US EPA RECORDS CENTER REGION 5
515440

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January 8, 2015

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. 129
Groundwater and Landfill RD/RA
Reporting Period: October 1 through December 31, 2014
Rasmussen Landfill (Site), Livingston Co., Michigan

1.0 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.

2.0 Activities Performed During this Reporting Period

2.1 Operation and Maintenance

The quarterly round of groundwater elevations were measured on December 4, 2014. The corresponding groundwater contour map is provided on Figure 1.

CRA collected quarterly groundwater samples on December 9 through 12, December 15 and 16, 2014 consistent with the Groundwater Remediation Monitoring Program. The results from these samples are discussed below.

2.2 Reports

Quarterly Progress Report No. 128 was submitted to USEPA and Michigan Department of Environmental Quality (MDEQ) on October 10, 2014.

3.0 Summary of Findings

The results of the fourth quarter 2014 sampling are provided in Tables 1 through 5. 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 2014 sampling, five of the 21 monitoring wells sampled had Compounds of Concern (COCs) at concentrations above generic Part 201 Drinking Water Criteria (DWC).

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

CRA-RA-22	4.0 µg/L vinyl chloride
CRA-RA-24	5.3 µg/L vinyl chloride
CRA-RA-26S	86/85 µg/L trichloroethene (duplicate sample)
CRA-RA-27	11 µg/L vinyl chloride
CRA-RA-30	3.3 µg/L vinyl chloride

These were the same five monitoring wells that had COCs above Part 201 DWC during the third quarter 2014 sampling event. COC concentrations detected in these wells during fourth quarter 2014 sampling were similar to COC concentrations detected in these wells during third quarter 2014 sampling.

CRA did not collect the annual Rasmussen residential water well sample in the fourth quarter 2014 because the plumbing system is disconnected pending a repair. CRA will attempt to collect the annual Rasmussen residential water well sample during Q1 2015, pending repair of the plumbing system.

4.0 Problems Encountered

Other than several weather-related power interruptions, no problems were encountered with respect to the operation and maintenance of the ozone treatment system during the fourth quarter 2014.

5.0 Corrective Measures to Rectify Problems

CRA visited the Site and re-started the treatment system after each power outage. No corrective measures were implemented with respect to the operation and maintenance of the ozone treatment system during the fourth quarter 2014.

6.0 Contacts and Significant Correspondence with Public Representatives

Communication	*Date*	*Subject of Correspondence/Discussion*
Quarterly Report	October 10, 2014	Report No. 128 submitted to Mr. H. Caine (USEPA) and Mr. K. Krawczyk (MDEQ).
email	November 17, 2014	Inquiry from Mr. Howard Caine regarding the application for permit for to work in the right of way
email	December 8, 2014	Inquiry from Mr. Howard Caine regarding the application for permit for to work in the right of way

7.0 Planned Upcoming Activities/Schedule

Landfill and groundwater component activities planned for the first quarter of 2015:

- Continue the operation of ozone sparging system
- Continue to monitor for the presence of ozone at each sparge vault
- The first quarter groundwater sampling event is scheduled for the week of March 2, 2015

- The wells to be sampled in the first quarter of 2015 are listed in Table 5
- Apply to the Livingston County Road Commission for access to install vertical aquifer sampling (VAS) boreholes and monitoring wells in the Spicer Road right of way

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

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Bart Bartholomy

AJD/ac/38
Encl.

cc: Mike Stoelton, JCI
Chuck Pinter, Ford
Nan Bernado, BASF
Michael Simpson
Steven Nadeau, Honigman Miller

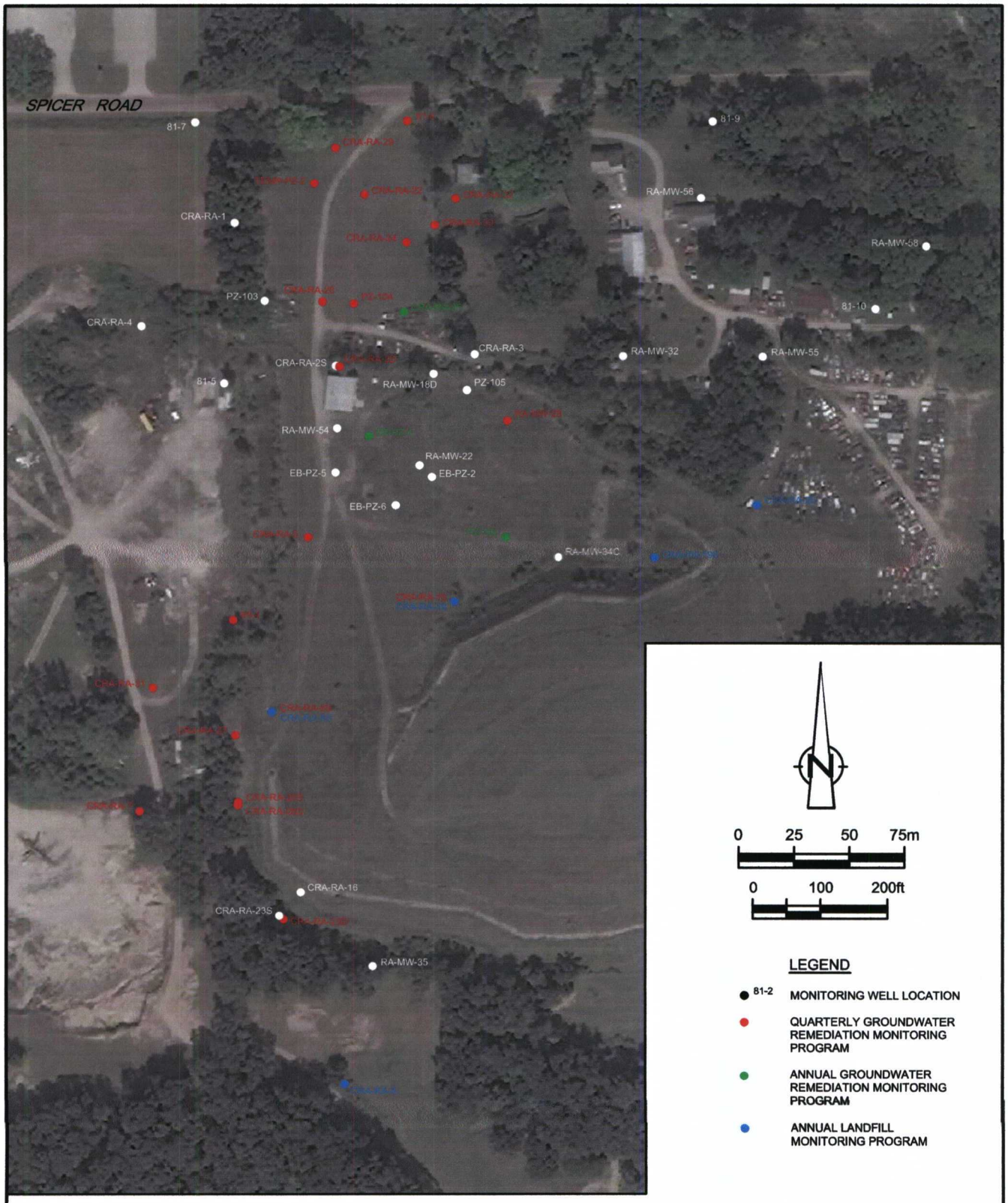

figure 1

2014 GROUNDWATER MONITORING PROGRAMS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN038)GN-WA001 DEC 23/2014

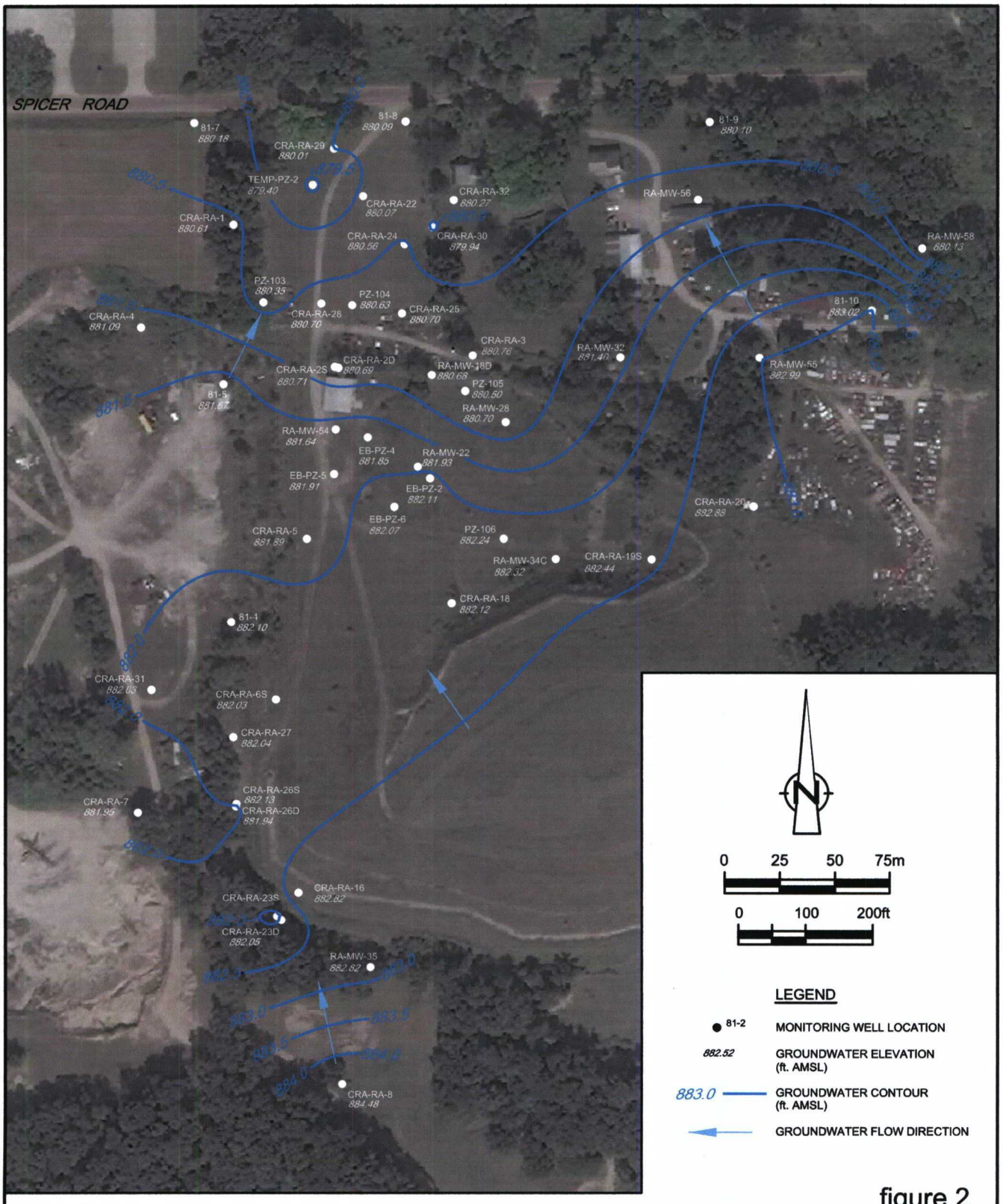

figure 2

GROUNDWATER ELEVATION CONTOURS (UPPER AQUIFER)
DECEMBER 2014
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN038)GN-WA002 DEC 23/2014

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
			DWC (1)	200	70 (2)	13,000	1,000	730	5	100	74	5	700	5	2	280
GIA-RA-22	GW-SR-1766	3/13/2014		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)	7.8	ND(1.0)
GIA-RA-22	GW-SR-1793	6/11/2014		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)	4.2	ND(1.0)
GIA-RA-22	GW-SR-1818	8/19/2014		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)	5.6	ND(1.0)
GIA-RA-22	GW-SR-1846	12/11/2014		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)	4	ND(1.0)
			Change												Down 1.6 µg/L	
GIA-RA-24	GW-SR-1769	4/8/2014		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)	6.2	ND(1.0)
GIA-RA-24	GW-SR-1790	6/11/2014		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)	5.2	ND(1.0)
GIA-RA-24	GW-SR-1815	8/18/2014		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)	6.0	ND(1.0)
GIA-RA-24	GW-SR-1843	12/9/2014		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)	5.3	ND(1.0)
			Change												Down 0.7 µg/L	
GIA-RA-25	GW-SR-1645	9/13/2012		ND(1.0)	1.2	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)
GIA-RA-25	GW-SR-1716	7/25/2013		ND(1)	1.0	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
GIA-RA-25	GW-SR-1717	7/25/2013	Duplicate	ND(1)	1.0	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
GIA-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)
			Change		Up 0.1 µg/L										Up 0.1 µg/L	
GIA-RA-28	GW-SR-1767	4/8/2014		ND(1.0)	1.8	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)
GIA-RA-28	GW-SR-1788	6/10/2014		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)	ND(1.0)	ND(1.0)
GIA-RA-28	GW-SR-1813	8/18/2014		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)	ND(1.0)	ND(1.0)
GIA-RA-28	GW-SR-1841	12/9/2014		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 0.3 µg/L											
GIA-RA-29	GW-SR-1772	4/8/2014		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)
GIA-RA-29	GW-SR-1796	6/11/2014		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)	ND(1.0)	ND(1.0)
GIA-RA-29	GW-SR-1820	8/19/2014		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)
GIA-RA-29	GW-SR-1849	12/12/2014		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)
			Change						Stable; all Non-Detect							
GIA-RA-30	GW-SR-1770	4/8/2014		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)	4.5	ND(1.0)
GIA-RA-30	GW-SR-1791	6/11/2014		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)	3.1	ND(1.0)
GIA-RA-30	GW-SR-1815	8/18/2014		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)	3.6	ND(1.0)
GIA-RA-30	GW-SR-1844	12/10/2014		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)	3.3	ND(1.0)
			Change												Down 0.3 µg/L	
GIA-RA-32	GW-SR-1771	4/8/2014		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)
GIA-RA-32	GW-SR-1792	6/11/2014		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)	ND(1.0)	ND(1.0)
GIA-RA-32	GW-SR-1817	8/18/2014		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)
GIA-RA-32	GW-SR-1845	12/11/2014		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)
			Change						Stable; all Non-Detect							
RJ-104	GW-SR-1768	4/8/2014		ND(1.0)	3.8	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)
RJ-104	GW-SR-1789	6/10/2014		ND(1.0)	3.8	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RJ-104	GW-SR-1814	8/18/2014		ND(1.0)	3.8	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)
RJ-104	GW-SR-1842	12/10/2014		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)
			Change		Down 0.6											
TEMP-PZ-2	GW-SR-1765	3/13/2014		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)
TEMP-PZ-2	GW-SR-1794	6/11/2014		ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
TEMP-PZ-2	GW-SR-1795	6/11/2014	Duplicate	ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1.1)	ND(1.0)	ND(1.0)	ND(1)	ND(1)
TEMP-PZ-2	GW-SR-1819	8/19/2014		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)
TEMP-PZ-2	GW-SR-1847	12/11/2014		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)
			Change						Stable; all Non-Detect							
EI-8	GW-SR-1773	4/8/2014		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)
EI-8	GW-SR-1797	6/11/2014		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)	ND(1.0)	ND(1.0)
EI-8	GW-SR-1821	8/19/2014		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.1)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
EI-8	GW-SR-1822	8/19/2014	Duplicate	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.1)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
EI-8	GW-SR-1849	12/12/2014		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)
			Change						Stable; all Non-Detect							

Notes:

(1) Michigan Part 201 Drinking Water 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 - POSLD 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
			DWC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-2D	GW-SR-1764	3/12/2014		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	60	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-2D	GW-SR-1787	6/10/2014		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	57	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-2D	GW-SR-1812	8/18/2014		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	67	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-2D	GW-SR-1839	12/9/2014		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	58	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
			Change							Down 9 µg/L						
CRA-RA-18	GW-SR-1777	4/9/2014		79	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-1799	6/17/2014		76	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-1831	9/3/2014		80	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-18	GW-SR-1853	12/15/2014		66	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 14 µg/L												
EB-PZ-4	GW-SR-1548	8/24/2011		ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	38.7	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
EB-PZ-4	GW-SR-1630	9/10/2012		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1)	39	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
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)
			Change							Up 2 µg/L					Down 0.8 µg/L	
PZ-106	GW-SR-1549	8/25/2011		ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
PZ-106	GW-SR-1640	9/12/2012		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-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)
			Change						Stable; all Non-Detect							
RA-MW-28	GW-SR-1778	4/9/2014		8.0	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)
RA-MW-28	GW-SR-1800	6/18/2014		7.7	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-1830	9/3/2014		11	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-1854	12/15/2014		8.7	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 2.3 µg/L												

Notes:

(1) Michigan Part 201 Drinking Water 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
			DWC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-5	GW-SR-1779	4/10/2014		21	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-1798	6/12/2014		21	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-1823	8/19/2014		15	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-1840	12/9/2014		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	Up 4 µg/L												
CRA-RA-6S	GW-SR-1780	4/10/2014		1.4	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)
CRA-RA-6S	GW-SR-1803	6/20/2014		ND(1.0)	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-1804	6/20/2014	Duplicate	ND(1.0)	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-1832	9/11/2014		1.5	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-1855	12/15/2014		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)
			Change	Up 0.2 µg/L												
CRA-RA-7	GW-SR-1776	4/9/2014		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)
CRA-RA-7	GW-SR-1806	6/19/2014		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)
CRA-RA-7	GW-SR-1825	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)
CRA-RA-7	GW-SR-1851	12/15/2014		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)
CRA-RA-7	GW-SR-1852	12/15/2014	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-27	GW-SR-1781	4/11/2014		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)	10	ND(1.0)
CRA-RA-27	GW-SR-1802	6/18/2014		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)	12	ND(1.0)
CRA-RA-27	GW-SR-1833	9/11/2014		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)	8.9	ND(1.0)
CRA-RA-27	GW-SR-1834	9/11/2014	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)	8.9	ND(1.0)
CRA-RA-27	GW-SR-1856	12/16/2014		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)	11	ND(1.0)
			Change												Up 2.1 µg/L	
CRA-RA-31	GW-SR-1774	4/9/2014		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)
CRA-RA-31	GW-SR-1775	4/9/2014	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-1805	6/20/2014		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)
CRA-RA-31	GW-SR-1824	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(1.6)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-1850	12/15/2014		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)
			Change						Stable; all Non-Detect							
81-4	GW-SR-1785	4/11/2014		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)	2.0	ND(1.0)
81-4	GW-SR-1811	6/19/2014		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)	2.1	ND(1.0)
81-4	GW-SR-1837	9/12/2014		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)	1.6	ND(1.0)
81-4	GW-SR-1860	12/16/2014		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)	2	ND(1.0)
			Change												Up 0.4 µg/L	

Notes:

(1) Michigan Part 201 Drinking Water 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	DWC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-23D	GW-SR-1786	4/14/2014		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)	5.9	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-1810	6/19/2014		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)	5.1	ND(1.0)	ND(1,0)
CRA-RA-23D	GW-SR-1838	9/12/2014		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)	4.0	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-1861	12/16/2014		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)	3.4	ND(1.0)	ND(1.0)
			Change											Down 0.6 µg/L		
CRA-RA-26D	GW-SR-1783	4/11/2014		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)
CRA-RA-26D	GW-SR-1784	4/11/2014	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-26D	GW-SR-1809	6/19/2014		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)
CRA-RA-26D	GW-SR-1836	9/11/2014		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)
CRA-RA-26D	GW-SR-1859	12/16/2014		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)
			Change						Stable; all Non-Detect							
CRA-RA-26S	GW-SR-1782	4/11/2014		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)	100	ND(4.0)	ND(4.0)
CRA-RA-26S	GW-SR-1808	6/19/2014		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	98	ND(2.9)	ND(4.0)
CRA-RA-26S	GW-SR-1835	9/11/2014		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)	99	ND(3.3)	ND(3.3)
CRA-RA-26S	GW-SR-1857	12/16/2014		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)	86	ND(2.5)	ND(2.5)
CRA-RA-26S	GW-SR-1858	12/16/2014	Duplicate	ND(5)	ND(5)	ND(50)	ND(50)	ND(50)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	85	ND(5)	ND(5)
			Change											Down 1 µg/L		

Notes:

(1) Michigan Part 201 Drinking Water 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

2015 GROUNDWATER SAMPLING PROGRAM
RASMUSSEN LANDFILL SITE
LIVINGSTON COUNTY, MICHIGAN

Quarterly Sampling - VOCs	*Q1*	*Q2*	*Q3*	*Q4*
81-4 SP-VC				
81-8 NP				
CRA-RA-2D PDSLD		*Annual Landfill Monitoring Program - VOCs, SVOCs & Metals*	CRA-RA-25 (VOCs only) NP	New Rasmussen Water Supply Well (VOCs only)
CRA-RA-5 SP-VC			EB-PZ-4 (VOCs only) PDSLD	
CRA-RA-6S SP-VC		CRA-RA-6S (included in quarterly sampling) LF	PZ-106 (VOCs only) PDSLD	
CRA-RA-7 SP-VC		CRA-RA-8 LF	RA-MW-47 (VOCs only) Lost 4RDIRR	
CRA-RA-18 PDSLD/SP-VC		CRA-RA-18 (included in quarterly sampling) LF		
CRA-RA-22 NP		CRA-RA-19S LF		
CRA-RA-23D SP-TCE		CRA-RA-20 LF		
CRA-RA-24 NP				
CRA-RA-26D SP-TCE				
CRA-RA-26S SP-TCE				
CRA-RA-27 SP-VC				
CRA-RA-28 NP				
CRA-RA-29 NP				
CRA-RA-30 NP				
CRA-RA-31 SP-VC				
CRA-RA-32 NP				
PZ-104 NP				
RA-MW-28 PDSLD				
TEMP-PZ-2 NP				

Rasmussen 32504

Ozone Sparge System Inspection

DATE	Oct. 3, 2014	Oct. 8, 2014	Oct. 17, 2014	Oct. 22, 2014	Oct. 28, 2014
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	93958.4	94078	94294	94415	94560

Air Sep					
Receiver Pressure psi	56	52	55	56	56
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	93958	~~GREEN~~ 94078.2	94293.8	94414.8	94560.2

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

Ozone Generator					
Oxygen Supply, LPM	7	8	7	7	8
% O3 capacity	45	45	45	45	45
Regulator #1 psi	32	22	33	37	35
Regulator #2 psi	32	35	22	24	23
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	3	2	1	3	3
Zone Time hours	2	1/2	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	Wed. Nov. 5, 2014	Nov. 13, 2014	Nov. 21, 2014	Nov. 25, 2014	Dec. 4, 2014
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		94943	95136	95206	

Air Sep					
Receiver Pressure psi	56	52	54	54	54
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		94942.8	95135.6	95206.2	

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

Ozone Generator					
Oxygen Supply, LPM	7	8	8	8	8
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	36	32	35	34
Regulator #2 psi	22	22	22	22	22
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	1	2	3	1	1
Zone Time hours	1/2	1/2	2	1/2	1/2

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

Comments: BREIF POWER OUTAGE ON NOV. 24 DUE TO VERY STRONG WINDS

Rasmussen 32504

Ozone Sparge System Inspection

DATE	Dec. 12, 2014	Dec 16, 2014	Dec 22, 2014	Dec 31, 2014	
OPERATOR SIGNATURE	A Rapai	A Rapai	A Rapai	A Rapai	

Air Compressor					
Output Pressure psi	110	110	110	110	
Temperature F					
Run Time hours	95619			96071	

Air Sep					
Receiver Pressure psi	56	54	56	54	
Feed Air Pressure psi	110	110	110	110	
Cycle Pressure psi	70	70	70	70	
Holding Tank Pressure psi	42	42	42	42	
Run Time hours	95619.0			96070.6	

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	

Ozone Generator					
Oxygen Supply, LPM	8	8	8	8	
% O3 capacity	45	45	45	45	
Regulator #1 psi	36	35	34	35	
Regulator #2 psi	23	22	22	22	
Alarm Reading ppm, O3	–	–	–	–	
Zone On	3	2	1	1	
Zone Time hours	2	1/2	1/2	1/2	

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

Comments:

SPARGE WELL PRESSURE READINGS
RASMUSSEN SITE
CRA PROJECT #32504

DATE:	Oct. 17 & 22		DATE:	Nov. 13 & 21		DATE:	Dec. 11, 12, 15 & 16	
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	0.8	8	SW-1	0.8	8
SW-2	0.8	8	SW-2	0.8	7	SW-2	0.8	8
SW-3	0.8	14	SW-3	0.7	14	SW-3	0.7	14
SW-4	0.8	14	SW-4	0.8	15	SW-4	0.8	13
SW-5	0.8	14	SW-5	0.8	15	SW-5	0.7	13
SW-6	0.8	15	SW-6	0.7	15	SW-6	0.8	14
SW-7	0.8	14	SW-7	0.7	14	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	0.8	14	SW-12	0.8	14	SW-12	0.8	14
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	0.7	16	SW-17	0.8	17	SW-17	0.8	16
SW-18	0.8	20	SW-18	0.8	20	SW-18	0.7	20
SW-19	0.7	17	SW-19	0.8	17	SW-19	0.7	16
SW-20	0.8	16	SW-20	0.8	17	SW-20	0.8	16
SW-21	—	—	SW-21	—	—	SW-21	—	—
SW-22	0.8	13	SW-22	0.8	14	SW-22	0.8	13
SW-23	0.8	15	SW-23	0.8	14	SW-23	0.8	14
SW-24	0.7	14	SW-24	0.7	14	SW-24	0.8	14
SW-25	0.7	16	SW-25	0.8	15	SW-25	0.7	15
SW-26	0.8	3	SW-26	0.8	2	SW-26	0.8	2
SW-27	0.8	6	SW-27	0.7	7	SW-27	0.8	6
SW-28	0.8	5	SW-28	0.7	6	SW-28	0.8	6
SW-29	0.8	6	SW-29	0.7	7	SW-29	0.8	6
SW-30	—	—	SW-30	—	—	SW-30	—	—

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: WEDNESDAY, OCT. 8, 2014
Time: 2:00 PM

Weather Conditions: WINDY, CLEAR, 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: EMPTY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: GRASS IS STILL GREEN, TREES TURNING COLORS

Signs, Gates, & Fences: GOOD

Actions Taken:

Recommendations:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: TUESDAY OCT. 28, 2014
Time: 3:30 PM

Weather Conditions: RAIN 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: WET

Drainage Spillways & Outfalls: FLOWING

Roadways: GOOD

Vegetation: GOING DORMANT

Signs, Gates, & Fences: OK

Actions Taken:

Recommendations:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: THURSDAY, NOVEMBER 13, 2014
Time: _____

Weather Conditions: MOSTLY CLOUDY, 35°

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:

Recommendations:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: TUESDAY, NOVEMBER 25, 2014
Time: 10:00 AM

Weather Conditions: WIND, SNOW, 35°

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: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:

Recommendations:

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: TUESDAY, DECEMBER 16, 2014
Time: 3:00PM

Weather Conditions: RAIN 48°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: WET BUT EMPTY

Drainage Spillways & Outfalls: FLOWING

Roadways: GOOD

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: DEC. 31, 2014
Time: 12:30 PM

Weather Conditions: MOSTLY CLOUDY 22°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: OK - DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:

—

Recommendations:

—

12/4/14 32504-25

TASK: 1/4LY WATERLEVELS

CRA: STEVE RAPAI

WEATHER: MOSTLY CLOUDY, 35°F

H&S: LEVEL D

WELL ID	LEVEL
81-4	29.72
81-5	34.10
81-7	46.13
81-8	43.10
81-9	15.90
81-10	32.29
RA-1	68.90
RA-2D	55.70
RA-2S	55.44
RA-3	52.59
RA-4	23.54
RA-5	54.60
RA-6	59.00
RA-7	32.52
RA-8	18.41
RA-16	58.32
RA-18	41.45
RA-18D	56.14
RA-19D	50.00

32504-25 12/4/14

WELL ID	LEVEL
RA19-3	47.30
RA-20	58.41
RA-22	53.01
RA-23D	33.01
RA-23S	33.28
RA-24	56.48
RA-25	53.91
RA-26D	49.75
RA-26S	49.64
RA-27	61.45
RA-28	54.11
RA-29	45.79
RA-30	58.15
RA-31	31.65
RA-32	57.08
MW-22	42.01
MW-28	42.22
MW-32	31.75
MW-34C	41.48
MW-35	24.10
MW-41	47.32
MW-42	63.36
MW-47	53.49
MW-54	55.66

12/4/14

WELL ID.	LEVEL
MW-55	36.66
MW-56	35.69
MW-58	21.25
EB-PZ-2	40.00
EB-PZ-4	53.15
EB-PZ-5	54.88
EB-PZ-6	54.62
PZ-103	56.92
PZ-104	54.77
PZ-105	51.54
PZ-106	39.04
TEMP-PZ-2	53.03

32504-25 12/09/14

TASK: BEGIN 1/4 LY SAMPLE EVENT

CRA: STEVE RAPAN

WEATHER: CLOUDY 38°F

H2S: LEVEL D

CALIBRATION OF RENTAL HORIBA U52-

IE B212938

pH=4.00, COND.=4.49, TURB=0.0, D.O.=7.77

SAMPLE OF CRA-RA-2D

TIME	pH	COND	TURB.	D.O.	TEMP.
1310	6.48	1.78	4.9	0.92	11.67
1320	6.63	1.70	3.9	0.21	11.43
1330	6.72	1.71	2.4	0.10	11.25
1335	6.75	1.65	2.6	0.10	11.25
1340	6.79	1.65	1.1	0.11	11.16
1345	6.79	1.66	1.0	0.10	11.15
1350	6.78	1.66	1.7	0.11	11.15

SAMPLED @ 1351 DGW 32504-120914-SR-1839

SAMPLE OF CRA-RA-5

1400	6.73	1.23	3.3	0.18	10.79
1410	6.69	1.20	3.8	0.09	10.78
1420	6.67	1.17	4.2	0.07	10.73
1425	6.67	1.17	4.2	0.08	10.92

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12/9/14 32504.25

SAMPLE OF CRA-RA-5 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1430	6.67	1.17	4.2	0.12	10.71
1435	6.68	1.17	4.1	0.09	10.72
1440	6.67	1.17	4.3	0.08	10.71

SAMPLED @ 1441 ID: GW-32504-120914-SR-1840

SAMPLE OF CRA-RA-28

1455	6.78	0.951	30.3	1.61	10.96
1505	6.72	0.952	11.5	0.21	10.96
1515	6.72	0.950	6.1	0.15	10.98
1520	6.71	0.952	5.8	0.13	10.97

CONTROL BOX NOT WORKING

1530	6.71	0.950	4.7	0.10	10.95
1535	6.72	0.952	4.2	0.09	10.95
1540	6.72	0.952	4.2	0.09	10.95

SAMPLED @ 1541 ID: GW-32504-120914-SR-1841

SAMPLE OF PZ-104

1555	6.96	1.13	108	1.72	10.84
1605	6.75	1.16	12.2	0.34	10.83
1610	6.77	1.17	10.7	0.26	10.88
1615	6.77	1.17	6.4	0.18	10.88

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32504.25 12/9/14

SAMPLE OF PZ-104 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1620	6.75	1.17	5.2	0.11	10.84
1625	6.76	1.17	4.8	0.09	10.84
1630	6.74	1.17	4.6	0.09	10.84
1635	6.74	1.17	4.7	0.09	10.84
1640	6.74	1.17	4.6	0.10	10.85

SAMPLED @ 1641 ID: GW-32504-120914-SR-1842

SAMPLES PACKED IN COOLER WITH ICE

12/10/14 32504-25

TASK: CONTINUE 1/4 LY SAMPLE EVENT

CRA: STEVE RAPAI

WEATHER: CLOUDY, WINDY 30°F

H&S: LEVEL D

CALIBRATION OF RENTAL HORIBA-U52-
I.E. BZ1293B.

pH=4.00, COND=4.49, TURB=0.0, D.O.=8.83

SAMPLE OF CRA-RA-24

TIME	pH	COND	TURB.	D.O.	TEMP.
1330	6.72	0.931	6.4	2.14	10.97
1350	6.77	0.925	1.3	0.51	11.11
1355	6.82	0.926	0.3	0.31	11.08
1400	6.84	0.925	0.5	0.21	11.04
1405	6.85	0.925	2.4	0.17	11.00
1410	6.84	0.925	2.1	0.15	11.01
1420	6.85	0.925	2.0	0.15	11.01

SAMPLED @ 1421 ID: GW-32504-121014-SR-1843

SAMPLE OF CRA-RA-30

1430	6.74	0.849	7.4	1.26	10.80
1440	6.88	0.858	5.1	0.64	10.85
1450	6.87	0.860	4.7	0.29	10.78
1455	6.88	0.860	4.4	0.26	10.77

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32504-25 12/10/14

SAMPLE OF CRA-RA-30 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1500	6.88	0.861	4.3	0.25	10.78
1505	6.88	0.861	4.4	0.25	10.78

SAMPLED @ 1506 ID: GW-32504-121014-SR-1844

SAMPLE OF CRA-RA-32

1515	6.90	0.778	4.7	2.72	10.53
1525	6.90	0.779	4.5	0.53	10.56
1535	6.90	0.779	4.7	0.26	10.54
1540	6.90	0.779	4.6	0.25	10.54
1545	6.90	0.779	4.6	0.25	10.54

SAMPLED @ 1546 ID: GW-32504-121014-SR-1845

SAMPLES PACKED IN COOLER WITH ICE

12/11/14 32504-25

TASK: CONTINUE 1/4LY SAMPLING

CRA: STEVE RAPAI

WEATHER: MOSTLY CLOUDY, WIND, HIGH 38°

H&S: LEVEL D

CALIBRATION OF RENTAL U-52 HORIBA

IE B21293B

pH: 4.00, COND = 4.49, TURB = 0.0, D.O. = 7.93

SAMPLE OF CRA-RA-22

TIME	pH	COND.	TURB.	D.O.	TEMP.
10:00	6.91	0.981	4.9	4.91	11.34
10:20	6.86	0.981	3.7	1.27	11.16
10:25	6.84	0.981	3.1	0.62	11.10
10:30	6.82	0.984	3.4	0.31	11.01
10:35	6.82	0.978	3.0	0.49	10.99
10:40	6.82	0.973	3.1	0.51	10.94
10:45	6.81	0.969	2.0	0.52	10.93
10:50	6.82	0.966	1.4	0.55	10.91
10:55	6.83	0.963	2.5	0.54	10.88

PURGED FOR OVER ONE HOUR

SAMPLED @ 1106 ID: GW-32504-121114-SR-1846

SAMPLE OF TEMP-PZ-2

1115	6.88	1.68	6.4	2.56	10.70

CONTINUED ON NEXT PAGE

32504-25 12/11/14

SAMPLE OF TEMP-PZ-2 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1125	6.81	1.78	6.8	1.47	10.67
1135	6.81	1.82	4.1	1.20	10.60
1140	6.81	1.85	3.9	1.18	10.58
1145	6.80	1.86	2.7	1.21	10.58
1150	6.80	1.86	3.2	1.19	10.59

SAMPLED @ 1151 ID: GW-32504-121114-SR-1847

CRA-RA-29

SET UP AT WELL AND CONTROL BOX WILL NOT WORK - WILL NOT CYCLE FROM DISCHARGE TO REFILL & BACK. PUT IN CALL TO QED AND ALSO CALLED N.F. OFFICE TO SEE IF I CAN RENT ANOTHER CONTROL BOX.

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

12/12/14 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

CRA: STEVE RAPAI

WEATHER: CLOUDY 38°F

H_2S: LEVEL D

CALIBRATION OF RENTAL U-52 HORIBA

IE B21293B

pH=4.00, COND.=4.49, TURB=0.0, D.O.=8.01

NEW CONTROL BOX FROM NF OFFICE

SAMPLE OF CRA-RA-29

TIME	pH	COND.	TURB.	D.O.	TEMP.
BEGAN PURGING @ 1300					
1345	7.04	0.708	3.8	6.82	9.62
1350	7.03	0.708	3.7	6.51	9.46
1355	7.02	0.711	4.5	6.80	9.66
1400	6.98	0.709	4.4	6.35	10.06
1405	6.98	0.709	4.2	6.27	10.08
1410	6.97	0.708	4.0	6.35	10.07
1415	6.97	0.709	3.8	6.36	10.07

SAMPLED @ 1416 ID: GW-32504-121214-SR-1848

SAMPLE OF 81-8

1440	7.05	0.811	35.0	4.16	10.13
1450	7.23	0.806	28.3	6.47	8.59

WELL HAS GONE DRY AFTER ABOUT 15 MINUTES OF PURGING. CAME BACK 2 HRS LATER TO SAMPLE.

SAMPLED @ 1700 ID: GW-32504-121214-SR-1849

SAMPLES PACKED IN COOLER WITH ICE

32504-25 12/15/14

TASK: CONTINUE 1/4LY SAMPLE EVENT

CRA: STEVE RAPAI

WEATHER: CLOUDY 50°F

H_2S: LEVEL D

CALIBRATION OF RENTAL U-52 HORIBA

IE B21293B

pH=4.00, COND. 4.49, TURB=0.0, D.O.=9.32

SAMPLE OF CRA-RA-31

TIME	pH	COND.	TURB	D.O.	TEMP.
1245	7.41	0.543	6.1	5.62	11.21
1255	7.30	0.549	4.0	2.22	14.14
1305	7.29	0.487	3.9	0.43	15.87
1310	7.27	0.451	3.3	0.39	16.14
1315	7.22	0.463	2.8	0.35	15.19
1320	7.20	0.467	2.2	0.32	14.93
1325	7.19	0.473	1.0	0.29	14.42
1330	7.19	0.478	0.9	0.31	14.02
1335	7.18	0.482	0.8	0.30	13.69
1340	7.18	0.483	0.9	0.29	13.67
1345	7.18	0.483	0.9	0.29	13.66

SAMPLED @ 1346 ID: GW-32504-121514-SR-1850

12/15/14 32504.25

SAMPLE OF CRA-RA-7

TIME	pH	COND.	TURB.	D.O.	TEMP.
1355	7.59	0.300	5.1	6.32	10.73
1405	7.56	0.301	4.4	6.01	10.68
1415	7.53	0.302	4.6	5.86	10.66
1420	7.54	0.302	4.5	5.87	10.65
1425	7.54	0.303	4.2	5.87	10.65
1430	7.54	0.303	4.2	5.86	10.64

SAMPLED @ 1431 ID:GW-32504-121514-SR-1851

SAMPLED @ 1440 ID:GW-32504-121514-SR-1852

SAMPLE OF CRA-RA-18

1450	6.92	1.52	5.8	9.42	10.43
1500	6.78	1.51	4.3	4.43	10.33
1510	6.77	1.50	4.1	4.29	10.32
1515	6.77	1.50	4.2	4.26	10.31
1520	6.77	1.50	4.2	4.25	10.31
1525	6.76	1.50	4.2	4.25	10.31

SAMPLED @ 1526 ID:GW-32504-121514-SR-1853

SAMPLE OF RA-MW-28

1540	7.08	0.632	14.2	1.67	10.53
1550	7.00	0.633	10.5	1.19	10.51
1600	6.97	0.632	8.4	1.32	10.51

CONTINUED ON NEXT PAGE

32504.25 12/15/14

SAMPLE OF RA-MW-28 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1605	6.99	0.632	6.3	1.34	10.49
1610	6.98	0.632	4.7	1.37	10.45
1615	6.97	0.633	4.5	1.40	10.45
1620	6.97	0.633	4.1	1.41	10.44
1625	6.98	0.633	3.9	1.41	10.44

SAMPLED @ 1626 ID:GW-32504-121514-SR-1854

SAMPLE OF CRA-RA-65

1640	6.81	0.993	5.0	2.96	11.21
1650	6.69	0.990	4.3	0.18	11.34
1700	6.68	0.987	4.6	0.13	11.34
1705	6.69	0.987	4.6	0.11	11.29
1710	6.69	0.987	4.4	0.11	11.30
1715	6.69	0.987	4.5	0.10	11.30

SAMPLED @ 1716 ID:GW-32504-121514-SR-1855

SAMPLES PACKED IN COOLER WITH ICE

12/16/14 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

CRA: STEVE RAPAI

WEATHER: RAIN 43°

H&S: LEVEL D

CALIBRATION OF RENTAL HORIBA-U52

IE B21293B

pH=4.00, COND.=4.49, TURB=0.0, D.O.=8.41

SAMPLE OF CRA-RA-27

TIME	pH	COND.	TURB.	D.O.	TEMP.
0915	6.96	1.49	3.4	2.31	11.86
0930	6.85	1.56	3.1	1.01	11.82
0940	6.81	1.56	2.6	0.16	11.71
0945	6.79	1.57	2.4	0.11	11.51
0950	6.76	1.59	0.9	0.13	11.37
0955	6.76	1.59	1.7	0.11	11.37
1000	6.76	1.59	1.8	0.10	11.38

SAMPLED @ 1001 ID:GW-32504-121614-SR-1856

SAMPLE OF CRA-RA-26S

BEGAN PURGING @ 1015

1035	6.71	1.24	3.9	10.38	10.60
1045	6.76	1.26	3.6	5.48	10.61
1050	6.76	1.26	3.4	5.50	10.60
1055	6.76	1.26	3.5	5.51	10.61

SAMPLED @ 1056 ID:GW-32504-121614-SR-1857

32504-25 12/16/14

SAMPLE OF CRA-RA-26D

BEGAN PURGING WELL @ 1105

TIME	pH	COND.	TURB.	D.O.	TEMP.
1125	6.77	1.46	7.6	1.70	10.74
1130	6.76	1.45	4.7	0.26	10.76
1135	6.76	1.45	4.6	0.24	10.75
1140	6.77	1.45	4.6	0.25	10.75

SAMPLED @ 1141 ID:GW-32504-121614-SR-1859

MS/MSD

SAMPLE OF B1-4

1215	6.32	1.47	3.6	5.64	10.74
1225	6.59	1.46	2.1	1.04	10.61
1235	6.71	1.48	1.7	0.37	10.62
1240	6.74	1.48	1.9	0.52	10.63
1245	6.75	1.47	2.1	0.53	10.62
1250	6.75	1.48	1.6	0.52	10.62

SAMPLED @ 1251 ID: GW-32504-121614-SR-1860

SAMPLE OF CRA-RA-23D

1330	6.92	0.797	2.4	4.39	10.63
1340	6.84	0.802	1.9	0.86	10.61
1350	6.79	0.804	2.6	1.00	10.54
1355	6.77	0.805	1.7	0.95	10.52

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12/16/14 32504-25

SAMPLE OF CRA-RA-23D (CONTINUED)

TIME	pH	COND	TURB	D.O.	TEMP
1400	6.75	0.806	1.2	0.93	10.52
1405	6.75	0.806	1.4	0.91	10.52
1410	6.76	0.806	0.9	0.92	10.52

SAMPLED @ 1411 ID: GW-32504-121614-SR-1861

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

CONESTOGA-ROVERS
& ASSOCIATES

651 Colby Drive, Waterloo, Ontario, N2V 1C2
Telephone: (519) 884-0510 Fax: (519) 884-0525
www.CRAworld.com

April 10, 2015

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. 130
Groundwater and Landfill RD/RA
Reporting Period: January 1 through March 31, 2015
Rasmussen Landfill (Site), Livingston Co., Michigan

1.0 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.

2.0 Activities Performed During this Reporting Period

2.1 Operation and Maintenance

The quarterly round of groundwater elevations were measured on March 16, 2015. The corresponding groundwater contour map is provided on Figure 1.

CRA collected quarterly groundwater samples on March 16 through March 20, 2015, consistent with the Groundwater Remediation Monitoring Program. The results from these samples are discussed below.

REGISTERED COMPANY FOR
ISO 9001

2.2 Reports

Quarterly Progress Report No. 129 was submitted to USEPA and Michigan Department of Environmental Quality (MDEQ) on January 8, 2015.

3.0 Summary of Findings

The results of the first quarter 2015 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 2015 sampling, five of the 21 monitoring wells sampled had Compounds of Concern (COCs) at concentrations above generic Part 201 Drinking Water Criteria (DWC).

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

CRA-RA-22	4.0 µg/L vinyl chloride
CRA-RA-24	6.9 µg/L vinyl chloride
CRA-RA-26S	76/83 µg/L trichloroethene (duplicate sample)
CRA-RA-27	8.6 µg/L vinyl chloride
CRA-RA-30	3.6 µg/L vinyl chloride

These were the same five monitoring wells that had COCs above Part 201 DWC during the fourth quarter 2014 sampling event. COC concentrations detected in these wells during first quarter 2015 sampling were similar to COC concentrations detected in these wells during fourth quarter 2014 sampling.

CRA did not collect the annual Rasmussen residential water well sample in the first quarter 2015 because the plumbing system is disconnected pending a repair. CRA will attempt to collect the annual Rasmussen residential water well sample during Q2 2015, pending repair of the plumbing system.

4.0 Problems Encountered

Other than several weather-related power interruptions, no problems were encountered with respect to the operation and maintenance of the ozone treatment system during the first quarter 2015.

5.0 Corrective Measures to Rectify Problems

CRA visited the Site and re-started the treatment system after each power outage. No corrective measures were implemented with respect to the operation and maintenance of the ozone treatment system during the first quarter 2015.

6.0 Contacts and Significant Correspondence with Public Representatives

Communication	*Date*	*Subject of Correspondence/Discussion*
Quarterly Report	January 8, 2015	Report No. 129 submitted to Mr. H. Caine (USEPA) and Mr. K. Krawczyk (MDEQ).
email	February 5, 2015	Answer inquiry about Report 129 from Mr. H Caine
email	March 25, 2015	Spiegelberg access agreement update from S. Nadeau to H. Caine and L. Kirby-Miles
email	March 25, 2015	Spiegelberg access agreement update from S. Nadeau to H. Caine and L. Kirby-Miles

7.0 Planned Upcoming Activities/Schedule

Landfill and groundwater component activities planned for the second quarter of 2015:

- Continue the operation of ozone sparging system
- Continue to monitor for the presence of ozone at each sparge vault
- The second quarter groundwater sampling event is scheduled for the week of May 18, 2015

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& ASSOCIATES

- The wells to be sampled in the second quarter of 2015 are listed in Table 5
- Install vertical aquifer sampling (VAS) boreholes and monitoring wells in the Spicer Road right of way, north of the Site, and the Speiglberg property, west of the Site

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

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

For Steven Rapai
Bart Bartholomy

AJD/ac/39
Encl.

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

TABLES AND FIGURES

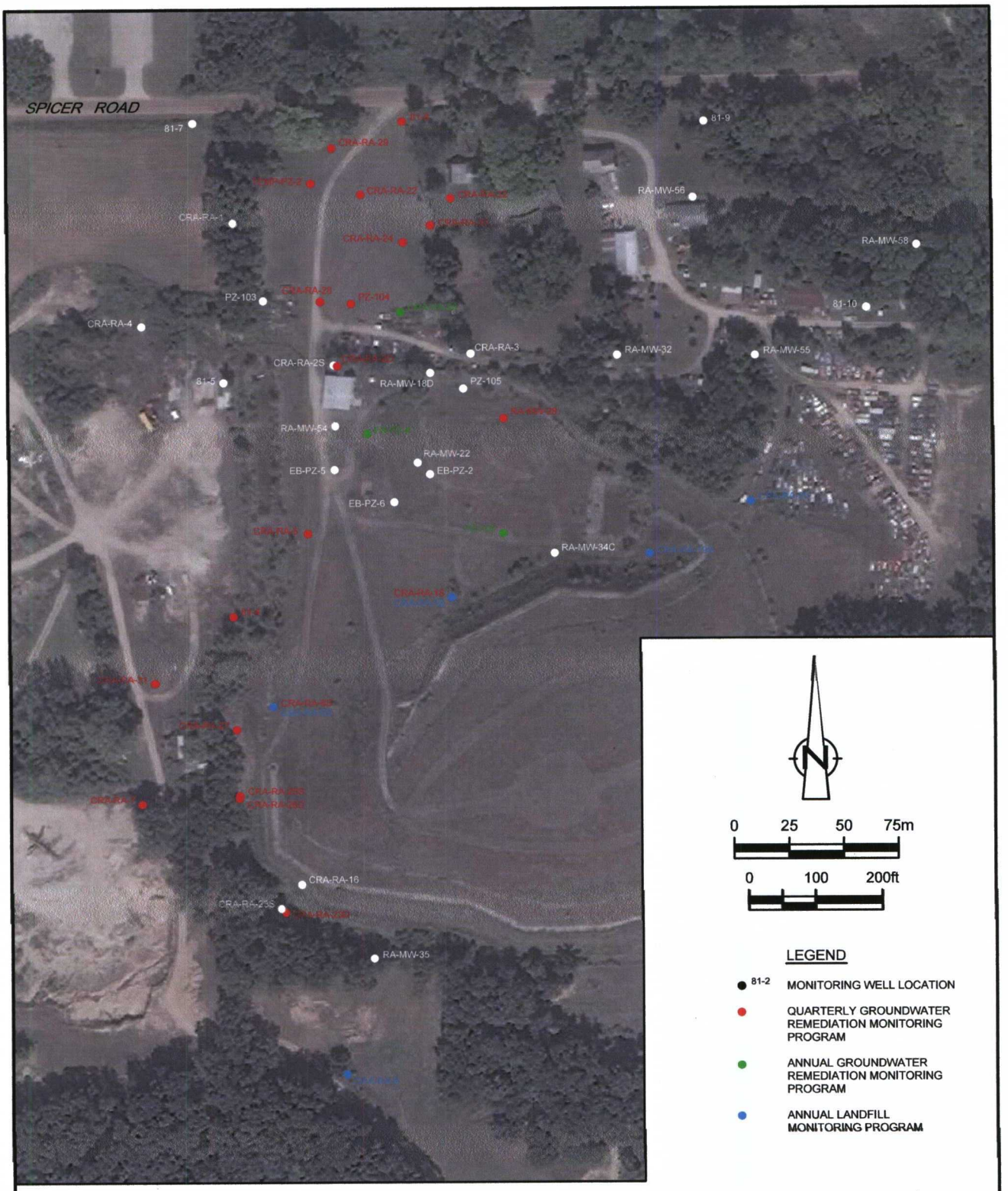

figure 1

2015 GROUNDWATER MONITORING PROGRAMS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN039)GN-WA001 MAR 30/2015

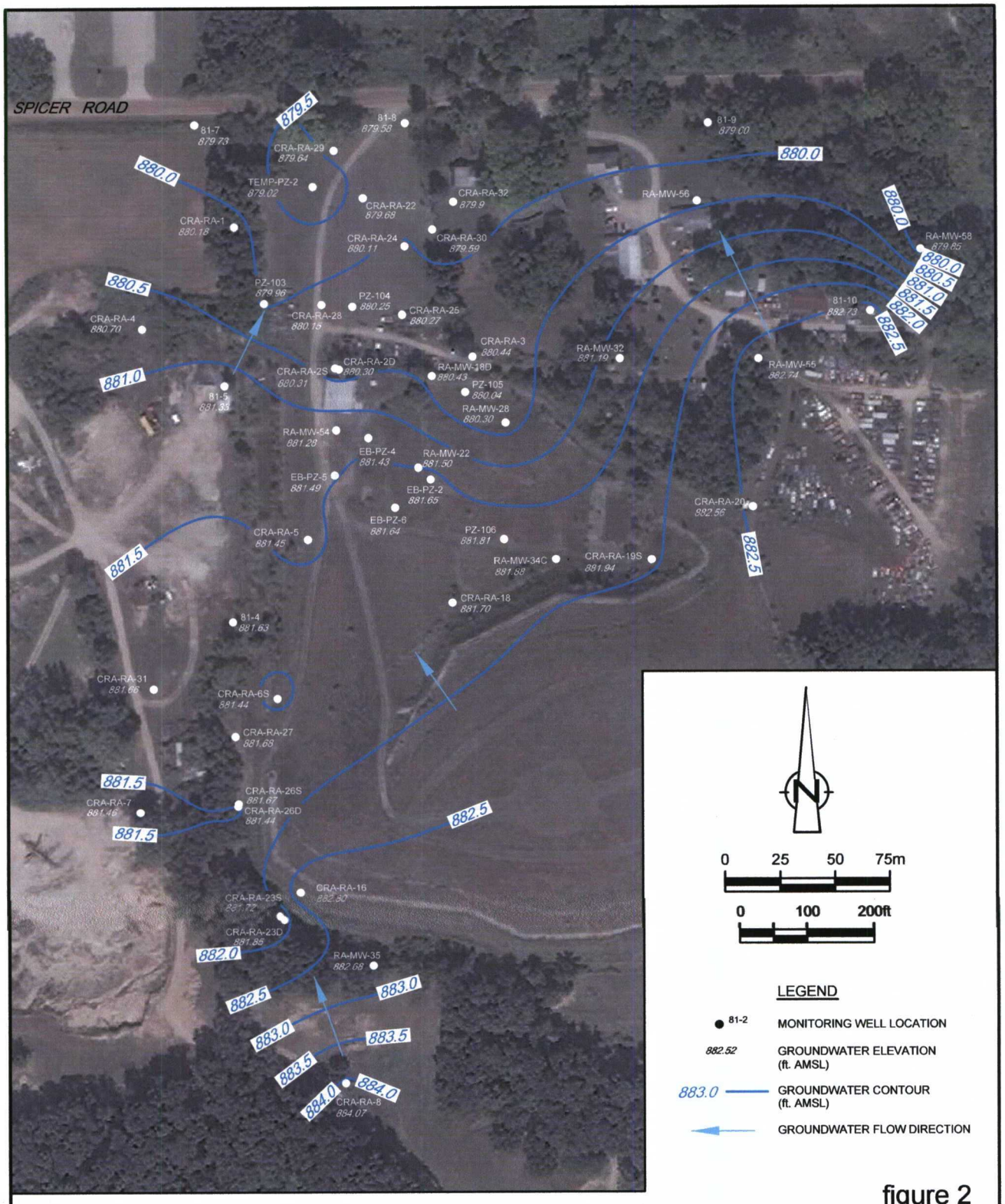

figure 2

GROUNDWATER ELEVATION CONTOURS (UPPER AQUIFER)
MARCH 2015
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN039)GN-WA002 MAR 30/2015

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
			DWC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	750	5	2	280
CRA-RA-22	GW-SR-1793	6/11/2014		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)	4.2	ND(1.0)
CRA-RA-22	GW-SR-1818	8/19/2014		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)	5.6	ND(1.0)
CRA-RA-22	GW-SR-1846	12/11/2014		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)	4.0	ND(1.0)
CRA-RA-22	GW-SR-1872	3/18/2015		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)
			Change												Stable	
CRA-RA-24	GW-SR-1790	6/11/2014		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.8)	ND(1.0)	ND(1.0)	5.2	ND(1.0)
CRA-RA-24	GW-SR-1815	8/18/2014		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)	6.0	ND(1.0)
CRA-RA-24	GW-SR-1843	12/9/2014		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)	5.3	ND(1.0)
CRA-RA-24	GW-SR-1869	3/17/2015		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)	6.9	ND(1.0)
			Change												Up 1.6 µg/L	
CRA-RA-25	GW-SR-1645	9/13/2012		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-1716	7/25/2013		ND(1)	1.0	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
CRA-RA-25	GW-SR-1717	7/25/2013	Duplicate	ND(1)	1.0	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
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)
			Change		Up 0.1 µg/L										Up 0.1 µg/L	
CRA-RA-28	GW-SR-1788	6/10/2014		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)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-1813	8/18/2014		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)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-1841	12/9/2014		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)
CRA-RA-28	GW-SR-1866	3/17/2015		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)
CRA-RA-28	GW-SR-1867	3/17/2015		ND(1.0)	2.2	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)
			Change		Down 0.1 µg/L											
CRA-RA-29	GW-SR-1796	6/11/2014		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)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-1820	8/19/2014		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)
CRA-RA-29	GW-SR-1849	12/12/2014		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)
CRA-RA-29	GW-SR-1874	3/18/2015		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)
			Change						Stable; all Non-Detect							
CRA-RA-30	GW-SR-1791	6/11/2014		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)	3.1	ND(1.0)
CRA-RA-30	GW-SR-1815	8/18/2014		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)	3.6	ND(1.0)
CRA-RA-30	GW-SR-1844	12/10/2014		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)	3.2	ND(1.0)
CRA-RA-30	GW-SR-1870	3/17/2015		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)	3.6	ND(1.0)
			Change												Up 0.3 µg/L	
CRA-RA-32	GW-SR-1792	6/11/2014		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)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-1817	8/18/2014		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)
CRA-RA-32	GW-SR-1845	12/11/2014		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)
CRA-RA-32	GW-SR-1871	3/18/2015		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)
			Change						Stable; all Non-Detect							
PZ-104	GW-SR-1789	6/10/2014		ND(1.0)	3.8	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-1814	8/18/2014		ND(1.0)	3.8	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)
PZ-104	GW-SR-1842	12/10/2014		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-1868	3/17/2015		ND(1.0)	3.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
			Change		Up 0.3 µg/L										Up 0.1 µg/L	
TEMP-PZ-2	GW-SR-1794	6/11/2014		ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
TEMP-PZ-2	GW-SR-1795	6/11/2014	Duplicate	ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1.1)	ND(1.0)	ND(1.0)	ND(1)	ND(1)
TEMP-PZ-2	GW-SR-1819	8/19/2014		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)
TEMP-PZ-2	GW-SR-1847	12/11/2014		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)
TEMP-PZ-2	GW-SR-1873	3/18/2015		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)
			Change						Stable; all Non-Detect							
B1-B	GW-SR-1797	6/11/2014		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)	ND(1.0)	ND(1.0)
B1-B	GW-SR-1821	8/19/2014		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.1)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
B1-B	GW-SR-1822	8/19/2014	Duplicate	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.1)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
B1-B	GW-SR-1848	12/12/2014		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)
B1-B	GW-SR-1875	3/18/2015		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)
			Change						Stable; all Non-Detect							

Notes:

(1) Michigan Part 201 Drinking Water 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 RESUTLS - 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
			DWC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-2D	GW-SR-1787	6/10/2014		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	57	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-2D	GW-SR-1812	8/18/2014		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	67	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-2D	GW-SR-1839	12/9/2014		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	58	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
CRA-RA-2D	GW-SR-1862	3/16/2015		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	76	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
			Change							Up 18 µg/L						
CRA-RA-18	GW-SR-1799	6/17/2014		76	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-1831	9/3/2014		80	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-18	GW-SR-1853	12/15/2014		66	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-1865	3/17/2015		87	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)
			Change	Up 21 µg/L												
EB-PZ-4	GW-SR-1548	8/24/2011		ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	38.7	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
EB-PZ-4	GW-SR-1630	9/10/2012		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1)	39	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
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)
			Change							Up 2 µg/L					Down 0.8 µg/L	
PZ-106	GW-SR-1549	8/25/2011		ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
PZ-106	GW-SR-1640	9/12/2012		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-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)
			Change						Stable; all Non-Detect							
RA-MW-28	GW-SR-1800	6/18/2014		7.7	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-1830	9/3/2014		11	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-1854	12/15/2014		8.7	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-1864	3/17/2015		8.7	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												

Notes:

1) Michigan Part 201 Drinking Water 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

ample ocation	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
			DWC(1)	200	70 (2)	13,000	1,900	730	5	100	74	5	790	5	2	280
A-RA-5	GW-SR-1798	6/12/2014		21	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)
A-RA-5	GW-SR-1823	8/19/2014		15	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)
A-RA-5	GW-SR-1840	12/9/2014		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)
A-RA-5	GW-SR-1863	3/16/2015		20	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 1 µg/L												
A-RA-6S	GW-SR-1803	6/20/2014		ND(1.0)	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)
A-RA-6S	GW-SR-1804	6/20/2014	Duplicate	ND(1.0)	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)
A-RA-6S	GW-SR-1832	9/11/2014		1.5	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)
A-RA-6S	GW-SR-1855	12/15/2014		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)
A-RA-6S	GW-SR-1878	3/19/2015		1.7	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												
A-RA-7	GW-SR-1806	6/19/2014		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)
A-RA-7	GW-SR-1825	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)
A-RA-7	GW-SR-1851	12/15/2014		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)
A-RA-7	GW-SR-1852	12/15/2014	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)
A-RA-7	GW-SR-1877	3/19/2015		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)
			Change						Stable; all Non-Detect							
A-RA-27	GW-SR-1802	6/18/2014		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)	12	ND(1.0)
A-RA-27	GW-SR-1833	9/11/2014		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)	8.9	ND(1.0)
A-RA-27	GW-SR-1834	9/11/2014	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)	8.9	ND(1.0)
A-RA-27	GW-SR-1856	12/16/2014		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)	11	ND(1.0)
A-RA-27	GW-SR-1879	3/19/2015		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)	8.6	ND(1.0)
			Change												Down 2.4 µg/L	
A-RA-31	GW-SR-1775	4/9/2014	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)
A-RA-31	GW-SR-1805	6/20/2014		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)
A-RA-31	GW-SR-1824	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(1.6)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
A-RA-31	GW-SR-1850	12/15/2014		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)
A-RA-31	GW-SR-1876	3/19/2015		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)
			Change						Stable; all Non-Detect							
81-4	GW-SR-1811	6/19/2014		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)	2.1	ND(1.0)
81-4	GW-SR-1837	9/12/2014		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)	1.6	ND(1.0)
81-4	GW-SR-1860	12/16/2014		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)	2	ND(1.0)
81-4	GW-SR-1883	3/19/2015		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)	1.7	ND(1.0)
			Change												Down 0.3 µg/L	

ichigan Part 201 Drinking Water Criteria.
a 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	DWC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
RA-RA-23D	GW-SR-1810	6/19/2014		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)	5.1	ND(1.0)	ND(1.0)
RA-RA-23D	GW-SR-1838	9/12/2014		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)	4.0	ND(1.0)	ND(1.0)
RA-RA-23D	GW-SR-1861	12/16/2014		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)	3.4	ND(1.0)	ND(1.0)
RA-RA-23D	GW-SR-1884	3/20/2015		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)	4.7	ND(1.0)	ND(1.0)
			Change											Up 1.3 µg/L		
RA-RA-26D	GW-SR-1809	6/19/2014		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)
RA-RA-26D	GW-SR-1836	9/11/2014		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)
RA-RA-26D	GW-SR-1859	12/16/2014		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)
RA-RA-26D	GW-SR-1882	3/19/2015		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)
			Change						Stable; all Non-Detect							
RA-RA-26S	GW-SR-1808	6/19/2014		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	98	ND(2.9)	ND(4.0)
RA-RA-26S	GW-SR-1835	9/11/2014		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)	99	ND(3.3)	ND(3.3)
RA-RA-26S	GW-SR-1857	12/16/2014		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)	86	ND(2.5)	ND(2.5)
RA-RA-26S	GW-SR-1858	12/16/2014	Duplicate	ND(5.0)	ND(5.0)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(5.0)	ND(5.0)	76	ND(5.0)	ND(5.0)
RA-RA-26S	GW-SR-1880	3/19/2015		ND(5.0)	ND(5.0)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	5.8	ND(5.0)	76	ND(5.0)	ND(5.0)
RA-RA-26S	GW-SR-1881	3/19/2015	Duplicate	ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	4.2	ND(4.0)	83	ND(3.3)	ND(3.3)
			Change											Down 1.5 µg/L		

es:

Michigan Part 201 Drinking Water Criteria
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.

4Calne-09-T4

TABLE 5

2015 GROUNDWATER SAMPLING PROGRAM
RASMUSSEN LANDFILL SITE
LIVINGSTON COUNTY, MICHIGAN

Quarterly Sampling - VOCs	*Q1*	*Q2*	*Q3*	*Q4*
81-4				
81-8		*Annual Landfill Monitoring Program - VOCs, SVOCs & Metals*	CRA-RA-25 (VOCs only)	New Rasmussen Water Supply Well (VOCs only)
CRA-RA-2D			EB-PZ-4 (VOCs only)	
CRA-RA-5		CRA-RA-6S (included in quarterly sampling)	PZ-106 (VOCs only)	
CRA-RA-6S		CRA-RA-8	RA-MW-47 (VOCs only)	
CRA-RA-7		CRA-RA-18 (included in quarterly sampling)		
CRA-RA-18		CRA-RA-19S		
CRA-RA-22		CRA-RA-20		
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				
PZ-104				
RA-MW-28				
TEMP-PZ-2				

LOG FORM COPIES

Rasmussen 32504

Ozone Sparge System Inspection

DATE	1/9/2015	1/14/2015	1/25/2015	1/30/2015	2/6/2015
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	96290	96408	96673	96791	96961

Air Sep					
Receiver Pressure psi	52	54	54	54	54
Feed Air Pressure psi	110	110	110	105	105
Cycle Pressure psi	70	65	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	96289.9	96408.0	96672.7	96790.8	96960.6

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

Ozone Generator					
Oxygen Supply, LPM	8	7	7	8	8
% O3 capacity	45	45	45	45	45
Regulator #1 psi	36	36	37	36	38
Regulator #2 psi	22	22	24	22	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	2/13/2015	2/19/2015	2/27/2015	3/5/2015	3/13/2015
OPERATOR SIGNATURE	L Thapa	L Thapa	L Thapa	L Thapa	L Thapa

Air Compressor					
Output Pressure psi	110	110	110	110	110
Temperature F					
Run Time hours	97128	97271	97463	97611	97805

Air Sep					
Receiver Pressure psi	54	54	54	54	54
Feed Air Pressure psi	110	115	110	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	97128.4	97270.9	97463.3	97610.9	97805.2

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

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	8
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	36	35	37	37
Regulator #2 psi	22	24	22	23	24
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	3	3	2	3	1
Zone Time hours	2	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:

Rasmussen 32504

Ozone Sparge System Inspection

DATE	3/20/2015	3/26/2015	3/31/2015		
OPERATOR SIGNATURE	L Rapp	L Rapp	L Rapp		

Air Compressor					
Output Pressure psi	110	110	110		
Temperature F					
Run Time hours	97966		98229		

Air Sep					
Receiver Pressure psi	52	52	54		
Feed Air Pressure psi	110	110	110		
Cycle Pressure psi	70	70	70		
Holding Tank Pressure psi	42	42	42		
Run Time hours	97966.0		98228.6		

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN		

Ozone Generator					
Oxygen Supply, LPM	7	8	7		
% O3 capacity	45	45	45		
Regulator #1 psi	32	35	38		
Regulator #2 psi	22	22	23		
Alarm Reading ppm, O3	-	-	-		
Zone On	2	1	3		
Zone Time hours	1/2	1/2	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 RAPAI **Signature:** Steve Rapai

Date: JANUARY 9, 2015
Time: 3:30 PM

Weather Conditions: WIND, SNOW SQUALS, 18°

Observations

Erosion-North Face: SNOW COVERED - 2" OF SNOW LAST NIGHT

Erosion-South Face: ↓

Erosion-East Face: ↓

Erosion-West Face: ↓

Erosion-Misc.: ↓

Storm Water Ponds: ↓

Drainage Spillways & Outfalls: ↓

Roadways: RECENTLY PLOWED

Vegetation: DORMANT - SNOW COVERED

Signs, Gates, & Fences: OK

Actions Taken:
ROADS PLOWED

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: JANUARY 30, 2015
Time: 10:30 AM

Weather Conditions: SUN, WIND, 16°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: SNOW COVERED & DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
ROADS PLOWED

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: FEBRUARY 6, 2015
Time: 2:45 PM

Weather Conditions: PARTLY CLOUDY, 28°

Observations

Erosion-North Face: SITE RECEIVED 18" SNOWFALL THIS PAST MONDAY

Erosion-South Face:

Erosion-East Face:

Erosion-West Face:

Erosion-Misc.:

Storm Water Ponds:

Drainage Spillways & Outfalls:

Roadways: PLOWED

Vegetation: DORMANT & SNOW COVERED

Signs, Gates, & Fences: OK

Actions Taken:
ROADS PLOWED

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: FEBRUARY 27, 2015
Time: 3:00 PM

Weather Conditions: 16°F, SUN

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: SNOW COVERED & DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
ROADS PLOWED

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: 3/5/2015
Time: 4:00 PM

Weather Conditions: PARTLY CLOUDY, 19°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: SNOW COVERED & DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
ROADS PLOWED

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

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

Date: MARCH 24, 2015
Time: 2:30 PM

Weather Conditions: CLEAR 49°

Observations

Erosion-North Face: SNOW HAS MELTED 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: DORMANT

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
BRUSH CLEARING SCHEDULED FOR END OF MONTH.

SPARGE WELL PRESSURE READINGS
RASMUSSEN SITE
CRA PROJECT #32504

DATE:	JANUARY 14, 2015		DATE:	FEB. 13 & 19, 2015		DATE:	MARCH 16, 17, 18 & 19, 2015	
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	7	SW-1	0.7	7	SW-1	0.8	7
SW-2	0.8	7	SW-2	0.7	8	SW-2	0.8	7
SW-3	0.8	14	SW-3	0.8	13	SW-3	0.8	14
SW-4	0.8	15	SW-4	0.8	13	SW-4	0.8	15
SW-5	0.8	15	SW-5	0.7	15	SW-5	0.7	16
SW-6	0.8	14	SW-6	0.8	15	SW-6	0.8	15
SW-7	0.8	13	SW-7	0.8	13	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	0.8	16	SW-12	0.7	13	SW-12	0.8	14
SW-13	0.7	2	SW-13	0.7	3	SW-13	0.7	3
SW-14	–	–	SW-14	–	–	SW-14	–	–
SW-15	–	–	SW-15	–	–	SW-15	–	–
SW-16	–	–	SW-16	–	–	SW-16	–	–
SW-17	0.8	17	SW-17	0.8	18	SW-17	0.8	17
SW-18	0.8	19	SW-18	0.7	19	SW-18	0.8	20
SW-19	0.8	17	SW-19	0.8	17	SW-19	0.7	17
SW-20	0.8	17	SW-20	0.8	17	SW-20	0.8	17
SW-21	–	–	SW-21	–	–	SW-21	–	–
SW-22	0.8	13	SW-22	0.8	14	SW-22	0.8	14
SW-23	0.8	14	SW-23	0.8	15	SW-23	0.8	15
SW-24	0.8	15	SW-24	0.7	15	SW-24	0.7	15
SW-25	0.8	15	SW-25	0.7	15	SW-25	0.8	15
SW-26	0.7	3	SW-26	0.7	3	SW-26	0.8	3
SW-27	0.7	6	SW-27	0.8	7	SW-27	0.8	6
SW-28	0.8	6	SW-28	0.8	6	SW-28	0.8	6
SW-29	0.8	6	SW-29	0.8	7	SW-29	0.7	6
SW-30	–	–	SW-30	–	–	SW-30	–	–

12/16/14 32504-25

SAMPLE OF CRA-RA-23D (CONTINUED)

TIME	pH	COND	TURB	D.O.	TEMP
1400	6.75	0.806	1.2	0.93	10.52
1405	6.75	0.806	1.4	0.91	10.52
1410	6.76	0.806	0.9	0.92	10.52

SAMPLED @ 1411 ID: GW-32504-121614-SR-1861

SAMPLES PACKED IN COOLER WITH ICE FOR DROPOFF AT TEST AMERICA, BRIGHTON, MI.

32504-25 3/16/15

TASK: 1/4LY WATER LEVELS & 1/4LY SAMPLING

CRA: STEVE RAPAI

WEATHER: CLOUDY 63°

HES: LEVEL D

CALIBRATION OF RENTAL HORIBA-U52 IE

pH=4.00, COND.=4.49, TURB.=0.0, D.O.=8.22

WELL ID	LEVEL
81-4	30.19
81-5	34.44
81-7	46.58
81-8	43.61
81-9	46.40
81-10	32.58
RA-1	49.33
RA-2D	56.09
RA-2S	55.84
RA-3	52.91
RA-4	23.93
RA-5	55.04
RA-6	59.59
RA-7	33.01
RA-8	18.82
RA-16	58.34

3/16/15 32504-25

WELL ID	LEVEL
RA-18	41.88
RA-18D	56.39
RA-19D	50.25
RA-19S	47.80
RA-20	58.73
RA-22	54.00
RA-23D	33.21
RA-23S	33.47
RA-24	56.93
RA-25	54.34
RA-26D	50.25
RA-26S	50.10
RA-27	61.81
RA-28	54.66
RA-29	46.16
RA-30	58.50
RA-31	32.02
RA-32	57.45
MW-22	42.44
MW-28	42.62
MW-32	34.96
MW-34C	41.92
MW-35	24.24
MW-41	47.01

3/16/15 32504-25

WELL ID	LEVEL
MW-42	68.09
MW-47	53.35
MW-54	56.02
MW-55	36.91
MW-56	36.07
MW-58	21.53
EB-PZ-2	40.46
EB-PZ-4	53.57
EB-PZ-5	55.30
EB-PZ-6	55.05
PZ-103	57.31
PZ-104	55.15
PZ-105	52.00
PZ-106	39.47
TEMP-PZ-2	53.41

32504.25 TOT 3/16/15

SAMPLE OF CRA-RA-2D

TIME	pH	COND.	TURB.	D.O.	TEMP °C
1500	7.12	2.08	2.0	2.15	12.21
1510	7.07	2.00	0.0	0.10	11.90
1520	7.08	2.05	0.1	0.10	11.88
1525	7.08	2.04	0.0	0.10	11.87
1530	7.09	2.04	0.0	0.10	11.83
1535	7.09	2.03	0.0	0.09	11.83
1540	7.09	2.03	0.0	0.09	11.83

SAMPLED @ 1541 ID: GW-32504-031615-SR-1862

SAMPLE OF CRA-RA-5

1550	7.01	1.45	0.3	4.72	11.78
1600	6.96	1.42	0.0	0.09	11.53
1610	6.96	1.40	0.0	0.08	11.49
1615	6.96	1.40	0.0	0.08	11.46
1620	6.96	1.39	0.0	0.08	11.55
1625	6.96	1.39	0.0	0.08	11.54
1630	6.96	1.39	0.0	0.08	11.53
1635	6.96	1.39	0.0	0.08	11.54

SAMPLED @ 1636 ID: GW-32504-031615-SR-1863

SAMPLES PACKED IN COOLER WITH ICE.

3/17/15 32504.03

TASK: CONTINUE 1/4LY SAMPLE EVENT

CRA: STEVE RAPAI

WEATHER: SUN, WIND, HIGH 40°F

H&S: LEVEL D

CALIBRATION OF RETINAL HORIBA IE

B206643

pH=4.00, COND=4.49, TURB=0.0, D.O.=9.55

TEMP=19.22

SAMPLE OF RA-MW-28

TIME	pH	COND.	TURB.	D.O.	TEMP.
10:30	6.97	0.720	10.9	3.28	11.63
10:40	6.99	0.720	8.0	1.43	11.11
10:50	6.99	0.726	6.6	1.14	10.81
10:55	6.99	0.725	4.8	1.08	10.85
11:00	6.99	0.725	4.1	1.07	10.86
11:05	6.99	0.725	3.6	1.05	10.85
11:10	6.99	0.725	3.2	1.04	10.86
11:15	6.99	0.725	3.0	1.04	10.86

SAMPLED @ 11:16 ID: GW-32504-031615-SR-1864

SAMPLE OF CRA-RA-18

12:45	6.81	1.68	3.0	18.65	10.37
12:55	6.77	1.68	1.6	6.49	10.68

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SAMPLE OF CRA-RA-18 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1300	6.77	1.67	1.3	6.18	10.70
1305	6.77	1.67	1.1	6.15	10.74
1310	6.78	1.67	1.1	6.06	10.73
1315	6.78	1.67	1.2	6.04	10.64
1320	6.78	1.67	0.9	6.03	10.63
1325	6.78	1.67	0.9	6.04	10.63

SAMPLED @ 1326 ID: GW-32504-031715-SR-1865

SAMPLE OF CRA-RA-28

1410	6.93	0.994	116	5.21	11.32
1420	6.93	1.02	34.2	2.50	11.31
1430	6.94	1.02	17.4	0.00	11.27
1435	6.94	1.02	11.3	0.00	11.32
1440	6.94	1.01	7.2	0.00	11.28
1445	6.94	0.996	6.1	0.00	11.28
1450	6.94	0.989	4.0	0.00	11.26
1455	6.94	0.985	4.6	0.00	11.27
1500	6.94	0.984	4.2	0.00	11.26
1505	6.94	0.984	4.0	0.00	11.27

SAMPLED @ 1506 ID: GW-32504-031715-SR-1866

SAMPLED @ 1510 ID: GW-32504-031715-SR-1867

SAMPLE OF PZ-104

TIME	pH	COND.	TURB.	D.O.	TEMP.
1520	7.00	1.22	6.8	3.10	11.27
1530	6.97	1.32	4.7	0.00	11.27
1540	6.97	1.34	3.2	0.00	11.21
1545	6.96	1.34	3.3	0.00	11.24
1550	6.96	1.34	2.4	0.00	11.18
1555	6.96	1.34	2.8	0.00	11.19
1600	6.96	1.34	2.7	0.00	11.19

SAMPLED @ 1601 ID: GW-32504-031715-SR-1868

SAMPLE OF CRA-RA-24

1620	7.02	1.08	1.6	9.17	10.98
1630	6.98	1.07	0.8	0.00	11.16
1440	6.97	1.07	0.6	0.00	11.16
1445	6.98	1.07	0.5	0.00	11.15
1450	6.97	1.07	0.5	0.00	11.16

SAMPLED @ 1451 ID: GW-32504-031715-SR-1869

SAMPLE OF CRA-RA-30

1505	6.95	0.868	140	0.00	10.74
1520	7.00	1.02	23.5	0.00	11.01
1525	7.01	1.02	16.2	0.00	11.02
1530	7.01	1.02	9.1	0.00	11.02

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3/17/15 32504-25

SAMPLE OF CRA-RA-30 (CONTINUED)

TIME	pH	COND	TURB	D.O.	TEMP
1535	7.01	1.02	6.4	0.00	11.03
1540	7.01	1.02	5.3	0.00	11.04
1545	7.01	1.02	4.8	0.00	11.03

SAMPLED @ 1546 ID: GW-32504-031715-SR-1870

SAMPLES PACKED IN COOLER WITH ICE.

32504-25 3/18/15

TASK: CONTINUE 1/4LY SAMPLE EVENT

CRA: STEVE RAPAI

WEATHER: SUN 23°, WINDY, HIGH 45°

H&S: LEVEL D

CALIBRATION OF RENTAL HORIBA IE #

B20664B

pH=4.00, COND.=4.49, TURB=0.0, D.O.=8.93

SAMPLE OF CRA-RA-32

TIME	pH	COND.	TURB.	D.O.	TEMP.
1040	6.98	0.987	31.5	3.69	11.22
1050	7.00	0.841	24.9	1.04	11.14
1100	7.01	0.886	4.2	0.43	10.71
1110	7.00	0.888	3.1	0.00	10.85
1115	7.00	0.886	3.5	0.00	10.97
1120	6.98	0.886	2.1	0.00	10.98
1125	6.98	0.886	1.3	0.00	10.97

SAMPLED @ 1126 ID: GW-32504-031815-SR-1871

SAMPLE OF CRA-RA-22

1140	6.91	1.29	113	0.00	10.78
1150	6.84	1.20	10.1	0.00	11.02
1200	6.85	1.15	1.3	0.00	10.96
1205	6.86	1.12	1.2	0.00	11.01

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3/18/15 TJS 32504-25

SAMPLE OF CRA-RA-22 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1210	6.86	1.11	1.4	0.00	11.00
1215	6.86	1.11	2.8	0.00	11.00
1220	6.86	1.11	2.8	0.00	10.99

SAMPLED @ 1221 ID: GW-32504-031815-SR-1872

SAMPLE OF TEMP-PZ-2

1335	6.96	1.98	8.0	0.00	11.07
1345	6.90	1.89	9.5	0.00	11.16
1355	6.90	2.04	4.5	0.00	11.21
1400	6.90	2.05	3.7	0.00	11.21
1405	6.90	2.06	3.5	0.00	11.24
1410	6.90	2.06	2.2	0.00	11.23
1415	6.90	2.06	2.4	0.00	11.23

SAMPLED @ 1416 ID: GW-32504-031815-SR-1873

SAMPLE OF CRA-RA-29

1430	7.32	0.731	8.2	9.70	11.06
1445	7.21	0.464	1.5	14.48	10.83
1500	7.22	0.451	0.7	15.40	10.66
1505	7.22	0.458	0.5	15.95	10.68
1510	7.22	0.463	0.4	15.92	10.83
1515	7.22	0.466	0.4	16.02	10.86

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32504-25 3/18/15

SAMPLE OF CRA-RA-29 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1520	7.22	0.471	0.6	16.37	10.83
1525	7.22	0.474	0.5	16.25	10.84
1530	7.22	0.479	1.0	16.35	10.84

PURGED WELL FOR OVER ONE HOUR

SAMPLED @ 1531 ID: GW-32504-031815-SR-1874

SAMPLE OF 81-8

1545	6.90	0.775	3.9	1.80	11.13
1555	7.26	0.767	4.5	3.24	11.03

AFTER APPROXIMATELY 20 MINUTES OF PURGING, THE WELL WAS PUMPED DRY. I ALLOWED THE WELL TO RECHARGE AND THEN COLLECTED THE SAMPLE.

SAMPLED @ 1700 ID: GW-32504-031815-SR-1875

3/19/15 TMD 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

CRA: STEVE RAPAI

WEATHER: CLOUDY 29°, HIGH 44°

H2S: LEVEL D

CALIBRATION OF RENTAL HORIBA IE-71

B20664B

pH=4.00, COND.=4.49, TURB=0.0, D.O.=10.26

SET UP @ CRA-RA-31. TUBING WAS FROZEN. HAD TO THAW TOP 6 FEET OF TUBING IN TRUCK (3 FEET STICK UP ABOVE GROUND & 3 FEET BELOW GROUND).

SAMPLE OF CRA-RA-31

TIME	pH	COND	TURB.	D.O.	TEMP.
1045	6.86	0.601	23.1	6.34	11.01
1055	6.99	0.544	19.8	0.46	10.93
1105	7.13	0.547	5.1	0.00	10.84
1110	7.14	0.547	4.7	0.00	10.82
1115	7.16	0.548	4.7	0.00	10.82
1120	7.16	0.548	4.0	0.00	10.81

SAMPLED @ 1121 ID: GW-32504-031915-SR-1876

SAMPLE OF CRA-RA-7

1135	7.53	0.317	3.6	6.13	10.82

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32504-25 3/19/15

SAMPLE OF CRA-RA-7 (CONTINUED)

TIME	pH	COND	TURB	D.O.	TEMP.
1150	7.55	0.314	3.3	6.29	10.85
1200	7.55	0.315	2.2	6.21	10.85
1205	7.56	0.315	1.9	6.17	10.87
1210	7.56	0.315	2.0	6.16	10.85
1215	7.56	0.315	1.8	6.16	10.85

SAMPLED @ 1216 ID: GW-32504-031915-SR-1877

SAMPLE OF CRA-RA-65 FROZEN TUBING

1345	6.69	1.07	13.9	10.23	11.60
1355	6.68	1.07	2.6	8.50	11.51
1405	6.68	1.07	1.6	7.05	11.68
1410	6.69	1.07	1.7	6.39	11.60
1415	6.69	1.07	2.2	5.84	11.68
1420	6.68	1.07	1.0	5.26	11.58
1425	6.68	1.07	0.9	4.83	11.61
1430	6.69	1.06	1.1	4.53	11.58
1435	6.69	1.06	1.2	4.50	11.59
1440	6.69	1.06	0.8	4.51	11.59

SAMPLED @ 1441 ID: GW-32504-031915-SR-1878

SAMPLE OF CRA-RA-27

1455	6.75	1.70	1.8	0.00	11.69

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3/19/15 32504-25

SAMPLE OF CRA-RA-27 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1505	6.75	1.72	1.7	0.00	11.62
1515	6.74	1.73	1.1	0.00	11.57
1520	6.74	1.73	1.2	0.00	11.56
1525	6.74	1.73	0.8	0.00	11.56

SAMPLED @ 1526 ID: GW-32504-031915-SR-1879

SAMPLE OF CRA-RA-26S

1555	6.78	1.33	2.6	4.23	10.91
1610	6.76	1.34	2.8	4.11	10.92
1620	6.76	1.35	3.0	4.09	10.91
1625	6.76	1.35	2.7	4.11	10.91
1630	6.76	1.35	3.0	4.12	10.91
1635	6.76	1.35	2.6	4.11	10.91

SAMPLED @ 1636 ID: GW-32504-031915-SR-1880

SAMPLED @ 1641 ID: GW-32504-031915-SR-1881

SAMPLE OF CRA-RA-26D

1650	6.90	1.48	7.2	5.92	10.58
1705	6.80	1.53	5.3	1.33	10.92
1715	6.80	1.55	4.9	0.00	11.00
1720	6.80	1.55	4.6	0.00	11.01
1725	6.80	1.55	4.7	0.00	11.01

SAMPLED @ 1726 ID: GW-32504-031915-SR-1882

SAMPLES PACKED IN COOLER WITH ICE.

32504-25 3/20/15

TASK: FINISH 1/4LY SAMPLE EVENT

CRA: STEVE FRAPA

WEATHER: CLOUDY 30°, HIGH 54

H&S: LEVEL D

CALIBRATION OF RENTAL HORIBA IE #

B20664B

pH=4.00, COND.=4.49, TURB.=0.0, D.O.=9.36

SAMPLE OF 81-4

TIME	pH	COND.	TURB.	D.O.	TEMP.
1025	6.99	1.25	3.9	10.11	12.01
1035	6.95	1.25	2.0	9.44	11.56
1045	6.78	1.26	1.6	9.03	11.49
1050	6.77	1.26	1.3	8.46	11.48
1055	6.77	1.26	0.9	8.18	11.47
1100	6.77	1.26	0.9	8.20	11.46
1105	6.77	1.26	1.0	8.18	11.46

SAMPLED @ 1106 ID: GW-32504-032015-SR-1883

MS/MSD

SAMPLE OF CRA-RA-23D

1130	7.23	0.622	1.9	4.23	10.51
1140	7.01	0.674	2.1	1.03	10.51
1150	6.95	0.695	3.0	0.00	10.51

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3/20/15 32504-25

SAMPLE OF CRA-RA-23D

TIME	pH	COND.	TURB.	D.O.	TEMP.
1155	6.95	0.698	3.0	0.00	10.50
1200	6.95	0.699	2.6	0.00	10.51
1205	6.95	0.699	2.3	0.00	10.51

SAMPLED @ 1206 ID: GW-32504-032015-SR-1884

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

SR