**Southern Nuclear**
**Operating Company, Inc.**
42 Inverness Center Parkway
Birmingham, Alabama 35242

SOUTHERN COMPANY
*Energy to Serve Your World*℠

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FEDERAL EXPRESS

Vogtle Electric Generating Plant Landfills #2 and #3
Solid Waste Permit No. 017-006D(L)(I)
Solid Waste Permit No. 017-007D(L)(I)

Mr. Steve McManus
Solid Waste Management Program
Georgia Environmental Protection Division
4244 International Parkway, Suite 104
Atlanta, GA 30354

Dear Mr. McManus:

In response to your telephone request, Southern Nuclear has prepared individual landfill groundwater monitoring reports from the December, 2005 Vogtle Landfill #2 and #3 combined report. The combined report was submitted to EPD under a Southern Nuclear correspondence dated March 27, 2006. It is understood that EPD prefers individual reports for each Vogtle landfill for this, and future groundwater monitoring events to facilitate report filing. The information and conclusions provided in these individual groundwater monitoring reports remains unchanged since the March 27 submittal of the combined report.

Please find enclosed both individual December, 2005 groundwater monitoring reports for Vogtle Landfill #2 and Landfill #3 attached under this correspondence. Future groundwater monitoring reports will be submitted under two separate cover letters to the EPD Solid Waste Management Program Manager. If you have any questions, please contact Mickey Perry at (205) 992-6994.

Sincerely,

J. M. Godfrey
Manager – Environmental Affairs

JMG/MEP:ahl

Enclosure

cc: Mr. Michael Kemp (w/o)
Mr. Earl Hinkle (w/o)
Mr. Kurt Batsell (Dextra) (w/o)

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# GROUNDWATER MONITORING REPORT
# PLANT VOGTLE LANDFILL #2
# SOLID WASTE PERMIT NO. 017-006D(L)(I)
# BURKE COUNTY, GEORGIA
## APRIL 2006

***PREPARED FOR:***

Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Birmingham, Alabama 35201

***PREPARED BY:***

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4/26/06

# GROUNDWATER MONITORING REPORT
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# TABLE OF CONTENTS

1 – Introduction ..... 1

2 – Monitoring Well Network ..... 1

3 - Groundwater Flow Rate and Directional Data ..... 1

3.1 Geology/Hydrogeology
3.2 Groundwater Elevations and Gradients

4 – Sampling Procedures and Parameter Analyses ..... 3

4.1 Ptocedures and Field Measurements
4.2 Parameter Analyses

5 – Groundwater Quality Evaluation ..... 4

5.1 Detected Parameters
5.2 Statistical Analyses

6 – Conclusions ..... 4

In Order Following Page 4

*Tables*
1 – Groundwater Elevations and Monitoring Well Construction Details
2 – Groundwater Sampling Field Measurements
3 – Constituents for Detection Monitoring
4 – Summary of Detected Parameters

*Figures*
1 – Groundwater Contour Elevation Map, December 6-7, 2005

*Appendices*
A – Hydraulic Gradient Calculation Sheet
B – Laboratory Analytical Report
C – Statistical Analyses

# 1 – Introduction

This report presents the results of groundwater sampling conducted in December 2005 at private solid waste Landfill #2 operated by Southern Nuclear Operating Company, Inc. (SNC) at Plant Vogtle in Waynesboro, Georgia. Groundwater monitoring was initiated in 2002 in accordance with the approved Groundwater Monitoring Plan for the landfills. The landfill is operated under Solid Waste Permit #s 017-006D(L)(I) and is used for disposal of non-putrescible, non-liquid office and solid waste as well as construction/demolition debris such as asbestos insulation, wooden pallets and concrete. The active trench is used only for asbestos disposal.

Sampling, analyses and data evaluation were conducted in accordance with the rules of the Georgia Department of Natural Resources Environmental Protection Division (EPD), Chapter 391-3-4, the September 1991 "Manual for Groundwater Monitoring" and the approved Groundwater Monitoring Plan for the landfills.

The findings of the initial four sampling events, conducted from August 2002 through December 2002, and subsequent semi-annual sampling events are presented in reports previously submitted to the EPD. This report presents the results of the December 2005 semi-annual monitoring event. Subsequent reports will be prepared upon completion of semi-annual monitoring events as scheduled in the Groundwater Monitoring Plan.

# 2 – Monitoring Well Network

The groundwater monitoring well network consists of four permanent monitoring wells located along the north, east and south waste unit management boundaries of Landfill #2 (*Figure 1*). As shown in the figures, the wells are located outside of, but as close as practical to, the waste disposal areas. The wells are screened within the uppermost water-producing zones underlying the landfill, which occur from approximately 35 to 60 feet below land surface.

The four permanent groundwater monitoring wells at Landfill #2 were installed in September 2001 after advancing a total of eight deep soil borings around the landfill boundary. The upgradient well is GWA-2/MW-2 and the downgradient, or compliance, wells are GWC-3/MW-3, GWB-4/MW-4 and GWC-11/MW-11. The well construction details are presented in *Table 1*. The wells will be referred to as GWA-2, GWC-3, GWB-4 and GWC-11 in this report consistent with the EPD's well identification guidelines.

# 3 – Groundwater Flow Rate and Directional Data

## *3.1 Geology/Hydrogeology*

The geology of the Plant Vogtle site consists of sedimentary deposits within the Coastal Plain physiographic province of Georgia. These sediments consist of unconsolidated sands, silts and clays comprised of marine and non-marine fluvial deposits. Marls and limestone were also encountered at depth in deep borings completed at the landfills. A boring completed to approximately 126 feet below land surface at the northwest boundary of Landfill #2 appears to have been completed just into or immediately on top of the Utley Limestone member. The marls encountered during drilling were components of the Irwinton Sand member. Either all or parts of the Barnwell Group members (except the Utley Limestone member) were also encountered in the other borings conducted at the landfill. Underlying the Barnwell Group is the Lisbon Formation with its uppermost unit, the Blue Bluff Marl, located immediately under the Utley Limestone. This marl layer, approximately 70 feet

thick, is a near-impermeable layer that effectively confines the Tertiary and Cretaceous aquifers, the two confined aquifers beneath the Plant site.

The occurrence of groundwater underlying the landfill appears in confined, semi-confined, unconfined, and perched hydrogeologic units. Groundwater is found primarily in sands, silty sands, clayey sands and marl limestone interfaces. The main difference between boring/well water production characteristics and aquifer confining characteristics appears to be the thickness of the water-producing zone, the grain size of the sand component, the sand/clay ratio and the characteristics of the marl/limestone interface.

Groundwater may also exist in an unconfined water table aquifer in the Barnwell sands and limestone that overlie the marl. The water table aquifer at the site is on an interfluvial ridge, or a topographically high area in which the groundwater in the water table discharges along streams that surround the topographic high. The streams eventually discharge to the Savannah River.

### *3.2 Groundwater Elevations and Gradients*

During well installation, the occurrence of groundwater was determined by collecting continuous split spoon samples beginning approximately five feet above the location of expected groundwater-producing zones. At the landfill, groundwater was generally found in water producing zones less than one foot thick and was observed to be under semi-confined or confined conditions.

Upon completion of all drilling activities, measuring points were located on the tops of the well casings and surveyed relative to mean sea level (msl). During each sampling event, depth to water measurements were recorded in the wells from the surveyed elevations using an electronic water-level indicator. The water level measurements were then subtracted from the appropriate measuring point elevations to determine groundwater elevations in the wells.

Hydraulic conductivity (K) in the wells was measured on September 26, 2001. The values ranged from $5.634 \times 10^{-4}$ cm/sec in GWB-6 to $3.064 \times 10^{-2}$ cm/sec in GWA-2.

Depth to water measurements and groundwater elevations for the wells at Landfill 2 are presented in *Table 1*. Groundwater elevations measured during the sampling events to date indicate groundwater underneath Landfill 2 trends from a relatively higher elevation at the eastern/northeastern portion of the landfill (GWA-2) to relatively lower elevations to the west/southwest beneath the landfill (*Figure 1*). Well GWC-11 is not used to construct the potentiometric surface map because the uppermost water-bearing unit at this location appears to be within a different hydrologic zone based on the significantly lower groundwater elevation measured in well GWC-11 compared to wells GWA-2, GWC-3 and GWB-4.

The hydraulic gradient of 0.014 (shown on *Figure 1* for December 2005) was calculated using a three-point problem from potentiometric surface elevations in monitoring wells GWA-2, GWC-3 and GWB-4. The calculations used in determining the gradient are provided in *Appendix A*. The hydraulic gradient has ranged from a minimum of 0.01 (October 2002 and December 2004) to a maximum of 0.08 (June 2003).

# 4 – Sampling Procedures and Parameter Analyses

*4.1 Procedures and Field Measurements*

Prior to sample collection during each sampling event, depth to water measurements are recorded in each well from the surveyed elevations using an electronic water level indicator. The water level indicator is decontaminated using a potable water and Alconox® wash and a distilled water rinse between use at each well. The water level measurements are then subtracted from the appropriate measuring point elevations to determine the groundwater elevations in the wells.

Groundwater samples were collected from all monitoring wells after the wells were properly purged according to the EPA document entitled "Low-Flow Purging & Sampling of Groundwater Monitoring Wells (Bulletin QAD023)". The wells were purged and sampled using QED SamplePro pumps equipped with Teflon® bladders. Purge rates were matched to the recovery rates of the wells, verified by periodic depth to water measurements to determine draw-down during purging. Purging was conducted until at least three consecutive stable readings of pH, conductivity, and turbidity were recorded. Groundwater samples were then collected directly into pre-preserved sample containers supplied by the laboratory. Final measurements of pH, conductivity, and turbidity were performed to verify that these parameters remained stable during sampling. All field instruments were calibrated in the field daily prior to use and at the conclusion of each sampling event. The field measurements are provided in *Table 2.*

After each sample was collected, the SamplePro pumps and airlines were decontaminated according to the following protocol:

- The pump and air line were placed on clean plastic;
- The pump was disassembled and the bladder was removed;
- The pump was sprayed with a potable water and Alconox® solution, followed with a distilled water rinse until all soap residue was removed;
- A new pump bladder was then installed in the pump prior to reassembly; and
- The pump airline was placed in a clean plastic bag between use at each well.

*4.2 Parameter Analyses*

In accordance with the approved Groundwater Monitoring Plan, the groundwater samples and field and laboratory quality assurance/quality control (QA/QC) samples were analyzed for the Chapter 391-3-4 Appendix I list of parameters, which consists of total metals and volatile organic compounds (*Table 4*). The field QA/QC samples consisted of duplicate samples, trip blanks and equipment blanks. Metals analyses were conducted using EPA Methods 6010B/7841, and VOCs analyses were conducted using EPA Methods 6010B/8260B and 504.1 to provide sufficiently sensitive quantitation limits for comparison with maximum contaminant limits. Advanced Chemistry Labs, Inc., Atlanta, Georgia performed the laboratory analyses. The complete laboratory analytical reports, which include field and laboratory QA/QC results and chain-of-custody forms, are provided in *Appendix B.*

# 5 – Groundwater Quality Evaluation

*5.1 Detected Parameters*

*Table 4* presents a summary of all analyzed parameters detected above the laboratory method reporting limits. Barium was detected at 0.025 milligrams per liter (mg/l) in well GWC-3 and 0.021 mg/l in GWB-4. The maximum contaminant level (MCL) for barium is 2.0 mg/l. Zinc was detected

at 0.08 mg/l in well GWA-2, 0.137 mg/l in well GWC-3, 0.082 mg/l in well GWB-4 and 0.181 in GWC-11. No organic parameters were detected during this monitoring event.

No parameters were detected in any of the field or laboratory QA/QC samples, and the laboratory QA/QC checks were within acceptable limits.

### *5.2 Statistical Analyses*

In accordance with the approved Groundwater Monitoring Plan, statistical analyses were conducted for each constituent detected in the compliance well samples for this sampling event. The analyses were conducted to help identify any significant increase in constituent concentrations in downgradient, or compliance, well samples over samples representative of background water quality. The analyses were conducted consistent with U.S. EPA recommended methods as detailed in the guidance document "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Interim Final Guidelines" (1989) and the corresponding Addendum (1992).

The following methodology was used to evaluate the data:

- The distribution of the data was first evaluated for normality using either the Shapiro-Wilkes Test (for parameters with less than 50 samples) or the Shapiro-Francia Test (for parameters with greater than 50 samples) as recommended in the 1992 EPA guidance. The tests indicate that the concentrations of all detected parameters do not follow normal distributions.

- For the well data sets at the landfill, the Kruskal-Wallis non-parametric analysis of variance method was used to compare the concentrations of individual parameters in each compliance well to the concentrations of these parameters in the background well. This method is recommended by the 1992 EPA guidance for non-normal sample sets that have between 15% and 90% non-detects.

The detailed statistical analyses are provided in *Appendix C* and the results are summarized below.

At Landfill #2, statistical analysis was performed for the two detected parameters barium and zinc. The analyses do not indicate statistically significant higher concentrations for these parameters in the compliance well samples compared to the concentrations in the background well sample.

## 6 – Conclusions

As no statistically significant detections were found during this monitoring event, no modifications to the monitoring program or additional notices in the operating record are required at this time.

# TABLES

Table 1
Southern Nuclear Operating Company Plant Vogtle Landfill #2
Groundwater Elevations and Monitoring Well Construction Details

| Well ID | Date | Measuring Point Elevation (feet, msl) | Ground Surface Elevation (feet, msl) | Depth to Water (feet, topvc) | Total Boring Depth (feet, bls) | Total Well Depth (feet, topvc) | Riser Height (feet) | Screened Interval (feet, msl) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|---|---|---|---|---|
| GWA-2/MW-2 | 9/26/2001 | 249.41 | 246.76 | 40.02 | 57 | 47.70 | 2.65 | 201.76 to 211.76 | 209.39 |
| | 7/29/2002 | | | 41.69 | | | | | 207.72 |
| | 9/9/2002 | | | 41.64 | | | | | 207.77 |
| | 10/21/2002 | | | 42.72 | | | | | 206.69 |
| | 12/3/2002 | | | 40.69 | | | | | 208.72 |
| | 6/24/2003 | | | 37.58 | | | | | 211.83 |
| | 12/17/2003 | | | 39.98 | | | | | 209.43 |
| | 6/15/2004 | | | 39.59 | | | | | 209.82 |
| | 12/28/2004 | | | 43.02 | | | | | 206.39 |
| | 6/13/2005 | | | 39.41 | | | | | 210.00 |
| | 12/5/2005 | | | 40.40 | | | | | 209.01 |
| GWC-3/MW-3 | 9/26/2001 | 250.41 | 247.81 | 50.45 | 62 | 52.60 | 2.60 | 197.81 to 207.81 | 199.96 |
| | 7/29/2002 | | | 50.05 | | | | | 200.36 |
| | 9/9/2002 | | | 50.79 | | | | | 199.62 |
| | 10/21/2002 | | | 49.30 | | | | | 201.11 |
| | 12/3/2002 | | | 50.26 | | | | | 200.15 |
| | 6/24/2003 | | | 51.58 | | | | | 198.83 |
| | 12/17/2003 | | | 47.89 | | | | | 202.52 |
| | 6/15/2004 | | | 47.44 | | | | | 202.97 |
| | 12/28/2004 | | | 49.13 | | | | | 201.28 |
| | 6/13/2005 | | | 46.77 | | | | | 203.64 |
| | 12/5/2005 | | | 47.34 | | | | | 203.07 |
| GWB-4/MW-4 | 9/26/2001 | 242.40 | 239.83 | 39.84 | 57 | 48.57 | 2.57 | 193.83 to 203.83 | 202.56 |
| | 7/29/2002 | | | 40.06 | | | | | 202.34 |
| | 9/9/2002 | | | 41.27 | | | | | 201.13 |
| | 10/21/2002 | | | 40.50 | | | | | 201.90 |
| | 12/4/2002 | | | 39.65 | | | | | 202.75 |
| | 6/24/2003 | | | 38.10 | | | | | 204.30 |
| | 12/17/2003 | | | 39.53 | | | | | 202.87 |
| | 6/15/2004 | | | 39.46 | | | | | 202.94 |
| | 12/28/2004 | | | 40.02 | | | | | 202.38 |
| | 6/13/2005 | | | 38.96 | | | | | 203.44 |
| | 12/5/2005 | | | 39.70 | | | | | 202.70 |
| GWC-11/MW-11 | 7/29/2002 | 227.53 | 225.09 | 64.80 | 65 | 67.44 | 2.44 | 160.09 to 170.09 | 162.73 |
| | 9/9/2002 | | | 59.99 | | | | | 167.54 |
| | 10/21/2002 | | | 65.27 | | | | | 162.26 |
| | 12/4/2002 | | | 65.49 | | | | | 162.04 |
| | 6/24/2003 | | | 59.72 | | | | | 167.81 |
| | 12/17/2003 | | | 59.33 | | | | | 168.20 |
| | 6/15/2004 | | | 60.69 | | | | | 166.84 |
| | 12/28/2004 | | | 62.71 | | | | | 164.82 |
| | 6/13/2005 | | | 62.96 | | | | | 164.57 |
| | 12/5/2005 | | | 62.73 | | | | | 164.80 |

Notes:
Ground surface measured at survey bolt set in concrete pad at base of protective casing.
msl = mean sea level.
topvc = measured from top of pvc riser.
bls = below land surface.

Table 2
Southern Nuclear Operating Company Plant Vogtle Landfill #2
Groundwater Sampling Field Measurements

| Well ID | Date | pH | Conductivity/1 | Turbidity/2 | Gallons Purged | Odor | Color | Comments |
|---|---|---|---|---|---|---|---|---|
| GWA-2/MW-2 | 9/26/2001 | -- | -- | -- | -- | -- | -- | Well development only |
| | 7/29/2002 | 4.69 | 19 | 13.8 | 2.5 | none | none | |
| | 9/9/2002 | 4.51 | 24.9 | 7.53 | -- | none | none | |
| | 10/21/2002 | 5.17 | 18 | 1.31 | 3.1 | none | none | |
| | 12/3/2002 | 5.30 | 13 | 9.1 | 3.5 | none | none | |
| | 6/24/2003 | 6.28 | 26.9 | 5.76 | 1.0 | none | none | |
| | 12/17/2003 | 4.93 | 22.7 | 4.5 | 3.5 | none | none | |
| | 6/16/2004 | 6.97 | 15.32 | 5.9 | 1.5 | none | none | |
| | 12/28/2004 | 4.80 | 10.3 | 9.67 | 2.0 | none | none | |
| | 6/14/2005 | 5.28 | 17.8 | 8.65 | 2.5 | none | none | |
| | 12/6/2005 | 6.82 | 17 | 6.36 | 2.0 | none | none | |
| GWC-3/MW-3 | 9/26/2001 | -- | -- | -- | -- | -- | -- | Well development only |
| | 7/29/2002 | 4.08 | 27.9 | 22.2 | 1.3 | none | none | |
| | 9/9/2002 | 6.03 | 36.5 | 4.08 | 0.5 | none | none | |
| | 10/21/2002 | -- | 176 | 35.6 | <0.5 gal | -- | -- | Too little water to purge and sample |
| | 12/3/2002 | 5.51 | 488 | 14.0 | <0.5 gal | -- | -- | Too little water to purge and sample |
| | 6/24/2003 | -- | -- | -- | <0.5 gal | none | none | Too little water to purge and sample |
| | 12/17/2003 | 6.59 | 22.7 | 2.79 | 2.0 | none | none | |
| | 6/16/2004 | 4.91 | 40.8 | 5.78 | 1.25 | none | none | |
| | 12/28/2004 | -- | -- | -- | -- | -- | -- | Too little water to purge and sample |
| | 6/14/2005 | 5.83 | 29.5 | 4.25 | 1.25 | none | none | |
| | 12/6/2005 | 5.88 | 35 | 5.89 | 1.50 | none | none | |
| GWB-4/MW-4 | 9/26/2001 | 4.73 | 36.0 | 15.5 | 35.0 | -- | -- | Well development only |
| | 7/29/2002 | 4.21 | 269 | 3.63 | 2.0 | none | none | |
| | 9/9/2002 | 4.35 | 34.8 | 0.55 | 2.0 | none | none | |
| | 10/21/2002 | 5.01 | 25 | 6.44 | 3.0 | none | none | |
| | 12/4/2002 | 5.51 | 98.7 | 2.60 | 4.0 | none | none | |
| | 6/24/2003 | 5.33 | 36.0 | 5.27 | 2.0 | none | none | |
| | 12/17/2003 | 4.62 | 3.55 | 0.00 | 1.5 | none | none | |
| | 6/16/2004 | 4.63 | 33.80 | 1.40 | 3.3 | none | none | |
| | 12/28/2004 | 4.43 | 20.70 | 0.00 | 2.0 | none | none | |
| | 6/14/2005 | 4.66 | 38.25 | 2.50 | 2.5 | none | none | |
| | 12/7/2005 | 4.80 | 43.00 | 2.08 | 1.5 | none | none | |
| GWC-11/MW-11 | 7/29/2002 | 5.30 | 67.5 | 36.6 | 4.0 | none | pale white | |
| | 9/9/2002 | 6.24 | 97.0 | 6.51 | 2.0 | none | none | |
| | 10/21/2002 | 5.05 | 75.0 | 8.05 | 1.8 | none | none | |
| | 12/4/2002 | 5.72 | 57.1 | 8.10 | 2.0 | none | none | |
| | 6/24/2003 | 6.93 | 70.0 | 2.70 | 2.5 | none | none | |
| | 12/17/2003 | 7.04 | 69.2 | 11.2 | 4.5 | none | none | |
| | 6/16/2004 | 6.10 | 58.9 | 6.1 | 3.5 | none | none | |
| | 12/28/2004 | 5.85 | 30.5 | 9.3 | 2.0 | none | none | |
| | 6/14/2005 | 5.98 | 33.2 | 8.6 | 2.5 | none | none | |
| | 12/7/2005 | 5.95 | 32.0 | 3.0 | 2.0 | none | none | |

Notes:
-- = no data recorded
/1 - Conductivity in units of umhos/sec
/2 - Turbidity in units of NTU

**Table 3**
**Southern Nuclear Operating Company**
**Plant Vogtle Landfill #2**
**Appendix I to Part 40 CFR Part 258: Constituents for Detection Monitoring (1)**

| Common Name (2) | EPA Method |
|---|---|
| Inorganic Constituents: | |
| (1) Antimony | 6010B/7041 |
| (2) Arsenic | 6010B/7061 |
| (3) Barium | 6010B/7091 |
| (4) Beryllium | 6010B/7091 |
| (5) Cadmium | 6010B/7131 |
| (6) Chromium | 6010B/7191 |
| (7) Cobalt | 6010B/7201 |
| (8) Copper | 6010B/7211 |
| (9) Lead | 6010B/7421 |
| (10) Nickel | 6010B/7520 |
| (11) Selenium | 6010B/7741 |
| (12) Silver | 6010B/7761 |
| (13) Thallium | 6010B/7841 |
| (14) Vanadium | 6010B/7911 |
| (15) Zinc | 6010B/7951 |
| Organic Constituents: | 8260 |
| (16) Acetone | |
| (17) Acrylonitrile | |
| (18) Benzene | |
| (19) Bromochloromethane | |
| (20) Bromodichloromethane | |
| (21) Bromoform; Tribromomethane | |
| (22) Carbon disulfide | |
| (23) Carbon tetrachloride | |
| (24) Chlorobenzene | |
| (25) Chloroethane; Ethyl chloride | |
| (26) Chloroform; Trichloromethane | |
| (27) Dibromochloromethane; Chlorodibromomethane | |
| (28) 1,2-Dibromo-3-chloropropane; DBCP | |
| (29) 1,2-Dibromoethane; Ethylene dibromide; EDB | |
| (30) o-Dichlorobenzene; 1,2-Dichlorobenzene | |
| (31) p-Dichlorobenzene; 1,4-Dichlorobenzene | |
| (32) trans-1,4-Dichloro-2-butene | |
| (33) 1,1-Dichloroethane; Ethylidene chloride | |
| (34) 1,2-Dichloroethane; Ethylene dichloride | |
| (35) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride | |
| (36) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene | |
| (37) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene | |
| (38) 1,2-Dichloropropane; Propylene dichloride | |
| (39) cis-1,3-Dichloropropene | |
| (40) trans-1,3-Dichloropropene | |
| (41) Ethylbenzene | |
| (42) 2-Hexanone; Methyl butyl ketone | |
| (43) Methyl bromide; Bromomethane | |
| (44) Methyl chloride; Chloromethane | |

**Table 3 (continued)**
**Southern Nuclear Operating Company, Inc.**
**Plant Vogtle Landfill #2**
**Appendix I to Part 40 CFR Part 258: Constituents for Detection Monitoring (1)**

| Common Name (2) | EPA Method |
|---|---|
| (45) Methylene bromide; Dibromomethane | 8260 |
| (46) Methylene chloride; Dichloromethane | |
| (47) Methyl ethyl ketone; MEK; 2-Butanone | |
| (48) Methyl iodide; Iodomethane | |
| (49) 4-Methyl-2-pentanone; Methyl isobutyl ketone | |
| (50) Styrene | |
| (51) 1,1,1,2-Tetrachloroethane | |
| (52) 1,1,2,2-Tetrachloroethane | |
| (53) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene | |
| (54) Toluene | |
| (55) 1,1,1-Trichloroethane; Methylchloroform | |
| (56) 1,1,2-Trichloroethane | |
| (57) Trichloroethylene; Trichloroethene | |
| (58) Trichlorofluoromethane; CFC-11 | |
| (59) 1,2,3-Trichloropropane | |
| (60) Vinyl acetate | |
| (61) Vinyl chloride | |
| (62) Xylenes | |

(1) This list contains 47 volatile organics for which possible analytical procedures provided in EPA Report SW-846 ``Test Methods for Evaluating Solid Waste,'' third edition, November 1986, as revised December 1987,includes Method 8260; and 15 metals for which SW-846 provides either Method 6010 or a method from the 7000 series of methods.
(2) Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

**Table 4**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**December 2005**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2.00 | BQL | 0.025 | 0.021 | BQL |
| Zinc | NA | 0.08 | 0.137 | 0.082 | 0.181 |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recharge to sample well
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**June 2005**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2.00 | 0.021 | BQL | 0.042 | 0.034 |
| Zinc | NA | BQL | BQL | 0.029 | 0.025 |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recharge to sample well
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**December 2004**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2.00 | BQL | NS | 0.021 | BQL |
| Zinc | NA | BQL | NS | BQL | BQL |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | NS | BQL | BQL |
| Chlorobenzene | 100 | BQL | NS | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | NS | BQL | BQL |
| Methylene chloride | 5 | BQL | NS | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | NS | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | NS | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | NS | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | NS | BQL | BQL |
| Vinyl chloride | 2 | BQL | NS | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recharge to sample well
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**June 2004**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2.00 | BQL | 0.020 | BQL | BQL |
| Zinc | NA | BQL | BQL | BQL | BQL |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 7 | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**December 2003**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2.00 | BQL | BQL | BQL | 0.022 |
| Zinc | NA | BQL | BQL | BQL | BQL |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 6 | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**June 2003**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2.00 | BQL | NS | BQL | BQL |
| Zinc | NA | BQL | NS | BQL | 0.029 |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | NS | BQL | BQL |
| Chlorobenzene | 100 | BQL | NS | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | NS | BQL | BQL |
| Methylene chloride | 5 | BQL | NS | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | NS | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | NS | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | NS | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | NS | BQL | BQL |
| Vinyl chloride | 2 | BQL | NS | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recharge to sample well
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**December 2002**

| CONSTITUENT | MCL | WELL SAMPLES | | | | |
|---|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWB-4/MW-4[3] | GWC-11/MW-11 |
| Metals[1] | | | | | | |
| Barium | 2.00 | 0.015 | 0.020 | 0.021 | 0.020 | 0.018 |
| Zinc | NA | BQL | 0.047 | BQL | BQL | BQL |
| Organics[2] | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | BQL | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**October 2002**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3[3] | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2 | BQL | NS | 0.021 | 0.025 |
| Zinc | NA | BQL | NS | BQL | BQL |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | NS | BQL | BQL |
| Chlorobenzene | 100 | BQL | NS | BQL | BQL |
| 1,4-Dichlorobenzene | 75 | BQL | NS | BQL | BQL |
| Methylene chloride | 5 | BQL | NS | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | NS | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | NS | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | NS | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | NS | BQL | BQL |
| Vinyl chloride | 2 | BQL | NS | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recharge to sample well
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**September 2002**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2 | BQL | BQL | 0.021 | 0.020 |
| Zinc | NA | BQL | BQL | BQL | BQL |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL |
| 1,4-Dichlorobenzene | 75 | BQL | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL |

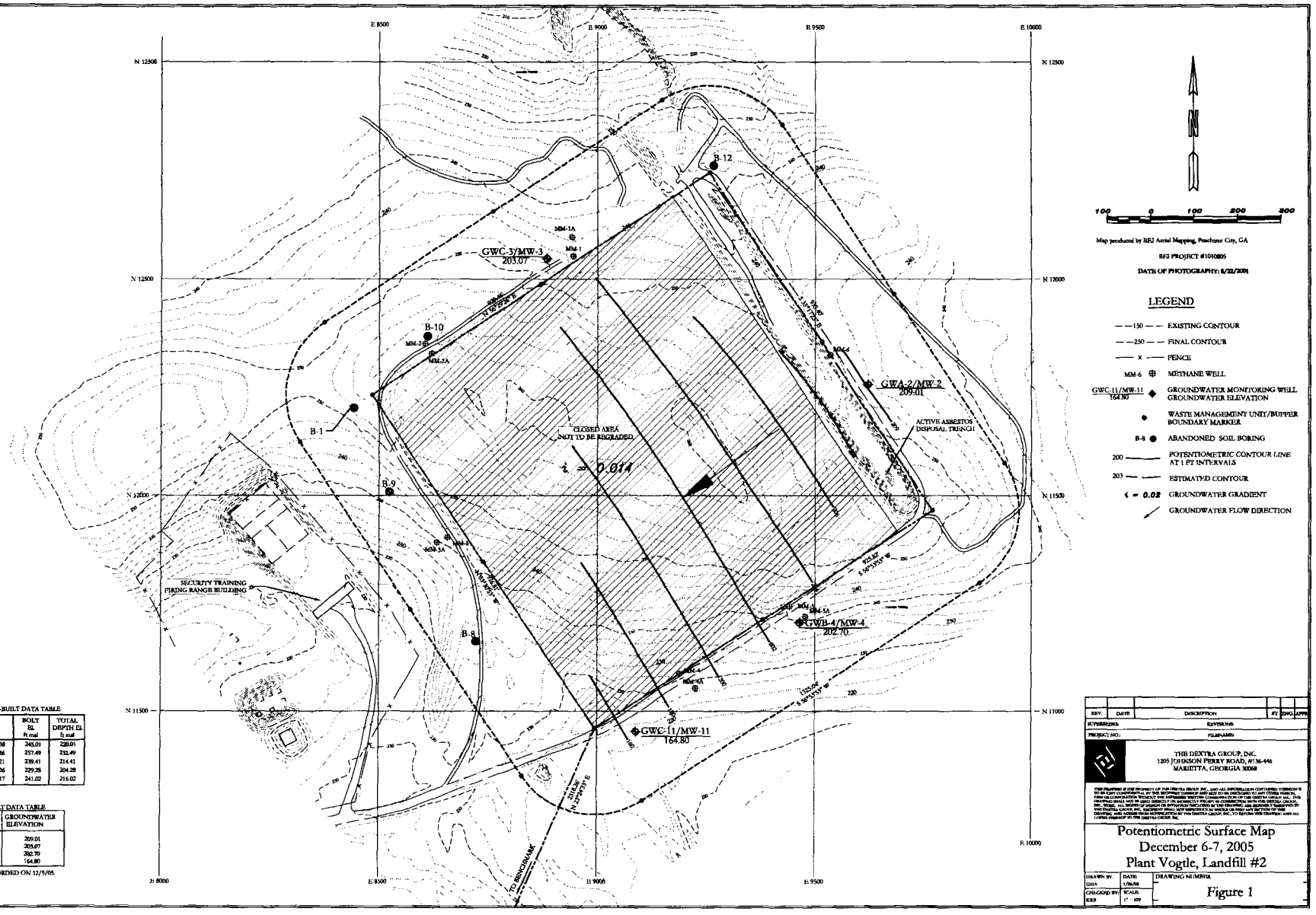
BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #2**
**Summary of Detected Parameters**
**July 2002**

| CONSTITUENT | MCL | WELL SAMPLES | | | |
|---|---|---|---|---|---|
| | | GWA-2/MW-2 | GWC-3/MW-3 | GWB-4/MW-4 | GWC-11/MW-11 |
| Metals[1] | | | | | |
| Barium | 2 | 0.027 | BQL | 0.021 | 0.085 |
| Zinc | NA | BQL | BQL | BQL | 0.034 |
| Organics[2] | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL |
| 1,4-Dichlorobenzene | 75 | BQL | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | **6** | **6** | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 5 | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L or ppm
[2]Organics concentrations in ug/l or ppb
**Bold** indicates detected concentration is greater than the MCL.

# FIGURE




METHANE MONITOR WELL AS-BUILT DATA TABLE

| METHANE MONITOR WELL | N | E | BOLT EL ft msl | TOTAL DEPTH EL ft msl |
|---|---|---|---|---|
| MM-1A | 12096.8010 | 8942.4438 | 245.01 | 220.01 |
| MM-2A | 11827.9677 | 8621.6326 | 257.49 | 232.49 |
| MM-3A | 11403.7741 | 8657.4921 | 239.41 | 214.41 |
| MM-4A | 11053.0012 | 9227.7626 | 229.28 | 204.28 |
| MM-5A | 11219.5738 | 9478.0037 | 241.02 | 216.02 |

GROUND WATER WELL AS-BUILT DATA TABLE

| GROUNDWATER WELL | TOP OF CASING | GROUNDWATER ELEVATION |
|---|---|---|
| GWA-2/MW-2 | 249.41 | 209.01 |
| GWC-3/MW-3 | 250.41 | 203.07 |
| GWB-4/MW-4 | 242.40 | 202.70 |
| GWA-11/MW-11 | 227.53 | 164.80 |

GROUNDWATER ELEVATION RECORDED ON 12/5/05.

# APPENDIX A – HYDRAULIC GRADIENT CALCULATION SHEET

Plant Vogtle Landfill #2
Gradient Calculation
(based on three-point problem)
**December 2005 Monitoring Event**

| Well Designation | Water Table Elevation | Northing | Easting |
|---|---|---|---|
| GWA-2/MW-2 | 209.01 | 11755.95 | 9622.59 |
| GWC-3/MW-3 | 203.07 | 12048.48 | 8881.72 |
| GWB-4/MW-4 | 202.7 | 11205.40 | 9466.20 |

**Gradient Calculation** from fitting a plane to three points

$$a\,x_1 + b\,y_1 + cz_1 + d = 0$$
$$a\,x_2 + b\,y_2 + cz_2 + d = 0$$
$$a\,x_3 + b\,y_3 + cz_3 + d = 0$$

where $(x_i,y_i)$ are the coordinates of the well and zi is the head, i = 1,2,3
The gradient is calculated from the square root of $(a^2 + b^2)$

**Southwest Gradient**

Wells of Interest = (GWA-2, GWC-3 & GWB-4) (High-Mid-Low)

| | x | y | z |
|---|---|---|---|
| GWA-2/MW-2 | 11755.95 | 9622.59 | 209.01 |
| GWC-3/MW-3 | 12048.48 | 8881.72 | 203.07 |
| GWB-4/MW-4 | 11205.40 | 9466.20 | 202.7 |

$$a = \begin{vmatrix} 9622.59 & 209.01 & 1 \\ 8881.72 & 203.07 & 1 \\ 9466.20 & 202.7 & 1 \end{vmatrix} = 3745.9331$$

$$b = \begin{vmatrix} 11755.95 & 209.01 & 1 \\ 12048.48 & 203.07 & 1 \\ 11205.40 & 202.7 & 1 \end{vmatrix} = -5116.131$$

$$c = \begin{vmatrix} 11755.95 & 9622.59 & 1 \\ 12048.48 & 8881.72 & 1 \\ 11205.40 & 9466.20 & 1 \end{vmatrix} = -453634.7$$

$$d = \begin{vmatrix} 11755.95 & 9622.59 & 209.01 \\ 12048.48 & 8881.72 & 203.07 \\ 11205.40 & 9466.20 & 202.7 \end{vmatrix} = -1546762$$

| | |
|---|---|
| z0 = | -3.409707915 |
| mx = | 0.008257597 |
| my = | -0.011278085 |
| Southwest Gradient = | 0.014 |

# APPENDIX B – LABORATORY ANALYTICAL REPORT
## DECEMBER 2005

ACL

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# Laboratory Report

**ACL Project #: 49406**

**Client Proj #:** Vogtle LF#2

***Prepared For:***

The Dextra Group, LLC
4665 Lower Roswell Road
#154
Marietta, GA 30068-0000

**Attention:** Mr. Kurt Batsel

**Report Date:** 12/20/2005

**This report contains 24 pages.**
(including this cover page and chain of custody)

John Andros
Technical Director

***Advanced Chemistry Labs is a woman owned small business concern.***

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**Client:** The Dextra Group, LLC
4665 Lower Roswell Road
#154
Marietta, GA 30068-0000

**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWA-2/MW-2

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005

**ACL Sample #:** 238729 **Units:** µg/L **Analyst:** RP

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

ACL

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4665 Lower Roswell Road
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Marietta, GA 30068-0000

**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWC-3/MW-3

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** RP

**ACL Sample #:** 238730 **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| [illegible]ylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client:** The Dextra Group, LLC
4665 Lower Roswell Road
#154
Marietta, GA 30068-0000

**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWB-4/MW-4

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** RP

**ACL Sample #:** 238731 **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWC-11/MW-11

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** RP

**ACL Sample #:** 238732 **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWA-2/MW-2

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005
**Analyst:** TM

**ACL Sample #:** 238729 **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWC-3/MW-3

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238730 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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|---|---|---|---|
| **Client:** | The Dextra Group, LLC<br>4665 Lower Roswell Road<br>#154<br>Marietta, GA 30068-0000 | **Client Proj #:**<br>**ACL Project #:**<br>**Date Received:**<br>**Date Reported:** | Vogtle LF#2<br>49406<br>12/08/2005<br>12/20/2005 |
| **Contact:** | Mr. Kurt Batsel | | |

## Miscellaneous Organics (8011) - Appendix II

| | | | |
|---|---|---|---|
| **Sample ID:** | GWB-4/MW-4 | **Matrix:** | Water |
| | | **Date Sampled:** | 12/06/2005 |
| | | **Date Extracted:** | 12/13/2005 |
| | | **Date Analyzed:** | 12/14/2005 |
| **ACL Sample #:** 238731 | **Units:** µg/L | **Analyst:** | TM |

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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|---|---|---|---|
| **Client:** | The Dextra Group, LLC<br>4665 Lower Roswell Road<br>#154<br>Marietta, GA 30068-0000 | **Client Proj #:** | Vogtle LF#2 |
| | | **ACL Project #:** | 49406 |
| | | **Date Received:** | 12/08/2005 |
| | | **Date Reported:** | 12/20/2005 |
| **Contact:** | Mr. Kurt Batsel | | |

## Miscellaneous Organics (8011) - Appendix II

| | | | |
|---|---|---|---|
| **Sample ID:** | GWC-11/MW-11 | **Matrix:** | Water |
| | | **Date Sampled:** | 12/06/2005 |
| | | **Date Extracted:** | 12/13/2005 |
| | | **Date Analyzed:** | 12/14/2005 |
| **ACL Sample #:** 238732 | **Units:** µg/L | **Analyst:** | TM |

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWA-2/MW-2

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** 238729 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.080 | 0.020 |

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**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWC-3/MW-3

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** 238730 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | 0.025 | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.137 | 0.020 |

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**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWB-4/MW-4

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** 238731 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | 0.021 | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.082 | 0.020 |

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**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWC-11/MW-11

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** 238732 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.181 | 0.020 |

# QUALITY CONTROL

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| Contact: | Mr. Kurt Batsel | | |

## V.O. (5030B/8260B) - Appendix I
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | Dibromofluoromethane (77-137) | 1,2-Dichloroethane-d4 (72-138) | Toluene-d8 (84-112) | 4-Bromofluorobenzene (77-125) |
|---|---|---|---|---|
| 238729 | 111 | 107 | 104 | 108 |
| 238730 | 111 | 105 | 105 | 108 |
| 238731 | 112 | 106 | 105 | 107 |
| 238732 | 112 | 107 | 105 | 108 |

** Matrix Interference
DO=Diluted Out

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**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** RP

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

# ADVANCED CHEMISTRY LABS, INC.

## GC/MS UNIT # 2

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Sequence Date : 12-13-05

Matrix Spike - Sample No.: 238718-1

19.66

| COMPOUND | ADDED (µg/l) | SAMPLE CONCENTRATION (µg/l) | MS CONCENTRATION (µg/l) | MS % REC # | QC. LIMITS REC. |
|---|---|---|---|---|---|
| 1,1-dichloroethene | 20.0 | 0.0 | 19.5 | 97 | (54-144) |
| benzene | 20.0 | 0.0 | 19.6 | 98 | (82-132) |
| trichloroethene | 20.0 | 0.0 | 18.5 | 92 | (73-128) |
| toluene | 20.0 | 0.0 | 18.7 | 93 | (83-130) |
| chlorobenzene | 20.0 | 0.0 | 18.1 | 91 | (88-123) |

| COMPOUND | SPIKE ADDED (µg/l) | MSD CONCENTRATION (µg/l) | MSD % REC # | % RPD # | QC LIMITS RPD | QC LIMITS REC. |
|---|---|---|---|---|---|---|
| 1,1-dichloroethene | 20.0 | 19.4 | 97 | 1 | 14 | (54-144) |
| benzene | 20.0 | 19.3 | 96 | 2 | 11 | (82-132) |
| trichloroethene | 20.0 | 18.5 | 92 | 0 | 14 | (73-128) |
| toluene | 20.0 | 18.5 | 92 | 1 | 13 | (83-130) |
| chlorobenzene | 20.0 | 17.8 | 89 | 2 | 13 | (88-123) |

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

Comments: _____

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ADVANCED CHEMISTRY LABS, INC.

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Fax: (770) 409-1844
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3039 Amwiler Road • Suite 100 • Atlanta, GA 30360
P.O. Box 88610 • Atlanta, GA 30356
www.advancedchemistrylabs.com

**Client:** The Dextra Group, LLC
4665 Lower Roswell Road
#154
Marietta, GA 30068-0000

**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## Miscellaneous Organics (8011) - Appendix II
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | Bromofluorobenzene (40-140) |
|---|---|
| 238729 | 101 |
| 238730 | 94 |
| 238731 | 96 |
| 238732 | 46 |

** Matrix Interference
DO=Diluted Out

ACL

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**Date Received:** 12/08/2005
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## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/13/2005
**Analyst:** TM

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

# Advanced Chemistry Labs

*Outside QC limits*

## Pesticides Spike Report (SW-846 Method 8011/Method 504.1)

*Instrument ID:* *HP5890A-ECDGC#5*
*Column:* *STx-CLP, 30m, 0.53mm, 0.5µm*

*ACL #:* LCSW121305
*Matrix:* Water
*Extraction Date:* 12/13/05
*Analysis Date:* 12/13/05
*Initial Volume:* 35.0 *ml*
*Final Volume:* 2
*Dilution Factor:* 1
*Unit:* *µg/L or ppb*

| Pesticide | R.T. MS | Spike Added | Sample Result | MS Conc. | MS Rec. (%) | R.T. MSD | MSD Conc. | MSD Rec. (%) | RPD (%) | QC Limits RPD | QC Limits % Recovery | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EDB | 6.091 | 0.500 | 0.000 | 0.442 | **88** | 6.069 | 0.443 | **89** | **0** | 25 | 60 | 140 |
| TCP | 8.770 | 0.500 | 0.000 | 0.500 | **100** | 8.767 | 0.482 | **96** | **4** | 25 | 60 | 140 |
| DBCP | 12.104 | 0.500 | 0.000 | 0.421 | **84** | 12.108 | 0.386 | **77** | **9** | 25 | 60 | 140 |

*Outside QC limits*

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Marietta, GA 30068-0000

**Client Proj #:** Vogtle LF#2
**ACL Project #:** 49406
**Date Received:** 12/08/2005
**Date Reported:** 12/20/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** Blank **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | BQL | 0.020 |

# ADVANCED CHEMISTRY LABS, INC.

ICP Metals

Water LCS/LCSD Recoveries

Instrument : TJA 61E Trace ICP

Date Digested : 12/12/05

Date Analyzed : 12/13/05

ACL Sample No. : LCS/LCSD-1 120905

| ANALYTE | SPIKE Added (ppm) | Blank Result (ppm) | LCS Result (ppm) | LCS Recovery (%) # | LCSD Result (ppm) | LCSD Recovery (%) # | RPD # | QC Limits RPD | QC Limits % Recovery | |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.000 | BRL | 0.9712 | 97.1 | 0.9570 | 95.7 | 1.5 | 20 | 75 | 125 |
| Antimony | 0.040 | BRL | 0.0354 | 88.5 | 0.0355 | 88.8 | 0.3 | 20 | 75 | 125 |
| Arsenic | 0.200 | BRL | 0.1948 | 97.4 | 0.1949 | 97.5 | 0.1 | 20 | 75 | 125 |
| Barium | 1.000 | BRL | 0.9918 | 99.2 | 0.9781 | 97.8 | 1.4 | 20 | 75 | 125 |
| Beryllium | 0.200 | BRL | 0.2040 | 102.0 | 0.2011 | 100.6 | 1.4 | 20 | 75 | 125 |
| Cadmium | 0.050 | BRL | 0.0510 | 102.0 | 0.0507 | 101.4 | 0.6 | 20 | 75 | 125 |
| Calcium | 1.000 | BRL | 1.0170 | 101.7 | 0.9970 | 99.7 | 2.0 | 20 | 75 | 125 |
| Chromium | 0.200 | BRL | 0.2061 | 103.1 | 0.2039 | 102.0 | 1.1 | 20 | 75 | 125 |
| Cobalt | 0.200 | BRL | 0.2058 | 102.8 | 0.2030 | 101.5 | 1.3 | 20 | 75 | 125 |
| Copper | 0.200 | BRL | 0.2045 | 102.3 | 0.2014 | 100.7 | 1.5 | 20 | 75 | 125 |
| Iron | 0.250 | BRL | 0.2354 | 94.2 | 0.2259 | 90.4 | 4.1 | 20 | 75 | 125 |
| Lead | 0.200 | BRL | 0.2070 | 103.5 | 0.2049 | 102.5 | 1.0 | 20 | 75 | 125 |
| Magnesium | 0.200 | BRL | 0.1974 | 98.7 | 0.1945 | 97.3 | 1.5 | 20 | 75 | 125 |
| Molybdenum | 1.000 | BRL | 1.0470 | 104.7 | 1.0370 | 103.7 | 1.0 | 20 | 75 | 125 |
| Nickel | 0.200 | BRL | 0.2052 | 102.6 | 0.2027 | 101.4 | 1.2 | 20 | 75 | 125 |
| Selenium | 0.050 | BRL | 0.0502 | 100.4 | 0.0483 | 96.6 | 3.9 | 20 | 75 | 125 |
| Silver | 0.020 | BRL | 0.0225 | 112.5 | 0.0222 | 111.0 | 1.3 | 20 | 75 | 125 |
| Tin | 2.000 | BRL | 2.0390 | 102.0 | 2.0190 | 101.0 | 1.0 | 20 | 75 | 125 |
| Thallium | 0.040 | BRL | 0.0440 | 110.0 | 0.0441 | 110.3 | 0.2 | 20 | 75 | 125 |
| Vanadium | 0.500 | BRL | 0.5111 | 102.2 | 0.5055 | 101.1 | 1.1 | 20 | 75 | 125 |
| Zinc | 0.200 | BRL | 0.2118 | 105.9 | 0.2100 | 105.0 | 0.9 | 20 | 75 | 125 |

BRL denotes results 'Below Reporting Level'

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 21 outside limits

Rec. %: 0 out of 42 outside limits

Comments : _____

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# CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

Company Name: The Dextra Group

Phone #: (770) 578-9696

Fax #: (770) 521-5345

Company Address: 4665 Lower Roswell Rd. Suite 154 Marrietta, GA 30068

Site Location:

Project Manager: Mr. Kurt Batsel

Client Project: (#)

(Name) Voogtle LF #2

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): Tiffany Messick, Josh Thoroughgill

ANALYSIS REQUEST

| Field Sample ID | # Container | Matrix: Water | Soil | Air | Sludge | Product | Other | Method Preserved: HCl | $HNO_3$ | $H_2SO_4$ | Ice | None | Other | Sampling: Date | Time | App I VOC | App I Metals | EDB/DBCP | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWA-2/MW-2 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 14:30 | X | X | X | |
| GWC-3/MW-3 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 12:15 | X | X | X | |
| GWB-4/MW-4 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 13:35 | X | X | X | |
| GWC-11/MW-11 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 13:30 | X | X | X | |

Special Detection Limits

Remarks:

TAT: Priority (24 hr) ☐ Rush (48 hr) ☐ Rush (72 hr) ☐ Normal ☒

Special Handling: ACL Contact ____ Quote # ____ P. O. ____

Special Reporting Requirements: Fax ☐

Lab Use Only: ACL Project #: 49406

Cooler Temp.: 3.7 °C

QA/QC Level: Level 1 ☐ Level 2 ☒ Other ☐

CUSTODY RECORD

| Relinquished by | Date | Time | Received by |
|---|---|---|---|
| Tiffany Messick | 12/8/05 | 10:50 | |
| | | | |
| | 12/8/05 | 10:50 | Received by Laboratory Waybill # Lo-Bartholomew |

# APPENDIX C – STATISTICAL ANALYSES

# Concentrations (mg/L)

## Parameter: Barium

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Samples: 37
Total Non-Detect: 18
Percent Non-Detects: 48.6486%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-2/MW-2 | 10 | 7 (70%) | 7/30/2002 | 0.027 | 0.027 |
| | | | 9/24/2002 | ND<0.02 | ND<0.02 |
| | | | 10/21/2002 | ND<0.02 | ND<0.02 |
| | | | 12/4/2002 | 0.015 | 0.015 |
| | | | 6/25/2003 | ND<0.02 | ND<0.02 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | ND<0.02 | ND<0.02 |
| | | | 6/14/2005 | 0.021 | 0.021 |
| | | | 12/6/2005 | ND<0.02 | ND<0.02 |

There are 3 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWB-4/MW-4 | 10 | 3 (30%) | 7/30/2002 | 0.021 | 0.021 |
| | | | 9/24/2002 | 0.021 | 0.021 |
| | | | 10/21/2002 | 0.021 | 0.021 |
| | | | 12/4/2002 ~ | 0.0205 | 0.0205 |
| | | | 6/25/2003 | ND<0.02 | ND<0.02 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | 0.021 | 0.021 |
| | | | 6/14/2005 | 0.042 | 0.042 |
| | | | 12/6/2005 | 0.021 | 0.021 |
| GWC-11/MW-11 | 10 | 4 (40%) | 7/30/2002 | 0.085 | 0.085 |
| | | | 9/24/2002 | 0.02 | 0.02 |
| | | | 10/21/2002 | 0.025 | 0.025 |
| | | | 12/4/2002 | 0.018 | 0.018 |
| | | | 6/25/2003 | ND<0.02 | ND<0.02 |
| | | | 12/17/2003 | 0.022 | 0.022 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | ND<0.02 | ND<0.02 |
| | | | 6/14/2005 | 0.034 | 0.034 |
| | | | 12/6/2005 | ND<0.02 | ND<0.02 |
| GWC-3/MW-3 | 7 | 4 (57.1429%) | 7/30/2002 | ND<0.02 | ND<0.02 |
| | | | 9/24/2002 | ND<0.02 | ND<0.02 |
| | | | 12/4/2002 | 0.02 | 0.02 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | 0.02 | 0.02 |
| | | | 6/14/2005 | ND<0.02 | ND<0.02 |
| | | | 12/6/2005 | 0.025 | 0.025 |

There is 1 unused well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 4 | 4 (100%) | 6/25/2003 | ND<0.02 | ND<0.02 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | ND<0.02 | ND<0.02 |

# Shapiro-Francia Test of Normality

## Parameter: Barium

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Sample Size = 37

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0.015 | -1.94314 | 3.77578 | -0.029147 |
| 2 | 0.018 | -1.62576 | 6.41888 | -0.0584108 |
| 3 | 0.02 | -1.41865 | 8.43145 | -0.0867838 |
| 4 | 0.02 | -1.25357 | 10.0029 | -0.111855 |
| 5 | 0.02 | -1.12168 | 11.261 | -0.134289 |
| 6 | 0.02 | -1.00687 | 12.2748 | -0.154426 |
| 7 | 0.02 | -0.900227 | 13.0852 | -0.172431 |
| 8 | 0.02 | -0.806422 | 13.7355 | -0.188559 |
| 9 | 0.02 | -0.719228 | 14.2528 | -0.202944 |
| 10 | 0.02 | -0.634124 | 14.6549 | -0.215626 |
| 11 | 0.02 | -0.556308 | 14.9644 | -0.226752 |
| 12 | 0.02 | -0.481728 | 15.1965 | -0.236387 |
| 13 | 0.02 | -0.40701 | 15.3621 | -0.244527 |
| 14 | 0.02 | -0.337155 | 15.4758 | -0.25127 |
| 15 | 0.02 | -0.268908 | 15.5481 | -0.256648 |
| 16 | 0.02 | -0.199336 | 15.5879 | -0.260635 |
| 17 | 0.02 | -0.133244 | 15.6056 | -0.2633 |
| 18 | 0.02 | -0.0677301 | 15.6102 | -0.264654 |
| 19 | 0.02 | 0 | 15.6102 | -0.264654 |
| 20 | 0.02 | 0.0677301 | 15.6148 | -0.2633 |
| 21 | 0.02 | 0.133244 | 15.6325 | -0.260635 |
| 22 | 0.02 | 0.199336 | 15.6723 | -0.256648 |
| 23 | 0.02 | 0.268908 | 15.7446 | -0.25127 |
| 24 | 0.0205 | 0.337155 | 15.8583 | -0.244358 |
| 25 | 0.021 | 0.40701 | 16.0239 | -0.235811 |
| 26 | 0.021 | 0.481728 | 16.256 | -0.225695 |
| 27 | 0.021 | 0.556308 | 16.5655 | -0.214012 |
| 28 | 0.021 | 0.634124 | 16.9676 | -0.200696 |
| 29 | 0.021 | 0.719228 | 17.4849 | -0.185592 |
| 30 | 0.021 | 0.806422 | 18.1352 | -0.168657 |
| 31 | 0.022 | 0.900227 | 18.9456 | -0.148852 |
| 32 | 0.025 | 1.00687 | 19.9594 | -0.12368 |
| 33 | 0.025 | 1.12168 | 21.2175 | -0.0956386 |
| 34 | 0.027 | 1.25357 | 22.789 | -0.0617923 |
| 35 | 0.034 | 1.41865 | 24.8015 | -0.0135581 |
| 36 | 0.042 | 1.62576 | 27.4446 | 0.0547239 |

Sample Standard Deviation = 0.0113741
Numerator = 0.00299471
Denominator = 0.127818 = 36 27.4446
W Statistic = 0.0234295
5% Critical value of 0.953 exceeds 0.0234295
Evidence of non-normality at 95% level of significance
1% Critical value of 0.935 exceeds 0.0234295
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Barium

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-2/MW-2 | 7/30/2002 | 0.027 | 34 |
| | 9/24/2002 | ND<0.02 | 9.5 |
| | 10/21/2002 | ND<0.02 | 9.5 |
| | 12/4/2002 | 0.015 | 19 |
| | 6/25/2003 | ND<0.02 | 9.5 |
| | 12/17/2003 | ND<0.02 | 9.5 |
| | 6/16/2004 | ND<0.02 | 9.5 |
| | 12/28/2004 | ND<0.02 | 9.5 |
| | 6/14/2005 | 0.021 | 25 |
| | 12/6/2005 | ND<0.02 | 9.5 |

Rank Sum = 144.5
Rank Mean = 14.45

Background Rank Sum = 144.5
Background Rank Mean = 14.45

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWB-4/MW-4 | 7/30/2002 | 0.021 | 26 |
| | 9/24/2002 | 0.021 | 27 |
| | 10/21/2002 | 0.021 | 28 |
| | 12/4/2002 ~ | 0.0205 | 24 |
| | 6/25/2003 | ND<0.02 | 9.5 |
| | 12/17/2003 | ND<0.02 | 9.5 |
| | 6/16/2004 | ND<0.02 | 9.5 |
| | 12/28/2004 | 0.021 | 29 |
| | 6/14/2005 | 0.042 | 36 |
| | 12/6/2005 | 0.021 | 30 |

Rank Sum = 228.5
Rank Mean = 22.85

| | | | |
|---|---|---|---|
| GWC-11/MW-11 | 7/30/2002 | 0.085 | 37 |
| | 9/24/2002 | 0.02 | 21 |
| | 10/21/2002 | 0.025 | 32 |
| | 12/4/2002 | 0.018 | 20 |
| | 6/25/2003 | ND<0.02 | 9.5 |
| | 12/17/2003 | 0.022 | 31 |
| | 6/16/2004 | ND<0.02 | 9.5 |
| | 12/28/2004 | ND<0.02 | 9.5 |
| | 6/14/2005 | 0.034 | 35 |
| | 12/6/2005 | ND<0.02 | 9.5 |

Rank Sum = 214
Rank Mean = 21.4

| | | | |
|---|---|---|---|
| GWC-3/MW-3 | 7/30/2002 | ND<0.02 | 9.5 |
| | 9/24/2002 | ND<0.02 | 9.5 |
| | 12/4/2002 | 0.02 | 22 |
| | 12/17/2003 | ND<0.02 | 9.5 |
| | 6/16/2004 | 0.02 | 23 |
| | 6/14/2005 | ND<0.02 | 9.5 |
| | 12/6/2005 | 0.025 | 33 |

Rank Sum = 116
Rank Mean = 16.5714

## Calculation Results:

Kruskal-Wallis H Statistic = 3.87598
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 4.37897
95% Confidence comparison value is 7.81472 at 3 degrees of freedom
3.87598 < 7.81472 indicating no significant group difference at 5% significance level
4.37897 < 7.81472 indicating no significant group difference at 5% significance level when adjusted for ties

# Concentrations (mg/L)

## Parameter: Zinc

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Samples: 37
Total Non-Detect: 28
Percent Non-Detects: 75.6757%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-2/MW-2 | 10 | 9 (90%) | 7/30/2002 | ND<0.02 | ND<0.02 |
| | | | 9/24/2002 | ND<0.02 | ND<0.02 |
| | | | 10/21/2002 | ND<0.02 | ND<0.02 |
| | | | 12/4/2002 | ND<0.02 | ND<0.02 |
| | | | 6/25/2003 | ND<0.02 | ND<0.02 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | ND<0.02 | ND<0.02 |
| | | | 6/14/2005 | ND<0.02 | ND<0.02 |
| | | | 12/6/2005 | 0.08 | 0.08 |

There are 3 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWB-4/MW-4 | 10 | 8 (80%) | 7/30/2002 | ND<0.02 | ND<0.02 |
| | | | 9/24/2002 | ND<0.02 | ND<0.02 |
| | | | 10/21/2002 | ND<0.02 | ND<0.02 |
| | | | 12/4/2002 ~ | ND<0.02 | ND<0.02 |
| | | | 6/25/2003 | ND<0.02 | ND<0.02 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | ND<0.02 | ND<0.02 |
| | | | 6/14/2005 | 0.029 | 0.029 |
| | | | 12/6/2005 | 0.082 | 0.082 |
| GWC-11/MW-11 | 10 | 6 (60%) | 7/30/2002 | 0.034 | 0.034 |
| | | | 9/24/2002 | ND<0.02 | ND<0.02 |
| | | | 10/21/2002 | ND<0.02 | ND<0.02 |
| | | | 12/4/2002 | ND<0.02 | ND<0.02 |
| | | | 6/25/2003 | 0.029 | 0.029 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | ND<0.02 | ND<0.02 |
| | | | 6/14/2005 | 0.025 | 0.025 |
| | | | 12/6/2005 | 0.181 | 0.181 |
| GWC-3/MW-3 | 7 | 5 (71.4286%) | 7/30/2002 | ND<0.02 | ND<0.02 |
| | | | 9/24/2002 | ND<0.02 | ND<0.02 |
| | | | 12/4/2002 | 0.047 | 0.047 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 6/14/2005 | ND<0.02 | ND<0.02 |
| | | | 12/6/2005 | 0.137 | 0.137 |

There is 1 unused well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 4 | 4 (100%) | 6/25/2003 | ND<0.02 | ND<0.02 |
| | | | 12/17/2003 | ND<0.02 | ND<0.02 |
| | | | 6/16/2004 | ND<0.02 | ND<0.02 |
| | | | 12/28/2004 | ND<0.02 | ND<0.02 |

# Shapiro-Francia Test of Normality

## Parameter: Zinc

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Sample Size = 37

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0.02 | -1.94314 | 3.77578 | -0.0388627 |
| 2 | 0.02 | -1.62576 | 6.41888 | -0.071378 |
| 3 | 0.02 | -1.41865 | 8.43145 | -0.099751 |
| 4 | 0.02 | -1.25357 | 10.0029 | -0.124822 |
| 5 | 0.02 | -1.12168 | 11.261 | -0.147256 |
| 6 | 0.02 | -1.00687 | 12.2748 | -0.167393 |
| 7 | 0.02 | -0.900227 | 13.0852 | -0.185398 |
| 8 | 0.02 | -0.806422 | 13.7355 | -0.201526 |
| 9 | 0.02 | -0.719228 | 14.2528 | -0.215911 |
| 10 | 0.02 | -0.634124 | 14.6549 | -0.228593 |
| 11 | 0.02 | -0.556308 | 14.9644 | -0.239719 |
| 12 | 0.02 | -0.481728 | 15.1965 | -0.249354 |
| 13 | 0.02 | -0.40701 | 15.3621 | -0.257494 |
| 14 | 0.02 | -0.337155 | 15.4758 | -0.264237 |
| 15 | 0.02 | -0.268908 | 15.5481 | -0.269615 |
| 16 | 0.02 | -0.199336 | 15.5879 | -0.273602 |
| 17 | 0.02 | -0.133244 | 15.6056 | -0.276267 |
| 18 | 0.02 | -0.0677301 | 15.6102 | -0.277622 |
| 19 | 0.02 | 0 | 15.6102 | -0.277622 |
| 20 | 0.02 | 0.0677301 | 15.6148 | -0.276267 |
| 21 | 0.02 | 0.133244 | 15.6325 | -0.273602 |
| 22 | 0.02 | 0.199336 | 15.6723 | -0.269615 |
| 23 | 0.02 | 0.268908 | 15.7446 | -0.264237 |
| 24 | 0.02 | 0.337155 | 15.8583 | -0.257494 |
| 25 | 0.02 | 0.40701 | 16.0239 | -0.249354 |
| 26 | 0.02 | 0.481728 | 16.256 | -0.239719 |
| 27 | 0.02 | 0.556308 | 16.5655 | -0.228593 |
| 28 | 0.02 | 0.634124 | 16.9676 | -0.215911 |
| 29 | 0.025 | 0.719228 | 17.4849 | -0.19793 |
| 30 | 0.029 | 0.806422 | 18.1352 | -0.174544 |
| 31 | 0.029 | 0.900227 | 18.9456 | -0.148437 |
| 32 | 0.034 | 1.00687 | 19.9594 | -0.114204 |
| 33 | 0.047 | 1.12168 | 21.2175 | -0.0614849 |
| 34 | 0.08 | 1.25357 | 22.789 | 0.0388003 |
| 35 | 0.082 | 1.41865 | 24.8015 | 0.15513 |
| 36 | 0.137 | 1.62576 | 27.4446 | 0.377859 |

Sample Standard Deviation = 0.0342974
Numerator = 0.142778
Denominator = 1.1622 = 36 27.4446
W Statistic = 0.122851
5% Critical value of 0.953 exceeds 0.122851
Evidence of non-normality at 95% level of significance
1% Critical value of 0.935 exceeds 0.122851
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Zinc

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-2/MW-2 | 7/30/2002 | ND<0.02 | 14.5 |
| | 9/24/2002 | ND<0.02 | 14.5 |
| | 10/21/2002 | ND<0.02 | 14.5 |
| | 12/4/2002 | ND<0.02 | 14.5 |
| | 6/25/2003 | ND<0.02 | 14.5 |
| | 12/17/2003 | ND<0.02 | 14.5 |
| | 6/16/2004 | ND<0.02 | 14.5 |
| | 12/28/2004 | ND<0.02 | 14.5 |
| | 6/14/2005 | ND<0.02 | 14.5 |
| | 12/6/2005 | 0.08 | 34 |

Rank Sum = 164.5
Rank Mean = 16.45

Background Rank Sum = 164.5
Background Rank Mean = 16.45

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWB-4/MW-4 | 7/30/2002 | ND<0.02 | 14.5 |
| | 9/24/2002 | ND<0.02 | 14.5 |
| | 10/21/2002 | ND<0.02 | 14.5 |
| | 12/4/2002 ~ | ND<0.02 | 14.5 |
| | 6/25/2003 | ND<0.02 | 14.5 |
| | 12/17/2003 | ND<0.02 | 14.5 |
| | 6/16/2004 | ND<0.02 | 14.5 |
| | 12/28/2004 | ND<0.02 | 14.5 |
| | 6/14/2005 | 0.029 | 30 |
| | 12/6/2005 | 0.082 | 35 |

Rank Sum = 181
Rank Mean = 18.1

| | | | |
|---|---|---|---|
| GWC-11/MW-11 | 7/30/2002 | 0.034 | 32 |
| | 9/24/2002 | ND<0.02 | 14.5 |
| | 10/21/2002 | ND<0.02 | 14.5 |
| | 12/4/2002 | ND<0.02 | 14.5 |
| | 6/25/2003 | 0.029 | 31 |
| | 12/17/2003 | ND<0.02 | 14.5 |
| | 6/16/2004 | ND<0.02 | 14.5 |
| | 12/28/2004 | ND<0.02 | 14.5 |
| | 6/14/2005 | 0.025 | 29 |
| | 12/6/2005 | 0.181 | 37 |

Rank Sum = 216
Rank Mean = 21.6

| | | | |
|---|---|---|---|
| GWC-3/MW-3 | 7/30/2002 | ND<0.02 | 14.5 |
| | 9/24/2002 | ND<0.02 | 14.5 |
| | 12/4/2002 | 0.047 | 33 |
| | 12/17/2003 | ND<0.02 | 14.5 |
| | 6/16/2004 | ND<0.02 | 14.5 |
| | 6/14/2005 | ND<0.02 | 14.5 |
| | 12/6/2005 | 0.137 | 36 |

Rank Sum = 141.5
Rank Mean = 20.2143

## Calculation Results:

Kruskal-Wallis H Statistic = 1.28916
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 2.27422
95% Confidence comparison value is 7.81472 at 3 degrees of freedom
1.28916 < 7.81472 indicating no significant group difference at 5% significance level
2.27422 < 7.81472 indicating no significant group difference at 5% significance level when adjusted for ties

# GROUNDWATER MONITORING REPORT
# PLANT VOGTLE LANDFILL #3
# SOLID WASTE PERMIT NO. 017-007D(L)(I)
# BURKE COUNTY, GEORGIA
## APRIL 2006

***PREPARED FOR:***

Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Birmingham, Alabama 35201

***PREPARED BY:***

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GEORGIA REGISTERED No. 16594 PROFESSIONAL ENGINEER KURT R. BATSEL

4/6/06

# GROUNDWATER MONITORING REPORT
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# TABLE OF CONTENTS

1 – Introduction ..... 1

2 – Monitoring Well Network ..... 1

3 - Groundwater Flow Rate and Directional Data ..... 2

3.1 Geology/Hydrogeology
3.2 Groundwater Elevations and Gradients

4 – Sampling Procedures and Parameter Analyses ..... 4

4.1 Procedures and Field Measurements
4.2 Parameter Analyses

5 – Groundwater Quality Evaluation ..... 5

5.1 Detected Parameters
5.2 Statistical Analyses

6 – Conclusions ..... 7

In Order Following Page 7

*Tables*
1 – Groundwater Elevations and Monitoring Well Construction Details
2 – Groundwater Sampling Field Measurements
3 – Constituents for Detection Monitoring
4 – Summary of Detected Parameters

*Figures*
1 – Groundwater Contour Elevation Map, December 5, 2005

*Appendices*
A – Hydraulic Gradient Calculation Sheets
B – Laboratory Analytical Reports
C – Statistical Analyses

# 1 – Introduction

This report presents the results of groundwater sampling conducted in December 2005 at private solid waste Landfill #3 operated by Southern Nuclear Operating Company, Inc. (SNC) at Plant Vogtle in Waynesboro, Georgia. Groundwater monitoring was initiated in 2002 in accordance with the approved Groundwater Monitoring Plan for the landfill. The landfill is operated under Solid Waste Permit #017-007D(L)(I) and used for disposal of non-putrescible, non-liquid office and solid waste as well as construction/demolition debris such as asbestos insulation, wooden pallets and concrete. Landfill #3, permitted in 1987, has been utilized solely for construction and demolition debris disposal since 1992.

Sampling, analyses and data evaluation were conducted in accordance with the rules of the Georgia Department of Natural Resources Environmental Protection Division (EPD), Chapter 391-3-4, the September 1991 "Manual for Groundwater Monitoring" and the approved Groundwater Monitoring Plan for the landfill.

The findings of the initial four sampling events, conducted from August 2002 through December 2002, and subsequent semi-annual sampling events are presented in reports previously submitted to the EPD. This report presents the results of the December 2005 semi-annual monitoring event. Subsequent reports will be prepared upon completion of semi-annual monitoring events as scheduled in the Groundwater Monitoring Plan.

# 2 – Monitoring Well Network

The groundwater monitoring well network consists of nine permanent monitoring wells located along the perimeter of the waste management unit boundary of Landfill #3 (*Figure 1*). As shown in the figure, the wells are located outside of, but as close as practical to, the waste disposal areas. The wells are screened within the uppermost water-producing zones underlying the landfill, which occur from approximately 30 to 80 feet below land surface at Landfill #3.

The nine permanent groundwater monitoring wells at Landfill #3 were installed in September 2001, July 2002 and June 2005. The well construction details are presented in *Table 1*. As noted in the table, well GWC-16 has been dry during each groundwater monitoring event. Wells GWA-7/MW-7 and GWA-15/MW-15 are located at the south and southwest portions of the landfill boundary. Wells GWC-5/MW-5, GWC-13/MW-13 and GWC-14/MW-14 are located along the eastern portion of the landfill boundary, and wells GWB-6/MW-6 and GWB-16/MW-16 are located along the northern landfill boundary. Wells GWC-17/MW-17 and GWC-18/MW-18 were recently installed at the southeast corner of the landfill as part of the contamination assessment program at Landfill #3. Well GWA-7/MW-7 was initially treated as a compliance (downgradient) well for Landfill #3. However, due to review of water level measurements showing this well to be side gradient from the active fill area of the landfill, well GWA-7/MW-7 was evaluated as a background well in the monitoring reports from the June 2003 and December 2003 sampling events. Based on the consistent detection of trichlorofluoromethane and the June 2004 detection of trichloroethene in Well GWA-7/MW-7, it was decided to return to evaluating this well as a compliance well. This approach was used in this monitoring report. The most appropriate designation for this well will continue to be evaluated in light of future monitoring results. For this report, well GWA-15/MW-15 is the designated background well, and the remaining wells are designated compliance wells. The wells will be referred to as GWC-5, GWB-6, GWA-7, GWC-13, GWC-14, GWA-15, GWB-16, GWC-17 and GWC-18 in this report in accordance with the EPD's well identification guidelines.

Two stormwater sediment ponds were completed in 2004 in accordance with the approved Design and Operational Plan for the Vogtle Landfill #3. As there was no discharge from either pond at the time of the December 2005 groundwater monitoring event, no surface water samples were collected from the surface water monitoring stations located at the pond outfalls.

## 3 – Groundwater Flow Rate and Directional Data

### *3.1 Geology/Hydrogeology*

The geology of the Plant Vogtle site consists of sedimentary deposits within the Coastal Plain physiographic province of Georgia. These sediments consist of unconsolidated sands, silts and clays comprised of marine and non-marine fluvial deposits. Marls and limestone were also encountered at depth in deep borings completed at the landfill. The marls encountered during drilling were components of the Irwinton Sand member. Either all or parts of the Barnwell Group members (except the Utley Limestone member) were also encountered in the other borings conducted at the landfill. Underlying the Barnwell Group is the Lisbon Formation with its uppermost unit, the Blue Bluff Marl, located immediately under the Utley Limestone. This marl layer, approximately 70 feet thick, is a near-impermeable layer that effectively confines the Tertiary and Cretaceous aquifers, the two confined aquifers beneath the Plant site.

The occurrence of groundwater underlying the landfill appears in confined, semi-confined, unconfined, and perched hydrogeologic units. Groundwater is found primarily in sands, silty sands, clayey sands and marl limestone interfaces. The main difference between boring/well water production characteristics and aquifer confining characteristics appears to be the thickness of the water-producing zone, the grain size of the sand component, the sand/clay ratio and the characteristics of the marl/limestone interface.

Groundwater may also exist in an unconfined water table aquifer in the Barnwell sands and limestone that overlie the marl. The water table aquifer at the site is on an interfluvial ridge, or a topographically high area in which the groundwater in the water table discharges along streams that surround the topographic high. The streams eventually discharge to the Savannah River.

### *3.2 Groundwater Elevations and Gradients*

During well installation, the occurrence of groundwater was determined by collecting continuous split spoon samples beginning approximately five feet above the location of expected groundwater-producing zones. At both landfill, groundwater was generally found in water producing zones less than one foot thick and was observed to be under semi-confined or confined conditions.

Upon completion of all drilling activities, measuring points were located on the tops of the well casings and surveyed relative to mean sea level (msl). During each sampling event, depth to water measurements were recorded in the wells from the surveyed elevations using an electronic water-level indicator. The water level measurements were then subtracted from the appropriate measuring point elevations to determine groundwater elevations in the wells.

Hydraulic conductivity (K) in the wells was measured on September 26, 2001. The values ranged from $5.634 \times 10^{-4}$ cm/sec in GWB-6 to $3.064 \times 10^{-2}$ cm/sec in GWA-2.

Depth to water measurements and groundwater elevations for the wells at Landfill #3 are presented in *Table 1*. Groundwater elevations measured to date indicate that the groundwater elevation, or hydraulic 'head,' is greatest beneath the center area of the landfill, and decreases to the southeast, to

the northeast and to the west-southwest beneath the landfill. This mounding effect is believed to be the result of natural infiltration in the sandy soils within the historic topographically high area in the center of the landfill. This topographically high area, which encompasses a broad area within the landfill, is a natural site feature that was present prior to any landfilling operations. *Figure 1* shows the topography of the landfill.

As discussed previously, the water-bearing stratigraphy beneath Landfill #3 is composed of individual saturated sand units within a clayey/marl matrix. These units may or may not be interconnected. As such, groundwater elevations in the monitoring wells may reflect head in multiple perched layers and may not represent groundwater 'flow' direction beneath the landfill. *Figure* 2 presents a map depicting the saturated head contours measured on December 5, 2005.

Monitoring well GWA-15 is the well most representative of background water quality at the site because of the distance between the well and the current landfilled area, and the location of the area of relatively higher head located between the well and the current landfilled area on the eastern portion of the site. This well is therefore used as a background well to evaluate groundwater quality at the landfill. Well GWA-7 is now evaluated as a downgradient well based on review of the groundwater elevation and chemical analysis data collected since 2002.

The hydraulic gradient was calculated using a three-point problem from groundwater elevations in the monitoring wells as follows for each main direction of head difference:

Southwest: GWB-6, GWA-7 and GWA-15;
Northeast: GWC-13, GWB-6 and GWC-5; and
Southeast: GWC-13, GWA-7 and GWC-14.

The calculated hydraulic gradients are presented on the contour map (*Figure 1*). The calculations used in determining the gradients are provided in *Appendix A*. For the December 2005 event, the southwest gradient was 0.015, the northeast gradient was 0.08, and the southeast gradient was 0.12. The southwest gradient has typically been 0.01, with a maximum of 0.02 (June 2003), reflecting the consistently flattest gradient across the landfill. The northeast trending gradient has ranged from a minimum of 0.08 (October and December 2002, June 2004) to a maximum of 0.17 (June 2003). The southeast gradient has ranged from a low of 0.06 (December 2002) to a maximum of 0.16 (June 2003). For this monitoring event, the steepest gradient was observed in the southeast flow component.

## 4 – Sampling Procedures and Parameter Analyses

### *4.1 Procedures and Field Measurements*

Prior to sample collection during each sampling event, depth to water measurements are recorded in each well from the surveyed elevations using an electronic water level indicator. The water level indicator is decontaminated using a potable water and Alconox® wash and a distilled water rinse between use at each well. The water level measurements are then subtracted from the appropriate measuring point elevations to determine the groundwater elevations in the wells.

Groundwater samples were collected from all monitoring wells after the wells were properly purged according to the EPA document entitled "Low-Flow Purging & Sampling of Groundwater Monitoring Wells (Bulletin QAD023)". The wells were purged and sampled using QED SamplePro pumps equipped with Teflon® bladders. Purge rates were matched to the recovery rates of the wells, verified by periodic depth to water measurements to determine draw-down during purging. Purging was conducted until at least three consecutive stable readings of pH, conductivity, and turbidity were

recorded. Groundwater samples were then collected directly into pre-preserved sample containers supplied by the laboratory. Final measurements of pH, conductivity, and turbidity were performed to verify that these parameters remained stable during sampling. All field instruments were calibrated in the field daily prior to use and at the conclusion of each sampling event. The field measurements are provided in *Table 2*.

After each sample was collected, the SamplePro pumps and airlines were decontaminated according to the following protocol:

- The pump and air line were placed on clean plastic;
- The pump was disassembled and the bladder was removed;
- The pump was sprayed with a potable water and Alconox® solution, followed with a distilled water rinse until all soap residue was removed;
- A new pump bladder was then installed in the pump prior to reassembly; and
- The pump airline was placed in a clean plastic bag between use at each well.

### *4.2 Parameter Analyses*

In accordance with the approved Groundwater Monitoring Plan, the groundwater samples and field and laboratory quality assurance/quality control (QA/QC) samples were analyzed for the Chapter 391-3-4 Appendix I list of parameters, which consists of total metals and volatile organic compounds (*Table 5*). The field QA/QC samples consisted of duplicate samples, trip blanks and equipment blanks. Metals analyses were conducted using EPA Methods 6010B/7841, and VOCs analyses were conducted using EPA Methods 6010B/8260B and 504.1 to provide sufficiently sensitive quantitation limits for comparison with maximum contaminant limits. Advanced Chemistry Labs, Inc., Atlanta, Georgia performed the laboratory analyses. The complete laboratory analytical reports, which include field and laboratory QA/QC results and chain-of-custody forms, are provided in *Appendix B*.

Samples were also collected for the Chapter 391-3-4 Appendix II parameter mercury in all wells due to this parameter's detection in previous assessment monitoring conducted at the landfill. Full Appendix II analysis was performed for well GWA-7 during the December 2005 event.

## 5 – Groundwater Quality Evaluation

### *5.1 Detected Parameters*

*Table 4* presents a summary of all analyzed parameters detected above the laboratory method reporting limits. Barium was detected at concentrations below the MCL in well GWA-7 (0.024 mg/l), the replicate sample from well GWA-7 (0.022 mg/l) and in well GWC-13 (0.044 mg/l) . Zinc was detected in well GWC-5 at 0.055 mg/l, in well GWB-6 at 0.020 mg/l, in well GWA-7 at 0.068 mg/l, in the replicate sample well GWA-7 at 0.217 mg/l, in well GWC-13 at 0.194 mg/l, in well GWA-15 at 0.042 mg/l and in well GWC-17 at 0.096 mg/l; there is no MCL for zinc. In the compliance well GWA-7 the VOC trichlorofluoromethane was detected at 88 ug/l, and at 85 ug/l in the replicate sample well GWA-7; there is no MCL for trichlorofluoromethane. In the compliance well GWC-13, 1,1-dichloroethane, chlorobenzene, cis-1,2-dichloroethene, trichlorofluoromethane, vinyl chloride, benzene and trichloroethene were detected at low levels. All VOC concentrations in GWC-13 were below applicable MCLs, except for benzene and trichloroethene which were detected at concentrations equal to the respective MCLs of 5 ug/l. The Appendix II parameter naphthalene was detected in well GWA-7 at 5 ug/l; however, this constituent was not detected in the duplicate sample from well GWA-7.

No parameters were detected in any of the field or laboratory QA/QC samples, and the laboratory QA/QC checks were within acceptable limits.

*5.2 Statistical Analyses*

In accordance with the approved Groundwater Monitoring Plan, statistical analyses were conducted for each constituent detected in the compliance well samples for this sampling event. The analyses were conducted to help identify any significant increase in constituent concentrations in downgradient, or compliance, well samples over samples representative of background water quality. The analyses were conducted consistent with U.S. EPA recommended methods as detailed in the guidance document "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Interim Final Guidelines" (1989) and the corresponding Addendum (1992).

The following methodology was used to evaluate the data:

- The distribution of the data was first evaluated for normality using either the Shapiro-Wilkes Test (for parameters with less than 50 samples) or the Shapiro-Francia Test (for parameters with greater than 50 samples) as recommended in the 1992 EPA guidance. The tests indicate that the concentrations of all detected parameters do not follow normal distributions.

- For the well data sets, the Kruskal-Wallis non-parametric analysis of variance method was used to compare the concentrations of individual parameters in each compliance well to the concentrations of these parameters in the background well. This method is recommended by the 1992 EPA guidance for non-normal sample sets that have between 15% and 90% non-detects.

The detailed statistical analyses are provided in *Appendix C* and the results are summarized below.

At Landfill #3, statistical analysis was performed for the seven detected parameters barium, zinc, 1,1-dichloroethane, chlorobenzene, cis-1,2-dichloroethene, trichlorofluoromethane, vinyl chloride, benzene, and trichloroethene. Compared to background well GWA-15/MW-15, the analyses indicate statistically significant higher concentrations of the following parameters:

- Barium, 1,1-dichloroethane and trichlorofluoromethane in the GWC-13 well samples,
- Trichlorofluoromethane in the GWA-7 well samples, and
- Barium, 1,1-dichloroethane, chlorobenzene and cis-1,2-dichloroethene in the GWC-14 well samples.

It should be noted that the statistical analyses data sets include all sampling events to date for all wells. As a result, statistically higher concentrations of detected parameters in a well are determined based on all reported concentrations (including consideration of non-detects) from all sampling events for that well. If a concentration is lower in the current event for a well, the complete data set for the well may still indicate a statistically higher concentration over the background well data set considering all sampling events to date. For example, although there was no sample available for GWC-14 for this event, the statistical analyses indicate significantly higher concentrations of barium, 1,1-dichloroethane, chlorobenzene and cis-1,2-dichloroethene for the GWC-14 historical sample data set.

## 6 – Conclusions

Since a statistically significant increase over background is indicated for several analyzed parameters in wells GWA-7, GWC-13 and GWC-14 at Landfill #3, SNC will place a notice in the operating record within 14 days of submittal of this report as required by Chapter 391-3-4. The notice will indicate which constituents have shown statistically significant higher concentrations compared to the background wells.

In the Appendix II parameter sampling during this event, naphthalene was detected at a level of 10 ug/l in one GWA-7 sample, but was not detected in the duplicate sample from GWA-7. Based on the non-detection of naphthalene in the duplicate GWA-7 sample and no prior detections of this constituent in previous Appendix II sampling at the site, no modification to the Appendix II sampling program action is proposed at this time. Based on prior detections of the Appendix II parameter mercury in Landfill #3 wells, SNC will continue to perform analysis for mercury in all Landfill #3 wells during the regular semi-annual sampling events.

# TABLES

Table 1
Southern Nuclear Operating Company Plant Vogtle Landfill #3
Groundwater Elevations and Monitoring Well Construction Details

| Well ID | Date | Measuring Point Elevation (feet, msl) | Ground Surface Elevation (feet, msl) | Depth to Water (feet, topvc) | Total Boring Depth (feet, bls) | Total Well Depth (feet, topvc) | Riser Height (feet) | Screened Interval (feet, msl) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|---|---|---|---|---|
| GWC-5/MW-5 | 9/26/2001 | 251.96 | 249.11 | 48.65 | 67 | 56.85 | 2.85 | 195.11 to 205.11 | 203.31 |
| | 7/29/2002 | | | 50.21 | | | | | 201.75 |
| | 9/9/2002 | | | 50.43 | | | | | 201.53 |
| | 10/21/2002 | | | 49.26 | | | | | 202.70 |
| | 12/3/2002 | | | 49.26 | | | | | 202.70 |
| | 6/24/2003 | | | 44.60 | | | | | 207.36 |
| | 12/16/2003 | | | 47.55 | | | | | 204.41 |
| | 6/15/2004 | | | 47.76 | | | | | 204.20 |
| | 12/28/2004 | | | 49.13 | | | | | 202.83 |
| | 6/13/2005 | | | 45.94 | | | | | 206.02 |
| | 12/5/2005 | | | 48.05 | | | | | 203.91 |
| GWB-6/MW-6 | 9/26/2001 | 278.87 | 276.45 | 47.47 | 67 | 64.42 | 2.42 | 214.45 to 224.45 | 231.40 |
| | 7/29/2002 | | | 48.52 | | | | | 230.35 |
| | 9/9/2002 | | | 48.55 | | | | | 230.32 |
| | 10/21/2002 | | | 49.21 | | | | | 229.66 |
| | 12/3/2002 | | | 48.86 | | | | | 230.01 |
| | 6/24/2003 | | | 46.92 | | | | | 231.95 |
| | 12/16/2003 | | | 46.30 | | | | | 232.57 |
| | 6/15/2004 | | | 46.49 | | | | | 232.38 |
| | 12/28/2004 | | | 47.22 | | | | | 231.65 |
| | 6/13/2005 | | | 47.84 | | | | | 231.03 |
| | 12/5/2005 | | | 47.20 | | | | | 231.67 |
| GWA-7/MW-7 | 9/26/2001 | 261.33 | 259.39 | 31.11 | 50 | 41.94 | 1.94 | 219.39 to 229.39 | 230.22 |
| | 7/29/2002 | | | 33.16 | | | | | 228.17 |
| | 9/9/2002 | | | 33.25 | | | | | 228.08 |
| | 10/21/2002 | | | 33.20 | | | | | 228.13 |
| | 12/3/2002 | | | 32.94 | | | | | 228.39 |
| | 6/24/2003 | | | 27.51 | | | | | 233.82 |
| | 12/16/2003 | | | 30.59 | | | | | 230.74 |
| | 6/15/2004 | | | 30.87 | | | | | 230.46 |
| | 12/28/2004 | | | 32.33 | | | | | 229.00 |
| | 6/13/2005 | | | 30.64 | | | | | 230.69 |
| | 12/5/2005 | | | 31.60 | | | | | 229.73 |

Table 1
Southern Nuclear Operating Company Plant Vogtle Landfill #3
Groundwater Elevations and Monitoring Well Construction Details

| Well ID | Date | Measuring Point Elevation (feet, msl) | Ground Surface Elevation (feet, msl) | Depth to Water (feet, topvc) | Total Boring Depth (feet, bls) | Total Well Depth (feet, topvc) | Riser Height (feet) | Screened Interval (feet, msl) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|---|---|---|---|---|
| GWC-13/MW-13 | 7/29/2002 | 273.08 | 270.99 | 40.92 | 50 | 50.09 | 2.09 | 222.99 to 232.99 | 232.16 |
| | 9/9/2002 | | | 41.00 | | | | | 232.08 |
| | 10/21/2002 | | | 40.94 | | | | | 232.14 |
| | 12/3/2002 | | | 40.48 | | | | | 232.60 |
| | 6/24/2003 | | | 36.90 | | | | | 236.18 |
| | 12/16/2003 | | | 39.17 | | | | | 233.91 |
| | 6/15/2004 | | | 39.59 | | | | | 233.49 |
| | 12/28/2004 | | | 40.59 | | | | | 232.49 |
| | 6/13/2005 | | | 38.76 | | | | | 234.32 |
| | 12/5/2005 | | | 39.93 | | | | | 233.15 |
| GWC-14/MW-14 | 7/29/2002 | 262.88 | 260.66 | 40.05 | 55 | 53.22 | 2.22 | 209.66 to 219.66 | 222.83 |
| | 9/9/2002 | | | 42.31 | | | | | 220.57 |
| | 10/21/2002 | | | 42.79 | | | | | 220.09 |
| | 12/3/2002 | | | 42.35 | | | | | 220.53 |
| | 6/24/2003 | | | 44.29 | | | | | 218.59 |
| | 12/16/2003 | | | 51.52 | | | | | 211.36 |
| | 6/15/2004 | | | 52.11 | | | | | 210.77 |
| | 12/28/2004 | | | 52.66 | | | | | 210.22 |
| | 6/13/2005 | | | 51.66 | | | | | 211.22 |
| | 12/5/2005 | | | 52.56 | | | | | 210.32 |
| GWA-15/MW-15 | 7/29/2002 | 268.15 | 265.34 | 45.94 | 55 | 55.81 | 2.81 | 212.34 to 222.34 | 222.21 |
| | 9/9/2002 | | | 46.05 | | | | | 222.10 |
| | 10/21/2002 | | | 46.19 | | | | | 221.96 |
| | 12/3/2002 | | | 46.23 | | | | | 221.92 |
| | 6/24/2003 | | | 41.76 | | | | | 226.39 |
| | 12/16/2003 | | | 43.29 | | | | | 224.86 |
| | 6/15/2004 | | | 43.24 | | | | | 224.91 |
| | 12/28/2004 | | | 44.68 | | | | | 223.47 |
| | 6/13/2005 | | | 40.1 | | | | | 228.05 |
| | 12/5/2005 | | | 47.39 | | | | | 220.76 |

Table 1
Southern Nuclear Operating Company Plant Vogtle Landfill #3
Groundwater Elevations and Monitoring Well Construction Details

| Well ID | Date | Measuring Point Elevation (feet, msl) | Ground Surface Elevation (feet, msl) | Depth to Water (feet, topvc) | Total Boring Depth (feet, bls) | Total Well Depth (feet, topvc) | Riser Height (feet) | Screened Interval (feet, msl) | Groundwater Elevation (feet, msl) |
|---|---|---|---|---|---|---|---|---|---|
| GWB-16/MW-16 | 7/29/2002 | 256.95 | 254.57 | DRY | 65 | 55.38 | 2.38 | 201.57 to 211.57 | DRY |
| | 9/9/2002 | | | DRY | | | | | DRY |
| | 10/21/2002 | | | DRY | | | | | DRY |
| | 12/3/2002 | | | DRY | | | | | DRY |
| | 6/24/2003 | | | DRY | | | | | DRY |
| | 12/16/2003 | | | DRY | | | | | DRY |
| | 6/15/2004 | | | DRY | | | | | DRY |
| | 12/28/2004 | | | DRY | | | | | DRY |
| | 6/13/2005 | | | DRY | | | | | DRY |
| | 12/5/2005 | | | DRY | | | | | DRY |
| GWC-17/MW-17 | 6/13/2005 | 222.64 | 220.28 | 72.82 | 85 | 82.00 | 3.00 | 141.28 to 151.28 | 149.82 |
| | 12/5/2005 | | | 72.6 | | | | | 150.04 |
| GWC-18/MW-18 | 6/13/2005 | 227.54 | 225.03 | 77.05 | 80 | 79.00 | 3.00 | 149.03 to 159.03 | 150.49 |
| | 12/5/2005 | | | DRY | | | | | DRY |

Notes:
Ground surface measured at survey bolt set in concrete pad at base of protective casing.
msl = mean sea level; topvc = measured from top of pvc riser; bls = below land surface

Table 2
Southern Nuclear Operating Company Plant Vogtle Landfill #3
Groundwater Sampling Field Measurements

| Well ID | Date | pH | Conductivity[1] | Turbidity[2] | Gallons Purged | Odor | Color | Comments |
|---|---|---|---|---|---|---|---|---|
| GWC-5/MW-5 | 9/26/2001 | 5.11 | 47.5 | 28.6 | 6.0 | none | cloudy | Well development only |
| | 7/29/2002 | 5.41 | 24.4 | 2.83 | 1.75 | none | none | |
| | 9/9/2002 | 8.13 | 365 | 4.11 | 2.0 | none | none | |
| | 10/21/2002 | -- | -- | -- | -- | -- | -- | |
| | 12/3/2002 | 5.94 | 117 | 7.8 | 2.0 | none | none | |
| | 6/24/2003 | 5.18 | 29 | 3.5 | 6.0 | none | none | |
| | 12/16/2003 | 6.27 | 210 | 79.7 | 3.0 | none | cloudy | Split with GAEPD |
| | 6/16/2004 | 5.94 | 40.7 | 16.5 | 2.0 | none | none | |
| | 12/28/2004 | 4.96 | 30 | 7.33 | 2.3 | none | none | |
| | 6/13/2005 | 5.86 | 580 | 6.2 | 3.5 | none | none | |
| | 12/6/2005 | 5.48 | 548 | 6.03 | 2.5 | none | none | |
| GWB-6/MW-6 | 9/26/2001 | 7.13 | 242 | 25.6 | 2.0 | none | -- | Well development only |
| | 7/29/2002 | 6.75 | 1,338 | 0.35 | 1.5 | none | none | |
| | 9/9/2002 | 4.13 | 198 | 6.43 | 1.5 | none | none | |
| | 10/21/2002 | 6.72 | 573 | 0.44 | 2.5 | none | none | |
| | 12/3/2002 | 6.14 | 116 | 0.45 | 1.5 | none | none | |
| | 6/24/2003 | 7.09 | 155 | 9.1 | 1.5 | none | none | |
| | 12/17/2003 | 6.82 | 126 | 2.27 | 1.5 | none | none | |
| | 6/16/2004 | 6.77 | 178.5 | 1.25 | 2.75 | none | none | |
| | 12/28/2004 | 7.05 | 130 | 2.84 | 2.25 | none | none | |
| | 6/13/2005 | 6.88 | 125 | 2.67 | 2.50 | none | none | |
| | 12/5/2005 | 7.10 | 122 | 2.22 | 2.00 | none | none | |
| GWA-7/MW-7 | 9/26/2001 | -- | -- | cloudy | 30.0 | -- | -- | Well development only |
| | 7/29/2002 | 6.97 | 251 | 8.33 | 2.5 | none | none | |
| | 9/9/2002 | 7.52 | 327 | 9.97 | 5.0 | none | none | |
| | 10/21/2002 | 4.39 | 92 | 3.14 | 2.0 | none | none | |
| | 12/3/2002 | 6.51 | 188 | 7.3 | 2.5 | none | none | |
| | 6/24/2003 | 7.02 | 163 | 101.3 | 4.0 | none | dark brown | Turbidity >100 ntu for 2 hours |
| | 12/16/2003 | 5.73 | 62.7 | 100 | 4.0 | none | mod. brown | Turbidity 85-100 ntu for 1 hour |
| | 6/15/2004 | 5.94 | 68.9 | 42.7 | 2.0 | none | none | |
| | 12/28/2004 | 8.16 | 109 | 9.86 | 3.5 | none | none | |
| | 6/14/2005 | 7.25 | 275 | 8.56 | 3.0 | none | none | |
| | 12/6/2005 | 5.37 | 92 | 96 | 8.5 | none | mod. brown | Turbidity >100 ntu for 2 hours |

Table 2
Southern Nuclear Operating Company Plant Vogtle Landfill #3
Groundwater Sampling Field Measurements

| Well ID | Date | pH | Conductivity/1 | Turbidity/2 | Gallons Purged | Odor | Color | Comments |
|---|---|---|---|---|---|---|---|---|
| GWC-13/MW-13 | 7/29/2002 | 6.52 | 421 | 0.66 | -- | | | |
| | 9/9/2002 | 5.96 | 77.5 | 6.40 | 1.0 | none | none | |
| | 10/21/2002 | 6.19 | 73.4 | 3.09 | 2.5 | none | none | |
| | 12/3/2002 | 6.54 | 481 | 1.00 | 2.5 | none | none | |
| | 6/24/2003 | 5.95 | 271 | 2.02 | 2.5 | none | none | |
| | 12/16/2003 | 5.65 | 294 | 0.75 | 6.0 | none | none | Split with GAEPD |
| | 6/16/2004 | 5.84 | 366 | 4.70 | 1.75 | none | none | |
| | 12/28/2004 | 6.09 | 268 | 0.38 | 1.75 | none | none | |
| | 6/13/2005 | 5.75 | 255 | 2.00 | 1.50 | none | none | |
| | 12/6/2005 | 4.03 | 4.24 | 1.07 | 2.50 | none | none | |
| GWC-14/MW-14 | 7/29/2002 | 6.49 | 448 | 1.15 | -- | none | none | |
| | 9/9/2002 | 5.57 | 717 | 5.19 | -- | none | none | |
| | 10/21/2002 | 6.00 | 674 | 4.65 | 3.2 | none | none | |
| | 12/3/2002 | 5.54 | 547 | 2.7 | 4.5 | none | none | |
| | 6/24/2003 | 5.97 | 197 | 3.61 | 2.5 | none | none | |
| | 12/17/2003 | -- | -- | -- | -- | -- | -- | Split with GAEPD-VOCs & metals |
| | 6/15/2004 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 12/28/2004 | -- | -- | -- | -- | -- | -- | Too little water to purge and sample |
| | 6/14/2005 | -- | -- | -- | -- | -- | -- | Too little water to purge and sample |
| | 12/6/2005 | | | | | | | Too little water to purge and sample |
| GWA-15/MW-15 | 7/29/2002 | 5.70 | 95.8 | 1.12 | 4.0 | none | none | |
| | 9/9/2002 | 5.92 | 118 | 8.53 | 2.5 | none | none | |
| | 10/21/2002 | 5.19 | 81 | 1.88 | 4.5 | none | none | |
| | 12/3/2002 | 7.58 | 78.2 | 3.6 | 2.5 | none | none | |
| | 6/24/2003 | 7.44 | 48.0 | 5.38 | 2.5 | none | none | |
| | 12/17/2003 | 6.93 | 39.4 | 4.55 | 6.5 | none | none | Split with GAEPD |
| | 6/15/2004 | 6.47 | 55.7 | 5.59 | 2.25 | none | none | |
| | 12/28/2004 | 6.83 | 50.0 | 8.85 | 3.00 | none | none | |
| | 6/14/2005 | 7.85 | 72.0 | 7.75 | 4.00 | none | none | |
| | 12/5/2005 | 6.88 | 56.0 | 2.3 | 2.50 | none | none | |

Table 2
Southern Nuclear Operating Company Plant Vogtle Landfill #3
Groundwater Sampling Field Measurements

| Well ID | Date | pH | Conductivity/1 | Turbidity/2 | Gallons Purged | Odor | Color | Comments |
|---|---|---|---|---|---|---|---|---|
| GWB-16/MW-16 | 7/29/2002 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 9/9/2002 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 10/21/2002 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 12/3/2002 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 6/24/2003 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 12/16/2003 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 6/15/2004 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 12/28/2004 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 6/15/2005 | -- | -- | -- | -- | -- | -- | Well Dry |
| | 12/6/2005 | -- | -- | -- | -- | -- | -- | Well Dry |
| GWB-17/MW-17 | 6/15/2005 | 5.84 | 77.58 | 5.29 | 3.5 | none | none | |
| | 12/6/2005 | 6.33 | 68 | 10 | 3 | none | none | |
| GWB-18/MW-18 | 6/15/2005 | 6.67 | 85.6 | 8.2 | 4.2 | none | none | |
| | 12/6/2005 | -- | -- | -- | -- | -- | -- | Well Dry |

Notes:
-- = no data recorded;
/1 - Conductivity in units of umhos/sec
/2 - Turbidity in units of NTU

**Table 3**
**Southern Nuclear Operating Company**
**Plant Vogtle Landfill #3**
**Appendix I to Part 40 CFR Part 258: Constituents for Detection Monitoring (1)**

| Common Name (2) | EPA Method |
|---|---|
| Inorganic Constituents: | |
| (1) Antimony | 6010B/7041 |
| (2) Arsenic | 6010B/7061 |
| (3) Barium | 6010B/7091 |
| (4) Beryllium | 6010B/7091 |
| (5) Cadmium | 6010B/7131 |
| (6) Chromium | 6010B/7191 |
| (7) Cobalt | 6010B/7201 |
| (8) Copper | 6010B/7211 |
| (9) Lead | 6010B/7421 |
| (10) Nickel | 6010B/7520 |
| (11) Selenium | 6010B/7741 |
| (12) Silver | 6010B/7761 |
| (13) Thallium | 6010B/7841 |
| (14) Vanadium | 6010B/7911 |
| (15) Zinc | 6010B/7951 |
| Organic Constituents: | 8260 |
| (16) Acetone | |
| (17) Acrylonitrile | |
| (18) Benzene | |
| (19) Bromochloromethane | |
| (20) Bromodichloromethane | |
| (21) Bromoform; Tribromomethane | |
| (22) Carbon disulfide | |
| (23) Carbon tetrachloride | |
| (24) Chlorobenzene | |
| (25) Chloroethane; Ethyl chloride | |
| (26) Chloroform; Trichloromethane | |
| (27) Dibromochloromethane; Chlorodibromomethane | |
| (28) 1,2-Dibromo-3-chloropropane; DBCP | |
| (29) 1,2-Dibromoethane; Ethylene dibromide; EDB | |
| (30) o-Dichlorobenzene; 1,2-Dichlorobenzene | |
| (31) p-Dichlorobenzene; 1,4-Dichlorobenzene | |
| (32) trans-1,4-Dichloro-2-butene | |
| (33) 1,1-Dichloroethane; Ethylidene chloride | |
| (34) 1,2-Dichloroethane; Ethylene dichloride | |
| (35) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride | |
| (36) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene | |
| (37) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene | |
| (38) 1,2-Dichloropropane; Propylene dichloride | |
| (39) cis-1,3-Dichloropropene | |
| (40) trans-1,3-Dichloropropene | |
| (41) Ethylbenzene | |
| (42) 2-Hexanone; Methyl butyl ketone | |
| (43) Methyl bromide; Bromomethane | |
| (44) Methyl chloride; Chloromethane | |

**Table 3 (continued)**
**Southern Nuclear Operating Company, Inc.**
**Plant Vogtle Landfill #3**
**Appendix I to Part 40 CFR Part 258: Constituents for Detection Monitoring (1)**

| Common Name (2) | EPA Method |
|---|---|
| (45) Methylene bromide; Dibromomethane | 8260 |
| (46) Methylene chloride; Dichloromethane | |
| (47) Methyl ethyl ketone; MEK; 2-Butanone | |
| (48) Methyl iodide; Iodomethane | |
| (49) 4-Methyl-2-pentanone; Methyl isobutyl ketone | |
| (50) Styrene | |
| (51) 1,1,1,2-Tetrachloroethane | |
| (52) 1,1,2,2-Tetrachloroethane | |
| (53) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene | |
| (54) Toluene | |
| (55) 1,1,1-Trichloroethane; Methylchloroform | |
| (56) 1,1,2-Trichloroethane | |
| (57) Trichloroethylene; Trichloroethene | |
| (58) Trichlorofluoromethane; CFC-11 | |
| (59) 1,2,3-Trichloropropane | |
| (60) Vinyl acetate | |
| (61) Vinyl chloride | |
| (62) Xylenes | |

(1) This list contains 47 volatile organics for which possible analytical procedures provided in EPA Report SW-846 ``Test Methods for Evaluating Solid Waste,'' third edition, November 1986, as revised December 1987,includes Method 8260; and 15 metals for which SW-846 provides either Method 6010 or a method from the 7000 series of methods.
(2) Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

**Table 4**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**December 2005**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWA-7/MW-7[3] | GWC-13/MW-13 | GWC-14/MW-14 | GWA-15/MW-15 | GWC-17/MW-17 | GWC-18/MW-18 |
| Metals[1] | | | | | | | | | | |
| Barium | 2.00 | BQL | BQL | 0.024 | 0.022 | 0.044 | NS | BQL | BQL | NS |
| Zinc | NA | 0.055 | 0.020 | 0.068 | 0.217 | 0.194 | NS | 0.042 | 0.096 | NS |
| Organics[2] | | | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL | 18 | NS | BQL | BQL | NS |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | 4J | NS | BQL | BQL | NS |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL | 9 | NS | BQL | BQL | NS |
| Trichlorofluoromethane | NA | BQL | BQL | 88 | 85 | 60 | NS | BQL | BQL | NS |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | 1J | NS | BQL | BQL | NS |
| Napthalene[4] | NA | NA | NA | 5 | BQL | NA | NS | NA | NA | NA |
| Benzene | 5 | BQL | BQL | BQL | BQL | 5 | NS | BQL | BQL | NS |
| Trichloroethene | 5 | BQL | BQL | BQL | BQL | 5 | NS | BQL | BQL | NS |

BQL - Below quantification level; J - Estimated Value
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recovery to sample well
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Replicate sample of well GWC-7/MW-7 sample
[4]Appendix II parameter; NA reflects that this parameter was not analyzed for those wells not included in the Assessment Monitoring Program
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**June 2005**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWC-13/MW-13 | GWC-13/MW-13[5] | GWC-14/MW-14 | GWA-15/MW-15 | GWC-17/MW-17 | GWC-18/MW-18 |
| Metals[1] | | | | | | | | | | |
| Barium | 2.00 | BQL | BQL | BQL | 0.028 | 0.031 | NS | BQL | BQL | BQL |
| Zinc | NA | BQL | BQL | BQL | 0.020 | BQL | NS | 0.029 | BQL | BQL |
| Copper | 1.3[6] | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Mercury[4] | 0.002 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Chromium (total) | 0.1 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Beryllium | 0.004 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Cadmium | 0.005 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Nickel | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Lead | 0.015[6] | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Vanadium | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Organics[2] | | | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | 15 | 15 | NS | BQL | BQL | BQL |
| Carbon disulfide | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL | 32 | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | 8 | 8 | NS | BQL | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 22 | 46 | 45 | NS | BQL | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Chloroform[3] | 0.1 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |
| Trichloroethene | 5 | BQL | BQL | BQL | BQL | BQL | NS | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recovery to sample well
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Applies only to Community Water Systems serving 10,000
[4]Appendix II parameter; NA reflects that this parameter was not analyzed for those wells not included in the Assessment Monitoring Program
[5]Replicate sample of well GWC-13/MW-13 sample
[6]Action Level
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**December 2004**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWA-7/MW-7[5] | GWC-13/MW-13 | GWC-14/MW-14 | GWA-15/MW-15 |
| Metals[1] | | | | | | | | |
| Barium | 2.00 | BQL | BQL | BQL | BQL | 0.043 | NS | BQL |
| Zinc | NA | BQL | BQL | BQL | BQL | 0.044 | NS | BQL |
| Copper | 1.3[6] | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Mercury[4] | 0.002 | BQL | BQL | BQL | 0.0017 | BQL | NS | 0.0004 |
| Chromium (total) | 0.1 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Beryllium | 0.004 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Cadmium | 0.005 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Nickel | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Lead | 0.015[6] | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Vanadium | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Organics[2] | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL | 16 | NS | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL | 8 | NS | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 146 | 143 | 81 | NS | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Chloroform[3] | 0.1 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Trichloroethene | 5 | BQL | BQL | BQL | BQL | BQL | NS | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recovery to sample well
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Applies only to Community Water Systems serving 10,000
[4]Appendix II parameter; NA reflects that this parameter was not analyzed for those wells not included in the Assessment Monitoring Program
[5]Replicate sample of well GWA-7/MW-7 sample
[6]Action Level
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**June 2004**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWC-13/MW-13 | GWC-13/MW-13[5] | GWC-14/MW-14 | GWA-15/MW-15 |
| Metals[1] | | | | | | | | |
| Barium | 2.00 | 0.040 | BQL | BQL | 0.034 | 0.034 | NS | BQL |
| Zinc | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Copper | 1.3[6] | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Mercury[4] | 0.002 | BQL | BQL | 0.0006 | BQL | BQL | NS | BQL |
| Chromium (total) | 0.1 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Beryllium | 0.004 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Cadmium | 0.005 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Nickel | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Lead | 0.015[6] | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Vanadium | NA | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Organics[2] | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | 17 | 19 | NS | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | 9 | 10 | NS | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 46 | 121 | 133 | NS | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | 2 | 2 | NS | BQL |
| Chloroform[3] | 0.1 | BQL | BQL | BQL | BQL | BQL | NS | BQL |
| Trichloroethene | 5 | BQL | BQL | **13** | BQL | BQL | NS | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
NS - Not sampled; well dry or insufficient recovery to sample well
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Applies only to Community Water Systems serving 10,000
[4]Appendix II parameter; NA reflects that this parameter was not analyzed for those wells not included in the Assessment Monitoring Program
[5]Replicate sample of well GWC-13/MW-13 sample
[6]Action Level
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**December 2003**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWC-13/MW-13 | GWC-13/MW-13[5] | GWC-14/MW-14 | GWA-15/MW-15 |
| Metals[1] | | | | | | | | |
| Barium | 2.00 | 0.142 | BQL | BQL | 0.033 | 0.032 | 0.189 | BQL |
| Zinc | NA | 0.032 | BQL | 0.023 | BQL | BQL | 0.127 | BQL |
| Copper | 1.3[6] | 0.025 | BQL | BQL | BQL | BQL | 0.026 | BQL |
| Mercury[4] | 0.002 | BQL | BQL | BQL | BQL | BQL | **0.01** | BQL |
| Chromium (total) | 0.1 | 0.028 | BQL | BQL | BQL | BQL | 0.091 | BQL |
| Beryllium | 0.004 | BQL | BQL | BQL | BQL | BQL | 0.004 | BQL |
| Cadmium | 0.005 | BQL | BQL | BQL | BQL | BQL | **0.011** | BQL |
| Nickel | NA | BQL | BQL | BQL | BQL | BQL | 0.034 | BQL |
| Lead | 0.015[6] | BQL | BQL | BQL | BQL | BQL | 0.015 | BQL |
| Vanadium | NA | BQL | BQL | BQL | BQL | BQL | 0.060 | BQL |
| Organics[2] | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | 20 | 21 | 10 | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | BQL | 19 | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | BQL | 33 | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | 14 | 14 | 17 | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 34 | 102 | 97 | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | BQL | 10 | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Chloroform[3] | 0.1 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Applies only to Community Water Systems serving 10,000
[4]Appendix II parameter
[5]Replicate sample of well GWC-13/MW-13 sample
[6]Action Level
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**June 2003**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWC-13/MW-13 | GWC-13/MW-13[5] | GWC-14/MW-14 | GWA-15/MW-15 |
| Metals[1] | | | | | | | | |
| Barium | 2.00 | BQL | BQL | 0.036 | 0.029 | 0.030 | 0.051 | BQL |
| Zinc | NA | BQL | BQL | 0.034 | BQL | BQL | BQL | BQL |
| Copper | 1.3 | BQL | BQL | 0.035 | BQL | BQL | BQL | BQL |
| Mercury[4] | 0.002 | NS | NS | NS | 0.0005 | 0.0005 | **0.0072** | BQL |
| Organics[2] | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | 9 | 9 | 10 | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | BQL | 7 | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | BQL | 16 | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | 6 | 6 | 10 | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 23 | 41 | 47 | 5 | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Chloroform[3] | 0.1 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Applies only to Community Water Systems serving 10,000
[4]Appendix II parameter; NS reflects that this parameter was not analyzed for those wells not included in the Assessment Monitoring Program
[5]Replicate sample of well GWC-13/MW-13 sample
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**December 2002**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | |
|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWC-13/MW-13 | GWC-14/MW-14 | GWA-15/MW-15 |
| Metals[1] | | | | | | | |
| Barium | 2.00 | 0.018 | BQL | 0.015 | 0.082 | 0.106 | BQL |
| Zinc | NA | BQL | BQL | BQL | 0.027 | BQL | BQL |
| Organics[2] | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | 7 | 16 | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | 10 | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | 39 | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL | 19 | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 210 | 391 | 27 | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | **11** | **24** | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | 21 | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | **4** | BQL |
| Chloroform[3] | 0.1 | BQL | BQL | BQL | 5 | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Applies only to Community Water Systems serving 10,000
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**October 2002**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWC-13/MW-13 | GWC-14/MW-14 | GWA-15/MW-15 | GWA-15-2/MW-15-2[3] |
| Metals[1] | | | | | | | | |
| Barium | | BQL | BQL | BQL | 0.083 | 0.064 | BQL | BQL |
| Zinc | | BQL | BQL | BQL | 0.027 | BQL | BQL | BQL |
| Organics[2] | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | 6 | 17 | BQL | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | 9 | BQL | BQL |
| 1,4-Dicholorbenzene | 75 | BQL | BQL | BQL | BQL | 35 | BQL | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | **11** | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL | 16 | BQL | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 221 | 348 | 31 | BQL | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | 11 | BQL | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Replicate sample of GWA-15//MW-15 well
**Bold** indicates detected concentration is greater than the MCL.

**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**September 2002**

| CONSTITUENT | MCL | WELL SAMPLES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWC-13/MW-13 | GWC-14/MW-14 | GWC-14-2/MW-14-2[3] | GWA-15/MW-15 |
| Metals[1] | | | | | | | | |
| Barium | 2 | 0.020 | BQL | BQL | 0.085 | 0.092 | 0.095 | BQL |
| Zinc | NA | BQL | BQL | BQL | 0.023 | BQL | BQL | BQL |
| Organics[2] | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | 6 | 21 | 21 | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | 8 | 8 | BQL |
| 1,4-Dichlorobenzene | 75 | BQL | BQL | BQL | BQL | 37 | 36 | BQL |
| Methylene chloride | 5 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL | 19 | 18 | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 32 | 381 | 47 | 48 | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | **8** | **29** | **28** | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | 23 | 23 | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL | **3** | BQL |

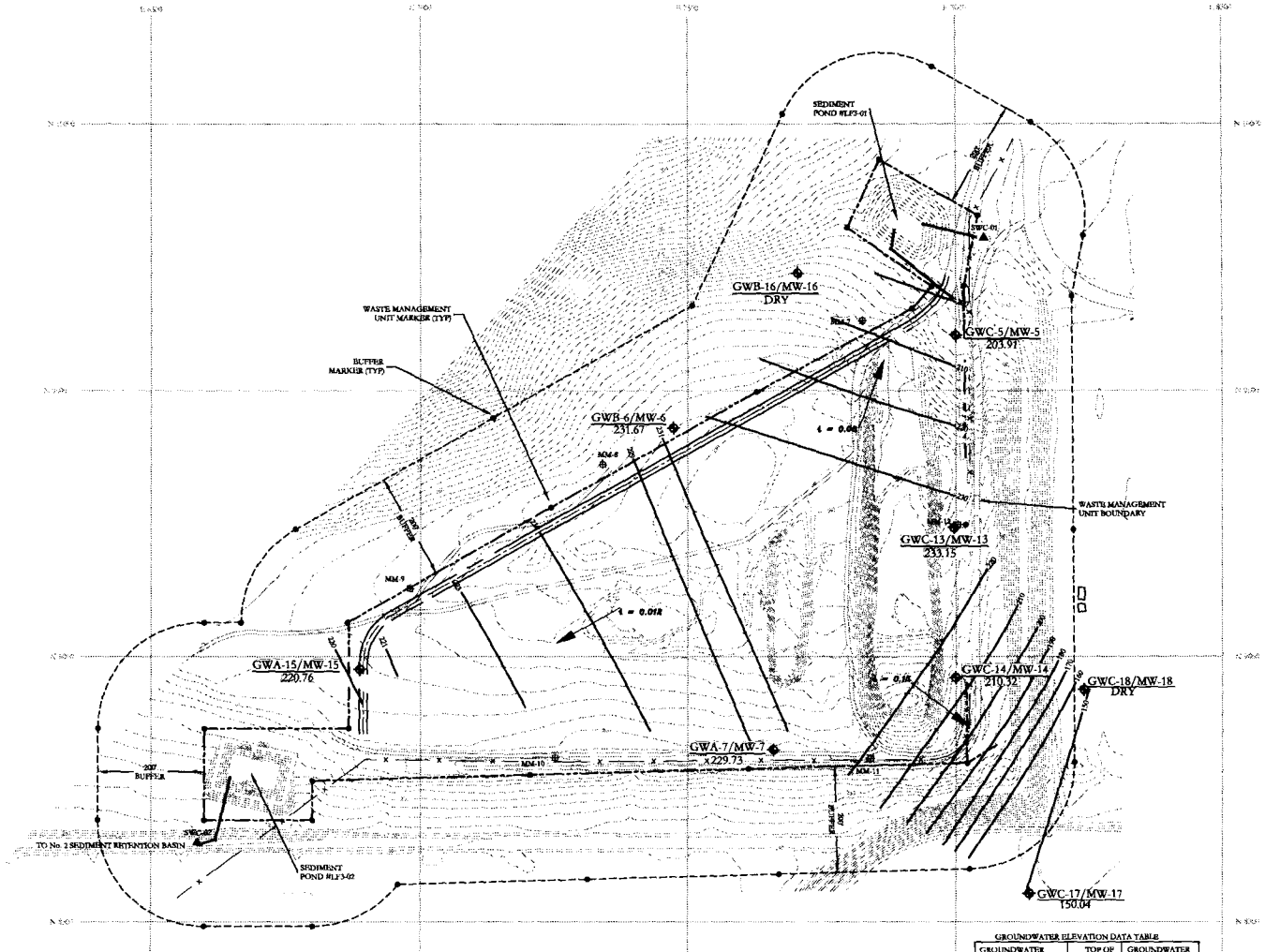
BQL - Below quantification level
MCL - Maximum Contaminant Level per Georgia EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Replicate sample of GWB-14//MW-14 well sample
**Bold** indicates detected concentration is greater than the MCL.

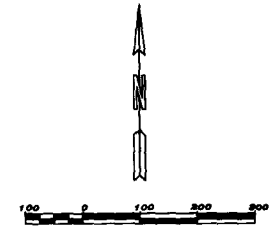
**Table 4 (Continued)**
**Southern Nuclear Operating Company Plant Vogtle Landfill #3**
**Summary of Detected Parameters**
**July 2002**

| CONSTITUENT | MCL | WELLS[1] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GWC-5/MW-5 | GWB-6/MW-6 | GWA-7/MW-7 | GWA-7-2/MW-7-2[3] | GWC-13/MW-13 | GWC-14/MW-14 | GWA-15/MW-15 |
| Metals[1] | | | | | | | | |
| Barium | 2 | BQL | BQL | BQL | BQL | 0.077 | 0.068 | BQL |
| Zinc | NA | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Organics[2] | | | | | | | | |
| 1,1-Dichloroethane | NA | BQL | BQL | BQL | BQL | BQL | 13 | BQL |
| Chlorobenzene | 100 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| 1,4-Dichlorobenzene | 75 | BQL | BQL | BQL | BQL | BQL | 20 | BQL |
| Methylene chloride | 5 | **9** | **6** | **8** | **7** | **8** | **8** | BQL |
| cis-1,2-Dichloroethene | 70 | BQL | BQL | BQL | BQL | BQL | 10 | BQL |
| Trichlorofluoromethane | NA | BQL | BQL | 177 | 192 | 300 | 43 | BQL |
| 1,1-Dichloroethene | 7 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |
| Xylenes (Total) | 10000 | BQL | BQL | BQL | BQL | BQL | 8 | BQL |
| Vinyl chloride | 2 | BQL | BQL | BQL | BQL | BQL | BQL | BQL |

BQL - Below quantification level
MCL - Maximum Contaminant Level per Georgia EPD Rule Chapter 391-3-5; NA - None available
[1]Metals concentrations in mg/L
[2]Organics concentration units in ug/l or ppb
[3]Replicate sample of GWA-7/MW-7 well sample
**Bold** indicates detected concentration is greater than the MCL.

# FIGURES




Map produced by BEI Aerial Mapping, Peachtree City, GA

BEI PROJECT #1010805

DATE OF PHOTOGRAPHY: 8/22/2001

**LEGEND**

- POWER POLE
- TREELINE
- 150 — EXISTING CONTOUR
- 250 — FINAL CONTOUR
- x — FENCE
- MM-7 — METHANE WELL
- GWC-5/MW-5 — GROUNDWATER MONITORING WELL
- WASTE MANAGEMENT UNIT/BUFFER BOUNDARY MARKER

METHANE MONITOR WELL AS-BUILT DATA TABLE

| METHANE MONITOR WELL | N | E | BOLT EL ft msl | TOTAL DEPTH EL ft msl |
|---|---|---|---|---|
| MM-7 | 9631.6193 | 7836.0659 | 257.56 | 232.56 |
| MM-8 | 9361.2699 | 7341.2712 | 272.99 | 242.99 |
| MM-9 | 9127.9166 | 6980.2829 | 268.32 | 238.32 |
| MM-10 | 8809.0679 | 7253.0077 | 257.95 | 227.95 |
| MM-11 | 8808.1725 | 7841.8269 | 259.39 | 234.39 |
| MM-12 | 9248.4436 | 8053.8302 | 270.86 | 240.86 |

GROUNDWATER ELEVATION DATA TABLE

| GROUNDWATER WELL | TOP OF CASING | GROUNDWATER ELEVATION |
|---|---|---|
| GWC-5/MW-5 | 251.96 | 203.91 |
| GWB-6/MW-6 | 278.87 | 231.67 |
| GWA-7/MW-7 | 261.33 | 229.73 |
| GWA-13/MW-13 | 273.08 | 233.15 |
| GWA-14/MW-14 | 262.88 | 210.32 |
| GWA-15/MW-15 | 268.15 | 220.76 |
| GWA-16/MW-16 | 256.95 | DRY |
| GWA-17/MW-17 | 222.64 | 150.04 |
| GWC-18/MW-18 | 227.54 | DRY |

GROUNDWATER ELEVATION RECORDED ON 12-5-05.

| REV. | DATE | DESCRIPTION | BY | CHK | APPR |
|---|---|---|---|---|---|
| SUPERSEDES: | | REVISIONS: | | | |
| PROJECT NO: | | PREPARED: | | | |

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# Groundwater Contour Elevation Map
## December 5, 2005
## Plant Vogtle Landfill #3

| DRAWN BY: | DATE: | DRAWING NUMBER |
|---|---|---|
| GHA | 1/5/06 | Figure 2 |
| CHECKED BY: | SCALE: | |
| KRB | 1" 100' | |

# APPENDIX A – HYDRAULIC GRADIENT CALCULATION SHEETS

Plant Vogtle Landfill #3
Gradient Calculation
(based on three-point problem)
**December 2005 Monitoring Event**

| Well Designation | Water Table Elevation | Northing | Easting |
|---|---|---|---|
| GWC-5/MW-5 | 203.91 | 9604.30 | 7999.33 |
| GWB-6/MW-6 | 231.67 | 9432.48 | 7473.25 |
| GWA-7/MW-7 | 229.73 | 8826.22 | 7657.89 |
| GWC-13/MW-13 | 233.15 | 9242.72 | 7995.86 |
| GWC-14/MW-14 | 210.32 | 8960.64 | 7999.10 |
| GWA-15/MW-15 | 220.76 | 8975.71 | 6886.73 |
| GWC-17/MW-17 | 150.04 | 8553.09 | 8135.59 |
| GWC-18/MW-18 | DRY | 8938.05 | 8238.63 |

**Gradient Calculation** from fitting a plane to three points

$$a\,x_1 + b\,y_1 + cz_1 + d = 0$$
$$a\,x_2 + b\,y_2 + cz_2 + d = 0$$
$$a\,x_3 + b\,y_3 + cz_3 + d = 0$$

where $(x_i,y_i)$ are the coordinates of the well and zi is the head, i = 1,2,3
The gradient is calculated from the square root of $(a^2 + b^2)$

**Southwest Gradient**

Wells of Interest = (GWB-6, GWA-7 & GWA-15) (High-Mid-Low)

| | x | y | z |
|---|---|---|---|
| GWB-6/MW-6 | 9432.48 | 7473.25 | 231.67 |
| GWA-7/MW-7 | 8826.22 | 7657.89 | 229.73 |
| GWA-15/MW-15 | 8975.71 | 6886.73 | 220.76 |

$$a = \begin{vmatrix} 7473.25 & 231.67 & 1 \\ 7657.89 & 229.73 & 1 \\ 6886.73 & 220.76 & 1 \end{vmatrix} = -3152.271$$

$$b = \begin{vmatrix} 9432.48 & 231.67 & 1 \\ 8826.22 & 229.73 & 1 \\ 8975.71 & 220.76 & 1 \end{vmatrix} = 5728.1628$$

$$c = \begin{vmatrix} 9432.48 & 7473.25 & 1 \\ 8826.22 & 7657.89 & 1 \\ 8975.71 & 6886.73 & 1 \end{vmatrix} = 439921.63$$

$$d = \begin{vmatrix} 9432.48 & 7473.25 & 231.67 \\ 8826.22 & 7657.89 & 229.73 \\ 8975.71 & 6886.73 & 220.76 \end{vmatrix} = 29374916$$

| | |
|---|---|
| z0 = | -66.77306592 |
| mx = | 0.007165529 |
| my = | -0.013020871 |
| Southwest Gradient = | 0.015 |

Plant Vogtle Landfill #3
Gradient Calculation
(based on three-point problem)

**Northeast Gradient**

Wells of Interest = (GWC-13, GWB-6 & GWC-5) (High-Mid-Low)

| | x | y | z |
|---|---|---|---|
| GWC-13/MW-13 | 9242.72 | 7995.86 | 233.15 |
| GWB-6/MW-6 | 9432.48 | 7473.25 | 231.67 |
| GWC-5/MW-5 | 9604.30 | 7999.33 | 203.91 |

$$a = \begin{vmatrix} 7995.86 & 233.15 & 1 \\ 7473.25 & 231.67 & 1 \\ 7999.33 & 203.91 & 1 \end{vmatrix} = 15286.252$$

$$b = \begin{vmatrix} 9242.72 & 233.15 & 1 \\ 9432.48 & 231.67 & 1 \\ 9604.30 & 203.91 & 1 \end{vmatrix} = -5013.444$$

$$c = \begin{vmatrix} 9242.72 & 7995.86 & 1 \\ 9432.48 & 7473.25 & 1 \\ 9604.30 & 7999.33 & 1 \end{vmatrix} = 189623.79$$

$$d = \begin{vmatrix} 9242.72 & 7995.86 & 233.15 \\ 9432.48 & 7473.25 & 231.67 \\ 9604.30 & 7999.33 & 203.91 \end{vmatrix} = 225584130$$

| | |
|---|---|
| z0 = | -1189.640441 |
| mx = | -0.080613577 |
| my = | 0.026438898 |
| Northeast Gradient = | 0.08 |

Plant Vogtle Landfill #3
Gradient Calculation
(based on three-point problem)

**Southeast Gradient**

Wells of Interest = (GWC-13, GWA-7 & GWC-14) (High-Mid-Low)

| | x | y | z |
|---|---|---|---|
| GWC-13/MW-13 | 9242.72 | 7995.86 | 233.15 |
| GWA-7/MW-7 | 8826.22 | 7657.89 | 229.73 |
| GWC-14/MW-14 | 8960.64 | 7999.10 | 210.32 |

$$a = \begin{vmatrix} 7995.86 & 233.15 & 1 \\ 7657.89 & 229.73 & 1 \\ 7999.10 & 210.32 & 1 \end{vmatrix} = 7726.9359$$

$$b = \begin{vmatrix} 9242.72 & 233.15 & 1 \\ 8826.22 & 229.73 & 1 \\ 8960.64 & 210.32 & 1 \end{vmatrix} = 8543.9814$$

$$c = \begin{vmatrix} 9242.72 & 7995.86 & 1 \\ 8826.22 & 7657.89 & 1 \\ 8960.64 & 7999.10 & 1 \end{vmatrix} = -96684.04$$

$$d = \begin{vmatrix} 9242.72 & 7995.86 & 233.15 \\ 8826.22 & 7657.89 & 229.73 \\ 8960.64 & 7999.10 & 210.32 \end{vmatrix} = -19440458$$

| | |
|---|---|
| z0 = | -201.0720485 |
| mx = | 0.079919458 |
| my = | 0.088370134 |
| Southeast Gradient = | 0.12 |

# APPENDIX B – LABORATORY ANALYTICAL REPORTS
## DECEMBER 2005

ACL

ADVANCED CHEMISTRY LABS, INC.

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# Laboratory Report

**ACL Project #:** **49407**

**Client Proj #:** Vogtle LF #3

***Prepared For:***

The Dextra Group, LLC
4665 Lower Roswell Road
#154
Marietta, GA 30068-0000

**Attention:** Mr. Kurt Batsel

**Report Date:** 12/29/2005

**This report contains 71 pages.**
(including this cover page and chain of custody)

John Andrbs
Technical Director

***Advanced Chemistry Labs is a woman owned small business concern.***

If you have any questions concerning this report, please do not hesitate to call us at (770) 409-1444.

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# Data Qualifier Codes

| Code | Description |
|---|---|
| A | Value reported is the mean of two or more determinations; |
| B | Indicates the analyte was detected in the sample and method blank; |
| BQL | Below practical quantitation limit; |
| DW | Results reported on a dry-weight basis (ex: mg/kg,dw); |
| E | Estimated value: (i) sample received or analyzed beyond the accepted holding time; (ii) sample received at improper temperature; (iii) the continuing calibration for an analyte did not meet qc criteria; |
| H | Estimated value; result higher than the highest calibration standard; |
| J | Reported value is between the method detection limit and the practical quantitation limit; |
| PQL | Practical quantitation limit; |
| TIC | Tentatively identified compound; |
| *** | Not analyzed due to interferences; |

Upon client request, a statement of the test result estimated uncertainty can be provided.

**NOTE: Unless otherwise noted, all results are reported on an as received basis.**

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**Client:** The Dextra Group, LLC
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#154
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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWC-5/MW-5

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238733 **Units:** µg/L **Analyst:** RP

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client:** The Dextra Group, LLC
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#154
Marietta, GA 30068-0000

**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWC-5/MW-5

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238733 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWC-5/MW-5

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** 238733 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.055 | 0.020 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| GWC-5/MW-5 | 238733 | Mercury (7470A) | Water | BQL | 0.0005 | mg/L | 12/19/2005 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWB-6/MW-6

**Matrix:** Water
**Date Sampled:** 12/05/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005
**Analyst:** RP

**ACL Sample #:** 238734 **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWB-6/MW-6

**Matrix:** Water
**Date Sampled:** 12/05/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005
**Analyst:** TM

**ACL Sample #:** 238734 **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWB-6/MW-6

**Matrix:** Water
**Date Sampled:** 12/05/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** 238734 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.020 | 0.020 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| GWB-6/MW-6 | 238734 | Mercury (7470A) | Water | BQL | 0.0005 | mg/L | 12/19/2005 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## V.O. (5030B/8260B) - Appendix II

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005
**Analyst:** RP

**ACL Sample #:** 238735 **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Ethyl methacrylate | BQL | 10 |
| Acetonitrile | BQL | 100 | Ethylbenzene | BQL | 5 |
| Acrolein | BQL | 100 | 2-Hexanone | BQL | 50 |
| Acrylonitrile | BQL | 50 | Isobutyl alcohol | BQL | 50 |
| Allyl chloride | BQL | 10 | Methacrylonitrile | BQL | 100 |
| Benzene | BQL | 5 | Methyl bromide | BQL | 10 |
| Bromochloromethane | BQL | 5 | Methyl chloride | BQL | 10 |
| Bromodichloromethane | BQL | 5 | Methyl ethyl ketone | BQL | 100 |
| Bromoform | BQL | 5 | Methyl iodide | BQL | 5 |
| Carbon disulfide | BQL | 5 | Methyl methacrylate | BQL | 30 |
| Carbon tetrachloride | BQL | 5 | 4-Methyl-2-pentanone | BQL | 50 |
| Chlorobenzene | BQL | 5 | Methylene bromide | BQL | 5 |
| Chloroethane | BQL | 10 | Methylene chloride | BQL | 5 |
| Chloroform | BQL | 5 | Naphthalene | 5 | 5 |
| Chloroprene | BQL | 20 | Propionitrile | BQL | 150 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Styrene | BQL | 5 |
| Dibromochloromethane | BQL | 5 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| 1,2-Dibromoethane | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | Tetrachloroethene | BQL | 5 |
| 1,2-Dichlorobenzene | BQL | 5 | Toluene | BQL | 5 |
| 1,3-Dichlorobenzene | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| 1,4-Dichlorobenzene | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Dichlorodifluoromethane | BQL | 5 | Trichloroethene | BQL | 5 |
| 1,1-Dichloroethane | BQL | 5 | Trichlorofluoromethane | 88 | 5 |
| 1,2-Dichloroethane | BQL | 5 | 1,2,3-Trichloropropane | BQL | 5 |
| 1,1-Dichloroethene | BQL | 5 | Vinyl acetate | BQL | 50 |
| cis-1,2-Dichloroethene | BQL | 5 | Vinyl chloride | BQL | 2 |
| trans-1,2-Dichloroethene | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dichloropropane | BQL | 5 | o-Xylene | BQL | 5 |
| 1,3-Dichloropropane | BQL | 5 | | | |
| 2,2-Dichloropropane | BQL | 15 | | | |
| 1,1-Dichloropropene | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |

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Marietta, GA 30068-0000

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Acid Extractables (8270C) - Appendix II

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** 238735 **Units:** µg/L **Analyst:** RB

| Analyte | Result | PQL |
|---|---|---|
| 4-Chloro-3-methylphenol | BQL | 20 |
| 2-Chlorophenol | BQL | 10 |
| m & p-Cresol | BQL | 10 |
| o-Cresol | BQL | 10 |
| 2,4-Dichlorophenol | BQL | 10 |
| 2,6-Dichlorophenol | BQL | 10 |
| 2,4-Dimethylphenol | BQL | 10 |
| 4,6-Dinitro-2-methylphenol | BQL | 50 |
| 2,4-Dinitrophenol | BQL | 50 |
| 2-Nitrophenol | BQL | 10 |
| 4-Nitrophenol | BQL | 50 |
| Pentachlorophenol | BQL | 50 |
| Phenol | BQL | 10 |
| 2,3,4,6-Tetrachlorophenol | BQL | 10 |
| 2,4,5-Trichlorophenol | BQL | 10 |
| 2,4,6-Trichlorophenol | BQL | 10 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Base Neutral Extractables (8270C) - Appendix II

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** 238735 **Units:** µg/L **Analyst:** RB

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acenaphthene | BQL | 10 | Dimethyl phthalate | BQL | 10 |
| Acenaphthylene | BQL | 10 | p-(Dimethylamino)azobenzene | BQL | 10 |
| Acetophenone | BQL | 10 | 7,12-Dimethylbenz(a)anthracene | BQL | 10 |
| 2-Acetylaminofluorene | BQL | 20 | 3,3'-Dimethylbenzidine | BQL | 10 |
| 4-Aminobiphenyl | BQL | 20 | m-Dinitrobenzene | BQL | 20 |
| Anthracene | BQL | 10 | 2,4-Dinitrotoluene | BQL | 10 |
| Benzo(a)anthracene | BQL | 10 | 2,6-Dinitrotoluene | BQL | 10 |
| Benzo(a)pyrene | BQL | 10 | Diphenylamine | BQL | 10 |
| Benzo(b)fluoranthene | BQL | 10 | Disulfoton | BQL | 10 |
| Benzo(g,h,i)perylene | BQL | 10 | Ethyl methanesulfonate | BQL | 20 |
| Benzo(k)fluoranthene | BQL | 10 | Famphur | BQL | 20 |
| Benzyl alcohol | BQL | 20 | Fluoranthene | BQL | 10 |
| Bis(2-chloroethoxy)methane | BQL | 10 | Fluorene | BQL | 10 |
| Bis(2-chloroethyl)ether | BQL | 10 | Hexachlorobenzene | BQL | 10 |
| Bis(2-chloroisopropyl)ether | BQL | 10 | Hexachlorobutadiene | BQL | 10 |
| Bis(2-ethylhexyl)phthalate | BQL | 10 | Hexachlorocyclopentadiene | BQL | 10 |
| 4-Bromophenyl phenyl ether | BQL | 10 | Hexachloroethane | BQL | 10 |
| Butyl benzyl phthalate | BQL | 10 | Hexachloropropene | BQL | 10 |
| p-Chloroaniline | BQL | 20 | Indeno(1,2,3-cd)pyrene | BQL | 10 |
| Chlorobenzilate | BQL | 10 | Isodrin | BQL | 20 |
| 2-Chloronaphthalene | BQL | 10 | Isophorone | BQL | 10 |
| 4-Chlorophenyl phenyl ether | BQL | 10 | Isosafrole | BQL | 10 |
| Chrysene | BQL | 10 | Kepone | BQL | 20 |
| Di-n-butyl phthalate | BQL | 10 | Methapyrilene | BQL | 100 |
| Di-n-octyl phthalate | BQL | 10 | Methyl methanesulfonate | BQL | 10 |
| Diallate | BQL | 10 | Methyl parathion | BQL | 10 |
| Dibenz(a,h)anthracene | BQL | 10 | 3-Methylcholanthrene | BQL | 10 |
| Dibenzofuran | BQL | 10 | 2-Methylnaphthalene | BQL | 10 |
| 1,2-Dichlorobenzene | BQL | 10 | Naphthalene | BQL | 10 |
| 1,3-Dichlorobenzene | BQL | 10 | 1,4-Naphthoquinone | BQL | 10 |
| 1,4-Dichlorobenzene | BQL | 10 | 1-Naphthylamine | BQL | 10 |
| 3,3'-Dichlorobenzidine | BQL | 20 | 2-Naphthylamine | BQL | 10 |
| Diethyl phthalate | BQL | 10 | 5-Nitro-o-toluidine | BQL | 10 |
| Dimethoate | BQL | 10 | 2-Nitroaniline | BQL | 50 |

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4665 Lower Roswell Road
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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Base Neutral Extractables (8270C) - Appendix II

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005
**Analyst:** RB

**ACL Sample #:** 238735 **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 3-Nitroaniline | BQL | 50 |
| 4-Nitroaniline | BQL | 20 |
| Nitrobenzene | BQL | 10 |
| N-Nitroso-di-n-butylamine | BQL | 10 |
| N-Nitrosodiethylamine | BQL | 20 |
| N-Nitrosodimethylamine | BQL | 10 |
| N-Nitrosodiphenylamine | BQL | 10 |
| N-Nitrosodipropylamine | BQL | 10 |
| N-Nitrosomethylethylamine | BQL | 10 |
| N-Nitrosopiperidine | BQL | 20 |
| N-Nitrosopyrrolidine | BQL | 40 |
| Parathion | BQL | 20 |
| Pentachlorobenzene | BQL | 10 |
| Pentachloronitrobenzene | BQL | 20 |
| Phenacetin | BQL | 20 |
| Phenanthrene | BQL | 10 |
| p-Phenylenediamine | BQL | 10 |
| Phorate | BQL | 10 |
| Pronamide | BQL | 10 |
| Pyrene | BQL | 10 |
| Safrole | BQL | 10 |
| 1,2,4,5-Tetrachlorobenzene | BQL | 10 |
| Thionazin | BQL | 20 |
| o-Toluidine | BQL | 10 |
| 1,2,4-Trichlorobenzene | BQL | 10 |
| o,o,o-Triethyl phosphorothioate | BQL | 50 |
| 1,3,5-Trinitrobenzene | BQL | 10 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Pesticides/PCBs (8081A/8082) - Appendix II

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/08/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** 238735 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| Aldrin | BQL | 0.05 |
| Arochlor-1016 | BQL | 0.50 |
| Arochlor-1221 | BQL | 0.50 |
| Arochlor-1232 | BQL | 0.50 |
| Arochlor-1242 | BQL | 0.50 |
| Arochlor-1248 | BQL | 0.50 |
| Arochlor-1254 | BQL | 0.50 |
| Arochlor-1260 | BQL | 0.50 |
| a-BHC | BQL | 0.05 |
| b-BHC | BQL | 0.05 |
| d-BHC | BQL | 0.05 |
| g-BHC | BQL | 0.05 |
| Chlordane | BQL | 0.10 |
| 4,4'-DDD | BQL | 0.05 |
| 4,4'-DDE | BQL | 0.05 |
| 4,4'-DDT | BQL | 0.05 |
| Dieldrin | BQL | 0.05 |
| Endosulfan I | BQL | 0.05 |
| Endosulfan II | BQL | 0.05 |
| Endosulfan sulfate | BQL | 0.05 |
| Endrin | BQL | 0.05 |
| Endrin aldehyde | BQL | 0.05 |
| Heptachlor | BQL | 0.05 |
| Heptachlor epoxide | BQL | 0.05 |
| Methoxychlor | BQL | 0.05 |
| Toxaphene | BQL | 2.00 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Chlorinated Herbicides (8151A) - Appendix II

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/21/2005

**ACL Sample #:** 238735 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 2,4-D | BQL | 1.0 |
| Dinoseb | BQL | 1.0 |
| 2,4,5-TP (Silvex) | BQL | 1.0 |
| 2,4,5-T | BQL | 1.0 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238735 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Appendix II Metals (6010B/7470A/7841/7041)

**Sample ID:** GWA-7/MW-7

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW/JR

**ACL Sample #:** 238735 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | 0.024 | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Mercury | BQL | 0.0005 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Tin | BQL | 0.025 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.068 | 0.020 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| GWA-7/MW-7 | 238735 | Cyanide (9012A) | Water | BQL | 0.020 | mg/L | 12/12/2005 |
| GWA-7/MW-7 | 238735 | Sulfide (9034) | Water | BQL | 1.0 | mg/L | 12/10/2005 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## V.O. (5030B/8260B) - Appendix II

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238736 **Units:** µg/L **Analyst:** RP

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Ethyl methacrylate | BQL | 10 |
| Acetonitrile | BQL | 100 | Ethylbenzene | BQL | 5 |
| Acrolein | BQL | 100 | 2-Hexanone | BQL | 50 |
| Acrylonitrile | BQL | 50 | Isobutyl alcohol | BQL | 50 |
| Allyl chloride | BQL | 10 | Methacrylonitrile | BQL | 100 |
| Benzene | BQL | 5 | Methyl bromide | BQL | 10 |
| Bromochloromethane | BQL | 5 | Methyl chloride | BQL | 10 |
| Bromodichloromethane | BQL | 5 | Methyl ethyl ketone | BQL | 100 |
| Bromoform | BQL | 5 | Methyl iodide | BQL | 5 |
| Carbon disulfide | BQL | 5 | Methyl methacrylate | BQL | 30 |
| Carbon tetrachloride | BQL | 5 | 4-Methyl-2-pentanone | BQL | 50 |
| Chlorobenzene | BQL | 5 | Methylene bromide | BQL | 5 |
| Chloroethane | BQL | 10 | Methylene chloride | BQL | 5 |
| Chloroform | BQL | 5 | Naphthalene | BQL | 5 |
| Chloroprene | BQL | 20 | Propionitrile | BQL | 150 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Styrene | BQL | 5 |
| Dibromochloromethane | BQL | 5 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| 1,2-Dibromoethane | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | Tetrachloroethene | BQL | 5 |
| 1,2-Dichlorobenzene | BQL | 5 | Toluene | BQL | 5 |
| 1,3-Dichlorobenzene | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| 1,4-Dichlorobenzene | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Dichlorodifluoromethane | BQL | 5 | Trichloroethene | BQL | 5 |
| 1,1-Dichloroethane | BQL | 5 | Trichlorofluoromethane | 85 | 5 |
| 1,2-Dichloroethane | BQL | 5 | 1,2,3-Trichloropropane | BQL | 5 |
| 1,1-Dichloroethene | BQL | 5 | Vinyl acetate | BQL | 50 |
| cis-1,2-Dichloroethene | BQL | 5 | Vinyl chloride | BQL | 2 |
| trans-1,2-Dichloroethene | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dichloropropane | BQL | 5 | o-Xylene | BQL | 5 |
| 1,3-Dichloropropane | BQL | 5 | | | |
| 2,2-Dichloropropane | BQL | 15 | | | |
| 1,1-Dichloropropene | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Acid Extractables (8270C) - Appendix II

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** 238736 **Units:** µg/L **Analyst:** RB

| Analyte | Result | PQL |
|---|---|---|
| 4-Chloro-3-methylphenol | BQL | 20 |
| 2-Chlorophenol | BQL | 10 |
| m & p-Cresol | BQL | 10 |
| o-Cresol | BQL | 10 |
| 2,4-Dichlorophenol | BQL | 10 |
| 2,6-Dichlorophenol | BQL | 10 |
| 2,4-Dimethylphenol | BQL | 10 |
| 4,6-Dinitro-2-methylphenol | BQL | 50 |
| 2,4-Dinitrophenol | BQL | 50 |
| 2-Nitrophenol | BQL | 10 |
| 4-Nitrophenol | BQL | 50 |
| Pentachlorophenol | BQL | 50 |
| Phenol | BQL | 10 |
| 2,3,4,6-Tetrachlorophenol | BQL | 10 |
| 2,4,5-Trichlorophenol | BQL | 10 |
| 2,4,6-Trichlorophenol | BQL | 10 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Base Neutral Extractables (8270C) - Appendix II

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** 238736 **Units:** µg/L **Analyst:** RB

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acenaphthene | BQL | 10 | Dimethyl phthalate | BQL | 10 |
| Acenaphthylene | BQL | 10 | p-(Dimethylamino)azobenzene | BQL | 10 |
| Acetophenone | BQL | 10 | 7,12-Dimethylbenz(a)anthracene | BQL | 10 |
| 2-Acetylaminofluorene | BQL | 20 | 3,3'-Dimethylbenzidine | BQL | 10 |
| 4-Aminobiphenyl | BQL | 20 | m-Dinitrobenzene | BQL | 20 |
| Anthracene | BQL | 10 | 2,4-Dinitrotoluene | BQL | 10 |
| Benzo(a)anthracene | BQL | 10 | 2,6-Dinitrotoluene | BQL | 10 |
| Benzo(a)pyrene | BQL | 10 | Diphenylamine | BQL | 10 |
| Benzo(b)fluoranthene | BQL | 10 | Disulfoton | BQL | 10 |
| Benzo(g,h,i)perylene | BQL | 10 | Ethyl methanesulfonate | BQL | 20 |
| Benzo(k)fluoranthene | BQL | 10 | Famphur | BQL | 20 |
| Benzyl alcohol | BQL | 20 | Fluoranthene | BQL | 10 |
| Bis(2-chloroethoxy)methane | BQL | 10 | Fluorene | BQL | 10 |
| Bis(2-chloroethyl)ether | BQL | 10 | Hexachlorobenzene | BQL | 10 |
| Bis(2-chloroisopropyl)ether | BQL | 10 | Hexachlorobutadiene | BQL | 10 |
| Bis(2-ethylhexyl)phthalate | BQL | 10 | Hexachlorocyclopentadiene | BQL | 10 |
| 4-Bromophenyl phenyl ether | BQL | 10 | Hexachloroethane | BQL | 10 |
| Butyl benzyl phthalate | BQL | 10 | Hexachloropropene | BQL | 10 |
| p-Chloroaniline | BQL | 20 | Indeno(1,2,3-cd)pyrene | BQL | 10 |
| Chlorobenzilate | BQL | 10 | Isodrin | BQL | 20 |
| 2-Chloronaphthalene | BQL | 10 | Isophorone | BQL | 10 |
| 4-Chlorophenyl phenyl ether | BQL | 10 | Isosafrole | BQL | 10 |
| Chrysene | BQL | 10 | Kepone | BQL | 20 |
| Di-n-butyl phthalate | BQL | 10 | Methapyrilene | BQL | 100 |
| Di-n-octyl phthalate | BQL | 10 | Methyl methanesulfonate | BQL | 10 |
| Diallate | BQL | 10 | Methyl parathion | BQL | 10 |
| Dibenz(a,h)anthracene | BQL | 10 | 3-Methylcholanthrene | BQL | 10 |
| Dibenzofuran | BQL | 10 | 2-Methylnaphthalene | BQL | 10 |
| 1,2-Dichlorobenzene | BQL | 10 | Naphthalene | BQL | 10 |
| 1,3-Dichlorobenzene | BQL | 10 | 1,4-Naphthoquinone | BQL | 10 |
| 1,4-Dichlorobenzene | BQL | 10 | 1-Naphthylamine | BQL | 10 |
| 3,3'-Dichlorobenzidine | BQL | 20 | 2-Naphthylamine | BQL | 10 |
| Diethyl phthalate | BQL | 10 | 5-Nitro-o-toluidine | BQL | 10 |
| Dimethoate | BQL | 10 | 2-Nitroaniline | BQL | 50 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Base Neutral Extractables (8270C) - Appendix II

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** 238736 **Units:** µg/L **Analyst:** RB

| Analyte | Result | PQL |
|---|---|---|
| 3-Nitroaniline | BQL | 50 |
| 4-Nitroaniline | BQL | 20 |
| Nitrobenzene | BQL | 10 |
| N-Nitroso-di-n-butylamine | BQL | 10 |
| N-Nitrosodiethylamine | BQL | 20 |
| N-Nitrosodimethylamine | BQL | 10 |
| N-Nitrosodiphenylamine | BQL | 10 |
| N-Nitrosodipropylamine | BQL | 10 |
| N-Nitrosomethylethylamine | BQL | 10 |
| N-Nitrosopiperidine | BQL | 20 |
| N-Nitrosopyrrolidine | BQL | 40 |
| Parathion | BQL | 20 |
| Pentachlorobenzene | BQL | 10 |
| Pentachloronitrobenzene | BQL | 20 |
| Phenacetin | BQL | 20 |
| Phenanthrene | BQL | 10 |
| p-Phenylenediamine | BQL | 10 |
| Phorate | BQL | 10 |
| Pronamide | BQL | 10 |
| Pyrene | BQL | 10 |
| Safrole | BQL | 10 |
| 1,2,4,5-Tetrachlorobenzene | BQL | 10 |
| Thionazin | BQL | 20 |
| o-Toluidine | BQL | 10 |
| 1,2,4-Trichlorobenzene | BQL | 10 |
| o,o,o-Triethyl phosphorothioate | BQL | 50 |
| 1,3,5-Trinitrobenzene | BQL | 10 |

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**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Pesticides/PCBs (8081A/8082) - Appendix II

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/08/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** 238736 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| Aldrin | BQL | 0.05 |
| Arochlor-1016 | BQL | 0.50 |
| Arochlor-1221 | BQL | 0.50 |
| Arochlor-1232 | BQL | 0.50 |
| Arochlor-1242 | BQL | 0.50 |
| Arochlor-1248 | BQL | 0.50 |
| Arochlor-1254 | BQL | 0.50 |
| Arochlor-1260 | BQL | 0.50 |
| a-BHC | BQL | 0.05 |
| b-BHC | BQL | 0.05 |
| d-BHC | BQL | 0.05 |
| g-BHC | BQL | 0.05 |
| Chlordane | BQL | 0.10 |
| 4,4'-DDD | BQL | 0.05 |
| 4,4'-DDE | BQL | 0.05 |
| 4,4'-DDT | BQL | 0.05 |
| Dieldrin | BQL | 0.05 |
| Endosulfan I | BQL | 0.05 |
| Endosulfan II | BQL | 0.05 |
| Endosulfan sulfate | BQL | 0.05 |
| Endrin | BQL | 0.05 |
| Endrin aldehyde | BQL | 0.05 |
| Heptachlor | BQL | 0.05 |
| Heptachlor epoxide | BQL | 0.05 |
| Methoxychlor | BQL | 0.05 |
| Toxaphene | BQL | 2.00 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Chlorinated Herbicides (8151A) - Appendix II

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/21/2005

**ACL Sample #:** 238736 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 2,4-D | BQL | 1.0 |
| Dinoseb | BQL | 1.0 |
| 2,4,5-TP (Silvex) | BQL | 1.0 |
| 2,4,5-T | BQL | 1.0 |

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**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238736 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Appendix II Metals (6010B/7470A/7841/7041)

**Sample ID:** GWA-7/MW-7 Dup

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005

**ACL Sample #:** 238736 **Units:** mg/L **Analyst:** SW/JR

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | 0.022 | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Mercury | BQL | 0.0005 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Tin | BQL | 0.025 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.217 | 0.020 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| GWA-7/MW-7 Dup | 238736 | Cyanide (9012A) | Water | BQL | 0.020 | mg/L | 12/12/2005 |
| GWA-7/MW-7 Dup | 238736 | Sulfide (9034) | Water | BQL | 1.0 | mg/L | 12/10/2005 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWC-13/MW-13

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238737 **Units:** µg/L **Analyst:** RP

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | 5 | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | 5 | 5 |
| Chlorobenzene | 4 J | 5 | Trichlorofluoromethane | 60 | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | 1 J | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | 18 | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | 9 | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWC-13/MW-13

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238737 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWC-13/MW-13

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005

**ACL Sample #:** 238737 **Units:** mg/L **Analyst:** SW

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | 0.044 | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.194 | 0.020 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| GWC-13/MW-13 | 238737 | Mercury (7470A) | Water | BQL | 0.0005 | mg/L | 12/19/2005 |

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**Date Received:** 12/08/2005
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**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWA-15/MW-15

**Matrix:** Water
**Date Sampled:** 12/05/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238738 **Units:** µg/L **Analyst:** RP

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWA-15/MW-15

**Matrix:** Water
**Date Sampled:** 12/05/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238738 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWA-15/MW-15

**Matrix:** Water
**Date Sampled:** 12/05/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW

**ACL Sample #:** 238738 **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.042 | 0.020 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| GWA-15/MW-15 | 238738 | Mercury (7470A) | Water | BQL | 0.0005 | mg/L | 12/19/2005 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** GWC-17/MW-17

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238739 **Units:** µg/L **Analyst:** RP

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** GWC-17/MW-17

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005
**Analyst:** TM

**ACL Sample #:** 238739 **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** GWC-17/MW-17

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005

**ACL Sample #:** 238739 **Units:** mg/L **Analyst:** SW

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | 0.096 | 0.020 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| GWC-17/MW-17 | 238739 | Mercury (7470A) | Water | BQL | 0.0005 | mg/L | 12/19/2005 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** EQ-Blank

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005
**Analyst:** RP

**ACL Sample #:** 238740 **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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#154
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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** EQ-Blank

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/14/2005

**ACL Sample #:** 238740 **Units:** µg/L **Analyst:** TM

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Appendix I Metals (6010B/7841/7041)

**Sample ID:** EQ-Blank

**Matrix:** Water
**Date Sampled:** 12/06/2005
**Date Extracted:**
**Date Analyzed:** 12/13/2005

**ACL Sample #:** 238740 **Units:** mg/L **Analyst:** SW

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Vanadium | BQL | 0.050 |
| Zinc | BQL | 0.020 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

| Sample ID | ACL # | Analyte | Matrix | Result | PQL | Units | Date Analyzed |
|---|---|---|---|---|---|---|---|
| EQ-Blank | 238740 | Mercury (7470A) | Water | BQL | 0.0005 | mg/L | 12/19/2005 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix II

**Sample ID:** Trip Blank

**Matrix:** Water
**Date Sampled:** 12/05/2005
**Date Extracted:**
**Date Analyzed:** 12/14/2005
**Analyst:** RP

**ACL Sample #:** 238741 **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Ethyl methacrylate | BQL | 10 |
| Acetonitrile | BQL | 100 | Ethylbenzene | BQL | 5 |
| Acrolein | BQL | 100 | 2-Hexanone | BQL | 50 |
| Acrylonitrile | BQL | 50 | Isobutyl alcohol | BQL | 50 |
| Allyl chloride | BQL | 10 | Methacrylonitrile | BQL | 100 |
| Benzene | BQL | 5 | Methyl bromide | BQL | 10 |
| Bromochloromethane | BQL | 5 | Methyl chloride | BQL | 10 |
| Bromodichloromethane | BQL | 5 | Methyl ethyl ketone | BQL | 100 |
| Bromoform | BQL | 5 | Methyl iodide | BQL | 5 |
| Carbon disulfide | BQL | 5 | Methyl methacrylate | BQL | 30 |
| Carbon tetrachloride | BQL | 5 | 4-Methyl-2-pentanone | BQL | 50 |
| Chlorobenzene | BQL | 5 | Methylene bromide | BQL | 5 |
| Chloroethane | BQL | 10 | Methylene chloride | BQL | 5 |
| Chloroform | BQL | 5 | Naphthalene | BQL | 5 |
| Chloroprene | BQL | 20 | Propionitrile | BQL | 150 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Styrene | BQL | 5 |
| Dibromochloromethane | BQL | 5 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| 1,2-Dibromoethane | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | Tetrachloroethene | BQL | 5 |
| 1,2-Dichlorobenzene | BQL | 5 | Toluene | BQL | 5 |
| 1,3-Dichlorobenzene | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| 1,4-Dichlorobenzene | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Dichlorodifluoromethane | BQL | 5 | Trichloroethene | BQL | 5 |
| 1,1-Dichloroethane | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| 1,2-Dichloroethane | BQL | 5 | 1,2,3-Trichloropropane | BQL | 5 |
| 1,1-Dichloroethene | BQL | 5 | Vinyl acetate | BQL | 50 |
| cis-1,2-Dichloroethene | BQL | 5 | Vinyl chloride | BQL | 2 |
| trans-1,2-Dichloroethene | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dichloropropane | BQL | 5 | o-Xylene | BQL | 5 |
| 1,3-Dichloropropane | BQL | 5 | | | |
| 2,2-Dichloropropane | BQL | 15 | | | |
| 1,1-Dichloropropene | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |

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# QUALITY CONTROL SECTION

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix I
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | Dibromofluoromethane (77-137) | 1,2-Dichloroethane-d4 (72-138) | Toluene-d8 (84-112) | 4-Bromofluorobenzene (77-125) |
|---|---|---|---|---|
| **238733** | 100 | 94 | 103 | 98 |
| **238734** | 98 | 95 | 103 | 99 |
| **238737** | 101 | 95 | 102 | 101 |
| **238738** | 101 | 96 | 102 | 101 |
| **238739** | 102 | 98 | 105 | 97 |
| **238740** | 99 | 95 | 102 | 100 |

** Matrix Interference
DO=Diluted Out

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**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## V.O. (5030B/8260B) - Appendix I

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:**
**Date Analyzed:** 12/14/2005

**ACL Sample #:** Blank **Units:** µg/L **Analyst:** RP

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Styrene | BQL | 5 |
| Acrylonitrile | BQL | 50 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| Benzene | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| Bromochloromethane | BQL | 5 | Tetrachloroethene | BQL | 5 |
| Bromodichloromethane | BQL | 5 | Toluene | BQL | 5 |
| Bromoform | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| Carbon disulfide | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Carbon tetrachloride | BQL | 5 | Trichloroethene | BQL | 5 |
| Chlorobenzene | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| Chloroethane | BQL | 10 | 1,2,3-Trichloropropane | BQL | 5 |
| Chloroform | BQL | 5 | Vinyl acetate | BQL | 50 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Vinyl chloride | BQL | 2 |
| Dibromochloromethane | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dibromoethane | BQL | 5 | o-Xylene | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | | | |
| 1,2-Dichlorobenzene | BQL | 5 | | | |
| 1,4-Dichlorobenzene | BQL | 5 | | | |
| 1,1-Dichloroethane | BQL | 5 | | | |
| 1,2-Dichloroethane | BQL | 5 | | | |
| 1,1-Dichloroethene | BQL | 5 | | | |
| cis-1,2-Dichloroethene | BQL | 5 | | | |
| trans-1,2-Dichloroethene | BQL | 5 | | | |
| 1,2-Dichloropropane | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |
| Ethylbenzene | BQL | 5 | | | |
| 2-Hexanone | BQL | 50 | | | |
| Methyl bromide | BQL | 10 | | | |
| Methyl chloride | BQL | 10 | | | |
| Methyl ethyl ketone | BQL | 100 | | | |
| Methyl iodide | BQL | 5 | | | |
| 4-Methyl-2-pentanone | BQL | 50 | | | |
| Methylene bromide | BQL | 5 | | | |
| Methylene chloride | BQL | 5 | | | |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix II
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | Dibromofluoromethane (77-137) | 1,2-Dichloroethane-d4 (72-138) | Toluene-d8 (84-112) | 4-Bromofluorobenzene (77-125) |
|---|---|---|---|---|
| **238735** | 100 | 98 | 104 | 102 |
| **238736** | 103 | 95 | 104 | 99 |
| **238741** | 99 | 97 | 100 | 100 |

** Matrix Interference
DO=Diluted Out

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## V.O. (5030B/8260B) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:**
**Date Analyzed:** 12/14/2005
**Analyst:** RP

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acetone | BQL | 100 | Ethyl methacrylate | BQL | 10 |
| Acetonitrile | BQL | 100 | Ethylbenzene | BQL | 5 |
| Acrolein | BQL | 100 | 2-Hexanone | BQL | 50 |
| Acrylonitrile | BQL | 50 | Isobutyl alcohol | BQL | 50 |
| Allyl chloride | BQL | 10 | Methacrylonitrile | BQL | 100 |
| Benzene | BQL | 5 | Methyl bromide | BQL | 10 |
| Bromochloromethane | BQL | 5 | Methyl chloride | BQL | 10 |
| Bromodichloromethane | BQL | 5 | Methyl ethyl ketone | BQL | 100 |
| Bromoform | BQL | 5 | Methyl iodide | BQL | 5 |
| Carbon disulfide | BQL | 5 | Methyl methacrylate | BQL | 30 |
| Carbon tetrachloride | BQL | 5 | 4-Methyl-2-pentanone | BQL | 50 |
| Chlorobenzene | BQL | 5 | Methylene bromide | BQL | 5 |
| Chloroethane | BQL | 10 | Methylene chloride | BQL | 5 |
| Chloroform | BQL | 5 | Naphthalene | BQL | 5 |
| Chloroprene | BQL | 20 | Propionitrile | BQL | 150 |
| 1,2-Dibromo-3-chloropropane | BQL | 20 | Styrene | BQL | 5 |
| Dibromochloromethane | BQL | 5 | 1,1,1,2-Tetrachloroethane | BQL | 5 |
| 1,2-Dibromoethane | BQL | 5 | 1,1,2,2-Tetrachloroethane | BQL | 5 |
| trans-1,4-Dichloro-2-butene | BQL | 10 | Tetrachloroethene | BQL | 5 |
| 1,2-Dichlorobenzene | BQL | 5 | Toluene | BQL | 5 |
| 1,3-Dichlorobenzene | BQL | 5 | 1,1,1-Trichloroethane | BQL | 5 |
| 1,4-Dichlorobenzene | BQL | 5 | 1,1,2-Trichloroethane | BQL | 5 |
| Dichlorodifluoromethane | BQL | 5 | Trichloroethene | BQL | 5 |
| 1,1-Dichloroethane | BQL | 5 | Trichlorofluoromethane | BQL | 5 |
| 1,2-Dichloroethane | BQL | 5 | 1,2,3-Trichloropropane | BQL | 5 |
| 1,1-Dichloroethene | BQL | 5 | Vinyl acetate | BQL | 50 |
| cis-1,2-Dichloroethene | BQL | 5 | Vinyl chloride | BQL | 2 |
| trans-1,2-Dichloroethene | BQL | 5 | m & p-Xylenes | BQL | 10 |
| 1,2-Dichloropropane | BQL | 5 | o-Xylene | BQL | 5 |
| 1,3-Dichloropropane | BQL | 5 | | | |
| 2,2-Dichloropropane | BQL | 15 | | | |
| 1,1-Dichloropropene | BQL | 5 | | | |
| cis-1,3-Dichloropropene | BQL | 5 | | | |
| trans-1,3-Dichloropropene | BQL | 5 | | | |

# ADVANCED CHEMISTRY LABS, INC.

**GC/MS UNIT # 3**

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Sequence Date : 12-14-05

Matrix Spike - Sample No.: 238733-1

| COMPOUND | SPIKE ADDED (µg/L) | SAMPLE CONCENTRATION (µg/L) | MS CONCENTRATION (µg/L) | MS % REC # | QC LIMITS REC. |
|---|---|---|---|---|---|
| 1,1-dichloroethene | 20.0 | 0.0 | 17.2 | 86 | (54-144) |
| benzene | 20.0 | 0.0 | 21.1 | 106 | (82-132) |
| trichloroethene | 20.0 | 0.0 | 21.8 | 109 | (73-128) |
| toluene | 20.0 | 0.0 | 22.0 | 110 | (83-130) |
| chlorobenzene | 20.0 | 0.0 | 23.2 | 116 | (82-123) |

| COMPOUND | SPIKE ADDED (µg/L) | MSD CONCENTRATION (µg/L) | MSD % REC # | % RPD # | QC LIMITS RPD | QC LIMITS REC. |
|---|---|---|---|---|---|---|
| 1,1-dichloroethene | 20.0 | 17.0 | 85 | 1 | 14 | (54-144) |
| benzene | 20.0 | 20.6 | 103 | 3 | 14 | (82-132) |
| trichloroethene | 20.0 | 21.2 | 106 | 3 | 14 | (73-128) |
| toluene | 20.0 | 22.1 | 111 | 1 | 13 | (83-130) |
| chlorobenzene | 20.0 | 22.0 | 110 | 5 | 13 | (82-123) |

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

Comments: _____

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Marietta, GA 30068-0000

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Acid Extractables (8270C) - Appendix II
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | Phenol-d6 (8-50) | 2-Fluorophenol (8-58) | 2,4,6-Tribromophenol (10-123) |
|---|---|---|---|
| **238735** | 18 | 27 | 34 |
| **238736** | 17 | 23 | 37 |

** Matrix Interference
DO=Diluted Out

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**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Acid Extractables (8270C) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005
**Analyst:** RB

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 4-Chloro-3-methylphenol | BQL | 20 |
| 2-Chlorophenol | BQL | 10 |
| m & p-Cresol | BQL | 10 |
| o-Cresol | BQL | 10 |
| 2,4-Dichlorophenol | BQL | 10 |
| 2,6-Dichlorophenol | BQL | 10 |
| 2,4-Dimethylphenol | BQL | 10 |
| 4,6-Dinitro-2-methylphenol | BQL | 50 |
| 2,4-Dinitrophenol | BQL | 50 |
| 2-Nitrophenol | BQL | 10 |
| 4-Nitrophenol | BQL | 50 |
| Pentachlorophenol | BQL | 50 |
| Phenol | BQL | 10 |
| 2,3,4,6-Tetrachlorophenol | BQL | 10 |
| 2,4,5-Trichlorophenol | BQL | 10 |
| 2,4,6-Trichlorophenol | BQL | 10 |

# ADVANCED CHEMISTRY LABS, INC.

## SEMI-VOL GC/MS UNIT # 4

ACID EXTRACTABLES (8270C)

WATER SEMI-VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Sequence Date : 12-12-05

Matrix Spike - Sample No.: LCS121205

| COMPOUND | SPIKE ADDED (µg/L) | SAMPLE CONCENTRATION (µg/L) | MS CONCENTRATION (µg/L) | MS % REC # | QC. LIMITS REC. |
|---|---|---|---|---|---|
| Pentachlorophenol | 200 | 0 | 121 | 60.5 | (9-103) |
| Phenol | 200 | 0 | 63 | 31.5 | (12-89) |
| 2-Chlorophenol | 200 | 0 | 130 | 65.0 | (27-123) |
| 4-Chloro-3-methylphenol | 200 | 0 | 137 | 68.5 | (23-97) |
| 4-Nitrophenol | 200 | 0 | 43 | 21.5 | (10-80) |

| COMPOUND | SPIKE ADDED (µg/L) | MSD CONCENTRATION (µg/L) | MSD % REC # | % RPD # | QC LIMITS | |
|---|---|---|---|---|---|---|
| | | | | | RPD | REC. |
| Pentachlorophenol | 200 | 134 | 67.0 | 10.2 | 50 | (9-103) |
| Phenol | 200 | 61 | 30.5 | 3.2 | 42 | (12-89) |
| 2-Chlorophenol | 200 | 129 | 64.5 | 0.8 | 40 | (27-123) |
| 4-Chloro-3-methylphenol | 200 | 143 | 71.5 | 4.3 | 42 | (23-97) |
| 4-Nitrophenol | 200 | 32 | 16.0 | 29.3 | 50 | (10-80) |

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

Comments: _____

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**Client:** The Dextra Group, LLC
4665 Lower Roswell Road
#154
Marietta, GA 30068-0000

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Base Neutral Extractables (8270C) - Appendix II
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | Nitrobenzene-d5 (28-87) | 2-Fluorobiphenyl (25-106) | Terphenyl-d14 (32-135) |
|---|---|---|---|
| **238735** | 47 | 46 | 52 |
| **238736** | 54 | 52 | 46 |

** Matrix Interference
DO=Diluted Out

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**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Base Neutral Extractables (8270C) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005

**ACL Sample #:** Blank **Units:** µg/L **Analyst:** RB

| Analyte | Result | PQL | Analyte | Result | PQL |
|---|---|---|---|---|---|
| Acenaphthene | BQL | 10 | Dimethyl phthalate | BQL | 10 |
| Acenaphthylene | BQL | 10 | p-(Dimethylamino)azobenzene | BQL | 10 |
| Acetophenone | BQL | 10 | 7,12-Dimethylbenz(a)anthracene | BQL | 10 |
| 2-Acetylaminofluorene | BQL | 20 | 3,3'-Dimethylbenzidine | BQL | 10 |
| 4-Aminobiphenyl | BQL | 20 | m-Dinitrobenzene | BQL | 20 |
| Anthracene | BQL | 10 | 2,4-Dinitrotoluene | BQL | 10 |
| Benzo(a)anthracene | BQL | 10 | 2,6-Dinitrotoluene | BQL | 10 |
| Benzo(a)pyrene | BQL | 10 | Diphenylamine | BQL | 10 |
| Benzo(b)fluoranthene | BQL | 10 | Disulfoton | BQL | 10 |
| Benzo(g,h,i)perylene | BQL | 10 | Ethyl methanesulfonate | BQL | 20 |
| Benzo(k)fluoranthene | BQL | 10 | Famphur | BQL | 20 |
| Benzyl alcohol | BQL | 20 | Fluoranthene | BQL | 10 |
| Bis(2-chloroethoxy)methane | BQL | 10 | Fluorene | BQL | 10 |
| Bis(2-chloroethyl)ether | BQL | 10 | Hexachlorobenzene | BQL | 10 |
| Bis(2-chloroisopropyl)ether | BQL | 10 | Hexachlorobutadiene | BQL | 10 |
| Bis(2-ethylhexyl)phthalate | BQL | 10 | Hexachlorocyclopentadiene | BQL | 10 |
| 4-Bromophenyl phenyl ether | BQL | 10 | Hexachloroethane | BQL | 10 |
| Butyl benzyl phthalate | BQL | 10 | Hexachloropropene | BQL | 10 |
| p-Chloroaniline | BQL | 20 | Indeno(1,2,3-cd)pyrene | BQL | 10 |
| Chlorobenzilate | BQL | 10 | Isodrin | BQL | 20 |
| 2-Chloronaphthalene | BQL | 10 | Isophorone | BQL | 10 |
| 4-Chlorophenyl phenyl ether | BQL | 10 | Isosafrole | BQL | 10 |
| Chrysene | BQL | 10 | Kepone | BQL | 20 |
| Di-n-butyl phthalate | BQL | 10 | Methapyrilene | BQL | 100 |
| Di-n-octyl phthalate | BQL | 10 | Methyl methanesulfonate | BQL | 10 |
| Diallate | BQL | 10 | Methyl parathion | BQL | 10 |
| Dibenz(a,h)anthracene | BQL | 10 | 3-Methylcholanthrene | BQL | 10 |
| Dibenzofuran | BQL | 10 | 2-Methylnaphthalene | BQL | 10 |
| 1,2-Dichlorobenzene | BQL | 10 | Naphthalene | BQL | 10 |
| 1,3-Dichlorobenzene | BQL | 10 | 1,4-Naphthoquinone | BQL | 10 |
| 1,4-Dichlorobenzene | BQL | 10 | 1-Naphthylamine | BQL | 10 |
| 3,3'-Dichlorobenzidine | BQL | 20 | 2-Naphthylamine | BQL | 10 |
| Diethyl phthalate | BQL | 10 | 5-Nitro-o-toluidine | BQL | 10 |
| Dimethoate | BQL | 10 | 2-Nitroaniline | BQL | 50 |

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Base Neutral Extractables (8270C) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/12/2005
**Analyst:** RB

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 3-Nitroaniline | BQL | 50 |
| 4-Nitroaniline | BQL | 20 |
| Nitrobenzene | BQL | 10 |
| N-Nitroso-di-n-butylamine | BQL | 10 |
| N-Nitrosodiethylamine | BQL | 20 |
| N-Nitrosodimethylamine | BQL | 10 |
| N-Nitrosodiphenylamine | BQL | 10 |
| N-Nitrosodipropylamine | BQL | 10 |
| N-Nitrosomethylethylamine | BQL | 10 |
| N-Nitrosopiperidine | BQL | 20 |
| N-Nitrosopyrrolidine | BQL | 40 |
| Parathion | BQL | 20 |
| Pentachlorobenzene | BQL | 10 |
| Pentachloronitrobenzene | BQL | 20 |
| Phenacetin | BQL | 20 |
| Phenanthrene | BQL | 10 |
| p-Phenylenediamine | BQL | 10 |
| Phorate | BQL | 10 |
| Pronamide | BQL | 10 |
| Pyrene | BQL | 10 |
| Safrole | BQL | 10 |
| 1,2,4,5-Tetrachlorobenzene | BQL | 10 |
| Thionazin | BQL | 20 |
| o-Toluidine | BQL | 10 |
| 1,2,4-Trichlorobenzene | BQL | 10 |
| o,o,o-Triethyl phosphorothioate | BQL | 50 |
| 1,3,5-Trinitrobenzene | BQL | 10 |

# ADVANCED CHEMISTRY LABS, INC.

## SEMI-VOL GC/MS UNIT # 4

BASE/NEUTRAL EXTRACTABLES (8270C)

WATER SEMI-VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Sequence Date : 12-12-05

Matrix Spike - Sample No.: LCS121205

| COMPOUND | SPIKE ADDED (µg/L) | SAMPLE CONCENTRATION (µg/L) | MS CONCENTRATION (µg/L) | MS % REC # | QC. LIMITS REC. |
|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | 100 | 0 | 72 | 72.0 | (39-98) |
| Acenaphthene | 100 | 0 | 75 | 75.0 | (46-118) |
| 2,4-Dinitrotoluene | 100 | 0 | 88 | 88.0 | (24-96) |
| Di-n-butyl phthalate | 100 | 0 | 53 | 53.0 | (11-117) |
| Pyrene | 100 | 0 | 61 | 61.0 | (26-127) |
| N-Nitrosodi-n-propylamine | 100 | 0 | 63 | 63.0 | (41-116) |
| 1,4-Dichlorobenzene | 100 | 0 | 58 | 58.0 | (36-97) |

| COMPOUND | SPIKE ADDED µg/L | MSD CONCENTRATION µg/L | MSD % REC # | % RPD # | QC LIMITS RPD | QC LIMITS REC. |
|---|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | 100 | 73 | 73.0 | 1.4 | 28 | (39-98) |
| Acenaphthene | 100 | 61 | 61.0 | 20.6 | 31 | (46-118) |
| 2,4-Dinitrotoluene | 100 | 72 | 72.0 | 20.0 | 38 | (24-96) |
| Di-n-butyl phthalate | 100 | 62 | 62.0 | 15.7 | 40 | (11-117) |
| Pyrene | 100 | 57 | 57.0 | 6.8 | 31 | (26-127) |
| N-Nitrosodi-n-propylamine | 100 | 61 | 61.0 | 3.2 | 38 | (41-116) |
| 1,4-Dichlorobenzene | 100 | 57 | 57.0 | 1.7 | 28 | (36-97) |

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 7 outside limits
Spike Recovery: 0 out of 14 outside limits

Comments: _____

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Pesticides/PCBs (8081A/8082) - Appendix II
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | TCMX (30-130) | DCBP (30-130) |
|---|---|---|
| **238735** | 100 | 47 |
| **238736** | 97 | 43 |

** Matrix Interference
DO=Diluted Out

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**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Pesticides/PCBs (8081A/8082) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:** 12/08/2005
**Date Analyzed:** 12/12/2005
**Analyst:** TM

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| Aldrin | BQL | 0.05 |
| Arochlor-1016 | BQL | 0.50 |
| Arochlor-1221 | BQL | 0.50 |
| Arochlor-1232 | BQL | 0.50 |
| Arochlor-1242 | BQL | 0.50 |
| Arochlor-1248 | BQL | 0.50 |
| Arochlor-1254 | BQL | 0.50 |
| Arochlor-1260 | BQL | 0.50 |
| a-BHC | BQL | 0.05 |
| b-BHC | BQL | 0.05 |
| d-BHC | BQL | 0.05 |
| g-BHC | BQL | 0.05 |
| Chlordane | BQL | 0.10 |
| 4,4'-DDD | BQL | 0.05 |
| 4,4'-DDE | BQL | 0.05 |
| 4,4'-DDT | BQL | 0.05 |
| Dieldrin | BQL | 0.05 |
| Endosulfan I | BQL | 0.05 |
| Endosulfan II | BQL | 0.05 |
| Endosulfan sulfate | BQL | 0.05 |
| Endrin | BQL | 0.05 |
| Endrin aldehyde | BQL | 0.05 |
| Heptachlor | BQL | 0.05 |
| Heptachlor epoxide | BQL | 0.05 |
| Methoxychlor | BQL | 0.05 |
| Toxaphene | BQL | 2.00 |

# Advanced Chemistry Labs

## Pesticides Spike/Spike Dup. Report (SW-846 Method 8081A)

*Instrument ID:* *HP5890A-ECDGC#1*
*Column:* *STx-CLP, 30m, 0.53mm, 0.5µm*
*ACL #:* LCSW120805
*Matrix:* WATER
*Extraction Date:* 12/8/05
*Analysis Date:* 12/12/05
*Initial Volume:* 1000.0 *ml*
*Final Volume:* 1
*Dilution Factor:* 1
*Unit:* *µg/L or ppb*

| Pesticide | R.T. MS | Spike Added | Sample Result | MS Conc. | MS Rec. (%) | R.T. MSD | MSD Conc. | MSD Rec. (%) | RPD (%) | QC Limits RPD | QC Limits % Recovery | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a-BHC | 5.503 | 0.500 | 0.000 | 0.560 | 112 | 5.507 | 0.554 | 111 | 1 | 25 | 40 | 160 |
| g-BHC (Lindane) | 6.156 | 0.500 | 0.000 | 0.540 | 108 | 6.160 | 0.530 | 106 | 2 | 25 | 40 | 160 |
| b-BHC | 6.346 | 0.500 | 0.000 | 0.511 | 102 | 6.350 | 0.505 | 101 | 1 | 25 | 40 | 160* |
| d-BHC | 6.762 | 0.500 | 0.000 | 0.546 | 109 | 6.766 | 0.537 | 107 | 2 | 25 | 40 | 160 |
| Heptachlor | 7.246 | 0.500 | 0.000 | 0.549 | 110 | 7.249 | 0.541 | 108 | 2 | 25 | 40 | 160 |
| Aldrin | 7.999 | 0.500 | 0.000 | 0.547 | 109 | 8.003 | 0.524 | 105 | 4 | 25 | 40 | 160 |
| Heptachlor Epoxide | 9.648 | 0.500 | 0.000 | 0.560 | 112 | 9.651 | 0.549 | 110 | 2 | 25 | 40 | 160 |
| DDE | 10.645 | 0.500 | 0.000 | 0.552 | 110 | 10.648 | 0.536 | 107 | 3 | 25 | 40 | 160 |
| a-Endosulfan I | 10.787 | 0.500 | 0.000 | 0.549 | 110 | 10.790 | 0.543 | 109 | 1 | 25 | 40 | 160 |
| Dieldrin | 11.513 | 0.500 | 0.000 | 0.613 | 123 | 11.515 | 0.575 | 115 | 6 | 25 | 40 | 160 |
| Endrin | 12.221 | 0.500 | 0.000 | 0.612 | 122 | 12.223 | 0.597 | 119 | 3 | 25 | 40 | 160 |
| DDD | 12.500 | 0.500 | 0.000 | 0.609 | 122 | 12.502 | 0.593 | 119 | 3 | 25 | 40 | 160 |
| b-Endosulfan II | 12.939 | 0.500 | 0.000 | 0.562 | 112 | 12.941 | 0.547 | 109 | 3 | 25 | 40 | 160 |
| DDT | 13.391 | 0.500 | 0.000 | 0.481 | 96 | 13.393 | 0.467 | 93 | 3 | 25 | 40 | 160 |
| Endrin Aldehyde | 14.314 | 0.500 | 0.000 | 0.518 | 104 | 14.315 | 0.502 | 100 | 3 | 25 | 40 | 160 |
| Methoxychlor | 15.053 | 0.500 | 0.000 | 0.584 | 117 | 15.054 | 0.574 | 115 | 2 | 25 | 40 | 160 |
| Mirex | 15.314 | 0.500 | 0.000 | 0.464 | 93 | 15.315 | 0.455 | 91 | 2 | 25 | 40 | 160 |
| Endosulfan Sulfate | 15.749 | 0.500 | 0.000 | 0.530 | 106 | 15.749 | 0.506 | 101 | 5 | 25 | 40 | 160 |
| Endrin Ketone | 16.633 | 0.500 | 0.000 | 0.521 | 104 | 16.633 | 0.512 | 102 | 2 | 25 | 40 | 160 |

*Pesticide Calculation based on curve prep. on* *11/21/05*

** Outside QC limits*

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Chlorinated Herbicides (8151A) - Appendix II
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | DCAA (30-130) |
|---|---|
| **238735** | 93 |
| **238736** | 106 |

** Matrix Interference
DO=Diluted Out

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**Contact:** Mr. Kurt Batsel

**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

## Chlorinated Herbicides (8151A) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:** 12/12/2005
**Date Analyzed:** 12/21/2005
**Analyst:** TM

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 2,4-D | BQL | 1.0 |
| Dinoseb | BQL | 1.0 |
| 2,4,5-TP (Silvex) | BQL | 1.0 |
| 2,4,5-T | BQL | 1.0 |

# Advanced Chemistry Labs

## Herbicides Spike Report (SW-846 Method 8151A)

*Instrument ID:* *HP5890A-ECDGC#5*
*Column:* *STx-CLP, 30m, 0.53mm, 0.5µm*

*ACL #:* LCSW121205
*Matrix:* WATER
*Extraction Date:* 12/12/05
*Analysis Date:* 12/12/05
*Initial Volume:* 1000.0 *ml*
*Final Volume:* 4
*Dilution Factor:* 1
*Unit:* *µg/L or ppb*

| Herbicide | R.T. MS | Spike Added | Sample Result | MS Conc. | MS Rec. (%) | R.T. MSD | MSD Conc. | MSD Rec. (%) | RPD (%) | Q RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| Dalapon | 6.819 | 4.000 | 0.000 | 3.832 | **96** | 6.819 | 3.744 | **94** | **2** | 25 |
| 4-Nitrophenol | 19.420 | 4.000 | 0.000 | 4.383 | **110** | 19.423 | 4.185 | **105** | **5** | 25 |
| Dicamba | 21.479 | 0.800 | 0.000 | 0.670 | **84** | 21.481 | 0.610 | **76** | **9** | 25 |
| MCPP | 0.000 | | 0.000 | | | 0.000 | | | | 25 |
| MCPA | 22.253 | 400.000 | 0.000 | 410.812 | **103** | 22.254 | 384.680 | **96** | **7** | 25 |
| Dichlorprop | 22.880 | 4.000 | 0.000 | 3.297 | **82** | 22.882 | 3.287 | **82** | **0** | 25 |
| 2,4-D | 23.612 | 4.000 | 0.000 | 3.600 | **90** | 23.614 | 3.474 | **87** | **4** | 25 |
| Pentachlorophenol | 23.841 | 0.400 | 0.000 | 0.412 | **103** | 23.843 | 0.395 | **99** | **4** | 25 |
| Silvex(2,4,5-TP) | 24.383 | 0.800 | 0.000 | 0.775 | **97** | 24.385 | 0.757 | **95** | **2** | 25 |
| 2,4,5-T | 24.808 | 0.800 | 0.000 | 1.048 | **131** | 24.809 | 1.027 | **128** | **2** | 25 |
| Dinoseb | 25.484 | 0.800 | 0.000 | 1.203 | **150** | 25.485 | 1.170 | **146** | **3** | 25 |
| 2,4-DB | 26.082 | 4.000 | 0.000 | 3.802 | **95** | 26.083 | 3.618 | **90** | **5** | 25 |
| Picloram | 28.017 | 0.400 | 0.000 | 0.257 | **64** | 28.019 | 0.242 | **61** | **6** | 25 |
| Acifluorfen | 29.496 | 0.400 | 0.000 | 0.247 | **62** | 29.498 | 0.240 | **60** | **3** | 25 |

*Herbicide Calculation based on curve prep. on* *08/26/05*

** Outside QC limits*

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Miscellaneous Organics (8011) - Appendix II
## SURROGATE PERCENT RECOVERY SUMMARY
## Water

| ACL Sample # | Bromofluorobenzene (40-140) |
|---|---|
| 238733 | 89 |
| 238734 | 99 |
| 238735 | 96 |
| 238736 | 94 |
| 238737 | 68 |
| 238738 | 65 |
| 238739 | 96 |
| 238740 | 97 |

** Matrix Interference
DO=Diluted Out

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**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Miscellaneous Organics (8011) - Appendix II

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:** 12/13/2005
**Date Analyzed:** 12/13/2005
**Analyst:** TM

**ACL Sample #:** Blank **Units:** µg/L

| Analyte | Result | PQL |
|---|---|---|
| 1,2-Dibromo-3-chloropropane | BQL | 0.20 |
| 1,2-Dibromoethane | BQL | 0.05 |

# Advanced Chemistry Labs

## Pesticides Spike Report (SW-846 Method 8011/Method 504.1)

*Instrument ID:* *HP5890A-ECDGC#5*
*Column:* *STx-CLP, 30m, 0.53mm, 0.5µm*

*ACL #:* LCSW121305
*Matrix:* Water
*Extraction Date:* 12/13/05
*Analysis Date:* 12/13/05
*Initial Volume:* 35.0 *ml*
*Final Volume:* 2
*Dilution Factor:* 1
*Unit:* *µg/L or ppb*

| Pesticide | R.T. MS | Spike Added | Sample Result | MS Conc. | MS Rec. (%) | R.T. MSD | MSD Conc. | MSD Rec. (%) | RPD (%) | QC Limits RPD | QC Limits % Recovery | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EDB | 6.091 | 0.500 | 0.000 | 0.442 | ***88*** | 6.089 | 0.443 | ***89*** | ***0*** | 25 | 60 | 140 |
| TCP | 8.770 | 0.500 | 0.000 | 0.500 | ***100*** | 8.767 | 0.482 | ***96*** | ***4*** | 25 | 60 | 140 |
| DBCP | 12.104 | 0.500 | 0.000 | 0.421 | ***84*** | 12.108 | 0.386 | ***77*** | ***9*** | 25 | 60 | 140 |

*Outside QC limits*

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**Client Proj #:** Vogtle LF #3
**ACL Project #:** 49407
**Date Received:** 12/08/2005
**Date Reported:** 12/29/2005

**Contact:** Mr. Kurt Batsel

## Appendix II Metals (6010B/7470A/7841/7041)

**Sample ID:** ----------

**Matrix:** Water
**Date Sampled:** ----------
**Date Extracted:**
**Date Analyzed:** 12/13/2005
**Analyst:** SW/JR

**ACL Sample #:** Blank **Units:** mg/L

| Analyte | Result | PQL |
|---|---|---|
| Antimony | BQL | 0.006 |
| Arsenic | BQL | 0.010 |
| Barium | BQL | 0.020 |
| Beryllium | BQL | 0.004 |
| Cadmium | BQL | 0.005 |
| Chromium | BQL | 0.020 |
| Cobalt | BQL | 0.050 |
| Copper | BQL | 0.020 |
| Lead | BQL | 0.010 |
| Mercury | BQL | 0.0005 |
| Nickel | BQL | 0.020 |
| Selenium | BQL | 0.040 |
| Silver | BQL | 0.010 |
| Thallium | BQL | 0.002 |
| Tin | BQL | 0.025 |
| Vanadium | BQL | 0.050 |
| Zinc | BQL | 0.020 |

# ADVANCED CHEMISTRY LABS, INC.

**Appendix II Metals (6010B/7470A/7841/7041)**
Water Matrix Spike/Spike Duplicate Recoveries

Instrument : TJA 61E Trace ICAP
Date Digested : 12-12-05
Date Analyzed : 12-13-05
ACL Sample No.: LCS/LCSD 121205

| ANALYTE | SPIKE Added (mg/L) | SAMPLE Result (mg/L) | MS Conc. (mg/L) | MS Rec. (%) | MSD Conc. (mg/L) | MSD Rec. (%) | RPD | QC Limits RPD | QC Limits % Recovery | |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony (7041) | 0.040 | 0.000 | 0.035 | 89 | 0.036 | 89 | 0 | 20 | 70 | 130 |
| Arsenic | 0.200 | 0.000 | 0.195 | 97 | 0.195 | 97 | 0 | 20 | 75 | 125 |
| Barium | 1.000 | 0.000 | 0.992 | 99 | 0.978 | 98 | 1 | 20 | 75 | 125 |
| Beryllium | 0.200 | 0.000 | 0.204 | 102 | 0.201 | 101 | 1 | 20 | 75 | 125 |
| Cadmium | 0.050 | 0.000 | 0.051 | 102 | 0.051 | 101 | 1 | 20 | 75 | 125 |
| Chromium | 0.200 | 0.000 | 0.206 | 103 | 0.204 | 102 | 1 | 20 | 75 | 125 |
| Cobalt | 0.200 | 0.000 | 0.206 | 103 | 0.203 | 102 | 1 | 20 | 75 | 125 |
| Copper | 0.200 | 0.000 | 0.205 | 102 | 0.201 | 101 | 2 | 20 | 75 | 125 |
| Lead | 0.200 | 0.000 | 0.207 | 104 | 0.205 | 102 | 1 | 20 | 75 | 125 |
| Mercury (7470A) | 0.0020 | 0.0000 | 0.0021 | 106 | 0.0022 | 109 | 3 | 20 | 70 | 130 |
| Nickel | 0.200 | 0.000 | 0.205 | 103 | 0.203 | 101 | 1 | 20 | 75 | 125 |
| Selenium | 0.050 | 0.000 | 0.050 | 100 | 0.048 | 97 | 4 | 20 | 75 | 125 |
| Silver | 0.020 | 0.000 | 0.023 | 113 | 0.022 | 111 | 1 | 20 | 75 | 125 |
| Tin | 2.000 | 0.000 | 2.039 | 102 | 2.019 | 101 | 1 | 20 | 75 | 125 |
| Thallium (7841) | 0.040 | 0.000 | 0.044 | 110 | 0.044 | 110 | 0 | 20 | 70 | 130 |
| Vanadium | 0.500 | 0.000 | 0.511 | 102 | 0.506 | 101 | 1 | 20 | 75 | 125 |
| Zinc | 0.200 | 0.000 | 0.212 | 106 | 0.210 | 105 | 1 | 20 | 75 | 125 |

* Outside QC Limits

Comment :

**ACL**

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3039 Amwiler Road • Suite 100 • Atlanta, GA 30360 ■ P. O. Box 88610 • Atlanta, GA 30356 ■ (770) 409-1444 • Fax (770) 409-1844

## CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

Company Name: The Dextra Group
Phone #: (770) 578-9696
Fax #: (770) 521-5345
Company Address: 4665 Lower Roswell Rd. Suite 154 Marietta, GA 30068
Site Location:
Project Manager: Mr. Kurt Batsel
Client Project: (#)
(Name) Vogtle LF #3
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): Tiffany Messier Josh Threadgill

ANALYSIS REQUEST

| Field Sample ID | # Container | Matrix: Water | Soil | Air | Sludge | Product | Other | Method Preserved: HCl | $HNO_3$ | $H_2SO_4$ | Ice | None | Other | Sampling: Date | Time | App I VOC | App I Metals | Hg | EDB/DBCP | | Complete App II | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWC-5/MW-5 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 11:30 | X | X | X | X | | | | | | | | | | |
| GWB-6/MW-6 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/5/05 | 14:30 | X | X | X | X | | | | | | | | | | |
| GWA-7/MW-7 | 12 | X | | | | | | 2 | 1 | | X | 7 | 2 | 12/6/05 | 11:30 | | | | | | X | | | | | | | | |
| GWA-7/MW-7 Dup | 12 | X | | | | | | 2 | 1 | | X | 7 | 2 | 12/6/05 | 12:10 | | | | | | X | | | | | | | | |
| GWC-13/MW-13 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 09:45 | X | X | X | X | | | | | | | | | | |
| ~~GWC-14/MW-14~~ | ~~5~~ | ~~X~~ | | | | | | ~~2~~ | ~~1~~ | | ~~X~~ | ~~2~~ | | | | ~~X~~ | ~~X~~ | ~~X~~ | ~~X~~ | | | | | | | | | | DRY WELL |
| GWA-15/MW-15 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/5/05 | 13:30 | X | X | X | X | | | | | | | | | | |
| ~~GWB-16/MW-16~~ | ~~5~~ | ~~X~~ | | | | | | ~~2~~ | ~~1~~ | | ~~X~~ | ~~2~~ | | ~~12/6/05~~ | ~~16:30~~ | ~~X~~ | ~~X~~ | ~~X~~ | ~~X~~ | | | | | | | | | | DRY WELL |
| GWC-17/MW-17 | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 16:30 | X | X | X | X | | | | | | | | | | |
| ~~GWC-18/MW-18~~ | ~~5~~ | ~~X~~ | | | | | | ~~2~~ | ~~1~~ | | ~~X~~ | ~~2~~ | | | | ~~X~~ | ~~X~~ | ~~X~~ | ~~X~~ | | | | | | | | | | DRY WELL |

Special Detection Limits

Remarks:

TAT: Priority (24 hr) ☐ Rush (48 hr) ☐ Rush (72 hr) ☐ Normal ☒

Special Handling: ACL Contact ____ Quote # ____ P. O. ____

Special Reporting Requirements: Fax ☐

Lab Use Only: ACL Project #: 419407

Cooler Temp.: 2.9 °C

QA/QC Level: Level 1 ☐ Level 2 ☒ Other ☐

**CUSTODY RECORD**

| | | | |
|---|---|---|---|
| Relinquished by Sampler: Tiffany Messier | Date 12/8/05 | Time 10:50 | Received by: |
| Relinquished by: | Date | Time | Received by: |
| Relinquished by: | Date 12/8/05 | Time 10:50 | Received by Laboratory: Waybill # L. Bartholomew |

**ACL**

# ADVANCED CHEMISTRY LABS, INC.

3039 Amwiler Road • Suite 100 • Atlanta, GA 30360 ■ P. O. Box 88610 • Atlanta, GA 30356 ■ (770) 409-1444 • Fax (770) 409-1844

## CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

Company Name: The Dextra Group
Phone #: (770) 578-9696
Fax #: (770) 521-5345
Company Address: 4665 Lower Roswell Rd. Suite 154 Marietta, GA 30068
Site Location:
Project Manager: Mr. Kurt Batsel
Client Project: (#)
(Name) Voqtle LF #3
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): Tiffany Messier Josh Thoendgill

ANALYSIS REQUEST

| Field Sample ID | # Container | Matrix: Water | Soil | Air | Sludge | Product | Other | Method Preserved: HCl | $HNO_3$ | $H_2SO_4$ | Ice | None | Other | Sampling: Date | Time | App I VOC | App I Metals | Hg | EDB/DBCP | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EQ-Blank | 5 | X | | | | | | 2 | 1 | | X | 2 | | 12/6/05 | 16:00 | X | X | X | X | |
| SWC-1 | 5 | X | | | | | | 2 | 1 | | X | 2 | | | | X | X | | X | DRY |
| SWC-2 | 5 | X | | | | | | 2 | 1 | | X | 2 | | | | X | X | | X | DRY |

Special Detection Limits

Remarks:

TAT: Priority (24 hr) ☐ Rush (48 hr) ☐ Rush (72 hr) ☐ Normal ☒

Special Handling: ACL Contact ___ Quote # ___ P. O. ___

Special Reporting Requirements: Fax ☐

Lab Use Only: ACL Project #: 49407

Cooler Temp.: 2.9 °C

QA/QC Level: Level 1 ☐ Level 2 ☒ Other ☐

**CUSTODY RECORD**

| | Date | Time | |
|---|---|---|---|
| Relinquished by Sampler: Tiffany Messier | 12/6/05 | 10:50 | Received by: |
| Relinquished by: | Date | Time | Received by: |
| Relinquished by: | 12/8/05 | 10:50 | Received by Laboratory: C. Barkholmew Waybill # |

# APPENDIX C – STATISTICAL ANALYSES

# Concentrations (mg/L)

## Parameter: Barium

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 36
Percent Non-Detects: 61.0169%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 ~ | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | ND<0.005 | ND<0.01 |
| | | | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 | ND<0.01 | ND<0.02 |
| | | | 6/14/2005 | ND<0.01 | ND<0.02 |
| | | | 12/5/2005 | ND<0.01 | ND<0.02 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 7 (70%) | 7/30/2002 ~ | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | 0.015 | 0.015 |
| | | | 6/24/2003 | 0.036 | 0.036 |
| | | | 12/17/2003 | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 ~ | ND<0.01 | ND<0.02 |
| | | | 6/14/2005 | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 ~ | 0.023 | 0.023 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | ND<0.005 | ND<0.01 |
| | | | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 | ND<0.01 | ND<0.02 |
| | | | 6/13/2005 | ND<0.01 | ND<0.02 |
| | | | 12/5/2005 | ND<0.01 | ND<0.02 |
| GWC-13/MW-13 | 10 | 0 (0%) | 7/30/2002 | 0.077 | 0.077 |
| | | | 9/24/2002 | 0.085 | 0.085 |
| | | | 10/21/2002 | 0.083 | 0.083 |
| | | | 12/3/2002 | 0.082 | 0.082 |
| | | | 6/24/2003 ~ | 0.0295 | 0.0295 |
| | | | 12/17/2003 ~ | 0.0325 | 0.0325 |
| | | | 6/15/2004 ~ | 0.034 | 0.034 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | 0.043 | 0.043 |
| | | | 6/13/2005 ~ | 0.03 | 0.03 |
| | | | 12/6/2005 | 0.044 | 0.044 |
| GWC-14/MW-146 | | 0 (0%) | 7/30/2002 | 0.068 | 0.068 |
| | | | 9/24/2002 ~ | 0.0935 | 0.0935 |
| | | | 10/21/2002 | 0.064 | 0.064 |
| | | | 12/3/2002 | 0.106 | 0.106 |
| | | | 6/24/2003 | 0.051 | 0.051 |
| | | | 12/17/2003 | 0.189 | 0.189 |
| GWC-5/MW-5 | 10 | 6 (60%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | 0.02 | 0.02 |
| | | | 10/21/2002 | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | 0.018 | 0.018 |
| | | | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | 0.142 | 0.142 |
| | | | 6/15/2004 | 0.04 | 0.04 |
| | | | 12/28/2004 | ND<0.01 | ND<0.02 |
| | | | 6/13/2005 | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 | ND<0.01 | ND<0.02 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 | ND<0.01 | ND<0.02 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<0.01 | ND<0.02 |

There is 1 unused well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 ~ | ND<0.01 | ND<0.02 |
| | | | 6/15/2005 ~ | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 | ND<0.01 | ND<0.02 |

# Shapiro-Francia Test of Normality

## Parameter: Barium

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0.005 | -2.14441 | 4.59848 | -0.010722 |
| 2 | 0.005 | -1.83843 | 7.97829 | -0.0199142 |
| 3 | 0.01 | -1.64485 | 10.6838 | -0.0363627 |
| 4 | 0.01 | -1.50626 | 12.9526 | -0.0514253 |
| 5 | 0.01 | -1.38517 | 14.8713 | -0.065277 |
| 6 | 0.01 | -1.28155 | 16.5137 | -0.0780925 |
| 7 | 0.01 | -1.19522 | 17.9423 | -0.0900447 |
| 8 | 0.01 | -1.11232 | 19.1795 | -0.101168 |
| 9 | 0.01 | -1.03643 | 20.2537 | -0.111532 |
| 10 | 0.01 | -0.970094 | 21.1948 | -0.121233 |
| 11 | 0.01 | -0.903992 | 22.012 | -0.130273 |
| 12 | 0.01 | -0.841621 | 22.7203 | -0.138689 |
| 13 | 0.01 | -0.785774 | 23.3378 | -0.146547 |
| 14 | 0.01 | -0.729003 | 23.8692 | -0.153837 |
| 15 | 0.01 | -0.67449 | 24.3242 | -0.160582 |
| 16 | 0.01 | -0.624956 | 24.7147 | -0.166832 |
| 17 | 0.01 | -0.573953 | 25.0442 | -0.172571 |
| 18 | 0.01 | -0.524401 | 25.3191 | -0.177815 |
| 19 | 0.01 | -0.478914 | 25.5485 | -0.182604 |
| 20 | 0.01 | -0.431644 | 25.7348 | -0.186921 |
| 21 | 0.01 | -0.385321 | 25.8833 | -0.190774 |
| 22 | 0.01 | -0.342466 | 26.0006 | -0.194199 |
| 23 | 0.01 | -0.297612 | 26.0892 | -0.197175 |
| 24 | 0.01 | -0.253347 | 26.1533 | -0.199708 |
| 25 | 0.01 | -0.212137 | 26.1983 | -0.20183 |
| 26 | 0.01 | -0.168741 | 26.2268 | -0.203517 |
| 27 | 0.01 | -0.125661 | 26.2426 | -0.204774 |
| 28 | 0.01 | -0.0853288 | 26.2499 | -0.205627 |
| 29 | 0.01 | -0.0426257 | 26.2517 | -0.206053 |
| 30 | 0.01 | 0 | 26.2517 | -0.206053 |
| 31 | 0.01 | 0.0426257 | 26.2535 | -0.205627 |
| 32 | 0.01 | 0.0853288 | 26.2608 | -0.204774 |
| 33 | 0.01 | 0.125661 | 26.2766 | -0.203517 |
| 34 | 0.01 | 0.168741 | 26.3051 | -0.20183 |
| 35 | 0.01 | 0.212137 | 26.3501 | -0.199708 |
| 36 | 0.01 | 0.253347 | 26.4142 | -0.197175 |
| 37 | 0.015 | 0.297612 | 26.5028 | -0.192711 |
| 38 | 0.018 | 0.342466 | 26.6201 | -0.186546 |
| 39 | 0.02 | 0.385321 | 26.7686 | -0.17884 |
| 40 | 0.023 | 0.431644 | 26.9549 | -0.168912 |
| 41 | 0.0295 | 0.478914 | 27.1843 | -0.154784 |
| 42 | 0.03 | 0.524401 | 27.4592 | -0.139052 |
| 43 | 0.0325 | 0.573953 | 27.7887 | -0.120398 |
| 44 | 0.034 | 0.624956 | 28.1792 | -0.0991499 |
| 45 | 0.036 | 0.67449 | 28.6342 | -0.0748683 |
| 46 | 0.04 | 0.729003 | 29.1656 | -0.0457082 |

| | | | | |
|---|---|---|---|---|
| 47 | 0.043 | 0.785774 | 29.7831 | -0.0119199 |
| 48 | 0.044 | 0.841621 | 30.4914 | 0.0251115 |
| 49 | 0.051 | 0.903992 | 31.3086 | 0.0712151 |
| 50 | 0.064 | 0.970094 | 32.2497 | 0.133301 |
| 51 | 0.068 | 1.03643 | 33.3239 | 0.203779 |
| 52 | 0.077 | 1.11232 | 34.5611 | 0.289427 |
| 53 | 0.082 | 1.19522 | 35.9897 | 0.387435 |
| 54 | 0.083 | 1.28155 | 37.6321 | 0.493804 |
| 55 | 0.085 | 1.38517 | 39.5508 | 0.611544 |
| 56 | 0.0935 | 1.50626 | 41.8196 | 0.752379 |
| 57 | 0.106 | 1.64485 | 44.5251 | 0.926733 |
| 58 | 0.142 | 1.83843 | 47.9049 | 1.18779 |

Sample Standard Deviation = 0.0365091
Numerator = 1.41084
Denominator = 3.70349 = 58 47.9049
W Statistic = 0.38095
5% Critical value of 0.962 exceeds 0.38095
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.38095
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Barium

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<0.01 | 18.5 |
| | 9/24/2002 | ND<0.01 | 18.5 |
| | 10/21/2002 ~ | ND<0.01 | 18.5 |
| | 12/3/2002 | ND<0.005 | 18.5 |
| | 6/24/2003 | ND<0.01 | 18.5 |
| | 12/17/2003 | ND<0.01 | 18.5 |
| | 6/15/2004 | ND<0.01 | 18.5 |
| | 12/28/2004 | ND<0.01 | 18.5 |
| | 6/14/2005 | ND<0.01 | 18.5 |
| | 12/5/2005 | ND<0.01 | 18.5 |

Rank Sum = 185
Rank Mean = 18.5

Background Rank Sum = 185
Background Rank Mean = 18.5

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | ND<0.01 | 18.5 |
| | 9/24/2002 | ND<0.01 | 18.5 |
| | 10/21/2002 | ND<0.01 | 18.5 |
| | 12/3/2002 | 0.015 | 37 |
| | 6/24/2003 | 0.036 | 45 |
| | 12/17/2003 | ND<0.01 | 18.5 |
| | 6/15/2004 | ND<0.01 | 18.5 |
| | 12/28/2004 ~ | ND<0.01 | 18.5 |
| | 6/14/2005 | ND<0.01 | 18.5 |
| | 12/6/2005 ~ | 0.023 | 40 |

Rank Sum = 251.5
Rank Mean = 25.15

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<0.01 | 18.5 |
| | 9/24/2002 | ND<0.01 | 18.5 |
| | 10/21/2002 | ND<0.01 | 18.5 |
| | 12/3/2002 | ND<0.005 | 18.5 |
| | 6/24/2003 | ND<0.01 | 18.5 |
| | 12/17/2003 | ND<0.01 | 18.5 |
| | 6/15/2004 | ND<0.01 | 18.5 |
| | 12/28/2004 | ND<0.01 | 18.5 |
| | 6/13/2005 | ND<0.01 | 18.5 |
| | 12/5/2005 | ND<0.01 | 18.5 |

Rank Sum = 185
Rank Mean = 18.5

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | 0.077 | 52 |
| | 9/24/2002 | 0.085 | 55 |
| | 10/21/2002 | 0.083 | 54 |
| | 12/3/2002 | 0.082 | 53 |
| | 6/24/2003 ~ | 0.0295 | 41 |
| | 12/17/2003 ~ | 0.0325 | 43 |
| | 6/15/2004 ~ | 0.034 | 44 |
| | 12/28/2004 | 0.043 | 47 |
| | 6/13/2005 ~ | 0.03 | 42 |
| | 12/6/2005 | 0.044 | 48 |

Rank Sum = 479
Rank Mean = 47.9

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | 0.068 | 51 |
| | 9/24/2002 ~ | 0.0935 | 56 |
| | 10/21/2002 | 0.064 | 50 |
| | 12/3/2002 | 0.106 | 57 |
| | 6/24/2003 | 0.051 | 49 |
| | 12/17/2003 | 0.189 | 59 |

Rank Sum = 322
Rank Mean = 53.6667

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<0.01 | 18.5 |
| | 9/24/2002 | 0.02 | 39 |
| | 10/21/2002 | ND<0.01 | 18.5 |
| | 12/3/2002 | 0.018 | 38 |
| | 6/24/2003 | ND<0.01 | 18.5 |
| | 12/17/2003 | 0.142 | 58 |
| | 6/15/2004 | 0.04 | 46 |
| | 12/28/2004 | ND<0.01 | 18.5 |
| | 6/13/2005 | ND<0.01 | 18.5 |
| | 12/6/2005 | ND<0.01 | 18.5 |

Rank Sum = 292
Rank Mean = 29.2

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<0.01 | 18.5 |
| | 12/6/2005 | ND<0.01 | 18.5 |

Rank Sum = 37
Rank Mean = 18.5

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<0.01 | 18.5 |

Rank Sum = 18.5
Rank Mean = 18.5

## Calculation Results:

Kruskal-Wallis H Statistic = 33.3835
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 43.1903
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
33.3835 > 14.0671 indicating a significant group difference at 5% significance level
43.1903 > 14.0671 indicating a significant group difference at 5% significance level when adjusted for ties

## Individual Well Comparisons at 1% Significance Level per Comparison

1% Z score is 2.32634
Mean background rank is 18.5

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| GWA-7/MW-7 | 25.15 | 6.65 | 17.869 |
| GWB-6/MW-6 | 18.5 | 0 | 17.869 |
| GWC-13/MW-13 | 47.9 | 29.4 | 17.869 |
| GWC-14/MW-14 | 53.6667 | 35.1667 | 20.6333 |
| GWC-5/MW-5 | 29.2 | 10.7 | 17.869 |
| GWC-17/MW-17 | 18.5 | 0 | 30.95 |
| GWC-18/MW-18 | 18.5 | 0 | 41.9065 |

## Individual Well Comparisons at Groupwise 5% Significance Level (0.714286% Significance Level per comparison)

0.714286% Z score is 2.45727

Mean background rank is 18.5

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|
| GWA-7/MW-7 | 25.15 | 6.65 | 18.8747 |
| GWB-6/MW-6 | 18.5 | 0 | 18.8747 |
| GWC-13/MW-13 | 47.9 | 29.4 | 18.8747 |
| GWC-14/MW-14 | 53.6667 | 35.1667 | 21.7946 |
| GWC-5/MW-5 | 29.2 | 10.7 | 18.8747 |
| GWC-17/MW-17 | 18.5 | 0 | 32.6919 |
| GWC-18/MW-18 | 18.5 | 0 | 44.265 |

# Concentrations (mg/L)

## Parameter: Zinc

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 43
Percent Non-Detects: 72.8814%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 8 (80%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 ~ | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | ND<0.01 | ND<0.02 |
| | | | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 | ND<0.01 | ND<0.02 |
| | | | 6/14/2005 | 0.029 | 0.029 |
| | | | 12/5/2005 | 0.042 | 0.042 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 7 (70%) | 7/30/2002 ~ | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | ND<0.01 | ND<0.02 |
| | | | 6/24/2003 | 0.034 | 0.034 |
| | | | 12/17/2003 | 0.023 | 0.023 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 ~ | ND<0.01 | ND<0.02 |
| | | | 6/14/2005 | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 ~ | 0.1425 | 0.1425 |
| GWB-6/MW-6 | 10 | 9 (90%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | ND<0.01 | ND<0.02 |
| | | | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 | ND<0.01 | ND<0.02 |
| | | | 6/13/2005 | ND<0.01 | ND<0.02 |
| | | | 12/5/2005 | 0.02 | 0.02 |
| GWC-13/MW-13 | 10 | 4 (40%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | 0.023 | 0.023 |
| | | | 10/21/2002 | 0.027 | 0.027 |
| | | | 12/3/2002 | 0.027 | 0.027 |
| | | | 6/24/2003 ~ | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 ~ | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 ~ | ND<0.01 | ND<0.02 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | 0.044 | 0.044 |
| | | | 6/13/2005 ~ | 0.02 | 0.02 |
| | | | 12/6/2005 | 0.194 | 0.194 |
| GWC-14/MW-146 | | 5 (83.3333%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 ~ | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | ND<0.01 | ND<0.02 |
| | | | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | 0.127 | 0.127 |
| GWC-5/MW-5 | 10 | 8 (80%) | 7/30/2002 | ND<0.01 | ND<0.02 |
| | | | 9/24/2002 | ND<0.01 | ND<0.02 |
| | | | 10/21/2002 | ND<0.01 | ND<0.02 |
| | | | 12/3/2002 | ND<0.01 | ND<0.02 |
| | | | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | 0.032 | 0.032 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 | ND<0.01 | ND<0.02 |
| | | | 6/13/2005 | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 | 0.055 | 0.055 |
| GWC-17/MW-172 | | 1 (50%) | 6/15/2005 | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 | 0.096 | 0.096 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<0.01 | ND<0.02 |

There is 1 unused well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<0.01 | ND<0.02 |
| | | | 12/17/2003 | ND<0.01 | ND<0.02 |
| | | | 6/15/2004 | ND<0.01 | ND<0.02 |
| | | | 12/28/2004 ~ | ND<0.01 | ND<0.02 |
| | | | 6/15/2005 ~ | ND<0.01 | ND<0.02 |
| | | | 12/6/2005 | ND<0.01 | ND<0.02 |

# Shapiro-Francia Test of Normality

## Parameter: Zinc

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0.01 | -2.14441 | 4.59848 | -0.0214441 |
| 2 | 0.01 | -1.83843 | 7.97829 | -0.0398283 |
| 3 | 0.01 | -1.64485 | 10.6838 | -0.0562768 |
| 4 | 0.01 | -1.50626 | 12.9526 | -0.0713394 |
| 5 | 0.01 | -1.38517 | 14.8713 | -0.0851912 |
| 6 | 0.01 | -1.28155 | 16.5137 | -0.0980067 |
| 7 | 0.01 | -1.19522 | 17.9423 | -0.109959 |
| 8 | 0.01 | -1.11232 | 19.1795 | -0.121082 |
| 9 | 0.01 | -1.03643 | 20.2537 | -0.131446 |
| 10 | 0.01 | -0.970094 | 21.1948 | -0.141147 |
| 11 | 0.01 | -0.903992 | 22.012 | -0.150187 |
| 12 | 0.01 | -0.841621 | 22.7203 | -0.158604 |
| 13 | 0.01 | -0.785774 | 23.3378 | -0.166461 |
| 14 | 0.01 | -0.729003 | 23.8692 | -0.173751 |
| 15 | 0.01 | -0.67449 | 24.3242 | -0.180496 |
| 16 | 0.01 | -0.624956 | 24.7147 | -0.186746 |
| 17 | 0.01 | -0.573953 | 25.0442 | -0.192485 |
| 18 | 0.01 | -0.524401 | 25.3191 | -0.197729 |
| 19 | 0.01 | -0.478914 | 25.5485 | -0.202518 |
| 20 | 0.01 | -0.431644 | 25.7348 | -0.206835 |
| 21 | 0.01 | -0.385321 | 25.8833 | -0.210688 |
| 22 | 0.01 | -0.342466 | 26.0006 | -0.214113 |
| 23 | 0.01 | -0.297612 | 26.0892 | -0.217089 |
| 24 | 0.01 | -0.253347 | 26.1533 | -0.219622 |
| 25 | 0.01 | -0.212137 | 26.1983 | -0.221744 |
| 26 | 0.01 | -0.168741 | 26.2268 | -0.223431 |
| 27 | 0.01 | -0.125661 | 26.2426 | -0.224688 |
| 28 | 0.01 | -0.0853288 | 26.2499 | -0.225541 |
| 29 | 0.01 | -0.0426257 | 26.2517 | -0.225967 |
| 30 | 0.01 | 0 | 26.2517 | -0.225967 |
| 31 | 0.01 | 0.0426257 | 26.2535 | -0.225541 |
| 32 | 0.01 | 0.0853288 | 26.2608 | -0.224688 |
| 33 | 0.01 | 0.125661 | 26.2766 | -0.223431 |
| 34 | 0.01 | 0.168741 | 26.3051 | -0.221744 |
| 35 | 0.01 | 0.212137 | 26.3501 | -0.219622 |
| 36 | 0.01 | 0.253347 | 26.4142 | -0.217089 |
| 37 | 0.01 | 0.297612 | 26.5028 | -0.214113 |
| 38 | 0.01 | 0.342466 | 26.6201 | -0.210688 |
| 39 | 0.01 | 0.385321 | 26.7686 | -0.206835 |
| 40 | 0.01 | 0.431644 | 26.9549 | -0.202518 |
| 41 | 0.01 | 0.478914 | 27.1843 | -0.197729 |
| 42 | 0.01 | 0.524401 | 27.4592 | -0.192485 |
| 43 | 0.01 | 0.573953 | 27.7887 | -0.186746 |
| 44 | 0.02 | 0.624956 | 28.1792 | -0.174247 |
| 45 | 0.02 | 0.67449 | 28.6342 | -0.160757 |
| 46 | 0.023 | 0.729003 | 29.1656 | -0.14399 |

| | | | | |
|---|---|---|---|---|
| 47 | 0.023 | 0.785774 | 29.7831 | -0.125917 |
| 48 | 0.027 | 0.841621 | 30.4914 | -0.103193 |
| 49 | 0.027 | 0.903992 | 31.3086 | -0.0787854 |
| 50 | 0.029 | 0.970094 | 32.2497 | -0.0506526 |
| 51 | 0.032 | 1.03643 | 33.3239 | -0.0174868 |
| 52 | 0.034 | 1.11232 | 34.5611 | 0.0203321 |
| 53 | 0.042 | 1.19522 | 35.9897 | 0.0705314 |
| 54 | 0.044 | 1.28155 | 37.6321 | 0.12692 |
| 55 | 0.055 | 1.38517 | 39.5508 | 0.203104 |
| 56 | 0.096 | 1.50626 | 41.8196 | 0.347705 |
| 57 | 0.127 | 1.64485 | 44.5251 | 0.556601 |
| 58 | 0.1425 | 1.83843 | 47.9049 | 0.818577 |

Sample Standard Deviation = 0.0345029
Numerator = 0.670068
Denominator = 3.30764 = 58 47.9049
W Statistic = 0.202582
5% Critical value of 0.962 exceeds 0.202582
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.202582
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Zinc

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<0.01 | 22 |
| | 9/24/2002 | ND<0.01 | 22 |
| | 10/21/2002 ~ | ND<0.01 | 22 |
| | 12/3/2002 | ND<0.01 | 22 |
| | 6/24/2003 | ND<0.01 | 22 |
| | 12/17/2003 | ND<0.01 | 22 |
| | 6/15/2004 | ND<0.01 | 22 |
| | 12/28/2004 | ND<0.01 | 22 |
| | 6/14/2005 | 0.029 | 50 |
| | 12/5/2005 | 0.042 | 53 |

Rank Sum = 279
Rank Mean = 27.9

Background Rank Sum = 279
Background Rank Mean = 27.9

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | ND<0.01 | 22 |
| | 9/24/2002 | ND<0.01 | 22 |
| | 10/21/2002 | ND<0.01 | 22 |
| | 12/3/2002 | ND<0.01 | 22 |
| | 6/24/2003 | 0.034 | 52 |
| | 12/17/2003 | 0.023 | 46 |
| | 6/15/2004 | ND<0.01 | 22 |
| | 12/28/2004 ~ | ND<0.01 | 22 |
| | 6/14/2005 | ND<0.01 | 22 |
| | 12/6/2005 ~ | 0.1425 | 58 |

Rank Sum = 310
Rank Mean = 31

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<0.01 | 22 |
| | 9/24/2002 | ND<0.01 | 22 |
| | 10/21/2002 | ND<0.01 | 22 |
| | 12/3/2002 | ND<0.01 | 22 |
| | 6/24/2003 | ND<0.01 | 22 |
| | 12/17/2003 | ND<0.01 | 22 |
| | 6/15/2004 | ND<0.01 | 22 |
| | 12/28/2004 | ND<0.01 | 22 |
| | 6/13/2005 | ND<0.01 | 22 |
| | 12/5/2005 | 0.02 | 44 |

Rank Sum = 242
Rank Mean = 24.2

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | ND<0.01 | 22 |
| | 9/24/2002 | 0.023 | 47 |
| | 10/21/2002 | 0.027 | 48 |
| | 12/3/2002 | 0.027 | 49 |
| | 6/24/2003 ~ | ND<0.01 | 22 |
| | 12/17/2003 ~ | ND<0.01 | 22 |
| | 6/15/2004 ~ | ND<0.01 | 22 |
| | 12/28/2004 | 0.044 | 54 |
| | 6/13/2005 ~ | 0.02 | 45 |
| | 12/6/2005 | 0.194 | 59 |

Rank Sum = 390
Rank Mean = 39

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | ND<0.01 | 22 |
| | 9/24/2002 ~ | ND<0.01 | 22 |
| | 10/21/2002 | ND<0.01 | 22 |
| | 12/3/2002 | ND<0.01 | 22 |
| | 6/24/2003 | ND<0.01 | 22 |
| | 12/17/2003 | 0.127 | 57 |

Rank Sum = 167
Rank Mean = 27.8333

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<0.01 | 22 |
| | 9/24/2002 | ND<0.01 | 22 |
| | 10/21/2002 | ND<0.01 | 22 |
| | 12/3/2002 | ND<0.01 | 22 |
| | 6/24/2003 | ND<0.01 | 22 |
| | 12/17/2003 | 0.032 | 51 |
| | 6/15/2004 | ND<0.01 | 22 |
| | 12/28/2004 | ND<0.01 | 22 |
| | 6/13/2005 | ND<0.01 | 22 |
| | 12/6/2005 | 0.055 | 55 |

Rank Sum = 282
Rank Mean = 28.2

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<0.01 | 22 |
| | 12/6/2005 | 0.096 | 56 |

Rank Sum = 78
Rank Mean = 39

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<0.01 | 22 |

Rank Sum = 22
Rank Mean = 22

## Calculation Results:

Kruskal-Wallis H Statistic = 5.0409
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 8.22367
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
5.0409 < 14.0671 indicating no significant group difference at 5% significance level
8.22367 < 14.0671 indicating no significant group difference at 5% significance level when adjusted for ties

# Concentrations (µg/L)
## Parameter: 1,1-Dichloroethane

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 44
Percent Non-Detects: 74.5763%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 ~ | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 10 (100%) | 7/30/2002 ~ | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 ~ | ND<2.5 | ND<5 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |
| GWC-13/MW-13 | 10 | 1 (10%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | 6 | 6 |
| | | | 10/21/2002 | 6 | 6 |
| | | | 12/3/2002 | 7 | 7 |
| | | | 6/24/2003 ~ | 9 | 9 |
| | | | 12/17/2003 ~ | 20.5 | 20.5 |
| | | | 6/15/2004 ~ | 18 | 18 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | 16 | 16 |
| | | | 6/13/2005 ~ | 15 | 15 |
| | | | 12/6/2005 | 18 | 18 |
| GWC-14/MW-146 | | 0 (0%) | 7/30/2002 | 13 | 13 |
| | | | 9/24/2002 ~ | 21 | 21 |
| | | | 10/21/2002 | 17 | 17 |
| | | | 12/3/2002 | 16 | 16 |
| | | | 6/24/2003 | 10 | 10 |
| | | | 12/17/2003 | 10 | 10 |
| GWC-5/MW-5 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<2.5 | ND<5 |

There are 2 unused wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| Trip Blank | 3 | 3 (100%) | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

# Shapiro-Francia Test of Normality
## Parameter: 1,1-Dichloroethane
## All Wells
## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 2.5 | -2.14441 | 4.59848 | -5.36102 |
| 2 | 2.5 | -1.83843 | 7.97829 | -9.95708 |
| 3 | 2.5 | -1.64485 | 10.6838 | -14.0692 |
| 4 | 2.5 | -1.50626 | 12.9526 | -17.8349 |
| 5 | 2.5 | -1.38517 | 14.8713 | -21.2978 |
| 6 | 2.5 | -1.28155 | 16.5137 | -24.5017 |
| 7 | 2.5 | -1.19522 | 17.9423 | -27.4897 |
| 8 | 2.5 | -1.11232 | 19.1795 | -30.2705 |
| 9 | 2.5 | -1.03643 | 20.2537 | -32.8616 |
| 10 | 2.5 | -0.970094 | 21.1948 | -35.2868 |
| 11 | 2.5 | -0.903992 | 22.012 | -37.5468 |
| 12 | 2.5 | -0.841621 | 22.7203 | -39.6509 |
| 13 | 2.5 | -0.785774 | 23.3378 | -41.6153 |
| 14 | 2.5 | -0.729003 | 23.8692 | -43.4378 |
| 15 | 2.5 | -0.67449 | 24.3242 | -45.124 |
| 16 | 2.5 | -0.624956 | 24.7147 | -46.6864 |
| 17 | 2.5 | -0.573953 | 25.0442 | -48.1213 |
| 18 | 2.5 | -0.524401 | 25.3191 | -49.4323 |
| 19 | 2.5 | -0.478914 | 25.5485 | -50.6296 |
| 20 | 2.5 | -0.431644 | 25.7348 | -51.7087 |
| 21 | 2.5 | -0.385321 | 25.8833 | -52.672 |
| 22 | 2.5 | -0.342466 | 26.0006 | -53.5282 |
| 23 | 2.5 | -0.297612 | 26.0892 | -54.2722 |
| 24 | 2.5 | -0.253347 | 26.1533 | -54.9056 |
| 25 | 2.5 | -0.212137 | 26.1983 | -55.4359 |
| 26 | 2.5 | -0.168741 | 26.2268 | -55.8578 |
| 27 | 2.5 | -0.125661 | 26.2426 | -56.1719 |
| 28 | 2.5 | -0.0853288 | 26.2499 | -56.3852 |
| 29 | 2.5 | -0.0426257 | 26.2517 | -56.4918 |
| 30 | 2.5 | 0 | 26.2517 | -56.4918 |
| 31 | 2.5 | 0.0426257 | 26.2535 | -56.3852 |
| 32 | 2.5 | 0.0853288 | 26.2608 | -56.1719 |
| 33 | 2.5 | 0.125661 | 26.2766 | -55.8578 |
| 34 | 2.5 | 0.168741 | 26.3051 | -55.4359 |
| 35 | 2.5 | 0.212137 | 26.3501 | -54.9056 |
| 36 | 2.5 | 0.253347 | 26.4142 | -54.2722 |
| 37 | 2.5 | 0.297612 | 26.5028 | -53.5282 |
| 38 | 2.5 | 0.342466 | 26.6201 | -52.672 |
| 39 | 2.5 | 0.385321 | 26.7686 | -51.7087 |
| 40 | 2.5 | 0.431644 | 26.9549 | -50.6296 |
| 41 | 2.5 | 0.478914 | 27.1843 | -49.4323 |
| 42 | 2.5 | 0.524401 | 27.4592 | -48.1213 |
| 43 | 2.5 | 0.573953 | 27.7887 | -46.6864 |
| 44 | 2.5 | 0.624956 | 28.1792 | -45.124 |
| 45 | 6 | 0.67449 | 28.6342 | -41.0771 |
| 46 | 6 | 0.729003 | 29.1656 | -36.7031 |

| | | | | |
|---|---|---|---|---|
| 47 | 7 | 0.785774 | 29.7831 | -31.2027 |
| 48 | 9 | 0.841621 | 30.4914 | -23.6281 |
| 49 | 10 | 0.903992 | 31.3086 | -14.5882 |
| 50 | 10 | 0.970094 | 32.2497 | -4.88721 |
| 51 | 13 | 1.03643 | 33.3239 | 8.58642 |
| 52 | 15 | 1.11232 | 34.5611 | 25.2712 |
| 53 | 16 | 1.19522 | 35.9897 | 44.3948 |
| 54 | 16 | 1.28155 | 37.6321 | 64.8996 |
| 55 | 17 | 1.38517 | 39.5508 | 88.4475 |
| 56 | 18 | 1.50626 | 41.8196 | 115.56 |
| 57 | 18 | 1.64485 | 44.5251 | 145.168 |
| 58 | 20.5 | 1.83843 | 47.9049 | 182.855 |

Sample Standard Deviation = 5.45524
Numerator = 33436
Denominator = 82686.7 = 58 47.9049
W Statistic = 0.40437
5% Critical value of 0.962 exceeds 0.40437
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.40437
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: 1,1-Dichloroethane

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<2.5 | 22.5 |
| | 9/24/2002 | ND<2.5 | 22.5 |
| | 10/21/2002 ~ | ND<2.5 | 22.5 |
| | 12/3/2002 | ND<2.5 | 22.5 |
| | 6/24/2003 | ND<2.5 | 22.5 |
| | 12/17/2003 | ND<2.5 | 22.5 |
| | 6/15/2004 | ND<2.5 | 22.5 |
| | 12/28/2004 | ND<2.5 | 22.5 |
| | 6/14/2005 | ND<2.5 | 22.5 |
| | 12/5/2005 | ND<2.5 | 22.5 |

Rank Sum = 225
Rank Mean = 22.5

Background Rank Sum = 225
Background Rank Mean = 22.5

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | ND<2.5 | 22.5 |
| | 9/24/2002 | ND<2.5 | 22.5 |
| | 10/21/2002 | ND<2.5 | 22.5 |
| | 12/3/2002 | ND<2.5 | 22.5 |
| | 6/24/2003 | ND<2.5 | 22.5 |
| | 12/17/2003 | ND<2.5 | 22.5 |
| | 6/15/2004 | ND<2.5 | 22.5 |
| | 12/28/2004 ~ | ND<2.5 | 22.5 |
| | 6/14/2005 | ND<2.5 | 22.5 |
| | 12/6/2005 ~ | ND<2.5 | 22.5 |

Rank Sum = 225
Rank Mean = 22.5

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<2.5 | 22.5 |
| | 9/24/2002 | ND<2.5 | 22.5 |
| | 10/21/2002 | ND<2.5 | 22.5 |
| | 12/3/2002 | ND<2.5 | 22.5 |
| | 6/24/2003 | ND<2.5 | 22.5 |
| | 12/17/2003 | ND<2.5 | 22.5 |
| | 6/15/2004 | ND<2.5 | 22.5 |
| | 12/28/2004 | ND<2.5 | 22.5 |
| | 6/13/2005 | ND<2.5 | 22.5 |
| | 12/5/2005 | ND<2.5 | 22.5 |

Rank Sum = 225
Rank Mean = 22.5

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | ND<2.5 | 22.5 |
| | 9/24/2002 | 6 | 45 |
| | 10/21/2002 | 6 | 46 |
| | 12/3/2002 | 7 | 47 |
| | 6/24/2003 ~ | 9 | 48 |
| | 12/17/2003 ~ | 20.5 | 58 |
| | 6/15/2004 ~ | 18 | 56 |
| | 12/28/2004 | 16 | 53 |
| | 6/13/2005 ~ | 15 | 52 |
| | 12/6/2005 | 18 | 57 |

Rank Sum = 484.5
Rank Mean = 48.45

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | 13 | 51 |
| | 9/24/2002 ~ | 21 | 59 |
| | 10/21/2002 | 17 | 55 |
| | 12/3/2002 | 16 | 54 |
| | 6/24/2003 | 10 | 49 |
| | 12/17/2003 | 10 | 50 |

Rank Sum = 318
Rank Mean = 53

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<2.5 | 22.5 |
| | 9/24/2002 | ND<2.5 | 22.5 |
| | 10/21/2002 | ND<2.5 | 22.5 |
| | 12/3/2002 | ND<2.5 | 22.5 |
| | 6/24/2003 | ND<2.5 | 22.5 |
| | 12/17/2003 | ND<2.5 | 22.5 |
| | 6/15/2004 | ND<2.5 | 22.5 |
| | 12/28/2004 | ND<2.5 | 22.5 |
| | 6/13/2005 | ND<2.5 | 22.5 |
| | 12/6/2005 | ND<2.5 | 22.5 |

Rank Sum = 225
Rank Mean = 22.5

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<2.5 | 22.5 |
| | 12/6/2005 | ND<2.5 | 22.5 |

Rank Sum = 45
Rank Mean = 22.5

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<2.5 | 22.5 |

Rank Sum = 22.5
Rank Mean = 22.5

## Calculation Results:

Kruskal-Wallis H Statistic = 30.4975
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 52.1031
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
30.4975 > 14.0671 indicating a significant group difference at 5% significance level
52.1031 > 14.0671 indicating a significant group difference at 5% significance level when adjusted for ties

## Individual Well Comparisons at 1% Significance Level per Comparison

1% Z score is 2.32634
Mean background rank is 22.5

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| GWA-7/MW-7 | 22.5 | 0 | 17.869 |
| GWB-6/MW-6 | 22.5 | 0 | 17.869 |
| GWC-13/MW-13 | 48.45 | 25.95 | 17.869 |
| GWC-14/MW-14 | 53 | 30.5 | 20.6333 |
| GWC-5/MW-5 | 22.5 | 0 | 17.869 |
| GWC-17/MW-17 | 22.5 | 0 | 30.95 |
| GWC-18/MW-18 | 22.5 | 0 | 41.9065 |

## Individual Well Comparisons at Groupwise 5% Significance Level (0.714286% Significance Level per comparison)

0.714286% Z score is 2.45727

Mean background rank is 22.5

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|
| GWA-7/MW-7 | 22.5 | 0 | 18.8747 |
| GWB-6/MW-6 | 22.5 | 0 | 18.8747 |
| GWC-13/MW-13 | 48.45 | 25.95 | 18.8747 |
| GWC-14/MW-14 | 53 | 30.5 | 21.7946 |
| GWC-5/MW-5 | 22.5 | 0 | 18.8747 |
| GWC-17/MW-17 | 22.5 | 0 | 32.6919 |
| GWC-18/MW-18 | 22.5 | 0 | 44.265 |

# Concentrations (µg/L)
## Parameter: Chlorobenzene

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 53
Percent Non-Detects: 89.8305%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 ~ | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 10 (100%) | 7/30/2002 ~ | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 ~ | ND<2.5 | ND<5 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |
| GWC-13/MW-13 | 10 | 9 (90%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 ~ | ND<2.5 | ND<5 |
| | | | 12/17/2003 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2004 ~ | ND<2.5 | ND<5 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | 4 | 4 |
| GWC-14/MW-146 | | 1 (16.6667%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 ~ | 8 | 8 |
| | | | 10/21/2002 | 9 | 9 |
| | | | 12/3/2002 | 10 | 10 |
| | | | 6/24/2003 | 7 | 7 |
| | | | 12/17/2003 | 19 | 19 |
| GWC-5/MW-5 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<2.5 | ND<5 |

There are 2 unused wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| Trip Blank | 3 | 3 (100%) | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

# Shapiro-Francia Test of Normality

## Parameter: Chlorobenzene

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 2.5 | -2.14441 | 4.59848 | -5.36102 |
| 2 | 2.5 | -1.83843 | 7.97829 | -9.95708 |
| 3 | 2.5 | -1.64485 | 10.6838 | -14.0692 |
| 4 | 2.5 | -1.50626 | 12.9526 | -17.8349 |
| 5 | 2.5 | -1.38517 | 14.8713 | -21.2978 |
| 6 | 2.5 | -1.28155 | 16.5137 | -24.5017 |
| 7 | 2.5 | -1.19522 | 17.9423 | -27.4897 |
| 8 | 2.5 | -1.11232 | 19.1795 | -30.2705 |
| 9 | 2.5 | -1.03643 | 20.2537 | -32.8616 |
| 10 | 2.5 | -0.970094 | 21.1948 | -35.2868 |
| 11 | 2.5 | -0.903992 | 22.012 | -37.5468 |
| 12 | 2.5 | -0.841621 | 22.7203 | -39.6509 |
| 13 | 2.5 | -0.785774 | 23.3378 | -41.6153 |
| 14 | 2.5 | -0.729003 | 23.8692 | -43.4378 |
| 15 | 2.5 | -0.67449 | 24.3242 | -45.124 |
| 16 | 2.5 | -0.624956 | 24.7147 | -46.6864 |
| 17 | 2.5 | -0.573953 | 25.0442 | -48.1213 |
| 18 | 2.5 | -0.524401 | 25.3191 | -49.4323 |
| 19 | 2.5 | -0.478914 | 25.5485 | -50.6296 |
| 20 | 2.5 | -0.431644 | 25.7348 | -51.7087 |
| 21 | 2.5 | -0.385321 | 25.8833 | -52.672 |
| 22 | 2.5 | -0.342466 | 26.0006 | -53.5282 |
| 23 | 2.5 | -0.297612 | 26.0892 | -54.2722 |
| 24 | 2.5 | -0.253347 | 26.1533 | -54.9056 |
| 25 | 2.5 | -0.212137 | 26.1983 | -55.4359 |
| 26 | 2.5 | -0.168741 | 26.2268 | -55.8578 |
| 27 | 2.5 | -0.125661 | 26.2426 | -56.1719 |
| 28 | 2.5 | -0.0853288 | 26.2499 | -56.3852 |
| 29 | 2.5 | -0.0426257 | 26.2517 | -56.4918 |
| 30 | 2.5 | 0 | 26.2517 | -56.4918 |
| 31 | 2.5 | 0.0426257 | 26.2535 | -56.3852 |
| 32 | 2.5 | 0.0853288 | 26.2608 | -56.1719 |
| 33 | 2.5 | 0.125661 | 26.2766 | -55.8578 |
| 34 | 2.5 | 0.168741 | 26.3051 | -55.4359 |
| 35 | 2.5 | 0.212137 | 26.3501 | -54.9056 |
| 36 | 2.5 | 0.253347 | 26.4142 | -54.2722 |
| 37 | 2.5 | 0.297612 | 26.5028 | -53.5282 |
| 38 | 2.5 | 0.342466 | 26.6201 | -52.672 |
| 39 | 2.5 | 0.385321 | 26.7686 | -51.7087 |
| 40 | 2.5 | 0.431644 | 26.9549 | -50.6296 |
| 41 | 2.5 | 0.478914 | 27.1843 | -49.4323 |
| 42 | 2.5 | 0.524401 | 27.4592 | -48.1213 |
| 43 | 2.5 | 0.573953 | 27.7887 | -46.6864 |
| 44 | 2.5 | 0.624956 | 28.1792 | -45.124 |
| 45 | 2.5 | 0.67449 | 28.6342 | -43.4378 |
| 46 | 2.5 | 0.729003 | 29.1656 | -41.6153 |

| | | | | |
|---|---|---|---|---|
| 47 | 2.5 | 0.785774 | 29.7831 | -39.6509 |
| 48 | 2.5 | 0.841621 | 30.4914 | -37.5468 |
| 49 | 2.5 | 0.903992 | 31.3086 | -35.2868 |
| 50 | 2.5 | 0.970094 | 32.2497 | -32.8616 |
| 51 | 2.5 | 1.03643 | 33.3239 | -30.2705 |
| 52 | 2.5 | 1.11232 | 34.5611 | -27.4897 |
| 53 | 2.5 | 1.19522 | 35.9897 | -24.5017 |
| 54 | 4 | 1.28155 | 37.6321 | -19.3755 |
| 55 | 7 | 1.38517 | 39.5508 | -9.67926 |
| 56 | 8 | 1.50626 | 41.8196 | 2.37082 |
| 57 | 9 | 1.64485 | 44.5251 | 17.1745 |
| 58 | 10 | 1.83843 | 47.9049 | 35.5587 |

Sample Standard Deviation = 2.60504
Numerator = 1264.42
Denominator = 18855.5 = 58 47.9049
W Statistic = 0.0670588
5% Critical value of 0.962 exceeds 0.0670588
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.0670588
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Chlorobenzene

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<2.5 | 27 |
| | 9/24/2002 | ND<2.5 | 27 |
| | 10/21/2002 ~ | ND<2.5 | 27 |
| | 12/3/2002 | ND<2.5 | 27 |
| | 6/24/2003 | ND<2.5 | 27 |
| | 12/17/2003 | ND<2.5 | 27 |
| | 6/15/2004 | ND<2.5 | 27 |
| | 12/28/2004 | ND<2.5 | 27 |
| | 6/14/2005 | ND<2.5 | 27 |
| | 12/5/2005 | ND<2.5 | 27 |

Rank Sum = 270
Rank Mean = 27

Background Rank Sum = 270
Background Rank Mean = 27

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | ND<2.5 | 27 |
| | 9/24/2002 | ND<2.5 | 27 |
| | 10/21/2002 | ND<2.5 | 27 |
| | 12/3/2002 | ND<2.5 | 27 |
| | 6/24/2003 | ND<2.5 | 27 |
| | 12/17/2003 | ND<2.5 | 27 |
| | 6/15/2004 | ND<2.5 | 27 |
| | 12/28/2004 ~ | ND<2.5 | 27 |
| | 6/14/2005 | ND<2.5 | 27 |
| | 12/6/2005 ~ | ND<2.5 | 27 |

Rank Sum = 270
Rank Mean = 27

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<2.5 | 27 |
| | 9/24/2002 | ND<2.5 | 27 |
| | 10/21/2002 | ND<2.5 | 27 |
| | 12/3/2002 | ND<2.5 | 27 |
| | 6/24/2003 | ND<2.5 | 27 |
| | 12/17/2003 | ND<2.5 | 27 |
| | 6/15/2004 | ND<2.5 | 27 |
| | 12/28/2004 | ND<2.5 | 27 |
| | 6/13/2005 | ND<2.5 | 27 |
| | 12/5/2005 | ND<2.5 | 27 |

Rank Sum = 270
Rank Mean = 27

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | ND<2.5 | 27 |
| | 9/24/2002 | ND<2.5 | 27 |
| | 10/21/2002 | ND<2.5 | 27 |
| | 12/3/2002 | ND<2.5 | 27 |
| | 6/24/2003 ~ | ND<2.5 | 27 |
| | 12/17/2003 ~ | ND<2.5 | 27 |
| | 6/15/2004 ~ | ND<2.5 | 27 |
| | 12/28/2004 | ND<2.5 | 27 |
| | 6/13/2005 ~ | ND<2.5 | 27 |
| | 12/6/2005 | 4 | 54 |

Rank Sum = 297
Rank Mean = 29.7

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | ND<2.5 | 27 |
| | 9/24/2002 ~ | 8 | 56 |
| | 10/21/2002 | 9 | 57 |
| | 12/3/2002 | 10 | 58 |
| | 6/24/2003 | 7 | 55 |
| | 12/17/2003 | 19 | 59 |

Rank Sum = 312
Rank Mean = 52

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<2.5 | 27 |
| | 9/24/2002 | ND<2.5 | 27 |
| | 10/21/2002 | ND<2.5 | 27 |
| | 12/3/2002 | ND<2.5 | 27 |
| | 6/24/2003 | ND<2.5 | 27 |
| | 12/17/2003 | ND<2.5 | 27 |
| | 6/15/2004 | ND<2.5 | 27 |
| | 12/28/2004 | ND<2.5 | 27 |
| | 6/13/2005 | ND<2.5 | 27 |
| | 12/6/2005 | ND<2.5 | 27 |

Rank Sum = 270
Rank Mean = 27

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<2.5 | 27 |
| | 12/6/2005 | ND<2.5 | 27 |

Rank Sum = 54
Rank Mean = 27

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<2.5 | 27 |

Rank Sum = 27
Rank Mean = 27

## Calculation Results:

Kruskal-Wallis H Statistic = 11.159
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 40.5544
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
11.159 < 14.0671 indicating no significant group difference at 5% significance level
40.5544 > 14.0671 indicating a significant group difference at 5% significance level when adjusted for ties

## Individual Well Comparisons at 1% Significance Level per Comparison

1% Z score is 2.32634
Mean background rank is 27

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| GWA-7/MW-7 | 27 | 0 | 17.869 |
| GWB-6/MW-6 | 27 | 0 | 17.869 |
| GWC-13/MW-13 | 29.7 | 2.7 | 17.869 |
| GWC-14/MW-14 | 52 | 25 | 20.6333 |
| GWC-5/MW-5 | 27 | 0 | 17.869 |
| GWC-17/MW-17 | 27 | 0 | 30.95 |
| GWC-18/MW-18 | 27 | 0 | 41.9065 |

## Individual Well Comparisons at Groupwise 5% Significance Level (0.714286% Significance Level per comparison)

0.714286% Z score is 2.45727

Mean background rank is 27

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|
| GWA-7/MW-7 | 27 | 0 | 18.8747 |
| GWB-6/MW-6 | 27 | 0 | 18.8747 |
| GWC-13/MW-13 | 29.7 | 2.7 | 18.8747 |
| GWC-14/MW-14 | 52 | 25 | 21.7946 |
| GWC-5/MW-5 | 27 | 0 | 18.8747 |
| GWC-17/MW-17 | 27 | 0 | 32.6919 |
| GWC-18/MW-18 | 27 | 0 | 44.265 |

# Concentrations (µg/L)

## Parameter: cis-1,2-Dichloroethene

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 47
Percent Non-Detects: 79.661%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 ~ | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 10 (100%) | 7/30/2002 ~ | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 ~ | ND<2.5 | ND<5 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |
| GWC-13/MW-13 | 10 | 4 (40%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 ~ | 6 | 6 |
| | | | 12/17/2003 ~ | 14 | 14 |
| | | | 6/15/2004 ~ | 9.5 | 9.5 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | 8 | 8 |
| | | | 6/13/2005 ~ | 8 | 8 |
| | | | 12/6/2005 | 9 | 9 |
| GWC-14/MW-146 | | 0 (0%) | 7/30/2002 | 10 | 10 |
| | | | 9/24/2002 ~ | 18.5 | 18.5 |
| | | | 10/21/2002 | 16 | 16 |
| | | | 12/3/2002 | 19 | 19 |
| | | | 6/24/2003 | 10 | 10 |
| | | | 12/17/2003 | 17 | 17 |
| GWC-5/MW-5 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<2.5 | ND<5 |

There are 2 unused wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| Trip Blank | 3 | 3 (100%) | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

# Shapiro-Francia Test of Normality
## Parameter: cis-1,2-Dichloroethene
## All Wells
## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 2.5 | -2.14441 | 4.59848 | -5.36102 |
| 2 | 2.5 | -1.83843 | 7.97829 | -9.95708 |
| 3 | 2.5 | -1.64485 | 10.6838 | -14.0692 |
| 4 | 2.5 | -1.50626 | 12.9526 | -17.8349 |
| 5 | 2.5 | -1.38517 | 14.8713 | -21.2978 |
| 6 | 2.5 | -1.28155 | 16.5137 | -24.5017 |
| 7 | 2.5 | -1.19522 | 17.9423 | -27.4897 |
| 8 | 2.5 | -1.11232 | 19.1795 | -30.2705 |
| 9 | 2.5 | -1.03643 | 20.2537 | -32.8616 |
| 10 | 2.5 | -0.970094 | 21.1948 | -35.2868 |
| 11 | 2.5 | -0.903992 | 22.012 | -37.5468 |
| 12 | 2.5 | -0.841621 | 22.7203 | -39.6509 |
| 13 | 2.5 | -0.785774 | 23.3378 | -41.6153 |
| 14 | 2.5 | -0.729003 | 23.8692 | -43.4378 |
| 15 | 2.5 | -0.67449 | 24.3242 | -45.124 |
| 16 | 2.5 | -0.624956 | 24.7147 | -46.6864 |
| 17 | 2.5 | -0.573953 | 25.0442 | -48.1213 |
| 18 | 2.5 | -0.524401 | 25.3191 | -49.4323 |
| 19 | 2.5 | -0.478914 | 25.5485 | -50.6296 |
| 20 | 2.5 | -0.431644 | 25.7348 | -51.7087 |
| 21 | 2.5 | -0.385321 | 25.8833 | -52.672 |
| 22 | 2.5 | -0.342466 | 26.0006 | -53.5282 |
| 23 | 2.5 | -0.297612 | 26.0892 | -54.2722 |
| 24 | 2.5 | -0.253347 | 26.1533 | -54.9056 |
| 25 | 2.5 | -0.212137 | 26.1983 | -55.4359 |
| 26 | 2.5 | -0.168741 | 26.2268 | -55.8578 |
| 27 | 2.5 | -0.125661 | 26.2426 | -56.1719 |
| 28 | 2.5 | -0.0853288 | 26.2499 | -56.3852 |
| 29 | 2.5 | -0.0426257 | 26.2517 | -56.4918 |
| 30 | 2.5 | 0 | 26.2517 | -56.4918 |
| 31 | 2.5 | 0.0426257 | 26.2535 | -56.3852 |
| 32 | 2.5 | 0.0853288 | 26.2608 | -56.1719 |
| 33 | 2.5 | 0.125661 | 26.2766 | -55.8578 |
| 34 | 2.5 | 0.168741 | 26.3051 | -55.4359 |
| 35 | 2.5 | 0.212137 | 26.3501 | -54.9056 |
| 36 | 2.5 | 0.253347 | 26.4142 | -54.2722 |
| 37 | 2.5 | 0.297612 | 26.5028 | -53.5282 |
| 38 | 2.5 | 0.342466 | 26.6201 | -52.672 |
| 39 | 2.5 | 0.385321 | 26.7686 | -51.7087 |
| 40 | 2.5 | 0.431644 | 26.9549 | -50.6296 |
| 41 | 2.5 | 0.478914 | 27.1843 | -49.4323 |
| 42 | 2.5 | 0.524401 | 27.4592 | -48.1213 |
| 43 | 2.5 | 0.573953 | 27.7887 | -46.6864 |
| 44 | 2.5 | 0.624956 | 28.1792 | -45.124 |
| 45 | 2.5 | 0.67449 | 28.6342 | -43.4378 |
| 46 | 2.5 | 0.729003 | 29.1656 | -41.6153 |

| | | | | |
|---|---|---|---|---|
| 47 | 2.5 | 0.785774 | 29.7831 | -39.6509 |
| 48 | 6 | 0.841621 | 30.4914 | -34.6011 |
| 49 | 8 | 0.903992 | 31.3086 | -27.3692 |
| 50 | 8 | 0.970094 | 32.2497 | -19.6085 |
| 51 | 9 | 1.03643 | 33.3239 | -10.2806 |
| 52 | 9.5 | 1.11232 | 34.5611 | 0.286491 |
| 53 | 10 | 1.19522 | 35.9897 | 12.2387 |
| 54 | 10 | 1.28155 | 37.6321 | 25.0542 |
| 55 | 14 | 1.38517 | 39.5508 | 44.4466 |
| 56 | 16 | 1.50626 | 41.8196 | 68.5468 |
| 57 | 17 | 1.64485 | 44.5251 | 96.5093 |
| 58 | 18.5 | 1.83843 | 47.9049 | 130.52 |

Sample Standard Deviation = 4.36551
Numerator = 17035.5
Denominator = 52951.6 = 58 47.9049
W Statistic = 0.321719
5% Critical value of 0.962 exceeds 0.321719
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.321719
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: cis-1,2-Dichloroethene

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<2.5 | 24 |
| | 9/24/2002 | ND<2.5 | 24 |
| | 10/21/2002 ~ | ND<2.5 | 24 |
| | 12/3/2002 | ND<2.5 | 24 |
| | 6/24/2003 | ND<2.5 | 24 |
| | 12/17/2003 | ND<2.5 | 24 |
| | 6/15/2004 | ND<2.5 | 24 |
| | 12/28/2004 | ND<2.5 | 24 |
| | 6/14/2005 | ND<2.5 | 24 |
| | 12/5/2005 | ND<2.5 | 24 |

Rank Sum = 240
Rank Mean = 24

Background Rank Sum = 240
Background Rank Mean = 24

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | ND<2.5 | 24 |
| | 9/24/2002 | ND<2.5 | 24 |
| | 10/21/2002 | ND<2.5 | 24 |
| | 12/3/2002 | ND<2.5 | 24 |
| | 6/24/2003 | ND<2.5 | 24 |
| | 12/17/2003 | ND<2.5 | 24 |
| | 6/15/2004 | ND<2.5 | 24 |
| | 12/28/2004 ~ | ND<2.5 | 24 |
| | 6/14/2005 | ND<2.5 | 24 |
| | 12/6/2005 ~ | ND<2.5 | 24 |

Rank Sum = 240
Rank Mean = 24

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<2.5 | 24 |
| | 9/24/2002 | ND<2.5 | 24 |
| | 10/21/2002 | ND<2.5 | 24 |
| | 12/3/2002 | ND<2.5 | 24 |
| | 6/24/2003 | ND<2.5 | 24 |
| | 12/17/2003 | ND<2.5 | 24 |
| | 6/15/2004 | ND<2.5 | 24 |
| | 12/28/2004 | ND<2.5 | 24 |
| | 6/13/2005 | ND<2.5 | 24 |
| | 12/5/2005 | ND<2.5 | 24 |

Rank Sum = 240
Rank Mean = 24

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | ND<2.5 | 24 |
| | 9/24/2002 | ND<2.5 | 24 |
| | 10/21/2002 | ND<2.5 | 24 |
| | 12/3/2002 | ND<2.5 | 24 |
| | 6/24/2003 ~ | 6 | 48 |
| | 12/17/2003 ~ | 14 | 55 |
| | 6/15/2004 ~ | 9.5 | 52 |
| | 12/28/2004 | 8 | 49 |
| | 6/13/2005 ~ | 8 | 50 |
| | 12/6/2005 | 9 | 51 |

Rank Sum = 401
Rank Mean = 40.1

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | 10 | 53 |
| | 9/24/2002 ~ | 18.5 | 58 |
| | 10/21/2002 | 16 | 56 |
| | 12/3/2002 | 19 | 59 |
| | 6/24/2003 | 10 | 54 |
| | 12/17/2003 | 17 | 57 |

Rank Sum = 337
Rank Mean = 56.1667

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<2.5 | 24 |
| | 9/24/2002 | ND<2.5 | 24 |
| | 10/21/2002 | ND<2.5 | 24 |
| | 12/3/2002 | ND<2.5 | 24 |
| | 6/24/2003 | ND<2.5 | 24 |
| | 12/17/2003 | ND<2.5 | 24 |
| | 6/15/2004 | ND<2.5 | 24 |
| | 12/28/2004 | ND<2.5 | 24 |
| | 6/13/2005 | ND<2.5 | 24 |
| | 12/6/2005 | ND<2.5 | 24 |

Rank Sum = 240
Rank Mean = 24

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<2.5 | 24 |
| | 12/6/2005 | ND<2.5 | 24 |

Rank Sum = 48
Rank Mean = 24

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<2.5 | 24 |

Rank Sum = 24
Rank Mean = 24

## Calculation Results:

Kruskal-Wallis H Statistic = 22.6314
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 45.7603
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
22.6314 > 14.0671 indicating a significant group difference at 5% significance level
45.7603 > 14.0671 indicating a significant group difference at 5% significance level when adjusted for ties

## Individual Well Comparisons at 1% Significance Level per Comparison

1% Z score is 2.32634
Mean background rank is 24

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| GWA-7/MW-7 | 24 | 0 | 17.869 |
| GWB-6/MW-6 | 24 | 0 | 17.869 |
| GWC-13/MW-13 | 40.1 | 16.1 | 17.869 |
| GWC-14/MW-14 | 56.1667 | 32.1667 | 20.6333 |
| GWC-5/MW-5 | 24 | 0 | 17.869 |
| GWC-17/MW-17 | 24 | 0 | 30.95 |
| GWC-18/MW-18 | 24 | 0 | 41.9065 |

## Individual Well Comparisons at Groupwise 5% Significance Level (0.714286% Significance Level per comparison)

0.714286% Z score is 2.45727

Mean background rank is 24

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|
| GWA-7/MW-7 | 24 | 0 | 18.8747 |
| GWB-6/MW-6 | 24 | 0 | 18.8747 |
| GWC-13/MW-13 | 40.1 | 16.1 | 18.8747 |
| GWC-14/MW-14 | 56.1667 | 32.1667 | 21.7946 |
| GWC-5/MW-5 | 24 | 0 | 18.8747 |
| GWC-17/MW-17 | 24 | 0 | 32.6919 |
| GWC-18/MW-18 | 24 | 0 | 44.265 |

# Concentrations (µg/L)

## Parameter: Trichlorofluoromethane

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 34
Percent Non-Detects: 57.6271%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 ~ | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 0 (0%) | 7/30/2002 ~ | 184.5 | 184.5 |
| | | | 9/24/2002 | 32 | 32 |
| | | | 10/21/2002 | 221 | 221 |
| | | | 12/3/2002 | 210 | 210 |
| | | | 6/24/2003 | 23 | 23 |
| | | | 12/17/2003 | 34 | 34 |
| | | | 6/15/2004 | 46 | 46 |
| | | | 12/28/2004 ~ | 144 | 144 |
| | | | 6/14/2005 | 22 | 22 |
| | | | 12/6/2005 ~ | 86.5 | 86.5 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |
| GWC-13/MW-13 | 10 | 0 (0%) | 7/30/2002 | 300 | 300 |
| | | | 9/24/2002 | 381 | 381 |
| | | | 10/21/2002 | 348 | 348 |
| | | | 12/3/2002 | 391 | 391 |
| | | | 6/24/2003 ~ | 44 | 44 |
| | | | 12/17/2003 ~ | 99.5 | 99.5 |
| | | | 6/15/2004 ~ | 127 | 127 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | 81 | 81 |
| | | | 6/13/2005 ~ | 45.3333 | 45.3333 |
| | | | 12/6/2005 | 60 | 60 |
| GWC-14/MW-146 | | 1 (16.6667%) | 7/30/2002 | 43 | 43 |
| | | | 9/24/2002 ~ | 47.5 | 47.5 |
| | | | 10/21/2002 | 31 | 31 |
| | | | 12/3/2002 | 27 | 27 |
| | | | 6/24/2003 | 5 | 5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| GWC-5/MW-5 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<2.5 | ND<5 |

There are 2 unused wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| Trip Blank | 3 | 3 (100%) | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

# Shapiro-Francia Test of Normality
## Parameter: Trichlorofluoromethane
## All Wells
## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 2.5 | -2.14441 | 4.59848 | -5.36102 |
| 2 | 2.5 | -1.83843 | 7.97829 | -9.95708 |
| 3 | 2.5 | -1.64485 | 10.6838 | -14.0692 |
| 4 | 2.5 | -1.50626 | 12.9526 | -17.8349 |
| 5 | 2.5 | -1.38517 | 14.8713 | -21.2978 |
| 6 | 2.5 | -1.28155 | 16.5137 | -24.5017 |
| 7 | 2.5 | -1.19522 | 17.9423 | -27.4897 |
| 8 | 2.5 | -1.11232 | 19.1795 | -30.2705 |
| 9 | 2.5 | -1.03643 | 20.2537 | -32.8616 |
| 10 | 2.5 | -0.970094 | 21.1948 | -35.2868 |
| 11 | 2.5 | -0.903992 | 22.012 | -37.5468 |
| 12 | 2.5 | -0.841621 | 22.7203 | -39.6509 |
| 13 | 2.5 | -0.785774 | 23.3378 | -41.6153 |
| 14 | 2.5 | -0.729003 | 23.8692 | -43.4378 |
| 15 | 2.5 | -0.67449 | 24.3242 | -45.124 |
| 16 | 2.5 | -0.624956 | 24.7147 | -46.6864 |
| 17 | 2.5 | -0.573953 | 25.0442 | -48.1213 |
| 18 | 2.5 | -0.524401 | 25.3191 | -49.4323 |
| 19 | 2.5 | -0.478914 | 25.5485 | -50.6296 |
| 20 | 2.5 | -0.431644 | 25.7348 | -51.7087 |
| 21 | 2.5 | -0.385321 | 25.8833 | -52.672 |
| 22 | 2.5 | -0.342466 | 26.0006 | -53.5282 |
| 23 | 2.5 | -0.297612 | 26.0892 | -54.2722 |
| 24 | 2.5 | -0.253347 | 26.1533 | -54.9056 |
| 25 | 2.5 | -0.212137 | 26.1983 | -55.4359 |
| 26 | 2.5 | -0.168741 | 26.2268 | -55.8578 |
| 27 | 2.5 | -0.125661 | 26.2426 | -56.1719 |
| 28 | 2.5 | -0.0853288 | 26.2499 | -56.3852 |
| 29 | 2.5 | -0.0426257 | 26.2517 | -56.4918 |
| 30 | 2.5 | 0 | 26.2517 | -56.4918 |
| 31 | 2.5 | 0.0426257 | 26.2535 | -56.3852 |
| 32 | 2.5 | 0.0853288 | 26.2608 | -56.1719 |
| 33 | 2.5 | 0.125661 | 26.2766 | -55.8578 |
| 34 | 2.5 | 0.168741 | 26.3051 | -55.4359 |
| 35 | 5 | 0.212137 | 26.3501 | -54.3752 |
| 36 | 22 | 0.253347 | 26.4142 | -48.8016 |
| 37 | 23 | 0.297612 | 26.5028 | -41.9565 |
| 38 | 27 | 0.342466 | 26.6201 | -32.71 |
| 39 | 31 | 0.385321 | 26.7686 | -20.765 |
| 40 | 32 | 0.431644 | 26.9549 | -6.95241 |
| 41 | 34 | 0.478914 | 27.1843 | 9.33066 |
| 42 | 43 | 0.524401 | 27.4592 | 31.8799 |
| 43 | 44 | 0.573953 | 27.7887 | 57.1338 |
| 44 | 45.3333 | 0.624956 | 28.1792 | 85.4651 |
| 45 | 46 | 0.67449 | 28.6342 | 116.492 |
| 46 | 47.5 | 0.729003 | 29.1656 | 151.119 |

| | | | | |
|---|---|---|---|---|
| 47 | 60 | 0.785774 | 29.7831 | 198.266 |
| 48 | 81 | 0.841621 | 30.4914 | 266.437 |
| 49 | 86.5 | 0.903992 | 31.3086 | 344.632 |
| 50 | 99.5 | 0.970094 | 32.2497 | 441.157 |
| 51 | 127 | 1.03643 | 33.3239 | 572.784 |
| 52 | 144 | 1.11232 | 34.5611 | 732.958 |
| 53 | 184.5 | 1.19522 | 35.9897 | 953.476 |
| 54 | 210 | 1.28155 | 37.6321 | 1222.6 |
| 55 | 221 | 1.38517 | 39.5508 | 1528.73 |
| 56 | 300 | 1.50626 | 41.8196 | 1980.6 |
| 57 | 348 | 1.64485 | 44.5251 | 2553.01 |
| 58 | 381 | 1.83843 | 47.9049 | 3253.45 |

Sample Standard Deviation = 97.4728
Numerator = 1.05849e+007
Denominator = 2.63982e+007 = 58 47.9049
W Statistic = 0.400972
5% Critical value of 0.962 exceeds 0.400972
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.400972
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Trichlorofluoromethane

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<2.5 | 17.5 |
| | 9/24/2002 | ND<2.5 | 17.5 |
| | 10/21/2002 ~ | ND<2.5 | 17.5 |
| | 12/3/2002 | ND<2.5 | 17.5 |
| | 6/24/2003 | ND<2.5 | 17.5 |
| | 12/17/2003 | ND<2.5 | 17.5 |
| | 6/15/2004 | ND<2.5 | 17.5 |
| | 12/28/2004 | ND<2.5 | 17.5 |
| | 6/14/2005 | ND<2.5 | 17.5 |
| | 12/5/2005 | ND<2.5 | 17.5 |

Rank Sum = 175
Rank Mean = 17.5

Background Rank Sum = 175
Background Rank Mean = 17.5

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | 184.5 | 53 |
| | 9/24/2002 | 32 | 40 |
| | 10/21/2002 | 221 | 55 |
| | 12/3/2002 | 210 | 54 |
| | 6/24/2003 | 23 | 37 |
| | 12/17/2003 | 34 | 41 |
| | 6/15/2004 | 46 | 45 |
| | 12/28/2004 ~ | 144 | 52 |
| | 6/14/2005 | 22 | 36 |
| | 12/6/2005 ~ | 86.5 | 49 |

Rank Sum = 462
Rank Mean = 46.2

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<2.5 | 17.5 |
| | 9/24/2002 | ND<2.5 | 17.5 |
| | 10/21/2002 | ND<2.5 | 17.5 |
| | 12/3/2002 | ND<2.5 | 17.5 |
| | 6/24/2003 | ND<2.5 | 17.5 |
| | 12/17/2003 | ND<2.5 | 17.5 |
| | 6/15/2004 | ND<2.5 | 17.5 |
| | 12/28/2004 | ND<2.5 | 17.5 |
| | 6/13/2005 | ND<2.5 | 17.5 |
| | 12/5/2005 | ND<2.5 | 17.5 |

Rank Sum = 175
Rank Mean = 17.5

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | 300 | 56 |
| | 9/24/2002 | 381 | 58 |
| | 10/21/2002 | 348 | 57 |
| | 12/3/2002 | 391 | 59 |
| | 6/24/2003 ~ | 44 | 43 |
| | 12/17/2003 ~ | 99.5 | 50 |
| | 6/15/2004 ~ | 127 | 51 |
| | 12/28/2004 | 81 | 48 |
| | 6/13/2005 ~ | 45.3333 | 44 |
| | 12/6/2005 | 60 | 47 |

Rank Sum = 513
Rank Mean = 51.3

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | 43 | 42 |
| | 9/24/2002 ~ | 47.5 | 46 |
| | 10/21/2002 | 31 | 39 |
| | 12/3/2002 | 27 | 38 |
| | 6/24/2003 | 5 | 35 |
| | 12/17/2003 | ND<2.5 | 17.5 |

Rank Sum = 217.5
Rank Mean = 36.25

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<2.5 | 17.5 |
| | 9/24/2002 | ND<2.5 | 17.5 |
| | 10/21/2002 | ND<2.5 | 17.5 |
| | 12/3/2002 | ND<2.5 | 17.5 |
| | 6/24/2003 | ND<2.5 | 17.5 |
| | 12/17/2003 | ND<2.5 | 17.5 |
| | 6/15/2004 | ND<2.5 | 17.5 |
| | 12/28/2004 | ND<2.5 | 17.5 |
| | 6/13/2005 | ND<2.5 | 17.5 |
| | 12/6/2005 | ND<2.5 | 17.5 |

Rank Sum = 175
Rank Mean = 17.5

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<2.5 | 17.5 |
| | 12/6/2005 | ND<2.5 | 17.5 |

Rank Sum = 35
Rank Mean = 17.5

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<2.5 | 17.5 |

Rank Sum = 17.5
Rank Mean = 17.5

## Calculation Results:

Kruskal-Wallis H Statistic = 42.5489
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 52.6115
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
42.5489 > 14.0671 indicating a significant group difference at 5% significance level
52.6115 > 14.0671 indicating a significant group difference at 5% significance level when adjusted for ties

## Individual Well Comparisons at 1% Significance Level per Comparison

1% Z score is 2.32634
Mean background rank is 17.5

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| GWA-7/MW-7 | 46.2 | 28.7 | 17.869 |
| GWB-6/MW-6 | 17.5 | 0 | 17.869 |
| GWC-13/MW-13 | 51.3 | 33.8 | 17.869 |
| GWC-14/MW-14 | 36.25 | 18.75 | 20.6333 |
| GWC-5/MW-5 | 17.5 | 0 | 17.869 |
| GWC-17/MW-17 | 17.5 | 0 | 30.95 |
| GWC-18/MW-18 | 17.5 | 0 | 41.9065 |

## Individual Well Comparisons at Groupwise 5% Significance Level (0.714286% Significance Level per comparison)

0.714286% Z score is 2.45727

Mean background rank is 17.5

| Well | Mean Rank | Dif from Bkg | Critical Value |
|---|---|---|---|
| GWA-7/MW-7 | 46.2 | 28.7 | 18.8747 |
| GWB-6/MW-6 | 17.5 | 0 | 18.8747 |
| GWC-13/MW-13 | 51.3 | 33.8 | 18.8747 |
| GWC-14/MW-14 | 36.25 | 18.75 | 21.7946 |
| GWC-5/MW-5 | 17.5 | 0 | 18.8747 |
| GWC-17/MW-17 | 17.5 | 0 | 32.6919 |
| GWC-18/MW-18 | 17.5 | 0 | 44.265 |

# Concentrations (µg/L)
## Parameter: Vinyl chloride

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 55
Percent Non-Detects: 93.2203%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<1 | ND<2 |
| | | | 9/24/2002 | ND<1 | ND<2 |
| | | | 10/21/2002 ~ | ND<1 | ND<2 |
| | | | 12/3/2002 | ND<1 | ND<2 |
| | | | 6/24/2003 | ND<1 | ND<2 |
| | | | 12/17/2003 | ND<1 | ND<2 |
| | | | 6/15/2004 | ND<1 | ND<2 |
| | | | 12/28/2004 | ND<1 | ND<2 |
| | | | 6/14/2005 | ND<1 | ND<2 |
| | | | 12/5/2005 | ND<1 | ND<2 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 10 (100%) | 7/30/2002 ~ | ND<1 | ND<2 |
| | | | 9/24/2002 | ND<1 | ND<2 |
| | | | 10/21/2002 | ND<1 | ND<2 |
| | | | 12/3/2002 | ND<1 | ND<2 |
| | | | 6/24/2003 | ND<1 | ND<2 |
| | | | 12/17/2003 | ND<1 | ND<2 |
| | | | 6/15/2004 | ND<1 | ND<2 |
| | | | 12/28/2004 ~ | ND<1 | ND<2 |
| | | | 6/14/2005 | ND<1 | ND<2 |
| | | | 12/6/2005 ~ | ND<1 | ND<2 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<1 | ND<2 |
| | | | 9/24/2002 | ND<1 | ND<2 |
| | | | 10/21/2002 | ND<1 | ND<2 |
| | | | 12/3/2002 | ND<1 | ND<2 |
| | | | 6/24/2003 | ND<1 | ND<2 |
| | | | 12/17/2003 | ND<1 | ND<2 |
| | | | 6/15/2004 | ND<1 | ND<2 |
| | | | 12/28/2004 | ND<1 | ND<2 |
| | | | 6/13/2005 | ND<1 | ND<2 |
| | | | 12/5/2005 | ND<1 | ND<2 |
| GWC-13/MW-13 | 10 | 8 (80%) | 7/30/2002 | ND<1 | ND<2 |
| | | | 9/24/2002 | ND<1 | ND<2 |
| | | | 10/21/2002 | ND<1 | ND<2 |
| | | | 12/3/2002 | ND<1 | ND<2 |
| | | | 6/24/2003 ~ | ND<1 | ND<2 |
| | | | 12/17/2003 ~ | ND<1 | ND<2 |
| | | | 6/15/2004 ~ | 2 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | ND<1 | ND<2 |
| | | | 6/13/2005 ~ | ND<1 | ND<2 |
| | | | 12/6/2005 | 1 | 1 |
| GWC-14/MW-146 | | 4 (66.6667%) | 7/30/2002 | ND<1 | ND<2 |
| | | | 9/24/2002 ~ | 2.5 | 2.5 |
| | | | 10/21/2002 | ND<1 | ND<2 |
| | | | 12/3/2002 | 4 | 4 |
| | | | 6/24/2003 | ND<1 | ND<2 |
| | | | 12/17/2003 | ND<1 | ND<2 |
| GWC-5/MW-5 | 10 | 10 (100%) | 7/30/2002 | ND<1 | ND<2 |
| | | | 9/24/2002 | ND<1 | ND<2 |
| | | | 10/21/2002 | ND<1 | ND<2 |
| | | | 12/3/2002 | ND<1 | ND<2 |
| | | | 6/24/2003 | ND<1 | ND<2 |
| | | | 12/17/2003 | ND<1 | ND<2 |
| | | | 6/15/2004 | ND<1 | ND<2 |
| | | | 12/28/2004 | ND<1 | ND<2 |
| | | | 6/13/2005 | ND<1 | ND<2 |
| | | | 12/6/2005 | ND<1 | ND<2 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<1 | ND<2 |
| | | | 12/6/2005 | ND<1 | ND<2 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<1 | ND<2 |

There are 2 unused wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<1 | ND<2 |
| | | | 12/17/2003 | ND<1 | ND<2 |
| | | | 6/15/2004 | ND<1 | ND<2 |
| | | | 12/28/2004 ~ | ND<1 | ND<2 |
| | | | 6/15/2005 ~ | ND<1 | ND<2 |
| | | | 12/6/2005 | ND<1 | ND<2 |
| Trip Blank | 3 | 3 (100%) | 12/17/2003 | ND<1 | ND<2 |
| | | | 6/13/2005 | ND<1 | ND<2 |
| | | | 12/5/2005 | ND<1 | ND<2 |

# Shapiro-Francia Test of Normality

## Parameter: Vinyl chloride

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | -2.14441 | 4.59848 | -2.14441 |
| 2 | 1 | -1.83843 | 7.97829 | -3.98283 |
| 3 | 1 | -1.64485 | 10.6838 | -5.62768 |
| 4 | 1 | -1.50626 | 12.9526 | -7.13394 |
| 5 | 1 | -1.38517 | 14.8713 | -8.51912 |
| 6 | 1 | -1.28155 | 16.5137 | -9.80067 |
| 7 | 1 | -1.19522 | 17.9423 | -10.9959 |
| 8 | 1 | -1.11232 | 19.1795 | -12.1082 |
| 9 | 1 | -1.03643 | 20.2537 | -13.1446 |
| 10 | 1 | -0.970094 | 21.1948 | -14.1147 |
| 11 | 1 | -0.903992 | 22.012 | -15.0187 |
| 12 | 1 | -0.841621 | 22.7203 | -15.8604 |
| 13 | 1 | -0.785774 | 23.3378 | -16.6461 |
| 14 | 1 | -0.729003 | 23.8692 | -17.3751 |
| 15 | 1 | -0.67449 | 24.3242 | -18.0496 |
| 16 | 1 | -0.624956 | 24.7147 | -18.6746 |
| 17 | 1 | -0.573953 | 25.0442 | -19.2485 |
| 18 | 1 | -0.524401 | 25.3191 | -19.7729 |
| 19 | 1 | -0.478914 | 25.5485 | -20.2518 |
| 20 | 1 | -0.431644 | 25.7348 | -20.6835 |
| 21 | 1 | -0.385321 | 25.8833 | -21.0688 |
| 22 | 1 | -0.342466 | 26.0006 | -21.4113 |
| 23 | 1 | -0.297612 | 26.0892 | -21.7089 |
| 24 | 1 | -0.253347 | 26.1533 | -21.9622 |
| 25 | 1 | -0.212137 | 26.1983 | -22.1744 |
| 26 | 1 | -0.168741 | 26.2268 | -22.3431 |
| 27 | 1 | -0.125661 | 26.2426 | -22.4688 |
| 28 | 1 | -0.0853288 | 26.2499 | -22.5541 |
| 29 | 1 | -0.0426257 | 26.2517 | -22.5967 |
| 30 | 1 | 0 | 26.2517 | -22.5967 |
| 31 | 1 | 0.0426257 | 26.2535 | -22.5541 |
| 32 | 1 | 0.0853288 | 26.2608 | -22.4688 |
| 33 | 1 | 0.125661 | 26.2766 | -22.3431 |
| 34 | 1 | 0.168741 | 26.3051 | -22.1744 |
| 35 | 1 | 0.212137 | 26.3501 | -21.9622 |
| 36 | 1 | 0.253347 | 26.4142 | -21.7089 |
| 37 | 1 | 0.297612 | 26.5028 | -21.4113 |
| 38 | 1 | 0.342466 | 26.6201 | -21.0688 |
| 39 | 1 | 0.385321 | 26.7686 | -20.6835 |
| 40 | 1 | 0.431644 | 26.9549 | -20.2518 |
| 41 | 1 | 0.478914 | 27.1843 | -19.7729 |
| 42 | 1 | 0.524401 | 27.4592 | -19.2485 |
| 43 | 1 | 0.573953 | 27.7887 | -18.6746 |
| 44 | 1 | 0.624956 | 28.1792 | -18.0496 |
| 45 | 1 | 0.67449 | 28.6342 | -17.3751 |
| 46 | 1 | 0.729003 | 29.1656 | -16.6461 |

| | | | | |
|---|---|---|---|---|
| 47 | 1 | 0.785774 | 29.7831 | -15.8604 |
| 48 | 1 | 0.841621 | 30.4914 | -15.0187 |
| 49 | 1 | 0.903992 | 31.3086 | -14.1147 |
| 50 | 1 | 0.970094 | 32.2497 | -13.1446 |
| 51 | 1 | 1.03643 | 33.3239 | -12.1082 |
| 52 | 1 | 1.11232 | 34.5611 | -10.9959 |
| 53 | 1 | 1.19522 | 35.9897 | -9.80067 |
| 54 | 1 | 1.28155 | 37.6321 | -8.51912 |
| 55 | 1 | 1.38517 | 39.5508 | -7.13394 |
| 56 | 1 | 1.50626 | 41.8196 | -5.62768 |
| 57 | 2 | 1.64485 | 44.5251 | -2.33798 |
| 58 | 2.5 | 1.83843 | 47.9049 | 2.25808 |

Sample Standard Deviation = 0.449852
Numerator = 5.09894
Denominator = 562.274 = 58 47.9049
W Statistic = 0.00906844
5% Critical value of 0.962 exceeds 0.00906844
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.00906844
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Vinyl chloride

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

## Kruskal Wallis Ranks

### Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<1 | 28 |
| | 9/24/2002 | ND<1 | 28 |
| | 10/21/2002 ~ | ND<1 | 28 |
| | 12/3/2002 | ND<1 | 28 |
| | 6/24/2003 | ND<1 | 28 |
| | 12/17/2003 | ND<1 | 28 |
| | 6/15/2004 | ND<1 | 28 |
| | 12/28/2004 | ND<1 | 28 |
| | 6/14/2005 | ND<1 | 28 |
| | 12/5/2005 | ND<1 | 28 |

Rank Sum = 280
Rank Mean = 28

Background Rank Sum = 280
Background Rank Mean = 28

### Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | ND<1 | 28 |
| | 9/24/2002 | ND<1 | 28 |
| | 10/21/2002 | ND<1 | 28 |
| | 12/3/2002 | ND<1 | 28 |
| | 6/24/2003 | ND<1 | 28 |
| | 12/17/2003 | ND<1 | 28 |
| | 6/15/2004 | ND<1 | 28 |
| | 12/28/2004 ~ | ND<1 | 28 |
| | 6/14/2005 | ND<1 | 28 |
| | 12/6/2005 ~ | ND<1 | 28 |

Rank Sum = 280
Rank Mean = 28

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<1 | 28 |
| | 9/24/2002 | ND<1 | 28 |
| | 10/21/2002 | ND<1 | 28 |
| | 12/3/2002 | ND<1 | 28 |
| | 6/24/2003 | ND<1 | 28 |
| | 12/17/2003 | ND<1 | 28 |
| | 6/15/2004 | ND<1 | 28 |
| | 12/28/2004 | ND<1 | 28 |
| | 6/13/2005 | ND<1 | 28 |
| | 12/5/2005 | ND<1 | 28 |

Rank Sum = 280
Rank Mean = 28

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | ND<1 | 28 |
| | 9/24/2002 | ND<1 | 28 |
| | 10/21/2002 | ND<1 | 28 |
| | 12/3/2002 | ND<1 | 28 |
| | 6/24/2003 ~ | ND<1 | 28 |
| | 12/17/2003 ~ | ND<1 | 28 |
| | 6/15/2004 ~ | 2 | 57 |
| | 12/28/2004 | ND<1 | 28 |
| | 6/13/2005 ~ | ND<1 | 28 |
| | 12/6/2005 | 1 | 56 |

Rank Sum = 337
Rank Mean = 33.7

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | ND<1 | 28 |
| | 9/24/2002 ~ | 2.5 | 58 |
| | 10/21/2002 | ND<1 | 28 |
| | 12/3/2002 | 4 | 59 |
| | 6/24/2003 | ND<1 | 28 |
| | 12/17/2003 | ND<1 | 28 |

Rank Sum = 229
Rank Mean = 38.1667

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<1 | 28 |
| | 9/24/2002 | ND<1 | 28 |
| | 10/21/2002 | ND<1 | 28 |
| | 12/3/2002 | ND<1 | 28 |
| | 6/24/2003 | ND<1 | 28 |
| | 12/17/2003 | ND<1 | 28 |
| | 6/15/2004 | ND<1 | 28 |
| | 12/28/2004 | ND<1 | 28 |
| | 6/13/2005 | ND<1 | 28 |
| | 12/6/2005 | ND<1 | 28 |

Rank Sum = 280
Rank Mean = 28

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<1 | 28 |
| | 12/6/2005 | ND<1 | 28 |

Rank Sum = 56
Rank Mean = 28

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<1 | 28 |

Rank Sum = 28
Rank Mean = 28

## Calculation Results:

Kruskal-Wallis H Statistic = 2.40362
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 12.6541
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
2.40362 < 14.0671 indicating no significant group difference at 5% significance level
12.6541 < 14.0671 indicating no significant group difference at 5% significance level when adjusted for ties

# Concentrations (µg/L)

## Parameter: Benzene

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 58
Percent Non-Detects: 98.3051%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 ~ | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 10 (100%) | 7/30/2002 ~ | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 ~ | ND<2.5 | ND<5 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |
| GWC-13/MW-13 | 10 | 9 (90%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 ~ | ND<2.5 | ND<5 |
| | | | 12/17/2003 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2004 ~ | ND<2.5 | ND<5 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | 5 | 5 |
| GWC-14/MW-146 | | 6 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 ~ | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| GWC-5/MW-5 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<2.5 | ND<5 |

There are 2 unused wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| Trip Blank | 3 | 3 (100%) | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

# Shapiro-Francia Test of Normality

## Parameter: Benzene

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 2.5 | -2.14441 | 4.59848 | -5.36102 |
| 2 | 2.5 | -1.83843 | 7.97829 | -9.95708 |
| 3 | 2.5 | -1.64485 | 10.6838 | -14.0692 |
| 4 | 2.5 | -1.50626 | 12.9526 | -17.8349 |
| 5 | 2.5 | -1.38517 | 14.8713 | -21.2978 |
| 6 | 2.5 | -1.28155 | 16.5137 | -24.5017 |
| 7 | 2.5 | -1.19522 | 17.9423 | -27.4897 |
| 8 | 2.5 | -1.11232 | 19.1795 | -30.2705 |
| 9 | 2.5 | -1.03643 | 20.2537 | -32.8616 |
| 10 | 2.5 | -0.970094 | 21.1948 | -35.2868 |
| 11 | 2.5 | -0.903992 | 22.012 | -37.5468 |
| 12 | 2.5 | -0.841621 | 22.7203 | -39.6509 |
| 13 | 2.5 | -0.785774 | 23.3378 | -41.6153 |
| 14 | 2.5 | -0.729003 | 23.8692 | -43.4378 |
| 15 | 2.5 | -0.67449 | 24.3242 | -45.124 |
| 16 | 2.5 | -0.624956 | 24.7147 | -46.6864 |
| 17 | 2.5 | -0.573953 | 25.0442 | -48.1213 |
| 18 | 2.5 | -0.524401 | 25.3191 | -49.4323 |
| 19 | 2.5 | -0.478914 | 25.5485 | -50.6296 |
| 20 | 2.5 | -0.431644 | 25.7348 | -51.7087 |
| 21 | 2.5 | -0.385321 | 25.8833 | -52.672 |
| 22 | 2.5 | -0.342466 | 26.0006 | -53.5282 |
| 23 | 2.5 | -0.297612 | 26.0892 | -54.2722 |
| 24 | 2.5 | -0.253347 | 26.1533 | -54.9056 |
| 25 | 2.5 | -0.212137 | 26.1983 | -55.4359 |
| 26 | 2.5 | -0.168741 | 26.2268 | -55.8578 |
| 27 | 2.5 | -0.125661 | 26.2426 | -56.1719 |
| 28 | 2.5 | -0.0853288 | 26.2499 | -56.3852 |
| 29 | 2.5 | -0.0426257 | 26.2517 | -56.4918 |
| 30 | 2.5 | 0 | 26.2517 | -56.4918 |
| 31 | 2.5 | 0.0426257 | 26.2535 | -56.3852 |
| 32 | 2.5 | 0.0853288 | 26.2608 | -56.1719 |
| 33 | 2.5 | 0.125661 | 26.2766 | -55.8578 |
| 34 | 2.5 | 0.168741 | 26.3051 | -55.4359 |
| 35 | 2.5 | 0.212137 | 26.3501 | -54.9056 |
| 36 | 2.5 | 0.253347 | 26.4142 | -54.2722 |
| 37 | 2.5 | 0.297612 | 26.5028 | -53.5282 |
| 38 | 2.5 | 0.342466 | 26.6201 | -52.672 |
| 39 | 2.5 | 0.385321 | 26.7686 | -51.7087 |
| 40 | 2.5 | 0.431644 | 26.9549 | -50.6296 |
| 41 | 2.5 | 0.478914 | 27.1843 | -49.4323 |
| 42 | 2.5 | 0.524401 | 27.4592 | -48.1213 |
| 43 | 2.5 | 0.573953 | 27.7887 | -46.6864 |
| 44 | 2.5 | 0.624956 | 28.1792 | -45.124 |
| 45 | 2.5 | 0.67449 | 28.6342 | -43.4378 |
| 46 | 2.5 | 0.729003 | 29.1656 | -41.6153 |

| | | | | |
|---|---|---|---|---|
| 47 | 2.5 | 0.785774 | 29.7831 | -39.6509 |
| 48 | 2.5 | 0.841621 | 30.4914 | -37.5468 |
| 49 | 2.5 | 0.903992 | 31.3086 | -35.2868 |
| 50 | 2.5 | 0.970094 | 32.2497 | -32.8616 |
| 51 | 2.5 | 1.03643 | 33.3239 | -30.2705 |
| 52 | 2.5 | 1.11232 | 34.5611 | -27.4897 |
| 53 | 2.5 | 1.19522 | 35.9897 | -24.5017 |
| 54 | 2.5 | 1.28155 | 37.6321 | -21.2978 |
| 55 | 2.5 | 1.38517 | 39.5508 | -17.8349 |
| 56 | 2.5 | 1.50626 | 41.8196 | -14.0692 |
| 57 | 2.5 | 1.64485 | 44.5251 | -9.95708 |
| 58 | 2.5 | 1.83843 | 47.9049 | -5.36102 |

Sample Standard Deviation = 0.325472
Numerator = 28.7405
Denominator = 294.331 = 58 47.9049
W Statistic = 0.0976468
5% Critical value of 0.962 exceeds 0.0976468
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.0976468
Evidence of non-normality at 99% level of significance

# Kruskal-Wallis Non-Parametric Test

## Parameter: Benzene

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

# Kruskal Wallis Ranks

## Background Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-15/MW-15 | 7/30/2002 | ND<2.5 | 29.5 |
| | 9/24/2002 | ND<2.5 | 29.5 |
| | 10/21/2002 ~ | ND<2.5 | 29.5 |
| | 12/3/2002 | ND<2.5 | 29.5 |
| | 6/24/2003 | ND<2.5 | 29.5 |
| | 12/17/2003 | ND<2.5 | 29.5 |
| | 6/15/2004 | ND<2.5 | 29.5 |
| | 12/28/2004 | ND<2.5 | 29.5 |
| | 6/14/2005 | ND<2.5 | 29.5 |
| | 12/5/2005 | ND<2.5 | 29.5 |

Rank Sum = 295
Rank Mean = 29.5

Background Rank Sum = 295
Background Rank Mean = 29.5

## Compliance Wells

| Well ID | Date | Result | Rank |
|---|---|---|---|
| GWA-7/MW-7 | 7/30/2002 ~ | ND<2.5 | 29.5 |
| | 9/24/2002 | ND<2.5 | 29.5 |
| | 10/21/2002 | ND<2.5 | 29.5 |
| | 12/3/2002 | ND<2.5 | 29.5 |
| | 6/24/2003 | ND<2.5 | 29.5 |
| | 12/17/2003 | ND<2.5 | 29.5 |
| | 6/15/2004 | ND<2.5 | 29.5 |
| | 12/28/2004 ~ | ND<2.5 | 29.5 |
| | 6/14/2005 | ND<2.5 | 29.5 |
| | 12/6/2005 ~ | ND<2.5 | 29.5 |

Rank Sum = 295
Rank Mean = 29.5

| | | | |
|---|---|---|---|
| GWB-6/MW-6 | 7/30/2002 | ND<2.5 | 29.5 |
| | 9/24/2002 | ND<2.5 | 29.5 |
| | 10/21/2002 | ND<2.5 | 29.5 |
| | 12/3/2002 | ND<2.5 | 29.5 |
| | 6/24/2003 | ND<2.5 | 29.5 |
| | 12/17/2003 | ND<2.5 | 29.5 |
| | 6/15/2004 | ND<2.5 | 29.5 |
| | 12/28/2004 | ND<2.5 | 29.5 |
| | 6/13/2005 | ND<2.5 | 29.5 |
| | 12/5/2005 | ND<2.5 | 29.5 |

Rank Sum = 295
Rank Mean = 29.5

| | | | |
|---|---|---|---|
| GWC-13/MW-13 | 7/30/2002 | ND<2.5 | 29.5 |
| | 9/24/2002 | ND<2.5 | 29.5 |
| | 10/21/2002 | ND<2.5 | 29.5 |
| | 12/3/2002 | ND<2.5 | 29.5 |
| | 6/24/2003 ~ | ND<2.5 | 29.5 |
| | 12/17/2003 ~ | ND<2.5 | 29.5 |
| | 6/15/2004 ~ | ND<2.5 | 29.5 |
| | 12/28/2004 | ND<2.5 | 29.5 |
| | 6/13/2005 ~ | ND<2.5 | 29.5 |
| | 12/6/2005 | 5 | 59 |

Rank Sum = 324.5
Rank Mean = 32.45

| | | | |
|---|---|---|---|
| GWC-14/MW-14 | 7/30/2002 | ND<2.5 | 29.5 |
| | 9/24/2002 ~ | ND<2.5 | 29.5 |
| | 10/21/2002 | ND<2.5 | 29.5 |
| | 12/3/2002 | ND<2.5 | 29.5 |
| | 6/24/2003 | ND<2.5 | 29.5 |
| | 12/17/2003 | ND<2.5 | 29.5 |

Rank Sum = 177
Rank Mean = 29.5

| | | | |
|---|---|---|---|
| GWC-5/MW-5 | 7/30/2002 | ND<2.5 | 29.5 |
| | 9/24/2002 | ND<2.5 | 29.5 |
| | 10/21/2002 | ND<2.5 | 29.5 |
| | 12/3/2002 | ND<2.5 | 29.5 |
| | 6/24/2003 | ND<2.5 | 29.5 |
| | 12/17/2003 | ND<2.5 | 29.5 |
| | 6/15/2004 | ND<2.5 | 29.5 |
| | 12/28/2004 | ND<2.5 | 29.5 |
| | 6/13/2005 | ND<2.5 | 29.5 |
| | 12/6/2005 | ND<2.5 | 29.5 |

Rank Sum = 295
Rank Mean = 29.5

| | | | |
|---|---|---|---|
| GWC-17/MW-17 | 6/15/2005 | ND<2.5 | 29.5 |
| | 12/6/2005 | ND<2.5 | 29.5 |

Rank Sum = 59
Rank Mean = 29.5

| | | | |
|---|---|---|---|
| GWC-18/MW-18 | 6/15/2005 | ND<2.5 | 29.5 |

Rank Sum = 29.5
Rank Mean = 29.5

## Calculation Results:

Kruskal-Wallis H Statistic = 0.245
Kruskal-Wallis H Statistic (adjusted for tied non-detects) = 4.9
95% Confidence comparison value is 14.0671 at 7 degrees of freedom
0.245 < 14.0671 indicating no significant group difference at 5% significance level
4.9 < 14.0671 indicating no significant group difference at 5% significance level when adjusted for ties

# Concentrations (µg/L)

## Parameter: Trichloroethene

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Samples: 59
Total Non-Detect: 57
Percent Non-Detects: 96.6102%
Total Background Samples: 10
There is 1 background well

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-15/MW-15 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 ~ | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

There are 7 compliance wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| GWA-7/MW-7 | 10 | 9 (90%) | 7/30/2002 ~ | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | 13 | 13 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/14/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 ~ | ND<2.5 | ND<5 |
| GWB-6/MW-6 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |
| GWC-13/MW-13 | 10 | 9 (90%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 ~ | ND<2.5 | ND<5 |
| | | | 12/17/2003 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2004 ~ | ND<2.5 | ND<5 |

| | | | | | |
|---|---|---|---|---|---|
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | 5 | 5 |
| GWC-14/MW-146 | | 6 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 ~ | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| GWC-5/MW-5 | 10 | 10 (100%) | 7/30/2002 | ND<2.5 | ND<5 |
| | | | 9/24/2002 | ND<2.5 | ND<5 |
| | | | 10/21/2002 | ND<2.5 | ND<5 |
| | | | 12/3/2002 | ND<2.5 | ND<5 |
| | | | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-17/MW-172 | | 2 (100%) | 6/15/2005 | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| GWC-18/MW-181 | | 1 (100%) | 6/15/2005 | ND<2.5 | ND<5 |

There are 2 unused wells

| Well | Samples | ND | Date | Result | Original |
|---|---|---|---|---|---|
| EQ-Blank | 6 | 6 (100%) | 6/24/2003 | ND<2.5 | ND<5 |
| | | | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/15/2004 | ND<2.5 | ND<5 |
| | | | 12/28/2004 ~ | ND<2.5 | ND<5 |
| | | | 6/15/2005 ~ | ND<2.5 | ND<5 |
| | | | 12/6/2005 | ND<2.5 | ND<5 |
| Trip Blank | 3 | 3 (100%) | 12/17/2003 | ND<2.5 | ND<5 |
| | | | 6/13/2005 | ND<2.5 | ND<5 |
| | | | 12/5/2005 | ND<2.5 | ND<5 |

# Shapiro-Francia Test of Normality

## Parameter: Trichloroethene

## All Wells

## Normality Test of Parameter Concentrations

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
Total Sample Size = 59

| i | x(i) | m(i) | sum(m^2) | sum(mx) |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 2.5 | -2.14441 | 4.59848 | -5.36102 |
| 2 | 2.5 | -1.83843 | 7.97829 | -9.95708 |
| 3 | 2.5 | -1.64485 | 10.6838 | -14.0692 |
| 4 | 2.5 | -1.50626 | 12.9526 | -17.8349 |
| 5 | 2.5 | -1.38517 | 14.8713 | -21.2978 |
| 6 | 2.5 | -1.28155 | 16.5137 | -24.5017 |
| 7 | 2.5 | -1.19522 | 17.9423 | -27.4897 |
| 8 | 2.5 | -1.11232 | 19.1795 | -30.2705 |
| 9 | 2.5 | -1.03643 | 20.2537 | -32.8616 |
| 10 | 2.5 | -0.970094 | 21.1948 | -35.2868 |
| 11 | 2.5 | -0.903992 | 22.012 | -37.5468 |
| 12 | 2.5 | -0.841621 | 22.7203 | -39.6509 |
| 13 | 2.5 | -0.785774 | 23.3378 | -41.6153 |
| 14 | 2.5 | -0.729003 | 23.8692 | -43.4378 |
| 15 | 2.5 | -0.67449 | 24.3242 | -45.124 |
| 16 | 2.5 | -0.624956 | 24.7147 | -46.6864 |
| 17 | 2.5 | -0.573953 | 25.0442 | -48.1213 |
| 18 | 2.5 | -0.524401 | 25.3191 | -49.4323 |
| 19 | 2.5 | -0.478914 | 25.5485 | -50.6296 |
| 20 | 2.5 | -0.431644 | 25.7348 | -51.7087 |
| 21 | 2.5 | -0.385321 | 25.8833 | -52.672 |
| 22 | 2.5 | -0.342466 | 26.0006 | -53.5282 |
| 23 | 2.5 | -0.297612 | 26.0892 | -54.2722 |
| 24 | 2.5 | -0.253347 | 26.1533 | -54.9056 |
| 25 | 2.5 | -0.212137 | 26.1983 | -55.4359 |
| 26 | 2.5 | -0.168741 | 26.2268 | -55.8578 |
| 27 | 2.5 | -0.125661 | 26.2426 | -56.1719 |
| 28 | 2.5 | -0.0853288 | 26.2499 | -56.3852 |
| 29 | 2.5 | -0.0426257 | 26.2517 | -56.4918 |
| 30 | 2.5 | 0 | 26.2517 | -56.4918 |
| 31 | 2.5 | 0.0426257 | 26.2535 | -56.3852 |
| 32 | 2.5 | 0.0853288 | 26.2608 | -56.1719 |
| 33 | 2.5 | 0.125661 | 26.2766 | -55.8578 |
| 34 | 2.5 | 0.168741 | 26.3051 | -55.4359 |
| 35 | 2.5 | 0.212137 | 26.3501 | -54.9056 |
| 36 | 2.5 | 0.253347 | 26.4142 | -54.2722 |
| 37 | 2.5 | 0.297612 | 26.5028 | -53.5282 |
| 38 | 2.5 | 0.342466 | 26.6201 | -52.672 |
| 39 | 2.5 | 0.385321 | 26.7686 | -51.7087 |
| 40 | 2.5 | 0.431644 | 26.9549 | -50.6296 |
| 41 | 2.5 | 0.478914 | 27.1843 | -49.4323 |
| 42 | 2.5 | 0.524401 | 27.4592 | -48.1213 |
| 43 | 2.5 | 0.573953 | 27.7887 | -46.6864 |
| 44 | 2.5 | 0.624956 | 28.1792 | -45.124 |
| 45 | 2.5 | 0.67449 | 28.6342 | -43.4378 |
| 46 | 2.5 | 0.729003 | 29.1656 | -41.6153 |

| | | | | |
|---|---|---|---|---|
| 47 | 2.5 | 0.785774 | 29.7831 | -39.6509 |
| 48 | 2.5 | 0.841621 | 30.4914 | -37.5468 |
| 49 | 2.5 | 0.903992 | 31.3086 | -35.2868 |
| 50 | 2.5 | 0.970094 | 32.2497 | -32.8616 |
| 51 | 2.5 | 1.03643 | 33.3239 | -30.2705 |
| 52 | 2.5 | 1.11232 | 34.5611 | -27.4897 |
| 53 | 2.5 | 1.19522 | 35.9897 | -24.5017 |
| 54 | 2.5 | 1.28155 | 37.6321 | -21.2978 |
| 55 | 2.5 | 1.38517 | 39.5508 | -17.8349 |
| 56 | 2.5 | 1.50626 | 41.8196 | -14.0692 |
| 57 | 2.5 | 1.64485 | 44.5251 | -9.95708 |
| 58 | 5 | 1.83843 | 47.9049 | -0.764953 |

Sample Standard Deviation = 1.39973
Numerator = 0.585153
Denominator = 5443.7 = 58 47.9049
W Statistic = 0.000107492
5% Critical value of 0.962 exceeds 0.000107492
Evidence of non-normality at 95% level of significance
1% Critical value of 0.945 exceeds 0.000107492
Evidence of non-normality at 99% level of significance