

FINAL
JUNE 2010 (N=20) GROUNDWATER AND
METHANE MONITORING REPORT

FOR

THE LAMONT ROAD LCID AND C&D LANDFILLS
NCDENR LANDFILL PERMIT #26G AND #26-08

FORT BRAGG, NORTH CAROLINA

Prepared by:

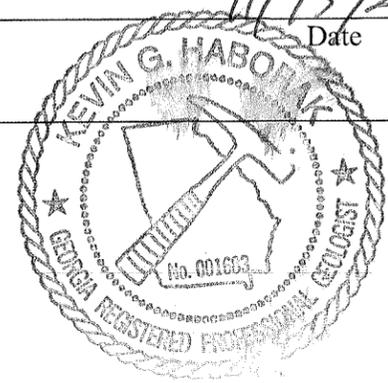
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NOVEMBER 2010

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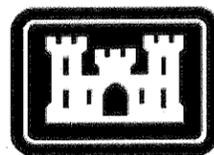


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LIST OF ACRONYMS

C&D	Construction and Demolition
COCs	Chemicals of Concern
DPW	Directorate of Public Works
IDW	Investigation Derived Waste
LCID	Land Clearing and Inert Debris
µg/L	Micrograms Per Liter
MSWLF	Municipal Solid Waste Landfill Facility
NC2L	North Carolina Administrative Code, Title 15A, Subchapter 2L
NCDENR	North Carolina Department of Environmental and Natural Resources
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
USACE	US Army Corps of Engineers
VOCs	Volatile Organic Compounds

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1.0 INTRODUCTION

This is the Report for the June, 2010 groundwater and methane monitoring at the Lamont Road Landfills (Figure 1) performed by the United States Army Corps of Engineers (USACE), Savannah District in June, 2010. The monitoring is required by the North Carolina Department of Environmental and Natural Resources (NCDENR) Solid Waste Management Division. This was the twentieth (N=20) event performed for the Site. This report summarizes the methods used for the groundwater and methane monitoring and presents the results of the sampling event.

1.1 Project Background

The USACE was contracted by the Directorate of Public Works (DPW), Fort Bragg, North Carolina to perform groundwater sampling and methane monitoring. The original groundwater monitoring well network for the land clearing and inert debris (LCID) and construction and demolition (C&D) landfills consisted of 11 wells. Four of the original eleven monitoring wells have been permanently abandoned and replaced with new wells at different locations. An additional two wells have also been installed. The current Sampling and Analysis Plan (SAP), approved by NCDENR, includes sampling these 13 monitoring wells. The monitoring wells are LMW-3, LMW-3s, LMW-4, LMW-6, LMW-7, LMW-8, LMW-9, LMW-9s, LMW-9d, LMW-10, LMW-14R, LMW-15R, and LMW-16. Groundwater monitoring locations are shown on Figure 2. All sampling was conducted according to North Carolina Solid Waste Management Guidelines.

1.2 Project Scope

The scope for this project included collecting groundwater samples from 13

monitoring wells at the Lamont Road LCID and C&D Landfill for analyses of Appendix I constituents, sampling for methane at 13 selected methane monitoring wells and at three additional buildings, evaluating the analytical results, and reporting the results of the investigation. The groundwater sampling and data analyses included obtaining field parameter measurements (i.e. pH, temperature, etc.), measuring water levels at the monitoring well locations, determining groundwater flow directions, validating laboratory analytical data, performing statistical analysis for each detected constituent as required by NC regulations, and determining the concentration changes of chemicals of concern (COCs) with time.

2.0 PROJECT HISTORY

2.1 Site Description and History

The Lamont Road LCID and C&D Landfills are on the west side of Cooleyconch Mountain (Figure 2). The site was previously utilized as a maneuver training area (conducted continuously for 50 years), a borrow pit for sands and clays, and a repository for unclassified debris from land clearing and construction demolition. The LCID Landfill started as an uncontrolled dump site which was associated with reclaiming borrow excavation. Its initial operation pre-dated Federal and State regulations governing waste disposal. The LCID Landfill has been operated as a controlled repository for C&D debris as well as for land clearing and inert debris since its permitting under NCDENR Permit No. 26C on August 28, 1987. From February 1993 to date of closure, C&D debris was diverted to the Longstreet Road Sanitary Landfill, and only LCID has been accepted at the LCID Landfill site. It is presumed that asbestos materials are disposed of in this landfill.

Cooleyconch Mountain is the prominent terrain feature west of the main post. The LCID Landfill site is 1.5 miles west of the Longstreet Road municipal solid waste landfill (MSWLF) (closed January 1, 1998) and 200 yards northwest of the Lamont Road C&D Landfill. The area adjacent and east of the LCID Landfill has been excavated to be used as a borrow pit for sandy fill material. To the south of the LCID Landfill, in the C&D Landfill site, petroleum contaminated soils have been spread, dried, and stored for subsequent removal. To the east of the LCID Landfill, petroleum contaminated sludge has been stored in earthen impoundments for subsequent removal. The LCID Landfill drains north to Cypress Creek, which intersects the Little River a mile upstream of the Fort Bragg Water Plant intake.

2.2 General Site Geology and Hydrology

Lithologic descriptions of soil borings and monitoring well borings from previous investigations at Fort Bragg indicate that in general Fort Bragg is underlain by alternating sands, silty sands, clayey sands, sandy clays, and clays, likely belonging to the

Middendorf Formation. The sands and silty sands range in thickness from approximately 2 to 22 ft and are coarse grained. The clay units range in thickness from approximately 2 to 7 ft and are typically plastic.

2.3 Previous Investigation and Results

Several sampling events have been conducted at the landfills. Initially, four monthly sampling events were conducted in July, August, September, and October 1996 by R,S & H Architect, Engineering, & Planning, Inc. Law & Company, Inc. conducted two sampling events in March and September, 1999 in conjunction with the installation of new wells. Then until 2005, sampling events were conducted by BPA Environmental & Engineering, Inc. The USACE has monitored the site since 2005.

The previous sampling event, held in November of 2009 for Lamont Landfill, was conducted by the USACE, Savannah District. There were low level concentrations of Appendix I volatile organic compounds (VOCs) and Appendix I metals. However, most of the detections were below the respective NC2L standard and none of the detections were determined to be statistically significant increases (SSIs) over background concentrations.

3.0 METHODS

3.1 Methane Monitoring

Methane monitoring was performed at 13 wells and at three additional buildings. The monitoring included measuring levels of methane, carbon dioxide, and oxygen at each location. The results of the monitoring are summarized in Table 1 and are also presented on Figure 3.

3.2 Water-Level Gauging

During this sampling event, USACE personnel measured the water levels in 13 monitoring wells. Measured water levels and calculated groundwater elevations are presented in Table 2. A potentiometric map was developed based on the groundwater elevations; the map is presented as Figure 4. The map shows that the general direction of the groundwater flow at the Lamont Landfill is towards the west-northwest.

3.3 Groundwater Sampling

The groundwater sampling was conducted in accordance with the SAP for the Lamont Road LCID and C&D Landfills (NCDENR Landfill Permits # 26G and #26-08 dated April 2005, which have been updated to reflect the most recent SAP).

Groundwater samples were collected from 13 wells. Water quality parameters pH, specific conductivity, temperature, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) were measured during the purge cycle of each well. The measurements are summarized in Table 3.

Groundwater samples were collected using a low-flow purge method with a bladder pump. Immediately before purging a well, the static water level below the top of the well casing and the total depth of the well were measured to the nearest 0.01 foot and recorded in the field notebook. The volume of water in the well was calculated based on the static water level and the well construction information. Well volume calculations were placed in the field notebook. The inlet of the sampling pump was placed at the mid-point of the screened interval. This level was adjusted for wells where the static water

level is within the well screen. The monitoring wells were purged using a variable-flow bladder pump at a rate of 500 ml/min or less.

The wells were purged until the water quality had stabilized or five purge volumes were removed. The wells were considered stable when the following requirements were met for three consecutive readings: turbidity values within 10% or lower than 10 Nephelometric Turbidity Units (NTUs), temperature values within a range of 0.5 degrees Celcius, pH readings within 0.1 Standard Units (SU), ORP values within a range of 10 milivolts (mV), and conductivity values within 3%, and DO values within 10%.

The rate of pumping was determined and noted in the field notebook. The purge rate was adjusted, as necessary, to avoid purging any well to dryness and to equal the recharge of the aquifer. All sampling equipment was protected from contaminated soil surfaces to prevent contamination of the samples (e.g., equipment may be placed on disposable polyethylene plastic sheeting). Groundwater samples were collected after purging was complete. The tubing was disconnected from the flow through cell, and the samples were collected from the pump outlet. The samples were labeled and placed into an ice-filled cooler for preservation.

Groundwater sampling data (including sample number, location, quantity of water purged, field parameters, site conditions, etc.) were documented in the field notebook. Water samples for Resource Conservation and Recovery Act (RCRA) metal analyses were un-filtered. The results of the groundwater sampling are presented in Table 4 and on Figure 5. The groundwater sampling field data logs are presented in Appendix A.

3.4 Investigation Derived Wastes Handling

The investigation derived wastes (IDW), including the waste water from well purging and decontamination water, were containerized in 55-gallon drums. Those drums were appropriately labeled, sealed, and staged within designated areas until analytical results had been received and reviewed. Based on the analytical results of the groundwater samples, the IDW was classified as non-hazardous. With the concurrence of

the Fort Bragg Installation Restoration Program Manager, the IDW was disposed of at an appropriate disposal facility.

4.0 ANALYTICAL RESULTS AND STATISTICAL ANALYSIS

4.1 Analytical Data Summary

Groundwater samples collected in June 2010 were analyzed for Appendix I VOCs and metals. The summary of detections of the COCs is presented in Table 4. Figure 5 shows the distribution of the detections and their concentrations from this sampling event. The reports of chemical data quality assessment prepared by the Project Chemist are included as Appendix B. The laboratory reports of analytical results are included as Appendix C. For comparison, the analytical results of previous investigations are also presented in the Statistical Analyses Summary Report included in Appendix D.

In accordance with North Carolina guidance, analytical results are compared to North Carolina Groundwater 2L Standards (NC2L standards). The analytical data of the second 2010 sampling event indicated that some VOCs and inorganics were detected at low levels, and all detections were below NC2L standards (Table 4).

Three wells had detections exceeding the NC2L standards: wells LMW-8, LMW-9S, and LMW-15R. The analytical results for each of those wells are shown below:

- Well LMW-8

Two compounds were estimated or detected above the 2L standard as listed below:

<u>Compound</u>	<u>2L</u>	<u>Concentration</u>
Iron	300 µg/L	9,400 µg/L
Manganese	50 µg/L	150 µg/L

- Well LMW-9S

One compound was estimated or detected above the 2L standard as listed below:

<u>Compound</u>	<u>2L</u>	<u>Concentration</u>
Iron	300 µg/L	360 µg/L

- Well SLMW-15R

One compound was estimated or detected above the 2L standard as listed below:

<u>Compound</u>	<u>2L</u>	<u>Concentration</u>
Nitrate as NO ₃	10,000 µg/L	21,000 µg/L

No other constituents were above their 2L standard.

Though wells had constituent detections above method detection limits, all other detections were below the respective NC2L standard and most are estimated values that were detected above the method detection limits but below the reporting limit (Table 4).

4.2 Statistical Analysis Results

A statistical test predicts the average behavior (distribution) of a random variable by comparing the means (normal distribution) or medians (lognormal and non-parametric distributions) of the compliance well data to background well data. Different statistical tests were used as appropriate for the different distributional patterns that occur within the data. Prior to testing for statistical significance, the distribution of each parameter was determined to be normal, lognormal, or non-normal.

If the data were non-normally distributed, or the fraction of nondetects exceeded 15% but were less than 90%, then the Kruskal-Wallis Test was applied. If the fraction of non-detects exceeded 90%, then the Non-Parametric Prediction Limit was applied. For these tests to be sufficiently sensitive, the sample size for any group must be at least 4. A Kruskal-Wallis Test can be used in any situation that the parametric analysis of variance can be used. This test computes the H-statistic, adjusts it for ties, and compares it to the appropriate chi-square critical value. If the H-statistic is less than the critical value, the null-hypothesis is accepted, and it is concluded that there are no differences between median background and compliance well concentrations. If the H-statistic is greater than the critical value, it is concluded that at least one pair of well groups is statistically different. However, the Kruskal-Wallis test is prone to false positives. Therefore, additional statistical analyses were used to determine the validity of the positive results. Intra-well comparisons of data from a single well to previous data from the same well were performed to determine if a trend of increasing concentration is occurring. The Mann-Kendall Trend Analysis and the Shewhart-CUSUM Control Chart statistical tests were selected for these additional analyses.

A detailed discussion of the statistical methods is presented in Appendix D. The results of the statistical analysis indicate that there are no SSIs in the concentrations of the detected constituents.

4.3 Methane Monitoring Results

The methane levels were measured at 16 locations at Lamont Landfill. The results of the monitoring are summarized in Table 1 and are also presented on Figure 3. All but one of the methane wells that were sampled were below 1% Methane by volume, Methane monitoring well 13 was measured at 23.4 % Methane by volume.

5.0 CONCLUSIONS AND RECOMMENATIONS

The annual monitoring program consists of two sampling events conducted six months apart. This was the June 2009 sampling event for groundwater and methane monitoring performed by the USACE, Savannah District. It was the N=19 sampling event for the Lamont Road Landfills. Low levels of Appendix I VOCs and metals were detected, but most of the detections were at estimated levels and/or were below NC2L standards. Iron was detected above its NC2L standard in two wells, while Manganese and Nitrate as NO₃ were detected above their NC2L standards in one well.

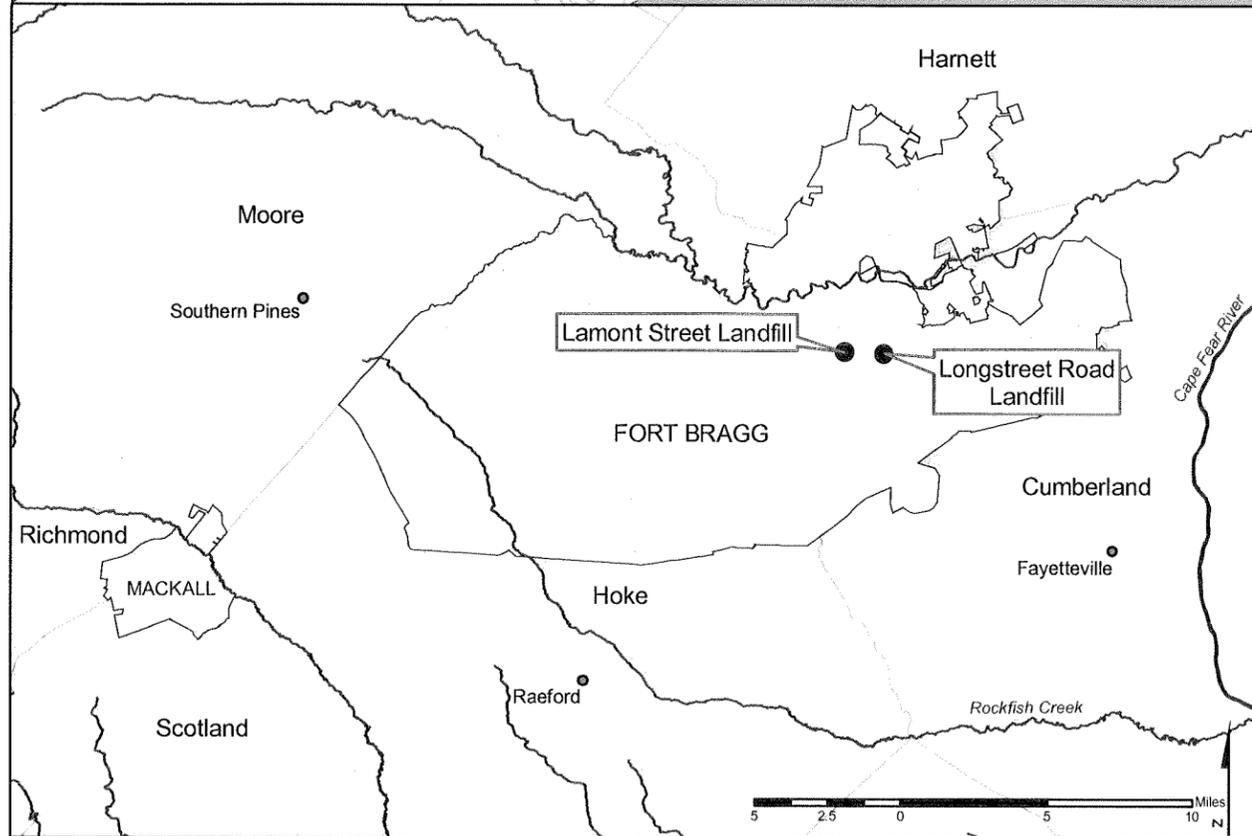
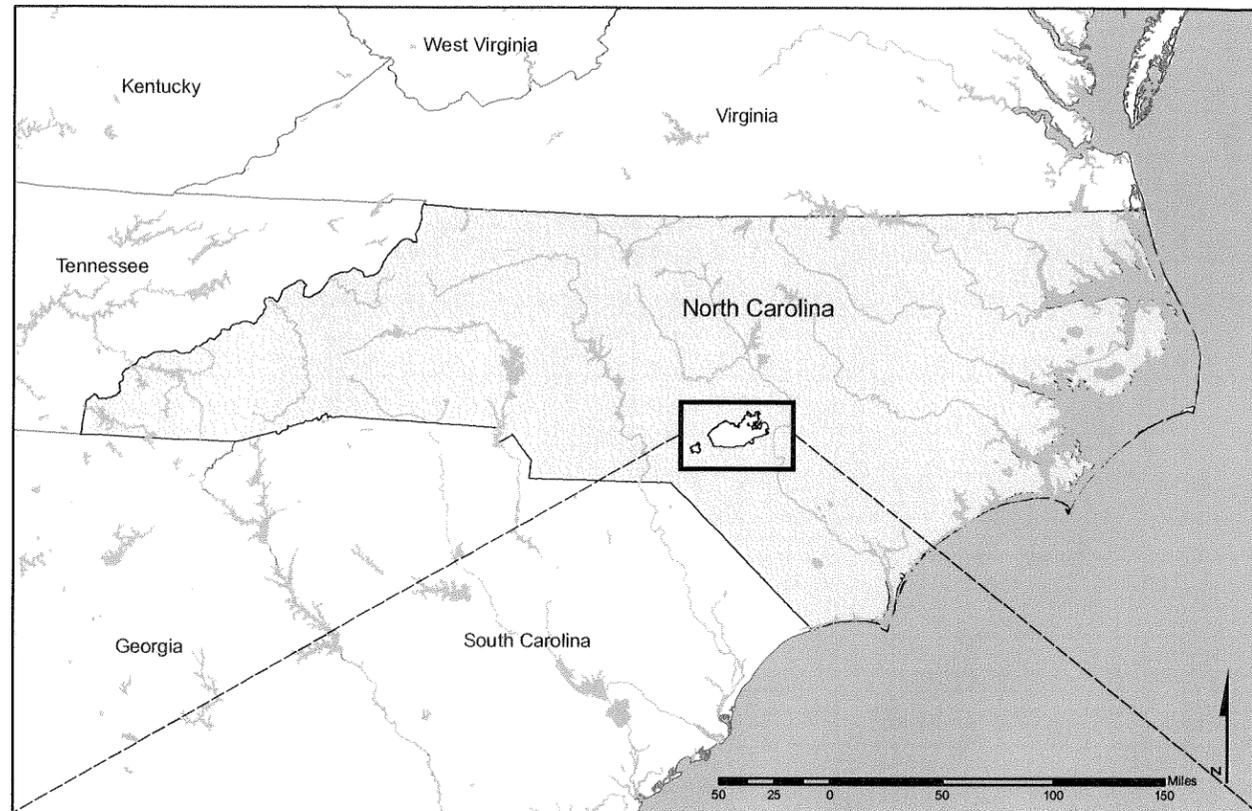
According to the Statistical Analysis of groundwater Data (Appendix D), there is no evidence of an upward trend in constituent concentrations. The statistical findings at the Lamont Road Landfill demonstrated that any statistical abnormalities were due to natural variation in the results. Long-term monitoring should continue at the Lamont Road Landfill because it is still an active site and NC Solid Waste Regulations require it.

The methane levels were measured at 16 locations around Lamont landfill. One methane monitoring well showed a high concentration of methane by volume of 23.4%.

REFERENCES

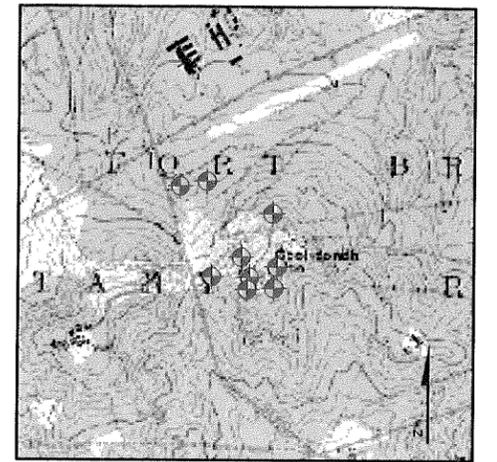
North Carolina Administrative Code, Title 15A, Department of Environment, Health, and Natural Resources, Division of Solid Waste, Management, Subchapter 13B, Solid Waste Management, Section .1600 (January 4, 1994).

North Carolina Administrative Code, Title 15A, Department of Environment, Health, and Natural Resources, Division of Solid Waste, Management, SubchapterNC2L, Classifications and Water Quality Standards Applicable to the Ground Waters of North Carolina, Sections .0100, .0200, and .0300 (November 8, 1993): from the Environmental Management Commission, Raleigh, North Carolina.



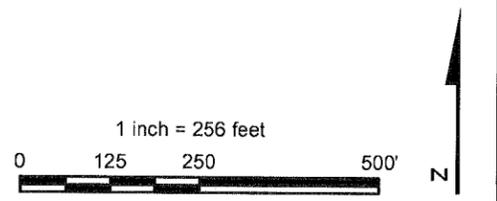

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Figure 1
 Site Map -- Ft. Bragg, NC



LEGEND

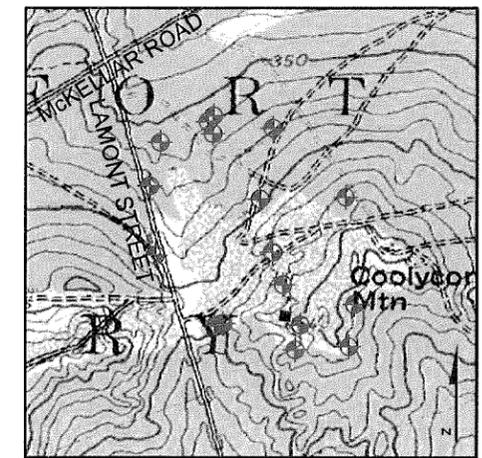
- Ⓜ METHANE SAMPLE
- ⊕ MONITORING WELL
- ⊕ MONITORING WELL (REMOVED)
- ~ STREAM
- ▬ PAVED ROAD
- - - DIRT ROAD
- ▭ BUILDING
- ⋯ SWMU AREA



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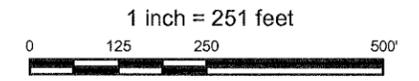
**LOCATION MAP- LAMONT STREET
LANDFILL**

FT. BRAGG, NC



LEGEND

- METHANE SAMPLE
- STREAM
- BUILDING
- SWMU AREA
- ROAD
- TRAIL

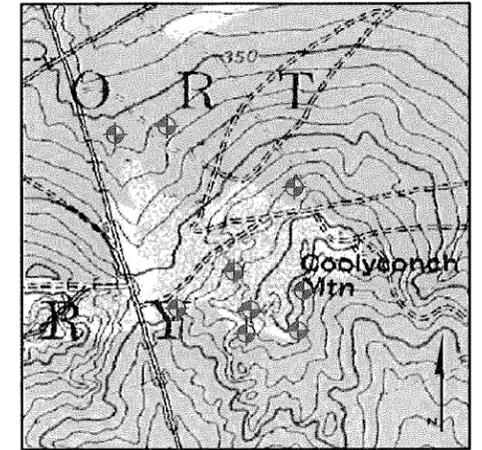


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METHANE MONITORING RESULTS

LAMONT STREET LANDFILL
FT. BRAGG, NC

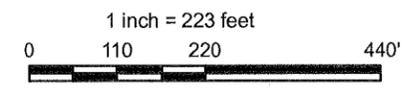
Note:
TOC – Top of casing
btoc – Below top of casing
NA – Not Available
bgs – Below ground surface
amsl – Above mean sea level
D --- Selected Well for Long Term Monitoring
TOC elevation is based on vertical datum NGVD29 (source: USGS RFI, Aug. 1999)



LEGEND

- ◄ Groundwater Flow
- Groundwater Contour
- ⊕ Monitoring Well
- ⋯ SWMU Area

Note: Monitoring wells used for potentiometric surface are displayed with elevations in feet above MSL in parenthesis below the label.



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LAMONT ST LANDFILL, FORT BRAGG, NC

POTENTIOMETRIC MAP

LMW-8-06-10	
VOCs	(µg/L)
cis-1,2-dichloroethene	1.1
tetrachloroethene	0.25 J
trichloroethene	0.29 J
Appendix I Metals	(µg/L)
Arsenic	0.43 J
Barium	30
Cobalt	0.78
Chromium	0.35 J
Copper	1.3
Iron	9400
Manganese	150
Nickel	0.69 J
Selenium	.33 J
Zinc	8.2 J
Nitrate/Nitrite	(µg/L)
NO3	450 J

LMW-15R-06-10	
Appendix II Inorganics	(µg/L)
Barium	36
Cobalt	0.7
Chromium	0.51 J
Iron	110
Lead	0.08 J
Manganese	1.6 J
Nickel	1
Zinc	6.6 J
Nitrate/Nitrite	(µg/L)
NO3	21,000

LMW-14R-06-10	
Appendix II Inorganics	(µg/L)
Barium	13
Cobalt	0.17 J
Chromium	0.49 J
Iron	43 J
Lead	0.10 J
Manganese	1.3 J
Nickel	0.84 J
Zinc	4.9 J

LMW-3 -06-10	
VOCs	(µg/L)
Chloroform	0.31 J
Trichlorofluoromethane	0.58 J
Appendix II Inorganics	(µg/L)
Barium	5
Cobalt	0.17 J
Chromium	0.76 J
Iron	53
Lead	0.17 J
Manganese	1.1 J
Nickel	1.3 J
Zinc	8.5 J
Nitrate/Nitrite	(µg/L)
NO3	780 J

LMW-9S-06-10	
Appendix II Inorganics	(µg/L)
Arsenic	0.57 J
Barium	38
Cobalt	0.16 J
Chromium	0.58 J
Copper	1.7
Iron	360
Lead	0.11 J
Manganese	13
Zinc	3.5 J
Nitrate/Nitrite	(µg/L)
NO3	600 J

LMW-9D -06-10	
Appendix II Inorganics	(µg/L)
Arsenic	1.8
Barium	2.1
Chromium	0.5 J
Copper	0.9 J
Iron	150
Lead	0.23 J
Manganese	1.5 J
Nickel	0.53 J
Vanadium	1.8 J
Zinc	5.6
Nitrate/Nitrite	(µg/L)
NO3	580 J

LMW-9-06-10	
Appendix II Inorganics	(µg/L)
Arsenic	0.58 J
Barium	2.8
Cobalt	0.13 J
Chromium	0.44 J
Copper	2.4
Iron	200
Lead	0.16 J
Manganese	1.4 J
Zinc	4.4 J
Nitrate/Nitrite	(µg/L)
NO3	450 J

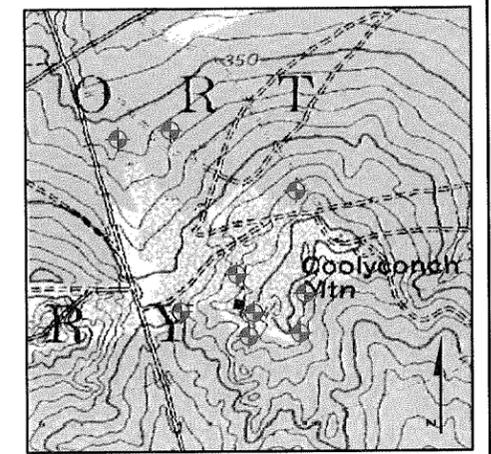
LMW-16-06-10	
Appendix II Inorganics	(µg/L)
Arsenic	0.5 J
Barium	8.8
Cobalt	0.098 J
Chromium	0.56 J
Iron	150
Lead	0.26 J
Manganese	1.1 J
Nickel	0.97 J
Zinc	7.9 J

LMW-10-06-10	
VOCs	(µg/L)
Trichloroethene	1.1
Trichlorofluoromethane	5.8
Appendix II Inorganics	(µg/L)
Barium	12
Cobalt	0.2
Chromium	0.36 J
Copper	1.9
Iron	41 J
Lead	0.11 J
Manganese	1.1 J
Zinc	3.6 J
Nitrate/Nitrite	(µg/L)
NO3	3,700

LMW-4 -06-10	
Appendix II Inorganics	(µg/L)
Barium	15
Cobalt	0.27
Chromium	0.72 J
Copper	1.3
Iron	130
Lead	0.19 J
Nickel	0.76 J
Zinc	6.9 J
Nitrate/Nitrite	(µg/L)
NO3	840 J

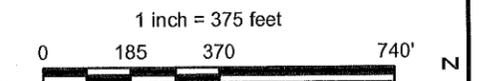
LMW-6 -06-10	
VOCs	(µg/L)
Trichlorofluoromethane	0.72 J
Appendix II Inorganics	(µg/L)
Arsenic	0.46 J
Barium	77
Beryllium	0.13 J
Cobalt	1.2
Chromium	0.57 J
Copper	3
Iron	52
Lead	0.14 J
Manganese	5.6
Nickel	1.9
Selenium	3.2
Zinc	11
Nitrate/Nitrite	(µg/L)
NO3	8,800

LMW-3S -06-10	
VOCs	(µg/L)
Dichlorodifluoromethane	4
Trichlorofluoromethane	1.4
Appendix II Inorganics	(µg/L)
Barium	12
Cobalt	0.57
Chromium	0.37 J
Iron	41 J
Lead	0.093 J
Manganese	23
Nickel	4.1



- LEGEND**
- ⊕ MONITORING WELL
 - ▬ PAVED ROAD
 - - - DIRT ROAD
 - ▨ WASH RACK AREA
 - ▭ BUILDING
 - ⋯ SWMU AREA

NOTE: Only detected analytes shown. Well labels show total well depth below ground surface in parenthesis. NA - Not Available U - Target analytes were not detected above the reporting limits J - Analyte was present but concentration is an estimated value. Bold - Concentrations exceed NC 2L standards. *IMAC - Interim maximum allowable concentration **PRG based on carcinogenic factor.



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LAMONT ST LANDFILL, FORT BRAGG, NC

GROUNDWATER ANALYTICAL RESULTS

**Table 1. Methane Monitoring Results
Lamont Landfills, Fort Bragg, NC**

Well ID	Date Sampled	Time Sampled	%Methane by Volume	%Oxygen	%CO2
Gas-MW-1	June 10	1105	0.0 %	21.4 %	8.4 %
Gas-MW-2	June 10	1128	0.0 %	17.7 %	5.5 %
Gas-MW-3	June 10	1135	0.0 %	21.0 %	2.5 %
Gas-MW-4	June 10	1238	0.0 %	20.9 %	0.8 %
Gas-MW-5	June 10	1313	0.0 %	21.6 %	1.5 %
Gas-MW-6	June 10	1244	0.0 %	21.0 %	2.0 %
Gas-MW-7	June 10	1225	0.0%		1.9
Gas-MW-8	June 10	1221	0.0 %	20.9 %	1.4%
Gas-MW-9	June 10	1142	0.3 %	21.1 %	5.4%
Gas-MW-10	June 10	1209	0.3 %	21.0 %	18.8%
Gas-MW-11	June 10	1115	0.0 %	20.9 %	1.3%
Gas-MW-12	June 10	1112	0.1 %	21.6 %	8.6%
Gas-MW-13	June 10	1109	23.4 %	21.0 %	22.4%
Bldg 0-3533	June 10	--	N/A	N/A	N/A
Workshop	June 10	1132	0.0	20.0	0.0
Equipment Shed	June 10	--	N/A	N/A	N/A
Office	June 10	1130	0.0	19.9	0.0
Gear House	June 10	1125	0.0	20.0	0.0
Trailer	June 10	--	N/A	N/A	N/A

Note:

TOC – Top of casing, btoc – Below top of casing, NA – Not Available
bgs – Below ground surface, amsl – Above mean sea level
Δ --- Selected Well for Long Term Monitoring
TOC elevation is based on vertical datum NGVD29 (source: USGS RFI, Aug. 1999)
* Erroneous reading not reported in table.

**Table 2. Groundwater Elevation Data
Lamont Landfills, Fort Bragg, NC**

Well ID	TOC Elev. (ft. amsl)	11/06		5/07to 6/07		11/07		11/08		06/09		11/09		11/09		06/10	
		Water Level (ft. btoc)	Water Elev. (ft. amsl)	Water Level (ft. btoc)	Water Elev. (ft. amsl)	Water Level (ft. btoc)	Water Elev. (ft. amsl)	Water Level (ft. btoc)	Water Elev. (ft. amsl)	Water Level (ft. btoc)	Water Elev. (ft. amsl)	Water Level (ft. btoc)	Water Elev. (ft. amsl)	Water Level (ft. btoc)	Water Elev. (ft. amsl)	Water Level (ft. btoc)	Water Elev. (ft. amsl)
LMW-3	408.32	102.95	305.37	101.3	307.02	102.18	306.14	103.2	305.12	102.21	306.11	87.27	321.05	102.13	306.19		
LMW-3s	*	NA	NA	58.1	NA	59.19	NA	60.4	NA	59.12	NA	59.61	NA	58.91	NA		
LMW-4	441.79	75.12	366.67	74.71	367.08	75.42	366.37	74.65	367.14	74.74	367.05	75.39	366.4	74.83	366.96		
LMW-6	431.45	81.25	350.2	79.12	352.33	80.3	351.15	81.65	349.8	80.15	351.3	80.75	350.7	80.04	351.41		
LMW-7	436.62	125.86	310.76	125.42	311.2	125.87	310.75	125.63	310.99	124.78	311.84	128.8	307.82	124.54	312.08		
LMW-8	354.07	47.08	306.99	45.48	308.59	48.68	305.39	76.66	277.41	46.85	307.22	304.86	49.21	46.86	307.21		
LMW-9	364.79	83.15	281.64	84.71	280.08	82.16	282.63	80	284.79	80.71	284.08	87.27	277.52	80.73	284.06		
LMW-9s	*	NA	NA	49.46	NA	52.46	NA	49.01	NA	51.01	NA	53.35	NA	51	NA		
LMW-9d	*	NA	NA	74.51	NA	76.95	NA	76.66	NA	75.41	NA	77.03	NA	75.48	NA		
LMW-10	428.68	76.22	352.46	75.13	353.55	76.81	351.87	76.48	352.2	76.38	352.3	72.11	356.57	NA	NA		
LMW-14R	*	NA	NA	48.82	NA	50.07	NA	49	NA	48.97	NA	50.06	NA	48.99	NA		
LMW-15R	*	NA	NA	37.85	NA	40.89	NA	37	NA	37.55	NA	40.31	NA	38.19	NA		
LMW-16	*	NA	NA	37.2	NA	86.02	NA	36.48	NA	37.5	NA	37.28	NA	36.61	NA		

Note:

TOC – Top of casing,
 btoc – Below ground surface,
 amsl – Above mean sea level,
 * -- Selected Well for Long Term Monitoring

btoc – Below top of casing, NA – Not Available
 amsl – Above mean sea level NS – Not Surveyed
 *Well & ground-water elevations unavailable at this time.

TOC elevation is based on vertical datum NGVD29 (source: USGS RFI, Aug. 1999)

**Table 3. Field Parameter Measurements
Lamont Landfills, Fort Bragg, NC**

Well ID	Sample Identification	pH	Specific Conductivity (µs/cm)	Temperature (°C)	Turbidity (N.T.U.)	Dissolved Oxygen (mg/L)	ORP
LMW-3	GW-LMW-3-06-10	4.05	0.014	19.7	1.95	5.9	112.4
LMW-3s	GW-LMW-3s-06-10	4.49	0.025	19.6	5.6	3.6	106.8
LMW-4	GW-LMW-4-06-10	3.85	0.021	25.6	9.59	2.54	74.8
LMW-6	GW-LMW-6-06-10	4.74	0.318	19.3	9.74	0.86	5.5
LMW-7	GW-LMW-7-06-10	5.34	0.015	27.7	22.7	6.81	56.6
LMW-8	GW-LMW-8-06-10	6.07	0.259	18.8	6.69	0.71	17.6
LMW-9	GW-LMW-9-06-10	3.97	0.013	20.2	10	8.52	194.1
LMW-9s	GW-LMW-9s-06-10	5.78	0.187	20.2	40.0	0.19	15.2
LMW-9d	GW-LMW-9d-06-10	5.47	0.022	21.1	24.3	7.89	100.7
LMW-10	GW-LMW-10-06-10	3.71	0.025	27.8	7.12	5.14	107.2
LMW-14R	GW-LMW-14R-06-10	3.83	0.013	24.9	6.10	5.4	132.4
LMW-15R	GW-LMW-15R-06-10	3.82	0.035	21.9	10.0	7.54	132
LMW-16	GW-LMW-16-06-10	6.29	0.246	24	9.57	3.12	52.7

Note: N.T.U. --- Nephelometric Turbidity Unit; ORP --- Oxidation Reduction Potential

#Monitoring Wells Permanently Abandoned

*High turbidity has been a continuing problem with this well.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 6/15/2010 TIME: 1310
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, chilly

Location: Lamont Landfill Sample ID: GW-LMW-10-06-10

PRESERVATIVE: HCL, HNO3, H2SO4, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 60 (minutes) Purge time: 1210
Amount Purged= 5.5 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1229	1241	1250	1300	1305
pH	3.46	3.69	3.65	3.57	3.71
Sp. Cond	.025	.025	.025	.025	.025
Temp. °C	27	27.4	27.1	27.6	27.8
Turbidity	71.9	23.9	18.4	11.4	7.12
DO	5.61	4.75	5.19	5.34	5.14
ORP	111.7	103.4	106.9	105.1	107.2
Water Level					

5.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/14/2010 TIME: 1125
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-14R-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 57.14 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 50.04 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × 48.99) 1.2 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 35 (minutes) Purge time: 1125
Amount Purged= 2.0 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1105	1115	1120			
pH	4.04	3.78	3.83			
Sp. Cond	.013	.013	.013			
Temp. °C	24.8	25.0	24.9			
Turbidity	18.1	7.53	6.10			
DO	5.46	5.57	5.40			
ORP	111.4	128.9	132.4			
Water Level						

5.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/14/2010 TIME: 1030
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, chilly

Location: Lamont Landfill Sample ID: GW-LMW-15R-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. WATER LEVEL DATA

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. WELL EVACUATION DATA

Well Depth (wd): 46.60 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 38.19 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.4 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 65 (minutes) Purge time: 830
Amount Purged = 5.0 (gallons) Pump depth:

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0940	1000	1010	1025		
pH	3.91	3.87	3.80	3.82		
Sp. Cond	.034	.035	.035	.035		
Temp. °C	20.7	21.8	21.9	21.9		
Turbidity	57.2	21.6	16.6	10.0		
DO	7.78	7.32	7.53	7.54		
ORP	117.7	126.0	129.1	132.0		
Water Level						

5.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
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GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/14/2010 TIME: 1425
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-16-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 44.02 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 36.61 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 1.2 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 155 (minutes) Purge time: 1155
Amount Purged = 4.0 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1215	1230	1300	1320	1400	1420
pH	4.66	5.76	6.00	6.17	6.26	6.27
Sp. Cond	.234	2.38	.244	.244	.244	.246
Temp. °C	20.6	21.9	22.9	22.9	23.1	24.0
Turbidity	129	64	58	38.5	34.7	9.57
DO	.93	1.55	3.06	2.97	3.00	3.12
ORP	50.2	28	46.2	47.9	48.8	52.3
Water Level						

5. Changed nitrogen cylinder



**U.S. ARMY CORPS OF ENGINEERS
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GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/14/2010 TIME: 1005
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, Warm

Location: Lamont Landfill Sample ID: GW-LMW-3-06-10

PRESERVATIVE: HCL, HNO3, H2SO4, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Amount Purged= 5.0 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0820	0840	0850			
pH	4.52	4.32	4.05			
Sp. Cond	.015	.014	.014			
Temp. °C	19.8	19.7	19.7			
Turbidity	5.15	2.30	1.95			
DO	6.41	6.19	5.90			
ORP	97.8	108.5	112.4			
Water Level						

5. LMW-Dup1 taken at 1000



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

**GROUND WATER
FIELD DATA LOG**

1. CLIENT: Ft. Bragg, NC
DATE: 06/14/2010 TIME: 0758
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-3s-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 70.53 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 58.91 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.9 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 108 (minutes) Purge time: 1340
Amount Purged= 7.5 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1418	1430	1450	1525	1555	0745
pH	3.85	2.76	2.76	2.68	2.58	4.49
Sp. Cond	.038	.034	.031	.027	.026	.025
Temp. °C	27.1	28.8	27.8	26.2	29.6	19.6
Turbidity	406	336	165	67.7	47.2	5.60
DO	3.72	2.78	2.85	2.94	2.87	3.60
ORP	201.6	198.1	203.9	212.9	231.1	106.8
Water Level						

5.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/15/2010 TIME: 0957
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-4-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 83.51 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 74.83 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 1.4 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 150 (minutes) Purge time: 727
Amount Purged = 8.5 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0803	0818	0835	0847	0933	0955
pH	2.84	3.57	3.30	3.58	3.72	3.85
Sp. Cond	0.022	.022	.022	.022	.022	.021
Temp. °C	21.1	22.0	21.7	22.4	23.7	25.6
Turbidity	28.8	22.3	14.6	29.5	25.1	9.59
DO	3.61	3.85	3.83	3.85	3.72	2.54
ORP	93.1	83.4	95.5	87.1	84.7	74.8
Water Level						

5.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/17/2010 TIME: 1030
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-6-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates

OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump

LOW FLOW: XYES NO

SAMPLES FILTERED: YES NO

DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:

METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 96.13 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 80.04 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 2.6 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 70 (minutes) Purge time: 920
Amount Purged = 6.0 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0945	1000	1015	1025		
pH	4.71	4.73	4.71	4.74		
Sp. Cond	.306	.313	.315	.318		
Temp. °C	19.7	19.7	19.5	19.3		
Turbidity	31.2	15.0	11.0	9.74		
DO	.52	.96	.87	.86		
ORP	26.0	19.6	10.4	5.5		
Water Level						

5.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/15/2010 TIME:
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-7-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 131.38 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 124.54 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 0 (minutes) Purge time: 1030
Amount Purged = 0.0 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1052	1112	1127			
pH	4.92	5.34	Dry			
Sp. Cond	.015	.015	Dry			
Temp. °C	24.0	27.7	Dry			
Turbidity	30.8	22.7	Dry			
DO	7.42	6.81	Dry			
ORP	72.1	56.6	dry			
Water Level						

5. Well went dry, got approx 1 liter with sand. PM was notified, samples not taken!



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/17/2010 TIME: 0820
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, chilly

Location: Lamont Landfill Sample ID: GW-LMW-8-6-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 62.70 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 46.86 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 2.6 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 65 (minutes) Purge time: 820
Amount Purged= 7.5 (gallons) Pump depth:

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0730	0745	0755	0805	0815
pH	6.44	5.45	5.91	6.01	6.07
Sp. Cond	.146	.203	.239	.249	.259
Temp. °C	19.2	18.7	18.9	18.7	18.8
Turbidity	15.3	13.1	9.70	6.26	6.69
DO	4.39	1.22	1.02	.89	.71
ORP	55.4	51.2	24.8	22.1	17.6
Water Level					

5.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/15/2010 TIME: 1300
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunnywarm

Location: Lamont Landfill Sample ID: GW-LMW-9-06-10

PRESERVATIVE: HCL, HNO₃, H₂SO₄, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. WATER LEVEL DATA

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. WELL EVACUATION DATA

Well Depth (wd): 137.35 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 87.27 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × 80.73) 8.2 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 60 (minutes) Purge time: 1200
Amount Purged= 5.5 (gallons) Pump depth:

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED
pH Meter – YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter – YSI 556	<input checked="" type="checkbox"/>
Temperature – YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter – Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter – YSI 556	<input checked="" type="checkbox"/>
ORP Meter – YSI 556	<input checked="" type="checkbox"/>
CO ₂ – Hach Digital Titrator	<input type="checkbox"/>

Time	1210	1215	1230	1250		
pH	5.46	4.39	4.14	3.97		
Sp. Cond	.013	.013	.013	.013		
Temp. °C	10.3	20.4	20.2	20.2		
Turbidity	19.4	14.1	15.1	10.0		
DO	8.50	8.49	9.21	8.52		
ORP	168.8	179.9	185.4	194.1		
Water Level						

5. LMW-DUP2-6-10 taken @ 1100



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/16/2010 TIME: 1640
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-9d-06-10

PRESERVATIVE: HCL, HNO3, H2SO4, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. WATER LEVEL DATA

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. WELL EVACUATION DATA

Well Depth (wd): 88.17 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 75.48 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 2.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 80 (minutes) Purge time: 1520
Amount Purged = 10.5 (gallons) Pump depth:

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1540	1555	1610	1630	1635
pH	6.51	5.37	5.52	5.48	5.47
Sp. Cond	.043	.030	.024	.023	.022
Temp. °C	21.1	20.9	20.8	20.9	21.1
Turbidity	21.0	33.0	34.0	26.6	24.3
DO	7.69	7.79	7.46	8.06	7.89
ORP	78.5	168.2	115.9	106.9	100.7
Water Level					

5. Purged 5x volume



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft. Bragg, NC
DATE: 06/16/2010 TIME: 1435
SAMPLED BY: Louis and Jackson
WEATHER CONDITIONS: Sunny, warm

Location: Lamont Landfill Sample ID: GW-LMW-9s-06-10

PRESERVATIVE: HCL, HNO3, H2SO4, ICE
ANALYSES REQUESTED: VOC 8260, Appendix I Metals, Nitrates
OF CONTAINERS: 5

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: XYES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. WATER LEVEL DATA

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. WELL EVACUATION DATA

Well Depth (wd): 60.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 53.35 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: 0.80 (gallons)
Length of Time Purged: 52 (minutes) Purge time: 830
Amount Purged = 3.5 (gallons) Pump depth:

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED
pH Meter - YSI 556	<input checked="" type="checkbox"/>
Conductivity Meter - YSI 556	<input checked="" type="checkbox"/>
Temperature - YSI 556	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - YSI 556	<input checked="" type="checkbox"/>
ORP Meter - YSI 556	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1340	1355	1410	1430		
pH	5.74	5.83	5.84	5.78		
Sp. Cond	.234	.192	.19	.187		
Temp. °C	20.6	20.4	20.3	20.2		
Turbidity	34.8	77.5	50.4	40.0		
DO	.60	.56	.38	.19		
ORP	50.2	32.2	23.7	15.2		
Water Level						

5. More than five times volume sampled

QA LEVEL II - DATA EVALUATION CHECKLIST

Col Name: USACE Project Manager: Z. Kidwai
 Project Name: LAMONT LANDFILL Project Number: _____
 Reviewer: F. Burwell Validation Date: 07-SEPT-2010
 Laboratory: TEST AMERICA SDG #: 680-58599-1
 Analytical Method (type and no.): 8260 B, 6020A, 7470A, EPA 300
 Matrix: Air Soil/Sed. Water Waste
 Sample Names:
LMW-4-6-10
Trip Blank
LMW-10-6-10

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab sample indicated on COC</u>
b) Sampling team indicated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>pH, Conductivity, Temperature</u>
e) Sample type indicated (grab/composite)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>dissolved Oxygen, ORP, Turbidity</u>
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Note Deficiencies: _____				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
k) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
l) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
m) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

General (Reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Sample dilutions done on 3000 method for Method Blank</u>
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were the correct preservatives used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Lab Control Sample + Matrix Spike</u>
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Were appropriate reporting limits achieved?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Blanks	YES	NO	NA	COMMENTS
Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>4/2</i> Chromium 0.21 J / Copper 0.219 J <i>4/2</i>
Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper compounds included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Blind Standards	YES	NO	NA	COMMENTS
Was a blind standard used (indicate name, compounds included and concentrations)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Was MSD accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Reagent Water Spike and Duplicate (RWS & RWSD)	YES	NO	NA	COMMENTS
a) Was RWS accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was RWSD accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Was RWS/RWSD precision criteria met (RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Surrogate Spikes	YES	NO	NA	COMMENTS
a) Were surrogate recoveries within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> FB	
Were surrogate recoveries not calculated due to dilutions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> FB	

QA LEVEL II - DATA EVALUATION CHECKLIST

Company Name: USACE Project Manager: Z. Kidwai
 Project Name: LAMONT LANDFILL Project Number: _____
 Reviewer: F. Burwell Validation Date: 07-SEPT-2010
 Laboratory: TEST AMERICA SDG #: 680-58695-1
 Analytical Method (type and no.): 8260B, 6020A, 7470A, EPA 300.0
 Matrix: Air Soil/Sed. Water Waste _____
 Sample Names: LMW-8-6-10, LMW-6-6-10, LMW-Bik-6-10
Trip Blank

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab sample indicated
b) Sampling team indicated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	on COC COC
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	pH, conductivity, Temperat
e) Sample type indicated (grab/composite)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	dissolved oxygen, ORP,
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Turbidity
Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Note Deficiencies:	_____			

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
k) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
l) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
m) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

General (Reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-Dilution for Method 300.0
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-Dilution for Method Blank,
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LAB Control Sample, + Matrix Spik.
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were appropriate reporting limits achieved?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Blanks	YES	NO	NA	COMMENTS
Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Total Xylenes 0.235 ug/L
Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper compounds included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Blind Standards	YES	NO	NA	COMMENTS
Was a blind standard used (indicate name, compounds included and concentrations)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Was MSD accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were MS/MSD precision criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Reagent Water Spike and Duplicate (RWS & RWSD)	YES	NO	NA	COMMENTS
a) Was RWS accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was RWSD accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Was RWS/RWSD precision criteria met (RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Surrogate Spikes	YES	NO	NA	COMMENTS
a) Were surrogate recoveries within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> FB	
Were surrogate recoveries not calculated due to dilutions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> FB	

QA LEVEL II - DATA EVALUATION CHECKLIST

Company Name: USACE
 Project Name: LAWMONT LANDFILL
 Reviewer: F. Burwell
 Laboratory: TEST AMERICA
 Analytical Method (type and no.): 8260B, 6020A, 7470A, E 300
 Matrix: Air Soil/Sed. Water Waste
 Sample Names: LMW-35-6-10, Trip Blank, LMW-DUP-1-6-10, LMW-3-6-10, LMW-15R-6-10, LMW-14R-6-10, LMW-16-6-10

Project Manager: Z. Kidzuki
 Project Number: _____
 Validation Date: 22-SEPT-2010
 SDG #: 680-58549-1

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab samples indicated on COC</u>
b) Sampling team indicated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, conductivity, Temperature, dissolved oxygen, ORP, Turbidity</u>
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Note Deficiencies:	_____			

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
k) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
l) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
m) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

General (Reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Dilution for Nitrate 5x</u>
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Blanks

- a) Were analytes detected in the method blank(s)? YES NO NA
- b) Were analytes detected in the field blank(s)? YES NO NA
- c) Were analytes detected in the equipment blank(s)? YES NO NA
- d) Were analytes detected in the trip blank(s)? YES NO NA

COMMENTS

Laboratory Control Sample (LCS)

- a) Was a LCS analyzed once per SDG? YES NO NA
- b) Were the proper compounds included in the LCS? YES NO NA
- c) Was the LCS accuracy criteria met? YES NO NA

COMMENTS

Duplicates

- a) Were field duplicates collected (note original and duplicate sample names)? YES NO NA
- b) Were field dup. precision criteria met (note RPD)? YES NO NA
- c) Were lab duplicates analyzed (note original and duplicate samples)? YES NO NA
- d) Were lab dup. precision criteria met (note RPD)? YES NO NA

COMMENTS

LMW-DUPI-6-10 taken
at LMW-3

Blind Standards

- a) Was a blind standard used (indicate name, compounds included and concentrations)? YES NO NA
- b) Was the %D within control limits? YES NO NA

COMMENTS

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

- a) Was MS accuracy criteria met? YES NO NA
- b) Recovery could not be calculated since sample contained high concentration of analyte? YES NO NA
- c) Was MSD accuracy criteria met? YES NO NA
Recovery could not be calculated since sample contained high concentration of analyte?
- d) Were MS/MSD precision criteria met? YES NO NA

COMMENTS

Reagent Water Spike and Duplicate (RWS & RWSD)

- a) Was RWS accuracy criteria met? YES NO NA
- b) Was RWSD accuracy criteria met? YES NO NA
- c) Was RWS/RWSD precision criteria met (RPD)? YES NO NA

COMMENTS

Surrogate Spikes

- a) Were surrogate recoveries within control limits? YES NO NA
- b) Were surrogate recoveries not calculated due to dilutions? YES NO NA

COMMENTS

QA LEVEL II - DATA EVALUATION CHECKLIST

Company Name: USACE Project Manager: Z. Kidwa
 Project Name: LAMONT LANDFILL Project Number: _____
 Reviewer: F. Burwell Validation Date: 7-Sept-2010
 Laboratory: TEST AMERICA SDG #: 680-58643
 Analytical Method (type and no.): 8260B, 6020A, 7470A, EPA 300
 Matrix: Air Soil/Sed. Water Waste _____
 Sample Names: LMW-9-6-10, LMW-9S-6-10, LMW-9D-6-10
Trip Blank, LMW-DUP-2-6-10

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab sample indicated</u>
b) Sampling team indicated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>on COC</u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>pH, Conductivity, Temperature,</u>
e) Sample type indicated (grab/composite)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>dissolved Oxygen ORP</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Turbidity</u>
Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Note Deficiencies:	_____			

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
k) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
l) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
m) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

General (Reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Dilution for method 300,00 5x</u>
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>(Aspirate)</u>
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Blanks	YES	NO	NA	COMMENTS
Were analytes detected in the method blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dup 2 taken at LMW-9-6-10

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper compounds included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Blind Standards	YES	NO	NA	COMMENTS
Was a blind standard used (indicate name, compounds included and concentrations)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
c) Was MSD accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Recovery could not be calculated since sample contained high concentration of analyte?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
d) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Reagent Water Spike and Duplicate (RWS & RWSD)	YES	NO	NA	COMMENTS
a) Was RWS accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was RWSD accuracy criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Was RWS/RWSD precision criteria met (RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Surrogate Spikes	YES	NO	NA	COMMENTS
a) Were surrogate recoveries within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were surrogate recoveries not calculated due to dilutions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

