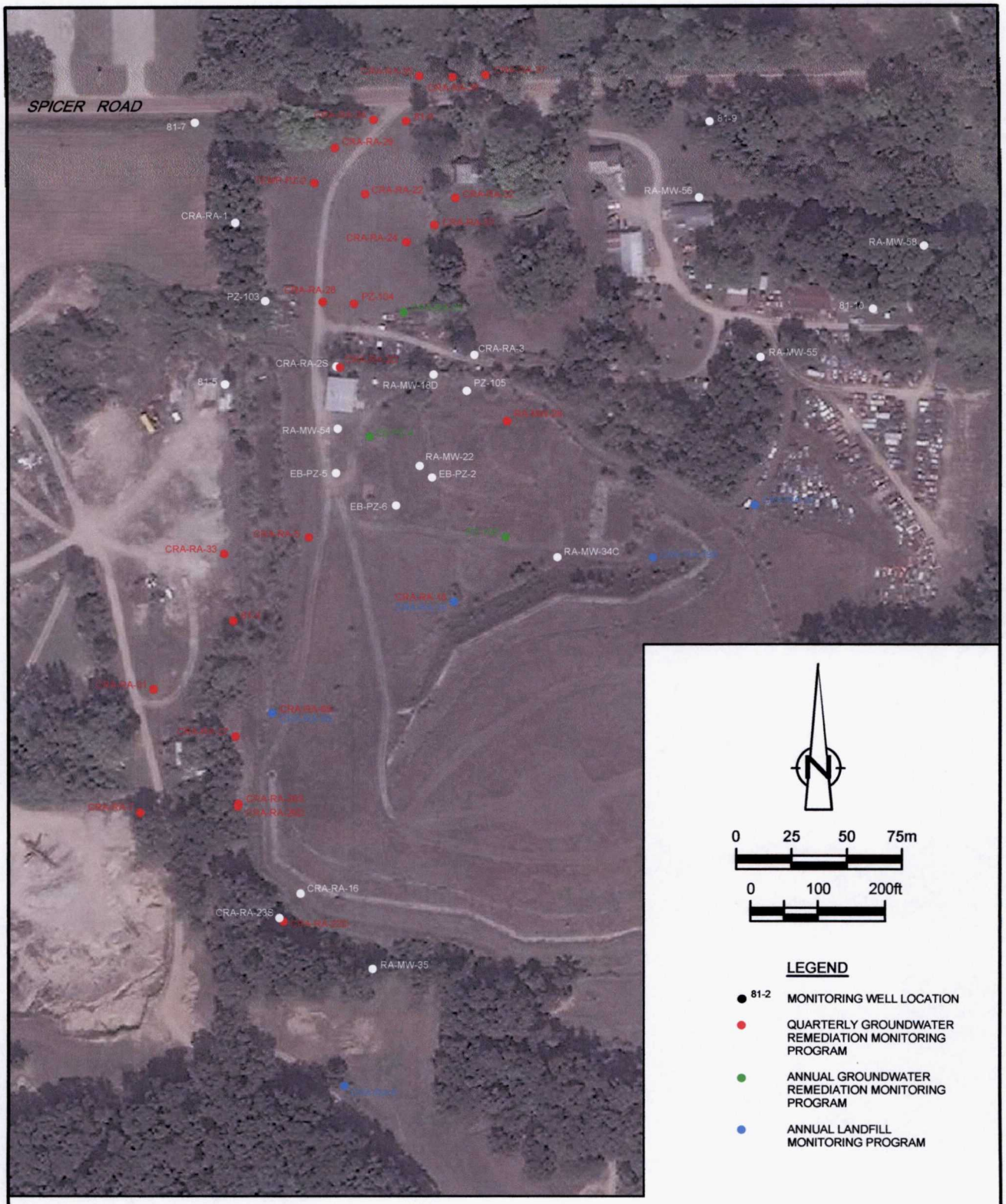


figure 2

2017 GROUNDWATER MONITORING PROGRAMS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN049)GN-WA002 JAN 5, 2017

Table 1

Analytical Results - Northern Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-22	GW-SR-1967	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	4.7	ND(1.0)
CRA-RA-22	GW-SR-1968	3/11/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	4.7	ND(1.0)
CRA-RA-22	GW-SR-1989	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.2	ND(1.0)
CRA-RA-22	GW-SR-2015	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
CRA-RA-22	GW-SR-2048	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
			Change					Up 1 µg/L							Up 1.6 µg/L	
CRA-RA-24	GW-SR-1964	3/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	6.0	ND(1.0)
CRA-RA-24	GW-SR-1986	6/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-24	GW-SR-2012	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-24	GW-SR-2044	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.8	ND(1.0)
			Change												Down 0.1 µg/L	
CRA-RA-25	GW-SR-1826	9/2/2014		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-25	GW-SR-1921	9/2/2015		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-25	GW-SR-2011	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Stable											
CRA-RA-28	GW-SR-1962	3/10/2016		ND(1.0)	2.7	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-1984	6/8/2016		ND(1.0)	3.2	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2009	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2042	11/17/2016		ND(1.0)	3.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Up 0.1 µg/L											
CRA-RA-29	GW-SR-1970	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-1991	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	12	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-2018	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-2050	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change					Down 2 µg/L								
CRA-RA-30	GW-SR-1965	3/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.8	ND(1.0)
CRA-RA-30	GW-SR-1987	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
CRA-RA-30	GW-SR-2014	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
CRA-RA-30	GW-SR-2045	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.7	ND(1.0)
CRA-RA-30	GW-SR-2046	11/17/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.6	ND(1.0)
			Change												Up 3.5 µg/L	
CRA-RA-32	GW-SR-1966	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-1988	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2013	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2047	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-34	GW-DT-003	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-001	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-02	8/6/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-35	GW-DT-005	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.9	ND(1.0)
CRA-RA-35	GW-DT-006	3/8/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.8	ND(1.0)
CRA-RA-35	GW-BW-04	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)
CRA-RA-35	GW-BW-04	6/6/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)
CRA-RA-35	GW-BW-05	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-35	GW-BW-04	11/3/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.2	ND(1.0)
			Change												Up 0.1 µg/L	
CRA-RA-36	GW-DT-002	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-003	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-04	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-03	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-37	GW-DT-001	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-02	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-03	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-02	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
PZ-104	GW-SR-1963	3/10/2016		ND(1.0)	3.2	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-1985	6/8/2016		ND(1.0)	2.9	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2010	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2043	11/17/2016		ND(1.0)	2.3	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Down 0.7 µg/L											
TEMP-PZ-2	GW-SR-1969	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-1990	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2017	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2049	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
81-8	GW-SR-1971	3/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-1992	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2016	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2051	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria.
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 2

Analytical Results - PDSLD Area Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-2D	GW-SR-1961	3/10/2016		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	78	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-2D	GW-SR-1983	6/8/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	61	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
CRA-RA-2D	GW-SR-2008	9/1/2016		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	68	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-2D	GW-SR-2036	11/16/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	79	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
			Change							Up 11 µg/L						
CRA-RA-18	GW-SR-1972	3/14/2016		82	ND(4.0)	ND(40)	ND(40)	ND(40)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)
CRA-RA-18	GW-SR-1997	6/10/2016		87	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
CRA-RA-18	GW-SR-2022	9/4/2016		79	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-18	GW-SR-2039	11/16/2016		60	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
			Change	Down 19 µg/L												
EB-PZ-4	GW-SR-1657	12/4/2012		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	39	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	4.0	ND(2.0)
EB-PZ-4	GW-SR-1729	8/27/2013		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	41	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	2.2	ND(1.4)
EB-PZ-4	GW-SR-1827	9/2/2014		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	43	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)
EB-PZ-4	GW-SR-1911	9/1/2015		ND(1.8)	ND(1.8)	ND(10)	ND(10)	ND(10)	ND(1.8)	46	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)
EB-PZ-4	GW-SR-2026	9/5/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	46	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable						
PZ-106	GW-SR-1731	8/27/2013		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1732	8/27/2013	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1828	9/2/2014		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1912	9/1/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-2023	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
RA-MW-28	GW-SR-1973	3/14/2016		8.2	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-1996	6/10/2016		8.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2025	9/5/2016		7.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2038	11/16/2016		7.4	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 0.4 µg/L												

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L

Table 3

Analytical Results - Southern Vinyl Chloride Plume
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units RDWCC(1)	µg/L 200	µg/L 70 (2)	µg/L 13,000	µg/L 1,800	µg/L 730	µg/L 5	µg/L 100	µg/L 74	µg/L 5	µg/L 790	µg/L 5	µg/L 2	µg/L 280
CRA-RA-5	GW-SR-1974	3/14/2016		18	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-1995	6/9/2016		23	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2027	9/6/2016		19	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2037	11/16/2016		17	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 2 µg/L												
CRA-RA-6S	GW-SR-1975	3/14/2016		2.0	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-1993	6/9/2016		1.8 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J
CRA-RA-6S	GW-SR-1994	6/9/2016	*Duplicate*	1.9 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J
CRA-RA-6S	GW-SR-2028	9/6/2016		2.2	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-2040	11/16/2016		2.0	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 0.2 µg/L												
CRA-RA-7	GW-SR-1979	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2000	6/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2021	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2053	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-27	GW-SR-1976	3/14/2016		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	10	ND(1.0)
CRA-RA-27	GW-SR-1977	3/14/2016	*Duplicate*	ND(1.0)	1.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	10	ND(1.0)
CRA-RA-27	GW-SR-2029	9/6/2016		ND(1.0)	1.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	9.1	ND(1.0)
CRA-RA-27	GW-SR-2041	11/17/2016		ND(1.0)	1.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	8.6	ND(1.0)
			Change		Stable										Down 0.5 µg/L	
CRA-RA-31	GW-SR-1978	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-1999	6/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2019	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2020	9/4/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2051	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-33	GW-DT-004	3/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.1	ND(1.0)
CRA-RA-33	GW-BW-06	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.5	ND(1.0)
CRA-RA-33	GW-BW-06	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
CRA-RA-33	GW-BW-05	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.4	ND(1.0)
									Up 0.5 µg/L						Up 1.6 µg/L	
81-4	GW-SR-1983	3/16/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.8	ND(1.0)
81-4	GW-SR-1998	6/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.5	ND(1.0)
81-4	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
81-4	GW-SR-2034	9/7/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
81-4	GW-SR-2054	11/28/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
81-4	GW-SR-2055	11/28/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
			Change												Up 0.1 µg/L	

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 4

Analytical Results - Southern TCE Plume
Rasmussen Landfill Site
Livingston County, Michigan

				Volatile Organics												
			Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Location	Sample ID	Date Sampled	RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-23D	GW-SR-1982	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.6	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2007	6/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.2	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2032	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.1	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2058	11/29/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2059	11/29/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)	ND(1.0)
			Change											Down 0.4 µg/L		
CRA-RA-26D	GW-SR-1981	3/15/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2006	6/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2057	11/28/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-26S	GW-SR-1980	3/15/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	81	ND(2.5)	ND(2.5)
CRA-RA-26S	GW-SR-2005	6/13/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	80	ND(2.5)	ND(2.5)
CRA-RA-26S	GW-SR-2030	9/7/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	78	ND(3.3)	ND(3.3)
CRA-RA-26S	GW-SR-2056	11/28/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	76	ND(3.3)	ND(3.3)
			Change											Down 2 µg/L		

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 5

2017 Groundwater Sampling Program
Rasmussen Landfill Site
Livingston County, Michigan

Quarterly Sampling - VOCs	Annual Landfill Monitoring Program - VOCs, SVOCs & Metals	Additional Annual Samples - VOCs
	(2nd Quarter)	*(3rd Quarter)*
81-4	CRA-RA-6S (included in quarterly sampling)	CRA-RA-25
81-8	CRA-RA-8	EB-PZ-4
CRA-RA-2D	CRA-RA-18 (included in quarterly sampling)	PZ-106
CRA-RA-5	CRA-RA-19S	RA-MW-47
CRA-RA-6S	CRA-RA-20	Rasmussen Water Supply Well
CRA-RA-7		
CRA-RA-18		
CRA-RA-22		
CRA-RA-23D		
CRA-RA-24		
CRA-RA-26D		
CRA-RA-26S		
CRA-RA-27		
CRA-RA-28		
CRA-RA-29		
CRA-RA-30		
CRA-RA-31		
CRA-RA-32		
CRA-RA-33		
CRA-RA-34		
CRA-RA-35		
CRA-RA-36		
CRA-RA-37		
PZ-104		
RA-MW-28		
TEMP-PZ-2		

Rasmussen 32504

Ozone Sparge System Inspection

DATE	Oct. 7, 2016	Oct. 12, 2016	Oct. 21, 2016	Oct. 25, 2016	Nov. 3, 2016
OPERATOR SIGNATURE	A. Rapai	A. Rapai	A. Rapai	A. Rapai	A. Rapai

Air Compressor					
Output Pressure psi	110	110	110	110	110
Temperature F					
Run Time hours	111400	111521	111734	111832	112045

Air Sep					
Receiver Pressure psi	60	60	58	58	60
Feed Air Pressure psi	110	110	110	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	44	42	42	44
Run Time hours	111400.2	111520.9	111734.3	111831.7	112045.2

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	36	37	36	36
Regulator #2 psi	23	22	23	24	25
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	3	3	3	1	1
Zone Time hours	2	2 HRS	2	1/2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments:

Rasmussen 32504

Ozone Sparge System Inspection

DATE	Nov. 10, 2016	Nov. 18, 2016	Nov. 22, 2016	Nov. 29 2016	Dec. 7, 2016
OPERATOR SIGNATURE	L. Rapai	L. Rapai	L. Rapai	L. Rapai	L. Rapai

Air Compressor					
Output Pressure psi	110	110	110	110	110
Temperature F					
Run Time hours	112213	112405	112503	112673	112861

Air Sep					
Receiver Pressure psi	58	56	58	56	58
Feed Air Pressure psi	110	110	110	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	112212.6	112404.7	112502.9	112673.0	112860.7

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	36	35	32	34
Regulator #2 psi	25	21	22	22	22
Alarm Reading ppm, O3	-	-	-	-	-
Zone On	2	3	1	3	3
Zone Time hours	1/2	2	1/2	2	2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments:

Rasmussen 32504

Ozone Sparge System Inspection

DATE	Dec. 16, 2016	Dec. 23, 2016	Dec. 29, 2016		
OPERATOR SIGNATURE	A Rápai	A Rápai	A Rápai		

Air Compressor					
Output Pressure psi	110	110	110		
Temperature F					
Run Time hours	113079	113245	113385		

Air Sep					
Receiver Pressure psi	54	54	54		
Feed Air Pressure psi	110	110	110		
Cycle Pressure psi	70	70	70		
Holding Tank Pressure psi	42	42	42		
Run Time hours	113078.8	113245.1	113385.2		

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN		

Ozone Generator					
Oxygen Supply, LPM	7	7	7		
% O3 capacity	45	45	45		
Regulator #1 psi	35	35	35		
Regulator #2 psi	25	21	25		
Alarm Reading ppm, O3	-	-	-		
Zone On	1	1	1		
Zone Time hours	1/2	1/2	1/2		

Distribution Panel					
CFM	0.8	0.8	0.8		
O3 Feed Conc. Ppm O3					

Comments:

SPARGE WELL PRESSURE READINGS
RASMUSSEN SITE
CRA PROJECT #32504

DATE:	OCTOBER 21, 2016		DATE:	NOVEMBER 15-18, 2016		DATE:	DECEMBER 9 & 16, 2016	
WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL
SW-1	0.8	9	SW-1	0.8	8	SW-1	0.8	8
SW-2	0.8	8	SW-2	0.7	8	SW-2	0.8	7
SW-3	0.8	15	SW-3	0.7	14	SW-3	0.7	13
SW-4	0.8	15	SW-4	0.8	14	SW-4	0.8	13
SW-5	0.7	15	SW-5	0.7	14	SW-5	0.8	14
SW-6	0.8	15	SW-6	0.8	14	SW-6	0.7	12
SW-7	0.7	14	SW-7	0.7	14	SW-7	0.7	14
SW-8	—	—	SW-8	—	—	SW-8	—	—
SW-9	—	—	SW-9	—	—	SW-9	—	—
SW-10	—	—	SW-10	—	—	SW-10	—	—
SW-11	—	—	SW-11	—	—	SW-11	—	—
SW-12	0.8	15	SW-12	0.8	14	SW-12	0.8	14
SW-13	0.8	2	SW-13	0.8	2	SW-13	0.8	1
SW-14	—	—	SW-14	—	—	SW-14	—	—
SW-15	—	—	SW-15	—	—	SW-15	—	—
SW-16	—	—	SW-16	—	—	SW-16	—	—
SW-17	0.7	18	SW-17	0.8	18	SW-17	0.7	17
SW-18	0.8	18	SW-18	0.7	17	SW-18	0.7	16
SW-19	0.8	18	SW-19	0.7	17	SW-19	0.8	16
SW-20	0.7	18	SW-20	0.7	18	SW-20	0.7	17
SW-21	—	—	SW-21	—	—	SW-21	—	—
SW-22	0.8	14	SW-22	0.7	14	SW-22	0.7	13
SW-23	0.8	14	SW-23	0.7	14	SW-23	0.7	13
SW-24	0.8	14	SW-24	0.8	16	SW-24	0.8	14
SW-25	0.8	15	SW-25	0.8	14	SW-25	0.7	13
SW-26	0.8	6	SW-26	0.7	6	SW-26	0.7	6
SW-27	0.8	6	SW-27	0.8	6	SW-27	0.7	5
SW-28	0.7	7	SW-28	0.8	6	SW-28	0.8	6
SW-29	0.7	6	SW-29	0.8	6	SW-29	0.7	5
SW-30	—	—	SW-30	—	—	SW-30	—	—

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: WED. OCT. 12, 2016
Time: 2:30 PM

Weather Conditions: CLOUDY 76°

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: OK - WOODY GROWTH ON SIDES OF CAP

Signs, Gates, & Fences: OK

Actions Taken:
NONE - CREW SCHEDULED FOR BRUSH WORK LATER THIS MONTH

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: MONDAY, OCTOBER 31, 2016
Time: 3:00PM

Weather Conditions: CLOUDY 55°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: GOOD

Signs, Gates, & Fences: OK

Actions Taken:
BRUSH CREW WORKING ON SITE CLEARING, ESPECIALLY SIDES OF LANDFILL CAP

Recommendations:
NONE AT THIS TIME

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPA **Signature:** Steve Rapa

Date: THURS. NOVEMBER 10, 2016
Time: 9:00 AM

Weather Conditions: 52° CLEAR

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: GOING DORMANT FOR WINTER

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: MON. NOVEMBER 28, 2016
Time: DRIZZLE, WINDY 45°F 11:00AM

Weather Conditions: _____

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: WET

Drainage Spillways & Outfalls: FLOWING

Roadways: WET

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:

Recommendations:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: FRIDAY, DECEMBER 16, 2016
Time: 4:00 PM

Weather Conditions: CLOUDY 15° 3"-6" OF SNOW PREDICTED

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: EMPTY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:

Recommendations:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: THURS, DECEMBER 29, 2016
Time: NOON

Weather Conditions: CLOUDY 34°F

Observations

Erosion-North Face: SNOW COVERED

Erosion-South Face:

Erosion-East Face:

Erosion-West Face:

Erosion-Misc.:

Storm Water Ponds:

Drainage Spillways & Outfalls:

Roadways: PLOWED

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
SITE HAS BEEN PLOWED - ROADS ARE CLEAR

Recommendations:

11/16/2016 32504

TASK: BEGIN 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: CLEAR 48°, HIGH 58°F

H&S: LEVEL D

CALIBRATION OF HORIBA NF 07597

pH=4.00, COND = 4.49 mS/cm, TURB=0.0 NTU,

D.O.=8.73 mg/l, TEMP. 21.91°C

SAMPLE OF CRA·RA·2D

TIME	pH	COND.	TURB.	D.O.	TEMP.
1100	6.56	1.97	14.9	4.16	11.48
1110	6.70	1.78	4.9	0.11	11.34
1120	6.75	1.76	4.3	0.09	11.34
1125	6.75	1.77	4.3	0.09	11.33
1130	6.75	1.76	3.9	0.09	11.34

SAMPLED @ 1131 ID: GW·32504·111616·SR·2036

SAMPLE OF CRA·RA·5

1220	7.03	1.46	20.6	2.17	11.46
1230	6.68	1.31	2.7	0.15	11.31
1245	6.69	1.31	2.6	0.11	11.30
1250	6.70	1.31	2.8	0.11	11.30
1255	6.71	1.31	2.6	0.09	11.34
1300	6.73	1.32	1.0	0.09	11.32
1310	6.76	1.32	1.3	0.08	11.36

CONTINUED ON NEXT PAGE

32504·24 11/16/16

SAMPLE OF CRA·RA·5 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1315	6.77	1.32	1.2	0.10	11.34
1320	6.76	1.32	1.1	0.09	11.34

SAMPLED @ 1321 ID: GW·32504·111616·SR·2037

SAMPLE OF RA·MW·28

1335	7.01	0.859	6.1	1.46	10.92
1350	6.93	0.855	4.5	1.61	10.81
1355	6.93	0.854	4.6	1.67	10.84
1400	6.93	0.855	4.6	1.70	10.83
1405	6.93	0.856	4.4	1.71	10.84
1410	6.93	0.855	4.4	1.71	10.83

SAMPLED @ 1411 ID: GW·32504·111616·SR·2038

SAMPLE OF CRA·RA·18

1420	6.82	1.81	9.5	4.95	11.00
1430	6.78	1.78	8.0	3.51	10.96
1440	6.79	1.79	6.5	3.35	10.92
1445	6.79	1.79	4.9	3.30	10.90
1450	6.79	1.80	3.6	3.30	10.91
1455	6.79	1.80	3.4	3.30	10.90

SAMPLED @ 1456 ID: GW·32504·111616·SR·2039

11/16/16 32504-25

SAMPLE OF CRA-RA-6S

TIME	pH	COND.	TURB.	D.O.	TEMP.
1510	6.79	1.16	2.0	4.71	12.68
1520	6.80	1.13	2.8	1.47	12.37
1530	6.80	1.13	2.8	1.10	12.56
1535	6.79	1.13	2.7	0.85	12.39
1540	6.79	1.13	2.6	0.84	12.37
1545	6.79	1.13	2.7	0.85	12.38

SAMPLED @ 1546 ID: GW-32504-111616-SR-2040

SAMPLES PACKED IN COOLER WITH ICE.

32504-25 11/17/16

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: DENSE FOG & 35°F CLEARING LATER, HIGH 64°F

H&S: LEVEL D

CALIBRATION OF HORIBA NF07597 pH=4.00, COND.=4.49, TURB.=0.0, D.O.=8.61, TEMP.=23.44

SAMPLE OF CRA-RA-27

TIME	pH	COND.	TURB.	D.O.	TEMP.
0930	6.43	1.89	1.4	4.58	11.69
0940	6.50	1.85	0.6	0.21	11.32
0950	6.48	1.85	1.3	0.09	11.32
0955	6.48	1.85	1.5	0.08	11.35
1000	6.47	1.85	1.1	0.08	11.36
1005	6.47	1.85	1.2	0.09	11.35

SAMPLED @ 1006 ID: GW-32504-111716-SR-2041

SET UP @ CRA-RA-26S BUT COULD NOT GET GASOLINE POWERED COMPRESSOR TO START. GAS POWERED COMPRESSOR NEEDED @ 26S, 26D, 23D & 81-4 BECAUSE I AM UNABLE TO PULL TRUCK NEAR WELLS TO USE SMALL 12V COMPRESSOR.

11/17/16 32504-25

SAMPLE OF CRA-RA-28

TIME	pH	COND.	TURB.	D.O.	TEMP
1045	6.75	0.871	0.5	2.39	11.54
1055	6.68	0.868	1.2	0.11	11.51
1105	6.71	0.874	1.8	0.10	11.53
1110	6.73	0.875	1.3	0.09	11.57
1115	6.75	0.877	1.2	0.09	11.56
1120	6.77	0.877	1.3	0.09	11.56
1125	6.78	0.877	1.1	0.08	11.56
1130	6.78	0.877	1.3	0.08	11.56

SAMPLED @ 1131 ID:GW-32504-111716-SR-2042

SAMPLE OF PZ-104

1140	7.05	1.32	4.8	3.64	11.56
1155	6.87	1.25	0.9	0.11	11.30
1205	6.90	1.07	1.9	0.07	11.31
1210	6.90	1.05	1.3	0.07	11.32
1215	6.89	1.03	1.0	0.08	11.32
1220	6.89	1.05	1.4	0.07	11.33
1225	6.90	1.05	1.3	0.07	11.33

SAMPLED @ 1226 ID:GW-32504-111716-SR-2043

SAMPLE OF CRA-RA-24

1320	6.96	1.03	6.8	2.94	12.03
1330	6.96	1.04	2.1	0.11	11.47

32504-25 11/17/2016

SAMPLE OF CRA-RA-24 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1345	6.89	1.05	1.6	0.08	11.45
1350	6.90	1.05	0.6	0.08	11.45
1355	6.89	1.05	0.3	0.08	11.44
1400	6.89	1.05	0.5	0.08	11.45

SAMPLED @ 1401 ID:GW-32504-111716-SR-2044

SAMPLE OF CRA-RA-30

1420	6.97	1.07	1.7	0.27	11.42
1440	6.99	1.07	0.3	0.11	11.38
1445	6.99	1.07	0.8	0.08	11.39
1450	7.00	1.07	0.5	0.08	11.39
1455	6.99	1.07	0.2	0.08	11.38
1500	6.99	1.07	0.0	0.08	11.38

SAMPLED @ 1501 ID:GW-32504-111716-SR-2045

SAMPLED @ 1506 ID:GW-32504-111716-SR-2046

SAMPLE OF CRA-RA-32

1515	7.17	0.902	0.3	3.91	11.52
1535	7.03	0.929	0.9	0.11	11.21
1540	7.05	0.930	0.0	0.10	11.23
1545	7.06	0.930	0.0	0.11	11.22
1550	7.06	0.930	0.0	0.11	11.23

SAMPLED @ 1551 ID:GW-32504-111716-SR-2047

SAMPLES PACKED IN COOLER WITH ICE

11/18/16 32504-25

TASK: CONTINUE 1/4 SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: CLEAR 50°F, HIGH 70°F

H&S: LEVEL D

CALIBRATION OF HORIBA NF07597

pH=4.00, COND.=4.49, TURB=0.0, D.O.=8.81, TEMP.=24.01

SAMPLE OF CRA-RA-22

TIME	pH	COND.	TURB.	D.O.	TEMP.
0930	6.81	1.17	35.7	3.21	11.45
0945	6.55	1.16	1.3	0.22	11.42
1000	6.47	1.16	1.0	0.11	11.42
1005	6.48	1.16	0.9	0.08	11.42
1010	6.48	1.16	0.9	0.08	11.42

SAMPLED @ 1011 ID:GW-32504-111816-SR-2048

SAMPLE OF TEMP-PZ-2

1025	6.67	2.15	0.0	3.18	11.53
1040	6.64	2.09	0.9	0.25	11.57
1050	6.68	2.16	0.0	0.07	11.60
1055	6.70	2.17	0.1	0.07	11.60
1100	6.72	2.17	0.0	0.06	11.61
1105	6.72	2.17	0.0	0.07	11.61

SAMPLED @ 1106 ID:GW-32504-111816-SR-2049

32504-25 11/18/16

SAMPLE OF CRA-RA-29

TIME	pH	COND.	TURB.	D.O.	TEMP.
1115	6.98	1.07	12.3	8.94	13.48
1130	6.91	0.94	3.5	11.54	12.88
1145	6.93	0.97	3.2	11.27	12.74
1150	6.93	0.97	3.1	11.24	12.74
1155	6.93	0.97	3.0	11.25	12.74

SAMPLED @ 1156 ID:GW-32504-111816-SR-2050

SAMPLES PACKED IN COOLER WITH ICE FOR DELIVERY TO TEST AMERICA, BRIGHTON, MI.

11/21/16 32504.25

TASK: CONTINUE 1/4LY SAMPLE EVENT

GMD: STEVE RAPAI

WEATHER: SUN, WIND, 36°F

H&S: LEVEL D

CALIBRATION OF HORIBA NF07597

pH=4.00, COND=4.49, TURB.=0.0, D.O.=8.58, TEMP=23.13

SAMPLE OF 81-8

TIME	pH	COND	TURB	D.O.	TEMP
1335	6.40	0.521	43.0	+19.99	11.51
1355	6.91	0.416	3.1	+19.99	11.20
1400	6.90	0.409	2.7	+19.99	11.10
1405	6.88	0.412	2.2	+19.99	11.10
1410	6.88	0.407	1.9	+19.99	11.11
1415	6.88	0.398	0.5	+19.99	11.12
1420	6.89	0.409	1.0	+19.99	11.10
1425	6.89	0.408	0.7	+19.99	11.12
1430	6.89	0.408	1.1	+19.99	11.12

SAMPLE OF 1431 ID: GW-32504-112116-SR-2051

SAMPLE OF CRA-RA-31

1440	6.34	0.502	4.3	10.48	10.73
1450	6.82	0.502	0.7	7.42	10.69
1500	6.86	0.502	0.5	7.19	10.66

CONTINUED ON NEXT PAGE

32504.25 11/21/16

SAMPLE OF CRA-RA-31 (CONTINUED)

TIME	pH	COND	TURB.	D.O.	TEMP.
1505	6.89	0.500	0.7	6.45	10.65
1510	6.92	0.499	1.0	6.22	10.67
1515	6.95	0.498	0.9	4.35	10.68
1520	6.96	0.501	1.0	3.52	10.68
1525	6.96	0.501	0.9	3.33	10.68
1530	6.96	0.501	0.9	3.31	10.68
1535	6.96	0.501	1.0	3.30	10.67

SAMPLED @ 1536 ID: GW-32504-112116-SR-2052

SAMPLE OF CRA-RA-7

1545	7.38	0.309	2.2	5.63	10.61
1555	7.28	0.306	1.8	5.39	10.65
1605	7.33	0.306	1.7	5.34	10.65
1610	7.34	0.306	0.9	5.33	10.65
1615	7.35	0.306	1.1	5.34	10.65
1620	7.35	0.306	1.0	5.33	10.65

SAMPLED @ 1621 ID: GW-32504-112116-SR-2053

SAMPLES PACKED IN COOLER WITH ICE.

11/22/16 32504.25

TASK

GHD:

WEATHER:

H&S: LEVEL D

CALIBRATION OF HORIBA NF07597

pH=3.99, COND.=4.49, TURB=0.0, D.O.=8.45, TEMP.=24.13

SET UP @ WELL NEXT 26. COMPRESSOR WOULD NOT START AGAIN. WILL TAKE SAMPLES COLLECTED YESTERDAY TO THE LAB. I WILL ALSO TRY TO COBBLE TOGETHER SOME AIR FITTINGS TO USE THE MP50 TO SAMPLE THE LONG DISTANCE WELLS

32504.25 11/28/16

TASK: ATTEMPT TO FINISH 1/4LY EVENT

GHD: STEVE RAPAI

WEATHER: DRIZZLE 40°, HIGH OF 48°

H&S: LEVEL D

CALIBRATION OF HORIBA NF07597

pH=4.00, COND.=4.49, TURB=0.0, D.O.=8.36, TEMP.=24.75

~~PZ-104~~ 81-4 SR

TIME	pH	COND.	TURB.	D.O.	TEMP.
1105	6.43	1.46	2.1	9.72	11.51
1130	6.44	1.47	1.0	0.15	11.40
1135	6.46	1.46	0.3	0.14	11.41
1140	6.47	1.46	0.6	0.11	11.41
1145	6.46	1.46	0.3	0.11	11.42

SAMPLED @ 1146 ID:GW-32504-112816-SR-2054

SAMPLED @ 1150 ID:GW-32504-112816-SR-2055

SAMPLE OF CRA-RA-263

1215	7.08	1.36	3.0	10.14	10.80
1235	6.60	1.36	0.6	5.44	10.75
1240	6.62	1.36	0.8	5.29	10.74
1245	6.63	1.37	1.6	5.23	10.75
1250	6.64	1.37	0.7	5.21	10.75
1255	6.64	1.37	1.2	5.21	10.75

SAMPLED @ 1256 ID:GW-32504-112816-SR-2056

32504-25

SAMPLE OF CRA-RA-26D

TIME	pH	COND.	TURB.	D.O.	TEMP
1305	6.91	1.73	4.2	7.71	10.48
1325	6.78	1.74	2.9	0.12	10.90
1330	6.79	1.74	1.8	0.11	10.92
1335	6.79	1.74	0.3	0.11	10.94
1340	6.80	1.74	0.5	0.11	10.93
1345	6.80	1.74	0.2	0.11	10.93

SAMPLED @ 1346 ID: GW-32504-112816-SR-2057
MS/MSD

32504-25 11/29/2016

TASK: COMPLETE SAMPLE EVENT.
GHD: STEVE RAPAI
WEATHER: PARTLY CLOUDY, HIGH 60°
H&S: LEVEL D
CALIBRATION OF HORIBA NF07597
pH=4.00, COND.=4.49, TURB.=0.0, D.O.=8.49, TEMP.=24.82

BEGAN BY SETTING UP TO SAMPLE WELL 23D. RAN 100' OF HOSE TO WELL BUT COULD NOT GET WELL TO PRODUCE. PROBLEMS WITH CONTROL BOX & PRESSURE VALVE. FINALLY ABLE TO GET WELL TO PRODUCE.

SAMPLE OF CRA-RA-23D

TIME	pH	COND.	TURB.	D.O.	TEMP.
1545	6.58	0.763	0.0	2.75	10.43
1615	6.59	0.768	0.0	0.66	10.39
1620	6.60	0.768	0.0	0.49	10.39
1625	6.60	0.768	0.0	0.50	10.40
1630	6.60	0.768	0.0	0.49	10.39

SAMPLED @ 1631 ID: GW-32504-112916-SR-2058
SAMPLED @ 1635 ID: GW-32504-112916-SR-2059

SAMPLES PACKED IN COOLER WITH ICE FOR LAB DROP OFF TOMORROW.

12/9/2016 32504.25

TASK: QUARTERLY WATER LEVELS

GHD: STEVE RAPAI

WEATHER: 32°F, MOSTLY CLOUDY, WINDY

H&S: LEVEL D

WELL ID	LEVEL
81-4	30.88
81-5	35.42
81-7	48.91
81-8	44.63
81-9	17.00
81-10	33.25
RA-1	70.14
RA-2D	56.99
RA-2S	56.75
RA-3	53.89
RA-5	65.95
RA-6S	60.41
RA-7	33.50
RA-8	17.45
RA-16	59.44
RA-18	57.35
RA-18D	42.72
RA-19D	51.30
RA-19S	48.62

32504.25 12/9/2016

WELL ID	LEVEL
RA-20	59.61
RA-22	54.99
RA-23D	33.75
RA-23S	34.03
RA-24	57.84
RA-25	55.31
RA-26D	51.05
RA-26S	50.94
RA-27	62.77
RA-28	55.55
RA-29	47.09
RA-30	59.49
RA-31	33.33
RA-32	36.04
RA-33	33.45
RA-34	42.91
RA-35	33.13
RA-36	37.51
RA-37	37.27
MW-22	43.28
MW-28	43.65
MW-32	58.27
MW-34C	42.81
MW-35	24.85

12/9/2016 32504-25

WELL ID	LEVEL
MW-41	48.26
MW-42	64.44
MW-47	54.52
MW-54	56.95
MW-55	37.69
MW-56	34.70
MW-58	22.22
EB-PZ-2	41.24
EB-PZ-4	54.51
EB-PZ-5	56.19
EB-PZ-6	55.95
PZ-103	58.11
PZ-104	56.13
PZ-105	52.83
PZ-106	40.29
TEMP-PZ-2	54.93

April 10, 2017 Reference No. 032504-15

Mr. Howard Caine
United States Environmental Protection Agency
Region V (SR-6J)
77 W. Jackson Boulevard
Chicago, Illinois
60604

Dear Mr. Caine:

Re: Progress Report No. 138
Groundwater and Landfill RD/RA
Reporting Period: January 1 through March 31, 2017
Rasmussen Landfill (Site), Livingston Co., Michigan

1. Introduction

This Progress Report is submitted in accordance with Paragraph 26 of the Consent Decree, Civil Action No. 92 40071. This report summarizes the activities performed during the reporting period and describes the activities to continue or which are scheduled to start during the next reporting period.

2. Activities Performed During this Reporting Period

2.1 Operation and Maintenance

The quarterly round of groundwater elevations were measured on March 31, 2017. The corresponding groundwater contour map is provided on Figure 1.

GHD collected quarterly groundwater samples on March 10, 14, 15, 16, 19, 20, and 218, 2017, consistent with the Groundwater Remediation Monitoring Program. The results from these samples are discussed below.

The aging site compressor, originally installed in 2000, was removed and replaced with a new Ingersoll Rand scroll compressor on February 23, 2017.

2.2 Reports

Quarterly Progress Report No. 137 was submitted to USEPA and Michigan Department of Environmental Quality (MDEQ) on January 10, 2017.

3. Summary of Findings

The results of the first quarter 2017 sampling are provided in Tables 1 through 4. Figure 2 is a Site location map showing the wells included in the quarterly Groundwater Remediation Monitoring Program and the annual Landfill Monitoring Program.

During the first quarter 2017 sampling, five of the 25 monitoring wells sampled had Compounds of Concern (COCs) at concentrations above Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria (RDWCC).

Specifically, the five monitoring wells with COCs exceeding RDWCC are:

CRA-RA-22	3.6 μg/L vinyl chloride
CRA-RA-24	4.7 μg/L vinyl chloride
CRA-RA-26S	75 μg/L trichloroethene
CRA-RA-27	8.6 μg/L vinyl chloride
CRA-RA-30	3.5 μg/L vinyl chloride

These same five monitoring wells had COCs above RDWCC during the fourth quarter 2016 sampling event. The concentration of vinyl chloride in the groundwater samples collected from monitoring well CRA-RA-33 decreased from 4.4 μg/L in the fourth quarter 2016 to 1.1 μg/L in the first quarter 2017.

4. Problems Encountered

On February 10, 2017 GHD arrived at the Site for a weekly inspection and found the system down upon arrival. High winds interrupted power but an alarm call was not sent. The system was restarted without issue and trouble shooting began on the site autodialer.

5. Corrective Measures to Rectify Problems

On February 10, 2017, an alarm condition existed but the site autodialer did not function as designed, with no notification to numbers on the call list. An attempt was made to reset the autodialer by disconnecting the power to the unit and then turning the unit back on. The autodialer began to function correctly but a false alarm condition on "channel 1" would not clear. The false problem on "channel 1" could not be identified and "channel 1" was set to the "Ignore mode" on the autodialer. "Channel 1" is basically a power failure alarm and is redundant along with the power failure alarm that is factory built into the autodialer. Running with "channel 1" disabled should not impact trouble notification via the autodialer. The site autodialer has 2 remaining channels that function to monitor system pressure and ozone trouble.

6. Contacts and Significant Correspondence with Public Representatives

Communication	Date	Subject of Correspondence/Discussion
email	January 3, 2017	Correction to survey map sent from S. Nadeau to L. Kirby Miles
Quarterly Report	**January 10, 2017**	**Report No. 137 submitted to H. Caine (USEPA) and K. Krawczyk (MDEQ).**

7. Planned Upcoming Activities/Schedule

Activities planned for the second quarter of 2017 include:

- Continue the operation of ozone sparging system
- Continue to monitor for the presence of ozone at each sparge vault
- The second quarter 2017 groundwater sampling event is scheduled for the week of June 6, 2017
- The wells to be sampled in the second quarter of 2017 are listed in Table 5

Should you have any questions on the above, please do not hesitate to contact the undersigned.

Yours truly,

GHD

For Arthur Rapai

Bart Bartholomy

AJD/cb/50

Encl.

cc: Mike Stoelton, JCI
Chuck Pinter, Ford
Karyllan Dodson Mack, BASF
Michael Simpson
Steven Nadeau, Honigman

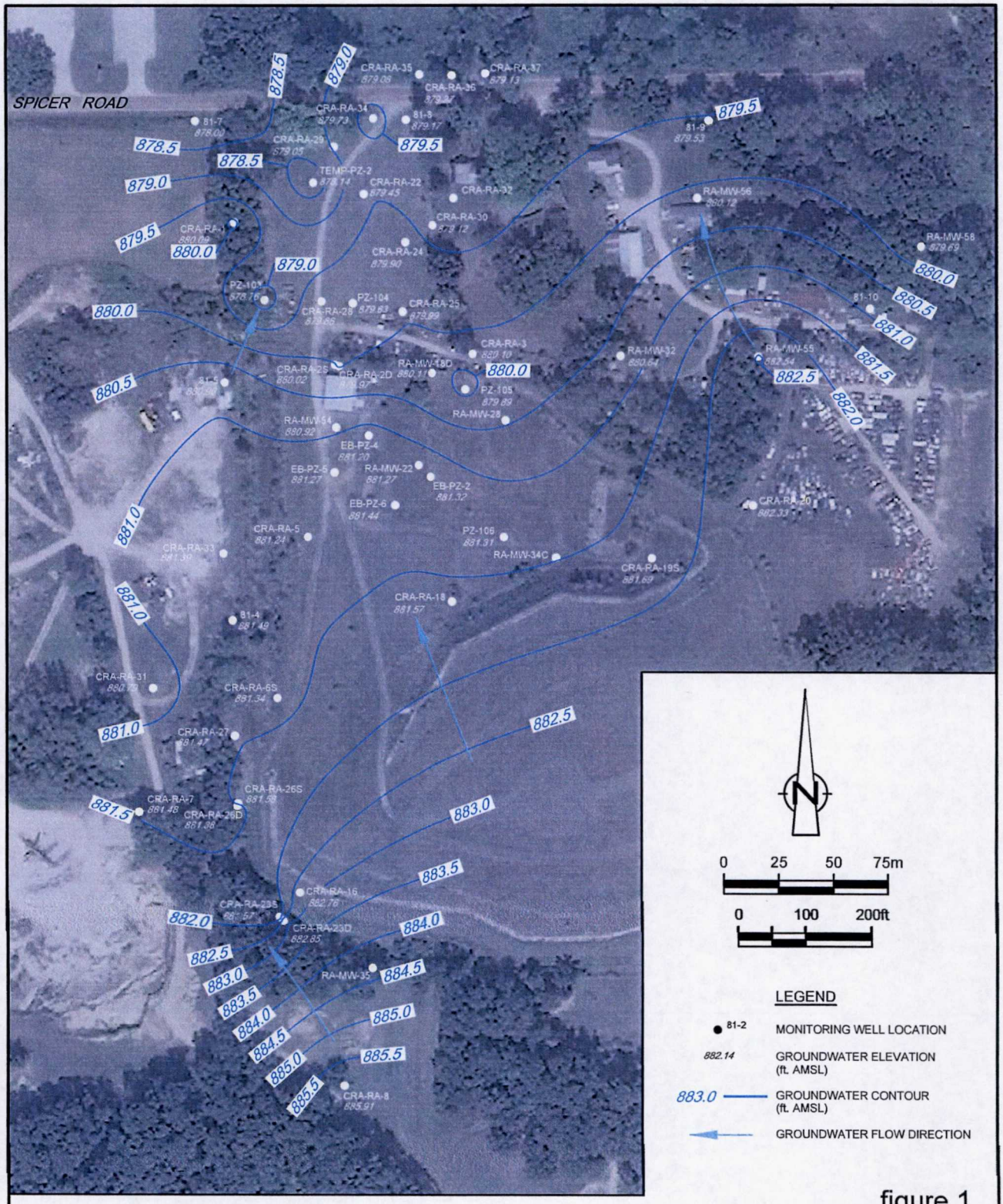


figure 1

GROUNDWATER ELEVATION CONTOURS (UPPER AQUIFER)
MARCH 31, 2017
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN050)GN-WA001 APR 4, 2017

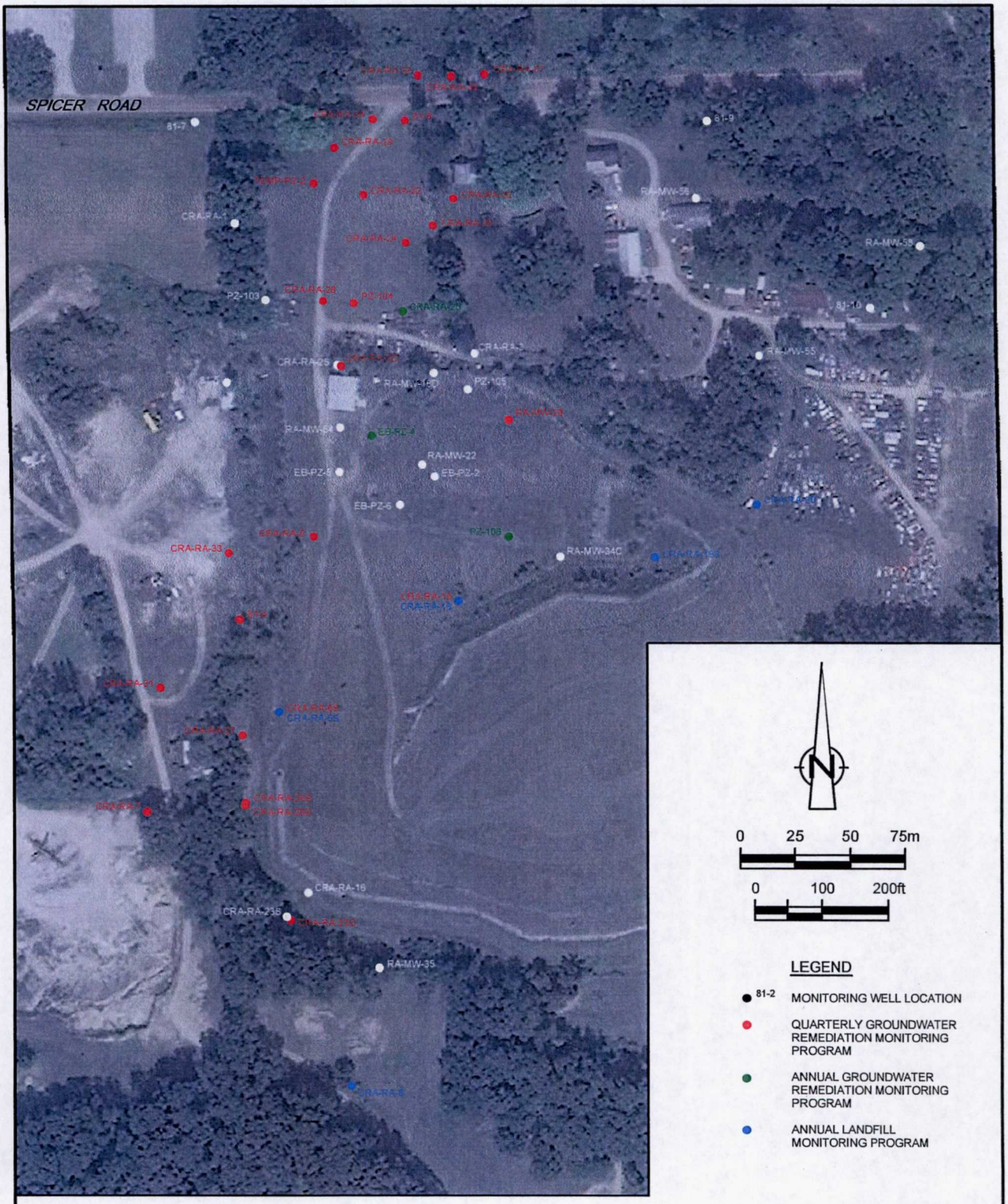


figure 2

2017 GROUNDWATER MONITORING PROGRAMS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN050)GN-WA002 APR 4, 2017

Table 1

Analytical Results - Northern Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-22	GW-SR-1989	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.2	ND(1.0)
CRA-RA-22	GW-SR-2015	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
CRA-RA-22	GW-SR-2046	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-22	GW-SR-2069	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.6	ND(1.0)
CRA-RA-22	GW-SR-2070	3/15/2017	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.6	ND(1.0)
			Change					Down 1 µg/L							Down 1.3 µg/L	
CRA-RA-24	GW-SR-1986	6/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-24	GW-SR-2012	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-24	GW-SR-2044	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.8	ND(1.0)
CRA-RA-24	GW-SR-2066	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.7	ND(1.0)
			Change												Down 0.1 µg/L	
CRA-RA-25	GW-SR-1826	9/2/2014		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-25	GW-SR-1921	9/2/2015		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-25	GW-SR-2011	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Stable											
CRA-RA-28	GW-SR-1984	6/8/2016		ND(1.0)	3.2	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2009	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2042	11/17/2016		ND(1.0)	3.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2064	3/15/2017		ND(1.0)	2.8	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Down 0.3 µg/L											
CRA-RA-29	GW-SR-1991	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	12	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-2018	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-2050	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29								Not sampled; insufficient water in well								
			Change													
CRA-RA-30	GW-SR-1987	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
CRA-RA-30	GW-SR-2014	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
CRA-RA-30	GW-SR-2045	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.7	ND(1.0)
CRA-RA-30	GW-SR-2046	11/17/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.6	ND(1.0)
CRA-RA-30	GW-SR-2067	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.5	ND(1.0)
			Change												Down 0.1 µg/L	
CRA-RA-32	GW-SR-1988	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2013	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2047	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2047	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-34	GW-BW-001	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	8/8/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-02	8/8/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-35	GW-BW-04	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)
CRA-RA-35	GW-BW-04	6/6/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)
CRA-RA-35	GW-BW-05	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-35	GW-BW-04	11/3/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.2	ND(1.0)
CRA-RA-35	GW-BW-04	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-35	GW-BW-05	3/10/2017	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.0	ND(1.0)
			Change												Down 0.2 µg/L	
CRA-RA-36	GW-BW-003	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-04	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-03	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-03	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-37	GW-BW-02	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-03	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-02	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-02	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
PZ-104	GW-SR-1985	6/8/2016		ND(1.0)	2.9	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2010	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2043	11/17/2016		ND(1.0)	2.3	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2065	3/15/2017		ND(1.0)	2.6	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.0	ND(1.0)
			Change		Up 0.3 µg/L										Up 0.5 µg/L	
TEMP-PZ-2	GW-SR-1990	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2017	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2049	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2071	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
81-8	GW-SR-1992	6/9/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2016	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2051	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2081	3/21/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria.
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 2

Analytical Results - PDSLD Area Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-2D	GW-SR-1983	6/8/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	61	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
CRA-RA-2D	GW-SR-2008	9/1/2016		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	68	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-2D	GW-SR-2036	11/16/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	79	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
CRA-RA-2D	GW-SR-2060	3/14/2017		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	75	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
			Change							Down 4 µg/L						
CRA-RA-18	GW-SR-1997	6/10/2016		87	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
CRA-RA-18	GW-SR-2022	9/4/2016		79	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-18	GW-SR-2039	11/16/2016		60	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
CRA-RA-18	GW-SR-2063	3/14/2017		66	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
			Change	Up 6 µg/L												
EB-PZ-4	GW-SR-1657	12/4/2012		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	39	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	4.0	ND(2.0)
EB-PZ-4	GW-SR-1729	8/27/2013		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	41	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	2.2	ND(1.4)
EB-PZ-4	GW-SR-1827	9/2/2014		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	43	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)
EB-PZ-4	GW-SR-1911	9/1/2015		ND(1.8)	ND(1.8)	ND(10)	ND(10)	ND(10)	ND(1.8)	46	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)
EB-PZ-4	GW-SR-2026	9/5/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	46	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable						
PZ-106	GW-SR-1731	8/27/2013		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1732	8/27/2013	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1828	9/2/2014		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1912	9/1/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-2023	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
RA-MW-28	GW-SR-1996	6/10/2016		8.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2025	9/5/2016		7.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2038	11/16/2016		7.4	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2062	3/14/2017		6.0	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 1.4 µg/L												

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L

Table 3

Analytical Results - Southern Vinyl Chloride Plume
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-5	GW-SR-1995	6/9/2016		23	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2027	9/6/2016		19	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2037	11/16/2016		17	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2061	3/14/2017		16	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 1 µg/L												
CRA-RA-6S	GW-SR-1993	6/9/2016		1.8 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J
CRA-RA-6S	GW-SR-1994	6/9/2016	*Duplicate*	1.9 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J
CRA-RA-6S	GW-SR-2028	9/6/2016		2.2	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-2040	11/16/2016		2.0	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-2078	3/20/2017		1.6	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Down 0.4 µg/L												
CRA-RA-7	GW-SR-2000	6/11/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2021	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2053	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2080	3/20/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-27	GW-SR-1977	3/14/2016	*Duplicate*	ND(1.0)	1.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	10	ND(1.0)
CRA-RA-27	GW-SR-2029	9/6/2016		ND(1.0)	1.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	9.1	ND(1.0)
CRA-RA-27	GW-SR-2041	11/17/2016		ND(1.0)	1.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	8.6	ND(1.0)
CRA-RA-27	GW-SR-2072	3/16/2017		ND(1.0)	1.9	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	8.6	ND(1.0)
			Change		Up 0.4 µg/L										Stable	
CRA-RA-31	GW-SR-1999	6/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2019	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2020	9/4/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2051	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2079	3/20/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-33	GW-BW-06	6/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.5	ND(1.0)
CRA-RA-33	GW-BW-06	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
CRA-RA-33	GW-BW-05	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.4	ND(1.0)
CRA-RA-33	GW-BW-06	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
									Stable						Down 3.3 µg/L	
81-4	GW-SR-1998	6/10/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.5	ND(1.0)
81-4	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
81-4	GW-SR-2034	9/7/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
81-4	GW-SR-2054	11/28/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
81-4	GW-SR-2055	11/28/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
81-4	GW-SR-2075	3/14/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
			Change												Stable	

NOTES:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 4

Analytical Results - Southern TCE Plume
Rasmussen Landfill Site
Livingston County, Michigan

				Volatile Organics												
			Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Location	Sample ID	Date Sampled	RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-23D	GW-SR-2007	6/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.2	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2032	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.1	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2058	11/29/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2059	11/29/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2076	3/19/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2077	3/19/2017	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)	ND(1.0)
			Change											Down 0.4 µg/L		
CRA-RA-26D	GW-SR-2006	6/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2057	11/28/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2074	3/16/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-26S	GW-SR-2005	6/13/2016		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	80	ND(2.5)	ND(2.5)
CRA-RA-26S	GW-SR-2030	9/7/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	78	ND(3.3)	ND(3.3)
CRA-RA-26S	GW-SR-2056	11/28/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	76	ND(3.3)	ND(3.3)
CRA-RA-26S	GW-SR-2073	3/16/2017		ND(4.0)	ND(4.0)	ND(40)	ND(40)	ND(40)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	75	ND(4.0)	ND(4.0)
			Change											Down 1 µg/L		

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria.
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L

Table 5

2017 Groundwater Sampling Program
Rasmussen Landfill Site
Livingston County, Michigan

Quarterly Sampling - VOCs	Annual Landfill Monitoring Program - VOCs, SVOCs & Metals	Additional Annual Samples - VOCs
	(2nd Quarter)	*(3rd Quarter)*
81-4	CRA-RA-6S (included in quarterly sampling)	CRA-RA-25
81-8	CRA-RA-8	EB-PZ-4
CRA-RA-2D	CRA-RA-18 (included in quarterly sampling)	PZ-106
CRA-RA-5	CRA-RA-19S	RA-MW-47
CRA-RA-6S	CRA-RA-20	Rasmussen Water Supply Well
CRA-RA-7		
CRA-RA-18		
CRA-RA-22		
CRA-RA-23D		
CRA-RA-24		
CRA-RA-26D		
CRA-RA-26S		
CRA-RA-27		
CRA-RA-28		
CRA-RA-29		
CRA-RA-30		
CRA-RA-31		
CRA-RA-32		
CRA-RA-33		
CRA-RA-34		
CRA-RA-35		
CRA-RA-36		
CRA-RA-37		
PZ-104		
RA-MW-28		
TEMP-PZ-2		

Rasmussen 32504

Ozone Sparge System Inspection

DATE	JAN 4, 2017	JAN 11, 2017	JAN. 16 2017	JAN. 27, 2017	FEB. 1, 2017
OPERATOR SIGNATURE	Steve Rapai	S Rapai	S Rapai	S Rapai	S Rapai

Air Compressor					
Output Pressure psi	110	110	110	110	110
Temperature F					
Run Time hours		113693	113814	114081	114202

Air Sep					
Receiver Pressure psi	54	56	56	58	60
Feed Air Pressure psi	110	110	110	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours		113693.3	113814.3	114080.6	114202.2

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	34	35	36	38
Regulator #2 psi	24	22	21	24	22
Alarm Reading ppm, O3	–	–	–	–	-
Zone On	1	1	3	3	3
Zone Time hours	1/2	1/2	2	2	2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments:

Rasmussen 32504

Ozone Sparge System Inspection

DATE	FEB. 10, 2017	FEB 16, 2017	FEB. 23, 2017	MARCH 1, 2017	MARCH 9, 2017
OPERATOR SIGNATURE	A Rapai	Alex Rapai	A Rapai	A. Rapai	

Air Compressor			NEW COMPRESSOR INSTALLED TODAY	CHANGED OIL FILTER - 150HRS	
Output Pressure psi	110	110	115	115	110
Temperature F			182	177	181
Run Time hours	114418	114568	0	146	

Air Sep					
Receiver Pressure psi	70	~~70~~ 52	56	52	54
Feed Air Pressure psi	110	110	110	115	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	114418.3	114558.4	114751.3	114871.4	

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	37	35	34	36
Regulator #2 psi	22	22	22	22	24
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	1	1	1	3	2
Zone Time hours	1/2	1/2	1/2	2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments: SHUT DOWN FOR COMPRESSOR INSTALLATION WAS ONLY A FEW HOURS.

Rasmussen 32504

Ozone Sparge System Inspection

DATE	MARCH 15, 2017	MARCH 21, 2017	MARCH 31, 2017		
OPERATOR SIGNATURE	A Rapai	A Rapai	A Rapai		

Air Compressor					
Output Pressure psi	115	120	105		
Temperature F	181	182	181		
Run Time hours	446	593	832		

Air Sep					
Receiver Pressure psi	56	58	56		
Feed Air Pressure psi	110	110	110		
Cycle Pressure psi	70	75	70		
Holding Tank Pressure psi	42	42	42		
Run Time hours		115321.7	115561.7		

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN		

Ozone Generator					
Oxygen Supply, LPM	7	7	7		
% O3 capacity	45	45	45		
Regulator #1 psi	35	36	36		
Regulator #2 psi	22	22	24		
Alarm Reading ppm, O3	-	-	-		
Zone On	2	3	1		
Zone Time hours	1/2	2	1/2		

Distribution Panel					
CFM	0.5	0.8	0.8		
O3 Feed Conc. Ppm O3					

Comments:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: WED. JAN. 11, 2017
Time: 3:45 PM

Weather Conditions: CLOUDY, WINDY 39°F

Observations

Erosion-North Face: SNOW COVERED

Erosion-South Face:

Erosion-East Face:

Erosion-West Face:

Erosion-Misc.:

Storm Water Ponds: EMPTY - FROZEN

Drainage Spillways & Outfalls: SNOW COVERED

Roadways: GOOD - PLOWED

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
SITE ROADS PLOWED

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: FRIDAY, JANUARY 27, 2017
Time: 2:00 PM

Weather Conditions: PERIODIC SNOW SHOWERS, 34°F

Observations

Erosion-North Face: OK - PARTIALLY SNOW COVERED

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: OK - EMPTY

Drainage Spillways & Outfalls: OK

Roadways: OK

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: FRIDAY, FEBRUARY 10, 2017
Time: 1:00PM

Weather Conditions: SNOW SHOWERS 35°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: EMPTY

Drainage Spillways & Outfalls: OK

Roadways: OK

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: FEBRUARY 24, 2017
Time: 2:00 PM

Weather Conditions: CLOUDY, STRONG, THUNDERSTORMS EXPECTED, 65°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: EMPTY

Drainage Spillways & Outfalls: EMPTY - DRY

Roadways: GOOD

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: WEDNESDAY, MARCH 8, 2017
Time: 10:00AM

Weather Conditions: VERY STRONG WINDS (HIGH WIND WARNING), GUSTS UP TO 70 MPH, SUN, 42°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: EMPTY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: MARCH 31, 2017
Time: 5:00PM

Weather Conditions: CLOUDY 48°

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: WET

Drainage Spillways & Outfalls: WET - FLOWING

Roadways: MUDDY

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

SPARGE WELL PRESSURE READINGS
RASMUSSEN SITE
CRA PROJECT #32504

DATE:	JAN 24 & 27, 2017		DATE:	FEB 16 & 24, 2017		DATE:	MARCH 14, 15, 16, 19 & 20, 2017	
WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL
SW-1	0.8	8	SW-1	0.7	8	SW-1	0.8	10
SW-2	0.8	8	SW-2	0.7	8	SW-2	0.8	8
SW-3	0.7	14	SW-3	0.8	15	SW-3	0.8	15
SW-4	0.7	15	SW-4	0.8	15	SW-4	0.8	14
SW-5	0.8	15	SW-5	0.8	14	SW-5	0.7	15
SW-6	0.8	15	SW-6	0.8	15	SW-6	0.8	14
SW-7	0.8	14	SW-7	0.8	15	SW-7	0.7	14
SW-8	—	—	SW-8	—	—	SW-8	—	—
SW-9	—	—	SW-9	—	—	SW-9	—	—
SW-10	—	—	SW-10	—	—	SW-10	—	—
SW-11	—	—	SW-11	—	—	SW-11	—	—
SW-12	0.7	14	SW-12	0.8	15	SW-12	0.7	15
SW-13	0.7	2	SW-13	0.7	2	SW-13	0.8	2
SW-14	—	—	SW-14	—	—	SW-14	—	—
SW-15	—	—	SW-15	—	—	SW-15	—	—
SW-16	—	—	SW-16	—	—	SW-16	—	—
SW-17	0.8	16	SW-17	0.8	16	SW-17	0.8	16
SW-18	0.7	17	SW-18	0.8	16	SW-18	0.7	17
SW-19	0.7	17	SW-19	0.8	17	SW-19	0.8	17
SW-20	0.7	17	SW-20	0.8	16	SW-20	0.8	17
SW-21	—	—	SW-21	—	—	SW-21	—	—
SW-22	0.7	14	SW-22	0.8	13	SW-22	0.7	15
SW-23	0.8	13	SW-23	0.7	15	SW-23	0.8	14
SW-24	0.8	16	SW-24	0.7	15	SW-24	0.8	14
SW-25	0.8	15	SW-25	0.8	15	SW-25	0.8	15
SW-26	0.7	6	SW-26	0.8	7	SW-26	0.7	6
SW-27	0.8	6	SW-27	0.7	7	SW-27	0.8	7
SW-28	0.8	7	SW-28	0.8	7	SW-28	0.7	6
SW-29	0.8	7	SW-29	0.8	7	SW-29	0.8	7
SW-30	—	—	SW-30	—	—	SW-30	—	—

12/9/2016 32504-25

WELL ID	LEVEL
MW-41	48.26
MW-42	64.44
MW-47	54.52
MW-54	56.95
MW-55	37.69
MW-56	34.70
MW-58	22.22
EB-PZ-2	41.24
EB-PZ-4	54.51
EB-PZ-5	56.19
EB-PZ-6	55.95
PZ-103	58.11
PZ-104	56.13
PZ-105	52.83
PZ-106	40.29
TEMP-PZ-2	54.93

32504-25 3/14/2017

TASK: BEGIN 1/4LY SAMPLE EVENT
GHD: STEVE RAPA,
WEATHER: SUN, 17°, WIND CHILL 0°F (COLD!)
H&S: LEVEL D
TAILGATE: COLD STRESS, WORKING IN SNOW, PRESERVED GLASS SAMPLE BOTTLES.
CALIBRATION OF RENTAL HORIBA (U-22) NF07596,
pH=4.00, COND.=4.49 mS/cm, TURB.=0.0 NTU, D.O.=8.80 mg/L, TEMP=22.03.

SAMPLE OF CRA-RA-2D

TIME	pH	COND.	TURB.	D.O.	TEMP.
1145	6.19	1.16	8.0	13.83	10.57
1200	6.70	1.15	4.0	9.69	10.32
1205	6.73	1.14	1.6	9.30	10.44
1210	6.76	1.13	1.3	8.93	10.28
1215	6.78	1.12	1.8	8.70	10.43
1220	6.79	1.11	1.8	8.52	10.41
1225	6.79	1.11	1.9	8.51	10.43
1230	6.79	1.11	1.7	8.51	10.41

SAMPLED @ 1231 ID: GW-32504-031417-SR-2060

3/14/17 32504-25

SAMPLE OF CRA-RA-5

TIME	pH	COND.	TURB.	D.O.	TEMP.
1250	6.85	0.775	2.5	9.68	10.34
1310	6.71	0.725	1.4	8.34	10.83
1315	6.71	0.717	0.9	8.39	10.72
1320	6.68	0.713	0.8	8.35	10.61
1325	6.69	0.715	0.4	8.39	10.59
1330	6.72	0.713	0.2	8.38	10.58
1335	6.72	0.713	0.1	8.35	10.58
1340	6.72	0.712	0.3	0.36	10.58

SAMPLED @ 1341 ID: GW-32504-031417-SR-2061

SAMPLE OF RA-MW-28

1355	7.09	0.486	27.6	10.45	10.32
1410	6.76	0.505	4.1	9.94	10.43
1415	6.77	0.506	3.5	9.97	10.45
1420	6.77	0.506	1.3	9.98	10.44
1425	6.77	0.506	1.3	9.99	10.48
1430	6.78	0.507	1.8	9.97	10.48
1435	6.78	0.507	1.4	9.99	10.48

SAMPLED @ 1436 ID: GW-32504-031417-SR-2062

SAMPLE OF CRA-RA-18

1450	6.78	1.17	9.2	12.13	10.08

CONTINUED ON NEXT PAGE

32504-25 3/14/17

SAMPLE OF CRA-RA-18 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1505	6.67	1.10	1.3	11.68	9.98
1515	6.69	1.11	0.2	11.65	9.98
1520	6.71	1.11	0.3	11.63	9.99
1525	6.71	1.11	0.2	11.63	10.01
1530	6.71	1.11	0.1	11.65	11.01

SAMPLED @ 1531 ID: GW-32504-031417-SR-2063

SAMPLES PACKED IN COOLER WITH ICE.

3/15/17 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT.
GHD: STEVE RAPAI
WEATHER: 14°, SUN, WINDY, WIND CHILL = -2°
H&S: LEVEL D
TAILGATE: WORKING IN SNOW, SNOW BLIND (BRIGHT SUN), WIND, COLD STRESS, SAMPLE BOTTLES.
CALIBRATION OF HORIBA (U-22)
NF07596: pH = 4.00, COND. = 4.49 mS/cm, TURB. = 0.0 NTU, D.O. = 8.21 mg/L, TEMP. = 23.46 °C

SAMPLE OF CRA-RA-28

TIME	pH	COND.	TURB.	D.O.	TEMP.
1045	6.54	1.02	7.0	11.36	11.55
1100	6.74	1.00	2.6	8.89	11.39
1105	6.77	1.00	1.6	8.54	11.44
1110	6.78	1.00	1.1	8.40	11.42
1115	6.78	1.00	0.0	8.38	11.41
1120	6.78	0.99	0.2	8.37	11.40
1125	6.78	1.00	0.2	0.37	11.40

SAMPLED @ 1126 ID: GW-32504-031517-SR-2064

3/15/17 32504-25

SAMPLE OF PZ-104

TIME	pH	COND.	TURB.	D.O.	TEMP.
1140	7.17	1.38	37.0	9.26	11.52
1155	6.77	1.51	2.6	7.80	11.53
1200	6.76	1.51	1.6	7.68	11.55
1205	6.80	1.52	0.4	7.58	11.52
1210	6.81	1.53	0.8	7.55	11.50
1220	6.81	1.53	0.6	7.53	11.50
1225	6.81	1.53	1.0	7.52	11.50

SAMPLED @ 1226 ID: GW-32504-031517-SR-2065

SAMPLE OF CRA-RA-24

1235	7.00	1.14	0.7	8.67	11.43
1250	6.80	1.13	3.6	7.47	11.51
1255	6.79	1.13	3.0	7.41	11.53
1300	6.78	1.13	2.2	7.35	11.53
1305	6.78	1.13	2.6	7.33	11.53
1310	6.78	1.13	2.4	7.33	11.53

SAMPLED @ 1311 ID: GW-32504-031517-SR-2066

SET UP AT CRA-RA-30 – WELL WOULD NOT PRODUCE. PULLED TOP SECTION OF TUBING INTO TRUCK TO WARM. TUBING EVENTUALLY THAWED & BEGAN TO PRODUCE WATER.

3/15/17 32504-25

SAMPLE OF CRA-RA-30

TIME	pH	COND.	TURB.	D.O.	TEMP.
1350	6.85	1.14	18.2	8.25	11.31
1405	6.82	1.15	9.8	7.55	11.22
1420	6.83	1.15	3.2	7.32	11.27
1430	6.84	1.15	1.5	7.26	11.27
1435	6.84	1.15	1.3	7.22	11.20
1440	6.83	1.15	1.2	7.23	11.21
1445	6.83	1.15	1.0	7.22	11.20

SAMPLED @ 1446 ID: GW-32504-031517-SR-2067

SAMPLE OF CRA-RA-32

1455	6.86	1.02	2.5	7.58	11.12
1515	6.85	1.01	0.0	6.90	11.04
1520	6.85	1.00	0.0	6.81	11.03
1525	6.86	1.00	0.0	6.81	11.03
1530	6.86	1.00	0.0	6.83	11.03

SAMPLED @ 1531 ID: GW-32504-031517-SR-2068

SAMPLE OF CRA-RA-22

1545	6.83	1.26	15.7	7.42	11.18
1600	6.76	1.21	6.3	6.95	11.28
1605	6.75	1.19	2.7	6.89	11.21
1610	6.76	1.18	1.4	6.87	11.23

CONTINUED ON NEXT PAGE

32504-25 3/15/2017

SAMPLE OF CRA-RA-22 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1615	6.76	1.17	1.9	6.84	11.35
1620	6.76	1.16	1.6	6.82	11.35
1625	6.76	1.16	1.8	6.83	11.35

SAMPLED @ 1626 ID: GW-32504-031517-SR-2069

SAMPLED @ 1630 ID: GW-32504-031517-SR-2070

SAMPLE OF TEMP-PZ-2

1645	6.81	2.06	0.0	7.25	11.09
1655	6.79	2.10	0.0	7.03	11.09
1705	6.80	2.15	0.0	6.90	11.05
1710	6.80	2.16	0.0	6.90	11.02
1715	6.80	2.16	0.0	6.90	11.01
1720	6.80	2.15	0.0	6.90	11.01

SAMPLED @ 1721 ID: GW-32504-031517-SR-2071

SAMPLES PACKED IN COOLER WITH ICE.

3/16/17 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT.

GHD: STEVE RAPAI

WEATHER: SUN 18°F, HIGH OF 38°F

H&S: LEVEL D

TAILGATE: SAMPLE BOTTLES, WORKING WITH SNOW ON THE GROUND, MELTING SNOW, SAMPLE EQUIPMENT.

CALIBRATION OF HORIBA (U-22)

NF 07596: pH = 4.00, COND. = 4.49 mS/cm

TURB. = 0.0 NTU, D.O. = 8.02 mg/L,

TEMP. = 24.45 °C

SAMPLE OF CRA-RA-27

TIME	pH	COND	TURB.	D.O.	TEMP.
1200	6.73	1.81	13.4	10.40	13.21
1215	6.53	1.94	1.8	9.14	11.97
1225	6.57	1.95	2.6	8.63	11.85
1230	6.58	1.95	2.5	8.41	11.85
1235	6.58	1.95	1.7	8.38	11.87
1240	6.58	1.95	1.4	8.39	11.86

SAMPLED @ 1241 ID: GW-32504-031617-SR-2072

SAMPLE OF CRA-RA-26S

1305	6.86	1.41	5.2	11.45	10.98

CONTINUED ON NEXT PAGE

32504-25 3/16/17

SAMPLE OF CRA-RA-26S (CONTINUE)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1325	6.58	1.41	0.0	10.22	11.05
1330	6.58	1.42	0.0	10.09	11.09
1335	6.58	1.42	0.0	10.01	11.12
1340	6.58	1.42	0.0	9.99	11.09
1345	6.58	1.42	0.0	9.99	11.09

SAMPLED @ 1346 ID: GW-32504-031617-SR-2073

SAMPLE OF CRA-RA-26D

1400	6.86	1.75	62.7	10.64	11.32
1425	6.65	1.76	1.0	7.83	10.98
1430	6.66	1.76	0.9	7.78	10.98
1435	6.66	1.76	0.6	7.76	10.98
1440	6.66	1.76	0.5	7.76	10.97

SAMPLED @ 1441 ID: GW-32504-031617-SR-2074

SAMPLES PACKED IN COOLER WITH ICE FOR GHD DROP OFF @ TEST AMERICA, BRIGHTON, MI.

3/19/2017 32504-25

TASK: CONTINE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: MOSTLY CLOUDY 38°F, HIGH OF 42°F

H&S: LEVEL D

TAILGATE: WORKING IN MELTING SNOW & MUDDY CONDITIONS, SAMPLE BOTTLES, CONTROL BOX FOR WELL PUMPS.

CALIBRATION OF HORIBA (U-22) NFO7596 pH=4.00 COND=4.49 mS/cm, TURB=0.0 NTU, D.O.=7.78 mg/L, TEMP=26.01 °C

SAMPLE OF 81-4

TIME	pH	COND	TURB	D.O.	TEMP
1345	6.30	1.39	54.0	11.42	11.51
1415	6.62	1.35	4.1	8.61	11.57
1420	6.63	1.35	4.1	8.58	11.58
1425	6.63	1.35	3.8	8.57	11.58
1430	6.62	1.35	3.6	8.58	11.58

SAMPLED @ 1431 ID: GW-32504-031917-SR-2075

SAMPLE OF CRA-RA-23D

1500	7.39	0.814	21.2	12.99	13.24
1530	7.07	0.694	2.3	11.11	10.58
1535	7.08	0.693	3.6	10.17	10.59

CONTINUED ON NEXT PAGE

3/19/17 32504-25

SAMPLE OF CRA-RA-23D (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1540	6.98	0.691	1.5	9.88	10.52
1545	6.96	0.692	1.9	9.85	10.51
1550	6.95	0.692	2.1	9.83	10.51
1555	6.95	0.692	1.7	9.83	10.52

SAMPLED @ 1556 ID: GW-32504-031917-SR-2076

SAMPLED @ 1600 ID: GW-32504-031917-SR-2077

SAMPLES PACKED IN COOLER WITH ICE.

3/20/2017 32504-25

TASK: CONTINUE 1/4 LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: CLOUDY 46°F

H&S: LEVEL D

TAILGATE: WORKING IN MUDDY CONDITIONS, SAMPLE BOTTLES, PUMP CONTROL BOX.

CALIBRATION OF HORIBA (U-22) NF0759

pH=4.00, COND=4.49 mS/cm, TURB=0.0 NTU, D.O.=8.11 mg/L, TEMP=24.20°C

SAMPLE OF CRA-RA-65

TIME	pH	COND.	TURB.	D.O.	TEMP.
1405	6.69	1.14	7.0	11.06	12.42
1420	6.60	1.15	1.6	9.50	12.03
1430	6.61	1.15	1.7	8.99	11.94
1435	6.61	1.15	1.0	8.89	11.94
1440	6.61	1.15	1.4	8.86	11.95
1445	6.61	1.15	1.4	8.86	11.95

SAMPLED @ 1446 ID: GW-32504-032017-SR-2078

MS/MSD

SAMPLE OF CRA-RA-31

1500	7.21	0.576	3.0	10.33	11.14
1515	7.05	0.575	3.1	8.86	11.06
1520	7.03	0.574	2.9	8.74	11.04

CONTINUED ON NEXT PAGE

32504-25 3/20/17

SAMPLE OF CRA-RA-31 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1525	7.03	0.582	1.9	8.63	11.04
1530	7.03	0.603	0.6	8.54	11.02
1535	7.03	0.630	0.9	8.45	11.02
1540	7.03	0.657	2.7	8.35	11.02
1545	7.04	0.696	1.4	8.26	11.02
1550	7.03	0.698	1.3	8.23	11.02
1555	7.03	0.698	1.1	8.22	11.02

SAMPLED @ 1556 ID: GW-32504-032017-SR-2079

SAMPLE OF CRA-RA-7

1605	7.30	0.348	3.9	10.46	11.51
1615	7.25	0.334	3.2	10.16	11.44
1625	7.26	0.335	0.8	10.15	11.43
1630	7.26	0.335	0.7	10.16	11.43
1635	7.25	0.336	0.9	10.15	11.43
1640	7.25	0.335	0.8	10.15	11.43

SAMPLED @ 1641 ID: GW-32504-032017-SR-2080

SAMPLES PACKED IN COOLER WITH ICE.

3/21/2017 32504-25

TASK: FINISH 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: SUN 43°, HIGH 55°F

H&S: LEVEL D

TAILGATE: SAMPLE BOTTLES, PUMP CONTROL BOX, PINCH POINTS, TRIP HAZARDS.

CALIBRATION OF HORIBA (U-22)

NFO 7596: pH = 4.00, COND. = 4.49 mS/cm TURB = 0.0 NTU, D.O. = 7.62 mg/L, TEMP = 25.86°C

SET UP @ C2A-RA-29. PULLED ON WELL FOR OVER 15 MINUTES WITH NO RESULTS. PULLED PUMP & FOUND WATER LEVEL ONLY HALFWAY UP LENGTH OF PUMP. WATER LEVEL TOO LOW WITH NO RESULTS.

SAMPLE OF 81-8

TIME	pH	COND.	TURB.	D.O.	TEMP.
1230	6.26	0.774	6.0	17.99	11.44
1245	6.63	0.760	2.5	19.25	11.41
1255	6.78	0.741	1.4	19.56	11.42
1300	6.82	0.745	1.9	19.59	11.39

CONTINUED ON NEXT PAGE.

32504-25 3/21/17

SAMPLE OF 81-8 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1305	6.84	0.745	2.4	19.62	11.39
1310	6.87	0.750	1.3	19.67	11.42
1315	6.88	0.751	0.4	19.66	11.41
1320	6.88	0.751	0.9	19.66	11.42

SAMPLED @ 1321 ID: GW-32504-032117-SR-2081

SAMPLES PACKED IN COOLER WITH ICE FOR GHD DROP OFF @ TEST AMERICA IN BRIGHTON, MICHIGAN.

3/31/2017 32504-25

TASK: QUARTERLY WATER LEVELS

GHD: STEVE RAPAI

WEATHER:

HES: LEVEL D

TAILGATE: TRIPHAZARDS, MUDDY CONDITIONS, PINCH POINTS

WELL ID	LEVEL
81-4	30.33
81-5	34.87
81-7	48.31
81-8	44.02
81-9	16.47
RA-1	69.42
RA-2D	56.42
RA-2S	56.13
RA-3	53.25
RA-5	55.25
RA-6S	59.69
RA-7	32.99
RA-8	16.98
RA-16	58.38
RA-18	42.00
RA-18D	56.71
RA-19D	50.68

32504-25 3/31/2017

WELL ID	LEVEL
RA-19S	48.05
RA-20	58.96
RA-22	54.23
RA-23D	32.21
RA-23S	33.62
RA-24	57.14
RA-25	54.62
RA-26D	50.31
RA-26S	50.19
RA-27	62.02
RA-28	54.93
RA-29	46.75
RA-30	58.97
RA-31	32.89
RA-32	35.51
RA-33	32.96
RA-34	42.24
RA-35	32.70
RA-36	37.00
RA-37	36.72
MW-22	42.67
MW-28	57.57
MW-32	42.14
MW-34C	24.27

3/31/2017 32504-25

WELL ID	LEVEL
MW-35	34.26
MW-41	47.70
MW-42	63.89
MW-47	53.99
MW-54	56.38
MW-55	37.11
MW-56	34.27
MW-58	21.69
EB-PZ-2	40.79
EB-PZ-4	53.80
EB-PZ-5	55.52
EB-PZ-6	55.25
PZ-103	58.51
PZ-104	55.77
PZ-105	52.15
PZ-106	39.97
TEMP-PZ-2	54.29