Groundwater Monitoring Report, March 2018
Butler Green Industrial Landfill, Parcel 175(5)
(Permit No. 08-02)
McClellan, Anniston, Alabama

Prepared for:

McCLELLAN
DEVELOPMENT AUTHORITY

Prepared by:

Matrix ENVIRONMENTAL

283 Rucker Street, Bldg. 3165
Anniston, Alabama 36205
(256) 847-0780
Fax (256) 847-0905

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

ADEM	Alabama Department of Environmental Management
ADEM Division 7 Regulations	*Alabama Department of Environmental Management Water Division Water Supply Program Division 335-7*
ADEM Division 13 Regulations	*Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations*
AGMRG	*Alabama Groundwater Monitoring Reporting Guidance for Solid Waste Facilities*
ARBCA	*Alabama Risk-Based Corrective Action Guidance Manual*
Army	United States Department of the Army
BTOC	Below top of casing
CA	Cleanup agreement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CUSUM	Shewhart Cumulative Sum
DO	Dissolved oxygen
DQS	Data Quality Summary
EMAX	EMAX Laboratories, Inc.
EPA	United States Environmental Protection Agency
ESCA	Environmental Services Cooperative Agreement
Fill Area Definition Report	*Draft Final Site Investigation and Fill Area Definition Report, Parcels 78(6), 79(6), 80(6), 81(5), 175(5), 230(7), 227(7), 126(7), 229(7), 231(7), 233(7), and 82(7), Fort McClellan, Calhoun County, Alabama, Revision 1*
Final EE/CA	*Final Revision 1 Engineering Evaluation/Cost Analysis Landfills and Fill Areas, Landfills 1, 2, 4, and Industrial Landfill, Parcels 78(6), 79(6), 81(5), 175(5), McClellan, Anniston, Alabama*
ft	feet
ft/ft	feet per foot
GWMR	Groundwater monitoring report
h	decision internal value
ICP	Inductively-coupled plasma
Industrial Landfill	Butler Green Industrial Landfill, Parcel 175(5)
IT	IT Corporation
k	reference value
Landfill 4	Landfill 4, Parcel 81(5)
McClellan	McClellan, Anniston, Alabama
MCL	Maximum contaminant level
MDA	McClellan Development Authority
MES	Matrix Environmental Services, LLC
µg/L	micrograms per liter
ORP	Oxidation-reduction potential
Permit	Solid Waste Disposal Facility Permit No. 08-02
QAP	*Quality Assurance Plan*
RBTL	Risk-based target level
SCL	Shewhart control limit
Shaw	Shaw Environmental, Inc.

Site	Landfill 4, Parcel 81(5) and the Butler Green Industrial Landfill, 175(5)
SSI	Statistically Significant Increase
TCE	trichloroethene
TDS	Total dissolved solids
U.S.	United States
VOC	Volatile Organic Compound
Zi	standardized means

EXECUTIVE SUMMARY

Matrix Environmental Services, L.L.C. (MES) has prepared this groundwater monitoring report (GWMR) on behalf of the McClellan Development Authority (MDA) to meet the requirements of the Solid Waste Disposal Facility Permit No. 08-02 (permit) for the Butler Green Industrial Landfill, formerly the McClellan Industrial Landfill, Parcel 175(5) located within McClellan, Anniston, Alabama (McClellan), formerly known as Fort McClellan. Figure 1-1 shows a map of McClellan and Figure 1-2 shows the parcel location. As shown in Figure 1-2, the Butler Green Industrial Landfill, Parcel 175(5) (Industrial Landfill) is located in the northeast corner of Landfill 4, Parcel 81(5) (Landfill 4). The area was permitted as the McClellan Industrial Landfill (Permit No. 08-02). In July 2017, the MDA requested the Alabama Department of Environmental Management (ADEM) to change the name of the Industrial Landfill from the McClellan Industrial Landfill to the Butler Green Industrial Landfill. This request was granted in a letter from the Department dated August 23, 2017. In this GWMR Landfill 4 and the Industrial Landfill will collectively be referred to as "the Site".

This GWMR presents results related to the implementation of groundwater monitoring under the requirements of the permit and the *Alabama Department of Environmental Management Land Division Solid Waste Program Division 13 Regulations* (*ADEM Division 13 Regulations*) for solid waste facilities.

The March 2018 monitoring event was performed under the Assessment Monitoring program, described in Section 2.4.3. Groundwater samples were collected from five residuum monitoring wells at the Site on March 8, 2018. The groundwater samples were analyzed for the constituents listed in *Appendix I* of Code Rule 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2).

Groundwater elevations showed groundwater at the Site flowed in a north and northwesterly direction. The horizontal hydraulic gradients were low over the Site, ranging from 0.004 feet per foot (ft/ft) to 0.014 ft/ft, averaging 0.011 ft/ft Site-wide.

During the March 2018 monitoring event, chlorobenzene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and trichloroethene were detected in well LF4-MW4 and as such are considered statistically significant increase (SSI) occurrences. All results were consistent with historical data.

To evaluate whether there were any SSI occurrences for metal constituents in groundwater at the Site, a statistical analysis was performed on the metals data using Shewhart Cumulative Sum (CUSUM) control charts in accordance with Code Rule 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable United States Environmental Protection Agency (EPA) guidance. The statistical analysis showed SSI occurrences for cobalt and nickel in well LF4-MW1 and cobalt, nickel and zinc in well LF4-MW2. All results were consistent with historical data.

The concentrations of the SSI constituents were compared to the groundwater protection standards for the Site. Maximum contaminant levels (MCLs), as listed in the *Alabama*

Department of Environmental Management Water Division Water Supply Program Division 335-7 Regulations (*ADEM Division 7 Regulations*), were used as the groundwater protection standards for the SSIs. Nickel, zinc, chlorobenzene, cis-1,2-dichloroethene and trans-1,2-dichloroethene concentrations were all below MCLs. Only trichloroethene (27 µg/L) in well LF4-MW4 was greater than the MCL (5 µg/L) and is within the concentration range of previous detections. Because there is no promulgated MCL for cobalt, the concentration for the cobalt SSI in well LF4-MW1 and LF4-MW2 were compared to the cobalt concentration for background well LF4-MW5. The concentrations for metal SSI constituent cobalt in wells LF4-MW1 (27.9 µg/L) and LF4-MW2 (125 µg/L) were greater than the background concentration (10.5 µg/L).

MDA recommends that natural attenuation and land use controls be allowed to continue and the site continue to be monitored on a semi-annual basis under the assessment monitoring program.

1.0 INTRODUCTION

Matrix Environmental Services, L.L.C. (MES) has prepared this groundwater monitoring report (GWMR) on behalf of the McClellan Development Authority (MDA) to meet the requirements of the Solid Waste Disposal Facility Permit No. 08-02 (permit) for the Butler Green Industrial Landfill, formerly the McClellan Industrial Landfill, Parcel 175(5) located within McClellan, Anniston, Alabama (McClellan), formerly known as Fort McClellan. Figure 1-1 shows a map of McClellan and Figure 1-2 shows the parcel location. As shown in Figure 1-2, the Butler Green Industrial Landfill, Parcel 175(5) (Industrial Landfill) is located in the northeast corner of Landfill 4, Parcel 81(5) (Landfill 4). The area was permitted as the McClellan Industrial Landfill (Permit No. 08-02) The area was permitted as the McClellan Industrial Landfill (Permit No. 08-02). In July 2017, the MDA requested the Alabama Department of Environmental Management (ADEM) to change the name of the Industrial Landfill from the McClellan Industrial Landfill to the Butler Green Industrial Landfill. This request was granted in a letter from the Department dated August 23, 2017. (ADEM, 2017). In this GWMR Landfill 4 and the Industrial Landfill will collectively be referred to as "the Site".

This GWMR presents results related to the implementation of groundwater monitoring under the requirements of the permit and the *Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations* (*ADEM Division 13 Regulations*) for solid waste facilities.

1.1 Purpose and Objectives

The purpose of this GWMR is to describe the activities performed and present the results of the March 2018 groundwater monitoring event. The objectives of the March 2018 groundwater monitoring event and this GWMR include the following:

- Summarize data from previous monitoring events and present analytical results for the March 2018 monitoring event.
- Evaluate the groundwater analytical data and demonstrate compliance with the permit and the *ADEM Division 13 Regulations*.

1.2 Report Organization

Section 2.0 of this report presents a summary of the background information including the parcel location, description, and physical characteristics. Section 3.0 presents a summary of the March 2018 sampling activities. Section 4.0 describes the results of the March 2018 sampling activities. Section 5.0 presents the evaluation of the groundwater data. Section 6.0 presents the conclusions and recommendations. Section 7.0 provides the references cited in this report. Tables and figures follow the text and the appendices are organized as follow:

Appendix A Groundwater Sample Collection Logs, March 2018
Appendix B Chains-of-Custody, March 2018
Appendix C Analytical Data, March 2018
Appendix D Data Quality Summary
Appendix E Statistical Evaluation of Metals Data, March 2018

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2.0 BACKGROUND

This section provides background information about the Site. Parts of this section is adapted from the *Final Revision 1 Engineering Evaluation/Cost Analysis Landfills and Fill Areas, Landfills 1, 2, 4, and Industrial Landfill, Parcels 78(6), 79(6), 81(5), 175(5), McClellan, Anniston, Alabama* (*Final EE/CA*) (MES, 2006) and the *Draft Final Site Investigation and Fill Area Definition Report, Parcels 78(6), 79(6), 80(6), 81(5), 175(5), 230(7), 227(7), 126(7), 229(7), 231(7), 233(7), and 82(7), Fort McClellan, Calhoun County, Alabama, Revision 1* (*Fill Area Definition Report*) (IT Corporation [IT], 2002a).

2.1 Site Location and Description

Landfill 4 operated as the main sanitary landfill for McClellan from 1967 to 1994. The unlined landfill used trench and fill as the method of disposal and was not equipped with a leachate collection system. The landfill reportedly received the McClellan household garbage, construction and demolition debris, oil-contaminated soil, and dead animals. One pound of waste Diazinon dust (pesticide) was also reportedly disposed at Landfill 4 and the Industrial Landfill (IT, 2002).

The landfill was closed in April 1994 because of changes in the permit requirements governing sanitary landfills, including that sanitary landfills be lined. A temporary permit was issued to the Army in 1993 to dispose of industrial and construction debris at the landfill. A permanent industrial landfill permit allowing the disposal of waste with a 30-ton per day limit in a previously unused section of the landfill property was issued in October 1995. This permit was transferred from the Army to the MDA (MES, 2006). The permit was renewed by the MDA on January 5, 2016, effective January 9, 2016, and will expire on January 8, 2021. The revised permit for the Industrial Landfill allows 3,204 cubic yards per day of disposal. The total permitted disposal area for the Industrial Landfill is approximately 53 acres. This year the MDA plans to formally cap the remaining approximately 12 acres that are still active.

2.2 Site Characterization

This subsection summarizes the physical setting, geology and hydrogeology at the Site.

2.2.1 Physical Setting

With the exception of the Industrial Landfill, Landfill 4 is covered with an engineered, low-permeability clay cover that met the landfill closure requirements at the time of closure. Landfill 4 is devoid of natural vegetation, but is currently covered with seeded grasses and vegetation. A concrete-lined drainage swale runs from east to west across most of the Site. The Site is bound on the north by mixed coniferous/deciduous forest and the Fill Area Northwest of Reilly Airfield, Parcel 229(7) (Fill Area Northwest of Reilly Airfield), on the east by mixed coniferous/deciduous forest, on the south by a soil borrow area, on the west by a road, and on the northwest by Landfill 3, Parcel 80(6) (Landfill 3). Much of the perimeter of the Site is enclosed by chain-link fence that restricts access to the Site (MES, 2006).

Surface water is diverted around the Site by concrete ditches that drain into a settling pond at the southeastern end of the Site. Drainage exits the Site to the north into a culvert under Reilly Airfield (MES, 2006).

2.2.2 Site Geology and Hydrogeology

The bedrock mapped beneath the Site is the Cambrian Conasauga Formation. The Cambrian Conasauga Formation is comprised of dark gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (IT, 2002). A geologic map of the Site is presented in Figure 2-1.

Underlying soils at the Site include the Cumberland loam, Purdy silt loam, Tyler silt loam, and the Anniston Gravelly loam. These soils were derived mainly from limestone, shale, and sandstone and are classified generally as silts to silty and clayey sands. The color of these soils are generally brown to dark brown with lesser amount of reddish-brown, grayish-brown, and yellowish-brown (IT, 2002).

The topography of the combined Landfill 4 and Industrial Landfill area is relatively flat of which a portion is within the floodplain of Cave Creek (Figure 2-2). Groundwater flow has generally been to the northwest and north (MES, 2006). Static groundwater levels measured during the historical monitoring events at the Site are presented in Table 4-1. See Section 4.1 for further details concerning groundwater elevations, groundwater flow, and gradients at the Site.

2.3 Groundwater Monitoring System

Five monitoring wells (LF4-MW1, LF4-MW2, LF4-MW3, LF4-MW4, and LF4-MW5) were installed at the Site in 1994 and completed in the residuum zone, i.e., first zone of saturation. None of the borings for these wells penetrated fill material (IT, 2002). A monitoring well construction summary is included in Table 2-1. Figure 1-2 shows the well locations.

Well LF4-MW5 is the upgradient background monitoring well used for the detection of representative background groundwater quality at the Site. Wells LF4-MW1, LF4-MW2, LF4-MW3, and LF4-MW4 are the downgradient monitoring wells used for the detection of representative groundwater quality at the Site.

2.4 Groundwater Monitoring History

The groundwater monitoring history of the Site including detection monitoring and assessment monitoring sampling events are summarized in this section.

2.4.1 Previous Monitoring Events

Semi-annual groundwater monitoring was conducted at the Site by the Army, pursuant to the permit, from March 2000 through September 2003. The MDA assumed the semi-annual groundwater monitoring at the Site in March 2004 and has continued the long-term groundwater monitoring to the present. The MDA conducted a detection monitoring program at the Site

from March 2004 through September 2009 and an assessment monitoring program from March 2010 to the present. A summary of the historical detected volatile organic compound (VOC) and metals data are presented in Tables 4-4 and 4-5 (see Section 4.4 for details concerning Tables 4-4 and 4-5). A summary of the Detection Monitoring and Assessment Monitoring programs performed at the Site is described below.

2.4.2 Detection Monitoring Program

During the detection monitoring events from March 2004 through September 2009, groundwater samples were collected at wells LF4-MW1, LF4-MW2, LF4-MW3, LF4-MW4, and LF4-MW5 and analyzed for the constituents listed in *Appendix I* of Code Rule 335-13-4-27 of the *ADEM Division 13 Regulations* (ADEM, 2016). The *Appendix I* constituents are shown in Table 2-2 of this report.

The detection monitoring data at the Site demonstrated compliance with the permit and *ADEM Division 13 Regulations* until the March 2009 sampling event when a Statistically Significant Increase (SSI) occurred for zinc in downgradient well LF4-MW2. Please see Section 5.1 for details concerning the statistical analysis performed on the semi-annual groundwater monitoring results collected by the MDA at the Site. Pursuant to subparagraph (2)(n) of Rule 335-13-4-27, a letter was sent by the MDA informing ADEM of the SSI. Because this was the first SSI occurrence, and because the groundwater sample with the SSI showed a high level of turbidity (145 NTU), the detection monitoring program continued with the September 2009 monitoring event to confirm whether the SSI from the March 2009 monitoring event was an isolated occurrence, a result of an error in sampling or analysis, or due to natural variation in groundwater quality. The September 2009 sampling round confirmed the SSI occurrence of zinc in downgradient well LF4-MW2. In accordance with Rule 335-13-4-27 subparagraph (3)(c) of the *ADEM Division 13 Regulations*, an assessment monitoring program was initiated pursuant to subparagraphs (4)(a) through (4)(j).

2.4.3 Assessment Monitoring Program

An Assessment Monitoring program was initiated during the March 2010 groundwater monitoring event and conducted in accordance with the permit and *ADEM Division 13 Regulations*, which continues to the present.

Pursuant to subparagraph (4)(b)1 of the *ADEM Division 13 Regulations*, during an Assessment Monitoring program groundwater must be sampled and analyzed for the constituents listed in *Appendix II* of the *ADEM Division 13 Regulations*. However, the Industrial Landfill is a nonhazardous solid waste disposal facility that allows for the disposal of only nonhazardous industrial wastes and construction/demolition wastes, pursuant to the permit (Permit No. 08-02). No additional constituents from the *Appendix II* list that were not already on the *Appendix I* list were detected during previous groundwater sampling events performed by the Army and the MDA, as indicated in the *Final EE/CA* (MES, 2006). Therefore, during the assessment monitoring March 2010 and September 2010 events at the Industrial Landfill, the *Appendix I* list of constituents were sampled and analyzed in lieu of the *Appendix II* list, as allowed by subparagraph (4)(b)2 of the *ADEM Division 13 Regulations*.

For the March 2010 and September 2010 groundwater monitoring events, metal constituents cobalt, nickel, and zinc were determined to be SSIs in well LF4-MW2. Although there were some VOC detections, no organic constituents were considered to be SSIs during any of the previous monitoring events at the Site. Because historical statistical analyses showed SSIs for only metal constituents, only metals were sampled and analyzed during the March 2011 monitoring event. The concentrations of constituents detected in groundwater samples collected during past and current monitoring events are presented in Tables 4-4 (VOCs) and 4-5 (metals).

In March 2011 ADEM issued the *Alabama Groundwater Monitoring Reporting Guidance for Solid Waste Facilities* (*AGMRG*) (ADEM, 2011) to be used in conjunction with the *ADEM Division 13 Regulations*. Subparagraph 2.2.10.3.7 of the *AGMRG* stated "the detection of any organic constituents is considered an SSI". Because historical sampling events showed metal and VOC detections in groundwater at the Site, in a letter dated August 5, 2011 the MDA proposed to analyze groundwater samples collected at the Site under the Assessment Monitoring program for the *Appendix I* list of constituents (Table 2-2), which include metals and VOCs, starting with the September 2011 monitoring event. The MDA received concurrence from ADEM in a letter dated August 16, 2011 to use the *Appendix I* list of constituents (Table 2-2) for the Assessment Monitoring program at the Site.

In a letter dated September 13, 2016, ADEM issued comments on the March 2016 GWMR requesting MDA conduct an assessment of corrective measures (ACM) in accordance with ADEM Admin. Code r. 335-13-4-.27(4)(g) related to the detection of cobalt in LF4-MW2 and trichloroethene in LF4-MW4 and include surface water samples from the stream downgradient of LF4-MW4. In December 2016, MDA responded to ADEM comments and explained the stream is an ephemeral feature that channels storm water around the site and does not influence groundwater flow to which ADEM concurred on April 20, 2017. MDA also collected three surface water samples in January 2017 for *Appendix I* constituents and all were non-detect for chlorinated VOCs. Cobalt was detected at 11.6 µg/L which is well below the site-wide surface water risk-based target level (RBTL) of 30 µg/L. These findings were provided to ADEM in a letter dated February 8, 2017.

In the December 2016 response to ADEM comments, MDA proposed an alternate groundwater protection standard (GWPS) for cobalt of 5400 µg/L based on a site-specific risk-based evaluation of exposure pathways. ADEM responded in a letter dated April 20, 2017 that the proposed 5400 ug/L GWPS was not applicable and cobalt concentration should be compared to the highest detected concentration in background well LF4-MW5. The highest detected cobalt concentration in LF4-MW5 is 10.5 µg/L sampled on September 21, 2010. ADEM also requested that MDA comply with ADEM Admin. Code r. 335-13-4-.27(4)(g) and conduct an ACM. In June 2017, MDA responded to ADEM and summarized the ACM conducted to date and existing land use controls and proposed that natural attenuation be allowed to continue and the site continue to be monitored on a semi-annual basis under the assessment monitoring program. ADEM concurred with MDA's proposal in June 2017.

3.0 SUMMARY OF MARCH 2018 ACTIVITIES

During the March 2018 monitoring event, groundwater samples were collected and analyzed for the parameters on the *Appendix I* of Code Rule 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2). The March 2018 monitoring event was performed under the Assessment Monitoring program, discussed in Section 2.4.3.

To meet the recommended actions outlined in the permit, *ADEM Division 13 Regulations*, and applicable United States Environmental Protection Agency (EPA) guidance, the following activities were performed during the March 2018monitoring event:

- Measured groundwater levels in the monitoring wells.
- Collected groundwater samples from five monitoring wells.
- Analyzed the groundwater samples for the constituents listed in *Appendix I* of Code Rule 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2) by Methods SW8260B (VOCs), SW6020A (Inductively Coupled Plasma/Mass Spectrometry [ICP/MS)] metals), and SW7470A (mercury).
- Performed statistical analysis on the metals results (described in Section 5.0).

3.1 Groundwater Sampling

To address the issues with high turbidity concentrations in the groundwater at the Site, the groundwater samples are collected from each well using the sampling technique described below.

- The day before groundwater samples are to be collected, water levels are measured to the nearest hundredth of a foot using a Solinst™ water level indicator and recorded. Total well depth are also measured and recorded.
- After the water levels are taken, the wells are purged and allowed to recharge overnight, approximately 24 hours before sampling.
- The following day, chemical and physical field screening parameters including pH, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), total dissolved solids (TDS), turbidity, and temperature are measured using a YSI 556 MPS Water Quality Meter. The field parameters are measured 24 hours after the wells are purged and before sampling.
- Using disposable bailers, groundwater samples are collected directly into laboratory-supplied sample bottles with the appropriate preservatives.

Groundwater samples were collected on March 8, 2018 from five residuum monitoring wells, LF4-MW1 through LF4-MW5. The sample containers were labeled, placed in a chilled cooler and shipped under chain-of-custody procedures to EMAX Laboratories, Inc. (EMAX) in Torrance, California. The groundwater samples for monitoring wells LF4-MW1 through LF4-MW5 were analyzed for VOCs and metals. Figure 1-2 shows the groundwater sampling locations. The groundwater sample collection logs are provided in Appendix A and the chain-of-custody forms for the groundwater samples collected during the March 2018 monitoring event are provided in Appendix B.

3.2 Data Quality Review

MES reviewed the analytical data for the groundwater samples collected during the March 2018 monitoring event. The data quality review was performed in accordance with the *Quality Assurance Plan (QAP)* in *Appendix A* of the *Final Installation-Wide Sampling and Analysis Plan* (MES, 2013) to assess compliance with quality assurance objectives, and to assess hard copy and electronic deliverable consistency and integrity. Appendix C presents the analytical data collected during the March 2018 monitoring event. The Data Quality Summary (DQS) for the March 2018 groundwater samples is included in Appendix D. The laboratory data forms showing the validated results are also included in Appendix D.

4.0 RESULTS OF MARCH 2018 GROUNDWATER SAMPLING

This section discusses the results of the March 2018 groundwater monitoring event at the Site.

4.1 Groundwater Levels

Groundwater elevations measured during the March 2018 groundwater monitoring event are presented in Table 4-1. Groundwater elevations from previous monitoring events are also shown in Table 4-1. Figure 4-1 shows groundwater elevations and potentiometric surface contours for the residuum monitoring wells based on the March 2018 water level measurements. As indicated in Figure 4-1, groundwater flowed in a north and northwesterly direction.

To further aid in assessing groundwater flow at the Site, horizontal hydraulic gradients were calculated using the groundwater data collected during the March 2018 monitoring event, presented in Table 4-2. The horizontal hydraulic gradients were low over the Site, ranging from 0.004 feet per foot (ft/ft) to 0.014 ft/ft. Site-wide horizontal hydraulic gradients averaged 0.011 ft/ft. The highest horizontal hydraulic gradient occurred between wells LF4-MW3 and LF4-MW2 in the north-eastern portion of the Site.

Based on the groundwater flow direction (Figure 4-1) and horizontal hydraulic gradients (Table 4-2), the groundwater monitoring well network at the Site is functioning as intended and is sufficient for determining the facility's impact on the quality of groundwater in the first zone of saturation at the Site.

4.2 Analytical Data and Data Quality Review

The analytical data for the March 2018 samples are provided in Appendix C. Groundwater samples were analyzed for VOCs and metals. MES reviewed the analytical data in accordance with the *QAP* (MES, 2013). Based on the data quality review, the analytical data generated for these monitoring events are adequate to fulfill program objectives and are suitable for preparation of this report. A more detailed discussion of the analytical results can be found in the DQS provided in Appendix D.

4.3 Groundwater Field Parameter Results

Field screening parameters, including pH, conductivity, DO, ORP, TDS, turbidity, and temperature, and other sampling data (e.g., groundwater depths, well depths, sampling conditions, etc.) were recorded on the Groundwater Sampling Logs included in Appendix A. The field parameters for the groundwater samples are summarized in Table 4-3.

4.4 Summary of Groundwater Analytical Results

Groundwater samples were collected from five monitoring wells during the March 2018 monitoring event and analyzed for VOCs and metals. This section describes the analytical results for the groundwater samples.

4.4.1 Volatile Organic Compounds Analytical Results

Chlorobenzene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and trichloroethene were detected in well LF4-MW4 during March 2018. The analytical results for VOCs including historical data are presented in Table 4-4. Review of the current and historical analytical results indicate VOC detections have been limited to well LF4-MW4 and concentrations detected were all within the range of previous detections.

4.4.2 Metals Analytical Results

The analytical results for metals in the groundwater samples during the March 2018 monitoring event are presented in Table 4-5. Sixteen of the 16 target metals, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc, were detected in groundwater samples from at least one of the monitoring wells during the March 2018 monitoring event.

To simplify the presentation of historical analytical results and facilitate identification of downward or upward trends in metal concentrations, analytical results from previous sampling events are also presented in Table 4-5. Further details concerning trends in metal concentrations over time are described in Section 5.0.

5.0 EVALUATION OF GROUNDWATER ANALYTICAL DATA

The analytical results for groundwater collected during the March 2018 groundwater monitoring event were evaluated to determine whether there was a SSI over background groundwater quality at the Site.

5.1 Evaluation of Groundwater VOCs Quality Data

Detections of organic constituents are considered SSIs, as per the *Alabama Groundwater Monitoring Report Guidance For Solid Waste Facilities* (2011). For the March 2018 groundwater sampling event, low levels of chlorobenzene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and trichloroethene were detected in the groundwater samples. Therefore, there were four SSIs for VOCs. The concentrations of three of the four VOCs were below their respective MCLs. Trichloroethene (27) was above its MCL (5 µg/L).

5.2 Evaluation of Groundwater Metals Quality Data

To evaluate whether there were any SSI occurrences for metal constituents in groundwater at the Site a statistical analysis was performed on the metals data using control charts in accordance with Code Rule 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable United States Environmental Protection Agency (EPA) guidance.

Control charts are used to monitor the inherent statistical variation of the data collected within a single well. Because intrawell comparisons involve a single well, significant changes in the level of contamination in a well cannot be attributed to spatial and/or hydrogeological differences between wells. Intrawell control charts employ historical measurements from a compliance point well as background. Control charts are mostly appropriate for analytes with a reasonably high detection frequency in monitoring wells. Control charts allow data from a well to be viewed graphically over time (EPA, 2009).

The combined Shewhart Cumulative Sums (CUSUMs) control charts assesses two statistical quantities at every sampling event, both the new individual measurement and the CUSUM of past and current measurements. The Shewhart portion compares compliance measurements against a background limit. The CUSUM portion sequentially analyzes each new measurement with prior compliance data. Both portions are used to assess the similarity of compliance data to background. The baseline parameters for the chart, estimates of the mean and standard deviation, are obtained from historical background data collected from the specific compliance well. These baseline measurements characterize the expected background concentrations at compliance wells. As future compliance observations are collected, the baseline parameters are used to standardize the newly gathered data (EPA, 2009).

The combined CUSUM control chart is declared out-of-control in one of two ways. First, the standardized means (Z_i) computed at each sampling period may cross the Shewhart control limit (SCL). Such a change signifies a rapid increase in well concentration levels among the most recent sample data. Second, the CUSUM of the standardized means (Z_i) may become too large, crossing the "decision internal value" (h). Crossing the h threshold can mean either a sudden rise

in concentration levels or a gradual increase over a longer span of time. A gradual increase or trend is particularly indicated if the CUSUM crosses its threshold but the standardized mean Z_i does not. The reason for this is that several consecutive small increases in Z_i will not trigger the SCL threshold, but may trigger the CUSUM threshold. As such, the control chart can indicate the onset of either sudden or gradual contamination at the compliance point. Three parameters are necessary to construct a CUSUM control chart, a reference value (k), h, and SCL. The combination of k = 1, h = 5 and SCL = 4.5 was determined to be the most appropriate for the application of CUSUM control charts for groundwater monitoring (EPA, 2009).

The CUSUM control charts are constructed with respect to a log scale. The lognormal distribution is a frequently-used model in groundwater statistics and is generally more appropriate as a default statistical model than the normal distribution (EPA, 2009). The log-mean and the log-standard deviation represent the sample mean and standard deviation computed using log-transformed values instead of the raw measurements.

5.2.1 Metals Background Groundwater Quality Data

For the statistical analyses performed on the March 2004 to March 2007 semi-annual groundwater sampling events, the results from the March 2000 to the September 2003 sampling events were used for the background data. However, several metals had only one or no background results out of the eight sampling events from March 2000 to September 2003. As of the September 2007 groundwater sampling event, four additional metals (cobalt, copper, nickel, and zinc) had 9 sampling events and at least one groundwater sample with nondetects less than 50%. However, these metals only had one background result out of the eight sampling events from March 2000 to September 2003. Code Rule 335-13-4-27, subparagraphs (3)(b) and (4)(b) of the *ADEM Division 13 Regulations* and the permit requires that a minimum of four independent samples from each well be used to establish background. In addition, the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance* (EPA, 2009) recommends that if control charts remain "in control" for a long period of time the baseline parameters should be updated to include more recent background data.

A two-sample t-test was performed comparing the March 2004 through September 2005 data with the previous background data set from March 2000 through September 2003 data to ensure there were no significant differences at the 95 percent confidence level between the two data sets. Details of the t-test are presented in the *Statistical Analysis of Semi-Annual Groundwater Sampling Results September 2008 Groundwater Sampling Event, Fort McClellan Industrial Landfill (Permit No. 08-02), Ft. McClellan, Anniston, Calhoun County, Alabama* (MDA, 2008). The t-tests showed there were no significant differences at the 95 percent confidence level between the March 2004 to September 2005 data set and the March 2000 to September 2003 data set. Therefore, the data from the twelve sampling events from March 2000 to September 2005 were used for the background during the statistical analysis of metal constituents in wells that had 9 or more sampling events and percentages of nondetects less than 50%, starting with the September 2007 sampling event and continuing to the present.

5.2.2 March 2018 Metals Groundwater Quality Data

Statistical analysis was performed for the March 2018 groundwater metals data using CUSUM control charts in accordance with Code Rule 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable EPA guidance. Because control charts must be constructed from a data set large enough to characterize the behavior of a specific well and because control charts do not efficiently handle data sets with a significant fraction of nondetects (EPA, 2009), control charts were developed for those metal constituents in wells that had nine (9) or more sampling events and the percentage of nondetects was less than 50%. The results of the statistical analysis performed for the March 2018 groundwater metals data are provided in Appendix E. Attachment E1 summarizes the number of analyses and percentage of nondetects. Attachment E2 provides the calculations for the CUSUMs and Attachment E3 provides the CUSUM control charts for the statistical analyses.

The CUSUMs for nickel (22.9) in well LF4-MW1; and cobalt (125), nickel (25.3), and zinc (180) in well LF4-MW2 were above the threshold value of 5, and are therefore considered SSI occurrences.

5.3 SSI Occurrences in Groundwater for the March 2018 Sampling Event

Table 5-1 presents a summary of the SSI occurrences for the March 2018 groundwater sampling event. The concentrations of the SSI constituents were compared to the groundwater protection standards (Table 5-1). In accordance with Code Rule 335-13-4-27, subparagraph (4)(h), the maximum contaminant levels (MCLs) were used as the groundwater protection standards for the SSIs. For constituents for which MCLs have not been promulgated (cobalt), the background well concentrations were used as the groundwater protection standards, as per Code Rule 335-13-4-27, subparagraph (4)(h)2.

SSI occurrences of nickel, zinc, chlorobenzene, cis-1,2-dichloroethene, and trans-1,2-dichloroethene were all below the groundwater protection standards or MCLs. The concentrations for metal SSI constituent cobalt (27.9 and 125 µg/L) in wells LF4-MW1 and LF4-MW2 respectively, were greater than the background concentration in LF4-MW5 (10.5 µg/L). Trichloroethene (27 µg/L) in well LF4-MW4 was greater than the MCL (5 µg/L).

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6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This section summarizes the activities performed and the results of the March 2018 monitoring event, and provides conclusions and recommendations based on the results of the groundwater monitoring activities.

6.1 Summary of Activities and Results

The March 2018 monitoring event was performed under the Assessment Monitoring program. Groundwater samples were collected from five residuum monitoring wells at the Site on March 8, 2018. The groundwater samples were analyzed for the constituents listed in *Appendix I* of Code Rule 335-13-4-27 of the *ADEM Division 13 Regulations* (Table 2-2).

Groundwater elevations showed groundwater at the Site flowed in a north and northwesterly direction. The horizontal hydraulic gradients were low over the Site, ranging from 0.004 ft/ft to 0.014 ft/ft.

During the March 2018 monitoring event, four VOCs were detected in well LF4-MW4 and considered SSIs. Concentrations were consistent with historical data.

To evaluate whether there were any SSI occurrences for metal constituents in groundwater at the Site a statistical analysis was performed on the metals data using CUSUM control charts in accordance with Code Rule 335-13-4-27, subparagraph (2) of the *ADEM Division 13 Regulations* and applicable EPA guidance. The statistical analysis showed SSI occurrences for cobalt and nickel in well LF4-MW1; and cobalt, nickel and zinc in well LF4-MW2 during March 2018 groundwater monitoring event. Concentrations were consistent with historical data.

The concentrations of the SSI constituents were compared to the groundwater protection standards for the Site (Table 5-1). MCLs, as listed in the *ADEM Division 7 Regulations*, were used as the groundwater protection standards for the SSIs. Because there is no promulgated MCL for cobalt, the concentration for the cobalt SSI in wells were compared to the cobalt concentration for background well LF4-MW5.

6.2 Conclusions and Recommendations

The concentrations for metal SSI constituent cobalt (27.9 and 125 µg/L) in wells LF4-MW1 and LF4-MW2 respectively, were greater than the groundwater protection standard or background concentration (10.5 µg/L). Trichloroethene (27) was greater than the MCL (5µg/L) in well LF4-MW4. All other SSI constituents were below groundwater protection standards. All concentrations were consistent with historical data. MDA recommends that natural attenuation and land use controls be allowed to continue and the site continue to be monitored on a semi-annual basis under the assessment monitoring program.

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7.0 REFERENCES

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TABLES

Table 2-1. Monitoring Well Construction Summary
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Well ID	Permit Design	Northing	Easting	Ground Elevation (ft msl)	TOC Elevation (ft msl)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Well Depth (ft bgs)	Well Material
LF4-MW1	CMP	1180041.4	669625.24	737.13	739.79	15	40	40	4" ID PVC
LF4-MW2	CMP	1180244.71	670492.08	738.5	738.5	6	36	36	4" ID PVC
LF4-MW3	CMP	1180197.72	671013.48	739.78	739.78	11	31	31	4" ID PVC
LF4-MW4	CMP	1179683.62	671522.79	743.35	743.35	5	25	25	4" ID PVC
LF4-MW5	BKG	1178445.5	669747.69	753.32	753.32	12	32	32	4" ID PVC

Notes:
bgs = below ground surface
BKG = Background well
CMP = Compliance/downgradient well
ft = feet
msl = Mean sea level
NM = Not Measured
TOC = Top of Casing
4" ID = 4-inch inside diameter
PVC = polyvinyl chloride

Table 2-2. Analyte List
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Method	Parameters	CAS No.
Volatile Organic Compounds		
SW8260B	1,1,1,2-Tetrachloroethane	630-20-6
SW8260B	1,1,1-Trichloroethane	71-55-6
SW8260B	1,1,2,2-Tetrachloroethane	79-34-5
SW8260B	1,1,2-Trichloroethane	79-00-5
SW8260B	1,1-Dichloroethane	75-34-3
SW8260B	1,1-Dichloroethene	75-35-4
SW8260B	1,2,3-Trichloropropane	96-18-4
SW8260B	1,2-Dibromo-3-Chloropropane	96-12-8
SW8260B	1,2-Dibromoethane	106-93-4
SW8260B	1,2-Dichlorobenzene	95-50-1
SW8260B	1,2-Dichloroethane	107-06-2
SW8260B	1,2-Dichloropropane	78-87-5
SW8260B	1,4-Dichlorobenzene	106-46-7
SW8260B	2-Butanone (MEK)	78-93-3
SW8260B	2-Hexanone	591-78-6
SW8260B	4-Methyl-2-Pentanone (MIBK)	108-10-1
SW8260B	Acetone	67-64-1
SW8260B	Acrylonitrile	107-13-1
SW8260B	Benzene	71-43-2
SW8260B	Bromochloromethane	74-97-5
SW8260B	Bromodichloromethane	75-27-4
SW8260B	Bromoform	75-25-2
SW8260B	Bromomethane	74-83-9
SW8260B	Carbon Disulfide	75-15-0
SW8260B	Carbon Tetrachloride	56-23-5
SW8260B	Chlorobenzene	108-90-7
SW8260B	Chloroethane	75-00-3
SW8260B	Chloroform	67-66-3
SW8260B	Chloromethane	74-87-3
SW8260B	Cis-1,2-Dichloroethene	156-59-2
SW8260B	Cis-1,3-Dichloropropene	10061-01-5
SW8260B	Dibromochloromethane	124-48-1
SW8260B	Dibromomethane	74-95-3
SW8260B	Ethylbenzene	100-41-4
SW8260B	Iodomethane	74-88-4
SW8260B	Methylene Chloride	75-09-2
SW8260B	Styrene	100-42-5
SW8260B	Tetrachloroethene	127-18-4
SW8260B	Toluene	108-88-3
SW8260B	Trans-1,2-Dichloroethene	156-60-5
SW8260B	Trans-1,3-Dichloropropene	10061-02-6
SW8260B	Trans-1,4-Dichloro-2-Butene	110-57-6
SW8260B	Trichloroethene	79-01-6
SW8260B	Trichlorofluoromethane	75-69-4
SW8260B	Vinyl Acetate	108-05-4
SW8260B	Vinyl Chloride	75-01-4
SW8260B	Xylenes (Total)	1330-20-7

Method	Parameters	CAS No.
Metals		
SW6020A	Antimony	7440-36-0
SW6020A	Arsenic	7440-38-2
SW6020A	Barium	7440-39-3
SW6020A	Beryllium	7440-41-7
SW6020A	Cadmium	7440-43-9
SW6020A	Chromium	7440-47-3
SW6020A	Cobalt	7440-48-4
SW6020A	Copper	7440-50-8
SW6020A	Lead	7439-92-1
SW6020A	Nickel	7440-02-0
SW6020A	Selenium	7782-49-2
SW6020A	Silver	7440-22-4
SW6020A	Thallium	1314-32-5
SW6020A	Vanadium	7440-62-2
SW6020A	Zinc	7440-66-6
SW7470A	Mercury	7487-94-7

µg/L = micrograms per liter
mg/L = milligrams per liter

Analyte list from Appendix I of Code Rule 335-13-4-27 of the Alabama Department of Environmental Management Land Division Solid Waste Program Division 13 Regulations

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
LF4-MW1	CMP	3/14/00	--	20.9	718.89
LF4-MW1		3/22/04	--	--	--
LF4-MW1		3/16/05	42.57	10.95	728.84
LF4-MW1		9/28/05	42.57	16.68	723.11
LF4-MW1		3/13/06	41.8	13.46	726.33
LF4-MW1		9/12/06	41.8	20.83	718.96
LF4-MW1		3/6/07	41.8	16.88	722.91
LF4-MW1		9/24/07	41.8	23.58	716.21
LF4-MW1		3/26/08	41.8	24.97	714.82
LF4-MW1		9/16/08	41.8	24.61	715.18
LF4-MW1		3/17/09	41.95	21.67	718.12
LF4-MW1		9/17/09	42.05	21.81	717.98
LF4-MW1		3/17/10	42	9.3	730.49
LF4-MW1		9/20/10	42.38	27.2	712.59
LF4-MW1		3/15/11	--	--	--
LF4-MW1		9/7/11	42.45	22.59	717.2
LF4-MW1		3/13/12	42.45	20.29	719.5
LF4-MW1		9/5/12	42.46	21.62	718.17
LF4-MW1		3/4/13	42.5	20.85	718.94
LF4-MW1		9/10/13	42.5	12.72	727.07
LF4-MW1		3/4/14	42.5	11.00	728.79
LF4-MW1		10/24/14	42.4	20.75	719.04
LF4-MW1		3/12/15	42.5	14.90	724.89
LF4-MW1		9/15/15	42.5	19.55	720.24
LF4-MW1		3/16/16	42.5	10.05	729.74
LF4-MW1		9/21/16	42.5	21.85	717.94
LF4-MW1		3/14/17	42.5	23.90	715.89
LF4-MW1		9/8/17	42.5	19.21	720.58
LF4-MW1		3/8/18	42.5	14.74	725.05
LF4-MW2	CMP	3/14/00	--	27.8	710.7
LF4-MW2		3/22/04	--	--	719
LF4-MW2		3/16/05	39.85	16.48	722.02
LF4-MW2		9/28/05	39.85	22.2	716.3
LF4-MW2		3/13/06	36	18.81	719.69
LF4-MW2		9/12/06	36	26.49	712.01
LF4-MW2		3/6/07	36	22.06	716.44
LF4-MW2		9/24/07	36	28.6	709.9
LF4-MW2		3/26/08	36	26.11	712.39
LF4-MW2		9/16/08	36	27.98	710.52
LF4-MW2		3/17/09	39	22.68	715.82
LF4-MW2		9/17/09	39.06	26.51	711.99
LF4-MW2		3/17/10	39.15	15.65	722.85
LF4-MW2		9/20/10	40.25	27.33	711.17
LF4-MW2		3/15/11	--	--	--
LF4-MW2		9/7/11	40.23	25.6	712.9
LF4-MW2		3/13/12	40.23	23.19	715.31
LF4-MW2		9/5/12	40.25	24.83	713.67
LF4-MW2		3/4/13	40.25	23.66	714.84
LF4-MW2		9/10/13	40.25	20.35	718.15

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
LF4-MW2		3/4/14	40.25	18.90	719.60
LF4-MW2		10/24/14	40.2	26.01	712.49
LF4-MW2		3/12/15	40.25	19.14	719.36
LF4-MW2		9/15/15	40.28	24.95	713.55
LF4-MW2		3/16/16	40.25	17.11	721.39
LF4-MW2		9/21/16	40.25	27.28	711.22
LF4-MW2		3/14/17	40.25	23.30	715.20
LF4-MW2		9/8/17	40.25	24.24	716.14
LF4-MW2		3/8/18	40.25	17.26	721.24
LF4-MW3	CMP	3/14/00	--	21.6	718.18
LF4-MW3		3/22/04	--	--	727.18
LF4-MW3		3/16/05	34.41	11.69	728.09
LF4-MW3		9/29/05	34.41	17.33	722.45
LF4-MW3		3/13/06	31	11.21	728.57
LF4-MW3		9/14/06	31	17.9	721.88
LF4-MW3		3/6/07	31	12.33	727.45
LF4-MW3		9/25/07	31	21.63	718.16
LF4-MW3		3/26/08	31	12.63	727.15
LF4-MW3		9/16/08	31	16.27	723.51
LF4-MW3		3/17/09	34.13	12.05	727.73
LF4-MW3		9/17/09	34.12	17.2	722.58
LF4-MW3		3/17/10	34.05	11.8	727.98
LF4-MW3		9/20/10	34.1	26.8	712.98
LF4-MW3		3/15/11	--	--	--
LF4-MW3		9/7/11	34.15	16.4	723.38
LF4-MW3		3/13/12	34.15	12.51	727.27
LF4-MW3		9/5/12	34.2	13.7	726.08
LF4-MW3		3/4/13	34.2	17.3	722.48
LF4-MW3		9/10/13	34.2	13.15	726.63
LF4-MW3		3/4/14	34.2	12.45	727.33
LF4-MW3		10/24/14	34.2	19.90	719.88
LF4-MW3		3/12/15	34.2	11.71	728.07
LF4-MW3		9/15/15	34.19	16.85	722.93
LF4-MW3		3/16/16	34.2	12.13	727.65
LF4-MW3		9/21/16	34.2	20.17	719.61
LF4-MW3		3/14/17	34.2	13.15	726.63
LF4-MW3		9/8/17	34.2	15.41	724.37
LF4-MW3		3/8/18	34.2	11.91	728.27
LF4-MW4	CMP	3/14/00	--	8.45	734.9
LF4-MW4		3/22/04	--	--	736.95
LF4-MW4		3/15/05	27.27	5.24	738.11
LF4-MW4		9/29/05	27.27	10.6	732.75
LF4-MW4		3/14/06	25	4.36	738.99
LF4-MW4		9/14/06	25	12.41	730.94
LF4-MW4		3/7/07	25	6.95	736.4
LF4-MW4		9/25/07	25	14.42	728.93
LF4-MW4		3/26/08	25	7.81	735.54
LF4-MW4		9/17/08	25	10.19	733.16

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
LF4-MW4		3/17/09	26.74	5.35	738
LF4-MW4		9/21/09	26.55	9.8	733.55
LF4-MW4		3/17/10	26.65	4.93	738.42
LF4-MW4		9/20/10	26.65	14.26	729.09
LF4-MW4		3/15/11	--	--	--
LF4-MW4		9/7/11	26.6	13.4	729.95
LF4-MW4		3/13/12	26.6	7.06	736.29
LF4-MW4		9/5/12	26.81	8.31	735.04
LF4-MW4		3/4/13	26.8	10.5	732.85
LF4-MW4		9/10/13	26.8	6.35	737.0
LF4-MW4		3/4/14	26.8	5.50	737.85
LF4-MW4		10/24/14	25	13.95	729.40
LF4-MW4		3/12/15	26.8	5.79	737.56
LF4-MW4		9/15/15	26.82	11.91	731.44
LF4-MW4		3/16/16	26.8	4.77	738.58
LF4-MW4		9/21/16	26.8	14.21	729.14
LF4-MW4		3/14/17	26.8	6.37	736.98
LF4-MW4		9/8/17	26.8	9.11	734.24
LF4-MW4		3/8/18	26.8	4.68	738.67
LF4-MW5	BKG	3/14/00	--	12.27	741.05
LF4-MW5		3/22/04	--	--	742.02
LF4-MW5		3/16/05	34.76	10.44	742.88
LF4-MW5		9/29/05	34.76	14.39	738.93
LF4-MW5		3/14/06	32	5.35	747.97
LF4-MW5		9/14/06	32	15.62	737.7
LF4-MW5		3/7/07	32	11.5	741.82
LF4-MW5		9/24/07	32	19.58	733.74
LF4-MW5		3/26/08	32	11.64	741.68
LF4-MW5		9/16/08	32	14.29	739.03
LF4-MW5		3/18/09	34.28	10.3	743.02
LF4-MW5		9/17/09	34.25	13.8	739.52
LF4-MW5		3/17/10	34.2	10.25	743.07
LF4-MW5		9/20/10	34.6	18.75	734.57
LF4-MW5		3/15/11	--	--	--
LF4-MW5		9/7/11	34.6	17.54	735.78
LF4-MW5		3/13/12	34.6	11.95	741.37
LF4-MW5		9/5/12	34.6	12.1	741.22
LF4-MW5		3/4/13	34.6	16.1	737.22
LF4-MW5		9/10/13	34.6	11.58	741.74
LF4-MW5		3/4/14	34.6	10.65	742.67
LF4-MW5		10/24/14	34.6	17.32	736.00
LF4-MW5		3/12/15	34.6	9.97	743.35
LF4-MW5		9/15/15	34.55	15.57	737.75
LF4-MW5		3/16/16	34.6	10.11	743.21
LF4-MW5		9/21/16	34.6	19.77	733.55
LF4-MW5		3/14/17	34.6	12.44	740.88
LF4-MW5		9/8/17	34.6	13.59	739.73
LF4-MW5		3/8/18	34.6	9.69	743.63

Table 4-1: Groundwater Elevations
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Permit Design	Measurement Date	Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)

Notes:

-- = Not available or not measured
bgs = below ground surface
BKG = Background well
BTOC = Below top of casing
CMP = Compliance/downgradient well
ft = feet
msl = Mean sea level

Table 4-2: Horizontal Hydraulic Gradients, March 2018
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Upgradient Well	Groundwater Elevation	Downgradient Well	Groundwater Elevation	Estimated Groundwater Flow Direction	Horizontal Distance	Groundwater Elevation Difference (feet)	Horizontal Gradient (ft/ft)
LF4-MW5	743.63	LF4-MW1	725.05	north	1601	18.58	0.012
LF4-MW4	738.67	LF4-MW3	728.37	northwest	724	10.30	0.014
LF4-MW3	728.37	LF4-MW2	721.24	west	524	7.13	0.014
LF4-MW1	725.05	LF4-MW2	721.24	northeast	890	3.81	0.004
					Average Horizontal Gradient:		**0.011**

Notes:
Elevations in feet above mean sea level.
ft/ft = feet per foot

Table 4-3: Groundwater Field Parameters, March 2018
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Sample Location	Sample Date	Temperature (^{o}C)	Conductivity (µs/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH
LF4-MW1	3/8/18	14.70	126.2	1.86	101.4	0.082	37.60	5.35
LF4-MW2	3/8/18	13.90	386	1.23	65.6	0.251	26.06	5.67
LF4-MW3	3/8/18	13.40	68.1	3.38	222.5	0.044	44.58	5.11
LF4-MW4	3/8/18	13.90	834	1.09	-5.4	0.546	7.85	6.44
LF4-MW5	3/8/18	13.50	33.6	2.53	230.1	0.022	55.97	5.10

Notes:

^{o}C = Degrees Celsius
µs/cm = Microsiemens per centimeter
mg/L = Milligrams per liter
mV = Millivolts
NM = Not measured
NTU = Nephelometric turbidity units
ORP = Oxidation-reduction potential
TDS = Total Dissolved Solids

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW1	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW1	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	0.7	1.9	< 0.5	< 0.5	--
LF4-MW1	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW1	3/31/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	9/29/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	3/16/05	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	9/28/05	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	3/13/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	9/13/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	3/6/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	9/24/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	3/26/08	< 1.0	< 1.0	< 10 (UJC)	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW1	9/16/08	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/17/09	< 1.0	< 1.0	8.4 J	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/17/09	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/17/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/21/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/8/11	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/14/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/6/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/5/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/11/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/5/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/4/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/13/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/16/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW1	3/16/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/21/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/15/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	9/8/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW1	3/8/18	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW2	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	0.6	2	< 0.5	< 0.5	--
LF4-MW2	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW2	3/31/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	9/29/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	3/16/05	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	9/28/05	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	3/13/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	9/13/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	3/6/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	9/24/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	3/26/08	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW2	9/16/08	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/17/09	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/17/09	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/17/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/21/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/8/11	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/14/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/6/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/5/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW2	9/11/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/5/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/4/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/13/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/16/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/16/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/21/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/15/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	9/8/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW2	3/8/18	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW3	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW3	3/31/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	9/29/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	3/16/05	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	9/29/05	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	3/13/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	9/14/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	3/6/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	9/25/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	3/26/08	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW3	9/16/08	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/17/09	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/17/09	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/17/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW3	9/21/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/8/11	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/14/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	0.46 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/6/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/5/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/11/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/5/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/4/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/13/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/16/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/16/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/21/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/15/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	9/8/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW3	3/8/18	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	3.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW4	9/26/00	< 0.5	--	--	< 0.5	--	4.1	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW4	4/24/01	< 0.5	--	--	< 0.5	--	2.6	--	--	--	< 0.5	< 0.5	< 0.5	10.4	--
LF4-MW4	9/28/01	< 0.5	--	--	< 0.5	--	7.8	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW4	4/2/02	< 0.5	--	--	< 0.5	--	5.6	--	--	--	< 0.5	< 0.5	< 0.5	6	--
LF4-MW4	9/18/02	< 0.5	--	--	< 0.5	--	6.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW4	3/5/03	< 0.5	--	--	< 0.5	--	1.9	--	--	--	< 0.5	< 0.5	< 0.5	7.2	--
LF4-MW4	9/26/03	< 0.5	--	--	< 0.5	--	7.4	--	--	--	< 0.5	< 0.5	< 0.5	0.6	--
LF4-MW4	3/31/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	3.7	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW4	9/29/04	< 1.0	0.99 J	< 10	0.5 J	< 1.0	8.5	0.35 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW4	3/15/05	< 1.0	< 1.0	2.9 J	< 1.0	< 1.0	1.4	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW4	9/29/05	< 1.0	0.36 J	< 10	< 1.0	< 1.0	4.1	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW4	3/14/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	0.82 J	< 2.0	< 1.0	1.3	< 1.0	< 1.0	< 1.0	7	< 1.0
LF4-MW4	9/14/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	1.7	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW4	3/7/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW4	9/25/07	< 1.0	0.7 J	< 10	0.37 J	2.8	13	0.25 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW4	3/26/08	< 1.0	< 1.0	< 10 (UJC)	< 1.0	< 1.0	1.9	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW4	9/17/08	< 1.0	0.93 J	< 10	0.42 J	< 1 (UJCL)	15	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	3/17/09	< 1.0	0.39 J	< 10	< 1.0	< 1.0	4.9	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	9/21/09	< 1.0	0.24 J	< 10	< 1.0	< 1.0	3.6	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	3/17/10	0.22 J	< 1.0	< 10	< 1.0	< 1.0	2.1	< 2.0	< 1.0	16	< 1.0	< 1.0	2.4	61	0.21 J
LF4-MW4	9/21/10	< 1.0	0.53 J	< 10	< 1.0	< 1.0	7.6	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.22 J	< 0.8
LF4-MW4	9/8/11	< 1.0	0.54 J	< 10	< 1.0	< 1.0	7.5	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	3/14/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	9/6/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	3/5/13	< 1.0	0.23 J	< 10	< 1.0	< 1.0	2.8	< 2.0	< 1.0	16	< 1.0	< 1.0	1.6	40	< 0.8
LF4-MW4	9/11/13	< 1.0	0.5 J	< 10	< 1.0	< 1.0	7.7	< 2.0	< 1.0	2.9	< 1.0	< 1.0	< 1.0	1.7	< 0.8
LF4-MW4	3/5/14	< 1.0	0.28 J	< 10	< 1.0	< 1.0	3.7	< 2.0	< 1.0	19	< 1.0	< 1.0	1.3	17	0.25 J
LF4-MW4	9/4/14	< 1.0	0.21 J	< 10	< 1.0	< 1.0	4.6	< 2.0	< 1.0	7.7	< 1.0	< 1.0	0.45 J	6.1	< 0.8
LF4-MW4	3/13/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	1.3	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	9/16/15	< 1.0	0.33 J	< 10	< 1.0	< 1.0	5.6	< 2.0	< 1.0	0.38 J	< 1.0	< 1.0	< 1.0	0.33 J	< 0.8
LF4-MW4	3/16/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	1	< 2.0	< 1.0	30	< 1.0	< 1.0	2.3	32	< 0.8
LF4-MW4	9/21/16	< 1.0	0.31 J	< 10	< 1.0	< 1.0	5	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	3/15/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW4	9/8/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	2.6	< 2.0	< 1.0	2.1	< 1.0	< 1.0	< 1.0	1	< 0.8
LF4-MW4	3/8/18	< 1.0	< 1.0	< 10	< 1.0	< 1.0	1.6	< 2.0	< 1.0	20	< 1.0	< 1.0	1.6	27	< 0.8
LF4-MW5	3/29/00	< 0.5	< 0.5	< 5	< 0.5	< 5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
LF4-MW5	9/26/00	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	4/24/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	9/28/01	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	4/2/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	9/18/02	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	3/5/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	9/26/03	< 0.5	--	--	< 0.5	--	< 0.5	--	--	--	< 0.5	< 0.5	< 0.5	< 0.5	--
LF4-MW5	3/31/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	9/29/04	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	3/16/05	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC
LF4-MW5	9/29/05	< 1.0	< 1.0	< 10 (UJI)	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	3/14/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	9/14/06	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	3/7/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	9/24/07	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	3/26/08	< 1.0	< 1.0	< 10 (UJC)	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
LF4-MW5	9/16/08	< 1.0	< 1.0	< 10	< 1.0	< 1 (UJC)	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/18/09	< 1.0	< 1.0	5.5 J	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/17/09	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/17/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/21/10	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/8/11	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/14/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/6/12	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	0.67 J	< 1.0	< 1.0	< 0.8
LF4-MW5	3/5/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/11/13	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/5/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/4/14	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/13/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/16/15	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/16/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/21/16	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/15/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	9/8/17	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8
LF4-MW5	3/8/18	< 1.0	< 1.0	< 10	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.8

Notes:

-- = Not analyzed

< = Indicates the analyte was not detected at the reported quantitation limit shown.

1,1-DCE = 1,1-Dichloroethene

Data reported in micrograms per liter (µg/L)

Samples collected 2000 through 2003 by IT Corporation/Shaw Environmental.

Samples collected in 2004 to the present by Matrix Environmental Services, LLC (MES).

Table 4-4: Analytical Data for VOCs Detected in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	1,1-DCE	1,4-DCB	Acetone	Benzene	Carbon Disulfide	Chloro-benzene	Chloro-ethane	Chloro-form	c-1,2-DCE	Ethyl-benzene	Toluene	t-1,2-DCE	TCE	VC

1,4-DCB = 1,4-Dichlorobenzene
c-1,2-DCE = Cis-1,2-Dichloroethene
t-1,2-DCE = Trans-1,2-Dichloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
VOC = Volatile organic compound

Lab Flag:
J = Estimated detection. Concentration is between the method detection limit and the practical quantitation limit.
Validation Flags:
(UJC) = Reported quantitation limit is estimated; continuing calibration was outside method-specific control limits.
(UJI) = Reported quantitation limit is estimated; initial calibration was outside method-specific control limits.
(UJL) = Reported quantitation limit is estimated; the LCS and LCSD recoveries were outside laboratory historical control limits.

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW1	3/29/00	< 5.0	< 5.0	< 50	< 1.0	< 1.0	< 5.0	< 500	< 5.0	< 3.0	< 1	18	< 5.0	--	< 2.0	< 100	71
LF4-MW1	9/26/00	--	< 5.0	60	--	< 1.0	12.4	--	--	28.4	< 1	--	< 5.0	--	--	--	--
LF4-MW1	4/24/01	--	< 5.0	< 50	--	< 1.0	17.8	--	--	21.1	< 1	--	< 5.0	--	--	--	--
LF4-MW1	9/28/01	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	4/2/02	--	< 5.0	60	--	< 1.0	< 5.0	--	--	< 3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	9/18/02	--	< 5.0	60	--	< 1.0	< 5.0	--	--	3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	3/5/03	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1	--	< 5.0	--	--	--	--
LF4-MW1	9/26/03	--	< 5.0	< 50	--	1.0	< 5.0	--	--	13	< 1	--	< 5.0	--	--	--	--
LF4-MW1	3/31/04	< 100	< 10	40.8	< 10	< 10	< 20 (UJ-)	8.81 J (J-)	< 20	2.1 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10	< 10	21.6 J
LF4-MW1	9/29/04	< 100	< 10	41.2	< 10	2.31 J	< 20	30.5	< 20	2.25 J (J-)	< 0.4	13.1 J	< 10	5.11 J	< 10	< 10	51.9 J
LF4-MW1	3/16/05	< 100	< 10	29.1	< 10	< 10	< 20	8.6 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	14.4 J
LF4-MW1	9/28/05	< 100	< 10	43.2	< 10	< 10	< 20	14.6 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW1	3/13/06	< 100	< 10	71.5	1.62 J	< 10	7.94 J	17.8 J	15.1 J	< 10	< 0.4	20 U^ (UB)	< 10	20 U^ (UB)	< 10	14.3	83.1 J
LF4-MW1	9/13/06	< 100	5.07 J	41.6	1.13 J	< 10	< 20	8.79 J	10.1 J	2.86 J	< 0.4	12.9 J	< 10	38	< 10	< 10	30.4 J
LF4-MW1	3/6/07	< 100	< 10	40	< 10	< 10	< 20	8.36 J	9.69 J	4.77 J	< 0.4	< 20	< 10	< 20	< 10	< 10	39.5 J
LF4-MW1	9/24/07	< 100	< 10	32.1	< 10	< 10	< 20	9.65 J	6.72 J	3.48 J	< 0.4	10.2 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW1	3/26/08	< 100	< 10	50.3	< 10	< 10	< 20	28.6	9.1 J	7.19 J	< 0.4	16.3 J	< 10	< 20	< 10	< 10	41.7 J
LF4-MW1	9/16/08	< 100	< 10	31.3	< 10	< 10	< 20	10.6 J	6.42 J	< 10	< 0.4	10.1 J	< 10	< 20	< 10	< 10	23.9 J
LF4-MW1	3/17/09	< 100	< 10	28.7	< 10	< 10	< 20	19.9 J	4.64 J	< 10	< 0.8	12.3 J	< 10	< 20	6.41 J	< 10	34.9 J
LF4-MW1	9/17/09	< 100	< 10	33.1	< 10	< 10	< 20	14.7 J	4.63 J	3.4 J	< 0.4	11 J	< 10	< 20	< 10	< 10	31.3 J
LF4-MW1	3/17/10	< 100	< 10	32.5	< 10	< 10	< 20	12.6 J	4.74 J	5.31 J	< 0.4	6.78 J	< 10	< 20	< 10	< 10	13.1 J
LF4-MW1	9/21/10	100 U^ (UB)	< 10	29.9	< 10	< 10	< 20	21.7	2.12 J	< 10	< 0.4	13.8 J	< 10	< 20	< 10	< 10	41.2 J
LF4-MW1	3/15/11	< 100	< 10	40.9	< 10	< 10	< 20	26.7	17.8 J	< 10	< 0.4	19.1 J	< 10	< 20	< 10	< 10	65.9 J
LF4-MW1	9/8/11	< 100	< 10	39.1	< 10	< 10	< 20	31.9	< 20	3.17 J	< 2	19.1 J	< 10	< 20	< 10	< 10	52.1 J
LF4-MW1	3/14/12	< 100	< 10	47.2	< 10	< 10	< 20	32.8	< 20	3.18 J	< 0.4	20.5	< 10	< 20	< 10	< 10	52.8 J
LF4-MW1	9/6/12	< 100	< 10	46.6	< 10	< 10	< 20	36.8	< 20	< 10	< 0.4	25.4	< 10	< 20	< 10	< 10	55.9 J
LF4-MW1	3/5/13	< 100	< 10	47.7	< 10	< 10	< 20	33.0	< 20	3.26 J	< 0.4	23.1	< 10	< 20	< 10	< 10	62.9 J
LF4-MW1	9/11/13	< 100	< 10	36.1	< 10	< 10	< 20	22.1	3.11 J	7.36 J	< 0.4	15.4 J	< 10	< 20	< 10	< 10	39.1 J
LF4-MW1	3/5/14	< 1.0	0.258 J	37.1	0.284 J	< 1.0	< 1.0	26.4	2.74	0.223 J	< 0.4	17.7	< 1.0	< 1.0	< 1.0	< 1.0	43.3
LF4-MW1	9/4/14	< 1.0	0.263 J	36.0	0.391 J	< 1.0	0.296 J	24.3	2.71	0.378 J	< 0.4	14.7	< 1.0	< 1.0	< 1.0	< 1.0	39.3
LF4-MW1	3/13/15	< 1.0	0.227 J	43.5	0.289 J	< 1.0	< 1.0	33.6	1.45	0.282 J	< 0.4	19.4	< 1.0	< 1.0	< 1.0	< 1.0	59.5
LF4-MW1	9/16/15	< 1.0	0.513 J	42.3	0.497 J	< 1.0	1.89	25	4.87	3.77	< 0.4	16.4	< 1.0	< 1.0	< 1.0	1.77	40.5
LF4-MW1	3/16/16	< 1.0	< 1.0	42.7	0.275 J	0.201 J	< 1.0	39.5	1.78	0.374 J	< 0.4	22.1	< 1.0	< 1.0	< 1.0	< 1.0	60.5
LF4-MW1	9/21/16	< 1.0	0.314 J	40.7	0.429 J	< 1.0	0.408 J	30.4	2.16	0.722 J	< 0.4	18.3	<1.0	<1.0	<1.0	<1.0	47
LF4-MW1	3/15/17	< 1.0	0.309 J	45.5	0.276 J	0.249 J	0.481 J	33.7	1.31	0.472 J	< 0.4	21.8	<1.0	<1.0	<1.0	<1.0	55.8
LF4-MW1	9/8/17	< 1	0.346 J	44	0.224 J	< 1	0.377 J	37.7	1.33	0.368 J	< 0.4	22.9	< 1	< 1	< 1	< 1	60.9
LF4-MW1	3/8/18	< 1	1.48	44.6	0.207 J	< 1	1.45	27.9	2.23	1.67	< 0.4	18.3	< 1	< 1	< 1	1.58	50.3

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW2	3/29/00	< 5.0	< 5.0	96.5	< 1.0	< 1.0	< 5.0	< 500	< 5.0	< 3.0	< 1.0	15	< 5.0	--	< 2.0	< 100	39.5
LF4-MW2	9/26/00	--	< 5.0	120	--	< 1.0	7.4	--	--	23.9	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	4/24/01	--	< 5.0	100	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	9/28/01	--	< 5.0	70	--	< 1.0	5.77	--	--	8.14	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	4/2/02	--	< 5.0	120	--	< 1.0	< 5.0	--	--	5.69	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	9/18/02	--	< 5.0	110	--	< 1.0	< 5.0	--	--	3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	3/5/03	--	< 5.0	60	--	< 1.0	9.0	--	--	10	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	9/26/03	--	< 5.0	90	--	1.0	< 5.0	--	--	15	< 1.0	--	< 5.0	--	--	--	--
LF4-MW2	3/31/04	< 100	< 10	87.2	< 10	< 10	< 20 (UJ-)	7.27 J (J-)	< 20	4.27 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10	< 10	50.4 J
LF4-MW2	9/29/04	< 100	15.2	227	4.41 J	< 10	30.1	27.2	55.6	78.8	0.188 J	33.2	< 10	< 20	< 10	101	92.9 J
LF4-MW2	3/16/05	< 100	< 10	60.3	< 10	< 10	< 20	8.53 J	< 20	2.71 J	< 0.4	< 20	< 10	< 20	< 10	< 10	65.6 J
LF4-MW2	9/28/05	< 100	< 10	87.7	1.32 J	< 10	< 20	22.0	< 20	< 10	< 0.4	14.8 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW2	3/13/06	< 100	< 10	25.4	< 10	< 10	< 20	6.39 J	10.7 J	10.1	< 0.4	< 20	< 10	20 U^ (UB)	< 10	< 10	54.2 J
LF4-MW2	9/13/06	46.2 J	6.34 J	111	2.38 J	< 10	5.68 J	15 J	16.1 J	12.1	< 0.4	18.7 J	< 10	20 U^ (UB)	10 U^ (UB)	18.7	96 J
LF4-MW2	3/6/07	< 100	< 10	94.7	< 10	< 10	< 20	14.6 J	9.44 J	7.79 J	< 0.4	10.8 J	< 10	< 20	< 10	6.95 J	35.5 J
LF4-MW2	9/24/07	< 100	< 10	82	< 10	< 10	< 20	12.7 J	2.59 J	4.45 J	< 0.4	10.8 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW2	3/26/08	< 100	< 10	133	< 10	< 10	< 20	9.79 J	4.98 J	7.24 J	< 0.4	9.77 J	< 10	< 20	< 10	< 10	17.1 J
LF4-MW2	9/16/08	< 100	< 10	97.6	< 10	< 10	< 20	19.4 J	4.2 J	5.01 J	< 0.4	14.8 J	< 10	< 20	< 10	< 10	30.6 J
LF4-MW2	3/17/09	< 100	< 10	125	1.06 J	< 10	< 20	96.4	3.4 J	< 10	< 0.8	68.3	< 10	< 20	5.84 J	< 10	501
LF4-MW2	9/17/09	< 100	< 10	93.4	< 10	< 10	< 20	113	3.54 J	< 10	< 0.4	70.1	< 10	< 20	6.54 J	< 10	608
LF4-MW2	3/17/10	< 100	< 10	89.8	2.02 J	1.01 J	3.36 J	87	24.3	9.3 J	< 0.4	64.8	< 10	< 20	< 10	< 10	887
LF4-MW2	9/21/10	< 100	8.3 J	99.7	< 10	< 10	< 20	31.3	< 20	< 10	< 0.4	20.5	< 10	< 20	< 10	< 10	105
LF4-MW2	3/15/11	< 100	< 10	102	< 10	< 10	< 20	23.5	< 20	< 10	< 0.4	14.6 J	< 10	< 20	< 10	< 10	703 J
LF4-MW2	9/8/11	< 100	5.4 J	107	< 10	< 10	< 20	24.6	< 20	< 10	< 2.0	15 J	< 10	< 20	< 10	< 10	73.7 J
LF4-MW2	3/14/12	< 100	< 10	107	< 10	< 10	< 20	19.9 J	< 20	< 10	< 0.4	11.6 J	< 10	< 20	< 10	< 10	54.9 J
LF4-MW2	9/6/12	< 100	< 10	109	< 10	< 10	< 20	18.7 J	4.79 J	< 10	< 0.4	15.4 J	< 10	< 20	< 10	< 10	62.4 J
LF4-MW2	3/5/13	< 100	< 10	128	< 10	< 10	< 20	142	11.8 J	3.74 J	< 0.4	83.4	< 10	< 20	< 10	< 10	733
LF4-MW2	9/11/13	< 100	< 10	75.4	< 10	< 10	< 20	109	< 20	4.31 J	< 0.4	61.6	< 10	< 20	< 10	< 10	410
LF4-MW2	3/5/14	< 1.0	1.38	63	0.8 J	1.08	2.4	175	23.5	2.2	< 0.4	99	0.771 J	< 1.0	< 1.0	< 1.0	1020
LF4-MW2	9/4/14	< 1.0	1.96	57.6	0.11 J	0.303 J	0.667 J	90.6	1.86	0.987 J	< 0.4	44.2	< 1.0	< 1.0	< 1.0	0.639 J	311
LF4-MW2	3/13/15	< 1.0	2.36	73.6	0.709 J	0.715 J	2.04	139	15.1	2.08	< 0.4	75.4	1.04	< 1.0	< 1.0	< 1.0	826
LF4-MW2	9/16/15	< 1.0	4.05	79.1	0.148 J	0.232 J	0.972 J	75.5	2.42	1.9	< 0.4	41.1	< 1.0	< 1.0	< 1.0	0.8 J	281
LF4-MW2	3/16/16	< 1.0	2.46	58.8	0.345 J	0.5 J	1.83	92.8	10.4	4.16	< 0.4	53.8	< 1.0	< 1.0	< 1.0	1.4	434
LF4-MW2	9/21/16	<1.0	3.33	69.7	0.14 J	0.282 J	1	91.7	2.54	1.8	< 0.4	49.1	<1.0	<1.0	<1.0	0.895 J	389
LF4-MW2	3/15/17	<1.0	2.85	66.5	0.119 J	<1.0	0.854 J	55.7	2.31	2.24	< 0.4	27.5	<1.0	<1.0	<1.0	1.4	175
LF4-MW2	9/8/17	< 1	5.43	87.3	0.115 J	< 1	1.22	51.3	2.11	1.93	< 0.4	25.3	< 1	< 1	< 1	1.96	180
LF4-MW2	3/8/18	< 1	2.74	77	0.542 J	0.915 J	2.97	125	10.9	3.91	< 0.4	64.8	0.608 J	< 1	< 1	2.52	732

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW3	3/29/00	< 5.0	< 5.0	< 50	< 1.0	< 1.0	< 5.0	< 500	< 5.0	4.0	< 1.0	< 5.0	< 5.0	--	< 2.0	< 100	< 30
LF4-MW3	9/26/00	--	< 5.0	60	--	< 1.0	6.23	--	--	11.4	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	4/24/01	--	< 5.0	60	--	< 1.0	< 5.0	--	--	5.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	9/28/01	--	6.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	4/2/02	--	< 5.0	60	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	9/18/02	--	< 5.0	70	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	3/5/03	--	< 5.0	50	--	< 1.0	7.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	9/26/03	--	< 5.0	70	--	< 1.0	< 5.0	--	--	17	< 1.0	--	< 5.0	--	--	--	--
LF4-MW3	3/31/04	< 100	< 10	53.7	< 10	< 10	< 20 (UJ-)	< 20 (UJ-)	27.4	5.34 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10 (UJ-)	< 10	69.4 J
LF4-MW3	9/29/04	< 100	< 10	66.8	< 10	< 10	< 20	12.3 J	< 20	< 10 (UJ-)	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW3	3/16/05	< 100	< 10	36.3	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	5.05 J
LF4-MW3	9/29/05	< 100	< 10	54.1	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW3	3/13/06	< 100	< 10	57	< 10	< 10	< 20	< 20	6.48 J	5.43 J	< 0.4	< 20	< 10	20 U^ (UB)	< 10	7.06 J	21.1 J
LF4-MW3	9/14/06	< 100	5.12 J	65.4	< 10	< 10	20 U^ (UB)	14 J	7.02 J	3.01 J	< 0.4	15.4 J	< 10	< 20 (UJ-)	5.41 J	5.79 J	25.1 J
LF4-MW3	3/6/07	< 100	< 10	48.3	< 10	< 10	< 20	< 20	< 20	2.38 J	< 0.4	< 20	< 10	< 20 (UJM)	< 10	< 10	26.2 J
LF4-MW3	9/25/07	< 100	< 10	59.7	< 10	< 10	< 20	7.41 J	< 20	< 10	< 0.4	6.81 J	< 10	< 20	< 10	< 10	15.6 J
LF4-MW3	3/26/08	< 100	< 10	69.8	< 10	< 10	< 20	< 20	2.46 J	4.79 J	< 0.4	6.14 J	< 10	< 20	< 10	< 10	15.9 J
LF4-MW3	9/16/08	< 100	< 10	51.9	< 10	< 10	< 20	< 20	3.72 J	< 10	< 0.4	3.94 J	< 10	< 20	< 10	< 10	8.07 J
LF4-MW3	3/17/09	< 100	< 10	53.5	< 10	< 10	< 20	< 20	2.2 J	< 10	< 0.8	3.49 J	< 10	< 20	< 10	< 10	15 J
LF4-MW3	9/17/09	< 100	22.4	76.3	< 10	< 10	< 20	< 20	< 20	29.1	< 0.4	6.87 J	< 10	< 20	< 10	< 10	26.6 J
LF4-MW3	3/17/10	< 100	< 10	58.5	< 10	< 10	< 20	< 20	2.03 J	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	7.51 J
LF4-MW3	9/21/10	< 100	< 10	39.2	< 10	< 10	< 20	3.39 J	< 20	< 10	< 0.4	2.66 J	< 10	< 20	< 10	< 10	5.95 J
LF4-MW3	3/15/11	< 100	< 10	69.2	< 10	< 10	< 20	2.92 J	6.07 J	5.0 J	< 0.4	3.87 J	< 10	< 20	< 10	< 10	20.6 J
LF4-MW3	9/8/11	< 100	< 10	57.1	< 10	< 10	< 20	2.74 J	< 20	< 10	< 2.0	3.49 J	< 10	< 20	< 10	< 10	10.1 J
LF4-MW3	3/14/12	< 100	< 10	60.8	< 10	< 10	< 20	< 20	3.23 J	< 10	< 0.4	3.43 J	< 10	< 20	< 10	< 10	14.7 J
LF4-MW3	9/6/12	< 100	< 10	59	< 10	< 10	< 20	< 20	3.05 J	< 10	< 0.4	3.62 J	< 10	< 20	< 10	< 10	17.1 J
LF4-MW3	3/5/13	< 100	< 10	75.7	< 10	< 10	< 20	< 20	3.46 J	4.5 J	< 0.4	4.38 J	< 10	< 20	< 10	< 10	16.6 J
LF4-MW3	9/11/13	< 100	< 10	52.2	< 10	< 10	< 20	9.77 J	< 20	3.13 J	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW3	3/5/14	< 1.0	0.272 J	54.7	0.27 J	< 1.0	0.256 J	1.76	1.74	2.01	< 0.4	2.85	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW3	9/4/14	< 1.0	679 J	67200	0.35 J	0.243 J	0.654 J	4.03	1.67	2.01	< 0.4	3.4	< 1.0	< 1.0	< 1.0	1.28	< 20
LF4-MW3	3/13/15	< 1.0	0.648 J	84.5	0.597 J	< 1.0	0.356 J	1.61	1.93	4.32	< 0.4	3.37	< 1.0	< 1.0	< 1.0	< 1.0	14.9 J
LF4-MW3	9/16/15	< 1.0	0.432 J	97.8	0.308 J	0.248 J	0.406 J	17.7	1.1	1.53	< 0.4	6.0	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW3	3/16/16	< 1.0	0.352 J	56.7	0.31 J	< 1.0	0.34 J	1.49	1.91	2.41	< 0.4	2.9	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW3	9/21/16	<1.0	0.992 J	86.8	0.508 J	0.262 J	1.19	1.02	2.26	3.16	< 0.4	3.93	<1.0	<1.0	<1.0	1.83	11.2 J
LF4-MW3	3/15/17	<1.0	0.782 J	60.3	0.373 J	< 1.0	0.786 J	1.5	1.3	3.05	< 0.4	3.0	<1.0	<1.0	<1.0	0.949 J	10.4 J
LF4-MW3	9/8/17	< 1	0.207 J	59.3	0.224 J	< 1	0.591 J	1.86	3.36	0.935 J	< 0.4	3.4	< 1	< 1	< 1	< 1	18 J
LF4-MW3	3/8/18	< 1 UJM	0.715 J	58.1	0.329 J	< 1	0.841	1.38	1.58	2.91	< 0.4	2.84	< 1	< 1	< 1	0.898 J	14.2 J

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW4	3/29/00	< 5.0	< 5.0	245	< 1	< 1.0	< 5.0	< 500	< 5.0	6.0	< 1.0	< 5.0	< 5.0	--	< 2.0	< 100	< 30
LF4-MW4	9/26/00	--	< 5.0	200	--	< 1.0	5.55	--	--	22.3	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	4/24/01	--	< 5.0	140	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	9/28/01	--	6.0	250	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	4/2/02	--	< 5.0	250	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	9/18/02	--	< 5.0	240	--	< 1.0	< 5.0	--	--	5.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	3/5/03	--	< 5.0	170	--	< 1.0	< 5.0	--	--	5.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	9/26/03	--	< 5.0	230	--	2.0	< 5.0	--	--	15	< 1.0	--	< 5.0	--	--	--	--
LF4-MW4	3/31/04	< 100	< 10	197	< 10	< 10	< 20 (UJ-)	6.45 J (J-)	< 20	< 10 (UJ-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10 (UJ-)	< 10	17.5 J
LF4-MW4	9/29/04	< 100	< 10	181	< 10	< 10	< 20	< 20	< 20	6.94 J (J-)	< 2.0	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW4	3/15/05	< 100	< 10	152	< 10	< 10	< 20	< 20 (UJ-)	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	10.4 J
LF4-MW4	9/29/05	< 100	< 10	186	< 10	< 10	< 20	< 20	< 20	2.7 J	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW4	3/14/06	< 100	< 10	145	< 10	< 10	< 20	< 20	< 20	11.6	< 0.4	< 20	< 10	< 20	< 10	6.87 J	25.5 J
LF4-MW4	9/14/06	< 100	5.18 J	180	< 10	< 10	20 U^ (UB)	< 20	8.16 J	28.5	< 0.4	< 20	< 10	< 20 (UJ-)	< 10	12.5	45 J
LF4-MW4	3/7/07	< 100	5.59 J	119	< 10	< 10	< 20	< 20	< 20	5.62 J	< 0.4	< 20	< 10	< 20	< 10	< 10	9.82 J
LF4-MW4	9/25/07	< 100	< 10	209	< 10	< 10	< 20	4.34 J	< 20	5 J	< 0.4	5.16 J	< 10	< 20	< 10	< 10	14 J
LF4-MW4	3/26/08	< 100	< 10	143	< 10	< 10	< 20	6.95 J	< 20	< 10	< 0.4	4.22 J	< 10	< 20	8.84 J	< 10	7.11 J
LF4-MW4	9/17/08	68.6 J	< 10	193	< 10	< 10	< 20	4.32 J	2.4 J	5.62 J	< 0.4	4.99 J	< 10	3.37 J (JM)	10.7	< 10	17.8 J
LF4-MW4	3/17/09	< 100	< 10	139	< 10	< 10	< 20	5.29 J	< 20	4.94 J	< 0.8	4.39 J	< 10	< 20	11.8	< 10	19.3 J
LF4-MW4	9/21/09	< 100	< 10	115	< 10	< 10	< 20	< 20	2.06 J	5.62 J	< 0.4	2.83 J	< 10	< 20	< 10	< 10	7.15 J
LF4-MW4	3/17/10	36.7 J	< 10	129	< 10	< 10	< 20	2.63 J	2 U^ (UB)	3.32 J	< 0.4 (UJM)	4.59 J	< 10	< 20	< 10	< 10	6.8 J
LF4-MW4	9/21/10	< 100	< 10	177	< 10	1.62 J	< 20	4.49 J	< 20	3.58 J	< 0.4	3.93 J	< 10	< 20	< 10	< 10	12.9 J
LF4-MW4	3/15/11	< 100	< 10	89.8	< 10	< 10	< 20	3.02 J	3.05 J	3.56 J	< 0.4	< 20	< 10	< 20	< 10	< 10	12.7 J
LF4-MW4	9/8/11	< 100	< 10	169	< 10	< 10	< 20	4.25 J	< 20	3.69 J	< 2.0	3.72 J	< 10	< 20	< 10	2.75 J	10.2 J
LF4-MW4	3/14/12	< 100	< 10	136	< 10	< 10	< 20	3.92 J	3.03 J	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW4	9/6/12	< 100	< 10	115	< 10	< 10	< 20	< 20	4.83 J	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW4	3/5/13	< 100	< 10	162	< 10	< 10	< 20	2.86 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	12.7 J
LF4-MW4	9/11/13	< 100	< 10	201	< 10	< 10	< 20	6.32 J	< 20	4.8 J	< 0.4	8.64 J	< 10	< 20	< 10	< 10	11.8 J
LF4-MW4	3/5/14	< 1.0	2.03	174	< 1.0	< 1.0	< 1.0	3.05	1.37	1.01	< 0.4 (UJM)	2.57	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW4	9/4/14	< 1.0	2720	188000	0.114 J	0.926 J	< 1.0	3.31	0.889 J	4.09	< 0.4	3.73	< 1.0	< 1.0	< 1.0	2.33	< 20
LF4-MW4	3/13/15	< 1.0	2.29	112	< 1.0	< 1.0	0.22 J	5.34	< 1.0	0.601 J	< 0.4	2.11	< 1.0	< 1.0	< 1.0	1.28	< 20
LF4-MW4	9/16/15	< 1.0	1.3	174	0.196 J	1.5	1.95	4.47	2.53	10.9	< 0.4	4.35	0.308 J	< 1.0	< 1.0	7.32	17.3 J
LF4-MW4	3/16/16	< 1.0	5.22	186	< 1.0	< 1.0	< 1.0	2.11	< 1.0	0.407 J	< 0.4	2.2	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW4	9/21/16	<1.0	1.02	160	<1.0	0.508 J	<1.0	4.22	1.17	3.2	< 0.4	3.16	<1.0	<1.0	<1.0	2.91	17.1 J
LF4-MW4	3/15/17	<1.0	3.28	127	<1.0	< 1.0	0.289 J	7.09	0.501 J	0.711 J	< 0.4	2.29	<1.0	<1.0	<1.0	2.09	< 20
LF4-MW4	9/8/17	< 1	6.17	225	0.103 J	0.892 J	0.709 J	8.34	1.28	8.82	< 0.4	3.63	0.463 J	< 1	< 1	3.91	23.5
LF4-MW4	3/8/18	< 1	2.47	197	< 1	< 1	0.253 J	2.71	< 1	0.547 J	< 0.4	1.47	< 1	< 1	< 1	0.799 J	< 20

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
LF4-MW5	3/29/00	< 5.0	< 5.0	< 50	< 1	< 1.0	< 5.0	< 500	< 5.0	3.0	< 1.0	< 5.0	< 5.0	--	< 2.0	< 100	< 30
LF4-MW5	9/26/00	--	< 5.0	< 20	--	< 1.0	< 5.0	--	--	11.2	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	4/24/01	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	9/28/01	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	4/2/02	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	9/18/02	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	3/5/03	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	< 3.0	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	9/26/03	--	< 5.0	< 50	--	< 1.0	< 5.0	--	--	17	< 1.0	--	< 5.0	--	--	--	--
LF4-MW5	3/31/04	< 100	< 10	14.4	< 10	< 10	< 20 (UJ-)	< 20 (UJ-)	29.2	4.98 J (J-)	< 0.4	< 20	< 10	< 20 (UJ-)	< 10 (UJ-)	< 10	67.5 J
LF4-MW5	9/29/04	< 100	< 10	12.7	< 10	< 10	< 20	7.63 J	< 20	< 10 (UJ-)	< 0.4	< 20	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW5	3/16/05	< 100	< 10	15.8	< 10	< 10	< 20	< 20	< 20	3.87 J	< 0.4	< 20	< 10	< 20	< 10	< 10	7.98 J
LF4-MW5	9/29/05	< 100	< 10	11.6	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/14/06	< 100	< 10	20.4	< 10	< 10	< 20	7.09 J	< 20	4.51 J	< 0.4	< 20	< 10	20 U^ (UB)	6.92 J	9.47 J	12.8 J
LF4-MW5	9/14/06	< 100	< 10	20.8	< 10	< 10	< 20	6.42 J	< 20	10.7	< 0.4	< 20	< 10	< 20 (UJ-)	8.76 J	7.5 J	20.9 J
LF4-MW5	3/7/07	< 100	< 10	14.5	< 10	< 10	< 20	< 20	< 20	3.2 J	< 0.4	< 20	< 10	< 20	< 10	< 10	18.8 J
LF4-MW5	9/24/07	< 100	< 10	20.5	< 10	< 10	< 20	4.25 J	2.14 J	5 J	< 0.4	3.21 J	< 10	< 20	< 10	< 10	100 U^ (UB)
LF4-MW5	3/26/08	< 100	< 10	12.2	< 10	< 10	< 20	2.59 J	< 20	< 10	< 0.4	2.75 J	< 10	< 20	< 10	< 10	6.55 J
LF4-MW5	9/16/08	< 100	< 10	10.7	< 10	< 10	< 20	3.33 J	< 20	< 10	< 0.4	2.58 J	< 10	< 20	< 10	< 10	6.3 J
LF4-MW5	3/18/09	< 100	< 10	13.1	< 10	< 10	< 20	2.91 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	8.63 J
LF4-MW5	9/17/09	< 100	< 10	9.23 J	< 10	< 10	< 20	4.33 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	5.65 J
LF4-MW5	3/17/10	< 100	< 10	13.6	< 10	< 10	< 20	6.24 J	< 20	< 10	< 0.4	3.17 J	< 10	< 20	< 10	< 10	< 100
LF4-MW5	9/21/10	100 U^ (UB)	< 10	12.5	< 10	< 10	< 20	10.5 J	< 20	< 10	< 0.4	3.69 J	< 10	< 20	< 10	< 10	8.21 J
LF4-MW5	3/15/11	< 100	< 10	28.9	< 10	< 10	4.91 J	2.95 J	4.69 J	9.14 J	< 0.4	5.17 J	< 10	< 20	< 10	12.5	15 J
LF4-MW5	9/8/11	< 100	< 10	17.2	< 10	< 10	< 20	7.26 J	< 20	< 10	< 2.0	3.14 J	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/14/12	< 100	< 10	12.5	< 10	< 10	< 20	3.17 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	11.5 J
LF4-MW5	9/6/12	< 100	< 10	11.1	< 10	< 10	< 20	2.34 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/5/13	< 100	< 10	12	< 10	< 10	< 20	2.76 J	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	11 J
LF4-MW5	9/11/13	< 100	< 10	< 10	< 10	< 10	< 20	< 20	< 20	< 10	< 0.4	< 20	< 10	< 20	< 10	< 10	< 100
LF4-MW5	3/5/14	< 1.0	0.21 J	11.6	< 1.0	< 1.0	< 1.0	4.02	1.1	0.943 J	< 0.4	2.36	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW5	9/4/14	< 1.0	226 J	10100	0.101 J	< 1.0	< 1.0	3.24	0.788 J	0.638 J	< 0.4	1.61	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW5	3/13/15	< 1.0	< 1.0	13.5	0.102 J	< 1.0	< 1.0	3.15	0.624 J	0.923 J	< 0.4	1.89	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW5	9/16/15	< 1.0	< 1.0	10.8	< 1.0	< 1.0	0.206 J	2.31	< 1.0	0.6 J	< 0.4	1.46	< 1.0	< 1.0	< 1.0	< 1.0	< 20
LF4-MW5	3/16/16	< 1.0	0.284 J	16.2	0.101 J	< 1.0	0.402 J	4.38	1.13	2.28	< 0.4	2.63	< 1.0	< 1.0	< 1.0	1.0 J	11.6 J
LF4-MW5	9/21/16	<1.0	<1.0	14.7	0.163 J	<1.0	<1.0	6.56	0.616 J	0.647 J	< 0.4	3.3	<1.0	<1.0	<1.0	<1.0	< 20
LF4-MW5	3/15/17	<1.0	<1.0	14.8	0.125 J	<1.0	0.477 J	2.67	1.22	1.24	< 0.4	2.07	<1.0	<1.0	<1.0	0.903 J	< 20
LF4-MW5	9/8/17	< 1	0.232 J	11.8	0.124 J	< 1	0.388 J	3.05	1.15	0.715 J	< 0.4	1.46	< 1	< 1	< 1	< 1	< 20
LF4-MW5	3/8/18	< 1	0.658 J	17.4	0.123 J	< 1	0.796	4.09	1.7	3.18	< 0.4	2.77	< 1	< 1	< 1	2.46	59.7

Table 4-5: Analytical Data for Metals in Groundwater
Industrial Landfill, Parcel 175(5)
McClellan, Anniston Alabama

Well ID	Sample Date	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)

Notes:
-- = Not analyzed
< = Indicates the analyte was not detected at the reported quantitation limit shown.
µg/L = micrograms per liter
mg/L = milligrams per liter

Samples collected 2000 through 2003 by IT Corporation/Shaw Environmental.
Samples collected in 2004 to the present by Matrix Environmental Services, LLC.

Lab Flags:
J = Estimated detection. Concentration is between the method detection limit and the practical quantitation limit.
U^ = Analyte is not detected above the reporting limit. Lab flag updated by MES data reviewer.

Validation Flags:
(UB) = Value is considered a non-detection due to a detection of the analyte in an associated blank.
(JM) = Estimated detection; the MS and MSD recoveries were outside laboratory historical control limits.
(UJM) = Reported quantitation limit is estimated; the MS and MSD recoveries were outside laboratory historical control limits.
(J-) = Analyte was reported as a negative concentration in the method or continuing calibration blank; affected sample detects may be biased low.
(UJ-) = Analyte was reported as a negative concentration in the method or continuing calibration blank; affected sample non-detects may be potential false negatives.

Table 5-1 - Summary of Statistically Significant Increases, March 2018
Sampling Event
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Well Location	SSI Analyte	CUSUM	Sample Concentration	MCL	BKG Concentration	Units
LF4-MW1	cobalt	4.67	27.9	NA	10.5	µg/L
	nickel	11.75	22.9	100	--	µg/L
LF4-MW2	cobalt	25.13	125	NA	10.5	µg/L
	nickel	18.61	25.3	100	--	µg/L
	zinc	72.14	180	5000*	--	µg/L
LF4-MW4	chlorobenzene	NA	1.6	100	--	µg/L
	cis-1,2-dichloroethene	NA	20	70	--	µg/L
	trans-1,2-dichloroethene	NA	1.6	100	--	µg/L
	trichloroethene	NA	27	5	--	µg/L

Notes:
-- = Not applicable or not established
µg/L = micrograms per liter
BKG = Background well LF4-MW5
CUSUM = Shewhart Cumulative Sum
MCL = Maximum contaminant level (Codes 335-7-2-.03, 335-7-2-.05, and 335-7-3-.02 of the *ADEM Division 7 Regulations* [ADEM, 2014])
NA = Promulgated MCL not available
SSI = Statistically Significant Increase
* Secondary MCL (Code 335-7-3-.02 of the *ADEM Division 7 Regulations* [ADEM, 2014])

Sample concentration > MCL or BKG Concentration

FIGURES

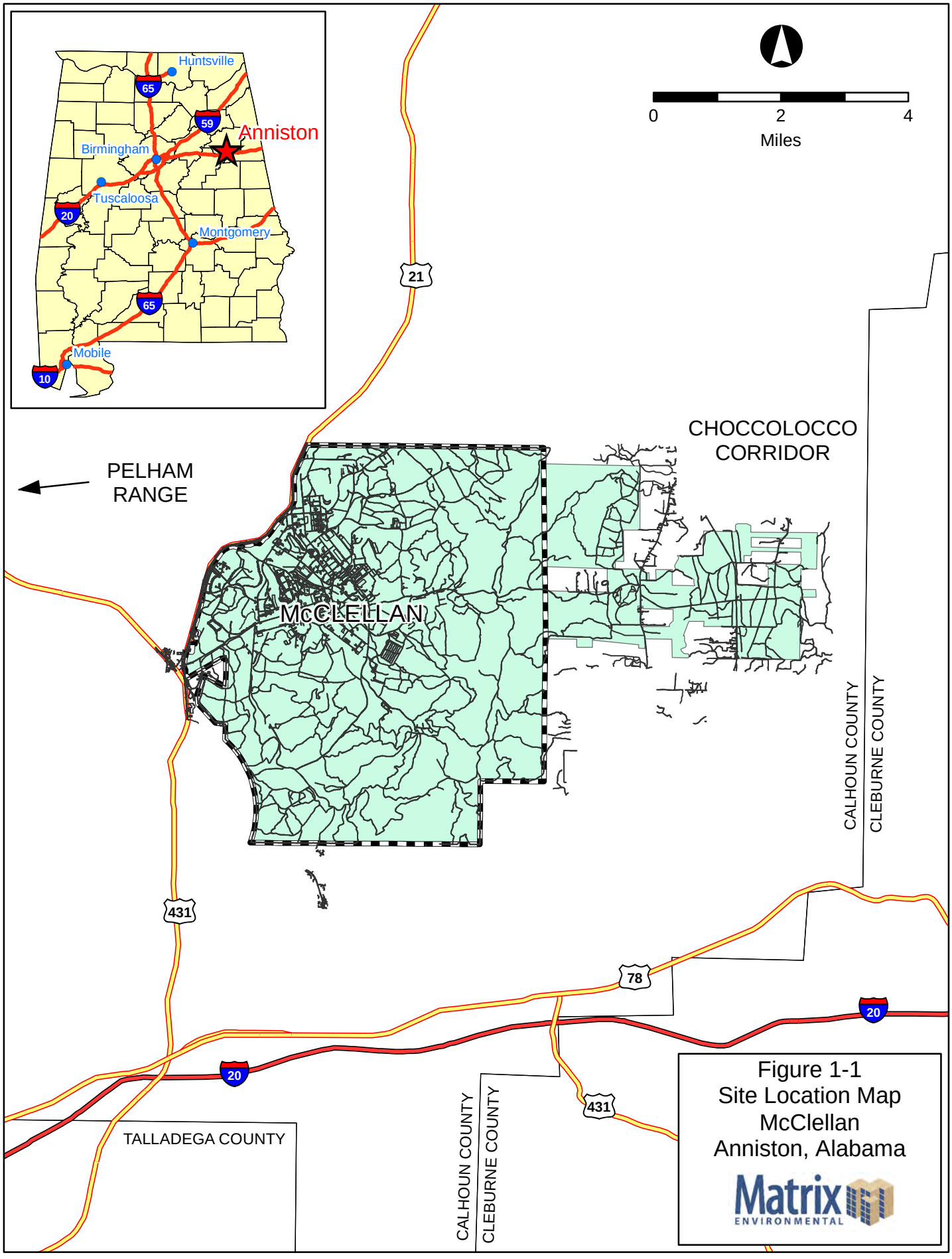

Figure 1-1
Site Location Map
McClellan
Anniston, Alabama

Matrix ENVIRONMENTAL

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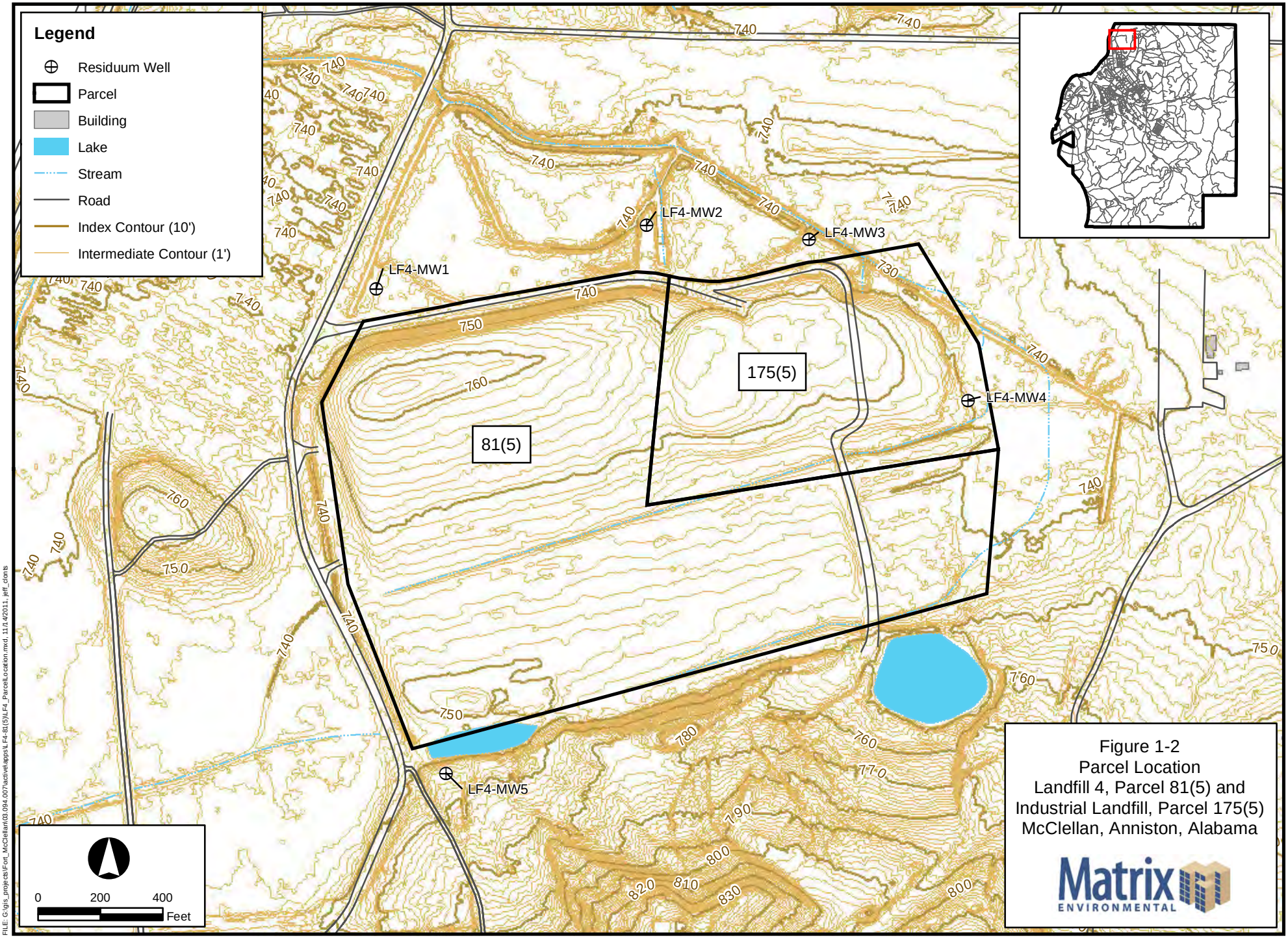

Figure 1-2
Parcel Location
Landfill 4, Parcel 81(5) and
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Matrix ENVIRONMENTAL

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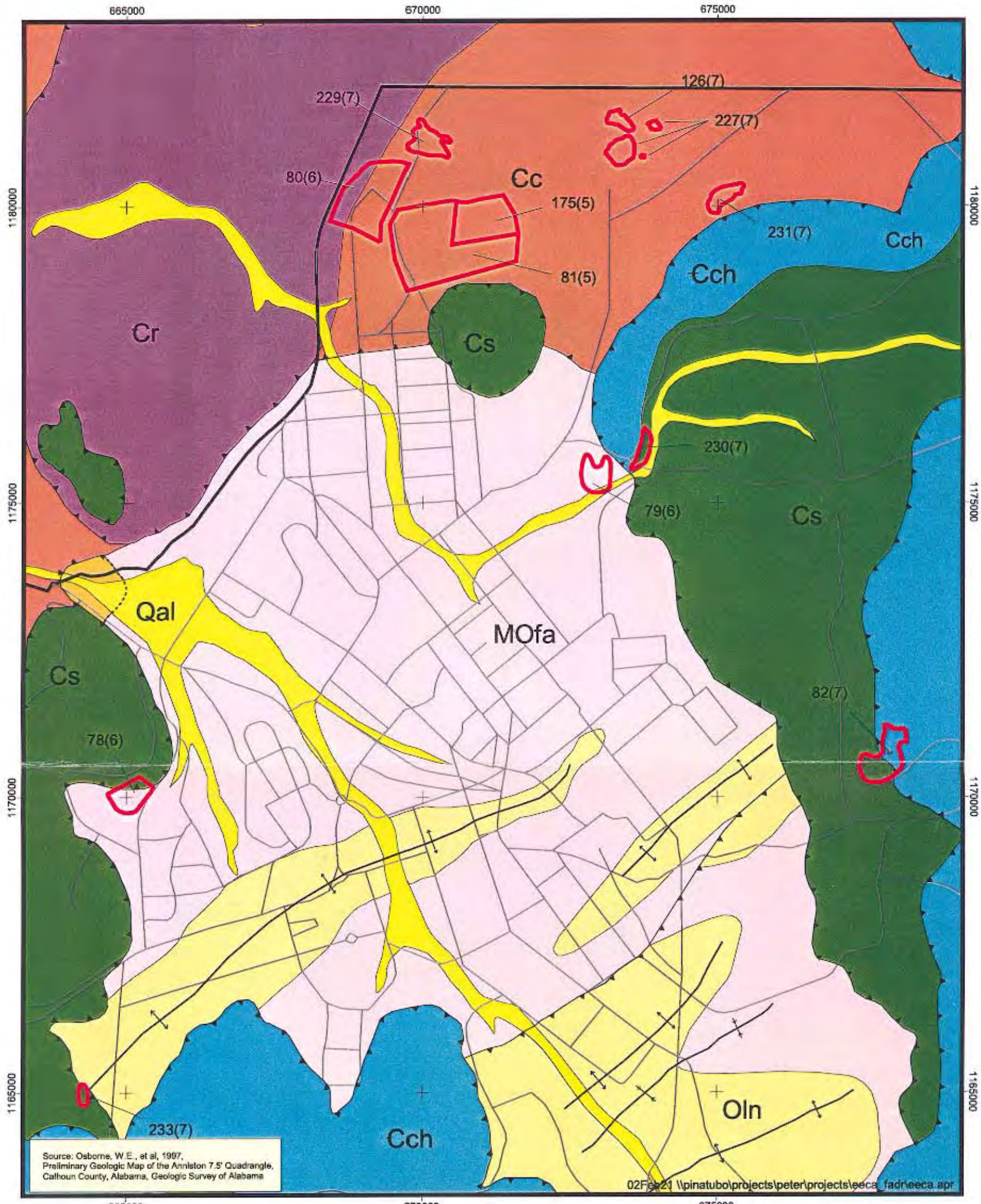

Figure 2-1 Geologic Map

N

0 2000 4000

State Plane feet, NAD 83

Source: IT Corporation, 2002

Matrix ENVIRONMENTAL

Legend

- Syncline
- Anticline
- Fault
- Roads
- Main Post Boundary
- Landfill Boundary

Geology

- l — Limestone - age unknown
- ls — Terrace Deposit - age unknown
- col — Colluvium - age unknown
- Qal — Quaternary - alluvium
- OCk — Ordovician - Little Oak and Newala Limestones
- MOfa — Cambrian/Ordovician - Knox Group, Undifferentiated
- Oln — Mississippian/Ordovician - Floyd & Athens Shale, Undifferentiated
- Cs — Cambrian - Shady Dolomite
- Cr — Cambrian - Rome Formation
- Cch — Cambrian - Chilhowee Group
- Cc — Cambrian - Conasauga Formation

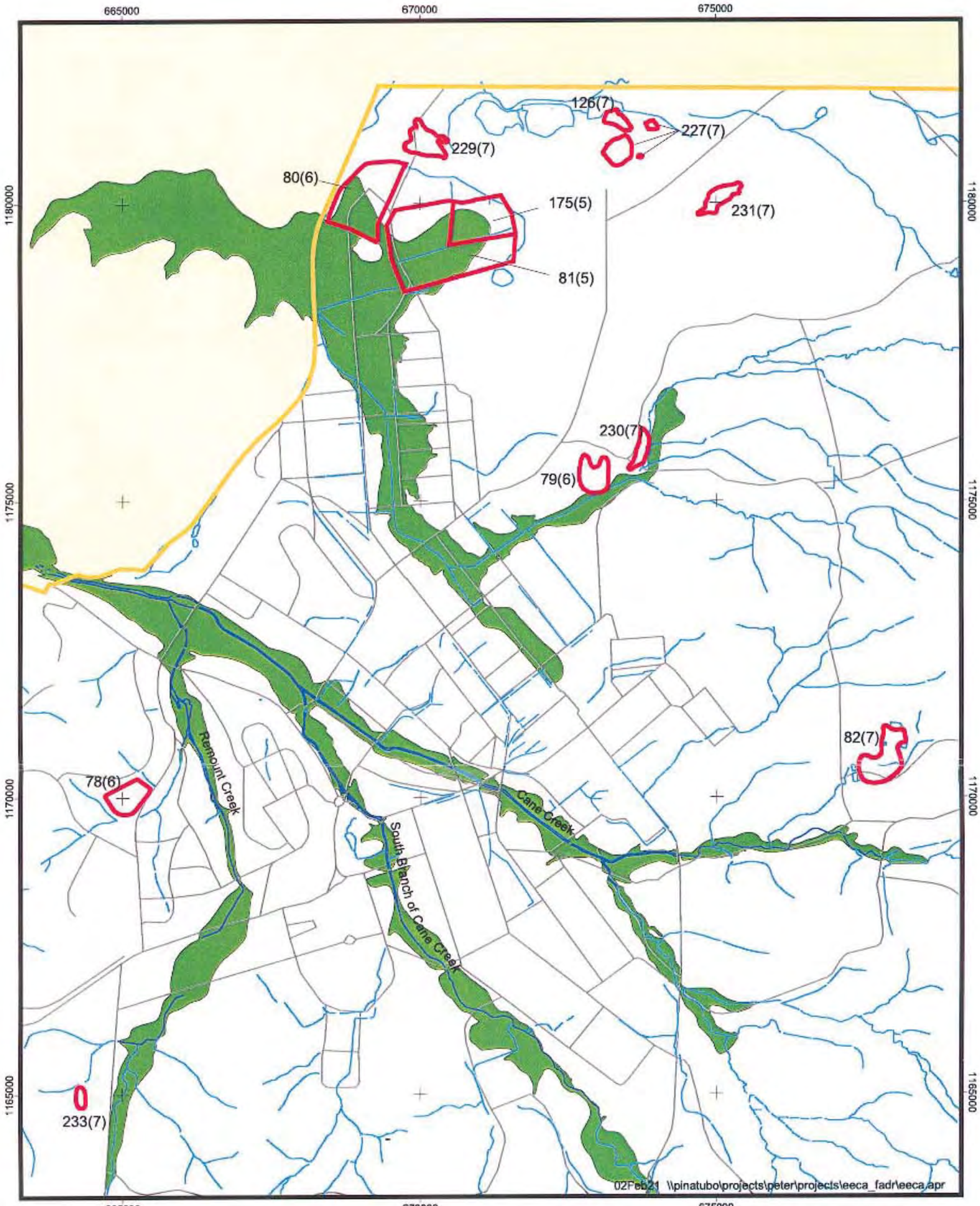

Figure 2-2 Floodplain Map

The "Special Flood Hazard Areas", as determined by FEMA, is an area inundated by 1% annual chance flooding for which Base Flood Elevations or velocity may have been determined. These areas were created at a scale of 1:24,000 and therefore are not as spatially accurate as the planimetric data. Use with caution.

Legend

- Creeks - Intermittent
- Creeks
- Roads
- EE/CA Area
- Special Flood Hazard Area
- Main Post Boundary

0 1500 3000

State Plane feet, NAD 83

N

Matrix ENVIRONMENTAL

Source: IT Corporation, 2002

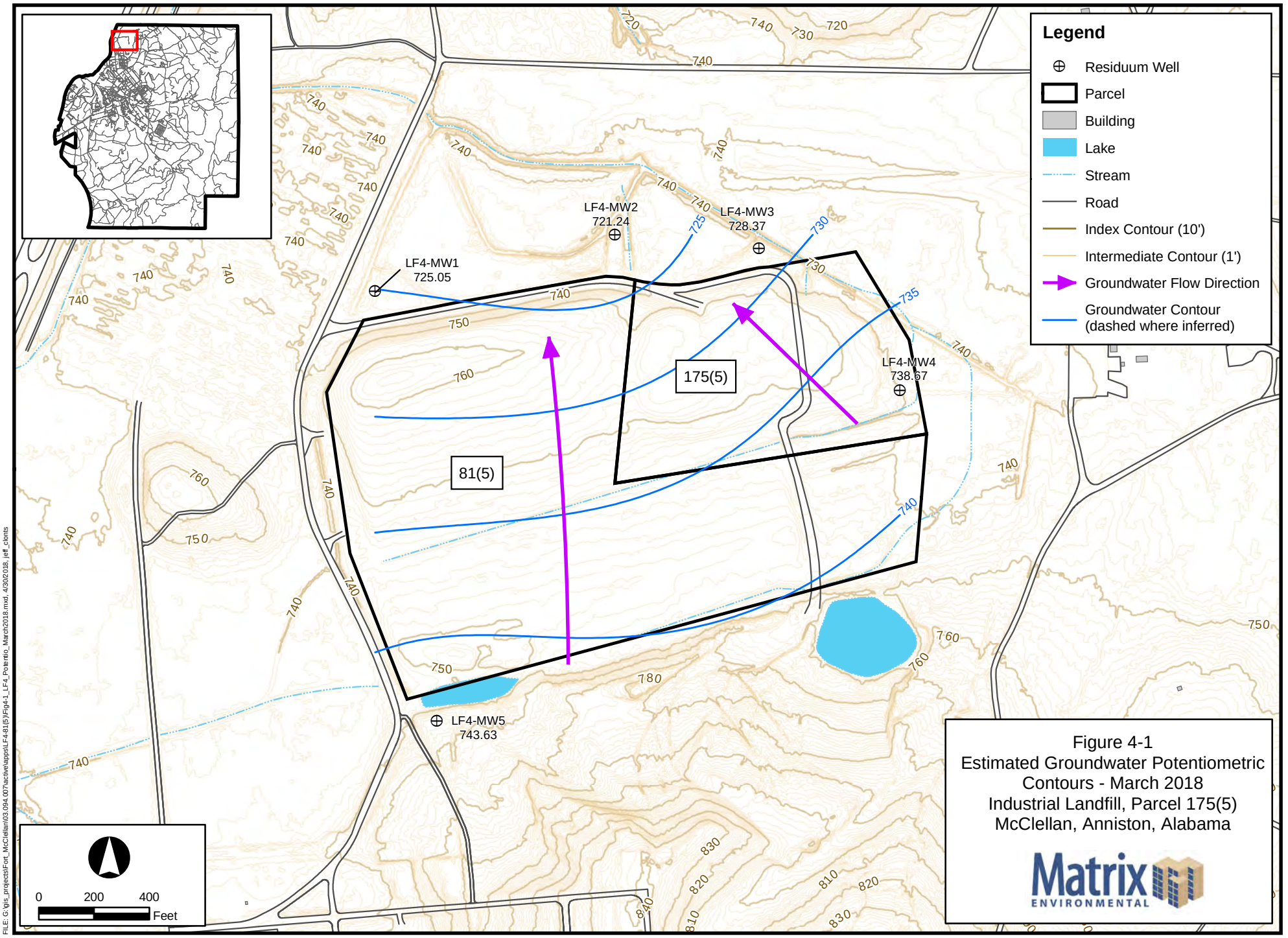

Figure 4-1
Estimated Groundwater Potentiometric Contours - March 2018
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Matrix ENVIRONMENTAL

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APPENDICES

Groundwater Monitoring Report, March 2018
Butler Green Industrial Landfill, Parcel 175(5)
(Permit No. 08-02)
McClellan, Anniston, Alabama

APPENDIX A

Groundwater Sample Collection

Logs, March 2018

Location LF4 | McClellan Date 3/15/2017

Project / Client March 2017 GW Sampling

1125- J. Owens (MES) onsite to collect groundwater samples.

1126- collect sample from LF4-MW01

Temp- 13.17°C

Conductivity- 136 µS/cm

TDS - 0.088 g/L

DO - 2.39 mg/L

pH - 5.34

ORP - 71.6

Turbidity - 19.42 NTU

1145- set up on LF4-MW02

1200- collect samples from MW02

Temp- 11.24°C

Conductivity - 335 µS/cm

TDS - 0.218 g/L

DO - 1.49 mg/L

pH - 6.04

ORP - 42.9

Turbidity - 29.92 NTU

1215- set up on LF4-MW03

Parameters:

Temp: 12.78°C DO: 6.03 Turbidity: 42.36 NTU

Cond: 90µS/cm pH: 5.15

TDS: 0.059 g/L ORP: 150.3

Location Date

Project / Client

Scale

1220: collect samples from MW03.

1240: set up on LF4-MW04

Temp- 11.16°C

Conductivity - 641 µS/cm

TDS - 0.417 g/L

DO - 1.45 mg/L

pH - 6.39

ORP - 2.7

Turbidity: 3.49 NTU

12:45- collect samples from MW-03.

12:55- set up on LF4-MW05

Parameters:

Temp: 11.78°C

Conductivity: 50 µS/cm

Total Dissolved solids: 0.032 g/L

Dissolved oxygen: 3.31 mg/L

pH: 5.24

ORP: 39.7

Turbidity: 20.47 NTU

13:05- collect samples

* ~~Dup 250 collected @ 13:05 from MW-05~~

Dup 250 collected from MW05

collection time written as 10:00

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW01	
Project	**Project Number**
McClellan	18-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 14.74 feet	**Equipment**	**Sampler** Owens	**Date** 3/8/2018
Well Depth (TOC) 42.5 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 12:30
Water Column Thickness 27.76 feet	____ Check Valve	**Laboratory** EMAX	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 18.04 gallons	____ Peristaltic	**Meters** YSI 556 MPS; Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 739.79 feet	____ PID/FID	**Calibration** 3/8/2018	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 725.05 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit	**Conditions (temp, weather, precip)** Overcast, 50°F		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
12:30	0.25	14.70	126.2	1.86	101.4	0.08	37.60	5.35	clear, colorless, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples Not Applicable

Signature

Rev 5/30/08

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW02	
Project	**Project Number**
McClellan	18-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 17.26 feet	**Equipment**	**Sampler** Owens	**Date** 3/8/2018
Well Depth (TOC) 40.25 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 13:10
Water Column Thickness 22.99 feet	____ Check Valve	**Laboratory** EMAX	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 14.94 gallons	____ Peristaltic	**Meters** YSI 556 MPS Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 738.5 feet	____ PID/FID	**Calibration** 3/8/2018	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 721.24 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit	**Conditions (temp, weather, precip)** Overcast, 50's		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
13:10	0.25	13.90	386	1.23	65.6	0.25	26.06	5.67	slightly cloudy, colorless, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples

Signature

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW03	
Project	**Project Number**
McClellan	18-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 11.91 feet	**Equipment**	**Sampler** Owens	**Date** 3/8/2018
Well Depth (TOC) 34.2 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 13:35
Water Column Thickness 22.29 feet	____ Check Valve	**Laboratory** EMAX	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 14.49 gallons	____ Peristaltic	**Meters** YSI 556 MPS; Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 739.78 feet	____ PID/FID	**Calibration** 3/8/2017	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 727.87 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit	**Conditions (temp, weather, precip)** Overcast, 50's		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
13:35	0.25	13.40	68.1	3.38	222.5	0.04	44.58	5.11	slightly cloudy, colorless, no odor

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	

QA/QC Samples MS/MSD

Signature

Rev 5/30/08

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW04	
Project	**Project Number**
McClellan	18-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 4.68 feet	**Equipment**	**Sampler** Owens	**Date** 3/8/2018
Well Depth (TOC) 26.8 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 14:10
Water Column Thickness 22.12 feet	____ Check Valve	**Laboratory** EMAX	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 14.38 gallons	____ Peristaltic	**Meters** YSI 556 MPS; Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 743.35 feet	____ PID/FID	**Calibration** 3/8/2018	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 738.67 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit	**Conditions (temp, weather, precip)** Overcast, 50's		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
14:10	0.25	13.90	834	1.09	-5.4	0.55	7.85	6.44	clear, colorless

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples

Signature

Matrix ENVIRONMENTAL

Matrix Environmental Services
283 Rucker Street
Anniston, Alabama 36205
(256) 847-0780

Station Name/Sample ID	
LF4-MW05	
Project	**Project Number**
McClellan	18-07.1

GROUNDWATER SAMPLING LOG

Groundwater Depth (TOC) 9.69 feet	**Equipment**	**Sampler** Owens	**Date** 3/8/2018
Well Depth (TOC) 34.6 feet	_X_ Bailer	**Location (Site)** Landfill 4	**Begin Time** 14:30
Water Column Thickness 24.91 feet	____ Check Valve	**Laboratory** EMAX	**Sample Depth** Bailer
Casing Diameter 4 inches	____ Grundfos	**Sample Suite** See COCs	
Casing Volume 16.19 gallons	____ Peristaltic	**Meters** YSI 556 MPS; Solinst Water Level	**Serial numbers**
1"=x0.04 2"=x0.16 4"=x0.65 6"=x1.47 8"=x10.4	____ Bladder Pump		
Well Elevation (TOC) 753.32 feet	____ PID/FID	**Calibration** 3/8/2018	**Ferrous Iron (Fe II) (mg/L) (for MNA sampling)** Not Applicable
Groundwater Elevation 743.63 feet	____ Other (describe)	**Product Observed (yes/no)** No	**Depth to product** Not Applicable
	Conditions (temp, weather, precip) Overcast, 50's		
	Parameter Stabilization temp +/- 1° DO +/- 10% Turbidity +/- 10% cond +/- 3% ORP +/- 10mV pH +/- 0.1 unit		

Time	Volume removed (gallon)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	ORP (mV)	TDS (g/L)	Turbidity (NTU)	pH	Description (e.g. odor, clarity, color)
14:30	0.25	13.50	33.6	2.53	230.1	0.02	55.97	5.10	slightly cloudy, pale yellow color

Total Time (min.)	Total Volume Removed	Well pumped dry (yes/no)	Notes
Not Applicable	0.25 gallons	No	N/A

QA/QC Samples	Signature
DUP 283	

APPENDIX B

Chains-of-Custody, March 2018

MATRIX ENVIRONMENTAL SERVICES CHAIN OF CUSTODY RECORD

18C050

COC Number 5267

Cooler ID

Page 1 of 1

Laboratory EMAX
Lab Contact Ye Myint
MES Contact Betty Van Pelt
MES Phone 801-699-1246
Project Parcel 81(5), Landfill 4
Task # 18.094.17-07.2 500
Lab contract: TO101

Samplers Signature

	SWMU	Station ID	QC Code	Station Code	Matrix	Sample Method	Date Collected	Sample Time	Analysis: SW8260 - VOC 3 - 40 ml vials, HCl	Analysis: 6020A/7470A Metals (Total) 1 - 250 ml poly HNO3			
1	Parcel 81(5), Landfill 4	LF4-MW1	NS	MW	WG	Grab	3/8/18	12:30	X	X			
2	Parcel 81(5), Landfill 4	LF4-MW2	NS	MW	WG			13:10	X	X			
3	Parcel 81(5), Landfill 4	LF4-MW3	NS	MW	WG			13:35	X	X			
4	Parcel 81(5), Landfill 4	LF4-MW3	MS/MSD	MW	WG			13:35	X	X			
5	Parcel 81(5), Landfill 4	LF4-MW4	NS	MW	WG			14:10	X	X			
6	Parcel 81(5), Landfill 4	LF4-MW5	NS	MW	WG			14:30	X	X			
7	Parcel 81(5), Landfill 4	DUP250	NS	MW	WG			14:30	X	X			
8	Parcel 81(5), Landfill 4	MATERIAL076	SW	WQ	W			15:05	X	X			
9	Parcel 81(5), Landfill 4	TB447	TB	WQ	W			15:00	X				

NOTES:

QC Code: NS = Investigative Sample, FD = Field Duplicate, MS/MSD = Matrix Spike/Matrix Spike Duplicate, EB = Equipment Blank, TB = Trip Blank, WQ = Water Quality, WS = Source Water

Station Type = MW = Monitoring Well, BH = Bore Hole, SD = Sediment, SW = Surface Water, SS = Surface Soil, SU = Sump, WS = Waste Solid/Soil, WW = Waste Water

Temp 1.4 °C

White Copy = Lab COC, Yellow COC = Field Copy, Pink COC = Data Mgmt

Double the number of bottles for MS/MSD

COMMENTS: See Task Order 093 for required list of VOCs and metals.

**Collect FEII in the field

Relinquished by (Signature):

Date/Time: 3/8/18 16:00

Received by (Signature): Fedex

Relinquished by (Signature):

Date/Time: 3/9/18 0915

Received by (Signature):

APPENDIX C

Analytical Data, March 2018

Sample Matrix	Station Name	Sample Date	QC Code	Delivery Group	Lab Sample ID	Method	Parameter	Value	Flag Code	Validation Code	Units
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Antimony	0.001	U		mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Arsenic	0.00148			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Barium	0.0446			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Beryllium	0.000207	J		mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Cadmium	0.001	U		mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Chromium	0.00145			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Cobalt	0.0279			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Copper	0.00223			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Lead	0.00167			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Nickel	0.0183			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Selenium	0.001	U		mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Silver	0.001	U		mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Thallium	0.001	U		mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Vanadium	0.00158			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW6020A	Zinc	0.0503			mg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW7470A	Mercury	0.4	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,1,1-Trichloroethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,2-Dibromoethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	2-Hexanone	10	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L

W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Acetone	10	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Acrylonitrile	10	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Benzene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Bromochloromethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Bromodichloromethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Bromoform	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Bromomethane	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Carbon Disulfide	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Chlorobenzene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Chloroethane	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Chloroform	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Chloromethane	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Cis-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Dibromochloromethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Dibromomethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Ethylbenzene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Iodomethane	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Methylene Chloride	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Styrene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Tetrachloroethylene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Toluene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Trans-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Trichloroethene	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Trichlorofluoromethane	1	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Vinyl Acetate	2	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	LF4-MW1	3/8/18	NS	18C050	C050-01	SW8260B	Xylenes (Total)	3	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Antimony	0.005	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Antimony	0.001	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Arsenic	0.00274			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Arsenic	0.00282	J		mg/L

W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Barium	0.07700001			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Barium	0.07700001			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Beryllium	0.000542	J		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Beryllium	0.000538	J		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Cadmium	0.000915	J		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Cadmium	0.005	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Chromium	0.00296	J		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Chromium	0.00297			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Cobalt	0.125			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Cobalt	0.135			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Copper	0.0109			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Copper	0.0109			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Lead	0.00395	J		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Lead	0.00391			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Nickel	0.06480001			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Nickel	0.0663			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Selenium	0.000608	J		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Selenium	0.005	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Silver	0.001	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Silver	0.005	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Thallium	0.001	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Thallium	0.005	U		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Vanadium	0.00256	J		mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW6020A	Vanadium	0.00252			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02G	SW6020A	Zinc	0.7320001			mg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW7470A	Mercury	0.4	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,1,1-Trichloroethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,2-Dibromoethane	1	U		µg/L

W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	2-Hexanone	10	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Acetone	10	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Acrylonitrile	10	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Benzene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Bromochloromethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Bromodichloromethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Bromoform	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Bromomethane	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Carbon Disulfide	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Chlorobenzene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Chloroethane	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Chloroform	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Chloromethane	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Cis-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Dibromochloromethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Dibromomethane	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Ethylbenzene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Iodomethane	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Methylene Chloride	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Styrene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Tetrachloroethylene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Toluene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Trans-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Trichloroethene	1	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Trichlorofluoromethane	1	U		µg/L

W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Vinyl Acetate	2	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	LF4-MW2	3/8/18	NS	18C050	C050-02	SW8260B	Xylenes (Total)	3	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Antimony	0.001	U	UJM	mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Arsenic	0.000715	J		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Barium	0.0581			mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Beryllium	0.000329	J		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Cadmium	0.001	U		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Chromium	0.000841	J		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Cobalt	0.00138			mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Copper	0.00158			mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Lead	0.00291			mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Nickel	0.00284			mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Selenium	0.001	U		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Silver	0.001	U		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Thallium	0.001	U		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Vanadium	0.000898	J		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03N	SW6020A	Zinc	0.0142	J		mg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW7470A	Mercury	0.4	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,1,1-Trichloroethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,2-Dibromoethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	2-Hexanone	10	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L

W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Acetone	10	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Acrylonitrile	10	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Benzene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Bromochloromethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Bromodichloromethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Bromoform	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Bromomethane	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Carbon Disulfide	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Chlorobenzene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Chloroethane	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Chloroform	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Chloromethane	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Cis-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Dibromochloromethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Dibromomethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Ethylbenzene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Iodomethane	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Methylene Chloride	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Styrene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Tetrachloroethylene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Toluene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Trans-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Trichloroethene	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Trichlorofluoromethane	1	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Vinyl Acetate	2	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	LF4-MW3	3/8/18	NS	18C050	C050-03	SW8260B	Xylenes (Total)	3	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Antimony	0.001	U		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Arsenic	0.00247			mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Barium	0.197			mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Beryllium	0.001	U		mg/L

W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Cadmium	0.001	U		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Chromium	0.000253	J		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Cobalt	0.00271			mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Copper	0.001	U		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Lead	0.000547	J		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Nickel	0.00147			mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Selenium	0.001	U		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Silver	0.001	U		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Thallium	0.001	U		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Vanadium	0.000799	J		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW6020A	Zinc	0.02	U		mg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW7470A	Mercury	0.4	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,1,1-Trichloroethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,2-Dibromoethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	2-Hexanone	10	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Acetone	10	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Acrylonitrile	10	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Benzene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Bromochloromethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Bromodichloromethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Bromoform	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Bromomethane	2	U		µg/L

W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Carbon Disulfide	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Chlorobenzene	1.6			µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Chloroethane	2	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Chloroform	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Chloromethane	2	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Cis-1,2-Dichloroethene	20			µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Dibromochloromethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Dibromomethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Ethylbenzene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Iodomethane	2	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Methylene Chloride	2	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Styrene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Tetrachloroethylene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Toluene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Trans-1,2-Dichloroethene	1.6			µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Trichloroethene	27			µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Trichlorofluoromethane	1	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Vinyl Acetate	2	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	LF4-MW4	3/8/18	NS	18C050	C050-04	SW8260B	Xylenes (Total)	3	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Antimony	0.001	U		mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Arsenic	0.000658	J		mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Barium	0.0174			mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Beryllium	0.000123	J		mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Cadmium	0.001	U		mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Chromium	0.000796	J		mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Cobalt	0.00409			mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Copper	0.0017			mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Lead	0.00318			mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Nickel	0.00277			mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Selenium	0.001	U		mg/L

W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Silver	0.001	U		mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Thallium	0.001	U		mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Vanadium	0.00246			mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW6020A	Zinc	0.0597			mg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW7470A	Mercury	0.4	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,1,1-Trichloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,2-Dibromoethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	2-Hexanone	10	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Acetone	10	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Acrylonitrile	10	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Benzene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Bromochloromethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Bromodichloromethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Bromoform	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Bromomethane	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Carbon Disulfide	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Chlorobenzene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Chloroethane	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Chloroform	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Chloromethane	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Cis-1,2-Dichloroethene	1	U		µg/L

W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Dibromochloromethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Dibromomethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Ethylbenzene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Iodomethane	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Methylene Chloride	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Styrene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Tetrachloroethylene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Toluene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Trans-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Trichloroethene	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Trichlorofluoromethane	1	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Vinyl Acetate	2	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	LF4-MW5	3/8/18	NS	18C050	C050-05	SW8260B	Xylenes (Total)	3	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Antimony	0.001	U		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Arsenic	0.000786	J		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Barium	0.0176			mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Beryllium	0.000123	J		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Cadmium	0.001	U		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Chromium	0.00096	J		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Cobalt	0.00418			mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Copper	0.00169			mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Lead	0.00354			mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Nickel	0.00289			mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Selenium	0.001	U		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Silver	0.001	U		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Thallium	0.001	U		mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Vanadium	0.00281			mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW6020A	Zinc	0.0654			mg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW7470A	Mercury	0.4	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,1,1-Trichloroethane	1	U		µg/L

W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,2-Dibromoethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	2-Hexanone	10	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Acetone	10	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Acrylonitrile	10	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Benzene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Bromochloromethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Bromodichloromethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Bromoform	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Bromomethane	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Carbon Disulfide	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Chlorobenzene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Chloroethane	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Chloroform	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Chloromethane	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Cis-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Dibromochloromethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Dibromomethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Ethylbenzene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Iodomethane	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Methylene Chloride	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Styrene	1	U		µg/L

W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Tetrachloroethylene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Toluene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Trans-1,2-Dichloroethene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Trichloroethene	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Trichlorofluoromethane	1	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Vinyl Acetate	2	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	LF4-MW5	3/8/18	FD	18C050	C050-06	SW8260B	Xylenes (Total)	3	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Antimony	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Arsenic	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Barium	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Beryllium	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Cadmium	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Chromium	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Cobalt	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Copper	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Lead	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Nickel	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Selenium	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Silver	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Thallium	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Vanadium	0.001	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW6020A	Zinc	0.02	U		mg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW7470A	Mercury	0.4	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,1,1-Trichloroethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,2-Dibromoethane	1	U		µg/L

W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	2-Hexanone	10	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Acetone	10	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Acrylonitrile	10	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Benzene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Bromochloromethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Bromodichloromethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Bromoform	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Bromomethane	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Carbon Disulfide	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Chlorobenzene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Chloroethane	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Chloroform	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Chloromethane	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Cis-1,2-Dichloroethene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Dibromochloromethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Dibromomethane	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Ethylbenzene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Iodomethane	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Methylene Chloride	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Styrene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Tetrachloroethylene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Toluene	0.27	J		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Trans-1,2-Dichloroethene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Trichloroethene	1	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Trichlorofluoromethane	1	U		µg/L

W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Vinyl Acetate	2	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	Material Blank	3/8/18	NS	18C050	C050-07	SW8260B	Xylenes (Total)	3	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,1,1,2-Tetrachloroethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,1,1-Trichloroethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,1,2,2-Tetrachloroethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,1,2-Trichloroethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,1-Dichloroethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,1-Dichloroethene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,2,3-Trichloropropane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,2-Dibromo-3-Chloropropane	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,2-Dibromoethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,2-Dichlorobenzene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,2-Dichloroethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,2-Dichloropropane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	1,4-Dichlorobenzene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	2-Butanone (MEK)	10	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	2-Hexanone	10	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	4-Methyl-2-Pentanone (MIBK)	10	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Acetone	10	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Acrylonitrile	10	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Benzene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Bromochloromethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Bromodichloromethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Bromoform	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Bromomethane	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Carbon Disulfide	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Carbon Tetrachloride	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Chlorobenzene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Chloroethane	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Chloroform	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Chloromethane	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Cis-1,2-Dichloroethene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Cis-1,3-Dichloropropene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Dibromochloromethane	1	U		µg/L

W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Dibromomethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Ethylbenzene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Iodomethane	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Methylene Chloride	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Styrene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Tetrachloroethylene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Toluene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Trans-1,2-Dichloroethene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Trans-1,3-Dichloropropene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Trans-1,4-Dichloro-2-Butene	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Trichloroethene	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Trichlorofluoromethane	1	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Vinyl Acetate	2	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Vinyl Chloride	0.8	U		µg/L
W	Trip Blank	3/8/18	TB	18C050	C050-08	SW8260B	Xylenes (Total)	3	U		µg/L

APPENDIX D

Data Quality Summary, March 2018

Appendix D

Data Quality Summary:

Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

March 2018 Monitoring Event

Prepared for:

MCCLELLAN
DEVELOPMENT AUTHORITY

Prepared by:

Matrix ENVIRONMENTAL

283 Rucker Street, Bldg. 3165
Anniston, Alabama 36205
(256) 847-0780
Fax (256) 847-0905

May 2018

TABLE OF CONTENTS

LIST OF TABLES

ATTACHMENTS

LIST OF ABBREVIATIONS AND ACRONYMS

ADEM	Alabama Department of Environmental Management
ADEM Division 13 Regulations	*Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations*
ARBCA	*Alabama Risk-Based Corrective Action Guidance Manual*
CCAL	Continuing calibration
CCB	Continuing calibration blank
COC	Chain-of-custody
DQO	Data Quality Objective
DQS	Data Quality Summary
EMAX	EMAX Laboratories, Torrance, California
EPA	United States Environmental Protection Agency
FD	Field duplicate
GC/MS	Gas chromatography/mass spectrometry
ICAL	Initial calibration
ID	Identification
IDL	Instrument detection limit
IS	Internal standard
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MCL	Maximum contaminant level
MDA	McClellan Development Authority
MDL	Method detection limit
MES	Matrix Environmental Services, LLC
MS	Matrix spike
MSD	Matrix spike duplicate
PARCCS	Precision, accuracy, representativeness, completeness, comparability, and sensitivity
Permit	Solid Waste Disposal Facility Permit No. 08-02
QA	Quality assurance
QAP	*Quality Assurance Plan*
QC	Quality control
%R	Percent recovery
RL	Reporting limit
RPD	Relative percent difference
RSD	Relative standard deviation
Site	Butler Green Industrial Landfill, Parcel 175(5)
SOP	Standard Operating Procedure
TB	Trip blank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Matrix Environmental Services, LLC (MES) has prepared this Data Quality Summary (DQS) on behalf of the McClellan Development Authority (MDA) in support of the groundwater monitoring at Butler Green Industrial Landfill, Parcel 175(5) (Site) within McClellan, Anniston, Alabama, formerly known as Fort McClellan. The purpose of this monitoring event was to collect data to support the implementation of groundwater monitoring under the requirements of the Solid Waste Disposal Facility Permit No. 08-02 (permit) and the *Alabama Department of Environmental Management (ADEM) Land Division Solid Waste Program Division 13 Regulations* (*ADEM Division 13 Regulations*) for solid waste facilities (ADEM, 2016).

This DQS addresses the data quality review for groundwater samples collected during the March 2018 monitoring event. The approved methods used to conduct the investigations are discussed in the *Quality Assurance Plan* (*QAP*) in *Appendix A* of the *Final Installation-Wide Sampling and Analysis Plan* (MES, 2013) which details the specifics of quality assurance (QA) and quality control (QC) with respect to sampling and data evaluation.

2.0 PROJECT DESCRIPTION

Project objectives and QA objectives in terms of precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are described in this section.

2.1 PROJECT OBJECTIVES

The objective of the environmental sampling at the Site is to evaluate the groundwater analytical data and demonstrate compliance with the permit and the *ADEM Division 13 Regulations*. To support this objective, groundwater samples were collected from five residuum monitoring wells using quiescent sampling techniques and analyzed for volatile organic compounds (VOCs) and metals.

2.2 DATA QUALITY LEVELS

During the field program, groundwater samples were collected and analyzed with screening level methods for field parameters and definitive level methods for specific chemical analytes. Screening and definitive level data are defined as follows (United States Environmental Protection Agency [EPA], 1994):

- Screening Level Data – Screening level data are subject to minimal QC requirements. Results are often not compound-specific and not quantitative, but results are available in real time. Obtaining screening level data is less costly than obtaining definitive level data, but the results are less defensible because of the greater potential for error and the inherent precision and accuracy limitations. This level is normally used for field investigation health and safety screening, but can also be used to identify media or samples for consideration for further analyses. Field pH, conductivity, temperature, turbidity, total dissolved solids, dissolved oxygen, and oxidation/reduction potential measurements collected during this investigation are considered screening level data.

- Definitive Level Data - Analyses performed using established analytical procedures and strict QC procedures produce definitive level data. Applicable EPA test methods (EPA, 1986) were used to collect definitive level data for the Site. Analytical results produced were analyte-specific with confirmation of analyte identity and concentration. Definitive level data meeting quality criteria are suitable for site assessments, risk assessments, remedial design, and remediation efforts.

2.3 DATA QUALITY OBJECTIVES

QA objectives in terms of PARCCS are outlined below.

Precision is a measure of the reproducibility of a set of duplicate analytical results, usually under prescribed similar conditions. Precision, as discussed in Section A3.3.1 in the *QAP*, is expressed in terms of the relative percent difference (RPD) between duplicate determinations, or

in terms of the relative standard deviation (RSD) when three or more determinations are made. Various measures of precision exist depending on the prescribed similar conditions.

Overall sampling and analysis precision was assessed using RPDs for duplicate environmental samples and matrix spike/matrix spike duplicates (MS/MSDs). The RPDs for laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results were used to assess laboratory precision. RPD is defined as the difference between two measurements divided by their mean and expressed as a percent as shown in the following equation:

$$RPD = \frac{|X - Y|}{(X + Y) / 2} \times 100\%$$

where:

X = Primary sample concentration (primary field investigative sample, MS, or LCS)

Y = Duplicate sample concentration (laboratory duplicate, field duplicate [FD], MSD, or LCSD)

To evaluate precision, the RPDs for MS/MSDs, laboratory duplicates, and LCS/LCSDs were compared to laboratory historical limits. The RPDs for FDs were compared to the project precision goal of 50 percent for aqueous samples.

The RSD is the standard deviation of a set of values divided by the average value expressed as a percent as shown in the following equation:

$$RSD = S/\overline{X} \times 100$$

where:

S = The standard deviation of the sample data

$\overline{X}$ = The arithmetic mean of the sample data

RSDs can be used to evaluate the linearity of the initial calibration (EPA, 1986).

Accuracy is a measure of the agreement of an analytical result with the true value. Accuracy, as discussed in Section A3.3.2 in the *QAP*, is typically expressed as a percent recovery (%R) calculated by the ratio of the measurement and accepted true value as shown in the following equation:

$$\%R = ((Xs - Xu) / K) \times 100\%$$

where:

Xs = Measured value of the spiked sample

Xu = Measured value of the unspiked sample

K = Known amount of the spike in the sample

Analytical accuracy is assessed through the analysis of spikes such as surrogates, MS/MSDs and LCS/LCSDs, performance evaluation samples, standard reference materials and calibration check samples. Surrogates and MS/MSDs are spiked into the actual sample matrix

and are accuracy indicators that take into account the nature of the matrix in question and the native concentration of the analyte spiked. Matrix variability or interferences from high concentrations of native compounds may adversely affect spike recovery and yield less than conclusive data. Accuracy checks that focus on analytical method and consist of compounds spiked in a blank or non-interfering matrix (e.g., LCSs or calibration check samples) address the accuracy of the method or instrumentation at detecting the target analyte(s) at a certain quantification level and are not considered to be subject to matrix effects. The accuracy of sample results can also be affected by holding time violations.

Representativeness, as described in Section A3.3.3 in the *QAP*, is a qualitative parameter that expresses the degree to which sample data actually represent the matrix conditions. For example, in conducting groundwater monitoring, representativeness requires proper location of wells and the collection of samples under consistent, documented procedures. Wells are located based upon the results of the hydrogeologic study in progress and are designed to provide maximum coverage of the flow conditions. Requirements and procedures for sample collection and handling are designed to maximize sample representativeness. Representativeness can also be monitored by reviewing field documentation and by performing field QA audits.

Completeness, as discussed in Section A3.3.4 in the *QAP*, represents the percentage of valid data collected from a sampling/analytical program or measurement system compared to the amount achieved under optimal conditions. The completeness goal for investigative samples is 95 percent. Completeness is calculated using the following formula:

$$\text{Percent Complete} = \frac{\text{Valid Data}}{\text{Total Data}} \times 100\%$$

Valid data are identified during the data review process as being acceptable for use or usable as qualified. Invalid data are identified as rejected.

Comparability, as discussed in Section A3.3.5 of the *QAP*, is a qualitative parameter expressing the confidence with which one data set can be compared with another. Comparability for sampling and analysis tasks is achieved by:

- Specifying well-recognized techniques and accepted standard methods for sampling and analysis, and using well-trained sampling and analysis technicians to execute the prescribed methods consistently.
- Requiring that sampling and analysis personnel produce adequate documentation to record how the prescribed methods were actually executed.
- Noting non-conformances and corrective measures taken.

Specifying standardized laboratory methods helps to ensure that the data generated for a sampling event are comparable to past and future sampling events.

Sensitivity is used broadly here to describe the method detection limits (MDLs) or reporting limits (RLs) established to meet project-specific data quality objectives (DQOs). In addition,

sensitivity can be used to describe the capability of a method for instrument to discriminate between measurement responses. Several limits have been established to describe sensitivity requirements as specified in Section A3.3.6 of the *QAP*. Reported instrument detection limits (IDLs) and MDLs are typically based upon a reagent water matrix or purified solid, and ignore sample matrix interferences and the resulting effects on the limits. For this reason, published MDLs or IDLs may not be achievable for environmental samples. The *QAP* RLs were generated by the laboratory and may exceed Maximum Contaminant Levels (MCLs) due to instrument limitations. Section 6.2 discusses the comparisons between the MCLs and the laboratory RLs and MDLs for this sampling event.

2.4 ANALYTICAL SERVICES

EMAX Laboratories, Inc (EMAX), Torrance, California, provided analytical services for the sampling conducted by MES.

2.4.1 Analytical Program

The *QAP* lists the EPA analytical methods used to meet definitive data requirements. Based on activities conducted at the Site during the March 2018 monitoring event, the methods used to analyze constituents of concern in samples during this sampling event were:

- Method SW8260B - VOCs by Gas Chromatography/Mass Spectrometry (GC/MS)
- Method SW6020A - Total Metals by Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)
- Method SW7470A - Mercury by Cold Vapor Atomic Absorption

2.4.2 Quality Control

The *QAP* describes the analytical QC requirements. The results of the analytical QC data review for this sampling event are presented in Section 5.0.

3.0 DEVIATIONS FROM PLANNED FIELD ACTIVITIES

No deviations from the planned field activities were noted during the preparation of this DQS.

4.0 ASSESSMENT OF DATA QUALITY

Data quality is assessed through two review processes. The contracted analytical laboratory performs the first data review to assess compliance with *QAP*-approved analytical methods (MES, 2013) and with laboratory standard operating procedures. MES performs the second data review to assess compliance with the QA objectives, and to assess hard copy and electronic deliverable consistency and integrity.

4.1 LABORATORY DATA QUALITY ASSESSMENT

The laboratory data quality assessment includes an analytical data review to ensure accurate and complete data reporting and compliance with the analytical method specifications.

4.1.1 Laboratory Qualification of Data

The laboratory will flag analytical results, when necessary, to indicate potential impacts to data usability and to alert the user to special analytical conditions. More than one qualifier may be used to indicate multiple conditions or situations that apply to an individual result. The following laboratory qualifiers were used during this investigation:

FLAG	DESCRIPTION
J	Estimated value. The analyte is positively identified and the concentration is less than the RL but greater than the MDL.
U	Analyte is not detected above the RL.
V	Detected value.

4.2 MES DATA QUALITY AND USABILITY ASSESSMENT

The following sections describe the procedures that MES followed to assess the quality and usability of both field measurement and definitive data. Data assessment is complete when 100 percent of the information have been collected and reviewed. Based on the results of the review process, data are categorized as fully usable, usable as qualified, or rejected.

4.2.1 Data Review and Validation

MES reviewed the analytical data in accordance with the *QAP* (MES, 2013), analytical methods (EPA, 1986), and *USEPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review* (EPA, 2014a and 2014b). The data review process included reviewing and evaluating 100 percent of the hard copy data for (1) extraction and analysis holding times, (2) surrogate recoveries, (3) blank detections, (4) LCS/LCSD recoveries and RPDs, (5) MS/MSD recoveries and RPDs, (6) FD RPDs, (7) laboratory duplicate RPDs, if applicable, (8) initial and continuing calibrations (ICALs and CCALs), (9) instrument tuning and performance, (10) reporting limits, and (11) completeness of the chain-of-custody (COC) forms.

Hard copy data packages were checked to verify that the following items were included:

- Case narrative
- Data summary sheets
- ICALs and CCALs
- Method or preparation blanks (at least one per QC batch)
- MS/MSD (5 percent of client samples)
- LCS/LCSD (one per QC batch)
- Duplicate analyses (laboratory duplicate sample, LCS/LCSD, MS/MSD, as applicable)
- Holding times
- Retention time window calculation (if applicable)
- Standard preparation sheets
- Linear range calculations (correlation coefficients)

The results of the review of the chemical data obtained during this investigation are included in Section 5.0. The laboratory data forms showing the validated results are included in Attachment D1.

4.2.2 MES Qualification of Data

Based on the data review, MES may assign final qualifiers to analytical results on both the hard copy results and in the database. The following final qualifiers may be assigned to the results to describe data quality and usability:

FLAG	DESCRIPTION
J	Estimated detection. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ	Analyte was analyzed for, but was not detected. The reported quantitation limit is estimated.
U	Result was qualified as not detected above the RL or reported sample quantitation limit.

In addition to the qualifier, a sub-qualifier is applied to describe the specific multiple conditions or situations that apply to an individual result. These qualifiers and sub-qualifiers are collectively referred to as validation codes.

FLAG	DESCRIPTION
A	Internal standard area was outside method-specific control limits.
B	Result was qualified based on method blank, continuing calibration blank, or trip blank contamination.
C	Continuing calibration was outside method-specific control limits.
H	Holding time exceeded method criteria.
I	Initial calibration was outside method-specific control limits.
L	The LCS and LCSD recoveries were outside laboratory historical control limits.
M	The MS and MSD recoveries were outside laboratory historical control limits.

FLAG	DESCRIPTION
S	Surrogate recovery was outside laboratory historical control limits.
X	Result exceeded the calibration range of the instrument.
Q	Result was qualified based on reviewer judgment.

Whenever duplicate sets of results were reported by the laboratory due to dilutions, re-analyses, re-extractions, or dual column analytical methods, the MES reviewer chose the "most-preferred" results based on the data review. In the "Reportable Result" column shown on the hard copy sample data reports and the database, MES assigned a "Y" flag for the "most-preferred" results, and an "N" flag for the "least-preferred" results. When there was only one set of laboratory reported results, MES assigned a "Y" flag in the "Reportable Data" column. In Section 5.0, only the reportable data (flagged "Y") are shown in Tables D5-2 to D5-5.

5.0 RESULTS OF QUALITY CONTROL ANALYSES

Table D5-1 lists samples and analytical methods included in the sampling event for the Site. To evaluate the data quality, the results were compared to method requirements and laboratory historical control limits.

Based on the data review process, one analyte was qualified. None of the data were rejected. The results of the data review process are discussed further in the following sections.

5.1 QUALITY CONTROL PROCEDURES AND RESULTS OF QUALITY CONTROL ANALYSES

Two types of QC results were used to evaluate data quality: field QC samples were collected and analyzed to evaluate field sampling activities, and laboratory QC samples were analyzed to evaluate laboratory analytical procedures and maintain control of the analytical methods.

5.1.1 Field Quality Control Procedures and Analyses

Field QC samples included MS/MSD samples, FDs, material blanks, and trip blanks (TBs). The *QAP* was used as the guidance document to identify the appropriate number of field QC samples, procedures for their collection and analysis, and evaluation of results required for this sampling event. The evaluation procedures for the field QC sample analyses are summarized below.

5.1.1.1 Matrix Spike/Matrix Spike Duplicate Samples

MS and MSD samples are investigative samples spiked by the laboratory with known concentrations of target analytes. MS and MSD sample results are used to evaluate possible matrix interferences. The formulas used to calculate the percent recoveries and RPDs are presented in Section 2.3.

Accuracy was assessed by calculating the MS and MSD %Rs of the concentrations of the target analytes added to the investigative sample. The %Rs were then compared to laboratory historical control limits. When both the MS and MSD %Rs were outside laboratory historical control limits, MS/MSD qualifiers were applied only to the results for the investigative sample used for the MS/MSD. When only an MS was analyzed, qualifiers were applied when the MS %R was outside laboratory historical control limits. Low recoveries in an MS/MSD may indicate the matrix has negatively influenced the results. Constituent concentrations could be potentially higher in samples with low MS/MSD recoveries. High MS/MSD recoveries may indicate the matrix has positively influenced the results. Constituent concentrations may be potentially lower in samples with high MS/MSD recoveries.

Precision was assessed by calculating the RPDs for the MS/MSD sample pairs and laboratory duplicate samples. The MS/MSD and laboratory duplicate RPD values were reviewed to assess the precision of the analytical results based on the magnitude of the RPD values. In cases

where a target analyte was not detected in at least one of the MS/MSD sample pair or laboratory duplicate sample pair, an RPD would not be valid, and therefore, was not calculated. Qualifiers were not applied based on the MS/MSD or laboratory duplicate RPD values, however, the MS/MSD and laboratory duplicate RPD values were compared to laboratory historical control limits to assess if further evaluation of the data was warranted.

For this investigation, sample LF4-MW3 was collected and analyzed for the MS and MSD for Methods SW8260B, SW6020A, and SW7470A. The MS/MSD analyses met criteria with the following exception which resulted in antimony in sample LF4-MW being UJM qualified.

Station Name	Sample Date	Parameter Name	MS %R	MSD %R	%R LCL	%R UCL	RPD	RPD Limit
LF4-MW3	3/8/18	Antimony	65.7	62.3	75	125	5.3	20

A summary of the MS/MSD %R and RPD data is shown in Table D5-2. All criteria were met with the above exception. The overall accuracy of the analytical results and variability of the precision measurements are considered to be acceptable.

5.1.1.2 Field Duplicate Samples

FD samples were collected and analyzed as specified in the *QAP* (Section A6.3.5). FD samples are independent samples collected simultaneously or in immediate succession with the original investigative samples such that they are expected to be equally representative of the medium at the time of sampling. These samples provide precision information for the entire measurement system, including sample collection, handling, shipping, storage, preparation, and analysis. The precision of FD pairs was assessed by calculating the RPDs using the equation in Section 2.3. In cases where a target analyte was not detected in either sample or was detected in only one of the samples, an RPD would not be valid, and therefore, was not calculated.

One groundwater FD sample was collected for this sampling event. The original station name from the COC forms (i.e. COC identifications (IDs) used to disguise the sample's identity when the sample was sent to the laboratory), the parent station name, and the methods analyzed are shown below.

Matrix	COC ID	Parent Station Name	Sample Date	Delivery Group	Method
WG	DUP283	LF4-MW5	3/8/18	18C050	SW6020A
WG	DUP283	LF4-MW5	3/8/18	18C050	SW7470A
WG	DUP283	LF4-MW5	3/8/18	18C050	SW8260B

The results for the FD and associated investigative sample analyses were reviewed to assess the precision of the analytical results based on the magnitude of the RPD values. Table D5-3 shows the RPDs calculated for the investigative and FD sample pair. The criterion of 50 percent for aqueous samples was used to assess if further evaluation of the data was warranted. None of the RPD values exceeded 50 percent. No data were qualified based on field duplicate

results. Therefore, the overall variability of the precision measurements is considered acceptable.

5.1.1.3 Material and Trip Blanks Analyses

A material blank sample is defined as a sample of a "clean" reagent source such as deionized water, a chemical reagent source, or a sampling medium such as air filter or sorbent cartridge considered to be "analyte-free" or "background-free" of contamination. If these blanks show elevated concentrations of target analytes, the corresponding data set may be considered biased (MES, 2013). Material blanks were collected on a weekly basis to monitor the final rinse water used by the sampler for potential contaminants. One material blank was collected for this sampling event. No target analytes were detected in the material blank collected during the March 2018 sampling event with the exception of toluene. Toluene was not detected in the associated samples; no data were qualified based on material blanks.

TBs are used to assess the potential introduction of contaminants from sample containers or during the sampling, transportation, and storage procedures (MES, 2013). A TB sample consists of VOC sample vials filled in the laboratory with American Society of Testing and Materials Type II reagent grade water, transported to the sampling site, handled like an environmental sample and returned to the laboratory for analysis. TBs are not opened in the field and are only prepared when aqueous VOC samples are scheduled to be collected and analyzed by the laboratory. Sample results are considered affected by TB contamination when the sample concentration is less than five times the blank concentration (ten times for common laboratory contaminants acetone, methylene chloride, and 2-butanone). Affected sample results less than the reporting limit and less than five times the associated blank concentration are considered non-detects at the reporting limit. Affected sample results greater than the reporting limit and less than five times the blank concentration are considered non-detects at the concentration observed in the sample. One TB was collected for this sampling event. No target analytes were detected in the TB.

5.1.2 Laboratory Quality Control Procedures and Analyses

Laboratory QC checks include internal system checks and QC samples used to monitor the possible effect of laboratory activities on sample results. The analytical method and method-specific standard operating procedures (SOPs) developed by the laboratory define the types of laboratory QC checks required. QC procedures followed by the laboratory include sample container inspection, COC documentation review, sample holding time review, LCS/LCSD analyses, method blank analyses, and surrogate spike percent recovery evaluation. The laboratories are also responsible for analytical instrument calibration, which includes method-specific criteria for initial and continuing calibrations for external and internal standard calibration procedures.

5.1.2.1 Initial Sample Inspection and Chain-of-Custody Documentation

The laboratory inspected the shipping containers upon receipt and compared the contents with the COC forms associated with each cooler. Information from the sample check-in procedure was recorded on the Sample Receipt Form, including sample receipt anomalies. These forms were used by the laboratory to document that sample identifications listed on the COC forms agreed with the samples contained in the coolers. The laboratory verified that COC forms were filled out properly, sample containers were not broken, custody seals were intact, the pH met method-specific criteria for water samples (if applicable), and cooler temperatures were maintained at 4 ± 2 degrees Celsius. The completed forms are included in the laboratory analytical packages and were reviewed during the data review process. The samples arrived at the laboratory at the proper temperature, and no sample containers were damaged during transit.

MES compared the data on the COC forms with the laboratory reports and documented any differences. If minor discrepancies were found and verified by the laboratory, the laboratory reports and MES electronic databases were corrected. In addition to the COC checks, MES reviewers verified approximately 10 percent of the laboratory hard copy reports against the laboratory electronic data deliverables.

5.1.2.2 Holding Times

Samples were shipped regularly in coordination with the analytical laboratory to ensure analyses were conducted within the required holding times. The time elapsed between sample collection and sample extraction/analysis was calculated as part of the review process to evaluate if holding times were met. Holding time criteria were met for this sampling event, therefore, accuracy of the analytical results is acceptable with regards to holding time.

5.1.2.3 Laboratory Control Sample/Laboratory Control Sample Duplicate

The laboratory analyzed LCS/LCSD pairs with each analytical batch of field samples to assess internal precision and accuracy. LCS/LCSD pairs consisted of analyte-free water spiked with selected target constituents of known concentration. The LCS/LCSD %Rs and RPDs are used to determine laboratory accuracy and precision, respectively. The formulas used to calculate the %Rs and RPDs are presented in Section 2.3. The %Rs and RPDs were then compared to laboratory historical control limits. When the LCS and LCSD %Rs were outside laboratory historical control limits, the LCS/LCSD qualifications were applied to investigative samples within the same analytical batch. Qualifiers were applied only when both the LCS and LCSD %Rs were outside laboratory historical control limits. In cases where only an LCS was analyzed, qualifiers were applied when the LCS %R was outside laboratory historical control limits. Qualifiers were not applied based on LCS/LCSD RPD values, however, the LCS/LCSD RPD values were compared to laboratory historical control limits to assess if further evaluation of the data was warranted. For this sampling event, MES reviewed the LCS/LCSD %Rs and RPDs for Methods SW8260B, SW6020A, and SW7470A.

Table D5-4 shows the LCS/LCSD percent recovery and RPD data. The LCS and LCSD percent recoveries met criteria, therefore, no qualifiers were required. One hundred percent of the LCS/LCSD percent recoveries and one hundred percent of the RPD results were within the laboratory control limits, therefore, the overall accuracy and precision measurements are considered to be acceptable.

5.1.2.4 Method Blank and Continuing Calibration Blank Samples

Method blanks are prepared and analyzed by the laboratory to assess the level of background interferences and possible contamination in the analytical system. The method blank must be carried through the complete procedure and contain analyte-free reagents in the same volumes as used in processing the samples. The goal is to conduct investigative sample analysis in such a manner that sample contamination is not introduced by the analytical methods, equipment, or reagents. If such contamination occurs, it is usually identified by the detection of target analytes at trace or low concentrations in the method blanks. When these detections are found, the laboratory investigates the source, qualifies the affected data as appropriate according to the magnitude of the detections, and implements corrective measures as appropriate. For this investigation, method blanks were prepared and analyzed with each analytical batch for Methods SW6020A, SW8260B, and SW7470A.

Continuing calibration blanks (CCBs) are used to check the instrument calibration and level of background interferences. CCBs are prepared by acidifying reagent water to the same concentrations of the acids used in the calibration standards and investigative samples. For this investigation, CCBs were analyzed for Methods SW6020A and SW7470A to evaluate if any analytes detected in the CCBs impacted the concentrations of the associated samples.

The following are descriptions of the qualifiers that may be used based on blank contamination:

- When a VOC target analyte was detected in the sample and associated method blank, affected sample results with concentrations less than five times the blank concentration (ten times for common laboratory contaminants acetone, methylene chloride, and 2-butanone) were qualified as non-detect (UB) at the reporting limit (when the sample concentration was less than the reporting limit) or qualified as non-detect (UB) at the concentration observed in the sample (when the sample concentration was greater than the reporting limit).
- When an inorganic target analyte was detected in the sample and associated method blank or CCB, affected sample results with concentrations > MDL but ≤ RL were qualified as non-detect (UB) at the RL; associated sample results with concentrations > RL but < 5x the blank concentration were qualified as non-detect (UB) at the sample concentration; for sample results with concentrations > RL and > 5x the blank concentration, no qualifiers were required.

No target analytes were detected in the method blanks or CCBs for this sampling event.

5.1.2.5 Surrogate Recovery

Surrogate spike compounds were added to investigative samples during organic analyses to assess the individual matrix effect of investigative samples and to monitor overall analytical system performance. Surrogate recoveries that are outside the laboratory historical control limits may indicate performance problems with the analytical system and extraction procedures, or significant matrix effects when evaluated in conjunction with the MS/MSD results. MES reviewers used laboratory historical control limits to assess percent recoveries for surrogate spike constituents. For sample results affected by surrogate percent recoveries less than the lower control limit, detects were qualified as estimated (JS) and may be biased low, and non-detects were qualified as estimated (UJS) and may be potential false negatives. For sample results affected by surrogate percent recoveries greater than the upper control. No qualifiers are required; all surrogates were within acceptance criteria.

A summary of the surrogate percent recovery data is provided in Table D5-5. No qualifiers were required for sample results based on surrogate recoveries.

5.1.2.6 Internal Standards

Adherence to method-specific internal standards (ISs) criteria ensures that GC/MS sensitivity and response are stable during each analysis. *SW-846* (EPA, 1986) recommended ISs are often brominated, fluorinated, or stable isotopically labeled analogs of specific target compounds, or are closely related compounds whose presence in environmental samples is unlikely. The IS spike solution is added after the preparation or extraction of a sample. ISs are used in internal calibration methods to correct sample results affected by column injection loss, purging loss, or viscosity effects. ISs are added to environmental samples, control standards, and blanks, in accordance with method requirements and laboratory SOPs (MES, 2013). No qualifiers were required for samples based on the IS data.

5.1.2.7 Initial and Continuing Calibration

The calibration of an analytical instrument involves the delineation of the relationship between the response of the instrument and the concentration of an analyte introduced into the instrument. An ICAL is performed on an analytical instrument prior to the analysis of samples to ensure that the equipment is capable of producing acceptable qualitative and quantitative data. The CCAL is the verification of the ICAL at periodic intervals. The CCAL demonstrates that the instrument is capable of acceptable performance during the course of the analytical analysis. Review of the ICAL data included the evaluation of the correlation coefficients and relative standard deviations. Review of the CCAL data included the evaluation of the percent difference between the concentration of the CCAL standard and the expected concentration. All calibration data meet acceptance criteria.

5.2 SUMMARY OF DATA QUALITY INDICATORS

A summary of the data quality indicators in terms of the PARCCS are described in this section.

5.2.1 Precision

As discussed in Section 2.3, the precision evaluation included field precision (FDs), laboratory precision (LCS/LCSDs), and combined field/laboratory precision (MS/MSDs). The MS/MSD, FD, and LCS/LCSD RPDs are discussed in Sections 5.1.1.1, 5.1.1.2, and 5.1.2.3 of this report, respectively. Based on this evaluation, the precision of the data is acceptable for its intended use.

5.2.2 Accuracy

As discussed in Section 2.3, the accuracy evaluation included a comparison of spike recoveries from field samples (surrogate and MS/MSD spikes) and laboratory QC samples (LCS and LCSD), and assessing holding time. The MS/MSD, LCS/LCSD, and surrogate spike recoveries are discussed in Sections 5.1.1.1, 5.1.2.3, and 5.1.2.5, respectively, and holding time is discussed in Section 5.1.2.2. Recoveries from MS/MSDs, LCS/LCSD and surrogate percent recoveries were compared to laboratory historical control limits to determine a laboratory's ability to accurately determine both qualitative and quantitative results. The investigative sample results were within the required percent recovery limits. The investigative sample results were within the required holding time limits. Based on this evaluation, the accuracy of the data is acceptable for its intended use.

5.2.3 Representativeness

Representativeness is the degree to which the data accurately and precisely portray the environmental conditions being studied. For this investigation, sampling procedures and locations were selected to accurately represent overall Site conditions and were biased toward areas that were likely to exhibit evidence of past releases. Sampling was conducted using known, approved field procedures to minimize variability introduced during field sampling. The investigative and FD analyses indicate that the overall combined variability introduced by the sampling procedures, sample matrix, and laboratory analysis is acceptable, and the FD samples are representative of the data associated with the investigative sample.

5.2.4 Completeness

Completeness refers to the amount of valid data obtainable from a measurement system compared to the expected amount of data. Data that have not been qualified as rejected during the data validation process are considered to be valid. As presented in the *QAP* (MES, 2013), a completeness goal of 95 percent was established for investigations. Of the 393 investigative and field duplicate sample records from the sampling event, no records were qualified as rejected based on MES' review of the data. Therefore a completeness of 100 percent was calculated for the sampling event, which exceeds project goals. One hundred percent of the results are usable and are acceptable for their intended use.

5.2.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability objectives were met by minimizing the number of contract laboratories used, using EPA methods for analyses, and reporting results in standardized units. The comparability objective for the project was fulfilled.

6.0 REPORTING LIMITS AND DATA USES

This section discusses the laboratory reporting limits and how they compare to MCLs.

6.1 LABORATORY REPORTING LIMITS

EMAX confirms reporting limits on an annual or quarterly basis by performing MDL studies. The MDL is defined as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is generated from the analysis of a sample in a given matrix containing the analyte (40 Code of Federal Regulations, Chapter 1, Part 136, Appendix B). The reporting limit is defined as the lowest concentration of the target analyte required to be reported. This value is based on project-specific criteria.

The laboratory reports detections that are below the reporting limit as estimated values by assigning a flag to the analytical result. This flag is assigned because the laboratory cannot accurately quantify analyte concentrations at levels below the reporting limit. For detections in the concentration range between the MDL and the reporting limit, the laboratory is confident of the analyte identification and detection but can only estimate the analyte concentration.

6.2 COMPARISON OF LABORATORY REPORTING LIMITS TO MCLS

For this assessment, the laboratory RLs and MDLs were compared to MCLs, shown in Table D6-1. The laboratory RLs and MDLs for the investigative samples were equal to or lower than the MCLs with the exception of 1,2-dibromo-3-chloropropane. These limits were above the MCLs due to limitations with the analytical method. If a MCL was not available for comparison, the target analyte was not shown in Table D6-1.

7.0 CONCLUSIONS

This DQS presents in specific terms the QA and QC practices used to achieve the project objectives for the Site during the March 2018 sampling event. Samples were collected and analyzed in accordance with EPA methods and using laboratory-specific QA/QC procedures. These procedures were followed to generate legally and technically defensible data.

Some of the quality issues addressed in Section 5.0 of this report resulted in qualification of investigative sample results. One analyte was qualified, no data were rejected. Based on this review, the analytical data generated for this sampling event are acceptable and adequate to fulfill program objectives.

8.0 REFERENCES

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TABLES

Table D5-1: Sample Index
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Site Name	Station Name	QC Code	Matrix	Sample Date	Lab	Delivery Group	Laboratory Sample ID	Method
PARCEL 81(5), LANDFILL 4	LF4-MW1	NS	WG	3/8/2018	EMAX	18C050	C050-01	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW1	NS	WG	3/8/2018	EMAX	18C050	C050-01	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW1	NS	WG	3/8/2018	EMAX	18C050	C050-01	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW2	NS	WG	3/8/2018	EMAX	18C050	C050-02	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW2	NS	WG	3/8/2018	EMAX	18C050	C050-02G	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW2	NS	WG	3/8/2018	EMAX	18C050	C050-02	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW2	NS	WG	3/8/2018	EMAX	18C050	C050-02	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW3	NS	WG	3/8/2018	EMAX	18C050	C050-03N	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW3	NS	WG	3/8/2018	EMAX	18C050	C050-03	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW3	NS	WG	3/8/2018	EMAX	18C050	C050-03	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW3	MSD	WG	3/8/2018	EMAX	18C050	C050-03S	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW3	MSD	WG	3/8/2018	EMAX	18C050	C050-03S	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW3	MSD	WG	3/8/2018	EMAX	18C050	C050-03S	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW3	MS	WG	3/8/2018	EMAX	18C050	C050-03M	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW3	MS	WG	3/8/2018	EMAX	18C050	C050-03M	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW3	MS	WG	3/8/2018	EMAX	18C050	C050-03M	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW4	NS	WG	3/8/2018	EMAX	18C050	C050-04	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW4	NS	WG	3/8/2018	EMAX	18C050	C050-04	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW4	NS	WG	3/8/2018	EMAX	18C050	C050-04	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW5	NS	WG	3/8/2018	EMAX	18C050	C050-05	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW5	NS	WG	3/8/2018	EMAX	18C050	C050-05	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW5	NS	WG	3/8/2018	EMAX	18C050	C050-05	SW8260B
PARCEL 81(5), LANDFILL 4	LF4-MW5	FD	WG	3/8/2018	EMAX	18C050	C050-06	SW6020A
PARCEL 81(5), LANDFILL 4	LF4-MW5	FD	WG	3/8/2018	EMAX	18C050	C050-06	SW7470A
PARCEL 81(5), LANDFILL 4	LF4-MW5	FD	WG	3/8/2018	EMAX	18C050	C050-06	SW8260B
PARCEL 81(5), LANDFILL 4	Material Blank (Material083)	NS	W	3/8/2018	EMAX	18C050	C050-07	SW6020A
PARCEL 81(5), LANDFILL 4	Material Blank (Material083)	NS	W	3/8/2018	EMAX	18C050	C050-07	SW7470A
PARCEL 81(5), LANDFILL 4	Material Blank (Material083)	NS	W	3/8/2018	EMAX	18C050	C050-07	SW8260B
PARCEL 81(5), LANDFILL 4	Trip Blank (TB475)	TB	W	3/8/2018	EMAX	18C050	C050-08	SW8260B

Notes:
EMXT = EMAX Laboratories, Torrance, CA
FD = Field duplicate
ID = Identification
MS = Matrix spike
MSD = Matrix spike duplicate
NS = Normal sample
QC = Quality Control
TB = Trip blank
W = Water
WG = Groundwater
WS = Material Blank

Table D5-2: Summary of MS/MSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	Matrix	Sample Date	Delivery Group	Method	Parameter Name	MS %R	MSD %R	%R LCL	%R UCL	RPD	RPD Limit
LF4-MW3	WG	3/8/18	18C050	SW6020A	Antimony	66	62.3	75	125	5.3	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Arsenic	93	86.6	75	125	6.7	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Barium	104	87.7	75	125	17.0	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Beryllium	101	93.2	75	125	8.0	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Cadmium	100	93.3	75	125	6.6	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Chromium	103	94.9	75	125	8.2	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Cobalt	99	92.7	75	125	7.0	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Copper	101	93.7	75	125	7.5	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Lead	100	93	75	125	7.3	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Nickel	104	95.9	75	125	8.1	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Selenium	95	87.3	75	125	8.4	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Silver	100	94	75	125	6.2	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Thallium	107	99	75	125	7.8	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Vanadium	99	92.3	75	125	7.3	20
LF4-MW3	WG	3/8/18	18C050	SW6020A	Zinc	104	96.5	75	125	7.5	20
LF4-MW3	WG	3/8/18	18C050	SW7470A	Mercury	110	108	80	120	1.8	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,1,1,2-Tetrachloroethane	99	101	63	143	2.0	30
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,1,1-Trichloroethane	97	99	70	127	2.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,1,2,2-Tetrachloroethane	101	103	68	129	2.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,1,2-Trichloroethane	101	104	79	136	2.9	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,1-Dichloroethane	93	94	80	133	1.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,1-Dichloroethene	85	88	75	125	3.5	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,2,3-Trichloropropane	102	107	65	139	4.8	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,2-Dibromo-3-Chloropropane	100	108	75	132	7.7	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,2-Dibromoethane	103	103	80	127	0.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,2-Dichlorobenzene	98	102	73	120	4.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,2-Dichloroethane	95	97	67	132	2.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,2-Dichloropropane	94	97	77	127	3.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	1,4-Dichlorobenzene	96	99	74	123	3.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	2-Butanone (MEK)	91	95	45	150	4.3	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	2-Hexanone	94	101	79	121	7.2	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	4-Methyl-2-Pentanone (MIBK)	94	102	59	150	8.2	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Acetone	94	94	51	157	0.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Acrylonitrile	101	104	45	165	2.9	30
LF4-MW3	WG	3/8/18	18C050	SW8260B	Benzene	94	95	79	126	1.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Bromochloromethane	90	92	78	127	2.2	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Bromodichloromethane	100	101	70	130	1.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Bromoform	104	105	72	136	1.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Bromomethane	99	101	35	153	2.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Carbon Disulfide	113	120	74	123	6.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Carbon Tetrachloride	101	100	71	132	1.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Chlorobenzene	99	99	80	127	0.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Chloroethane	89	94	72	129	5.5	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Chloroform	96	99	74	127	3.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Chloromethane	87	90	58	135	3.4	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Cis-1,2-Dichloroethene	98	100	73	133	2.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Cis-1,3-Dichloropropene	96	100	73	132	4.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Dibromochloromethane	102	104	74	145	1.9	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Dibromomethane	99	102	76	132	3.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Ethylbenzene	93	94	79	120	1.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Iodomethane	88	90	63	143	2.2	30
LF4-MW3	WG	3/8/18	18C050	SW8260B	Methylene Chloride	86	89	69	118	3.4	20

Table D5-2: Summary of MS/MSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	Matrix	Sample Date	Delivery Group	Method	Parameter Name	MS %R	MSD %R	%R LCL	%R UCL	RPD	RPD Limit
LF4-MW3	WG	3/8/18	18C050	SW8260B	Styrene	91	93	76	130	2.2	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Tetrachloroethylene	95	96	80	129	1.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Toluene	93	95	80	125	2.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Trans-1,2-Dichloroethene	89	90	78	134	1.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Trans-1,3-Dichloropropene	99	98	74	131	1.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Trans-1,4-Dichloro-2-Butene	84	89	45	165	5.8	30
LF4-MW3	WG	3/8/18	18C050	SW8260B	Trichloroethene	96	98	67	128	2.1	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Trichlorofluoromethane	100	101	68	133	1.0	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Vinyl Acetate	88	86	36	176	2.3	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Vinyl Chloride	92	95	73	134	3.2	20
LF4-MW3	WG	3/8/18	18C050	SW8260B	Xylenes (Total)	95	98	79	122	3.1	20

Notes:
%R = Percent recovery
LCL = Lower control limit
UCL = Upper control limit
MS = Matrix spike
MSD = Matrix spike duplicate
RPD = Relative percent difference
WG = Groundwater

Blue text and outlined indicates value above acceptance critieria.
Shade indicates value below acceptance criteria.

Table D5-3: Comparison of Investigative and Field Duplicate Sample Detections
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	Matrix	Sample Date	Delivery Group	Method	Parameter Name	FD Value	FD Lab Flag	NS Value	NS Lab Flag	Units	RPD	MDL	RL
LF4-MW5	WG	3/8/18	18C050	SW6020A	Arsenic	0.786	J	0.658	J	mg/L	17.7	0.2	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Barium	17.6		17.4		mg/L	1.1	0.5	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Beryllium	0.123	J	0.123	J	mg/L	0.0	0.1	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Chromium	0.96	J	0.796	J	mg/L	18.7	0.2	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Cobalt	4.18		4.09		mg/L	2.2	0.2	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Copper	1.69		1.7		mg/L	0.6	0.5	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Lead	3.54		3.18		mg/L	10.7	0.1	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Nickel	2.89		2.77		mg/L	4.2	0.2	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Vanadium	2.81		2.46		mg/L	13.3	0.5	1
LF4-MW5	WG	3/8/18	18C050	SW6020A	Zinc	65.4		59.7		mg/L	9.1	10	20

Notes:

FD = Field duplicate
MDL = Method detection limit
µg/L = micrograms per liter
NS = Normal sample
RL = Reporting limit
RPD = Relative percent difference
WG = Groundwater

Blue text and outlined indicates RPD outside acceptance critieria of 50%.

Lab Flag:

J = Estimated value. The analyte is positively identified and the concentration is less than the reporting limit, but greater than the method detection limit.
V = Detected value.

Table D5-4: Summary of LCS/LCSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Method	Delivery Group	Analysis Date	Analytical Batch	Matrix	Parameter Name	LCS %R	LCSD %R	LCL	UCL	RPD	RPD Limit
SW6020A	18C050	3/16/18	IMC019W	W	Antimony	98	99	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Arsenic	98	99	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Barium	100	100	80	120	0	20
SW6020A	18C050	3/16/18	IMC019W	W	Beryllium	98	97	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Cadmium	97	98	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Chromium	101	101	80	120	0	20
SW6020A	18C050	3/16/18	IMC019W	W	Cobalt	106	107	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Copper	100	100	80	120	0	20
SW6020A	18C050	3/16/18	IMC019W	W	Lead	98	99	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Nickel	101	100	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Selenium	99	98	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Silver	100	100	80	120	0	20
SW6020A	18C050	3/16/18	IMC019W	W	Thallium	103	104	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Vanadium	99	98	80	120	1	20
SW6020A	18C050	3/16/18	IMC019W	W	Zinc	111	112	80	120	1	20
SW7470A	18C050	3/15/18	18HGC009	W	Mercury	103	103	80	120	0	20
SW8260B	18C050	3/9/18	VO94C05	W	1,1,1,2-Tetrachloroethane	107	106	63	143	1	30
SW8260B	18C050	3/9/18	VO94C05	W	1,1,1-Trichloroethane	102	99	70	127	3	20
SW8260B	18C050	3/9/18	VO94C05	W	1,1,2,2-Tetrachloroethane	103	103	68	129	0	20
SW8260B	18C050	3/9/18	VO94C05	W	1,1,2-Trichloroethane	104	106	79	136	2	20
SW8260B	18C050	3/9/18	VO94C05	W	1,1-Dichloroethane	96	95	80	133	1	20
SW8260B	18C050	3/9/18	VO94C05	W	1,1-Dichloroethene	86	82	75	125	5	20
SW8260B	18C050	3/9/18	VO94C05	W	1,2,3-Trichloropropane	108	106	65	139	2	20
SW8260B	18C050	3/9/18	VO94C05	W	1,2-Dibromo-3-Chloropropane	109	104	75	132	5	20
SW8260B	18C050	3/9/18	VO94C05	W	1,2-Dibromoethane	108	107	80	127	1	20
SW8260B	18C050	3/9/18	VO94C05	W	1,2-Dichlorobenzene	101	102	73	120	1	20
SW8260B	18C050	3/9/18	VO94C05	W	1,2-Dichloroethane	95	95	67	132	0	20
SW8260B	18C050	3/9/18	VO94C05	W	1,2-Dichloropropane	100	96	77	127	4	20
SW8260B	18C050	3/9/18	VO94C05	W	1,4-Dichlorobenzene	101	101	74	123	0	20
SW8260B	18C050	3/9/18	VO94C05	W	2-Butanone (MEK)	100	98	45	150	2	20
SW8260B	18C050	3/9/18	VO94C05	W	2-Hexanone	108	109	79	121	1	20
SW8260B	18C050	3/9/18	VO94C05	W	4-Methyl-2-Pentanone (MIBK)	103	104	59	150	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Acetone	100	105	51	157	5	20
SW8260B	18C050	3/9/18	VO94C05	W	Acrylonitrile	107	108	45	165	1	30
SW8260B	18C050	3/9/18	VO94C05	W	Benzene	96	94	79	126	2	20

Table D5-4: Summary of LCS/LCSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Method	Delivery Group	Analysis Date	Analytical Batch	Matrix	Parameter Name	LCS %R	LCSD %R	LCL	UCL	RPD	RPD Limit
SW8260B	18C050	3/9/18	VO94C05	W	Bromochloromethane	93	92	78	127	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Bromodichloromethane	101	100	70	130	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Bromoform	106	107	72	136	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Bromomethane	99	94	35	153	5	20
SW8260B	18C050	3/9/18	VO94C05	W	Carbon Disulfide	110	110	74	123	0	20
SW8260B	18C050	3/9/18	VO94C05	W	Carbon Tetrachloride	105	100	71	132	5	20
SW8260B	18C050	3/9/18	VO94C05	W	Chlorobenzene	101	102	80	127	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Chloroethane	87	85	72	129	2	20
SW8260B	18C050	3/9/18	VO94C05	W	Chloroform	98	97	74	127	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Chloromethane	87	83	58	135	5	20
SW8260B	18C050	3/9/18	VO94C05	W	Cis-1,2-Dichloroethene	102	101	73	133	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Cis-1,3-Dichloropropene	101	100	73	132	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Dibromochloromethane	106	107	74	145	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Dibromomethane	101	102	76	132	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Ethylbenzene	99	99	79	120	0	20
SW8260B	18C050	3/9/18	VO94C05	W	Iodomethane	90	85	63	143	6	30
SW8260B	18C050	3/9/18	VO94C05	W	Methylene Chloride	90	86	69	118	5	20
SW8260B	18C050	3/9/18	VO94C05	W	Styrene	102	104	76	130	2	20
SW8260B	18C050	3/9/18	VO94C05	W	Tetrachloroethylene	100	100	80	129	0	20
SW8260B	18C050	3/9/18	VO94C05	W	Toluene	98	97	80	125	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Trans-1,2-Dichloroethene	93	92	78	134	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Trans-1,3-Dichloropropene	102	101	74	131	1	20
SW8260B	18C050	3/9/18	VO94C05	W	Trans-1,4-Dichloro-2-Butene	86	88	45	165	2	30
SW8260B	18C050	3/9/18	VO94C05	W	Trichloroethene	102	99	67	128	3	20
SW8260B	18C050	3/9/18	VO94C05	W	Trichlorofluoromethane	98	95	68	133	3	20
SW8260B	18C050	3/9/18	VO94C05	W	Vinyl Acetate	89	92	36	176	3	20
SW8260B	18C050	3/9/18	VO94C05	W	Vinyl Chloride	93	89	73	134	4	20
SW8260B	18C050	3/9/18	VO94C05	W	Xylenes (Total)	100	99	79	122	1	20

Notes:

LCL = Lower control limit
LCS = Laboratory control sample
LCSD = Laboratory control sample duplicate
RPD = Relative percent difference
UCL = Upper control limit

Blue text and outlined indicates value above acceptance critieria.
Shade indicates value below acceptance criteria.

Table D5-4: Summary of LCS/LCSD Recoveries and RPDs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Method	Delivery Group	Analysis Date	Analytical Batch	Matrix	Parameter Name	LCS %R	LCSD %R	LCL	UCL	RPD	RPD Limit

W = Water
%R = Percent recovery

Table D5-5: Summary of Surrogate Recoveries
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Station Name	Sample Date	Matrix	QC Code	Delivery Group	Method	Parameter Name	%R	LCL	UCL
LF4-MW1	3/8/18	W	NS	18C050	SW8260B	1,2-Dichloroethane-D4	105	63	132
LF4-MW1	3/8/18	W	NS	18C050	SW8260B	4-Bromofluorobenzene	99.3	73	129
LF4-MW1	3/8/18	W	NS	18C050	SW8260B	Toluene-D8	98.9	75	122
LF4-MW2	3/8/18	W	NS	18C050	SW8260B	1,2-Dichloroethane-D4	105	63	132
LF4-MW2	3/8/18	W	NS	18C050	SW8260B	4-Bromofluorobenzene	97.7	73	129
LF4-MW2	3/8/18	W	NS	18C050	SW8260B	Toluene-D8	96	75	122
LF4-MW3	3/8/18	W	NS	18C050	SW8260B	1,2-Dichloroethane-D4	101	63	132
LF4-MW3	3/8/18	W	NS	18C050	SW8260B	4-Bromofluorobenzene	99.6	73	129
LF4-MW3	3/8/18	W	NS	18C050	SW8260B	Toluene-D8	102	75	122
LF4-MW4	3/8/18	W	NS	18C050	SW8260B	1,2-Dichloroethane-D4	107	63	132
LF4-MW4	3/8/18	W	NS	18C050	SW8260B	4-Bromofluorobenzene	98.5	73	129
LF4-MW4	3/8/18	W	NS	18C050	SW8260B	Toluene-D8	98.3	75	122
LF4-MW5	3/8/18	W	NS	18C050	SW8260B	1,2-Dichloroethane-D4	106	63	132
LF4-MW5	3/8/18	W	NS	18C050	SW8260B	4-Bromofluorobenzene	98.2	73	129
LF4-MW5	3/8/18	W	NS	18C050	SW8260B	Toluene-D8	99.7	75	122
LF4-MW5	3/8/18	W	FD	18C050	SW8260B	1,2-Dichloroethane-D4	105	63	132
LF4-MW5	3/8/18	W	FD	18C050	SW8260B	4-Bromofluorobenzene	99.6	73	129
LF4-MW5	3/8/18	W	FD	18C050	SW8260B	Toluene-D8	95.8	75	122
Material Blank	3/8/18	W	NS	18C050	SW8260B	1,2-Dichloroethane-D4	106	63	132
Material Blank	3/8/18	W	NS	18C050	SW8260B	4-Bromofluorobenzene	98.6	73	129
Material Blank	3/8/18	W	NS	18C050	SW8260B	Toluene-D8	98	75	122
Trip Blank	3/8/18	W	TB	18C050	SW8260B	1,2-Dichloroethane-D4	105	63	132
Trip Blank	3/8/18	W	TB	18C050	SW8260B	4-Bromofluorobenzene	98.6	73	129
Trip Blank	3/8/18	W	TB	18C050	SW8260B	Toluene-D8	99.3	75	122

Notes:

FD = Field duplicate
LCL = Lower control limit
NS = Normal sample
QC = Quality control
%R = Percent recovery
TB = Trip blank
UCL = Upper control limit
W = Water
WG = Groundwater
WS = Material Blank

Table D6-1: Reporting Limits and Method Detection Limits Compared to MCLs
Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Matrix	Method	Parameter Name	MDL	RL	Units	MCL
WG	SW6020A	Antimony	0.5	1	µg/L	6.0
WG	SW6020A	Arsenic	0.2	1	µg/L	10
WG	SW6020A	Barium	0.5	1	µg/L	2000
WG	SW6020A	Beryllium	0.1	1	µg/L	4.0
WG	SW6020A	Cadmium	0.2	1	µg/L	5.0
WG	SW6020A	Chromium	0.2	1	µg/L	100
WG	SW6020A	Cobalt	0.2	1	µg/L	NA
WG	SW6020A	Copper	0.5	1	µg/L	1300
WG	SW6020A	Lead	0.1	1	µg/L	15
WG	SW6020A	Nickel	0.2	1	µg/L	100
WG	SW6020A	Selenium	0.3	1	µg/L	50
WG	SW6020A	Silver	0.2	1	µg/L	100
WG	SW6020A	Thallium	0.2	1	µg/L	2.0
WG	SW6020A	Zinc	10	20	µg/L	5000
WG	SW7470A	Mercury	0.1	0.4	µg/L	2.0
WG	SW8260B	1,1,1-Trichloroethane	0.2	1	µg/L	200
WG	SW8260B	1,1,2-Trichloroethane	0.2	1	µg/L	5.0
WG	SW8260B	1,1-Dichloroethene	0.2	1	µg/L	7.0
WG	SW8260B	1,2-Dibromo-3-Chloropropane	0.5	2	µg/L	0.2
WG	SW8260B	1,2-Dichlorobenzene	0.2	1	µg/L	600
WG	SW8260B	1,2-Dichloroethane	0.2	1	µg/L	5.0
WG	SW8260B	1,2-Dichloropropane	0.2	1	µg/L	5.0
WG	SW8260B	1,4-Dichlorobenzene	0.2	1	µg/L	75
WG	SW8260B	Benzene	0.2	1	µg/L	5.0
WG	SW8260B	Carbon Tetrachloride	0.2	1	µg/L	5.0
WG	SW8260B	Chlorobenzene	0.2	1	µg/L	100
WG	SW8260B	Cis-1,2-Dichloroethene	0.2	1	µg/L	70
WG	SW8260B	Ethylbenzene	0.2	1	µg/L	700
WG	SW8260B	Styrene	0.2	1	µg/L	100
WG	SW8260B	Tetrachloroethene	0.2	1	µg/L	5.0
WG	SW8260B	Toluene	0.2	1	µg/L	1000
WG	SW8260B	Trans-1,2-Dichloroethene	0.2	1	µg/L	100
WG	SW8260B	Trichloroethene	0.2	1	µg/L	5.0
WG	SW8260B	Vinyl Chloride	0.2	0.8	µg/L	2.0
WG	SW8260B	Xylenes (Total)	0.4	3	µg/L	10000

Notes:
MDL = Method detection limit
µg/L = micrograms per liter
mg/L = milligrams per liter
MCL = Maximum contaminant level
RL = Reporting limit
WG = Groundwater

Indicates the limit is greater than the MCL.

ATTACHMENT D1

Laboratory Data Forms

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
Batch No. : 18C050	Date Extracted: 03/09/18 16:00
Sample ID: LF4-MW1	Date Analyzed: 03/09/18 16:00
Lab Samp ID: C050-01	Dilution Factor: 1
Lab File ID: RCD097	Matrix : WATER
Ext Btch ID: V094C05	% Moisture : NA
Calib. Ref.: RBD066	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	1.0	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.50
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.20
1,2,3-TRICHLOROPROPANE	ND	1.0	0.50
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.20
BROMOFORM	ND	1.0	0.30
BROMOMETHANE	ND	2.0	0.30
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	ND	1.0	0.20
CHLOROETHANE	ND	2.0	0.30
CHLOROFORM	ND	1.0	0.20
CHLOROMETHANE	ND	2.0	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	1.0	0.20
TOTAL XYLENES	ND	3.0	0.40
METHYLENE CHLORIDE	ND	2.0	0.50
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	ND	1.0	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	ND	1.0	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.30
VINYL CHLORIDE	ND	0.80	0.20
ACETONE	ND	10	5.0
2-BUTANONE(MEK)	ND	10	4.0
2-HEXANONE	ND	10	2.3
4-METHYL-2-PENTANONE(MIBK)	ND	10	4.0
CARBON DISULFIDE	ND	1.0	0.20
VINYL ACETATE	ND	2.0	0.50
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.20
TRANS-1,4-DICHLORO-2-BUTENE	ND	2.0	1.0
ACRYLONITRILE	ND	10	5.0
IODOMETHANE	ND	2.0	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.5	10.00	105	63-132
TOLUENE-D8	9.89	10.00	98.9	75-122
4-BROMOFLUOROBENZENE	9.93	10.00	99.3	73-129

RL: Reporting Limit

04/2/18
MP

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
Batch No. : 18C050	Date Extracted: 03/09/18 16:31
Sample ID: LF4-MW2	Date Analyzed: 03/09/18 16:31
Lab Samp ID: C050-02	Dilution Factor: 1
Lab File ID: RCD098	Matrix : WATER
Ext Btch ID: V094C05	% Moisture : NA
Calib. Ref.: RBD066	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	1.0	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.50
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.20
1,2,3-TRICHLOROPROPANE	ND	1.0	0.50
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.20
BROMOFORM	ND	1.0	0.30
BROMOMETHANE	ND	2.0	0.30
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	ND	1.0	0.20
CHLOROETHANE	ND	2.0	0.30
CHLOROFORM	ND	1.0	0.20
CHLOROMETHANE	ND	2.0	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	1.0	0.20
TOTAL XYLENES	ND	3.0	0.40
METHYLENE CHLORIDE	ND	2.0	0.50
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	ND	1.0	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	ND	1.0	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.30
VINYL CHLORIDE	ND	0.80	0.20
ACETONE	ND	10	5.0
2-BUTANONE(MEK)	ND	10	4.0
2-HEXANONE	ND	10	2.3
4-METHYL-2-PENTANONE(MIBK)	ND	10	4.0
CARBON DISULFIDE	ND	1.0	0.20
VINYL ACETATE	ND	2.0	0.50
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.20
TRANS-1,4-DICHLORO-2-BUTENE	ND	2.0	1.0
ACRYLONITRILE	ND	10	5.0
IODOMETHANE	ND	2.0	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.5	10.00	105	63-132
TOLUENE-D8	9.60	10.00	96.0	75-122
4-BROMOFLUOROBENZENE	9.77	10.00	97.7	73-129

RL: Reporting Limit

4/2/18
BMP

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : MATRIX ENVIRONMENTAL SERVICES
Project : PARCEL 81(5), LANDFILL 4
Batch No. : 18C050
Sample ID: LF4-MW3
Lab Samp ID: C050-03
Lab File ID: RCD092
Ext Btch ID: VO94C05
Calib. Ref.: RBD066

Date Collected: 03/08/18
Date Received: 03/09/18
Date Extracted: 03/09/18 13:26
Date Analyzed: 03/09/18 13:26
Dilution Factor: 1
Matrix : WATER
% Moisture : NA
Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	1.0	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.50
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.20
1,2,3-TRICHLOROPROPANE	ND	1.0	0.50
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.20
BROMOFORM	ND	1.0	0.30
BROMOMETHANE	ND	2.0	0.30
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	ND	1.0	0.20
CHLOROETHANE	ND	2.0	0.30
CHLOROFORM	ND	1.0	0.20
CHLOROMETHANE	ND	2.0	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	1.0	0.20
TOTAL XYLENES	ND	3.0	0.40
METHYLENE CHLORIDE	ND	2.0	0.50
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	ND	1.0	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	ND	1.0	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.30
VINYL CHLORIDE	ND	0.80	0.20
ACETONE	ND	10	5.0
2-BUTANONE(MEK)	ND	10	4.0
2-HEXANONE	ND	10	2.3
4-METHYL-2-PENTANONE(MIBK)	ND	10	4.0
CARBON DISULFIDE	ND	1.0	0.20
VINYL ACETATE	ND	2.0	0.50
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.20
TRANS-1,4-DICHLORO-2-BUTENE	ND	2.0	1.0
ACRYLONITRILE	ND	10	5.0
IODOMETHANE	ND	2.0	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.1	10.00	101	63-132
TOLUENE-D8	10.2	10.00	102	75-122
4-BROMOFLUOROBENZENE	9.96	10.00	99.6	73-129

RL: Reporting Limit

4/2/18 BVP

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
Batch No. : 18C050	Date Extracted: 03/09/18 17:02
Sample ID: LF4-MW4	Date Analyzed: 03/09/18 17:02
Lab Samp ID: C050-04	Dilution Factor: 1
Lab File ID: RCD099	Matrix : WATER
Ext Btch ID: V094C05	% Moisture : NA
Calib. Ref.: RBD066	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	1.0	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.50
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.20
1,2,3-TRICHLOROPROPANE	ND	1.0	0.50
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.20
BROMOFORM	ND	1.0	0.30
BROMOMETHANE	ND	2.0	0.30
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	1.6	1.0	0.20
CHLOROETHANE	ND	2.0	0.30
CHLOROFORM	ND	1.0	0.20
CHLOROMETHANE	ND	2.0	0.30
CIS-1,2-DICHLOROETHENE	20	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	1.0	0.20
TOTAL XYLENES	ND	3.0	0.40
METHYLENE CHLORIDE	ND	2.0	0.50
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	ND	1.0	0.20
TRANS-1,2-DICHLOROETHENE	1.6	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	27	1.0	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.30
VINYL CHLORIDE	ND	0.80	0.20
ACETONE	ND	10	5.0
2-BUTANONE(MEK)	ND	10	4.0
2-HEXANONE	ND	10	2.3
4-METHYL-2-PENTANONE(MIBK)	ND	10	4.0
CARBON DISULFIDE	ND	1.0	0.20
VINYL ACETATE	ND	2.0	0.50
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.20
TRANS-1,4-DICHLORO-2-BUTENE	ND	2.0	1.0
ACRYLONITRILE	ND	10	5.0
IODOMETHANE	ND	2.0	0.50

4/2/18 BLP

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.7	10.00	107	63-132
TOLUENE-D8	9.83	10.00	98.3	75-122
4-BROMOFLUOROBENZENE	9.85	10.00	98.5	73-129

RL: Reporting Limit

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
Batch No. : 18C050	Date Extracted: 03/09/18 17:33
Sample ID: LF4-MW5	Date Analyzed: 03/09/18 17:33
Lab Samp ID: C050-05	Dilution Factor: 1
Lab File ID: RCD100	Matrix : WATER
Ext Btch ID: V094C05	% Moisture : NA
Calib. Ref.: RBD066	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	1.0	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.50
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.20
1,2,3-TRICHLOROPROPANE	ND	1.0	0.50
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.20
BROMOFORM	ND	1.0	0.30
BROMOMETHANE	ND	2.0	0.30
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	ND	1.0	0.20
CHLOROETHANE	ND	2.0	0.30
CHLOROFORM	ND	1.0	0.20
CHLOROMETHANE	ND	2.0	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	1.0	0.20
TOTAL XYLENES	ND	3.0	0.40
METHYLENE CHLORIDE	ND	2.0	0.50
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	ND	1.0	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	ND	1.0	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.30
VINYL CHLORIDE	ND	0.80	0.20
ACETONE	ND	10	5.0
2-BUTANONE(MEK)	ND	10	4.0
2-HEXANONE	ND	10	2.3
4-METHYL-2-PENTANONE(MIBK)	ND	10	4.0
CARBON DISULFIDE	ND	1.0	0.20
VINYL ACETATE	ND	2.0	0.50
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.20
TRANS-1,4-DICHLORO-2-BUTENE	ND	2.0	1.0
ACRYLONITRILE	ND	10	5.0
IODOMETHANE	ND	2.0	0.50

4/2/18 BVP

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.6	10.00	106	63-132
TOLUENE-D8	9.97	10.00	99.7	75-122
4-BROMOFLUOROBENZENE	9.82	10.00	98.2	73-129

RL: Reporting Limit

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
Batch No. : 18C050	Date Extracted: 03/09/18 18:04
Sample ID: DUP283	Date Analyzed: 03/09/18 18:04
Lab Samp ID: C050-06	Dilution Factor: 1
Lab File ID: RCD101	Matrix : WATER
Ext Btch ID: VO94C05	% Moisture : NA
Calib. Ref.: RBD066	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	1.0	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.50
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.20
1,2,3-TRICHLOROPROPANE	ND	1.0	0.50
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.20
BROMOFORM	ND	1.0	0.30
BROMOMETHANE	ND	2.0	0.30
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	ND	1.0	0.20
CHLOROETHANE	ND	2.0	0.30
CHLOROFORM	ND	1.0	0.20
CHLOROMETHANE	ND	2.0	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	1.0	0.20
TOTAL XYLENES	ND	3.0	0.40
METHYLENE CHLORIDE	ND	2.0	0.50
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	ND	1.0	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	ND	1.0	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.30
VINYL CHLORIDE	ND	0.80	0.20
ACETONE	ND	10	5.0
2-BUTANONE(MEK)	ND	10	4.0
2-HEXANONE	ND	10	2.3
4-METHYL-2-PENTANONE(MIBK)	ND	10	4.0
CARBON DISULFIDE	ND	1.0	0.20
VINYL ACETATE	ND	2.0	0.50
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.20
TRANS-1,4-DICHLORO-2-BUTENE	ND	2.0	1.0
ACRYLONITRILE	ND	10	5.0
IODOMETHANE	ND	2.0	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.5	10.00	105	63-132
TOLUENE-D8	9.58	10.00	95.8	75-122
4-BROMOFLUOROBENZENE	9.96	10.00	99.6	73-129

RL: Reporting Limit

4/24/18
BVP

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
Batch No. : 18C050	Date Extracted: 03/09/18 18:35
Sample ID: MATERIAL083	Date Analyzed: 03/09/18 18:35
Lab Samp ID: C050-07	Dilution Factor: 1
Lab File ID: RCD102	Matrix : WATER
Ext Btch ID: V094C05	% Moisture : NA
Calib. Ref.: RBD066	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	1.0	0.20
1,2-DIBROMO-3-CHLOROPROPANE	ND	2.0	0.50
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.20
1,2,3-TRICHLOROPROPANE	ND	1.0	0.50
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.20
BROMOFORM	ND	1.0	0.30
BROMOMETHANE	ND	2.0	0.30
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	ND	1.0	0.20
CHLOROETHANE	ND	2.0	0.30
CHLOROFORM	ND	1.0	0.20
CHLOROMETHANE	ND	2.0	0.30
CIS-1,2-DICHLOROETHENE	ND	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	1.0	0.20
TOTAL XYLENES	ND	3.0	0.40
METHYLENE CHLORIDE	ND	2.0	0.50
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	0.27J	1.0	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	ND	1.0	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.30
VINYL CHLORIDE	ND	0.80	0.20
ACETONE	ND	10	5.0
2-BUTANONE(MEK)	ND	10	4.0
2-HEXANONE	ND	10	2.3
4-METHYL-2-PENTANONE(MIBK)	ND	10	4.0
CARBON DISULFIDE	ND	1.0	0.20
VINYL ACETATE	ND	2.0	0.50
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.20
TRANS-1,4-DICHLORO-2-BUTENE	ND	2.0	1.0
ACRYLONITRILE	ND	10	5.0
IODOMETHANE	ND	2.0	0.50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.6	10.00	106	63-132
TOLUENE-D8	9.80	10.00	98.0	75-122
4-BROMOFLUOROBENZENE	9.86	10.00	98.6	73-129

RL: Reporting Limit

4/10/18 DLP

SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client	: MATRIX ENVIRONMENTAL SERVICES	Date Collected:	03/08/18
Project	: PARCEL 81(5), LANDFILL 4	Date Received:	03/09/18
Batch No.	: 18C050	Date Extracted:	03/09/18 15:29
Sample ID:	TB475	Date Analyzed:	03/09/18 15:29
Lab Samp ID:	C050-08	Dilution Factor:	1
Lab File ID:	RCD096	Matrix	: WATER
Ext Btch ID:	V094C05	% Moisture	: NA
Calib. Ref.:	RBD066	Instrument ID	: T-094

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	1.0	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHANE	ND	1.0	0.20
1,1-DICHLOROETHENE	ND	2.0	0.50
1,2-DIBROMO-3-CHLOROPROPANE	ND	1.0	0.20
1,2-DICHLOROBENZENE	ND	1.0	0.20
1,2-DICHLOROETHANE	ND	1.0	0.20
1,2-DICHLOROPROPANE	ND	1.0	0.20
1,2-DIBROMOETHANE	ND	1.0	0.50
1,2,3-TRICHLOROPROPANE	ND	1.0	0.20
1,4-DICHLOROBENZENE	ND	1.0	0.20
BENZENE	ND	1.0	0.20
BROMOCHLOROMETHANE	ND	1.0	0.20
BROMODICHLOROMETHANE	ND	1.0	0.30
BROMOFORM	ND	2.0	0.30
BROMOMETHANE	ND	1.0	0.20
CARBON TETRACHLORIDE	ND	1.0	0.20
CHLOROBENZENE	ND	2.0	0.30
CHLOROETHANE	ND	1.0	0.20
CHLOROFORM	ND	2.0	0.30
CHLOROMETHANE	ND	1.0	0.20
CIS-1,2-DICHLOROETHENE	ND	1.0	0.20
CIS-1,3-DICHLOROPROPENE	ND	1.0	0.20
DIBROMOCHLOROMETHANE	ND	1.0	0.20
DIBROMOMETHANE	ND	1.0	0.20
ETHYLBENZENE	ND	3.0	0.40
TOTAL XYLENES	ND	2.0	0.50
METHYLENE CHLORIDE	ND	1.0	0.20
STYRENE	ND	1.0	0.20
TETRACHLOROETHENE	ND	1.0	0.20
TOLUENE	ND	1.0	0.20
TRANS-1,2-DICHLOROETHENE	ND	1.0	0.20
TRANS-1,3-DICHLOROPROPENE	ND	1.0	0.20
TRICHLOROETHENE	ND	1.0	0.30
TRICHLOROFLUOROMETHANE	ND	0.80	0.20
VINYL CHLORIDE	ND	10	5.0
ACETONE	ND	10	4.0
2-BUTANONE(MEK)	ND	10	2.3
2-HEXANONE	ND	10	4.0
4-METHYL-2-PENTANONE(MIBK)	ND	1.0	0.20
CARBON DISULFIDE	ND	2.0	0.50
VINYL ACETATE	ND	1.0	0.20
1,1,1,2-TETRACHLOROETHANE	ND	2.0	1.0
TRANS-1,4-DICHLORO-2-BUTENE	ND	10	5.0
ACRYLONITRILE	ND	2.0	0.50
IODOMETHANE			

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	10.5	10.00	105	63-132
TOLUENE-D8	9.93	10.00	99.3	75-122
4-BROMOFLUOROBENZENE	9.86	10.00	98.6	73-129

RL: Reporting Limit

4/2/18 DUP

METHOD SW6020A
METALS BY ICP-MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18 12:30
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
SDG NO. : 18C050	Date Extracted: 03/15/18 12:09
Sample ID: LF4-MW1	Date Analyzed: 03/16/18 14:25
Lab Samp ID: C050-01	Dilution Factor: 1
Lab File ID: F6C10050	Matrix: WATER
Ext Btch ID: IMC019W	% Moisture: NA
Calib. Ref.: F6C10048	Instrument ID: F6

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Antimony	ND	1.00	0.500
Arsenic	1.48	1.00	0.200
Barium	44.6	1.00	0.500
Beryllium	0.207J	1.00	0.100
Cadmium	ND	1.00	0.200
Chromium	1.45	1.00	0.200
Cobalt	27.9	1.00	0.200
Copper	2.23	1.00	0.500
Lead	1.67	1.00	0.100
Nickel	18.3	1.00	0.200
Selenium	ND	1.00	0.300
Silver	ND	1.00	0.200
Thallium	ND	1.00	0.200
Vanadium	1.58	1.00	0.500
Zinc	50.3	20.0	10.0

4/3/18 BVP

Note: Detection limits are reported relative to sample result significant figures.
Sample Amount : 50ml Final Volume:50ml
Prepared by : SPara Analyzed by:SKao\LVicto

METHOD SW6020A
METALS BY ICP-MS

Client : MATRIX ENVIRONMENTAL SERVICES
Project : PARCEL 81(5). LANDFILL 4
SDG NO. : 18C050
Sample ID: LF4-MW2
Lab Samp ID: C050-02
Lab File ID: F6C10051
Ext Btch ID: IMC019W
Calib. Ref.: F6C10048

Date Collected: 03/08/18 13:10
Date Received: 03/09/18
Date Extracted: 03/15/18 12:09
Date Analyzed: 03/16/18 14:30
Dilution Factor: 1
Matrix: WATER
% Moisture: NA
Instrument ID: F6

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Antimony	ND	1.00	0.500
Arsenic	2.74	1.00	0.200
Barium	77.0	1.00	0.500
Beryllium	0.542J	1.00	0.100
Cadmium	0.915J	1.00	0.200
Chromium	2.97	1.00	0.200
Cobalt	125	1.00	0.200
Copper	10.9	1.00	0.500
Lead	3.91	1.00	0.100
Nickel	64.8	1.00	0.200
Selenium	0.608J	1.00	0.300
Silver	ND	1.00	0.200
Thallium	ND	1.00	0.200
Vanadium	2.52	1.00	0.500

Sample ID: LF4-MW2
Lab Samp ID: C050-02G
Lab File ID: F6C10063
Ext Btch ID: IMC019W
Calib. Ref.: F6C10060

Date Analyzed: 03/16/18 15:24
Dilution Factor: 5
Matrix: WATER
% Moisture: NA
Instrument ID: F6

4/3/18
BVP

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Zinc	732	100	50.0

Note: Detection limits are reported relative to sample result significant figures.
Sample Amount : 50ml
Prepared by : SPara

Final Volume:50ml
Analyzed by:SKao\LVicto

METHOD SW6020A
METALS BY ICP-MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18 13:35
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
SDG NO. : 18C050	Date Extracted: 03/15/18 12:09
Sample ID: LF4-MW3	Date Analyzed: 03/20/18 13:28
Lab Samp ID: C050-03N	Dilution Factor: 1
Lab File ID: F6C11033	Matrix: WATER
Ext Btch ID: IMC019W	% Moisture: NA
Calib. Ref.: F6C11028	Instrument ID: F6

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Antimony	ND UJM	1.00	0.500
Arsenic	0.715J	1.00	0.200
Barium	58.1	1.00	0.500
Beryllium	0.329J	1.00	0.100
Cadmium	ND	1.00	0.200
Chromium	0.841J	1.00	0.200
Cobalt	1.38	1.00	0.200
Copper	1.58	1.00	0.500
Lead	2.91	1.00	0.100
Nickel	2.84	1.00	0.200
Selenium	ND	1.00	0.300
Silver	ND	1.00	0.200
Thallium	ND	1.00	0.200
Vanadium	0.898J	1.00	0.500
Zinc	14.2J	20.0	10.0

4/7/18
BVP

Note: Detection limits are reported relative to sample result significant figures.
Sample Amount : 50ml Final Volume:50ml
Prepared by : SPara Analyzed by:SKao\LVicto

METHOD SW6020A
METALS BY ICP-MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18 14:10
Project : PARCEL 81(5), LANDFILL 4	Date Received: 03/09/18
SDG NO. : 18C050	Date Extracted: 03/15/18 12:09
Sample ID: LF4-MW4	Date Analyzed: 03/16/18 14:57
Lab Samp ID: C050-04	Dilution Factor: 1
Lab File ID: F6C10057	Matrix: WATER
Ext Btch ID: IMC019W	% Moisture: NA
Calib. Ref.: F6C10048	Instrument ID: F6

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Antimony	ND	1.00	0.500
Arsenic	2.47	1.00	0.200
Barium	197	1.00	0.500
Beryllium	ND	1.00	0.100
Cadmium	ND	1.00	0.200
Chromium	0.253J	1.00	0.200
Cobalt	2.71	1.00	0.200
Copper	ND	1.00	0.500
Lead	0.547J	1.00	0.100
Nickel	1.47	1.00	0.200
Selenium	ND	1.00	0.300
Silver	ND	1.00	0.200
Thallium	ND	1.00	0.200
Vanadium	0.799J	1.00	0.500
Zinc	ND	20.0	10.0

4/3/18 PSVP

Note: Detection limits are reported relative to sample result significant figures.
Sample Amount : 50ml Final Volume:50ml
Prepared by : SPara Analyzed by:SKao\LVicto

METHOD SW6020A
METALS BY ICP-MS

Client : MATRIX ENVIRONMENTAL SERVICES
Project : PARCEL 81(5), LANDFILL 4
SDG NO. : 18C050
Sample ID: LF4-MW5
Lab Samp ID: C050-05
Lab File ID: F6C10058
Ext Btch ID: IMC019W
Calib. Ref.: F6C10048

Date Collected: 03/08/18 14:30
Date Received: 03/09/18
Date Extracted: 03/15/18 12:09
Date Analyzed: 03/16/18 15:01
Dilution Factor: 1
Matrix: WATER
% Moisture: NA
Instrument ID: F6

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Antimony	ND	1.00	0.500
Arsenic	0.658J	1.00	0.200
Barium	17.4	1.00	0.500
Beryllium	0.123J	1.00	0.100
Cadmium	ND	1.00	0.200
Chromium	0.796J	1.00	0.200
Cobalt	4.09	1.00	0.200
Copper	1.70	1.00	0.500
Lead	3.18	1.00	0.100
Nickel	2.77	1.00	0.200
Selenium	ND	1.00	0.300
Silver	ND	1.00	0.200
Thallium	ND	1.00	0.200
Vanadium	2.46	1.00	0.500
Zinc	59.7	20.0	10.0

4/3/18 DVP

Note: Detection limits are reported relative to sample result significant figures.
Sample Amount : 50ml
Prepared by : SPara

Final Volume:50ml
Analyzed by:SKao\LVicto

METHOD SW6020A
METALS BY ICP-MS

Client : MATRIX ENVIRONMENTAL SERVICES
Project : PARCEL 81(5), LANDFILL 4
SDG NO. : 18C050
Sample ID: DUP283
Lab Samp ID: C050-06
Lab File ID: F6C10059
Ext Btch ID: IMC019W
Calib. Ref.: F6C10048

Date Collected: 03/08/18 14:30
Date Received: 03/09/18
Date Extracted: 03/15/18 12:09
Date Analyzed: 03/16/18 15:06
Dilution Factor: 1
Matrix: WATER
% Moisture: NA
Instrument ID: F6

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Antimony	ND	1.00	0.500
Arsenic	0.786J	1.00	0.200
Barium	17.6	1.00	0.500
Beryllium	0.123J	1.00	0.100
Cadmium	ND	1.00	0.200
Chromium	0.960J	1.00	0.200
Cobalt	4.18	1.00	0.200
Copper	1.69	1.00	0.500
Lead	3.54	1.00	0.100
Nickel	2.89	1.00	0.200
Selenium	ND	1.00	0.300
Silver	ND	1.00	0.200
Thallium	ND	1.00	0.200
Vanadium	2.81	1.00	0.500
Zinc	65.4	20.0	10.0

4/3/18
DUP

Note: Detection limits are reported relative to sample result significant figures.
Sample Amount : 50ml
Prepared by : SPara

Final Volume:50ml
Analyzed by:SKao\LVicto

METHOD SW6020A
METALS BY ICP-MS

Client : MATRIX ENVIRONMENTAL SERVICES	Date Collected: 03/08/18 15:05
Project : PARCEL 81(5). LANDFILL 4	Date Received: 03/09/18
SDG NO. : 18C050	Date Extracted: 03/15/18 12:09
Sample ID: MATERIAL083	Date Analyzed: 03/16/18 15:19
Lab Samp ID: C050-07	Dilution Factor: 1
Lab File ID: F6C10062	Matrix: WATER
Ext Btch ID: IMC019W	% Moisture: NA
Calib. Ref.: F6C10060	Instrument ID: F6

PARAMETERS	Result (ug/L)	RL (ug/L)	MDL (ug/L)
Antimony	ND	1.00	0.500
Arsenic	ND	1.00	0.200
Barium	ND	1.00	0.500
Beryllium	ND	1.00	0.100
Cadmium	ND	1.00	0.200
Chromium	ND	1.00	0.200
Cobalt	ND	1.00	0.200
Copper	ND	1.00	0.500
Lead	ND	1.00	0.100
Nickel	ND	1.00	0.200
Selenium	ND	1.00	0.300
Silver	ND	1.00	0.200
Thallium	ND	1.00	0.200
Vanadium	ND	1.00	0.500
Zinc	ND	20.0	10.0

4/3/18 BVP

Note: Detection limits are reported relative to sample result significant figures.
Sample Amount : 50ml — Final Volume:50ml
Prepared by : SPara — Analyzed by:SKao\LVicto

METHOD SW7470A
MERCURY BY COLD VAPOR

Client : MATRIX ENVIRONMENTAL SERVICES
Project : PARCEL 81(5), LANDFILL 4
Batch No. : 18C050

Matrix : WATER
InstrumentID : 47

CLIENT SAMPLE ID	EMAX SAMPLE ID	RESULTS (ug/L)	DILT'N FACTOR	MOIST (%)	RL (ug/L)	MDL (ug/L)	ANALYSIS DATETIME	PREPARATION DATETIME	DATA FILE ID	CAL REF	PREP BATCH	COLLECTION DATETIME	RECEIVED DATETIME
MBLK1W	HGC009WB	ND	1	NA	0.400	0.100	03/15/1814:56	03/15/1811:30	M47C008011	M47C008	18HGC009W	NA	NA
LCS1W	HGC009WL	2.57	1	NA	0.400	0.100	03/15/1814:59	03/15/1811:30	M47C008012	M47C008	18HGC009W	NA	NA
LCD1W	HGC009WC	2.57	1	NA	0.400	0.100	03/15/1815:01	03/15/1811:30	M47C008013	M47C008	18HGC009W	NA	NA
LF4-MW3	C050-03	ND	1	NA	0.400	0.100	03/15/1815:11	03/15/1811:30	M47C008017	M47C008	18HGC009W	03/08/1813:35	03/09/18
LF4-MW3MS	C050-03M	2.75	1	NA	0.400	0.100	03/15/1815:16	03/15/1811:30	M47C008019	M47C008	18HGC009W	03/08/1813:35	03/09/18
LF4-MW3MSD	C050-03S	2.71	1	NA	0.400	0.100	03/15/1815:18	03/15/1811:30	M47C008020	M47C008	18HGC009W	03/08/1813:35	03/09/18
LF4-MW1	C050-01	ND	1	NA	0.400	0.100	03/15/1815:23	03/15/1811:30	M47C008023	M47C008	18HGC009W	03/08/1812:30	03/09/18
LF4-MW2	C050-02	ND	1	NA	0.400	0.100	03/15/1815:26	03/15/1811:30	M47C008024	M47C008	18HGC009W	03/08/1813:10	03/09/18
LF4-MW4	C050-04	ND	1	NA	0.400	0.100	03/15/1815:28	03/15/1811:30	M47C008025	M47C008	18HGC009W	03/08/1814:10	03/09/18
LF4-MW5	C050-05	ND	1	NA	0.400	0.100	03/15/1815:30	03/15/1811:30	M47C008026	M47C008	18HGC009W	03/08/1814:30	03/09/18
DUP283	C050-06	ND	1	NA	0.400	0.100	03/15/1815:32	03/15/1811:30	M47C008027	M47C008	18HGC009W	03/08/1814:30	03/09/18
MATERIAL083	C050-07	ND	1	NA	0.400	0.100	03/15/1815:34	03/15/1811:30	M47C008028	M47C008	18HGC009W	03/08/1815:05	03/09/18

4/3/18
3VP

Note: Detection limits are reported relative to sample result significant figures.

APPENDIX E

Statistical Evaluation of Metals Data, March 2018

Attachment E1. Analyses and Percent Non-Detects
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

	Antimony			Arsenic			Barium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	30	30	100%	37	28	76%	38	5	13%
LF4-MW2	30	29	97%	37	24	65%	37	0	0%
LF4-MW3	30	30	100%	37	25	68%	37	2	5%
LF4-MW4	30	28	93%	37	25	68%	37	0	0%
LF4-MW5	30	30	100%	37	32	86%	37	9	24%

	Beryllium			Cadmium			Chromium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	29	19	66%	36	32	89%	36	28	78%
LF4-MW2	29	16	55%	36	28	78%	36	22	61%
LF4-MW3	29	21	72%	36	33	92%	36	26	72%
LF4-MW4	29	26	90%	36	30	83%	36	31	86%
LF4-MW5	29	23	79%	36	36	100%	36	31	86%

	Cobalt			Copper			Lead		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	29	0	0%	30	10	33%	37	12	32%
LF4-MW2	29	0	0%	30	10	33%	37	10	27%
LF4-MW3	29	13	45%	30	11	37%	37	15	41%
LF4-MW4	29	8	28%	30	17	57%	37	9	24%
LF4-MW5	29	5	17%	30	20	67%	37	17	46%

	Mercury			Nickel			Selenium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	37	37	100%	30	5	17%	37	38	103%
LF4-MW2	37	36	97%	30	3	10%	37	34	92%
LF4-MW3	37	37	100%	30	9	30%	37	37	100%
LF4-MW4	37	37	100%	30	12	40%	37	35	95%
LF4-MW5	37	37	100%	30	14	47%	37	37	100%

	Silver			Thallium			Vanadium		
Well ID	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	29	27	93%	30	29	97%	30	27	90%
LF4-MW2	29	29	100%	30	28	93%	30	21	70%
LF4-MW3	29	29	100%	30	29	97%	30	25	83%
LF4-MW4	29	28	97%	30	27	90%	30	21	70%
LF4-MW5	29	29	100%	30	28	93%	30	24	80%

	Zinc		
Well ID	**Sample #**	**# of NDs**	**%NDs**
LF4-MW1	30	2	7%
LF4-MW2	30	2	7%
LF4-MW3	30	8	27%
LF4-MW4	30	11	37%
LF4-MW5	30	15	50%

Attachment E2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-2.638	1.84	0.84	0.84
LF4-MW1	9/13/06	-3.180	0.40	-0.60	0.23
LF4-MW1	3/6/07	-3.219	0.29	-0.71	0.00
LF4-MW1	9/24/07	-3.439	-0.29	-1.29	0.00
LF4-MW1	3/26/08	-2.990	0.90	-0.10	0.00
LF4-MW1	9/16/08	-3.464	-0.36	-1.36	0.00
LF4-MW1	3/17/09	-3.551	-0.59	-1.59	0.00
LF4-MW1	9/17/09	-3.408	-0.21	-1.21	0.00
LF4-MW1	3/17/10	-3.427	-0.26	-1.26	0.00
LF4-MW1	9/21/10	-3.510	-0.48	-1.48	0.00
LF4-MW1	3/15/11	-3.197	0.35	-0.65	0.00
LF4-MW1	9/8/11	-3.242	0.23	-0.77	0.00
LF4-MW1	3/14/12	-3.053	0.73	-0.27	0.00
LF4-MW1	9/6/12	-3.066	0.70	-0.30	0.00
LF4-MW1	3/5/13	-3.043	0.76	-0.24	0.00
LF4-MW1	9/11/13	-3.321	0.02	-0.98	0.00
LF4-MW1	3/5/14	-3.294	0.09	-0.91	0.00
LF4-MW1	9/4/14	-3.324	0.01	-0.99	0.00
LF4-MW1	3/13/15	-3.135	0.52	-0.48	0.00
LF4-MW1	9/16/15	-3.163	0.44	-0.56	0.00
LF4-MW1	3/16/16	-3.154	0.47	-0.53	0.00
LF4-MW1	9/21/16	-3.202	0.34	-0.66	0.00
LF4-MW1	3/15/17	-3.090	0.64	-0.36	0.00
LF4-MW1	9/8/17	-3.124	0.55	-0.45	0.00
LF4-MW1	3/8/18	-3.110	0.58	-0.42	0.00
Background					
LF4-MW1	MEAN	-3.329			
LF4-MW1	STDEV	0.377			

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-3.673	-3.70	-4.70	0.00
LF4-MW2	9/13/06	-2.198	0.41	-0.59	0.00
LF4-MW2	3/6/07	-2.357	-0.03	-1.03	0.00
LF4-MW2	9/24/07	-2.501	-0.44	-1.44	0.00
LF4-MW2	3/26/08	-2.017	0.91	-0.09	0.00
LF4-MW2	9/16/08	-2.327	0.05	-0.95	0.00
LF4-MW2	3/17/09	-2.079	0.74	-0.26	0.00
LF4-MW2	9/17/09	-2.371	-0.07	-1.07	0.00
LF4-MW2	3/17/10	-2.410	-0.18	-1.18	0.00
LF4-MW2	9/21/10	-2.306	0.11	-0.89	0.00
LF4-MW2	3/15/11	-2.283	0.17	-0.83	0.00
LF4-MW2	9/8/11	-2.235	0.31	-0.69	0.00
LF4-MW2	3/14/12	-2.235	0.31	-0.69	0.00
LF4-MW2	9/6/12	-2.216	0.36	-0.64	0.00
LF4-MW2	3/5/13	-2.056	0.80	-0.20	0.00
LF4-MW2	9/11/13	-2.585	-0.67	-1.67	0.00
LF4-MW2	3/5/14	-2.765	-1.17	-2.17	0.00
LF4-MW2	9/4/14	-2.854	-1.42	-2.42	0.00
LF4-MW2	3/13/15	-2.609	-0.74	-1.74	0.00
LF4-MW2	9/16/15	-2.537	-0.54	-1.54	0.00
LF4-MW2	3/16/16	-2.834	-1.36	-2.36	0.00
LF4-MW2	9/21/16	-2.664	-0.89	-1.89	0.00
LF4-MW2	3/15/17	-2.711	-1.02	-2.02	0.00
LF4-MW2	9/8/17	-2.438	-0.26	-1.26	0.00
LF4-MW2	3/8/18	-2.564	-0.61	-1.61	0.00
Background					
LF4-MW2	MEAN	-2.344			
LF4-MW2	STDEV	0.359			

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-2.865	0.37	-0.63	0.00
LF4-MW3	9/14/06	-2.727	0.74	-0.26	0.00
LF4-MW3	3/6/07	-3.030	-0.08	-1.08	0.00
LF4-MW3	9/25/07	-2.818	0.49	-0.51	0.00
LF4-MW3	3/26/08	-2.662	0.92	-0.08	0.00
LF4-MW3	9/16/08	-2.958	0.11	-0.89	0.00
LF4-MW3	3/17/09	-2.928	0.19	-0.81	0.00
LF4-MW3	9/17/09	-2.573	1.16	0.16	0.16
LF4-MW3	3/17/10	-2.839	0.44	-0.56	0.00
LF4-MW3	9/21/10	-3.239	-0.65	-1.65	0.00
LF4-MW3	3/15/11	-2.671	0.90	-0.10	0.00
LF4-MW3	9/8/11	-2.863	0.37	-0.63	0.00
LF4-MW3	3/14/12	-2.800	0.54	-0.46	0.00
LF4-MW3	9/6/12	-2.830	0.46	-0.54	0.00
LF4-MW3	3/5/13	-2.581	1.14	0.14	0.14
LF4-MW3	9/11/13	-2.953	0.13	-0.87	0.00
LF4-MW3	3/5/14	-2.906	0.26	-0.74	0.00
LF4-MW3	9/4/14	-2.700	0.82	-0.18	0.00
LF4-MW3	3/13/15	-2.471	1.44	0.44	0.44
LF4-MW3	9/16/15	-2.325	1.84	0.84	1.28
LF4-MW3	3/16/16	-2.870	0.35	-0.65	0.63
LF4-MW3	9/21/16	-2.444	1.51	0.51	1.14
LF4-MW3	3/15/17	-2.808	0.52	-0.48	0.66
LF4-MW3	9/8/17	-2.825	0.47	-0.53	0.62
LF4-MW3	3/8/18	-2.846	0.42	-0.58	0.08
Background					
LF4-MW3	MEAN	-3.000			
LF4-MW3	STDEV	0.367			

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-1.931	-1.61	-2.61	0.00
LF4-MW4	9/14/06	-1.715	-0.52	-1.52	0.00
LF4-MW4	3/7/07	-2.129	-2.60	-3.60	0.00
LF4-MW4	9/25/07	-1.565	0.22	-0.78	0.00
LF4-MW4	3/26/08	-1.945	-1.68	-2.68	0.00
LF4-MW4	9/17/08	-1.645	-0.17	-1.17	0.00
LF4-MW4	3/17/09	-1.973	-1.82	-2.82	0.00
LF4-MW4	9/21/09	-2.163	-2.77	-3.77	0.00
LF4-MW4	3/17/10	-2.048	-2.19	-3.19	0.00
LF4-MW4	9/21/10	-1.732	-0.61	-1.61	0.00
LF4-MW4	3/15/11	-2.410	-4.01	-5.01	0.00
LF4-MW4	9/8/11	-1.778	-0.84	-1.84	0.00
LF4-MW4	3/14/12	-1.995	-1.93	-2.93	0.00
LF4-MW4	9/6/12	-2.163	-2.77	-3.77	0.00
LF4-MW4	3/5/13	-1.820	-1.05	-2.05	0.00
LF4-MW4	9/11/13	-1.604	0.03	-0.97	0.00
LF4-MW4	3/5/14	-1.749	-0.69	-1.69	0.00
LF4-MW4	9/4/14	-1.671	-0.31	-1.31	0.00
LF4-MW4	3/13/15	-2.189	-2.90	-3.90	0.00
LF4-MW4	9/16/15	-1.749	-0.69	-1.69	0.00
LF4-MW4	3/16/16	-1.682	-0.36	-1.36	0.00
LF4-MW4	9/21/16	-1.833	-1.12	-2.12	0.00
LF4-MW4	3/15/17	-2.064	-2.27	-3.27	0.00
LF4-MW4	9/8/17	-1.492	0.59	-0.41	0.00
LF4-MW4	3/8/18	-1.625	-0.07	-1.07	0.00
Background					
LF4-MW4	MEAN	-1.610			
LF4-MW4	STDEV	0.200			

Attachment E2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Barium

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW5	3/14/06	-3.892	0.21	-0.79	0.00
LF4-MW5	9/14/06	-3.873	0.27	-0.73	0.00
LF4-MW5	3/7/07	-4.234	-0.73	-1.73	0.00
LF4-MW5	9/24/07	-3.887	0.23	-0.77	0.00
LF4-MW5	3/26/08	-4.406	-1.20	-2.20	0.00
LF4-MW5	9/16/08	-4.538	-1.56	-2.56	0.00
LF4-MW5	3/18/09	-4.335	-1.00	-2.00	0.00
LF4-MW5	9/17/09	-4.685	-1.97	-2.97	0.00
LF4-MW5	3/17/10	-4.298	-0.90	-1.90	0.00
LF4-MW5	9/21/10	-4.382	-1.13	-2.13	0.00
LF4-MW5	3/15/11	-3.544	1.17	0.17	0.17
LF4-MW5	9/8/11	-4.063	-0.26	-1.26	0.00
LF4-MW5	3/14/12	-4.382	-1.13	-2.13	0.00
LF4-MW5	9/6/12	-4.501	-1.46	-2.46	0.00
LF4-MW5	3/5/13	-4.423	-1.25	-2.25	0.00
LF4-MW5	9/11/13	-5.298	-3.65	-4.65	0.00
LF4-MW5	3/5/14	-4.457	-1.34	-2.34	0.00
LF4-MW5	9/4/14	-4.595	-1.72	-2.72	0.00
LF4-MW5	3/13/15	-4.305	-0.92	-1.92	0.00
LF4-MW5	9/16/15	-4.528	-1.54	-2.54	0.00
LF4-MW5	3/16/16	-4.123	-0.42	-1.42	0.00
LF4-MW5	9/21/16	-4.220	-0.69	-1.69	0.00
LF4-MW5	3/15/17	-4.213	-0.67	-1.67	0.00
LF4-MW5	9/8/17	-4.440	-1.29	-2.29	0.00
LF4-MW5	3/8/18	-4.051	-0.22	-1.22	0.00
Background					
LF4-MW5	MEAN	-3.970			
LF4-MW5	STDEV	0.364			

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-4.029	0.46	-0.54	0.00
LF4-MW1	9/13/06	-4.734	-0.73	-1.73	0.00
LF4-MW1	3/6/07	-4.784	-0.81	-1.81	0.00
LF4-MW1	9/24/07	-4.641	-0.57	-1.57	0.00
LF4-MW1	3/26/08	-3.554	1.26	0.26	0.26
LF4-MW1	9/16/08	-4.547	-0.41	-1.41	0.00
LF4-MW1	3/17/09	-3.917	0.65	-0.35	0.00
LF4-MW1	9/17/09	-4.220	0.14	-0.86	0.00
LF4-MW1	3/17/10	-4.374	-0.12	-1.12	0.00
LF4-MW1	9/21/10	-3.830	0.79	-0.21	0.00
LF4-MW1	3/15/11	-3.623	1.14	0.14	0.14
LF4-MW1	9/8/11	-3.445	1.44	0.44	0.59
LF4-MW1	3/14/12	-3.417	1.49	0.49	1.08
LF4-MW1	9/6/12	-3.302	1.68	0.68	1.76
LF4-MW1	3/5/13	-3.411	1.50	0.50	2.26
LF4-MW1	9/11/13	-3.812	0.82	-0.18	2.08
LF4-MW1	3/5/14	-3.634	1.12	0.12	2.21
LF4-MW1	9/4/14	-3.717	0.98	-0.02	2.19
LF4-MW1	3/13/15	-3.393	1.53	0.53	2.72
LF4-MW1	9/16/15	-3.689	1.03	0.03	2.75
LF4-MW1	3/16/16	-3.231	1.80	0.80	3.56
LF4-MW1	9/21/16	-3.493	1.36	0.36	3.92
LF4-MW1	3/15/17	-3.390	1.54	0.54	4.46
LF4-MW1	9/8/17	-3.278	1.72	0.72	4.64
LF4-MW1	3/8/18	-3.579	1.22	0.22	4.67
Background					
LF4-MW1	MEAN	-4.301			
LF4-MW1	STDEV	0.593			

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-5.053	-1.17	-2.17	0.00
LF4-MW2	9/13/06	-4.200	0.12	-0.88	0.00
LF4-MW2	3/6/07	-4.227	0.08	-0.92	0.00
LF4-MW2	9/24/07	-4.366	-0.13	-1.13	0.00
LF4-MW2	3/26/08	-4.626	-0.53	-1.53	0.00
LF4-MW2	9/16/08	-3.942	0.50	-0.50	0.00
LF4-MW2	3/17/09	-2.339	2.92	1.92	1.92
LF4-MW2	9/17/09	-2.180	3.16	2.16	4.08
LF4-MW2	3/17/10	-2.442	2.77	1.77	5.85
LF4-MW2	9/21/10	-3.464	1.23	0.23	6.08
LF4-MW2	3/15/11	-3.751	0.79	-0.21	5.87
LF4-MW2	9/8/11	-3.705	0.86	-0.14	5.73
LF4-MW2	3/14/12	-3.917	0.54	-0.46	5.28
LF4-MW2	9/6/12	-3.979	0.45	-0.55	4.73
LF4-MW2	3/5/13	-1.952	3.51	2.51	7.23
LF4-MW2	9/11/13	-2.216	3.11	2.11	9.34
LF4-MW2	3/5/14	-1.743	3.82	2.82	12.16
LF4-MW2	9/4/14	-2.401	2.83	1.83	13.99
LF4-MW2	3/13/15	-1.973	3.47	2.47	16.46
LF4-MW2	9/16/15	-2.584	2.55	1.55	18.01
LF4-MW2	3/16/16	-2.377	2.86	1.86	19.88
LF4-MW2	9/21/16	-2.389	2.85	1.85	21.73
LF4-MW2	3/15/17	-2.888	2.09	1.09	22.82
LF4-MW2	9/8/17	-2.970	1.97	0.97	22.70
LF4-MW2	3/8/18	-2.079	3.31	2.31	25.13
Background					
LF4-MW2	MEAN	-4.277			
LF4-MW2	STDEV	0.663			

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-4.605	0.50	-0.50	0.00
LF4-MW4	9/14/06	-4.605	0.50	-0.50	0.00
LF4-MW4	3/7/07	-4.605	0.50	-0.50	0.00
LF4-MW4	9/25/07	-5.440	-3.31	-4.31	0.00
LF4-MW4	3/26/08	-4.969	-1.16	-2.16	0.00
LF4-MW4	9/17/08	-5.444	-3.33	-4.33	0.00
LF4-MW4	3/17/09	-5.242	-2.40	-3.40	0.00
LF4-MW4	9/21/09	-4.605	0.50	-0.50	0.00
LF4-MW4	3/17/10	-5.941	-5.59	-6.59	0.00
LF4-MW4	9/21/10	-5.406	-3.15	-4.15	0.00
LF4-MW4	3/15/11	-5.802	-4.96	-5.96	0.00
LF4-MW4	9/8/11	-5.461	-3.40	-4.40	0.00
LF4-MW4	3/14/12	-5.542	-3.77	-4.77	0.00
LF4-MW4	9/6/12	-4.605	0.50	-0.50	0.00
LF4-MW4	3/5/13	-5.857	-5.21	-6.21	0.00
LF4-MW4	9/11/13	-5.064	-1.59	-2.59	0.00
LF4-MW4	3/5/14	-5.793	-4.92	-5.92	0.00
LF4-MW4	9/4/14	-5.711	-4.54	-5.54	0.00
LF4-MW4	3/13/15	-5.233	-2.36	-3.36	0.00
LF4-MW4	9/16/15	-5.410	-3.17	-4.17	0.00
LF4-MW4	3/16/16	-6.161	-6.60	-7.60	0.00
LF4-MW4	9/21/16	-5.468	-3.44	-4.44	0.00
LF4-MW4	3/15/17	-4.949	-1.07	-2.07	0.00
LF4-MW4	9/8/17	-4.787	-0.33	-1.33	0.00
LF4-MW4	3/8/18	-5.911	-5.45	-6.45	0.00
Background					
LF4-MW4	MEAN	-4.715			
LF4-MW4	STDEV	0.219			

Attachment E2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Cobalt

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW5	3/14/06	-4.949	-2.04	-3.04	0.00
LF4-MW5	9/14/06	-5.048	-2.78	-3.78	0.00
LF4-MW5	3/7/07	-4.605	0.50	-0.50	0.00
LF4-MW5	9/24/07	-5.461	-5.83	-6.83	0.00
LF4-MW5	3/26/08	-5.956	-9.49	-10.49	0.00
LF4-MW5	9/16/08	-5.705	-7.63	-8.63	0.00
LF4-MW5	3/18/09	-5.840	-8.63	-9.63	0.00
LF4-MW5	9/17/09	-5.442	-5.69	-6.69	0.00
LF4-MW5	3/17/10	-5.077	-2.99	-3.99	0.00
LF4-MW5	9/21/10	-4.556	0.86	-0.14	0.00
LF4-MW5	3/15/11	-5.826	-8.53	-9.53	0.00
LF4-MW5	9/8/11	-4.925	-1.87	-2.87	0.00
LF4-MW5	3/14/12	-5.754	-7.99	-8.99	0.00
LF4-MW5	9/6/12	-6.058	-10.24	-11.24	0.00
LF4-MW5	3/5/13	-5.893	-9.02	-10.02	0.00
LF4-MW5	9/11/13	-4.605	0.50	-0.50	0.00
LF4-MW5	3/5/14	-5.516	-6.24	-7.24	0.00
LF4-MW5	9/4/14	-5.732	-7.83	-8.83	0.00
LF4-MW5	3/13/15	-5.760	-8.04	-9.04	0.00
LF4-MW5	9/16/15	-6.071	-10.33	-11.33	0.00
LF4-MW5	3/16/16	-5.431	-5.60	-6.60	0.00
LF4-MW5	9/21/16	-5.027	-2.62	-3.62	0.00
LF4-MW5	3/15/17	-5.926	-9.26	-10.26	0.00
LF4-MW5	9/8/17	-5.793	-8.28	-9.28	0.00
LF4-MW5	3/8/18	-5.499	-6.11	-7.11	0.00
Background					
LF4-MW5	MEAN	-4.673			
LF4-MW5	STDEV	0.135			

Copper

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-4.193	1.11	0.11	0.11
LF4-MW1	9/13/06	-4.595	0.46	-0.54	0.00
LF4-MW1	3/6/07	-4.637	0.40	-0.60	0.00
LF4-MW1	9/24/07	-5.003	-0.19	-1.19	0.00
LF4-MW1	3/26/08	-4.699	0.30	-0.70	0.00
LF4-MW1	9/16/08	-5.048	-0.27	-1.27	0.00
LF4-MW1	3/17/09	-5.373	-0.79	-1.79	0.00
LF4-MW1	9/17/09	-5.375	-0.79	-1.79	0.00
LF4-MW1	3/17/10	-5.352	-0.76	-1.76	0.00
LF4-MW1	9/21/10	-6.156	-2.05	-3.05	0.00
LF4-MW1	3/15/11	-4.029	1.38	0.38	0.38
LF4-MW1	9/8/11	-4.605	0.45	-0.55	0.00
LF4-MW1	3/14/12	-4.605	0.45	-0.55	0.00
LF4-MW1	9/6/12	-4.605	0.45	-0.55	0.00
LF4-MW1	3/5/13	-4.605	0.45	-0.55	0.00
LF4-MW1	9/11/13	-5.773	-1.44	-2.44	0.00
LF4-MW1	3/5/14	-5.900	-1.64	-2.64	0.00
LF4-MW1	9/4/14	-5.911	-1.66	-2.66	0.00
LF4-MW1	3/13/15	-6.536	-2.67	-3.67	0.00
LF4-MW1	9/16/15	-5.325	-0.71	-1.71	0.00
LF4-MW1	3/16/16	-6.331	-2.34	-3.34	0.00
LF4-MW1	9/21/16	-6.138	-2.03	-3.03	0.00
LF4-MW1	3/15/17	-6.638	-2.83	-3.83	0.00
LF4-MW1	9/8/17	-6.623	-2.81	-3.81	0.00
LF4-MW1	3/8/18	-6.106	-1.97	-2.97	0.00
Background					
LF4-MW1	MEAN	-4.882			
LF4-MW1	STDEV	0.620			

Copper

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-4.538	0.00	-1.00	0.00
LF4-MW2	9/13/06	-4.129	0.37	-0.63	0.00
LF4-MW2	3/6/07	-4.663	-0.11	-1.11	0.00
LF4-MW2	9/24/07	-5.956	-1.29	-2.29	0.00
LF4-MW2	3/26/08	-5.302	-0.69	-1.69	0.00
LF4-MW2	9/16/08	-5.473	-0.85	-1.85	0.00
LF4-MW2	3/17/09	-5.684	-1.04	-2.04	0.00
LF4-MW2	9/17/09	-5.644	-1.00	-2.00	0.00
LF4-MW2	3/17/10	-3.717	0.75	-0.25	0.00
LF4-MW2	9/21/10	-6.215	-1.52	-2.52	0.00
LF4-MW2	3/15/11	-4.605	-0.06	-1.06	0.00
LF4-MW2	9/8/11	-4.605	-0.06	-1.06	0.00
LF4-MW2	3/14/12	-4.605	-0.06	-1.06	0.00
LF4-MW2	9/6/12	-5.341	-0.73	-1.73	0.00
LF4-MW2	3/5/13	-4.440	0.09	-0.91	0.00
LF4-MW2	9/11/13	-4.605	-0.06	-1.06	0.00
LF4-MW2	3/5/14	-3.751	0.72	-0.28	0.00
LF4-MW2	9/4/14	-6.287	-1.59	-2.59	0.00
LF4-MW2	3/13/15	-4.193	0.31	-0.69	0.00
LF4-MW2	9/16/15	-6.024	-1.35	-2.35	0.00
LF4-MW2	3/16/16	-4.566	-0.02	-1.02	0.00
LF4-MW2	9/21/16	-5.976	-1.31	-2.31	0.00
LF4-MW2	3/15/17	-6.071	-1.39	-2.39	0.00
LF4-MW2	9/8/17	-6.161	-1.47	-2.47	0.00
LF4-MW2	3/8/18	-4.519	0.02	-0.98	0.00
Background					
LF4-MW2	MEAN	-4.539			
LF4-MW2	STDEV	1.100			

Copper

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-5.039	0.53	-0.47	0.00
LF4-MW3	9/14/06	-4.959	0.60	-0.40	0.00
LF4-MW3	3/6/07	-6.215	-0.49	-1.49	0.00
LF4-MW3	9/25/07	-6.215	-0.49	-1.49	0.00
LF4-MW3	3/26/08	-6.008	-0.31	-1.31	0.00
LF4-MW3	9/16/08	-5.594	0.05	-0.95	0.00
LF4-MW3	3/17/09	-6.119	-0.41	-1.41	0.00
LF4-MW3	9/17/09	-6.215	-0.49	-1.49	0.00
LF4-MW3	3/17/10	-6.200	-0.48	-1.48	0.00
LF4-MW3	9/21/10	-6.215	-0.49	-1.49	0.00
LF4-MW3	3/15/11	-5.104	0.47	-0.53	0.00
LF4-MW3	9/8/11	-4.605	0.91	-0.09	0.00
LF4-MW3	3/14/12	-5.735	-0.08	-1.08	0.00
LF4-MW3	9/6/12	-5.793	-0.13	-1.13	0.00
LF4-MW3	3/5/13	-5.666	-0.02	-1.02	0.00
LF4-MW3	9/11/13	-4.605	0.91	-0.09	0.00
LF4-MW3	3/5/14	-6.354	-0.62	-1.62	0.00
LF4-MW3	9/4/14	-6.395	-0.65	-1.65	0.00
LF4-MW3	3/13/15	-6.250	-0.53	-1.53	0.00
LF4-MW3	9/16/15	-6.812	-1.01	-2.01	0.00
LF4-MW3	3/16/16	-6.261	-0.53	-1.53	0.00
LF4-MW3	9/21/16	-6.092	-0.39	-1.39	0.00
LF4-MW3	3/15/17	-6.645	-0.87	-1.87	0.00
LF4-MW3	9/8/17	-5.696	-0.04	-1.04	0.00
LF4-MW3	3/8/18	-6.450	-0.70	-1.70	0.00
Background					
LF4-MW3	MEAN	-5.647			
LF4-MW3	STDEV	1.150			

Attachment E2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-5.298	0.22	-0.78	0.00
LF4-MW1	9/13/06	-5.857	-0.30	-1.30	0.00
LF4-MW1	3/6/07	-5.345	0.18	-0.82	0.00
LF4-MW1	9/24/07	-5.661	-0.12	-1.12	0.00
LF4-MW1	3/26/08	-4.935	0.56	-0.44	0.00
LF4-MW1	9/16/08	-5.298	0.22	-0.78	0.00
LF4-MW1	3/17/09	-5.298	0.22	-0.78	0.00
LF4-MW1	9/17/09	-5.684	-0.14	-1.14	0.00
LF4-MW1	3/17/10	-5.238	0.28	-0.72	0.00
LF4-MW1	9/21/10	-5.809	-0.25	-1.25	0.00
LF4-MW1	3/15/11	-5.298	0.22	-0.78	0.00
LF4-MW1	9/8/11	-5.754	-0.20	-1.20	0.00
LF4-MW1	3/14/12	-5.751	-0.20	-1.20	0.00
LF4-MW1	9/6/12	-5.298	0.22	-0.78	0.00
LF4-MW1	3/5/13	-5.726	-0.18	-1.18	0.00
LF4-MW1	9/11/13	-4.912	0.58	-0.42	0.00
LF4-MW1	3/5/14	-8.408	-2.67	-3.67	0.00
LF4-MW1	9/4/14	-7.881	-2.18	-3.18	0.00
LF4-MW1	3/13/15	-8.174	-2.45	-3.45	0.00
LF4-MW1	9/16/15	-5.581	-0.04	-1.04	0.00
LF4-MW1	3/16/16	-7.891	-2.19	-3.19	0.00
LF4-MW1	9/21/16	-7.233	-1.57	-2.57	0.00
LF4-MW1	3/15/17	-7.659	-1.97	-2.97	0.00
LF4-MW1	9/8/17	-7.907	-2.20	-3.20	0.00
LF4-MW1	3/8/18	-6.395	-0.80	-1.80	0.00
Background					
LF4-MW1	MEAN	-5.537			
LF4-MW1	STDEV	1.077			

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-4.595	0.39	-0.61	0.00
LF4-MW2	9/13/06	-4.415	0.54	-0.46	0.00
LF4-MW2	3/6/07	-4.855	0.16	-0.84	0.00
LF4-MW2	9/24/07	-5.415	-0.32	-1.32	0.00
LF4-MW2	3/26/08	-4.928	0.10	-0.90	0.00
LF4-MW2	9/16/08	-5.296	-0.22	-1.22	0.00
LF4-MW2	3/17/09	-5.298	-0.22	-1.22	0.00
LF4-MW2	9/17/09	-5.298	-0.22	-1.22	0.00
LF4-MW2	3/17/10	-4.678	0.32	-0.68	0.00
LF4-MW2	9/21/10	-5.809	-0.66	-1.66	0.00
LF4-MW2	3/15/11	-5.298	-0.22	-1.22	0.00
LF4-MW2	9/8/11	-5.298	-0.22	-1.22	0.00
LF4-MW2	3/14/12	-5.298	-0.22	-1.22	0.00
LF4-MW2	9/6/12	-5.298	-0.22	-1.22	0.00
LF4-MW2	3/5/13	-5.589	-0.47	-1.47	0.00
LF4-MW2	9/11/13	-5.447	-0.35	-1.35	0.00
LF4-MW2	3/5/14	-6.119	-0.93	-1.93	0.00
LF4-MW2	9/4/14	-6.921	-1.62	-2.62	0.00
LF4-MW2	3/13/15	-6.175	-0.98	-1.98	0.00
LF4-MW2	9/16/15	-6.266	-1.05	-2.05	0.00
LF4-MW2	3/16/16	-5.482	-0.38	-1.38	0.00
LF4-MW2	9/21/16	-6.320	-1.10	-2.10	0.00
LF4-MW2	3/15/17	-6.101	-0.91	-1.91	0.00
LF4-MW2	9/8/17	-6.250	-1.04	-2.04	0.00
LF4-MW2	3/8/18	-5.544	-0.43	-1.43	0.00
Background					
LF4-MW2	MEAN	-5.045			
LF4-MW2	STDEV	1.159			

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-5.216	0.40	-0.60	0.00
LF4-MW3	9/14/06	-5.806	-0.32	-1.32	0.00
LF4-MW3	3/6/07	-6.041	-0.61	-1.61	0.00
LF4-MW3	9/25/07	-5.298	0.30	-0.70	0.00
LF4-MW3	3/26/08	-5.341	0.25	-0.75	0.00
LF4-MW3	9/16/08	-5.298	0.30	-0.70	0.00
LF4-MW3	3/17/09	-5.298	0.30	-0.70	0.00
LF4-MW3	9/17/09	-3.537	2.46	1.46	1.46
LF4-MW3	3/17/10	-5.298	0.30	-0.70	0.76
LF4-MW3	9/21/10	-5.298	0.30	-0.70	0.06
LF4-MW3	3/15/11	-5.298	0.30	-0.70	0.00
LF4-MW3	9/8/11	-5.298	0.30	-0.70	0.00
LF4-MW3	3/14/12	-5.298	0.30	-0.70	0.00
LF4-MW3	9/6/12	-5.298	0.30	-0.70	0.00
LF4-MW3	3/5/13	-5.404	0.17	-0.83	0.00
LF4-MW3	9/11/13	-5.767	-0.28	-1.28	0.00
LF4-MW3	3/5/14	-6.210	-0.82	-1.82	0.00
LF4-MW3	9/4/14	-6.210	-0.82	-1.82	0.00
LF4-MW3	3/13/15	-5.444	0.12	-0.88	0.00
LF4-MW3	9/16/15	-6.482	-1.15	-2.15	0.00
LF4-MW3	3/16/16	-6.028	-0.60	-1.60	0.00
LF4-MW3	9/21/16	-5.757	-0.26	-1.26	0.00
LF4-MW3	3/15/17	-5.793	-0.31	-1.31	0.00
LF4-MW3	9/8/17	-6.975	-1.76	-2.76	0.00
LF4-MW3	3/8/18	-5.840	-0.36	-1.36	0.00
Background					
LF4-MW3	MEAN	-5.542			
LF4-MW3	STDEV	0.816			

Lead

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-4.457	1.08	0.08	0.08
LF4-MW4	9/14/06	-3.558	2.12	1.12	1.21
LF4-MW4	3/7/07	-5.298	0.11	-0.89	0.31
LF4-MW4	9/25/07	-5.298	0.11	-0.89	0.00
LF4-MW4	3/26/08	-5.298	0.11	-0.89	0.00
LF4-MW4	9/17/08	-5.181	0.24	-0.76	0.00
LF4-MW4	3/17/09	-5.310	0.09	-0.91	0.00
LF4-MW4	9/21/09	-5.298	0.11	-0.89	0.00
LF4-MW4	3/17/10	-5.708	-0.37	-1.37	0.00
LF4-MW4	9/21/10	-5.632	-0.28	-1.28	0.00
LF4-MW4	3/15/11	-5.638	-0.28	-1.28	0.00
LF4-MW4	9/8/11	-5.602	-0.24	-1.24	0.00
LF4-MW4	3/14/12	-5.298	0.11	-0.89	0.00
LF4-MW4	9/6/12	-5.298	0.11	-0.89	0.00
LF4-MW4	3/5/13	-5.298	0.11	-0.89	0.00
LF4-MW4	9/11/13	-5.339	0.06	-0.94	0.00
LF4-MW4	3/5/14	-6.898	-1.74	-2.74	0.00
LF4-MW4	9/4/14	-5.499	-0.12	-1.12	0.00
LF4-MW4	3/13/15	-7.417	-2.34	-3.34	0.00
LF4-MW4	9/16/15	-4.519	1.01	0.01	0.01
LF4-MW4	3/16/16	-7.807	-2.80	-3.80	0.00
LF4-MW4	9/21/16	-5.745	-0.41	-1.41	0.00
LF4-MW4	3/15/17	-7.249	-2.15	-3.15	0.00
LF4-MW4	9/8/17	-4.731	0.77	-0.23	0.00
LF4-MW4	3/8/18	-7.511	-2.45	-3.45	0.00
Background					
LF4-MW4	MEAN	-5.392			
LF4-MW4	STDEV	0.864			

Attachment E2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-4.605	-0.66	-1.66	0.00
LF4-MW1	9/13/06	-4.351	0.32	-0.68	0.00
LF4-MW1	3/6/07	-4.605	-0.66	-1.66	0.00
LF4-MW1	9/24/07	-4.585	-0.58	-1.58	0.00
LF4-MW1	3/26/08	-4.117	1.22	0.22	0.22
LF4-MW1	9/16/08	-4.595	-0.62	-1.62	0.00
LF4-MW1	3/17/09	-4.398	0.14	-0.86	0.00
LF4-MW1	9/17/09	-4.510	-0.29	-1.29	0.00
LF4-MW1	3/17/10	-4.994	-2.15	-3.15	0.00
LF4-MW1	9/21/10	-4.283	0.58	-0.42	0.00
LF4-MW1	3/15/11	-3.958	1.83	0.83	0.83
LF4-MW1	9/8/11	-3.958	1.83	0.83	1.65
LF4-MW1	3/14/12	-3.887	2.10	1.10	2.75
LF4-MW1	9/6/12	-3.673	2.92	1.92	4.67
LF4-MW1	3/5/13	-3.768	2.56	1.56	6.23
LF4-MW1	9/11/13	-4.173	1.00	0.00	6.23
LF4-MW1	3/5/14	-4.034	1.53	0.53	6.76
LF4-MW1	9/4/14	-4.220	0.82	-0.18	6.58
LF4-MW1	3/13/15	-3.942	1.89	0.89	7.47
LF4-MW1	9/16/15	-4.110	1.24	0.24	7.71
LF4-MW1	3/16/16	-3.812	2.39	1.39	9.09
LF4-MW1	9/21/16	-4.001	1.66	0.66	9.76
LF4-MW1	3/15/17	-3.826	2.33	1.33	11.09
LF4-MW1	9/8/17	-3.777	2.52	1.52	11.28
LF4-MW1	3/8/18	-4.001	1.66	0.66	11.75
Background					
LF4-MW1	MEAN	-4.434			
LF4-MW1	STDEV	0.260			

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-4.605	-0.82	-1.82	0.00
LF4-MW2	9/13/06	-3.979	0.46	-0.54	0.00
LF4-MW2	3/6/07	-4.528	-0.66	-1.66	0.00
LF4-MW2	9/24/07	-4.528	-0.66	-1.66	0.00
LF4-MW2	3/26/08	-4.628	-0.86	-1.86	0.00
LF4-MW2	9/16/08	-4.213	-0.02	-1.02	0.00
LF4-MW2	3/17/09	-2.684	3.11	2.11	2.11
LF4-MW2	9/17/09	-2.658	3.16	2.16	4.27
LF4-MW2	3/17/10	-2.736	3.00	2.00	6.26
LF4-MW2	9/21/10	-3.887	0.65	-0.35	5.91
LF4-MW2	3/15/11	-4.227	-0.04	-1.04	4.87
LF4-MW2	9/8/11	-4.200	0.01	-0.99	3.88
LF4-MW2	3/14/12	-4.457	-0.51	-1.51	2.37
LF4-MW2	9/6/12	-4.173	0.07	-0.93	1.44
LF4-MW2	3/5/13	-2.484	3.51	2.51	3.95
LF4-MW2	9/11/13	-2.787	2.90	1.90	5.85
LF4-MW2	3/5/14	-2.313	3.86	2.86	8.71
LF4-MW2	9/4/14	-3.119	2.22	1.22	9.93
LF4-MW2	3/13/15	-2.585	3.31	2.31	12.24
LF4-MW2	9/16/15	-3.192	2.07	1.07	13.31
LF4-MW2	3/16/16	-2.922	2.62	1.62	14.93
LF4-MW2	9/21/16	-3.014	2.43	1.43	16.36
LF4-MW2	3/15/17	-3.594	1.25	0.25	16.61
LF4-MW2	9/8/17	-3.677	1.08	0.08	16.44
LF4-MW2	3/8/18	-2.736	3.00	2.00	18.61
Background					
LF4-MW2	MEAN	-4.206			
LF4-MW2	STDEV	0.490			

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-4.605	0.45	-0.55	0.00
LF4-MW3	9/14/06	-4.173	1.14	0.14	0.14
LF4-MW3	3/6/07	-4.605	0.45	-0.55	0.00
LF4-MW3	9/25/07	-4.989	-0.17	-1.17	0.00
LF4-MW3	3/26/08	-5.093	-0.34	-1.34	0.00
LF4-MW3	9/16/08	-5.537	-1.06	-2.06	0.00
LF4-MW3	3/17/09	-5.658	-1.25	-2.25	0.00
LF4-MW3	9/17/09	-4.981	-0.16	-1.16	0.00
LF4-MW3	3/17/10	-4.605	0.45	-0.55	0.00
LF4-MW3	9/21/10	-5.929	-1.69	-2.69	0.00
LF4-MW3	3/15/11	-5.555	-1.08	-2.08	0.00
LF4-MW3	9/8/11	-5.658	-1.25	-2.25	0.00
LF4-MW3	3/14/12	-5.675	-1.28	-2.28	0.00
LF4-MW3	9/6/12	-5.621	-1.19	-2.19	0.00
LF4-MW3	3/5/13	-5.431	-0.88	-1.88	0.00
LF4-MW3	9/11/13	-4.605	0.45	-0.55	0.00
LF4-MW3	3/5/14	-5.860	-1.58	-2.58	0.00
LF4-MW3	9/4/14	-5.684	-1.29	-2.29	0.00
LF4-MW3	3/13/15	-5.693	-1.31	-2.31	0.00
LF4-MW3	9/16/15	-5.116	-0.38	-1.38	0.00
LF4-MW3	3/16/16	-5.836	-1.54	-2.54	0.00
LF4-MW3	9/21/16	-5.539	-1.06	-2.06	0.00
LF4-MW3	3/15/17	-5.802	-1.48	-2.48	0.00
LF4-MW3	9/8/17	-5.675	-1.28	-2.28	0.00
LF4-MW3	3/8/18	-5.864	-1.58	-2.58	0.00
Background					
LF4-MW3	MEAN	-4.882			
LF4-MW3	STDEV	0.620			

Nickel

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-4.605	0.45	-0.55	0.00
LF4-MW4	9/14/06	-4.605	0.45	-0.55	0.00
LF4-MW4	3/7/07	-5.267	-0.62	-1.62	0.00
LF4-MW4	9/25/07	-5.468	-0.94	-1.94	0.00
LF4-MW4	3/26/08	-5.300	-0.67	-1.67	0.00
LF4-MW4	9/17/08	-5.428	-0.88	-1.88	0.00
LF4-MW4	3/17/09	-5.428	-0.88	-1.88	0.00
LF4-MW4	9/21/09	-5.867	-1.59	-2.59	0.00
LF4-MW4	3/17/10	-5.384	-0.81	-1.81	0.00
LF4-MW4	9/21/10	-5.539	-1.06	-2.06	0.00
LF4-MW4	3/15/11	-4.605	0.45	-0.55	0.00
LF4-MW4	9/8/11	-5.594	-1.15	-2.15	0.00
LF4-MW4	3/14/12	-4.605	0.45	-0.55	0.00
LF4-MW4	9/6/12	-4.605	0.45	-0.55	0.00
LF4-MW4	3/5/13	-4.605	0.45	-0.55	0.00
LF4-MW4	9/11/13	-4.751	0.21	-0.79	0.00
LF4-MW4	3/5/14	-5.964	-1.74	-2.74	0.00
LF4-MW4	9/4/14	-5.591	-1.14	-2.14	0.00
LF4-MW4	3/13/15	-6.161	-2.06	-3.06	0.00
LF4-MW4	9/16/15	-5.438	-0.90	-1.90	0.00
LF4-MW4	3/16/16	-6.119	-2.00	-3.00	0.00
LF4-MW4	9/21/16	-5.757	-1.41	-2.41	0.00
LF4-MW4	3/15/17	-6.079	-1.93	-2.93	0.00
LF4-MW4	9/8/17	-5.619	-1.19	-2.19	0.00
LF4-MW4	3/8/18	-6.522	-2.65	-3.65	0.00
Background					
LF4-MW4	MEAN	-4.882			
LF4-MW4	STDEV	0.620			

Attachment E2. Calculations for CUSUM Control Charts
Butler Green Industrial Landfill, Parcel 175(5)
McClellan, Anniston, Alabama

Zinc

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW1	3/13/06	-2.488	1.26	0.26	0.26
LF4-MW1	9/13/06	-3.493	-0.24	-1.24	0.00
LF4-MW1	3/6/07	-3.231	0.15	-0.85	0.00
LF4-MW1	9/24/07	-2.996	0.51	-0.49	0.00
LF4-MW1	3/26/08	-3.177	0.23	-0.77	0.00
LF4-MW1	9/16/08	-3.734	-0.59	-1.59	0.00
LF4-MW1	3/17/09	-3.355	-0.03	-1.03	0.00
LF4-MW1	9/17/09	-3.464	-0.19	-1.19	0.00
LF4-MW1	3/17/10	-4.335	-1.49	-2.49	0.00
LF4-MW1	9/21/10	-3.189	0.22	-0.78	0.00
LF4-MW1	3/15/11	-2.720	0.92	-0.08	0.00
LF4-MW1	9/8/11	-2.955	0.57	-0.43	0.00
LF4-MW1	3/14/12	-2.941	0.59	-0.41	0.00
LF4-MW1	9/6/12	-2.884	0.67	-0.33	0.00
LF4-MW1	3/5/13	-2.766	0.85	-0.15	0.00
LF4-MW1	9/11/13	-3.242	0.14	-0.86	0.00
LF4-MW1	3/5/14	-3.140	0.29	-0.71	0.00
LF4-MW1	9/4/14	-3.237	0.15	-0.85	0.00
LF4-MW1	3/13/15	-2.822	0.76	-0.24	0.00
LF4-MW1	9/16/15	-3.206	0.19	-0.81	0.00
LF4-MW1	3/16/16	-2.805	0.79	-0.21	0.00
LF4-MW1	9/21/16	-3.058	0.41	-0.59	0.00
LF4-MW1	3/15/17	-2.886	0.67	-0.33	0.00
LF4-MW1	9/8/17	-2.799	0.80	-0.20	0.00
LF4-MW1	3/8/18	-2.990	0.51	-0.49	0.00
Background					
LF4-MW1	MEAN	-3.335			
LF4-MW1	STDEV	0.671			

Zinc

Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW2	3/13/06	-2.915	-0.16	-1.16	0.00
LF4-MW2	9/13/06	-2.343	1.59	0.59	0.59
LF4-MW2	3/6/07	-3.338	-1.46	-2.46	0.00
LF4-MW2	9/24/07	-2.996	-0.41	-1.41	0.00
LF4-MW2	3/26/08	-4.069	-3.70	-4.70	0.00
LF4-MW2	9/16/08	-3.487	-1.91	-2.91	0.00
LF4-MW2	3/17/09	-0.691	6.66	5.66	5.66
LF4-MW2	9/17/09	-0.498	7.26	6.26	11.92
LF4-MW2	3/17/10	-0.120	8.41	7.41	19.33
LF4-MW2	9/21/10	-2.254	1.87	0.87	20.20
LF4-MW2	3/15/11	-2.655	0.64	-0.36	19.84
LF4-MW2	9/8/11	-2.608	0.78	-0.22	19.62
LF4-MW2	3/14/12	-2.902	-0.12	-1.12	18.50
LF4-MW2	9/6/12	-2.774	0.27	-0.73	17.77
LF4-MW2	3/5/13	-0.311	7.83	6.83	24.60
LF4-MW2	9/11/13	-0.892	6.05	5.05	29.65
LF4-MW2	3/5/14	0.020	8.84	7.84	37.49
LF4-MW2	9/4/14	-1.168	5.20	4.20	41.69
LF4-MW2	3/13/15	-0.191	8.20	7.20	48.89
LF4-MW2	9/16/15	-1.269	4.89	3.89	52.78
LF4-MW2	3/16/16	-0.835	6.22	5.22	58.00
LF4-MW2	9/21/16	-0.944	5.89	4.89	62.88
LF4-MW2	3/15/17	-1.743	3.44	2.44	65.32
LF4-MW2	9/8/17	-1.715	3.52	2.52	65.41
LF4-MW2	3/8/18	-0.312	7.82	6.82	72.14
Background					
LF4-MW2	MEAN	-2.863			
LF4-MW2	STDEV	0.326			

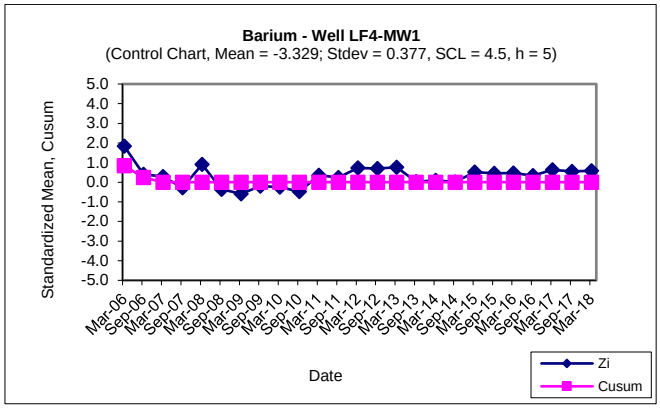
Zinc

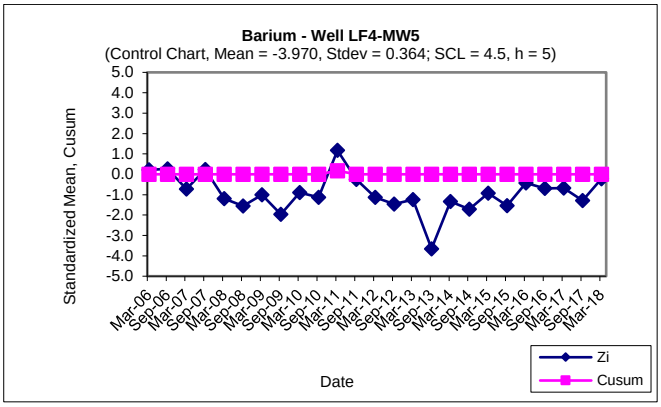
Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW3	3/13/06	-3.858	-0.21	-1.21	0.00
LF4-MW3	9/14/06	-3.685	-0.05	-1.05	0.00
LF4-MW3	3/6/07	-3.642	-0.01	-1.01	0.00
LF4-MW3	9/25/07	-4.160	-0.48	-1.48	0.00
LF4-MW3	3/26/08	-4.141	-0.47	-1.47	0.00
LF4-MW3	9/16/08	-4.820	-1.09	-2.09	0.00
LF4-MW3	3/17/09	-4.200	-0.52	-1.52	0.00
LF4-MW3	9/17/09	-3.627	0.00	-1.00	0.00
LF4-MW3	3/17/10	-4.892	-1.15	-2.15	0.00
LF4-MW3	9/21/10	-5.124	-1.36	-2.36	0.00
LF4-MW3	3/15/11	-3.882	-0.23	-1.23	0.00
LF4-MW3	9/8/11	-4.595	-0.88	-1.88	0.00
LF4-MW3	3/14/12	-4.220	-0.54	-1.54	0.00
LF4-MW3	9/6/12	-4.069	-0.40	-1.40	0.00
LF4-MW3	3/5/13	-4.098	-0.43	-1.43	0.00
LF4-MW3	9/11/13	-2.996	0.58	-0.42	0.00
LF4-MW3	3/5/14	-4.605	-0.89	-1.89	0.00
LF4-MW3	9/4/14	-4.605	-0.89	-1.89	0.00
LF4-MW3	3/13/15	-4.206	-0.53	-1.53	0.00
LF4-MW3	9/16/15	-4.605	-0.89	-1.89	0.00
LF4-MW3	3/16/16	-4.605	-0.89	-1.89	0.00
LF4-MW3	9/21/16	-4.492	-0.79	-1.79	0.00
LF4-MW3	3/15/17	-4.566	-0.85	-1.85	0.00
LF4-MW3	9/8/17	-4.017	-0.35	-1.35	0.00
LF4-MW3	3/8/18	-4.255	-0.57	-1.57	0.00
Background					
LF4-MW3	MEAN	-3.629			
LF4-MW3	STDEV	1.096			

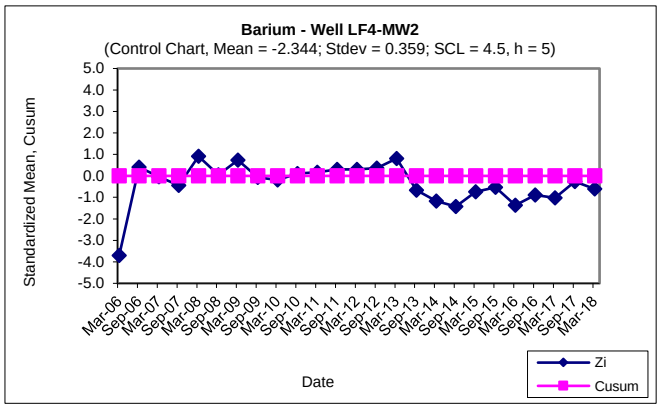
Zinc

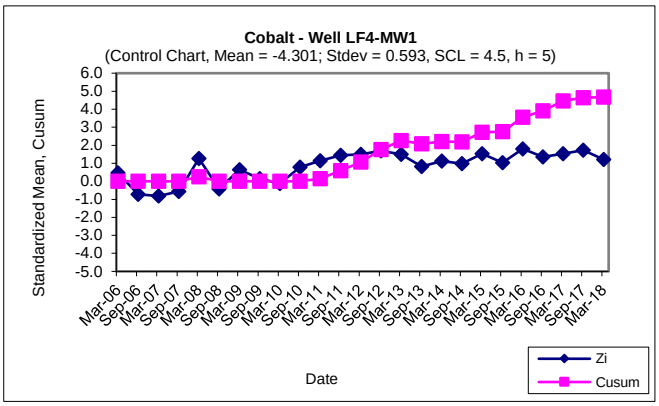
Well ID	Date	Ln Conc	Zi	Zi - k	Cusum
LF4-MW4	3/14/06	-3.669	0.13	-0.87	0.00
LF4-MW4	9/14/06	-3.101	0.91	-0.09	0.00
LF4-MW4	3/7/07	-4.623	-1.19	-2.19	0.00
LF4-MW4	9/25/07	-4.269	-0.70	-1.70	0.00
LF4-MW4	3/26/08	-4.946	-1.64	-2.64	0.00
LF4-MW4	9/17/08	-4.029	-0.37	-1.37	0.00
LF4-MW4	3/17/09	-3.948	-0.26	-1.26	0.00
LF4-MW4	9/21/09	-4.941	-1.63	-2.63	0.00
LF4-MW4	3/17/10	-4.991	-1.70	-2.70	0.00
LF4-MW4	9/21/10	-4.351	-0.82	-1.82	0.00
LF4-MW4	3/15/11	-4.366	-0.84	-1.84	0.00
LF4-MW4	9/8/11	-4.585	-1.14	-2.14	0.00
LF4-MW4	3/14/12	-2.996	1.06	0.06	0.06
LF4-MW4	9/6/12	-2.996	1.06	0.06	0.11
LF4-MW4	3/5/13	-4.366	-0.84	-1.84	0.00
LF4-MW4	9/11/13	-4.440	-0.94	-1.94	0.00
LF4-MW4	3/5/14	-4.605	-1.17	-2.17	0.00
LF4-MW4	9/4/14	-4.605	-1.17	-2.17	0.00
LF4-MW4	3/13/15	-4.605	-1.17	-2.17	0.00
LF4-MW4	9/16/15	-4.057	-0.41	-1.41	0.00
LF4-MW4	3/16/16	-4.605	-1.17	-2.17	0.00
LF4-MW4	9/21/16	-4.069	-0.43	-1.43	0.00
LF4-MW4	3/15/17	-4.605	-1.17	-2.17	0.00
LF4-MW4	9/8/17	-3.423	0.47	-0.53	0.00
LF4-MW4	3/8/18	-4.605	-1.17	-2.17	0.00
Background					
LF4-MW4	MEAN	-3.761			
LF4-MW4	STDEV	0.723			

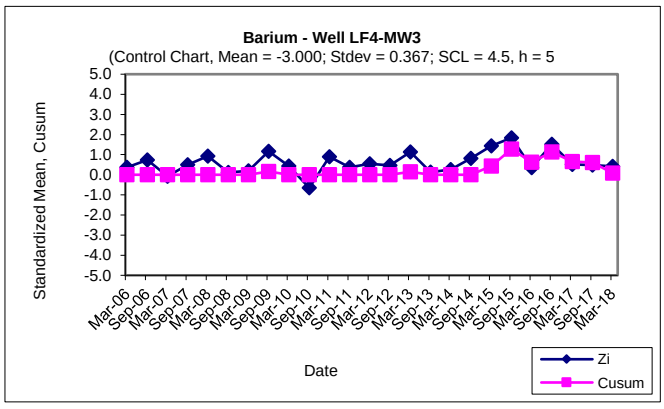
Attachment E3. Control Charts
Butler Green Industrial Landfill, Parcel 175(5), McClellan, Anniston, Alabama

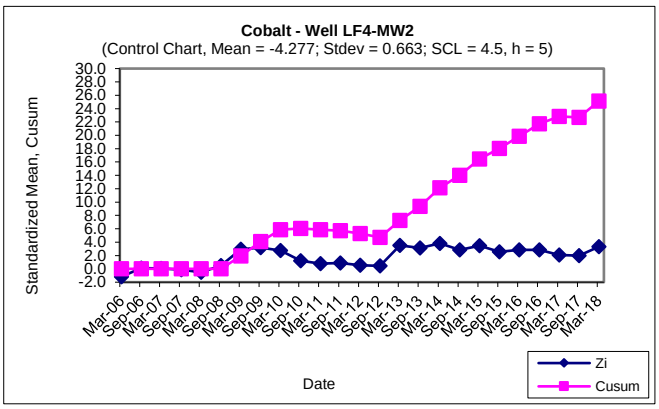


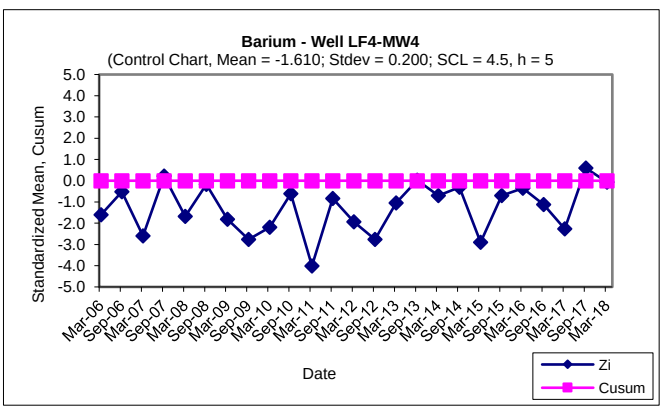


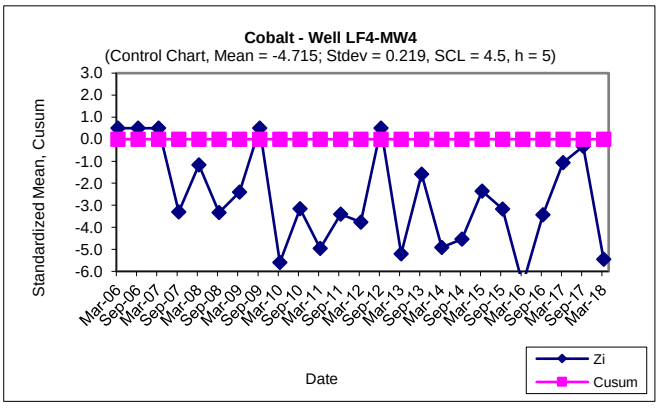




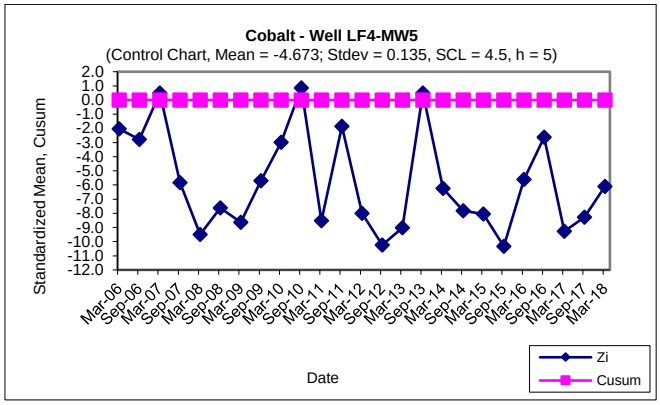


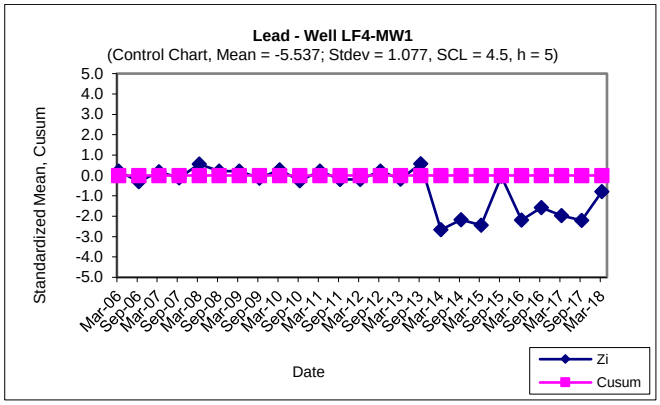


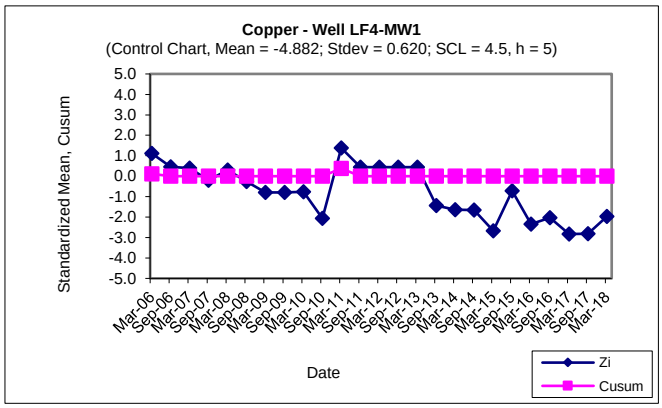


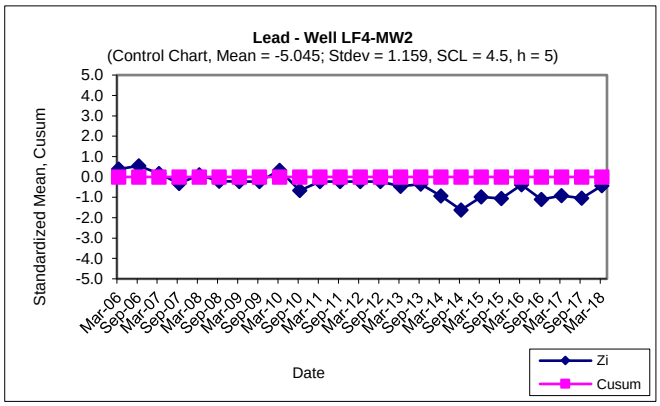


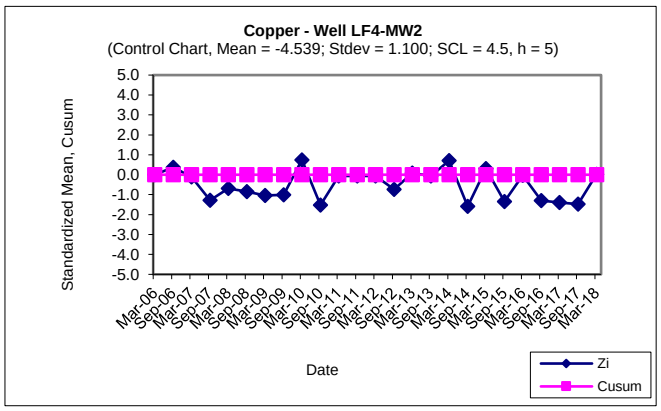
Attachment E3. Control Charts
Butler Green Industrial Landfill, Parcel 175(5), McClellan, Anniston, Alabama

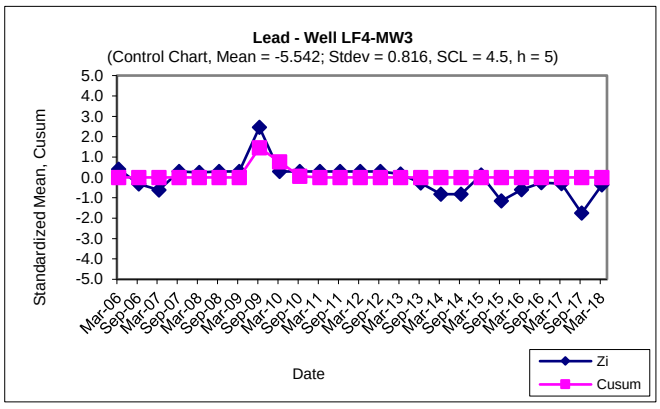


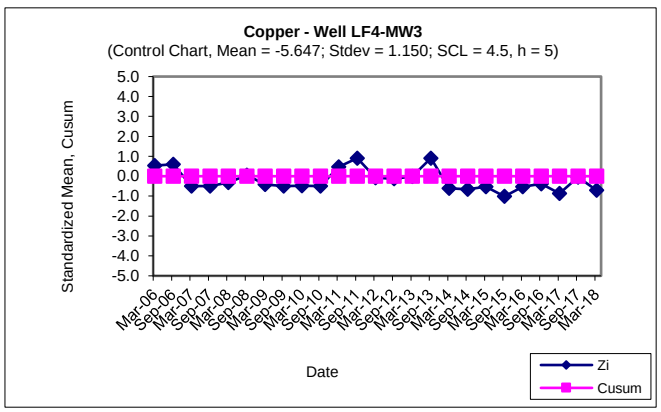


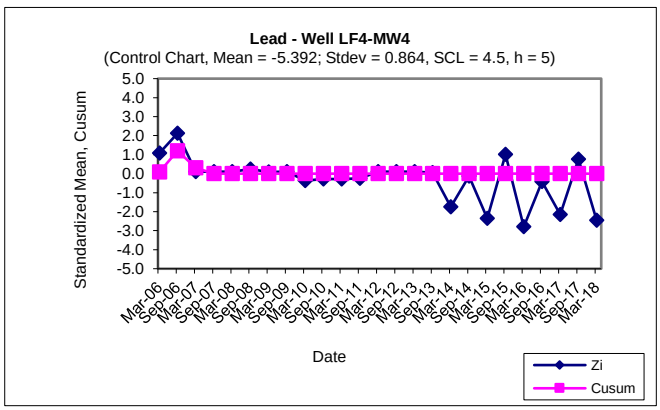












Attachment E3. Control Charts
Butler Green Industrial Landfill, Parcel 175(5), McClellan, Anniston, Alabama