

**C-404 Hazardous Waste Landfill  
November 2014 Semiannual  
Groundwater Report  
(April 2014–September 2014),  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

This document is approved for public release per review by:

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LATA Kentucky Classification Support

11-25-14  
Date



**PAD-ENM-0091/V2**

**C-404 Hazardous Waste Landfill  
November 2014 Semiannual  
Groundwater Report,  
(April 2014–September 2014)  
Paducah Gaseous Diffusion Plant,  
Paducah, Kentucky**

Date Issued—November 2014

Prepared for the  
U.S. Department of Energy  
Office of Environmental Management

Prepared by  
LATA ENVIRONMENTAL SERVICES OF KENTUCKY, LLC  
managing the  
Environmental Remediation Activities at the  
Paducah Gaseous Diffusion Plant  
under contract DE-AC30-10CC40020

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## ACRONYMS

AKGWA	Assembled Kentucky Groundwater Database
ANOVA	Analysis of Variance
KDWM	Kentucky Division of Waste Management
LOD	level of detection
MW	monitoring well
PGDP	Paducah Gaseous Diffusion Plant
RCRA	Resource Conservation and Recovery Act
RGA	Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer

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## EXECUTIVE SUMMARY

This report, *C-404 Hazardous Waste Landfill November 2014 Semiannual Groundwater Report (April 2014–September 2014)*, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, PAD-ENM-0091/V2, is being submitted by the U.S. Department of Energy in accordance with requirements in the Kentucky Division of Waste Management Hazardous Waste Facility Permit, KY8-890-008-982. The reporting period covers April 2014 through September 2014 and includes analytical data from the July 2014 sampling of monitoring wells located in the vicinity of the closed C-404 Hazardous Waste Landfill (C-404 Landfill). In 1986, disposal of waste at C-404 Landfill was halted, and a portion of the disposed waste was found to be Resource Conservation and Recovery Act (RCRA) hazardous. The landfill was covered with a RCRA multilayered cap and certified closed in 1987.

The groundwater monitoring results were subjected to statistical analyses, in accordance with the Hazardous Waste Facility Permit. There is no statistically significant evidence of contamination from the C-404 Landfill because concentrations in the compliance wells are not statistically different from the concentrations in background wells.

The annual leachate sump integrity test was performed from September 2014 to October 2014 and is included in Appendix C of this report. On April 24, 2014, the leachate level was measured at 36.4 inches and 1,200 gal was removed on May 7, 2014. The leachate level was 3 inches after removal on May 7, 2014.

Leachate levels, removal information, and sample data from the previous semiannual report are provided in this report because the laboratory data were not available by the regulatory deadline of the previous report.

Minor maintenance was performed on monitoring wells 90A, 93A, and 333. The well casings were painted and their identifying numbers were stenciled. Protective sleeves also were installed on the bollards.

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# 1. INTRODUCTION

This report contains the statistical evaluation of data from groundwater sampling and analysis for the C-404 Hazardous Waste Landfill (C-404 Landfill) at the Paducah Gaseous Diffusion Plant (PGDP), Paducah, Kentucky. This semiannual report is required by the Kentucky Division of Waste Management (KDWM) Hazardous Waste Facility Permit, KY8-890-008-982 (the permit), GSTR2 Part II, Condition T-47—Detection Monitoring Program—Recordkeeping, Reporting, and Response. The period covered by this report is April 2014 through September 2014.

Groundwater analytical results are provided in Appendix A. The statistical analyses and qualification statement are provided in Appendix B. Landfill leachate information, analytical data, and annual sump integrity test are provided in Appendix C. The groundwater flow direction determination is provided in Appendix D.

## 1.1 BACKGROUND

The C-404 Landfill is located in the west-central portion of the PGDP secured area. The 1.2-acre facility operated as a surface impoundment from approximately 1952 until early 1957. During this time, influents to the impoundment originated from the C-400 Cleaning Building. In 1957, the impoundment was converted to a solid waste disposal facility for solid uranium-contaminated wastes. When the impoundment was converted into a disposal facility, a sump was installed at the former weir to collect the leachate from the facility. Leachate is pumped from the sump and treated as needed.

In 1986, the disposal of waste at C-404 Landfill was halted, and a portion of the disposed waste was found to be Resource Conservation and Recovery Act (RCRA)-hazardous. The landfill was covered with a RCRA multilayered cap and certified closed in 1987. It currently is regulated under RCRA as a land disposal unit and compliance is monitored under a RCRA postclosure permit issued in 1992.

Previous groundwater monitoring documented that concentrations in compliance wells were statistically different from background wells for trichloroethene (TCE). The *C-404 Landfill Source Demonstration, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (PRS 2007), documented that the source of the differences from background concentrations in compliance wells is not from the C-404 Landfill, but rather, the source is located upgradient/cross-gradient of the C-404 Landfill.

## 1.2 MONITORING PERIOD ACTIVITIES

### 1.2.1 Groundwater Monitoring

Groundwater sampling was conducted in July 2014 using LATA Environmental Services of Kentucky, LLC, procedure PAD-ENM-2101, *Groundwater Sampling*. Appropriate sample containers and preservatives were used. The laboratories that performed analyses used U.S. Environmental Protection Agency-approved methods, as applicable. There are nine monitoring wells (MWs) sampled under this permit for the C-404 Landfill: four Upper Continental Recharge System (UCRS) wells and five Upper Regional Gravel Aquifer (URGA) wells. Table 1 presents the well numbers for URGA wells located upgradient and downgradient of the C-404 Landfill. Table 1 also presents the well numbers for

**Table 1. Monitoring Well Locations**

<b>UCRS</b>	
Located south of C-404, adjacent to upgradient Regional Gravel Aquifer (RGA) background well MW93	MW94
Located north of C-404, adjacent to downgradient RGA compliance wells	MW85, MW88, MW91
<b>URGA</b>	
Upgradient background wells	MW93, MW420
Downgradient compliance wells	MW84, MW87, MW90A*

\*MW90 was abandoned in 2001 and replaced with MW90A.

the UCRS wells located in proximity to the URGA wells. This table refers to these UCRS wells as being adjacent to an “upgradient” or “downgradient” URGA well location, identified relative to the URGA groundwater flow direction (see Figure 1).

The conceptual model for the site demonstrates that groundwater in the UCRS wells flows vertically until it reaches the URGA; therefore, UCRS wells are not considered “upgradient” or “downgradient” of other wells in the area.

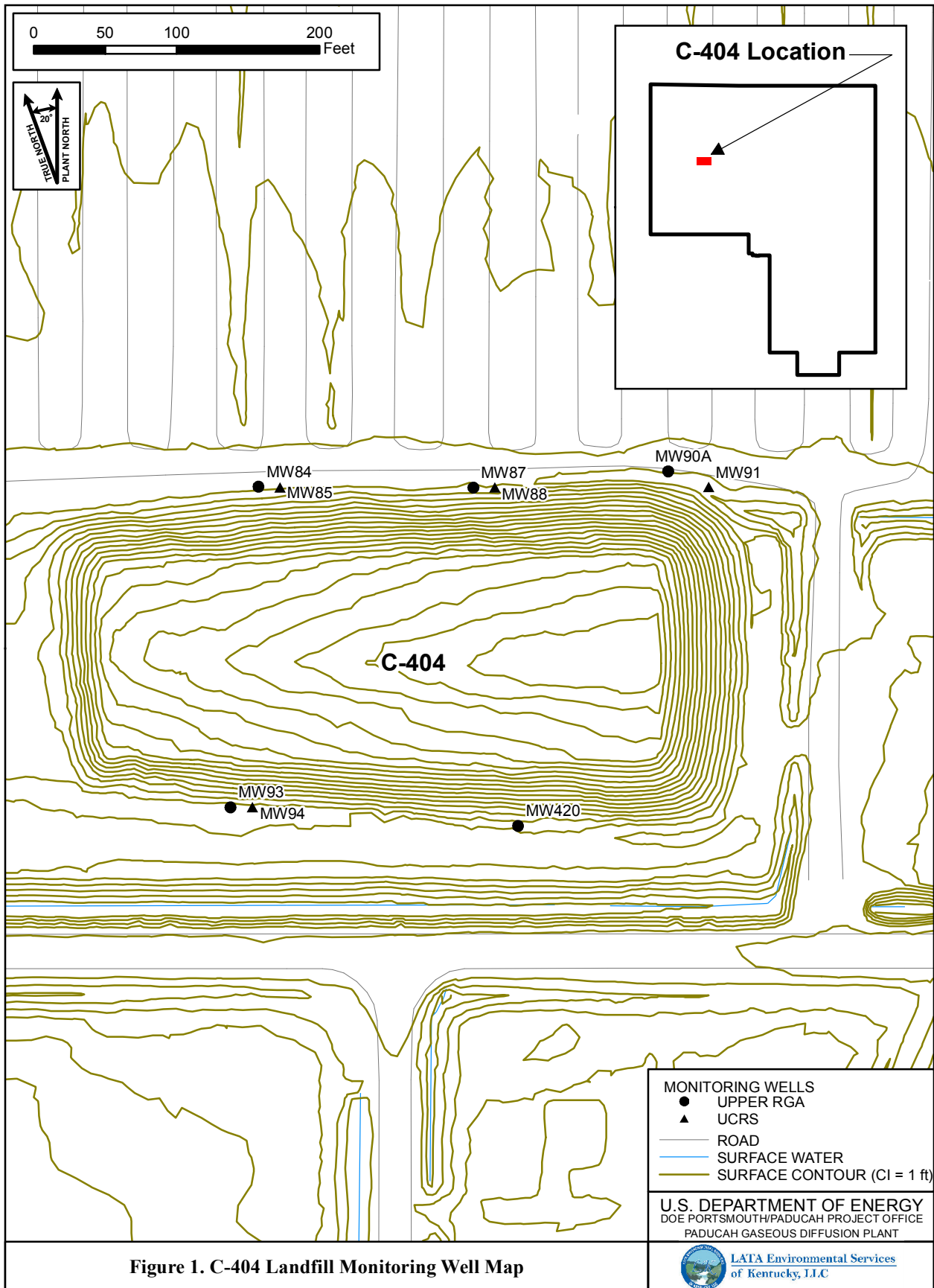
Table 2 presents the Assembled Kentucky Groundwater Database (AKGWA) numbers for each MW. A map of the MW locations is provided in Figure 1. All of the MWs listed in Tables 1 and 2 were sampled during this reporting period, and the samples were analyzed for the required parameters.

**Table 2. Assembled Kentucky Groundwater Database Numbers**

<b>PGDP Well Number</b>	<b>AKGWA Number</b>
MW84	8000-5233
MW85	8000-5234
MW87	8000-5236
MW88	8000-5237
MW90A	8004-0357
MW91	8000-5240
MW93	8000-5102
MW94	8000-5103
MW420	8005-3263

Appendix A of this report contains the analytical results from the wells that were sampled during the July 2014 semiannual sampling event. The parameters specified in Hazardous Waste Facility Permit, Attachment E, Groundwater Monitoring, were analyzed for all locations sampled. Appendix B of this report contains the statistical analyses. Appendix C of this report contains analytical results from leachate sampling, as well as the C-404 general inspection records, and the monthly leachate depths in the C-404 sump for this reporting period. The annual leachate sump integrity test was performed from September 2014 to October 2014 and is included in Appendix C of this report.

Per Permit Condition GSTR2, T-37, the groundwater flow rate and direction are evaluated annually and reported in the November report. For this November report, a potentiometric map has been included in Appendix D using data from sampling performed in January as supplemental information. Depth-to-water was measured on January 30 and July 30 and 31, 2014, from several wells at the perimeter of the



**Figure 1. C-404 Landfill Monitoring Well Map**

G:\GIS\ARCVIEWS\PROJECTS\C404R3.mxd  
11/4/2013

C-404 Landfill (see Table D.3). Water level measurements in 11 vicinity well locations define the potentiometric surface for the URGA (see Table D.3). Groundwater flow direction beneath the C-404 Landfill generally trends northward, but commonly varies from northeast to northwest.

### **1.2.2 Landfill Leachate**

The C-404 General Inspection Records and the Monthly and Quarterly Landfill Inspection Results are included in Appendix C. In accordance with the Hazardous Waste Facility Permit, the quantity of liquid in the leachate collection system is monitored (at least monthly) and, at a minimum, will be “removed when the quantity exceeds three ft in depth.” The monthly leachate depths in the C-404 sump recorded for this reporting period are included in Appendix C.

The volume of leachate removed from the sump during this reporting period, April–September 2014, was 1,200 gal. Once the leachate depth reached 3 ft, the leachate was sampled and pumped into a mobile tank. Then, the leachate was transferred to a permitted hazardous waste storage facility on-site prior to characterization and transfer off-site for treatment.

Leachate levels, removal information, and sample data from the previous semiannual report are provided in this report because the laboratory data were not available by the regulatory deadline of the previous report. Analytical results from leachate sampling conducted for this removal event (June 2014), which was conducted in association with leachate removal during the period, are included in Appendix C.

Per Permit Attachment I, a leachate sump integrity test is conducted annually at C-404. The test is a measure of water elevations monitored over a one-month period during the year, and reported in this semiannual report. The leachate level was monitored using an automated system at hourly intervals from 8:00 a.m. on September 15, 2014, through 8:00 a.m. on October 16, 2014. The printout of the data is provided in Appendix C. The test shows the leachate level was constant (within 0.01 ft) over the monitoring period; the measurement shows no evidence of leaking.

### **1.2.3 Maintenance**

Minor maintenance was performed on monitoring wells 90A, 93A, and 333. The well casings were painted and their identifying numbers were stenciled. Protective sleeves also were installed on the bollards.



## 2. STATISTICAL SYNOPSIS

The statistical analyses conducted on the data collected from C-404 Landfill were performed in accordance with procedures in the approved Hazardous Waste Facility Permit, Attachment Part E. Appendix B of this report contains the statistical analyses performed for this reporting period. Data utilized for statistical analyses included data from the URGA background wells, MW93 and MW420, and URGA compliance wells, MW84, MW87, and MW90A. For these statistical analyses, the reporting period data set includes data from January 2012, July 2012, January 2013, August 2013, January 2014, and July 2014.

The Statistical Test 1, Level of Detection (LOD), was performed for 7 of the 13 parameters (cadmium, mercury, selenium, uranium, urapagenium-234, uranium-235, and uranium-238) that are infrequently detected [and have more than 90% censored (nondetect) results]. LOD values are presented in Appendix B. The Statistical Test 2, Test of Proportions, was performed for 4 of the 13 parameters [arsenic (dissolved), chromium, lead, and Tc-99] that have between 50% and 90% censored results. The Statistical Test 3, nonparametric Analysis of Variance (ANOVA), was performed for arsenic and TCE. The Statistical Test 4, parametric ANOVA, was found not to be appropriate for the TCE data set because equality of variance could not be established.

The statistical tests on all parameters showed no statistically significant evidence of contamination from the C-404 Landfill.

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### **3. DATA VALIDATION AND QA/QC SUMMARY**

The data and the data validation qualifiers for the July 2014 data set are provided in Appendix A. All data for this data set were considered useable as reported.

Data validation was performed on the organic, inorganic, and radiochemical analytical data by an independent, third-party validator.

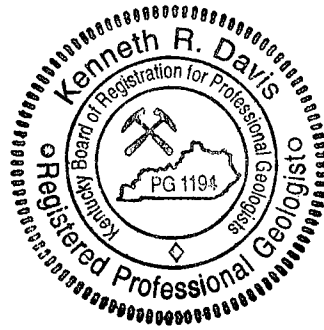
Field quality control samples are collected semiannually during each sampling event. Equipment rinseate blanks, field blanks, and trip blanks are obtained to ensure quality control and are reported in the Analytical Results in Appendix A. No contamination was detected in these samples. Laboratory quality control samples, such as matrix spikes, matrix spike duplicates, and method blanks, are performed by the laboratory and reported in the laboratory report. Both field and laboratory quality control sample results are reviewed as part of the data validation process.

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#### 4. PROFESSIONAL GEOLOGIST AUTHORIZATION

**DOCUMENT IDENTIFICATION:** *C-404 Hazardous Waste Landfill  
November 2014 Semiannual Groundwater Report  
(April 2014–September 2014),  
Paducah Gaseous Diffusion Plant, Paducah, Kentucky  
(PAD-ENM-0091/V2)*

Stamped and signed pursuant to my authority as a duly registered geologist under the provisions of *KRS* Chapter 322A.



*Kenneth R. Davis*  
Kenneth R. Davis

PG1194

*November 25, 2014*  
Date

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## **5. REFERENCE**

PRS (Paducah Remediation Services, LLC) 2007. *C-404 Landfill Source Demonstration, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, PRS-ENM-0031/R2, Paducah Remediation Services, LLC, Kevil, KY.

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**APPENDIX A**

**C-404 HAZARDOUS WASTE LANDFILL ANALYTICAL RESULTS**

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**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW84 REG      Downgradient      URGA      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5233

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic		0.0051	mg/L	7/22/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Barometric Pressure Reading		30.1	Inches/Hg	7/22/2014				X
Cadmium	U	0.001	mg/L	7/22/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/22/2014			SW846-6020	=
Chromium		0.331	mg/L	7/22/2014			SW846-6020	=
Chromium, Dissolved	J	0.0023	mg/L	7/22/2014			SW846-6020	U
Conductivity		334	umho/cm	7/22/2014				X
Depth to Water		48.59	ft	7/22/2014				X
Dissolved Oxygen		2.78	mg/L	7/22/2014				X
Lead	U	0.002	mg/L	7/22/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/22/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
pH		5.97	Std Unit	7/22/2014				X
Redox		328	mV	7/22/2014				X
Selenium	U	0.005	mg/L	7/22/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Technetium-99	U	13.5	pCi/L	7/22/2014	9.75	9.86	HASL 300, Tc-02-RC M	=
Temperature		67.3	deg F	7/22/2014				X
Trichloroethene		1270	ug/L	7/22/2014			SW846-8260B	=
Turbidity		39.3	NTU	7/22/2014				X
Uranium	J	0.0001	mg/L	7/22/2014			SW846-6020	=
Uranium-234	U	0.564	pCi/L	7/22/2014	1.3	1.3	HASL 300	=
Uranium-235	U	0.349	pCi/L	7/22/2014	1.31	1.31	HASL 300	=
Uranium-238	U	0.653	pCi/L	7/22/2014	1.28	1.29	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW85 REG      Downgradient      UCRS      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5234

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic		0.0060	mg/L	7/24/2014			SW846-6020	=
Arsenic, Dissolved	J	0.005	mg/L	7/24/2014			SW846-6020	U
Barometric Pressure Reading		30.07	Inches/Hg	7/24/2014				X
Cadmium	U	0.001	mg/L	7/24/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/24/2014			SW846-6020	=
Chromium	J	0.0047	mg/L	7/24/2014			SW846-6020	=
Chromium, Dissolved	J	0.005	mg/L	7/24/2014			SW846-6020	U
Conductivity		351	umho/cm	7/24/2014				X
Depth to Water		10.23	ft	7/24/2014				X
Dissolved Oxygen		3.36	mg/L	7/24/2014				X
Lead	U	0.002	mg/L	7/24/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/24/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/24/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/24/2014			SW846-7470A	=
pH		6.27	Std Unit	7/24/2014				X
Redox		372	mV	7/24/2014				X
Selenium	U	0.005	mg/L	7/24/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/24/2014			SW846-6020	=
Technetium-99		77.7	pCi/L	7/24/2014	11.3	14.2	HASL 300, Tc-02-RC M	J
Temperature		64.5	deg F	7/24/2014				X
Trichloroethene		1.17	ug/L	7/24/2014			SW846-8260B	UJ
Turbidity		2.6	NTU	7/24/2014				X
Uranium		0.0003	mg/L	7/24/2014			SW846-6020	=
Uranium-234	U	-0.396	pCi/L	7/24/2014	1.34	1.34	HASL 300	=
Uranium-235	U	0	pCi/L	7/24/2014	1.07	1.08	HASL 300	=
Uranium-238	U	-0.103	pCi/L	7/24/2014	0.891	0.894	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW85 FR      Downgradient      UCRS      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5234

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic		0.0062	mg/L	7/24/2014			SW846-6020	=
Arsenic, Dissolved	J	0.0046	mg/L	7/24/2014			SW846-6020	U
Barometric Pressure Reading		30.07	Inches/Hg	7/24/2014				X
Cadmium	U	0.001	mg/L	7/24/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/24/2014			SW846-6020	=
Chromium	J	0.0039	mg/L	7/24/2014			SW846-6020	=
Chromium, Dissolved	J	0.0067	mg/L	7/24/2014			SW846-6020	U
Conductivity		351	umho/cm	7/24/2014				X
Depth to Water		10.23	ft	7/24/2014				X
Dissolved Oxygen		3.36	mg/L	7/24/2014				X
Lead	U	0.002	mg/L	7/24/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/24/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/24/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/24/2014			SW846-7470A	=
pH		6.27	Std Unit	7/24/2014				X
Redox		372	mV	7/24/2014				X
Selenium	U	0.005	mg/L	7/24/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/24/2014			SW846-6020	=
Technetium-99		96.2	pCi/L	7/24/2014	12.3	16.3	HASL 300, Tc-02-RC M	J
Temperature		64.5	deg F	7/24/2014				X
Trichloroethene		2.79	ug/L	7/24/2014			SW846-8260B	J
Turbidity		2.6	NTU	7/24/2014				X
Uranium		0.0003	mg/L	7/24/2014			SW846-6020	=
Uranium-234	U	0.13	pCi/L	7/24/2014	1.35	1.36	HASL 300	=
Uranium-235	U	0.435	pCi/L	7/24/2014	1.63	1.63	HASL 300	=
Uranium-238	U	0.463	pCi/L	7/24/2014	1.3	1.3	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW87 REG      Downgradient      URGA      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5236

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic	J	0.0030	mg/L	7/22/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Barometric Pressure Reading		30.1	Inches/Hg	7/22/2014				X
Cadmium	U	0.001	mg/L	7/22/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/22/2014			SW846-6020	=
Chromium	J	0.0090	mg/L	7/22/2014			SW846-6020	=
Chromium, Dissolved	J	0.0021	mg/L	7/22/2014			SW846-6020	U
Conductivity		290	umho/cm	7/22/2014				X
Depth to Water		48.52	ft	7/22/2014				X
Dissolved Oxygen		2.43	mg/L	7/22/2014				X
Lead	U	0.002	mg/L	7/22/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/22/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
pH		6.11	Std Unit	7/22/2014				X
Redox		352	mV	7/22/2014				X
Selenium	U	0.005	mg/L	7/22/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Technetium-99	U	0.314	pCi/L	7/22/2014	9.65	9.65	HASL 300, Tc-02-RC M	=
Temperature		67.7	deg F	7/22/2014				X
Trichloroethene		1030	ug/L	7/22/2014			SW846-8260B	=
Turbidity		31.8	NTU	7/22/2014				X
Uranium	J	9E-05	mg/L	7/22/2014			SW846-6020	=
Uranium-234	U	0.918	pCi/L	7/22/2014	1.32	1.33	HASL 300	=
Uranium-235	U	0	pCi/L	7/22/2014	0.829	0.831	HASL 300	=
Uranium-238	U	0.838	pCi/L	7/22/2014	1.33	1.34	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW88 REG      Downgradient      UCRS      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5237

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic	U	0.005	mg/L	7/23/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/23/2014			SW846-6020	=
Barometric Pressure Reading		30.05	Inches/Hg	7/23/2014				X
Cadmium	U	0.001	mg/L	7/23/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/23/2014			SW846-6020	=
Chromium	J	0.0049	mg/L	7/23/2014			SW846-6020	=
Chromium, Dissolved	U	0.01	mg/L	7/23/2014			SW846-6020	=
Conductivity		588	umho/cm	7/23/2014				X
Depth to Water		9.8	ft	7/23/2014				X
Dissolved Oxygen		1.71	mg/L	7/23/2014				X
Lead	J	0.0011	mg/L	7/23/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/23/2014			SW846-6020	=
Mercury	J	7E-05	mg/L	7/23/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/23/2014			SW846-7470A	=
pH		5.86	Std Unit	7/23/2014				X
Redox		384	mV	7/23/2014				X
Selenium	U	0.005	mg/L	7/23/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/23/2014			SW846-6020	=
Technetium-99	U	16.3	pCi/L	7/23/2014	12.2	12.3	HASL 300, Tc-02-RC M	=
Temperature		69.7	deg F	7/23/2014				X
Trichloroethene		8.02	ug/L	7/23/2014			SW846-8260B	J
Turbidity		18.8	NTU	7/23/2014				X
Uranium	J	0.0001	mg/L	7/23/2014			SW846-6020	=
Uranium-234	U	-0.234	pCi/L	7/23/2014	1.04	1.04	HASL 300	=
Uranium-235	U	-0.145	pCi/L	7/23/2014	1.25	1.25	HASL 300	=
Uranium-238	U	0.0195	pCi/L	7/23/2014	1.45	1.45	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW90A REG      Downgradient      URGA      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8004-0357

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic	U	0.005	mg/L	7/22/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Barometric Pressure Reading		30.08	Inches/Hg	7/22/2014				X
Cadmium	U	0.001	mg/L	7/22/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/22/2014			SW846-6020	=
Chromium	J	0.0023	mg/L	7/22/2014			SW846-6020	=
Chromium, Dissolved	J	0.0023	mg/L	7/22/2014			SW846-6020	U
Conductivity		203	umho/cm	7/22/2014				X
Depth to Water		46.95	ft	7/22/2014				X
Dissolved Oxygen		3.68	mg/L	7/22/2014				X
Lead	U	0.002	mg/L	7/22/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/22/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
pH		5.98	Std Unit	7/22/2014				X
Redox		354	mV	7/22/2014				X
Selenium	J	0.0017	mg/L	7/22/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Technetium-99	U	9.16	pCi/L	7/22/2014	9.62	9.67	HASL 300, Tc-02-RC M	=
Temperature		67.5	deg F	7/22/2014				X
Trichloroethene		46.2	ug/L	7/22/2014			SW846-8260B	=
Turbidity		63.8	NTU	7/22/2014				X
Uranium	U	0.0002	mg/L	7/22/2014			SW846-6020	=
Uranium-234	U	1.88	pCi/L	7/22/2014	2.22	2.24	HASL 300	=
Uranium-235	U	0.471	pCi/L	7/22/2014	1.77	1.77	HASL 300	=
Uranium-238	U	0.26	pCi/L	7/22/2014	1.45	1.45	HASL 300	=



**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW91 REG      Downgradient      UCRS      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5240

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic	U	0.005	mg/L	7/24/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/24/2014			SW846-6020	=
Barometric Pressure Reading		30.07	Inches/Hg	7/24/2014				X
Cadmium	U	0.001	mg/L	7/24/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/24/2014			SW846-6020	=
Chromium		0.543	mg/L	7/24/2014			SW846-6020	=
Chromium, Dissolved		0.0186	mg/L	7/24/2014			SW846-6020	=
Conductivity		529	umho/cm	7/24/2014				X
Depth to Water		11.32	ft	7/24/2014				X
Dissolved Oxygen		3.05	mg/L	7/24/2014				X
Lead	J	0.0008	mg/L	7/24/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/24/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/24/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/24/2014			SW846-7470A	=
pH		5.66	Std Unit	7/24/2014				X
Redox		425	mV	7/24/2014				X
Selenium	J	0.0021	mg/L	7/24/2014			SW846-6020	=
Selenium, Dissolved	J	0.0023	mg/L	7/24/2014			SW846-6020	=
Technetium-99		2620	pCi/L	7/24/2014	52.2	295	HASL 300, Tc-02-RC M	=
Temperature		70.9	deg F	7/24/2014				X
Trichloroethene		82	ug/L	7/24/2014			SW846-8260B	J
Turbidity		39.1	NTU	7/24/2014				X
Uranium		0.0003	mg/L	7/24/2014			SW846-6020	=
Uranium-234	U	-0.464	pCi/L	7/24/2014	1.08	1.08	HASL 300	=
Uranium-235	U	-0.143	pCi/L	7/24/2014	1.24	1.24	HASL 300	=
Uranium-238	U	0.368	pCi/L	7/24/2014	1.38	1.38	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW93 REG      Upgradient      URGA      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5102

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic		0.0058	mg/L	7/22/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Barometric Pressure Reading		30.09	Inches/Hg	7/22/2014				X
Cadmium	U	0.001	mg/L	7/22/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/22/2014			SW846-6020	=
Chromium		0.011	mg/L	7/22/2014			SW846-6020	=
Chromium, Dissolved	U	0.01	mg/L	7/22/2014			SW846-6020	=
Conductivity		364	umho/cm	7/22/2014				X
Depth to Water		50	ft	7/22/2014				X
Dissolved Oxygen		1.88	mg/L	7/22/2014				X
Lead	J	0.0007	mg/L	7/22/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/22/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
pH		5.96	Std Unit	7/22/2014				X
Redox		344	mV	7/22/2014				X
Selenium	U	0.005	mg/L	7/22/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Technetium-99	U	4.72	pCi/L	7/22/2014	9.82	9.83	HASL 300, Tc-02-RC M	=
Temperature		69.8	deg F	7/22/2014				X
Trichloroethene		2710	ug/L	7/22/2014			SW846-8260B	=
Turbidity		96.2	NTU	7/22/2014				X
Uranium	J	9E-05	mg/L	7/22/2014			SW846-6020	=
Uranium-234	U	1.55	pCi/L	7/22/2014	1.96	1.97	HASL 300	=
Uranium-235	U	-0.13	pCi/L	7/22/2014	1.12	1.13	HASL 300	=
Uranium-238	U	1.11	pCi/L	7/22/2014	1.76	1.77	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW94 REG      Upgradient      UCRS      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8000-5103

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic	U	0.005	mg/L	7/23/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/23/2014			SW846-6020	=
Barometric Pressure Reading		30.08	Inches/Hg	7/23/2014				X
Cadmium	U	0.001	mg/L	7/23/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/23/2014			SW846-6020	=
Chromium		0.0305	mg/L	7/23/2014			SW846-6020	=
Chromium, Dissolved	U	0.01	mg/L	7/23/2014			SW846-6020	=
Conductivity		903	umho/cm	7/23/2014				X
Depth to Water		13.69	ft	7/23/2014				X
Dissolved Oxygen		1.37	mg/L	7/23/2014				X
Lead		0.0041	mg/L	7/23/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/23/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/23/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/23/2014			SW846-7470A	=
pH		6.36	Std Unit	7/23/2014				X
Redox		421	mV	7/23/2014				X
Selenium	U	0.005	mg/L	7/23/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/23/2014			SW846-6020	=
Technetium-99		952	pCi/L	7/23/2014	34.5	111	HASL 300, Tc-02-RC M	=
Temperature		67.4	deg F	7/23/2014				X
Trichloroethene		2.4	ug/L	7/23/2014			SW846-8260B	J
Turbidity		160	NTU	7/23/2014				X
Uranium		0.0024	mg/L	7/23/2014			SW846-6020	=
Uranium-234	U	1.26	pCi/L	7/23/2014	1.88	1.89	HASL 300	=
Uranium-235	U	-0.247	pCi/L	7/23/2014	1.09	1.09	HASL 300	=
Uranium-238	U	1.98	pCi/L	7/23/2014	2.02	2.04	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982

**Sampling Point:** MW420 REG      Upgradient      URGA      **Period:** Semiannual Report

**AKGWA Well Tag #:** 8005-3263

Parameter	Qualifier	Result	Units	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Arsenic	U	0.005	mg/L	7/22/2014			SW846-6020	=
Arsenic, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Barometric Pressure Reading		30.09	Inches/Hg	7/22/2014				X
Cadmium	U	0.001	mg/L	7/22/2014			SW846-6020	=
Cadmium, Dissolved	U	0.001	mg/L	7/22/2014			SW846-6020	=
Chromium	U	0.01	mg/L	7/22/2014			SW846-6020	=
Chromium, Dissolved	U	0.01	mg/L	7/22/2014			SW846-6020	=
Conductivity		295	umho/cm	7/22/2014				X
Depth to Water		50.11	ft	7/22/2014				X
Dissolved Oxygen		1.41	mg/L	7/22/2014				X
Lead	U	0.002	mg/L	7/22/2014			SW846-6020	=
Lead, Dissolved	U	0.002	mg/L	7/22/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
Mercury, Dissolved	U	0.0002	mg/L	7/22/2014			SW846-7470A	=
pH		5.98	Std Unit	7/22/2014				X
Redox		368	mV	7/22/2014				X
Selenium	U	0.005	mg/L	7/22/2014			SW846-6020	=
Selenium, Dissolved	U	0.005	mg/L	7/22/2014			SW846-6020	=
Technetium-99	U	6.67	pCi/L	7/22/2014	9.26	9.29	HASL 300, Tc-02-RC M	=
Temperature		71.8	deg F	7/22/2014				X
Trichloroethene		203	ug/L	7/22/2014			SW846-8260B	=
Turbidity		31.4	NTU	7/22/2014				X
Uranium	U	0.0002	mg/L	7/22/2014			SW846-6020	=
Uranium-234	U	0.394	pCi/L	7/22/2014	1.52	1.52	HASL 300	=
Uranium-235	U	-0.217	pCi/L	7/22/2014	0.958	0.96	HASL 300	=
Uranium-238	U	0.292	pCi/L	7/22/2014	1.31	1.31	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982  
**Type of Sample:** FB      **Period:** Semiannual Report QC Samples  
**AKGWA Well Tag #:** 0000-0000

<b>Parameter</b>	<b>Qualifier</b>	<b>Result</b>	<b>Units</b>	<b>Date Collected</b>	<b>Counting Error (+/-)</b>	<b>TPU</b>	<b>Method</b>	<b>Validation</b>
Arsenic	U	0.005	mg/L	7/23/2014			SW846-6020	=
Cadmium	U	0.001	mg/L	7/23/2014			SW846-6020	=
Chromium	U	0.01	mg/L	7/23/2014			SW846-6020	=
Lead	U	0.002	mg/L	7/23/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/23/2014			SW846-7470A	=
Selenium	U	0.005	mg/L	7/23/2014			SW846-6020	=
Technetium-99	U	-1.79	pCi/L	7/23/2014	9.16	9.16	HASL 300, Tc-02-RC M	=
Trichloroethene	U	1	ug/L	7/23/2014			SW846-8260B	UJ
Uranium	U	0.0002	mg/L	7/23/2014			SW846-6020	=
Uranium-234	U	0.779	pCi/L	7/23/2014	1.77	1.77	HASL 300	=
Uranium-235	U	0	pCi/L	7/23/2014	1.08	1.08	HASL 300	=
Uranium-238	U	0	pCi/L	7/23/2014	0.872	0.875	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982  
**Type of Sample:** RI      **Period:** Semiannual Report QC Samples  
**AKGWA Well Tag #:** 0000-0000

<b>Parameter</b>	<b>Qualifier</b>	<b>Result</b>	<b>Units</b>	<b>Date Collected</b>	<b>Counting Error (+/-)</b>	<b>TPU</b>	<b>Method</b>	<b>Validation</b>
Arsenic	U	0.005	mg/L	7/23/2014			SW846-6020	=
Cadmium	U	0.001	mg/L	7/23/2014			SW846-6020	=
Chromium	U	0.01	mg/L	7/23/2014			SW846-6020	=
Lead	U	0.002	mg/L	7/23/2014			SW846-6020	=
Mercury	U	0.0002	mg/L	7/23/2014			SW846-7470A	=
Selenium	U	0.005	mg/L	7/23/2014			SW846-6020	=
Technetium-99	U	2.6	pCi/L	7/23/2014	9.33	9.33	HASL 300, Tc-02-RC M	=
Trichloroethene	J	0.45	ug/L	7/23/2014			SW846-8260B	J
Uranium	U	0.0002	mg/L	7/23/2014			SW846-6020	=
Uranium-234	U	0.308	pCi/L	7/23/2014	1.99	1.99	HASL 300	=
Uranium-235	U	0	pCi/L	7/23/2014	1.37	1.38	HASL 300	=
Uranium-238	U	0.836	pCi/L	7/23/2014	1.92	1.93	HASL 300	=

**Paducah OREIS  
GROUNDWATER MONITORING REPORT**

**Facility:** C-404 Landfill      **County:** McCracken      **Permit #:** KY8-890-008-982  
**Type of Sample:** TB      **Period:** Semiannual Report QC Samples  
**AKGWA Well Tag #:** 0000-0000

<b>Parameter</b>	<b>Qualifier</b>	<b>Result</b>	<b>Units</b>	<b>Date Collected</b>	<b>Counting Error (+/-)</b>	<b>TPU</b>	<b>Method</b>	<b>Validation</b>
Trichloroethene	U	1	ug/L	7/22/2014			SW846-8260B	=
	U	1	ug/L	7/24/2014			SW846-8260B	UJ
	U	1	ug/L	7/23/2014			SW846-8260B	UJ

**MEDIA Codes**

WG Groundwater

**QUALIFIER Codes**

U Analyte analyzed for, but not detected at or below the lowest concentration reported.

J Estimated quantitation.

**SAMPLE METHOD Codes**

GR Grab

**SAMPLING POINT Codes**

UCRS Upper Continental Recharge System

URGA Upper Regional Gravel Aquifer

**SAMPLE TYPE Codes**

FB Field Blank

FR Field Replicate (Code used for Field Duplicate)

REG Regular

RI QC Equipment Rinseate/Decon

TB Trip Blank

**VALIDATION Code**

= Validated result, which is detected and unqualified.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

X Not validated.



**APPENDIX B**

**C-404 HAZARDOUS WASTE LANDFILL STATISTICAL ANALYSES**

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## GROUNDWATER STATISTICAL SUMMARY

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### Introduction

The statistical analyses conducted on the data collected from C-404 Hazardous Waste Landfill (C-404 Landfill) were performed in accordance with procedures provided in Appendix E of the C-404 Hazardous Waste Management Permit and previously approved by the Kentucky Division of Waste Management (KDWM). The percent of censored (nondetected) data points for individual parameters was calculated for the combined analytical data from the most recent six sampling events. The percent of censored data was used to select the types of statistical analyses to determine whether compliance well concentrations differed from background well concentrations. For this report, the reporting period data set includes data from January 2012, July 2012, January 2013, August 2013, January 2014, and July 2014.

### Statistical Analysis Process

The type of statistical test conducted for each chemical data set is a function of the number of samples and proportion of censored data (nondetects) to uncensored data (detects) in each group. The percent of censored (nondetected) data points for individual parameters was calculated for the combined analytical data. The statistical procedures applied to the data are summarized below.

- Determine the percentage of the censored data using the reporting period data set.
- Group by percentage of censored data where the following apply:
  - If censored data are greater than or equal to 90%, determine the limit of detection (LOD) and half of the LOD (1/2 LOD). This is Statistical Test 1.
  - If censored data are between 50% and 90%, perform a Test of Proportions. If the analysis indicates a significant proportional difference in compliance wells, further analyze through nonparametric Analysis of Variance (ANOVA) Test. This is Statistical Test 2.
  - If censored data are between 15% and 50%, perform nonparametric ANOVA Test. If results exceed the critical value, compute the critical difference used to identify individual well concentrations, which are significantly elevated compared with background. This is Statistical Test 3.
  - If censored data are less than 15%, actual data values are analyzed using parametric ANOVA procedures. If the wells exhibit equal variances, then the data are used as presented. If the wells do not exhibit equal variances, then the log of the data is taken and then used in the calculations. Where statistical testing indicates elevated compliance well concentrations, Bonferroni's Test of Contrasts is performed. This is Statistical Test 4. If variances are found to be unequal even for log-transformed concentrations, Statistical Test 4 is abandoned and Statistical Test 3 is used to compare compliance wells with background wells.

## Data Analysis

Data from the upgradient background wells in the Upper Regional Gravel Aquifer (URGA) are included for comparison with three downgradient URGA wells. Figure 1 of this C-404 Landfill Groundwater Report provides a map of the well locations associated with the C-404 Landfill. Upper Continental Recharge System (UCRS) wells in Figure 1 are provided for reference only. Data from wells that are in the UCRS are not included in the statistical analyses.

Table B.1 presents the C-404 Landfill upgradient or background wells and downgradient or compliance wells from the URGA. Data from the URGA compliance wells were compared with data from the URGA background wells.

For this report, the reporting period data set from January 2012 through July 2014 consists of six sets of data.

**Table B.1. Monitoring Well Locations**

<b>UCRS</b>	
Located South of C-404; adjacent to upgradient Regional Gravel Aquifer (RGA) background well MW93	MW94
Located North of C-404, adjacent to downgradient RGA compliance wells	MW85, MW88, MW91
<b>URGA</b>	
Upgradient background wells	MW93, MW420
Downgradient compliance wells	MW84, MW87, MW90A*

\*MW90 was abandoned in 2001 and replaced with MW90A.

Table B.2 lists the number of analyses (observations), nondetects (censored observations), detects (uncensored observations), and missing observations by parameter. When field duplicate data are available from a well, the higher of the two readings was retained for further evaluation.

## Censoring Percentage and Statistical Analysis

The type of statistical test set applied to the data is a function of the number of nondetects (censored) versus detects (uncensored) in each of the parameter groups and among the wells. Table B.3 presents the percentage of censored and uncensored data and type of statistical test chosen for each of the parameters.

**Table B.2. Summary of Missing, Censored, and Uncensored Data Collected**

<b>Parameters</b>	<b>Observations</b>	<b>Missing Observations*</b>	<b>Censored Observations</b>	<b>Uncensored Observations</b>
<b>URGA</b>				
Arsenic	30	0	11	19
Arsenic, Dissolved	30	0	15	15
Cadmium	30	0	29	1
Cadmium, Dissolved	30	0	30	0
Chromium	30	0	16	14
Chromium, Dissolved	30	0	27	3
Lead	30	0	24	6
Lead, Dissolved	30	0	30	0
Mercury	30	0	30	0
Mercury, Dissolved	30	0	30	0
Selenium	30	0	27	3
Selenium, Dissolved	30	0	30	0
Technetium-99	30	0	24	6
Trichloroethene	30	0	0	30
Uranium (Metals)	30	0	27	3
Uranium, Dissolved	30	0	29	1
Uranium-234	30	0	30	0
Uranium-235	30	0	30	0
Uranium-238	30	0	29	1

\*Missing parameters that were dissolved metals were not analyzed when the parent total metals were not detected in prior sampling events.

**Table B.3. Percent Censored Report and Statistical Test Set Selected**

<b>Parameter</b>	<b>Total Samples (Nonmissing)</b>	<b>Uncensored</b>	<b>Censored</b>	<b>Percent Censored</b>	<b>Statistical Test Set</b>
<b>URGA</b>					
Arsenic	30	19	11	37 %	3
Arsenic, Dissolved	30	15	15	50 %	2
Cadmium	30	1	29	97 %	1
Chromium	30	14	16	53 %	2
Chromium, Dissolved	30	3	27	90%	1
Lead	30	6	24	80 %	2
Mercury	30	0	30	100 %	1
Selenium	30	3	27	90 %	1
Technetium-99	30	6	24	80 %	2
Trichloroethene	30	30	0	0%	4/3*
Uranium	30	3	27	90%	1
Uranium, Dissolved	30	1	29	97%	1
Uranium-234	30	0	30	100 %	1
Uranium-235	30	0	30	100 %	1
Uranium-238	30	1	29	97 %	1

A list of the constituents with greater than or equal to 90% censored data is included in Table B.4, which summarizes the results of Statistical Test 1.

\*Because equality of variance could not be confirmed, Statistical Test 4 was abandoned and Statistical Test 3, Nonparametric ANOVA, was performed.

**Table B.4. Statistical Test 1: Limit of Detection**

<b>Parameter</b>	<b>LOD Values</b>	<b>½ LOD Values</b>
<b>URGA</b>		
Cadmium (mg/L)	0.001	0.0005
Chromium, Dissolved (mg/L)	0.01	0.005
Mercury (mg/L)	0.0002	0.0001
Selenium (mg/L)	0.005	0.0025
Uranium (mg/L)	0.0002	0.0001
Uranium, Dissolved (mg/L)	0.0002	0.0001
Uranium-234 (pCi/L)	1.88	0.94
Uranium-235 (pCi/L)	0.471	0.235
Uranium-238 (pCi/L)	1.11	0.58

LOD = Limit of Detection; mg/L = milligrams per liter; pCi/L = picocuries per liter

## **SUMMARY OF CONCLUSIONS**

The results for Statistical Test 1, LOD, are summarized in Table B.4. Table B.5 provides the summary of conclusions for the statistical analyses for the C-404 Landfill, including the statistical tests performed, the attachment number, well type, parameter, and results of each statistical test. Results of Statistical Test 2, Statistical Test 3, and Statistical Test 4 are presented in Attachments 1 through 6.

In summary, Statistical Test 2, Test of Proportions, for dissolved arsenic, chromium, lead, and Tc-99 and Statistical Test 3, Nonparametric ANOVA, for total arsenic in the URGA indicated no statistical evidence of releases of these contaminants from the C-404 Landfill.

Statistical Test 4, Parametric ANOVA, could not be used for TCE in the URGA because there was no evidence of equality of variance. Thus, Statistical Test 4 was abandoned and Statistical Test 3, Nonparametric ANOVA, was performed. Statistical Test 3 showed there was no evidence of contamination of TCE in any compliance well.

**Table B.5. Summary of Conclusions from the Statistical Analyses for the C-404 Hazardous Waste Landfill for the January 2014 Data Set**

<b>Attachment</b>	<b>RGA Well Type</b>	<b>Parameter</b>	<b>Applied Statistical Test</b>	<b>Results</b>
B1	URGA	Arsenic	Statistical Test 3, Nonparametric ANOVA	No statistically significant evidence of contamination from the C-404 Landfill in compliance wells.
B2	URGA	Arsenic, Dissolved	Statistical Test 2, Test of Proportions	No statistically significant evidence of contamination from the C-404 Landfill in compliance wells.
B3	URGA	Chromium	Statistical Test 2, Test of Proportions	No statistically significant evidence of contamination from the C-404 Landfill in compliance wells.
B4	URGA	Lead	Statistical Test 2, Test of Proportions	No statistically significant evidence of contamination from the C-404 Landfill in compliance wells.
B5	URGA	Technetium-99	Statistical Test 2 Test of Proportions	No statistically significant evidence of contamination from the C-404 Landfill in compliance wells.
B6	URGA	Trichloroethene	Statistical Test 4 Parametric ANOVA	Because equality of variance could not be confirmed, Statistical Test 4 was abandoned and Statistical Test 3, Nonparametric ANOVA, was performed. No statistically significant evidence of contamination in compliance wells.

RGA = Regional Gravel Aquifer; URGA = Upper Regional Gravel Aquifer



**ATTACHMENT B1**

**ARSENIC (TOTAL) NOVEMBER 2014**

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**Attachment B1. Statistical Test 3, Nonparametric ANOVA, July 2014 Arsenic (Total) URG**

Arsenic (Total) (mg/L)					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	<b>0.00535</b>	0.0005	<b>0.00434</b>	<b>0.00187</b>	0.0005
Jul-12	<b>0.00412</b>	0.0005	<b>0.00425</b>	<b>0.00133</b>	0.0005
Jan-13	<b>0.00652</b>	0.0005	<b>0.00572</b>	<b>0.00183</b>	0.0005
Aug-13	<b>0.00472</b>	0.0005	<b>0.00441</b>	<b>0.0015</b>	0.0005
Jan-14	<b>0.00656</b>	<b>0.0011</b>	<b>0.00514</b>	<b>0.00218</b>	0.0005
Jul-14	<b>0.0058</b>	0.0025	<b>0.00511</b>	<b>0.00302</b>	0.0025
Sum	0.0386		0.02897	0.01173	0.0050
n <sub>i</sub>	12		6	6	6
(x <sub>i</sub> ) <sub>avg</sub>	0.00322		0.00483	0.00196	0.0008

mg/L = milligrams per liter

BG=background

DL=detection limit

All data sets represent 1/2DL values for nondetects.

**Bolded values indicate a detected result.**

Overall mean x.. = 0.00281

N = 30

p = 4

x.. = 0.08

## Attachment B1. Statistical Test 3, Nonparametric ANOVA, July 2014 Arsenic (Total) URGAs

### Statistical Test 3, Non-parametric ANOVA

#### Ranking of Observations

Sequence	Arsenic (mg/L)	Adjusted Rank	Tie Number
1	0.0005	5	Tie 1
2	0.0005	5	
3	0.0005	5	
4	0.0005	5	
5	0.0005	5	
6	0.0005	5	
7	0.0005	5	
8	0.0005	5	
9	0.0005	5	
10	<b>0.0011</b>	10	
11	<b>0.00133</b>	11	
12	<b>0.0015</b>	12	
13	<b>0.00183</b>	13	
14	<b>0.00187</b>	14	
15	<b>0.00218</b>	15	
16	0.0025	16.5	Tie 2
17	0.0025	16.5	
18	<b>0.00302</b>	18	
19	<b>0.00412</b>	19	
20	<b>0.00425</b>	20	
21	<b>0.00434</b>	21	
22	<b>0.00441</b>	22	
23	<b>0.00472</b>	23	
24	<b>0.00511</b>	24	
25	<b>0.00514</b>	25	
26	<b>0.00535</b>	26	
27	<b>0.00572</b>	27	
28	<b>0.0058</b>	28	
29	<b>0.00652</b>	29	
30	<b>0.00656</b>	30	

mg/L = milligrams per liter

BG=background

DL=detection limit

All data sets represent 1/2DL values for nondetects.

**Bolded values indicate a detected result.**

Adjustment for Ties:

$$\text{Tie 1} = (9^3 - 9) = 720$$

$$\text{Ties 2} = (2^3 - 2) = 6$$

$$\sum T_i = 726$$

## Attachment B1. Statistical Test 3, Nonparametric ANOVA, July 2014 Arsenic (Total) URG

### Sums of Ranks and Averages

Arsenic (mg/L)					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	<b>0.00535</b>	0.0005	<b>0.00434</b>	<b>0.00187</b>	0.0005
Jul-12	<b>0.00412</b>	0.0005	<b>0.00425</b>	<b>0.00133</b>	0.0005
Jan-13	<b>0.00652</b>	0.0005	<b>0.00572</b>	<b>0.00183</b>	0.0005
Aug-13	<b>0.00472</b>	0.0005	<b>0.00441</b>	<b>0.0015</b>	0.0005
Jan-14	<b>0.00656</b>	<b>0.0011</b>	<b>0.00514</b>	<b>0.00218</b>	0.0005
Jul-14	<b>0.0058</b>	0.0025	<b>0.00511</b>	<b>0.00302</b>	0.0025

Observation Ranks for Arsenic					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jul-10	26	5	21	14	5
Jan-11	19	5	20	11	5
Jul-11	29	5	27	13	5
Jan-12	23	5	22	12	5
Jul-12	30	10	25	15	5
Jan-13	28	16.5	24	18	16.5
R <sub>i</sub>	201.5		139	83	41.5
(R <sub>i</sub> ) <sub>avg</sub>	16.8		23.2	13.8	6.9
R <sub>i</sub> <sup>2</sup> /n <sub>i</sub>	3383.5		3220.2	1148.2	287.0

$$\sum R_i^2/n_i = 8038.9$$

mg/L = milligrams per liter

BG=background

DL=detection limit

All data sets represent 1/2DL values for nondetects.

**Bolded values indicate a detected result.**

$$K = 4$$

$$N = 30$$

### Calculation of Kruskal-Wallis Statistic

$$H = 10.728 \quad \text{Kruskal-Wallis Statistic} \quad H = [12/N(N+1)*\sum R_i^2/n_i] - 3(N+1)$$

$$H' = 11.024 \quad \text{Corrected Kruskal-Wallis} \quad H' = H/[1-(\sum T_i^3/N^3-N)]$$

$$\chi^2_{crit} = 7.815 \quad 3 \quad \text{degrees of freedom at the 5\% significance level}$$

NOTE:  $H' > \chi^2_{crit}$

If  $H' \leq \chi^2_{crit}$ , the data from each well come from the same continuous distribution and hence have the same median concentrations of a specific constituent.

If  $H' > \chi^2_{crit}$ , reject the null hypothesis and calculate the critical difference for well comparisons to the background.

$$\begin{array}{llll} K-1 = & 3 & \alpha/(K-1) = & 0.01667 & Z(\alpha/(K-1))^{**} = & 2.1280 \\ \alpha = & 0.05 & 1-(\alpha/(K-1)) = & 0.983 & & \end{array}$$

NOTE \*Table 1, Appendix B, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance*, U.S. EPA, 1989.

\*\*Table 4, Appendix B, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance*, U.S. EPA, 1989.

## Attachment B1. Statistical Test 3, Nonparametric ANOVA, July 2014 Arsenic (Total) URGAs

### Calculate Critical Values

Average Background Ranking = 16.792

	Well No.	C <sub>i</sub>	(R <sub>i</sub> ) <sub>avg</sub> - (R <sub>b</sub> ) <sub>avg</sub>	Conclusion
BG Well	MW93			
BG Well	MW420			
	MW84	9.367	6.38	not contaminated
	MW87	9.367	-2.96	not contaminated
	MW90A	9.367	-9.88	not contaminated

mg/L = milligrams per liter

BG=background

DL=detection limit

All data sets represent 1/2DL values for nondetects.

**Bolded values indicate a detected result.**

If  $(R_i)_{avg} - (R_b)_{avg} > C_i$ , then there is evidence that the compliance well is contaminated.

**CONCLUSION:** Since  $(R_i)_{avg} - (R_b)_{avg} < C_i$  for all MW84, MW87 and MW90A, there is no statistically significant evidence of contamination from C-404 in these downgradient compliance test wells.

*Section 5.2.2, Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance, U.S. EPA, 1989*

\*Detection limit was 0.001 mg/L for all samples included in the graph.

**ATTACHMENT B2**

**ARSENIC DISSOLVED, NOVEMBER 2014**

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**Attachment B2. Statistical Test 2, Test of Proportions,  
July 2014 Arsenic, Dissolved URGAs**

Arsenic, Dissolved (mg/L)					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	<b>0.00328</b>	0.0005	<b>0.0042</b>	<b>0.00132</b>	0.0005
Jul-12	<b>0.00377</b>	0.0005	<b>0.00411</b>	<b>0.00128</b>	0.0005
Jan-13	<b>0.004</b>	0.0005	<b>0.00374</b>	<b>0.00132</b>	0.0005
Aug-13	<b>0.00422</b>	0.0005	<b>0.00391</b>	<b>0.0016</b>	0.0005
Jan-14	<b>0.00536</b>	0.0005	<b>0.00412</b>	<b>0.00181</b>	0.0005
Jul-14	0.0025	0.0025	0.0025	0.0025	0.0025

mg/L = milligrams per liter

BG=background

DL=detection limit

All data sets represent 1/2DL values for nondetects.

**Bolded values indicate a detected result.**

**<sup>1</sup>Test of Proportions**

Calculate the number of detections in background wells vs. compliance wells.

X=	5	X=number of samples above DL in background wells
Y=	10	Y=number of samples above DL in compliance wells
n <sub>b</sub> =	12	n <sub>b</sub> =count of background well results/samples analyzed
n <sub>c</sub> =	18	n <sub>c</sub> =count of compliance well results/samples analyzed
n=	30	n=total number of samples

P =	0.500	P=(x+y)/n
nP =	15	n=n <sub>b</sub> +n <sub>c</sub>
n(1-P) =	15	

**NOTE:** If nP and n(1-P) are both >= 5, then the normal approximation may be used.

P <sub>b</sub> =	0.417	P <sub>b</sub> =proportion of detects in background wells
P <sub>c</sub> =	0.556	P <sub>c</sub> =proportion of detects in compliance wells
S <sub>D</sub> =	0.186	S <sub>D</sub> =standard error of difference in proportions
Z =	-0.745	Z = (P <sub>b</sub> -P <sub>c</sub> )/S <sub>D</sub>
absolute value of Z =	0.745	

If the absolute value of Z exceeds the 97.5th percentile value of 1.96 from the standard normal distribution, this provides statistically significant evidence at the 5% significance level that the proportion of detects in one group of data exceeds the proportion of detects in the other group.

**CONCLUSION:** Because the absolute value of Z is less than 1.96, there is no statistical evidence that the proportion of samples with detected results differs between the background well and compliance well samples.

<sup>1</sup> Section 8.1.2, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (EPA 1989)

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**ATTACHMENT B3**  
**CHROMIUM, NOVEMBER 2014**

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### Attachment B3. Statistical Test 2, Test of Proportions, July 2014 Chromium URGA

Chromium (mg/L)					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	<b>0.0214</b>	0.005	0.005	<b>0.0792</b>	0.005
Jul-12	0.005	0.005	0.005	<b>0.0218</b>	0.005
Jan-13	<b>0.224</b>	0.005	<b>0.0604</b>	<b>0.177</b>	0.005
Aug-13	<b>0.0288</b>	0.005	<b>0.0639</b>	<b>0.0691</b>	0.005
Jan-14	0.005	0.005	<b>0.0921</b>	0.005	0.005
Jul-14	<b>0.011</b>	0.005	<b>0.331</b>	<b>0.00903</b>	<b>0.00227</b>

mg/L = milligrams per liter

BG=background

DL=detection limit

All data sets represent 1/2DL values for nondetects.

**Bolded values indicate a detected result.**

#### <sup>1</sup>Test of Proportions

Calculate the number of detections in background wells vs. compliance wells.

X=	4	X=number of samples above DL in background wells
Y=	10	Y=number of samples above DL in compliance wells
n <sub>b</sub> =	12	n <sub>b</sub> =count of background well results/samples analyzed
n <sub>c</sub> =	18	n <sub>c</sub> =count of compliance well results/samples analyzed
n=	30	n=total number of samples

P =	0.467	P=(x+y)/n
nP =	14	n=n <sub>b</sub> +n <sub>c</sub>
n(1-P) =	16	

**NOTE:** If nP and n(1-P) are both >= 5, then the normal approximation may be used.

P <sub>b</sub> =	0.333	P <sub>b</sub> =proportion of detects in background wells
P <sub>c</sub> =	0.556	P <sub>c</sub> =proportion of detects in compliance wells
S <sub>D</sub> =	0.186	S <sub>D</sub> =standard error of difference in proportions
Z =	-1.195	Z = (P <sub>b</sub> -P <sub>c</sub> )/S <sub>D</sub>
absolute value of Z =	1.195	

If the absolute value of Z exceeds the 97.5th percentile value of 1.96 from the standard normal distribution, this provides statistically significant evidence at the 5% significance level that the proportion of detects in one group of data exceeds the proportion of detects in the other group.

**CONCLUSION:** Because the absolute value of Z is less than 1.96, there is no statistical evidence that the proportion of samples with detected results differs between the background well and compliance well samples.

<sup>1</sup> Section 8.1.2, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (EPA 1989)

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**ATTACHMENT B4**  
**LEAD, NOVEMBER 2014**

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## Attachment B4. Statistical Test 2, Test of Proportions, July 2014 Lead URGA

Lead (mg/L)					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	<b>0.00229</b>	0.00065	0.00065	<b>0.00279</b>	0.00065
Jul-12	0.00065	0.00065	0.00065	0.00065	0.00065
Jan-13	<b>0.00256</b>	0.00065	<b>0.00164</b>	<b>0.0117</b>	0.00065
Aug-13	0.00065	0.00065	0.00065	0.00065	0.00065
Jan-14	0.00065	0.00065	0.00065	0.00065	0.00065
Jul-14	<b>0.00066</b>	0.001	0.001	0.001	0.001

mg/L = milligrams per liter

BG=background

DL=detection limit

Nondetect values are 1/2DL.

**Bolded values indicate a detected result.**

### <sup>1</sup>Test of Proportions

Calculate the number of detections in background wells vs. compliance wells.

X=	3	X=	number of samples above DL in background wells
Y=	3	Y=	number of samples above DL in compliance wells
n <sub>b</sub> =	12	n <sub>b</sub> =	count of background well results/samples analyzed
n <sub>c</sub> =	18	n <sub>c</sub> =	count of compliance well results/samples analyzed
n=	30	n=	total number of samples

P =	0.200	P=(x+y)/n
nP =	6	n=n <sub>b</sub> +n <sub>c</sub>
n(1-P) =	24	

**NOTE:** If nP and n(1-P) are both >= 5, then the normal approximation may be used.

P <sub>b</sub> =	0.250	P <sub>b</sub> =	proportion of detects in background wells
P <sub>c</sub> =	0.167	P <sub>c</sub> =	proportion of detects in compliance wells
S <sub>D</sub> =	0.149	S <sub>D</sub> =	standard error of difference in proportions
Z =	0.559	Z =	(P <sub>b</sub> -P <sub>c</sub> )/S <sub>D</sub>
absolute value of Z =	0.559		

If the absolute value of Z exceeds the 97.5th percentile value of 1.96 from the standard normal distribution, this provides statistically significant evidence at the 5% significance level that the proportion of detects in one group of data exceeds the proportion of detects in the other group.

**CONCLUSION:** Because the absolute value of Z is less than 1.96, there is no statistical evidence that the proportion of samples with detected results differs between the background well and compliance well samples.

<sup>1</sup> Section 8.1.2, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (EPA 1989)

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**ATTACHMENT B5**

**TECHNETIUM-99, NOVEMBER 2014**

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## Attachment B5. Statistical Test 2, Test of Proportions, July 2014 Technetium-99 URGA

Technetium-99 (pCi/L)					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	7.90	<b>32.6</b>	7.90	7.90	7.90
Jul-12	9.25	9.25	<b>22.3</b>	9.25	9.25
Jan-13	7.4	<b>49.1</b>	7.4	7.4	7.4
Aug-13	3.165	<b>17.9</b>	<b>18.8</b>	4.88	7.25
Jan-14	8.1	<b>16.8</b>	8.1	8.1	8.1
Jul-14	8.4	7.85	8.05	8.4	8.05

pCi/L = picocuries per liter

BG=background

DL=detection limit

Data represent 1/2DL values for nondetects.

**Bolded values indicate a detected result.**

### <sup>1</sup>Test of Proportions

Calculate the number of detections in background wells vs. compliance wells.

X=	4	X=	number of samples above DL in background wells
Y=	2	Y=	number of samples above DL in compliance wells
n <sub>b</sub> =	12	n <sub>b</sub> =	count of background well results/samples analyzed
n <sub>c</sub> =	18	n <sub>c</sub> =	count of compliance well results/samples analyzed
n=	30	n=	total number of samples

P =	0.200	P=(x+y)/n
nP =	6	n=n <sub>b</sub> +n <sub>c</sub>
n(1-P) =	24	

**NOTE:** If nP and n(1-P) are both  $\geq 5$ , then the normal approximation may be used.

P <sub>b</sub> =	0.333	P <sub>b</sub> =	proportion of detects in background wells
P <sub>c</sub> =	0.111	P <sub>c</sub> =	proportion of detects in compliance wells
S <sub>D</sub> =	0.149	S <sub>D</sub> =	standard error of difference in proportions
Z =	1.491	Z =	(P <sub>b</sub> -P <sub>c</sub> )/S <sub>D</sub>
absolute value of Z =	1.491		

If the absolute value of Z exceeds the 97.5th percentile value of 1.96 from the standard normal distribution, this provides statistically significant evidence at the 5% significance level that the proportion of detects in one group of data exceeds the proportion of detects in the other group.

**CONCLUSION:** Because the absolute value of Z is less than 1.96, there is no statistical evidence that the proportion of samples with detected results differs between the background well and compliance well samples.

<sup>1</sup> Section 8.1.2, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (EPA 1989)

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**ATTACHMENT B6**  
**TRICHLOROETHENE, NOVEMBER 2014**

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**Attachment B6. Statistical Test 4, Parametric ANOVA,  
July 2014 Trichloroethene URGAs**

Trichloroethene (TCE, $\mu\text{g/L}$ )					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	<b>1200</b>	<b>280</b>	<b>1300</b>	<b>540</b>	<b>24</b>
Jul-12	<b>1500</b>	<b>210</b>	<b>1100</b>	<b>450</b>	<b>14</b>
Jan-13	<b>1900</b>	<b>190</b>	<b>1100</b>	<b>470</b>	<b>17</b>
Aug-13	<b>2200</b>	<b>230</b>	<b>1300</b>	<b>760</b>	<b>35</b>
Jan-14	<b>2900</b>	<b>290</b>	<b>1500</b>	<b>670</b>	<b>25</b>
Jul-14	<b>2710</b>	<b>203</b>	<b>1270</b>	<b>1030</b>	<b>46.2</b>
$n_i$	12		6	6	6
Sum	13813		7570	3920	161.20
$(\bar{x}_i)_{avg}$	1151.08		1261.67	653.33	26.87

$\mu\text{g/L}$  = micrograms per liter

**Bolded values indicate a detected result.**

Overall mean  $\bar{x}..$  = 848.81  
 N = 30  
 p = 4  
 $\bar{x}..$  = 25464.20

**Determine Normality of Dataset**

**Coefficient of Variability Test**

Table of Residuals

Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	48.92	-871.08	38.33	-113.33	-2.87
Jul-12	348.92	-941.08	-161.67	-203.33	-12.87
Jan-13	748.92	-961.08	-161.67	-183.33	-9.87
Aug-13	1048.92	-921.08	38.33	106.67	8.13
Jan-14	1748.92	-861.08	238.33	16.67	-1.87
Jul-14	1558.92	-948.08	8.33	376.67	19.33

X: Mean Value =  $-8.64\text{E-}15$                       848.8066667  
 S: Standard Deviation = 661.4                      811.2797833  
 K\* Factor = 2.22                      (for n = 30)  
 $CV = S/X = -7.65\text{E+}16$  < 1, residuals are normal                      0.96

\*K factor [from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance* (EPA 1989)].

Because the coefficient of variation is < 1, the residuals appear to be normally distributed.

**Attachment B6. Statistical Test 4, Parametric ANOVA,  
July 2014 Trichloroethene URGA**

**Determine Equality of Variance of Dataset**

p = number of wells	$\bar{x}_{..} = 25464.20$
$n_i$ = number of data points per well	$(\bar{x}_{avg})_{..} = 848.81$
N = total sample size	
$S^2$ = the square of the standard deviation	p = 4
$\ln(S_i^2)$ = natural logarithm of each variance	N = 30
f = total sample size minus the number of wells (groups)	
$f_i = n_i - 1$	

Calculations for Equality of Variance: Bartlett's Test

$S_i$	$S_i^2$	$\ln(S_i^2)$	$n_i$	$f_i S_i^2$	$f_i \ln(S_i^2)$
1058.773	1120999.54	13.930	12	12330994.9	153.2

149.722	22416.667	10.018	6	112083.333	50.1
219.697	48266.667	10.784	6	241333.333	53.9
11.954	142.907	4.962	6	714.533	24.8

$$\sum(S_i^2) = 1191825.78 \qquad \sum f_i \ln(S_i^2) = 282.0$$

Equality of Variance: Bartlett's Test

$$f = 26$$

$$Sp^2 = 487889.466$$

$$\ln Sp^2 = 13.098$$

$$\chi^2 = 58.496 \quad (\text{If calculated } \chi^2 \leq \chi^2_{crit}, \text{ then variances are equal at the given significance level).)$$

$$\chi^2_{crit} * = 7.815 \quad \text{at a 5\% significance level with } 3 \text{ degrees of freedom}$$

Variances are not equal, transform the original data to lognormal.

\*Table 1, Appendix B, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*, Interim Guidance (EPA 1989).

**Attachment B6. Statistical Test 4, Parametric ANOVA,  
July 2014 Trichloroethene URGA**

**Lognormal Data for TCE**

Date	ln[TCE (µg/L)]				
	Background MW93	Background MW420	Compliance MW84	Compliance MW87	Compliance MW90A
Jan-12	7.09	5.63	7.17	6.29	3.18
Jul-12	7.31	5.35	7.00	6.11	2.64
Jan-13	7.55	5.25	7.00	6.15	2.83
Aug-13	7.70	5.44	7.17	6.63	3.56
Jan-14	7.97	5.67	7.31	6.51	3.22
Jul-14	7.90	5.31	7.15	6.94	3.83
$x_i$	78.18		42.81	38.63	19.26
$(x_i)_{avg}$	6.51		7.13	6.44	3.21

µg/L = micrograms per liter

**Determine Normality of Dataset**

**Coefficient of Variability Test**

Table of residuals

Date	Background MW93	Background MW420	Compliance MW84	Compliance MW87	Compliance MW90A
Jan-12	0.58	-0.88	0.04	-0.15	-0.03
Jul-12	0.80	-1.17	-0.13	-0.33	-0.57
Jan-13	1.03	-1.27	-0.13	-0.29	-0.38
Aug-13	1.18	-1.08	0.04	0.19	0.35
Jan-14	1.46	-0.84	0.18	0.07	0.01
Jul-14	1.39	-1.20	0.01	0.50	0.62

X: Mean Value = 0.00  
 S: Standard Deviation = 0.7  
 K\* Factor = 2.22 (for n = 30)  
 CV = S/X = 2.65E+15 > 1, residuals of log-transformed data are not normally distributed

\*K factor [from Table 5, Appendix B of *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance* (EPA 1989)].

**Attachment B6. Statistical Test 4, Parametric ANOVA,  
July 2014 Trichloroethene URGAs**

**Determine Equality of Variance of Dataset**

p = number of wells (background wells considered as one group) x<sub>..</sub> = 178.87  
 n<sub>i</sub> = number of data points per well (x<sub>avg</sub>)<sub>..</sub> = 5.96  
 N = total sample size  
 S<sup>2</sup> = the square of the standard deviation p = 4  
 ln(S<sub>i</sub><sup>2</sup>) = natural logarithm of each variance N = 30  
 f = total sample size minus the number of wells (groups)  
 f<sub>i</sub> = n<sub>i</sub> - 1

Calculations for Equality of Variance: Bartlett's Test

S <sub>i</sub>	S <sub>i</sub> <sup>2</sup>	ln(S <sub>i</sub> <sup>2</sup> )	n <sub>i</sub>	f <sub>i</sub> S <sub>i</sub> <sup>2</sup>	f <sub>i</sub> ln(S <sub>i</sub> <sup>2</sup> )
1.150	1.323	0.280	12	14.554	3.1

0.118	0.014	-4.280	6	0.069	-21.4
0.317	0.101	-2.296	6	0.503	-11.5
0.442	0.195	-1.633	6	0.976	-8.2

$$\sum(S_i^2) = 1.63 \qquad \sum f_i \ln(S_i^2) = -38.0$$

Equality of Variance: Bartlett's Test

f = 26  
 Sp<sup>2</sup> = 0.619  
 ln Sp<sup>2</sup> = -0.479  
 $\chi^2 = 25.514$  (If calculated  $\chi^2 \leq$  tabulated  $\chi^2$ , then variances are equal at the given significance level).  
 tabulated  $\chi^2 * = 7.815$  at a 5% significance level with 3 degrees of freedom

Variances are not equal.

\*Table 1, Appendix B, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance* (EPA 1989)].

Because variances are not equal, Statistical Test 3 - Nonparametric ANOVA is performed.

**Attachment B6. Statistical Test 3, Nonparametric ANOVA,  
July 2014 Trichloroethene URGA**

**Statistical Test 3, Nonparametric ANOVA**

TCE ( $\mu\text{g/L}$ )					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	1200	280	1300	540	24
Jul-12	1500	210	1100	450	14
Jan-13	1900	190	1100	470	17
Aug-13	2200	230	1300	760	35
Jan-14	2900	290	1500	670	25
Jul-14	2710	203	1270	1030	46.2
$n_i$	12		6	6	6
$x_i$	13813		7570	3920	161.20
$(x_i)_{\text{avg}}$	1151.08		1261.67	653.33	26.87

Overall mean  $x_{..}$  = 848.81

$N$  = 30

$p$  = 4

$x_{..}$  = 25464.20

$\mu\text{g/L}$  = micrograms per liter

**Attachment B6. Statistical Test 3, Nonparametric ANOVA,  
July 2014 Trichloroethene URGA**

**Non-Parametric ANOVA**

**Ranking of Observations**

Sequence	TCE (µg/L)	Adjusted Rank	Tie Number
1	14	1	
2	17	2	
3	24	3	
4	25	4	
5	35	5	
6	46.2	6	
7	190	7	
8	203	8	
9	210	9	
10	230	10	
11	280	11	
12	290	12	
13	450	13	
14	470	14	
15	540	15	
16	670	16	
17	760	17	
18	1030	18	
19	1100	19.5	Tie 1
20	1100	19.5	
21	1200	21	
22	1270	22	
23	1300	23.5	Tie 2
24	1300	23.5	
25	1500	25.5	Tie 3
26	1500	25.5	
27	1900	27	
28	2200	28	
29	2710	29	
30	2900	30	

Adjustment for Ties:

Tie 1 =  $(2^3 - 2) = 6$

Tie 2 =  $(2^3 - 2) = 6$

Tie 3 =  $(2^3 - 2) = 6$

$\Sigma T_i = 18$

**Attachment B6. Statistical Test 3, Nonparametric ANOVA,  
July 2014 Trichloroethene URGA**

**Sums of Ranks and Averages**

TCE (µg/L)					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	1200	280	1300	540	24
Jul-12	1500	210	1100	450	14
Jan-13	1900	190	1100	470	17
Aug-13	2200	230	1300	760	35
Jan-14	2900	290	1500	670	25
Jul-14	2710	203	1270	1030	46.2

Observation Ranks for TCE					
Date	Background	Background	Compliance	Compliance	Compliance
	MW93	MW420	MW84	MW87	MW90A
Jan-12	21	11	23.5	15	3
Jul-12	25.5	9	19.5	13	1
Jan-13	27	7	19.5	14	2
Aug-13	28	10	23.5	17	5
Jan-14	30	12	25.5	16	4
Jul-14	29	8	22	18	6
R <sub>i</sub>	217.5		133.5	93	21
(R <sub>i</sub> ) <sub>avg</sub>	18.1		22.3	15.5	3.5
R <sub>i</sub> <sup>2</sup> /n <sub>i</sub>	3942.2		2970.4	1441.5	73.5

$$\Sigma R_i^2/n_i = 8427.6$$

$$K = 4$$

$$N = 30$$

**Calculation of Kruskal-Wallis Statistic**

$$H = 15.743 \quad \text{Kruskal-Wallis Statistic} \quad H = [12/N(N+1) * \Sigma R_i^2/n_i] - 3(N+1)$$

$$H' = 15.753 \quad \text{Corrected Kruskal-Wallis} \quad H' = H/[1 - (\Sigma T_i^3/N^3 - N)]$$

$$\chi^2_{crit} = 7.815 \quad 3 \quad \text{degrees of freedom at the 5\% significance level}$$

NOTE:  $H' > \chi^2_{crit}$

If  $H' \leq \chi^2_{crit}$ , the data from each well come from the same continuous distribution and hence have the same median concentrations of a specific constituent.

If  $H' > \chi^2_{crit}$ , reject the null hypothesis and calculate the critical difference for well comparisons to the background.

$$K-1 = 3 \quad \alpha/(K-1) = 0.01667 \quad Z(\alpha/(K-1))^{**} = 2.128$$

$$\alpha = 0.05 \quad 1 - (\alpha/(K-1)) = 0.983$$

NOTE \*Table 1, Appendix B, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance* (EPA 1989).

\*\*Table 4, Appendix B, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance* (EPA 1989).

**Attachment B6. Statistical Test 3, Nonparametric ANOVA,  
July 2014 Trichloroethene URGA**

**Calculate Critical Values**

Average Background Ranking = 18.1

	Well No.	$C_i$	$(R_i)_{avg} - (R_b)_{avg}$	Conclusion
BG Well	MW93			
BG Well	MW420			
	MW84	9.367	4.54	not contaminated
	MW87	9.367	-2.21	not contaminated
	MW90A	9.367	-14.63	not contaminated

If  $(R_i)_{avg} - (R_b)_{avg} > C_i$ , then there is evidence that the compliance well is contaminated.

**CONCLUSION:** Since  $(R_i)_{avg} - (R_b)_{avg} < C_i$ , there is no statistically significant evidence that downgradient compliance test wells are contaminated; however, the negative value indicates that background wells have elevated concentrations.

Section 5.2.2, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Guidance* (EPA 1989).



**ATTACHMENT B7**  
**WEST-GEO CERTIFICATION STATEMENT**

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November 5, 2014  
LKYBA10836-14-0011

Ms. Jennifer Johnson  
LATA Sharp Remediation Services  
P.O. Box 280,  
Kevil, KY 42053

Subject: Statistical analysis of groundwater data for C-404 landfill

Dear Ms. Johnson:

I am submitting this statement as a supplementary document to the completed statistical analysis I performed on the groundwater data for the C-404 Landfill at the Paducah Gaseous Diffusion Plant.

As a Senior Environmental Engineer, with a doctorate in Civil Engineering and Professional Engineer license with the States of Tennessee and Georgia, I have twenty-two years of experience in the analysis and interpretation of environmental data.

For this project, the statistical analyses on groundwater data from January 2012 through July 2014 were performed in accordance with the C-404 Hazardous Waste Landfill Permit, Appendix C using Microsoft Excel 2010. The Excel files were saved in a format compatible with Microsoft Excel 1997-2003. The spreadsheets include the results for the following statistical tests:

- Test of Proportions
- Parametric Analysis of Variance (ANOVA)
- Nonparametric ANOVA

The statistical analyses procedures were based on the U.S. Environmental Protection Agency (USEPA) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

Please feel free to contact me via email ([westor@geoconsultantsllc.com](mailto:westor@geoconsultantsllc.com)) or phone (865-242-7732) if you have any questions.

Sincerely,



Olivia R. West, Ph.D., P.E.

OW:km

cc: GEO Kevil DMC

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**APPENDIX C**

**C-404 HAZARDOUS WASTE LANDFILL  
LEACHATE INFORMATION**

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**PADUCAH GASEOUS DIFFUSION PLANT  
C-404 HAZARDOUS WASTE LANDFILL  
PERMIT NUMBER KY8-890-008-982**

**LEACHATE INFORMATION**

This appendix includes the C-404 Landfill monthly and quarterly inspection checklist, volumes of leachate removed during this reporting period, annual C-404 sump integrity test, and analytical results of leachate sampling for both this reporting period and the previous reporting period.

## Paducah OREIS Report for 404L14-01

**L1404L1-14**

from: C404L

on 2/27/2014

Media: WW

SmpMethod: GR

Comments: F039

Analysis	Results	Counting Error	Units	Result Qual	Foot Note	Reporting Limit	TPU	Method	V/V/A*
<b>ANION</b>									
Fluoride	9.7		mg/L			1		SW846-9056	I / X /
<b>FS</b>									
Conductivity	580		umho/cm					FS	//
Dissolved Oxygen	8.08		mg/L					FS	//
pH	8.09		Std Unit					FS	//
Redox	789		mV					FS	//
Temperature	64.9		deg F					FS	//
<b>METAL</b>									
Arsenic	0.00103		mg/L			0.001		SW846-6020	/ X /
Barium	0.0858		mg/L			0.005		SW846-6020	/ X /
Cadmium	0.00269		mg/L			0.001		SW846-6020	/ X /
Chromium	0.0125		mg/L	B		0.01		SW846-6020	/ X /
Copper	0.11		mg/L			0.1		SW846-6020	/ X /
Iron	0.1		mg/L	U		0.1		SW846-6010B	/ X /
Lead	0.0209		mg/L			0.0013		SW846-6020	/ X /
Mercury	0.0002		mg/L	U		0.0002		SW846-7470A	/ X /
Nickel	0.0131		mg/L	X		0.005		SW846-6020	/ X /
Selenium	0.005		mg/L	U		0.005		SW846-6020	/ X /
Silver	0.00503		mg/L			0.001		SW846-6020	/ X /
Uranium	110		mg/L			10		SW846-6020	I / X /
Zinc	0.0427		mg/L			0.02		SW846-6020	/ X /
<b>PPCB</b>									
PCB-1016	0.16		ug/L	U		0.16		SW846-8082	/ X /
PCB-1221	0.17		ug/L	U		0.17		SW846-8082	/ X /
PCB-1232	0.13		ug/L	U		0.13		SW846-8082	/ X /
PCB-1242	0.1		ug/L	U		0.1		SW846-8082	/ X /
PCB-1248	0.11		ug/L	U		0.11		SW846-8082	/ X /
PCB-1254	0.07		ug/L	U		0.07		SW846-8082	/ X /
PCB-1260	0.15		ug/L	U		0.05		SW846-8082	/ X /
PCB-1268	0.09		ug/L	U		0.09		SW846-8082	/ X /
Polychlorinated biphenyl	0.17		ug/L	U		0.17		SW846-8082	/ X /
<b>RADS</b>									
Cesium-137	3.61	7.23	pCi/L	U		9.07	7.23	RL-7124	/ X /
Neptunium-237	-0.2	0.401	pCi/L	U		2.59	1.24	RL-7128	/ X /
Plutonium-239/240	0.333	0.468	pCi/L	U		3.89	1.61	RL-7128	/ X /
Technetium-99	225	17.1	pCi/L			16.9	18	RL-7100	/ X /
Thorium-230	0.899	0.988	pCi/L	U		5.79	2.51	RL-7128	/ X /
Uranium-234	2880	109	pCi/L	T		31	610	RL-7128	/ X / J
Uranium-235	439	47.1	pCi/L	T		18	103	RL-7128	S / X / J
Uranium-238	32800	365	pCi/L	T		14.3	6850	RL-7128	/ X / J
<b>VOA</b>									
Trichloroethene	1		ug/L	U		1		SW846-8260B	/ X /
<b>WETCHEM</b>									
Ammonia as Nitrogen	0.2		mg/L	U		0.2		EPA-350.3	/ X /



## Paducah OREIS Report for 404L14-01

**L1404LD1-14**

from: C404L

on 2/27/2014

Media: WW

SmpMethod: GR

Comments: F039

Analysis	Results	Counting Error	Units	Result Qual	Foot Note	Reporting Limit	TPU	Method	V/V/A*
<b>ANION</b>									
Fluoride	9.7		mg/L			1		SW846-9056	I / X /
<b>FS</b>									
Conductivity	580		umho/cm					FS	//
Dissolved Oxygen	8.08		mg/L					FS	//
pH	8.09		Std Unit					FS	//
Redox	789		mV					FS	//
Temperature	64.9		deg F					FS	//
<b>METAL</b>									
Arsenic	0.00108		mg/L			0.001		SW846-6020	/ X /
Barium	0.08		mg/L			0.005		SW846-6020	/ X /
Cadmium	0.00245		mg/L			0.001		SW846-6020	/ X /
Chromium	0.0116		mg/L	B		0.01		SW846-6020	/ X /
Copper	0.105		mg/L			0.02		SW846-6020	/ X /
Iron	0.1		mg/L	U		0.1		SW846-6010B	/ X /
Lead	0.0203		mg/L			0.0013		SW846-6020	/ X /
Mercury	0.0002		mg/L	U		0.0002		SW846-7470A	/ X /
Nickel	0.0124		mg/L	X		0.005		SW846-6020	/ X /
Selenium	0.005		mg/L	U		0.005		SW846-6020	/ X /
Silver	0.00399		mg/L			0.001		SW846-6020	/ X /
Uranium	111		mg/L			10		SW846-6020	I / X /
Zinc	0.0422		mg/L			0.02		SW846-6020	/ X /
<b>PPCB</b>									
PCB-1016	0.16		ug/L	U		0.16		SW846-8082	/ X /
PCB-1221	0.17		ug/L	U		0.17		SW846-8082	/ X /
PCB-1232	0.14		ug/L	U		0.14		SW846-8082	/ X /
PCB-1242	0.1		ug/L	U		0.1		SW846-8082	/ X /
PCB-1248	0.12		ug/L	U		0.12		SW846-8082	/ X /
PCB-1254	0.07		ug/L	U		0.07		SW846-8082	/ X /
PCB-1260	0.15		ug/L	U		0.05		SW846-8082	/ X /
PCB-1268	0.09		ug/L	U		0.09		SW846-8082	/ X /
Polychlorinated biphenyl	0.17		ug/L	U		0.17		SW846-8082	/ X /
<b>RADS</b>									
Cesium-137	-4.23	8.47	pCi/L	U		8.92	8.47	RL-7124	/ X /
Neptunium-237	0.973	0.785	pCi/L	U		2.33	1.08	RL-7128	/ X /
Plutonium-239/240	0.202	0.414	pCi/L	U		3.84	1.59	RL-7128	/ X /
Technetium-99	215	16.9	pCi/L			16.9	17.7	RL-7100	/ X /
Thorium-230	0.386	0.792	pCi/L	U		5.73	2.44	RL-7128	/ X /
Uranium-234	3140	119	pCi/L	T		31.7	686	RL-7128	/ X / J
Uranium-235	428	49.1	pCi/L	T		14.2	105	RL-7128	S / X / J
Uranium-238	35500	399	pCi/L	T		12.8	7670	RL-7128	/ X / J
<b>VOA</b>									
Trichloroethene	1		ug/L	UX		1		SW846-8260B	/ X /
<b>WETCHEM</b>									
Ammonia as Nitrogen	0.2		mg/L	U		0.2		EPA-350.3	/ X /

**Paducah OREIS Report for 404L14-01**

**FB404L1-14**

from: QC

on 2/27/2014

Media: WQ

SmpMethod:

Comments:

Analysis	Results	Counting Error	Units	Result Qual	Foot Note	Reporting Limit	TPU	Method	V/V/A*
<b>ANION</b>									
Fluoride	1		mg/L	U		1		SW846-9056	/ X /
<b>METAL</b>									
Arsenic	0.001		mg/L	U		0.001		SW846-6020	/ X /
Barium	0.005		mg/L	U		0.005		SW846-6020	/ X /
Cadmium	0.001		mg/L	U		0.001		SW846-6020	/ X /
Chromium	0.01		mg/L	UB		0.01		SW846-6020	/ X /
Copper	0.02		mg/L	U		0.02		SW846-6020	/ X /
Iron	0.1		mg/L	U		0.1		SW846-6010B	/ X /
Lead	0.0013		mg/L	U		0.0013		SW846-6020	/ X /
Mercury	0.0002		mg/L	U		0.0002		SW846-7470A	/ X /
Nickel	0.005		mg/L	UX		0.005		SW846-6020	/ X /
Selenium	0.005		mg/L	U		0.005		SW846-6020	/ X /
Silver	0.001		mg/L	U		0.001		SW846-6020	/ X /
Uranium	0.001		mg/L	U		0.001		SW846-6020	/ X /
Zinc	0.02		mg/L	U		0.02		SW846-6020	/ X /
<b>PCCB</b>									
PCB-1016	0.16		ug/L	U		0.16		SW846-8082	/ X /
PCB-1221	0.17		ug/L	U		0.17		SW846-8082	/ X /
PCB-1232	0.14		ug/L	U		0.14		SW846-8082	/ X /
PCB-1242	0.1		ug/L	U		0.1		SW846-8082	/ X /
PCB-1248	0.12		ug/L	U		0.12		SW846-8082	/ X /
PCB-1254	0.07		ug/L	U		0.07		SW846-8082	/ X /
PCB-1260	0.05		ug/L	U		0.05		SW846-8082	/ X /
PCB-1268	0.09		ug/L	U		0.09		SW846-8082	/ X /
Polychlorinated biphenyl	0.17		ug/L	U		0.17		SW846-8082	/ X /
<b>RADS</b>									
Cesium-137	-1.34	2.68	pCi/L	U		7.62	4.42	RL-7124	/ X /
Neptunium-237	-0.0166	0.0191	pCi/L	U		0.15	0.0474	RL-7128	/ X /
Plutonium-239/240	0.00924	0.0249	pCi/L	U		0.235	0.0955	RL-7128	/ X /
Technetium-99	-2.41	11.3	pCi/L	U		17.5	11.3	RL-7100	/ X /
Thorium-230	0.00209	0.0397	pCi/L	U		0.35	0.144	RL-7128	/ X /
Uranium-234	0.0192	0.0363	pCi/L	U		0.399	0.167	RL-7128	/ X /
Uranium-235	-0.0121	0.021	pCi/L	U		0.132	0.0535	RL-7128	/ X /
Uranium-238	0.129	0.054	pCi/L	U		0.147	0.0765	RL-7128	/ X /
<b>VOA</b>									
Trichloroethene	1		ug/L	U		1		SW846-8260B	/ X /
<b>WETCHEM</b>									
Ammonia as Nitrogen	0.2		mg/L	U		0.2		EPA-350.3	/ X /

**Paducah OREIS Report for 404L14-01**

<b>RI404L1-14</b>	from: QC	on 2/27/2014	Media: WQ	SmpMethod:
Comments:				

Analysis	Results	Counting Error	Units	Result Qual	Foot Note	Reporting Limit	TPU	Method	V/V/A*
<b>ANION</b>									
Fluoride	1		mg/L	U		1		SW846-9056	/ X /
<b>METAL</b>									
Arsenic	0.001		mg/L	U		0.001		SW846-6020	/ X /
Barium	0.005		mg/L	U		0.005		SW846-6020	/ X /
Cadmium	0.001		mg/L	U		0.001		SW846-6020	/ X /
Chromium	0.01		mg/L	UB		0.01		SW846-6020	/ X /
Copper	0.02		mg/L	U		0.02		SW846-6020	/ X /
Iron	0.1		mg/L	U		0.1		SW846-6010B	/ X /
Lead	0.0013		mg/L	U		0.0013		SW846-6020	/ X /
Mercury	0.0002		mg/L	U		0.0002		SW846-7470A	/ X /
Nickel	0.005		mg/L	UX		0.005		SW846-6020	/ X /
Selenium	0.005		mg/L	U		0.005		SW846-6020	/ X /
Silver	0.001		mg/L	U		0.001		SW846-6020	/ X /
Uranium	0.001		mg/L	U		0.001		SW846-6020	/ X /
Zinc	0.02		mg/L	U		0.02		SW846-6020	/ X /
<b>PCCB</b>									
PCB-1016	0.16		ug/L	U		0.16		SW846-8082	/ X /
PCB-1221	0.17		ug/L	U		0.17		SW846-8082	/ X /
PCB-1232	0.13		ug/L	U		0.13		SW846-8082	/ X /
PCB-1242	0.1		ug/L	U		0.1		SW846-8082	/ X /
PCB-1248	0.11		ug/L	U		0.11		SW846-8082	/ X /
PCB-1254	0.07		ug/L	U		0.07		SW846-8082	/ X /
PCB-1260	0.05		ug/L	U		0.05		SW846-8082	/ X /
PCB-1268	0.09		ug/L	U		0.09		SW846-8082	/ X /
Polychlorinated biphenyl	0.17		ug/L	U		0.17		SW846-8082	/ X /
<b>RADS</b>									
Cesium-137	-1.76	3.52	pCi/L	U		7.53	4.39	RL-7124	/ X /
Neptunium-237	0.00227	0.00453	pCi/L	U		0.127	0.0494	RL-7128	/ X /
Plutonium-239/240	-0.0136	0.0128	pCi/L	U		0.229	0.0931	RL-7128	/ X /
Technetium-99	0.168	12.9	pCi/L	U		17.5	12.9	RL-7100	/ X /
Thorium-230	-0.0102	0.043	pCi/L	U		0.373	0.162	RL-7128	/ X /
Uranium-234	0.00756	0.0296	pCi/L	U		0.401	0.165	RL-7128	/ X /
Uranium-235	-0.00162	0	pCi/L	U		0.134	0.0676	RL-7128	/ X /
Uranium-238	0.0279	0.0332	pCi/L	U		0.161	0.053	RL-7128	/ X /
<b>VOA</b>									
Trichloroethene	1		ug/L	U		1		SW846-8260B	/ X /
<b>WETCHEM</b>									
Ammonia as Nitrogen	0.2		mg/L	U		0.2		EPA-350.3	/ X /

<b>TB404L1-14</b>	from: QC	on 2/27/2014	Media: WQ	SmpMethod:
Comments:				

Analysis	Results	Counting Error	Units	Result Qual	Foot Note	Reporting Limit	TPU	Method	V/V/A*
<b>VOA</b>									
Trichloroethene	1		ug/L	U		1		SW846-8260B	/ X /

## Paducah OREIS Report for 404L14-02

**L1404L2-14**

from: C404L

on 6/18/2014

Media: WW

SmpMethod: GR

Comments:

Analysis	Results	Counting Error	Units	Result Qual	Foot Note	Reporting Limit	TPU	Method	V/V/A*
<b>ANION</b>									
Fluoride	8.56		mg/L			0.2		SW846-9056	I / X /
<b>FS</b>									
Conductivity	552		umho/cm					FS	//
Dissolved Oxygen	9.45		mg/L					FS	//
pH	8		Std Unit					FS	//
Redox	334		mV					FS	//
Temperature	79.2		deg F					FS	//
<b>METAL</b>									
Arsenic	0.005		mg/L	U		0.005		SW846-6020	I / X /
Barium	0.0673		mg/L			0.002		SW846-6020	I / X /
Cadmium	0.002		mg/L			0.001		SW846-6020	I / X /
Chromium	0.01		mg/L	U		0.01		SW846-6020	I / X /
Copper	0.00458		mg/L			0.001		SW846-6020	S / X /
Iron	0.304		mg/L			0.1		SW846-6020	S / X /
Lead	0.002		mg/L	U		0.002		SW846-6020	I / X /
Mercury	0.0002		mg/L	U		0.0002		SW846-7470A	I / X /
Nickel	0.00346		mg/L			0.002		SW846-6020	S / X /
Selenium	0.005		mg/L	U		0.005		SW846-6020	I / X /
Silver	0.001		mg/L	U		0.001		SW846-6020	I / X /
Uranium	80.7		mg/L			0.4		SW846-6020	I / X /
Zinc	0.0154		mg/L			0.01		SW846-6020	S / X /
<b>PCCB</b>									
PCB-1016	0.101		ug/L	U		0.101		SW846-8082	I / X /
PCB-1221	0.101		ug/L	U		0.101		SW846-8082	I / X /
PCB-1232	0.101		ug/L	U		0.101		SW846-8082	I / X /
PCB-1242	0.101		ug/L	U		0.101		SW846-8082	I / X /
PCB-1248	0.101		ug/L	U		0.101		SW846-8082	I / X /
PCB-1254	0.0728		ug/L	J		0.101		SW846-8082	I / X /
PCB-1260	0.0941		ug/L	J		0.101		SW846-8082	I / X /
PCB-1268	0.101		ug/L	U		0.101		SW846-8082	I / X /
Polychlorinated biphenyl	0.167		ug/L			0.101		SW846-8082	I / X /
<b>RADS</b>									
Cesium-137	-2.22	8.54	pCi/L	U		12.8	8.6	EPA-901.1	I / X /
Neptunium-237	2.13	1.99	pCi/L	U		2.33	2	HASL 300	I / X /
Plutonium-239/240	-0.0677	1.57	pCi/L	U		3.55	1.57	Pu-11-RC M	I / X /
Technetium-99	163	16.5	pCi/L			19.9	24.5	Tc-02-RC M	I / X /
Thorium-230	0.991	0.997	pCi/L	U		1.49	1.02	Th-01-RC M	I / X /
Uranium-234	3170	1690	pCi/L			1750	1770	HASL 300	I / X /
Uranium-235	-534	557	pCi/L	U		1930	558	HASL 300	I / X /
Uranium-238	34200	4920	pCi/L			1700	7670	HASL 300	I / X /
<b>VOA</b>									
Trichloroethene	1		ug/L	U		1		SW846-8260B	I / X /
<b>WETCHEM</b>									
Ammonia as Nitrogen	0.0669		mg/L			0.05		EPA-350.1	S / X /

**Paducah OREIS Report for 404L14-02**

<b>TB404L2-14</b>	from: QC	on 6/18/2014	Media: WQ	SmpMethod:
Comments:				

Analysis	Results	Counting Error	Units	Result Qual	Foot Note	Reporting Limit	TPU	Method	V/V/A*
<b>VOA</b>									
Trichloroethene	1		ug/L	U		1		SW846-8260B	/ X /

**C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>**

Period of Inspection: January 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination	1-30-14	32"	Jeff Boulton <del>Jeff Boulton</del>
Second monthly leachate level determination	<del>_____</del>		
Third monthly leachate level determination	<del>_____</del> JLB 1-30-14		

\* If the leachate level in the sump is at **3 feet (36 inches)**, then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the **"C-404 Inspection Checklist for Leachate Removal."**

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022

### C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>

Period of Inspection: January, February 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination	1-30-14	32"	Jeff Boulton Jeff Boulton
Second monthly leachate level determination	2-17-14	35"	Jeff Boulton Jeff Boulton
Third monthly leachate level determination		JLB 2-17-14	

\* If the leachate level in the sump is at 3 feet (36 inches), then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the "C-404 Inspection Checklist for Leachate Removal."

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022

**C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>**

Period of Inspection: January, February, March 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination	1-30-14	32"	Jeff Boulton Jeff Boulton
Second monthly leachate level determination	2-17-14	38"	Jeff Boulton Jeff Boulton
Third monthly leachate level determination	3-18-14	16"	Jeff Boulton Jeff Boulton

\* If the leachate level in the sump is at 3 feet (36 inches), then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the "C-404 Inspection Checklist for Leachate Removal."

**NOTES:**

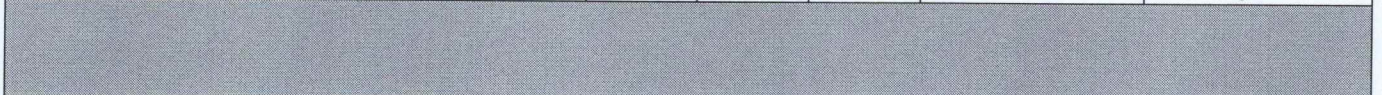
1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022



**C-404 Inspection Checklist for Leachate Removal<sup>1, 2, 3</sup>**

Leachate Removal Inspection	YES	NO	N/A	Date (M/D/YY)	Volume (gallons)
Was any removal necessary during the quarter?	✓			2-19-14	1200
Has any leachate removed during the quarter been sampled?	✓			2-27-14	↓
Date of superficial inspection upon removal of leachate.	✓			2-19-14	
Date of sampling of leachate after removal.	✓			2-27-14	



Item No.	Inspection Item	Item Description	Inspection Results		Comments
			A	U	
A	Leachate Pit	Interior malformations	✓		
		Exterior malformations	✓		

Inspector: <u>Jeff Boulton</u> (Printed Name)	Signature: <u><i>Jeff Boulton</i></u> Date: <u>2-19-14</u> Time: <u>1426</u>
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A=Acceptable  
 U=Unacceptable

**NOTES:**

1. This form is completed if the leachate level in the sump is at **3 feet (36 inches)** and is being removed. Ensure the appropriate personnel have been contacted and complete the information above.
2. If any item is found to be unacceptable, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
3. The original forms shall be kept on file in the facility operating record.

*Leachate was sampled at C-752-A from poly container RFD 118261-01. Jeff Boulton 2-27-14*

**C-404 Quarterly Inspection Checklist<sup>1, 5</sup>**

Item No.	Inspection Item	Item Description	Inspection Results		Comments/Observations
			A	U	
A	Warning Signs	Four signs around landfill	✓		
B	Vegetative Cover <sup>2</sup>	Gully erosion depth > 6 inches	✓		
		Vegetative die-off	✓		
		Varmint intrusion/burrowing from animals	✓		
		Overgrowth	✓		
		Depressions	✓		
C	Ditches <sup>3</sup>	Debris in ditches	✓		
		Excessive sediment	✓		
		Drainage	✓		
		Erosion	✓		
D	Anchor Trench <sup>4</sup>	Washouts or depressions	✓		
		Lack of discharge	✓		
		Unusual volume or color	✓		
		Drainage (4 drains from landfill)	✓		
E	Leachate System	Level	✓		
		Cracks or damage	✓		
Inspector: <u>Jeff Boulton</u> (Printed Name)			Signature: <u>Jeff Boulton</u> Date: <u>3-18-14</u> Time: <u>1:22</u>		

A=Acceptable  
U=Unacceptable

**NOTES:**

1. If any item is found to be unacceptable, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. For Item No. B, the vegetative cover shall be mowed regularly during the active growing season to discourage the growth of weeds, competitive species, or deep-rooted vegetation. Mowing shall be conducted using a sickle-type mower to prevent airborne contaminants. A radiation work permit will be required. Any erosion damage greater than 6 inches will be repaired by restoring to its original grade and reseeding. Differential settlement will be repaired by restoring site to its original grade and reseeding.
3. For Item No. C, blockage of or damage to the system shall be repaired by removing debris and accumulated sediment and restoring the ditch to its original grade. Ditches shall be reseeded and additional gravel shall be installed as needed.
4. For Item No. D, drainage pipe failures shall be repaired by removing the failed pipe, installing a new section, and replacing the fill material as necessary.
5. The original forms shall be kept on file in the facility operating record.

C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>

Period of Inspection: April 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination	4-24-14	36.4	JEFF Boulton <del>JEFF Boulton</del>
Second monthly leachate level determination	<del>JB A-24-14</del>		
Third monthly leachate level determination	<del>JB A-24-14</del>		

\* If the leachate level in the sump is at **3 feet (36 inches)**, then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the "C-404 Inspection Checklist for Leachate Removal."

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022

**C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>**

Period of Inspection: May 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination		<del>JB 5-7-14</del>	
Second monthly leachate level determination	5-7-14	3	<del>Jeff Boulton</del> Jett Boulton
Third monthly leachate level determination		<del>JB 5-7-14</del>	

*after leachate was removed. JB 5-7-14*

\* If the leachate level in the sump is at 3 feet (36 inches), then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the "C-404 Inspection Checklist for Leachate Removal."

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

**C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>**

Period of Inspection: June 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination	<del>                    </del>	<del>                    </del>	<del>                    </del>
Second monthly leachate level determination	<del>                    </del>	<del>                    </del>	<del>                    </del>
Third monthly leachate level determination	6-5-14	11	Jett Boulton <i>Jett Boulton</i>

\* If the leachate level in the sump is at **3 feet (36 inches)**, then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the **"C-404 Inspection Checklist for Leachate Removal."**

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022

### C-404 Inspection Checklist for a 24-Hour Rain Event<sup>1, 2, 3</sup>

Item No.	Inspection Item	Item Description	Inspection Results		Comments/Observations	
			A	U		
A	Vegetative Cover	Gully erosion depth > 6 inches	✓		Rainfall 2.5" on 6-3-14 and 3.5" over night into 6-4-14. Jeff Boulton	
		Vegetative die-off	✓			
		Varmint intrusion/burrowing from animals	✓			
		Overgrowth	✓			
		Depressions	✓			
B	Ditches	Debris in ditches	✓			
		Excessive sediment	✓			
		Drainage	✓			
		Erosion	✓			
C	Anchor Trench	Washouts or depressions	✓			
		Lack of discharge	✓			
		Unusual volume or color	✓			
		Drainage (4 drains from landfill)	✓			
Inspector: <u>Jeff Boulton</u> (Printed Name)			Signature: <u>Jeff Boulton</u> Date: <u>6-5-14</u> Time: <u>1053</u>			

A=Acceptable  
U=Unacceptable

**NOTES:**

1. This checklist is used after a major storm in the event that 5.8 inches falls in 24 hours.
2. If any item is found to be unacceptable, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
3. The original forms shall be kept on file in the facility operating record.

### C-404 Inspection Checklist for Leachate Removal<sup>1, 2, 3</sup>

Leachate Removal Inspection	YES	NO	N/A	Date (M/D/YY)	Volume (gallons)
Was any removal necessary during the quarter?	✓			5-7-14	1200
Has any leachate removed during the quarter been sampled?	✓			6-18-14	
Date of superficial inspection upon removal of leachate.	✓			5-7-14	
Date of sampling of leachate after removal.	✓			6-18-14	w C-752-A RFD-119508-01
Item No.	Inspection Item	Item Description	Inspection Results		Comments
			A	U	
A	Leachate Pit	Interior malformations	✓		Done on 5-7-14
		Exterior malformations	✓		Done on 5-7-14
Inspector: <u>Jeff Boulton</u> (Printed Name)			Signature: <u><i>Jeff Boulton</i></u> Date: <u>6-18-14</u> Time: <u>1437</u>		

A=Acceptable  
U=Unacceptable

**NOTES:**

1. This form is completed if the leachate level in the sump is at **3 feet (36 inches)** and is being removed. Ensure the appropriate personnel have been contacted and complete the information above.
2. If any item is found to be unacceptable, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
3. The original forms shall be kept on file in the facility operating record.

### C-404 Quarterly Inspection Checklist<sup>1, 5</sup>

Item No.	Inspection Item	Item Description	Inspection Results		Comments/Observations
			A	U	
A	Warning Signs	Four signs around landfill	✓		
B	Vegetative Cover <sup>2</sup>	Gully erosion depth > 6 inches	✓		
		Vegetative die-off	✓		
		Varmint intrusion/burrowing from animals	✓		
		Overgrowth	✓		
		Depressions	✓		
C	Ditches <sup>3</sup>	Debris in ditches	✓		
		Excessive sediment	✓		
		Drainage	✓		
		Erosion	✓		
D	Anchor Trench <sup>4</sup>	Washouts or depressions	✓		
		Lack of discharge	✓		
		Unusual volume or color	✓		
		Drainage (4 drains from landfill)	✓		
E	Leachate System	Level	✓		11 inches
		Cracks or damage	✓		
Inspector: <u>Jeff Boulton</u> (Printed Name)			Signature: <u>Jeff Boulton</u> Date: <u>6-5-14</u> Time: <u>1053</u>		

A=Acceptable  
U=Unacceptable

**NOTES:**

1. If any item is found to be unacceptable, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. For Item No. B, the vegetative cover shall be mowed regularly during the active growing season to discourage the growth of weeds, competitive species, or deep-rooted vegetation. Mowing shall be conducted using a sickle-type mower to prevent airborne contaminants. A radiation work permit will be required. Any erosion damage greater than 6 inches will be repaired by restoring to its original grade and reseeding. Differential settlement will be repaired by restoring site to its original grade and reseeding.
3. For Item No. C, blockage of or damage to the system shall be repaired by removing debris and accumulated sediment and restoring the ditch to its original grade. Ditches shall be reseeded and additional gravel shall be installed as needed.
4. For Item No. D, drainage pipe failures shall be repaired by removing the failed pipe, installing a new section, and replacing the fill material as necessary.
5. The original forms shall be kept on file in the facility operating record.



**C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>**

Period of Inspection: July 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination	7-8-14	17	<del>Jeff Boulton</del> Jeff Boulton
Second monthly leachate level determination	<del>JB-7-8-14</del>		
Third monthly leachate level determination	<del>JB-7-8-14</del>		

\* If the leachate level in the sump is at 3 feet (36 inches), then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the "C-404 Inspection Checklist for Leachate Removal."

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022

**C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>**

Period of Inspection: August 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination	<del>JB 8-9-14</del>	<del></del>	<del></del>
Second monthly leachate level determination	8-9-14	17.8	Jeff Boulton Jeff Boulton
Third monthly leachate level determination	<del>JB 8-9-14</del>	<del></del>	<del></del>

\* If the leachate level in the sump is at 3 feet (36 inches), then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the "C-404 Inspection Checklist for Leachate Removal."

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022

**C-404 Monthly Inspection Summary<sup>1, 2, 3, 4</sup>**

Period of Inspection: September 2014

Leachate Level	Date (M/D/YY)	Level (inches deep)*	Inspector(s)
First monthly leachate level determination			
Second monthly leachate level determination	<del>JB</del>	<del>9-15-14</del>	
Third monthly leachate level determination	9-15-14	18.2	Jeff Boulton Jeff Boulton

\* If the leachate level in the sump is at 3 feet (36 inches), then contact the appropriate personnel to initial removal and sampling of leachate AND when leachate is removed, complete the "C-404 Inspection Checklist for Leachate Removal."

**NOTES:**

1. If any item is found to be unacceptable and cannot be explained in the space available, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. Third quarter of calendar year inspection includes the annual leachate collection system inspection.
3. The original forms shall be kept on file in the facility operating record.
4. Upon completing the monthly inspections, e-mail Environmental Compliance the leachate level and whether or not the leachate needs to be sampled or removed.

ENM-F-0001 (8/17/10)  
PAD-ENM-0022

### C-404 Quarterly Inspection Checklist<sup>1, 5</sup>

Item No.	Inspection Item	Item Description	Inspection Results		Comments/Observations
			A	U	
A	Warning Signs	Four signs around landfill	✓		
B	Vegetative Cover <sup>2</sup>	Gully erosion depth > 6 inches	✓		
		Vegetative die-off	✓		
		Varmint intrusion/burrowing from animals	✓		
		Overgrowth	✓		
		Depressions	✓		
C	Ditches <sup>3</sup>	Debris in ditches	✓		
		Excessive sediment	✓		
		Drainage	✓		
		Erosion	✓		
D	Anchor Trench <sup>4</sup>	Washouts or depressions	✓		
		Lack of discharge	✓		
		Unusual volume or color	✓		
		Drainage (4 drains from landfill)	✓		
E	Leachate System	Level	✓		17 inches
		Cracks or damage	✓		
Inspector: <u>Jeff Boulton</u> (Printed Name)			Signature: <u>Jeff Boulton</u> Date: <u>9-25-14</u> Time: _____		

A=Acceptable  
U=Unacceptable

**NOTES:**

1. If any item is found to be unacceptable, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. For Item No. B, the vegetative cover shall be mowed regularly during the active growing season to discourage the growth of weeds, competitive species, or deep-rooted vegetation. Mowing shall be conducted using a sickle-type mower to prevent airborne contaminants. A radiation work permit will be required. Any erosion damage greater than 6 inches will be repaired by restoring to its original grade and reseeding. Differential settlement will be repaired by restoring site to its original grade and reseeding.
3. For Item No. C, blockage of or damage to the system shall be repaired by removing debris and accumulated sediment and restoring the ditch to its original grade. Ditches shall be reseeded and additional gravel shall be installed as needed.
4. For Item No. D, drainage pipe failures shall be repaired by removing the failed pipe, installing a new section, and replacing the fill material as necessary.
5. The original forms shall be kept on file in the facility operating record.

### C-404 Annual Inspection Checklist<sup>1, 2, 3</sup>

Item No.	Inspection Item	Item Description	Inspection Results		Comments
			A	U	
A	Wells	14 Wells (attach well inspection form)	✓		<i>Done on 9-24 9-25-14</i>
B	Leachate Pit	Interior malformations	✓		
		Exterior malformations	✓		
		Integrity test (attach data) <sup>4</sup>	✓		<i>Started on 9/15/14/0800 ended on 10/16/14/0500</i>
Inspector: <u>Jeff Boulton</u> (Printed Name)			Signature: <u><i>Jeff Boulton</i></u> Date: <u>10/16/14</u> Time: <u>0910</u>		

A=Acceptable  
U=Unacceptable

**NOTES:**

1. If any item is found to be unacceptable, the inspector must identify the specific observation and nature of the problem on the "C-404 Inspection Addendum" Form.
2. The original forms shall be kept on file in the facility operating record.
3. Annual inspection performed during the third quarter of the calendar year.
4. For the integrity test of the leachate pit during the annual inspection, data from the data logger is downloaded electronically and printed annually, and then attached to the annual inspection checklist for maintaining in the file.

# INSPECTIONS FORM

SAMPLE POINT : MW84  
Location: C-404 Landfill  
AKGWA Number: 8000-5233

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *needs painting*

Signature: *Jeff Barker* Time: *0815* Date: *9-25-14*

ENM-F-0039 (8/22/10)  
PAD-ENM-0022

# INSPECTIONS FORM

SAMPLE POINT : MW85  
Location: C-404 Landfill  
AKGWA Number: 8000-5234

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *well needs painting*

Signature: *Jeff Baults* Time: *0832* Date: *9-25-14*

ENM-F-0040 (8/22/10)  
PAD-ENM-0022

# INSPECTIONS FORM

SAMPLE POINT : MW86  
Location: C-404 Landfill  
AKGWA Number: 8000-5235

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *needs painting*

Signature: *Jeff Bault* Time: *0856* Date: *9-25-14*

ENM-F-0041 (8/22/10)  
PAD-ENM-0022



# INSPECTIONS FORM

SAMPLE POINT : MW87  
Location: C-404 Landfill  
AKGWA Number: 8000-5236

Accept

Reject

N/A

AKGWA Number Tag

Stamped AKGWA Number

Outer Casing

Concrete Pad

Bumper Post

Painting

Cap

Road Access

Brush/Weed eating/Mowing

Fittings/Tubing/Pump Repair

Lettering/Numbers

Lock and Hasp

Comments: *Needs painting*

Signature: *Jeff Bowls* Time: *1215* Date: *9-24-14*

ENM-F-0042 (8/22/10)  
PAD-ENM-0022

# INSPECTIONS FORM

SAMPLE POINT : MW88  
 Location: C-404 Landfill  
 AKGWA Number: 8000-5237

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *needs painting & relettering*

Signature: *[Handwritten Signature]* Time: 1232 Date: 9-24-14

ENM-F-0043 (8/22/10)  
 PAD-ENM-0022

# INSPECTIONS FORM

**SAMPLE POINT :** MW89  
**Location:** C-404 Landfill  
**AKGWA Number:** 8000-5239

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

*Needs painting & relettering*

Signature: \_\_\_\_\_

*Jeff Barltz*

Time: \_\_\_\_\_

*1252*

Date: \_\_\_\_\_

*9-24-14*

# INSPECTIONS FORM

SAMPLE POINT : MW90A  
Location: C-404 Landfill  
AKGWA Number: 8004-0357

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *well was painted this year*

Signature: *Jeff Bault* Time: *1308* Date: *9-24-14*

ENM-F-0045 (8/22/10)  
PAD-ENM-0022

# INSPECTIONS FORM

SAMPLE POINT : MW91  
Location: C-404 Landfill  
AKGWA Number: 8000-5240

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *Needs painting*

Signature: *Jeff Boulter* Time: *0917* Date: *9-25-14*

# INSPECTIONS FORM

SAMPLE POINT : MW92  
 Location: C-404 Landfill  
 AKGWA Number: 8000-5101

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Painting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *Needs painting & relettering.*

Signature: *Jeff Ban* Time: *09:39* Date: *9-25-14*

# INSPECTIONS FORM

SAMPLE POINT : MW93  
Location: C-404 Landfill  
AKGWA Number: 8000-5102

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

Signature: Jeff Bault Time: 1326 Date: 9-24-14

ENM-F-0048 (8/22/10)  
PAD-ENM-0022

# INSPECTIONS FORM

SAMPLE POINT : MW94  
Location: C-404 Landfill  
AKGWA Number: 8000-5103

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

Signature: Jeff Banta Time: 1344 Date 9-24-14



# INSPECTIONS FORM

SAMPLE POINT : MW95A  
Location: C-404 Landfill  
AKGWA Number: 8004-0356

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *well was painted this year.*

Signature: *Jeff Bank* Time: *1403* Date: *9-24-14*

# INSPECTIONS FORM

SAMPLE POINT : MW226  
Location: C-404 Landfill  
AKGWA Number: 8000-4785

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: *well was painted this year.*

Signature: *Jeff Barber* Time: 1423 Date: 9-24-14

# INSPECTIONS FORM

SAMPLE POINT : MW227  
Location: C-404 Landfill  
AKGWA Number: 8000-4786

Accept

Reject

N/A

	Accept	Reject	N/A
AKGWA Number Tag	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stamped AKGWA Number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outer Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete Pad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bumper Post	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Painting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brush/Weed eating/Mowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fittings/Tubing/Pump Repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lettering/Numbers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lock and Hasp	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

*well was painted This year.*

Signature:

*Jeff Bumb*

Time:

*1445*

Date

*9-24-14*

10/21/2014  
Report Date: 3:23:09 PM  
Report User Name: C400  
Report Computer Name RVABXXLAP03323  
Application: WinSituPlus.exe  
Application Version: 5.6.24.4

#### Log File Properties

File Name C-404 Landfill Sump 2014\_2014-10-16\_12-44-15-520.wsl  
10/16/2014  
Create Date 12:44:07 PM

#### Device Properties

Device Level TROLL 500  
Site C-404 Landfill Sump  
Device Name C404 sump sept 2014  
Serial Number 102673  
Firmware Version 1.18  
Hardware Version 0  
Device Address 1  
Device Comm Cfg 19200 8 Even 1 (Modbus-RTU)  
Used Memory 22  
Used Battery 50

#### Log Configuration

Log Name C-404 Landfill Sump 2014  
Created By C400  
Computer Name RVABXXLAP03323  
Application WinSituPlus.exe  
Application Version 5.6.24.4  
Create Date 9/15/2014 7:46:37 AM Central Daylight Time  
Log Setup  
Time Zone Central Daylight Time  
Notes Size (bytes) 4096  
Overwrite when full Enabled  
Scheduled  
Start Time 9/15/2014 8:00:00 AM Central Daylight Time  
Scheduled  
Stop Time 10/16/2014 8:00:00 AM Central Daylight Time  
Type Linear  
Duration Days: 31 hrs: 00 mins: 00 secs: 00  
Interval Days: 0 hrs: 01 mins: 00 secs: 00

Level Reference Settings at Log Creation

Level  
Measurement  
Mode Level Depth To Water  
Specific Gravity 0.999  
Level  
Reference  
Mode: Set new reference  
Level  
Reference  
Value: 7 (ft)  
  
Level  
Reference  
Head Pressure 0.476861 (PSI)

Other Log Settings

Pressure  
Offset: 0.0261036 (PSI)  
Depth of  
Probe: 1.09849 (ft)  
Head  
Pressure: 0.475749 (PSI)  
Temperature: 21.6524 (C)

Log Notes:

Date and Time	Note
9/15/2014 7:46	Sensor SN: 102673
9/15/2014 7:46	Used Battery: 50% Used Memory: 22% User Name: C400

Log Data:

Record Count	745
Sensors	1
	1 102673 Pressure/Temp 15 PSIG (11m/35ft)

Time Zone: Central Daylight Time

	Elapsed Time	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
9/15/2014 8:00	0	0.48	21.58	6.993
9/15/2014 9:00	3599.951	0.479	21.58	6.994
9/15/2014 10:00	7199.951	0.478	21.58	6.997
9/15/2014 11:00	10799.951	0.478	21.581	6.997
9/15/2014 12:00	14399.951	0.479	21.577	6.995
9/15/2014 13:00	17999.951	0.478	21.579	6.997
9/15/2014 14:00	21599.951	0.478	21.574	6.996
9/15/2014 15:00	25199.951	0.478	21.57	6.997
9/15/2014 16:00	28799.951	0.478	21.566	6.997
9/15/2014 17:00	32399.951	0.478	21.564	6.998
9/15/2014 18:00	35999.951	0.478	21.562	6.996
9/15/2014 19:00	39599.951	0.478	21.562	6.997
9/15/2014 20:00	43199.951	0.478	21.562	6.998
9/15/2014 21:00	46799.951	0.478	21.56	6.998
9/15/2014 22:00	50399.951	0.478	21.558	6.997
9/15/2014 23:00	53999.951	0.478	21.557	6.997
9/16/2014 0:00	57599.951	0.478	21.555	6.997
9/16/2014 1:00	61199.951	0.478	21.555	6.997
9/16/2014 2:00	64799.951	0.478	21.555	6.997
9/16/2014 3:00	68399.951	0.478	21.552	6.997
9/16/2014 4:00	71999.951	0.478	21.555	6.997
9/16/2014 5:00	75599.951	0.478	21.555	6.997
9/16/2014 6:00	79199.951	0.478	21.55	6.997
9/16/2014 7:00	82799.951	0.478	21.553	6.997
9/16/2014 8:00	86399.951	0.479	21.55	6.996
9/16/2014 9:00	89999.951	0.479	21.548	6.996
9/16/2014 10:00	93599.951	0.478	21.55	6.997
9/16/2014 11:00	97199.951	0.478	21.551	6.997
9/16/2014 12:00	100799.951	0.478	21.547	6.998
9/16/2014 13:00	104399.951	0.478	21.547	6.997
9/16/2014 14:00	107999.951	0.479	21.547	6.996
9/16/2014 15:00	111599.951	0.478	21.545	6.997
9/16/2014 16:00	115199.951	0.479	21.54	6.996
9/16/2014 17:00	118799.951	0.478	21.542	6.996
9/16/2014 18:00	122399.951	0.478	21.539	6.997
9/16/2014 19:00	125999.951	0.478	21.535	6.997
9/16/2014 20:00	129599.951	0.478	21.537	6.997
9/16/2014 21:00	133199.951	0.478	21.538	6.997
9/16/2014 22:00	136799.951	0.478	21.537	6.997
9/16/2014 23:00	140399.951	0.479	21.537	6.996
9/17/2014 0:00	143999.951	0.478	21.54	6.996
9/17/2014 1:00	147599.951	0.478	21.54	6.997

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
9/17/2014 2:00	151199.951	0.478	21.541	6.996
9/17/2014 3:00	154799.951	0.478	21.54	6.996
9/17/2014 4:00	158399.951	0.478	21.54	6.996
9/17/2014 5:00	161999.951	0.478	21.539	6.997
9/17/2014 6:00	165599.951	0.479	21.537	6.995
9/17/2014 7:00	169199.951	0.478	21.539	6.996
9/17/2014 8:00	172799.951	0.478	21.538	6.997
9/17/2014 9:00	176399.951	0.479	21.538	6.996
9/17/2014 10:00	179999.951	0.479	21.533	6.995
9/17/2014 11:00	183599.951	0.478	21.53	6.996
9/17/2014 12:00	187199.951	0.478	21.522	6.997
9/17/2014 13:00	190799.951	0.478	21.513	6.998
9/17/2014 14:00	194399.951	0.478	21.508	6.997
9/17/2014 15:00	197999.951	0.478	21.497	6.998
9/17/2014 16:00	201599.951	0.478	21.493	6.997
9/17/2014 17:00	205199.951	0.478	21.485	6.997
9/17/2014 18:00	208799.951	0.478	21.479	6.997
9/17/2014 19:00	212399.951	0.478	21.473	6.996
9/17/2014 20:00	215999.951	0.478	21.471	6.997
9/17/2014 21:00	219599.951	0.478	21.466	6.997
9/17/2014 22:00	223199.951	0.479	21.462	6.996
9/17/2014 23:00	226799.951	0.478	21.457	6.996
9/18/2014 0:00	230399.951	0.478	21.455	6.997
9/18/2014 1:00	233999.951	0.478	21.453	6.997
9/18/2014 2:00	237599.951	0.478	21.447	6.997
9/18/2014 3:00	241199.951	0.478	21.445	6.997
9/18/2014 4:00	244799.951	0.478	21.447	6.997
9/18/2014 5:00	248399.951	0.479	21.443	6.996
9/18/2014 6:00	251999.951	0.478	21.443	6.997
9/18/2014 7:00	255599.951	0.478	21.44	6.997
9/18/2014 8:00	259199.951	0.478	21.434	6.997
9/18/2014 9:00	262799.951	0.478	21.435	6.997
9/18/2014 10:00	266399.951	0.478	21.43	6.997
9/18/2014 11:00	269999.951	0.478	21.427	6.997
9/18/2014 12:00	273599.951	0.479	21.425	6.996
9/18/2014 13:00	277199.951	0.478	21.417	6.997
9/18/2014 14:00	280799.951	0.478	21.41	6.997
9/18/2014 15:00	284399.951	0.478	21.41	6.997
9/18/2014 16:00	287999.951	0.478	21.402	6.997
9/18/2014 17:00	291599.951	0.478	21.403	6.997
9/18/2014 18:00	295199.951	0.478	21.399	6.997
9/18/2014 19:00	298799.951	0.478	21.4	6.997

		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Elapsed Time		Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
Date and Time	Seconds			
9/18/2014 20:00	302399.951	0.478	21.399	6.996
9/18/2014 21:00	305999.951	0.478	21.399	6.998
9/18/2014 22:00	309599.951	0.478	21.402	6.997
9/18/2014 23:00	313199.951	0.478	21.401	6.997
9/19/2014 0:00	316799.951	0.478	21.401	6.997
9/19/2014 1:00	320399.951	0.478	21.404	6.997
9/19/2014 2:00	323999.951	0.478	21.404	6.997
9/19/2014 3:00	327599.951	0.479	21.405	6.996
9/19/2014 4:00	331199.951	0.478	21.405	6.996
9/19/2014 5:00	334799.951	0.479	21.405	6.996
9/19/2014 6:00	338399.951	0.479	21.409	6.995
9/19/2014 7:00	341999.951	0.479	21.405	6.996
9/19/2014 8:00	345599.951	0.478	21.409	6.996
9/19/2014 9:00	349199.951	0.478	21.411	6.996
9/19/2014 10:00	352799.951	0.478	21.407	6.997
9/19/2014 11:00	356399.951	0.478	21.406	6.997
9/19/2014 12:00	359999.951	0.478	21.405	6.996
9/19/2014 13:00	363599.951	0.478	21.403	6.996
9/19/2014 14:00	367199.951	0.478	21.4	6.997
9/19/2014 15:00	370799.951	0.478	21.396	6.996
9/19/2014 16:00	374399.951	0.478	21.393	6.997
9/19/2014 17:00	377999.951	0.478	21.39	6.997
9/19/2014 18:00	381599.951	0.478	21.389	6.996
9/19/2014 19:00	385199.951	0.478	21.391	6.998
9/19/2014 20:00	388799.951	0.479	21.388	6.996
9/19/2014 21:00	392399.951	0.478	21.39	6.997
9/19/2014 22:00	395999.951	0.478	21.391	6.996
9/19/2014 23:00	399599.951	0.479	21.394	6.996
9/20/2014 0:00	403199.951	0.479	21.396	6.996
9/20/2014 1:00	406799.951	0.478	21.396	6.997
9/20/2014 2:00	410399.951	0.478	21.401	6.996
9/20/2014 3:00	413999.951	0.479	21.403	6.996
9/20/2014 4:00	417599.951	0.478	21.407	6.997
9/20/2014 5:00	421199.951	0.479	21.414	6.996
9/20/2014 6:00	424799.951	0.479	21.413	6.996
9/20/2014 7:00	428399.951	0.479	21.418	6.996
9/20/2014 8:00	431999.951	0.478	21.418	6.997
9/20/2014 9:00	435599.951	0.478	21.424	6.996
9/20/2014 10:00	439199.951	0.479	21.422	6.996
9/20/2014 11:00	442799.951	0.479	21.421	6.996
9/20/2014 12:00	446399.951	0.479	21.42	6.996
9/20/2014 13:00	449999.951	0.479	21.421	6.996



Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
9/20/2014 14:00	453599.951	0.479	21.422	6.996
9/20/2014 15:00	457199.951	0.478	21.42	6.996
9/20/2014 16:00	460799.951	0.479	21.418	6.996
9/20/2014 17:00	464399.951	0.479	21.421	6.996
9/20/2014 18:00	467999.951	0.479	21.42	6.995
9/20/2014 19:00	471599.951	0.479	21.424	6.996
9/20/2014 20:00	475199.951	0.478	21.424	6.996
9/20/2014 21:00	478799.951	0.479	21.429	6.996
9/20/2014 22:00	482399.951	0.478	21.427	6.996
9/20/2014 23:00	485999.951	0.478	21.431	6.997
9/21/2014 0:00	489599.951	0.479	21.43	6.996
9/21/2014 1:00	493199.951	0.478	21.437	6.996
9/21/2014 2:00	496799.951	0.479	21.439	6.996
9/21/2014 3:00	500399.951	0.479	21.443	6.996
9/21/2014 4:00	503999.951	0.478	21.445	6.996
9/21/2014 5:00	507599.951	0.479	21.45	6.996
9/21/2014 6:00	511199.951	0.478	21.452	6.998
9/21/2014 7:00	514799.951	0.479	21.454	6.995
9/21/2014 8:00	518399.951	0.479	21.454	6.996
9/21/2014 9:00	521999.951	0.478	21.458	6.997
9/21/2014 10:00	525599.951	0.478	21.459	6.997
9/21/2014 11:00	529199.951	0.478	21.459	6.996
9/21/2014 12:00	532799.951	0.479	21.459	6.996
9/21/2014 13:00	536399.951	0.479	21.461	6.996
9/21/2014 14:00	539999.951	0.478	21.462	6.997
9/21/2014 15:00	543599.951	0.479	21.459	6.996
9/21/2014 16:00	547199.951	0.479	21.464	6.996
9/21/2014 17:00	550799.951	0.479	21.46	6.996
9/21/2014 18:00	554399.951	0.479	21.458	6.996
9/21/2014 19:00	557999.951	0.478	21.464	6.997
9/21/2014 20:00	561599.951	0.478	21.463	6.997
9/21/2014 21:00	565199.951	0.479	21.465	6.996
9/21/2014 22:00	568799.951	0.479	21.468	6.996
9/21/2014 23:00	572399.951	0.479	21.476	6.996
9/22/2014 0:00	575999.951	0.479	21.478	6.996
9/22/2014 1:00	579599.951	0.479	21.476	6.996
9/22/2014 2:00	583199.951	0.479	21.484	6.995
9/22/2014 3:00	586799.951	0.479	21.489	6.995
9/22/2014 4:00	590399.951	0.479	21.491	6.996
9/22/2014 5:00	593999.951	0.479	21.492	6.995
9/22/2014 6:00	597599.951	0.479	21.495	6.995
9/22/2014 7:00	601199.951	0.479	21.5	6.995

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
9/22/2014 8:00	604799.951	0.479	21.499	6.996
9/22/2014 9:00	608399.951	0.479	21.499	6.996
9/22/2014 10:00	611999.951	0.478	21.499	6.996
9/22/2014 11:00	615599.951	0.478	21.501	6.997
9/22/2014 12:00	619199.951	0.478	21.503	6.997
9/22/2014 13:00	622799.951	0.478	21.499	6.998
9/22/2014 14:00	626399.951	0.479	21.494	6.995
9/22/2014 15:00	629999.951	0.478	21.496	6.996
9/22/2014 16:00	633599.951	0.478	21.492	6.998
9/22/2014 17:00	637199.951	0.478	21.489	6.997
9/22/2014 18:00	640799.951	0.478	21.489	6.996
9/22/2014 19:00	644399.951	0.478	21.485	6.997
9/22/2014 20:00	647999.951	0.478	21.486	6.996
9/22/2014 21:00	651599.951	0.478	21.485	6.997
9/22/2014 22:00	655199.951	0.478	21.486	6.997
9/22/2014 23:00	658799.951	0.478	21.492	6.996
9/23/2014 0:00	662399.951	0.478	21.49	6.997
9/23/2014 1:00	665999.951	0.479	21.491	6.996
9/23/2014 2:00	669599.951	0.478	21.491	6.997
9/23/2014 3:00	673199.951	0.479	21.493	6.996
9/23/2014 4:00	676799.951	0.479	21.496	6.996
9/23/2014 5:00	680399.951	0.479	21.497	6.995
9/23/2014 6:00	683999.951	0.478	21.494	6.997
9/23/2014 7:00	687599.951	0.479	21.494	6.996
9/23/2014 8:00	691199.951	0.479	21.492	6.996
9/23/2014 9:00	694799.951	0.479	21.491	6.995
9/23/2014 10:00	698399.951	0.479	21.489	6.996
9/23/2014 11:00	701999.951	0.478	21.484	6.996
9/23/2014 12:00	705599.951	0.478	21.476	6.996
9/23/2014 13:00	709199.951	0.478	21.474	6.997
9/23/2014 14:00	712799.951	0.478	21.467	6.997
9/23/2014 15:00	716399.951	0.478	21.461	6.997
9/23/2014 16:00	719999.951	0.478	21.454	6.997
9/23/2014 17:00	723599.951	0.478	21.447	6.997
9/23/2014 18:00	727199.951	0.478	21.439	6.997
9/23/2014 19:00	730799.951	0.478	21.438	6.997
9/23/2014 20:00	734399.951	0.478	21.435	6.998
9/23/2014 21:00	737999.951	0.478	21.436	6.996
9/23/2014 22:00	741599.951	0.479	21.429	6.996
9/23/2014 23:00	745199.951	0.478	21.43	6.997
9/24/2014 0:00	748799.951	0.478	21.431	6.997
9/24/2014 1:00	752399.951	0.478	21.432	6.996

		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Elapsed Time		Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
Date and Time	Seconds			
9/24/2014 2:00	755999.951	0.479	21.433	6.996
9/24/2014 3:00	759599.951	0.479	21.433	6.996
9/24/2014 4:00	763199.951	0.478	21.435	6.996
9/24/2014 5:00	766799.951	0.478	21.433	6.996
9/24/2014 6:00	770399.951	0.479	21.43	6.996
9/24/2014 7:00	773999.951	0.479	21.433	6.995
9/24/2014 8:00	777599.951	0.478	21.432	6.997
9/24/2014 9:00	781199.951	0.479	21.431	6.995
9/24/2014 10:00	784799.951	0.479	21.425	6.995
9/24/2014 11:00	788399.951	0.479	21.423	6.996
9/24/2014 12:00	791999.951	0.478	21.42	6.997
9/24/2014 13:00	795599.951	0.479	21.415	6.995
9/24/2014 14:00	799199.951	0.478	21.406	6.996
9/24/2014 15:00	802799.951	0.478	21.402	6.997
9/24/2014 16:00	806399.951	0.479	21.397	6.995
9/24/2014 17:00	809999.951	0.479	21.393	6.996
9/24/2014 18:00	813599.951	0.479	21.392	6.995
9/24/2014 19:00	817199.951	0.479	21.387	6.995
9/24/2014 20:00	820799.951	0.479	21.383	6.995
9/24/2014 21:00	824399.951	0.479	21.385	6.995
9/24/2014 22:00	827999.951	0.479	21.382	6.995
9/24/2014 23:00	831599.951	0.479	21.38	6.995
9/25/2014 0:00	835199.951	0.479	21.382	6.994
9/25/2014 1:00	838799.951	0.479	21.383	6.994
9/25/2014 2:00	842399.951	0.479	21.385	6.995
9/25/2014 3:00	845999.951	0.479	21.387	6.994
9/25/2014 4:00	849599.951	0.479	21.389	6.995
9/25/2014 5:00	853199.951	0.479	21.391	6.994
9/25/2014 6:00	856799.951	0.479	21.393	6.994
9/25/2014 7:00	860399.951	0.479	21.39	6.995
9/25/2014 8:00	863999.951	0.479	21.394	6.995
9/25/2014 9:00	867599.951	0.479	21.391	6.995
9/25/2014 10:00	871199.951	0.479	21.392	6.994
9/25/2014 11:00	874799.951	0.479	21.392	6.995
9/25/2014 12:00	878399.951	0.479	21.391	6.994
9/25/2014 13:00	881999.951	0.479	21.389	6.994
9/25/2014 14:00	885599.951	0.48	21.385	6.994
9/25/2014 15:00	889199.951	0.48	21.386	6.994
9/25/2014 16:00	892799.951	0.48	21.38	6.994
9/25/2014 17:00	896399.951	0.479	21.378	6.994
9/25/2014 18:00	899999.951	0.48	21.38	6.994
9/25/2014 19:00	903599.951	0.48	21.378	6.994

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
9/25/2014 20:00	907199.951	0.479	21.377	6.995
9/25/2014 21:00	910799.951	0.48	21.375	6.993
9/25/2014 22:00	914399.951	0.48	21.379	6.994
9/25/2014 23:00	917999.951	0.48	21.377	6.993
9/26/2014 0:00	921599.951	0.48	21.381	6.993
9/26/2014 1:00	925199.951	0.48	21.386	6.994
9/26/2014 2:00	928799.951	0.476	21.386	7.001
9/26/2014 3:00	932399.951	0.476	21.391	7.001
9/26/2014 4:00	935999.951	0.476	21.395	7.001
9/26/2014 5:00	939599.951	0.476	21.396	7.001
9/26/2014 6:00	943199.951	0.477	21.399	7
9/26/2014 7:00	946799.951	0.476	21.399	7.001
9/26/2014 8:00	950399.951	0.477	21.404	7
9/26/2014 9:00	953999.951	0.476	21.403	7.001
9/26/2014 10:00	957599.951	0.476	21.406	7.002
9/26/2014 11:00	961199.951	0.477	21.405	7
9/26/2014 12:00	964799.951	0.476	21.404	7.001
9/26/2014 13:00	968399.951	0.477	21.407	7
9/26/2014 14:00	971999.951	0.477	21.401	7.001
9/26/2014 15:00	975599.951	0.477	21.401	7
9/26/2014 16:00	979199.951	0.476	21.401	7.001
9/26/2014 17:00	982799.951	0.477	21.399	7.001
9/26/2014 18:00	986399.951	0.477	21.399	7
9/26/2014 19:00	989999.951	0.476	21.395	7.001
9/26/2014 20:00	993599.951	0.477	21.399	7
9/26/2014 21:00	997199.951	0.477	21.401	7.001
9/26/2014 22:00	1000799.951	0.476	21.399	7.001
9/26/2014 23:00	1004399.951	0.476	21.404	7.001
9/27/2014 0:00	1007999.951	0.477	21.406	7
9/27/2014 1:00	1011599.951	0.477	21.406	7
9/27/2014 2:00	1015199.951	0.477	21.412	7
9/27/2014 3:00	1018799.951	0.477	21.417	7.001
9/27/2014 4:00	1022399.951	0.477	21.418	7
9/27/2014 5:00	1025999.951	0.476	21.422	7.001
9/27/2014 6:00	1029599.951	0.477	21.422	7
9/27/2014 7:00	1033199.951	0.476	21.426	7.001
9/27/2014 8:00	1036799.951	0.477	21.428	7
9/27/2014 9:00	1040399.951	0.476	21.429	7.001
9/27/2014 10:00	1043999.951	0.477	21.428	7
9/27/2014 11:00	1047599.951	0.477	21.428	7.001
9/27/2014 12:00	1051199.951	0.477	21.43	7
9/27/2014 13:00	1054799.951	0.476	21.43	7.001

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
9/27/2014 14:00	1058399.951	0.476	21.427	7.001
9/27/2014 15:00	1061999.951	0.476	21.427	7.001
9/27/2014 16:00	1065599.951	0.477	21.426	7.001
9/27/2014 17:00	1069199.951	0.476	21.424	7.001
9/27/2014 18:00	1072799.951	0.477	21.422	7.001
9/27/2014 19:00	1076399.951	0.477	21.423	7
9/27/2014 20:00	1079999.951	0.477	21.426	7
9/27/2014 21:00	1083599.951	0.477	21.425	7
9/27/2014 22:00	1087199.951	0.477	21.432	7.001
9/27/2014 23:00	1090799.951	0.477	21.432	6.999
9/28/2014 0:00	1094399.951	0.477	21.437	7
9/28/2014 1:00	1097999.951	0.477	21.439	7
9/28/2014 2:00	1101599.951	0.477	21.442	7.001
9/28/2014 3:00	1105199.951	0.476	21.445	7.001
9/28/2014 4:00	1108799.951	0.477	21.449	7.001
9/28/2014 5:00	1112399.951	0.477	21.455	7
9/28/2014 6:00	1115999.951	0.476	21.456	7.001
9/28/2014 7:00	1119599.951	0.477	21.461	7
9/28/2014 8:00	1123199.951	0.476	21.463	7.002
9/28/2014 9:00	1126799.951	0.477	21.464	7.001
9/28/2014 10:00	1130399.951	0.477	21.466	7.001
9/28/2014 11:00	1133999.951	0.476	21.465	7.002
9/28/2014 12:00	1137599.951	0.477	21.465	7.001
9/28/2014 13:00	1141199.951	0.476	21.464	7.001
9/28/2014 14:00	1144799.951	0.477	21.47	7.001
9/28/2014 15:00	1148399.951	0.477	21.467	7
9/28/2014 16:00	1151999.951	0.477	21.466	7.001
9/28/2014 17:00	1155599.951	0.476	21.464	7.002
9/28/2014 18:00	1159199.951	0.477	21.465	7
9/28/2014 19:00	1162799.951	0.476	21.463	7.001
9/28/2014 20:00	1166399.951	0.477	21.462	7
9/28/2014 21:00	1169999.951	0.477	21.463	7.001
9/28/2014 22:00	1173599.951	0.476	21.463	7.001
9/28/2014 23:00	1177199.951	0.476	21.466	7.001
9/29/2014 0:00	1180799.951	0.477	21.47	7
9/29/2014 1:00	1184399.951	0.476	21.47	7.001
9/29/2014 2:00	1187999.951	0.477	21.469	7
9/29/2014 3:00	1191599.951	0.477	21.474	7
9/29/2014 4:00	1195199.951	0.477	21.478	7.001
9/29/2014 5:00	1198799.951	0.477	21.478	7
9/29/2014 6:00	1202399.951	0.476	21.484	7.001
9/29/2014 7:00	1205999.951	0.477	21.482	7

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
9/29/2014 8:00	1209599.951	0.477	21.483	7
9/29/2014 9:00	1213199.951	0.476	21.484	7.001
9/29/2014 10:00	1216799.951	0.477	21.485	7
9/29/2014 11:00	1220399.951	0.477	21.484	7
9/29/2014 12:00	1223999.951	0.477	21.48	7
9/29/2014 13:00	1227599.951	0.476	21.483	7.001
9/29/2014 14:00	1231199.951	0.476	21.483	7.001
9/29/2014 15:00	1234799.951	0.477	21.48	7.001
9/29/2014 16:00	1238399.951	0.477	21.479	7.001
9/29/2014 17:00	1241999.951	0.477	21.478	7
9/29/2014 18:00	1245599.951	0.477	21.475	7.001
9/29/2014 19:00	1249199.951	0.477	21.475	7
9/29/2014 20:00	1252799.951	0.476	21.474	7.001
9/29/2014 21:00	1256399.951	0.477	21.479	7
9/29/2014 22:00	1259999.951	0.476	21.48	7.001
9/29/2014 23:00	1263599.951	0.476	21.483	7.001
9/30/2014 0:00	1267199.951	0.477	21.485	7.001
9/30/2014 1:00	1270799.951	0.477	21.488	7.001
9/30/2014 2:00	1274399.951	0.476	21.489	7.001
9/30/2014 3:00	1277999.951	0.476	21.494	7.001
9/30/2014 4:00	1281599.951	0.477	21.497	7
9/30/2014 5:00	1285199.951	0.477	21.502	7
9/30/2014 6:00	1288799.951	0.477	21.503	6.999
9/30/2014 7:00	1292399.951	0.477	21.506	7
9/30/2014 8:00	1295999.951	0.477	21.508	7.001
9/30/2014 9:00	1299599.951	0.476	21.509	7.001
9/30/2014 10:00	1303199.951	0.477	21.51	7
9/30/2014 11:00	1306799.951	0.477	21.511	7.001
9/30/2014 12:00	1310399.951	0.477	21.51	7
9/30/2014 13:00	1313999.951	0.477	21.508	7.001
9/30/2014 14:00	1317599.951	0.477	21.507	7
9/30/2014 15:00	1321199.951	0.477	21.504	7
9/30/2014 16:00	1324799.951	0.476	21.505	7.001
9/30/2014 17:00	1328399.951	0.476	21.503	7.001
9/30/2014 18:00	1331999.951	0.476	21.5	7.001
9/30/2014 19:00	1335599.951	0.476	21.5	7.002
9/30/2014 20:00	1339199.951	0.476	21.501	7.001
9/30/2014 21:00	1342799.951	0.477	21.501	7.001
9/30/2014 22:00	1346399.951	0.476	21.504	7.001
9/30/2014 23:00	1349999.951	0.476	21.509	7.002
10/1/2014 0:00	1353599.951	0.476	21.511	7.001
10/1/2014 1:00	1357199.951	0.477	21.512	7.001

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/1/2014 2:00	1360799.951	0.476	21.514	7.001
10/1/2014 3:00	1364399.951	0.477	21.52	7
10/1/2014 4:00	1367999.951	0.476	21.52	7.001
10/1/2014 5:00	1371599.951	0.477	21.522	7
10/1/2014 6:00	1375199.951	0.476	21.524	7.002
10/1/2014 7:00	1378799.951	0.477	21.526	7
10/1/2014 8:00	1382399.951	0.476	21.528	7.002
10/1/2014 9:00	1385999.951	0.477	21.53	7.001
10/1/2014 10:00	1389599.951	0.476	21.531	7.001
10/1/2014 11:00	1393199.951	0.477	21.53	7
10/1/2014 12:00	1396799.951	0.476	21.53	7.002
10/1/2014 13:00	1400399.951	0.477	21.529	7
10/1/2014 14:00	1403999.951	0.476	21.529	7.001
10/1/2014 15:00	1407599.951	0.476	21.523	7.001
10/1/2014 16:00	1411199.951	0.476	21.525	7.001
10/1/2014 17:00	1414799.951	0.477	21.524	7
10/1/2014 18:00	1418399.951	0.476	21.525	7.001
10/1/2014 19:00	1421999.951	0.477	21.519	7.001
10/1/2014 20:00	1425599.951	0.476	21.522	7.001
10/1/2014 21:00	1429199.951	0.476	21.522	7.001
10/1/2014 22:00	1432799.951	0.476	21.522	7.001
10/1/2014 23:00	1436399.951	0.477	21.526	7.001
10/2/2014 0:00	1439999.951	0.476	21.528	7.002
10/2/2014 1:00	1443599.951	0.477	21.53	7.001
10/2/2014 2:00	1447199.951	0.476	21.531	7.001
10/2/2014 3:00	1450799.951	0.477	21.535	7.001
10/2/2014 4:00	1454399.951	0.476	21.538	7.002
10/2/2014 5:00	1457999.951	0.477	21.542	7
10/2/2014 6:00	1461599.951	0.476	21.543	7.001
10/2/2014 7:00	1465199.951	0.476	21.544	7.001
10/2/2014 8:00	1468799.951	0.476	21.548	7.001
10/2/2014 9:00	1472399.951	0.476	21.547	7.002
10/2/2014 10:00	1475999.951	0.476	21.543	7.001
10/2/2014 11:00	1479599.951	0.476	21.547	7.002
10/2/2014 12:00	1483199.951	0.476	21.545	7.002
10/2/2014 13:00	1486799.951	0.477	21.545	7.001
10/2/2014 14:00	1490399.951	0.477	21.542	6.999
10/2/2014 15:00	1493999.951	0.477	21.545	7
10/2/2014 16:00	1497599.951	0.477	21.546	6.999
10/2/2014 17:00	1501199.951	0.477	21.548	6.999
10/2/2014 18:00	1504799.951	0.477	21.545	6.999
10/2/2014 19:00	1508399.951	0.477	21.545	7

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/2/2014 20:00	1511999.951	0.477	21.548	7
10/2/2014 21:00	1515599.951	0.477	21.549	6.999
10/2/2014 22:00	1519199.951	0.477	21.551	6.999
10/2/2014 23:00	1522799.951	0.478	21.553	6.998
10/3/2014 0:00	1526399.951	0.479	21.557	6.996
10/3/2014 1:00	1529999.951	0.48	21.558	6.994
10/3/2014 2:00	1533599.951	0.48	21.561	6.992
10/3/2014 3:00	1537199.951	0.48	21.563	6.993
10/3/2014 4:00	1540799.951	0.48	21.565	6.993
10/3/2014 5:00	1544399.951	0.48	21.567	6.993
10/3/2014 6:00	1547999.951	0.48	21.567	6.993
10/3/2014 7:00	1551599.951	0.48	21.567	6.993
10/3/2014 8:00	1555199.951	0.48	21.565	6.992
10/3/2014 9:00	1558799.951	0.48	21.562	6.993
10/3/2014 10:00	1562399.951	0.48	21.559	6.993
10/3/2014 11:00	1565999.951	0.48	21.557	6.993
10/3/2014 12:00	1569599.951	0.479	21.552	6.994
10/3/2014 13:00	1573199.951	0.48	21.549	6.993
10/3/2014 14:00	1576799.951	0.48	21.545	6.992
10/3/2014 15:00	1580399.951	0.48	21.544	6.992
10/3/2014 16:00	1583999.951	0.48	21.539	6.993
10/3/2014 17:00	1587599.951	0.48	21.532	6.992
10/3/2014 18:00	1591199.951	0.48	21.528	6.993
10/3/2014 19:00	1594799.951	0.48	21.525	6.993
10/3/2014 20:00	1598399.951	0.48	21.52	6.993
10/3/2014 21:00	1601999.951	0.479	21.515	6.994
10/3/2014 22:00	1605599.951	0.48	21.514	6.993
10/3/2014 23:00	1609199.951	0.48	21.511	6.994
10/4/2014 0:00	1612799.951	0.48	21.507	6.993
10/4/2014 1:00	1616399.951	0.48	21.502	6.993
10/4/2014 2:00	1619999.951	0.48	21.498	6.994
10/4/2014 3:00	1623599.951	0.48	21.496	6.992
10/4/2014 4:00	1627199.951	0.48	21.49	6.993
10/4/2014 5:00	1630799.951	0.48	21.483	6.992
10/4/2014 6:00	1634399.951	0.48	21.473	6.992
10/4/2014 7:00	1637999.951	0.48	21.453	6.993
10/4/2014 8:00	1641599.951	0.48	21.43	6.993
10/4/2014 9:00	1645199.951	0.48	21.4	6.993
10/4/2014 10:00	1648799.951	0.48	21.36	6.992
10/4/2014 11:00	1652399.951	0.48	21.324	6.993
10/4/2014 12:00	1655999.951	0.48	21.296	6.993
10/4/2014 13:00	1659599.951	0.48	21.27	6.993



Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/4/2014 14:00	1663199.951	0.48	21.255	6.993
10/4/2014 15:00	1666799.951	0.48	21.242	6.992
10/4/2014 16:00	1670399.951	0.48	21.235	6.992
10/4/2014 17:00	1673999.951	0.48	21.225	6.992
10/4/2014 18:00	1677599.951	0.48	21.22	6.993
10/4/2014 19:00	1681199.951	0.48	21.21	6.992
10/4/2014 20:00	1684799.951	0.48	21.204	6.992
10/4/2014 21:00	1688399.951	0.48	21.198	6.992
10/4/2014 22:00	1691999.951	0.48	21.196	6.993
10/4/2014 23:00	1695599.951	0.48	21.193	6.992
10/5/2014 0:00	1699199.951	0.48	21.188	6.993
10/5/2014 1:00	1702799.951	0.48	21.184	6.992
10/5/2014 2:00	1706399.951	0.48	21.175	6.992
10/5/2014 3:00	1709999.951	0.48	21.156	6.992
10/5/2014 4:00	1713599.951	0.48	21.131	6.993
10/5/2014 5:00	1717199.951	0.48	21.096	6.993
10/5/2014 6:00	1720799.951	0.48	21.054	6.992
10/5/2014 7:00	1724399.951	0.48	21.01	6.993
10/5/2014 8:00	1727999.951	0.48	20.961	6.992
10/5/2014 9:00	1731599.951	0.481	20.927	6.992
10/5/2014 10:00	1735199.951	0.48	20.884	6.992
10/5/2014 11:00	1738799.951	0.48	20.859	6.992
10/5/2014 12:00	1742399.951	0.48	20.839	6.992
10/5/2014 13:00	1745999.951	0.48	20.827	6.992
10/5/2014 14:00	1749599.951	0.48	20.822	6.993
10/5/2014 15:00	1753199.951	0.48	20.818	6.992
10/5/2014 16:00	1756799.951	0.48	20.823	6.993
10/5/2014 17:00	1760399.951	0.48	20.823	6.992
10/5/2014 18:00	1763999.951	0.48	20.823	6.992
10/5/2014 19:00	1767599.951	0.48	20.825	6.993
10/5/2014 20:00	1771199.951	0.48	20.825	6.992
10/5/2014 21:00	1774799.951	0.48	20.831	6.992
10/5/2014 22:00	1778399.951	0.48	20.833	6.992
10/5/2014 23:00	1781999.951	0.48	20.837	6.992
10/6/2014 0:00	1785599.951	0.48	20.839	6.993
10/6/2014 1:00	1789199.951	0.48	20.843	6.993
10/6/2014 2:00	1792799.951	0.48	20.851	6.992
10/6/2014 3:00	1796399.951	0.48	20.853	6.993
10/6/2014 4:00	1799999.951	0.48	20.855	6.993
10/6/2014 5:00	1803599.951	0.48	20.856	6.992
10/6/2014 6:00	1807199.951	0.48	20.86	6.992
10/6/2014 7:00	1810799.951	0.48	20.859	6.992

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/6/2014 8:00	1814399.951	0.48	20.857	6.992
10/6/2014 9:00	1817999.951	0.48	20.85	6.992
10/6/2014 10:00	1821599.951	0.48	20.843	6.992
10/6/2014 11:00	1825199.951	0.48	20.835	6.993
10/6/2014 12:00	1828799.951	0.48	20.834	6.992
10/6/2014 13:00	1832399.951	0.48	20.828	6.993
10/6/2014 14:00	1835999.951	0.48	20.826	6.994
10/6/2014 15:00	1839599.951	0.48	20.82	6.993
10/6/2014 16:00	1843199.951	0.48	20.816	6.992
10/6/2014 17:00	1846799.951	0.48	20.815	6.994
10/6/2014 18:00	1850399.951	0.48	20.816	6.993
10/6/2014 19:00	1853999.951	0.48	20.815	6.993
10/6/2014 20:00	1857599.951	0.48	20.816	6.993
10/6/2014 21:00	1861199.951	0.48	20.816	6.993
10/6/2014 22:00	1864799.951	0.48	20.819	6.992
10/6/2014 23:00	1868399.951	0.48	20.82	6.993
10/7/2014 0:00	1871999.951	0.48	20.821	6.992
10/7/2014 1:00	1875599.951	0.48	20.825	6.992
10/7/2014 2:00	1879199.951	0.48	20.828	6.992
10/7/2014 3:00	1882799.951	0.48	20.831	6.993
10/7/2014 4:00	1886399.951	0.48	20.831	6.992
10/7/2014 5:00	1889999.951	0.48	20.833	6.993
10/7/2014 6:00	1893599.951	0.48	20.839	6.993
10/7/2014 7:00	1897199.951	0.481	20.836	6.991
10/7/2014 8:00	1900799.951	0.48	20.839	6.993
10/7/2014 9:00	1904399.951	0.48	20.838	6.993
10/7/2014 10:00	1907999.951	0.48	20.834	6.993
10/7/2014 11:00	1911599.951	0.48	20.834	6.992
10/7/2014 12:00	1915199.951	0.48	20.832	6.993
10/7/2014 13:00	1918799.951	0.48	20.828	6.993
10/7/2014 14:00	1922399.951	0.48	20.825	6.993
10/7/2014 15:00	1925999.951	0.48	20.822	6.993
10/7/2014 16:00	1929599.951	0.48	20.818	6.992
10/7/2014 17:00	1933199.951	0.48	20.814	6.992
10/7/2014 18:00	1936799.951	0.48	20.813	6.993
10/7/2014 19:00	1940399.951	0.48	20.812	6.993
10/7/2014 20:00	1943999.951	0.48	20.809	6.993
10/7/2014 21:00	1947599.951	0.48	20.812	6.993
10/7/2014 22:00	1951199.951	0.48	20.812	6.992
10/7/2014 23:00	1954799.951	0.48	20.814	6.993
10/8/2014 0:00	1958399.951	0.48	20.816	6.993
10/8/2014 1:00	1961999.951	0.48	20.815	6.993

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/8/2014 2:00	1965599.951	0.48	20.818	6.994
10/8/2014 3:00	1969199.951	0.48	20.817	6.994
10/8/2014 4:00	1972799.951	0.48	20.822	6.994
10/8/2014 5:00	1976399.951	0.48	20.822	6.992
10/8/2014 6:00	1979999.951	0.48	20.824	6.993
10/8/2014 7:00	1983599.951	0.48	20.826	6.992
10/8/2014 8:00	1987199.951	0.48	20.828	6.993
10/8/2014 9:00	1990799.951	0.48	20.829	6.993
10/8/2014 10:00	1994399.951	0.48	20.829	6.993
10/8/2014 11:00	1997999.951	0.48	20.824	6.992
10/8/2014 12:00	2001599.951	0.48	20.821	6.993
10/8/2014 13:00	2005199.951	0.48	20.817	6.994
10/8/2014 14:00	2008799.951	0.48	20.814	6.993
10/8/2014 15:00	2012399.951	0.48	20.811	6.993
10/8/2014 16:00	2015999.951	0.479	20.805	6.994
10/8/2014 17:00	2019599.951	0.48	20.806	6.993
10/8/2014 18:00	2023199.951	0.48	20.804	6.994
10/8/2014 19:00	2026799.951	0.48	20.801	6.993
10/8/2014 20:00	2030399.951	0.48	20.805	6.993
10/8/2014 21:00	2033999.951	0.48	20.806	6.993
10/8/2014 22:00	2037599.951	0.48	20.805	6.993
10/8/2014 23:00	2041199.951	0.48	20.81	6.993
10/9/2014 0:00	2044799.951	0.479	20.815	6.994
10/9/2014 1:00	2048399.951	0.479	20.815	6.994
10/9/2014 2:00	2051999.951	0.48	20.818	6.994
10/9/2014 3:00	2055599.951	0.48	20.822	6.994
10/9/2014 4:00	2059199.951	0.48	20.82	6.993
10/9/2014 5:00	2062799.951	0.479	20.829	6.994
10/9/2014 6:00	2066399.951	0.48	20.833	6.994
10/9/2014 7:00	2069999.951	0.48	20.837	6.993
10/9/2014 8:00	2073599.951	0.48	20.842	6.992
10/9/2014 9:00	2077199.951	0.48	20.844	6.992
10/9/2014 10:00	2080799.951	0.48	20.844	6.994
10/9/2014 11:00	2084399.951	0.48	20.845	6.993
10/9/2014 12:00	2087999.951	0.48	20.846	6.994
10/9/2014 13:00	2091599.951	0.48	20.845	6.993
10/9/2014 14:00	2095199.951	0.48	20.847	6.993
10/9/2014 15:00	2098799.951	0.48	20.848	6.993
10/9/2014 16:00	2102399.951	0.48	20.848	6.992
10/9/2014 17:00	2105999.951	0.48	20.847	6.992
10/9/2014 18:00	2109599.951	0.48	20.846	6.993
10/9/2014 19:00	2113199.951	0.48	20.846	6.992

		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Elapsed Time		Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
Date and Time	Seconds			
10/9/2014 20:00	2116799.951	0.48	20.845	6.993
10/9/2014 21:00	2120399.951	0.481	20.849	6.991
10/9/2014 22:00	2123999.951	0.481	20.851	6.99
10/9/2014 23:00	2127599.951	0.481	20.857	6.99
10/10/2014 0:00	2131199.951	0.481	20.857	6.99
10/10/2014 1:00	2134799.951	0.481	20.857	6.99
10/10/2014 2:00	2138399.951	0.481	20.864	6.989
10/10/2014 3:00	2141999.951	0.481	20.864	6.99
10/10/2014 4:00	2145599.951	0.481	20.867	6.991
10/10/2014 5:00	2149199.951	0.481	20.863	6.99
10/10/2014 6:00	2152799.951	0.481	20.868	6.991
10/10/2014 7:00	2156399.951	0.481	20.871	6.99
10/10/2014 8:00	2159999.951	0.482	20.88	6.989
10/10/2014 9:00	2163599.951	0.482	20.885	6.987
10/10/2014 10:00	2167199.951	0.482	20.883	6.987
10/10/2014 11:00	2170799.951	0.483	20.881	6.986
10/10/2014 12:00	2174399.951	0.482	20.879	6.987
10/10/2014 13:00	2177999.951	0.482	20.875	6.987
10/10/2014 14:00	2181599.951	0.482	20.873	6.987
10/10/2014 15:00	2185199.951	0.482	20.873	6.987
10/10/2014 16:00	2188799.951	0.483	20.869	6.986
10/10/2014 17:00	2192399.951	0.483	20.865	6.986
10/10/2014 18:00	2195999.951	0.483	20.863	6.986
10/10/2014 19:00	2199599.951	0.483	20.859	6.986
10/10/2014 20:00	2203199.951	0.483	20.856	6.986
10/10/2014 21:00	2206799.951	0.483	20.854	6.985
10/10/2014 22:00	2210399.951	0.483	20.85	6.986
10/10/2014 23:00	2213999.951	0.483	20.847	6.986
10/11/2014 0:00	2217599.951	0.483	20.839	6.986
10/11/2014 1:00	2221199.951	0.483	20.833	6.986
10/11/2014 2:00	2224799.951	0.483	20.819	6.987
10/11/2014 3:00	2228399.951	0.483	20.809	6.986
10/11/2014 4:00	2231999.951	0.483	20.791	6.986
10/11/2014 5:00	2235599.951	0.483	20.768	6.986
10/11/2014 6:00	2239199.951	0.483	20.743	6.986
10/11/2014 7:00	2242799.951	0.483	20.725	6.986
10/11/2014 8:00	2246399.951	0.483	20.695	6.986
10/11/2014 9:00	2249999.951	0.484	20.667	6.984
10/11/2014 10:00	2253599.951	0.483	20.637	6.985
10/11/2014 11:00	2257199.951	0.483	20.616	6.986
10/11/2014 12:00	2260799.951	0.483	20.602	6.986
10/11/2014 13:00	2264399.951	0.483	20.581	6.985

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/11/2014 14:00	2267999.951	0.483	20.568	6.986
10/11/2014 15:00	2271599.951	0.483	20.555	6.986
10/11/2014 16:00	2275199.951	0.483	20.539	6.986
10/11/2014 17:00	2278799.951	0.483	20.525	6.986
10/11/2014 18:00	2282399.951	0.483	20.515	6.986
10/11/2014 19:00	2285999.951	0.483	20.5	6.986
10/11/2014 20:00	2289599.951	0.483	20.487	6.986
10/11/2014 21:00	2293199.951	0.483	20.473	6.986
10/11/2014 22:00	2296799.951	0.483	20.457	6.986
10/11/2014 23:00	2300399.951	0.483	20.441	6.986
10/12/2014 0:00	2303999.951	0.483	20.423	6.986
10/12/2014 1:00	2307599.951	0.483	20.41	6.986
10/12/2014 2:00	2311199.951	0.483	20.393	6.987
10/12/2014 3:00	2314799.951	0.483	20.377	6.987
10/12/2014 4:00	2318399.951	0.483	20.364	6.985
10/12/2014 5:00	2321999.951	0.483	20.346	6.986
10/12/2014 6:00	2325599.951	0.483	20.329	6.986
10/12/2014 7:00	2329199.951	0.483	20.317	6.987
10/12/2014 8:00	2332799.951	0.483	20.299	6.987
10/12/2014 9:00	2336399.951	0.483	20.284	6.986
10/12/2014 10:00	2339999.951	0.483	20.271	6.986
10/12/2014 11:00	2343599.951	0.483	20.258	6.986
10/12/2014 12:00	2347199.951	0.483	20.25	6.986
10/12/2014 13:00	2350799.951	0.483	20.239	6.987
10/12/2014 14:00	2354399.951	0.483	20.242	6.986
10/12/2014 15:00	2357999.951	0.483	20.245	6.986
10/12/2014 16:00	2361599.951	0.483	20.243	6.987
10/12/2014 17:00	2365199.951	0.483	20.252	6.986
10/12/2014 18:00	2368799.951	0.482	20.254	6.988
10/12/2014 19:00	2372399.951	0.483	20.257	6.987
10/12/2014 20:00	2375999.951	0.482	20.261	6.987
10/12/2014 21:00	2379599.951	0.482	20.262	6.987
10/12/2014 22:00	2383199.951	0.482	20.268	6.987
10/12/2014 23:00	2386799.951	0.482	20.268	6.987
10/13/2014 0:00	2390399.951	0.483	20.275	6.986
10/13/2014 1:00	2393999.951	0.483	20.28	6.987
10/13/2014 2:00	2397599.951	0.482	20.281	6.987
10/13/2014 3:00	2401199.951	0.482	20.282	6.988
10/13/2014 4:00	2404799.951	0.482	20.285	6.987
10/13/2014 5:00	2408399.951	0.482	20.289	6.988
10/13/2014 6:00	2411999.951	0.482	20.289	6.988
10/13/2014 7:00	2415599.951	0.482	20.293	6.988

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/13/2014 8:00	2419199.951	0.482	20.294	6.988
10/13/2014 9:00	2422799.951	0.482	20.3	6.988
10/13/2014 10:00	2426399.951	0.482	20.297	6.987
10/13/2014 11:00	2429999.951	0.482	20.303	6.987
10/13/2014 12:00	2433599.951	0.482	20.301	6.988
10/13/2014 13:00	2437199.951	0.482	20.305	6.988
10/13/2014 14:00	2440799.951	0.481	20.303	6.99
10/13/2014 15:00	2444399.951	0.482	20.305	6.988
10/13/2014 16:00	2447999.951	0.484	20.311	6.983
10/13/2014 17:00	2451599.951	0.485	20.31	6.981
10/13/2014 18:00	2455199.951	0.485	20.313	6.981
10/13/2014 19:00	2458799.951	0.486	20.317	6.979
10/13/2014 20:00	2462399.951	0.487	20.32	6.977
10/13/2014 21:00	2465999.951	0.486	20.323	6.978
10/13/2014 22:00	2469599.951	0.487	20.325	6.977
10/13/2014 23:00	2473199.951	0.487	20.331	6.977
10/14/2014 0:00	2476799.951	0.487	20.329	6.977
10/14/2014 1:00	2480399.951	0.486	20.331	6.978
10/14/2014 2:00	2483999.951	0.486	20.334	6.978
10/14/2014 3:00	2487599.951	0.487	20.335	6.977
10/14/2014 4:00	2491199.951	0.487	20.335	6.976
10/14/2014 5:00	2494799.951	0.487	20.335	6.977
10/14/2014 6:00	2498399.951	0.487	20.333	6.977
10/14/2014 7:00	2501999.951	0.487	20.333	6.978
10/14/2014 8:00	2505599.951	0.486	20.326	6.978
10/14/2014 9:00	2509199.951	0.486	20.315	6.978
10/14/2014 10:00	2512799.951	0.487	20.302	6.977
10/14/2014 11:00	2516399.951	0.486	20.286	6.978
10/14/2014 12:00	2519999.951	0.487	20.275	6.977
10/14/2014 13:00	2523599.951	0.487	20.254	6.976
10/14/2014 14:00	2527199.951	0.487	20.248	6.977
10/14/2014 15:00	2530799.951	0.487	20.244	6.976
10/14/2014 16:00	2534399.951	0.487	20.243	6.977
10/14/2014 17:00	2537999.951	0.486	20.24	6.978
10/14/2014 18:00	2541599.951	0.487	20.222	6.977
10/14/2014 19:00	2545199.951	0.487	20.208	6.977
10/14/2014 20:00	2548799.951	0.486	20.199	6.978
10/14/2014 21:00	2552399.951	0.486	20.184	6.978
10/14/2014 22:00	2555999.951	0.487	20.168	6.977
10/14/2014 23:00	2559599.951	0.486	20.151	6.979
10/15/2014 0:00	2563199.951	0.486	20.129	6.979
10/15/2014 1:00	2566799.951	0.486	20.117	6.979

Elapsed Time		Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673	Sensor: Pres(G) 35 ft SN#: 102673
Date and Time	Seconds	Pressure (PSI)	Temperature (C)	Level Depth-to-Water (ft)
10/15/2014 2:00	2570399.951	0.486	20.092	6.979
10/15/2014 3:00	2573999.951	0.486	20.078	6.979
10/15/2014 4:00	2577599.951	0.485	20.057	6.98
10/15/2014 5:00	2581199.951	0.486	20.035	6.98
10/15/2014 6:00	2584799.951	0.485	20.017	6.98
10/15/2014 7:00	2588399.951	0.486	19.998	6.98
10/15/2014 8:00	2591999.951	0.486	19.978	6.979
10/15/2014 9:00	2595599.951	0.485	19.957	6.98
10/15/2014 10:00	2599199.951	0.485	19.94	6.981
10/15/2014 11:00	2602799.951	0.485	19.919	6.981
10/15/2014 12:00	2606399.951	0.486	19.902	6.98
10/15/2014 13:00	2609999.951	0.485	19.887	6.981
10/15/2014 14:00	2613599.951	0.485	19.87	6.981
10/15/2014 15:00	2617199.951	0.485	19.863	6.981
10/15/2014 16:00	2620799.951	0.485	19.856	6.981
10/15/2014 17:00	2624399.951	0.485	19.845	6.981
10/15/2014 18:00	2627999.951	0.485	19.835	6.982
10/15/2014 19:00	2631599.951	0.484	19.828	6.982
10/15/2014 20:00	2635199.951	0.482	19.817	6.989
10/15/2014 21:00	2638799.951	0.481	19.808	6.989
10/15/2014 22:00	2642399.951	0.481	19.795	6.99
10/15/2014 23:00	2645999.951	0.482	19.783	6.989
10/16/2014 0:00	2649599.951	0.481	19.774	6.99
10/16/2014 1:00	2653199.951	0.481	19.753	6.99
10/16/2014 2:00	2656799.951	0.481	19.742	6.99
10/16/2014 3:00	2660399.951	0.481	19.725	6.989
10/16/2014 4:00	2663999.951	0.481	19.713	6.99
10/16/2014 5:00	2667599.951	0.481	19.699	6.99
10/16/2014 6:00	2671199.951	0.482	19.681	6.989
10/16/2014 7:00	2674799.951	0.481	19.665	6.989
10/16/2014 8:00	2678399.951	0.481	19.645	6.99

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**APPENDIX D**

**C-404 HAZARDOUS WASTE LANDFILL  
GROUNDWATER FLOW RATE AND DIRECTION**

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## 2014 ANNUAL REPORT OF THE C-404 LANDFILL HYDRAULIC FLOW RATE AND DIRECTION

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The C-404 Hazardous Waste Landfill (C-404 Landfill) Permit requires annual determination of average hydraulic flow rate and direction of flow in the uppermost aquifer. The uppermost aquifer below C-404 Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently are taken from several wells at the perimeter of the C-404 Landfill on a semiannual basis. The water levels used for this analysis (taken on January 30 and July 30 and 31, 2014) were measured as closely as possible and within a 24-hour period to ensure the comparability of the data. These measurements were used to plot the potentiometric surface of the upper RGA for the January and July 2014 sampling events.

Contours for each potentiometric surface were drawn after water-level data were corrected for barometric pressure; groundwater hydraulic gradients then are calculated from the contours. The average of the gradients measured during this reporting period is the annual average groundwater hydraulic gradient for the upper RGA and is calculated at  $1.74 \times 10^{-3}$  ft/ft.

The hydraulic conductivity (K) values reported in the *Resource Conservation and Recovery Act (RCRA) Part B Permit Modification for Inclusion of C-404 Low-Level Radioactive/Hazardous Waste Landfill* (Clausen et al. 1992) were determined by multi-well testing and range from 21 to 140 ft/day ( $7.41 \times 10^{-3}$  to  $4.94 \times 10^{-2}$  cm/s).

Multiplication of the hydraulic gradient (i) and the hydraulic conductivity (K) yields the specific discharge (q) for a unit area of the RGA. Annual average linear-flow velocity (v) is calculated by multiplying the hydraulic conductivity by the gradient and dividing by the porosity (n). It is assumed that (n) equals 25 percent in the RGA beneath the C-404 Landfill.

Table D.1 summarizes the annual average results of the calculations. Table D.2 presents the calculation information for the annual groundwater flow rate. The January and July potentiometric surface data of the upper RGA are presented in Tables D.3 and D.4, and potentiometric surface maps are presented in Figures D.1 and D.2.

**Table D.1. C-404 Landfill Annual Average Groundwater Flow Rate for 2014**

Hydraulic Conductivity (K) Range	Annual Average Specific Discharge (q) ft/day (cm/s)	Annual Average Linear Flow Velocity (v) ft/day (cm/s)
High K	0.24 ( $8.60 \times 10^{-5}$ )	0.97 ( $3.44 \times 10^{-4}$ )
Low K	0.04 ( $1.29 \times 10^{-5}$ )	0.15 ( $5.16 \times 10^{-5}$ )

The potentiometric contours depict the directions of hydraulic flow during each sampling event. Hydraulic flow direction beneath the C-404 Landfill generally trends northward, but commonly varies from northeast to northwest.

**Table D.2. Calculation Information for the C-404 Landfill Annual Groundwater Flow Rate 2014**

<b>Upper RGA K = 21 ft/d</b>					
	i (ft/ft)	q (ft/d)	q (cm/s)	v (ft/d)	v (cm/s)
January 2014	-1.19E-03	0.03	8.85E-06	0.10	3.54E-05
July 2014	-2.29E-03	0.05	1.69E-05	0.19	6.78E-05
<b>Annual Average</b>	<b>-1.74E-03</b>	<b>0.04</b>	<b>1.29E-05</b>	<b>0.15</b>	<b>5.16E-05</b>
<b>Upper RGA K = 140 ft/d</b>					
	i (ft/ft)	q (ft/d)	q (cm/s)	v (ft/d)	v (cm/s)
January 2014	-1.19E-03	0.17	5.90E-05	0.67	2.36E-04
July 2014	-2.29E-03	0.32	1.13E-04	1.28	4.52E-04
<b>Annual Average</b>	<b>-1.74E-03</b>	<b>0.24</b>	<b>8.60E-05</b>	<b>0.97</b>	<b>3.44E-04</b>
q = K*i			v = q/n		
where			where		
q = specific discharge (per unit area)			v = average linear velocity		
K = hydraulic conductivity			q = specific discharge		
i = hydraulic gradient (from potentiometric map)			n <sub>e</sub> = porosity (assumed to be 25%)		

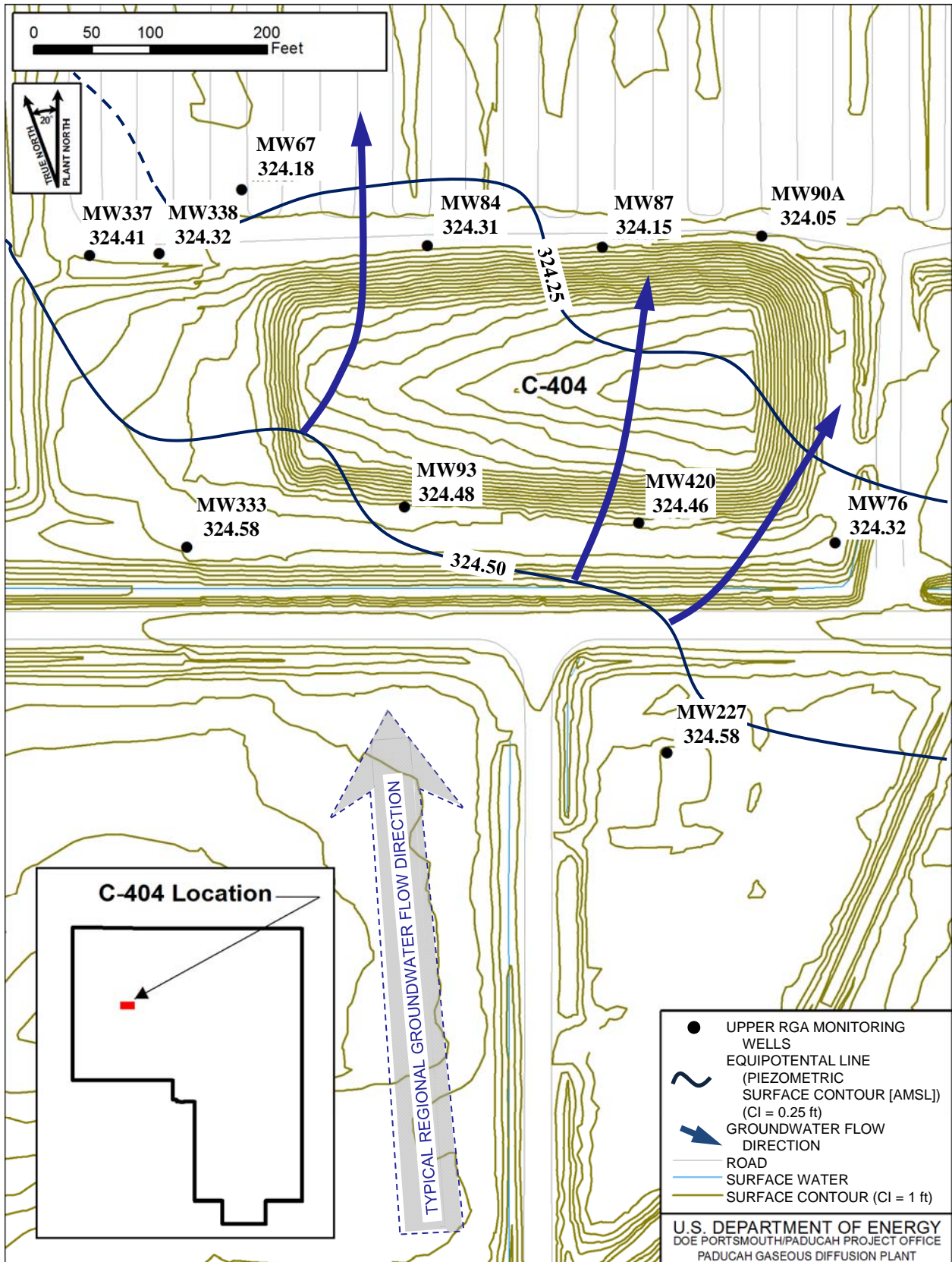
ft/ft = foot per foot  
ft/d = foot per day  
cm/s = centimeter/second

**Table D.3. Barometric Pressure Corrections**

<b>C-404 Landfill (January 2014) Water Levels</b>									
<b>Date</b>	<b>Time</b>	<b>Well</b>	<b>Datum Elev (ft amsl)</b>	<b>BP (in Hg)</b>	<b>Delta BP (ft H<sub>2</sub>O)</b>	<b>Raw Data</b>		<b>Corrected Data*</b>	
						<b>DTW (ft)</b>	<b>Elev (ft amsl)</b>	<b>DTW (ft)</b>	<b>Elev (ft amsl)</b>
1/30/2014	8:07	MW67	374.95	30.19	0.00	50.77	324.18	50.77	324.18
1/30/2014	7:40	MW76	376.77	30.19	0.00	52.45	324.32	52.45	324.32
1/30/2014	8:21	MW84	376.01	30.19	0.00	51.70	324.31	51.70	324.31
1/30/2014	8:05	MW87	375.79	30.19	0.00	51.64	324.15	51.64	324.15
1/30/2014	8:00	MW90A	374.20	30.19	0.00	50.15	324.05	50.15	324.05
1/30/2014	14:56	MW93	377.67	29.98	0.24	52.95	324.72	53.19	324.48
1/30/2014	7:36	MW227	378.81	30.19	0.00	54.23	324.58	54.23	324.58
1/30/2014	7:55	MW333	377.35	30.19	0.00	52.77	324.58	52.77	324.58
1/30/2014	8:16	MW337	374.67	30.19	0.00	50.26	324.41	50.26	324.41
1/30/2014	8:19	MW338	374.86	30.19	0.00	50.54	324.32	50.54	324.32
1/30/2014	7:43	MW420	377.70	30.19	0.00	53.24	324.46	53.24	324.46
Initial Barometric Pressure			<b>30.19</b>						
Elev = elevation									
amsl = above mean sea level									
BP = barometric pressure									
DTW = depth to water in feet below datum									
URGA = Upper Regional Gravel Aquifer									
LRGA = Lower Regional Gravel Aquifer									
UCRS = Upper Continental Recharge System									
*Assumes a barometric efficiency of 1.0.									

**Table D.4 Barometric Pressure Corrections**

<b>C-404 Landfill (July 2014) Water Levels</b>									
<b>Date</b>	<b>Time</b>	<b>Well</b>	<b>Datum Elev (ft amsl)</b>	<b>BP (in Hg)</b>	<b>Delta BP (ft H<sub>2</sub>O)</b>	<b>Raw Data</b>		<b>Corrected Data*</b>	
						<b>DTW (ft)</b>	<b>Elev (ft amsl)</b>	<b>DTW (ft)</b>	<b>Elev (ft amsl)</b>
7/30/2014	13:07	MW67	374.95	30.10	0.01	48.11	326.84	48.12	326.83
7/30/2014	13:26	MW76	376.77	30.10	0.01	49.50	327.27	49.51	327.26
7/30/2014	12:52	MW84	376.01	30.12	-0.01	48.93	327.08	48.92	327.09
7/30/2014	13:11	MW87	375.79	30.10	0.01	49.03	326.76	49.04	326.75
7/30/2014	13:17	MW90A	374.20	30.10	0.01	47.43	326.77	47.44	326.76
7/31/2014	8:21	MW93	377.67	30.10	0.01	50.37	327.30	50.38	327.29
7/30/2014	13:29	MW227	378.81	30.10	0.01	51.40	327.41	51.41	327.40
7/30/2014	13:24	MW333	377.35	30.10	0.01	49.92	327.43	49.93	327.42
7/30/2014	12:57	MW337	374.67	30.10	0.01	47.30	327.37	47.31	327.36
7/30/2014	12:55	MW338	374.86	30.10	0.01	47.67	327.19	47.68	327.18
7/30/2014	13:19	MW420	377.70	30.10	0.01	50.42	327.28	50.43	327.27
Initial Barometric Pressure			<b>30.11</b>						
Elev = elevation									
amsl = above mean sea level									
BP = barometric pressure									
DTW = depth to water in feet below datum									
URGA = Upper Regional Gravel Aquifer									
LRGA = Lower Regional Gravel Aquifer									
UCRS = Upper Continental Recharge System									
*Assumes a barometric efficiency of 1.0									

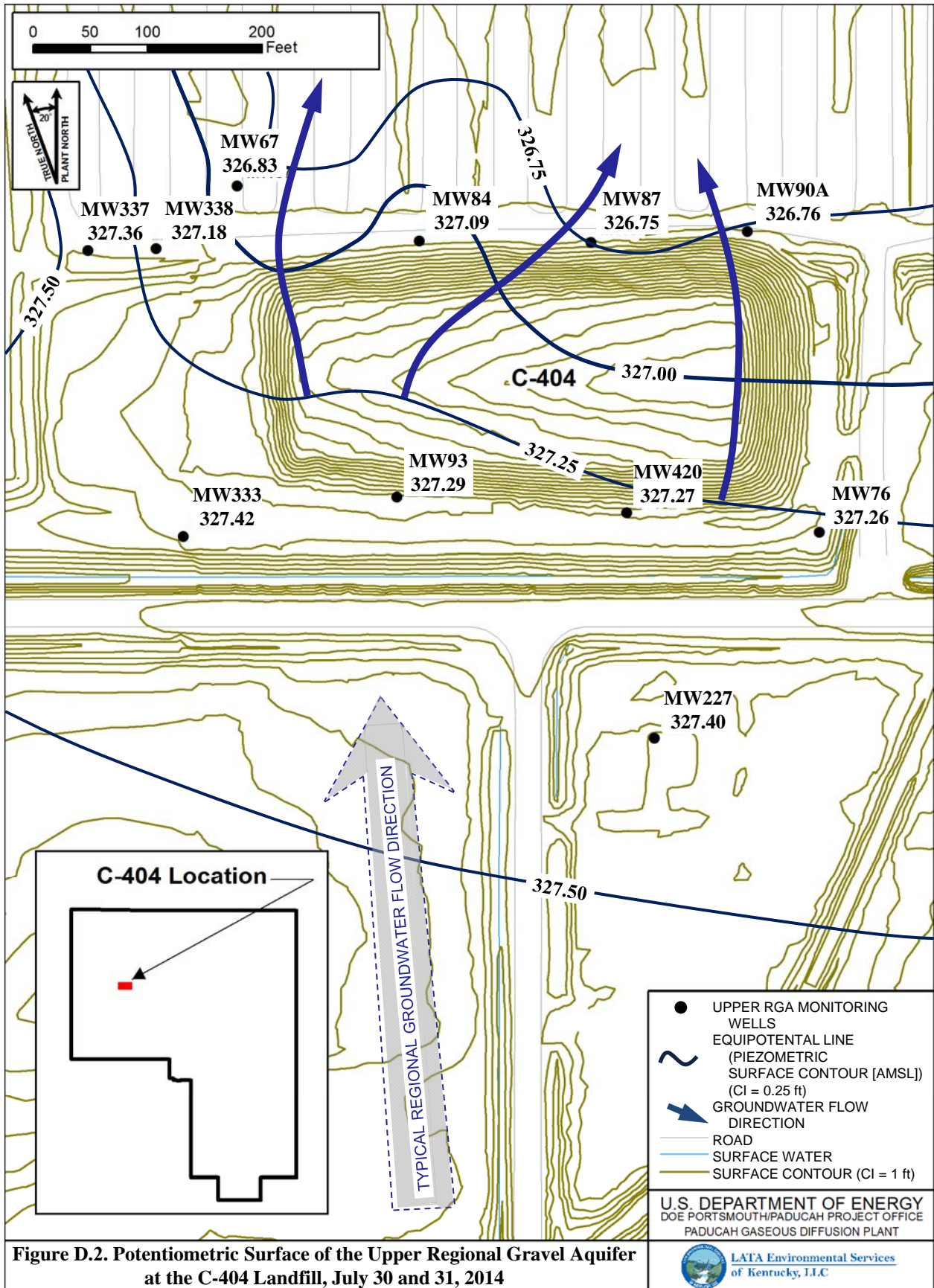


**Figure D.1. Potentiometric Surface of the Upper Regional Gravel Aquifer at the C-404 Landfill, January 30, 2014**

U.S. DEPARTMENT OF ENERGY  
DOE PORTSMOUTH/PADUCAH PROJECT OFFICE  
PADUCAH GASEOUS DIFFUSION PLANT

LATA Environmental Services  
of Kentucky, LLC

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