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January 15, 2014

Charlene S. Fitch, P.E.
Chief, Engineering Section
Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

RE: Landfill Corrective Action Plan Update
Bridgeton Landfill, L.L.C
Permit Number 0118912
St. Louis County

Dear Ms. Fitch:

On behalf of our client, Bridgeton Landfill, L.L.C., enclosed are one original and two copies of the *Landfill Gas Corrective Action Update.*

If you have any questions, please contact me at your convenience at the below listed number.

Sincerely,

Daniel R. Feezor Jr

Daniel R. Feezor
President

CC: Larry Lehman, Chief MDNR, Solid Waste Management Program
Laura Yates, St. Louis County Department of Health
Brian Power, Republic Services, Inc., Bridgeton Landfill, L.L.C.

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ENGINEERING FOR A BETTER WORLD
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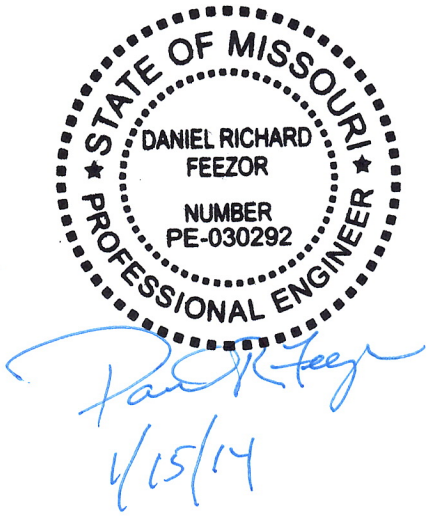
LANDFILL GAS CORRECTIVE ACTION UPDATE

BRIDGETON LANDFILL

BRIDGETON, ST. LOUIS COUNTY, MISSOURI

Submitted Pursuant to Section 23 of Agreed Order
Case No. 13SL-CC01088, Effective May 13, 2013

Prepared For:
Bridgeton Landfill, LLC
13570 St. Charles Rock Road
Bridgeton, MO 63044



JANUARY 15, 2014

Project No.: BT-024

Prepared By:

Feezor Engineering., Inc.
406 East Walnut Street
Chatham, IL 62692

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APPENDICES

1.0 INTRODUCTION

On May 13, 2013, Bridgeton Landfill entered into an Agreed Order with the State of Missouri which requires actions to address what was called a subsurface smoldering event (SSE). Section 23 of the Agreed Order requires the preparation of an updated "Landfill Gas Corrective Action Plan" (CAP) and requests that the update consider SSE control measures. Bridgeton Landfill subsequently submitted such an updated CAP on July 26, 2013.

Section 5.0 of the July 2013 CAP proposed that weekly monitoring data would be summarized and reviewed in a quarterly report. The Missouri Department of Natural Resources (MDNR) accepted this proposal and specified that the initial review be submitted by November 15, 2013. Bridgeton Landfill subsequently submitted an updated Corrective Action Plan on November 15, 2013 and proposed to update the CAP on January 15, 2014. As such, the purpose of this document is to provide monitoring data subsequent to the November 2013 CAP Update, and to review the current status of gas migration control measures.

The text of the July 2013 CAP is included in **Appendix A** for reference. This document will refer to the July 2013 CAP and will provide updates where appropriate.

2.0 REVIEW OF CURRENT GAS MIGRATION CONTROL STATUS

As noted in the November 2013 CAP, the subsurface smoldering event (SSE) continues to present challenging conditions for the control of gas migration.

Detailed graphs showing approximately one year of methane concentrations from November 1, 2012 to December 27, 2013 are included in this document as **Appendix B**.

Table 1 lists the gas monitoring probes and their corresponding abbreviations as presented in the July 2013 CAP, to clarify the historical graphs and the tabulated data for this monitoring period. The monitoring period is determined as November 7 through December 27, 2013.

Tables 2 through **5** present tabulated gas monitoring probe data along with weekly water level readings for the monitoring period November 7, 2013 through December 27, 2013. Weekly water level readings were required by the October 18, 2013 MDNR letter and are provided as depth to water (from top of well).

Weekly water level readings demonstrate little fluctuation from week to week in each monitoring probe. Changes in water level are most likely attributed to precipitation. Due to water levels being fairly consistent, it is requested to change the frequency of water level readings to monthly as opposed to weekly.

The following discussion highlights observations regarding methane which can be made from the data from this monitoring period. A site plan that includes the locations of the gas monitoring probes can be found in **Appendix C**.

Newly elevated probes

No additional Compliance monitoring probes have shown elevated methane readings since the November 15, 2013 CAP Update.

Probes with greater than 2.5% Methane

Several probes continue to show elevated concentrations of methane; however, do not appear to show increasing trends. Weekly sampling of Compliance probes GMP-01, GMP-02, GMP-5S, and Investigative probes TMP-3M, and TMP-2D, show methane percentages above 2.5%; however, do not show distinctive increasing trends. Compliance probes GMP-01, GMP-02, GMP-5S, and Investigative probe TMP-3M continue to show concentrations of methane consistent throughout the monitoring period. Investigative probe TMP-2D has fluctuated during the monitoring period (November 7 – December 27, 2013), but shows no distinctive trend.

Compliance probes GMP-03, GMP-4S, GMP-14S, and GMP-14D and Investigative probes TMP-2S and TMP-3D continue to show elevated methane with an overall upward trend during the past

year. However, Compliance probe GMP-14S shows improvement during the review period between November 7 and December 27, 2013.

Investigative probe TMP-1S shows a decreasing trend during the review period between November 7 and December 27, 2013. TMP-1S also shows an overall decreasing trend during the past year. Investigative probes TMP-2M and TMP-3S do not show a distinctive trend during the review period (November 7 – December 27, 2013); however, they do show a decrease in methane levels during the past monitoring year. The Investigative probes with prefix TMP are located near the southern boundary of the landfill near Boenker Lane, near impacted probe GMP-01.

Probes below 2.5% methane

Many of the weekly measurements of probes continue to be below 2.5% methane. These include Compliance probes GMP-08, GMP-4D, GMP-5D, GMP-6S, GMP-6D, GMP-7S, GMP-7D, GMP-13S, GMP-13D, GMP-15S, GMP-15D, GMP-16S, and GMP-16D. Investigative probes, TMP-1M and TMP-1D are below the 2.5% level for methane. Public safety probes GMP-09 through -12, PZ-204-SS, and PZ-204-ASS continue to be in compliance as well.

Quarterly-read probes

Sentry probes currently being monitored on a quarterly basis are GMP-04, GMP-05, GMP-06, and GMP-07. In the most recent monitoring event (November 14 & 29, 2013), GMP-04, GMP-05, and GMP-06 continued to show elevated methane, while GMP-07 was below 2.5% methane. Although Compliance probe GMP-08 was listed as a quarterly-read probe, it was monitored more frequently during this monitoring period. It is exhibiting percentages below 2.5%.

3.0 RECENT GAS MIGRATION CONTROL EFFORTS

The July 2013 CAP and subsequent November 2013 CAP Update provided an overview of several ongoing and planned measures that should ultimately reduce gas migration.
The following measures have also been completed since the November 2013 CAP Update.

1. Section 3.0 of the July 2013 CAP discussed the ongoing installation of a geomembrane cap:

> *4. Placement of 32 acres of geomembrane cap and enhanced gas collection features which should be completed in August 2013. The cap will allow additional vacuum to be pulled from the cover integrity system consisting of a composite liner system which will reduce concern for oxygen intrusion. This should result in better long term gas capture and, in time, reduced gas pressure.*

The advanced ethylene vinyl alcohol (EVOH) liner systems was completed in October 2013 and now covers approximately 42 acres including the South Quarry waste mass and the surrounding land on each side.

2. Section 4.0 of the July 2013 CAP discussed the pending installation of two utility flares:

> *3. The Bridgeton Landfill has submitted a Permit to Construct application to the St. Louis County Department of Health for the installation of two 4,000 scfm utility flares. These utility flares would replace the existing enclosed flares with a design flow of 3,500 scfm each. The replacement of the enclosed flares with the two 4,000 scfm utility flares coupled with the existing 3,500 scfm John Zink utility flare and the 2,500 scfm LFG Specialties utility flare will provide a combined design flow of the four utility flares of 14,000 scfm. Authorization to Construct is anticipated to be issued by the end of July 2013. The installation of the 4,000 scfm utility flares is anticipated to be completed shortly after permit issuance with operations of each unit by the end of third quarter 2013. Utility flares are better suited to handle the lower heating value gas at the Bridgeton Landfill resulting in less downtime of the control devices.*

Information regarding the two 4,000 scfm utility landfill gas flares, installed September 2013, are provided in the Monthly Data Submittals. The most recent information was compiled and included in the December 20, 2013 Monthly Data Submittal. The following was observed and reported in that document:

> *Landfill gas collection volume has appeared to decrease to 5,500 cfm. It is believed that the perceived decrease is due to the reconfiguration of flare piping and meters.*

Subsequent flare data shows an increase of volume for the month of December at 6,000 cfm. This information is still under review but will be available in the January 20, 2014 Monthly Data Submittals.

The colder air temperatures due to weather affect production at the flares due to expansion and contraction of the high density polyethylene (HDPE) piping. This also contributes to the apparent decrease in volume at the flare.

4.0 PROPOSED AND ONGOING GAS MIGRATION CONTROL EFFORTS

In addition to the recently-implemented measures discussed above, the following on-going efforts are in progress.

1. Section 4.0 of the July 2013 CAP discussed a proposed additional liquid force main:

> *1. The SSE has resulted in an increase in condensate generation. In order to improve liquid removal at the site a third party consultant has been contracted to evaluate the effectiveness of the existing force main. Due to the increased liquid movement within the force main pressure has built up within the system resulting in back pressure and reduced pump functionality. Pressure relief valves have been installed on numerous pneumatic pumps to address this issue. However, due to the increased liquid generation additional capacity within the force main is needed. As such, the preliminary design proposes utilizing the existing force main for management of liquid removed from the LCSs and a second separate force main for liquids removed from the remaining extraction points. The additional liquid force main will allow optimum operations of the pumps while providing increased available vacuum on the landfill gas collection system. This corrective action measure will be submitted to the MDNR in third quarter 2013 sealed by a Missouri Professional Engineer.*

   Since the November 2013 CAP Update, construction of a liquid force main was completed at LCS-1. Currently, this pump is operating properly at 15 gpm. An additional pump is expected to be installed in the next few months.

   Construction is approximately 75 percent complete, with completion currently estimated late in the first quarter of 2014, dependent on weather and scheduling considerations.

2. Section 4.0 of the July 2013 CAP also discussed construction of liquid storage and pretreatment capabilities:

> *2. In order to improve liquid management once the liquids are removed from the disposal area the Bridgeton Landfill has contracted with a third party consulting firm for additional storage and pretreatment of the extracted liquid. During the second quarter 2013 the landfill installed a 316,000 gallon above ground liquid storage and treatment tank. The preliminary treatment plant design includes incorporation of the existing 96,000 gallon tank located near Boenker Road, the newly installed 316,000 gallon tank, four-1,000,000 gallon tanks and a pretreatment facility. This will provide the landfill additional capacity to remove the liquid from the disposal area at a design capacity of 300,000 gallons per day. The treatment plant design will be submitted to the MDNR in third quarter 2013 sealed by a Missouri Professional Engineer.*

   The November 2013 CAP Update indicated the latest construction scheduled estimated completion early in the second quarter of 2014, and this estimate remains unchanged.

3. Section 4.0 of the July 2013 CAP also listed proposed upgraded landfill gas coolers:

> *5. The Bridgeton Landfill will be upgrading the landfill gas coolers at the east utility flare (2,500 scfm LFG Specialties) and at the flare compound in the near future. This improvement will result in additional vacuum available to the well field.*

On November 25, 2013, a Heat Exchanger installation was completed at the Bridgeton Landfill. The Heat Exchanger is an ambient-air cooled, single pass Heat Exchanger designed to handle 11,500 scfm of gas and designed to cool the gas from a maximum of 150F to 100F. The Heat Exchanger was designed to be installed in the upstream portion of the blower/flare station with the primary purpose of cooling the incoming gas to assist the blowers in performance. A secondary purpose of the Heat Exchanger is to lower the gas temperature to remove some of the saturation within the incoming gas stream. The installation of the Heat Exchanger incorporated bypass piping to allow for cleaning or maintenance of the unit while still allowing the flare station to operate.

The cooler at the main flare compound has improved the overall performance of the flare. The cooler reduced the temperature of the landfill gas approximately 30 degrees and stripped most of the moisture from the gas. Prior to the cooler installation, candlestick flare performance was less than 100% due to excess moisture causing a decrease in flare temperature and resulting in shutdown. After the cooler installation, the flare throttle is open resulting in optimizing performance.

It is difficult to ascertain the performance of the East Flare cooler due to the decreased ambient air temperatures. The East Flare primarily operates off of surface collectors which have ambient air temperature readings.

4. Section 4.0 of the November 2013 CAP Update discussed an enhanced Gas Control and Collection System:

> *Beginning in November 2013, the facility team began the expansion and enhancement of the Gas Control and Collection System in the North Quarry, which will involve the installation or replacement of 30 wells. Additionally, Bridgeton Landfill is completing installation of a 200-hp compressor. This will improve the pressure to improve efficiency of the large number of gas collection points.*

Bridgeton Landfill completed the installation of a 200-hp compressor in October 2013 (Monthly Data Submittal, December 20, 2013). As of the end of December 2013, 21 of the 30 North Quarry wells have been installed or replaced. The remainder of these are scheduled to be installed or replace beginning in February 2014.

5.0 CONTINUED MONITORING AND REPORTING

Bridgeton Landfill will continue with gas probe monitoring and reporting as specified in Section 5.0 of the July 2013 CAP. Therefore, the next update is proposed to be included in the April 15th quarterly report.

TABLE 1

LIST OF LANDFILL GAS MONITORING PROBES

Bridgeton Landfill
Landfill Gas Monitoring Probes
July 2013

ID	CSV ID	POINT NAME	Ref Boring/installation Record	Type	Current Monitoring Frequency
GMP-01	BRIGMP01	MP01	GMP-01	Compliance probe	weekly
GMP-02	BRIGMP02	MP02	GMP-02	Compliance probe	weekly
GMP-03	BRIGMP03	MP03	GMP-03	Compliance probe	weekly
GMP-04	BRIGMP04	MP04	GMP-04	Sentry probe	quarterly
GMP-05	BRIGMP05	MP05	GMP-05	Sentry probe	quarterly
GMP-06	BRIGMP06	MP06	PZ-201-SS	Sentry probe	quarterly
GMP-07	BRIGMP07	MP07	PZ-200-SS	Sentry probe	quarterly
GMP-08	BRIGMP08	MP08	GMP-08	Compliance probe	quarterly
GMP-09	BRIGMP09	MP09	GMP-09	Public Safety Probe	weekly
GMP-10	BRIGMP10	MP10	GMP-10	Public Safety Probe	weekly
GMP-11	BRIGMP11	MP11	GMP-11	Public Safety Probe	weekly
GMP-12	BRIGMP12	MP12	GMP-12	Public Safety Probe	weekly
GMP-4S	BRIGMP4S	BRIGMP4S	GMP-04	Compliance nested probe	weekly
GMP-4D	BRIGMP4D	BRIGMP4D	GMP-04	Compliance nested probe	weekly
GMP-5S	BRIGMP5S	BRIGMP5S	GMP-05	Compliance nested probe	weekly
GMP-5D	BRIGMP5D	BRIGMP5D	GMP-05	Compliance nested probe	weekly
GMP-6S	BRIGMP6S	BRIGMP6S	GMP-06	Compliance nested probe	weekly
GMP-6D	BRIGMP6D	BRIGMP6D	GMP-06	Compliance nested probe	weekly
GMP-7S	BRIGMP7S	BRIGMP7S	GMP-07	Compliance nested probe	weekly
GMP-7D	BRIGMP7D	BRIGMP7D	GMP-07	Compliance nested probe	weekly
GMP-13S	BRGMP13S	BRGMP13S	GMP-13	Compliance nested probe	weekly
GMP-13D	BRGMP13D	BRGMP13D	GMP-13	Compliance nested probe	weekly
GMP-14S	BRGMP14S	BRGMP14S	GMP-14	Compliance nested probe	weekly
GMP-14D	BRGMP14D	BRGMP14D	GMP-14	Compliance nested probe	weekly
GMP-15S	BRGMP15S	BRGMP15S	GMP-15	Compliance nested probe	weekly
GMP-15D	BRGMP15D	BRGMP15D	GMP-15	Compliance nested probe	weekly
GMP-16S	BRGMP16S	BRGMP16S	GMP-16	Compliance nested probe	weekly
GMP-16D	BRGMP16D	BRGMP16D	GMP-16	Compliance nested probe	weekly
TMP-1S	BRITMP1S	BRITMP1S	TMP-01	Investigative nested probe	weekly
TMP-1M	BRITMP1M	BRITMP1M	TMP-01	Investigative nested probe	weekly
TMP-1D	BRITMP1D	BRITMP1D	TMP-01	Investigative nested probe	weekly
TMP-2S	BRITMP2S	BRITMP2S	TMP-02	Investigative nested probe	weekly
TMP-2M	BRITMP2M	BRITMP2M	TMP-02	Investigative nested probe	weekly
TMP-2D	BRITMP2D	BRITMP2D	TMP-02	Investigative nested probe	weekly
TMP-3S	BRITMP3S	BRITMP3S	TMP-03	Investigative nested probe	weekly
TMP-3M	BRITMP3M	BRITMP3M	TMP-03	Investigative nested probe	weekly
TMP-3D	BRITMP3D	BRITMP3D	TMP-03	Investigative nested probe	weekly
PZ-204-SS	PZ2040SS	4OSS	PZ-204-SS	Public Safety Probe	weekly
PZ-204-ASS	PZ204ASS	4ASS	PZ-204-ASS	Public Safety Probe	weekly

TABLE 2

COMPLIANCE GAS MONITORING PROBE DATA

NOVEMBER 7, 2013 – DECEMBER 27, 2013

Gas Monitoring Probe Data - Compliance Probes

Bridgeton Landfill

11/7/2013 - 12/27/2013

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
GMP-01	weekly	11/7/2013	59.7	40.2	0	0.1	5.1	12.1	No Comment
GMP-01	weekly	11/14/2013	61.6	36.7	0	1.7	4.99	12.1	No Comment
GMP-01	weekly	11/21/2013	62.5	37	0	0.5	3.16	0	No Comment
GMP-01	weekly	11/29/2013	62.5	37.4	0	0.1	2.72	0	No Comment
GMP-01	weekly	12/7/2013	61.8	38	0	0.2	1.06	dry	No Comment
GMP-01	weekly	12/11/2013	59.2	36.1	4.2		2.18	dry	No Comment
GMP-01	weekly	12/19/2013	59.7	35.7	4.2		1.43	dry	No Comment
GMP-01	weekly	12/27/2013	56.6	38.3	4.2		2.36	dry	No Comment
GMP-02	weekly	11/7/2013	70.2	28.8	0	1	5.6	13.55	No Comment
GMP-02	weekly	11/14/2013	68.7	28.4	0	2.9	10.32	12.8	No Comment
GMP-02	weekly	11/21/2013	66.3	32.8	0	0.9	18.45	17.3	No Comment
GMP-02	weekly	11/29/2013	67.4	32.4	0	0.2	14.15	13	No Comment
GMP-02	weekly	12/7/2013	70.3	29.6	0	0.1	16.06	13.4	No Comment
GMP-02	weekly	12/11/2013	72.4	27.2	0.4		14.79	14.4	No Comment
GMP-02	weekly	12/19/2013	66.9	32.2	0.9		8.24	13.9	No Comment
GMP-02	weekly	12/27/2013	70.1	26.5	3.2		6.01	15	No Comment
GMP-03	weekly	11/7/2013	44.1	8.8	5.4	41.7	0	14.5	No Comment
GMP-03	weekly	11/14/2013	60.4	11.2	0.8	27.6	0.11	14.87	No Comment
GMP-03	weekly	11/21/2013	48.4	9.4	4.7	37.5	0	16.1	No Comment
GMP-03	weekly	11/29/2013	0	0.4	22	77.6	-0.1	14.9	No Comment
GMP-03	weekly	12/7/2013	61.7	10.4	1.1	26.8	0.02	15.1	No Comment
GMP-03	weekly	12/11/2013	54	8.4	33.5		-0.04	17	No Comment
GMP-03	weekly	12/19/2013	47.4	7.5	39.6		-0.15	16.8	No Comment
GMP-03	weekly	12/27/2013	57.2	8	30.1		0.01	18.1	No Comment
GMP-08	quarterly	11/7/2013	0	1.8	18.1	80.1	-0.09	36.25	No Comment
GMP-08	quarterly	11/14/2013	0	10.1	15.1	74.8	0.03	35.9	No Comment
GMP-08	quarterly	11/21/2013	0	3.6	16.2	80.2	0	35.8	No Comment
GMP-08	quarterly	11/29/2013	0	5.8	16.7	77.5	0.01	36.3	No Comment
GMP-08	quarterly	12/7/2013	0	5	17	78	0.02	37	No Comment
GMP-08	quarterly	12/11/2013	0	4.9	74.5		0.03	38.1	No Comment
GMP-08	quarterly	12/19/2013	0	3.6	79.2		-0.09	35	No Comment
GMP-08	quarterly	12/27/2013	0	3.1	78.8		0.06	37.4	No Comment
GMP-13D	weekly	11/7/2013	0.1	2.4	21	76.5	-0.01	15.2	No Comment
GMP-13D	weekly	11/14/2013	0.1	0.9	22.9	76.1	0.09	15.23	No Comment

Gas Monitoring Probe Data - Compliance Probes

Bridgeton Landfill

11/7/2013 - 12/27/2013

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
GMP-13D	weekly	11/21/2013	0	3.8	20.5	75.7	0.03	15	No Comment
GMP-13D	weekly	11/29/2013	0.1	2.2	21.5	76.2	0.04	15.1	No Comment
GMP-13D	weekly	12/7/2013	0.2	3.4	20.9	75.5	0.01	15.9	No Comment
GMP-13D	weekly	12/11/2013	0.2	3.7	74.4		-0.05	15	No Comment
GMP-13D	weekly	12/19/2013	0.1	0.7	77		-0.01	14.9	No Comment
GMP-13D	weekly	12/27/2013	0	2	77.9		0.11	15.5	No Comment
GMP-13S	weekly	11/7/2013	0.3	5.1	18.3	76.3	-0.01	12.95	No Comment
GMP-13S	weekly	11/14/2013	0.2	4.1	19.9	75.8	0.03	12.9	No Comment
GMP-13S	weekly	11/21/2013	0	4.6	18.8	76.6	0	13.6	No Comment
GMP-13S	weekly	11/29/2013	0.3	5.4	19.2	75.1	0	13	No Comment
GMP-13S	weekly	12/7/2013	0.3	4.7	19.3	75.7	-0.02	12.8	No Comment
GMP-13S	weekly	12/11/2013	0.3	5.6	74.2		0	14.3	No Comment
GMP-13S	weekly	12/19/2013	0.1	2.4	77.2		-0.14	14.4	No Comment
GMP-13S	weekly	12/27/2013	0.4	5.6	76.5		-0.11	14.9	No Comment
GMP-14D	weekly	11/7/2013	80.2	9.8	0.3	9.7	0.95	8.8	No Comment
GMP-14D	weekly	11/14/2013	44.5	7.2	8.7	39.6	0.76	9	No Comment
GMP-14D	weekly	11/21/2013	77.5	8.1	1.3	13.1	0.97	8.7	No Comment
GMP-14D	weekly	11/29/2013	65.6	11.1	2.9	20.4	1.18	9.1	No Comment
GMP-14D	weekly	12/7/2013	76.6	8.8	1.7	12.9	0.68	8.9	No Comment
GMP-14D	weekly	12/11/2013	78.8	10.7	9.2		1.01	8.7	No Comment
GMP-14D	weekly	12/19/2013	81.2	8	9.4		-2.8	9	No Comment
GMP-14D	weekly	12/27/2013	75.8	10.1	11.9		1.3	8.9	No Comment
GMP-14S	weekly	11/7/2013	32.1	16.5	10	41.4	-0.01	9.23	No Comment
GMP-14S	weekly	11/14/2013	16	14.8	14.8	54.4	0.01	8.97	No Comment
GMP-14S	weekly	11/21/2013	8.3	6.5	18	67.2	0	9.2	No Comment
GMP-14S	weekly	11/29/2013	16.4	4.6	17.1	61.9	0.06	9	No Comment
GMP-14S	weekly	12/7/2013	12.4	4.3	17.8	65.5	0.04	8.7	No Comment
GMP-14S	weekly	12/11/2013	9.7	4.5	66.8		0	9.6	No Comment
GMP-14S	weekly	12/19/2013	5.4	5	69.8		-0.1	9.4	No Comment
GMP-14S	weekly	12/27/2013	11.2	5.1	66.7		0.03	10.1	No Comment
GMP-15D	weekly	11/7/2013	0	3.7	20	76.3	-0.11	13	No Comment
GMP-15D	weekly	11/14/2013	0	3.2	21.2	75.6	0.01	13.3	No Comment
GMP-15D	weekly	11/21/2013	0	4.6	19.8	75.6	0.04	13.2	No Comment
GMP-15D	weekly	11/29/2013	0	4.7	20.4	74.9	0.18	13.9	No Comment

Gas Monitoring Probe Data - Compliance Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
GMP-15D	weekly	12/7/2013	0	4.7	17.9	77.4	0.08	14.3	No Comment
GMP-15D	weekly	12/11/2013	0	4.2	74.6		-0.13	13.8	No Comment
GMP-15D	weekly	12/19/2013	0	3.6	75.2		-0.09	13	No Comment
GMP-15D	weekly	12/27/2013	0	2.9	77.8		0.28	14.3	No Comment
GMP-15S	weekly	11/7/2013	0	6.8	15.4	77.8	-0.01	12.55	No Comment
GMP-15S	weekly	11/14/2013	0	2.9	17.2	79.9	0.03	12.6	No Comment
GMP-15S	weekly	11/21/2013	0	5.5	16.4	78.1	0	12.7	No Comment
GMP-15S	weekly	11/29/2013	0	2.8	17.8	79.4	0	12.8	No Comment
GMP-15S	weekly	12/7/2013	0	4.2	16.9	78.9	0.01	13.1	No Comment
GMP-15S	weekly	12/11/2013	0	4.5	77.1		0	13.3	No Comment
GMP-15S	weekly	12/19/2013	0	3.4	77.9		0.06	12.6	No Comment
GMP-15S	weekly	12/27/2013	0	1.9	79.8		0.01	13.9	No Comment
GMP-16D	weekly	11/7/2013	0	10.1	13.9	76	-0.08	10.9	No Comment
GMP-16D	weekly	11/14/2013	0	7.2	18.2	74.6	-0.04	10.6	No Comment
GMP-16D	weekly	11/21/2013	0	5.8	18.2	76	0	11.2	No Comment
GMP-16D	weekly	11/29/2013	0	9.6	12	78.4	0.02	10.4	No Comment
GMP-16D	weekly	12/7/2013	0	6.3	19.2	74.5	0	10.5	No Comment
GMP-16D	weekly	12/11/2013	0	5.8	73.2		0	11.5	No Comment
GMP-16D	weekly	12/19/2013	0	6.6	73.9		-0.09	10.6	No Comment
GMP-16D	weekly	12/27/2013	0	8.2	74.9		0.1	11.8	No Comment
GMP-16S	weekly	11/7/2013	0	13.1	5.5	81.4	-0.03	10.85	No Comment
GMP-16S	weekly	11/14/2013	0	8.2	7.8	84	-0.13	10.5	No Comment
GMP-16S	weekly	11/21/2013	0	4.3	9.6	86.1	0	11.2	No Comment
GMP-16S	weekly	11/29/2013	0	6.8	9.4	83.8	0.06	10.1	No Comment
GMP-16S	weekly	12/7/2013	0	7.1	10.2	82.7	0.07	11	No Comment
GMP-16S	weekly	12/11/2013	0	8.7	80.6		-0.02	11.5	No Comment
GMP-16S	weekly	12/19/2013	0	6.4	81.5		0.04	10.6	No Comment
GMP-16S	weekly	12/27/2013	0	7.4	80.9		0.03	11.7	No Comment
GMP-4D	weekly	11/7/2013	0.1	1.3	21.3	77.3	-0.04	11	No Comment
GMP-4D	weekly	11/14/2013	0	0.5	20.2	79.3	0.13	11.22	No Comment
GMP-4D	weekly	11/21/2013	0	1.8	21.1	77.1	0.07	11.3	No Comment
GMP-4D	weekly	11/29/2013	0.1	1.6	21.7	76.6	0.14	11.3	No Comment
GMP-4D	weekly	12/7/2013	0.2	1.8	21.3	76.7	0.03	11	No Comment
GMP-4D	weekly	12/11/2013	0.3	2.2	75.5		-0.07	11.6	No Comment

Gas Monitoring Probe Data - Compliance Probes

Bridgeton Landfill

11/7/2013 - 12/27/2013

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
GMP-4D	weekly	12/19/2013	0.1	0.6	77.2		-0.16	11.7	No Comment
GMP-4D	weekly	12/27/2013	0.1	1.4	78.3		0.16	11.9	No Comment
GMP-4S	weekly	11/7/2013	7.8	1.8	17.1	73.3	-0.01	10.9	No Comment
GMP-4S	weekly	11/14/2013	3.5	1.3	21	74.2	0.01	10.62	No Comment
GMP-4S	weekly	11/21/2013	5.6	2.9	17.2	74.3	0.03	11	No Comment
GMP-4S	weekly	11/29/2013	9.5	1.8	16.5	72.2	0.06	10.5	No Comment
GMP-4S	weekly	12/7/2013	11	3.2	14.9	70.9	0.04	10.3	No Comment
GMP-4S	weekly	12/11/2013	12	3.6	69.1		0.03	11.6	No Comment
GMP-4S	weekly	12/19/2013	16	2.4	67.5		0.13	11.2	No Comment
GMP-4S	weekly	12/27/2013	18.9	2.5	66.6		0.01	12.3	No Comment
GMP-5D	weekly	11/7/2013	0.2	7.5	19	73.3	-0.02	23.1	No Comment
GMP-5D	weekly	11/14/2013	0	6.3	20.2	73.5	-0.02	23.12	No Comment
GMP-5D	weekly	11/21/2013	0	3.2	20.3	76.5	0	23.4	No Comment
GMP-5D	weekly	11/29/2013	0	5.9	20.3	73.8	0	23.9	No Comment
GMP-5D	weekly	12/7/2013	0	5.5	19.6	74.9	0.06	23.1	No Comment
GMP-5D	weekly	12/11/2013	0.1	7	72.5		-0.01	23.1	No Comment
GMP-5D	weekly	12/19/2013	0.1	3.8	74.6		-0.14	23	No Comment
GMP-5D	weekly	12/27/2013	0.1	6.7	74.2		0.03	22	No Comment
GMP-5S	weekly	11/7/2013	22.7	54.9	2.9	19.5	0.29	16.5	No Comment
GMP-5S	weekly	11/14/2013	20.4	46.6	5.5	27.5	0	17	No Comment
GMP-5S	weekly	11/21/2013	10.2	25.7	12.1	52	0	17.1	No Comment
GMP-5S	weekly	11/29/2013	10.2	39.7	6.1	44	-0.03	16.7	No Comment
GMP-5S	weekly	12/7/2013	11.8	42.5	4.6	41.1	0.03	17.1	No Comment
GMP-5S	weekly	12/11/2013	12.4	40.7	41.8		-0.01	17	No Comment
GMP-5S	weekly	12/19/2013	13.7	49.2	35		-0.15	17.3	No Comment
GMP-5S	weekly	12/27/2013	23.1	46.3	28.6		0.04	16.9	No Comment
GMP-6D	weekly	11/7/2013	0.1	0.8	21.3	77.8	-0.05	14.5	No Comment
GMP-6D	weekly	11/14/2013	0	1	21.9	77.1	0.11	14.51	No Comment
GMP-6D	weekly	11/21/2013	0	1.4	20.6	78	0	14.7	No Comment
GMP-6D	weekly	11/29/2013	0	2.2	21.6	76.2	0.05	14.3	No Comment
GMP-6D	weekly	12/7/2013	0.1	1.2	21.5	77.2	-0.01	13.9	No Comment
GMP-6D	weekly	12/11/2013	0.1	1.6	76.2		0	15.2	No Comment
GMP-6D	weekly	12/19/2013	0	1	76.9		-0.11	14.8	No Comment
GMP-6D	weekly	12/27/2013	0	1.5	78.2		0.04	14.9	No Comment

Gas Monitoring Probe Data - Compliance Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
GMP-6S	weekly	11/7/2013	0.4	2.1	12	85.5	0.07	12.8	No Comment
GMP-6S	weekly	11/14/2013	0.2	1.5	16	82.3	0	12.77	No Comment
GMP-6S	weekly	11/21/2013	0.1	1.6	15.3	83	0.01	12.9	No Comment
GMP-6S	weekly	11/29/2013	0.4	4.1	11.2	84.3	0.07	12.9	No Comment
GMP-6S	weekly	12/7/2013	0.5	3.3	10.3	85.9	0.03	13.4	No Comment
GMP-6S	weekly	12/11/2013	0.5	3.4	85.2		0.02	13.1	No Comment
GMP-6S	weekly	12/19/2013	0.4	2.9	89.3		-0.03	13	No Comment
GMP-6S	weekly	12/27/2013	0.3	2.4	84.1		0.04	13.6	No Comment
GMP-7D	weekly	11/7/2013	0	3.3	20.9	75.8	-1.8	20	No Comment
GMP-7D	weekly	11/14/2013	0	4.3	21.2	74.5	-0.02	20.2	No Comment
GMP-7D	weekly	11/21/2013	0	3.9	20.2	75.9	0	21	No Comment
GMP-7D	weekly	11/29/2013	0	6.9	19.6	73.5	0.08	21	No Comment
GMP-7D	weekly	12/7/2013	0	4.7	19.6	75.7	0.01	20.6	No Comment
GMP-7D	weekly	12/11/2013	0	5.4	84.7		-0.02	21.2	No Comment
GMP-7D	weekly	12/19/2013	0	3.4	76.6		0.04	20.5	No Comment
GMP-7D	weekly	12/27/2013	0	4	77.8		0.05	22	No Comment
GMP-7S	weekly	11/7/2013	0	6.3	2.7	91	12.09	18.6	No Comment
GMP-7S	weekly	11/14/2013	0	5.1	4.2	90.7	0	18.8	No Comment
GMP-7S	weekly	11/21/2013	0	4.4	3.8	91.8	2.68	unable to obtain	Can't remove sample port
GMP-7S	weekly	11/29/2013	0	8.2	4.4	87.4	0.02	unable to obtain	Can't remove sample port
GMP-7S	weekly	12/7/2013	0	5.7	7.9	86.4	0	unable to obtain	Can't remove sample port
GMP-7S	weekly	12/11/2013	0	5.4	89.9		0	unable to obtain	excessive pressure
GMP-7S	weekly	12/19/2013	0	4.9	89.8		10.08	unable to obtain	can't remove sample port
GMP-7S	weekly	12/27/2013	0	6.2	77		0.1	unable to obtain	can't remove sample port

TABLE 3

SENTRY GAS MONITORING PROBE DATA

NOVEMBER 7, 2013 – DECEMBER 27, 2013

Gas Monitoring Probe Data - Sentry Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
GMP-04	quarterly	11/14/2013	23.3	64.2	0.7	11.8	128.19	Unable to obtain	excessive pressure
GMP-05	quarterly	11/29/2013	55.1	41.2	0	3.7	3.24	12.4	No Comment
GMP-06	quarterly	11/29/2013	27.8	63.3	0.5	8.4	0.06	12.9	No Comment
GMP-07	quarterly	11/14/2013	2	21.2	4.5	72.3	0.03	26.35	No Comment

TABLE 4

TEMPORARY GAS MONITORING PROBE DATA

NOVEMBER 7, 2013 – DECEMBER 27, 2013

Gas Monitoring Probe Data - Investigative Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
TMP-1D	weekly	11/7/2013	0.6	8.8	18.7	71.9	0.44	20.2	No Comment
TMP-1D	weekly	11/14/2013	0.5	6.1	22.1	71.3	0.89	19.77	No Comment
TMP-1D	weekly	11/21/2013	0.1	0.8	21.4	77.7	0.48	20.5	No Comment
TMP-1D	weekly	11/29/2013	0.6	4.4	21.1	73.9	0.95	19.8	No Comment
TMP-1D	weekly	12/7/2013	0.3	4.7	20.6	74.4	1.02	20	No Comment
TMP-1D	weekly	12/11/2013	0.3	1.9	76.1		1.03	21	No Comment
TMP-1D	weekly	12/19/2013	0.3	3.2	74.9		0.71	20.5	No Comment
TMP-1D	weekly	12/27/2013	0.4	7.9	72.5		0.58	21	No Comment
TMP-1M	weekly	11/7/2013	3.1	31.1	10.5	55.3	0.04	20.2	No Comment
TMP-1M	weekly	11/14/2013	0.4	12.2	19.8	67.6	-0.01	20.4	No Comment
TMP-1M	weekly	11/21/2013	0.3	7.9	19.7	72.1	0	20.5	No Comment
TMP-1M	weekly	11/29/2013	0.3	8.3	20.2	71.2	0.03	20.7	No Comment
TMP-1M	weekly	12/7/2013	0.3	8.8	19.7	71.2	0.02	20.3	No Comment
TMP-1M	weekly	12/11/2013	0.1	3.8	74.8		0	21.4	No Comment
TMP-1M	weekly	12/19/2013	0.3	7.1	72		-0.16	20.7	No Comment
TMP-1M	weekly	12/27/2013	0.5	12.8	69.1		-0.06	21.4	No Comment
TMP-1S	weekly	11/7/2013	33.8	58.9	0	7.3	0.28	19.75	No Comment
TMP-1S	weekly	11/14/2013	32.3	55.2	0.1	12.4	0.11	19.6	No Comment
TMP-1S	weekly	11/21/2013	32.7	62.1	0	5.2	0.02	20	No Comment
TMP-1S	weekly	11/29/2013	30.2	59.4	1	9.4	0.14	19.5	No Comment
TMP-1S	weekly	12/7/2013	32.1	63.4	0	4.5	0.09	19.1	No Comment
TMP-1S	weekly	12/11/2013	29	58	11.8		0.01	20.8	No Comment
TMP-1S	weekly	12/19/2013	28.6	62.8	7.6		0.57	20.1	No Comment
TMP-1S	weekly	12/27/2013	30.1	56.1	13		0.25	20.3	No Comment
TMP-2D	weekly	11/7/2013	29.3	25.2	8.4	37.1	0.55	15.4	No Comment
TMP-2D	weekly	11/14/2013	3.3	4	22.3	70.4	0.41	15.41	No Comment
TMP-2D	weekly	11/21/2013	55.5	36	1.3	7.2	6.23	20.8	No Comment
TMP-2D	weekly	11/29/2013	41.4	28.6	6	24	10.9	16	No Comment
TMP-2D	weekly	12/7/2013	13	13.1	16.2	57.7	1.26	15.9	No Comment
TMP-2D	weekly	12/11/2013	39.6	28.9	25.3		9.9	21.6	No Comment
TMP-2D	weekly	12/19/2013	5.1	4.5	70		0.39	16.6	No Comment
TMP-2D	weekly	12/27/2013	60.4	36.3	3.2		85.53	22	No Comment
TMP-2M	weekly	11/7/2013	7.7	8.9	17.6	65.8	0.27	14.43	No Comment
TMP-2M	weekly	11/14/2013	4.1	4.7	21.9	69.3	0.2	15.38	No Comment

Gas Monitoring Probe Data - Investigative Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
TMP-2M	weekly	11/21/2013	3.5	7.8	19.1	69.6	0	17.1	No Comment
TMP-2M	weekly	11/29/2013	1.4	3.2	21.3	74.1	0.03	15.2	No Comment
TMP-2M	weekly	12/7/2013	10.9	10.5	17.2	61.4	0.51	15.3	No Comment
TMP-2M	weekly	12/11/2013	1.3	2.9	74.5		0.02	16.8	No Comment
TMP-2M	weekly	12/19/2013	7.8	7.3	65.8		0.51	16.5	No Comment
TMP-2M	weekly	12/27/2013	1.9	4	74.1		-0.01	17.1	No Comment
TMP-2S	weekly	11/7/2013	2.7	4.4	18	74.9	0.09	14.25	No Comment
TMP-2S	weekly	11/14/2013	16.8	38.2	10.8	34.2	0	14.55	No Comment
TMP-2S	weekly	11/21/2013	19.7	74.5	0	5.8	0.03	16	No Comment
TMP-2S	weekly	11/29/2013	5.2	4.5	18.8	71.5	0.02	14.7	No Comment
TMP-2S	weekly	12/7/2013	26.2	48.5	4	21.3	0.06	15	No Comment
TMP-2S	weekly	12/11/2013	3.4	2.6	73.2		0	16.4	No Comment
TMP-2S	weekly	12/19/2013	0.1	11.6	74.4		-0.08	16.3	No Comment
TMP-2S	weekly	12/27/2013	40.1	31.1	23.7		0	16	No Comment
TMP-3D	weekly	11/7/2013	44.9	50.9	0	4.2	73.16	unable to obtain	excessive pressure
TMP-3D	weekly	11/14/2013	46.8	46.6	0	6.6	170.74	unable to obtain	excessive pressure
TMP-3D	weekly	11/21/2013	47.2	47.6	0	5.2	178.21	unable to obtain	excessive pressure
TMP-3D	weekly	11/29/2013	53.5	44.9	0	1.6	96.5	unable to obtain	excessive pressure
TMP-3D	weekly	12/7/2013	51.2	48	0	0.8	130.07	unable to obtain	excessive pressure
TMP-3D	weekly	12/11/2013	43.4	50.7	5.9		58.54	unable to obtain	excessive pressure
TMP-3D	weekly	12/19/2013	28	31.1	32.1		4.03	unable to obtain	excessive pressure
TMP-3D	weekly	12/27/2013	39.3	44.4	14.3		0.14	unable to obtain	excessive pressure
TMP-3M	weekly	11/7/2013	42.3	52.8	0	4.9	161.71	unable to obtain	excessive pressure
TMP-3M	weekly	11/14/2013	45.7	47.2	0	7.1	197.75	unable to obtain	excessive pressure
TMP-3M	weekly	11/21/2013	49.1	47.7	0	3.2	177.01	unable to obtain	excessive pressure
TMP-3M	weekly	11/29/2013	41.7	53.9	0	4.4	131.59	unable to obtain	excessive pressure
TMP-3M	weekly	12/7/2013	44.2	52.8	0	3	174.65	unable to obtain	excessive pressure
TMP-3M	weekly	12/11/2013	42.2	52.2	5.6		147.53	unable to obtain	excessive pressure
TMP-3M	weekly	12/19/2013	44.4	51.5	4.1		184.38	unable to obtain	excessive pressure
TMP-3M	weekly	12/27/2013	47.1	45.6	7.3		169.97	unable to obtain	excessive pressure
TMP-3S	weekly	11/7/2013	48	47	0	5	9.74	unable to obtain	excessive pressure
TMP-3S	weekly	11/14/2013	48.7	43.3	0.8	7.2	29.87	unable to obtain	excessive pressure
TMP-3S	weekly	11/21/2013	48.4	48.1	0.1	3.4	1.9	unable to obtain	excessive pressure
TMP-3S	weekly	11/29/2013	47.5	49.2	0.1	3.2	0.51	unable to obtain	excessive pressure

Gas Monitoring Probe Data - Investigative Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
TMP-3S	weekly	12/7/2013	47	49.4	0	3.6	10.99	unable to obtain	excessive pressure
TMP-3S	weekly	12/11/2013	46.7	47.4	5.8		5.2	unable to obtain	excessive pressure
TMP-3S	weekly	12/19/2013	45	50.9	4.1		18.3	unable to obtain	excessive pressure
TMP-3S	weekly	12/27/2013	47.6	45.6	6.3		32.05	unable to obtain	excessive pressure

TABLE 5

PUBLIC SAFETY GAS MONITORING PROBE DATA

NOVEMBER 7, 2013 – DECEMBER 27, 2013

Gas Monitoring Probe Data - Public Safety Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
4ASS	weekly	11/7/2013	0.2	2.3	19.3	78.2	-0.31	5.1	No Comment
4ASS	weekly	11/14/2013	0.1	4	21.8	74.1	-2.18	4.9	No Comment
4ASS	weekly	11/21/2013	0	2.5	19.3	78.2	-5.64	5.2	No Comment
4ASS	weekly	11/29/2013	0			M		NA	No Comment
4ASS	weekly	12/7/2013	0	1.1	20.8	78.1	-0.57	5.1	No Comment
4ASS	weekly	12/11/2013	0	3.3	76.2		-7.66	5.6	No Comment
4ASS	weekly	12/19/2013	0	4	76.5		-15.94	5.3	No Comment
4ASS	weekly	12/27/2013	0	3.2	77.7		-6.43	6.1	No Comment
4OSS	weekly	11/7/2013	0	3	19.2	77.8	5.56	7.71	No Comment
4OSS	weekly	11/14/2013	0	3	22	75	-3.61	7.9	No Comment
4OSS	weekly	11/21/2013	0	4.4	19.2	76.4	-14.01	8.8	No Comment
4OSS	weekly	11/29/2013	0			M		NA	No Comment
4OSS	weekly	12/7/2013	0	1.7	20.2	78.1	-15.35	7.6	No Comment
4OSS	weekly	12/11/2013	0	2.6	76		-14.25	9.1	No Comment
4OSS	weekly	12/19/2013	0	4.1	75.8		-3.27	9.4	No Comment
4OSS	weekly	12/27/2013	0	3	78.1		-6.25	10	No Comment
GMP-09	weekly	11/7/2013	0	0.1	21	78.9	-10.64	7.85	No Comment
GMP-09	weekly	11/14/2013	0	2.1	20.4	77.5	-4.15	8.3	No Comment
GMP-09	weekly	11/21/2013	0	1	21.4	77.6	-5.95	8.3	No Comment
GMP-09	weekly	11/29/2013	0.1	1.8	22.2	75.9	-7.71	8.1	No Comment
GMP-09	weekly	12/7/2013	0.2	1	21.6	77.2	-50.65	8.5	No Comment
GMP-09	weekly	12/11/2013	0.2	4.6	74		-16.05	9.2	No Comment
GMP-09	weekly	12/19/2013	0	2.2	76.2		3.74	9.2	No Comment
GMP-09	weekly	12/27/2013	0.1	3	76.2		-5.05	10	No Comment
GMP-10	weekly	11/7/2013	0	0.1	11	88.9	-7.72	3.82	No Comment
GMP-10	weekly	11/14/2013	0	1.5	18.3	80.2	0.6	4.1	No Comment
GMP-10	weekly	11/21/2013	0	0.9	17.3	81.8	-8.33	4.8	No Comment
GMP-10	weekly	11/29/2013	0	2.7	20.8	76.5	0.04	4.2	No Comment
GMP-10	weekly	12/7/2013	0	0.9	21.3	77.8	0	4.5	No Comment
GMP-10	weekly	12/11/2013	0	3	75.1		0.01	6	No Comment
GMP-10	weekly	12/19/2013	0	1.3	77.7		3.22	0	No Comment
GMP-10	weekly	12/27/2013	0	1.8	77.6		0.06	5.6	No Comment
GMP-11	weekly	11/7/2013	0	2.9	19.3	77.8	-15.32	0.4	No Comment
GMP-11	weekly	11/14/2013	0	2.6	22.1	75.3	-18.66	0.2	No Comment

Gas Monitoring Probe Data - Public Safety Probes
11/7/2013 - 12/27/2013

Bridgeton Landfill

Point Name	Frequency	Date	Methane	CO2	Balance	Pressure	Rel. Pressure	Depth to Water (ft)	Comment
GMP-11	weekly	11/21/2013	0	4.5	19.2	76.3	0.24	1.8	No Comment
GMP-11	weekly	11/29/2013	0	1.6	21	77.4	-7.11	0.8	No Comment
GMP-11	weekly	12/7/2013	0.1	0.7	21.9	77.3	-21.51	0	No Comment
GMP-11	weekly	12/11/2013	1.1	0.1	76.5		-14.92	2.6	No Comment
GMP-11	weekly	12/19/2013	0	4.1	75.6		14.02	0	No Comment
GMP-11	weekly	12/27/2013	0	3.6	75.9		0	0	No Comment
GMP-12	weekly	11/7/2013	0	2.5	19.5	78	-4.51	0	No Comment
GMP-12	weekly	11/14/2013	0	3.1	22.5	74.4	-6.89	0	No Comment
GMP-12	weekly	11/21/2013	0	3.4	20.3	76.3	0.8	0	No Comment
GMP-12	weekly	11/29/2013	0	1.6	20.7	77.7	-10.4	0	No Comment
GMP-12	weekly	12/7/2013	0.2	0.7	21.8	77.3	-22.36	0	No Comment
GMP-12	weekly	12/11/2013	0	0.1	77.2		-0.06	0.2	No Comment
GMP-12	weekly	12/19/2013	0	2.2	73.1		-2.49	0	No Comment
GMP-12	weekly	12/27/2013	0	4	75.7		0.58	0	No Comment

APPENDIX A

LANDFILL GAS CORRECTIVE ACTION PLAN UPDATE, JULY 26, 2013

BRIDGETON LANDFILL

LANDFILL GAS CORRECTIVE ACTION PLAN UPDATE

Submitted Pursuant to Section 23 of Agreed Order
Case No. 13SL-CC01088, Effective May 13, 2013

Bridgeton Landfill, LLC
13570 St. Charles Rock Rd.
Bridgeton, MO 63044

Technical Contributors:

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July 26, 2013

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1.0 INTRODUCTION

On May 13, 2013, Bridgeton Landfill entered into an Agreed Order with the State of Missouri which requires actions to address what was called a subsurface smoldering event (SSE). Section 23 of the Agreed Order requires the preparation of an updated "Landfill Gas Corrective Action Plan" (CAP) and requests that the update consider SSE control measures.

Missouri Solid Waste Management Regulations require that subsurface landfill gas be controlled so that it does not exceed 2.5% (which is equal to 50% of the lower explosive limit, or LEL) in the ground at the facility property boundary. If this level is exceeded at the property boundary, the facility must implement enhanced monitoring and corrective measures. Corrective Action Plans are frequently used to present and communicate these measures.

Bridgeton Landfill has been monitoring for gas migration using permanent gas monitoring probes since 1998. Since that time, landfill gas Corrective Action Plans have been implemented, additional monitoring locations have been added, and many control features have been installed. These efforts have been previously documented and are incorporated by reference as background for this current work.

Lateral landfill gas migration is common at unlined municipal solid waste (MSW) landfills, and especially in quarry fill environments. Bridgeton Landfill has some areas where the property line is close to solid waste limits (near the edge of the quarry wall) and monitoring has detected methane near the property line in certain locations. In addition, the SSE that Bridgeton Landfill has been experiencing since 2010, and that intensified in 2012, has further challenged methane control in those areas.

The purpose of this document, as required by the Agreed Order, is to provide an update to the November 27, 2012 CAP that considers the SSE control measures. As such, this document includes monitoring data up to July 2013, reviews the status of gas migration control, presents recent (since the approved November 27, 2012 CAP) efforts to reduce methane migration, and discusses forward-going monitoring and reporting procedures. It is intended that this CAP supplements and/or supersedes the previous CAPs and agreements.

2.0 REVIEW OF CURRENT GAS MIGRATION CONTROL STATUS

The intensification of the SSE has created conditions that have made control of gas migration more challenging, including:

- Increased pressure within the landfill waste with pressure-gradient which forces gas outward;
- Increased liquid generation resulting in steam and saturated gas which effects collection efficiency, and
- Carefully controlled and reduced application of gas extraction well vacuum with efforts to minimize oxygen content in the gas well.

Detailed graphs showing methane concentrations for the past three years are included in Appendix A. Appendix B includes a list of the gas monitoring probes monitored at the Bridgeton Landfill along with the boring logs and/or construction logs for each probe. Please note, the gas monitoring probes has been referenced with different abbreviations and the table in Appendix B is included to provide clarity.

As can be seen on the graphs, there are several compliance point and sentry monitoring probe locations that have been historically elevated (GMP-01, GMP-04, GMP-05 GMP-06 and GMP-07), as well as elevated levels in new gas monitoring probes where monitoring began in October 2012 after the SSE intensified (GMP-5S, GMP-14S, GMP-14D). Temporary monitoring probes installed to determine the rate and extent of the methane migration in the vicinity of impacted probe GMP-01 (TMP-1S, TMP-2S, TMP-2M, TMP-2D, TMP-3S, TMP-3M, and TMP-3D) have also exhibited elevated levels of methane since installation.

Due to the additional gas monitoring probes, which initiated monitoring in October 2012 to better define the zone of migration on the eastern boundary of the landfill, GMP-04 through GMP-07 located closer to the landfill are typically monitored on a quarterly basis but are sentry probes and are no longer utilized as the compliance probes in accordance with Missouri Solid Waste Law and Rules. Tables 1 through 4 present the probe results for the monitoring period November 21, 2012 through July 5, 2013.

Along the southern boundary of the landfill, adjacent to Boenker Road, GMP-01 has continued to show elevated levels above the regulatory threshold. Corrective measures have not been effective to address the migration in this vicinity. Corrective actions taken to date have focused on methane migration within the soil overburden due to investigative action demonstrating shallow migration. However, after the installation of the interceptor trench, which was constructed to the soil/bedrock interface between the waste disposal area and impacted GMP-01, elevated levels continued to be exhibited in GMP-01. Due to the ineffectiveness of the perimeter gas wells (2005) and interceptor trench (2010) installed in the vicinity of GMP-01 to eliminate or reduce methane impacts, further investigation was deemed necessary under the conditions of the Settlement Agreement.

In order to effectively determine the zone of migration in the vicinity of GMP-01, temporary probes (TMP-1, TMP-2 and TMP-3) were installed as investigation probes to better define the zone of migration. In order to do this, each temporary probe were installed as nested probes with three monitored zones – shallow (S), middle (M) and deep (D). The shallow zone was screened within the soil overburden; the middle zone was screened through the uppermost weathered/fractured bedrock and the deep zone within the saturated bedrock. As presented in Appendix A, TMP-1 located west of GMP-01 is impacted with elevated methane levels within the soil overburden and weathered bedrock. TMP-2, located east of GMP-01, and TMP-3, located north of GMP-01, has observed elevated methane in each of the monitored zones. It is likely the observed elevated methane within the deep monitored zone observed in TMP-2 and TMP-3 are a result of diffusion transport due to these probes located less than 75 feet from the waste mass as well as the pressure-gradient force caused by the SSE as noted with increased relative pressure during monitoring of the probes.

As noted in the TMP boring logs, weathered bedrock was observed at lower elevations than the base of the interceptor trench. TMP-1, located west of GMP-1, the weathered bedrock was observed between 36 feet below ground surface (bgs) to 66.5 feet bgs. TMP-2, located east of GMP-1, the weathered bedrock was observed between 18 feet bgs to 47 feet bgs. TMP-3, located between the landfill and GMP-1, the weathered bedrock was observed between 31 feet bgs to 50 feet bgs. TMP-2, located between the landfill and GMP-1, the weathered bedrock was observed between 31 feet bgs to 50 feet bgs. Due to weathered bedrock observed at lower elevations than the base of the interceptor trench, it is likely methane continues to migrate through these weathered zones. Table 3 presents the temporary gas monitoring probe data.

The intensification of the SSE in 2012, resulting in increased pressure within the landfill, brought challenges associated within dewatering the interceptor trench located south of the waste boundary and maintaining sufficient vacuum on select gas extraction wells located within the south quarry. As a result, elevated levels of methane continue to be observed since October 2012.

Currently the public safety probes located across Boenker Road, on private property (GMP-09, GMP-10, GMP-11, and GMP-12) have no detectable levels of methane and have not observed elevated methane in two years (GMP-11). There is no evidence of methane migration onto adjacent properties at this time. Table 4 presents the gas monitoring probe data for the public safety probes.

Along the east property boundary, adjacent to the south quarry, elevated methane has been observed at two gas monitoring probe locations utilized for compliance: GMP-5S, GMP-14S, GMP-14D. The gas monitoring probes installed between August and September 2012 were installed as nested probes with two monitoring zones - shallow (S) and deep (D). The shallow zone was screened within the soil overburden; the deep zone was screened through the uppermost weathered bedrock to approximately 10 feet below the historic low water table.

The intent of these nested probes is to determine if methane migration is occurring at the property boundary as well as to ascertain the zone in which it is occurring. Similar to GMP-01, weathered bedrock was observed below the soil overburden at GMP-14 where GMP-14D is screened. The weathered bedrock is likely providing a zone of migration within the deeper zone, GMP-14D.

As described in Section 3.0, Bridgeton Landfill has performed recent improvements that should ultimately reduce landfill gas migration.

3.0 RECENT GAS MIGRATION CONTROL EFFORTS

Many recent additional measures have been recently undertaken that should ultimately reduce gas migration, including:

1. The SSE has impacted the facility's infrastructure designed to remove liquid efficiently from the waste mass which results in increased liquid in the force main and the gas conveyance system resulting in a reduction of their efficiency to remove landfill gas. Adding new gas extraction wells, replacing compromised gas extraction wells, and adding liquid pumps and extraction points will improve landfill gas collection and improve overall efficiency of the system. The following features have been installed per the November 27, 2012 CAP and in addition to the measures proposed in the CAP:

    - In November 2012 the Bridgeton Landfill installed 5 new trench wells, 5 new liquid sumps, and 7 new gas extraction wells.
    - During the January 1, 2013 through June 30, 2013 period the following additional extraction points were installed at the Bridgeton Landfill:
    - In February 2013 the Bridgeton Landfill installed 9 new gas extraction wells,
    - In March 2013 the Bridgeton Landfill installed 3 new gas extraction wells,
    - In April 2013 the Bridgeton Landfill installed 11 new gas extraction wells,
    - In May 2013 the Bridgeton Landfill installed 13 new gas extraction wells,

2. Addition of a 2,500 scfm utility flare in the southeastern portion of the disposal area in June 2013. This flare has improved vacuum distribution around the well field, especially in the southern and southeastern end where migration has been problematic.

3. Installation of 25 perimeter liquid sumps connected by perforated liquid/gas collection piping in May and June 2013. These were installed as part of the South Quarry capping project, and will allow collection of additional gas at the perimeter of the landfill, and

4. Placement of 32 acres of geomembrane cap and enhanced gas collection features which should be completed in August 2013. The cap will allow additional vacuum to be pulled from the cover integrity system consisting of a composite liner system which will reduce concern for oxygen intrusion. This should result in better long term gas capture and, in time, reduced gas pressure.

An updated as-built map that shows all of these features that were in place as of June 30, 2013 is included in Appendix C.

Due to the increased liquid generation and increased pressure within the landfill the improvements completed within the past nine months have not yet resulted in a reduction of methane observed within the gas monitoring probes. It is premature to evaluate the

effectiveness of the recent gas migration control efforts outlined in this section due to impacts associated with increased liquid generation and the continued dynamic movement and changes of the SSE in the South Quarry area.

4.0 PROPOSED AND ONGOING GAS MIGRATION CONTROL EFFORTS

The recent additional measures outlined in Section 3.0 are on-going efforts to improve landfill gas control at the Bridgeton Landfill. These upgrades should reduce pressure within the waste mass that may be contributing to the exceedances and in turn alleviate methane migration along the southern and eastern property boundaries. Improvements to the landfill are on-going and will continue until the SSE is controlled. Below are additional improvements that are being proposed or currently implemented:

1. The SSE has resulted in an increase in condensate generation. In order to improve liquid removal at the site a third party consultant has been contracted to evaluate the effectiveness of the existing force main. Due to the increased liquid movement within the force main pressure has built up within the system resulting in back pressure and reduced pump functionality. Pressure relief valves have been installed on numerous pneumatic pumps to address this issue. However, due to the increased liquid generation additional capacity within the force main is needed. As such, the preliminary design proposes utilizing the existing force main for management of liquid removed from the LCSs and a second separate force main for liquids removed from the remaining extraction points. The additional liquid force main will allow optimum operations of the pumps while providing increased available vacuum on the landfill gas collection system. This corrective action measure will be submitted to the MDNR in third quarter 2013 sealed by a Missouri Professional Engineer.

2. In order to improve liquid management once the liquids are removed from the disposal area the Bridgeton Landfill has contracted with a third party consulting firm for additional storage and pretreatment of the extracted liquid. During the second quarter 2013 the landfill installed a 316,000 gallon above ground liquid storage and treatment tank The preliminary treatment plant design includes incorporation of the existing 96,000 gallon tank located near Boenker Road, the newly installed 316,000 gallon tank, four-1,000,000 gallon tanks and a pretreatment facility. This will provide the landfill additional capacity to remove the liquid from the disposal area at a design capacity of 300,000 gallons per day. The treatment plant design will be submitted to the MDNR in third quarter 2013 sealed by a Missouri Professional Engineer.

3. The Bridgeton Landfill has submitted a Permit to Construct application to the St. Louis County Department of Health for the installation of two 4,000 scfm utility flares. These utility flares would replace the existing enclosed flares with a design flow of 3,500 scfm each. The replacement of the enclosed flares with the two 4,000 scfm utility flares coupled with the existing 3,500 scfm John Zink utility flare and the 2,500 scfm LFG Specialties utility flare will provide a combined design flow of the four utility flares of 14,000 scfm. Authorization to Construct is anticipated to be issued by the end of July 2013. The installation of the 4,000 scfm utility flares is anticipated to be completed shortly after permit issuance with operations of each unit by the end of third quarter

2013. Utility flares are better suited to handle the lower heating value gas at the Bridgeton Landfill resulting in less downtime of the control devices.

4. A natural gas line has been installed in the vicinity of the flare compound. It will be connected to the gas collection system if the lower heating value or hydrogen concentration drop below levels to effectively operate the landfill gas control devices.

5. The Bridgeton Landfill will be upgrading the landfill gas coolers at the east utility flare (2,500 scfm LFG Specialties) and at the flare compound in the near future. This improvement will result in additional vacuum available to the well field.

The improvements associated with the liquid conveyance system and the landfill gas control devices are essential to address methane migration at the facility. These efforts should result in a decrease in pressure within the landfill and improved landfill gas collection efficiencies within the south quarry. The liquid force main modification and the liquid treatment system will be submitted to the MDNR for review and approval. The landfill appreciates the continued support to address the SSE in a timely manner and appreciates an expedited review of these submittals.

Monitoring results of the nested gas and temporary monitoring probes have shown that methane is migrating through the weathered bedrock and additional controls are likely needed to address these exceedances. However, due to increased liquid generation associated with the SSE, the effectiveness of the recent improvements could not be determined. It is requested to further evaluate the zone of migration of the impacted gas monitoring and temporary monitoring probes with weekly water level readings and monitoring of the impacted probes to better delineate if methane is migrating through deeper zones. It is requested that this evaluation period be extended through the third quarter 2013. At that time a comprehensive corrective action plan will be submitted evaluating the impact of the recently-completed capping, other recent measures, and the proposed measures described above. During this period the landfill will continue to complete improvements to the liquid conveyance system in efforts to minimize liquids within the gas collection system.

5.0 CONTINUED MONITORING AND REPORTING

The Bridgeton Landfill will initiate weekly monitoring of all monitoring probes including the gas monitoring probes, sentry probes and temporary monitoring probes. The Bridgeton Landfill proposes that landfill gas corrective summary reports to be incorporated into the quarterly report and submitted by the 15th of each month following a calendar quarter. These reports will summarize all corrective action completed to address methane migration within the prior quarter and, if elevated levels persist, provide a corrective action plan to address the methane exceedances.

Bridgeton Landfill understands that the submittal of quarterly landfill gas corrective action summary reports and corrective action plans is at a higher frequency than outlined in Paragraph 4 of the January 17, 2011 Settlement Agreement between the MDNR and the Bridgeton Landfill but believes that incorporation in the quarterly report is valuable.

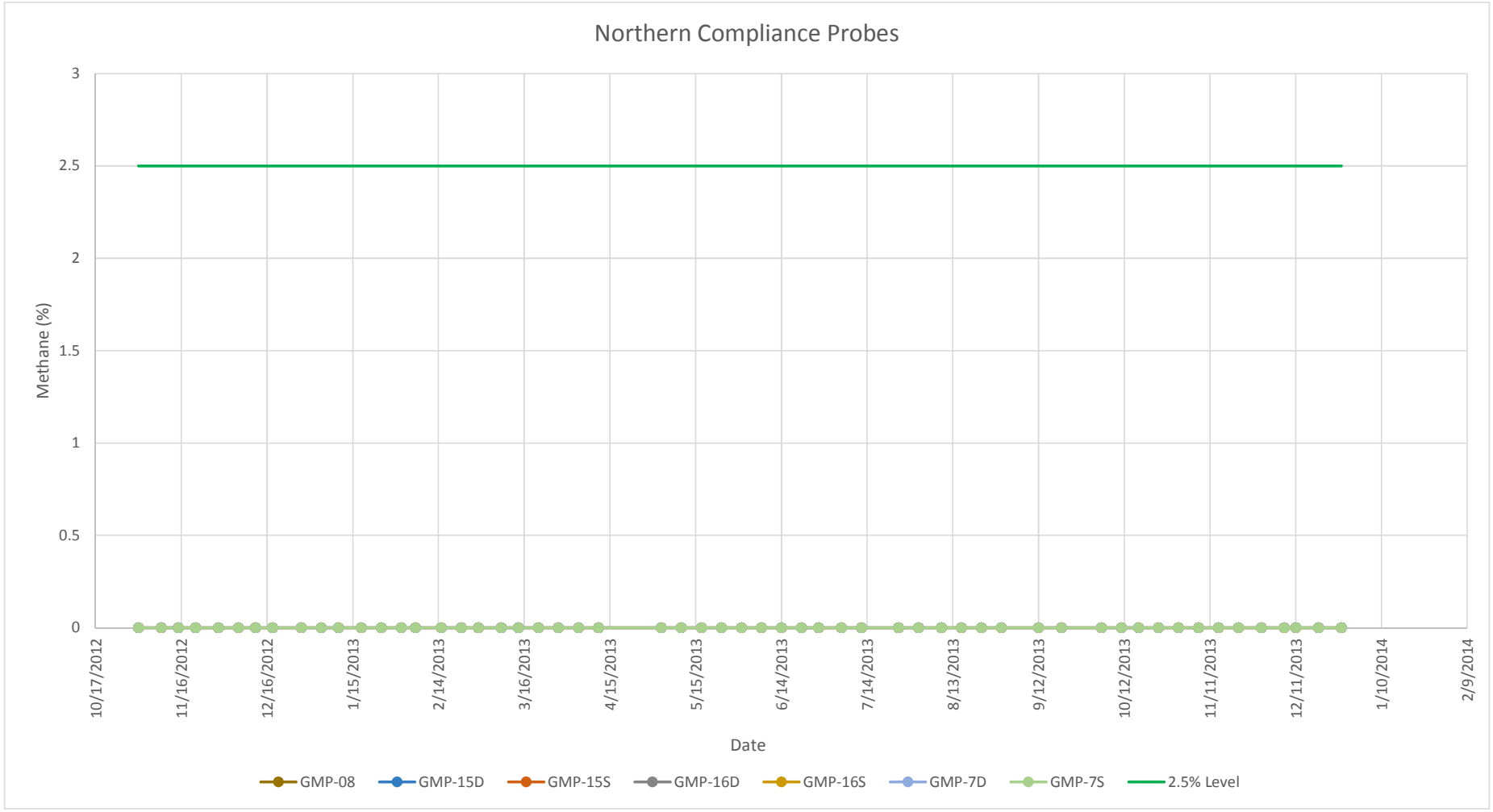
This section of the report will include at a minimum a review previous data, evaluate effectiveness of efforts made to control migration, and propose additional measures directed at eliminating detection levels in gas monitoring probes. As a regular procedure, these reports will be submitted by the 15th of each month following a calendar quarter.

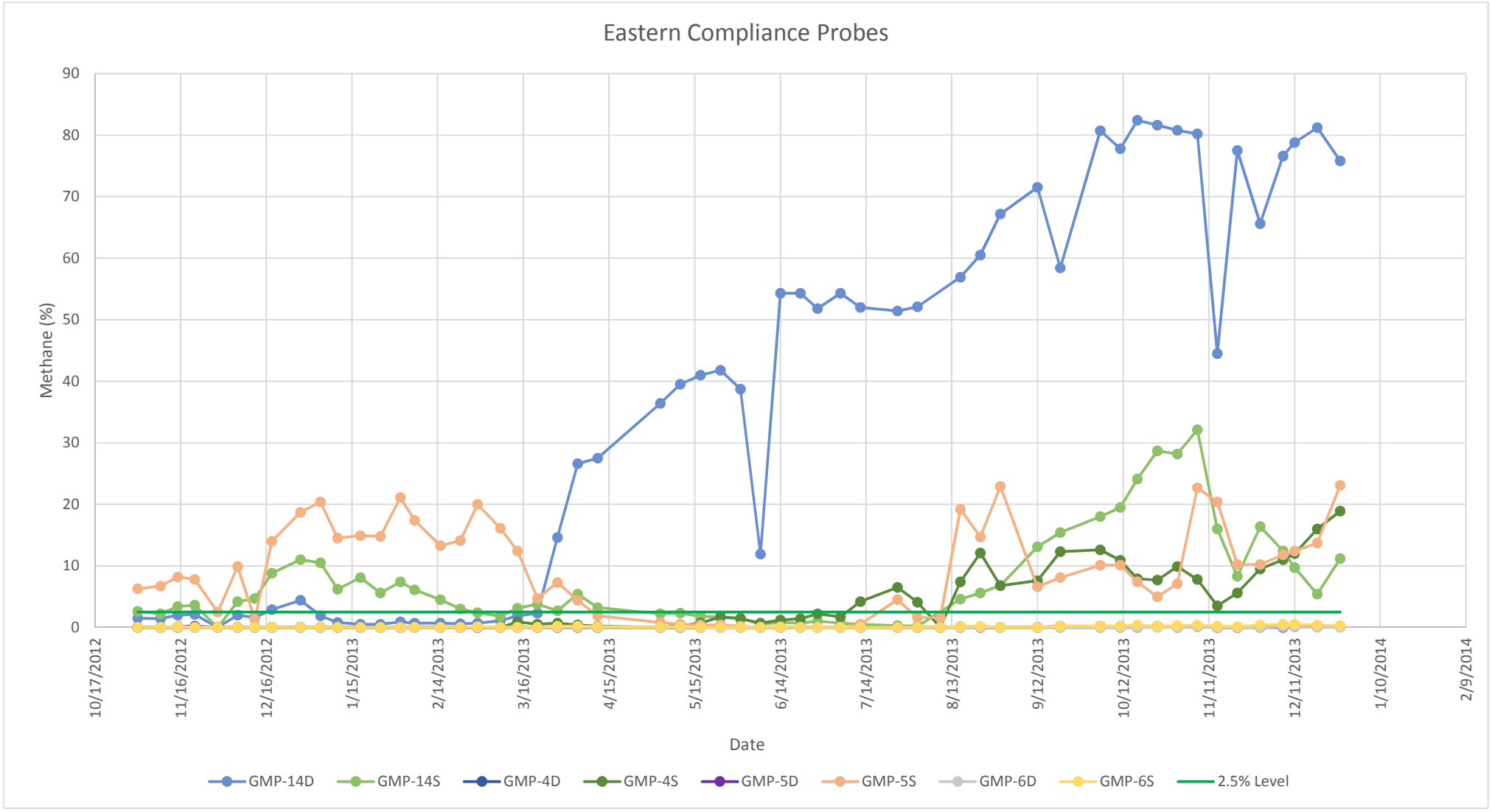
Bridgeton Landfill will continue to take aggressive action to control the impacts of the SSE, evaluate corrective measures to address methane migration within the weathered bedrock and improve gas collection within the limits of waste. Any major new gas migration control features needed--particularly those located outside the limit of waste--would be designed and sealed by a Missouri professional engineer and submitted to the MDNR for comment and approval.

The MDNR will continue to provide ongoing review, comment, and approval of actions as it deems necessary. This reporting process will continue until Bridgeton Landfill demonstrates uninterrupted compliance with the MDNR's methane regulations (all compliance gas monitoring probes less than 2.5% methane) for a period of one year.

APPENDIX B

GAS MONITORING PROBE METHANE LEVEL GRAPHS


Northern Compliance Probes
Methane (%)
3
2.5
2
1.5
1
0.5
0
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
11/11/2013
12/11/2013
1/10/2014
2/9/2014
Date
GMP-08
GMP-15D
GMP-15S
GMP-16D
GMP-16S
GMP-7D
GMP-7S
2.5% Level


Eastern Compliance Probes
Methane (%)
90
80
70
60
50
40
30
20
10
0
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
11/11/2013
12/11/2013
1/10/2014
2/9/2014
Date
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GMP-14S
GMP-4D
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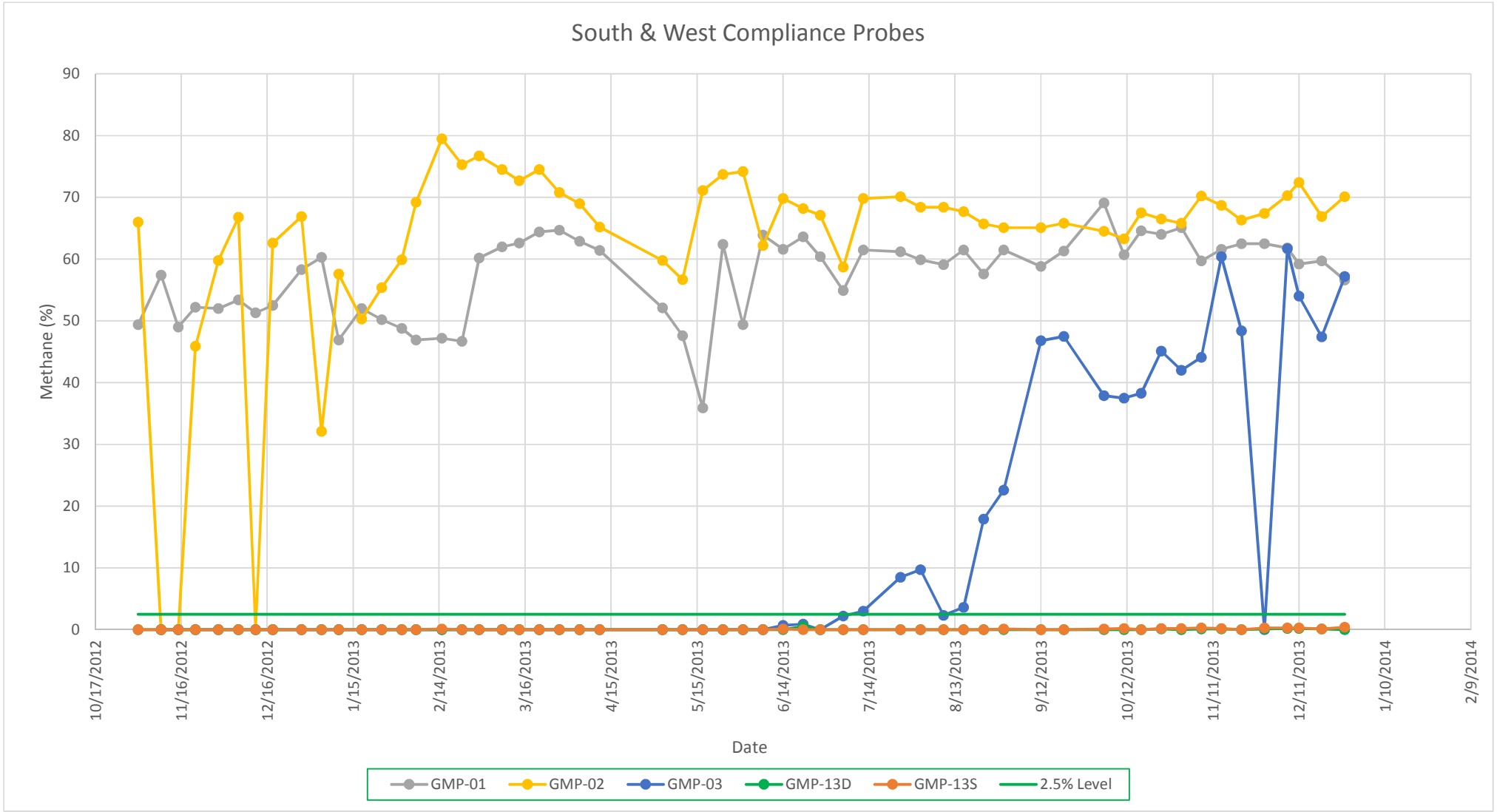
GMP-5D
GMP-5S
GMP-6D
GMP-6S
2.5% Level


South & West Compliance Probes
Methane (%)
90
80
70
60
50
40
30
20
10
0
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
11/11/2013
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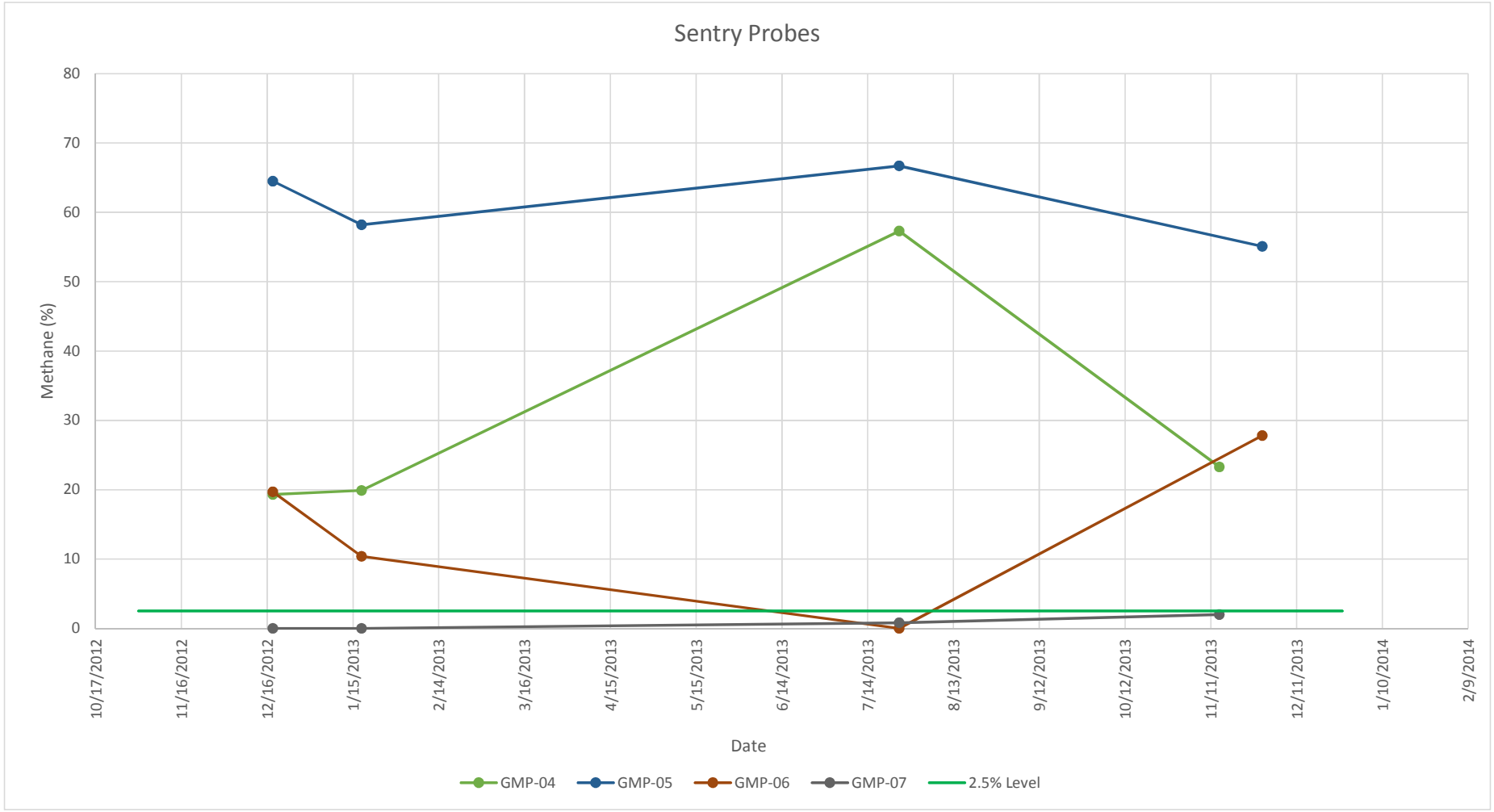
GMP-02
GMP-03
GMP-13D
GMP-13S
2.5% Level


Sentry Probes
Methane (%)
80
70
60
50
40
30
20
10
0
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
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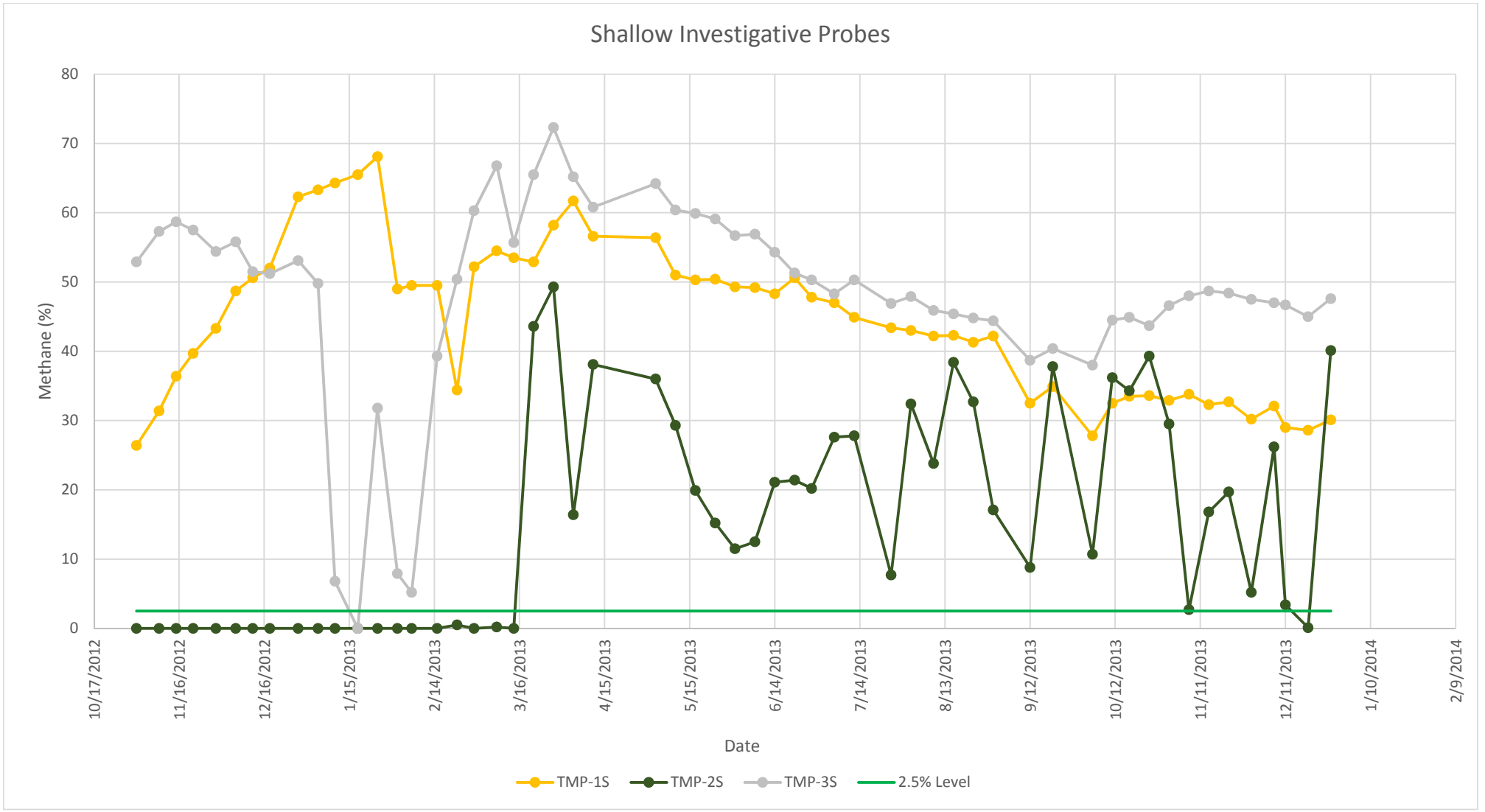
GMP-06
GMP-07
2.5% Level


Shallow Investigative Probes
Methane (%)
80
70
60
50
40
30
20
10
0
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
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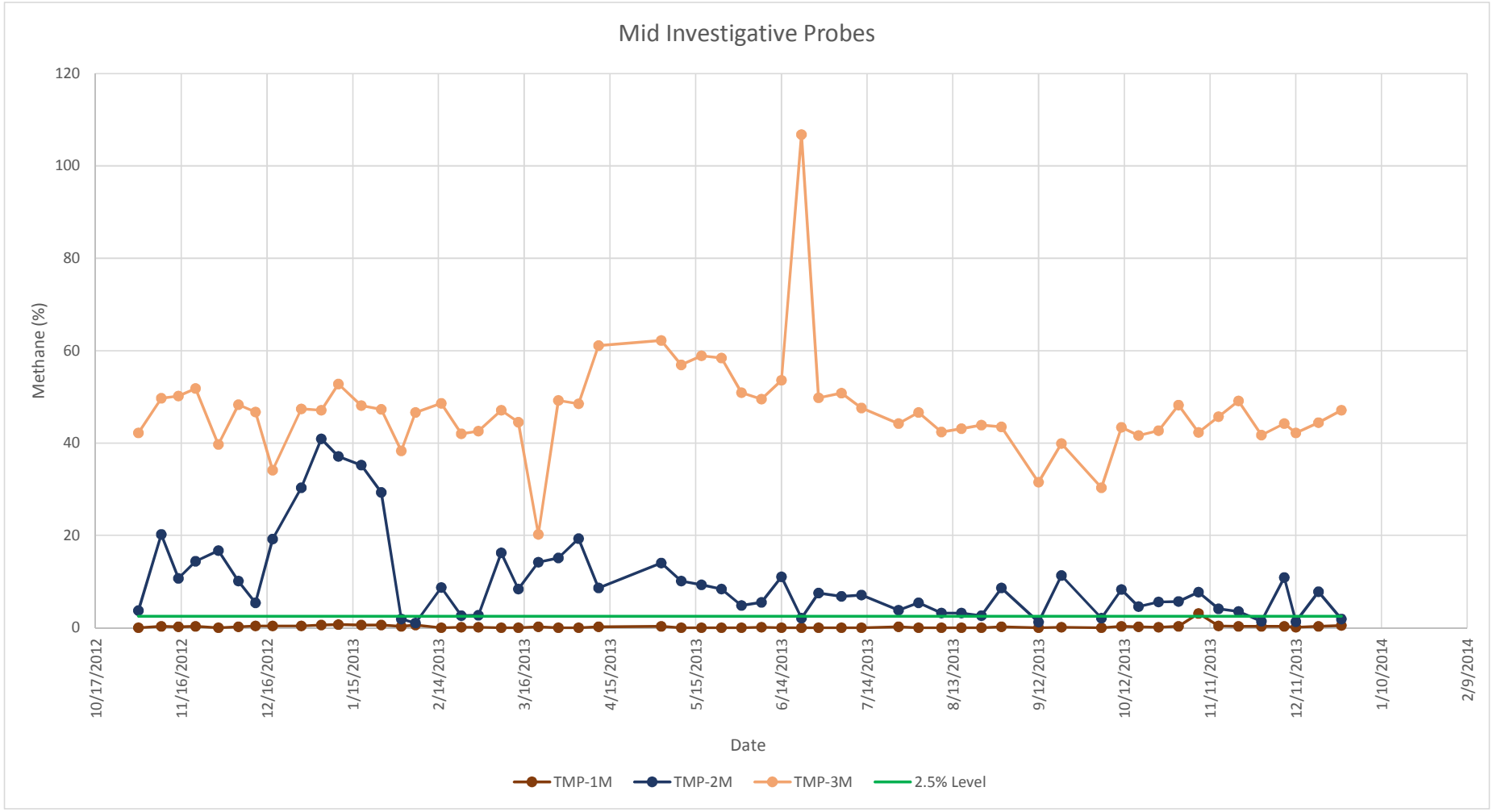
TMP-1S
TMP-2S
TMP-3S
2.5% Level


Mid Investigative Probes
120
100
80
60
40
20
0
Methane (%)
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
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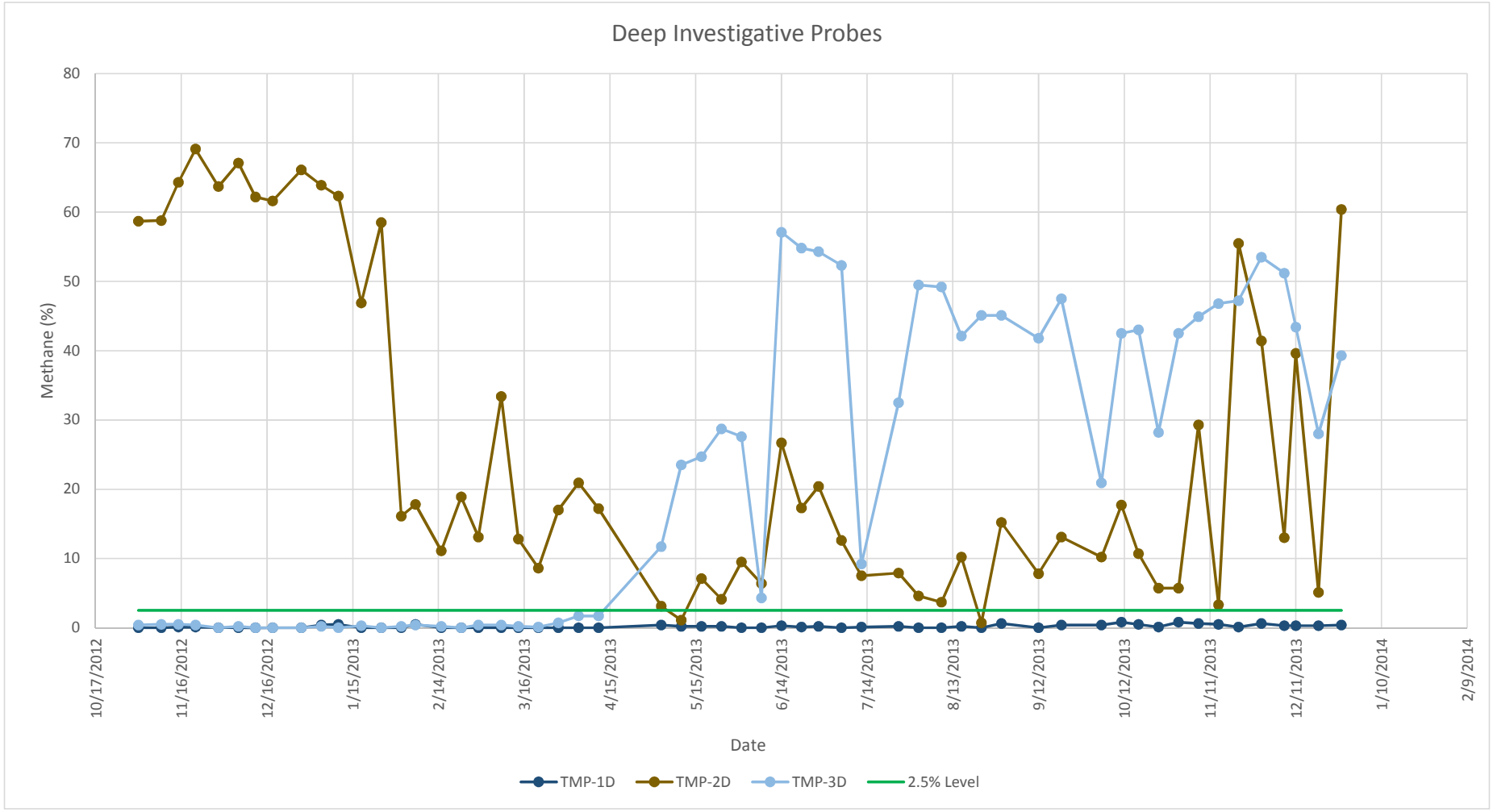
TMP-1M
TMP-2M
TMP-3M
2.5% Level


Deep Investigative Probes
Methane (%)
80
70
60
50
40
30
20
10
0
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
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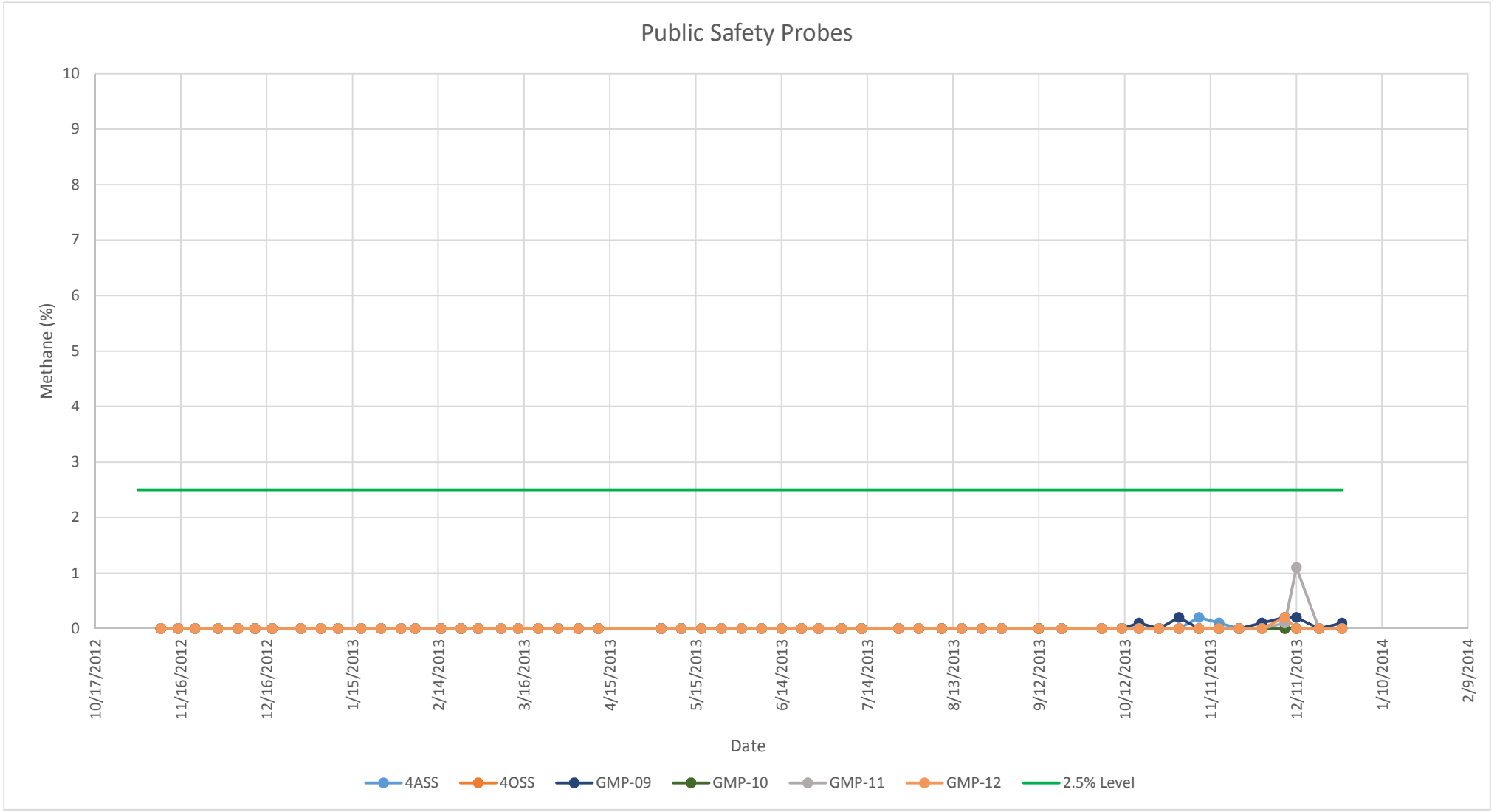
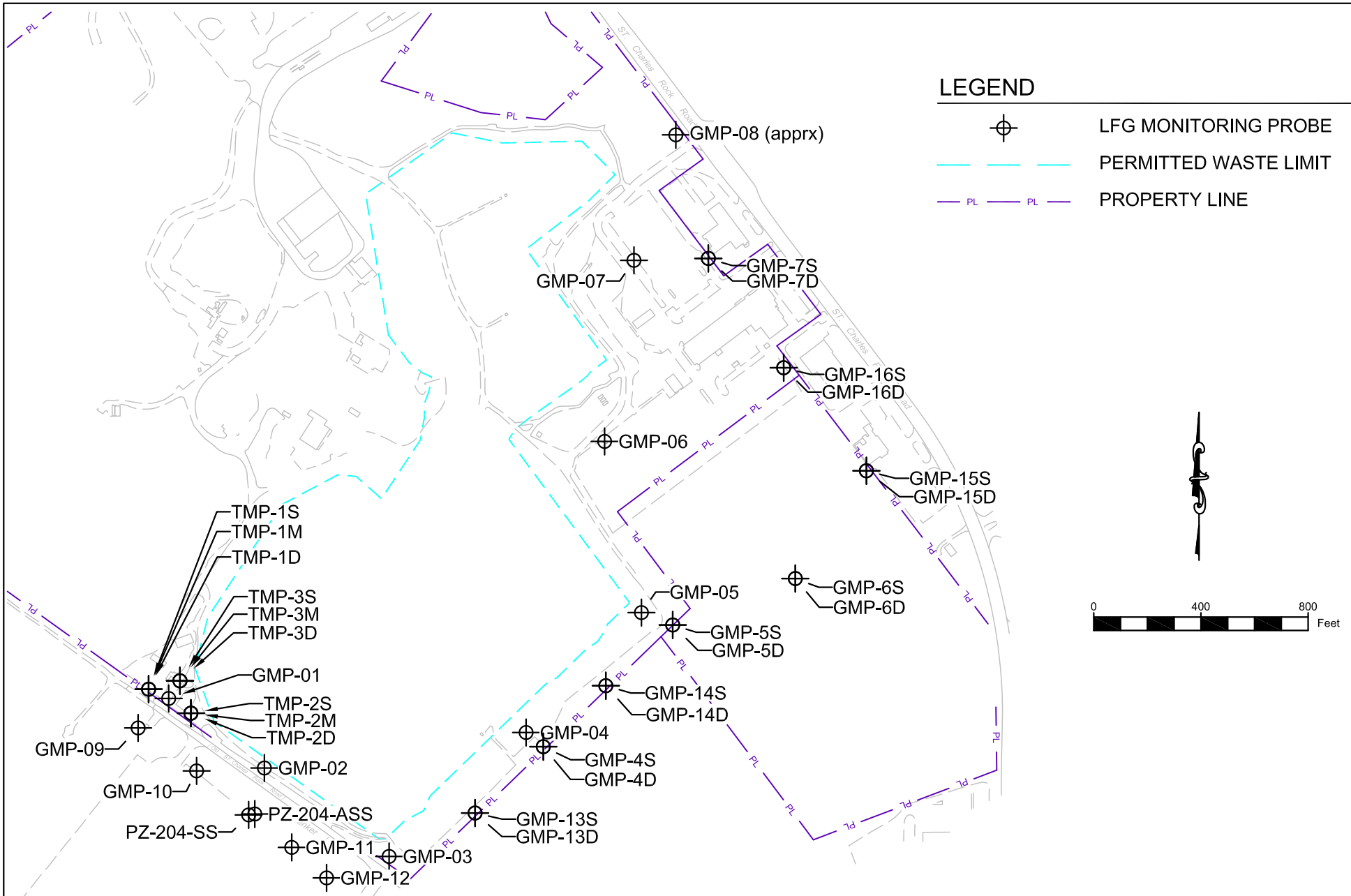
TMP-1D
TMP-2D
TMP-3D
2.5% Level


Public Safety Probes
Methane (%)
10
9
8
7
6
5
4
3
2
1
0
10/17/2012
11/16/2012
12/16/2012
1/15/2013
2/14/2013
3/16/2013
4/15/2013
5/15/2013
6/14/2013
7/14/2013
8/13/2013
9/12/2013
10/12/2013
11/11/2013
12/11/2013
1/10/2014
2/9/2014
Date
4ASS
4OSS
GMP-09
GMP-10
GMP-11
GMP-12
2.5% Level

APPENDIX C

INFRASTRUCTURE SITE PLAN, GAS MONITORING PROBE LOCATIONS



BRIDGETON LANDFILL LLC
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SITE INFRASTRUCTURE

GAS MONITORING PROBES

PROJECT NUMBER: BT-014 | FILE PATH: C:\Users\Paul\Desktop\Bridgeton\BT-014\DRAWINGS\gas Monitoring System.dwg

Engineering for a Better World
FEEZOR ENGINEERING, INC.

DECEMBERB 2013	
DESIGNED BY: PML	
APPROVED BY: ---	
REVISION	DATE

DRAWING NO.:
001