EXPLOSIVE GAS MONITORING CORRECTIVE ACTION PLAN

West Lake Landfill
Operable Unit 2 (OU-2)

Bridgeton, Missouri

Submitted for

Bridgeton Landfill LLC

Submitted by

Geosyntec consultants

engineers | scientists | innovators

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SECTION 1

INTRODUCTION

The following Corrective Action Plan (CAP) was developed in response to detections of methane above threshold values established in the Explosive Gas Monitoring Plan (EGMP)[1] and 10 CSR 80-3.010[2] at monitoring wells BRISL001, BRISL002, BRISL003, and BRISL004 of the West Lake Landfill Superfund Site (Site) Operable Unit 2 (OU-2). No exceedances have been observed at perimeter landfill gas (LFG) monitoring wells BRISL005 and BRISL006. As stated in Section 2.18.1 of the EGMP, if methane concentrations from a perimeter LFG monitoring well exceed threshold values, a CAP designed by a professional engineer shall be submitted to the United States Environmental Protection Agency (USEPA) and Missouri Department of Natural Resources (MoDNR).

Following the exceedance, in September of 2021, of the methane threshold value at BRISL004, a CAP was submitted to USEPA and MoDNR on 15 November 2021 and revisions were submitted on 10 February 2022 following receipt of comments from USEPA on 11 January 2022. An addendum to the CAP was provided to USEPA and MoDNR on 19 August 2022 after methane was detected above the threshold value at LFG monitoring wells BRISL001, BRISL002, and BRISL003 during July 2022. Comments from USEPA on both the CAP and CAP Addendum were received on 26 October 2022. A revised CAP was submitted to USEPA and MoDNR on 24 November 2022. EPA provided comments on the 24 November 2022 CAP submittal in email correspondence dated 30 January 2023. A response letter addressing the 30 January 2023 comments was submitted to USEPA and MoDNR on 6 March 2023. USEPA provided additional comments on the CAP in correspondence dated 9 June 2023. This document, Revision 3 of the CAP, is a compilation of the information provided to USEPA to address previous comments.

This LFG CAP includes a discussion of the following:

- Reason for LFG migration;
- Nature and extent of LFG migration; and
- Proposed additional investigation in support of corrective action.

[1] Geosyntec Consultants, *Explosive Gas Monitoring Plan, West Lake Landfill Remedial Design Operable Unit 2*, Bridgeton, Missouri, Final Version August 2021.

[2] The current MoDNR regulation, 10 CSR 80-3.010 (2019), is applicable offsite, while the regulation in effect at the time of the Record of Decision in 2008, 10 CSR 80-3.010 (1998) is the Applicable or Relevant and Appropriate Requirement (ARAR) onsite.

SECTION 2

LANDFILL GAS MONITORING

2.1 Site Background

USEPA approved the EGMP with modifications on 27 May 2021. Six perimeter LFG monitoring wells were installed along the western and southern boundaries of the Inactive Sanitary Landfill (ISL) between 6 September and 14 September 2021[3]. The limits of the ISL waste boundary shown on **Figure 1** are based on the ISL boundary shown in "The Waste Limits Investigation Summary Report" which is provided in **Appendix A**. Boring logs and well construction logs were submitted with the 22 October 2021 LFG As-Built Report and are provided in **Appendix B**. Locations of the perimeter LFG monitoring wells are shown on **Figure 1**.

The EGMP establishes the thresholds for implementation of corrective action as follows:[4]

- Twenty-five percent (25%) of the LEL or one and one quarter percent (1.25%) by volume for methane in buildings on the Bridgeton Landfill property (if located in the future); and
- Fifty percent (50%) of the LEL or two and one-half percent (2.5%) by volume for methane in the soil at the property boundary of the ISL.

2.2 Landfill Gas Composition or Quality

The principal gases present in LFG vary with the age of the landfill, the types of waste placed, and the landfill construction. LFG is generated in a series of five phases, as summarized below:

- Phase I – Initial adjustment. Microbial degradation of biodegradable wastes under aerobic conditions. Principal gases present are oxygen and nitrogen;
- Phase II – Transition phase. Oxygen depletion leads to anaerobic conditions. Principal gases present are nitrogen and hydrogen sulfide (H_2S);
- Phase III – Acid Phase. Continued anaerobic biodegradation of waste results in formation of acids and small amounts of hydrogen. Principal gas present is carbon dioxide (carbon dioxide);
- Phase IV – Methane fermentation phase. Anaerobic biodegradation of acids and hydrogen gas by methanogens. Principal gases present are carbon dioxide and methane;

[3] Aquaterra, Waste Limits Investigation Summary Report, Bridgeton Landfill, LLC, Bridgeton Landfill, St. Louis County, Missouri, September 2010, Revised July 2011.
[4] Geosyntec Consultants, Inc., Section 2.18.1, Explosive Gas Monitoring Plan, West Lake Landfill Remedial Design Operable Unit 2 (OU-2), Bridgeton, Missouri, July 2020, Revised September 2020.

- Phase V – Maturation phase. Remaining biodegradable mass is very slowly degraded and LFG production slows significantly. Principal gases present are carbon dioxide and methane with increases in nitrogen and oxygen possible.

Waste acceptance at the ISL area ceased in the 1980s; and therefore, the ISL is most likely in Phase V of LFG generation as indicated by principal gases of methane and carbon dioxide present in the LFG with trace levels of nitrogen and oxygen.

2.3 Summary of LFG Data Collection

LFG monitoring at the six ISL perimeter LFG monitoring wells began on 30 September 2021. Data collected from all of the perimeter LFG monitoring wells to date are provided in **Table 1**. The following initial monitoring schedule was established pursuant to the EGMP:[5]

- Weekly –September 30, 2021, through October 27, 2021;
- Monthly – October 27, 2021, through February 2, 2022; and
- Quarterly – February 3, 2022, through end of the established post closure monitoring period.

Quarterly sampling will be performed at perimeter LFG monitoring wells as described above as long as methane concentrations are less than 2.5%. Wells with methane concentrations above 2.5% will be monitored on a weekly basis. After methane concentrations decrease below 2.5%, wells shall be monitored weekly for one quarter; if methane concentrations remain below 2.5%, monitoring frequency shall be reduced to monthly for six months and then reduced to quarterly monitoring.

An Envision™ Landfill Gas Analyzer or equivalent will be utilized for collection and measurement of LFG and barometric pressure readings at the perimeter LFG monitoring wells. Barometric pressure readings have been reported at each monitoring location starting in November 2022.

Principal gases measured at BRISL001, BRISL0002, BRISL003, and BRISL004 are methane, oxygen, balance gas (nitrogen) and carbon dioxide; nitrogen and oxygen are most likely indicative of ambient soil gas. Measured methane concentrations for the perimeter LFG monitoring wells are provided in **Table 1.**

2.3.1 LFG Concentrations and Pressure Over Time

Figure 2 through **Figure 5** present the concentrations of various principal gases (methane, carbon dioxide, oxygen, and balance gas) measured at BRISL001, BRISL0002, BRISL003, and

[5] Ibid., Section 2.17.1.

BRISL004 between 30 September 2021 and 3 July 2023. Methane was detected above the threshold value at BRISL004 during various weekly sampling events, mainly in the spring through fall months, conducted between 30 September 2021 and 3 July 2023.

Methane concentrations at BRISL001, BRISL002, and BRISL003 were below the threshold value from installation until 5 July 2022, when concentrations above the threshold value were measured:

- Methane concentrations at BRISL001 fluctuated above and below the threshold value between 5 July and 23 August 2022 but have been below the threshold value since 30 August 2022;

- Methane concentrations at BRISL002 exceeded the threshold value between 5 July and 30 August 2022. Methane has been below the threshold value since 6 September 2022;

- Methane at BRISL003 was measured above the threshold value between 5 July and 13 September 2022 and during the months of April and May of 2023 but has been below the threshold value since 9 May 2023.

Pressure readings at the LFG monitoring wells were measured during each sampling event and are summarized in **Table 1**. Positive pressure readings at BRISL001, BRISL002, BRISL003, and BRISL004 have been less than 0.20 inches of water column (W.C.), with the highest positive pressure reading noted at location BRISL001. The highest positive pressure measured at BRISL001 was 0.13 inches of W.C. on 4 January 2022. Pressures measured at BRISL001, BRISL002, BRISL003, and BRISL004 have been relatively consistent and low since the monitoring program began in September 2021, indicating that there is not a significant outward pressure gradient from the western perimeter of the ISL.

2.4 Regulatory Notifications

2.4.1 Threshold Exceedance at BRISL004

Following the threshold exceedance of methane at well BRISL004 on 30 September 2021, Bridgeton Landfill, LLC (Respondent) immediately began the corrective action procedures outlined in Section 2.18 of the EGMP. This included notifying the USEPA, MoDNR Federal Facilities, MoDNR Waste Management Program, St. Louis County Department of Public Health, Pattonville Fire Protection District and notifying utilities and property owners and occupants located within 1,000 feet of perimeter LFG monitoring well BRISL004. Property owners and occupants were offered methane monitors with alarms, but none accepted.

On 5 October 2021, the Respondent conducted confirmatory sampling at BRISL004. Methane was detected at 28.6 percent, above the threshold value of 2.5 percent. At this time, one occupied structure is located within 1,000 feet of the estimated limits BRISL004 as shown on **Figure 1**.

Following the detection of methane above the threshold value, the Respondent screened the indoor air in this structure for the presence of LFG. No methane was detected. The Respondent summarized the notification process and steps taken to protect public health and safety in the Seven Day Notification Report, submitted to USEPA and MoDNR on 7 October 2021, in accordance with the EGMP and 10 CSR 80-3.010.

2.4.2 Threshold Exceedance at other Perimeter LFG Wells

Following the threshold exceedance of methane at wells BRISL001, BRISL002, and BRISL003 on 5 July 2022, the corrective action procedures described above were taken for properties within 1,000 feet of wells BRISL001, BRISL002, and BRISL003.

On 5 July 2022, the Respondent conducted confirmatory sampling at BRISL001, BRISL002, and BRISL003 approximately two hours after the initial methane readings were collected using both the same LFG meter used during the earlier data collection and a second LFG meter to ensure the accuracy of the first meter. Both monitors showed methane detections at comparable concentrations, above the threshold value of 2.5 percent.

Two occupied structures are located within 1,000 feet of BRISL001, BRISL002, and BRISLS003 as shown on **Figure 1**. Following the detection of methane above the threshold value at these perimeter LFG monitoring wells, the Respondent screened the indoor air in these structures for the presence of LFG. No methane was detected. The Respondents offered methane monitors to six property owners within the 1,000-foot radius. Four monitors were installed on 8 August 2022, and another was installed at a second location on 9 September 2022. No additional offers for methane detector installation were accepted.

Geosyntec summarized the notification process and steps taken to protect public health and safety in the Seven Day Notification Report, submitted to USEPA and MoDNR on 12 July 2022, in accordance with the EGMP and 10 CSR 80-3.010. The following communications took place after the 7-day notification report was submitted to USEPA and MoDNR:

- USEPA and MoDNR were provided an update on 26 July 2022 regarding methane monitoring conducted on 13 July 2022 at Missouri Asphalt (13570 St. Charles Rock Road), purchase of additional methane monitors for offsite monitoring, and a plan for the Bridgeton Landfill, LLC personnel to follow up with three additional property owners;

- USEPA and MoDNR were provided a notification table on 3 August 2022 summarizing the communications, methane monitoring, and monitoring device installation at properties within the 1,000-foot radius;

- On 5 August 2022, USEPA notified the Respondents that the 7-Day Notification activities would be published on the West Lake Site Profile Page and requested that AAA Trailer be

notified of the upcoming publication as they had declined methane monitoring. The building at AAA Trailer is outside the 1,000-foot radius of the nearest elevated LFG monitoring well;

- The Respondents contacted John O'Brien at AAA Trailer on 8 August 2022 to notify him of the upcoming publication.

- On August 17, 2022, a new occupant (Tight Line Composites) was discovered at building address 13328 Lakefront Drive, Earth City. Verbal notification was provided to the occupant and air monitoring was performed with no methane detected.

- On September 9, 2022, landfill gas detector was provided Missouri Asphalt.

- On January 11, 2023, all properties were re-notified and offered for additional landfill gas monitoring.

SECTION 3

POTENTIAL LFG PATHWAYS AND EXPOSURE ROUTES

The perimeter LFG monitoring wells are located adjacent to the ISL waste boundary along the western and southern edges as shown on **Figure 1**. Boring logs for the perimeter LFG monitoring wells are provided in **Appendix B**.

3.1 Potential Pathways and Routes

Potential pathways were evaluated following detection of methane above compliance limits at western perimeter LFG monitoring wells. **Figures 6** through **8** show cross sections through the western perimeter LFG monitoring wells and the soils observed at each perimeter LFG monitoring well. The limits of waste, surface water, and groundwater elevations are also shown. **Figures 6** through **8** show cross sections through the western perimeter LFG monitoring wells and the soils observed during drilling activities at each perimeter LFG monitoring well. The limits of waste, surface water, and groundwater elevations are also shown on the figures.

LFG gas movement is typically governed by pressure gradients; LFG moves from areas of high pressure to low pressure. As LFG is generated in the waste mass, the LFG pressure increases, and an outward pressure gradient develops (similar to hydraulic gradients that are present in groundwater flow). High positive pressure (greater than 0.5 inches of W.C.) at the LFG monitoring wells may indicate outward pressure gradients from the ISL waste mass. Conversely, low pressure (less than 0.5 inches of W.C.) may indicate a limited outward pressure gradient and therefore limited LFG migration.

3.2 Alluvial Sand Deposits

Alluvial sands were observed at all six LFG monitoring well locations at varying depths and thicknesses. These alluvial sands, consisting of sand and sand with silt, are permeable and will allow groundwater and LFG to flow more easily (i.e., present a preferential pathway) as compared to the silts and clay units also encountered. **Figure 6** presents the subsurface conditions observed at each monitoring location. Draft potentiometric maps of the alluvial groundwater for January 2021 through 1st quarter 2023 tare provided in **Appendix C[6]**. The preferential pathway zones created by the alluvial sands may fluctuate with rising and falling groundwater elevations.

Subsurface conditions observed at LFG monitoring wells BRISL001, BRISL002, BRISL003, and BRISL004 are discussed in detail below. In general, soils observed at BRISL004 and BRISL003 are less permeable to LFG migration than the soils observed at BRISL002 and BRISL001.

Soils at BRISL001 consist primarily of a thick layer of alluvial sand, ranging in depth from approximately 447 ft msl to 425 ft msl. Soils in this vicinity would theoretically allow migration of LFG in the subsurface.

Soils at BRISL002 consist of a thick clay layer underlain by an alluvial sand layer. The alluvial sand layer, approximately 10 feet in thickness from about 434 ft msl to 424 ft msl, could act as a preferential pathway for LFG.

Soils at BRISL003 also consist primarily of lower permeability silt and clay. The alluvial sand layer present at the bottom of the well is slightly thicker than the layer at BRISL004. A second, thin alluvial sand layer is present near the mid-point of the screened interval, between a top clay layer and a bottom silt layer, that could permit migration of LFG in the vicinity of BRISL003. A shallow sand layer is present at BRISL003 towards the top of the screened interval, at approximately 445 ft msl. This could act as a preferential pathway for LFG.

A sand seam, approximately 2 feet thick, was observed at BRISL004 at the bottom of the boring, saturated with groundwater. The remaining soils present at this location are classified as clay and silt soils which would inhibit migration, potentially contributing to LFG accumulation in the vicinity of BRISL004.

3.3 Barrier from the Earth City Levee District Canal

An Earth City Levee District canal runs along the western Site boundary and likely acts as a barrier to LFG migration. The canal and groundwater may be hydraulically connected, as evidenced in the cross sections in **Figures 7** and **8**. Based on data obtained from a December 2019 aerial survey (See **Appendix D**) and 2021 through 2023 Alluvial Potentiometric Maps (**Appendix C**), the surface water elevation in the canal is slightly higher or slight lower than the range of groundwater elevations collected between December 2020 and June 2022 from the OU-3 groundwater wells.

This indicates that, during the monitoring period, the canal and groundwater both recharge and discharge to each other. In both conditions, the soils beneath the canal would likely be saturated or nearly saturated which would impede vapor phase migration and therefore would reduce or potentially act as a barrier to LFG migration. An additional evaluation of the hydraulic interactions between the canal and groundwater is currently underway as part of the OU-3 Remedial Investigation/Feasibility Study.

Table 2 provides a summary of groundwater elevations measured in perimeter LFG monitoring wells from two sampling events (September 2021 and July 2022). The measured groundwater elevations are similar in elevation when compared to the OU-3 groundwater monitoring wells elevations.

It is also likely that the canal serves as a topographic barrier because its steep eastern side slopes expose the unsaturated soil zone. The eastern side slope of the canal extends below the invert elevations of the waste that are present on the western perimeter of the ISL as shown on **Figures**

7 and **8**. This geometry creates a continuous contour line (i.e., top of existing surface elevations) that is below the bottom most elevation of waste located along the western perimeter of the ISL.

3.4 Utility Corridor

The fiber optic (FO) corridor adjacent to the ISL could act as a preferential pathway. If a porous backfill material was utilized within the utility trench, the backfill material may act as a conduit for LFG. Potential receptors to this pathway would be utility and construction workers. Available FO corridor plans are provided in **Appendix E**. Charter Communications has been contacted for additional information regarding the both the method (i.e., trenching versus directional drilling) and details of construction (depth and type of backfill material, if used) of the FO corridor along the western boundary of the ISL.

SECTION 4

CORRECTIVE ACTION EVALUATION

4.1 Purge Testing at Perimeter LFG Monitoring Wells Exhibiting Methane Exceedances

Purge testing of perimeter LFG monitoring well BRISL004 or other wells exhibiting methane concentrations greater than 2.5%, is proposed to assess the relationship between methane concentrations and flow. The purge test will consist of withdrawing gases, at an approximate flow rate of 3,000 cc/min, from the perimeter LFG monitoring well until methane concentrations stabilize at a constant pumping rate or are no longer detected. Methane concentrations will then be measured during the recovery time (rebound). **Appendix F** presents the field procedures for the purge test.

The proposed pumping rate is similar to flow rates that can be achieved in passive venting systems using wind turbines or other equivalent devices. The data from this test will be utilized to evaluate corrective measures to address methane concentrations at BRISL004.

Since perimeter LFG monitoring wells BRISL001 and BRISL002 have methane concentration levels below threshold values between 6 September 2022 and 3 July 2023, and BRISL003 has had only sporadic methane concentrations above threshold values since 20 September 2022 (and none since 5 May 2023), and because there have been no discernable patterns to the exceedances to date such that we can confirm additional exceedances are to be expected, purge testing at these perimeter LFG monitoring wells is not proposed at this time. Should methane concentrations consistently exceed threshold values (i.e., three consecutive monitoring events) at BRISL001, BRISL002, or BRISL003 in the future, purge testing will be completed at that time, if appropriate.

4.2 Fiber Optic Utility Corridor Monitoring

Temporary monitoring probes will be constructed near the FO corridor at locations approximately 50 feet north and south of BRISL004. The temporary monitoring probes will consist of a shallow monitoring probe with a screened interval between approximately 5 to 8 feet below ground surface (ft bgs), and a deeper monitoring probe, screened between approximately 11 to 14 ft bgs in relationship. Temporary monitoring probes will be installed at other perimeter landfill gas monitoring wells if the wells measure methane concentrations above threshold values over three consecutive monitoring events.

The proposed locations of the temporary monitoring probes and a construction detail showing the depths of each probe are presented in **Figures 9** and **10A – 10D.** The screened intervals were selected to allow targeted monitoring from approximately 5 ft bgs to the bottom depth of the

existing perimeter LFG monitoring wells. If no LFG is measured in either of the temporary monitoring probes, it can be inferred that LFG present in the vicinity is sourced from the deeper subsurface, below 14 ft bgs.

One-inch diameter PVC temporary monitoring probes with 3-foot screened intervals will be installed using direct push technology (DPT) to the depths shown in **Figures 9** and **10**. As noted in **Figure 9**, stainless steel and carbon steel pipe are also acceptable materials for temporary monitoring probe construction. Other design modifications will require approval by the Design Engineer and will require USEPA notification (via email or telephone call) prior to implementation. The temporary monitoring probes will be monitored no sooner than 24 hours following installation and then on a frequency described in Section 4.3.

During a site visit on April 25, 2023, two above ground vaults along the corridor to the west of the ISL were observed, as shown on **Figure 1**. The two above ground vaults will be sampled per the sampling procedures provided in **Appendix G**. The above ground vaults will be sampled at the same frequency as the perimeter LFG monitoring wells, as discussed in Section 4.3.

4.3 Field Monitoring Frequency

Weekly LFG monitoring will continue at BRISL001, BRISL002, BRISL003, and BRISL004 until concentrations at those wells have decreased below the threshold values for at least three months (one quarter), in accordance with the EGMP. Following three months or one quarter of weekly readings below the threshold values, BRISL001, BRISL002, BRISL003, and BRISL004 will be monitored monthly for six months. Upon completion of nine months of monthly monitoring with concentrations below threshold values, Respondent will petition USEPA for a return to quarterly monitoring. The remaining perimeter LFG monitoring wells (BRISL005 and BRISL006) will be monitored quarterly, as no exceedances of threshold values have been detected at those locations.

Monitoring of the temporary monitoring probes will occur at the same frequency as the associated perimeter landfill gas monitoring well. Following three months of weekly readings below threshold values for the temporary probes, the monitoring frequency of the temporary monitoring probes will reduce to monthly. Upon completion of nine months of monthly readings below threshold values, sampling of the temporary probes may be reduced to quarterly upon USEPA approval. This is the same frequency schedule that is proposed for the permanent perimeter LFG monitoring wells.

Geosyntec proposes the following criterion for abandonment of the temporary monitoring probes:

- No readings above the methane threshold values at the temporary monitoring probe for 12 consecutive months under weekly, monthly, or quarterly sampling frequencies.

Should exceedances at the temporary monitoring probes continue to be observed, the need to transition the temporary monitoring probe to a permanent monitoring location will be evaluated. A temporary monitoring probe monitoring and abandonment flow chart is provided in **Appendix H.** Abandonment of the temporary monitoring probes will not be completed without prior review and approval from the USEPA.

4.4 VOC Testing

During the OU-2 Remedial Investigation (RI), LFG samples were analyzed for volatile organic compounds (VOCs) and hydrogen sulfide. Soil gas samples along the western boundary of the ISL were screened for VOCs using a photoionization detector (PID) and methane, and were sampled for hydrogen sulfide. Hydrogen sulfide was not detected in LFG or soil gas samples. Methane was detected at SG-03 at 2% of the LEL at 3.5 feet bgs and at SG-08 at 130% of the LEL at 3.5 ft bgs. VOCs detections in soil gas at SG-03 (7.6 ppm) and SG-08 (10.1 ppm) were considered isolated and sporadic. VOCs in LFG were detected at concentrations well below those commonly observed at landfills[7]. LFG and soil gas sampling locations and results from the OU-2 RI are provided in **Appendix I**. Additional VOC screening along the western boundary of the ISL is therefore not proposed as part of Corrective Action evaluation at the Site.

4.5 Schedule

Respondent is prepared to complete the purging test at perimeter LFG monitoring well locations that have methane concentrations greater than 2.5% described above within 14 days of written approval of the CAP by USEPA. Purge testing at an individual perimeter landfill gas monitoring well is estimated to take one day to complete. The proposed temporary monitoring probes will be installed within 45 days of completion of the purge testing, although an extension may be needed depending on driller availability and weather conditions.

4.6 Summary of Findings

Following implementation of the additional investigation, a Summary of Findings will be submitted to USEPA discussing the findings and proposed next steps for the corrective action. The Summary of Findings will be provided to USEPA for review and comment no later than 45 days following installation of the temporary monitoring probes and will include a discussion of the following:

- Results and initial conclusions from the purge test;
- As-built documentation for the temporary monitoring probes;
- Initial weekly sampling results (four sampling events) from the temporary monitoring probes; and

[7] Herst & Associates, Inc., Remedial Investigation Report, West Lake Landfill Operable Unit 2, Bridgeton, Missouri. Revised September 2005.

- Discussion of whether future corrective actions.

4.7 Future Corrective Actions

Since pressures measured at perimeter LFG monitoring wells BRISL001, BRISL002, BRISL003, and BRISL004 have consistently been low (less than 0.5 inches of W.C.), it is possible that methane exceedances may be effectively addressed using passive venting of LFG along the ISL boundary. The use of passive venting will be evaluated as a possible corrective action, along with other possible corrective actions. Passive venting would allow controlled removal of LFG to the atmosphere from the BRISL004 area, where methane concentrations have been consistently above the threshold value. Passive venting at this location could reduce potential migration of LFG.

Table 3 summarizes different design criteria and associated corrective actions based on the proposed data collection summarized in this section.

SECTION 5

CERTIFICATION STATEMENT

"I, Jesse Paul Varsho, hereby certify that I am a licensed Professional Engineer in the State of Missouri. This LFG corrective action plan has been prepared under my direct supervision in accordance with the Remedial Design Work Plan and EGMP for the West Lake Landfill Superfund Site OU-2."

July 7, 2023

Jesse Varsho, P.E.
Senior Principal Engineer

TABLES

Table 1. LFG Monitoring Data
Bridgeton Landfill ISL Area

Date	Well ID	Well Gas Pressure (in. of W.C.)	Methane Threshold Level (%)	Methane (%)	Carbon Dioxide (%)	Methane to Carbon Dioxide Ratio	Balance Gas (%)	Oxygen (%)	Balance to O2 Ratio	Ambient Air Barometric Pressure (in)	Ambient Air Temperature (°F)
9/30/2021	BRISL001	0	2.5	0.0	0	0.0	81.1	18.9	4.3	30.2	84
	BRISL002	0	2.5	0.0	2.3	0.0	81.0	16.7	4.9	30.2	83
	BRISL003	0	2.5	0.0	0.5	0.0	79.8	19.7	4.1	30.2	83
	BRISL004	0	2.5	**34.7**	17.4	2.0	38.6	9.3	4.2	30.2	79
	BRISL005	0	2.5	0.0	0.9	0.0	80.6	18.5	4.4	30.2	78
	BRISL006	-0.01	2.5	0.0	1.2	0.0	80.7	18.1	4.5	30.2	77
10/7/2021	BRISL001	0.01	2.5	0.0	3.8	0.0	80.4	15.8	5.1	30.12	74
	BRISL002	0	2.5	0.0	1.4	0.0	81.3	17.3	4.7	30.12	74
	BRISL003	0	2.5	0.0	0.6	0.0	79.8	19.4	4.1	30.12	74
	BRISL004	0.01	2.5	**32.2**	15.6	2.1	41.7	10.5	4.0	30.14	73
	BRISL005	-0.02	2.5	0.0	0.7	0.0	79.9	19.4	4.1	30.15	73
	BRISL006	-0.01	2.5	0.0	1.6	0.0	81.2	17.2	4.7	30.16	72
10/12/2021	BRISL001	0.02	2.5	0.0	0.2	0.0	78.7	21.1	3.7	30.09	76
	BRISL002	0.00	2.5	0.0	0.5	0.0	79.0	20.5	3.9	30.09	76
	BRISL003	0.00	2.5	0.3	1.1	0.27	78.4	20.2	3.9	30.09	75
	BRISL004	0.01	2.5	**21.5**	13.4	1.6	53.4	11.7	4.6	30.10	74
	BRISL005	-0.03	2.5	0.0	1.4	0.0	79.3	19.3	4.1	30.11	74
	BRISL006	0.00	2.5	0.0	2.4	0.0	79.8	17.8	4.5	30.11	74
10/19/2021	BRISL001	0.00	2.5	0.0	0.5	0.0	77.6	21.9	3.5	30.26	60
	BRISL002	0.00	2.5	0.0	3.5	0.0	80.1	16.4	4.9	30.26	59
	BRISL003	0.00	2.5	0.2	1.5	0.1	76.6	21.7	3.5	30.26	59
	BRISL004	0.01	2.5	**28.0**	15.7	1.8	44.8	11.5	3.9	30.25	56
	BRISL005	0.00	2.5	0.0	2.0	0.0	77.8	20.2	3.9	30.25	55
	BRISL006	0.00	2.5	0.0	2.6	0.0	79.9	17.5	4.6	30.25	55
10/26/2021	BRISL001	0.03	2.5	0.0	0.7	0.0	78.9	20.4	3.9	30.21	56
	BRISL002	0.00	2.5	0.0	1.3	0.0	78.9	19.8	4.0	30.21	56
	BRISL003	0.00	2.5	0.1	0.6	0.17	77.9	21.4	3.6	30.22	55
	BRISL004	0.00	2.5	**18.5**	13.9	1.3	56.4	11.2	5.0	30.25	53
	BRISL005	0.01	2.5	0.0	2.8	0.0	78.7	18.5	4.3	30.24	52
	BRISL006	0.00	2.5	0.0	3.0	0.0	80.3	16.7	4.8	30.24	51
11/2/2021	BRISL001	-0.01	2.5	0.0	0.3	0.0	76.4	23.3	3.3	30.63	41
	BRISL002	-0.01	2.5	0.0	3.0	0.0	77.7	19.3	4.0	30.31	10
	BRISL003	0.01	2.5	0.0	0.8	0.0	76.1	23.1	3.3	30.60	10
	BRISL004	-0.02	2.5	**9.1**	9.4	0.97	66.2	15.3	4.3	30.59	38
	BRISL005	0	2.5	0.0	1.2	0.0	77.2	21.6	3.6	30.58	38
	BRISL006	-0.01	2.5	0.0	3.1	0.0	79.7	17.2	4.6	30.58	38
11/9/2021	BRISL004	-0.04	2.5	**25.9**	15.7	1.6	47.6	10.8	4.4	30.24	59
11/16/2021	BRISL004	0.02	2.5	**27.4**	17.3	1.6	45.6	9.7	4.7	29.96	69
11/23/2021	BRISL004	0	2.5	**15.6**	12.6	1.2	58.9	12.9	4.6	30.40	34
11/30/2021	BRISL004	-0.02	2.5	**11.5**	9.5	1.2	63.1	15.9	4.0	30.22	45

Table 1. LFG Monitoring Data
Bridgeton Landfill ISL Area

Date	Well ID	Well Gas Pressure (in. of W.C.)	Methane Threshold Level (%)	Methane (%)	Carbon Dioxide (%)	Methane to Carbon Dioxide Ratio	Balance Gas (%)	Oxygen (%)	Balance to O2 Ratio	Ambient Air Barometric Pressure (in)	Ambient Air Temperature (°F)
12/7/2021	BRISL001	0.01	2.5	0.0	6.3	0.0	77.9	15.8	4.9	30.36	29
	BRISL002	-0.02	2.5	0.0	1.2	0.0	76.6	22.2	3.5	30.36	29
	BRISL003	-0.02	2.5	0.0	1.8	0.0	75	23.2	3.2	30.37	29
	BRISL004	-0.01	2.5	**7.7**	10.1	0.76	68.3	13.9	4.9	30.35	29
	BRISL005	-0.02	2.5	0.0	4.7	0.0	75.6	19.7	3.8	30.37	29
	BRISL006	-0.04	2.5	0.0	2.4	0.0	80	17.6	4.5	30.38	29
12/14/2021	BRISL004	0	2.5	**6.3**	9.4	0.67	71.3	13	5.5	30.33	63
12/21/2021	BRISL004	0	2.5	**7.4**	10.1	0.73	69.8	12.7	5.5	30.17	29
12/28/2021	BRISL004	0.01	2.5	**14.8**	13.3	1.1	60.9	11	5.5	29.67	45
1/4/2022	BRISL001	0.13	2.5	0.1	21.1	0.0	78.7	0	--	30.22	33
	BRISL002	0.01	2.5	0.1	16.4	0.0	81.5	2	40.8	30.24	33
	BRISL003	0.02	2.5	0.0	1.9	0.0	75.6	22.5	3.4	30.23	32
	BRISL004	0.02	2.5	**7.4**	11	0.67	69.5	12.1	5.7	30.25	30
	BRISL005	0.00	2.5	0.0	2.7	0.0	77.1	20.2	3.8	30.25	29
	BRISL006	-0.01	2.5	0.0	5.3	0	78.3	16.4	4.8	30.26	28
1/11/2022	BRISL004	0.04	2.5	2.3	5.8	0.40	75.3	16.6	4.5	30.56	38
1/18/2022	BRISL004	0	2.5	**4.9**	7.4	0.66	71.5	16.2	4.4	30.1	36
1/25/2022	BRISL004	-0.05	2.5	0.2	0.6	0.33	76.8	22.4	3.4	30.55	15
2/1/2022	BRISL001	0.03	2.5	0	0.2	0	77.7	22.1	3.5	29.52	59
	BRISL002	0	2.5	0	0.5	0	78.2	21.3	3.7	29.55	59
	BRISL003	0.01	2.5	0	0.8	0	77.6	21.6	3.6	29.52	58
	BRISL004	0	2.5	**3.7**	6.9	0.54	74.1	15.3	4.8	29.55	55
	BRISL005	0	2.5	0	1.7	0	77.5	20.8	3.7	29.55	54
	BRISL006	-0.01	2.5	0	3.5	0	78.3	18.2	4.3	29.55	54
2/8/2022	BRISL004	0.01	2.5	**4.2**	7.6	0.55	73.3	14.9	4.9	29.60	45
2/15/2022	BRISL004	0.0	2.5	1.2	4.3	0.28	77.2	17.3	4.5	30.42	39
2/22/2022	BRISL004	0.0	2.5	**9.6**	9.4	1.02	66.8	14.2	4.7	29.82	62
3/1/2022	BRISL004	0.02	2.5	**10.5**	9.6	1.09	66.9	13	5.1	30.13	55
3/8/2022	BRISL004	0.04	2.5	**7.6**	7.6	1	70.3	14.5	4.8	30.38	37
3/15/2022	BRISL004	0.01	2.5	**14.9**	8.9	1.7	62.2	14	4.4	30.32	60
3/22/2022	BRISL004	0.05	2.5	**29.8**	14.2	2.1	46.3	9.7	4.8	29.8	55
3/29/2022	BRISL004	0.02	2.5	**21.8**	11.3	1.9	54.1	12.8	4.2	30.13	45
4/5/2022	BRISL001	0.10	2.5	2.2	21.5	0.1	76.3	0.0	--	29.77	51
4/5/2022	BRISL002	0.05	2.5	0.3	18.3	0.0	81.4	0.0	--	29.79	50
4/5/2022	BRISL003	0.02	2.5	1.4	2.2	0.6	75.8	20.6	3.7	29.79	50
4/5/2022	BRISL004	0.04	2.5	**36.2**	15.7	2.3	37.9	10.2	3.7	29.79	50
4/5/2022	BRISL005	0.00	2.5	0.0	1.2	0.0	77.7	21.1	3.7	29.79	50
4/5/2022	BRISL006	0.00	2.5	0.0	3.2	0.0	78.2	18.6	4.2	29.80	50
4/12/2022	BRISL004	0.02	2.5	**24.8**	11.5	2.2	50.3	13.4	3.8	29.22	59
4/19/2022	BRISL004	0.00	2.5	**23.8**	10.9	2.2	51.5	13.8	3.7	30.45	46
4/26/2022	BRISL004	-0.01	2.5	**17.9**	8.8	2.0	56.9	16.4	3.5	30.53	44

Table 1. LFG Monitoring Data
Bridgeton Landfill ISL Area

Date	Well ID	Well Gas Pressure (in. of W.C.)	Methane Threshold Level (%)	Methane (%)	Carbon Dioxide (%)	Methane to Carbon Dioxide Ratio	Balance Gas (%)	Oxygen (%)	Balance to O2 Ratio	Ambient Air Barometric Pressure (in)	Ambient Air Temperature (°F)
5/3/2022	BRISL004	0.01	2.50	**21.6**	10.3	2.1	52.5	15.6	3.4	29.87	62
5/10/2022	BRISL004	0.00	2.50	**24.3**	11.6	2.1	50.8	13.3	3.8	30.08	86
5/17/2022	BRISL004	0.00	2.5	**24.4**	11.4	2.1	50.2	14.0	3.6	30.15	78
5/24/2022	BRISL004	0.01	2.5	**27.0**	13.3	2.0	47.0	12.7	3.7	30.22	60
5/31/2022	BRISL004	0.00	2.5	**23.4**	11.8	2.0	51.1	13.7	3.7	30.03	80
6/8/2022	BRISL004	-0.01	2.5	**25.8**	13.0	2.0	48.4	12.8	3.8	29.95	77
6/14/2022	BRISL004	0.01	2.5	**26.3**	13.0	2.0	48.3	12.4	3.9	30.00	91
6/21/2022	BRISL004	0.01	2.5	**25.8**	12.4	2.1	49.1	12.7	3.9	30.26	87
6/28/2022	BRISL004	0.00	2.5	**25.4**	12.8	2.0	48.4	13.4	3.6	30.26	76
7/5/2022	BRISL001	0.00	2.5	**11.5**	17.5	0.7	65.4	5.6	11.7	30.04	96
	BRISL002	0.02	2.5	**5.9**	11.5	0.5	72.5	10.1	7.2	30.04	96
	BRISL003	0.01	2.5	**25.5**	13.8	1.8	48.9	11.8	4.1	30.04	95
	BRISL004	0.00	2.5	**28.1**	14.1	2.0	45.4	12.4	3.7	30.05	94
	BRISL005	0.00	2.5	0.0	4.3	0.0	78.5	17.2	4.6	30.05	93
	BRISL006	-0.01	2.5	0.0	4.9	0.0	79.1	16.0	4.9	30.05	91
7/12/2022	BRISL001	0.00	2.5	0.2	1.7	0.1	76.6	21.5	3.6	30.09	89
	BRISL002	0.00	2.5	**4.1**	10.3	0.4	73.6	12.0	6.1	30.03	89
	BRISL003	-0.01	2.5	**9.5**	6.5	1.5	66.2	17.8	3.7	30.03	85
	BRISL004	-0.04	2.5	**25.7**	13.2	1.9	47.7	13.4	3.6	30.01	83
7/19/2022	BRISL001	0.02	2.5	1.8	6.7	0.3	77.3	14.2	5.4	29.99	86
	BRISL002	0.01	2.5	**2.7**	8.8	0.3	76.2	12.3	6.2	29.99	86
	BRISL003	0.01	2.5	**9.5**	6.8	1.4	66.7	17.0	3.9	29.98	86
	BRISL004	0.02	2.5	**27.5**	14.3	1.9	45.5	12.7	3.6	29.98	87
7/27/2022	BRISL001	-0.04	2.5	**12.9**	24.7	0.5	61.3	1.1	55.7	30.07	74
	BRISL002	0.03	2.5	**14.0**	22.4	0.6	63.6	0.0	--	30.07	74
	BRISL003	-0.04	2.5	**15.7**	8.1	1.9	59.2	17.0	3.5	30.07	74
	BRISL004	0.11	2.5	**45.7**	23.1	2.0	24.3	6.9	3.5	30.07	74
8/2/2022	BRISL001	0	2.5	**5.5**	14.8	0.4	70.1	9.6	7.3	30.04	80
	BRISL002	0	2.5	**14.2**	20.6	0.7	62.7	2.5	25.1	30.04	80
	BRISL003	0	2.5	**20.2**	10.5	1.9	54.0	15.3	3.5	30.04	80
	BRISL004	0.01	2.5	**34.2**	18.1	1.9	36.7	11.0	3.3	30.04	80
8/9/2022	BRISL001	-0.03	2.5	**4.4**	10.8	0.4	71.7	13.1	5.5	30.11	72
	BRISL002	-0.01	2.5	**17.7**	20.6	0.9	59.1	2.6	22.7	30.11	72
	BRISL003	-0.01	2.5	**24.4**	12.6	1.9	49.0	14.0	3.5	30.11	72
	BRISL004	-0.02	2.5	**29.9**	15.3	2.0	42.6	12.2	3.5	30.11	72
8/16/2022	BRISL001	-0.01	2.5	**3.4**	8.2	0.4	73.9	14.5	5.1	30.13	68
	BRISL002	-0.01	2.5	**10.4**	12.9	0.8	66.3	10.4	6.4	30.13	68
	BRISL003	-0.07	2.5	**23.1**	12.3	1.9	50.6	14.0	3.6	30.13	68
	BRISL004	0.00	2.5	**32.8**	16.0	2.1	39.8	11.4	3.5	30.13	68
8/23/2022	BRISL001	0.00	2.5	**3.0**	8.9	0.3	74.0	14.1	5.2	30.14	74
	BRISL002	0.00	2.5	**8.9**	15.3	0.6	67.3	8.5	7.9	30.14	74
	BRISL003	-0.03	2.5	**14.3**	8.2	1.7	61.1	16.4	3.7	30.14	74
	BRISL004	-0.04	2.5	**30.2**	15.2	2.0	42.5	12.1	3.5	30.14	74

Table 1. LFG Monitoring Data
Bridgeton Landfill ISL Area

Date	Well ID	Well Gas Pressure (in. of W.C.)	Methane Threshold Level (%)	Methane (%)	Carbon Dioxide (%)	Methane to Carbon Dioxide Ratio	Balance Gas (%)	Oxygen (%)	Balance to O2 Ratio	Ambient Air Barometric Pressure (in)	Ambient Air Temperature (°F)
8/30/2022	BRISL001	0.00	2.5	0.1	0.8	0.1	80.2	18.9	4.2	30.14	84
	BRISL002	-0.01	2.5	**6.2**	8.6	0.7	73.0	12.2	6.0	30.14	84
	BRISL003	-0.03	2.5	**14.3**	8.5	1.7	62.8	14.4	4.4	30.14	84
	BRISL004	-0.01	2.5	**29.6**	14.7	2.0	44.3	11.4	3.9	30.14	84
9/6/2022	BRISL001	-0.01	2.5	0.1	0.1	1.0	78.5	21.3	3.7	30.23	72
	BRISL002	0.00	2.5	2.2	2.5	0.9	77.4	17.9	4.3	30.23	72
	BRISL003	-0.04	2.5	**8.0**	5.2	1.5	68.9	17.9	3.8	30.23	72
	BRISL004	-0.01	2.5	**31.4**	15.6	2.0	41.8	11.2	3.7	30.23	72
9/13/2022	BRISL001	-0.01	2.5	0.0	0.0	--	78.3	21.7	3.6	30.10	72
	BRISL002	-0.01	2.5	1.6	3.8	0.4	77.5	17.1	4.5	30.10	72
	BRISL003	-0.05	2.5	**5.5**	3.5	1.6	72.3	18.7	3.9	30.10	72
	BRISL004	-0.09	2.5	**30.8**	15.7	2.0	42.2	11.3	3.7	30.10	72
9/20/2022	BRISL001	-0.02	2.5	0.0	0.1	0.0	78.4	21.5	3.6	30.09	81
	BRISL002	0.00	2.5	0.0	0.3	0.0	79.2	20.5	3.9	30.09	81
	BRISL003	-0.01	2.5	0.4	0.1	4.0	77.4	22.1	3.5	30.09	81
	BRISL004	0.00	2.5	**29.7**	15.0	2.0	43.4	11.9	3.6	30.09	81
9/27/2022	BRISL001	0.00	2.5	0.0	0.0	--	78.3	21.7	3.6	30.30	63
	BRISL002	-0.01	2.5	0.0	0.4	0.0	79.3	20.3	3.9	30.30	63
	BRISL003	-0.01	2.5	0.1	0.2	0.5	77.6	22.1	3.5	30.30	64
	BRISL004	0.00	2.5	**22.5**	12.9	1.7	52.6	12.0	4.4	30.30	65
10/4/2022	BRISL001	0.00	2.5	0.0	0.0	--	78.5	21.5	3.7	30.37	58
	BRISL002	-0.01	2.5	0.0	0.2	0.0	79.7	20.1	4.0	30.36	59
	BRISL003	-0.01	2.5	0.0	0.5	0.0	78.7	20.8	3.8	30.37	59
	BRISL004	0.00	2.5	**24.1**	14.8	1.6	49.7	11.4	4.4	30.37	62
	BRISL005	0.01	2.5	0.0	3.0	0.0	78.2	18.8	4.2	30.37	64
	BRISL006	0.00	2.5	0.0	11.0	0.0	76.2	12.8	6.0	30.37	65
10/12/2022	BRISL001	-0.04	2.5	0.3	5.1	0.1	78.6	16.0	4.9	29.86	69
	BRISL002	-0.02	2.5	0.0	4.5	0.0	79.4	16.1	4.9	29.86	69
	BRISL003	-0.14	2.5	0.0	3.2	0.0	76.7	20.1	3.8	29.86	69
	BRISL004	0.01	2.5	**22.9**	15.9	1.4	49.5	11.7	4.2	29.86	69
10/18/2022	BRISL001	-0.03	2.5	0.0	0.0	--	78.7	21.3	3.7	30.38	38
	BRISL002	-0.01	2.5	0.0	1.9	0.0	79.0	19.1	4.1	30.37	39
	BRISL003	0.00	2.5	0.0	0.3	0.0	78.7	21.0	3.7	30.38	39
	BRISL004	-0.02	2.5	**8.2**	9.7	0.8	69.1	13.0	5.3	30.38	40
10/26/2022	BRISL001	-0.04	2.5	0.0	0.0	--	78.6	21.4	3.7	30.24	50
	BRISL002	-0.01	2.5	0.0	0.3	0.0	79.3	20.4	3.9	30.24	50
	BRISL003	-0.01	2.5	0.0	0.1	0.0	78.5	21.4	3.7	30.24	50
	BRISL004	0.00	2.5	**5.6**	8.5	0.7	72.4	13.5	5.4	30.24	50
11/1/2022	BRISL001	-0.05	2.5	0.0	0.0	--	78.2	21.8	3.6	30.30	54
	BRISL002	-0.01	2.5	0.0	0.0	--	78.6	21.4	3.7	30.30	55
	BRISL003	-0.01	2.5	0.0	0.0	--	77.9	22.1	3.5	30.30	56
	BRISL004	-0.03	2.5	**10.4**	10.8	1.0	64.3	14.5	4.4	30.30	56
11/8/2022	BRISL001	0.01	2.5	0.0	0.1	0.0	79.1	20.8	3.8	30.60	52
	BRISL002	0.00	2.5	0.0	1.9	0.0	79.7	18.4	4.3	30.59	53
	BRISL003	0.00	2.5	0.0	1.1	0.0	78.1	20.8	3.8	30.59	54
	BRISL004	0.01	2.5	**7.8**	10.5	0.7	69.8	11.9	5.9	30.59	54
11/15/2022	BRISL001	-0.06	2.5	0.0	1.9	0.0	78.3	19.8	4.0	29.78	34
	BRISL002	-0.01	2.5	0.0	11.3	0.0	79.9	8.8	9.1	29.77	34
	BRISL003	-0.03	2.5	0.0	0.7	0.0	76.3	23.0	3.3	29.78	34
	BRISL004	0.02	2.5	**12.3**	11.8	1.0	61.6	14.3	4.3	29.78	34

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Bridgeton Landfill ISL Area

Date	Well ID	Well Gas Pressure (in. of W.C.)	Methane Threshold Level (%)	Methane (%)	Carbon Dioxide (%)	Methane to Carbon Dioxide Ratio	Balance Gas (%)	Oxygen (%)	Balance to O2 Ratio	Ambient Air Barometric Pressure (in)	Ambient Air Temperature (°F)
11/22/2022	BRISL001	0.01	2.5	0.0	0.3	0.0	78.4	21.3	3.7	29.89	49
	BRISL002	0.00	2.5	0.0	5.9	0.0	78.5	15.6	5.0	29.88	51
	BRISL003	0.01	2.5	0.0	1.3	0.0	77.8	20.9	3.7	29.88	52
	BRISL004	0.01	2.5	**9.6**	10.8	0.9	67.6	12.0	5.6	29.89	53
11/29/2022	BRISL001	0.09	2.5	0.0	20.1	0.0	79.2	0.7	113.1	29.25	52
	BRISL002	0.01	2.5	0.0	9.8	0.0	79.4	10.8	7.4	29.25	52
	BRISL003	-0.04	2.5	0.0	2.4	0.0	77.0	20.6	3.7	29.25	53
	BRISL004	0.02	2.5	**17.2**	15.1	1.1	57.3	10.4	5.5	29.25	53
12/6/2022	BRISL001	-0.09	2.5	0.0	0.0	-	77.6	22.4	3.5	29.55	41
	BRISL002	0.00	2.5	0.0	0.0	-	77.4	22.6	3.4	29.55	42
	BRISL003	-0.03	2.5	0.0	0.2	0.0	76.6	23.2	3.3	29.55	42
	BRISL004	-0.02	2.5	**8.4**	8.7	1.0	67.2	15.7	4.3	29.58	42
12/13/2022	BRISL001	-0.01	2.5	0.0	6.5	0.0	80.4	13.1	6.1	29.59	39
	BRISL002	0.00	2.5	0.0	6.8	0.0	78.8	14.4	5.5	29.60	39
	BRISL003	-0.02	2.5	0.0	0.9	0.0	75.9	23.2	3.3	29.62	39
	BRISL004	0.01	2.5	**7.3**	10.3	0.7	68.7	13.7	5.0	29.59	39
12/20/2022	BRISL001	-0.07	2.5	0.0	0.0	-	77.4	22.6	3.4	30.01	32
	BRISL002	-0.36	2.5	0.0	0.2	0.0	77.3	22.5	3.4	30.02	33
	BRISL003	-0.03	2.5	0.0	0.1	0.0	76.5	23.4	3.3	30.01	33
	BRISL004	-0.01	2.5	0.0	0.5	0.0	77.7	21.8	3.6	30.04	33
12/27/2022	BRISL001	0.00	2.5	0.0	1.9	0.0	77.7	20.4	3.8	29.86	16
	BRISL002	-0.03	2.5	0.0	1.9	0.0	75.7	22.4	3.4	29.89	17
	BRISL003	-0.05	2.5	0.0	1.3	0.0	74.4	24.3	3.1	29.89	18
	BRISL004	-0.01	2.5	0.3	2.0	0.2	76.2	21.5	3.5	29.85	18
1/3/2023	BRISL001	0.02	2.5	0.3	22.4	0.0	77.3	0.0	-	29.18	60
	BRISL002	-0.02	2.5	0.0	19.3	0.0	80.3	0.4	200.8	29.20	60
	BRISL003	-0.02	2.5	0.0	2.6	0.0	76.6	20.8	3.7	29.21	61
	BRISL004	0.02	2.5	**9.6**	10.3	0.9	66.1	14.0	4.7	29.22	61
1/10/2023	BRISL001	-0.01	2.5	0.0	0.4	0.0	78.2	21.4	3.7	29.53	46
	BRISL002	-0.02	2.5	0.0	2.3	0.0	79.6	18.1	4.4	29.52	46
	BRISL003	-0.04	2.5	0.0	0.7	0.0	76.8	22.5	3.4	29.53	47
	BRISL004	-0.04	2.5	**3.4**	6.3	0.5	74.1	16.2	4.6	29.55	47
	BRISL005	-0.03	2.5	0.0	1.2	0.0	76.9	21.9	3.5	29.51	49
	BRISL006	-0.01	2.5	0.0	9.9	0.0	74.7	15.4	4.9	29.51	50
1/17/2023	BRISL001	-0.12	2.5	0.0	0.0	-	77.7	22.3	3.5	29.32	42
	BRISL002	-0.06	2.5	0.0	0.0	-	77.0	23.0	3.3	29.34	42
	BRISL003	-0.05	2.5	0.0	0.0	-	77.0	23.0	3.3	29.33	42
	BRISL004	-0.03	2.5	0.2	0.2	1.0	76.5	23.1	3.3	29.36	42
1/24/2023	BRISL001	-0.10	2.5	0.0	0.0	-	78.3	21.7	3.6	29.81	37
	BRISL002	-0.06	2.5	0.0	0.0	-	77.4	22.6	3.4	29.85	37
	BRISL003	-0.06	2.5	0.0	0.0	-	76.7	23.3	3.3	29.85	38
	BRISL004	-0.03	2.5	0.0	0.0	-	76.4	23.6	3.2	29.83	39
1/31/2023	BRISL001	-0.12	2.5	0.0	0.1	0.0	77.5	22.4	3.5	30.04	11
	BRISL002	-0.06	2.5	0.0	0.1	0.0	76.9	23.0	3.3	30.07	11
	BRISL003	-0.07	2.5	0.0	0.1	0.0	76.3	23.6	3.2	30.08	12
	BRISL004	-0.05	2.5	0.0	0.0	-	76.7	23.3	3.3	30.07	11
2/7/2023	BRISL001	-0.08	2.5	0.0	0.0	-	77.7	22.3	3.5	29.63	48
	BRISL002	0.00	2.5	0.0	0.0	-	76.9	23.1	3.3	29.61	47
	BRISL003	-0.10	2.5	0.0	0.0	-	76.5	23.5	3.3	29.63	47
	BRISL004	-0.06	2.5	0.0	0.1	0.0	76.4	23.5	3.3	29.67	46

Table 1. LFG Monitoring Data
Bridgeton Landfill ISL Area

Date	Well ID	Well Gas Pressure (in. of W.C.)	Methane Threshold Level (%)	Methane (%)	Carbon Dioxide (%)	Methane to Carbon Dioxide Ratio	Balance Gas (%)	Oxygen (%)	Balance to O2 Ratio	Ambient Air Barometric Pressure (in)	Ambient Air Temperature (°F)
2/14/2023	BRISL001	-0.07	2.5	0.1	17.9	0.0	79.0	3.0	26.3	29.32	50
	BRISL002	-0.07	2.5	0.0	14.7	0.0	83.9	1.4	59.9	29.36	50
	BRISL003	-0.06	2.5	0.0	0.9	0.0	77.5	21.6	3.6	29.36	50
	BRISL004	-0.02	2.5	2.0	6.7	0.3	77.2	14.1	5.5	29.36	50
2/21/2023	BRISL001	-0.15	2.5	0.0	0.0	-	78.1	21.9	3.6	29.44	40
	BRISL002	-0.07	2.5	0.0	0.0	-	78.8	21.2	3.7	29.44	40
	BRISL003	-0.11	2.5	0.0	0.0	-	78.8	21.2	3.7	29.47	41
	BRISL004	-0.05	2.5	0.1	0.2	0.5	78.3	21.4	3.7	29.44	41
2/28/2023	BRISL001	-0.13	2.5	0.0	0.0	-	78.0	22.0	3.5	29.45	44
	BRISL002	-0.08	2.5	0.0	0.0	-	77.7	22.3	3.5	29.47	44
	BRISL003	-0.10	2.5	0.0	0.0	-	78.9	21.1	3.7	29.47	44
	BRISL004	-0.07	2.5	0.0	0.0	-	78.6	21.4	3.7	29.48	45
3/7/2023	BRISL001	-0.11	2.5	0.0	0.0	-	77.4	22.6	3.4	29.89	40
	BRISL002	-0.08	2.5	0.0	0.0	-	77.1	22.9	3.4	29.89	40
	BRISL003	-0.12	2.5	0.0	0.0	-	78.8	21.2	3.7	29.91	40
	BRISL004	-0.06	2.5	0.0	0.0	-	79.3	20.7	3.8	29.93	41
3/14/2023	BRISL001	0.01	2.5	0.0	0.0	-	78.7	21.3	3.7	30.04	35
	BRISL002	0.00	2.5	0.0	0.0	-	79.2	20.8	3.8	30.04	35
	BRISL003	0.00	2.5	0.0	0.0	-	79.0	21.0	3.8	30.04	35
	BRISL004	0.00	2.5	0.5	0.4	1.25	79.1	20.0	4.0	30.07	36
3/21/2023	BRISL001	0.03	2.5	0.0	0.4	0.00	79	20.6	3.8	29.71	45
	BRISL002	0.01	2.5	0.0	12.5	0.00	81	6.5	12.5	29.74	45
	BRISL003	-0.02	2.5	0.0	2.8	0.00	76.7	20.5	3.7	29.74	46
	BRISL004	-0.01	2.5	**4.4**	3.5	1.3	72.5	19.6	3.7	29.74	46
3/28/2023	BRISL001	-0.07	2.5	0.0	0.0	-	78.3	21.7	3.6	29.92	42
	BRISL002	-0.03	2.5	0.0	0.2	0.0	79.4	20.4	3.9	29.91	42
	BRISL003	-0.07	2.5	0.8	1.1	0.7	77.0	21.1	3.6	29.92	42
	BRISL004	-0.05	2.5	**5.7**	3.8	1.5	71.2	19.3	3.7	29.93	42
4/4/2023	BRISL001	0.03	2.5	1.6	19.0	0.1	78.3	1.1	71.2	29.21	67
	BRISL002	0.04	2.5	1.1	19.5	0.1	79.4	0.0	-	29.21	67
	BRISL003	-0.05	2.5	**2.7**	3.8	0.7	74.1	19.4	3.8	29.21	72
	BRISL004	-0.02	2.5	**14.9**	6.8	2.2	61.6	16.7	3.7	29.21	76
	BRISL005	-0.03	2.5	0.0	0.6	0.0	77.9	21.5	3.6	29.21	76
	BRISL006	-0.01	2.5	0.0	6.5	0.0	76.3	17.2	4.4	29.25	76
4/11/2023	BRISL001	-0.01	2.5	0.0	0.3	0.0	78.7	21.0	3.7	29.89	61
	BRISL002	-0.01	2.5	0.3	6.3	0.0	80.7	12.7	6.4	29.89	66
	BRISL003	-0.02	2.5	2.0	3.1	0.6	75.1	19.8	3.8	29.89	66
	BRISL004	-0.02	2.5	**9.0**	4.7	1.9	67.9	18.4	3.7	29.89	66
4/18/2023	BRISL001	-0.03	2.5	0.0	0.1	0.0	78.1	21.8	3.6	29.52	51
	BRISL002	-0.01	2.5	0.8	11.2	0.1	78.8	9.2	8.6	29.51	51
	BRISL003	-0.01	2.5	**4.0**	3.8	1.1	72.6	19.6	3.7	29.52	51
	BRISL004	-0.01	2.5	**11.4**	5.8	2.0	64.9	17.9	3.6	29.52	54
4/25/2023	BRISL001	-0.04	2.5	0.0	0.9	0.0	78.4	20.7	3.8	29.71	52
	BRISL002	-0.01	2.5	0.1	11.6	0.0	79.0	9.3	8.5	29.70	52
	BRISL003	-0.02	2.5	**3.4**	3.3	1.0	73.4	19.9	3.7	29.70	52
	BRISL004	-0.02	2.5	**10.4**	5.3	2.0	66.3	18.0	3.7	29.72	57
5/2/2023	BRISL001	-0.04	2.5	0.0	0.0	-	78.1	21.9	3.6	29.41	52
	BRISL002	-0.01	2.5	0.0	0.2	0.0	78.8	21.0	3.8	29.41	52
	BRISL003	-0.02	2.5	**2.8**	2.0	1.4	75.2	20.0	3.8	29.44	53
	BRISL004	-0.01	2.5	**7.4**	4.1	1.8	70.1	18.4	3.8	29.43	53

Table 1. LFG Monitoring Data
Bridgeton Landfill ISL Area

Date	Well ID	Well Gas Pressure (in. of W.C.)	Methane Threshold Level (%)	Methane (%)	Carbon Dioxide (%)	Methane to Carbon Dioxide Ratio	Balance Gas (%)	Oxygen (%)	Balance to O2 Ratio	Ambient Air Barometric Pressure (in)	Ambient Air Temperature (°F)
5/9/2023	BRISL001	-0.02	2.5	0.0	0.1	0	78.2	21.7	3.6	29.73	62
	BRISL002	-0.01	2.5	0.0	0.0	-	78.0	22.0	3.5	29.74	62
	BRISL003	-0.02	2.5	0.0	0.0	-	77.8	22.2	3.5	29.73	63
	BRISL004	-0.01	2.5	**8.0**	4.7	1.7	70.4	16.9	4.2	29.78	63
5/16/2023	BRISL001	0.01	2.5	2.1	11.0	0.2	76.1	10.8	7.0	29.59	59
	BRISL002	-0.01	2.5	0.2	11.6	0.0	80.9	7.3	11.1	29.59	59
	BRISL003	0.02	2.5	1.9	3.2	0.6	75.4	19.5	3.9	25.59	59
	BRISL004	0.00	2.5	**12.3**	6.2	2.0	64.2	17.3	3.7	25.59	59
5/23/2023	BRISL001	0.00	2.5	0.0	0.5	0.0	78.6	20.9	3.8	29.73	78
	BRISL002	0.01	2.5	0.0	2.4	0.0	80.8	16.8	4.8	29.72	79
	BRISL003	0.00	2.5	0.8	1.0	0.8	76.7	21.5	3.6	29.70	79
	BRISL004	0.01	2.5	**15.7**	7.3	2.2	60.0	17.0	3.5	29.71	79
5/30/2023	BRISL001	-0.04	2.5	0.0	0.1	0.0	78.2	21.7	3.6	29.59	76
	BRISL002	-0.02	2.5	0.0	1.7	0.0	79.9	18.4	4.3	29.59	76
	BRISL003	-0.02	2.5	0.8	1.1	0.7	76.5	21.6	3.5	29.59	76
	BRISL004	-0.03	2.5	**16.6**	8.1	2.0	58.4	16.9	3.5	29.59	80
6/6/2023	BRISL001	-0.03	2.5	0.0	0.3	0.0	78.3	21.4	3.7	29.59	66
	BRISL002	-0.02	2.5	0.0	2.3	0.0	78.4	19.3	4.1	29.60	66
	BRISL003	-0.02	2.5	0.2	0.3	0.7	77.6	21.9	3.5	29.59	68
	BRISL004	-0.03	2.5	**17.1**	8.5	2.0	58.1	16.3	3.6	29.61	69
6/13/2023	BRISL001	0.02	2.5	0.0	12.4	0.0	80.5	7.1	11.3	29.43	81
	BRISL002	0.03	2.5	0.0	10.2	0.0	78.0	11.8	6.6	29.43	81
	BRISL003	0.01	2.5	0.3	0.9	0.3	79.5	19.3	4.1	29.42	82
	BRISL004	0.02	2.5	**14.9**	7.3	2.0	62.2	15.6	4.0	29.44	83
6/20/2023	BRISL001	-0.03	2.5	0.0	0.0	-	78.8	21.2	3.7	29.55	74
	BRISL002	-0.02	2.5	0.0	0.0	-	78.8	21.2	3.7	29.55	75
	BRISL003	-0.03	2.5	0.0	0.0	-	78.5	21.5	3.7	29.55	75
	BRISL004	0.00	2.5	**13.4**	6.8	2.0	62.8	17.0	3.7	29.59	76
6/27/2023	BRISL001	-0.03	2.5	0.0	0.0	-	78.6	21.4	3.7	29.55	75
	BRISL002	-0.01	2.5	0.0	0.0	-	78.5	21.5	3.7	29.54	75
	BRISL003	-0.02	2.5	0.0	0.0	-	78.5	21.5	3.7	29.55	75
	BRISL004	-0.01	2.5	**14.3**	7.5	1.9	61.6	16.6	3.7	29.55	76
7/3/2023	BRISL001	0.00	2.5	0.0	0.1	0.0	79.1	20.8	3.8	29.59	86
	BRISL002	0.00	2.5	0.0	0.1	0.0	79.2	20.7	3.8	29.60	86
	BRISL003	0.00	2.5	0.0	0.1	0.0	78.8	21.1	3.7	29.59	86
	BRISL004	0.01	2.5	**14.5**	7.3	2.0	61.4	16.8	3.7	29.59	89
	BRISL005	-0.02	2.5	0.0	3.4	0.0	77.2	19.4	4.0	29.59	90
	BRISL006	0.00	2.5	0.0	4.4	0.0	77.5	18.1	4.3	29.59	90

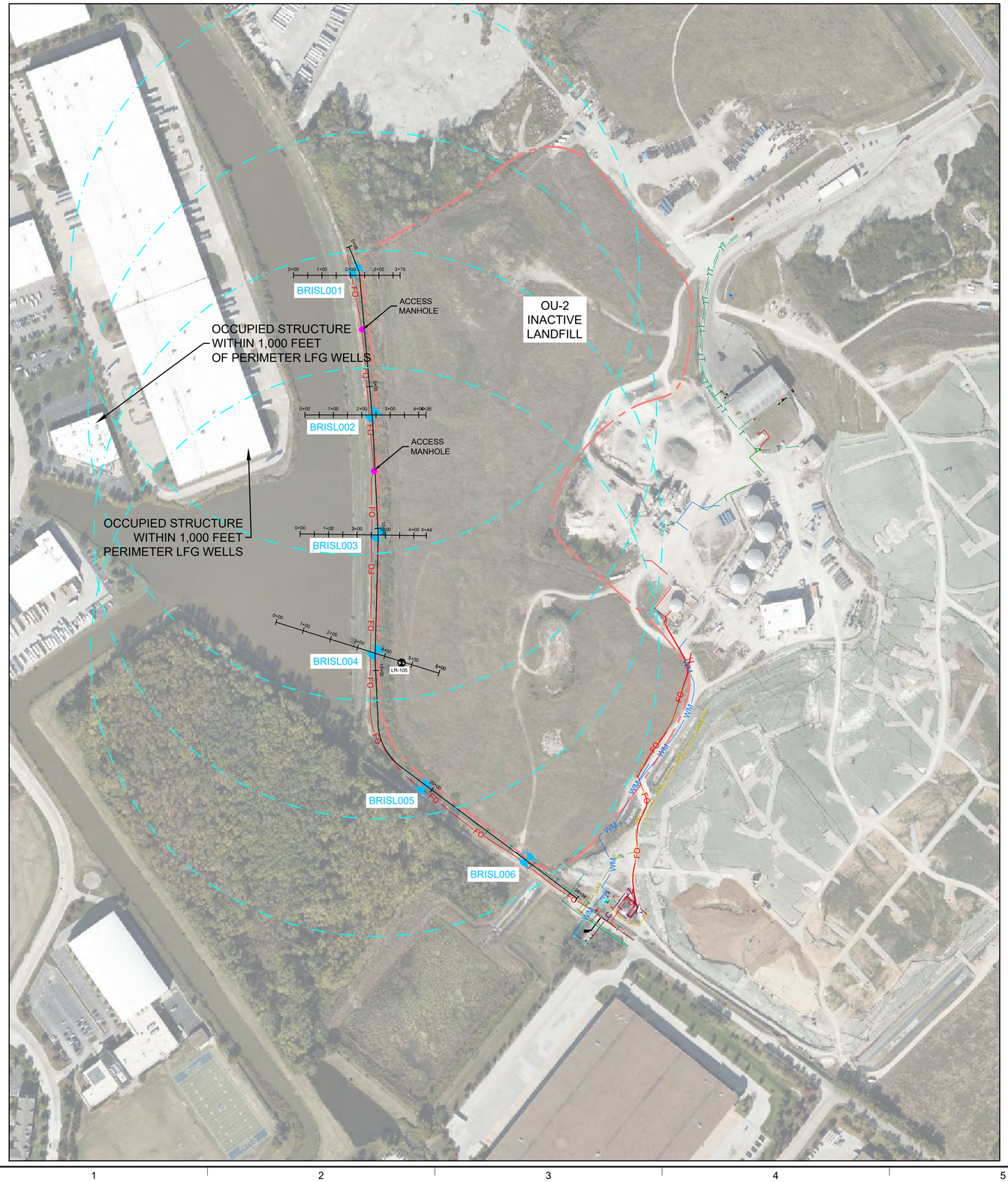
Table 2
Perimeter Landfill Gas Monitoring Well Depth to Groundwater

LFG Monitoring Well ID	Top of PVC Casing Surface Elevation (fmsl)	Oct. 2021 Depth to Groundwater (ft)[1,2]	Oct. 2021 Groundwater Elevation (fmsl)	July 2022 Depth to Groundwater (ft)[1,2]	July 2022 Groundwater Elevation (fmsl)
BRISL001	452.86	21.35	431.51	21.09	431.77
BRISL002	453.28	21.74	431.54	21.45	431.83
BRISL003	454.01	22.57	431.44	22.22	431.79
BRISL004	454.69	22.98	431.71	22.63	432.06
BRISL005	452.77	18.34	434.43	19.45	433.32
BRISL006	452.96	19.70	433.26	19.53	433.43

Notes:
1. Depth to groundwater measurements were taken on October 6, 2021, and July 11, 2022.
2. Depth to groundwater is from the top of PVC casing.

Table 3 LFG Mitigation Design Criteria and Corrective Actions	
Design Criteria	**Corrective Action**
Measurements of methane collected after purge testing at BRISL004 show either a sharp decrease in methane concentrations or methane concentrations below the action limit of 2.5 percent methane via volume.	Continue monitoring as described in the EGMP and potential installation of passive venting. Evaluate and discuss with USPEA the need to install the temporary monitoring probes.
Measurements of methane collected after purge testing at BRISL004 show elevated methane concentrations that indicates there is a continuous source of landfill gas present in the vicinity of BRSIL004.	More aggressive corrective actions will be evaluated such as: enhanced passive or active landfill gas collection.
Temporary monitoring probes measure methane concentrations above the action limit at the same vertical stratum as the utility corridor.	Potential venting and plugging of the utility trench to prevent mitigation of landfill gas.

FIGURES



LEGEND

- ISL WASTE BOUNDARY/LIMITS
- EXISTING FENCE
- 1,000 FOOT RADIUS AROUND PERIMETER LFG MONITORING WELLS
- FO — EXISTING FIBER OPTIC LANE
- GAS — EXISTING GAS LINE
- E — E — EXISTING ABOVE GROUND CONDUIT
- WM — EXISTING WATER LINE (BAKER PATERSON)
- WM — EXISTING WATER LINE
- LC — LC — EXISTING LEACHATE COLLECTION PIPE
- T — T — T — EXISTING TELEPHONE LINE
- INSTALLED PERIMETER LANDFILL GAS MONITORING WELLS
- ACCESS MANHOLES

N

0 200' 400'
SCALE IN FEET

NOTES:

1. AERIAL IMAGERY OBTAINED FROM BING MAPS.

AS-BUILT DRAWING

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
1210 KENSINGTON ROAD, SUITE 103
OAK BROOK,IL 60523 USA
TELEPHONE: 630.203.3360

TITLE: AS-BUILT SURVEY OF PERIMETER LFG MONITORING WELLS

PROJECT: WESTLAKE LANDFILL

SITE: BRIDGETON, MISSOURI

DESIGN BY:	DK	DATE:	JULY 2023
DRAWN BY:	MK	PROJECT NO.:	CHE8424
CHECKED BY:	JPV	FILE:	
REVIEWED BY:	RW	DRAWING NO.:	1
APPROVED BY:	JPV		

H:\RR\PUBLIC SERVICES\WEST LAKE - CHE8424\FIGURES\LFG CROSS-SECTIONS

Figure 2: Methane in LFG Perimeter Monitoring Wells
ISL Area

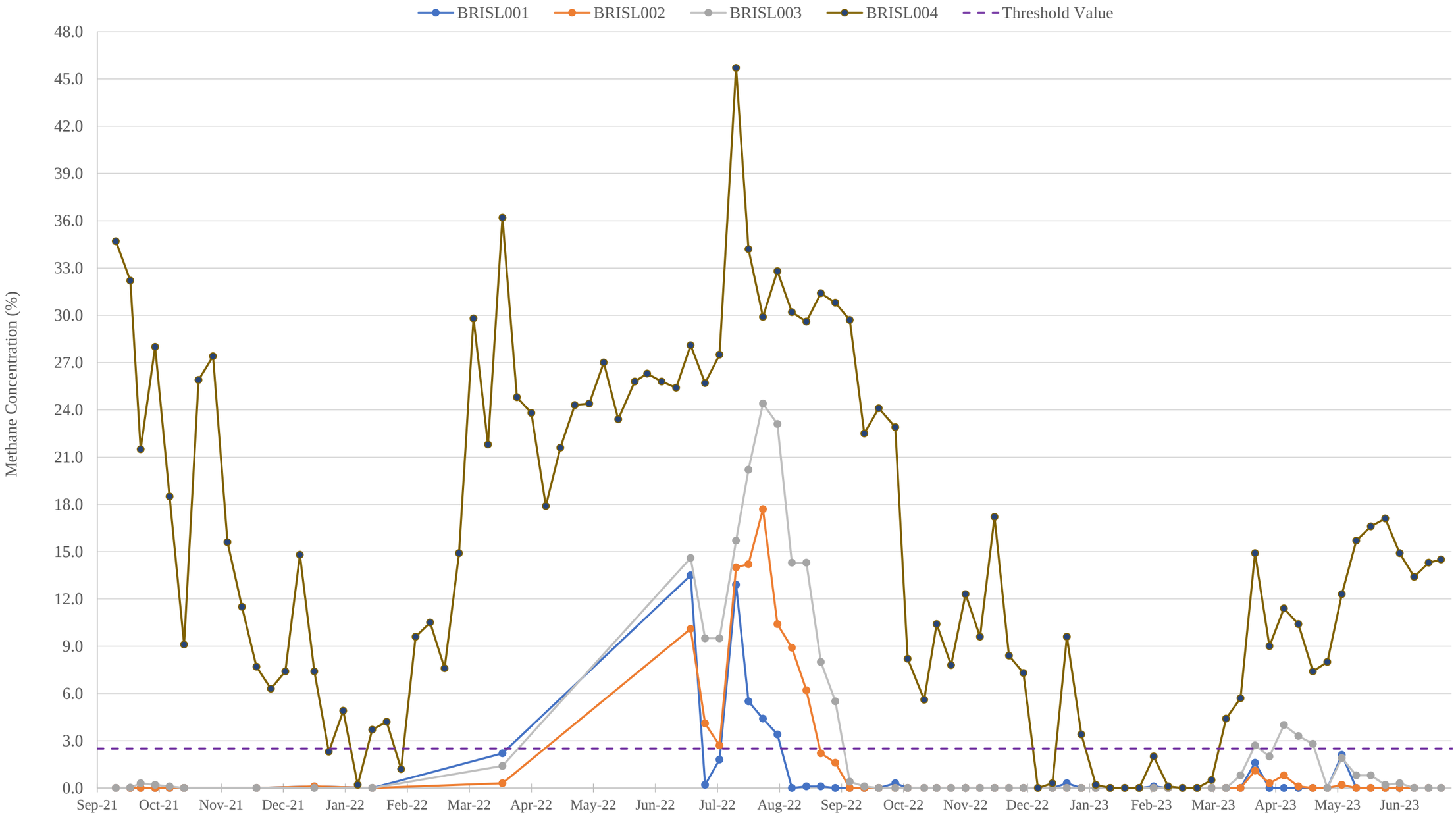


Figure 3: Carbon Dioxide in LFG Perimeter Monitoring Wells
ISL Area

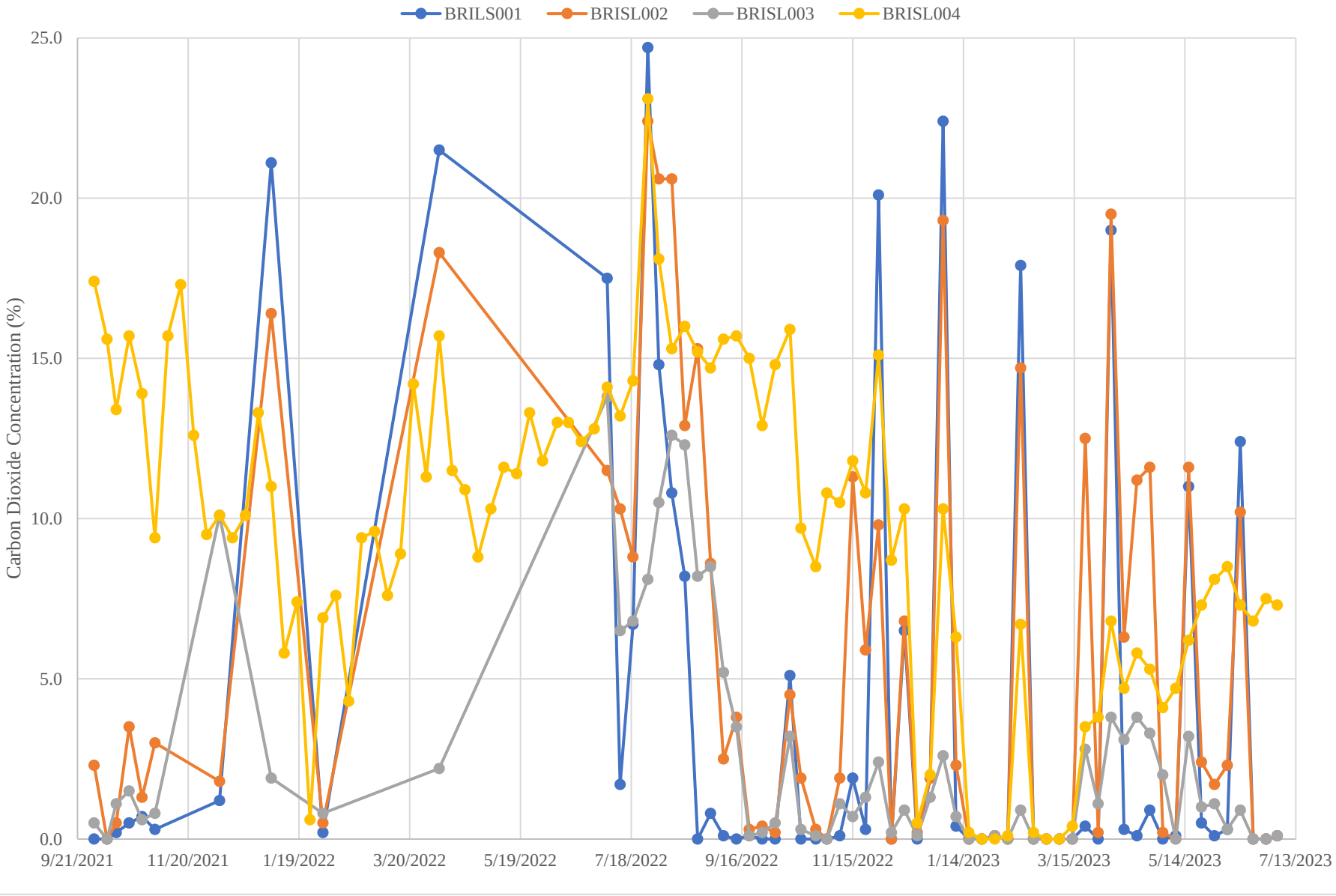


Figure 4: Oxygen in LFG Perimeter Monitoring Wells
ISL Area

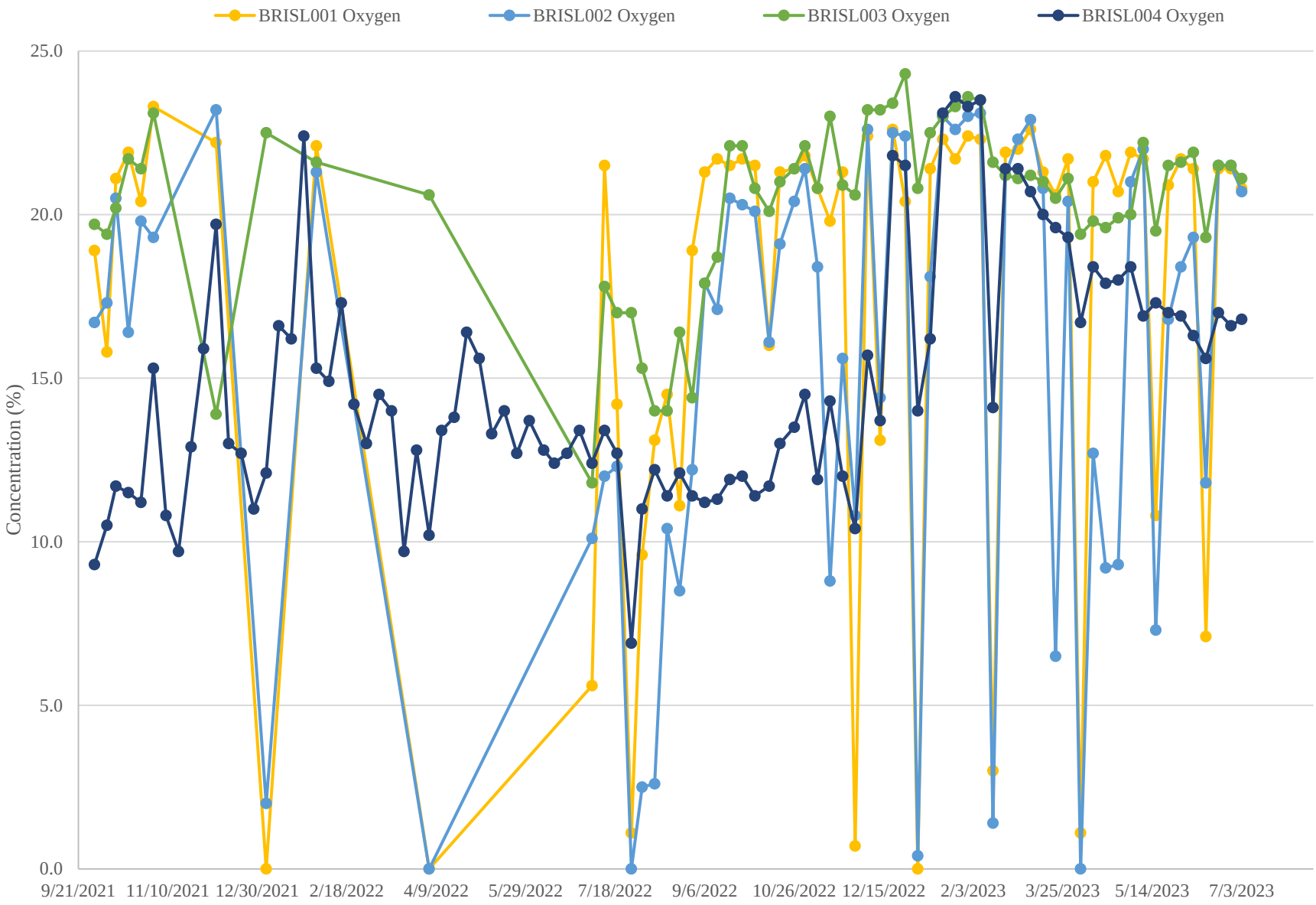
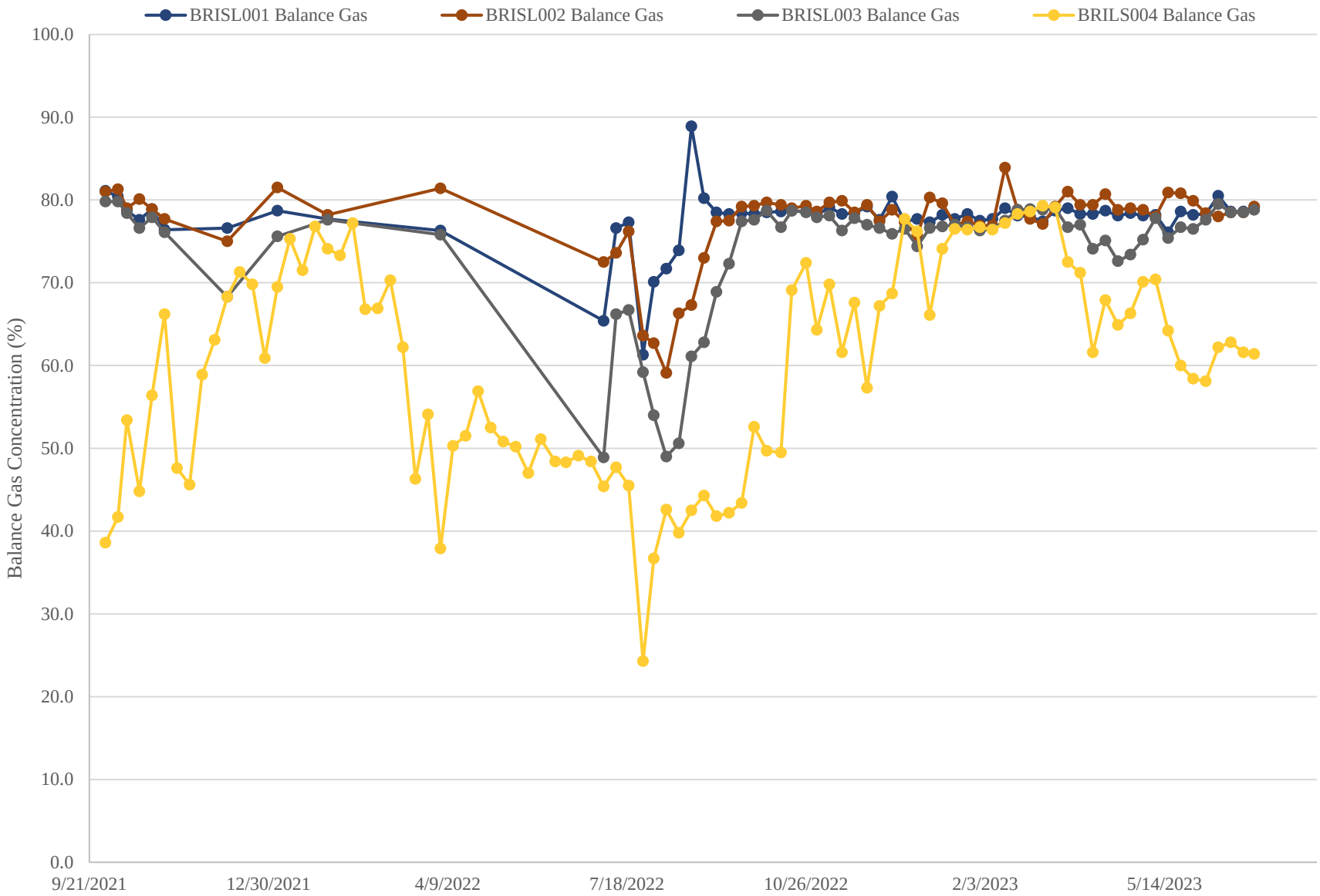
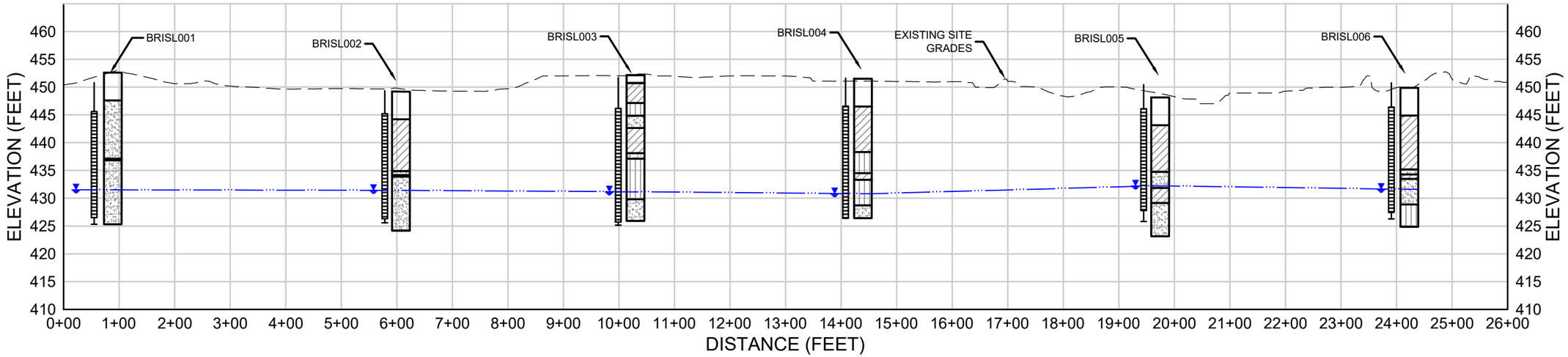


Figure 5: Balance Gas in LFG Perimeter Monitoring Wells
ISL Area



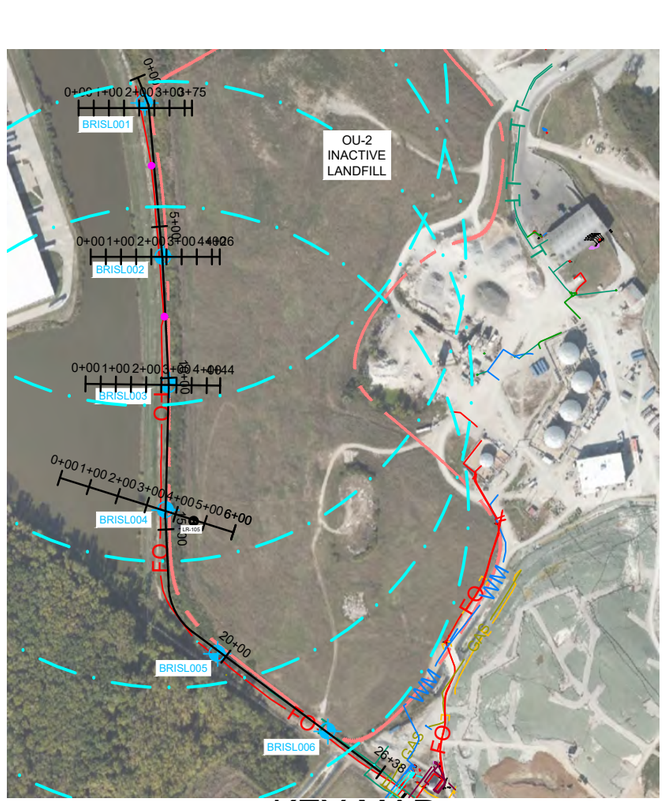


B PROFILE
HORIZONTAL: 1" =200'
VERTICAL: 1" =20'

NOTES:

1. EXISTING SITE GRADES AND SURFACE WATER ELEVATIONS IN EARTH CITY LEVEE CANAL ARE BASED ON AERIAL TOPOGRAPHIC SURVEY PROVIDED BY COOPER AERIAL SURVEYS CO., DATED DECEMBER 2019.

2. GROUNDWATER ELEVATIONS SHOWN ARE BASED ON DEPTH TO WATER READINGS OBTAINED FROM THE PERIMETER LFG MONITORING WELLS ON OCTOBER 6, 2021 AND JULY 11, 2022.



KEY MAP

LEGEND

- NO SAMPLE/ HYDRO-EXCAVATION
- CLAY TO SANDY CLAY
- SILT WITH SAND/CLAY
- SAND, SAND WITH SILT
- GROUNDWATER LEVEL
- ISL WASTE BOUNDARY OR LIMITS
- FIBER OPTIC UTILITY CORRIDOR
- 1,000 FOOT RADIUS AROUND LFG MONITORING WELLS

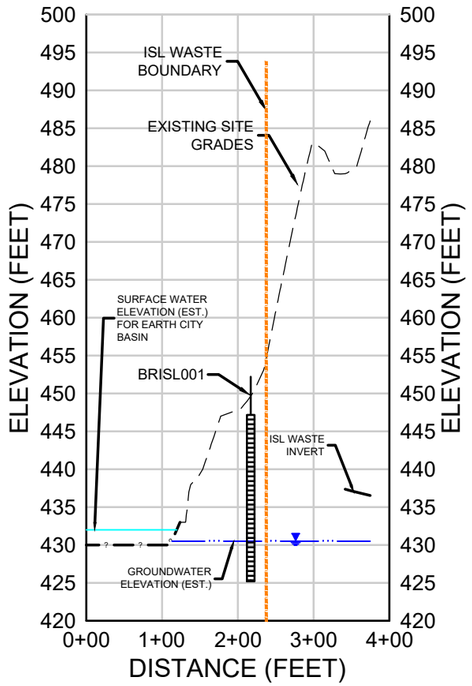
EXPLOSIVE GAS MONITORING
CORRECTIVE ACTION PLAN
CROSS SECTION (NORTH TO SOUTH)
WEST LAKE LANDFILL OU-2
BRIDGETON, MISSOURI

Geosyntec consultants

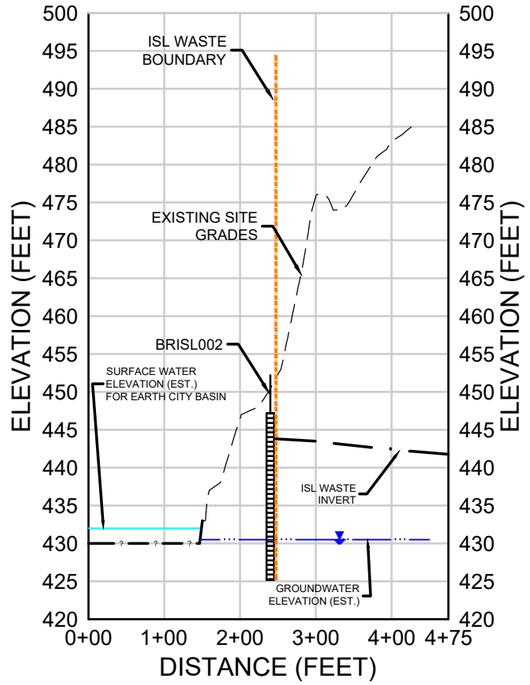
FIGURE 6

PROJECT NO: CHE8424 | JULY 2023

H:\RIREPUBLIC SERVICES\WEST LAKE - CHE8424\FIGURES\LFG CROSS-SECTIONS - Last Saved by: JVarsho on 7/6/23



BRISL001 PROFILE
HORIZONTAL: 1" =200'
VERTICAL: 1" =20'



BRISL002 PROFILE
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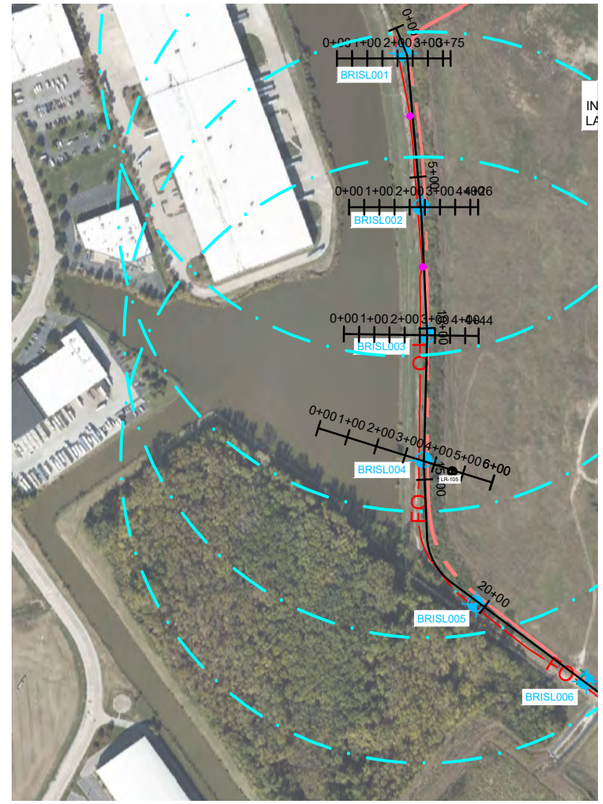


KEY MAP

LEGEND

- GROUNDWATER LEVEL
- ISL WASTE BOUNDARY OR LIMITS
- FIBER OPTIC UTILITY CORRIDOR
- 1,000 FOOT RADIUS AROUND LFG MONITORING WELLS

NOTES:

1. EXISTING SITE GRADES AND SURFACE WATER ELEVATIONS IN EARTH CITY LEVEE CANAL ARE BASED ON AERIAL TOPOGRAPHIC SURVEY PROVIDED BY COOPER AERIAL SURVEYS CO., DATED DECEMBER 2019.
2. GROUNDWATER ELEVATIONS SHOWN ARE BASED ON DEPTH TO WATER READINGS OBTAINED FROM THE PERIMETER LFG MONITORING WELLS ON OCTOBER 6, 2021 AND JULY 11, 2022.
3. THE EARTH CITY BASIN LEVEE CANAL INVERT WAS ESTIMATED FROM FIGURE 5-4 "CROSS SECTION 2A-2A', DATED 10/29/96, PREPARED BY EMSI FOR THE WEST LAKE OU-1 REMEDIAL INVESTIGATION REPORT.

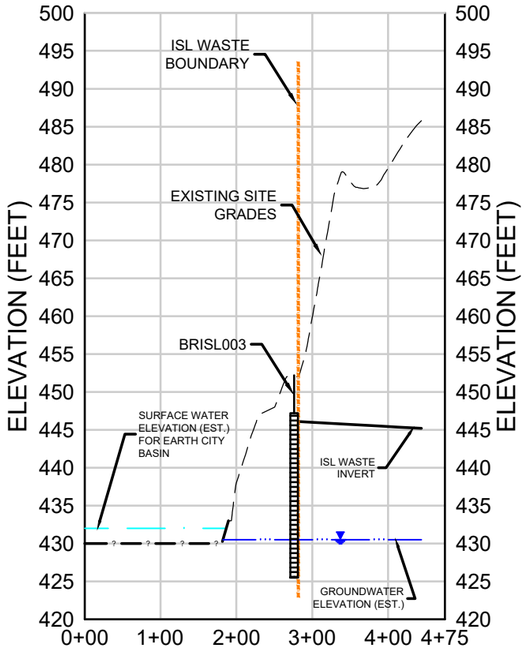
EXPLOSIVE GAS MONITORING
CORRECTIVE ACTION PLAN
CROSS SECTIONS - 1 (WEST TO EAST)
WEST LAKE LANDFILL OU-2
BRIDGETON, MISSOURI

Geosyntec consultants

PROJECT NO: CHE8424 | JULY 2023

FIGURE 7

H:\RREPUBLIC SERVICES\WEST LAKE - CHE8424\FIGURES\LFG CROSS-SECTIONS - Last Saved by: JVarsho on 7/6/23



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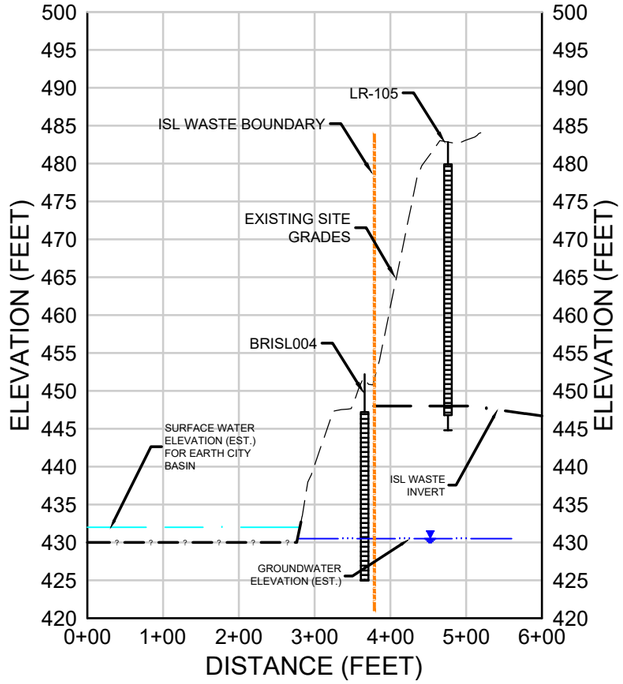
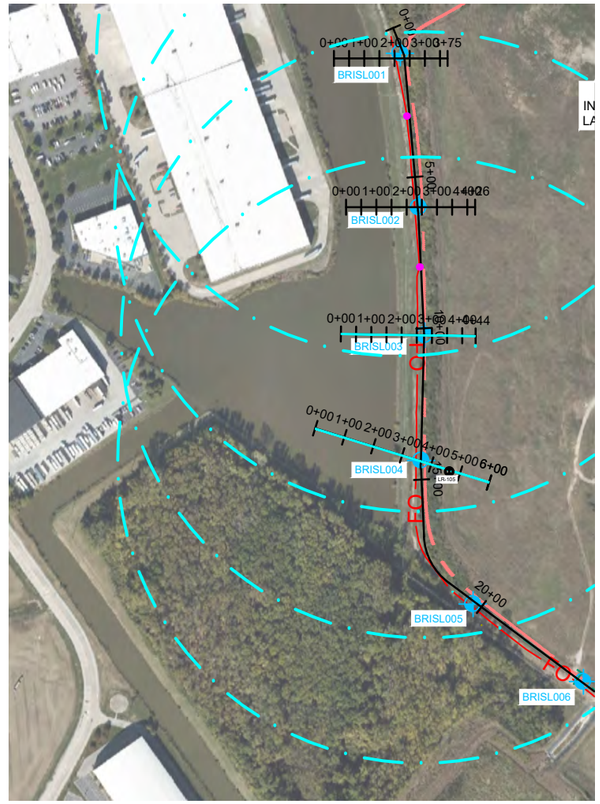


BRISL004 PROFILE
HORIZONTAL: 1" =200'
VERTICAL: 1" =20'



KEY MAP

LEGEND

- GROUNDWATER LEVEL
- ISL WASTE BOUNDARY OR LIMITS
- FIBER OPTIC UTILITY CORRIDOR
- 1,000 FOOT RADIUS AROUND LFG MONITORING WELLS

NOTES:

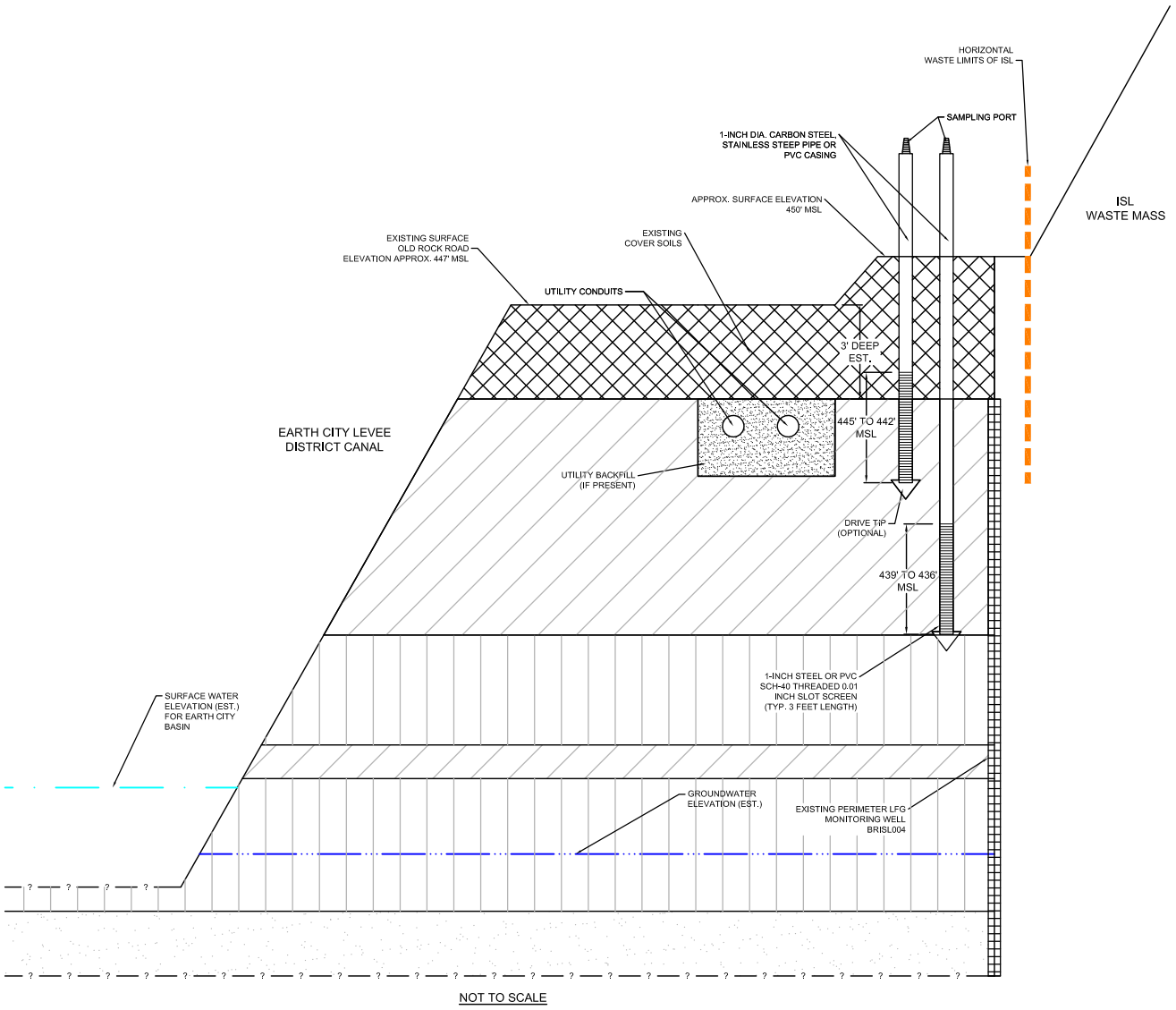
1. EXISTING SITE GRADES AND SURFACE WATER ELEVATIONS IN EARTH CITY LEVEE CANAL ARE BASED ON AERIAL TOPOGRAPHIC SURVEY PROVIDED BY COOPER AERIAL SURVEYS CO., DATED DECEMBER 2019.
2. GROUNDWATER ELEVATIONS SHOWN ARE BASED ON DEPTH TO WATER READINGS OBTAINED FROM THE PERIMETER LFG MONITORING WELLS ON OCTOBER 6, 2021 ON OCTOBER 6, 2021 AND JULY 11, 2022.
3. THE EARTH CITY BASIN LEVEE CANAL INVERT WAS ESTIMATED FROM FIGURE 5-4 "CROSS SECTION 2A-2A', DATED 10/29/96, PREPARED BY EMSI FOR THE WEST LAKE OU-1 REMEDIAL INVESTIGATION REPORT.

EXPLOSIVE GAS MONITORING
CORRECTIVE ACTION PLAN
CROSS SECTIONS - 2 (WEST TO EAST)
WEST LAKE LANDFILL OU-2
BRIDGETON, MISSOURI

Geosyntec consultants

PROJECT NO: CHE8424 | JULY 2023 | FIGURE 8

H:\RREPUBLIC SERVICES\WEST LAKE - CHE8424\FIGURES\LFG CROSS-SECTIONS - Last Saved by: JVarsho on 7/6/23



NOT TO SCALE

NOTES:

1. DETAIL ADAPTED FROM SWANA LANDFILL GAS LANDFILL GAS OPERATION AND MAINTENANCE MANUAL OF PRACTICE, DATED JANUARY 2001.
2. IF NON INTRUSION METHODS ARE UTILIZED, AIR KNIFING OR HYDRAULIC EXCAVATION, THEN THE DRIVE TIP WILL NOT BE REQUIRED. ADDITIONALLY, SAND WILL BE UTILIZED TO BACKFILL AROUND THE WELL SCREEN.
3. EQUIVALENT MATERIALS FOR THE PROBE CASING OR SAMPLING PORT MAY BE UTILIZED UPON APPROVAL BY THE DESIGN ENGINEER. USEPA WILL BE NOTIFIED OF ANY DESIGN CHANGES PRIOR TO CONSTRUCTION.
4. SCREEN DEPTHS ARE CONCEPTUAL AND WILL BE FINALIZED BASED ON DISCUSSIONS WITH USEPA. IT IS ANTICIPATED THAT THE SHALLOW NESTED LFG WELL BE SCREENED FROM 445 TO 442 FT MSL AND THE INTERMEDIATE LFG WELL WILL BE SCREENED FROM 439 TO 436 FT MSL.

LEGEND

- COVER SOILS
- CLAY TO SANDY CLAY
- SILT WITH SAND/CLAY
- SAND, SAND WITH SILT

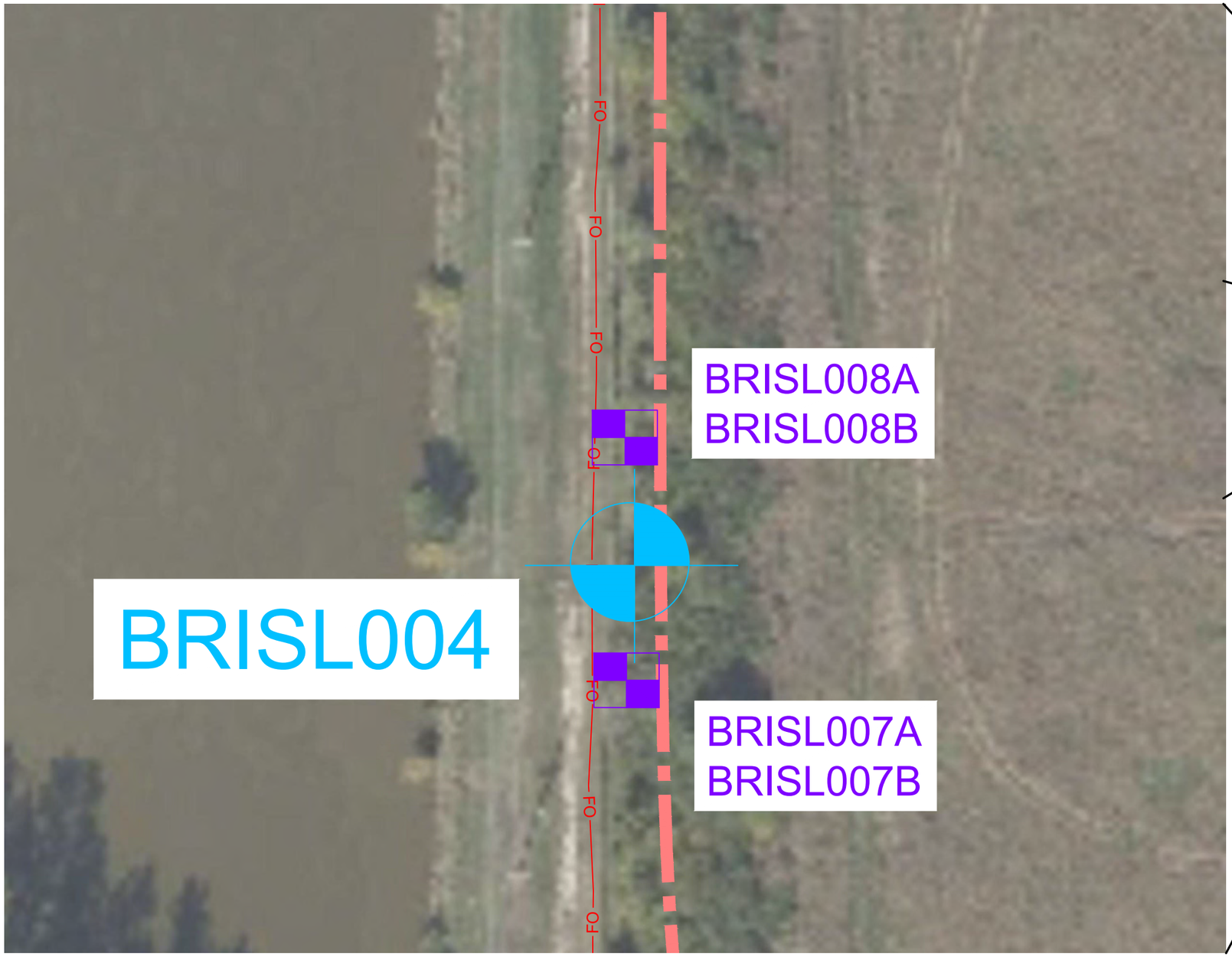
EXPLOSIVE GAS MONITORING CORRECTIVE ACTION PLAN TEMPORARY MONITORING PROBE DETAIL WEST LAKE LANDFILL OU-2 BRIDGETON, MISSOURI

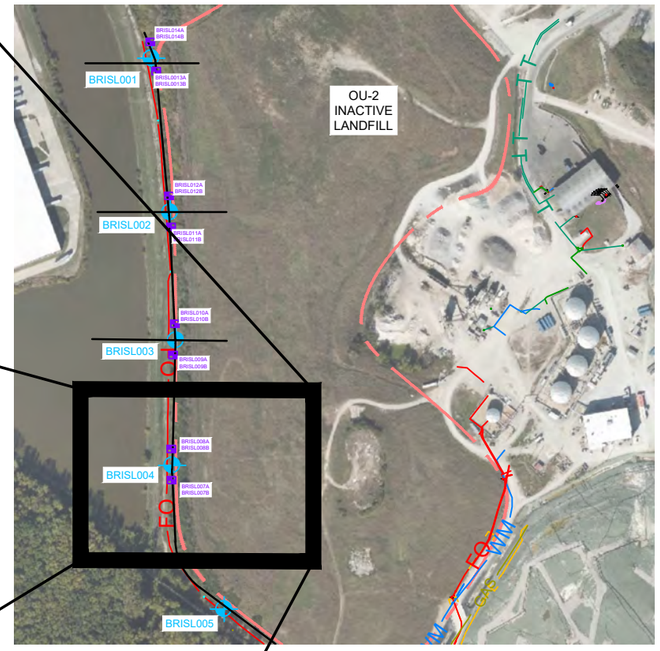
Geosyntec consultants

FIGURE 9

PROJECT NO: CHE8424 | JULY 2023

H:\R\REPUBLIC SERVICES\WEST LAKE - CHE8424\FIGURES\LFG CROSS-SECTIONS - Last Saved By: JVarsho on 11/23/22





KEY MAP

LEGEND

BRISL007A
BRISL007B — NESTED TEMPORARY MONITORING PROBE LOCATIONS (SEE FIGURE 7 FOR DETAILS)

ISL WASTE BOUNDARY/LIMITS

FO — FIBER OPTIC UTILITY CORRIDOR

NOTES:

1. NEST WELL LOCATION BRSIL007 WILL BE LOCATED APPROXIMATELY 50 FEET NORTH OF EXISTING LFG WELL LOCATION BRISL004; NESTED WELL LOCATION BRSIL008 WILL BE LOCATED APPROXIMATELY 50 FEET SOUTH OF EXISTING LFG WELL LOCATION BRISL004.

PROPOSED TEMPORARY MONITORING PROBE LOCATIONS - BRISL004
WEST LAKE LANDFILL OU-2
BRIDGETON, MISSOURI

Geosyntec consultants

FIGURE 10

PROJECT NO: CHE8424 | JULY 2023

H:\R\REPUBLIC SERVICES\WEST LAKE - CHE8424\FIGURES\LFG CROSS-SECTIONS - Last Saved by: JVarsho on 11/23/22

APPENDIX A

WASTE LIMITS INVESTIGATION SUMMARY REPORT

WASTE LIMITS INVESTIGATION SUMMARY REPORT
BRIDGETON LANDFILL, LLC
BRIDGETON LANDFILL
ST. LOUIS COUNTY, MISSOURI

MSW Permit No. 118912

Aquaterra Project Number 3718.10
September 2010
Revised July 2011

Prepared For:

Bridgeton Landfill, LLC
13570 St. Charles Rock Road
Bridgeton, Missouri

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WASTE LIMITS INVESTIGATION SUMMARY REPORT
BRIDGETON LANDFILL, LLC
ST. LOUIS COUNTY, MISSOURI
SEPTEMBER 2010 – REVISED JULY 2011

REPORT INDEX AND CERTIFICATION PAGE

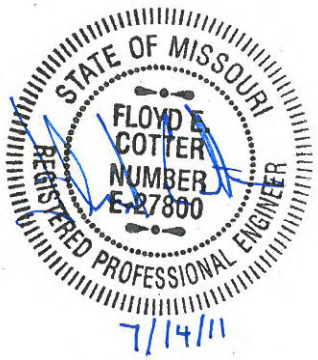
REPORT INDEX

CERTIFICATION

The registered professional whose signature appears below has prepared, or has supervised the preparation of the Waste Limits Investigation Summary Report for Bridgeton Landfill, LLC.

This report has been prepared for the exclusive use for Bridgeton Landfill, LLC for specific application to the project discussed and has been prepared in accordance with generally accepted engineering practices.

Prepared by:



Floyd Cotter, P.E.
Principal
Aquaterra Environmental Solutions, Inc.

WASTE LIMITS INVESTIGATION SUMMARY REPORT
BRIDGETON LANDFILL, LLC
ST. LOUIS COUNTY, MISSOURI
September 2010- Revised July 2011

1.0 INTRODUCTION

1.1 Site Location

The Bridgeton Landfill is located in Bridgeton, Missouri and is owned and operated by the Bridgeton Landfill, LLC. The landfill is located north of Interstate Highway 70 and south of St. Charles Rock Road. The facility is in U.S. Survey 131 Land Grant 131, Township 47 North, Range 5 East in St. Louis County, Missouri. The facility is located at 13570 St. Charles Rock Road in Bridgeton, Missouri and consists of approximately 214 acres.

1.2 Facility Background

The Bridgeton Landfill, previously referred to as the Westlake Landfill, has been used for disposal of waste as far back as 1952. Prior to being regulated by the state, the site operated six separate disposal areas (Areas 1 - 6) as shown on **Drawing 1**. Areas 1 - 5 were used for sanitary and demolition disposal. In March 1974, Areas 2 and 4 were closed. Areas 1, 3, 5, and 6 were sealed with 24 inches of clay prior to receiving additional demolition fill. The site holds seven Missouri Department of Natural Resources (MDNR) Solid Waste Disposal Permits, five for sanitary landfills and two for demolition landfills, listed in Table 1.

Table 1[3]:

Permit Number	Type	Acreage	Issue Date	Consultant
218903[1]	Demolition	27	1/27/76	Rogers and Assoc.
118903	Sanitary	25	1/27/76[2]	Rogers and Assoc.
Addendum	3.5 ac. Expansion	3.5	5/23/78	Paul H. Himebaugh
118906	Sanitary	13	1/22/79	Paul H. Himebaugh
118908	Sanitary	6	8/27/80	Reitz and Jens, Inc.
118909	Sanitary	9	8/20/81	Reitz and Jens, Inc.
218912	Demolition	22	9/17/84	Reitz and Jens, Inc.
118912	Sanitary	52	11/18/85	Burns and McDonnell

[1]Permit 218903 includes Areas 1, 3, 5, and 6.

[2]Authorization was granted on 8/27/74.

[3]Table 1 obtained from *Permit Consolidation Engineering Report*, Midwest Environmental Consultants, June 1995.

On August 30, 1990 the United States Environmental Protection Agency (USEPA) placed the site on the National Priorities List. The USEPA identified two operable units at the site, Operable Unit 1 (OU-1) and Operable Unit 2 (OU-2). OU-1 consists of Areas 1 and 2, both of which have been shown to contain radiological waste. OU-2, as described on page 3 of the Record of Decision for OU-2, dated July 2008, consists of the other landfill areas that are not impacted by radionuclides, i.e. the Closed Demolition Landfill, the Inactive Sanitary Landfill, and the Former Active Sanitary Landfill, these areas are shown on **Drawing 1**. This site is being addressed by USEPA under a consent agreement with federal and private responsible parties.

1.3 Purpose

This report has been developed to proceed with obtaining official closure of the disposal areas located at the Bridgeton property referenced in Table 1 above excluding the OU-1 area. This report summarize activities completed to date to identify the waste boundary for each disposal area as well as determine the closure requirements for all of the landfills located on the Bridgeton property to further address comments outlined in a Missouri Department of Natural Resources' Solid Waste Management Program (MDNR-SWMP) letter dated September 12, 2008 (**Appendix A**), as well as the Herst and Associates, Inc. submittal dated October 23, 2008 (**Appendix B**).

1.4 Summary of Activities

Activities completed to date to determine applicable closure requirements by disposal area and to satisfy comments outlined in the September 12, 2008 letter:

- Waste investigation of the permitted boundaries;
- Depth of cover investigation;
- File review at the MDNR-SWMP, St Louis County Department of Health and the Bridgeton Landfill;
- Interviews with site personnel;
- Comparison of historical aerial surveys; and
- Review and digitizing historical aerials.

To satisfy item 1 listed in the September 12, 2008 comment letter (Reitz and Jens, Inc), Aquaterra Environmental Solutions (Aquaterra) conducted a field investigation to verify waste limits for the following permitted areas: 118906, 118909, 118912, 218912, and 218903 (Area #1, Area #2 and Area #6) on the Bridgeton landfill property.

Prior to completing the field investigation, Aquaterra reviewed historical records to determine the most accurate permitted boundary for each disposal area within the Bridgeton property.

In addition, Aquaterra reviewed aerial photos to determine when permitted areas ceased accepting waste.

Based on this review it was determined that the permitted boundaries obtained from "Facility Upgrade and Permit Modification", Figure 3 of *Permit Consolidation Engineering Report,* Midwest Environmental Consultants, June 1995 (provided in **Appendix B**) was the most comprehensive for the property.

Points along the assumed waste boundaries were staked on 50-foot spacing, by surveyor Sherbut-Carson-Claxton, LLC. prior to the field investigation. The surveyed waste boundary was staked as the the outermost permit boundary in areas where two permitted boundaries overlapped. Permitted boundaries located within the interior/overlapping permitted boundary were not surveyed. The survey plat dated August 27, 2001 for the Demolition Landfill (218912) was also surveyed and staked on 50-foot centers.

Aquaterra utilized a mini-excavator at each staked location to determine the extents of waste placement; where waste was encountered the depth of cover was documented. If waste was encountered at the initial location, additional excavation was completed outward (in the direction away from the permitted boundary) until no waste was encountered. Aquaterra excavated at approximately 200 locations during the waste and cover investigation. Field investigation for the lateral extents of waste occurred on December 29 - December 30, 2009, February 1 - February 2, 2010, and March 1, 2010.

An additional field investigation was conducted to verify depth of cover for areas of Permit 118906, 218903 (Area #1) and 218912. The cover investigation was completed using a truck-mounted Geoprobe®. A mini excavator was used to complete the cover investigation in areas the truck-mounted Geoprobe® could not access. The cover thickness investigation was completed on May 5 - May 6, 2010 and May 12, 2010.

The results of the field investigation are included in **Appendix D** and daily field activity logs are included in **Appendix E.**

2.0 SANITARY LANDFILL AREAS

This section of the report contains historical information regarding each of the five sanitary landfills located at the Bridgeton property the results of the waste limits investigation for the permitted sanitary landfill areas as well as review of the aerial photos to determine when permitted areas ceased accepting waste.

2.1 Permit 118906

Permit 118906 was issued for the operation of a 13-acre Sanitary Landfill on January 22, 1979. This landfill is located in the northeast corner of the property located south of St. Charles Rock Road and west of Taussig Avenue. The northwest corner of Permit 118906 overlaps into OU-1 Area 1. Although the permit was issued for 13 acres, based on the Facility Upgrade and Permit Modification historical site map the area measures approximately 14.7 acres. Additionally, Solid Waste Permit 118906 was superseded by Permit 118912, however procedures to operate and close the existing 118906 permit was not outlined in the 118912 permit; it is also not included in the closure plan for Permit 118912. Additionally the northern and western portions of 118906 are outside of the 52-acre area permitted under 118912, as well as an approximate 50-foot strip on the southeast boundary of 118906. No applicable standards or rules were identified in the permit document or superseded documents.

To determine when this permit area ceased accepting waste, a comparison of aerial surveys was completed. Based on this review, Permit 118906 ceased accepting waste in three phases. The area northeast of 118912 and east of OU-1 Area 1 ceased accepting waste prior to May 27, 1984. Comparison of the aerial survey completed by Walker and Associates on May 27, 1984 to the aerial survey completed by The Sanborn Mapping Company dated January 20, 2005, in the area of 118906 which is not overlapped by 118912, shows similar elevations, except in the area north of 118912, where the January 20, 2005 aerial is approximately 10 feet lower.

The area west of 118912, which overlaps Area #2 and 218903 (Area #6), ceased accepting waste prior to October 8, 1991. Comparison of the aerial survey completed by Walker and Associates on May 27, 1984 to the aerial survey flown by Surdex Corporation on October 8, 1991, shows the southwest slope of 118906 was filled prior to 1991. In addition, the 2005 aerial survey was approximately 4 feet lower than the 1991 aerial survey indicating waste was relocated from this slope between 1991 and 2005. It is likely this occurred during construction of the transfer station, which is further discussed in **Section 3.2**.

The 50-foot wide area along the southeast boundary of 118906 ceased accepting waste prior to January 20, 2005. Comparison of an aerial survey completed by Walker and Associates on May 27, 1984 to the January 20, 2005 aerial survey completed by the Sanborn Mapping Company in the wedge between 118912 and 118906 shows the 2005 aerial is at a higher elevation.

2.1.1 Field investigation for Permit 118906

Investigation of this permitted area occurred in the three areas discussed above, specifically the following points shown on **Drawing 1** were investigated:

a. Northeast of 118912 and east of OU-1 Area 1: Points 154-161, R147-R161, 155B-160B, and Points 369, 371, 374 and 375.
b. West portion of 118906 which is located west of 118912 and overlaps onto Area #2 and 218903 (Area #6): Points 363, 364, 385 and 406.
c. 50-foot wide area along the Southeast boundary of 118906: Points 137-142, R143-R146, 377-381.

2.1.1.1 Field Investigation A for Permit 118906

Field Investigation A occurred northeast of 118912 and east of OU-1 Area 1. Points 154-161, R147-R161, 155B-160B, were investigated for the lateral extent of waste disposal on February 2, 2010 and March 1, 2010. Points 369, 371, 374 and 375 were investigated for cover thickness on May 12, 2010.

Access limitations due to fencing and the soil berm along St. Charles Rock Road, Points 147-161 were relocated to the inside of the drainage way or along the inside of the fence, the new Points are denoted as R147-R161. Points R147-R150 are located in the drainage way, waste was encountered at depths ranging from one to three feet. Excavation at point R151, located on the soil berm, was completed to a depth of six feet, no waste was encountered. Points R152 through R161 are located on the inside of the fence along St. Charles Rock Road; waste was encountered at depths ranging from two to three feet.

Since waste was encountered at R154-R161, which are located at the fence line, the original points were also investigated as well as points located on the outside of the fence. No waste was encountered at Points 154-161 excavation at these points ranged from three to four feet. Waste was encountered 10 feet to 15 feet outside the fenced area at point 156B and 158B, at a depth of one foot and 2.5 feet, respectively. Additionally, Points 369, 371, 374, and 375 were investigated to verify cover thickness on May 12, 2010 using a mini excavator and no waste was encountered during excavation and all points were found to have three feet of cover.

Based on the investigation for the lateral extent of waste it appears that the waste boundary for 118906 does not extend as far northeast, along St Charles Rock Road, as the permit boundary. Based on the investigation and review of aerial topography, the waste boundary has been modified to 14.2 acres, **Drawing 2**. Please note that the excavation in this area was limited to approximately 4 feet in depth.

This area has at least two feet of cover and a hardy stand of vegetation, except in a portion of the drainage way. Areas with less than two foot of cover are shown on **Drawing 2**. This area is approximately 1200 square feet in size. As shown on enclosed photo #6, included in Appendix C, the area has good vegetation. Due to the size of the area in question it is proposed no further action on the cap be completed.

2.1.1.2 Field Investigation B for Permit 118906

Field Investigation B occurred on the portion of 118906 which is west of 118912 and overlaps onto Area #2 and 218903 (Area #6). Since the boundary for 118906 is located within the boundary for 218903 (Area #6) no points were investigated for the lateral extents of waste associated with 118906. Points 363 and 406 were investigated for cover thickness using a truck-mounted Geoprobe® on May 5, 2010 and May 6, 2010, respectively. Points 364 and 385 were investigated for cover thickness on May 12, 2010 using a mini-excavator.

This area has at least three feet of cover and a hardy stand of vegetation; therefore it is proposed no further action on the cap be completed.

2.1.1.3 Field Investigation C for Permit 118906

Field investigation C occurred within the 50-foot wide area along the Southeast boundary of 118906. Points 137-142, R143-R146 were investigated for the lateral extent of waste disposal on February 2, 2010 and March 1, 2010. Points 377-381 were investigated for cover thickness on May 6, 2010. In addition, boring logs for Perimeter Gas Wells (PGWs), and the approximated bottom contours were reviewed.

No waste was encountered at Points 137-142, excavation ranged from three to six feet. Due to fencing along the southeast boundary of 118906, Points 143-146 were relocated; the new points are denoted as R143-R146. Waste was not encountered at Points R143-R146, excavation ranged from three to six feet. Points 377-381 were verified to have three feet of cover using a truck-mounted Geoprobe®.

PGW 53 – PGW 59, intended to be located outside waste, were installed east of Permit 118912 however were installed within the 118906 permitted area and subsequently abandoned due to penetrating underlying soils of the disposal unit. Based on the boring logs for PGW 53 - PGW 59 waste is located approximately 15 feet southeast of the permit boundary for 118912. The boring log for PGW-53 logged waste from 22 feet - 32 feet below ground surface (bgs), PGW-54 logged waste from 10 feet – 28 feet bgs, PGW-55 logged heavy waste deposits from 10-28 feet bgs. Waste depths at PGW-56 through PGW-59 ranged from 30 feet - 33.5 feet bgs. PGW 60 was drilled entirely in waste to a depth of 102 feet bgs. Based on the bottom contours obtained from “Permitted Original Bottom

Contours", Sheet 3 of *Facility Upgrade and Permit Modification,* Midwest Environmental Consultants, December 1996, the top of the quarry wall is located approximately 30 feet southeast of the permitted boundary for 118912 but does not extend to the permitted boundary for 118906.

This area has at least three feet of cover and a hardy stand of vegetation; therefore it is proposed no further action on the cap be completed.

2.2 Permit 118909

Permit 118909 was issued for the operation of a 9-acre Sanitary Landfill on August 20, 1981 located in the northeast corner of the property located south of St. Charles Rock Road and west of Taussig Avenue. Permit 118909 was superseded by Permit 118912 however it is not included in the closure plan for Permit 118912. Except for approximately 0.5 acre, Permit 118909 is overlapped by Permit 118912.

2.2.1 Field investigation for Permit 118909

Permit 118909 is not overlapped by Permit 118912 in three areas totaling approximately 0.5 acres. The northwest corner of Permit 118909 was not investigated due to close proximity to OU-1 Area 1. The permit boundaries for Permit 118906 and Permit 118909 overlap on the northeastern limits of Permit 118909. The investigation of this area was discussed in **Section 2.1.1.3** An area on the northern corner of 118909 is not overlapped by 118912 or OU-1 (Area 1), however, due to close proximity to OU-1 Area 1 this area was not investigated.

An approximate 3,500 square foot area where Permit 118909 is not covered by 118912 was investigated on February 2, 2010 for the lateral extents of waste at Points 117-127, 400-403 (**Drawing 1**). Waste was encountered at Point 122 approximately 2 feet bgs and at Point 127 approximately 2.5 feet bgs. Waste was not encountered at Points 123-126. Points 401-403 were investigated for cover thickness on May 12, 2010 using a truck mounted Geoprobe®, no waste was encountered to a depth of three feet. Of the 13 points investigated in this area only two points were found to have less than three feet of cover material, therefore it is assumed that this area did receive final cover during the closure of 118912.

2.3 Permit 118912

This permit was issued on November 18, 1985 for operation of a 52-acre Sanitary Landfill. This landfill is located on the eastern boundary of the Bridgeton Landfill which encompasses the north quarry and the south quarry. Permit 118912 received a vertical expansion in

1998. Permit 118912 ceased accepting waste on February 28, 2005. Cover placement occurred in two construction events, the north quarry consisting of 15.4 acres received final cover in 2005 and the south quarry consisting of 34.6 acres received final cover in 2006. The 2005 final cover construction was approved on July 1, 2011 and the 2006 final cover construction was approved on May 29, 2008. Per the permit documentation, Permit 118912 supersedes Permit 118906 and 118909.

2.3.1 Field Investigation for Permit 118912

Permit 118912 was investigated for lateral extents of waste at Points 18-116, 128-136 (**Drawing 1**) on February 1, 2010 and February 2, 2010. Waste was encountered outside the permitted boundary at seven points. Since waste was encountered at Points 25, 28, 80, 94, 94, 97 and 99 this area was further investigated using a truck mounted Geoprobe® on May 6, 2010. Waste was encountered at points 388 through 393 at a depth of three feet bgs.

Drawing 2 illustrates the revised waste boundary (50.23 acres) and areas which may have deficient cover. These areas total approximately 4,400 square feet in size. As shown on enclosed photo #9 included in Appendix C the area has good vegetation. Due to the size of the area in question it is proposed no further action be completed.

3.0 DEMOLITION LANDFILL AREAS

This section of the report contains the results of the waste limits investigation for the permitted demolition landfill areas.

3.1 Permit 218912

Permit 218912 was issued on September 17, 1984 for operation of a 22-acre Demolition Landfill. This landfill is located in the northwest corner of the property located south of St. Charles Rock Road and west of the property main entrance. Approximately 19.5 acres of the 22 acres permitted received additional waste under this permit. Prior to issuance of Permit 218912, this area was used for sanitary waste disposal as well as demolition waste under Permit 218903.

Permit 218912 ceased accepting waste in June 1995 per MDNR-SWMP letter dated September 1, 2005. This letter states that two feet of cover is acceptable in this area, however, the Bridgeton Demolition Landfill must complete a survey plat and execute an easement for the disposal area. Additionally a final inspection conducted and approved by the MDNR-SWMP must be conducted.

3.1.2 Field Investigation for Permit 218912

Permit 218912 was investigated for lateral extents of waste at Points 162-176, 192-216 (**Drawing 1**). A portion of this area was previously verified to have two feet of cover material by Herst & Associates, Inc. dated July 6, 1999, approved September 1, 2005. The work completed by Herst appears to have included the area within the Demolition Landfill Closure Survey Plat, Sherbut-Carson-Claxton, LLC, August 27, 2001 (Points 217-291). Permit 218912 was investigated on December 29 and December 30, 2009 for the lateral extent of waste disposal. Many points were not completed due to access limitations due to waste containers stored in this vicinity located west of the scale house. Waste was not encountered at Points 280-291 excavation ranged from 3 feet to 4 feet, therefore, the outermost points (Points 199-216) were not completed.

The boring log for existing piezometer PZ-207-AS logged waste from 5.8 feet - 28 feet bgs, and is located approximately 5 feet south of the certified closed area for Permit 218912.

Points 328 through 338, located in the container storage area were investigated for cover thickness on May 5, 2010 using a truck-mounted Geoprobe®. Cover thickness ranged from five feet to 10 feet and consisted of clay, gravel and clean fill. All points investigated for lateral extents of waste along the Demolition Landfill permit boundaries have a minimum of two feet of cover, except Point 219. Due to its close proximity to OU-1, it is anticipated that no further cover is needed in this area since it is highly likely additional cover will be needed in the vicinity of OU-1.

3.2 Permit 218903 (Area #1, Area #5, and Area #6)

Permit 218903 was issued on January 27, 1976 for operation of a Demolition Landfill. Prior to issuance of Permit 218903, these areas were used for sanitary waste disposal.

218903 (Area #1) was permitted for 13.3 acres of demolition waste disposal. This landfill is located in the northwest corner of the property located south of St. Charles Rock Road and west of the property main entrance the majority of this area received additional waste under Permit 218912. 218903 (Area #1) ceased accepting waste prior to May 27, 1984. This date is based on comparison of Aerial survey completed by Walker and Associates on May 27, 1984 to the January 20, 2005 aerial survey in the area of 218903 (Area #1) shows similar elevations.

218903 (Area #5) was permitted for 6 acres of demolition waste disposal and is located in the northwest corner of the property located south of St. Charles Rock Road. The majority of this disposal area is located within the fenced area for OU-1 Area 2. Historical aerial

topography for 218903 (Area 5) is limited to the portion which overlaps 218912. It is estimated that 218903 (Area 5) ceased accepting waste when approval for 218912 was obtained on September 17, 1984. Due to its locality, it is anticipated that no further cover is needed in this area since it is highly likely additional cover will be placed in the vicinity of OU-1 and will extend past the boundary of 218903 (Area 5).

218903 (Area #6) consists of 1.6 acres and is located north of the transfer station. Prior to issuance of Permit 218903, this area was used for sanitary waste disposal. 218903 (Area #6) ceased accepting waste prior to May 27, 1984. Comparison of aerial survey completed by Walker and Associates on May 27, 1984 to the January 20, 2005 aerial survey in the area of 218903 (Area #6) which is not overlapped by 118912, shows similar elevations. Additionally, during construction of the solid waste transfer station all waste encountered during excavation of the facility was excavated and disposed of appropriately. In this vicinity no waste underlies the transfer station.

3.2.1 Field investigation for Permit 218903 (Area #1)

Permit 218903 (Area #1) was investigated for lateral extents of waste at Points 171-191, 338-342 (**Drawing 1**)

Approximately 0.4 acres of 218903 (Area #1) was investigated for the lateral extent of waste disposal on December 29, 2009 and for cover thickness on May 5, 2010. No waste was encountered at Points 183 through 186. The other points along the 218903 boundary were not completed due to access limitations due to waste containers within the area, paved roads, or drainage structures. Points 338 through 342, located in the container area were investigated for cover thickness using a truck mounted Geoprobe®. Cover thickness ranged from four feet to 14 feet. Based on this investigation the waste boundary for Permit 218903 (Area #1) has been revised to 12.09 acres and is shown on **Drawing 2**.

3.2.2 Field Investigation for Permit 218903 (Area #5)

Field investigation for this area occurred at Points 219 through 230 (Points located along the 2001 Closure Survey Plat and within the boundary of 218903).

Investigation of the 2001 Closure Survey Plat indicates waste is located within the permitted boundary for 218903 (Area #5) and outside of the fenced area for OU-1 Area 2. Waste was encountered at Points 219 through 226 and at locations investigated approximately 40 feet outside the 2001 Closure Survey Plat, depth to waste ranged from two to three feet bgs except at Point 219 which had one foot of cover. No waste was encountered at points 227 through 230, indicating that waste may not have extended as far south as the permit

boundary for 218903 (Area #5). The revised waste boundary for Permit 218903 (Area #5) has been revised to 5.4 acres and is shown on **Drawing 2.**

3.2.3 Field Investigation for Permit 218903 (Area #6)

218903 (Area #6) was investigated for the lateral extent of waste disposal on December 30, 2009 at Points 6-17, 359, 360, and 368 (**Drawing 1)**. Waste was encountered at Point 7 and Point 10; cover thickness ranged from two to three feet. Excavation at Points 11-17 did not occur due to close proximity to the gas header line, interceptor trench, and leachate forcemain. Points 359, 360, 367, and 386 were investigated on May 5, 2010 and May 6, 2010 using a truck mounted Geoprobe®, waste was encountered at a depth of 3 feet bgs. The waste boundary for 218903 (Area #6) has been revised to 1.67 acres and is shown on **Drawing 2**.

4.0 UNPERMITTED AREAS

This section of the report contains the results of the waste limits investigation completed in areas which do not hold a MDNR-SWMP permit.

4.1 Area #2

Area #2 was used for both sanitary and demolition fill, and ceased accepting waste prior to January 27, 1976 (Date of 218903 permit issuance), and likely in March 1974. Area #2 consists of approximately 7.7 acres.

4.2 Field Investigation for Area #2

Area #2 was investigated for the lateral extent of waste disposal on December 30, 2009 at Points 1-5, 356-360, 360-361 (**Drawing 1**). A portion of Area #2 was not investigated because of the close proximity to the fence for OU-1 Area 1. Waste was not encountered at Points 1-5, excavation ranged from 3 feet - 3.5 feet. Waste was encountered at Points 356 through 358 and 360 through 361 at a depth of three feet bgs.

5.0 AREAS LOCATED WITHIN OU-1 OR THE INACTIVE SANITARY LANDFILL

This section of the report contains information obtained through reviewing site documentation in areas located within OU-1 or the Inactive Sanitary Landfill. Field investigation for these areas did not occur since this area will be addressed under the OU-2 ROD.

5.1 Permit 118903 and 118903 (3.5 acre addendum)

Permit 118903 was issued on January 27, 1976 for operation of a 25 acre Sanitary landfill, this area received authorization on August 27, 1974. The 3.5 acre addendum was permitted on May 23, 1978.

Permit 118903, including the 3.5 acre addendum, ceased accepting waste prior to May 27, 1984. This date is based on comparison of survey completed by Walker and Associates on May 27, 1984 to the January 20, 2005 aerial survey in the area of 118903. The 1984 survey and the 1991 aerial survey appear to be approximately 10 feet higher in elevation than the 2005 aerial survey on the western slope of the 3.5 acre addendum, indicating this slope may have been reworked. In addition, Table 3-1 from *Physical Characterization Technical Memorandum for The West Lake Landfill Operable Unit 2*, dated August 1996, Golder Associates, indicates the slope of the berm along the western portion of the inactive landfill was reworked in 1992.

Permit 118903 area was not investigated for the lateral extent of waste disposal since it is located within the Inactive Sanitary Landfill; however, a portion of Permit 118903 overlaps Permit 118912. No waste was encountered during investigation of Points 44-54 (**Drawing 1**) and cover thickness ranged from three to six feet. Based on the boring log for PZ-205-AS, waste was encountered from six feet to 12 feet bgs. Waste was encountered during drilling of PZ-107-SS from six feet to 28 feet bgs. Based on the documentation report for the drainage structure located through Permit 118903 ("Construction Quality Assurance Report – Stormwater Channel and Leachate Forcemain Piping Construction", Aquaterra, February 2005), no waste was encountered in this area. The revised waste boundary for Permit 118903 is 21.15 acres, shown on **Drawing 2**.

5.2 Permit 118908

Permit 118908 was issued on August 27, 1980 for operation of a 6-acre Sanitary landfill; however, based on the Facility Upgrade and Permit Modification historical site plan, the actual acreage is 8.25 acres. This landfill is located in the central area of the site located west of the asphalt plant.

Permit 118908 ceased accepting waste prior to May 27, 1984. This date is based on comparison of aerial survey completed by Walker and Associates on May 27, 1984 to the January 20, 2005 aerial survey in the area of 118903 shows similar elevations.

Based on comparison of the survey completed by Volz Engineering and Surveying, dated December 1981 to the survey completed by Walker and Associates on May 27, 1984 a

portion of Permit 118908 was not filled. Both surveys show the existing pond located on the eastern portion of the permitted boundary for Permit 118908 at the same elevation. The revised waste boundary is 6.92 acres, shown on **Drawing 2**.

5.3 Permit 218903 (Area #3)

Permit 218903 was issued on January 27, 1976 for operation of a Demolition Landfill. Prior to issuance of Permit 218903, these areas were used for sanitary waste disposal. This landfill is located in the central area of the property located northwest of the asphalt plant.

Permit 218908 (Area #3) ceased accepting waste prior to October 8, 1991. This date is based on comparison of the aerial survey flown by Surdex Corporation on October 8, 1991 to the January 20, 2005 aerial survey in the area of 218903 (Area #3) which shows similar elevations.

5.4 Area #4

Area #4 was used for both sanitary and demolition fill, and ceased accepting waste prior to January 27, 1976 (Date of 218903 permit issuance), and likely in March 1974. This landfill is located at the western boundary of the site and is located entirely within OU-1 Area 2. Area #4 consists of approximately 0.6 acres

6.0 RECOMMENDATIONS

The following table lists the date each permitted area ceased accepting waste and summarizes the revisions to the waste boundaries as discussed above.

Permit Number	Type	Revised Acreage	Issue Date	Date area ceased accepting waste
218903	Demolition	Total: 25.46	1/27/76	
Area #1		12.09		Prior to 5/27/84
Area #3		6.3		Prior to 10/8/91
Area #5		5.4		9/17/84
Area #6		1.67		Prior to 5/27/84
118903 Addendum	Sanitary 3.5 ac. expansion	21.15 3.5	1/27/76[1] 5/23/78	Prior to 5/27/84
118906	Sanitary	14.2	1/22/79	Northeast 5/27/84 West 10/8/91 Southeast 1/20/05
118908	Sanitary	6.94	8/27/80	5/27/84
118909	Sanitary	9	8/20/81	Overlapped by 118912
218912	Demolition	19.2	9/17/84	6/95
118912	Sanitary	50.23	11/18/85	2/28/05

[1] Authorization was granted on 8/27/74.

Drawing 2 identifies four areas, with a combined area of approximately one eighth of an acre (0.125 acres) in size. Points within these areas have been identified to have deficient cover thickness based on the above mentioned field investigations. On July 7, 2010 each of these areas were inspected to document current conditions. Photo documentation is included in **Appendix C**. Each identified area has a good stand of vegetation and sufficient drainage.

Tables 1 through 4 below summarize the cover requirements and the results of the cover thickness field investigation. Areas which were found to have insufficient cover at one or more point location are described in the table as generally having a cover thickness of 2 feet. The Bridgeton Landfill has established good vegetation in the identified areas and these areas are relatively small in nature. Many of these locations also have environmental controls that would limit placement of additional soils (i.e. drainage ways and perimeter gas wells). It is recommended that no additional soils be placed or QA/QC documentation needed within the identified areas.

The following table lists the date each permitted demolition landfill area ceased accepting waste, summarizes the MDNR cover requirements at that time, the Record of Decision for Operable Unit 2, dated July 2008, and the results of the cover thickness field investigation.

Table 1: Demolition Landfill Areas

Permit Number	Reference	MDNR Cover Requirements	Record of Decision Operable Unit 2 July 2008	QA/QC or Closure Inspection	Field Invest. Cover Thickness
218903 Area #1, Prior to 5/27/84	10 CSR 80-4.010(11)(C)(2) *Eff. Date Dec. 21, 1973*	The thickness of the compacted final cover shall not be less than 2-ft.	Closed Demolition Landfill to remain under the state of Missouri regulatory program.[1]	Closure Inspection	Cover thickness ranges from 4 to 14 feet
218903 Area #3, Prior to 10/8/91	10 CSR-4.010(13)(C)(2) *Eff. Date Aug. 1, 1988*	Cover shall be increased to a total thickness of at least a 2-ft compacted cap overlain by at least 1-ft of soil capable of supporting vegetative growth.	Portion of Inactive Sanitary Landfill, see table below.	Closure Inspection	n/a, Portion of Inactive Sanitary Landfill
218903 Area #5, 9/17/84	10 CSR 80-4.010(11)(C)(2) *Eff. Date Dec. 21, 1973*	The thickness of the compacted final cover shall not be less than 2-ft.	Closed Demolition Landfill to remain under the state of Missouri regulatory program.[1]	Closure Inspection	Generally has a cover thickness of 2-ft
218903 Area #6, Prior to 5/27/84	10 CSR 80-4.010(11)(C)(2) *Eff. Date Dec. 21, 1973*	The thickness of the compacted final cover shall not be less than 2-ft.	Closed Demolition Landfill to remain under the state of Missouri regulatory program.[1]	Closure Inspection	Cover thickness ranges from 2 to 3-ft
218912, June 1995	Letter from MDNR-SWMP dated September 1, 2005	Per approved closure plan, two foot of cover	Closed Demolition Landfill to remain under the state of Missouri regulatory program.[1]	Closure Inspection	Generally has a cover thickness of 2-ft

[1]Record of Decision Operable Unit 2, Page 4, Section 5.1.1

The following table lists the date each permitted sanitary landfill area ceased accepting waste, summarizes the MDNR cover requirements at that time, the Record of Decision for Operable Unit 2, dated July 2008, and the results of the cover thickness field investigation.

Table 2: Sanitary Landfill Areas

Permit Number	Regulation Reference	MDNR Cover Requirements	Record of Decision Operable Unit 2 July 2008	QA/QC or Closure Inspection	Field Invest. Cover Thickness
118903 (and 3.5 acre Add.) Prior to 5/27/1984	10 CSR 80-4.010(11)(C)(2) *Eff. Date Dec. 21, 1973*	The thickness of the compacted final cover shall not be less than 2-ft.	Portion of Inactive Sanitary Landfill, see table below	None	n/a, Portion of Inactive Sanitary Landfill
118906 Field Invest. A 5/27/1984	10 CSR 80-4.010(11)(C)(2) *Eff. Date Dec. 21, 1973*	The thickness of the compacted final cover shall not be less than 2-ft.	See Note[1]	None	Generally has a cover thickness of 2-ft
118906 Field Invest. B 10/8/1991	10 CSR 80-3.010(13)(C)(3) *Eff. Date Aug.1, 1988*	Cover shall be increased to a total thickness of at least a 2-ft compacted cap overlain by at least 1-ft of soil capable of supporting vegetative growth.		None	Cover thickness is at least 3-ft
118906 Field Invest. C 1/20/2005	Subtitle D	Subtitle D		QA/QC and Inspection	Cover thickness is at least 3-ft
118908 5/27/84	10 CSR 80-4.010(11)(C)(2) *Eff. Date Dec. 21, 1973*	The thickness of the compacted final cover shall not be less than 2-ft.	Portion of Inactive Sanitary Landfill, see table below	None	n/a, Portion of Inactive Sanitary Landfill
118909	Overlapped by 118912, see below				
118912 2/28/2005	Subtitle D	Subtitle D	See Note[1]	QA/QC and Inspection	Approval of Final Cover Construction [2]

[1] Former Active Sanitary Landfill is undergoing closure and post-closure pursuant to its state of Missouri permits and state of Missouri solid waste regulations. Record of Decision Operable Unit 2, Page 4, Section 5.1.2

[2] Approval of 2006 and 2005 Final Cover Construction granted on 5/29/2008 and 7/1/2011.

The following tables lists the date each unpermitted sanitary landfill area ceased accepting waste, summarizes the Record of Decision for Operable Unit 2, dated July 2008, the MDNR cover requirements for closure of unpermitted facilities, and the results of the cover thickness field investigation.

Table 3: Unpermitted Landfill Areas to be addressed by OU-2 Record of Decision

Reference Name	Type	Date area ceased accepting waste	Area as defined by Record of Decision Operable Unit 2 July 2008	Record of Decision Operable Unit 2 July 2008
Inactive Sanitary Landfill	Sanitary	Prior to 10/8/91 (based on assumptions made for 218903 Area #3)	Area shown on Drawing 2.	Feasibility Study was designed to evaluate appropriate Remedial Action of the Inactive Sanitary Landfill under CERCLA.[2]

[2] Record of Decision Operable Unit 2, Page 4, Section 5.1.3

Table 4: Unpermitted Landfill Areas

Reference Name	Type	Date area ceased accepting waste	Regulation Reference	MDNR Requirements	Field Invest. Cover Thickness
Inactive Sanitary Landfill	Sanitary	Prior to 10/8/91 (based on assumptions made for 218903 Area #3)	10 CSR 80-2.030(2)	Compact or cover solid wastes with soil, or both, and establish vegetation.	n/a, See table above
Area #2	Sanitary and Demo.	Prior to Jan. 27, 1976 (likely March 1974)	10 CSR 80-2.030(2)	Compact or cover solid wastes with soil, or both, and establish vegetation.	Cover thickness is at least 3-ft.
Area #4	Sanitary and Demo.	Prior to Jan. 27, 1976 (likely March 1974)	10 CSR 80-2.030(2)	Compact or cover solid wastes with soil, or both, and establish vegetation.	n/a, Located in OU-1 Area 2.

7.0 GENERAL COMMENTS AND CONCLUSIONS

Aquaterra Environmental Solutions, Inc. obtained information pertaining to general site information through files made available by the MDNR-SWMP and Bridgeton Landfill, LLC. Aquaterra relied on this information to be accurate without independent verification.

****

APPENDIX A

MDNR-SWMP LETTER DATED SEPTEMBER 12, 2008

STATE OF MISSOURI
Matt Blunt, Governor • Doyle Childers, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

SEP 12 2008

CERTIFIED MAIL #: 7007-3020-0003-2221-3901
RETURN RECEIPT REQUESTED

Mr. Allen Steinkamp
Environmental Manager
Allied Waste Industries, Inc.
13570 St. Charles Rock Road
Bridgeton, MO 63044

RE: Telephone Conference with the Environmental Protection Agency Regarding the West Lake Landfill Site and the Bridgeton Landfill, Solid Waste Disposal Area Permit Number 118912, St. Louis County

Dear Mr. Steinkamp:

This letter is intended to provide details of a recent telephone conference call the Missouri Department of Natural Resources held with the U.S. Environmental Protection Agency (EPA) on August 22, 2008, regarding the West Lake Landfill Site in Bridgeton. The purpose of the call was to discuss any potential conflicts and overlap between the Bridgeton Landfill closure activities administered by the department's Solid Waste Management Program (SWMP), and the selected remedies outlined in the Records of Decision for Operable Unit 2 (OU-2 ROD) and Operable Unit 1 (OU-1 ROD). The RODs were prepared in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Participating in the call were Scott Waltrip, and J.P. Boessen of the department's SWMP, Shawn Muenks and Brandon Doster of the department's Hazardous Waste Program (HWP), and Dan Wall of the EPA.

During the conference call remediation and closure activities that will occur at the site in the near future as outlined in the RODs were discussed. As you know, the OU-2 ROD specifies that all of the permitted landfills within OU-2 are to be closed in accordance with the requirements of the Missouri Solid Waste Management Law and Regulations. The department's concerns with the quality of the cap constructed over approximately sixteen (16) acres of the Bridgeton Landfill in 2005, which we have described to you in previous correspondence, were also discussed. One of the specific purposes of the conference call was to ensure that any alternative approach to cap certification the SWMP may consider approving would meet the objectives of the OU-2 ROD.

An understanding was reached with the EPA that the SWMP will ultimately be responsible for evaluating the closure of all areas of OU-2 that are regulated under a solid waste disposal area permit. SWMP staff mentioned that the closure requirements for the permitted areas may vary somewhat depending on the law and regulations in effect at the time and the specific requirements of the permits, and that we will evaluate each permitted area on a case by case basis. An understanding was also reached with the EPA that any reasonable alternative capping or certification procedures for the Bridgeton Landfill that are deemed

satisfactory by the SWMP will meet the objectives of the ROD. Of course, the closure requirements for any area(s) contaminated with radioactive material will likely exceed the requirements of the solid waste law and regulations. Essentially, the EPA will defer to the department on proper closure of all permitted areas not contaminated with radioactive material.

The next phase of the CERCLA process will involve development of the Remedial Design/Remedial Action work plan (RD/RA). We understand RD negotiations have been recently initiated and negotiations for the RA work plan are expected to begin by September 30, 2008. We believe it is in everyone's best interest to wait until the RD has been finalized before you consider any further actions to evaluate the cap on the sixteen (16) acre area of the Bridgeton Landfill in question. This will help minimize potential wasted effort on your part. One thing you need to consider, for example, is that the OU-1 cap is likely to overlap a significant distance onto the cap of the Bridgeton Landfill and may reduce the area you need to retest or remediate. Other aspects of the RD/RA work plan may affect your decisions as well.

On October 23, 2007, several staff members from the SWMP met with you, Mr. Rick Walker, Operations Manager, Bridgeton Landfill Authority and Ms. Michelle Boussad, Project Manager, Aquaterra Environmental Solutions, Inc., to discuss issues concerning the Bridgeton Landfill. One of the items we discussed was a summary report that your consultants were planning to prepare to address closure of all permitted areas at the site. Based on the telephone conference with EPA, the department will need to review this report and reach an understanding with you regarding the closure requirements for each area as soon as possible. This will not only eliminate any confusion between yourself and the department, but it will be necessary during the RD process and enable us to provide meaningful input during development of the RD/RA work plan. Therefore, please submit the summary report within sixty (60) days of the date of this letter.

Please ensure that the report includes, at a minimum, the following:

1. A plan sheet showing the location of all permitted landfills at the West Lake Landfill Site, including the limits of waste for each landfill. The solid waste and CERCLA files contain similar drawings showing outlines for the numerous permitted landfills. Our understanding is that these drawings were developed using the best available information from the various permit files, but have never been field verified. Please field verify the extent of waste for each permitted area as closely as is practical, and include in the report a description of the procedures that were used to do this. For areas for which a permit was issued but no waste placement occurred, simply indicate this on the plan sheet. This plan sheet will be extremely valuable to both the CERCLA and the solid waste closure processes, and will ultimately serve as the official record of waste placement at the site.

2. For each permitted area:

   A. The dates each permit was issued and when the operator ceased accepting waste.

   B. The regulatory requirements for landfill closure, post-closure, and quality assurance/quality control (QA/QC) that were in effect when the area ceased accepting waste.

   C. Any specific closure and QA/QC requirements outlined in the permit documents.

D. A description of the existing landfill cap and any closure or QA/QC activities that were performed, based on available information.

E. A detailed proposal for any exploration that may be necessary to determine the thickness or quality of the landfill cap.

F. Proposed closure and QA/QC plans for any area identified as being deficient.

G. Proposed post-closure plans, if required.

In addition, the RODs contain institutional controls that require the responsible parties to record covenants with the county Recorder of Deeds or equivalent office. EPA will also have provisions in the Consent Decree to allow EPA and the department access to all areas of the site. The solid waste regulations contain similar requirements. We would like to develop one set of these documents to avoid creating additional work for you or the other responsible parties, as well as to minimize review time for the department. Though it would be premature for you to propose a format or specific content of these documents, please keep this in mind, particularly when developing the plan sheets described in item 1, above.

If you have any questions or comments, please contact J. P. Boessen, of my staff at (573) 751-5401 or P.O. Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

SOLID WASTE MANAGEMENT PROGRAM

J. Bell

Jim Bell
Chief, Engineering Section

JB:jpbl

c: Mr. Rick Walker, Operations Manager, Bridgeton Landfill Authority
Mr. Dan Wall, Environmental Protection Agency
Ms. Michelle Boussad, Project Manager, Aquaterra
Matt Ballance, P.E., Senior Project Manager, Aquaterra
John Haasis, P.E., St. Louis County Department of Health
Brandon Doster, P.E, Hazardous Waste Program
Mr. Chris Nagel, Chief, Enforcement Section, Solid Waste Management Program
Mr. Joe Trunko, St. Louis Regional Office

APPENDIX B

HERST AND ASSOCIATES, INC. LETTER REPORT DATED OCTOBER 23, 2008

HERST & ASSOCIATES, INC.®

Global Presence
Personal Attention

Mr. Jim Bell
Chief, Engineering Section
Missouri Department of Natural Resources
1730 East Elm Street
Jefferson City, MO 65101

October 23, 2008

Dear Mr. Bell:

Historic Permitted Areas Information, Bridgeton Landfill, St. Louis County

Bridgeton Landfill Authority representatives have requested that Herst & Associates, Inc. assist in addressing various items discussed in a September 12, 2008 letter from you to Mr. Allen Steinkamp, given that Herst & Associates, Inc. is the lead consultant for CERCLA activities associated with Operable Unit 2 and has ongoing experience with environmental compliance at the recently-closed solid waste landfill area at the facility. The September 12, 2008 letter indicates that a summary report is due within 60 days (November 11), to discuss various items including closure of historic permitted areas at the facility. In response, and well in advance of the November 11 submittal deadline, Herst & Associates, Inc. is attaching a summary of historic permitted areas at the facility. The summary of historic permitted areas was previously prepared by Mr. Lee Tharpe and Midwest Environmental Consultants, PC (MEC) in 1995. Also attached is a map prepared by MEC that identifies the various permitted area boundaries.

Please review the attached information in light of the request for a summary of historic permitted areas. After completion of your review, please contact me and/or Allen Steinkamp to discuss the information.

Sincerely,

Herst & Associates, Inc.

Ward Herst
Managing Director

Cc: Dan Wall – USEPA
Allen Steinkamp – Bridgeton Landfill Authority
Rick Walker – Bridgeton Landfill Authority
Branden Doster – Hazardous Waste Program
Chris Nagel – Solid Waste Management Program
John Haasis – St. Louis County Department of Health
Joe Trunko – St. Louis Regional Office
Victoria Warren - AWIN

4630 South Highway 94 – North Outer Road
St. Charles, Missouri 63304

Telephone (636) 939-9111
Fax (636) 939-9757

LAIDLAW WASTE SYSTEMS (BRIDGETON), INC.
SANITARY LANDFILL

PERMIT CONSOLIDATION
ENGINEERING REPORT

June 1995

Prepared for:
LAIDLAW WASTE SYSTEMS (BRIDGETON), INC.
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MISSOURI

Prepared by:
MIDWEST ENVIRONMENTAL CONSULTANTS, P.C.
522 EAST CAPITOL AVENUE
JEFFERSON CITY, MISSOURI

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I. INTRODUCTION

Laidlaw Waste Systems (Bridgeton), Inc. owns and operates a sanitary landfill in Bridgeton, Missouri. The site is located approximately 0.75 miles north of Interstate 70 and immediately south of St. Charles Rock Road. This landfill operates under two separate permits: (1) the Missouri Department of Natural Resources (MDNR) Solid Waste Disposal Area Operating Permit No. 118912 which was issued on November 18, 1985 and (2) the St. Louis County Department of Health (DOH) Permit No. 0418.

The purposes of this document are as follows:

(1) Provide a comprehensive summary of the terms and conditions of the sanitary landfill's current permits.

(2) Prepare a master plan (site plan sheets) of all known appurtenances.

(3) Compare current operations to current regulations.

(4) Provide a history of the site.

In conjunction with this document, a set of engineering plan sheets has also been developed. The plan sheets are as follows:

Title Sheet
1. Quarter Mile Zoning and Land Use Map
2. Utilities and Property Map
3. Historic Development Plan
4. Existing Conditions
5. Original Bottom Contours and Leachate Collection
6. Permitted Gas Management System
7. Leachate Treatment System Design
8. Leachate Holding Lagoon Design
9. Intermediate Stormwater Management Plan (not available)
10. Final Development Plan
11. Cross Sections - I
12. Cross Sections - II
13. Cross Sections - III

14. Cross Sections - IV
15. Borrow Area Plan
16. Environmental Monitoring Plan
17. Leachate Collection System Details
18. Intermediate Stormwater Management Details (not available)
19. Miscellaneous Details
20. Permitted Gas System Details - I
21. Permitted Gas System Details - II
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24. Historical Details - I
25. Historical Details - II
26-39. As Built Gas Collection System (I-XIV)

This document along with the above-listed plan sheets are based primarily on the original conditions and documents of permit #118912. However, permit addendums and other significant historical correspondence documents also played a vital role in assembling this document and are therefore contained in Appendix 1. Other important sources of information in the preparation of this document include record searches, personnel interviews, and site inspections.

Throughout this document Laidlaw Waste Systems (Bridgeton), Inc. will simply be referred to as Laidlaw and the sanitary landfill that operates under the MDNR Solid Waste Disposal Area Operating Permit #118912 will be referred to as Bridgeton SLF.

II. SITE INFORMATION

This section provides detailed site information for the Bridgeton SLF. The specific topics addressed are site location, land use and zoning, site history, utilities, and site access and control.

A. Site Location

The landfill is located in U.S. Survey 131, Township 47 North, Range 5 East in St. Louis County, Missouri. This landfill is located approximately 0.75 miles north of U.S. Highway 70 and immediately south of St. Charles Rock Road. The landfill site is located entirely within the City of Bridgeton.

The applicable portions of the St. Charles Quadrangle United States Geological Survey (U.S.G.S.) Map and the General Highway Map for St. Louis County prepared by the Missouri Highway and Transportation Department are displayed as Figures 1 and 2 respectively.

B. Land Use and Zoning

The City zoning for the site and surrounding land within 1/4 mile of the site is shown on Plan Sheet 1. As can be seen from this plan sheet, the site includes the following zoning designations:

Regular Zoning Districts:

R-1: One Family Dwelling District

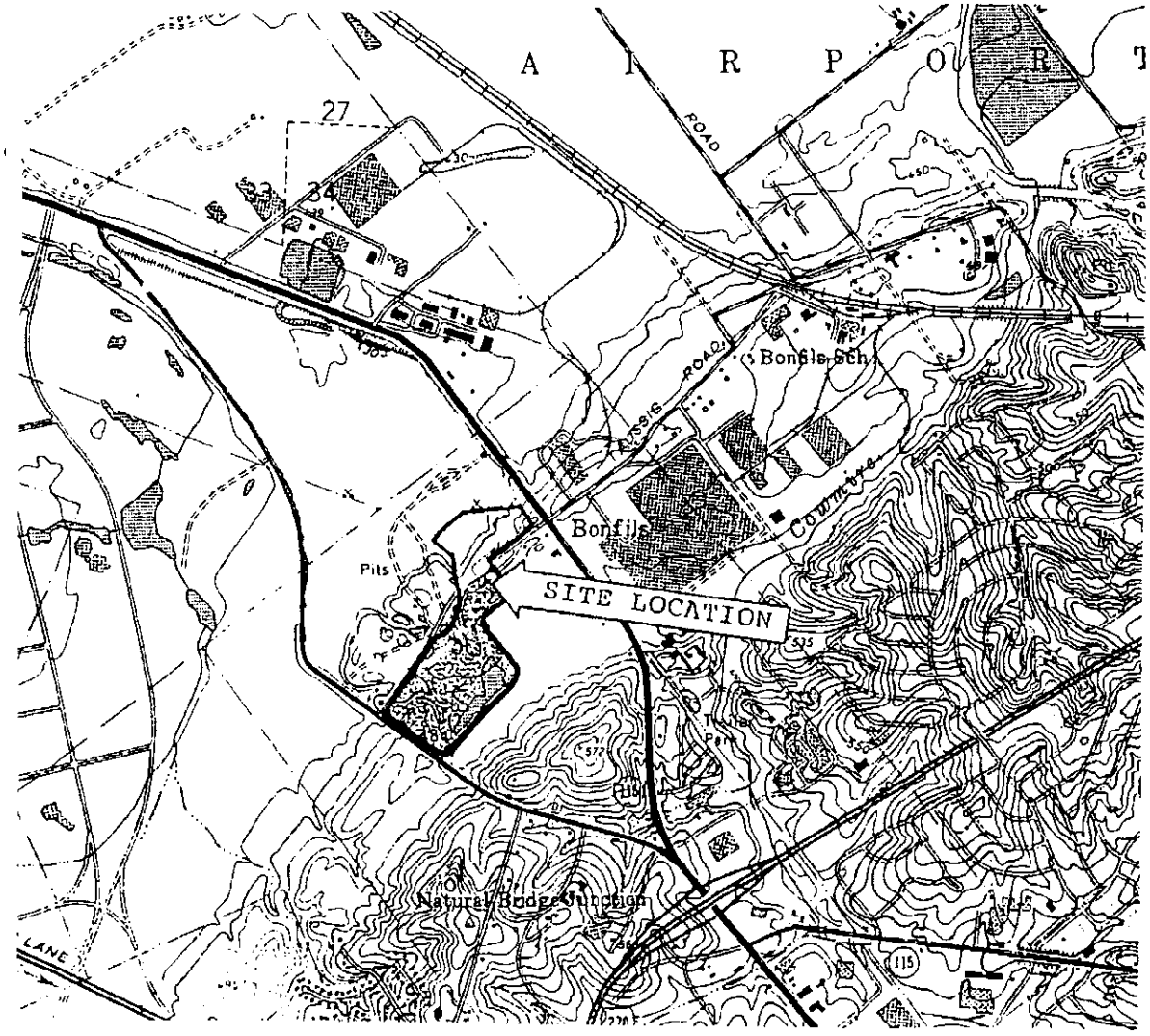
R-3: One Family Dwelling District

Project: Laidlaw Waste Systems (Bridgeton), Inc.
Permit Consolidation
Site Location Map
Project Number: 940130-004 **Date:** 6/95

Midwest Environmental Consultants, P.C.

Figure 1
Scale: 1"= 2000'
United States Geological Survey St. Charles, MO Quadangle

Longitude - 38° 46' 12"
Latitude - 92° 26' 34"

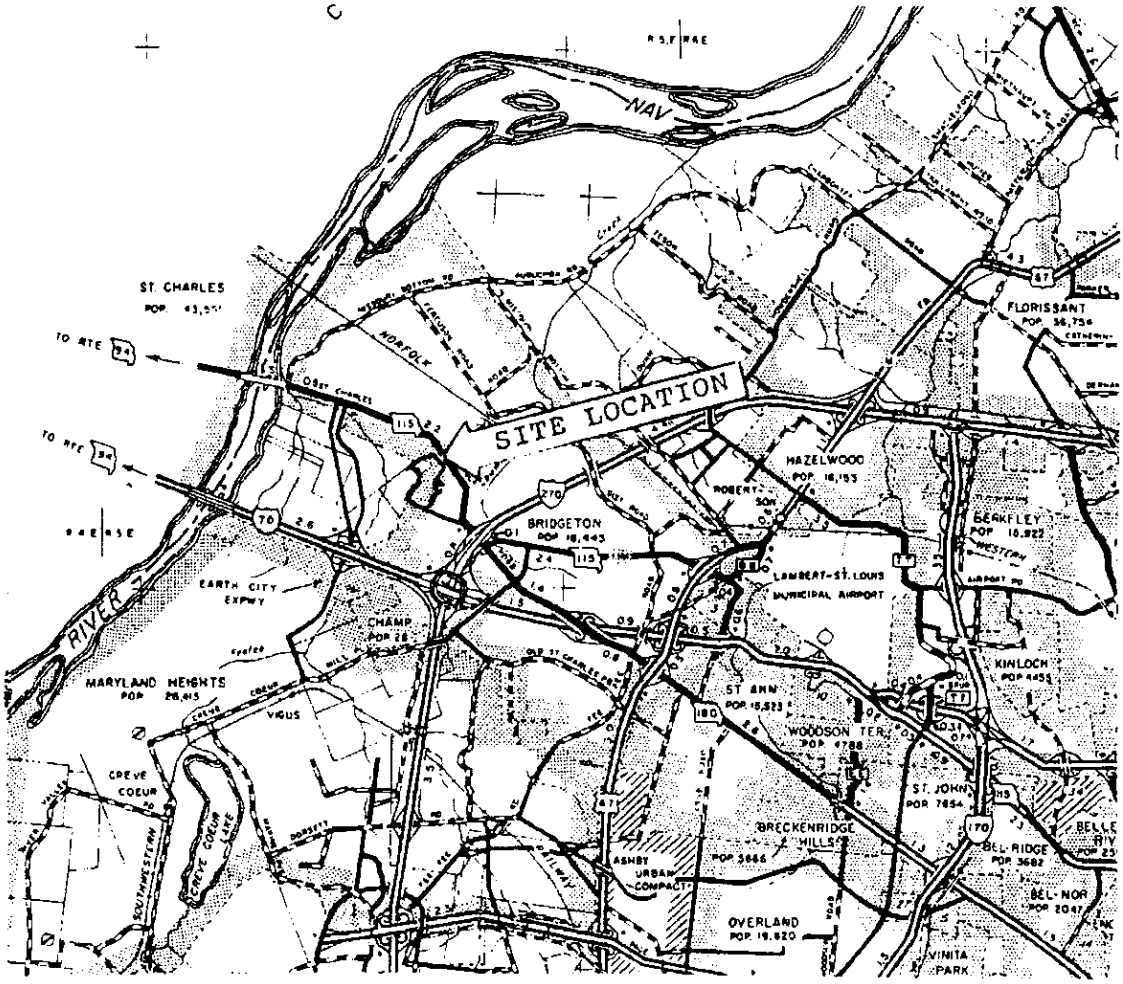


Project: Laidlaw Waste Systems (Bridgeton), Inc.
Permit Consolidation
Site Location Map
Project Number: 940130-004 **Date:** 6/95

Midwest Environmental Consultants, P.C.

Figure 2
Scale: 1"= 2 miles
General Highway Map for St. Louis County

Longitude - 38° 46' 12"
Latitude - 92° 26' 34"



B-3: Travel/Entertainment Services District

B-4: General Commercial District

M-1: Manufacturing District, Limited

M-2: Manufacturing District

Special Zoning Districts:

B-5(f): Planned Commercial District: West Lake Quarry Tract

M-3(g): Planned Manufacturing District: Northwest Industrial Park - 13575 St. Charles Rock Road

M-3(n): Planned Manufacturing District: West Lake Quarry Tract

See Appendix 2 for specific land use information for the above-listed zoning designations.

The property line depicted on Plan Sheet 1 (Land Use and Zoning Map), as well as all the other plan sheets which show the site's property line, assumes that Old St. Charles Rock Road is not abandoned. However, if Old St. Charles Rock Road is officially abandoned then the property line along the southern boundary would extend to the center line of Old St. Charles Rock Road.

C. Site History

It is estimated that the site has been utilized as a quarry since the early 1930s. On April 23, 1952, the Office of Zoning Enforcement of St. Louis County granted permission to V.R. Cruse and L.E. Trump, owners of the property, to operate a sanitary landfill. It is

assumed that the above-mentioned persons were full or partial owners of West Lake Quarry.

In a May 16, 1969 letter from H. Clifford Mitchell, P.E. (the Assistant Commissioner of Environmental Health Services for the St. Louis County Health Department) to Mr. William A Richter (Attorney) it was stated that prior to 1964 the facility was only authorized to accept combustible material (see Appendix 1). Following the closure of the Wade Landfill on Highway 67, the site was authorized to accept all forms of non hazardous solid waste. West Lake Landfill, Inc. became a separate entity from West Lake Quarry on its date of incorporation on February 16, 1962.

Prior to coming under state regulatory authority in the early 1970s, West Lake Landfill, Inc. had six separate disposal areas on the site. These areas, referred to as Areas 1-6, are shown on Plan Sheet 3. Subsequent to MDNR Formation, MDNR issued two permits for Areas 1-6. These were permit #218903 and permit #118903. It is not known exactly when each area was filled or with what each area is filled. However, based on the engineering report prepared by Rogers and Associates, Inc. in March 1974 and the accompanying plan sheets prepared by The Elbring Company, the following comments can be offered:

- Areas 1, 2, 3, 4 and 5 have all been used for both sanitary and demolition fill.
- Areas 2 and 4 were to be closed and completed at the time of the writing of the above-mentioned report.

- Areas 1, 3, 5, and 6 were originally used as sanitary fill areas; however, following the above-mentioned report they were to be sealed off with 24 inches of clay and used for demolition fill only. These areas were subsequently permitted under permit #218903.

- Area 6 is a partial and integral portion of Area 5 which had been completed as a fill area at the time of the writing of the above-mentioned report.

- No provisions were made for the collection of leachate. The engineering report states that it was confined to the fill areas by clay lining and cover of the refuse cells.

- Lateral gas movement from sanitary fill beneath demolition fill was to be controlled by gas vents. These vents were to be round openings filled with graded crushed limestone (see Plan Sheet 25 for detail).

The site came under state regulatory authority when the MDNR was formed in 1974. The site consists of a total of approximately 214 acres of which 52 acres are currently permitted under permit #118912. Since the inception of the MDNR, a total of approximately 86.5 acres either has been used or is currently in use as a sanitary landfill. In total, the site has received five separate MDNR sanitary landfill operating permits and two MDNR demolition landfill operating permits. The site's sanitary and demolition landfill permit history is summarized in Table 1 and the location of each permit area is shown on Plan Sheet 3.

Table 1
Bridgeton Site
Solid Waste and Demolition Landfill Permit History

No.	Type	Acreage	Issue Date	Consultant
218903[1]	Demolition	27	1/27/76	Rogers & Associates
118903	Sanitary	25	1/27/76[2]	Rogers & Associates
Addendum	3.5 acre expansion	3.5	5/23/78	Paul H. Himebaugh
118906	Sanitary	13	1/22/79	Paul H. Himebaugh
118908	Sanitary	6	8/27/80	Reitz & Jens, Inc.
118909	Sanitary	9	8/20/81	Reitz & Jens, Inc.
218912	Demolition	22	9/19/84	Burns & McDonnell
118912[3]	Sanitary	52	11/18/85	Burns & McDonnell

[1]Permit #218903 includes Areas 1, 3, 5, and 6.
[2]Actual Authorization was granted on 8/27/74.
[3]Permit #118912 supersedes permits #118909 and #118906; it represented a 33-acre expansion from the area permitted under permits #118909 and #118906.

According to permit #118912, there is a total of 52 acres available for landfill disposal. However, according to strict interpretation of the engineering report, there is only a total of 49 acres included in permit #118912. These 49 acres are comprised of the following areas:

Area (acres)	Description
13	Originally permitted area under permit #118906.
3	Expansion area under permit #118909 (permit #118909 was for a total area of 9 acres; however, 6 of these acres were originally permitted under permit #118906).
33	Expansion area under permit #118912.
49	Total

The acreage issue is further complicated by the fact that the permit boundary, which is implicitly shown on Drawing 2, Revision 3 of Burns & McDonnell's permit drawings (final revision date: July 27, 1987), measures approximately 54.1 acres instead of the 52

acres stated in the permit. Acreages are listed on this drawing for the three areas (Area 1, Area 2, and Northern Closure Area) that comprise the permitted area. These acreages total 52 acres; however, as previously stated they measure approximately 54.1 acres.

In an effort to further explore this issue the permitted area or assumed approximation was measured on the followings drawings:

Acreage	Drawing
54.0	Foth & Van Dyke; Bridgeton Sanitary Landfill; Figure 1; April 1993.
59.0	Paul H. Himebaugh, Consulting Engineer; Location & Area Maps with final Contours; West Lake Landfill, Inc.; Plate 1; Revision December 19, 1978. (The permit boundary south of permit #118906 was approximated based on the quarry wall.)

A contributing factor to this discrepancy is the fact that permit #118906 is listed as 13 acres on the issued permit, but measures 14.7 acres on the actual permit drawings. It is believed that Burns & McDonnell's permit boundary does not accurately reflect this portion of the permit boundary for permit #118912.

In addition to having multiple existing and closed sanitary and demolition landfills, the Bridgeton SLF is also a Superfund site as designated by the United States Environmental Protection Agency in 1990. This designation encompasses the entire site. Two areas on the site (totaling approximately 36.5 acres) that possess low-level radioactive wastes are collectively known as Operating Unit (OU)-1. The remainder of the site (that is, the entire site with the exception of the 36.5 acres known as OU-1) is referred to as OU-2.

Although further explanation of these areas is beyond the scope of this document, the two areas of OU-1 are shown on Plan Sheet 3.

In 1988 Laidlaw purchased all landfilling operations and associated properties from West Lake Landfill, Inc. and the name was legally changed to Laidlaw Waste Systems (Bridgeton), Inc., Sanitary Landfill. West Lake Quarries, Inc. possesses a license agreement and still operates the Red-Bird Ready-Mix plant; however, all quarrying operations have ceased at the site.

The site currently operates under permit #118912 which was issued on November 18, 1985. However, there have been a significant number of addendums issued since this date. In order to provide necessary thoroughness and detail all of these addendums along with the original permit letter and other significant correspondence are contained in Appendix 1. All permit addendums are summarized in the following listing.

Date: November 18, 1985
RE: Permit Issuance, Permit Number 118912
Conditions:

1. This permit, Solid Waste Disposal Area Operating Permit #118912, encompasses the proposed expansion area and additional solid waste fill by West Lake Landfill, Inc. over the disposal areas permitted under Solid Waste Disposal Area Operating Permit Numbers 118906 and 118909 issued to West Lake Landfill, Inc. This document supersedes and replaces the previous permits and permit documents.
2. West Lake Landfill, Inc. shall establish and maintain an escrow fund for the purpose of providing post-closure care and maintenance of the landfill. The amount and manner of maintaining this fund shall be as described in the approved permit documents.
   A. Fifty percent of the first yearly cost of this fund shall be deposited in this fund prior to acceptance of solid waste.
   B. The existence and maintenance of this fund shall be verified to the MDNR by the permittee prior to acceptance of solid waste. The maintenance of this fund shall be verified to the department annually prior to the anniversary date of establishment of the fund, in writing, by the financial institution wherein this fund is deposited.

3. An environmental assessment of the entire landfill site shall be initiated by West Lake Landfill, Inc. or any successor or assign ("hereinafter West Lake") immediately after the issuance of this permit. This assessment, including hydrogeologic investigation, shall be completed by November, 1986, and shall be used as the basis for the development of a monitoring program and feasibility study to assess necessary remedial action. The conclusions of the feasibility study shall be submitted to the MDNR within two years after the issuance of this permit. Implementation of necessary remedial action will be undertaken by West Lake in accordance with reasonable design and construction scheduling. Additional groundwater monitoring requirements will be required, based on review of the hydrogeologic investigation and feasibility study.
4. Initial training of the waste inspector (spotter) shall be provided so that he/she is able to adequately perform the duties as described in the permit documents. At a minimum, the initial training for this employee shall include:
   A. Familiarization with 10 CSR 80-3.010(3), solid waste excluded.
   B. Identification and recognition of unacceptable wastes, as described in 10 CSR 80-3.010(3).
   C. Familiarization with the necessary procedures to obtain approval of special waste disposal requests.
   D. Provision of a list of all special wastes approved for disposal by the MDNR.
5. Intermediate cover is not required until the fill is above the quarry rim, as proposed in the approved permit documents.
6. Leachate and sludge from leachate treatment shall be collected, treated and disposed of as per the approved permit documents.
   A. Leachate shall be treated and disposed of in accordance with all applicable water quality laws, rules, regulations, and policies as enforced by the Water Pollution Control Program, MDNR.
   B. West Lake Landfill, Inc. shall two times a year test the leachate and leachate treatment sludge for hazardous waste characteristics pursuant to 10 CSR 25-4.010 (2 through 5) and submit the results of such tests within 60 days to the MDNR. If hazardous wastes are detected in the leachate or sludge, West Lake Landfill, Inc. shall implement proper handling of such hazardous wastes in accordance with the Missouri Hazardous Waste Management law, Rules and Regulations.
   C. Sludge from the on-site leachate treatment system is acceptable for disposal at the landfill, unless tested to be a characteristic hazardous waste as per Condition #6B.
   D. Static leachate levels in the collection sumps in the unfilled area of the quarry, as shown in the approved permit documents, will be maintained at a level less than 30 feet above the base of the sump. The leachate level shall be checked monthly, recorded and made available upon MDNR request.
   E. Static leachate levels in the previously filled areas of the quarry, as shown on the approved permit documents, shall be maintained at a level less than 50 feet above the base of the sump. The leachate level shall be checked monthly, recorded and made available upon MDNR request.
7. A. Groundwater monitoring shall be required as per the document entitled Monitoring Program for the West Lake Landfill, Inc. Sanitary Landfill. The wells shall be sampled within 30 days of issuance of the permit. The first sample will be used as a

background sample and should be analyzed for the extended list of parameters, as if it were an annual analysis.

B. Three groundwater monitoring wells have been installed in the area of the grout curtain in the northeast corner of the large quarry. Two wells were installed during the placement of the initial grout curtain and were designated as groundwater monitoring wells (GWMW) #4/III and (GWMW) #14/III in the application for operating permit. The third well was installed during the placement of grout curtain #2 and was designated as groundwater monitoring well (GWMW) #17/IV in the application for operating permit. The water level in these wells shall be monitored monthly, recorded, and made available upon department request.

C. All three wells will be monitored, unless the department is requested to reevaluate the monitoring program. If requested and approved, one or more of the wells can be eliminated from the sampling program if hydraulic communication between the wells is verified.

D. Additional sampling points may be added to the monitoring program depending on the results of the hydrogeologic investigation (see Condition #4).

8. The following previously approved special wastes are approved for disposal under permit #118912:
   A. Fly ash derived from a coal burning industrial boiler, generated by McDonnell Douglas Corporation; 400 tons per month; approved November 1, 1984.
   B. Incinerator ash derived from municipal refuse incineration, generated by McDonnell Douglas Corporation; 800 cubic yards per month; approved November 1, 1984.
9. Each eight inch lift of the twelve-foot wide pad in the northeast corner should be tested for soil density to confirm that a minimum compaction of 90 percent of the standard proctor density is obtained.
10. All surface water discharges shall be made in accordance with all applicable air quality laws, rules, regulations, and policies as enforced by the Water Pollution Control Program, MDNR.
11. Methane gas shall be vented or burned in accordance with all applicable air quality laws, rules, regulations, and policies as enforced by the Water Pollution Control Program, MDNR.
12. Department review and approval of any planned final use is required prior to implementing a designated, commercial, final use of the site.
13. Within six months of the data of issuance of the permit, two copies of a final, comprehensive engineering report shall be submitted to the Waste Management Program. This report shall incorporate all present design and operating information into one reference manual detailing the final approved plans and specifications for the design and operation of the proposed sanitary landfill. This report shall incorporate all information required by regulation, eliminate all contradictory information, and include all revisions and additions to the original application for operating permit, as approved.

Date: March 13, 1987
Addendum: Expanded Gas Collection System and Utilization of Gas in Asphalt Plant (expansion consisted of nine collection wells, approximately 3,015 feet of collection pipe, a moisture removal unit, a blower building, and a waste gas flare)

Conditions: Continue to comply with all local requirements and maintain all necessary local permits and approvals.

Date: June 19, 1987
Addendum: Spray Irrigation of Treated Leachate
Conditions:
1. Land irrigation of the leachate shall cease after September 30, 1987.
2. Runoff of the treated leachate is not to enter surface drainage ditches.
3. Application rates shall be based on approved documents.
4. Land application of treated leachate shall conform to all applicable water quality laws, rules and permits enforced by the MDNR's WPCP.

Date: February 8, 1988
Addendum: Revised Chimney Drain Design (rock replaced with polyethylene drainage net that has geotextile bonded to both sides)
Conditions: None

Date: November 28, 1988
Addendum: Change of Ownership
Conditions: Refer to Appendix 3.

Date: May 10, 1989
Addendum: Revised Groundwater Monitoring Report Forms and Addition of TOX and TOC to Annual Sampling List
Condition: Failure to comply with any aspect of this program may be viewed as a violation of a condition of the solid waste disposal area permit.

Date: November 21, 1989
Addendum: Extended Operating Hours
Conditions:
1. Continued application of daily cover.
2. No operational difficulties traceable to the extension of operating hours.

Date: July 13, 1990
Addendum: Leachate Collection Sump (LCS-4) added and drain redirected.
Conditions: Conditions pursuant to the permit addendum are to comply with conditions specified in permit number 118912.

The department reserves the right to revoke, suspend or modify this addendum and/or permit number 118912 after due notice:
1. If it is found that the holder of the permit is in violation of the Missouri Solid Waste Management Law, or the Missouri Solid Waste Management Rules;
2. For failure to operate in accordance with the approved plans, specifications and operating procedures;
3. For failure to comply with any and all conditions of the permit;

4. For creating a public nuisance, health hazard or causing environmental pollution; or
5. If it is found that additional construction or alteration of the solid waste disposal area is necessary to comply with any and all rules promulgated in accordance with the Missouri Solid Waste Management Law.

Date: July 23, 1990
RE: MDNR request that an NPDES permit application be submitted for the demolition landfill.

Date: January 11, 1991
Addendum: Changes in Groundwater Monitoring Program
Condition: Submit by April 1, 1991 well abandonment procedures, well as-builts, boring logs and a background sample for each newly constructed well.

Date: July 31, 1992
Addendum: Modify Gas Collection System from a Passive to an Active System
Conditions:
1. Submit certification stating that implementation was in accordance with plans and specifications.
2. Meet requirements of sections 260.226 and 260.227, RSMo 1990 as applied to existing sanitary landfills to indicate any changes made as a result of this permit addendum. Also, submit revised closure/post-closure plans and cost estimates.
3. Obtain compliance with all applicable NPDES permits.

Date: September 9, 1992
RE: MDNR request for a financial assurance instrument to be submitted for both the sanitary and the demolition landfills. The deadline was 60 days from receipt of this letter.

Date: November 20, 1992
Addendum: Revised Closure/Post-Closure Plan
Conditions:
1. Submit certification stating that implementation was in accordance with plans and specifications.
2. Revise post-closure plans to reflect the additional costs for continued operational, maintenance, and incidental costs for operating pumps.
3. As part of the financial assurance for post-closure care, set up a separate funded irrevocable escrow or trust fund to cover the cost of perpetual care.

Date: January 5, 1993
Addendum: Use of Alternate Daily Cover
Conditions:
1. The Solid Waste Management Program must be notified of the day the trial period will begin;
2. Please submit two copies of the final bid specifications for the material to be used and two copies of a detailed operations manual specifying the final guidelines for the use of

the geotextile daily cover;

3. Upon completion of the six month trial period, please submit two copies of a detailed report, including but not limited, to daily records of whether or not the panel was used, weather conditions, unforeseen operational problems, notes on the performance and status of the geotextile, any reportable increase in leachate generated, conclusions and recommendations from the use of the geotextile daily cover.

Date: February 10, 1993
Addendum: Relocation of Gas Flare
Conditions:

1. Submit certification stating that implementation was in accordance with plans and specifications.
2. Meet requirements of sections 260.226 and 260.227, RSMo 1990 as applied to existing sanitary landfills to indicate any changes made as a result of this permit addendum. Also, submit revised closure/post-closure plans and cost estimates.
3. Obtain compliance with all applicable NPDES permits.
4. Submit as-built drawings.

Date: October 8, 1993
Addendum: Subtitle D Extension
Conditions:

1. Remain in compliance with all permit conditions.
2. Develop filling progression to promote stormwater drainage in order to minimize infiltration and leachate generation, while maintaining effective soil erosion control.
3. Limit the landfill to the permitted horizontal and vertical boundaries while maintaining sideslopes of 33 percent or less. Limit accepted wastes to flood debris and other solid wastes.

Operating and Closure Requirements:

1. Establish survey controls within 60 days upon receipt of this addendum letter.
2. Obtain compliance with all applicable NPDES permits as a result of any changes resulting from this extension.
3. Place three feet of final cover upon closure. Provide certification by a professional engineer of final cover depth on 50-foot centers.
4. Establish vegetation on disposal area and borrow area within 180 days after placement of final cover.
5. Submit the following within 60 days upon receipt of this addendum letter: (1) revised closure/post-closure plans and cost estimates, and (2) revised financial assurance instrument, if necessary.
6. Submit the following by June 9, 1994 (if the facility was closed by April 9, 1994):
   - Final grades and as-builts drawings which include associated landfill appurtenances to show proper final development of this landfill in accordance with this extension.
   - Details concerning the types and depth of final cover verified on 50-foot centers and vegetation establishment.

- Submit a topographic boundary survey designating the entire permitted acreage including final grades and associated landfill appurtenances in accordance with 10 CSR 80-3.010(16)(C)2.

Date: October 28, 1993
Addendum: Modified life of permit to be for the anticipated life of the facility.
Conditions: None.

Date: March 8, 1994
Addendum: Landfill fire mitigation
Conditions:
1. Apply a professional engineer's seal to document entitled "Proposal, Landfill Fire Mitigation, Laidlaw Bridgeton Sanitary Landfill, Bridgeton, Missouri" within 30 days.
2. Seek prior written approval for any changes in operation and/or design other than those described in the application and approved in permit.
3. Submit three copies of report to the SWMP.
4. The quarterly gas monitoring report to be sent to the SWMP is to include all reports on continuing monitoring and maintenance efforts for control of the fire.

Date: May 4, 1994
Addendum: Subtitle D liner waiver on the ramp leading into the landfill and the side walls of the landfill. Also, fire mitigation proposal approved.
Conditions:
1. Report on efforts to mitigate the current and any future landfill fire.
2. Report on the effectiveness of the current soil liner to control gas migration out of the landfill.
3. Submit an additional modification request for the liner showing how the landfill gas shall be controlled if the landfill cannot be controlled by the soil liner.

Date: May 4, 1994
Addendum: Interim stormwater detention basins and a gas condensate line.
Conditions:
1. Submit certification within 30 days of completion.
2. Submit to St. Louis Regional Office two copies of as-built drawings within 60 days of completion of construction if gas condensate line is located different from location shown in drawing.
3. Notify St. Louis Regional Office of all permits for storm water discharges.

Date: August 30, 1994
Addendum: Use of petroleum contaminated soil as an alternative daily cover for a six (6) month trial period.
Conditions:
1. The petroleum contaminated soil is approved for use only as daily cover material and shall not be used for intermediate cover or final cover.
2. The beneficial use of petroleum contaminated soils as daily cover materials shall follow

disposal and testing practices as outlined in the solid waste technical bulletins entitled Special Waste Technical Bulletin (dated January 1992) and Disposal of Soil Contaminated with Virgin Gasoline or Virgin Fuel Oil (dated December 1991) and shall meet the cover requirements as specified in the Missouri Solid Waste Management Law and Rules 10 CSR 80-3.010(14). Contaminated soils shall meet a classification of or be mixed with other cover soils to meet a Unified Soil Classification of CH, CL, ML, MH, or SC for daily cover.

3. The owner/operator shall screen the incoming petroleum contaminated soil for excessive or offensive odor emissions and for foreign debris or other items which would create an unsightly appearance and interfere with or limit its use as daily cover.
4. Within sixty (60) days of completion of the trial period, two copies of a detailed report must be submitted including but not limited to daily records of whether or not the alternative cover was used, weather conditions, unforeseen operational problems, any reportable increase in leachate generated, photographs, conclusions, and recommendations concerning the use of the contaminated soil as daily cover.
5. Petroleum contaminated soils shall not be used as daily cover when the following are detected:
   A. Soil contaminated with petroleum products has strong offensive odor;
   B. Soil contaminated with petroleum products contains excessive debris which would create an unsightly appearance on the landfill;
   C. Soil contaminated with petroleum products which is received during periods of excessive wet or severe inclement weather could result in contaminated surface water runoff from the active fill face when it is used as daily cover; or
   D. Soil contaminated with petroleum products does not meet the required testing limits as described in the aforementioned technical bulletins.
6. The use of soil contaminated with petroleum products shall not be used as daily cover in waste disposal cells located at the approved final waste contours or in locations where storm water runoff from the active face cannot be removed or collected through a leachate collection system for treatment.
7. Prior to use of petroleum contaminated soil as daily cover material the generator of the waste must provide lab results with a special waste disposal form on representative samples of the soil. Two copies of the testing results shall be submitted to the MDNR's St. Louis Regional Office.
8. The use of petroleum contaminated soil as daily cover material must conform to all applicable water quality laws, rules, regulations and permits which are enforced by the MDNR's Water Pollution Control Program.
9. The use of petroleum contaminated soil as daily cover material must conform to all applicable air quality laws, rules, regulations and permits which are enforced by the appropriate air pollution control regulatory agency.

Date: March 15, 1995
Addendum: Removal of cardboard near the working face of the landfill.
Conditions: MDNR reserves the right to revoke, suspend, or modify this approval and/or permit number 118912 after due notice, if the permit holder fails to maintain the facility in compliance with the state's Solid Waste Management Law and Rules, the terms and

conditions of the permit, and approved engineering plans and specifications.

Date: April 12, 1995
Addendum: Modification of operations to extract cardboard from incoming loads at the edge of the working face (St. Louis Department of Health).
Conditions: None listed.

D. Utilities

Specific information and location of all known utilities are shown on Plan Sheet 2. Utilities include storm sewers, gas lines, water lines, electrical lines, sanitary sewers, and septic tanks.

Electrical power for the facility is supplied by Union Electric (UE). The electrical demands of this facility consist of lighting, HVAC of the landfill office, the gas flare system, pumps and aerators for leachate management, and miscellaneous electrical requirements for maintenance. UE supplies 3 phase power to the facility. There have been no known problems with the power supply.

According to the engineering report (January 1986), there were no utility easements or lines located on the actual disposal site. Also, there were no known water supply wells within the 1/4-mile surrounding boundary.

E. Site Access and Control

Access to the landfill is provided by St. Charles Rock Road, a main entrance road, and landfill service roads (see Plan Sheet 4). The site is always accessible using St. Charles Rock Road since it is not susceptible to flooding or closing due to inclement weather. The main entrance road is an all weather asphalt surface. Landfill service roads are constructed

as needed for access to the working face. All entering vehicles must pass by the landfill office and then by the scale house prior to proceeding toward the working face.

Current operating hours are from 3:00 a.m. to 4:00 p.m. Monday through Friday and from 6:00 a.m. to 1:00 p.m. on Saturday.

Figure 3
Historical Permit Limits

Notes:

1. All depicted waste boundaries are approximations based on past permit documents. Refer to the table for the original source drawing for each boundary.
2. Topography is based on an aerial survey flown by Surdex Corporation and dated January 25, 1995.

Legend

- Permit #118903
- Permit #118906
- Permit #118908
- Permit #118909
- Permit #118912
- Permit #218903
- Permit #218912
- OU-1 Hazardous Disposal Areas

No.	Description	Acreage	Issue Date	Consultant	Source
218903[1]	Demolition	27	1/27/76	Rogers & Associates	The Elbring Co., 1979, Dwg 3-1
118903	Sanitary	25	1/27/76	Rogers & Associates	The Elbring Co., 1979, Dwg 3-1
Addendum	3.5 acre expansion	3.5	5/23/78	Paul H. Himebaugh	Laidlaw sketch, unknown origin
118906	Sanitary	13	1/22/79	Paul H. Himebaugh	Himebaugh, 12/19/78, Plate 1
118908	Sanitary	6	8/27/80	Reitz & Jens, Inc.	Laidlaw sketch, unknown origin
118909	Sanitary	9	8/20/81	Reitz & Jens, Inc.	Reitz & Jens, Inc., 8/28/81, Sheet 2 of 3
218912	Demolition	22	9/19/84	Burns & McDonnell	Burns & McDonnell, 1989, Dwg 2
118912	Sanitary	52	11/18/85	Burns & McDonnell	Burns & McDonnell, 1984, Dwg 4
OU-1, Area 1	Hazardous Waste	5.3	N/A	N/A	Burns & McDonnell, 1989, Dwg 1A
OU-2, Area 2	Hazardous Waste	30.2	N/A	N/A	Burns & McDonnell, 1989, Dwg 1A

[1] Includes Areas 1, 3, 5, and 6. These areas received sanitary waste fill prior to receiving MDNR Demolition Permit No. 218903. Areas 2 and 4 were denied permitting by MDNR, however, they also received waste fill prior to permit denial by MDNR.

Project: Laidlaw Waste Systems (Bridgeton), Inc.
Facility Upgrade And Permit Modification

Project Number: 940130-004 Date: 12/95

MIDWEST ENVIRONMENTAL CONSULTANTS, P.C.

APPENDIX C

PHOTO LOG

Bridgeton Waste Limit Investigation
Aquaterra Project No. 3718.10

Photo #1

Photographer: Jerry Jordan

Date: 12-29-09

Description: Excavation at Point 198.

Photo #2

Photographer: Jerry Jordan

Date: 12-29-09

Description: Excavation at Point 195.

Photo #3

Photographer: Jerry Jordan

Date: 12-29-09

Description: Overlooking Permit #218903 (Area #5) facing southwest near Point 222.

Bridgeton Waste Limit Investigation
Aquaterra Project No. 3718.10

Photo #4

Photographer: Jerry Jordan

Date: 12-29-09

Description: Excavation at Point 283.

Photo #5

Photographer: Jerry Jordan

Date: 12-29-09

Description: Facing west near Point 269.

Photo #6

Photographer: Corey Rice

Date: 7-7-2010

Description: Facing northeast toward GEW-1 and St. Charles Rock Road (near Point R147).

Bridgeton Waste Limit Investigation
Aquaterra Project No. 3718.10

Photo #7

Photographer: Corey Rice

Date: 7-7-2010

Description: Facing northwest toward PGW-60 (near Point R146).

Photographer: Corey Rice

Date: 7-7-2010

Description: Overlooking Area #2 and Area #6 (near Point 361).

Photo #9

Photographer: Corey Rice

Date: 7-7-2010

Description: Facing Northeast toward PGW- 28 (near Point 390).

APPENDIX D

INVESTIGATION TABLE

Waste Limits Investigation Table
Bridgeton Landfill, LLC

LATERAL EXTENTS OF WASTE INVESTIGATION							
POINT	DEPTH TO WASTE IF ENCONTERED IN FEET	TOTAL DEPTH OF EXCAVATION IN FEET	DISTANCE FROM PERMITTED LIMITS WHERE WASTE WAS ENCOUNTERED	DEPTH TO WASTE BEYOND PERMITTED BOUNDRY	DEPTH OF EXCAVATION BEYOND PERMIT BOUNDRY IF NO WASTE	NOTES	DATE
1		3					12/30/2009
2		3.5					12/30/2009
3		3					12/30/2009
4		3.5					12/30/2009
5		3					12/30/2009
6		2' ROCK					12/30/2009
7	2		10 FT, 20 FT	3 FT, NO WASTE			12/30/2009
8		3					12/30/2009
9						LOCATED IN ROADWAY	12/30/2009
10	3						12/30/2009
11-21						PROXIMITY TO ELECTRIC AND HEADER	12/30/2009
22	3		10	NO WASTE			12/30/2009
23						PROXIMITY TO ELECTRIC	12/30/2009
24		3					2/1/2010
27		3					2/1/2010
26		3					2/1/2010
25	2.5		10	2.5			2/1/2010
28	1		10	2			2/1/2010
29		3					2/1/2010
30		3					2/1/2010
31		3					2/1/2010
32		3					2/1/2010
33		3					2/1/2010
34		3					2/1/2010
35		3					2/1/2010
36						LOCATED IN LET DOWN	2/1/2010
37		3					2/1/2010
38						CLOSE PROXIMITY TO SUMP	2/1/2010
39		4					2/1/2010
40						LOCATED IN ROAD	2/1/2010
41						LOCATED IN ROAD	2/1/2010
42						LOCATED IN ROAD	2/1/2010
43		3					2/1/2010
44		3					2/1/2010
45		3					2/1/2010
46		3					2/1/2010
47		6					2/1/2010
48		6					2/1/2010
49		6					2/1/2010
50		6					2/1/2010
51		6					2/1/2010
52		6					2/1/2010
53		6					2/1/2010
54		6					2/1/2010
55		3					2/1/2010
56		3					2/1/2010
57		3					2/1/2010
58						CLOSE PROXIMITY TO SEWER	2/1/2010
59		3					2/1/2010
60		3					2/1/2010
61						CLOSE PROXIMITY TO SEWER	2/1/2010
62						CLOSE PROXIMITY TO SEWER	2/1/2010
63		3					2/1/2010
65		3					2/1/2010
67		3					2/1/2010
68		3					2/1/2010
69		3					2/1/2010
70						CLOSE PROXIMITY TO HEADER	2/1/2010
71						CLOSE PROXIMITY TO HEADER	2/1/2010
72						CLOSE PROXIMITY TO HEADER	2/1/2010
73						CLOSE PROXIMITY TO HEADER	2/1/2010
74						CLOSE PROXIMITY TO HEADER	2/1/2010
75		3					2/2/2010
76						NO ACCESS	2/2/2010
77		3					2/2/2010
78						NO ACCESS	2/2/2010
79		3					2/2/2010
80	3		10	3			2/2/2010
81		3					2/2/2010
82		3					2/2/2010
83		3					2/2/2010
84		3					2/2/2010
85						CLOSE PROXIMITY TO ELECTRIC	2/2/2010
86						CLOSE PROXIMITY TO HEADER	2/2/2010
87						CLOSE PROXIMITY TO HEADER	2/2/2010
88		3					2/2/2010
89		3					2/2/2010
90		3					2/2/2010
91		3					2/2/2010

Waste Limits Investigation Table
Bridgeton Landfill, LLC

POINT	DEPTH TO WASTE IF ENCONTERED IN FEET	TOTAL DEPTH OF EXCAVATION IN FEET	DISTANCE FROM PERMITTED LIMITS WHERE WASTE WAS ENCOUNTERED	DEPTH TO WASTE BEYOND PERMITTED BOUNDRY	DEPTH OF EXCAVATION BEYOND PERMIT BOUNDRY IF NO WASTE	NOTES	DATE
92		3					2/2/2010
93		3					2/2/2010
94	2		10	3			2/2/2010
95						POSSIBLE ELECTRIC	2/2/2010
96	3					LIGHT ISOLATED WASTE	2/2/2010
97	3		5	3			2/2/2010
98	2.5		10	2.5			2/2/2010
99	4		10	4			2/2/2010
100		3					2/2/2010
101		3					2/2/2010
102						LOCATED IN LET DOWN	2/2/2010
103		4					2/2/2010
104		4					2/2/2010
105		4					2/2/2010
106						CLOSE PROXIMITY TO ELECTRIC	2/2/2010
107		4					2/2/2010
108	4		20	NO WASTE	6		2/2/2010
109		6					2/2/2010
110		6					2/2/2010
111		6					2/2/2010
112		6					2/2/2010
113		6					2/2/2010
114		4					2/2/2010
115		3					2/2/2010
116		3					2/2/2010
117		3					2/2/2010
118						CLOSE PROXIMITY TO UTILITY POLE	2/2/2010
119		3					2/2/2010
120		3					2/2/2010
121		3					2/2/2010
122	2		20	NO WASTE	4		2/2/2010
123		3					2/2/2010
124		3					2/2/2010
125		3					2/2/2010
126		3					2/2/2010
127	2.5		10	NO WASTE	4		2/2/2010
128		3					2/2/2010
129		3					2/2/2010
130						CLOSE PROXIMITY TO HEADER	2/2/2010
131						CLOSE PROXIMITY TO HEADER	2/2/2010
132						CLOSE PROXIMITY TO HEADER	2/2/2010
133						CLOSE PROXIMITY TO HEADER	2/2/2010
134						CLOSE PROXIMITY TO HEADER	2/2/2010
135		3					2/2/2010
136		3					2/2/2010
137		6					2/2/2010
138		3					2/2/2010
139		3					2/2/2010
140		6					2/2/2010
141		5					2/2/2010
142		3					2/2/2010
R143		3				FENCE RELOCATED 5' WEST	2/2/2010
R144		6				RELOCATED 20' WEST	2/2/2010
R145		6				RELOCATED 10' WEST	2/2/2010
R146		4				RELOCATED 20' WEST	2/2/2010
R147	1					RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R148	1					RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R149	3					RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R150	1.5					RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R151		6				RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R152	3					RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R153	2.5					RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R154	2.5					RELOCATED TO DRAINAGE WAY DUE TO SOIL BERM	2/2/2010
R155	3					RELOCATED TO INSIDE FENCE	2/2/2010
R156	2					RELOCATED TO INSIDE FENCE	2/2/2010
R157	2					RELOCATED TO INSIDE FENCE	2/2/2010
R158	2					RELOCATED TO INSIDE FENCE	2/2/2010
R159	2.5					RELOCATED TO INSIDE FENCE	2/2/2010
R160	3					RELOCATED TO INSIDE FENCE	2/2/2010
R161	2.5					RELOCATED TO INSIDE FENCE	2/2/2010
153		3.2					3/1/2010
154		3.5					3/1/2010
155		4					3/1/2010
155B		3					3/1/2010
156		4					3/1/2010
156B	1		-30	NO WASTE	4		3/1/2010
157		3.8					3/1/2010
157B		3.5					3/1/2010
158		4					3/1/2010
158B	2.5		-25	NO WASTE	4		3/1/2010
159		4					3/1/2010
159B		3.5					3/1/2010

Waste Limits Investigation Table
Bridgeton Landfill, LLC

POINT	DEPTH TO WASTE IF ENCONTERED IN FEET	TOTAL DEPTH OF EXCAVATION IN FEET	DISTANCE FROM PERMITTED LIMITS WHERE WASTE WAS ENCOUNTERED	DEPTH TO WASTE BEYOND PERMITTED BOUNDRY	DEPTH OF EXCAVATION BEYOND PERMIT BOUNDRY IF NO WASTE	NOTES	DATE
160B		3					3/1/2010
160		3.8					3/1/2010
161		3.5					3/1/2010

Waste Limits Investigation Table
Bridgeton Landfill, LLC

DEMOLITION LANDFILL - LATERAL EXTENTS OF WASTE							
POINT	DEPTH TO WASTE IF ENCONTERED IN FEET	TOTAL DEPTH OF EXCAVATION IN FEET	DISTANCE FROM PERMITTED LIMITS WHERE WASTE WAS ENCOUNTERED	DEPTH TO WASTE BEYOND PERMITTED BOUNDRY	DEPTH OF EXCAVATION BEYOND PERMIT BOUNDRY IF NO WASTE	NOTES	DATE
162-168						LOCATED INSIDE CLOSURE STAKES	12/29/2009
168-182						LOCATED IN ROADWAY, DRAINAGE STRUCTURE OR CONTAINER YARD	12/29/2009
183		3					12/29/2009
184		3					12/29/2009
185		3					12/29/2009
186		3					12/29/2009
187-190						ROADWAY	12/29/2009
191						CEMENT OUTFALL	12/29/2009
192						CEMENT OUTFALL	12/29/2009
193		3.2					12/29/2009
194		3.5					12/29/2009
195		3					12/29/2009
196		3					12/29/2009
197		3					12/29/2009
198	3		NE 20'	2		STOPPED DUE TO LANDSCAPING	12/29/2009
199-216						EXCAVATED AT POINTS INSIDE FENCE	12/29/2009
217	3						12/29/2009
218	2						12/29/2009
219	1						12/29/2009
220	2						12/29/2009
221	2		10				12/29/2009
222	2		20				12/29/2009
223	2		40				12/29/2009
224	2		40				12/29/2009
225	2.5					WATER	12/29/2009
226	2.5		40				12/29/2009
227		3					12/29/2009
228		3					12/29/2009
229		3					12/29/2009
230		3					12/29/2009
231		3					12/29/2009
232		3					12/29/2009
233		3					12/29/2009
234		3					12/29/2009
235		2' ROCK					12/29/2009
236		2' ROCK					12/29/2009
237		2' ROCK					12/29/2009
238-244						POSSIBLE ELECTRIC LINE	12/29/2009
245	3					POSSIBLE ELECTRIC LINE	12/29/2009
246	2		20		4		12/29/2009
247	2.5		6	4			12/29/2009
248-258						CONTAINER YARD	12/29/2009
259		3					12/30/2009
260		3					12/30/2009
261		3					12/30/2009
262		1' ROCK					12/30/2009
263		ROCK					12/30/2009
264		1' ROCK					12/30/2009
265		1' ROCK					12/30/2009
266		6" ROCK					12/30/2009
267		2' ROCK					12/30/2009
268		CONCRETE					12/30/2009
269		3					12/30/2009
270		3					12/30/2009
271		3					12/30/2009
272		3 MINIMAL WASTE					12/30/2009
273	3						12/30/2009
274						UNDER WATER	12/29/2009
275						UNDER WATER	12/29/2009
276						UNDER WATER	12/29/2009
277						UNDER WATER	12/29/2009
278						UNDER WATER	12/29/2009
279						UNDER WATER	12/29/2009
280	3						12/29/2009
281		3.5					12/29/2009
282		3.5					12/29/2009
283		3.5					12/29/2009
284		3					12/29/2009
285		3.5					12/29/2009
286		3.5					12/29/2009
287		4					12/29/2009
288		3.5					12/29/2009
289		4					12/29/2009
290		3.5					12/29/2009
291		3.5					12/29/2009

Waste Limits Investigation Table
Bridgeton Landfill, LLC

DEMOLITION LANDFILL - COVER THICKNESS INVESTIGATION							
POINT	DEPTH TO WASTE IF ENCONTERED IN FEET	TOTAL DEPTH OF EXCAVATION IN FEET	DISTANCE FROM PERMITTED LIMITS WHERE WASTE WAS ENCOUNTERED	DEPTH TO WASTE BEYOND PERMITTED BOUNDRY	DEPTH OF EXCAVATION BEYOND PERMIT BOUNDRY IF NO WASTE	NOTES	DATE
328		4				GRAVEL	5/5/2010
329	10					0-4' GRAVEL, 4-8' CLAY AND GRAVEL, 8-10' GRAVEL	5/5/2010
330	8					0-4' CLAY AND GRAVEL, 4-8' CLEAN FILL	5/5/2010
331	8					0-4' GRAVEL AND CLEAN FILL, 4-8' GRAVEL	5/5/2010
332	8					0-4' GRAVEL AND CLEAN FILL, 4-8' CLEAN FILL	5/5/2010
333	6					0-4' GRAVEL AND CLEAN FILL, 4-6' FILL, 6-8' WASTE	5/5/2010
334	3					NO WASTE, 0-3' GRAVEL AND CLAY	5/5/2010
335	8					0-4' CLAY AND GRAVEL, 4-8' CLEAN FILL	5/5/2010
336	7					REFUSAL 7', 0-4 GRAVEL AND CLAY, WASTE AT 5'	5/5/2010
337	8					0-4' CLAY AND GRAVEL, 4-8' CLEAN FILL	5/5/2010
338	12						5/5/2010
339	12					PERMIT 218903 (AREA #2)	5/5/2010
340	6					PERMIT 218903 (AREA #2)	5/5/2010
341	4					PERMIT 218903 (AREA #2)	5/5/2010
342	14					PERMIT 218903 (AREA #2)	5/5/2010

COVER THICKNESS INVESTIGATION							
POINT	DEPTH TO WASTE IF ENCONTERED IN FEET	TOTAL DEPTH OF EXCAVATION IN FEET	DISTANCE FROM PERMITTED LIMITS WHERE WASTE WAS ENCOUNTERED	DEPTH TO WASTE BEYOND PERMITTED BOUNDRY	DEPTH OF EXCAVATION BEYOND PERMIT BOUNDRY IF NO WASTE	NOTES	DATE
356	3					PERMIT 218903 (AREA #2)	5/5/2010
357	3					PERMIT 218903 (AREA #2)	5/5/2010
358	3					PERMIT 218903 (AREA #2)	5/6/2010
359	3					PERMIT 218903 (AREA #6)	5/6/2010
360	3					PERMIT 218903 (AREA #6)	5/5/2010
361	3					PERMIT 218903 (AREA #2)	5/5/2010
363	3					PERMIT 118906	5/5/2010
364	3					PERMIT 118906	5/12/2010
367	3					PERMIT 218903 (AREA #6)	5/6/2010
369		3				PERMIT 118906	5/12/2010
371		3				PERMIT 118906	5/12/2010
374		3				PERMIT 118906	5/12/2010
375		3				PERMIT 118906	5/12/2010
377		3				PERMIT 118906	5/6/2010
378		3				PERMIT 118906 / PERMIT 118903	5/6/2010
379		3				PERMIT 118906 / PERMIT 118903	5/6/2010
380		3				PERMIT 118906 / PERMIT 118903	5/6/2010
381		3				PERMIT 118906 / PERMIT 118903	5/6/2010
385		3				PERMIT 118906	5/12/2010
386		3				PERMIT 218903 (AREA #6)	5/12/2010
388	3					PERMIT 118912	5/6/2010
389	3					PERMIT 118912	5/6/2010
390	3					PERMIT 118912	5/6/2010
391	3					PERMIT 118912	5/6/2010
393	3					PERMIT 118912	5/6/2010
400		3				PERMIT 118912	5/12/2010
401		3				PERMIT 118912	5/12/2010
402		3				PERMIT 118912	5/12/2010
403		3				PERMIT 118912	5/12/2010
406	3					PERMIT 118906	5/6/2010

APPENDIX E

DAILY FIELD ACTIVITY LOGS

DAILY FIELD ACTIVITIES REPORT

Client Name: *Bridgeton Landfill*
Aquaterra Project Name: *Waste Limits Investigation*
Aquaterra Project Number: *3718.1*
Project Location: *Bridgeton, MO*

Date: *December 29, 2009*
Start Time: *7:30 AM*
Stop Time: *7:00 PM*

Task: *Waste Limits Investigation*

Weather Information *26 ºF*

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra	*Mini Excavator*
Jerry Jordan - Aquaterra	

Work Areas/Boundaries

Demolition Landfill

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 183-186, 193-198, 217-235, 245-247, 280-291

Work Comments/Observations and Test Results

Investigation began at Pt 198, encountered waste 3' bgs and 20' NE from boundary. No further investigation due to landscapping. No waste encountered at Pts 193-197. No excavation occured ar Pts 191-192 (located in the outfall) and Pts 187-190 (located in the roadway). No waste encountered at Pts 183-186. Pts 168-182 were located in the roadway, drainage structure, or container yard. Pts 162-168 were located insde the closure stakes, therefore excavation began at Pt 247. Waste encountered at Pts 245 - 247 and 20' from boundary. Investigation at Pts 245 - 247 did not continue due to stockpiles located near waste boundary. Pts 238 - 245 were not investigated due to close proximity of electric line. Excavation at Pts 235 - 237 was limited due to rock. No waste encountered at Pts 227 - 234. Waste encountered at Pts 217-221 and up to 40' from waste boundary, further investigation did not occur due to proximity of the OU-1 fence. No waste encountered at Pts 280-291, except at Pt 280. Pts 275-279 were not completed due to water. Pts 199-216 were not completed, excavation at pts on the inside of the fence did not encounter waste.

Material(s) Delivered to Site

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

DAILY FIELD ACTIVITIES REPORT

Client Name: *Bridgeton Landfill*
Aquaterra Project Name: *Waste Limits Investigation*
Aquaterra Project Number: *3718.1*
Project Location: *Bridgeton, MO*

Date: *December 30, 2009*
Start Time: *7:30 AM*
Stop Time: *5:00 PM*

Task: *Waste Limits Investigation*

Weather Information *33 ºF*

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra	*Mini Excavator*
Jerry Jordan - Aquaterra	

Work Areas/Boundaries

Demolition Landfil, Area #2, Area #6, 118912

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 259-273	
Points 1-23	

Work Comments/Observations and Test Results

Attempted excavation at Pts 259-273 (closure stakes), waste at Pt 272 and 273. Moved to other side of office beginning at Pt 1. No waste encountered at Pts 1-6. Encountered waste at Pt 7. Excavated at Pt 9 (located in roadway). Waste encountered at Pt 10. No excavation at Pts 11-21 due to proximity to electric and header. Encountered waste at Pt 22. No excavation at Pt 23 due to proximity to electric.

Material(s) Delivered to Site

Corey M. Rice

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

DAILY FIELD ACTIVITIES REPORT

Client Name: *Bridgeton Landfill*
Aquaterra Project Name: *Waste Limits Investigation*
Aquaterra Project Number: *3718.1*
Project Location: *Bridgeton, MO*

Date: *February 1, 2010*
Start Time: *7:30 AM*
Stop Time: *5:00 PM*

Task: *Waste Limits Investigation*

Weather Information *32 ºF*

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra	*Mini Excavator*
Phil Allen - Aquaterra	

Work Areas/Boundaries

118912

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 24-74

Work Comments/Observations and Test Results

Began investigation at Pt 24. No waste encountered at Pts 24-26. Waste encountered at Pt 27 and Pt 28, and 10 ft from waste boundary. No further investigation due to drainage way. No waste encountered at Pts 29-35. Pt 36 was not completed due to being located in the letdown. No waste at Pt 37. Pt 38 was not completed due proximity to sump. No waste encountered at Pt 39. Pts 40-42 were located in the road. Completed Pts 43-46, no waste encountered. Increased depth of investigation to 6 ft for Pts 47-54, no waste encountered. Completed Pts 55-57, no waste encountered. Pts 58, 61, and 62 were located near sewer line. No waste encountered at Pts 59, 60, and 63-69. Pts 70-74 were not completed due to proximity to header.

Material(s) Delivered to Site

Corey M. Rice

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

DAILY FIELD ACTIVITIES REPORT

Client Name: *Bridgeton Landfill*
Aquaterra Project Name: *Waste Limits Investigation*
Aquaterra Project Number: *3718.1*
Project Location: *Bridgeton, MO*

Date: *February 2, 2010*
Start Time: *7:30 AM*
Stop Time: *5:00 PM*

Task: *Waste Limits Investigation*

Weather Information *34ºF*

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra	*Mini Excavator*
Phil Allen - Aquaterra	

Work Areas/Boundaries

118912, 118906

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 75-161

Work Comments/Observations and Test Results

No waste at Pts 75, 77, and 79. Pts 76 and 78 were not completed due to access limitations. Waste encountered at Pt 80 and 10' from waste boundary. No waste at Pts 81-84. Pts 85-87 were not completed due to proximity to header. No waste at 88-93. Waste encountered at Pts 94, 97-99 and 10' from waste boundary. Pt 95 was not completed due to proximity to electric. No waste at Pts 100-101. Pt 102 located in letdown. No waste at Pts 103-105. Pt 106 located near electric. Completed Pts 107 and 108, waste encountered at Pt 108, no waste 20' from waste boundary. No waste at Pts 109-117. Pt 118 located near power pole. No waste at Pt 119-120. Waste encountered at Pt 122 but not 20' from waste boundary. No waste at Pt 123-126. Waste encountered at Pt 127 but not 20' from waste boundary. Waste was not encountered at Pts 128-129. Pts 130-134 were not completed due to proximity to header. No waste at 135-142. Relocated Pts 143-16, denoted 143R-161R. No waste at Pts 143R-146R. Waste encountered at Pts 147R-161R, except 151R. Pt 151R was relocated to east side of drainage way to confirm berm was constructed of soil, no waste encountered, excavated to 6' bgs.

Material(s) Delivered to Site

Corey M. Rice

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

DAILY FIELD ACTIVITIES REPORT

Client Name:	*Bridgeton Landfill*	**Date:**	*March 1, 2010*
Aquaterra Project Name:	*Waste Limits Investigation*	**Start Time:**	*7:30 AM*
Aquaterra Project Number:	*3718.1*	**Stop Time:**	*11:00 AM*
Project Location:	*Bridgeton, MO*		

Task: *Waste Limits Investigation*

Weather Information *34 ºF*

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra	*Mini Excavator*
Claire Eubanks - Aquaterra	

Work Areas/Boundaries

118906

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 153-161

Work Comments/Observations and Test Results

Began waste investigation at Pt 153, outside the fence along St. Charles Rock Road. No waste encountered at Pts 153-161. Previous investigation inside the fence encountered waste at Pts R155-R161 additional Pts 155B-160B were completed. Waste was encountered at Pt 156B and Pt. 158B, no waste encountered at additional points investigated between permit boundary and fence.

Material(s) Delivered to Site

Cory M. Rice

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

DAILY FIELD ACTIVITIES REPORT

Client Name: *Bridgeton Landfill*
Aquaterra Project Name: *Waste Limits Investigation*
Aquaterra Project Number: *3718.1*
Project Location: *Bridgeton, MO*

Date: *May 5, 2010*
Start Time: *8:00 AM*
Stop Time: *4:00 PM*

Task: *Cover Thickness Investigation*

Weather Information *71 ºF*

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra
Operator - GeoDrill

Geoprobe

Work Areas/Boundaries

118912, 118906, 218903 (Area #1, Area #2 and Area #6)

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 328-342, 356-357, 360-363

Work Comments/Observations and Test Results

Began cover thickness investigation in contianer yard. Completed Pts 328-342, depth to waste ranged from 3-14 ft bgs. Cover consisted of gravel and clay. Moved to area upslope from transfer station. Completed Pts 356-357, and 360-363, waste encountered at 3 ft bgs.

Material(s) Delivered to Site

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

DAILY FIELD ACTIVITIES REPORT

Client Name: *Bridgeton Landfill*
Aquaterra Project Name: *Waste Limits Investigation*
Aquaterra Project Number: *3718.1*
Project Location: *Bridgeton, MO*

Date: *May 6, 2010*
Start Time: *8:00 AM*
Stop Time: *4:00 PM*

Task: *Cover Thickness Investigation*

Weather Information *65 ºF*

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra
Operator - GeoDrill

Geoprobe

Work Areas/Boundaries

118912, 118906, 218903 (Area #1, Area #2 and Area #6)

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 358-359, 367, 377-381, 388-393, 406

Work Comments/Observations and Test Results

Investigation in area upslope from transfer station. Completed Pts 358-359, 367, and 406, waste was encountered at 3 ft bgs. Other Pts to be completed in this area were not accessible to truck-mounted geoprobe. Moved to area north of flare. Completed Pts 377-381, no waste was encountered to 3 ft bgs. Moved to southeast corner of 118912, completed Points 388-393, waste was encountered 3 ft bgs.

Material(s) Delivered to Site

Corey M. Rice

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

DAILY FIELD ACTIVITIES REPORT

Client Name: *Bridgeton Landfill*
Aquaterra Project Name: *Waste Limits Investigation*
Aquaterra Project Number: *3718.1*
Project Location: *Bridgeton, MO*

Date: *May 12, 2010*
Start Time: *7:00 AM*
Stop Time: *4:00 PM*

Task: *Cover Thickness Investigation*

Weather Information

67 ºF

Contractors, Personnel, and Equipment On Site

Corey Rice - Aquaterra	*Mini Excavator*

Work Areas/Boundaries

118912, 118906, 218903 (Area #6)

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tests Completed/Observed

Points 364, 369-375, 385-386, 393, 400-403

Work Comments/Observations and Test Results

Cover thickness investigation using a mini excavator in areas where the truck-mounted Geoprobe could not access. No waste encountered at Pts 369-375, 385-386, 393, 400-403. Waste encountered 3 ft bgs at Pt 364.

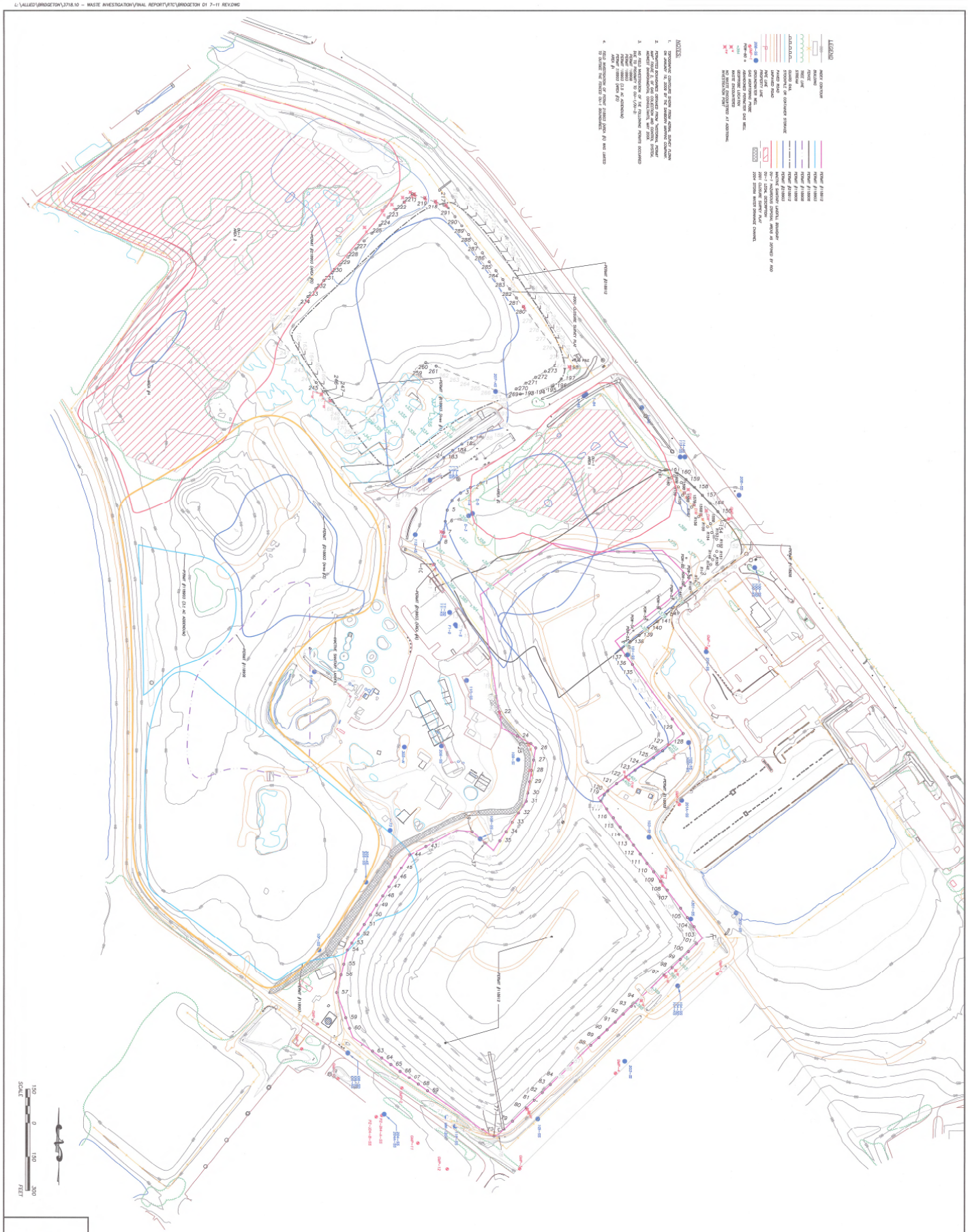
Material(s) Delivered to Site

Corey M. Rice

Aquaterra Personnel

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.

L:\ALLIED\BRIDGETON\3718.10 – WASTE INVESTIGATION\FINAL REPORT\RTC\BRIDGETON 01 7-11 REV.DWG

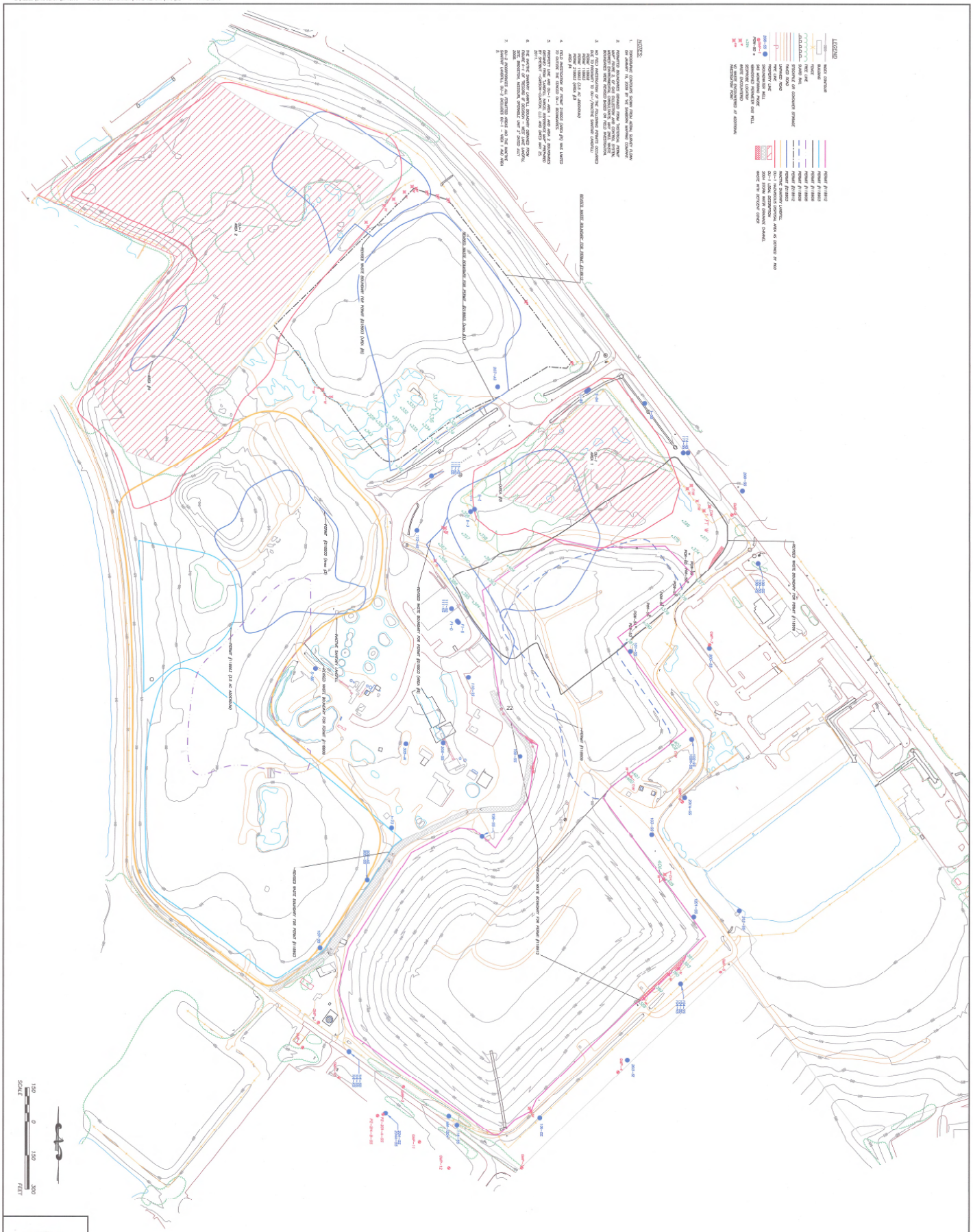


WASTE INVESTIGATION BRIDGETON LANDFILL WASTE INVESTIGATION	CLIENT: REPUBLIC SERVICES, INC. BRIDGETON LANDFILL BRIDGETON, MISSOURI
REV.: 0 · DRAWING NUMBER: 1 · PROJECT NUMBER: 3718.10 · SHT. 1 OF 2	DRAWN BY: CME · DESIGNED BY: CME · PROJECT MGR: CME ELECTRONIC FILE NAME: BRIDGETON 01 7-11 REV.DWG · DATE: 7/19/10

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.
7311 West 130th Street, Suite 100
Overland Park, Kansas 66213

REV.	DATE	BY	DESCRIPTION
R5	–	5BY	–
R4	–	4BY	–
R3	–	3BY	–
R2	–	2BY	–
R1	–	1BY	–
R0	7/1/11	CME	REVISED PER MDNR COMMENT LETTER DATED 6-24-11

L:\ALLIED\BRIDGETON\3718.10 – WASTE INVESTIGATION\FINAL REPORT\RTC\02 – 7-11 REV.DWG



SCALE 150 0 150 300 FEET

REVISED WASTE BOUNDARIES
BRIDGETON LANDFILL WASTE INVESTIGATION

REV: 0 | DRAWING NUMBER: 2 | PROJECT NUMBER: 3718.10 | SHT. 2 OF 2

CLIENT: REPUBLIC SERVICES, INC.
BRIDGETON LANDFILL
BRIDGETON, MISSOURI

DRAWN BY: CME | DESIGNED BY: CME | PROJECT MGR: CME
ELECTRONIC FILE NAME: 02 – 7-11 REV.DWG | DATE: 7/19/10

AQUATERRA
ENVIRONMENTAL SOLUTIONS, INC.
7311 West 130th Street, Suite 100
Overland Park, Kansas 66213

REV.	DATE	BY	DESCRIPTION
R5	–	SBY	–
R4	–	4BY	–
R3	–	3BY	–
R2	–	2BY	–
R1	–	1BY	–
R0	7/1/11	CME	REVISED PER MDNR COMMENT LETTER DATED 6-24-11

APPENDIX B

PERIMETER LFG MONITORING WELL BORING LOGS

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BORING NUMBER BRISL001

CLIENT Bridgeton Landfill, LLC
PROJECT NAME West Lake Landfill
PROJECT NUMBER CHE8424
PROJECT LOCATION Bridgeton, MO
DATE STARTED 09/08/21 **COMPLETED** 09/08/21
GROUND ELEVATION 450.3 ft. MSL **HOLE HOLE SIZE** 8"
DRILLING CONTRACTOR Bulldog
COORDINATES N 1069142.35 E 834521.73
DRILLING EQUIPMENT
GWL AT TIME OF DRILLING ---
DRILLING METHOD Hollow Stem Auger
GWL AT END OF DRILLING ---
LOGGED BY Amanda Toye **CHECKED BY** Jesse Varsho
GWL AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION SOIL TYPE (USCS); color; plasticity/grading; grain size and minor constituents; consistency/density; moisture; other; odor/staining [FORMATION]	USCS	SAMPLE TYPE NUMBER	RECOVERY/ ATTEMPTED (in)	BLOW COUNTS (N VALUE)	PID (ppm)	COMMENTS
450	0		(0') Hydro excavation, no samples recovered.						
	5		(5') Dark gray SAND with SILT, fine grained, moist.	SM	SS-1	12/24	1-2-1-3 (3)	0	
445			(7') Dark gray SAND with SILT, fine grained, moist.	SM	SS-2	12/24	2-3-2-3 (5)	0	
			(9') Dark gray SAND with SILT, fine grained, moist.	SM	SS-3	19/24	2-3-2-3 (5)	0	
	10		(9.8') Gray SAND, fine grained, cohesive, moist.	SM					
440			(10.4') Gray SAND, fine grained with trace silt, cohesive, moist.	SM					
			(11.3') Gray SAND, fine grained with trace silt, cohesive, moist.	SM	SS-4	20/24	5-4-4-4 (8)	0	
			(11.6') Light gray with some orange mottling SAND, fine grained, cohesive, moist.	SM					
			(13.5') Light gray SAND with SILT, fine grained with little silt, cohesive, moist.	SM	SS-5	18/24	3-4-3-3 (7)	0	
	15		(15.5') Gray SAND, fine grained, cohesive, moist.	SM	SS-6	18/24	3-3-4-6 (7)	0	
435			(15.8') Gray SILT, fine grained, cohesive, saturated.	CL-ML					
			(16.6') Gray SAND with SILT, fine grained, cohesive.	SM					
			(17.5') Gray SAND with SILT, fine grained, cohesive.	SM	SS-7	18/24	7-7-11-14 (18)	0	
			(17.7') Gray SAND, fine to medium grained, loose, moist.	SP					
	20		(19.5') Gray SAND, fine to medium grained, loose, moist to wet (water encountered).	SP	SS-8	18/24	4-6-6-8 (12)	0	
430			(22') Gray SAND, fine to medium grained, loose, moist.	SP	SS-9	12/24	WH-6-11-13 (17)	0	
			(24') Gray SAND, fine to medium grained, loose, moist.	SP	SS-10	12/24	3-7-11-12 (18)	0	
	25		(25') Boring terminated.						

GEOS ROCH MGP GEOT WEST LAKE LANDFILL - GINT STD US LAB.GDT - GEOS WEST LAKE LANDFILL.GPJ

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BORING NUMBER BRISL002

CLIENT Bridgeton Landfill, LLC
PROJECT NAME West Lake Landfill
PROJECT NUMBER CHE8424
PROJECT LOCATION Bridgeton, MO
DATE STARTED 09/08/21 **COMPLETED** 09/08/21
GROUND ELEVATION 450.13 ft. MSL **HOLE HOLE SIZE** 8"
DRILLING CONTRACTOR Bulldog
COORDINATES N 1068634.36 E 834584.42
DRILLING EQUIPMENT
GWL AT TIME OF DRILLING ---
DRILLING METHOD Hollow Stem Auger
GWL AT END OF DRILLING ---
LOGGED BY Amanda Toye **CHECKED BY** Jesse Varsho
GWL AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION SOIL TYPE (USCS); color; plasticity/grading; grain size and minor constituents; consistency/density; moisture; other; odor/staining [FORMATION]	USCS	SAMPLE TYPE NUMBER	RECOVERY/ ATTEMPTED (in)	BLOW COUNTS (N VALUE)	PID (ppm)	COMMENTS
450	0		(0') Hydro excavation, no samples recovered.						
	5								
445			(5') Gray CLAY with GRAVEL, nonplastic, fine to coarse grained, moist.	CL	SS-1	6/24	3-6-4-3 (10)	0	
			(7.3') Dark gray with trace orange brown mottling CLAY with SAND, low plasticity, trace sand, moist.	CL	SS-2	20/24	WH-3-3-4 (6)	0	
	10		(9') Dark gray with trace orange brown mottling CLAY with SAND, low plasticity, trace sand, moist.	CL	SS-3	24/24	1-3-5-6 (8)	0	
440			(11.5') Light gray CLAY with SAND, nonplastic, fine grained, cohesive, moist.	CL	SS-4	24/24	1-2-2-2 (4)	0	
			(13') Light gray CLAY with SAND, nonplastic, fine grained, cohesive, moist.	CL	SS-5	24/24	7-12-14-18 (26)	0	
	15		(14.3') Light gray SAND, fine grained, cohesive, moist.	SP					
435			(15') Light gray CLAY with SAND, medium plasticity, fine grained sand, moist.	CL					
			(15.3') Gray SAND, fine grained, cohesive, moist.	SP	SS-6	24/24	8-6-5-6 (11)	0	
			(17.3') Gray SAND, grades from medium to fine grained, loose, saturated (water encountered).	SP	SS-7	20/24	2-4-5-7 (9)	0	
	20		(19.3') Light gray SAND, fine grained, cohesive, moist.	SP	SS-8	20/24	4-5-5-8 (10)	0	
430			(22') Light gray SAND, fine grained, cohesive, moist, with black striation 3 inches from top.	SP	SS-9	12/24	WH-5-5-6 (10)	0	
			(23.9') Light gray SAND, fine grained, cohesive, moist.	SP	SS-10	13/24	2-4-9-11 (13)	0	
	25		(25') Boring terminated.						

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BORING NUMBER BRISL003

CLIENT Bridgeton Landfill, LLC
PROJECT NAME West Lake Landfill
PROJECT NUMBER CHE8424
PROJECT LOCATION Bridgeton, MO
DATE STARTED 09/09/21 **COMPLETED** 09/09/21
GROUND ELEVATION 451.55 ft. MSL **HOLE HOLE SIZE** 8"
DRILLING CONTRACTOR Bulldog
COORDINATES N 1068211.7 E 834603.84
DRILLING EQUIPMENT
GWL AT TIME OF DRILLING ---
DRILLING METHOD Hollow Stem Auger
GWL AT END OF DRILLING ---
LOGGED BY Amanda Toye **CHECKED BY** Jesse Varsho
GWL AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION SOIL TYPE (USCS); color; plasticity/grading; grain size and minor constituents; consistency/density; moisture; other; odor/staining [FORMATION]	USCS	SAMPLE TYPE NUMBER	RECOVERY/ ATTEMPTED (in)	BLOW COUNTS (N VALUE)	PID (ppm)	COMMENTS
	0		(0') Hydro excavation, no samples recovered.						
450									
	5								
			(5') Light gray CLAY, low plasticity, trace sand, soft, moist.	CL	SS-1	24/24	2-2-3-3 (5)	0	
445			(7.3') Light gray CLAY, low plasticity, trace sand, soft, moist.	CL	SS-2	20/24	2-3-3-3 (6)	0	
			(7.6') Light gray SILT with SAND, fine grained sand with trace clay, soft, moist.	ML					
	10		(9.5') Light gray SILT with SAND, fine grained sand with trace clay, soft, moist.	ML	SS-3	18/24	1-3-1-3 (4)	0	
			(9.6') Dark gray SAND with SILT, fine grained, moist, with <0.25 inch thick moist layer of asphalt waste at 10.3 feet.	SM					
440			(11') Gray SILT with SAND, fine grained sand, moist.	ML	SS-4	24/24	1-3-4-5 (7)	0	
			(11.2') Gray CLAY with SILT, medium plasticity, fine grained with little silt, moist.	CL					
			(13') Gray CLAY with SILT, medium plasticity, fine grained with little silt, dry.	CL	SS-5	24/24	2-3-8-10 (11)	0	
	15		(14') Light gray SAND, fine grained, dry.	SP					
			(15') Dark gray CLAY with SILT, medium plasticity, fine grained with little silt, moist.	CL	SS-6	24/24	4-4-3-4 (7)	0	
435			(15.1') Dark gray SILT with SAND, fine grained sand, dry.	SP					
			(15.2') Light to dark gray SAND, fine grained, cohesive.	ML					
			(17.4') Dark gray SILT with SAND, fine grained sand, becoming more moist with depth.	ML	SS-7	19/24	2-2-6-5 (8)	0	
	20		(19.2') Gray SILT, fine grained, saturated (water encountered).	ML	SS-8	22/24	2-2-4-5 (6)	0	
430					SS-9	8/24	5-7-6-4 (13)	0	
			(22.3') Gray SAND, fine grained, cohesive, moist.	SP	SS-10	12/24	1-3-5-7 (8)	0	
	25		(24') Gray SAND, fine grained, cohesive, moist.	SP					
			(25.7') Gray SAND, fine grained, cohesive, moist.	SP	SS-11	10/18	4-6-5 (11)	0	
425			(26.6') Boring terminated.						

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BORING NUMBER BRISL004

CLIENT Bridgeton Landfill, LLC
PROJECT NAME West Lake Landfill
PROJECT NUMBER CHE8424
PROJECT LOCATION Bridgeton, MO
DATE STARTED 09/10/21 **COMPLETED** 09/10/21
GROUND ELEVATION 451.64 ft. MSL **HOLE HOLE SIZE** 8"
DRILLING CONTRACTOR Bulldog
COORDINATES N 1067799.46 E 834592.72
DRILLING EQUIPMENT
GWL AT TIME OF DRILLING ---
DRILLING METHOD Hollow Stem Auger
GWL AT END OF DRILLING ---
LOGGED BY Amanda Toye **CHECKED BY** Jesse Varsho
GWL AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION SOIL TYPE (USCS); color; plasticity/grading; grain size and minor constituents; consistency/density; moisture; other; odor/staining [FORMATION]	USCS	SAMPLE TYPE NUMBER	RECOVERY/ ATTEMPTED (in)	BLOW COUNTS (N VALUE)	PID (ppm)	COMMENTS
	0		(0') Hydro excavation, no samples recovered.						
450									
	5								
			(5') Gray CLAY with SAND and SILT, high plasticity, some fine grained sand, moist.	CH	SS-1	20/24	1-5-7-7 (12)	0	
445			(7.5') Gray SILT with CLAY, trace fine to coarse sand with lens at 8.5 feet, moist.	MH	SS-2	18/24	1-3-2-2 (5)	0	
	10		(9.2') SILT with CLAY, low plasticity, trace fine to coarse sand, moist.	MH	SS-3	20/24	2-2-4-4 (6)	0	
440			(11') Gray CLAY with SILT, medium to low plasticity, some fine grained silt, soft, moist.	CL	SS-4	24/24	3-4-5-8 (9)	0	
			(13.2') Gray SILT with SAND, fine grained sand with trace clay, soft, moist.	ML	SS-5	21/24	2-2-3-3 (5)	0-0.3	
	15		(15') Gray SILT with SAND, fine grained sand with trace clay, soft, moist.	ML	SS-6	24/24	1-1-1-2 (2)	0	
435			(17') Gray CLAY with SILT, medium plasticity, little fine grained silt, moist.	CH	SS-7	24/24	1-2-2-2 (4)	0	
			(18.2') Gray SILT with CLAY, little fine grained silt, soft, moist.	ML					
	20		(19.2') Gray SILT with CLAY, fine grained silt with some clay, soft, moist.	ML	SS-8	22/24	1-1-2-2 (3)	0	
430			(21.5') Dark gray SILT with CLAY, fine grained silt with some clay, soft, moist.	ML	SS-9	18/24	1-1-3-5 (4)	3.0-15	PID increases with depth
			(22.8') Dark gray SAND, fine grained, cohesive, moist, petroleum odor.	SP					
			(23') Dark gray SAND, fine grained, cohesive, moist, petroleum odor.	SP	SS-10	20/24	2-3-8-7 (11)	3.0-7.0	PID increases with depth
	25		(23.3') Gray SAND, fine grained with trace clay, moist with water ecountered at base of boring.	SP-SC					
			(25.2') Boring terminated.						

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BORING NUMBER BRISL005

CLIENT Bridgeton Landfill, LLC
PROJECT NAME West Lake Landfill
PROJECT NUMBER CHE8424
PROJECT LOCATION Bridgeton, MO
DATE STARTED 09/13/21 **COMPLETED** 09/13/21
GROUND ELEVATION 450.1 ft. MSL **HOLE HOLE SIZE** 8"
DRILLING CONTRACTOR Bulldog
COORDINATES N 1067326.31 E 834763.3
DRILLING EQUIPMENT
GWL AT TIME OF DRILLING ---
DRILLING METHOD Hollow Stem Auger
GWL AT END OF DRILLING ---
LOGGED BY Amanda Toye **CHECKED BY** Jesse Varsho
GWL AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION SOIL TYPE (USCS); color; plasticity/grading; grain size and minor constituents; consistency/density; moisture; other; odor/staining [FORMATION]	USCS	SAMPLE TYPE NUMBER	RECOVERY/ ATTEMPTED (in)	BLOW COUNTS (N VALUE)	PID (ppm)	COMMENTS
450	0		(0') Hydro excavation, no samples recovered.						
445	5		(5') Gray CLAY with SAND, medium to low plasticity, little fine grained sand and trace gravel, soft, moist.	CL	SS-1	14/24	2-1-1-2 (2)	0	
			(7.2') Gray CLAY with SAND TO SILT, medium plasticity, little fine grained sand becoming sandier with depth, soft, moist.	CH	SS-2	22/24	1-2-4-3 (6)	0	
440	10		(9') Gray with dark orange mottling CLAY, medium to high plasticity, trace sand, stiff, moist.	CH	SS-3	24/24	2-6-5-8 (11)	0	
			(11') Gray CLAY with SAND TO SILT, fine grained sand, soft, moist.	CH	SS-4	24/24	2-2-4-3 (6)	0	
			(13.4') Gray CLAY with SAND TO SILT, fine grained sand, soft, moist.	CH	SS-5	19/24	2-4-4-3 (8)	0	
435	15		(13.8') Light gray SAND, fine grained, cohesive, dry.	SM					
			(15.3') Light gray SAND, fine grained, cohesive, dry.	SM	SS-6	20/24	2-2-2-2 (4)	0	
			(16.3') Gray CLAY with SAND, medium plasticity, fine grained sand, soft, moist.	CL	SS-7	0/24	NA	NA	
430	20		(19') Gray SAND and SILT, fine grained sand, cohesive, saturated (water encountered at base of sample).	SM	SS-8	24/24	2-4-2-1 (6)	0	
			(21.8') Gray SAND, fine grained, saturated.	SP	SS-9	15/24	WH-1-2-4 (3)	0	
425	25		(23.8') Gray SAND, fine grained, saturated.	SP	SS-10	14/24	2-10-6-16 (16)	0	
			(25.1') Boring terminated.						

GEOS ROCH MGP GEOT WEST LAKE LANDFILL - GINT STD US LAB.GDT - GEOS WEST LAKE LANDFILL.GPJ

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BORING NUMBER BRISL006

CLIENT Bridgeton Landfill, LLC
PROJECT NAME West Lake Landfill
PROJECT NUMBER CHE8424
PROJECT LOCATION Bridgeton, MO
DATE STARTED 09/14/21 **COMPLETED** 09/14/21
GROUND ELEVATION 450.46 ft. MSL **HOLE HOLE SIZE** 8"
DRILLING CONTRACTOR Bulldog
COORDINATES N 1067069.59 E 835127.07
DRILLING EQUIPMENT
GWL AT TIME OF DRILLING ---
DRILLING METHOD Hollow Stem Auger
GWL AT END OF DRILLING ---
LOGGED BY David Keln **CHECKED BY** Jesse Varsho
GWL AFTER DRILLING ---

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION SOIL TYPE (USCS); color; plasticity/grading; grain size and minor constituents; consistency/density; moisture; other; odor/staining [FORMATION]	USCS	SAMPLE TYPE NUMBER	RECOVERY/ ATTEMPTED (in)	BLOW COUNTS (N VALUE)	PID (ppm)	COMMENTS
450	0		(0') Hydro excavation, no samples recovered.						
	5		(5') Gray CLAY with SAND, low plasticity, little fine grained sand, soft, moist.	CH	SS-1	24/24	WH-2-2-2 (4)	0	
445			(7.4') Gray CLAY with SAND, medium plasticity, little fine grained sand, soft, moist.	CH	SS-2	24/24	WH-WH-2-2	0	
	10		(9.3') CLAY, medium to high plasticity, trace sand, stiff, moist.	CH	SS-3	24/24	1-2-3-5 (5)	0	
440			(11') Gray CLAY with SILT, medium to high plasticity, fine grained silt, stiff.	CH	SS-4	24/24	1-3-3-4 (6)	0	
			(13') Gray CLAY with SILT, medium to high plasticity, fine grained silt, stiff.	CH	SS-5	24/24	1-2-3-4 (5)	0	
	15		(14.7') CLAYEY SAND, fine grained sand, dry.	SC					
435			(15.6') Gray SANDY CLAY, fine grained sand.	CL	SS-6	24/24	WH-1-4-6 (5)	0	
			(16.4') Gray SAND, fine grained.	SP					
			(17.6') Gray SAND, fine grained, saturated.	SP	SS-7	24/24	2-3-7-8 (10)	NA	
	20				SS-8	24/24	5-6-6-5 (12)	0	
430			(20.2') Gray SAND, fine grained with trace silt, saturated.	SM					
			(21') Gray SANDY SILT and SILTY SAND, interbedded fine grained sand and silt, saturated.	SC-SM	SS-9	24/24	WH-WH-WH-4	0	
					SS-10	24/24	2-1-1-1 (2)	0	
	25		(24') Gray SANDY SILT and SILTY SAND, interbedded fine grained sand and silt, saturated.	SC-SM					
			(25.1') Boring terminated.						

GEOS ROCH MGP GEOT WEST LAKE LANDFILL - GINT STD US LAB.GDT - GEOS WEST LAKE LANDFILL.GPJ

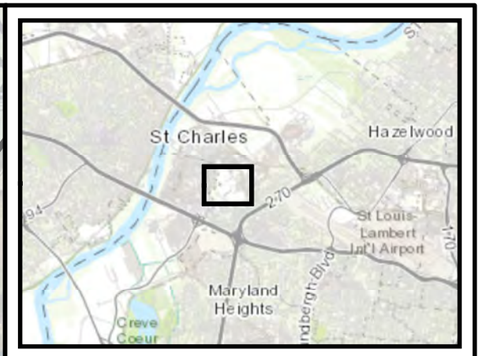
APPENDIX C

ALLUVIAL POTENTIOMETRIC MAPS

DRAFT

I-62
429.59
D-83*
432.59
I-65
429.69
I-66
429.96
D-13
429.70
D-6
429.47
I-67
429.93
D-12*
429.78
I-11
429.51
I-68
430.25
D-85
430.02
I-9*
429.53
D-93
429.48
429.5
PZ-113-AD*
429.79
PZ-113-AS
429.77
D-87
429.80
I-4
D-3
429.84
PZ-112-AS
430
PZ-304-AI
429.78
PZ-303-AS
429.93
I-73*
430.85
D-81
429.92
PZ-302-AI
429.97
D-89
429.99

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7a: Alluvium Potentiometric Surface Map January 2021

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

I-62
429.46
D-83*
429.54

I-65
429.56

I-66
429.82

D-13
429.46

D-6
429.38

D-12*
429.60

I-11
429.36

I-67
429.79

D-85
429.90

I-68
430.35

I-9*
429.52

429.5

D-93
429.51

PZ-113-AD*
429.52

429.5

I-4

D-87
429.60

PZ-113-AS
429.49

D-3
429.50

PZ-112-AS

430

PZ-304-AI
429.80

PZ-303-AS
430.04

430

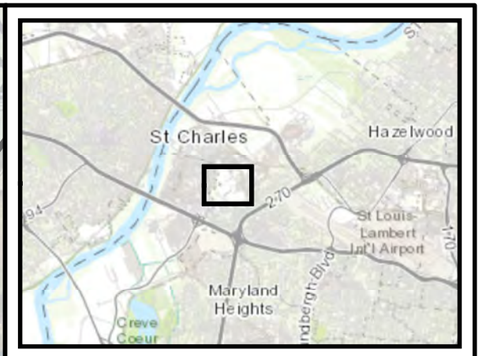
I-73
429.58

D-81
429.97

PZ-302-AI
429.92

D-89
429.85

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

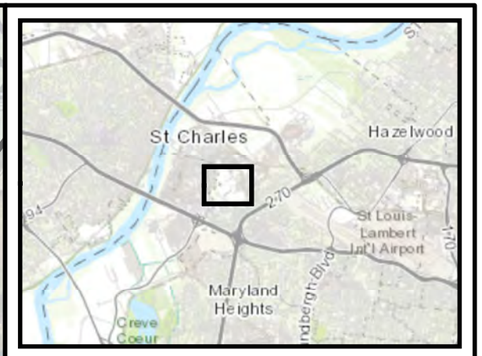
Figure 7b: Alluvium Potentiometric Surface Map
February 2021
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

I-62
430.79
D-83*
430.90
I-65
430.86
I-66
431.07
D-13
430.82
MW-409
MW-408
D-6
430.75
I-67
431.06
D-12*
429.93
I-11
430.67
I-68
431.55
D-85
431.09
I-9
430.83
D-93
430.83
PZ-113-AD*
430.83
PZ-113-AS
430.75
D-87
430.84
I-4
PZ-112-AS
D-3
430.73
431
431.5
PZ-304-AI
431.03
PZ-303-AS
431.33
431
I-73
430.82
D-81
431.21
PZ-302-AI
431.21
D-89
431.18

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. NM = Not measured; the OU-3 Respondents do not have legal access to this well location
5. For well clusters, the lowest value was included during contouring.
6. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
7. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7c: Alluvium Potentiometric Surface Map March 2021

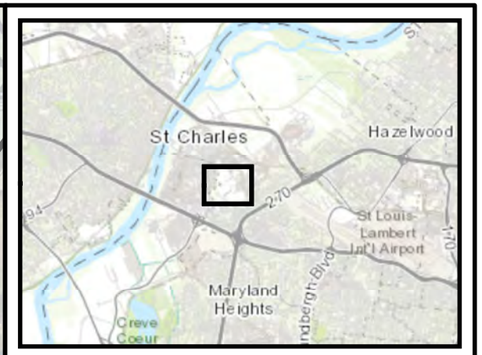
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

I-62
432.13
MW-401-P3*
432.43
D-83*
432.22
MW-401-P1
432.16
MW-401-P2*
431.41
I-65
432.16
I-66
432.36
D-13
432.10
I-67
432.27
MW-409
432.13
MW-408*
432.22
D-6
431.98
D-12*
432.19
I-11
431.87
MW-405-P1*
432.13
MW-405-P3*
432.25
MW-405-P2
431.99
I-9*
431.93
D-93
431.88
MW-117
432.10
PZ-113-AS*
431.98
D-87
432.01
PZ-113-AD
431.95
I-4
D-3
432.05
PZ-112-AS
D-85
432.32
I-68
432.66
PZ-304-AI
431.87
PZ-303-AS
432.30
D-81
432.13
PZ-302-AI
432.17
MW-302
432.37
D-89
432.16
I-73
431.96
432
432.5
432.25

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7d: Alluvium Potentiometric Surface Map April 2021

West Lake Landfill OU-3
Bridgeton, Missouri

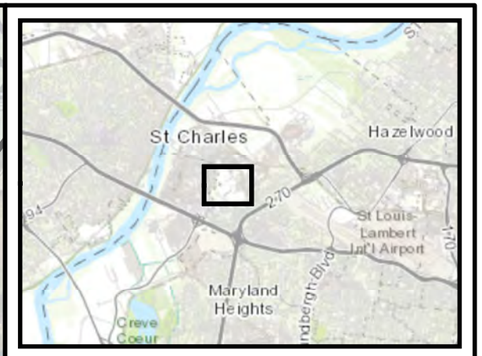
ERM

DRAFT

MW-401-P3* 432.61
I-62 432.58
D-83* 432.71
MW-401-P1 432.57
MW-401-P2* 432.83
I-65 432.67
I-66 432.86
D-13 432.62
I-67 432.74
MW-409 432.60
MW-408* 432.73
D-6 432.48
D-12* 432.68
I-11 432.43
432.5
MW-405-P3* 432.63
MW-405-P1* 432.67
MW-405-P2 432.51
I-9* 432.49
D-93 432.47
MW-117 432.65
D-87 432.63
PZ-113-AD* 432.61
PZ-113-AS 432.55
I-4
D-3 432.59
PZ-112-AS
D-85 432.77
I-68 433.01
433
PZ-304-AI 432.60
PZ-303-AS 432.94
I-73 432.58
PZ-302-AI 432.86
D-81 432.73
MW-302 432.94
D-89 432.73

N

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7e: Alluvium Potentiometric Surface Map May 2021
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

Q:\Boston\team\MW\Clients_V_Z\WestLake\WestLake\Landfill_MO\MXD\GW_Contours\2021\5_May\WestLake_GWContours_May2021_Alluvium_20220121.mxd - Kelly.Mizak - 2/1/2022

DRAFT

D-83
432.71

I-62
432.71

I-65
432.77

MW-401-P3
432.78

MW-401-P2*
433.04

MW-401-P1*
432.83

I-66
432.92

MW-400-P1*
431.82

MW-400-P3*
432.82

MW-400-P2
432.73

D-13
432.71

MW-409
432.72

MW-408*
432.82

D-6
432.63

I-67
432.83

D-12*
432.82

I-11
432.54

MW-405-P1*
432.81

MW-405-P2*
432.64

MW-405-P3
432.46

432.5

I-9*
432.63

D-93
432.52

D-85
432.85

I-68
433.01

433

PZ-113-AD*
432.74

MW-117
432.75

D-87
432.76

PZ-113-AS
432.72

I-4

D-3*
432.71

PZ-112-AS

MW-118
432.72

MW-306-P1
432.81

MW-306-P3*
432.86

MW-111-P3*
432.70

MW-306-P2*
432.83

MW-111-P2
432.69

MW-111-P1*
432.99

MW-304-P1*
432.75

PZ-304-AI
432.73

PZ-303-AS*
433.08

I-73
432.71

MW-303-P1*
432.89

MW-303-P2
432.71

PZ-302-AI
432.90

D-81
432.82

MW-302
432.97

D-89
432.82

433

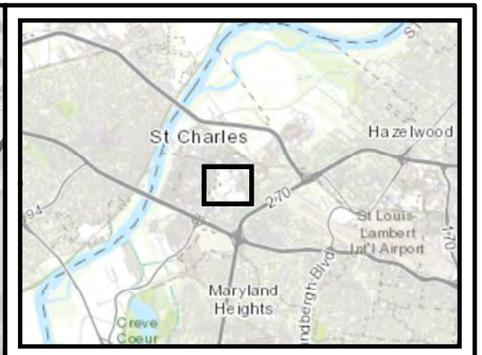
MW-505-P2*
433.06

MW-505-P3
433.10

MW-505-P1*
434.08

0 250 500 1,000
Feet

N



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7f: Alluvium Potentiometric Surface Map June 2021

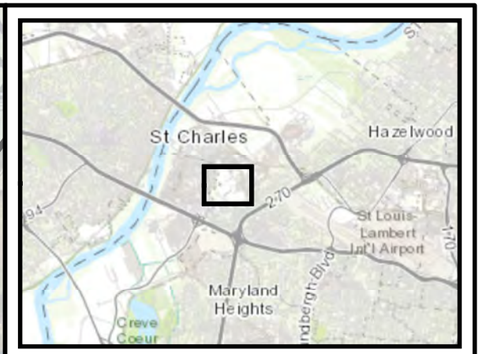
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

D-83
433.33
MW-401-P1
433.23
I-62*
431.24
MW-401-P3*
433.34
MW-401-P2*
433.27
I-65
433.19
I-66
433.27
MW-400-P3*
433.57
MW-400-P2
433.49
MW-400-P1*
433.62
D-13
433.12
MW-409
433.24
MW-408*
433.33
D-6
433.16
I-67
433.14
MW-407R-P1*
433.25
MW-407R-P2
433.18
MW-407R-P3*
433.22
D-12*
432.25
I-11
433.00
433
MW-405-P1*
433.46
MW-405-P3*
433.51
MW-405-P2
433.38
MW-117
433.12
D-85
433.14
I-68
433.22
D-93
433.01
I-9*
433.08
PZ-113-AS
433.07
PZ-113-AD*
433.08
I-4
D-87
433.13
D-3
433.12
MW-404-P1*
433.15
MW-404-P3
433.12
MW-404-P2*
433.23
PZ-112-AS
MW-118
433.06
MW-111-P3*
434.18
MW-306-P1*
434.61
MW-306-P3
432.96
MW-306-P2*
433.72
MW-111-P2*
434.78
MW-111-P1*
434.92
MW-304-P1*
432.26
PZ-304-AI
433.10
PZ-303-AS*
433.43
433
MW-303-P2
433.08
MW-303-P1*
433.26
I-73
432.94
PZ-302-AI
433.22
D-81
433.18
MW-302
433.35
D-89
433.17
MW-505-P1*
434.25
MW-505-P2
433.42
MW-505-P3*
433.47

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7g: Alluvium Potentiometric Surface Map July 2021

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

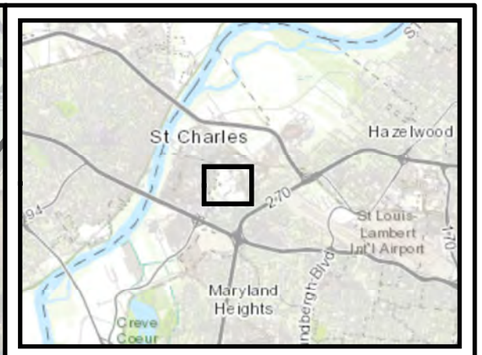
I-62
433.88
MW-401-P2
MW-401-P1
MW-401-P3
D-83*
433.89
I-65
434.09
I-66
434.26
MW-400-P2
433.71
MW-400-P3*
433.82
MW-400-P1*
433.83
D-13
433.94
MW-409
433.70
MW-408*
433.74
D-6*
431.59
I-67
434.11
MW-407R-P2
433.50
MW-407R-P3*
433.61
MW-407R-P1*
433.61
D-12*
433.75
I-11
433.52
MW-405-P2
433.51
MW-405-P1*
433.63
MW-405-P3*
433.64
D-85
434.07
I-68
434.23
MW-117
433.82
I-9*
433.36
D-93
433.30
PZ-113-AS
433.66
PZ-113-AD*
433.71
I-4
D-87
433.70
D-3
433.73
MW-404-P1*
433.54
MW-404-P2*
433.55
MW-404-P3
433.39
PZ-112-AS
MW-118
433.56
MW-306-P1*
432.44
MW-111-P1
MW-306-P3
433.34
MW-306-P2*
433.40
MW-111-P3
MW-111-P2
MW-304-P1*
433.57
PZ-304-AI
433.26
MW-303-P1*
433.35
PZ-303-AS*
433.58
MW-303-P2
433.20
I-73
433.38
PZ-302-AI
433.37
D-81
433.29
MW-302*
433.50
D-89
433.32
MW-505-P3
433.52
MW-505-P2*
433.94
MW-505-P1*
434.29

434

433.5

0 250 500 1,000
Feet

N



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7h: Alluvium Potentiometric Surface Map August 2021

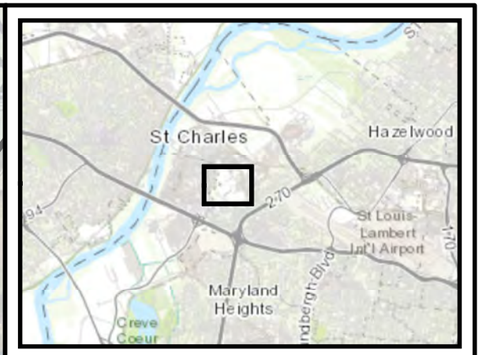
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

MW-401-P3 432.49
D-83 432.56
I-62* 432.58
MW-401-P2* 432.54
MW-401-P1* 432.59
I-65 432.75
I-66 433.01
MW-400-P2 432.43
MW-400-P3* 432.44
MW-400-P1* 432.57
D-13 432.66
MW-409 432.45
MW-408* 432.51
D-6 432.34
MW-407R-P1* 432.33
MW-407R-P3 432.30
MW-407R-P2* 432.32
D-12* 432.59
I-11 432.33
I-67 432.89
433
MW-405-P1* 432.78
MW-405-P3* 432.42
MW-405-P2 432.32
I-9* 432.24
D-93 432.21
I-68 433.08
D-85* 432.89
MW-117 432.66
PZ-113-AD* 432.60
D-87 432.57
PZ-113-AS 432.55
I-4
D-3 432.54
PZ-112-AS
432.5
MW-404-P1* 432.45
MW-404-P3 432.33
MW-404-P2* 432.39
MW-306-P3 432.33
MW-306-P2* 432.38
MW-118 432.50
MW-111-P3
MW-111-P2
MW-111-P1
MW-306-P1* 432.46
MW-304-P1
PZ-304-AI* 432.57
PZ-303-AS 432.42
MW-303-P1
MW-303-P2
I-73 432.35
PZ-302-AI 432.43
D-81 432.39
MW-302* 432.59
D-89 432.42
432.5
MW-505-P3* 432.65
MW-505-P2 432.63
MW-505-P1* 433.58

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7i: Alluvium Potentiometric Surface Map September 2021

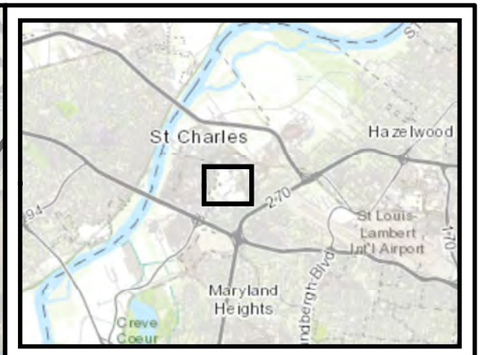
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

MW-401-P3 431.44
D-83 431.51
I-62* 431.55
MW-401-P2* 431.48
MW-401-P1* 431.56
I-65 431.66
I-66 431.89
MW-400-P3 431.42
MW-400-P2* 431.48
MW-400-P1* 431.61
D-13 431.61
MW-409 431.54
431.5
MW-408* 431.59
D-6 431.42
I-67 431.81
MW-407R-P1* 431.41
MW-407R-P2 431.33
MW-407R-P3* 431.37
D-12* 431.68
I-11 431.39
MW-405-P1* 431.56
MW-405-P3* 431.52
MW-405-P2 431.41
I-9* 431.37
D-93 431.33
431.5
MW-117 431.72
D-85 431.87
I-68 432.03
432
PZ-113-AS 431.67
PZ-113-AD* 431.69
I-4
D-87 431.68
D-3 431.70
PZ-112-AS
MW-404-P1* 431.60
MW-404-P2 431.56
MW-404-P3* 431.63
MW-118 431.67
MW-306-P1* 431.56
MW-306-P2* 431.52
MW-306-P3 431.49
431.5
MW-111-P3* 431.69
MW-111-P2 431.68
MW-111-P1* 431.78
MW-304-P1 431.60
PZ-304-AI 431.50
PZ-303-AS 431.68
MW-303-P1
MW-303-P2
I-73 431.61
PZ-302-AI 431.65
D-81 431.62
MW-302* 431.82
D-89* 431.32
MW-505-P1* 432.93
MW-505-P2 431.85
MW-505-P3* 431.89

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7j: Alluvium Potentiometric Surface Map October 2021

West Lake Landfill OU-3
Bridgeton, Missouri

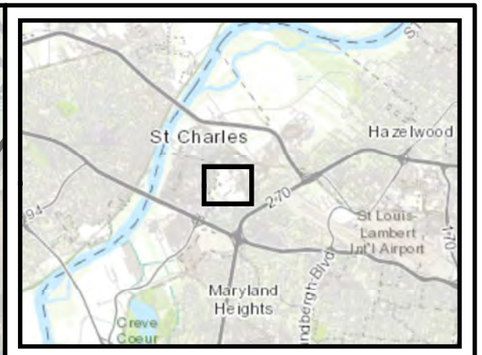
ERM

DRAFT

D-83
430.45
MW-401-P1
MW-401-P3
MW-401-P2
I-62
430.45
I-65
430.52
I-66
430.78
D-13
430.54
MW-400-P2*
430.47
MW-400-P3
430.46
MW-400-P1*
430.56
MW-409
430.47
MW-408*
430.53
D-6
430.35
MW-407R-P3*
430.39
MW-407R-P1*
430.39
MW-407R-P2
430.35
D-12*
430.63
I-11
430.33
MW-405-P1*
430.61
MW-405-P3*
430.55
MW-405-P2
430.44
I-9*
430.39
D-93
430.35
MW-404-P1*
430.64
MW-404-P2*
430.59
MW-404-P3
430.55
MW-306-P1*
430.66
MW-306-P2*
430.60
MW-306-P3
430.57
MW-304-P1
430.60
PZ-304-AI
430.55
PZ-303-AS*
430.88
MW-303-P1
430.67
MW-303-P2*
430.89
PZ-302-AI
430.74
D-81
430.72
MW-302*
430.89
D-89
430.68
MW-505-P1*
431.65
MW-505-P2
430.92
MW-505-P3*
430.99
430.5
I-67*
430.70
MW-213-P1
430.57
MW-213-P2*
430.59
I-68
430.91
D-85
430.88
MW-117
430.60
PZ-113-AS
430.56
PZ-113-AD*
430.58
D-87
430.57
MW-112-P3
I-4
MW-112-P2*
430.63
430.64
D-3
430.58
MW-112-P1*
430.44
PZ-112-AS
MW-118
430.56
MW-111-P1
430.61
MW-111-P3*
430.66
MW-111-P2*
430.62
I-73
430.50

N

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7k: Alluvium Potentiometric Surface Map November 2021

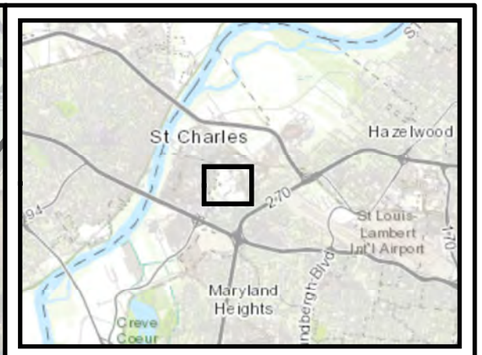
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

MW-401-P2 429.47
D-83* 429.68
I-62 429.65
MW-401-P3* 429.55
MW-401-P1* 429.58
429.5
I-65 429.67
I-66 429.96
MW-400-P2* 429.86
MW-400-P3 429.71
MW-400-P1* 429.84
MW-409 429.72
MW-408* 429.75
D-6 429.58
D-13 429.67
I-67* 429.91
MW-213-P1* 429.93
MW-213-P2 429.85
MW-407R-P1* 429.66
MW-407R-P2 429.60
MW-407R-P3* 429.65
D-12* 429.88
I-11 429.62
MW-405-P1* 429.87
MW-405-P3* 429.81
MW-405-P2 429.70
I-9* 429.63
D-93 429.62
D-85 430.03
I-68 430.20
MW-117 429.90
D-87* 430.04
PZ-113-AS* 429.87
PZ-113-AD 429.80
MW-112-P1 429.95
I-4
D-3 429.94
MW-112-P2* 430.05
MW-112-P3* 430.44
PZ-112-AS
MW-404-P1* 429.92
MW-404-P3 429.82
MW-404-P2* 429.93
430
MW-118 429.83
MW-111-P2 430.10
MW-111-P1* 430.71
MW-111-P3* 430.33
MW-306-P1* 430.11
MW-306-P3 429.97
MW-306-P2* 430.50
MW-304-P1 429.93
PZ-304-AI 429.83
PZ-303-AS* 430.08
MW-303-P1 429.99
MW-303-P2* 430.74
I-73 429.97
430
D-81 429.99
PZ-302-AI 430.05
MW-302* 430.18
D-89 430.03
MW-505-P1* 430.94
MW-505-P2 430.20
MW-505-P3* 430.24

0 250 500 1,000
Feet



Legend

- Well Location
- Inactive Well Location
- 456.87 Groundwater Elevation (ft. amsl)
- Groundwater Elevation Contour
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., from December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement not used in contouring.
4. For well clusters, the lowest value was included during contouring.
5. The 2021 alluvium potentiometric maps were prepared based on a limited data set which did not include any surface water elevation data.
6. At the time of 2021 reporting, groundwater elevation data within the alluvium were plotted as a single hydrostratigraphic unit; therefore, the shallow, intermediate, and deep alluvium wells were combined. During 2021 and 2022, significant subsurface characterization activities were completed, generating a high-resolution dataset that was interpreted to define environmental sequence stratigraphy at the site. Using the results of this work, multiple potential hydrostratigraphic units were defined. Detailed evaluation of the influence of these potential hydrostratigraphic units on groundwater flow is in progress.

Figure 7I: Alluvium Potentiometric Surface Map December 2021

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

428.83

SG-400
428.83

D-83
428.62

I-62
428.64

MW-401-P2
428.51

MW-401-P3
428.59

MW-401-P1
428.62

I-65
428.72

I-66
429.03

MW-400-P3
428.72

MW-400-P1
428.82

MW-400-P2
428.72

D-13
428.67

429

MW-409
428.66

MW-408
428.75

D-6
428.50

I-67
428.98

MW-213-P1
428.93

MW-213-P2
428.95

MW-407R-P2
428.61

MW-407R-P1
428.72

MW-407R-P3
428.66

D-12
428.78

I-11
428.57

428.75

MW-405-P1
428.88

MW-405-P3
428.82

MW-405-P2
428.71

D-85
428.78

I-68
429.28

MW-117
428.92

I-9
428.61

D-93
428.59

D-87
428.88

PZ-113-AS
428.80

PZ-113-AD
428.90

MW-404-P2
428.91

D-3
428.93

I-4

MW-112-P3
429.71

429

MW-404-P1
429.06

MW-404-P3
428.94

MW-112-P2
429.08

MW-112-P1
428.89

MW-306-P2
428.94

MW-118
428.88

MW-111-P2
429.07

MW-306-P1
428.99

MW-306-P3
428.90

MW-111-P3
429.21

MW-111-P1
429.06

MW-304-P1
428.97

PZ-304-AI
428.78

PZ-303-AS
429.09

429

I-73
428.88

MW-303-P1
429.06

MW-303-P2
429.08

K-128

SG-200
474.98

474.98

PZ-302-AI
429.02

D-81
428.95

429

MW-302
429.19

D-89
429.03

S-53

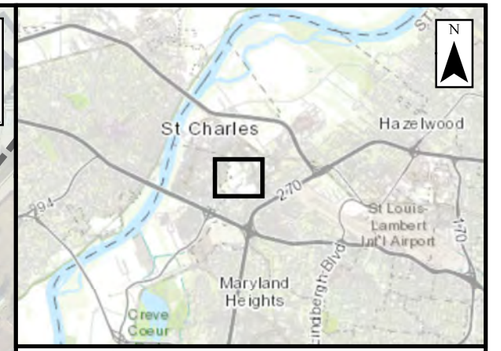
429.25

MW-505-P2
429.31

MW-505-P1
430.91

MW-505-P3
429.34

0 250 500 1,000
Feet



Legend

- Inactive Well Location
- Well Location
- Pumping Well Location
- Stilling Well Location (Surface Water Elevation - ft. amsl)
- 456.87 Groundwater Elevation used to develop groundwater contours (ft. amsl)
- 456.87 Groundwater Elevation not used to develop groundwater contours (ft. amsl) (See Note 4)
- 456.87 Surface Water Elevation (ft. amsl)
- Groundwater Elevation Contour (dashed where inferred)
- Surface Water Body
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

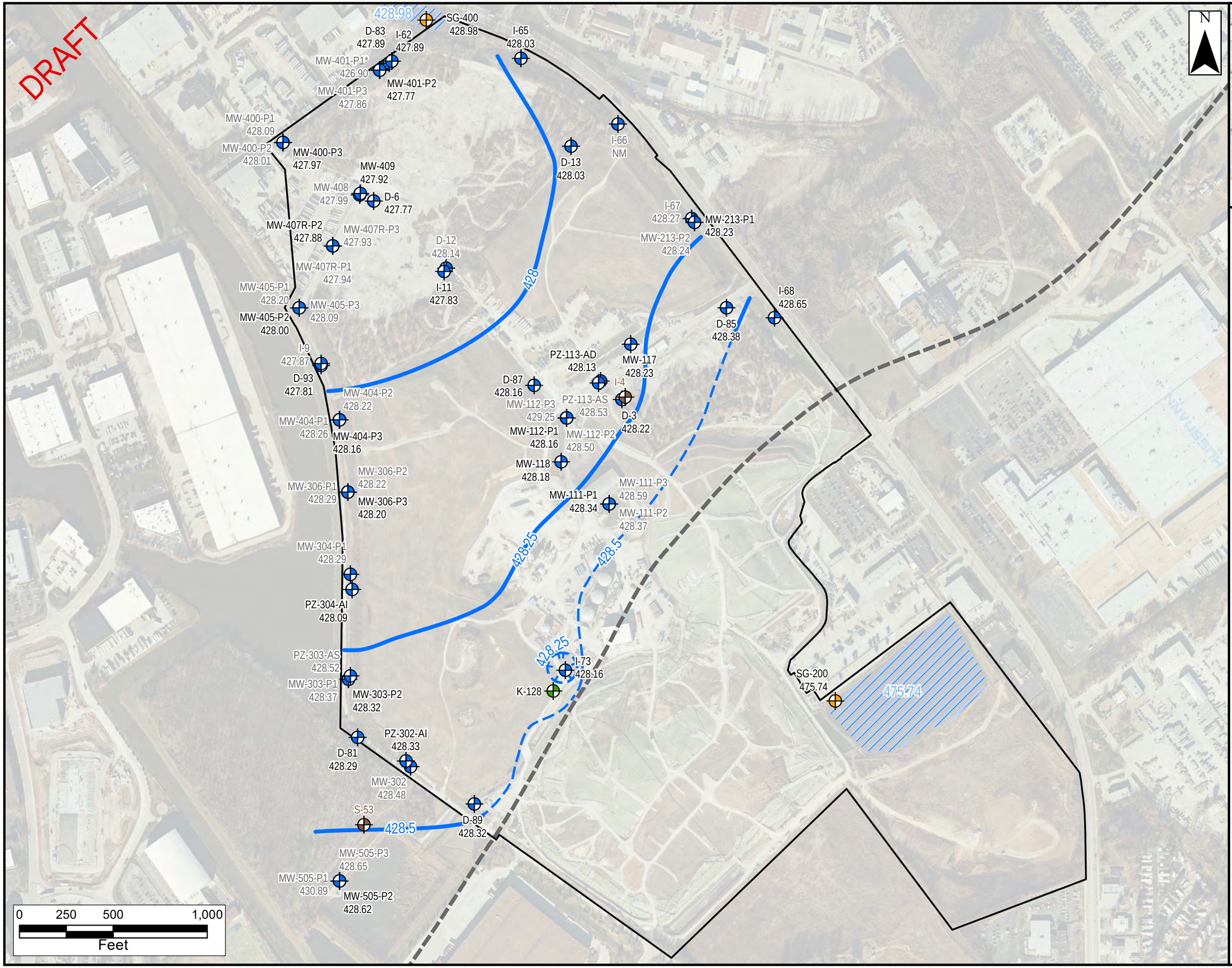
1. Aerial Imagery: Cooper Aerial Surveys Inc., December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Measurement flagged as anomalous through review of manual gauging data, transducer data, and time-series trends.
4. For well clusters, the lowest head value was used to develop groundwater contours, except in cases where anomalous data was recognized. Head values excluded from contouring are denoted by light gray text.
5. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
6. Groundwater elevation data within the alluvium are currently plotted as a single time-stratigraphic unit. Significant subsurface characterization activities were recently completed and detailed evaluation of the influence of the stratigraphic units on groundwater flow is in progress.
7. Shallow monitoring wells not screened in the alluvium are excluded from the alluvium maps. See gauging table for a list of shallow wells that are not screened in the alluvium.
8. Nearby surface water elevations are influenced by engineered water bodies and pumping. As such, surface water elevations are not honored in contouring of the Alluvium.
9. Stilling well surface water elevations represent the mean water level recorded during the gauging event on 1/10/2022.
10. Missouri River Stage Height at time of groundwater gauging (1/10/2022) was approximately 421.45 ft. amsl.

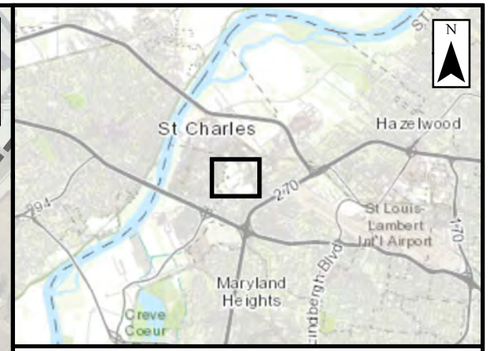
Figure X: Alluvium Potentiometric Surface Map January 2022

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT





Legend

- Inactive Well Location
- Well Location
- Pumping Well Location
- Stilling Well Location (Surface Water Elevation - ft. amsl)
- 456.87 Groundwater Elevation used to develop groundwater contours (ft. amsl)
- 456.87 Groundwater Elevation not used to develop groundwater contours (ft. amsl) (See Note 4)
- 456.87 Surface Water Elevation (ft. amsl)
- Groundwater Elevation Contour (dashed where inferred)
- Surface Water Body
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Measurement flagged as anomalous through review of manual gauging data, transducer data, and time-series trends.
4. For well clusters, the lowest head value was used to develop groundwater contours, except in cases where anomalous data was recognized. Head values excluded from contouring are denoted by light gray text.
5. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
6. Groundwater elevation data within the alluvium are currently plotted as a single time-stratigraphic unit. Significant subsurface characterization activities were recently completed and detailed evaluation of the influence of the stratigraphic units on groundwater flow is in progress.
7. Shallow monitoring wells not screened in the alluvium are excluded from the alluvium maps. See gauging table for a list of shallow wells that are not screened in the alluvium.
8. Nearby surface water elevations are influenced by engineered water bodies and pumping. As such, surface water elevations are not honored in contouring of the Alluvium.
9. Stilling well surface water elevations represent the mean water level recorded during the gauging event on 2/7/2022.
10. Missouri River Stage Height at time of groundwater gauging (2/7/2022) was approximately 423.13 ft. amsl.
11. NM = Well not measured

Figure X: Alluvium Potentiometric Surface Map February 2022

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

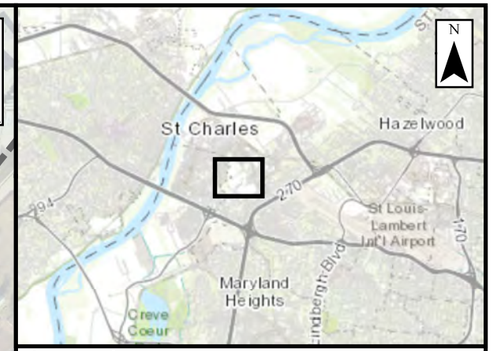
DRAFT

SG-400 428.86
I-65 428.04
I-66 428.27
I-67 428.29
I-68 428.64
D-83 428.00
I-62 427.92
MW-401-P1 427.94
MW-401-P3 427.92
MW-401-P2 427.84
MW-400-P1 428.17
MW-400-P2 427.97
MW-400-P3 428.06
MW-409 427.98
MW-408 428.02
D-6 427.84
D-13 427.98
MW-407R-P3 427.98
MW-407R-P2 428.01
MW-407R-P1 428.03
D-12 428.17
I-11 427.89
MW-213-P1* 427.91
MW-213-P2 428.23
MW-405-P2 428.09
MW-405-P3 428.21
MW-405-P1 428.27
I-9 427.99
D-93 428.01
D-85 428.38
MW-117 428.21
D-87 428.20
PZ-113-AS 428.50
PZ-113-AD 428.14
I-4
D-3 428.24
MW-112-P3 428.11
MW-112-P2 428.11
MW-112-P1 428.17
MW-118 428.19
MW-404-P2 428.39
MW-404-P1 428.43
MW-404-P3 428.28
MW-306-P2 428.33
MW-306-P3 428.31
MW-306-P1 428.39
MW-111-P3 428.27
MW-111-P2 428.24
MW-111-P1 428.24
MW-304-P1 428.40
PZ-304-AI 428.22
PZ-303-AS 428.68
MW-303-P1 428.51
MW-303-P2 428.38
I-73 428.39
K-128
SG-200 474.96
PZ-302-AI 428.46
D-81 428.40
MW-302 428.63
D-89 428.49
S-53
MW-505-P2 428.76
MW-505-P3 428.80
MW-505-P1 NM

428.86
428
428.25
428.5
428.75
474.96

N

0 250 500 1,000
Feet



Legend

- Inactive Well Location
- Well Location
- Pumping Well Location
- Stilling Well Location (Surface Water Elevation - ft. amsl)
- 456.87 Groundwater Elevation used to develop groundwater contours (ft. amsl)
- 456.87 Groundwater Elevation not used to develop groundwater contours (ft. amsl) (See Note 4)
- 456.87 Surface Water Elevation (ft. amsl)
- Groundwater Elevation Contour (dashed where inferred)
- Surface Water Body
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Measurement flagged as anomalous through review of manual gauging data, transducer data, and time-series trends.
4. For well clusters, the lowest head value was used to develop groundwater contours, except in cases where anomalous data was recognized. Head values excluded from contouring are denoted by light gray text.
5. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
6. Groundwater elevation data within the alluvium are currently plotted as a single time-stratigraphic unit. Significant subsurface characterization activities were recently completed and detailed evaluation of the influence of the stratigraphic units on groundwater flow is in progress.
7. Shallow monitoring wells not screened in the alluvium are excluded from the alluvium maps. See gauging table for a list of shallow wells that are not screened in the alluvium.
8. Nearby surface water elevations are influenced by engineered water bodies and pumping. As such, surface water elevations are not honored in contouring of the Alluvium.
9. Stilling well surface water elevations represent the mean water level recorded during the gauging event on 3/4/2022.
10. Missouri River Stage Height at time of groundwater gauging (3/4/2022) was approximately 421.29 ft. amsl.
11. NM = Well not measured

Figure X: Alluvium Potentiometric Surface Map March 2022

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

DRAFT

428.99

SG-400
428.99

D-83
428.79

I-65
428.79

MW-401-P2
428.68

I-62
428.75

MW-401-P1
428.72

MW-401-P3
428.78

MW-400-P1
428.97

I-66
429.04

MW-400-P3
429.03

MW-400-P2
428.95

D-13
428.75

MW-409
428.85

MW-408
429.02

D-6
428.78

429

429.25

I-67
429.02

MW-213-P1
428.94

MW-407R-P3
428.96

MW-407R-P1
428.93

MW-213-P2
428.97

D-12
428.99

MW-407R-P2
428.96

428.75

MW-405-P2
429.05

I-11
428.71

D-85
429.08

MW-405-P3
429.16

PZ-113-AS
428.82

MW-117
428.94

I-68
429.40

MW-405-P1
429.23

PZ-113-AD
428.88

I-9
428.94

D-87
428.96

D-93
428.88

I-4

MW-404-P3
429.29

MW-112-P2
428.80

D-3
428.90

MW-404-P2
429.18

MW-112-P3
428.78

MW-112-P1
429.02

MW-404-P1
429.26

MW-306-P2
429.26

MW-118
428.90

MW-306-P3
429.22

MW-111-P3*
428.62

MW-306-P1
429.30

MW-111-P2*
428.61

MW-111-P1*
428.55

MW-304-P1
429.22

429.25

SG-500
431.76

431.76

PZ-304-AI
429.21

MW-303-P1
429.50

I-73
429.02

PZ-303-AS
429.62

K-128

SG-505
475.24

475.24

MW-303-P2
429.38

D-81
429.42

PZ-302-AI
429.39

MW-302
429.57

D-89
429.39

429.5

S-53
429.62

MW-505-P3
429.82

MW-505-P1*
426.12

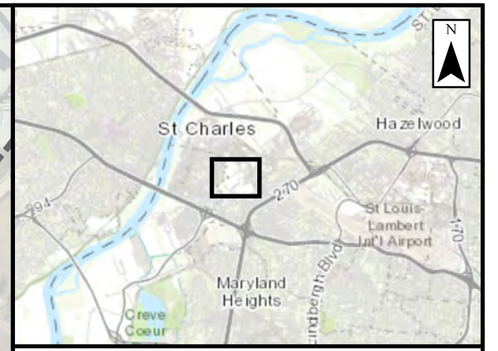
MW-505-P2
429.81

SG-505
443.80

443.80

0 250 500 1,000
Feet

N



Legend

- Inactive Well Location
- Well Location
- Pumping Well Location
- Stilling Well Location (Surface Water Elevation - ft. amsl)
- 456.87 Groundwater Elevation used to develop groundwater contours (ft. amsl)
- 456.87 Groundwater Elevation not used to develop groundwater contours (ft. amsl) (See Note 4)
- 456.87 Surface Water Elevation (ft. amsl)
- Groundwater Elevation Contour (dashed where inferred)
- Suface Water Body
- Edge of Alluvium (approximate)
- Superfund Site Boundary

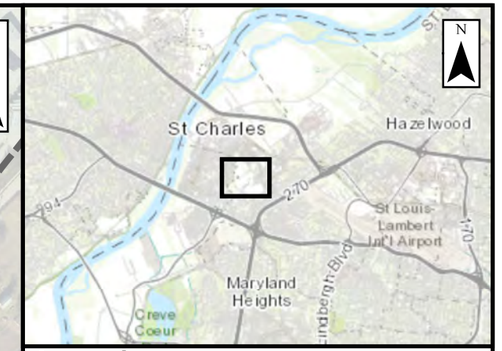
NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement flagged as anomalous through review of manual water level gauging data, transducer data, and time-series data trends.
4. For well clusters, the lowest head value was used to develop groundwater contours, except in cases where anomalous data was recognized. Head values excluded from contouring are denoted by light gray text.
5. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
6. Groundwater elevation data within the alluvium are currently plotted as a single time-stratigraphic unit. Significant subsurface characterization activities were recently completed and detailed evaluation of the influence of the stratigraphic units on groundwater flow is in progress.
7. Shallow monitoring wells not screened in the alluvium are excluded from the alluvium maps. See gauging table for a list of shallow wells that are not screened in the alluvium.
8. Nearby surface water elevations are influenced by engineered water bodies and pumping. As such, surface water elevations are not honored in contouring of the Alluvium.
9. Missouri River Stage Height at time of groundwater gauging (4/6/2022) was approximately 428.77 ft. amsl.

Figure X: Alluvium Potentiometric Surface Map April 2022 West Lake Landfill OU-3 Bridgeton, Missouri

ERM

DRAFT



Legend

- Inactive Well Location
- Well Location
- Pumping Well Location
- Stilling Well Location (Surface Water Elevation - ft. amsl)
- 456.87 Groundwater Elevation used to develop groundwater contours (ft. amsl)
- 456.87 Groundwater Elevation not used to develop groundwater contours (ft. amsl) (See Note 4)
- 456.87 Surface Water Elevation (ft. amsl)
- Groundwater Elevation Contour (dashed where inferred)
- Suface Water Body
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

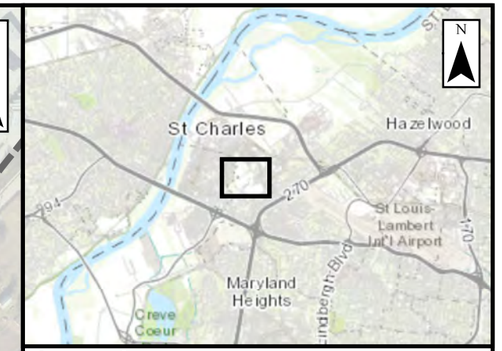
1. Aerial Imagery: Cooper Aerial Surveys Inc., December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement flagged as anomalous through review of manual water level gauging data, transducer data, and time-series data trends.
4. For well clusters, the lowest head value was used to develop groundwater contours, except in cases where anomalous data was recognized. Head values excluded from contouring are denoted by light gray text.
5. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
6. Groundwater elevation data within the alluvium are currently plotted as a single time-stratigraphic unit. Significant subsurface characterization activities were recently completed and detailed evaluation of the influence of the stratigraphic units on groundwater flow is in progress.
7. Shallow monitoring wells not screened in the alluvium are excluded from the alluvium maps. See gauging table for a list of shallow wells that are not screened in the alluvium.
8. Nearby surface water elevations are influenced by engineered water bodies and pumping. As such, surface water elevations are not honored in contouring of the Alluvium.
9. Missouri River Stage Height at time of groundwater gauging (5/2/2022) was approximately 429.91 ft. amsl.
10. NM = Not Measured

Figure X: Alluvium
Potentiometric Surface Map
May 2022
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

0 250 500 1,000
Feet

DRAFT



Legend

- Inactive Well Location
- Well Location
- Pumping Well Location
- Stilling Well Location (Surface Water Elevation - ft. amsl)
- 456.87 Groundwater Elevation used to develop groundwater contours (ft. amsl)
- 456.87 Groundwater Elevation not used to develop groundwater contours (ft. amsl) (See Note 4)
- 456.87 Surface Water Elevation (ft. amsl)
- Groundwater Elevation Contour (dashed where inferred)
- Suface Water Body
- Edge of Alluvium (approximate)
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: Cooper Aerial Surveys Inc., December 10, 2020
2. amsl = Above Mean Sea Level
3. * = Well measurement flagged as anomalous through review of manual water level gauging data, transducer data, and time-series data trends.
4. For well clusters, the lowest head value was used to develop groundwater contours, except in cases where anomalous data was recognized. Head values excluded from contouring are denoted by light gray text.
5. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
6. Groundwater elevation data within the alluvium are currently plotted as a single time-stratigraphic unit. Significant subsurface characterization activities were recently completed and detailed evaluation of the influence of the stratigraphic units on groundwater flow is in progress.
7. Shallow monitoring wells not screened in the alluvium are excluded from the alluvium maps. See gauging table for a list of shallow wells that are not screened in the alluvium.
8. Nearby surface water elevations are influenced by engineered water bodies and pumping. As such, surface water elevations are not honored in contouring of the Alluvium.
9. Missouri River Stage Height at time of groundwater gauging (6/1/2022) was approximately 432.97 ft. amsl.

Figure X: Alluvium
Potentiometric Surface Map
June 2022
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

0 250 500 1,000
Feet

DRAFT

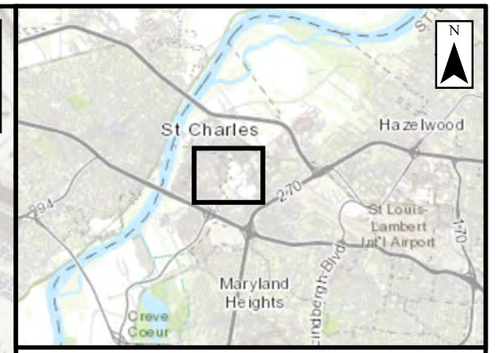
The net flow direction in alluvium for the reporting period was to the west-northwest.
Missouri River Stage Height at time of groundwater gauging (1/4/2023) was approximately 419.66 ft. amsl.

N

PZ-704
426.09
MW-503-P1
427.09
MW-504-P1
427.73
MW-406-P1
427.88
MW-502-P1
427.25
I-62
427.94
MW-401-P2
427.97
I-65
428.07
MW-402-P2
428.23
MW-400-P2
427.76
MW-401-P1
428.08
I-66
428.44
MW-402-P1
428.15
MW-400-P1
427.75
MW-409
427.92
MW-213-P1
428.49
I-67
428.32
MW-407R-P1
427.91
MW-501-P1
427.60
MW-405-P1
427.87
I-11
427.84
MW-117
428.28
I-68
428.78
PZ-113-AS
NM
D-85
428.45
I-9
427.87
MW-112-P2
428.24
MW-404-P1
428.08
MW-112-P1
428.24
MW-118
428.21
MW-111-P2
428.40
MW-103
428.03
MW-306-P1
428.26
MW-111-P3
428.48
MW-111-P1
428.37
PZ-304-AI
428.09
MW-500-P1
427.85
PZ-303-AS
428.38
I-73
428.06
MW-500-P2
427.79
MW-104
428.33
PZ-302-AI
428.29
K-128
D-81
428.26
D-89
428.16
MW-505-P1
NM
MW-505-P2
428.60
MW-505-P3
428.61

426.25
426.50
426.75
427.00
427.25
427.50
427.75
428.00
428.25
428.50
428.75

0 250 500 1,000
Feet



Legend

- Piezometer
- Upper Alluvium Well Location
- Upper/Middle Alluvium Well Location
- Pumping Well Location
- Groundwater Elevation Contour (dashed where inferred)
- Edge of Alluvium (approximate)
- Surface Water Body
- Superfund Site Boundary

NOTES:
1. Aerial Imagery: ArcGIS World Imagery Basemap, 2022
2. Goundwater elevations in ft. amsl (Above Mean Sea Level)
3. For well clusters, the lowest head values were used to develop contours. Head values excluded from contouring are denoted by light grey text.
4. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
5. NM = Well not measured

Figure X: Upper Alluvium Potentiometric Surface Map January 2023

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

M:\GIS\Projects\D-P\Exelon\WestLake\Landfill_NOW\MXD\GW_Contours\2025Q1_January\WestLake_GWContours_Jan2023_UpperAlluvium_20250822.mxd - KellyMorbey - 8/30/2025

DRAFT

The net flow direction in alluvium for the reporting period was to the west-northwest.
Missouri River Stage Height at time of groundwater gauging (2/1/2023) was approximately 419.62 ft. amsl.

N

PZ-704
425.72

MW-504-P1
427.03

MW-503-P1
426.78

MW-502-P1
426.50

MW-406-P1
427.17

I-62
427.23

I-65
427.47

MW-401-P2
427.25

MW-402-P1
427.43

I-66
427.79

MW-400-P2
427.07

MW-401-P1
427.43

MW-402-P2
427.57

MW-400-P1
427.16

MW-409
427.29

I-67
427.75

MW-213-P1
427.84

MW-407R-P1
427.21

D-85
427.77

I-11
427.21

MW-501-P1
426.92

MW-117
427.60

I-68
423.09

MW-405-P1
427.20

I-9
427.21

PZ-113-AS
427.47

MW-112-P1
427.70

MW-112-P2
427.68

MW-404-P1
427.47

MW-118
427.70

MW-111-P2
427.77

MW-306-P1
427.71

MW-111-P1
427.68

MW-103
427.44

MW-111-P3
427.89

PZ-304-AI
427.47

MW-500-P1
427.12

I-73
427.57

PZ-303-AS
427.77

MW-104
427.60

K-128

MW-500-P2
427.10

PZ-302-AI
427.57

D-81
427.60

D-89
428.00

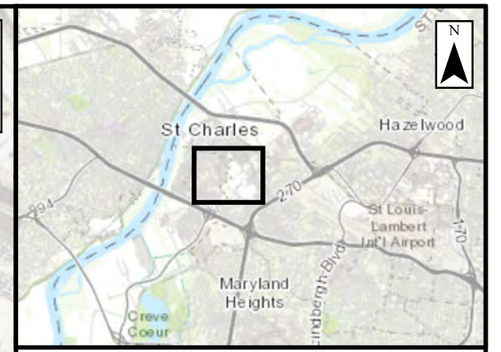
MW-505-P1
NM

MW-505-P2
427.94

MW-505-P3
427.98

425.75
426.00
426.25
426.50
426.75
427.00
427.25
427.50
427.75
428.00

0 250 500 1,000
Feet



Legend

- Piezometer
- Upper Alluvium Well Location
- Upper/Middle Alluvium Well Location
- Pumping Well Location
- Groundwater Elevation Contour (dashed where inferred)
- Edge of Alluvium (approximate)
- Surface Water Body
- Superfund Site Boundary

NOTES:

1. Aerial Imagery: ArcGIS World Imagery Basemap, 2022
2. Goundwater elevations in ft. amsl (Above Mean Sea Level)
3. For well clusters, the lowest head values were used to develop contours. Head values excluded from contouring are denoted by light grey text.
4. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
5. NM = Well not measured

Figure X: Upper Alluvium Potentiometric Surface Map
February 2023
West Lake Landfill OU-3
Bridgeton, Missouri

ERM

M:\GIS\Projects\D-FE\Exelon\WestLake\Landfill_MO\MXD\GW_Contours\2023\02_February\WestLake_GWContours_Feb2023_UpperAlluvium_20230622.mxd - KellyMcNeil - 6/30/2023

DRAFT

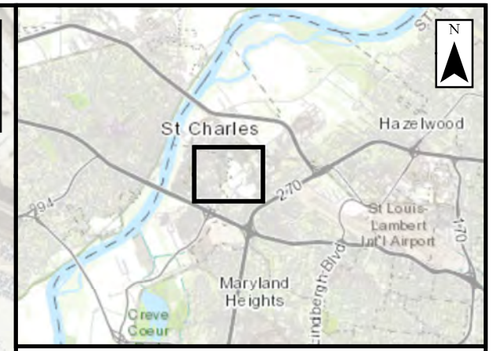
The net flow direction in alluvium for the reporting period was to the west-northwest.
Missouri River Stage Height at time of groundwater gauging (3/1/2023) was approximately 423.51 ft. amsl.

N

PZ-704 426.13
MW-504-P1 426.69
MW-503-P1 426.60
MW-502-P1 426.59
MW-406-P1 426.87
MW-401-P1 427.16
I-62 427.08
I-65 427.15
MW-402-P2 427.22
MW-400-P2 426.97
MW-401-P2 427.14
MW-402-P1 427.08
I-66 427.42
MW-400-P1 426.97
MW-409 427.12
I-67 427.37
MW-501-P1 426.90
MW-407R-P1 427.10
I-11 427.02
MW-213-P1 427.42
I-68 427.73
MW-117 427.20
MW-405-P1 427.08
PZ-113-AS 427.23
D-85 427.48
I-9 427.07
MW-404-P1 427.39
MW-112-P1 427.35
MW-112-P2 427.32
MW-118 427.35
MW-111-P1 427.44
MW-111-P3 427.48
MW-111-P2 427.47
MW-103 NM
MW-306-P1 427.60
PZ-304-AI 427.28
MW-500-P2 427.05
PZ-303-AS 427.70
MW-500-P1 427.11
I-73 427.10
MW-104 427.48
K-128
D-81 427.48
PZ-302-AI 427.50
D-89 427.53
MW-505-P1 NM
MW-505-P3 427.83
MW-505-P2 427.81

426.25
426.50
426.75
427.00
427.25
427.50
427.75

0 250 500 1,000
Feet



Legend

- Piezometer
- Upper Alluvium Well Location
- Upper/Middle Alluvium Well Location
- Pumping Well Location
- Groundwater Elevation Contour (dashed where inferred)
- Edge of Alluvium (approximate)
- Surface Water Body
- Superfund Site Boundary

NOTES:
1. Aerial Imagery: ArcGIS World Imagery Basemap, 2022
2. Goundwater elevations in ft. amsl (Above Mean Sea Level)
3. For well clusters, the lowest head values were used to develop contours. Head values excluded from contouring are denoted by light grey text.
4. Pumping well K-128 is included on alluvium contour maps since pumping may affect groundwater elevations in nearby monitoring wells.
6. NM = Well not measured

Figure X: Upper Alluvium Potentiometric Surface Map March 2023

West Lake Landfill OU-3
Bridgeton, Missouri

ERM

M:\US\Projects\0-Flexion\WestLake\Landfill_MO\MXD\GW_Contours\2023\03_March\WestLake_GWContours_March2023_UpperAlluvium.mxd - Carissa.True - 6/29/2023

APPENDIX D

EXISTING CONDITIONS OVERVIEW MAP

OU-1 AIR MONITORING STATION

OU-2 INACTIVE SANITARY LANDFILL

EARTH CITY LEVEE DISTRICT POND

ASPHALT PLANT

SOUTH QUARRY BRIDGETON LANDFILL

BRIDGETON LANDFILL LIFT STATION

CULVERT-001

CULVERT-002

CULVERT C-003

CULVERT C-004

CULVERT C-005

CULVERT C-006

CULVERT C-007

CULVERT C-008

CULVERT C-009

CULVERT C-010

CULVERT C-011

CULVERT C-012

OUTLET DEVICE (TOP = 451.70 FLOOR AT 448.84) GRATE OVER TOP

INLET DEVICE TOP=472.99 FT FL= 467.94 FT

30" STAND PIPE (CP-E)

30" STAND PIPE (CP-W)

CONCRETE SLAB

ROAD GATE

ROAD GATE

SOLAR PANEL

CAMERA STATION

K128 SUMP

M-103

LR-103

LR-105

LR-100

I-73

D81

D87

D-89

MW-104

PZ-303-AS

PZ-304-AS

PZ-304-AL

PZ-302-AS

PZ-302-AL

PZ-205-SS

PZ-205-AS

PZ-107-SS

N 1069000

N 1068500

N 1068000

N 1067500

N 1067000

E 514500

E 515000

E 515500

E 516000

LEGEND

- 490 — EXISTING GRADE MAJOR CONTOUR (5-FT INTERVAL)
- EXISTING GRADE MINOR CONTOUR (1-FT INTERVAL)
- EXISTING FENCE
- WASTE BOUNDARY OU-2 INACTIVE SANITARY LANDFILL
- EXISTING MONITORING WELL / PIEZOMETER
- K128 SUMP
- SURVEY PIN

0 100’ 200’

SCALE IN FEET

N

NOTES:

1. AERIAL TOPOGRAPHIC SURVEY PROVIDED BY COOPER AERIAL SURVEYS CO., DATED DECEMBER 2019.
2. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1927 (NAVD 27).
3. HORIZONTAL COORDINATES ARE REFERENCED TO NORTH AMERICAN DATUM OF 1927 (NAD 27) MISSOURI EAST STATE PLANE.
4. AERIAL IMAGERY OBTAINED FROM BING MAPS.
5. GROUND SURVEYING FOR UTILITY LOCATIONS PERFORMED BY FRAZIER SURVEYING DURING JULY 2020.

APP	DRN	DESCRIPTION	DATE	REV

DESIGN BY:
DRAWN BY:
CHECKED BY:
REVIEWED BY:
APPROVED BY:

Geosyntec consultants
1210 KENSINGTON ROAD, SUITE 103
OAK BROOK, IL 60523 USA
TELEPHONE: 630.203.3360

TITLE: EXISTING CONDITIONS OVERVIEW

PROJECT: WEST LAKE LANDFILL

SITE: BRIDGETON, MISSOURI

DATE: NOVEMBER 2020

PROJECT NO.: CHE8424

FILE:

DRAWING NO.: 1

P:\DWG\WEST LAKE\DRAWINGS-NAD27\CHE8424-001 EXISTING TOPOGRAPHY_REV_JPV

APPENDIX E

AT&T FIBER OPTIC PLANS

PRINT 1

PRINT 2

LAKEFRONT Dr

TRANS LAKEFRONT DR

EARTH CITY Expy

RAMS WAY

BOENKER LN

RIDER TRL S

RIDER TRL S RAMP

UG 18

UG 21

UG 23

UG 28

AJTA-25

ANMV-300

ANMV-200

3492MT-072

ANMV-100

AFMV-600

ANMV-1200

SBR24MT-072

1 - INNERDUCT

1 - 4" SDCNDT 12'

CLOSURE FOR LIFT PUMP

FDF

257C; CS467; 2005
LGX-24; CF9020
RTBS
13400 LAKEFRONT DR
SW LMCFS
13400 LAKEFRONT DR
BR009, 73078

257C; CS467; 2006
-82D-CABINET
NWTPMOCZ
S-1 RAMS WAY
FH93, 1-100

257C; CS467; 1993
FDF-216; CC3667
RT-41; BGTNMOAA
3301 RIDER TRAIL
BR009, 97-100
FE02A, 125-132
BR009, 97-100
FE02A, 125-132
A, 65-96
BR009, 97-100
A, 101-192

85C; CS007; 1998
CPS-241; CF0046
BGTNMDGC
RAMS WAY
C, 1-12
BR009, 229-234
C, 19-72

257C; CS463; 2006
LGX-024W/150TL); CF0046
NWTPMDCZ
S 1 RAMS WAY
BR009, 217-228
C, 13-24

Conduit Run Between Manholes Copper + Fiber

Bueteo copper pedestal at base of pole by car repair shop

Leachate Tank

Manhole 2035

Manhole 2034

PLEASE DO NOT REMOVE THIS NOTE

SOUTHWESTERN BELL TELEPHONE COMPANY

Approx. Scale: 1" = 104.2' — 1" = 104.2'

Market Area: ST. LOUIS
NPA/NXX: 314739
Exchange: BRIDGETON
Geo. Loc: CD2175
Tax District: CS467

Adjacent Maps:
N: 720-290-27
S: 720-290-25
E: 720-290-36
W: 720-290-16

Map Type: PLR

Map: 720-290-26
Update: 03/17/2014

2

PRINT 1

Manhole 2033

Conduit Run Between Manholes Copper + Fiber Cables

BOENKER LN

Manhole 2032

BOENKER LN

CORPORATE EXCHANGE

6 Fiber To 13201 CORP EXCHANGE

1200 PAIR Copper

72 fiber CABLE

TO PRINT 3

ST CHARLES ROCK RD

(11) 845C; CS463; 2013
IFWNNW24; CD2175
BGTNMODV
13201 CORPORATE EXCHANGE
BR009, 337-338
A, 3-24

(12) 845C; CS463; 2012
IFWNNW24; CD01DP
RT218; BGTNMODV
12750 ST CHARLES ROCK RD
A, 1-10
BR013, 419-420
A, 13-22
BR013, 419-420

Work Orders - Year	
9341404	2014
8866189	2013
7795999	2011

SOUTHWESTERN BELL TELEPHONE COMPANY

Approx. Scale: 1" = 104.8'

Market Area: ST. LOUIS
NPA/NXX: 314739
Exchange: BRIDGETON
Geo. Loc: CD2175
Tax District:

Adjacent Maps:
N: 720-290-37
S: 720-290-35
E: 720-290-46
W: 720-290-26

Map Type: PLR
Map: 720-290-36
Update: 03/13/2014

To print 2

To print 3

To print 4

MH 2081

CONDUIT RUN Fiber + COPPER

MANHOLE 2023
3 LIDS IN STREET

MH 2021
IN GRASS

BOENKER LN

CORPORATE EXCHANGE DR

CORPORATE EXCHANGE CT

FOERSTER RD

HOLLENBERG DR

STERLING Blvd

PENNRIDGE DR

EL FERROL CT

I-270

Buried copper

25 PAIR Buried copper TO 12900 Boenker

600 PAIR COPPER

50 PAIR COPPER

Fiber optic To 3496 Hollenberg

CONDUIT RUN Fiber & copper

900 PAIR COPPER

COPPER CROSS CONNECT BOX 3470 HOLLENBERG

845C; CS463; 2013
IFWNN#24; CD9007
BGTNMOVP
3435 HOLLENBERG
A, 1-20
BR009; 285-288

845C; CS463; 2011
IFWNN#24; CD6270
LGX; BGTNMOMS
3400 HOLLENBERG DR
B, 1-6
BR009, 271-276
B, 13-24

845C; CS463; 2013
BFGNDA24/24;
FDF
S 3496 HOLLENBERG
A, 1-22
BR009; 263-264

SOUTHWESTERN BELL TELEPHONE COMPANY

PROPRIETARY: Not for Disclosure Outside Southwestern Bell Telephone Company Except Under Written Agreement

Approx. Scale: 1" = 104.2'

Market Area: ST. LOUIS

NPA/NXX: 314739

Exchange: BRIDGETON

Geo. Loc: CD2175

Tax District: CS46-3

Adjacent Maps:

N: 720-290-36

S: 720-290-34

E: 720-290-45

W: 720-290-25

Map Type: PLR

Map: 720-290-35 **720-290-35**

Update: 03/13/2014

Quick Trip

Manhole in Tree Lane

Conduit Manhole Run

Conduit Run under Hwy 270

Buried 50 pair cable

Buried 100 pair cable

To point 5

Work Orders	Year
9341180	2014
9304861	2013
8058549	2011
8409178	2011
8269987	2011
7544629	2010
7041519	2009
6348336	2008
6329991	2008
6057215	2006
5997458	2006
5921640	2006
5671315	2006
5287348	2004
5211444	2003
4978550	2002
4955448	2001
4883478	2001
D492953	2001
D457843	2001
D489599	2001
4748893	2000
4656141	1999
4641414	1999
4613723	1999
4628496	1999
LIZ	1998
4541737	1998
BARB	1998
4503090	1997
D496854	1997
D491452	1996
D480687	1995

SOUTHWESTERN BELL TELEPHONE COMPANY

PROPRIETARY: Not For Disclosure Outside Southwestern Bell Telephone Company Except Under Written Agreement

Approx. Scale: 1" = 104.2'

Market Area: ST. LOUIS

NPA/NXX: 314739

Exchange: BRIDGETON

Geo. Loc.: CB175

Tax District:

Adjacent Maps:

N: 720-290-46

S: 720-290-44

E: 720-290-55

W: 720-290-35

Map Type: PLR

Map: 720-290-45 720-290-45

Updated: 08/13/2014

APPENDIX F

LFG WELL PURGE TESTING PROCEDURES

LFG WELL PURGE TEST PROCEDURE

This document describes the procedure to purge landfill gas monitoring wells using a Gilian® GilAir Plus pump while monitoring the landfill gas concentration using the Envision™ LFG meter. This work is being performed as part of the corrective action measures following four consecutive weekly detections of methane (CH_4) above 50% of the Lower Explosive Limit (LEL) (2.5% CH_4) at BRISL004.

Prior to beginning the purge test, record the pressure at the wellhead, the ambient temperature, and the barometric pressure.

Equipment and Parts:

- Gilian® GilAir Plus sampling pump (or equivalent)
- Envision™ LFG meter with sample tubing (¼" ID)
- ¼" ID sample tubing – 3 sections
- ¼" barbed tee
- ¼" barbed valve

Procedure:

1. Calibrate the LFG Meter according to the manufacturer's specifications. The meter should be calibrated on a daily basis before methane is measured at any monitoring location.

2. Set the GilAir Plus sampling pump to 3,000 cc/min flow rate.

3. Connect a section of the tubing to the LFG monitoring probe and connect the other end to the barbed tee.

4. Place a section of tubing on each remaining barb of the tee.

5. Connect the barbed valve to one of the sections of tubing.

6. Connect the LFG meter tubing to the barbed valve.

7. Connect the sampling pump to the remaining tubing.

8. Turn on the sampling pump and open the valve. Collect a reading from the LFG meter. Note the time the pump was turned on and the reading collected.

9. Close the valve. Continue purging the well with the sampling pump for 5 minutes then open the valve and collect a LFG reading. Note the time the reading was recorded.

10. Repeat step 9 for a minimum of 10 and maximum of 20 well volumes (approximately 100 minutes) OR until the LFG readings are zero or have stabilized.

11. Once the readings have zeroed/stabilized and a minimum 10 well volumes have been purged, turn the pump off and disconnect the tubing from the wellhead. Let the well recharge for 1-2 hours after turning off the pump. Record the time the pump was turned off.

12. Following the recharge period, connect the LFG meter tubing to the wellhead and collect a LFG reading. (Typical LFG measurement procedure.) Record the time of LFG reading collection.

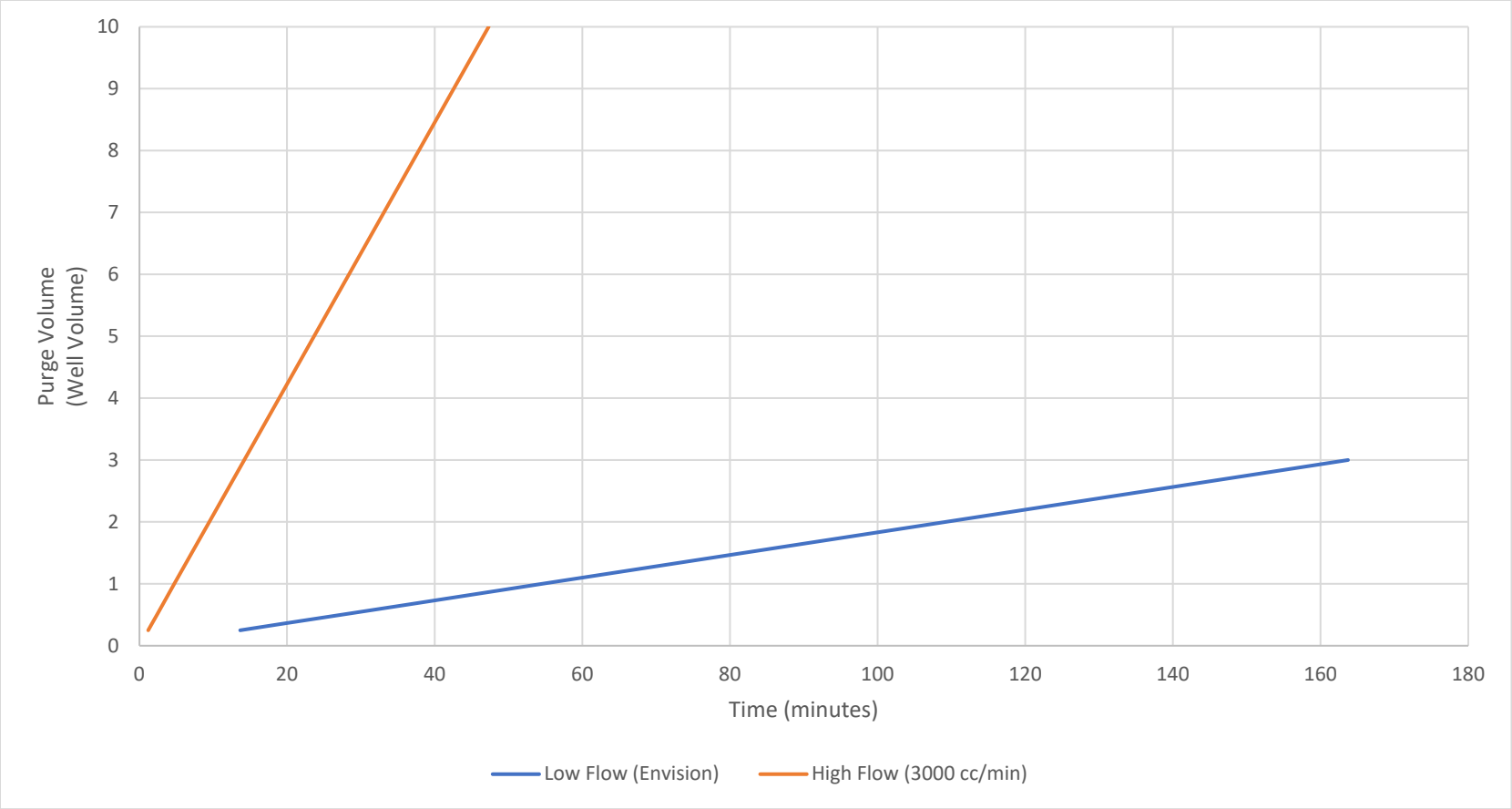


Figure 1
Purge Volume versus Time

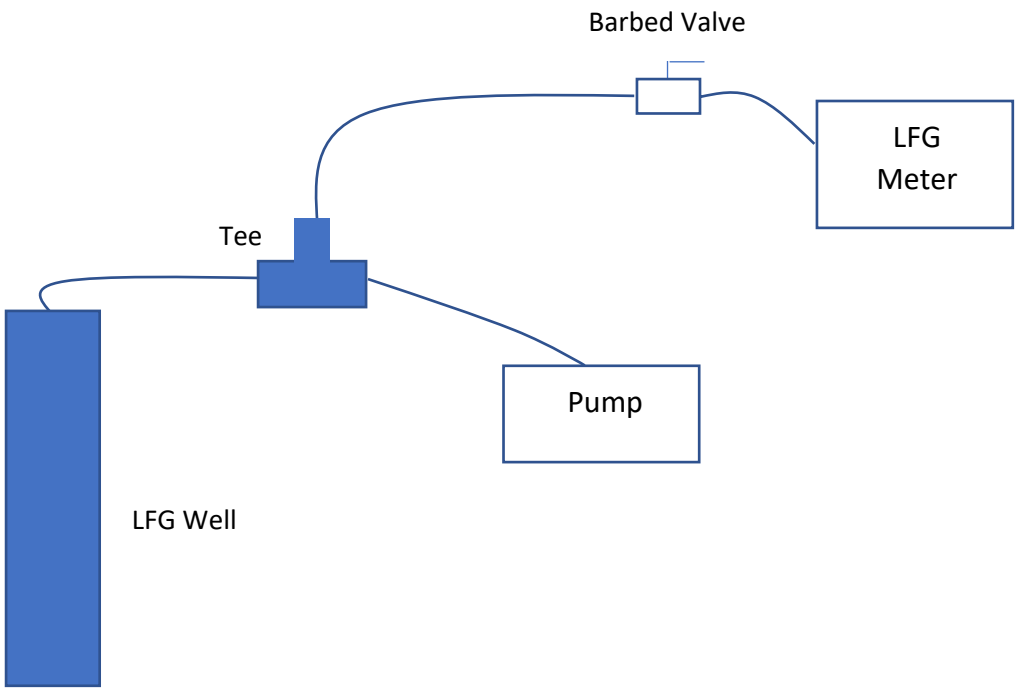


Figure 2: Field Setup for Purge Testing

APPENDIX G

UTILITY/ACCESS MANHOLE SAMPLING PROCEDURES

Appendix G - Utility Manhole Sampling Procedure

Introduction

This document describes the procedure for monitoring utility manholes for the presence of landfill gas (LFG) along the western boundary of the Inactive Sanitary Landfill (ISL) at the West Lake Landfill in Bridgeton, Missouri.

1.0 Field Procedures

1.1 GEM 2000 Calibration

Make sure that the GEM 2000 is calibrated once before each monitoring event, which will require the following items to complete:

- One 17 liter cylinder containing 15% CH_4 (methane)/ 15% CO_2 (carbon dioxide) calibration gas;
- One 17 liter cylinder containing 4% O_2 (oxygen) calibration gas;
- Constant (fixed) flow rate regulator rated for a 17 liter cylinder with 3/16" hose barb outlet;
- 1/4" ID diameter Tygon© tubing; and
- Polypropylene male connector (hose barb).

These items can be used to calibrate the GEM 2000 with the steps outlined in the GEM 2000 field calibration procedure provided by the manufacturer.

1.2 Utility Manhole Monitoring

For health and safety reasons, the preferred method for utility manhole monitoring is to leave the manhole cover in place and monitor for methane by feeding a water level meter and GEM 2000 tubing through a pick hole or other opening in the manhole cover.

If the manhole cover must be disturbed for monitoring, it should be removed only enough to expose an area large enough for the water level meter and the GEM 2000 sample tubing. Field staff shall not break the plane of the manhole opening (by reaching into the manhole), to avoid confined space entry. Proper lifting procedures shall be taken to avoid injury while moving the manhole cover. As a precaution, field staff should keep a safe distance from the exposed manhole area in case of methane accumulation.

Record the condition of the manhole and the surrounding area (note presence of vegetation, etc.) and take photographs of each manhole. Note the weather conditions and time of day the measurements are taken.

Using the water level meter, measure the depth to water in the manhole (if present). If no water is present, measure the depth to the bottom of the manhole (account for the probe length if appropriate). Calculate the depths corresponding to one-third and two-thirds of the total manhole depths, or depth to water, if water is present.

Lower the GEM 2000 tubing to the one-third depth and allow the instrument readings to stabilize before recording the measurements. Once stabilized readings have been recorded, lower the tubing to the two-thirds depth and allow the instrument readings to stabilize. Once stabilized, record the readings. Lower the tubing to the bottom depth and record the stabilized instrument readings.

If moved, the manhole cover should be put back following data collection.

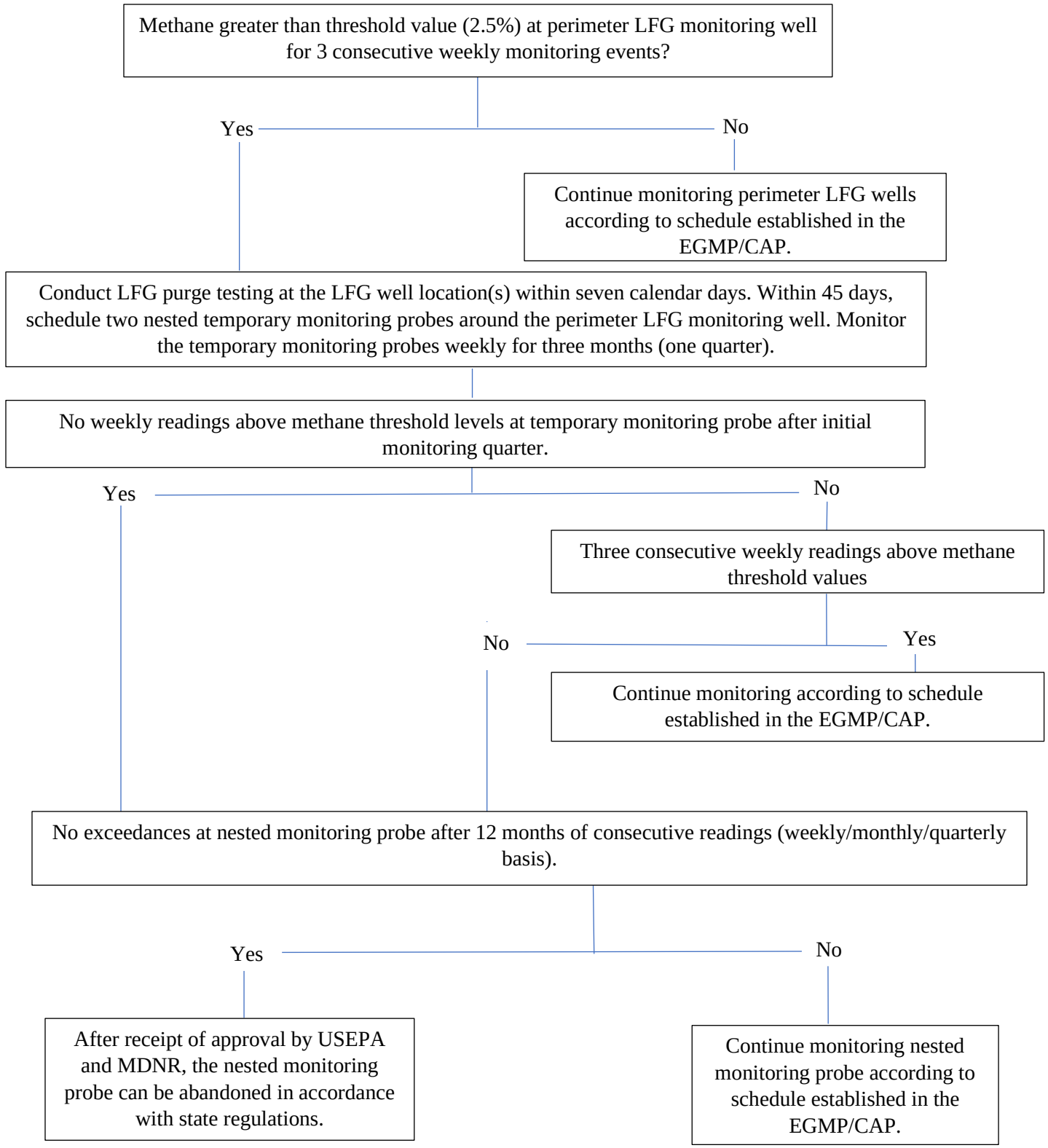
2.0 Notification Procedures

Notify the Project Manager immediately, if any reading is above 2.5% methane (50% LEL). The EPA, MDNR, and local emergency response agencies must be notified of all exceedances in any offsite monitoring locations, in accordance with the Explosive Gas Monitoring Plan.

APPENDIX H

TEMPORARY MONITORING PROBE SAMPLING FLOW CHART

Appendix H: Temporary Monitoring Probe Sampling Flow Chart



APPENDIX I

2004 RI LFG AND SOIL GAS SAMPLING LOCATIONS AND RESULTS

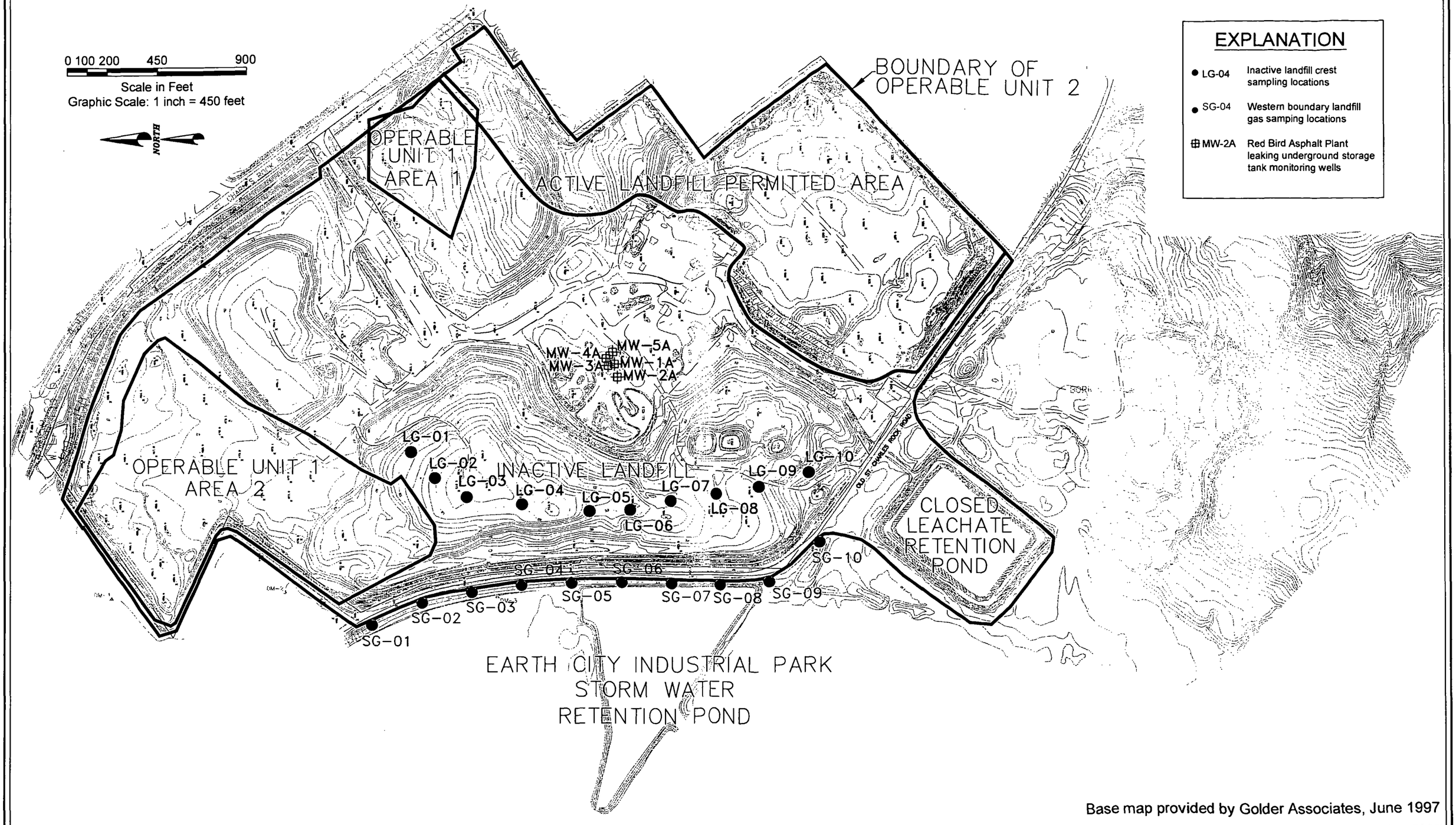
Table 4-22. Soil gas screening results, West Lake Landfill

Location	PID (ppm)	Percent Oxygen	Percent lower explosive limit	Hydrogen sulfide (ppm)
SG-01	0	20.8	0	0
SG-02	0	18.9	0	0
SG-03	7.6	14.4	2	0
SG-04	0	18.7	0	0
SG-05	10.1	18.3	0	0
SG-06	0	20.6	0	0
SG-07	0	20.7	0	0
SG-08	0	18.8	130	0
SG-09	0	14	0	0
SG-10	0	18.9	0	0

Table 4-23. Inactive landfill gas concentrations versus typical municipal solid waste landfill gas constituents

Detected compound	Typical landfill gas constituents*		Inactive landfill gas	
	Mean Result (ppmV)	Maximum Result (ppmV)	Result (ppmV)	Location
Acetone	6.838	240	24	LG-05
Benzene	2.057	39	0.41	LG-08
Chlorobenzene	0.082	1.64	1.1	LG-05
Chloroform	0.245	12		
1,1-Dichloroethane	2.801	36		
Dichloromethane	25.694	620		
1,1-Dichloroethene	0.13	4		
Diethylene chloride	2.835	20		
1,2-trans-Dichloroethane	0.036	0.85		
Ethyl benzene	7.334	87.5	0.24	LG-10
Methyl Ethyl Ketone	3.092	130	0.18	LG-08
1,1,1-Trichloroethane	0.615	14.5		
Trichloroethylene	2.079	32		
Toluene	34.907	280	1.2	LG-01
1,2,2 Tetrachloroethane	0.246	16		
Tetrachloroethane	5.244	180		
Vinyl Chloride	3.508	32	0.74	LG-08
Styrenes	1.517	87		
Vinyl Acetate	5.663	240		
Xylenes	2.651	38	0.91	LG-10
Chloroethane			0.25	LG-01
4 Ethyl Toluene			0.046	LG-10
Freon 11			0.02	LG-10
Freon-12			0.78	LG-09
Freon 114			0.52	LG-08
Methylene chloride			0.061	LG-07
1,4-Dichlorobenzene			0.066	LG-05
1,2,4-Trimethylbenzene			0.26	LG-05
1,3,5-Trimethylbenzene			0.068	LG-05
1,2-cis-Dichloroethylene			0.0071	LG-04
Carbon disulfide			0.13	LG-01

* Source: Tchobanoglous, et al, 1993.



Base map provided by Golder Associates, June 1997

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West Lake Landfill OU-2
Bridgeton, Missouri

Figure 4-3
Landfill Gas Sampling Locations