# ANNUAL GROUNDWATER MONITORING REPORT

**OPEN BURNING GROUND**
**(HAZARDOUS WASTE MANAGEMENT UNIT 13)**
**CALENDAR YEAR 2009**

**RADFORD ARMY AMMUNITION PLANT**
**RADFORD, VIRGINIA**

**Submitted to:**

Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219
(800) 592-5482

**Prepared for:**

Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
Radford, Virginia 24141-0100

FEBRUARY 2010

DAA PROJECT NO. B03204-07

Draper Aden Associates
*Engineering • Surveying • Environmental Services*

Blacksburg • Charlottesville • Hampton Roads • Richmond, Virginia

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## 1.0 INTRODUCTION

This document serves as the Annual Groundwater Monitoring Report for calendar year 2009 for the Open Burning Ground (OBG; also known as Hazardous Waste Management Unit [HWMU] 13) located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the *Permit for the Treatment of Hazardous Waste by Open Burning* (Permit) dated October 28, 2005. The Annual Groundwater Monitoring Report presents the following set of information: basic information and unit identification, a description of the groundwater monitoring plan, a discussion of groundwater movement, updated potentiometric maps, a table of groundwater elevations, and detailed statistical evaluations of the analytical data. The report evaluates the analytical data from two semiannual sampling events performed during calendar year 2009. Copies of field notes recorded during sample collection are included in **Appendix A**. The laboratory analytical results for the calendar year 2009 semiannual monitoring events are included in **Appendix B**.

The OBG is the waste propellant burning ground. Material that cannot be burned in the Explosive Waste Incinerators is open burned at this Unit. Groundwater monitoring activities for calendar year 2009 were conducted in accordance with the proposed *Groundwater Compliance Monitoring Plan*, which was included in the Class 3 Permit Modification dated August 9, 2007, was reviewed and modified by the VDEQ in a memorandum dated October 24, 2007, and was further revised by the VDEQ following the January 23, 2008 meeting between Radford AAP and the VDEQ. The Class 3 Permit Modification is pending final review for incorporation into the Permit.

## 2.0 ANNUAL GROUNDWATER MONITORING REPORT

### 2.1 Waste Management Unit Information

**Unit Name:** Open Burning Ground (OBG)
(Hazardous Waste Management Unit 13 [HWMU-13])
**Owner/Operator:** United States Army/Alliant Techsystems Inc.

**Unit Location:** Radford AAP Horseshoe Area, Radford, Virginia

**Class:** Hazardous Waste Management Unit
**Type:** Waste Propellant Burning Ground

### 2.2 Groundwater Monitoring Plan

**Monitoring Network**
Upgradient Well: 13MW1, 13MW2
Point of Compliance Wells: 13MW3, 13MW4, 13MW5, 13MW6, 13MW7

**Monitoring Status:** Compliance Monitoring Program

**CY 2009 Monitoring Events:**
Second Quarter 2009: April 13-14, 2009
Fourth Quarter 2009: October 19-20, 2009

### 2.3 Groundwater Movement

The static water level measurements gathered at the OBG during the 2009 monitoring events are summarized in **Table 1**. Annual groundwater fluctuations ranged from 0.46 to 10.3 feet. As shown on the Potentiometric Surface Maps (**Figures 1** and **2**), groundwater movement beneath the site is generally to the south toward the New River.

For the purposes of this report, Darcian flow conditions were assumed for the alluvium and carbonate bedrock beneath the OBG. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer materials. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the Fourth Quarter 2009 Potentiometric Surface Map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Fourth Quarter 2009 groundwater elevations was calculated to be 0.003 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of $6.56 \times 10^{-5}$ ft/second, which is consistent with literature values for carbonate rock and for clayey, silty sand, and gravel alluvium (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately $4.25 \times 10^{-2}$ ft/day or 15.5 ft/year, based on the following:

- An average hydraulic conductivity of $6.56 \times 10^{-5}$ ft/second.
- An average hydraulic gradient of 0.003 ft/ft.
- An assumed effective porosity of 0.40, based on a representative range of porosities for carbonate rock and clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the average velocity presented above depending on water level conditions and the distribution of secondary porosity.

## 2.4 2009 Groundwater Monitoring Activities

Radford AAP began semiannual Detection monitoring at the OBG after the Permit went into effect in October 2005. During Fourth Quarter 2005, carbon tetrachloride and perchlorate were detected at concentrations above their respective background concentrations, which prompted the need to develop a Compliance monitoring program. As a result, during First Quarter 2006, all wells were sampled for the constituents listed in Appendix IX of 40 CFR Part 264 to determine the Compliance Monitoring List. The hazardous constituents detected during the initial Appendix IX analysis formed the basis for the Compliance Groundwater Monitoring List for the Unit.

Groundwater monitoring activities for calendar year 2009 were conducted in accordance with the proposed *Groundwater Compliance Monitoring Plan* dated February 2007, including the annual monitoring of the point of compliance (POC) wells for the constituents listed in Appendix IX of 40 CFR Part 264. Copies of field notes recorded during sample collection activities are included in **Appendix A**. The groundwater analytical data for the calendar year 2009 semiannual monitoring events were evaluated in accordance with the procedures specified in the proposed *Groundwater Compliance Monitoring Plan*, including comparison to the proposed Groundwater Protection Standards (GPS). As the proposed *Groundwater Compliance Monitoring Plan* is pending final review for incorporation into the Permit, the groundwater analytical data for calendar year 2009 were also compared to the background concentrations for the OBG previously calculated in the *Constituent Background Values for the Compliance Groundwater Monitoring Program* dated February 2007 (a copy of which is included in **Appendix C**).

## 2.5 Groundwater Analytical Data Evaluation

The groundwater samples collected during the calendar year 2009 events were analyzed for the constituents listed in Attachment V.B (Compliance Groundwater Monitoring List) of the proposed *Groundwater Compliance Monitoring Plan*. Additionally, the groundwater samples collected from the POC wells during Second Quarter 2009 were analyzed for the constituents listed in Appendix IX of 40 CFR Part 264. The constituents detected during the semiannual events and their corresponding concentrations, background values, and proposed GPS are listed

in **Table 2**. The laboratory analytical results for the calendar year 2009 semiannual monitoring events are included in **Appendix B**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Data validation reports are included in **Appendix B**. No data were rejected.

### 2.5.1 Second Quarter 2009

Total barium was detected in all monitoring wells; however, all concentrations were below their respective background concentrations and proposed GPS. Total chromium was detected in all monitoring wells at concentrations below the quantitation limit (QL); however, the detected total chromium concentrations were below the background concentration and the proposed GPS.

Total nickel was detected in upgradient wells 13MW1 and 13MW2 and in POC wells 13MW3, 13MW4, 13MW5, and 13MW6 at concentrations below the QL; however, the detected total nickel concentrations were below the background concentration and the proposed GPS. Total nickel was also detected in POC well 13MW7 at a concentration of 222 µg/l, which was greater than the background concentration of 5 µg/l; however, the total nickel concentration detected in POC well 13MW7 was below the proposed GPS for nickel of 313 µg/l.

Total selenium was detected in upgradient well 13MW1 and in POC wells 13MW5, 13MW6, and 13MW7 at concentrations below the QL; however, the detected total selenium concentrations were below the background concentration and the proposed GPS.

Total zinc was detected in POC wells 13MW6 and 13MW7 at concentrations below the QL; however, the detected total zinc concentrations were below the background concentration and the proposed GPS. Total zinc was also detected in POC well 13MW7 at a concentration of 6.8 µg/l, which was greater than the background concentration of 5 µg/l; however, the total zinc concentration detected in POC well 13MW7 was below the proposed GPS for zinc of 4,695 µg/l.

Perchlorate was detected in POC well 13MW4 at a concentration of 127.3 µg/l, which was greater than the background concentration of 4 µg/l and the proposed GPS of 26 µg/l. Perchlorate was also detected in POC well 13MW6 at a concentration below the QL; however, the perchlorate concentration detected in POC well 13MW6 was below the background concentration and the proposed GPS. These detections of perchlorate are consistent with previous data; however, due to the fact that the concentration detected in POC well 13MW4 is greater than the proposed GPS, Radford AAP is required to establish a Corrective Action Program for perchlorate that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for perchlorate, which is pending final review for incorporation into the Permit.

Carbon tetrachloride was detected in POC well 13MW3 at a concentration of 6.6 µg/l, which was greater than the background concentration and proposed GPS of 5 µg/l. Carbon tetrachloride was also detected in POC well 13MW5 at a concentration below the QL; however, the carbon tetrachloride concentration detected in POC well 13MW6 was below the background

concentration and the proposed GPS. These detections of carbon tetrachloride are consistent with previous data; however, due to the fact that the concentration detected in POC well 13MW3 is greater than the proposed GPS, Radford AAP is required to establish a Corrective Action Program for carbon tetrachloride that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for carbon tetrachloride, which is pending final review for incorporation into the Permit.

Chloroform was detected in POC well 13MW3 at a concentration of 0.6 µg/l, which was below the background concentration of 1 µg/l and the proposed GPS of 80 µg/l. Tetrachloroethene was detected in POC well 13MW7 at a concentration below the QL; however, the detected tetrachloroethene concentration was below the background concentration and the proposed GPS.

Trichloroethene (TCE) was detected in POC wells 13MW3, 13MW4, and 13MW7 at concentrations of 1 µg/l, 1.5 µg/l, and 1.4 µg/l, respectively. These concentrations were equal to or greater than the site-specific background concentration of 1 µg/l. However, detection of TCE in wells 13MW4 and 13MW7 is consistent with previous data, and the concentrations were below the proposed GPS of 5 µg/l.

### 2.5.2 Fourth Quarter 2009

Total barium was detected in all monitoring wells; however, all concentrations were below the background concentration and proposed GPS.

Total chromium was detected in POC well 13MW4 at a concentration of 5.1 µg/l, which was below the background concentration and the proposed GPS. Total nickel was detected in POC well 13MW7 at a concentration of 5.1 µg/l, which was greater than the background concentration of 5 µg/l but below the GPS for nickel of 313 µg/l.

Total zinc was detected in POC wells 13MW6 and 13MW7 at concentrations of 6.4 µg/l and 7.8 µg/l, respectively, which were greater than the background concentration of 5 µg/l. However, the detected concentrations were below the proposed GPS for zinc of 4,695 µg/l.

Perchlorate was detected in POC well 13MW4 at a concentration of 132.2 µg/l, which was greater than the background concentration of 4 µg/l and the proposed GPS of 26 µg/l. Perchlorate was also detected in POC well 13MW6 at a concentration of 5.16 µg/l, which was greater than the background concentration but below the proposed GPS. These detections of perchlorate are consistent with previous data; however, due to the fact that the concentration detected in POC well 13MW4 is greater than the proposed GPS, Radford AAP is required to establish a Corrective Action Program for perchlorate that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for perchlorate, which is pending final review for incorporation into the Permit.

Carbon tetrachloride was detected in POC well 13MW3 at a concentration of 5.7 µg/l, which was greater than the background concentration and proposed GPS of 5 µg/l. This detection of carbon tetrachloride is consistent with previous data; however, due to the fact that

the concentration detected in POC well 13MW3 is greater than the proposed GPS, Radford AAP is required to establish a Corrective Action Program for carbon tetrachloride that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for carbon tetrachloride, which is pending final review for incorporation into the Permit.

Chloroform was detected in POC well 13MW3 at a concentration of 0.7 µg/l, which was below the background concentration of 1 µg/l and the proposed GPS of 80 µg/l.

TCE was detected in POC wells 13MW4 and 13MW7 at concentrations of 1.4 µg/l and 2.1 µg/l, respectively, which were greater than the background concentration of 1 µg/l. Additionally, TCE was detected in POC well 13MW3 at a concentration of 0.9 µg/l, which was below the background concentration of 1 µg/l. However, detection of TCE in these POC wells is consistent with previous data, and the concentrations were below the proposed GPS of 5 µg/l.

## 3.0 RECOMMENDATIONS

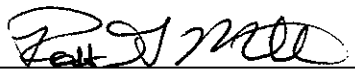
During the calendar year 2009 semiannual groundwater monitoring events, carbon tetrachloride was detected in POC well 13MW3 at concentration greater than the proposed GPS of 5 µg/l, and perchlorate was detected in POC well 13MW4 at concentrations greater than the proposed GPS of 26 µg/l. As a result, Radford AAP is required to establish a Corrective Action Program for carbon tetrachloride and perchlorate that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for carbon tetrachloride and perchlorate, which is pending final review for incorporation into the Permit.

Radford AAP will continue to monitoring groundwater at the OBG in accordance with the *Groundwater Compliance Monitoring Plan* until the Corrective Action Program is approved and implemented, at which time groundwater monitoring will be conducted in accordance with the Corrective Action and Groundwater Monitoring Program.

**SIGNATURES/CERTIFICATIONS**

*Prepared by:*

Name: Ross G. Miller, Senior Project Geologist

Signature: 

Company: Draper Aden Associates

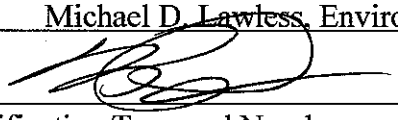
Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

*Virginia Professional Certification:*

I certify that I have prepared or supervised preparation of the attached report, that it has been prepared in accordance with industry standards and practices, and that the information contained herein is truthful and accurate to the best of my knowledge.

Name: Michael D. Lawless, Environmental Program Manager

Signature: 

Virginia Professional Certification Type and Number: PG 832

Company: Draper Aden Associates

Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

**FIGURES**

13MW1
1680.66

13MW2
1681.47

13MW3
1682.08

13MW4
1680.26

13MW5
1680.31

13MW6
1680.09

13MW7
1680.31

1682

1681

NEW RIVER

## LEGEND

13MW1 1680.66 — MONITORING WELL; GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)

1681 — GROUNDWATER CONTOUR

GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

GRAPHIC SCALE

200 0 100 200 400

( IN FEET )

1 inch = 200 ft.


Draper Aden Associates

Engineering ♦ Surveying ♦ Environmental Services

2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291

Richmond, VA
Charlottesville, VA
Hampton Roads, VA


| | |
|---|---|
| DESIGNED | RGM |
| DRAWN | JFF |
| CHECKED | MDL |
| DATE | 07-29-09 |

OPEN BURNING GROUND/HWMU-13 POTENTIOMETRIC SURFACE MAP (2ND QUARTER 2009)

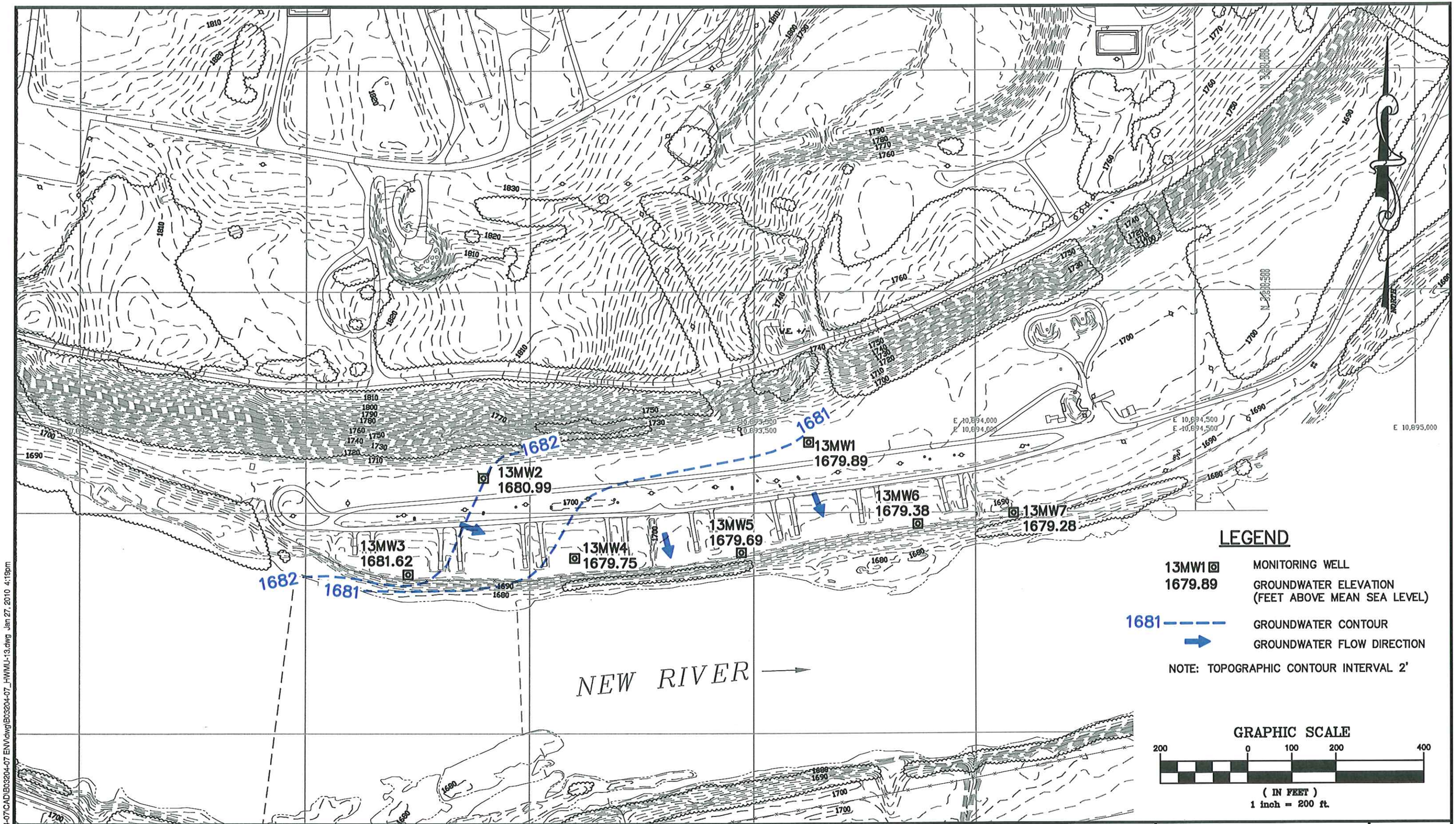
RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. B03204-07

FIGURE 1




Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA
Charlottesville, VA
Hampton Roads, VA

| | |
|---|---|
| DESIGNED | RGM |
| DRAWN | JFF |
| CHECKED | MDL |
| DATE | 01/26/10 |

OPEN BURNING GROUND/HWMU-13 POTENTIOMETRIC SURFACE MAP (4TH QUARTER 2009)

# RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. B03204-07

FIGURE 2

P:\B03200\B03204\B03204-07\CAD\B03204-07 ENV\dwg\B03204-07_HWMU-13.dwg Jan 27, 2010 4:19pm

# TABLES

**TABLE 1**
**GROUNDWATER ELEVATIONS - 2009**
**OPEN BURNING GROUND (HWMU-13)**
**RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA**

| MONITORING WELL ID | ELEVATION TOP OF WELL | SECOND QUARTER 2009 | | FOURTH QUARTER 2009 | |
|---|---|---|---|---|---|
| | | DTW | GW ELEV | DTW | GW ELEV |
| 13MW1 | 1701.46 | 20.80 | 1680.66 | 21.57 | 1679.89 |
| 13MW2 | 1702.71 | 21.24 | 1681.47 | 21.72 | 1680.99 |
| 13MW3 | 1695.01 | 12.93 | 1682.08 | 13.39 | 1681.62 |
| 13MW4 | 1696.58 | 16.32 | 1680.26 | 16.83 | 1679.75 |
| 13MW5 | 1696.76 | 16.45 | 1680.31 | 17.07 | 1679.69 |
| 13MW6 | 1696.11 | 16.02 | 1680.09 | 16.73 | 1679.38 |
| 13MW7 | 1695.51 | 15.20 | 1680.31 | 16.23 | 1679.28 |

**NOTES:**
DTW: Depth to water from top of casing.
GW ELEV: Groundwater elevation.
All elevations in feet above mean sea level.
NM: Not measured.

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| *Analyte/Quarter* | *13MW1 Q* | *13MW2 Q* | *13MW3 Q* | *13MW4 Q* | *13MW5 Q* | *13MW6 Q* | *13MW7 Q* | *QL* | *Background* | *Method* | *GPS* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Antimony** | | | | | *CAS # 7440-36-0* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 6 | 6020 | 6 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 6 | 6020 | 6 |
| **Arsenic** | | | | | *CAS # 7440-38-2* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 5 | 6020 | 10 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 5 | 6020 | 10 |
| **Barium** | | | | | *CAS # 7440-39-3* | | | | | | |
| Second Quarter 2009 | 120 | 147 | 81 J | 41.5 J | 106 J | 75.8 J | 125 J | 1 | 205.9 | 6020 | 2000 |
| Fourth Quarter 2009 | 115 | 169 | 110 | 55.3 | 108 | 104 | 173 | 1 | 205.9 | 6020 | 2000 |
| **Beryllium** | | | | | *CAS # 7440-41-7* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 1 | | 6020 | - |
| **Cadmium** | | | | | *CAS # 7440-43-9* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 1 | 1 | 6020 | 5 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 1 | 1 | 6020 | 5 |
| **Chromium** | | | | | *CAS # 7440-47-3* | | | | | | |
| Second Quarter 2009 | 4 J | 1.9 J | 1.6 J | 1.6 J | 3.3 J | 1.4 J | 1.4 J | 5 | 112 | 6020 | 112 |
| Fourth Quarter 2009 | U | U | U | 5.1 | U | U | U | 5 | 112 | 6020 | 112 |
| **Cobalt** | | | | | *CAS # 7440-48-4* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 6020 | - |
| **Copper** | | | | | *CAS # 7440-50-8* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 6020 | - |
| **Lead** | | | | | *CAS # 7439-92-1* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 14 | 6020 | 15 |
| Fourth Quarter 2009 | U | U | U | U | U | U J | U | 5 | 14 | 6020 | 15 |
| **Mercury** | | | | | *CAS # 7439-97-6* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 2.52 | 7470A | 2.52 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 2.52 | 7470A | 2.52 |
| **Nickel** | | | | | *CAS # 7440-02-0* | | | | | | |
| Second Quarter 2009 | 2.4 J | 2.2 J | 2.1 J | 2.6 J | 2.9 J | 3.7 J | 222 | 5 | 5 | 6020 | 313 |
| Fourth Quarter 2009 | U | U | U | U | U | U | 51 | 5 | 5 | 6020 | 313 |
| **Selenium** | | | | | *CAS # 7782-49-2* | | | | | | |
| Second Quarter 2009 | 4 J | U | U | U | 2.1 J | 3.2 J | 2.3 J | 5 | 5 | 6020 | 50 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 5 | 6020 | 50 |
| **Silver** | | | | | *CAS # 7440-22-4* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 2 | 2.4 | 6020 | 78.3 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 2 | 2.4 | 6020 | 78.3 |
| **Thallium** | | | | | *CAS # 7440-28-0* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 2 | | 6020 | - |
| **Tin** | | | | | *CAS # 7440-31-5* | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 10 | | 6020 | - |
| **Vanadium** | | | | | *CAS # 7440-62-2* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 6020 | - |
| **Zinc** | | | | | *CAS # 7440-66-6* | | | | | | |
| Second Quarter 2009 | U | U | U | 3.1 J | U | 2.8 J | 6.8 | 5 | 5 | 6020 | 4695 |
| Fourth Quarter 2009 | U | U | U | U | U | 6.4 | 7.8 | 5 | 5 | 6020 | 4695 |
| **Sulfide** | | | | | *CAS # 18496-25-8* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 3000 | | 9034 | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| *Analyte/Quarter* | *13MW1 Q* | *13MW2 Q* | *13MW3 Q* | *13MW4 Q* | *13MW5 Q* | *13MW6 Q* | *13MW7 Q* | *QL* | *Background* | *Method* | *GPS* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Perchlorate** | | | | | *CAS # 14797-73-0* | | | | | | |
| Second Quarter 2009 | U | U | U | 127.3 | U | 1.33 J | U | 4 | 4 | E314.0 | 26 |
| Fourth Quarter 2009 | U | U | U | 132.2 | U | 5.156 | U | 4 | 4 | E314.0 | 26 |
| **Cyanide** | | | | | *CAS # 57-12-5* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 20 | | 9012A | - |
| **Acenaphthene** | | | | | *CAS # 83-32-9* | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **Acenaphthylene** | | | | | *CAS # 208-96-8* | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **Acetone** | | | | | *CAS # 67-64-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8260B | - |
| **Acetonitrile** | | | | | *CAS # 75-05-8* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 20 | | 8260B | - |
| **Acetophenone** | | | | | *CAS # 98-86-2* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 224 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 224 |
| **2-Acetylaminofluorene** | | | | | *CAS # 53-96-3* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Acrolein** | | | | | *CAS # 107-02-8* | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 25 | | 8260B | - |
| **Acrylonitrile** | | | | | *CAS # 107-13-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8260B | - |
| **Aldrin** | | | | | *CAS # 309-00-2* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.05 | | 8081A | - |
| **Allyl chloride** | | | | | *CAS # 107-05-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **4-Aminobiphenyl** | | | | | *CAS # 92-67-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Aniline** | | | | | *CAS # 62-53-3* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Anthracene** | | | | | *CAS # 120-12-7* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Aramite** | | | | | *CAS # 140-57-8* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Benzene** | | | | | *CAS # 71-43-2* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 5 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 5 |
| **Benzyl chloride** | | | | | *CAS # 100-44-7* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 5 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 5 |
| **Benzyl alcohol** | | | | | *CAS # 100-51-6* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | |
| **Benzo[a]anthracene** | | | | | *CAS # 56-55-3* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 0.0917 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 0.0917 |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| *Analyte/Quarter* | *13MW1* | *Q* | *13MW2* | *Q* | *13MW3* | *Q* | *13MW4* | *Q* | *13MW5* | *Q* | *13MW6* | *Q* | *13MW7* | *Q* | *QL* | *Background* | *Method* | *GPS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benzo[b]fluoranthene** | | | | | | | | | *CAS # 205-99-2* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 0.0917 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 0.0917 |
| **Benzo[k]fluoranthene** | | | | | | | | | *CAS # 207-08-9* | | | | | | | | | |
| Second Quarter 2009 | U | J | U | J | U | J | U | J | U | J | U | J | U | J | 5 | 10 | 8270C | 0.917 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 0.917 |
| **Benzo[a]pyrene** | | | | | | | | | *CAS # 50-32-8* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 0.2 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 0.2 |
| **Benzo[ghi]perylene** | | | | | | | | | *CAS # 191-24-2* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | |
| **alpha-BHC** | | | | | | | | | *CAS # 319-84-6* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.05 | | 8081A | - |
| **beta-BHC** | | | | | | | | | *CAS # 319-85-7* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.05 | | 8081A | - |
| **delta-BHC** | | | | | | | | | *CAS # 319-86-8* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.05 | | 8081A | - |
| **gamma-BHC** | | | | | | | | | *CAS # 58-89-9* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.05 | | 8081A | - |
| **bis(2-Chloro-1-methylethyl)ether** | | | | | | | | | *CAS # 108-60-1* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **bis(2-Chloroethoxy)methane** | | | | | | | | | *CAS # 111-91-1* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | |
| **bis(2-Chloroethyl) ether** | | | | | | | | | *CAS # 111-44-4* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | |
| **bis(2-Ethylhexyl)phthalate** | | | | | | | | | *CAS # 117-81-7* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 6 | 8270C | 6 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 6 | 8270C | 6 |
| **Bromochloromethane** | | | | | | | | | *CAS # 74-97-5* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **Bromodichloromethane** | | | | | | | | | *CAS # 75-27-4* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | |
| **Bromoform** | | | | | | | | | *CAS # 75-25-2* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | |
| **Bromomethane** | | | | | | | | | *CAS # 74-83-9* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 1 | 8260B | 3.13 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 1 | 8260B | 3.13 |
| **4-Bromophenyl phenyl ether** | | | | | | | | | *CAS # 101-55-3* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **2-Butanone** | | | | | | | | | *CAS # 78-93-3* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8260B | - |
| **Butyl benzyl phthalate** | | | | | | | | | *CAS # 85-68-7* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 3130 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 3130 |
| **Carbon disulfide** | | | | | | | | | *CAS # 75-15-0* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
*Upgradient wells = 13MW1 and 13MW2*

*All Results in ug/L.*

| Analyte/Quarter | 13MW1 | Q | 13MW2 | Q | 13MW3 | Q | 13MW4 | Q | 13MW5 | Q | 13MW6 | Q | 13MW7 | Q | QL | Background | Method | GPS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon tetrachloride** | | | | | | | | | CAS # 56-23-5 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | 6.6 | J | U | | 0.1 | J | U | | U | | 0.5 | 5 | 8260B | 5 |
| Fourth Quarter 2009 | U | | U | | 5.7 | J | U | | U | | U | | U | | 0.5 | 5 | 8260B | 5 |
| **Chlordane** | | | | | | | | | CAS # 57-74-9 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.86 | | 8081A | - |
| **p-Chloroaniline** | | | | | | | | | CAS # 106-47-8 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **Chlorobenzene** | | | | | | | | | CAS # 108-90-7 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 5 | 8260B | 100 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 5 | 8260B | 100 |
| **Chlorobenzilate** | | | | | | | | | CAS # 510-15-6 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **Chloromethane** | | | | | | | | | CAS # 74-87-3 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 5 | 8260B | 58.1 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 5 | 8260B | 58.1 |
| **p-Chloro-m-cresol** | | | | | | | | | CAS # 59-50-7 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Chloroethane** | | | | | | | | | CAS # 75-00-3 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **Chloroform** | | | | | | | | | CAS # 67-66-3 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | 0.6 | J | U | | U | | U | | U | | 0.5 | 1 | 8260B | 80 |
| Fourth Quarter 2009 | U | | U | | 0.7 | | U | | U | | U | | U | | 0.5 | 1 | 8260B | 80 |
| **2-Chloronaphthalene** | | | | | | | | | CAS # 91-58-7 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **2-Chlorophenol** | | | | | | | | | CAS # 95-57-8 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 11.2 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 11.2 |
| **4-Chlorophenyl phenyl ether** | | | | | | | | | CAS # 7005-72-3 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **Chloroprene** | | | | | | | | | CAS # 126-99-8 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **Chrysene** | | | | | | | | | CAS # 218-01-9 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **Diethyl phthalate** | | | | | | | | | CAS # 84-66-2 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 12500 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 12500 |
| **2,4-Dinitrotoluene** | | | | | | | | | CAS # 121-14-2 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8330 | 31.3 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8330B | 31.3 |
| **p-Phenylenediamine** | | | | | | | | | CAS # 106-50-3 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 50 | | 8270C | |
| **Diphenylamine** | | | | | | | | | CAS # 122-39-4 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 391 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 391 |
| **2,4-Dichlorophenoxyacetic acid** | | | | | | | | | CAS # 94-75-7 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8151A | - |
| **4,4'-DDD** | | | | | | | | | CAS # 72-54-8 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.1 | | 8081A | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| *Analyte/Quarter* | *13MW1* | *Q* | *13MW2* | *Q* | *13MW3* | *Q* | *13MW4* | *Q* | *13MW5* | *Q* | *13MW6* | *Q* | *13MW7* | *Q* | *QL* | *Background* | *Method* | *GPS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **4,4'-DDE** | | | | | | | | | *CAS # 72-55-9* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.1 | | 8081A | - |
| **4,4'-DDT** | | | | | | | | | *CAS # 50-29-3* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.1 | | 8081A | - |
| **Diallate** | | | | | | | | | *CAS # 2303-16-4* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **Dibenz(a,h)anthracene** | | | | | | | | | *CAS # 53-70-3* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 0.00917 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 0.00917 |
| **Dibenzofuran** | | | | | | | | | *CAS # 132-64-9* | | | | | | | | | |
| Second Quarter 2009 | U | J | U | J | U | J | U | J | U | J | U | J | U | J | 5 | 10 | 8270C | 10 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 10 |
| **Dibromochloromethane** | | | | | | | | | *CAS # 124-48-1* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | |
| **1,2-Dibromo-3-chloropropane** | | | | | | | | | *CAS # 96-12-8* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **1,2-Dibromoethane** | | | | | | | | | *CAS # 106-93-4* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **Dibromomethane** | | | | | | | | | *CAS # 74-95-3* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **1,2-Dichlorobenzene** | | | | | | | | | *CAS # 95-50-1* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **1,3-Dichlorobenzene** | | | | | | | | | *CAS # 541-73-1* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **1,4-Dichlorobenzene** | | | | | | | | | *CAS # 106-46-7* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **3,3'-Dichlorobenzidine** | | | | | | | | | *CAS # 91-94-1* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **trans-1,4-Dichloro-2-butene** | | | | | | | | | *CAS # 110-57-6* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8260B | - |
| **Dichlorodifluoromethane** | | | | | | | | | *CAS # 75-71-8* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **1,1-Dichloroethane** | | | | | | | | | *CAS # 75-34-3* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **1,2-Dichloroethane** | | | | | | | | | *CAS # 107-06-2* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 1 | 8260B | 5 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 1 | 8260B | 5 |
| **1,1-Dichloroethene** | | | | | | | | | *CAS # 75-35-4* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 1 | 8260B | 7 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 0.5 | 1 | 8260B | 7 |
| **trans-1,2-Dichloroethene** | | | | | | | | | *CAS # 156-60-5* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | |
| **2,4-Dichlorophenol** | | | | | | | | | *CAS # 120-83-2* | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 47 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 47 |
| **2,6-Dichlorophenol** | | | | | | | | | *CAS # 87-65-0* | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
*Upgradient wells = 13MW1 and 13MW2*

*All Results in ug/L.*

| Analyte/Quarter | 13MW1 | Q | 13MW2 | Q | 13MW3 | Q | 13MW4 | Q | 13MW5 | Q | 13MW6 | Q | 13MW7 | Q | QL | Background | Method | GPS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **cis-1,3-Dichloropropene** | | | | | | | | | CAS # 10061-01-5 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **trans-1,3-Dichloropropene** | | | | | | | | | CAS # 10061-02-6 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **Dieldrin** | | | | | | | | | CAS # 60-57-1 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.1 | | 8081A | - |
| **1,2-Dichloropropane** | | | | | | | | | CAS # 78-87-5 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | |
| **O,O-Diethyl O-2-pyrazinyl** | | | | | | | | | CAS # 297-97-2 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Dimethoate** | | | | | | | | | CAS # 60-51-5 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **p-(Dimethylamino)azobenzene** | | | | | | | | | CAS # 60-11-7 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **7,12-Dimethylbenz[a]anthracene** | | | | | | | | | CAS # 57-97-6 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **3,3'-Dimethylbenzidine** | | | | | | | | | CAS # 119-93-7 | | | | | | | | | |
| Second Quarter 2009 | U | J | U | J | U | J | U | J | U | J | U | J | U | J | 5 | 10 | 8270C | 10 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 10 |
| **a,a-Dimethylphenethylamine** | | | | | | | | | CAS # 122-09-8 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 50 | | 8270C | - |
| **2,4-Dimethylphenol** | | | | | | | | | CAS # 105-67-9 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Dimethyl phthalate** | | | | | | | | | CAS # 131-11-3 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 10 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 10 |
| **Di-n-butyl phthalate** | | | | | | | | | CAS # 84-74-2 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 1570 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 1570 |
| **m-Dinitrobenzene** | | | | | | | | | CAS # 99-65-0 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 2.5 | 2.5 | 8330 | 1.57 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 2.5 | 2.5 | 8330B | 1.57 |
| **4,6-Dinitro-o-cresol** | | | | | | | | | CAS # 534-52-1 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 10 | | 8270C | - |
| **2,4-Dinitrophenol** | | | | | | | | | CAS # 51-28-5 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 10 | | 8270C | - |
| **2,6-Dinitrotoluene** | | | | | | | | | CAS # 606-20-2 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 5 | 8330 | 15.7 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 5 | 8330B | 15.7 |
| **Dinoseb** | | | | | | | | | CAS # 88-85-7 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 2.5 | | 8151A | |
| **Di-n-octyl phthalate** | | | | | | | | | CAS # 117-84-0 | | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 313 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 313 |
| **1,4-Dioxane** | | | | | | | | | CAS # 123-91-1 | | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 100 | | 8260B | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| Analyte/Quarter | 13MW1 Q | 13MW2 Q | 13MW3 Q | 13MW4 Q | 13MW5 Q | 13MW6 Q | 13MW7 Q | QL | Background | Method | GPS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Disulfoton** | | | | | CAS # 298-04-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Endosulfan I** | | | | | CAS # 959-98-8 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.05 | | 8081A | - |
| **Endosulfan II** | | | | | CAS # 33213-65-9 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.1 | | 8081A | - |
| **Endosulfan sulfate** | | | | | CAS # 1031-07-8 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.1 | | 8081A | - |
| **Endrin** | | | | | CAS # 72-20-8 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.1 | | 8081A | - |
| **Endrin aldehyde** | | | | | CAS # 7421-93-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.1 | | 8081A | - |
| **Ethylbenzene** | | | | | CAS # 100-41-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **Ethyl methacrylate** | | | | | CAS # 97-63-2 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **Ethyl methanesulfonate** | | | | | CAS # 62-50-0 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Famphur** | | | | | CAS # 52-85-7 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **Fluoranthene** | | | | | CAS # 206-44-0 | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 626 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 626 |
| **Fluorene** | | | | | CAS # 86-73-7 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **Heptachlor** | | | | | CAS # 76-44-8 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.05 | | 8081A | - |
| **Heptachlor epoxide** | | | | | CAS # 1024-57-3 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.05 | | 8081A | - |
| **Hexachlorobenzene** | | | | | CAS # 118-74-1 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Hexachlorobutadiene** | | | | | CAS # 87-68-3 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **Hexachlorocyclopentadiene** | | | | | CAS # 77-47-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | |
| **Hexachloroethane** | | | | | CAS # 67-72-1 | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 4.78 |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 10 | 8260B | 4.78 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 4.78 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 10 | 8260B | 4.78 |
| **Hexachlorophene** | | | | | CAS # 70-30-4 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 500 | | 8270C | - |
| **Hexachloropropene** | | | | | CAS # 1888-71-7 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **2-Hexanone** | | | | | CAS # 591-78-6 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8260B | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| *Analyte/Quarter* | *13MW1 Q* | *13MW2 Q* | *13MW3 Q* | *13MW4 Q* | *13MW5 Q* | *13MW6 Q* | *13MW7 Q* | *QL* | *Background* | *Method* | *GPS* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indeno[1,2,3-cd]pyrene** | | | | | *CAS # 193-39-5* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 0.0917 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 0.0917 |
| **Iodomethane** | | | | | *CAS # 74-88-4* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **Isobutyl alcohol** | | | | | *CAS # 78-83-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 25 | | 8260B | - |
| **Isodrin** | | | | | *CAS # 465-73-6* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Isophorone** | | | | | *CAS # 78-59-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Isosafrole** | | | | | *CAS # 120-58-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Kepone** | | | | | *CAS # 143-50-0* | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **Methacrylonitrile** | | | | | *CAS # 126-98-7* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8260B | - |
| **Methylene chloride** | | | | | *CAS # 75-09-2* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 5 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 5 |
| **Methapyrilene** | | | | | *CAS # 91-80-5* | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **Methoxychlor** | | | | | *CAS # 72-43-5* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8081A | - |
| **3-Methylcholanthrene** | | | | | *CAS # 56-49-5* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Methyl methacrylate** | | | | | *CAS # 80-62-6* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **Methyl methane sulfonate** | | | | | *CAS # 66-27-3* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **2-Methylnaphthalene** | | | | | *CAS # 91-57-6* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Methyl parathion** | | | | | *CAS # 298-00-0* | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **4-Methyl-2-pentanone** | | | | | *CAS # 108-10-1* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8260B | - |
| **2-Methylphenol** | | | | | *CAS # 95-48-7* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **3 & 4-Methylphenol** | | | | | *CAS # m 108-39-4 p 106-44-5* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 10 | 20 | 8270C | 78.3 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 10 | 20 | 8270C | 78.3 |
| **Naphthalene** | | | | | *CAS # 91-20-3* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 1 | 8260B | 2.33 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 1 | 8260B | 2.33 |
| **1,4-Naphthoquinone** | | | | | *CAS # 130-15-4* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
*Upgradient wells = 13MW1 and 13MW2*

*All Results in ug/L.*

| Analyte/Quarter | 13MW1 Q | 13MW2 Q | 13MW3 Q | 13MW4 Q | 13MW5 Q | 13MW6 Q | 13MW7 Q | QL | Background | Method | GPS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1-Naphthylamine** | | | | | CAS # 134-32-7 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **2-Naphthylamine** | | | | | CAS # 91-59-8 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **o-Nitroaniline** | | | | | CAS # 88-74-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 10 | | 8270C | - |
| **m-Nitroaniline** | | | | | CAS # 99-09-2 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 10 | | 8270C | - |
| **p-Nitroaniline** | | | | | CAS # 100-01-6 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 10 | | 8270C | - |
| **Nitrobenzene** | | | | | CAS # 98-95-3 | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 1.3 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | 10 | 8270C | 1.3 |
| **Nitroglycerin** | | | | | CAS # 55-63-0 | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 16 | 10000 | 8332 | 10000 |
| Fourth Quarter 2009 | U | U J | U | U | U | U | U | 16 | 10000 | 8332 | 10000 |
| **o-Nitrophenol** | | | | | CAS # 88-75-5 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **p-Nitrophenol** | | | | | CAS # 100-02-7 | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 10 | 20 | 8270C | 20 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 10 | 20 | 8270C | 20 |
| **4-Nitroquinoline-1-oxide** | | | | | CAS # 56-57-5 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **N-Nitrosodi-n-butylamine** | | | | | CAS # 924-16-3 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **N-Nitrosodiethylamine** | | | | | CAS # 55-18-5 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **N-Nitrosodimethylamine** | | | | | CAS # 62-75-9 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **N-Nitrosodiphenylamine** | | | | | CAS # 86-30-6 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 5 | | 8270C | - |
| **N-Nitrosodipropylamine** | | | | | CAS # 621-64-7 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **N-Nitrosomethylethylamine** | | | | | CAS # 10595-95-6 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **N-Nitrosomorpholine** | | | | | CAS # 59-89-2 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **N-Nitrosopiperidine** | | | | | CAS # 100-75-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **N-Nitrosopyrrolidine** | | | | | CAS # 930-55-2 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **5-Nitroso-o-toluidine** | | | | | CAS # 99-55-8 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Parathion** | | | | | CAS # 56-38-2 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| *Analyte/Quarter* | *13MW1* | *Q* | *13MW2* | *Q* | *13MW3* | *Q* | *13MW4* | *Q* | *13MW5* | *Q* | *13MW6* | *Q* | *13MW7* | *Q* | *QL* | *Background* | *Method* | *GPS* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pentachlorobenzene** | | | | | | | | | *CAS #* | *608-93-5* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | J | U | J | U | J | U | J | U | J | 5 | | 8270C | - |
| **Pentachloroethane** | | | | | | | | | *CAS #* | *76-01-7* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **Pentachloronitrobenzene** | | | | | | | | | *CAS #* | *82-68-8* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Pentachlorophenol** | | | | | | | | | *CAS #* | *87-86-5* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 10 | | 8270C | - |
| **Phenacetin** | | | | | | | | | *CAS #* | *62-44-2* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Phenanthrene** | | | | | | | | | *CAS #* | *85-01-8* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Phenol** | | | | | | | | | *CAS #* | *108-95-2* | | | | | | | | |
| Second Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 4700 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 4700 |
| **Phorate** | | | | | | | | | *CAS #* | *298-02-2* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **2-Picoline** | | | | | | | | | *CAS #* | *109-06-8* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **PCBs** | | | | | | | | | *CAS #* | *1336-36-3* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8082 | |
| **Pronamide** | | | | | | | | | *CAS #* | *23950-58-5* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Propionitrile** | | | | | | | | | *CAS #* | *107-12-0* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 10 | | 8260B | - |
| **Pyrene** | | | | | | | | | *CAS #* | *129-00-0* | | | | | | | | |
| Second Quarter 2009 | U | J | U | J | U | J | U | J | U | J | U | J | U | J | 5 | 10 | 8270C | 67.1 |
| Fourth Quarter 2009 | U | | U | | U | | U | | U | | U | | U | | 5 | 10 | 8270C | 67.1 |
| **Pyridine** | | | | | | | | | *CAS #* | *110-86-1* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Safrole** | | | | | | | | | *CAS #* | *94-59-7* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Silvex** | | | | | | | | | *CAS #* | *93-72-1* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 2.5 | | 8151A | |
| **Styrene** | | | | | | | | | *CAS #* | *100-42-5* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 0.5 | | 8260B | - |
| **Sulfotep** | | | | | | | | | *CAS #* | *3689-24-5* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | 5 | | 8270C | - |
| **Total TCDF** | | | | | | | | | *CAS #* | *55722-27-5* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | | | 8280A | |
| **Total PeCDF** | | | | | | | | | *CAS #* | *30402-15-4* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | | | 8280A | |
| **Total HxCDF** | | | | | | | | | *CAS #* | *55684-94-1* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | | | 8280A | |
| **Total TCDD** | | | | | | | | | *CAS #* | *41903-57-5* | | | | | | | | |
| Second Quarter 2009 | - | | - | | U | | U | | U | | U | | U | | | | 8280A | |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
*Upgradient wells = 13MW1 and 13MW2*

*All Results in ug/L.*

| Analyte/Quarter | 13MW1 Q | 13MW2 Q | 13MW3 Q | 13MW4 Q | 13MW5 Q | 13MW6 Q | 13MW7 Q | QL | Background | Method | GPS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | | | | | CAS # 1746-01-6 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | | | 8280A | |
| **Total PeCDD** | | | | | CAS # 36088-22-9 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | | | 8280A | |
| **Total HxCDD** | | | | | CAS # 34465-46-8 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | | | 8280A | |
| **2,4,5-Trichlorophenoxyacetic acid** | | | | | CAS # 93-76-5 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 2.5 | | 8151A | - |
| **1,2,4,5-Tetrachlorobenzene** | | | | | CAS # 95-94-3 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **1,1,1,2-Tetrachloroethane** | | | | | CAS # 630-20-6 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **1,1,2,2-Tetrachloroethane** | | | | | CAS # 79-34-5 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **Tetrachloroethene** | | | | | CAS # 127-18-4 | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | 0.1 J | 0.5 | 1 | 8260B | 5 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 1 | 8260B | 5 |
| **2,3,4,6-Tetrachlorophenol** | | | | | CAS # 58-90-2 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **Toluene** | | | | | CAS # 108-88-3 | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 1000 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 5 | 8260B | 1000 |
| **o-Toluidine** | | | | | CAS # 95-53-4 | | | | | | |
| Second Quarter 2009 | - | - | U J | U J | U J | U J | U J | 5 | | 8270C | - |
| **Toxaphene** | | | | | CAS # 8001-35-2 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 2.5 | | 8081A | - |
| **1,2,4-Trichlorobenzene** | | | | | CAS # 120-82-1 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **1,1,1-Trichloroethane** | | | | | CAS # 71-55-6 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **1,1,2-Trichloroethane** | | | | | CAS # 79-00-5 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | |
| **Trichloroethene** | | | | | CAS # 79-01-6 | | | | | | |
| Second Quarter 2009 | U | U | 1 J | 1.5 J | U | U | 1.4 J | 0.5 | 1 | 8260B | 5 |
| Fourth Quarter 2009 | U | U | 0.9 | 1.4 | U | U | 2.1 | 0.5 | 1 | 8260B | 5 |
| **Trichlorofluoromethane** | | | | | CAS # 75-69-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **2,4,5-Trichlorophenol** | | | | | CAS # 95-95-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **2,4,6-Trichlorophenol** | | | | | CAS # 88-06-2 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |
| **1,2,3-Trichloropropane** | | | | | CAS # 96-18-4 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 1 | | 8260B | - |
| **O,O,O-Triethyl phosphorothioate** | | | | | CAS # 126-68-1 | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 5 | | 8270C | - |

## *Table 2: Target Analyte Monitoring Results - Calendar Year 2009*
## *Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring*
### *Upgradient wells = 13MW1 and 13MW2*
### *All Results in ug/L.*

| *Analyte/Quarter* | *13MW1 Q* | *13MW2 Q* | *13MW3 Q* | *13MW4 Q* | *13MW5 Q* | *13MW6 Q* | *13MW7 Q* | *QL* | *Background* | *Method* | *GPS* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **sym-Trinitrobenzene** | | | | | *CAS # 99-35-4* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 2.5 | 2.5 | 8330 | 470 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 2.5 | 2.5 | 8330B | 470 |
| **Vinyl acetate** | | | | | *CAS # 108-05-4* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | - |
| **Vinyl chloride** | | | | | *CAS # 75-01-4* | | | | | | |
| Second Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 1 | 8260B | 2 |
| Fourth Quarter 2009 | U | U | U | U | U | U | U | 0.5 | 1 | 8260B | 2 |
| **Xylenes (Total)** | | | | | *CAS # 1330-20-7* | | | | | | |
| Second Quarter 2009 | - | - | U | U | U | U | U | 0.5 | | 8260B | |

**Definitions: QL** Denotes quantitation limit. **U** Denotes analyte not detected at or above QL. **UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes analyte reported at or above QL and associated result is estimated due to quality control reasons. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated due to quality control reasons. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated due to quality control reasons. **R** Denotes result rejected. **Q** Denotes data validation qualifier. **NS** denotes not sampled. **NA** denotes not analyzed.

Note: First Quarter 2006 – Appendix IX monitoring event. For Appendix IX monitoring events, results reported to at or above the detection limit. Results between the detection limit and QL are considered unquantifiable and estimated. See laboratory deliverable for presentation of detection limits.
Second Quarter 2006 – First semiannual sampling event, includes perchlorate confirmation via MS.
Third Quarter 2006 – Additional sampling event – background data collection.
Fourth Quarter 2006 – Second semiannual sampling event.
Second Quarter 2007 - Appendix IX monitoring event. For Appendix IX monitoring events, results reported to at or above the detection limit. Results between the detection limit and QL are considered unquantifiable and estimated. See laboratory deliverable for presentation of detection limits.
Second Quarter 2008 - Appendix IX monitoring event. For Appendix IX monitoring events, results reported to at or above the detection limit. Results between the detection limit and QL are considered unquantifiable and estimated. See laboratory deliverable for presentation of detection limits.
Second Quarter 2009 - Appendix IX monitoring event. For Appendix IX monitoring events, results reported to at or above the detection limit. Results between the detection limit and QL are considered unquantifiable and estimated. See laboratory deliverable for presentation of detection limits.

Hexachlorophene analyzed and reported as a tentatively identified compound (TIC- First Quarter 2006).
For Dioxin results (Method 8280A), see laboratory report for sample specific QLs (All results, not detected).

GPS Denotes Groundwater Protection Standard. GPS proposed (not final).

# APPENDIX A

# FIELD NOTES

74MW2

DTW - 56.32 Begin Purge (1444)

Post Purge DTW - 56.34 Initial Purge - Clear

| Time | Temp(°) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge K | Desc |
|---|---|---|---|---|---|---|---|
| (1445) | 14.15 | 267 | 10.20 | 7.42 | 88.0 | 0.3 4/min | Clear |
| (1450) | 14.26 | 271 | 9.89 | 7.39 | 96.5 | " | Clear |
| (1455) | 14.27 | 271 | 9.78 | 7.38 | 105.3 | " | Clear |
| (1500) | 14.24 | 272 | 9.71 | 7.36 | 110.7 | " | Clear |
| (1505) | 14.06 | 273 | 9.65 | 7.36 | 115.8 | " | Clear |
| (1510) | 13.83 | 272 | 9.58 | 7.36 | 118.4 | " | Clear |
| (1515) | 13.79 | 272 | 9.55 | 7.37 | 120.1 | " | Clear |
| (1515) | Readings Stable | | | | | | |
| (1528) | 14.12 | 272 | 9.63 | 7.36 | 138.8 | | Post Purge Reading |

Sample Time (1520) DS 4/9/09

Samples Collected: (3) 8260, (2) 8011, (1) TM

4-15-09
AK Completed





General Notes

Weather - Overcast, 40's

PPE - Eye Protection, Nitrile gloves, Cotton Suits, Hard Hats

Calibrations - YSI 650 MDS

pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.97

Conductivity reads 1414 us in 1413 us std

DO% = 100

- Dedicated tubing and well skirts used at each well
- All equipment deconed between each well
- Purge water contained and disposed of at dedicated location onsite
- All samples collected, stored and tranported on ice in coolers

STATIC WATER LEVEL TABLE - Unit 13

| WELL | DTW | Post Purge DTW | Notes |
|---|---|---|---|
| 13MW1 | 20.80 | 20.97 | |
| 13MW2 | 21.24 | 22.48 | |
| 13MW3 | 12.93 | 12.96 | |
| 13MW4 | 16.32 | 16.44 | |
| 13MW5 | 16.45 | 16.58 | |
| 13MW6 | 16.02 | 16.18 | |
| 13MW7 | 15.20 | 15.36 | |

13MW6

DTW - 16.02 Begin Purge (0703)

Post Purge DTW - 16.18 Initial Purge - Clear

| Time | Temp(°) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge K | Desc |
|---|---|---|---|---|---|---|---|
| (0705) | 12.12 | 850 | 5.97 | 6.88 | 182.2 | 0.3 4/min | Clear |
| (0710) | 12.00 | 851 | 5.57 | 6.84 | 184.1 | " | Clear |
| (0715) | 12.10 | 853 | 5.42 | 6.84 | 185.0 | " | Clear |
| (0720) | 12.19 | 853 | 5.37 | 6.89 | 183.2 | " | Clear |
| (0725) | 12.30 | 852 | 5.15 | 6.86 | 182.6 | " | Clear |

13MW6 (Cont.)

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mV) | Purge k | Desc |
|---|---|---|---|---|---|---|---|
| (0730) | 12.41 | 853 | 5.06 | 6.87 | 181.4 | 0.3 4/min | Clear |
| (0735) | 12.43 | 853 | 5.02 | 6.85 | 181.8 | " | Clear |
| (0735) | Readings Stable | | | | | | |
| (0800) | 12.52 | 851 | 4.70 | 6.83 | 179.6 | Post Purge Reading | |

Sample Time (0740)

Samples Collected: (3)8260, (2)8280, (2)8332, (2)8330, (2)8151
(1)314.0; (1)TM, (1)CN, (1)Sulfide, (2)8270, (2)8081/8082

13MW5

DTW - 16.45 Begin Purge (0817)
Post Purge DTW - 14.58 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mV) | Purge k | Desc |
|---|---|---|---|---|---|---|---|
| (0820) | 12.04 | 662 | 5.98 | 6.81 | 187.5 | 0.3 4/min | Clear |
| (0825) | 11.80 | 673 | 5.76 | 6.80 | 188.2 | " | Clear |
| (0830) | 11.95 | 681 | 5.64 | 6.80 | 188.3 | " | Clear |
| (0835) | 12.09 | 688 | 5.59 | 6.80 | 188.3 | " | Clear |
| (0840) | 12.18 | 692 | 5.56 | 6.82 | 186.7 | " | Clear |
| (0845) | 12.06 | 698 | 5.58 | 6.82 | 187.3 | " | Clear |
| (0845) | Readings Stable | | | | | | |
| (0947) | ~~11.89~~ Sabo | 687 | 6.01 | 6.87 | 181.1 | Post Purge Reading | |

4/13/09 DS Sample Time (0850)

Samples Collected: (9)8260, (6)8280, (4)8332, (6)8330, (6)8151
(3)314.0, (3)TM, (3)Sulfide, (3)CN, (6)8270, (6) 8081/8082

13MW DUP

Sample Time (1050)

Samples Collected: (3) 8260, (2) 8280, (2) 8332, (2) 8330
(2) 8151, (2) 8270, (2) 8081/8082
(1) 314.0, (1) TM, (1) CN, (1) Sulfide

* Duplicate well sampled at 13MW4





13MW4

DTW - 16.32 Begin Purge (1004)
Post Purge DTW - 16.44 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mV) | Purge k | Desc |
|---|---|---|---|---|---|---|---|
| (1005) | 12.04 | 418 | 7.26 | 6.78 | 182.8 | 0.3 4/min | Clear |
| (1010) | 11.74 | 416 | 7.10 | 6.74 | 186.1 | " | Clear |
| (1015) | 11.74 | 416 | 6.98 | 6.72 | 187.0 | " | clear |
| (1020) | 11.74 | 414 | 6.88 | 6.72 | 187.2 | " | Clear |
| (1025) | 11.82 | 409 | 6.79 | 6.71 | 187.3 | " | Clear |
| (1030) | 11.88 | 407 | 6.71 | 6.71 | 187.7 | " | Clear |
| (1030) | Readings Stable | | | | | | |
| (1108) | 12.12 | 380 | 7.05 | 4.66 | 176.2 | Post Purge Reading | |

Sample Time (1035)

Samples Collected: (3)8260, (2)8280, (2)8332, (2)8330, (2)8151
(2)8081/8082, (1)314.0, (1)TM, (1)CN, (1)Sulfide, (2)8270

13MW3

DTW - 12.93 Begin Purge (1122)
Post Purge DTW - 12.96 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purge k | Desc |
|---|---|---|---|---|---|---|---|
| (1125) | 12.03 | 571 | 7.22 | 6.81 | 180.3 | 0.3 4/min | Clear |
| (1130) | 11.92 | 578 | 6.38 | 6.81 | 181.4 | " | Clear |
| (1135) | 11.96 | 585 | 5.96 | 6.80 | 182.4 | " | Clear |
| (1140) | 12.03 | 590 | 5.73 | 6.80 | 182.4 | " | Clear |
| (1145) | 11.97 | 593 | 5.70 | 6.80 | 182.8 | " | Clear |
| (1150) | 11.99 | 593 | 5.65 | 6.79 | 183.3 | " | Clear |
| (1155) | 12.10 | 594 | 5.62 | 6.79 | 183.5 | " | Clear |
| (1155) | Readings Stable | | | | | | |
| (1216) | 12.38 | 594 | 5.68 | 6.79 | 189.1 | Post Purge Reading | |

Sample Time (1200)

Samples Collected: (3)8260, (2)8280, (2)8332, (2)8330, (2)8151, (2)8270
(2)8081/8082, (1)314.0, (1)TM, (1)CN, (1)Sulfide

6-15-09
ZDK completed

## General Notes

Weather- Overcast, Raining, 40's
PPE- Eye Protection, Nitrile gloves, Cotton Suits, Hard Hats
Calibrations- YSI 650 MDS
pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.01
Conductivity reads 1413 us in 1413 us std
DO% = 100

- Dedicated tubing and well skirts used at each well
- All equipment deconed between each well
- Purge water contained and disposed of at dedicated location onsite
- All samples collected, stored and transported in coolers on ice.

## 13MW2

DTW - 21.24 Begin Purge (0734)
Post Purge DTW - 22.48 Initial Purge - Clear

| Time | Temp(C°) | Cond(us) | DO mg/L | pH | ORP(mV) | Purge lt | Desc |
|---|---|---|---|---|---|---|---|
| (0735) | 12.40 | 975 | 8.24 | 6.95 | 189.1 | 0.3 L/min | Clear |
| (0740) | 12.43 | 826 | 6.40 | 6.90 | 187.6 | " | Clear |
| (0745) | 12.50 | 779 | 5.94 | 6.89 | 187.3 | " | Clear |
| (0750) | 12.46 | 744 | 5.46 | 6.88 | 185.4 | " | Clear |
| (0755) | 12.48 | 718 | 5.15 | 6.87 | 184.8 | " | Clear |
| (0800) | 12.44 | 705 | 4.90 | 6.87 | 185.6 | " | Clear |
| (0805) | 12.34 | 685 | 4.62 | 6.86 | 184.5 | " | Clear |
| (0810) | 12.31 | 680 | 4.54 | 6.86 | 184.4 | " | Clear |
| (0810) | Readings Stable | | | | | | |
| (0831) | Sc 12.76 DS 4/14/09 | 656 | 4.17 | 6.84 | 182.6 | | Post Purge Reading |

Sample Time (0815)
Samples Collected: (3)8260, (2)8332, (2)8330, (1)314.0, (1)TM
(2)8270





## 13MW1

DTW - 20.80 Begin Purge (0858)
Post Purge DTW - 20.97 Initial Purge - Clear

| Time | Temp(C°) | Cond(us) | DO mg/L | pH | ORP(mV) | Purge lt | Desc |
|---|---|---|---|---|---|---|---|
| (0900) | 12.08 | 690 | 6.36 | 6.81 | 196.2 | 0.3 L/min | Clear |
| (0905) | 12.07 | 692 | 4.89 | 6.84 | 194.5 | " | Clear |
| (0910) | 12.10 | 695 | 3.87 | 6.85 | 191.3 | " | Clear |
| (0915) | 12.11 | 697 | 3.59 | 6.85 | 189.3 | " | Clear |
| (0920) | 12.00 | 697 | 3.80 | 6.85 | 186.1 | " | Clear |
| (0925) | 11.93 | 697 | 3.67 | 6.85 | 185.2 | " | Clear |
| (0930) | 11.90 | 696 | 3.61 | 6.85 | 183.7 | " | Clear |
| (0930) | Readings Stable | | | | | Pos | |
| (0953) | 12.30 | 678 | 3.92 | 6.81 | 180.3 | | Post Purge Reading |

Sample Time (0935)
Samples Collected: (3)8260, (2)8332, (2)8330, (1)314.0, (1)TM
(2)8270

## 13MW7

DTW - 15.20 Begin Purge (1014)
Post Purge DTW - 15.36 Initial Purge - Clear

| Time | Temp(C°) | Cond(us) | DO mg/L | pH | ORP(mV) | Purge lt | Desc |
|---|---|---|---|---|---|---|---|
| (1015) | 11.55 | 703 | 5.02 | 6.95 | 183.2 | 0.3 L/min | Clear |
| (1020) | 11.63 | 697 | 4.20 | 6.95 | 180.1 | " | Clear |
| (1025) | 11.69 | 696 | 4.08 | 6.95 | 177.7 | " | Clear |
| (1030) | 11.77 | 695 | 4.05 | 6.95 | 176.3 | " | Clear |
| (1035) | 11.72 | 696 | 4.03 | 6.95 | 174.7 | " | Clear |
| (1040) | 11.72 | 698 | 3.99 | 6.95 | 172.8 | " | Clear |
| (1045) | 11.68 | 697 | 3.95 | 6.94 | 172.2 | " | Clear |
| (1045) | Readings Stable | | | | | | |
| (1112) | 11.88 | 698 | 3.86 | 6.94 | 167.9 | | Post Purge Reading |

Sample Time (1050)
Samples Collected: (3)8260, (2)8280, (2)8332, (2)8330, (2)8151
(2)8081/8082, (1)314.0, (1)TM, (1)CN, (1)Sulfide, (2)8270

6/17/09 RAAP FB# 8
B03204-07
DAS/TQE

## General Notes

Weather - Overcast, Showers, 60's
PPE - Eye Protection, Nitrile gloves, cotton suits
Calibrations - YSI 650 MDS
pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.98
Conductivity reads 1413 us in 1413 us std.
DO % = 100

- Dedicated tubing and well skirts used at each well
- All equipment deconed between each well
- Purge water disposed of at dedicated location onsite
- All samples collected, stored & transported on ice in coolers

## 13MW6

DTW - 14.17 Begin Purge (0749)
Post Purge DTW - 14.19 Initial Purge - Clear

| Time | Temp(°) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge(lgpm) | Vol(gal) |
|---|---|---|---|---|---|---|---|
| (0750) | 14.73 | 850 | 5.58 | 4.56 | 200.4 | 0.34/min | Clear |
| (0755) | 14.80 | 903 | 4.24 | 6.72 | 190.6 | " | " |
| (0800) | 14.77 | 900 | 3.90 | 6.68 | 185.2 | " | " |
| (0805) | 14.72 | 893 | 3.71 | 6.69 | 181.3 | " | " |
| (0810) | 14.75 | 886 | 3.66 | 6.70 | 179.0 | " | " |
| (0815) | 14.74 | 881 | 3.60 | 6.71 | 176.2 | " | " |
| (0820) | 14.65 | 873 | 3.54 | 6.71 | 173.4 | " | " |
| (0820) | Readings Stable | | | | | | |

Sample Time (0825)
Samples Collected: (1) sulfide

All Notes copied from DAS personal Field Book # 1.



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## 13MW3 (13MW3)

DTW - 11.68 Begin Purge (~~1023~~ 1023)
Post Purge DTW - 11.68 Initial Purge - Clear

| Time | Temp(°) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge(lgpm) | Desc. |
|---|---|---|---|---|---|---|---|
| (1025) | 15.99 | 529 | 7.54 | 6.75 | 175.7 | 0.34/min | Clear |
| (1030) | 15.77 | 514 | 6.63 | 6.67 | 177.1 | " | " |
| (1035) | 15.73 | 507 | 6.40 | 6.65 | 177.0 | " | " |
| (1040) | 15.66 | 496 | 6.20 | 6.63 | 176.3 | " | " |
| (1045) | 15.66 | 492 | 6.16 | 6.63 | 175.4 | " | " |
| (1050) | 15.67 | 488 | 6.14 | 6.63 | 174.8 | " | " |
| (1055) | 15.79 | 485 | 6.13 | 6.64 | 173.6 | " | " |
| (1055) | Readings Stable | | | | | | |

Sample Time (1100)
Samples Collected: (3) 8260, (3) 8260

## 13MW5

DTW - 14.45 Begin Purge (0842)
Post Purge DTW - 14.51 Initial Purge - Clear

| Time | Temp(°) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge(lgpm) | Desc |
|---|---|---|---|---|---|---|---|
| (0845) | 14.76 | 707 | 6.74 | 6.77 | 176.6 | 0.34/min | Clear |
| (0850) | 15.01 | 681 | 6.57 | 6.75 | 177.1 | " | " |
| (0855) | 15.00 | 674 | 6.49 | 6.75 | 176.6 | " | " |
| (0900) | 15.02 | 669 | 6.43 | 6.75 | 176.7 | " | " |
| (0905) | 15.02 | 664 | 6.38 | 6.74 | 176.4 | " | " |
| (0910) | 15.01 | 661 | 6.34 | 6.74 | 176.5 | " | " |
| ( ) | | | | | | " | " |
| (0910) | Readings Stable | | | | | | |

Sample Time (0915)
Samples Collected: (1) sulfide

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13MW4

DTW - 13.96 Begin Purge (0937)

Post Purge DTW - 13.99 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | Purgek(gpm) | Desc |
|---|---|---|---|---|---|---|---|
| (0940) | 14.91 | 446 | 6.87 | 6.68 | 175.5 | 0.3 4/min | Clear |
| (0945) | 14.83 | 449 | 6.14 | 6.60 | 177.6 | " | " |
| (0950) | 14.65 | 451 | 5.95 | 6.60 | 177.0 | " | " |
| (0955) | 14.57 | 451 | 5.90 | 6.60 | 176.6 | " | " |
| (1000) | 14.44 | 453 | 5.81 | 6.60 | 176.8 | " | " |
| (1005) | 14.42 | 452 | 5.79 | 6.60 | 176.3 | " | " |

(1005) Readings Stable

Sample Time (1010)

Samples Collected: (1) Sulfide

13MW7

DTW - 13.81 Begin Purge (1120)

Post Purge DTW - 13.81 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purgek(gpm) | Desc |
|---|---|---|---|---|---|---|---|
| (1120) | 14.40 | 700 | 2.59 | 6.85 | 159.9 | 0.3 4/min | Clear |
| (1125) | 14.15 | 696 | 1.22 | 6.76 | 161.2 | " | " |
| (1130) | 13.90 | 676 | 1.08 | 6.78 | 156.0 | " | " |
| (1135) | 13.79 | 649 | 1.10 | 6.82 | 150.7 | " | " |
| (1140) | 13.68 | 619 | 1.14 | 6.82 | 149.8 | " | " |
| (1145) | 13.69 | 603 | 1.29 | 6.82 | 149.4 | " | " |
| (1150) | 13.70 | 597 | 1.27 | 6.82 | 149.3 | " | " |

(1150) Readings Stable

Sample Time (1155)

Samples Collected: (1) Sulfide

LPK 8-26-09 Completed



10/5/09 RAAP B03204-07 DAS/TQE FB#8

General Notes

Weather - Partly Cloudy, 70's

PPE - Eye Protection, Nitrile gloves

Calibrations - YSI 650 MDS

pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00

Conductivity reads 1413 us in 1413 us std

DO% = 100

- Dedicated tubing and well skirts used at each well
- All equipment deconed between each well
- Purge water disposed of at dedicated location onsite
- All samples collected, stored and transported on ice in coolers.

Static Water Level Table Permit 433

| WELL | ID | DTW | Post Purge DTW | Notes |
|---|---|---|---|---|
| 74MW1 | | 23.07 | 23.24 | |
| 74MW2 | | 56.34 | 56.36 | |
| 74MW3 | | 20.47 | 22.23 | |
| 74MW4 | | 23.53 | 23.55 | |
| 74MW5 | | 25.64 | 25.65 | |
| 74MW6 | | 24.54 | 24.56 | |
| 74MW7 | | 24.68 | 25.09 | |

74MW3

DTW - 20.47 Begin Purge (1113)

Post Purge DTW - 22.23 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purgek | Desc |
|---|---|---|---|---|---|---|---|
| (1115) | 13.55 | 644 | 3.22 | 6.84 | -1.3 | 0.3 4/min | Clear |
| (1120) | 13.90 | 639 | 1.72 | 6.81 | 0.4 | " | Clear |
| (1125) | 14.38 | 637 | 1.57 | 6.83 | 7.3 | " | Clear |
| (1130) | 14.91 | 633 | 1.52 | 6.84 | 9.8 | " | Clear |
| (1135) | 14.52 | 640 | 1.54 | 6.85 | 17.9 | " | Clear |
| (1140) | 14.49 | 640 | 1.65 | 6.82 | 26.9 | " | Clear |
| (1145) | 14.51 | 644 | 1.78 | 6.80 | 30.8 | " | Clear |

## General Notes

Weather - Sunny, 50's
PPE - Eye Protection, Nitrile gloves, Cotton suits, HARD HATS
Calibrations - YSI 650 MDS
pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.98
Conductivity reads 1413 us in 1413 us std
DO % = 100

- Dedicated tubing and well skirts used at each well
- All equipment deconed between each well
- Purge water disposed of at dedicated location onsite
- All samples collected, stored and transported in coolers on ice

## Static Water Level Table - Unit 13

| WELL | DTW | Post Purge DTW | Notes |
|---|---|---|---|
| 13MW1 | 21.57 | 21.73 | |
| 13MW2 | 21.72 | 22.88 | |
| 13MW3 | 13.39 | ~~13.41~~ 13.41 | 10/19/09 DS |
| 13MW4 | 16.83 | 16.90 | |
| 13MW5 | 17.07 | 17.14 | |
| 13MW6 | 16.73 | 16.80 | |
| 13MW7 | 16.23 | 16.34 | |

## 13MW3

DTW - 13.39
Post Purge DTW - 13.41

Begin Purge (0707)
Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (0710) | 14.08 | 536 | 6.79 | 6.69 | 242.0 | 0.3 L/min | Clear | 13.42 |
| (0715) | 13.72 | 556 | 5.86 | 6.80 | 240.3 | " | Clear | 13.42 |
| (0720) | 13.65 | 566 | 5.52 | 6.83 | 239.7 | " | Clear | 13.41 |
| (0725) | 13.54 | 567 | 5.33 | 6.82 | 237.0 | " | Clear | 13.41 |
| (0730) | 13.67 | 566 | 5.24 | 6.82 | 236.3 | " | Clear | 13.41 |
| (0735) | 13.75 | 563 | 5.23 | 6.83 | 234.1 | " | Clear | |
| (0735) | Readings Stable | | | 6.79 | 228.6 | | Post Purge Reading | |
| (0750) | 14.11 | 548 | 5.25 | | | | | |

(144)



## 13MW3 (cont)

Sample Time (0740)
Samples Collected: (3) 8260, (1) 3140, (2) 8270, (1) TIM, (3) 8332-8330

## 13MW5

DTW - 17.07
Post Purge DTW - 17.14

Begin Purge (0814)
Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (0815) | 13.46 | 613 | 5.34 | 6.93 | 212.5 | 0.3 L/min | Clear | 17.10 |
| (0820) | 13.56 | 634 | 4.12 | 6.98 | 206.8 | " | Clear | 17.10 |
| (0825) | 13.61 | 640 | 4.04 | 6.91 | 204.7 | " | Clear | 17.09 |
| (0830) | 13.69 | 637 | 4.29 | 6.88 | 204.2 | " | Clear | 17.09 |
| (0835) | 13.70 | 628 | 4.44 | 6.85 | 203.6 | " | Clear | 17.09 |
| (0840) | 13.63 | 625 | 4.51 | 6.84 | 201.4 | " | Clear | 17.10 |
| (0845) | 13.53 | 620 | 4.60 | 6.84 | 201.8 | " | Clear | |
| (0845) | Readings Stable | | | | | | | |
| (0930) | 13.78 | 605 | 4.71 | 6.84 | 194.4 | | Post Purge Reading | |

Sample Time (0850)
Samples Collected: (9) 8260, (3) 3140, (6) 8270, (3) TIM, (9) 8332/8330

## 13MW6

DTW - 16.73
Post Purge DTW - 16.80

Begin Purge (0953)
Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (0955) | 13.21 | 742 | 3.54 | 6.92 | 188.5 | 0.3 L/min | Clear | 16.80 |
| (1000) | 13.12 | 752 | 3.01 | 6.92 | 185.4 | " | Clear | 16.80 |
| (1005) | 13.24 | 769 | 2.66 | 6.92 | 182.0 | " | Clear | 16.80 |
| (1010) | 13.33 | 775 | 2.62 | 6.92 | 180.6 | " | Clear | 16.79 |
| (1015) | 13.19 | 777 | 2.53 | 6.92 | 179.4 | " | Clear | 16.79 |
| (1020) | 13.22 | 777 | 2.47 | 6.92 | 178.6 | " | Clear | 16.79 |
| (1025) | 13.17 | 777 | 2.43 | 6.92 | 177.4 | " | Clear | 16.79 |
| (1025) | Readings Stable | | | | | | | |
| (1042) | 13.41 | 777 | 2.45 | 6.90 | 174.3 | | Post Purge Reading | |

(145)

## 13MW6 (Cont)

Sample Time (1030)

Samples Collected: (3)8260, (2)8270, (1)TM, (1)314.0, (3)8332/8330

## 13MW7

DTW - 16.23 Begin Purge (1052)

Post Purge DTW - 16.34 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1055) | 14.14 | 532 | 4.84 | 6.90 | 182.5 | 0.3 L/min | Clear | 16.33 |
| (1100) | 14.19 | 601 | 2.72 | 6.84 | 174.9 | " | Clear | 16.33 |
| (1105) | 14.28 | 648 | 1.50 | 6.83 | 169.1 | " | Clear | |
| (1110) | 14.47 | 667 | 1.25 | 6.83 | 165.4 | " | Clear | 16.33 |
| (1115) | 14.69 | 675 | 1.21 | 6.83 | 162.6 | " | Clear | 16.33 |
| (1120) | 14.83 | 673 | 1.14 | 6.81 | 160.5 | " | Clear | |
| (1125) | 14.94 | 671 | 1.17 | 6.79 | 159.3 | " | Clear | |
| (1125) | Readings Stable | | | | | | | |
| (1140) | 14.62 | 668 | 1.23 | 6.77 | 157.4 | Post Purge Reading | | |

Sample Time (1130)

Samples Collected: (3)8260, (2)8270, (1)TM, (1)314.0, (3)8332/8330

### Static Water Level Table - Unit 7

| WELL | DTW | Post Purge DTW | Notes |
|---|---|---|---|
| 7W12B | 24.84 | 24.86 | |
| 7W9C | 14.52 | 16.77 | |
| 7W10B | 15.57 | 16.00 | |
| 7W10C | 21.59 | 22.86 | |
| 7W13 | 19.28 | 21.05 | |
| 7MW6 | 26.41 | 31.55 | |
| 7W11B | 25.15 | 25.18 | |
| 7WCA | 24.71 | 25.63 | |
| 7W9B | 10/20/09 ~~22.60~~ 22.68 | | SWL ONLY |
| 7W11 | 24.42 | | " |
| 7MW5 | 24.95 | | " |





## 7W12B

DTW - 24.84 Begin Purge (1227)

Post Purge DTW - 24.86 Initial Purge -

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1228) | 14.26 | 616 | 8.21 | 7.08 | 168.4 | 0.3 L/min | Clear | 24.86 |
| (1230) | 14.31 | 616 | 7.96 | 7.06 | 168.9 | " | Clear | |
| (1235) | 14.27 | 616 | 7.76 | 7.03 | 167.8 | " | Clear | |
| (1240) | 14.33 | 617 | 7.70 | 7.02 | 167.7 | " | Clear | |
| (1245) | 14.41 | 616 | 7.64 | 7.00 | 166.5 | " | Clear | 24.84 |
| (1250) | 14.46 | 616 | 7.63 | 7.00 | 166.1 | " | Clear | |
| (1255) | 14.50 | 616 | 7.65 | 7.00 | 165.8 | " | Clear | |
| (1255) | Readings Stable | | | | | | | |
| (1316) | 14.65 | 619 | 7.70 | 7.01 | 161.7 | Post Purge Reading | | |

Sample Time (1300)

Samples Collected: (2)8270, (1)TM, (1)CN

## 7W9C

DTW - 14.52 Begin Purge (1334)

Post Purge DTW - 16.77 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1335) | 13.41 | 1073 | 2.61 | 6.85 | 60.7 | 0.3 L/min | Clear | 15.61 |
| (1340) | 13.38 | 1077 | 2.05 | 6.78 | 71.8 | " | Clear | 15.72 |
| (1345) | 13.70 | 1085 | 1.58 | 6.77 | 83.7 | " | Clear | 15.81 |
| (1350) | 13.80 | 1091 | 1.50 | 6.77 | 90.0 | " | Clear | 15.90 |
| (1355) | 14.03 | 1096 | 1.36 | 6.76 | 93.2 | " | Clear | 16.02 |
| (1400) | 14.29 | 1098 | 1.27 | 6.76 | 91.6 | " | Clear | 16.07 |
| (1405) | 14.42 | 1102 | 1.24 | 6.75 | 90.1 | " | Clear | 16.14 |
| (1405) | Readings Stable | | | | | | | |
| (1423) | 14.63 | 1102 | 1.30 | 6.69 | 90.5 | Post Purge Reading | | |

Sample Time (1410)

Samples Collected: (2)8270, (1)TM, (1)CN

## 7W10B

DTW - 15.57 Begin Purge (1438)

Post Purge DTW - 16.00 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1440) | 13.53 | 832 | 3.55 | 6.82 | 122.7 | 0.3 L/min | Clear | 16.18 |
| (1445) | 13.44 | 828 | 2.84 | 6.75 | 128.0 | " | Clear | 15.98 |
| (1450) | 13.31 | 815 | 2.40 | 6.74 | 128.3 | " | Clear | 15.98 |
| (1455) | 13.37 | 813 | 2.22 | 6.76 | 126.5 | " | Clear | 15.93 |
| (1500) | 13.29 | 811 | 2.09 | 6.77 | 125.9 | " | Clear | 15.87 ✓ |
| (1505) | 13.44 | 808 | 1.96 | 6.77 | 125.0 | " | Clear | 15.87 |
| (1510) | 13.57 | 806 | 1.95 | 6.77 | 124.6 | " | Clear | 15.85 |
| (1510) | Readings Stable | | | | | | | |
| (1528) | 13.78 | 797 | 1.88 | 6.80 | 125.8 | Post Purge Reading | | |

Sample Time (1515)

Samples Collected: (2)8270, (1)TM, (1)CN

## 7W10C

DTW - 21.59 Begin Purge (1540)

Post Purge DTW - 22.86 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1541) | 13.25 | 719 | 2.35 | 7.16 | -52.0 | 0.3 L/min | Clear | 21.85 |
| (1545) | 13.22 | 719 | 1.60 | 7.07 | -27.1 | " | Clear | 22.03 ✓ |
| (1550) | 13.19 | 720 | 1.17 | 7.05 | -4.8 | " | Clear | 22.19 |
| (1555) | 13.11 | 721 | 1.04 | 7.05 | 5.7 | " | Clear | 22.26 |
| (1600) | 13.00 | 721 | 0.90 | 7.04 | 24.8 | " | Clear | 22.53 |
| (1610) | 12.89 | 720 | 0.84 | 7.04 | 23.2 | " | Clear | 22.61 |
| (1615) | 12.83 | 720 | 0.80 | 7.04 | 26.0 | " | Clear | 22.70 |
| (1615) | Readings Stable | | | | | | | |
| (1634) | 12.58 | 717 | 0.79 | 7.06 | 32.3 | Post Purge Reading | | |

Sample Time (1620)

Samples Collected: (3)8270, (1)TM, (1)CN





## General Notes

Weather - Sunny, 60's

PPE - Eye Protection, Nitrile gloves, Cotton suits

Calibrations - YSI 650 MDS

pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00

Conductivity reads 1413 us in 1413 us std

DO% = 100

- Dedicated tubing and well skirts used at each well
- All equipment deconed between each well
- Purge water disposed of at dedicated location onsite
- All samples collected, stored and transported on ice in coolers

## 13MW4

DTW - 16.83 Begin Purge (0727) ✓

Post Purge DTW - 16.90 Initial Purge -

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(MV) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (0730) | 13.36 | 477 | 5.51 | 6.47 | 228.4 | 0.3 L/min | Clear | 16.88 |
| (0735) | 13.14 | 525 | 2.94 | 7.03 | 200.6 | " | Clear | |
| (0740) | 13.40 | 545 | 2.36 | 7.10 | 194.8 | " | Clear | 16.88 |
| (0745) | 13.70 | 564 | 2.20 | 7.14 | 188.2 | " | Clear | |
| (0750) | 13.84 | 569 | 2.19 | 7.14 | 182.9 | " | Clear | 16.88 |
| (0755) | 13.93 | 571 | 2.10 | 7.13 | 178.3 | " | Clear | |
| (0800) | 13.98 | 570 | 2.07 | 7.12 | 176.5 | " | Clear | |
| (0800) | Readings Stable | | | | | | | |
| (0839) | 14.10 | 520 | 3.15 | 6.71 | 170.6 | Post Purge Reading | | |

Sample Time (0805)

Samples Collected: (3)8260, (2)8270, (1)TM, (1)314.0, (3)8332/8330

## 13WDUP

Sample Time (0820)

Samples Collected: (3)8260, (2)8270, (1)TM, (1)314.0, (3)8332/8330

* Dup samples collected at 13MW4

13MW2

DTW - 21.76 Begin Purge (0853)

Post Purge DTW - 2288 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | PurgeK | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (0855) | 12.98 | 663 | 5.67 | 6.85 | 170.3 | 0.3 L/min | Clear | 22.10 |
| (0900) | 13.01 | 667 | 4.30 | 6.85 | 165.8 | " | Clear | 22.28 |
| (0905) | 13.01 | 669 | 3.50 | 6.86 | 161.5 | " | Clear | 22.38 ✓ |
| (0910) | 12.87 | 671 | 3.29 | 6.86 | 159.8 | " | Clear | 22.50 |
| (0915) | 12.63 | 672 | 3.16 | 6.86 | 157.2 | " | Clear | 22.59 |
| (0920) | 12.49 | 671 | 3.13 | 6.86 | 156.7 | " | Clear | 22.61 |
| (0925) | 12.25 | 672 | 3.12 | 6.86 | 155.3 | " | Clear | 22.64 |
| (0925) | Readings Stable | | | | | | | |
| (0946) | 12.31 | 665 | 3.22 | 6.85 | 151.5 | Post Purge Reading | | |

Sample Time (0930)

Samples Collected: (3)8260, (2)8270, (1)TM, (1)314.0, (3)8332/8330

13MW1

DTW - 21.58 Begin Purge (0959) ✓

Post Purge DTW - 21.73 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | PurgeK | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1000) | 12.56 | 593 | 6.90 | 6.82 | 157.9 | 0.3 L/min | Clear | 21.71 |
| (1005) | 12.56 | 645 | 5.41 | 6.80 | 152.2 | " | Clear | 21.70 |
| (1010) | 12.74 | 667 | 4.67 | 6.80 | 147.0 | " | Clear | 21.66 |
| (1015) | 12.79 | 690 | 4.34 | 6.81 | 143.1 | " | Clear | 21.66 |
| (1020) | 12.90 | 706 | 4.20 | 6.81 | 139.8 | " | Clear | |
| (1025) | 13.06 | 714 | 4.09 | 6.81 | 137.2 | " | Clear | 21.64 |
| (1030) | 13.18 | 719 | 3.99 | 6.81 | 135.6 | " | Clear | |
| (1035) | 13.27 | 722 | 3.90 | 6.81 | 132.6 | " | Clear | |
| (1035) | Readings Stable | | | | | | | |
| (1057) | 13.51 | 725 | 3.64 | 6.83 | 131.2 | Post Purge Reading | | |

Sample Time (1040)

Samples Collected: (3)8260, (2)8270, (1)TM, (1)314.0, (3)8332/8330





7W13

DTW - 19.28 Begin Purge (1123)

Post Purge DTW - 21.05 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | PurgeK | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1125) | 13.89 | 1383 | 4.39 | 7.28 | -6.6 | 0.3 L/min | Clear | 20.62 |
| (1130) | 13.84 | 1398 | 2.01 | 7.23 | -41.8 | " | Clear | 20.84 |
| (1135) | 13.99 | 1398 | 1.62 | 7.21 | -42.4 | " | Clear | 21.06 ✓ |
| (1140) | 14.23 | 1399 | 1.61 | 7.20 | -36.0 | " | Clear | 21.00 |
| (1145) | 14.59 | 1398 | 1.62 | 7.20 | -31.7 | " | Clear | 21.00 |
| (1150) | 14.80 | 1398 | 1.65 | 7.21 | -28.9 | " | Clear | 20.90 |
| (1155) | 14.93 | 1397 | 1.64 | 7.21 | -30.0 | " | Clear | 20.81 |
| (1155) | Readings Stable | | | | | | | |
| (1213) | 14.64 | 1393 | 1.83 | 7.2 | -19.7 | Post Purge Reading | | |

Sample Time (1200)

Samples Collected: (2)8270, (1)TM, (1)CN

7MW6

DTW - 26.41 Begin Purge (1231)

Post Purge DTW - 31.55 Initial Purge - Clear

| Time | Temp(C) | Cond(us) | DO mg/L | pH | ORP(mv) | PurgeK | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (1235) | 14.43 | 1679 | 1.70 | 7.30 | -23.2 | 0.3 L/min | Clear | 28.76 ✓ |
| (1240) | 14.75 | 1715 | 1.23 | 7.15 | -44.7 | " | Clear | 29.66 |
| (1245) | 15.10 | 1731 | 1.05 | 7.09 | -55.1 | " | Clear | 29.66 |
| (1250) | 15.15 | 1732 | 0.95 | 7.08 | -60.7 | " | Clear | 29.89 |
| (1255) | 15.34 | 1716 | 0.94 | 7.07 | -64.8 | " | Clear | 30.10 |
| (1300) | 15.64 | 1700 | 0.95 | 7.08 | -65.7 | " | Clear | 30.45 |
| (1305) | 15.76 | 1688 | 0.95 | 7.10 | -64.2 | " | Clear | 30.77 |
| (1305) | Readings Stable | | | | | | | |
| (1324) | 15.43 | 1656 | 0.98 | 7.07 | -61.7 | Post Purge Reading | | |

Sample Time (1310)

Samples Collected: (2)8270, (1)TM, (1) CN

12/9/09 RAAP FB#9
B03304-203D
OBG Soil Samples

NB-2
Sample Time: (1115)
Samples Collected: (3) 8260/5035, (1) 8270/TM, (1) 8290, (1) 8330/8332,
(1) Dry Weight

SB-1
Sample Time: (1230)
Samples Collected: (3) 8260/5035, (1) 8270/TM, (1) 8290, (1) 8330/8332,
(1) Dry Weight

SB-2
Sample Time: (1240)
Samples Collected: (3) 8260/5035, (1) 8270/TM, (1) 8290, (1) 8330/8332,
(1) Dry Weight

Berm-1
Sample Time: (1145)
Samples Collected: (3) 8260/5035, (1) 8270/TM, (1) 8290, (1) 8330/8332,
(1) Dry Weight

Pond-1
Sample Time: (1155)
Samples Collected: (3) 8260/5035, (1) 8270/TM, (1) 8290, (1) 8330/8332,
(1) Dry Weight

Equipment Blank
Sample Time: (1345)
Samples Collected: (2) TM - RCRA Metals 6010/7470

End of Soil Samples



12/9/09 RAAP FB#9
B03304-07
OBG resample event

General Notes
* Weather: Windy/Sunny - 50's
* PPE: Eye Protection, Nitrile Gloves, Flame retardant suits
* Calibrations: YSI 650 MDS
  - pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.97
  - conductivity 1,413 µS = 1,413 µS
  - DO % = 100%
* Dedicated tubing and well skirts used at each well.
* All equipment decon'ed between each well.
* Purge water disposed at wastewater treatment plant.
* All samples collected, then stored and transported in coolers and on ice.
* River's water level is very high and standing water is surrounding 13MW3

13MW6
DTW - 12.35 Begin Purge (1450)
Post Purge DTW - 12.50 Initial Purge - Clear

| Time | Temp (C°) | Cond (ms) | DO mg/L | pH | ORP (mV) | Purge lpm | Desc. | DTW |
|---|---|---|---|---|---|---|---|---|
| (1455) | 14.13 | 882 | 3.15 | 6.92 | 92.9 | 0.3 L/min | Clear | 12.54 |
| (1500) | 14.13 | 882 | 3.15 | 6.92 | 91.3 | " | " | 12.50 |
| (1505) | 14.16 | 882 | 3.13 | 6.94 | 88.2 | " | " | 12.51 |
| (1510) | 14.17 | 882 | 3.17 | 6.95 | 87.4 | " | " | 12.50 |
| (1515) | 14.17 | 881 | 3.20 | 6.95 | 86.4 | " | " | 12.51 |
| (1520) | 14.18 | 880 | 3.21 | 6.96 | 85.9 | " | " | 12.51 |
| (1520) | Readings stable | | | | | | | |
| (1535) | 14.12 | 877 | 3.23 | 6.96 | 85.6 | " | " | 12.50 |

Sample Time: (1525)
Samples Collected: (2) sulfides

12/10/09 RAAP FB#9

B03204-07
OBG resample event

General Notes
* Weather: Windy / Sunny - 30's
* PPE: Eye Protection, Nitrile Gloves, Flame retardent suits
* Calibrations: YSI 650 MDS
  - pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00
  - Conductivity: 1413 µS standard = 14
  - DO% = 100%
* Dedicated tubing and well skirts used at each well.
* All ~~sample well~~ equipment deconed after each well.
* Purge water disposed at wastewater treatment plant
* All samples stored and transported on ice.
* River level is very high.

13MW1

DTW = 8.69'

Begin Purge: (08:45)
Initial Purge: Clear

Post Purge DTW =

| Time | Temp(°C) | Cond(µs) | DO(mg/L) | pH | ORP(mV) | Purge K | Desc | DTW |
|---|---|---|---|---|---|---|---|---|
| (08:50) | 14.01 | 850 | 4.90 | 7.03 | 207.0 | 0.3 L/min | Clear | 8.91' |
| (08:55) | 13.96 | 592 | 4.90 | 6.94 | 206.8 | " | " | 8.90' |
| (09:00) | 13.99 | 546 | 4.57 | 6.90 | 204.6 | " | " | 8.88' |
| (09:05) | 14.09 | 521 | 4.30 | 6.87 | 198.6 | " | " | 8.88' |
| (09:10) | 13.94 | 505 | 4.32 | 6.86 | 195.0 | " | " | 8.80' |
| (09:15) | 13.85 | 493 | 4.26 | 6.85 | 190.7 | " | " | 8.84' |
| (09:20) | 14.04 | 495 | 4.26 | 6.84 | 187.1 | " | " | 8.88' |
| (09:20) | Readings Stable | | | | | | | |
| (09:40) | 13.90 | 493 | 4.20 | 6.83 | 186.8 | " | " | 8.71' |

Sample Time (0925).
Sample Collected: (2) Sulfides

* Could not complete sampling event due to burn operations near effected area. Will return next week. Left site ~1000



12/15/09 RAAP FB#9

B03204-07
OBG RESAMPLE
KFC/TGE

General Notes:
* Weather: Overcast 40's steel toed work boots.
* PPE: Eye Protection, Nitrile Gloves, White flame retardant suit.
* Calibrations: YSI 650 MDS
  - pH: 4.00 = 4.00, 7.00 = 6.99, 10.00 = 9.97
  - Conductivity reads 1412 µs in a 1413 µs standard
  - DO% = 100%
* Dedicated tubing and well skirts used at each well.
* All sample equipment deconed after each well.
* Purge water collected and disposed of at wastewater treatment plant.
* All samples stored and transported on ice.
* Additional Calibration Myron L Ultrameter
  pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00
  conductivity reads 1413 µs in a 1413 µs standard

13MW3

DTW = 10.50

Begin Purge (0906)
Initial Purge clear

TD = 20.40

9.90 x 0.65 = 6.43
~~6.43 - 1.61 x 3 = 4.84~~

pulled pump to develop well

| TIME | Temp(C°) | pH | Cond(µs) | Bail(#) | Vol(gal) | Notes |
|---|---|---|---|---|---|---|
| (0915) | 16.0 | 5.55 | 389.1 | 1.26 | ~~1.75~~ 6.5 | cloudy |
| (0920) | 15.9 | 6.17 | 358.0 | 1452 | 13.0 | cloudy |
| (0926) | 15.9 | 6.01 | 357.2 | 2165 | 19.5 | sl cloudy |
| (0931) | 15.9 | 6.07 | 322.5 | 78 | 26.0 | sl cloudy |
| (0932) | poured approx 1.0 gallon of purge water back in to well to rinse the side of the casing | | | | | |

| TIME | Temp(C°) | pH | Cond(µs) | Bail(#) | Vol(gal) | Desc |
|---|---|---|---|---|---|---|
| (0938) | 15.6 | 6.03 | 330.9 | 91 | 32.5 | sl cloudy |
| (0943) | 15.7 | 5.96 | 328.2 | 104 | 39.0 | sl cloudy |
| (0944) | poured approx 1.0 gallon of purge water back in to well | | | | | |
| (0950) | 15.7 | 6.03 | 313.1 | 117 | 45.5 | sl cloudy |
| (0955) | 15.6 | 6.07 | 315.2 | 130 | 52.0 | sl cloudy |

12/15/09

RAAP
B03204-07
OBG Resample
KFC/TBE

FB #9

13MW3 (Cont'd.)

| TIME | TEMP(C°) | pH | Cond(µs) | BAIL(#) | Vol(gal) | Notes |
|---|---|---|---|---|---|---|
| | | | | | | replace pump and purge |

13MW3

DTW = 10.22

Post Purge DTW = 10.61

Begin Purge (1005) ✓

Initial Purge = SI cloudy

| TIME | Temp(C°) | Cond(µs) | DO(mg/L) | pH | ORP(mV) | Purge K | Desc. | DTW |
|---|---|---|---|---|---|---|---|---|
| (1010) | 14.37 | 443 | 6.10 | 6.80 | 168.2 | ≤0.3 L/min | clear | 10.55 |
| (1015) | 14.39 | 445 | 6.06 | 6.79 | 166.9 | " | " | |
| (1020) | 14.43 | 447 | 6.02 | 6.77 | 165.7 | " | " | 10.58 |
| (1025) | 14.55 | 451 | 5.98 | 6.75 | 164.1 | " | " | |
| (1030) | 14.60 | 451 | 5.97 | 6.75 | 163.4 | " | " | 10.59 |
| (1035) | 14.66 | 454 | 5.92 | 6.74 | 162.0 | " | " | 10.60 |
| (1035) | Readings Stable | | | | | | | |
| (1046) | 14.77 | 454 | 6.10 | 6.75 | 162.0 | Post Purge Reading | | |

Sample Time (1040)

Samples Collected: (2) Sulfide



12/15/09

RAAP
B03204-07
OBG RESAMPLE
KFC/TBE

FB#9

13MW5

DTW = 12.58

Post Purge DTW = 12.71

Begin Purge (1059) ✓

Initial Purge = clear

| (TIME) | Temp(C°) | Cond(µs) | DO(mg/L) | pH | ORP(mV) | Purge K | Desc. | DTW |
|---|---|---|---|---|---|---|---|---|
| (1100) | 14.43 | 680 | 4.23 | 6.86 | 152.0 | ≤0.3 L/min | clear | 12.68 |
| (1105) | 14.48 | 653 | 4.99 | 6.70 | 154.2 | " | " | |
| (1110) | 14.38 | 640 | 5.38 | 6.66 | 154.4 | " | " | 12.67 |
| (1115) | 14.13 | 638 | 5.88 | 6.65 | 154.3 | " | " | |
| (1120) | 14.03 | 635 | 5.71 | 6.65 | 153.0 | " | " | 12.62 |
| (1125) | 14.00 | 634 | 5.80 | 6.65 | 152.0 | " | " | |
| (1130) | 14.01 | 634 | 5.70 | 6.65 | 151.6 | " | " | 12.64 |
| (1130) | Readings Stable | | | | | | | |
| (1143) | 14.25 | 631 | 5.58 | 6.70 | 150.3 | Post Purge Reading | | |

Sample Time (1135) / Samples Collected: (6) Sulfide

13MW4

DTW = 12.26

Post Purge DTW = 12.33

Begin Purge (0800) ✓

Initial Purge = Clear

| TIME | Temp(C°) | Cond(µs) | DO(mg/L) | pH | ORP(mV) | Purge K | Desc. | DTW |
|---|---|---|---|---|---|---|---|---|
| (0805) | 12.80 | 1022 | 7.92 | 6.85 | 219.4 | ≤0.3 L/min | Clear | 12.28 |
| (0810) | 13.25 | 775 | 5.01 | 6.59 | 209.1 | " | " | " |
| (0815) | 13.55 | 653 | 4.05 | 6.92 | 198.6 | " | " | " |
| (0820) | 13.59 | 653 | 3.67 | 6.95 | 193.3 | " | " | 12.29 |
| (0825) | 13.60 | 625 | 3.39 | 6.98 | 187.5 | " | " | " |
| (0830) | 13.60 | 615 | 3.24 | 6.98 | 184.2 | " | " | " |
| (0835) | 13.56 | 609 | 3.10 | 6.99 | 182.6 | " | " | 12.31 |
| (0835) | Readings Stable | | | ≤TE (2)15/04 | | | | |
| (0856) | 13.81 | 573 | 3.79 | 6.83 | 184.5 | Post Purge Reading | | |

Sample Time (0840)

Samples Collected: (2) Sulfide

13MW4 DUP

Sample Time (0850)

Samples Collected: (2) Sulfide

COMPLETED
1/12/09 EBR

**APPENDIX B**

**2009 LABORATORY ANALYTICAL RESULTS AND DATA VALIDATION REPORTS (CD-ROM)**

**APPENDIX C**

**CONSTITUENT BACKGROUND VALUES FOR THE COMPLIANCE GROUNDWATER MONITORING PROGRAM (CD-ROM)**

Draper Aden Associates
Engineering • Surveying • Environmental Services
www.daa.com

# *Data Validation Summary*
# *Second Quarter 2009 Groundwater Monitoring Event*
# *Appendix IX Groundwater Monitoring Event*
# *Open Burning Ground-Hazardous Waste Management Unit 13 (HWMU 13)*
# *Radford Facility Army Ammunition Plant, Radford, Virginia*
# *EPA ID# VA1210020730*

Draper Aden Associates performed a comprehensive manual review of the analytical results for the Second Quarter 2009 semiannual Appendix IX groundwater monitoring event at the Open Burning Ground (HWMU 13) located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia. The following information and attached table summarize the data validation results.

## *Sample Collection/Analytical Services*

Draper Aden Associates, of Blacksburg, Virginia, collected groundwater samples during April 13 and 14, 2009.

Draper Aden Associates sent the samples via courier to CompuChem, a Division of Liberty Analytical, of Cary, North Carolina, Lancaster Laboratories, of Lancaster, Pennsylvania, TestAmerica North Canton, North Canton, Ohio and TestAmerica Sacramento, Sacramento, California. The chain of custody and permit required target analytes for each laboratory is provided as an attachment.

The laboratory analyzed the sulfide samples one day outside of the 7-day holding time requirement. Alliant Techsystems Inc. resampled the point of compliance wells for sulfide on June 17, 2009; however, the data for the June 17, 2009 samples were suspect due to laboratory errors. As a result, the VDEQ instructed Alliant to resample the point of compliance wells for sulfide during the upcoming Fourth Quarter 2009 semiannual monitoring event. The results are provided under separate cover.

## *Receipt of Monitoring Event Data*

On behalf of Alliant Techsystems Inc., each laboratory submitted results to Draper Aden Associates in a final certificate of analysis which included analytical results as well as relevant documentation to verify and validate the results. Some revisions to the certificate of analysis for the event were received on June 4, 2009 and all final results were received on August 11, 2009.

## *Verification Events*

Trichlorofluoromethane (0.3 J µg/l) and 1,1,1-trichloroethane (0.1 J µg/l) were detected less than the QL in 13MW3 by SW-846 Method 8260B. A verification sampling event was conducted on June 17, 2009 to refute or confirm the reported detection. 1,1,1-Trichloroethane in sample

13MW3 was not detected by Lancaster Laboratories, Lancaster, PA (SDG RAD19 received on July 17, 2009). Trichlorofluoromethane and 1,1,1-trichloroethane in sample 13MW3 were not confirmed by TestAmerica, North Canton, Ohio (Lot # A9F180214 received on July 8, 2009). The verification result for 1,1,1-trichloroethane in sample 13MW3 (Lancaster) was reported as the final result. The verification result for trichlorofluoromethane in sample 13MW3 (TestAmerica) was reported as the final result.

***Additionally Detected Appendix IX Target Analytes***

None.

***Data Validation/Data Presentation***

Draper Aden Associates performed a comprehensive review of the analytical results as presented on the attached data validation reports and summary table. For the Appendix IX monitoring event, sample results were reported by the laboratory and validated to at or above the method detection limit. A reported value for a target analyte detected between the MDL and the quantitation limit (QL) should be considered an estimated concentration.

Detection limits and quantitation limits are presented on the Data Validation Report Summary Table.

Sample/blind field duplicate results (13MW4 and 13MWDUP) are presented on the Data Validation Report Summary Table.

No results were rejected based on the data validation criteria except for sulfide noted above.

The data validation results are summarized on the attached reports and table. A summary of the required methods of analysis is provided below.

***Summary of Required Analyses***

| **Analytical Method/ Well ID** | **13MW1** | **13MW2** | **13MW3** | **13MW4** | **13MWDUP (13MW4 Duplicate)** | **13MW5** | **13MW6** | **13MW7** |
|---|---|---|---|---|---|---|---|---|
| *Permit Required 8260B Volatiles* | X | X | X | X | X | X | X | X |
| *Permit Required 8270C Semivolatiles* | X | X | X | X | X | X | X | X |
| *Permit Required 6010B Inorganics* | X | X | X | X | X | X | X | X |
| *Permit Required 7470 Mercury* | X | X | X | X | X | X | X | X |
| *Permit Required 314.0 Perchlorate* | X | X | X | X | X | X | X | X |
| *Permit Required 8330 Explosives* | X | X | X | X | X | X | X | X |
| *Permit Required 8332 Nitroglycerin* | X | X | X | X | X | X | X | X |
| *Full Appendix IX Analytes* | | | X | X | X | X | X | X |

***Note:***

- ***13MW1 and 13MW2 background monitoring wells.***
- *X Denotes analysis required.*
- *Permit Required denotes Compliance Monitoring List as presented in the Class 3 Permit Module currently under VDEQ review.*

## *LIMITATIONS:*

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

**This Report has been prepared by:**

2.2.10

Janet C. Frazier
Senior Environmental Scientist
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444,
Jfrazier@daa.com
www.daa.com

Date:

**This Report has been subjected to technical and quality review by:**

for

2-2-10

Srikanth Nathella, P.E.,
Project Engineer
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444
snathella@daa.com
www.daa.com

Date:

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 6020** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Tin** | 13MWDUP | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). Field duplicate for 13MW4. |
| **Zinc** | 13MW4 | 3.1 | B | 3.1 | J | 5 | 2.7 | Result < QL. |
| | 13MW6 | 2.8 | B | 2.8 | J | 5 | 2.7 | Result < QL. |
| | 13MW7 | 6.8 | | 6.8 | | 5 | 2.7 | No action taken. |
| | 13MWDUP | 2.8 | B | 2.8 | J | 5 | 2.7 | Result < QL. Field duplicate for 13MW4. |
| **Method: 8260B** | | | | | | | | |
| ***Laboratory: Lancaster Laboratories, Lancaster, PA*** | | | | | | | | |
| **Acrolein** | 13MW3 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW4 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW5 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW6 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW7 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MWDUP | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| **Carbon tetrachloride** | 13MW3 | 6.6 | | 6.6 | J | 0.5 | 0.1 | MS/MSD recovered high (148%). |
| | 13MW5 | 0.1 | J | 0.1 | J | 0.5 | 0.1 | Result < QL. MS/MSD recovered high (148%). |
| **Chloroform** | 13MW3 | 0.6 | | 0.6 | J | 0.5 | 0.1 | MS/MSD recovered high (142%). |
| **trans-1,4-Dichloro-2-butene** | 13MW3 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW4 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW5 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW6 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW7 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MWDUP | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| **Tetrachloroethene** | 13MW7 | 0.1 | J | 0.1 | J | 0.5 | 0.1 | Result < QL. MS/MSD recovered high (136%). |
| **Trichloroethene** | 13MW3 | 1 | | 1 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). |
| | 13MW4 | 1.5 | | 1.5 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). Blind field duplicate 13MWDUP result is 1.5 ug/l. RPD between results is <1. |
| | 13MW7 | 1.4 | | 1.4 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). |
| | 13MWDUP | 1.5 | | 1.5 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). Blind field duplicate for 13MW4. RPD between results is <1. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Acenaphthene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Acenaphthylene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Benzo[k]fluoranthene** | 13MW1 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW2 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **bis(2-Chloroethyl) ether** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **p-Chloroaniline** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Chlorobenzilate** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Chlorobenzilate** | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| **2-Chloronaphthalene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **4-Chlorophenyl phenyl ether** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Chrysene** | 13MW3 | 5 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **p-Phenylenediamine** | 13MW3 | 50 | U | U | J | 50 | 50 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 53 | U | U | J | 50 | 53 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 50 | U | U | J | 50 | 50 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW6 | 51 | U | U | J | 50 | 51 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 50 | U | U | J | 50 | 50 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 51 | U | U | J | 50 | 51 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **Diallate** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Diallate** | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Dibenzofuran** | 13MW1 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW2 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Dimethoate** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **3,3'-Dimethylbenzidine** | 13MW1 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW2 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW3 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 4.2 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 4.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 4.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| **4,6-Dinitro-o-cresol** | 13MW3 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW6 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **2,4-Dinitrophenol** | 13MW3 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **2,4-Dinitrophenol** | 13MW6 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **Famphur** | 13MW3 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW4 | 5.3 | U | U | J | 5 | 5.3 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW5 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW6 | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW7 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |
| **Fluorene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Hexachlorophene** | 13MW3 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW4 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW5 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW6 | 500 | < | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW7 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MWDUP | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| **Hexachloropropene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| **Kepone** | 13MW3 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW4 | 5.3 | U | U | J | 5 | 5.3 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW5 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW6 | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW7 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Methapyrilene** | 13MW3 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 5.3 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| **Methyl parathion** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **2-Naphthylamine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **4-Nitroquinoline-1-oxide** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **N-Nitrosomorpholine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **N-Nitrosopyrrolidine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **N-Nitrosopyrrolidine** | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Pentachlorobenzene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Pyrene** | 13MW1 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW2 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW3 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.5 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1.5 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1.5 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **o-Toluidine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Method: E314.0** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Perchlorate** | 13MW4 | 127.3 | | 127.3 | | 4 | 0.887 | No action taken. Field duplicate result was 123.6 ug/l (RPD = 2.9). |
| | 13MW6 | 1.334 | J | 1.33 | J | 4 | 0.887 | Result < QL. |
| | 13MWDUP | 123.6 | | 123.6 | | 4 | 0.887 | No action taken. Field duplicate for 13MW4. |

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|

**Definitions:** **QL** Denotes quantitation limit. **DL** Denotes detection limit. **Q** Denotes data qualifier. **U** Denotes analyte not detected at or above QL.
**UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes analyte reported at or above QL and associated result is estimated due to quality control reasons.
When used with a "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated due to quality control reasons. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated due to quality control reasons. **R** Denotes result rejected.

**B or J** denotes result between detection limit and QL. Estimated result. B and J are laboratory result data qualifiers.

**Appendix IX Monitoring Events:**
For Appendix IX Monitoring Events, results are reported to the detection limit.
Appendix IX Monitoring Events: First Quarter 2006 (First Appendix IX Monitoring Event for unit). Second Quarter 2007. Second Quarter 2008. Second Quarter 2009.

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# *Data Validation Summary*
# *Fourth Quarter 2009 Semiannual Groundwater Monitoring Event*

## *Open Burning Ground (OBG) - HWMU 13*
## *Radford Facility Army Ammunition Plant, Radford, Virginia*
## *EPA ID# VA1210020730*

Draper Aden Associates performed data validation of the analytical results for the Fourth Quarter 2009 semiannual groundwater monitoring event at the Open Burning Ground (OBG) located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia. The following information and attached table summarize the data validation results.

### *Sample Collection/Analytical Services*

Draper Aden Associates of Blacksburg, Virginia collected the groundwater samples during October 19-20, 2009.

Samples were submitted for laboratory analysis via courier to CompuChem, a Division of Liberty Analytical, of Cary, North Carolina and Lancaster Laboratories, Lancaster, Pennsylvania.

The chain of custody and permit required target analytes submitted to each laboratory is provided as an attachment.

### *Receipt of Monitoring Event Data*

On behalf of Alliant Techsystems Inc., each laboratory submitted results to Draper Aden Associates in a final certificate of analysis which included analytical results as well as relevant documentation to verify and validate the results. The final certificate of analysis for the event was received on December 31, 2009.

### *Verification Events*

No verification sampling was required.

### *Data Presentation*

Sample results provided by the laboratory were reported and presented on the attached data validation summary table to at or above the method detection limit (MDL). Validated sample results are reported to at or above the quantitation limit (QL).

A reported value for a target analyte detected between the MDL and the QL should be considered an estimated concentration. Target analytes reported by the laboratory as detected less than the corresponding QLs are validated and qualified as "U" to note the analyte was analyzed for, but not detected above the QL.

No results were rejected based on the data validation criteria.

A summary of the data validation is provided below.

***Data Validation Summary***

The samples were analyzed by *SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA and III)* and *USEPA Methods for the "Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1, EPA 815-R-00-014.* All data, except where noted below, were evaluated in general accordance with:

- *USEPA Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, April 1993.*
- *USEPA Region III Modifications to National Functional Guidelines for Organic Data Review, September 1994.*
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008.*
- *USEPA Region III Innovative Approaches for Validation of Organic and Inorganic Data Standard Operating Procedures M-1, June 1995, modified, and the analytical method.*

The evaluation of the data was based on the following:

- Data package completeness
- Chain of custody
- Holding time/preservation
- Initial and continuing calibrations
- Blanks
- Interference check sample (inorganics)
- Surrogates
- Matrix spike/matrix spike duplicate (MS/MSD) samples
- Laboratory control samples (LCS)
- Internal standards
- Field duplicate
- Serial dilution (inorganics)
- Target analyte identification and quantitation
- Other criteria as noted below

Data validation results are summarized on the attached reports and table. A summary of the required methods of analysis and the laboratory that performed the analysis is provided below.

*Summary of Required Analytical Methods and Laboratory*

| Analytical Method | Laboratory/ SDG | Monitoring Well | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 13MW1 | 13MW2 | 13MW3 | 13MW4 | 13MWDUP (13MW4) | 13MW5 | 13MW6 | 13MW7 |
| *8260B Volatiles* | Lancaster Laboratories, Inc./ RAD23 | X | X | X | X | X | X | X | X |
| *8270C Semivolatiles* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *6020 Inorganics (*)* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *7470A Mercury* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *8330A Explosives* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *8332 Nitroglycerin* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *314.0 Perchlorate* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |

*Note: 13MW1 and 13MW2 background monitoring wells. Remaining monitoring locations are compliance wells.*
*(*) For 4Q2009, the laboratory analyzed inorganics by 6020 ICP-MS, instead of 6010B-ICP.*

Each final certificate of analysis was complete in its presentation and the data were of acceptable quality.

The chain of custody documentation was complete. The chain of custody was appropriately signed and dated by field and laboratory personnel.

Each laboratory received the samples on ice and in good condition, with custody seals intact. Applicable holding time and preservation criteria were met for all samples and methods, except where noted below. The data set demonstrated the laboratory's ability to achieve the reported permit QL, except where discussed below.

***SW-846 Method 8260B/5030B-25 ml purge volume***
***Volatile Organic Analytes***

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/field sample duplicate results, and target analyte identification and quantitation were met, except where noted below. The laboratory analyzed a passing method detection limit check sample. Although not required, the laboratory also analyzed a passing initial calibration verification standard. The MS/MSD analysis was performed on project sample 13MW5. MS/MSD criteria were met except where noted below. A trip blank was analyzed for each day of sample collection. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). Trichloroethene was detected at 1.4 µg/l in 13MW4 and in 13MWDUP. Sample/Field Sample Duplicate RPD criteria were met. Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- Toluene was reported in the trip blanks and influenced final sample results. For toluene, detected results were attributed to blank contamination and qualified as "U" to reflect the analyte was analyzed for, but not detected above the QL.

- MS/MSD recovered within laboratory control limits, with the exception of MS which recovered outside the project specified control limits for carbon tetrachloride. The MS for carbon tetrachloride recovered slightly high and detected results above the QL for carbon tetrachloride were qualified as "J" to note the result is estimated. This applied to 13MW3 only.

- The laboratory provided the analyst initial demonstration of capability data for analyst A. Sneeringer.

- Hexachloroethane was reported by Method 8260B and 8270C.

- The laboratory revised the Method 8260B certificate of analysis to include hexachloroethane.

- Performance evaluation samples were not evaluated with the sampling event.

***SW-846 Method 8270C/3510C - Semivolatile Organic Analytes***

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/field sample duplicate results, and target analyte identification and quantitation were met, except where noted below. The MS/MSD analysis was performed on project sample 13MW5. Associated blanks were interference free, except where noted below. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). No other target analytes were detected in the 13MW4 or the field duplicate. Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted, except noted below.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- The laboratory revised the certificate of analysis to include the initial demonstration of capability data for analyst 2650, the method detection limit study data and passing performance evaluation sample data.

- Hexachloroethane was reported by Method 8260B and 8270C.

- Bis(2-ethylhexyl)phthalate was reported below the QL in the blind field duplicate. Bis(2-ethylhexyl)phthalate was not detected in any project sample and no data qualification was required.

- Although listed on the certificate of analysis separately, 3-methylphenol and 4-methylphenol cannot be analyzed separately due to analytical limitations. 3-Methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total for both compounds.

- N-nitrosodiphenylamine converts to diphenylamine during analysis and cannot be resolved under the chromatographic conditions used for sample analysis. The result reported as n-nitrosodiphenylamine represents the combined total for both n-nitrosodiphenylamine and diphenylamine.

*SW-846 Method 6020/3005 – Inorganics-total*

Instrument tune, calibration, QL check standard, blank, interference check sample, MS/MSD, LCS, internal standards, serial dilution, sample/field sample duplicate results were met, except where noted below. The MS/MSD samples were analyzed on project sample 13MW5 as noted on the chain of custody. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). Barium was detected at 55.3 µg/l in 13MW4 and 56.1 µg/l in 13MWDUP. Sample/Field Sample Duplicate RPD criteria were met. Chromium was detected above the QL in 13MW4 and below the QL in the field duplicate.

Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- The internal standard relative intensity for Bi209 recovered low (68%R) in sample 13MW6. The result associated with the Bi209 internal standard (lead) was lead. Lead was not detected at or above the detection limit or QL and the QL was qualified as estimated "J" due to the observed QC deviation. Bi209 also recovered low in the ICSA and ICSAB.

- The laboratory reported the inorganic results by Method 6020, instead of Method 6010B as allowed by VDEQ. Target analyte QL were similar and reported concentrations were consistent with historical data. The laboratory was requested to analyze future project samples as noted on the chain of custody.

- The laboratory provided as a revision, the method detection limit study (MDL) and analyst initial demonstration of capability data.

*SW-846 Method 7470A – Mercury-total*

QL standard, Calibration, blank, MS/MSD, LCS, and sample/field sample duplicate results were met, except where noted below. The MS/MSD was analyzed on project sample 13MW5, as noted on the chain of custody. Mercury was not detected in the sample/field duplicate sample (13MW4/13MWDUP). Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

No deviations from specific QA/QC criteria were identified during the data review process.

- The laboratory provided as a revision, the method detection limit study (MDL) and analyst initial demonstration of capability data for analyst N. Bolton.

- Performance evaluation samples were not evaluated with the sampling event.

*SW-846 Methods 8330B/8332 - Explosives/Nitroglycerin*

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/field sample duplicate results, and target analyte identification and quantitation were met, except where noted below. The MS/MSD analysis was performed on project sample 13MW5. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). No target analytes were detected in the sample/field duplicate sample (13MW4/13MWDUP). Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- Low surrogate recovery was observed in sample MW-2 for Methods 8330B/8332. MW-2 was re-extracted within the holding time criteria for Method 8330B (explosives) with acceptable surrogate recoveries. MW-2 was re-extracted outside the holding time criteria for Method 8332 (nitroglycerin) with acceptable recoveries. Nitroglycerin was not detected at or above the detection limit or QL in MW-2 and the nitroglycerin result was qualified as "UJ" to note that the QL is estimated due to the 7-day holding time exceedance.

- The laboratory provided as a revision the analyst initial demonstration of capability data and MDL study data.

- As per the laboratory's narrative from Second Quarter 2009, the data meets the requirements outline in SW-846 8330B. The laboratory will reference 8330B for future events.

- Performance evaluation samples were not evaluated with the sampling event.

*US EPA Method 314.0 – Perchlorate*

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, and sample/field sample duplicate results were met, except where noted below. The laboratory analyzed an initial calibration standard at 4 µg/l, the QL. The MS/MSD analysis was performed on project sample 13MW5. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). Perchlorate was detected at 132.2 µg/l in 13MW4 and 140.8 µg/l in 13MWDUP. Sample/Field Sample Duplicate RPD criteria were met. Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

No deviations from specific QA/QC criteria were identified during the data review process.

- The laboratory provided the method detection limit study and analyst initial demonstration of capability data as a revision.

- Performance evaluation samples were not evaluated with the sampling event.

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

**This Report has been prepared by:**


Janet C. Frazier
Senior Environmental Scientist
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444,
Jfrazier@daa.com
www.daa.com


1-29-10
Date:

**This Report has been subjected to technical and quality review by:**


Srikanth Nathella, P.E.,
Project Engineer
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444
snathella@daa.com
www.daa.com


1-29-10
Date:

# Comprehensive Data Validation Report
# Monitoring Event: Fourth Quarter 2009

Draper Aden Associates
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## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 6020** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analtyical, Cary, NC*** | | | | | | | | |
| **Barium** | 13MW1 | 115 | | 115 | | 1 | 0.2 | No action taken. |
| | 13MW2 | 169 | | 169 | | 1 | 0.2 | No action taken. |
| | 13MW3 | 110 | | 110 | | 1 | 0.2 | No action taken. |
| | 13MW4 | 55.3 | | 55.3 | | 1 | 0.2 | No action taken. Blind field duplicate for 13MWDUP 56.1 ug/l. RPD <10. |
| | 13MW5 | 108 | | 108 | | 1 | 0.2 | No action taken. |
| | 13MW6 | 104 | | 104 | | 1 | 0.2 | No action taken. |
| | 13MW7 | 173 | | 173 | | 1 | 0.2 | No action taken. |
| | 13MWDUP | 56.1 | | 56.1 | | 1 | 0.2 | No action taken. Blind field duplicate for 13MW4. |
| **Chromium** | 13MW1 | 2.1 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW2 | 2.6 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW3 | 2.9 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW4 | 5.1 | | 5.1 | | 5 | 1.1 | No action taken. Blind field duplicate for 13MWDUP 4.4 B ug/l. |
| | 13MW5 | 3.9 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW6 | 1.6 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW7 | 1.5 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MWDUP | 4.4 | B | U | | 5 | 1.1 | Blind field duplicate for 13MW4. Result < QL. |
| **Lead** | 13MW6 | 5 | U | U | J | 5 | 1.5 | Analyte not detected. Internal standard (Bi_209) recoverd outside control limits (68%). |
| **Nickel** | 13MW1 | 3 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW2 | 2.4 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW3 | 1.5 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW4 | 4.5 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW5 | 2 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW6 | 2.5 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW7 | 51 | | 51 | | 5 | 0.9 | No action taken. |
| | 13MWDUP | 4 | B | U | | 5 | 0.9 | Blind field duplicate for 13MW4. Result < QL. |
| **Selenium** | 13MW1 | 3.9 | B | U | | 5 | 1 | Result < QL. |
| | 13MW5 | 1.6 | B | U | | 5 | 1 | Result < QL. |
| | 13MW6 | 3.1 | B | U | | 5 | 1 | Result < QL. |
| | 13MW7 | 1.9 | B | U | | 5 | 1 | Result < QL. |
| **Zinc** | 13MW4 | 3.9 | B | U | | 5 | 2.7 | Result < QL. |
| | 13MW6 | 6.4 | | 6.4 | | 5 | 2.7 | No action taken. |
| | 13MW7 | 7.8 | | 7.8 | | 5 | 2.7 | No action taken. |
| | 13MWDUP | 4.3 | B | U | | 5 | 2.7 | Blind field duplicate for 13MW4. Result < QL. |

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8260B** | | | | | | | | |
| ***Laboratory: Lancaster Laboratories, Lancaster, PA*** | | | | | | | | |
| **Carbon tetrachloride** | 13MW3 | 5.7 | | 5.7 | J | 0.5 | 0.1 | Analyte not detected. MS recovered high (127%). |
| | 13MW5 | 0.2 | J | U | | 0.5 | 0.1 | Result < QL. MS recovered high (127%). |
| **Chloroform** | 13MW3 | 0.7 | | 0.7 | | 0.5 | 0.1 | No action taken. |
| **Tetrachloroethene** | 13MW7 | 0.2 | J | U | | 0.5 | 0.1 | Result < QL. |
| **Trichloroethene** | 13MW3 | 0.9 | | 0.9 | | 0.5 | 0.1 | No action taken. |
| | 13MW4 | 1.4 | | 1.4 | | 0.5 | 0.1 | No action taken. |
| | 13MW7 | 2.1 | | 2.1 | | 0.5 | 0.1 | No action taken. |
| | 13MWDUP | 1.4 | | 1.4 | | 0.5 | 0.1 | No action taken. Blind field duplicate for 13MW4. |
| **Method: 8332** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analtyical, Cary, NC*** | | | | | | | | |
| **Nitroglycerin** | 13MW2 | 16 | U | U | J | 16 | 0.77 | Analyte not detected. Surrogate recovered low, sample re-extracted outside holding time criteria with acceptable results. |
| **Method: E314.0** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analtyical, Cary, NC*** | | | | | | | | |
| **Perchlorate** | 13MW1 | 2.802 | J | U | | 4 | 2.632 | Result < QL. |
| | 13MW4 | 132.2 | | 132.2 | | 4 | 2.632 | No action taken. Blind field duplicate 140.8 ug/l. RPD < 10. |
| | 13MW6 | 5.156 | | 5.156 | | 4 | 2.632 | No action taken. |
| | 13MW7 | 3.805 | J | U | | 4 | 2.632 | Result < QL. |
| | 13MWDUP | 140.8 | | 140.8 | | 4 | 2.632 | No action taken. Blind field duplicate for 13MW4. 132.2 ug/l. RPD < 10. |

**Definitions:** **QL** Denotes quantitation limit. **DL** Denotes detection limit. **Q** Denotes data qualifier. **U** Denotes analyte not detected at or above QL.
**UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes analyte reported at or above QL and associated result is estimated due to quality control reasons.
When used with a "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated due to quality control reasons. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated due to quality control reasons. **R** Denotes result rejected.

**B or J** denotes result between detection limit and QL. Estimated result. B and J are laboratory result data qualifiers.
**Appendix IX Monitoring Events:**
For Appendix IX Monitoring Events, results are reported to the detection limit.
Appendix IX Monitoring Events: First Quarter 2006 (First Appendix IX Monitoring Event for unit). Second Quarter 2007. Second Quarter 2008. Second Quarter 2009.

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 6020** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Barium** | 13MW1 | 120 | | 120 | | 1 | 0.2 | No action taken. |
| | 13MW2 | 147 | | 147 | | 1 | 0.2 | No action taken. |
| | 13MW3 | 81 | | 81 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW4 | 41.5 | | 41.5 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW5 | 106 | | 106 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW6 | 75.8 | | 75.8 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW7 | 125 | | 125 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MWDUP | 41 | | 41 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). Field duplicate for 13MW4. |
| **Chromium** | 13MW1 | 4 | B | 4 | J | 5 | 1.1 | Result < QL. |
| | 13MW2 | 1.9 | B | 1.9 | J | 5 | 1.1 | Result < QL. |
| | 13MW3 | 1.6 | B | 1.6 | J | 5 | 1.1 | Result < QL. |
| | 13MW4 | 1.6 | B | 1.6 | J | 5 | 1.1 | Result < QL. |
| | 13MW5 | 3.3 | B | 3.3 | J | 5 | 1.1 | Result < QL. |
| | 13MW6 | 1.4 | B | 1.4 | J | 5 | 1.1 | Result < QL. |
| | 13MW7 | 1.4 | B | 1.4 | J | 5 | 1.1 | Result < QL. |
| | 13MWDUP | 1.5 | B | 1.5 | J | 5 | 1.1 | Result < QL. Field duplicate for 13MW4. |
| **Nickel** | 13MW1 | 2.4 | B | 2.4 | J | 5 | 0.9 | Result < QL. |
| | 13MW2 | 2.2 | B | 2.2 | J | 5 | 0.9 | Result < QL. |
| | 13MW3 | 2.1 | B | 2.1 | J | 5 | 0.9 | Result < QL. |
| | 13MW4 | 2.6 | B | 2.6 | J | 5 | 0.9 | Result < QL. |
| | 13MW5 | 2.9 | B | 2.9 | J | 5 | 0.9 | Result < QL. |
| | 13MW6 | 3.7 | B | 3.7 | J | 5 | 0.9 | Result < QL. |
| | 13MW7 | 222 | | 222 | | 5 | 0.9 | No action taken. |
| | 13MWDUP | 2.6 | B | 2.6 | J | 5 | 0.9 | Result < QL. Field duplicate for 13MW4. |
| **Selenium** | 13MW1 | 4 | B | 4 | J | 5 | 1 | Result < QL. |
| | 13MW5 | 2.1 | B | 2.1 | J | 5 | 1 | Result < QL. |
| | 13MW6 | 3.2 | B | 3.2 | J | 5 | 1 | Result < QL. |
| | 13MW7 | 2.3 | B | 2.3 | J | 5 | 1 | Result < QL. |
| **Tin** | 13MW3 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW4 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW5 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW6 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW7 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |



*See last page of this report for definitions.*

# APPENDIX C

# CONSTITUENT BACKGROUND VALUES FOR THE COMPLIANCE GROUNDWATER MONITORING PROGRAM

**RADFORD ARMY AMMUNITION PLANT – OPEN BURNING GROUND**
**CALCULATION OF CONSTITUENT BACKGROUND VALUES FOR THE COMPLIANCE GROUNDWATER MONITORING PROGRAM CONSTITUENTS**

Draper Aden Associates calculated background values for the Compliance Groundwater Monitoring Program (CGMP) constituents for the Open Burning Ground located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. Background values were calculated for the additional CGMP constituents that are not on the Detection Groundwater Monitoring Program (DGMP) list.

Previously the background values for the DGMP constituents were calculated in May 2005. With the exceptions of carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate, the background values for each constituent listed in the DGMP were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from First Quarter 1996 through First Quarter 2005. Groundwater monitoring for carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate began in Fourth Quarter 2003; therefore, the background values for those six constituents were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from Fourth Quarter 2003 through First Quarter 2005. The background value calculations were based on site-wide 95% confidence, 95% coverage upper prediction intervals.

The background values for CGMP constituents not on the DGMP list were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from Fourth Quarter 2005 through Fourth Quarter 2006. The calculated background values for all target constituents are listed on **Table 1**.

**Background Data and Background Value Calculations**

Statistical calculations of background values were performed using the analytical data from upgradient wells 13MW1 and 13MW2 as background data. The methods of statistical analysis were dependent on the percentage of non-detects and the distribution of the background data. All CGMP constituents not on the DGMP list were 100% non-detected (<LOQ) in the background wells. The background values for these constituents were established as equal to their quantitation limits (QL). The one exception was bis(2-ethylhexyl)phthalate for which the background value was established as 6 µg/l (USEPA Maximum Contaminant Level (MCL)) whereas its LOQ is 10 µg/l. When GPS is less than the LOQ, constituent concentrations will be compared to the LOQ.

| Background Value = Quantitation Limit (QL) | | | | |
|---|---|---|---|---|
| **Constituent** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Cadmium | 10 | 100 | 1 | 1 |
| Nickel | 10 | 100 | 5 | 5 |
| Selenium | 10 | 100 | 5 | 5 |
| Zinc | 10 | 100 | 5 | 5 |
| Acetophenone | 10 | 100 | 10 | 10 |
| Benzyl chloride | 8 | 100 | 5 | 5 |
| Benzo[a]anthracene | 10 | 100 | 10 | 10 |

| Background Value = Quantitation Limit (QL) | | | | |
|---|---|---|---|---|
| **Constituent** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Benzo[b]fluoranthene | 10 | 100 | 10 | 10 |
| Benzo[k]fluoranthene | 10 | 100 | 10 | 10 |
| Benzo[a]pyrene | 10 | 100 | 10 | 10 |
| Chloromethane | 10 | 100 | 5 | 5 |
| Bis(2-ethylhexyl)phthalate | 10 | 100 | 10 | 6 |
| Butyl benzyl phthalate | 10 | 100 | 10 | 10 |
| Chloroform | 10 | 100 | 1 | 1 |
| 2-Chlorophenol | 10 | 100 | 10 | 10 |
| Dibenz(a, h)anthracene | 10 | 100 | 10 | 10 |
| Dibenzofuran | 10 | 100 | 10 | 10 |
| 1,2-Dichloroethane | 10 | 100 | 1 | 1 |
| 1,1-Dichloroethene | 10 | 100 | 1 | 1 |
| 2,4-Dichlorophenol | 10 | 100 | 10 | 10 |
| 3,3'-Dimethylbenzidine | 10 | 100 | 10 | 10 |
| Dimethyl phthalate | 10 | 100 | 10 | 10 |
| m-Dinitrobenzene | 10 | 100 | 2.5 | 2.5 |
| 2,6-Dinitrotoluene | 10 | 100 | 5 | 5 |
| Di-n-octyl phthalate | 10 | 100 | 10 | 10 |
| Fluoranthene | 10 | 100 | 10 | 10 |
| Indeno[1,2,3-cd]pyrene | 10 | 100 | 10 | 10 |
| Bromomethane | 10 | 100 | 1 | 1 |
| 3&4-Methylphenol | 10 | 100 | 20 | 20 |
| Naphthalene | 10 | 100 | 1 | 1 |
| Nitrobenzene | 10 | 100 | 10 | 10 |
| p-Nitrophenol | 10 | 100 | 20 | 20 |
| Phenol | 10 | 100 | 10 | 10 |
| Pyrene | 10 | 100 | 10 | 10 |
| Tetrachloroethene | 10 | 100 | 1 | 1 |
| Toluene | 10 | 100 | 5 | 5 |
| Trichloroethene | 10 | 100 | 1 | 1 |
| sym-Trinitrobenzene | 10 | 100 | 2.5 | 2.5 |
| Vinyl chloride | 10 | 100 | 1 | 1 |

# TABLE 1

## OPEN BURNING GROUND
## CALCULATED BACKGROUND VALUES

| Constituent | Background Value (µg/l unless otherwise noted) |
|---|---|
| **DGMP Parameters** | |
| Antimony | 6 |
| Arsenic | 5 |
| Barium | 228 |
| Chromium | 112 |
| Lead | 14.0 |
| Mercury | 2.52 |
| Silver | 2.4 |
| Acetone | 25 |
| Benzene | 5 |
| Carbon Tetrachloride | 5 |
| Chlorobenzene | 5 |
| Methyl chloride | 5 |
| Methylene chloride | 5 |
| Toluene | 5 |
| 2,4-Dinitrotoluene | 10 |
| Di-n-butylphthalate | 10 |
| Diethyl phthalate | 10 |
| Diphenylamine | 10 |
| Hexachloroethane | 10 |
| Nitroglycerine | 10 mg/l |
| Perchlorate | 4 |
| Total Phenols | 20.0 |
| Nitrate | 1,311 |
| Nitrite | 100 |
| Sulfate | 88,000 |
| Total Organic Carbon | 10,600 |
| Total Organic Halides | 54.5 |
| Specific Conductivity | 6,870 µS/cm |
| pH | 5.72 – 7.80 pH units |
| **CGMP Parameters not on DGMP List** | |
| Cadmium | 1 |
| Nickel | 5 |
| Selenium | 5 |
| Zinc | 5 |
| Acetophenone | 10 |
| Benzyl chloride | 5 |
| Benzo[a]anthracene | 10 |
| Benzo[b]fluoranthene | 10 |
| Benzo[k]fluoranthene | 10 |
| Benzo[a]pyrene | 10 |
| Chloromethane | 5 |
| Bis(2-ethylhexyl)phthalate | 6 |

| Constituent | Background Value (µg/l unless otherwise noted) |
|---|---|
| Butyl benzyl phthalate | 10 |
| Chloroform | 1 |
| 2-Chlorophenol | 10 |
| Dibenz(a, h)anthracene | 10 |
| Dibenzofuran | 10 |
| 1,2-Dichloroethane | 1 |
| 1,1-Dichloroethene | 1 |
| 2,4-Dichlorophenol | 10 |
| 3,3'-Dimethylbenzidine | 10 |
| Dimethyl phthalate | 10 |
| m-Dinitrobenzene | 2.5 |
| 2,6-Dinitrotoluene | 5 |
| Di-n-octyl phthalate | 10 |
| Fluoranthene | 10 |
| Indeno[1,2,3-cd]pyrene | 10 |
| Bromomethane | 1 |
| 3&4-Methylphenol | 20 |
| Naphthalene | 1 |
| Nitrobenzene | 10 |
| p-Nitrophenol | 20 |
| Phenol | 10 |
| Pyrene | 10 |
| Tetrachloroethene | 1 |
| Toluene | 5 |
| Trichloroethene | 1 |
| sym-Trinitrobenzene | 2.5 |
| Vinyl chloride | 1 |

# APPENDIX A

## OPEN BURNING GROUND
## BACKGROUND VALUE CALCULATIONS FOR DGMP PARAMETERS

# RADFORD ARMY AMMUNITION PLANT – OPEN BURNING GROUND CALCULATION OF CONSTITUENT BACKGROUND VALUES FOR THE DETECTION GROUNDWATER MONITORING PROGRAM

Draper Aden Associates calculated background values for each constituent listed in the Detection Groundwater Monitoring Program (DGMP) dated September 2003 for the Open Burning Ground located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. With the exceptions of carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate, the background values for each constituent listed in the DGMP were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from First Quarter 1996 through First Quarter 2005. Groundwater monitoring for carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate began in Fourth Quarter 2003; therefore, the background values for those six constituents were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from Fourth Quarter 2003 through First Quarter 2005. The background value calculations were based on site-wide 95% confidence, 95% coverage upper prediction intervals. The calculated background values are listed in **Table 1**.

## Background Data and Statistical Calculations

Statistical calculations of background values were performed using the analytical data from upgradient wells 13MW1 and 13MW2 as background data. Based on the percentage of non-detects and the distribution of the background data, methods of statistical calculations varied. Background average, standard deviation and other descriptive statistical data were computed for all constituents and are presented in **Appendix A**.

The constituents listed below were 100% non-detected (<LOQ) in the background wells. The background values for these constituents were established as equal to their quantitation limits (QL).

| Background Value = Quantitation Limit (QL) | | | | |
|---|---|---|---|---|
| **Parameter** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Acetone | 74 | 100 | 25 | 25 |
| Benzene | 74 | 100 | 5 | 5 |
| Carbon tetrachloride | 12 | 100 | 5 | 5 |
| Chlorobenzene | 12 | 100 | 5 | 5 |
| Methyl chloride | 12 | 100 | 5 | 5 |
| Methylene chloride | 12 | 100 | 5 | 5 |
| Toluene | 74 | 100 | 5 | 5 |
| 2,4-Dinitrotoluene | 74 | 100 | 10 | 10 |
| Di-n-butylphthalate | 74 | 100 | 10 | 10 |
| Diethyl phthalate | 74 | 100 | 10 | 10 |
| Diphenylamine | 74 | 100 | 10 | 10 |
| Hexachloroethane | 12 | 100 | 10 | 10 |
| Nitroglycerine | 74 | 100 | 10 mg/l | 10 mg/l |
| Perchlorate | 12 | 100 | 4 | 4 |
| Nitrite | 61 | 100 | 100 | 100 |

Non-parametric prediction intervals were computed for all of the constituents for which the data from upgradient wells 13MW1 and 13MW2 satisfied one of the following two criteria, per VDEQ regulations and guidance as well as USEPA guidance:

- Percentage of non-detects was greater than or equal to 50 and less than 100; or
- Percentage of non-detects was less than 50, but data was not normally distributed in original or log-transformed mode.

The background values for these constituents were set as equal to their upper prediction limits (UPLs), with one exception. For pH, a two-sided parametric prediction interval was computed; therefore, the background value for pH consists of a range between the lower prediction limit (LPL) and the UPL. The background and relevant statistical data for these constituents are summarized below. Associated statistical computations are presented in **Appendix A**.

| **Background Value = UPL of Non-parametric Prediction Interval<br>Background Value for pH = LPL – UPL of two-sided Prediction Interval** | | | | |
|---|---|---|---|---|
| **Parameter** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Antimony | 74 | 99 | 5 | 6 |
| Arsenic | 74 | 93 | 5 | 5 |
| Chromium | 74 | 31 | 5 | 112 |
| Lead | 74 | 69 | 5 | 14.0 |
| Mercury | 74 | 99 | 2 | 2.52 |
| Silver | 74 | 92 | 2 | 2.4 |
| Total Phenols | 74 | 97 | 5 | 20.0 |
| Total Organic Carbon | 74 | 73 | 1,000 | 10,600 |
| Total Organic Halides | 74 | 85 | 20 | 54.5 |
| Sulfate | 61 | 0 | 1,000 | 88,000 |
| pH | 62 | 0 | 0.1 pH units | 5.72 – 7.80 pH units |
| Specific Conductivity | 62 | 0 | 1 µS/cm | 6,870 µS/cm |

The following constituents exhibited normally or ln-normally distributed background data with less than 25% non-detects. One sided parametric prediction intervals were computed on the background data for each of these constituents. The background values for these constituents were set as equal to their UPLs. The background concentration calculations were based on a site wide 95% confidence, 95% coverage upper prediction intervals. When adjusted for multiple comparisons of the background data, the false positive rate was 5% (0.05). The background and relevant statistical data for these constituents are summarized below. The prediction interval computations for these constituents are presented in **Appendix A**.

| **Background Value = UPL of one-sided Prediction Interval** | | | | |
|---|---|---|---|---|
| **Parameter** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Barium | 74 | 0 | 10 | 228 |
| Nitrate | 61 | 3 | 100 | 1,311 |

# TABLE 1

## OPEN BURNING GROUND
## CALCULATED BACKGROUND VALUES

| Constituent | Background Value (µg/l unless otherwise noted) |
|---|---|
| Antimony | 6 |
| Arsenic | 5 |
| Barium | 228 |
| Chromium | 112 |
| Lead | 14.0 |
| Mercury | 2.52 |
| Silver | 2.4 |
| Acetone | 25 |
| Benzene | 5 |
| Carbon Tetrachloride | 5 |
| Chlorobenzene | 5 |
| Methyl chloride | 5 |
| Methylene chloride | 5 |
| Toluene | 5 |
| 2,4-Dinitrotoluene | 10 |
| Di-n-butylphthalate | 10 |
| Diethyl phthalate | 10 |
| Diphenylamine | 10 |
| Hexachloroethane | 10 |
| Nitroglycerine | 10 mg/l |
| Perchlorate | 4 |
| Total Phenols | 20.0 |
| Nitrate | 1,311 |
| Nitrite | 100 |
| Sulfate | 88,000 |
| Total Organic Carbon | 10,600 |
| Total Organic Halides | 54.5 |
| Specific Conductivity | 6,870 µS/cm |
| pH | 5.72 – 7.80 pH units |

# APPENDIX A

## OPEN BURNING GROUND
## BACKGROUND VALUE STATISTICAL CALCULATIONS

**RAAP - Open Burning Ground (HWMU-13) - Statistical Analysis - Background Calculation**

May 10, 2005

1) Y2K Correction dates on GRITS/STAT software are as shown in the table below.

| Actual Event Date | Date Used in Stat Software | Notes |
|---|---|---|
| 1st Quarter 2000 | 12/10/1999 | |
| 2nd Quarter 2000 | 12/11/1999 | |
| 3rd Quarter 2000 | 12/12/1999 | |
| 4th Quarter 2000 | 12/13/1999 | |
| 1st Quarter 2001 | 12/14/1999 | |
| 2nd Quarter 2001 | 12/15/1999 | |
| 3rd Quarter 2001 | 12/16/1999 | |
| 4th Quarter 2001 | 12/17/1999 | |
| 1st Quarter 2002 | 12/18/1999 | |
| 2nd Quarter 2002 | 12/19/1999 | |
| 3rd Quarter 2002 | 12/20/1999 | |
| 4th Quarter 2002 | 12/21/1999 | |
| 1st Quarter 2003 | 12/22/1999 | |
| 2nd Quarter 2003 | 12/23/1999 | |
| 3rd Quarter 2003 | 12/24/1999 | |
| 4th Quarter 2003 | 12/25/1999 | |
| 1st Quarter 2004 | 12/26/1999 | |
| 2nd Quarter 2004 | 12/27/1999 | |
| 3rd Quarter 2004 | 12/28/1999 | |
| 4th Quarter 2004 | 12/29/1999 | |
| 1st Quarter 2005 | 12/30/1999 | |

2) No adjustments for multiple comparisons could be made for non-parametric UPLs and where UPL=QL.
Any Statistically significant increase (SSI) must be confirmed by verification sampling.

3) No data available for pH and Specific conductivity from 2nd Qtr 1996 - 2nd Qtr 1997.

4) Background for chlorobenzene, Carbon tetrachloride, Methyl Chloride (Chloromethane), Methylene Chloride (Dichloromethane), Hexachloroethane and Perchlorate based on 4th Quarter 2003 to 1st Quarter 2005 data.

5) Background for all other target constituents based on 1st Quarter 1996 through 1st Quarter 2005 data.

P:\B03\200\B03204\B03204-03\WORK\[StatDate correction.xls]Statcorrection dates

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:CCl4 Carbon tetrachloride

CAS Number: 56-23-5
MCL: 5.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ChlBenz Chlorobenzene

CAS Number: 108-90-7
MCL: 100.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ChlMeth Chloromethane

CAS Number: 74-87-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DiClMe Dichloromethane

CAS Number: 75-09-2
MCL: 5.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:HClEth Hexachloroethane

CAS Number: 67-72-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 10.000 ppb | Ln Minimum: | 2.303 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 10.000 ppb | Ln Mean: | 2.303 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 10.000 ppb | Ln Minimum: | 2.303 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 10.000 ppb | Ln Mean: | 2.303 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Perchlor Perchlorate

CAS Number: - -
MCL: 0.000 ug/l
ACL: 0.000 ug/l
Detect Limit: 8.000 ug/l

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 26 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 27 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 28 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 29 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 30 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 4.000 ug/l | Ln Minimum: | 1.386 |
| Maximum: | 4.000 ug/l | Ln Maximum: | 1.386 |
| Mean: | 4.000 ug/l | Ln Mean: | 1.386 |
| Std. Dev.: | 0.000 ug/l | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 26 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 27 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 28 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 29 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 30 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 4.000 ug/l | Ln Minimum: | 1.386 |
| Maximum: | 4.000 ug/l | Ln Maximum: | 1.386 |
| Mean: | 4.000 ug/l | Ln Mean: | 1.386 |
| Std. Dev.: | 0.000 ug/l | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 17:22

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sb Antimony, total

CAS Number: 7440-36-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 09 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Aug 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 23 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jul 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 08 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 10 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 11 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 12 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 14 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 15 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 16 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 17 1999 | 1.500 ppb | 0.405 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 1.500 ppb | Ln Minimum: | 0.405 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 2.730 ppb | Ln Mean: | 0.828 |
| Std. Dev.: | 1.694 ppb | Ln Std. Dev.: | 0.583 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1996 | 6.000 ppb | 1.792 |
| Mar 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 09 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Aug 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 23 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jul 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 08 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 10 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 11 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 12 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 14 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 15 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 16 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 17 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 1.500 ppb | Ln Minimum: | 0.405 |
| Maximum: | 6.000 ppb | Ln Maximum: | 1.792 |
| Mean: | 2.851 ppb | Ln Mean: | 0.866 |
| Std. Dev.: | 1.763 ppb | Ln Std. Dev.: | 0.599 |

Normality Tests

Report Printed: 05-10-2005 15:34

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sb Antimony, total

CAS Number: 7440-36-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 1.500 | 5.000 | 2.730 | 1.694 |
| Log: | 0.405 | 1.609 | 0.828 | 0.583 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 1.500 | 6.000 | 2.851 | 1.763 |
| Log: | 0.405 | 1.792 | 0.866 | 0.599 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 2.791 | 0.847 |
| Std Dev: | 1.718 | 0.587 |
| Skewness: | 0.578 | 0.566 |
| Kurtosis: | -1.636 | -1.673 |
| Minimum: | 1.500 | 0.405 |
| Maximum: | 6.000 | 1.792 |

CV: 0.616 0.693

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6407* | 0.9690 | 0.9560 |
| Log: | 0.6351* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

% ND = 99 %. ~~100~~

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Antimony, total(CAS Number:7440-36-0)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | ***.***% |

UL: ~~[illegible]~~ 6.0 ppb
LL: 0.000

%ND : 99%

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:22

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:As Arsenic, total

CAS Number: 7440-38-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 09 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 3.000 ppb | 1.099 |
| Mar 13 1999 | 1.000 ppb | 0.000 |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 2.000 ppb | 0.693 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 92

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 2.203 ppb | Ln Mean: | 0.220 |
| Std. Dev.: | 2.139 ppb | Ln Std. Dev.: | 1.101 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 09 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 13 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 1.000 ppb | 0.000 |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 2.000 ppb | 0.693 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 95

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 2.135 ppb | Ln Mean: | 0.172 |
| Std. Dev.: | 2.153 ppb | Ln Std. Dev.: | 1.101 |

Normality Tests

Report Printed: 05-10-2005 15:45

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:As Arsenic, total

CAS Number: 7440-38-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 5.000 | 2.203 | 2.139 |
| Log: | -0.693 | 1.609 | 0.220 | 1.101 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 5.000 | 2.135 | 2.153 |
| Log: | -0.693 | 1.609 | 0.172 | 1.101 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 2.169 | 0.196 |
| Std Dev: | 2.131 | 1.094 |
| Skewness: | 0.552 | 0.465 |
| Kurtosis: | -1.649 | -1.725 |
| Minimum: | 0.500 | -0.693 |
| Maximum: | 5.000 | 1.609 |

| | | |
|---|---|---|
| CV: | 0.983 | 5.572 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6615* | 0.9690 | 0.9560 |
| Log: | 0.6742* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Arsenic, total(CAS Number:7440-38-2)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

Observations (n): 74
Conf. Level (1-$\alpha$): ***.***%

UL: ~~0.500~~ 5.0 ppb
LL: 0.000

% ND: 100%.

**BACKGROUND TO COMPLIANCE WELL COMPARISON**

**Well:13MW3**

| Sample Date | Observation |
|---|---|
| 12/17/99 | ND < 1.000 ppb |

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*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ba Barium, total

CAS Number: 7440-39-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 87.000 ppb | 4.466 |
| Jun 30 1996 | 105.000 ppb | 4.654 |
| Sep 30 1996 | 90.000 ppb | 4.500 |
| Dec 31 1996 | 88.000 ppb | 4.477 |
| Mar 31 1997 | 127.000 ppb | 4.844 |
| Jun 30 1997 | 129.000 ppb | 4.860 |
| Sep 30 1997 | 154.000 ppb | 5.037 |
| Dec 31 1997 | 126.000 ppb | 4.836 |
| Mar 09 1998 | 117.000 ppb | 4.762 |
| May 14 1998 | 98.000 ppb | 4.585 |
| Aug 14 1998 | 107.000 ppb | 4.673 |
| Nov 23 1998 | 255.000 ppb | 5.541 |
| Mar 13 1999 | 178.000 ppb | 5.182 |
| May 27 1999 | 85.000 ppb | 4.443 |
| Jul 27 1999 | 103.000 ppb | 4.635 |
| Nov 08 1999 | 128.000 ppb | 4.852 |
| Dec 10 1999 | 96.000 ppb | 4.564 |
| Dec 11 1999 | 91.000 ppb | 4.511 |
| Dec 12 1999 | 81.000 ppb | 4.394 |
| Dec 13 1999 | 111.000 ppb | 4.710 |
| Dec 14 1999 | 115.000 ppb | 4.745 |
| Dec 15 1999 | 81.800 ppb | 4.404 |
| Dec 16 1999 | 112.000 ppb | 4.718 |
| Dec 17 1999 | 132.000 ppb | 4.883 |

| | | |
|---|---|---|
| Dec 18 1999 | 127.000 ppb | 4.844 |
| Dec 19 1999 | 107.000 ppb | 4.673 |
| Dec 20 1999 | 132.000 ppb | 4.883 |
| Dec 21 1999 | 143.000 ppb | 4.963 |
| Dec 22 1999 | 110.000 ppb | 4.700 |
| Dec 23 1999 | 78.000 ppb | 4.357 |
| Dec 24 1999 | 89.500 ppb | 4.494 |
| Dec 25 1999 | 120.000 ppb | 4.787 |
| Dec 26 1999 | 98.800 ppb | 4.593 |
| Dec 27 1999 | 96.300 ppb | 4.567 |
| Dec 28 1999 | 97.100 ppb | 4.576 |
| Dec 29 1999 | 106.000 ppb | 4.663 |
| Dec 30 1999 | 101.000 ppb | 4.615 |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 78.000 ppb | Ln Minimum: | 4.357 |
| Maximum: | 255.000 ppb | Ln Maximum: | 5.541 |
| Mean: | 113.581 ppb | Ln Mean: | 4.703 |
| Std. Dev.: | 32.212 ppb | Ln Std. Dev.: | 0.235 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 134.000 ppb | 4.898 |
| Jun 30 1996 | 139.000 ppb | 4.934 |
| Sep 30 1996 | 128.000 ppb | 4.852 |
| Dec 31 1996 | 110.000 ppb | 4.700 |
| Mar 31 1997 | 137.000 ppb | 4.920 |
| Jun 30 1997 | 125.000 ppb | 4.828 |
| Sep 30 1997 | 140.000 ppb | 4.942 |
| Dec 31 1997 | 141.000 ppb | 4.949 |
| Mar 09 1998 | 220.000 ppb | 5.394 |
| May 14 1998 | 159.000 ppb | 5.069 |
| Aug 14 1998 | 151.000 ppb | 5.017 |
| Nov 23 1998 | 172.000 ppb | 5.147 |
| Mar 13 1999 | 168.000 ppb | 5.124 |
| May 27 1999 | 153.000 ppb | 5.030 |
| Jul 27 1999 | 124.000 ppb | 4.820 |
| Nov 08 1999 | 146.000 ppb | 4.984 |
| Dec 10 1999 | 138.000 ppb | 4.927 |
| Dec 11 1999 | 145.000 ppb | 4.977 |
| Dec 12 1999 | 130.000 ppb | 4.868 |
| Dec 13 1999 | 135.000 ppb | 4.905 |
| Dec 14 1999 | 131.000 ppb | 4.875 |
| Dec 15 1999 | 147.000 ppb | 4.990 |
| Dec 16 1999 | 148.000 ppb | 4.997 |
| Dec 17 1999 | 155.000 ppb | 5.043 |
| Dec 18 1999 | 128.000 ppb | 4.852 |
| Dec 19 1999 | 148.000 ppb | 4.997 |
| Dec 20 1999 | 148.000 ppb | 4.997 |
| Dec 21 1999 | 142.000 ppb | 4.956 |
| Dec 22 1999 | 153.000 ppb | 5.030 |

| | | |
|---|---|---|
| Dec 23 1999 | 172.000 ppb | 5.147 |
| Dec 24 1999 | 168.000 ppb | 5.124 |
| Dec 25 1999 | 152.000 ppb | 5.024 |
| Dec 26 1999 | 174.000 ppb | 5.159 |
| Dec 27 1999 | 168.000 ppb | 5.124 |
| Dec 28 1999 | 154.000 ppb | 5.037 |
| Dec 29 1999 | 171.000 ppb | 5.142 |
| Dec 30 1999 | 180.000 ppb | 5.193 |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 110.000 ppb | Ln Minimum: | 4.700 |
| Maximum: | 220.000 ppb | Ln Maximum: | 5.394 |
| Mean: | 149.568 ppb | Ln Mean: | 4.999 |
| Std. Dev.: | 20.240 ppb | Ln Std. Dev.: | 0.130 |

Normality Tests

Report Printed: 05-10-2005 15:54

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ba Barium, total

CAS Number: 7440-39-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 78.000 | 255.000 | 113.581 | 32.212 |
| Log: | 4.357 | 5.541 | 4.703 | 0.235 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 110.000 | 220.000 | 149.568 | 20.240 |
| Log: | 4.700 | 5.394 | 4.999 | 0.130 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 131.574 | 4.851 |
| Std Dev: | 32.278 | 0.241 |
| Skewness: | 0.845 | 0.030 |
| Kurtosis: | 1.800 | -0.118 |
| Minimum: | 78.000 | 4.357 |
| Maximum: | 255.000 | 5.541 |

CV: 0.245 0.050

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.9407* | 0.9690 | 0.9560 |
| Log: | 0.9794 | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Parametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Barium, total(CAS Number:7440-39-3)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Shapiro-Francia (W): | 0.9794 |
| Critical W,$\alpha$=0.01: | 0.9560 |
| Mean: | 4.851 ln(ppb) |
| Std Dev: | 0.241 ln(ppb) |
| DF: | 73 |
| Conf. Level (1-$\alpha$): | 0.9500 |
| Future Samples (k): | 5 |
| $t_{\left[1-\frac{\alpha}{k}\right]}$: | 2.3785 |
| Kappa: | 2.3945 |
| UL: | 227.572 ppb |
| LL: | 0.000 |

%ND: 0 %

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cr Chromium, total

CAS Number: 7440-47-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 11.000 ppb | 2.398 |
| Jun 30 1996 | 13.000 ppb | 2.565 |
| Sep 30 1996 | 56.000 ppb | 4.025 |
| Dec 31 1996 | 20.000 ppb | 2.996 |
| Mar 31 1997 | 22.000 ppb | 3.091 |
| Jun 30 1997 | 19.000 ppb | 2.944 |
| Sep 30 1997 | 40.000 ppb | 3.689 |
| Dec 31 1997 | 23.000 ppb | 3.135 |
| Mar 09 1998 | 55.000 ppb | 4.007 |
| May 14 1998 | 6.000 ppb | 1.792 |
| Aug 14 1998 | 9.000 ppb | 2.197 |
| Nov 23 1998 | 112.000 ppb | 4.718 |
| Mar 13 1999 | 108.000 ppb | 4.682 |
| May 27 1999 | 3.000 ppb | 1.099 |
| Jul 27 1999 | 2.000 ppb | 0.693 |
| Nov 08 1999 | 15.000 ppb | 2.708 |
| Dec 10 1999 | 2.000 ppb | 0.693 |
| Dec 11 1999 | 2.000 ppb | 0.693 |
| Dec 12 1999 | 2.000 ppb | 0.693 |
| Dec 13 1999 | 4.000 ppb | 1.386 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 46

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 112.000 ppb | Ln Maximum: | 4.718 |
| Mean: | 15.973 ppb | Ln Mean: | 1.847 |
| Std. Dev.: | 26.511 ppb | Ln Std. Dev.: | 1.386 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 13.000 ppb | 2.565 |
| Jun 30 1996 | 10.000 ppb | 2.303 |
| Sep 30 1996 | 11.000 ppb | 2.398 |
| Dec 31 1996 | 14.000 ppb | 2.639 |
| Mar 31 1997 | 10.000 ppb | 2.303 |
| Jun 30 1997 | 10.000 ppb | 2.303 |
| Sep 30 1997 | 19.000 ppb | 2.944 |
| Dec 31 1997 | 12.000 ppb | 2.485 |
| Mar 09 1998 | 12.000 ppb | 2.485 |
| May 14 1998 | 7.000 ppb | 1.946 |
| Aug 14 1998 | 17.000 ppb | 2.833 |
| Nov 23 1998 | 20.000 ppb | 2.996 |
| Mar 13 1999 | 9.000 ppb | 2.197 |
| May 27 1999 | 6.000 ppb | 1.792 |
| Jul 27 1999 | 6.000 ppb | 1.792 |
| Nov 08 1999 | 6.000 ppb | 1.792 |
| Dec 10 1999 | 4.000 ppb | 1.386 |
| Dec 11 1999 | 6.000 ppb | 1.792 |
| Dec 12 1999 | 2.000 ppb | 0.693 |
| Dec 13 1999 | 5.000 ppb | 1.609 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 10.700 ppb | 2.370 |
| Dec 16 1999 | 9.210 ppb | 2.220 |
| Dec 17 1999 | 7.020 ppb | 1.949 |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 57.600 ppb | 4.054 |
| Dec 22 1999 | 10.300 ppb | 2.332 |

| | | |
|---|---|---|
| Dec 23 1999 | 6.300 ppb | 1.841 |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 6.000 ppb | 1.792 |
| Dec 26 1999 | 7.600 ppb | 2.028 |
| Dec 27 1999 | 5.500 ppb | 1.705 |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 7.400 ppb | 2.001 |
| Dec 30 1999 | 7.600 ppb | 2.028 |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 16

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 57.600 ppb | Ln Maximum: | 4.054 |
| Mean: | 9.722 ppb | Ln Mean: | 2.025 |
| Std. Dev.: | 9.158 ppb | Ln Std. Dev.: | 0.733 |

Normality Tests

Report Printed: 05-10-2005 15:57

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cr Chromium, total

CAS Number: 7440-47-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 112.000 | 15.973 | 26.511 |
| Log: | -0.693 | 4.718 | 1.847 | 1.386 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 57.600 | 9.722 | 9.158 |
| Log: | -0.693 | 4.054 | 2.025 | 0.733 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 12.848 | 1.936 |
| Std Dev: | 19.947 | 1.105 |
| Skewness: | 3.603* | -0.168 |
| Kurtosis: | 13.679 | 1.161 |
| Minimum: | 0.500 | -0.693 |
| Maximum: | 112.000 | 4.718 |

| | | |
|---|---|---|
| CV: | 1.553 | 0.570 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.4961* | 0.9690 | 0.9560 |
| Log: | 0.9189* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Chromium, total(CAS Number:7440-47-3)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | ***.***% |
| UL: | ~~0.500~~ 112.0 ppb |
| LL: | 0.000 |

%ND: 31%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Pb Lead, total

CAS Number: 7439-92-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 1.000 ppb | 0.000 |
| Jun 30 1996 | 1.000 ppb | 0.000 |
| Sep 30 1996 | 2.000 ppb | 0.693 |
| Dec 31 1996 | 4.000 ppb | 1.386 |
| Mar 31 1997 | 14.000 ppb | 2.639 |
| Jun 30 1997 | 9.000 ppb | 2.197 |
| Sep 30 1997 | 8.000 ppb | 2.079 |
| Dec 31 1997 | 5.000 ppb | 1.609 |
| Mar 09 1998 | 2.000 ppb | 0.693 |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 6.000 ppb | 1.792 |
| Mar 13 1999 | 6.000 ppb | 1.792 |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 3.200 ppb | 1.163 |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 68

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 14.000 ppb | Ln Maximum: | 2.639 |
| Mean: | 3.573 ppb | Ln Mean: | 0.774 |
| Std. Dev.: | 3.027 ppb | Ln Std. Dev.: | 1.138 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.000 ppb | 0.693 |
| Jun 30 1996 | 4.000 ppb | 1.386 |
| Sep 30 1996 | 2.000 ppb | 0.693 |
| Dec 31 1996 | 6.000 ppb | 1.792 |
| Mar 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1997 | 7.000 ppb | 1.946 |
| Sep 30 1997 | 6.000 ppb | 1.792 |
| Dec 31 1997 | 5.000 ppb | 1.609 |
| Mar 09 1998 | 3.000 ppb | 1.099 |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 1.000 ppb | 0.000 |
| Mar 13 1999 | 2.000 ppb | 0.693 |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 2.000 ppb | 0.693 |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 70

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 7.000 ppb | Ln Maximum: | 1.946 |
| Mean: | 3.014 ppb | Ln Mean: | 0.657 |
| Std. Dev.: | 2.238 ppb | Ln Std. Dev.: | 1.078 |

Normality Tests

Report Printed: 05-10-2005 16:25

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Pb Lead, total

CAS Number: 7439-92-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 14.000 | 3.573 | 3.027 |
| Log: | -0.693 | 2.639 | 0.774 | 1.138 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 7.000 | 3.014 | 2.238 |
| Log: | -0.693 | 1.946 | 0.657 | 1.078 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 3.293 | 0.716 |
| Std Dev: | 2.658 | 1.102 |
| Skewness: | 0.876 | -0.314 |
| Kurtosis: | 1.714 | -1.614 |
| Minimum: | 0.500 | -0.693 |
| Maximum: | 14.000 | 2.639 |

CV: 0.807 1.540

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.8098* | 0.9690 | 0.9560 |
| Log: | 0.7963* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Lead, total(CAS Number:7439-92-1)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 14.0 ~~0.500~~ ppb |
| LL: | 0.000 |

%ND: 69%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Hg Mercury

CAS Number: 7439-97-6
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.000 ppb | Ln Maximum: | 0.693 |
| Mean: | 0.768 ppb | Ln Mean: | -1.250 |
| Std. Dev.: | 0.920 ppb | Ln Std. Dev.: | 1.450 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.520 ppb | 0.924 |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.520 ppb | Ln Maximum: | 0.924 |
| Mean: | 0.782 ppb | Ln Mean: | -1.244 |
| Std. Dev.: | 0.943 ppb | Ln Std. Dev.: | 1.459 |

Normality Tests

Report Printed: 05-10-2005 16:28

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Hg Mercury

CAS Number: 7439-97-6
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.000 | 0.768 | 0.920 |
| Log: | -2.303 | 0.693 | -1.250 | 1.450 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.520 | 0.782 | 0.943 |
| Log: | -2.303 | 0.924 | -1.244 | 1.459 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 0.775 | -1.247 |
| Std Dev: | 0.925 | 1.444 |
| Skewness: | 0.638 | 0.624 |
| Kurtosis: | -1.565 | -1.609 |
| Minimum: | 0.100 | -2.303 |
| Maximum: | 2.520 | 0.924 |

CV: 1.194 -1.158

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6336* | 0.9690 | 0.9560 |
| Log: | 0.6250* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Mercury(CAS Number:7439-97-6)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 2.52 ~~0.100~~ ppb |
| LL: | 0.000 |

%ND: ~99%.

Data Set Summary

Report Printed: 05-10-2005 17:24

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ag Silver, total

CAS Number: 7440-22-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.300 ppb | -1.204 |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 2.400 ppb | 0.875 |
| Dec 31 1996 | 0.900 ppb | -0.105 |
| Mar 31 1997 | 1.000 ppb | 0.000 |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 89

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.400 ppb | Ln Maximum: | 0.875 |
| Mean: | 0.881 ppb | Ln Mean: | -1.013 |
| Std. Dev.: | 0.930 ppb | Ln Std. Dev.: | 1.458 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 0.400 ppb | -0.916 |
| Dec 31 1996 | 0.700 ppb | -0.357 |
| Mar 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 95

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.000 ppb | Ln Maximum: | 0.693 |
| Mean: | 0.792 ppb | Ln Mean: | -1.160 |
| Std. Dev.: | 0.908 ppb | Ln Std. Dev.: | 1.434 |

Normality Tests

Report Printed: 05-10-2005 16:37

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ag Silver, total

CAS Number: 7440-22-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.400 | 0.881 | 0.930 |
| Log: | -2.303 | 0.875 | -1.013 | 1.458 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.000 | 0.792 | 0.908 |
| Log: | -2.303 | 0.693 | -1.160 | 1.434 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 0.836 | -1.086 |
| Std Dev: | 0.914 | 1.438 |
| Skewness: | 0.502 | 0.376 |
| Kurtosis: | -1.683 | -1.799 |
| Minimum: | 0.100 | -2.303 |
| Maximum: | 2.400 | 0.875 |

CV: 1.092 -1.324

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6793* | 0.9690 | 0.9560 |
| Log: | 0.6842* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Silver, total(CAS Number:7440-22-4)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-α): | ***.***% |
| UL: | ~~0.100~~ 2.4 ppb |
| LL: | 0.000 |

%ND: 92%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 16:44

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Acetone Acetone

CAS Number: 67-64-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 50.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 19 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 20 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 21 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 22 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 23 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 24 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 25 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 26 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 27 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 28 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 29 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 30 1999 | 25.000 ppb | 3.219 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 25.000 ppb | Ln Maximum: | 3.219 |
| Mean: | 12.027 ppb | Ln Mean: | 2.175 |
| Std. Dev.: | 9.680 ppb | Ln Std. Dev.: | 0.779 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 19 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 20 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 21 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 22 1999 | 25.000 ppb | 3.219 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 24 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 25 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 26 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 27 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 28 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 29 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 30 1999 | 25.000 ppb | 3.219 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 25.000 ppb | Ln Maximum: | 3.219 |
| Mean: | 12.027 ppb | Ln Mean: | 2.175 |
| Std. Dev.: | 9.680 ppb | Ln Std. Dev.: | 0.779 |

Data Set Summary

Report Printed: 05-10-2005 16:43

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Benzene Benzene

CAS Number: 71-43-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.050 ppb | Ln Minimum: | -2.996 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 1.789 ppb | Ln Mean: | -1.378 |
| Std. Dev.: | 2.396 ppb | Ln Std. Dev.: | 2.229 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | |

Data Set Summary

Report Printed: 05-10-2005 16:46

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Toluen Toluene

CAS Number: 108-88-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.200 ppb | -1.609 |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 0.050 ppb | Ln Minimum: | -2.996 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 1.793 ppb | Ln Mean: | -1.340 |
| Std. Dev.: | 2.393 ppb | Ln Std. Dev.: | 2.212 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.200 ppb | -1.609 |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 0.050 ppb | Ln Minimum: | -2.996 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 1.793 ppb | Ln Mean: | -1.340 |
| Std. Dev.: | 2.393 ppb | Ln Std. Dev.: | 2.212 |

Data Set Summary

Report Printed: 05-10-2005 16:46

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:2,4-DNT 2,4-Dinitrotoluene

CAS Number: 121-14-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 09 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Aug 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 23 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jul 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 08 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 10 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 11 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 12 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 14 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 15 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 16 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 17 1999 | 0.040 ppb | -3.219 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.040 ppb | Ln Minimum: | -3.219 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 3.539 ppb | Ln Mean: | -1.279 |
| Std. Dev.: | 4.820 ppb | Ln Std. Dev.: | 2.672 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 09 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Aug 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 23 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jul 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 08 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 10 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 11 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 12 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 14 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 15 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 16 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 17 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 0.040 ppb | Ln Minimum: | -3.219 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 3.539 ppb | Ln Mean: | -1.279 |
| Std. Dev.: | 4.820 ppb | Ln Std. Dev.: | 2.672 |

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Di-N-Bu Di-n-Butylphthalate

CAS Number: 84-74-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DEthPhth Diethylphthalate

CAS Number: 84-66-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DPA Diphenylamine

CAS Number: 122-39-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 6.757 ppb | Ln Mean: | 1.853 |
| Std. Dev.: | 2.420 ppb | Ln Std. Dev.: | 0.335 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 6.757 ppb | Ln Mean: | 1.853 |
| Std. Dev.: | 2.420 ppb | Ln Std. Dev.: | 0.335 |

Data Set Summary

Report Printed: 05-10-2005 16:48

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:NGlycern Nitroglycerin or1,2,3-Propanetriol,trinitrate

CAS Number: 55-63-0
MCL: 0.000 mg/l
ACL: 0.000 mg/l
Detect Limit: 20.000 mg/l

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 09 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Aug 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 23 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jul 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 08 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 10 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 11 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 12 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 14 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 15 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 16 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 17 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.005 mg/l | Ln Minimum: | -5.298 |
| Maximum: | 10.000 mg/l | Ln Maximum: | 2.303 |
| Mean: | 3.517 mg/l | Ln Mean: | -2.628 |
| Std. Dev.: | 4.837 mg/l | Ln Std. Dev.: | 3.679 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 09 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Aug 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 23 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jul 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 08 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 10 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 11 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 12 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 14 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 15 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 16 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 17 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 18 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 0.005 mg/l | Ln Minimum: | -5.298 |
| Maximum: | 10.000 mg/l | Ln Maximum: | 2.303 |
| Mean: | | | |

| | | | |
|---|---|---|---|
| 3.517 mg/l | Ln Mean: | -2.628 | |
| Std. Dev.: | 4.837 mg/l | Ln Std. Dev.: | 3.679 |

Data Set Summary

Report Printed: 05-10-2005 16:59

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Phenols Phenols, total

CAS Number: 108-95-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 20.000 ppb | 2.996 |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 14.000 ppb | 2.639 |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 13.000 ppb | 2.565 |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 92

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 20.000 ppb | Ln Maximum: | 2.996 |
| Mean: | 5.865 ppb | Ln Mean: | 1.701 |
| Std. Dev.: | 3.084 ppb | Ln Std. Dev.: | 0.316 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 12.000 ppb | 2.485 |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 12.000 ppb | Ln Maximum: | 2.485 |
| Mean: | 5.189 ppb | Ln Mean: | 1.633 |
| Std. Dev.: | 1.151 ppb | Ln Std. Dev.: | 0.144 |

Normality Tests

Report Printed: 05-10-2005 16:59

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Phenols Phenols, total

CAS Number: 108-95-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 5.000 | 20.000 | 5.865 | 3.084 |
| Log: | 1.609 | 2.996 | 1.701 | 0.316 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 5.000 | 12.000 | 5.189 | 1.151 |
| Log: | 1.609 | 2.485 | 1.633 | 0.144 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 5.527 | 1.667 |
| Std Dev: | 2.336 | 0.246 |
| Skewness: | 4.671* | 4.192* |
| Kurtosis: | 22.128 | 16.382 |
| Minimum: | 5.000 | 1.609 |
| Maximum: | 20.000 | 2.996 |

| | | |
|---|---|---|
| CV: | 0.423 | 0.148 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.2166* | 0.9690 | 0.9560 |
| Log: | 0.2249* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Phenols, total(CAS Number:108-95-2)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | ~~5.000~~ 20.0 ppb |
| LL: | 0.000 |

%ND: 97%

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:05

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1996 | 3000.000 ppb | 8.006 |
| Sep 30 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1997 | 2000.000 ppb | 7.601 |
| Sep 30 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 09 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| May 14 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Aug 14 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 23 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 13 1999 | 1725.000 ppb | 7.453 |
| May 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jul 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 08 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 10 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 11 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 12 1999 | 1550.000 ppb | 7.346 |
| Dec 13 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 14 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 15 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 16 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 17 1999 | 500.000 ppb | 6.215 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 19 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 20 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 21 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 22 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 23 1999 | 2177.000 ppb | 7.686 |
| Dec 24 1999 | 10600.000 ppb | 9.269 |
| Dec 25 1999 | 10600.000 ppb | 9.269 |
| Dec 26 1999 | 5682.000 ppb | 8.645 |
| Dec 27 1999 | 8370.000 ppb | 9.032 |
| Dec 28 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 29 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 30 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 76

| | | | |
|---|---|---|---|
| Minimum: | 500.000 ppb | Ln Minimum: | 6.215 |
| Maximum: | 10600.000 ppb | Ln Maximum: | 9.269 |
| Mean: | 1721.730 ppb | Ln Mean: | 6.861 |
| Std. Dev.: | 2653.605 ppb | Ln Std. Dev.: | 0.928 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1996 | 3000.000 ppb | 8.006 |
| Sep 30 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1997 | 2000.000 ppb | 7.601 |
| Sep 30 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 09 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| May 14 1998 | 1400.000 ppb | 7.244 |
| Aug 14 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 23 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 13 1999 | 8625.000 ppb | 9.062 |
| May 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jul 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 08 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 10 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 11 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 12 1999 | 1625.000 ppb | 7.393 |
| Dec 13 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 14 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 15 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 16 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 17 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 18 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 19 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 20 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 21 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 22 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 3550.000 ppb | 8.175 |
| Dec 24 1999 | 1505.000 ppb | 7.317 |
| Dec 25 1999 | 8417.000 ppb | 9.038 |
| Dec 26 1999 | 5972.000 ppb | 8.695 |
| Dec 27 1999 | 8255.000 ppb | 9.019 |
| Dec 28 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 29 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 30 1999 | 1042.000 ppb | 6.949 |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 70

| | | | |
|---|---|---|---|
| Minimum: | 500.000 ppb | Ln Minimum: | 6.215 |
| Maximum: | 8625.000 ppb | Ln Maximum: | 9.062 |
| Mean: | 1672.730 ppb | Ln Mean: | 6.890 |
| Std. Dev.: | 2302.313 ppb | Ln Std. Dev.: | 0.909 |

Normality Tests

Report Printed: 05-10-2005 17:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 500.000 | 10600.000 | 1721.730 | 2653.605 |
| Log: | 6.215 | 9.269 | 6.861 | 0.928 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 500.000 | 8625.000 | 1672.730 | 2302.313 |
| Log: | 6.215 | 9.062 | 6.890 | 0.909 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 1697.230 | 6.876 |
| Std Dev: | 2467.227 | 0.912 |
| Skewness: | 2.485* | 1.364* |
| Kurtosis: | 5.030 | 0.781 |
| Minimum: | 500.000 | 6.215 |
| Maximum: | 10600.000 | 9.269 |

| | | |
|---|---|---|
| CV: | 1.454 | 0.133 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.5304* | 0.9690 | 0.9560 |
| Log: | 0.7452* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Total Organic Carbon(CAS Number:- -)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | ***.***% |
| UL: | ~~16,000.0~~ ~~500.000 ppb~~ 10,600.00 ppb |
| LL: | 0.000 |

%ND: 73%.

*Report Produced by GRITS/STAT 5.01*

Normality Tests

Report Printed: 05-10-2005 17:10

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOX Total Organic Halogens, Halides

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 40.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 2.500 | 38.000 | 10.932 | 10.539 |
| Log: | 0.916 | 3.638 | 1.874 | 1.056 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 2.500 | 54.500 | 10.405 | 11.289 |
| Log: | 0.916 | 3.998 | 1.789 | 1.059 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 10.669 | 1.831 |
| Std Dev: | 10.849 | 1.051 |
| Skewness: | 1.378* | 0.399 |
| Kurtosis: | 2.259 | -1.616 |
| Minimum: | 2.500 | 0.916 |
| Maximum: | 54.500 | 3.998 |

CV: 1.017 0.574

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.7158* | 0.9690 | 0.9560 |
| Log: | 0.7407* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Data Set Summary

Report Printed: 05-10-2005 17:10

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOX Total Organic Halogens, Halides

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 40.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 9.000 ppb | 2.197 |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 5.500 ppb | 1.705 |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 25.500 ppb | 3.239 |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 6.500 ppb | 1.872 |
| Nov 08 1999 | 14.500 ppb | 2.674 |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 19 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 20 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 21 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 22 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 23 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 24 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 25 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 26 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 27 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 28 1999 | 38.000 ppb | 3.638 |
| Dec 29 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 30 1999 | 38.000 ppb | 3.638 |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 81

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 38.000 ppb | Ln Maximum: | 3.638 |
| Mean: | 10.932 ppb | Ln Mean: | 1.874 |
| Std. Dev.: | 10.539 ppb | Ln Std. Dev.: | 1.056 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 6.000 ppb | 1.792 |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 7.500 ppb | 2.015 |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 24.500 ppb | 3.199 |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 18 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 19 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 20 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 21 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 22 1999 | 20.000 ppb | 2.996 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 24 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 25 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 26 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 27 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 28 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 29 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 30 1999 | 54.500 ppb | 3.998 |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 89

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 54.500 ppb | Ln Maximum: | 3.998 |
| Mean: | 10.405 ppb | Ln Mean: | 1.789 |
| Std. Dev.: | 11.289 ppb | Ln Std. Dev.: | 1.059 |

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Total Organic Halogens, Halides(CAS Number:- -)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 54.5 ~~2500~~ ppb |
| LL: | 0.000 |

%ND : 85%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:13

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cond F Specific Conductivity, Field

CAS Number: - -
MCL: 0.000 umhos/cm
ACL: 0.000 umhos/cm
Detect Limit: 2.000 umhos/cm

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 707.500 umhos/cm | 6.562 |
| Sep 30 1997 | 717.500 umhos/cm | 6.576 |
| Dec 31 1997 | 692.500 umhos/cm | 6.540 |
| Mar 09 1998 | 660.000 umhos/cm | 6.492 |
| May 14 1998 | 590.000 umhos/cm | 6.380 |
| Aug 14 1998 | 613.000 umhos/cm | 6.418 |
| Nov 23 1998 | 660.000 umhos/cm | 6.492 |
| Mar 13 1999 | 1940.000 umhos/cm | 7.570 |
| May 27 1999 | 6870.000 umhos/cm | 8.835 |
| Jul 27 1999 | 759.000 umhos/cm | 6.632 |
| Nov 08 1999 | 896.000 umhos/cm | 6.798 |
| Dec 10 1999 | 634.000 umhos/cm | 6.452 |
| Dec 11 1999 | 599.000 umhos/cm | 6.395 |
| Dec 12 1999 | 506.000 umhos/cm | 6.227 |
| Dec 13 1999 | 871.000 umhos/cm | 6.770 |
| Dec 14 1999 | 754.000 umhos/cm | 6.625 |
| Dec 15 1999 | 457.000 umhos/cm | 6.125 |
| Dec 16 1999 | 762.000 umhos/cm | 6.636 |
| Dec 17 1999 | 730.000 umhos/cm | 6.593 |
| Dec 18 1999 | 732.000 umhos/cm | 6.596 |
| Dec 19 1999 | 665.000 umhos/cm | 6.500 |
| Dec 20 1999 | 733.000 umhos/cm | 6.597 |
| Dec 21 1999 | 729.000 umhos/cm | 6.592 |
| Dec 23 1999 | 430.000 umhos/cm | 6.064 |

| | | |
|---|---|---|
| Dec 24 1999 | 490.000 umhos/cm | 6.194 |
| Dec 25 1999 | 640.000 umhos/cm | 6.461 |
| Dec 26 1999 | 690.000 umhos/cm | 6.537 |
| Dec 27 1999 | 440.000 umhos/cm | 6.087 |
| Dec 28 1999 | 610.000 umhos/cm | 6.413 |
| Dec 29 1999 | 620.000 umhos/cm | 6.430 |
| Dec 30 1999 | 720.000 umhos/cm | 6.579 |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 430.000 umhos/cm | Ln Minimum: | 6.064 |
| Maximum: | 6870.000 umhos/cm | Ln Maximum: | 8.835 |
| Mean: | 900.564 umhos/cm | Ln Mean: | 6.586 |
| Std. Dev.: | 1136.958 umhos/cm | Ln Std. Dev.: | 0.495 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 582.500 umhos/cm | 6.367 |
| Sep 30 1997 | 567.500 umhos/cm | 6.341 |
| Dec 31 1997 | 570.000 umhos/cm | 6.346 |
| Mar 09 1998 | 568.000 umhos/cm | 6.342 |
| May 14 1998 | 573.000 umhos/cm | 6.351 |
| Aug 14 1998 | 553.000 umhos/cm | 6.315 |
| Nov 23 1998 | 560.000 umhos/cm | 6.328 |
| Mar 13 1999 | 500.000 umhos/cm | 6.215 |
| May 27 1999 | 5810.000 umhos/cm | 8.667 |
| Jul 27 1999 | 589.000 umhos/cm | 6.378 |
| Nov 08 1999 | 687.000 umhos/cm | 6.532 |
| Dec 10 1999 | 495.000 umhos/cm | 6.205 |
| Dec 11 1999 | 568.000 umhos/cm | 6.342 |
| Dec 12 1999 | 601.000 umhos/cm | 6.399 |
| Dec 13 1999 | 689.000 umhos/cm | 6.535 |
| Dec 14 1999 | 618.000 umhos/cm | 6.426 |
| Dec 15 1999 | 574.000 umhos/cm | 6.353 |
| Dec 16 1999 | 613.000 umhos/cm | 6.418 |
| Dec 17 1999 | 617.000 umhos/cm | 6.425 |
| Dec 18 1999 | 612.000 umhos/cm | 6.417 |
| Dec 19 1999 | 648.000 umhos/cm | 6.474 |
| Dec 20 1999 | 610.000 umhos/cm | 6.413 |
| Dec 21 1999 | 621.000 umhos/cm | 6.431 |
| Dec 23 1999 | 630.000 umhos/cm | 6.446 |
| Dec 24 1999 | 670.000 umhos/cm | 6.507 |
| Dec 25 1999 | 600.000 umhos/cm | 6.397 |
| Dec 26 1999 | 750.000 umhos/cm | 6.620 |
| Dec 27 1999 | 450.000 umhos/cm | 6.109 |
| Dec 28 1999 | 550.000 umhos/cm | 6.310 |
| Dec 29 1999 | 670.000 umhos/cm | 6.507 |
| Dec 30 1999 | 710.000 umhos/cm | 6.565 |

Well ID:13MW2 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 450.000 umhos/cm | Ln Minimum: | 6.109 |
| Maximum: | 5810.000 umhos/cm | Ln Maximum: | 8.667 |
| Mean: | 769.548 umhos/cm | Ln Mean: | 6.467 |
| Std. Dev.: | 937.607 umhos/cm | Ln Std. Dev.: | 0.422 |

Normality Tests

Report Printed: 05-10-2005 17:12

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cond F Specific Conductivity, Field

CAS Number: - -
MCL: 0.000 umhos/cm
ACL: 0.000 umhos/cm
Detect Limit: 2.000 umhos/cm

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 430.000 | 6870.000 | 900.564 | 1136.958 |
| Log: | 6.064 | 8.835 | 6.586 | 0.495 |

Well:13MW2 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 450.000 | 5810.000 | 769.548 | 937.607 |
| Log: | 6.109 | 8.667 | 6.467 | 0.422 |

Pooled Statistics
Observations: 62

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 835.056 | 6.527 |
| Std Dev: | 1035.592 | 0.460 |
| Skewness: | 5.111* | 3.858* |
| Kurtosis: | 25.116 | 15.873 |
| Minimum: | 430.000 | 6.064 |
| Maximum: | 6870.000 | 8.835 |

| | | |
|---|---|---|
| CV: | 1.240 | 0.071 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.2489* | 0.9640 | 0.9470 |
| Log: | 0.5030* | 0.9640 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Specific Conductivity, Field(CAS Number:- -)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 62 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 6870.0 umhos/cm |
| LL: | 0.000 |

%ND: 0

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:13

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:pH F pH, Field

CAS Number: - -
MCL: 0.000 SU
ACL: 0.000 SU
Detect Limit: 0.100 SU

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 7.100 SU | 1.960 |
| Sep 30 1997 | 7.200 SU | 1.974 |
| Dec 31 1997 | 7.200 SU | 1.974 |
| Mar 09 1998 | 6.700 SU | 1.902 |
| May 14 1998 | 6.300 SU | 1.841 |
| Aug 14 1998 | 6.500 SU | 1.872 |
| Nov 23 1998 | 7.000 SU | 1.946 |
| Mar 13 1999 | 6.700 SU | 1.902 |
| May 27 1999 | 6.990 SU | 1.944 |
| Jul 27 1999 | 7.030 SU | 1.950 |
| Nov 08 1999 | 6.950 SU | 1.939 |
| Dec 10 1999 | 6.820 SU | 1.920 |
| Dec 11 1999 | 6.600 SU | 1.887 |
| Dec 12 1999 | 6.390 SU | 1.855 |
| Dec 13 1999 | 5.720 SU | 1.744 |
| Dec 14 1999 | 7.010 SU | 1.947 |
| Dec 15 1999 | 6.480 SU | 1.869 |
| Dec 16 1999 | 6.520 SU | 1.875 |
| Dec 17 1999 | 6.690 SU | 1.901 |
| Dec 18 1999 | 6.940 SU | 1.937 |
| Dec 19 1999 | 6.570 SU | 1.883 |
| Dec 20 1999 | 6.550 SU | 1.879 |
| Dec 21 1999 | 6.650 SU | 1.895 |
| Dec 23 1999 | 6.670 SU | 1.898 |

| | | |
|---|---|---|
| Dec 24 1999 | 6.400 SU | 1.856 |
| Dec 25 1999 | 6.930 SU | 1.936 |
| Dec 26 1999 | 6.640 SU | 1.893 |
| Dec 27 1999 | 6.720 SU | 1.905 |
| Dec 28 1999 | 6.470 SU | 1.867 |
| Dec 29 1999 | 7.020 SU | 1.949 |
| Dec 30 1999 | 7.250 SU | 1.981 |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 5.720 SU | Ln Minimum: | 1.744 |
| Maximum: | 7.250 SU | Ln Maximum: | 1.981 |
| Mean: | 6.733 SU | Ln Mean: | 1.906 |
| Std. Dev.: | 0.323 SU | Ln Std. Dev.: | 0.049 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 7.400 SU | 2.001 |
| Sep 30 1997 | 7.800 SU | 2.054 |
| Dec 31 1997 | 7.200 SU | 1.974 |
| Mar 09 1998 | 6.800 SU | 1.917 |
| May 14 1998 | 6.700 SU | 1.902 |
| Aug 14 1998 | 6.700 SU | 1.902 |
| Nov 23 1998 | 7.100 SU | 1.960 |
| Mar 13 1999 | 7.700 SU | 2.041 |
| May 27 1999 | 7.180 SU | 1.971 |
| Jul 27 1999 | 7.170 SU | 1.970 |
| Nov 08 1999 | 7.090 SU | 1.959 |
| Dec 10 1999 | 6.910 SU | 1.933 |
| Dec 11 1999 | 6.960 SU | 1.940 |
| Dec 12 1999 | 6.710 SU | 1.904 |
| Dec 13 1999 | 6.200 SU | 1.825 |
| Dec 14 1999 | 7.090 SU | 1.959 |
| Dec 15 1999 | 6.830 SU | 1.921 |
| Dec 16 1999 | 6.670 SU | 1.898 |
| Dec 17 1999 | 6.790 SU | 1.915 |
| Dec 18 1999 | 7.060 SU | 1.954 |
| Dec 19 1999 | 6.840 SU | 1.923 |
| Dec 20 1999 | 6.670 SU | 1.898 |
| Dec 21 1999 | 6.710 SU | 1.904 |
| Dec 23 1999 | 7.130 SU | 1.964 |
| Dec 24 1999 | 7.030 SU | 1.950 |
| Dec 25 1999 | 7.070 SU | 1.956 |
| Dec 26 1999 | 7.020 SU | 1.949 |
| Dec 27 1999 | 7.090 SU | 1.959 |
| Dec 28 1999 | 7.220 SU | 1.977 |
| Dec 29 1999 | 6.970 SU | 1.942 |
| Dec 30 1999 | 7.500 SU | 2.015 |

Well ID:13MW2 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 6.200 SU | Ln Minimum: | 1.825 |
| Maximum: | 7.800 SU | Ln Maximum: | 2.054 |
| Mean: | 7.010 SU | Ln Mean: | 1.946 |
| Std. Dev.: | 0.322 SU | Ln Std. Dev.: | 0.046 |

Normality Tests

Report Printed: 05-10-2005 17:14

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:pH F pH, Field

CAS Number: - -
MCL: 0.000 SU
ACL: 0.000 SU
Detect Limit: 0.100 SU

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 5.720 | 7.250 | 6.733 | 0.323 |
| Log: | 1.744 | 1.981 | 1.906 | 0.049 |

Well:13MW2 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 6.200 | 7.800 | 7.010 | 0.322 |
| Log: | 1.825 | 2.054 | 1.946 | 0.046 |

Pooled Statistics
Observations: 62

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 6.871 | 1.926 |
| Std Dev: | 0.349 | 0.051 |
| Skewness: | -0.187 | -0.447 |
| Kurtosis: | 1.327 | 1.708 |
| Minimum: | 5.720 | 1.744 |
| Maximum: | 7.800 | 2.054 |

| | | |
|---|---|---|
| CV: | 0.051 | 0.027 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.9566* | 0.9640 | 0.9470 |
| Log: | 0.9489* | 0.9640 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:pH, Field(CAS Number:- -)

**TWO-TAILED PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 62 |
| Conf. Level (1-$\alpha$): | 100.000% |

UL: ~~6.990 SU~~ 7.80 SU
LL: 6.910 SU 5.72 SU

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:17

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrate Nitrate

CAS Number:14797-55-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 100.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 700.000 ppb | 6.551 |
| Jun 30 1996 | 700.000 ppb | 6.551 |
| Sep 30 1996 | 500.000 ppb | 6.215 |
| Dec 31 1996 | 600.000 ppb | 6.397 |
| Mar 31 1997 | 700.000 ppb | 6.551 |
| Jun 30 1997 | 700.000 ppb | 6.551 |
| Sep 30 1997 | 900.000 ppb | 6.802 |
| Dec 31 1997 | 700.000 ppb | 6.551 |
| Mar 09 1998 | 480.000 ppb | 6.174 |
| May 14 1998 | 360.000 ppb | 5.886 |
| Aug 14 1998 | 440.000 ppb | 6.087 |
| Nov 23 1998 | 560.000 ppb | 6.328 |
| Mar 13 1999 | 410.000 ppb | 6.016 |
| May 27 1999 | 230.000 ppb | 5.438 |
| Jul 27 1999 | 380.000 ppb | 5.940 |
| Nov 08 1999 | 430.000 ppb | 6.064 |
| Dec 10 1999 | 430.000 ppb | 6.064 |
| Dec 11 1999 | 130.000 ppb | 4.868 |
| Dec 12 1999 | 900.000 ppb | 6.802 |
| Dec 13 1999 | 310.000 ppb | 5.737 |
| Dec 14 1999 | 320.000 ppb | 5.768 |
| Dec 15 1999 | 150.000 ppb | 5.011 |
| Dec 16 1999 | 380.000 ppb | 5.940 |
| Dec 17 1999 | 400.000 ppb | 5.991 |

| | | |
|---|---|---|
| Dec 18 1999 | 340.000 ppb | 5.829 |
| Dec 19 1999 | 250.000 ppb | 5.521 |
| Dec 20 1999 | 260.000 ppb | 5.561 |
| Dec 21 1999 | 380.000 ppb | 5.940 |
| Dec 22 1999 | 300.000 ppb | 5.704 |
| Dec 23 1999 | 300.000 ppb | 5.704 |
| Dec 24 1999 | 50.000 ppb | 3.912 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 3

| | | | |
|---|---|---|---|
| Minimum: | 50.000 ppb | Ln Minimum: | 3.912 |
| Maximum: | 900.000 ppb | Ln Maximum: | 6.802 |
| Mean: | 441.613 ppb | Ln Mean: | 5.950 |
| Std. Dev.: | 212.259 ppb | Ln Std. Dev.: | 0.600 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 600.000 ppb | 6.397 |
| Jun 30 1996 | 800.000 ppb | 6.685 |
| Sep 30 1996 | 700.000 ppb | 6.551 |
| Dec 31 1996 | 800.000 ppb | 6.685 |
| Mar 31 1997 | 700.000 ppb | 6.551 |
| Jun 30 1997 | 900.000 ppb | 6.802 |
| Sep 30 1997 | 700.000 ppb | 6.551 |
| Dec 31 1997 | 600.000 ppb | 6.397 |
| Mar 09 1998 | 790.000 ppb | 6.672 |
| May 14 1998 | 380.000 ppb | 5.940 |
| Aug 14 1998 | 640.000 ppb | 6.461 |
| Nov 23 1998 | 600.000 ppb | 6.397 |
| Mar 13 1999 | 710.000 ppb | 6.565 |
| May 27 1999 | 860.000 ppb | 6.757 |
| Jul 27 1999 | 890.000 ppb | 6.791 |
| Nov 08 1999 | 920.000 ppb | 6.824 |
| Dec 10 1999 | 50.000 ppb | 3.912 (* Nondetect *) |
| Dec 11 1999 | 920.000 ppb | 6.824 |
| Dec 12 1999 | 1050.000 ppb | 6.957 |
| Dec 13 1999 | 1360.000 ppb | 7.215 |
| Dec 14 1999 | 1200.000 ppb | 7.090 |
| Dec 15 1999 | 1160.000 ppb | 7.056 |
| Dec 16 1999 | 1190.000 ppb | 7.082 |
| Dec 17 1999 | 710.000 ppb | 6.565 |
| Dec 18 1999 | 920.000 ppb | 6.824 |
| Dec 19 1999 | 750.000 ppb | 6.620 |
| Dec 20 1999 | 580.000 ppb | 6.363 |
| Dec 22 1999 | 800.000 ppb | 6.685 |
| Dec 23 1999 | 700.000 ppb | 6.551 |
| Dec 24 1999 | 441.000 ppb | 6.089 |

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND): 3

| | | | |
|---|---|---|---|
| Minimum: | 50.000 ppb | Ln Minimum: | 3.912 |
| Maximum: | 1360.000 ppb | Ln Maximum: | 7.215 |
| Mean: | 780.700 ppb | Ln Mean: | 6.562 |
| Std. Dev.: | 262.094 ppb | Ln Std. Dev.: | 0.574 |

Normality Tests

Report Printed: 05-10-2005 17:17

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrate Nitrate

CAS Number:14797-55-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 100.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 50.000 | 900.000 | 441.613 | 212.259 |
| Log: | 3.912 | 6.802 | 5.950 | 0.600 |

Well:13MW2 Position:Upgradient Observations:30

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 50.000 | 1360.000 | 780.700 | 262.094 |
| Log: | 3.912 | 7.215 | 6.562 | 0.574 |

Pooled Statistics
Observations: 61

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 608.377 | 6.251 |
| Std Dev: | 291.453 | 0.659 |
| Skewness: | 0.269 | -1.602* |
| Kurtosis: | -0.285 | 3.355 |
| Minimum: | 50.000 | 3.912 |
| Maximum: | 1360.000 | 7.215 |

| | | |
|---|---|---|
| CV: | 0.479 | 0.105 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.9813 | 0.9630 | 0.9470 |
| Log: | 0.8553* | 0.9630 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Parametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Nitrate(CAS Number:14797-55-8)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 61 |
| Shapiro-Francia (W): | 0.9813 |
| Critical W,$\alpha$=0.01: | 0.9470 |
| Mean: | 608.377 ppb |
| Std Dev: | 291.453 ppb |
| DF: | 60 |
| Conf. Level (1-$\alpha$): | 0.9500 |
| Future Samples (k): | 5 |
| $t_{\left[1-\frac{\alpha}{k}\right]}$: | 2.3901 |
| Kappa: | 2.4096 |
| UL: | 1310.672 ppb |
| LL: | -∞ |

X.ND: 3y.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrite Nitrite

CAS Number:14797-65-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sulfate Sulfate, total

CAS Number:14808-79-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 88000.000 ppb | 11.385 |
| Jun 30 1996 | 84000.000 ppb | 11.339 |
| Sep 30 1996 | 80000.000 ppb | 11.290 |
| Dec 31 1996 | 82000.000 ppb | 11.314 |
| Mar 31 1997 | 70000.000 ppb | 11.156 |
| Jun 30 1997 | 64000.000 ppb | 11.067 |
| Sep 30 1997 | 73000.000 ppb | 11.198 |
| Dec 31 1997 | 79000.000 ppb | 11.277 |
| Mar 09 1998 | 73900.000 ppb | 11.210 |
| May 14 1998 | 61500.000 ppb | 11.027 |
| Aug 14 1998 | 64100.000 ppb | 11.068 |
| Nov 23 1998 | 73300.000 ppb | 11.202 |
| Mar 13 1999 | 65000.000 ppb | 11.082 |
| May 27 1999 | 53900.000 ppb | 10.895 |
| Jul 27 1999 | 68500.000 ppb | 11.135 |
| Nov 08 1999 | 61700.000 ppb | 11.030 |
| Dec 10 1999 | 65000.000 ppb | 11.082 |
| Dec 11 1999 | 47500.000 ppb | 10.768 |
| Dec 12 1999 | 39800.000 ppb | 10.592 |
| Dec 13 1999 | 59600.000 ppb | 10.995 |
| Dec 14 1999 | 59100.000 ppb | 10.987 |
| Dec 15 1999 | 34700.000 ppb | 10.454 |
| Dec 16 1999 | 58300.000 ppb | 10.973 |
| Dec 17 1999 | 64900.000 ppb | 11.081 |

| | | |
|---|---|---|
| Dec 18 1999 | 65000.000 ppb | 11.082 |
| Dec 19 1999 | 49200.000 ppb | 10.804 |
| Dec 20 1999 | 62900.000 ppb | 11.049 |
| Dec 21 1999 | 65000.000 ppb | 11.082 |
| Dec 22 1999 | 50100.000 ppb | 10.822 |
| Dec 23 1999 | 40900.000 ppb | 10.619 |
| Dec 24 1999 | 38900.000 ppb | 10.569 |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 34700.000 ppb | Ln Minimum: | 10.454 |
| Maximum: | 88000.000 ppb | Ln Maximum: | 11.385 |
| Mean: | 62670.957 ppb | Ln Mean: | 11.020 |
| Std. Dev.: | 13583.912 ppb | Ln Std. Dev.: | 0.235 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 32000.000 ppb | 10.373 |
| Jun 30 1996 | 31000.000 ppb | 10.342 |
| Sep 30 1996 | 28000.000 ppb | 10.240 |
| Dec 31 1996 | 27000.000 ppb | 10.204 |
| Mar 31 1997 | 24000.000 ppb | 10.086 |
| Jun 30 1997 | 24000.000 ppb | 10.086 |
| Sep 30 1997 | 26000.000 ppb | 10.166 |
| Dec 31 1997 | 29000.000 ppb | 10.275 |
| Mar 09 1998 | 30300.000 ppb | 10.319 |
| May 14 1998 | 30700.000 ppb | 10.332 |
| Aug 14 1998 | 26900.000 ppb | 10.200 |
| Nov 23 1998 | 27500.000 ppb | 10.222 |
| Mar 13 1999 | 26200.000 ppb | 10.174 |
| May 27 1999 | 22400.000 ppb | 10.017 |
| Jul 27 1999 | 23100.000 ppb | 10.048 |
| Nov 08 1999 | 24400.000 ppb | 10.102 |
| Dec 10 1999 | 25700.000 ppb | 10.154 |
| Dec 11 1999 | 22200.000 ppb | 10.008 |
| Dec 12 1999 | 27300.000 ppb | 10.215 |
| Dec 13 1999 | 23400.000 ppb | 10.060 |
| Dec 14 1999 | 26300.000 ppb | 10.177 |
| Dec 15 1999 | 31800.000 ppb | 10.367 |
| Dec 16 1999 | 22700.000 ppb | 10.030 |
| Dec 17 1999 | 24100.000 ppb | 10.090 |
| Dec 18 1999 | 29900.000 ppb | 10.306 |
| Dec 19 1999 | 28300.000 ppb | 10.251 |
| Dec 20 1999 | 28500.000 ppb | 10.258 |
| Dec 22 1999 | 34100.000 ppb | 10.437 |
| Dec 23 1999 | 48800.000 ppb | 10.795 |
| Dec 24 1999 | 32800.000 ppb | 10.398 |

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 22200.000 ppb | Ln Minimum: | 10.008 |
| Maximum: | 48800.000 ppb | Ln Maximum: | 10.795 |
| Mean: | 27946.664 ppb | Ln Mean: | 10.224 |
| Std. Dev.: | 5141.363 ppb | Ln Std. Dev.: | 0.162 |

Normality Tests

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sulfate Sulfate, total

CAS Number:14808-79-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 34700.000 | 88000.000 | 62670.957 | 13583.912 |
| Log: | 10.454 | 11.385 | 11.020 | 0.235 |

Well:13MW2 Position:Upgradient Observations:30

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 22200.000 | 48800.000 | 27946.664 | 5141.363 |
| Log: | 10.008 | 10.795 | 10.224 | 0.162 |

Pooled Statistics
Observations: 61

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 45593.438 | 10.629 |
| Std Dev: | 20283.574 | 0.449 |
| Skewness: | 0.447 | 0.144 |
| Kurtosis: | -1.253 | -1.551 |
| Minimum: | 22200.000 | 10.008 |
| Maximum: | 88000.000 | 11.385 |

| | | |
|---|---|---|
| CV: | 0.445 | 0.042 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.8955* | 0.9630 | 0.9470 |
| Log: | 0.9128* | 0.9630 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Sulfate, total(CAS Number:14808-79-8)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 61 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 88,000.0 ~~22200.000~~ ppb |
| LL: | 0.000 |

% ND: 0

*Report Produced by GRITS/STAT 5.01*

Draper Aden Associates
Engineering • Surveying • Environmental Services
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# *Data Validation Summary*
# *Second Quarter 2009 Groundwater Monitoring Event*
# *Appendix IX Groundwater Monitoring Event*
# *Open Burning Ground-Hazardous Waste Management Unit 13 (HWMU 13)*
# *Radford Facility Army Ammunition Plant, Radford, Virginia*
# *EPA ID# VA1210020730*

Draper Aden Associates performed a comprehensive manual review of the analytical results for the Second Quarter 2009 semiannual Appendix IX groundwater monitoring event at the Open Burning Ground (HWMU 13) located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia. The following information and attached table summarize the data validation results.

## *Sample Collection/Analytical Services*

Draper Aden Associates, of Blacksburg, Virginia, collected groundwater samples during April 13 and 14, 2009.

Draper Aden Associates sent the samples via courier to CompuChem, a Division of Liberty Analytical, of Cary, North Carolina, Lancaster Laboratories, of Lancaster, Pennsylvania, TestAmerica North Canton, North Canton, Ohio and TestAmerica Sacramento, Sacramento, California. The chain of custody and permit required target analytes for each laboratory is provided as an attachment.

The laboratory analyzed the sulfide samples one day outside of the 7-day holding time requirement. Alliant Techsystems Inc. resampled the point of compliance wells for sulfide on June 17, 2009; however, the data for the June 17, 2009 samples were suspect due to laboratory errors. As a result, the VDEQ instructed Alliant to resample the point of compliance wells for sulfide during the upcoming Fourth Quarter 2009 semiannual monitoring event. The results are provided under separate cover.

## *Receipt of Monitoring Event Data*

On behalf of Alliant Techsystems Inc., each laboratory submitted results to Draper Aden Associates in a final certificate of analysis which included analytical results as well as relevant documentation to verify and validate the results. Some revisions to the certificate of analysis for the event were received on June 4, 2009 and all final results were received on August 11, 2009.

## *Verification Events*

Trichlorofluoromethane (0.3 J µg/l) and 1,1,1-trichloroethane (0.1 J µg/l) were detected less than the QL in 13MW3 by SW-846 Method 8260B. A verification sampling event was conducted on June 17, 2009 to refute or confirm the reported detection. 1,1,1-Trichloroethane in sample

13MW3 was not detected by Lancaster Laboratories, Lancaster, PA (SDG RAD19 received on July 17, 2009). Trichlorofluoromethane and 1,1,1-trichloroethane in sample 13MW3 were not confirmed by TestAmerica, North Canton, Ohio (Lot # A9F180214 received on July 8, 2009). The verification result for 1,1,1-trichloroethane in sample 13MW3 (Lancaster) was reported as the final result. The verification result for trichlorofluoromethane in sample 13MW3 (TestAmerica) was reported as the final result.

***Additionally Detected Appendix IX Target Analytes***

None.

***Data Validation/Data Presentation***

Draper Aden Associates performed a comprehensive review of the analytical results as presented on the attached data validation reports and summary table. For the Appendix IX monitoring event, sample results were reported by the laboratory and validated to at or above the method detection limit. A reported value for a target analyte detected between the MDL and the quantitation limit (QL) should be considered an estimated concentration.

Detection limits and quantitation limits are presented on the Data Validation Report Summary Table.

Sample/blind field duplicate results (13MW4 and 13MWDUP) are presented on the Data Validation Report Summary Table.

No results were rejected based on the data validation criteria except for sulfide noted above.

The data validation results are summarized on the attached reports and table. A summary of the required methods of analysis is provided below.

***Summary of Required Analyses***

| **Analytical Method/ Well ID** | **13MW1** | **13MW2** | **13MW3** | **13MW4** | **13MWDUP (13MW4 Duplicate)** | **13MW5** | **13MW6** | **13MW7** |
|---|---|---|---|---|---|---|---|---|
| *Permit Required 8260B Volatiles* | X | X | X | X | X | X | X | X |
| *Permit Required 8270C Semivolatiles* | X | X | X | X | X | X | X | X |
| *Permit Required 6010B Inorganics* | X | X | X | X | X | X | X | X |
| *Permit Required 7470 Mercury* | X | X | X | X | X | X | X | X |
| *Permit Required 314.0 Perchlorate* | X | X | X | X | X | X | X | X |
| *Permit Required 8330 Explosives* | X | X | X | X | X | X | X | X |
| *Permit Required 8332 Nitroglycerin* | X | X | X | X | X | X | X | X |
| *Full Appendix IX Analytes* | | | X | X | X | X | X | X |

***Note:***

- ***13MW1 and 13MW2 background monitoring wells.***
- *X Denotes analysis required.*
- *Permit Required denotes Compliance Monitoring List as presented in the Class 3 Permit Module currently under VDEQ review.*

## *LIMITATIONS:*

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Conclusions presented are based upon a review of available information, the results of our field studies, and/or professional judgment. To the best of our knowledge, information provided by others is true and accurate, unless otherwise noted.

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

**This Report has been prepared by:**

2.2.10

Janet C. Frazier
Senior Environmental Scientist
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444,
Jfrazier@daa.com
www.daa.com

Date:

**This Report has been subjected to technical and quality review by:**

for

2-2-10

Srikanth Nathella, P.E.,
Project Engineer
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444
snathella@daa.com
www.daa.com

Date:

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 6020** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Tin** | 13MWDUP | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). Field duplicate for 13MW4. |
| **Zinc** | 13MW4 | 3.1 | B | 3.1 | J | 5 | 2.7 | Result < QL. |
| | 13MW6 | 2.8 | B | 2.8 | J | 5 | 2.7 | Result < QL. |
| | 13MW7 | 6.8 | | 6.8 | | 5 | 2.7 | No action taken. |
| | 13MWDUP | 2.8 | B | 2.8 | J | 5 | 2.7 | Result < QL. Field duplicate for 13MW4. |
| **Method: 8260B** | | | | | | | | |
| ***Laboratory: Lancaster Laboratories, Lancaster, PA*** | | | | | | | | |
| **Acrolein** | 13MW3 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW4 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW5 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW6 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MW7 | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| | 13MWDUP | 5 | U | U | J | 25 | 5 | Target analyte not detected at or above the detection limit. QL estimated due to sample pH<2. |
| **Carbon tetrachloride** | 13MW3 | 6.6 | | 6.6 | J | 0.5 | 0.1 | MS/MSD recovered high (148%). |
| | 13MW5 | 0.1 | J | 0.1 | J | 0.5 | 0.1 | Result < QL. MS/MSD recovered high (148%). |
| **Chloroform** | 13MW3 | 0.6 | | 0.6 | J | 0.5 | 0.1 | MS/MSD recovered high (142%). |
| **trans-1,4-Dichloro-2-butene** | 13MW3 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW4 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW5 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW6 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MW7 | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| | 13MWDUP | 1 | U | U | J | 5 | 1 | Target analyte not detected at or above the detection limit. Percent drift requirement of +/- 25% exceeded (28%D). |
| **Tetrachloroethene** | 13MW7 | 0.1 | J | 0.1 | J | 0.5 | 0.1 | Result < QL. MS/MSD recovered high (136%). |
| **Trichloroethene** | 13MW3 | 1 | | 1 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). |
| | 13MW4 | 1.5 | | 1.5 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). Blind field duplicate 13MWDUP result is 1.5 ug/l. RPD between results is <1. |
| | 13MW7 | 1.4 | | 1.4 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). |
| | 13MWDUP | 1.5 | | 1.5 | J | 0.5 | 0.1 | MS/MSD recovered high (143%). Blind field duplicate for 13MW4. RPD between results is <1. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Acenaphthene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Acenaphthylene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Benzo[k]fluoranthene** | 13MW1 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW2 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **bis(2-Chloroethyl) ether** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **p-Chloroaniline** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Chlorobenzilate** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Chlorobenzilate** | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| **2-Chloronaphthalene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **4-Chlorophenyl phenyl ether** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Chrysene** | 13MW3 | 5 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1.3 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **p-Phenylenediamine** | 13MW3 | 50 | U | U | J | 50 | 50 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 53 | U | U | J | 50 | 53 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 50 | U | U | J | 50 | 50 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW6 | 51 | U | U | J | 50 | 51 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 50 | U | U | J | 50 | 50 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 51 | U | U | J | 50 | 51 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **Diallate** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Diallate** | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Dibenzofuran** | 13MW1 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW2 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Dimethoate** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **3,3'-Dimethylbenzidine** | 13MW1 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW2 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW3 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 4.2 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 4.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 4 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 4.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| **4,6-Dinitro-o-cresol** | 13MW3 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW6 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 10 | U | U | J | 10 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **2,4-Dinitrophenol** | 13MW3 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **2,4-Dinitrophenol** | 13MW6 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 10 | U | U | J | 10 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **Famphur** | 13MW3 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW4 | 5.3 | U | U | J | 5 | 5.3 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW5 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW6 | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW7 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |
| **Fluorene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Hexachlorophene** | 13MW3 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW4 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW5 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW6 | 500 | < | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MW7 | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| | 13MWDUP | 500 | U | U | J | 500 | 141 | Target analyte not detected by TIC. |
| **Hexachloropropene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. LCS recovered low. |
| **Kepone** | 13MW3 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW4 | 5.3 | U | U | J | 5 | 5.3 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW5 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW6 | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MW7 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. MS recovered low. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. MS recovered low. |

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Methapyrilene** | 13MW3 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 5.3 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 5 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 5.1 | Analyte not detected above the detection limit. Continuing calibration %D > +/-25%. |
| **Methyl parathion** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **2-Naphthylamine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. Continuing calibration %D > +/-25%. |
| **4-Nitroquinoline-1-oxide** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **N-Nitrosomorpholine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **N-Nitrosopyrrolidine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8270C** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **N-Nitrosopyrrolidine** | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Pentachlorobenzene** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Pyrene** | 13MW1 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW2 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW3 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.5 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1.5 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1.4 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1.5 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **o-Toluidine** | 13MW3 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW4 | 5.3 | U | U | J | 5 | 1.1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW5 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW6 | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MW7 | 5 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| | 13MWDUP | 5.1 | U | U | J | 5 | 1 | Analyte not detected above the detection limit. Initial calibration RSD > 15%. |
| **Method: E314.0** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Perchlorate** | 13MW4 | 127.3 | | 127.3 | | 4 | 0.887 | No action taken. Field duplicate result was 123.6 ug/l (RPD = 2.9). |
| | 13MW6 | 1.334 | J | 1.33 | J | 4 | 0.887 | Result < QL. |
| | 13MWDUP | 123.6 | | 123.6 | | 4 | 0.887 | No action taken. Field duplicate for 13MW4. |

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|

**Definitions:** **QL** Denotes quantitation limit. **DL** Denotes detection limit. **Q** Denotes data qualifier. **U** Denotes analyte not detected at or above QL.
**UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes analyte reported at or above QL and associated result is estimated due to quality control reasons.
When used with a "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated due to quality control reasons. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated due to quality control reasons. **R** Denotes result rejected.

**B or J** denotes result between detection limit and QL. Estimated result. B and J are laboratory result data qualifiers.

**Appendix IX Monitoring Events:**
For Appendix IX Monitoring Events, results are reported to the detection limit.
Appendix IX Monitoring Events: First Quarter 2006 (First Appendix IX Monitoring Event for unit). Second Quarter 2007. Second Quarter 2008. Second Quarter 2009.

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# *Data Validation Summary*
# *Fourth Quarter 2009 Semiannual Groundwater Monitoring Event*

## *Open Burning Ground (OBG) - HWMU 13*
## *Radford Facility Army Ammunition Plant, Radford, Virginia*
## *EPA ID# VA1210020730*

Draper Aden Associates performed data validation of the analytical results for the Fourth Quarter 2009 semiannual groundwater monitoring event at the Open Burning Ground (OBG) located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia. The following information and attached table summarize the data validation results.

### *Sample Collection/Analytical Services*

Draper Aden Associates of Blacksburg, Virginia collected the groundwater samples during October 19-20, 2009.

Samples were submitted for laboratory analysis via courier to CompuChem, a Division of Liberty Analytical, of Cary, North Carolina and Lancaster Laboratories, Lancaster, Pennsylvania.

The chain of custody and permit required target analytes submitted to each laboratory is provided as an attachment.

### *Receipt of Monitoring Event Data*

On behalf of Alliant Techsystems Inc., each laboratory submitted results to Draper Aden Associates in a final certificate of analysis which included analytical results as well as relevant documentation to verify and validate the results. The final certificate of analysis for the event was received on December 31, 2009.

### *Verification Events*

No verification sampling was required.

### *Data Presentation*

Sample results provided by the laboratory were reported and presented on the attached data validation summary table to at or above the method detection limit (MDL). Validated sample results are reported to at or above the quantitation limit (QL).

A reported value for a target analyte detected between the MDL and the QL should be considered an estimated concentration. Target analytes reported by the laboratory as detected less than the corresponding QLs are validated and qualified as "U" to note the analyte was analyzed for, but not detected above the QL.

No results were rejected based on the data validation criteria.

A summary of the data validation is provided below.

***Data Validation Summary***

The samples were analyzed by *SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA and III)* and *USEPA Methods for the "Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1, EPA 815-R-00-014.* All data, except where noted below, were evaluated in general accordance with:

- *USEPA Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, April 1993.*
- *USEPA Region III Modifications to National Functional Guidelines for Organic Data Review, September 1994.*
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008.*
- *USEPA Region III Innovative Approaches for Validation of Organic and Inorganic Data Standard Operating Procedures M-1, June 1995, modified, and the analytical method.*

The evaluation of the data was based on the following:

- Data package completeness
- Chain of custody
- Holding time/preservation
- Initial and continuing calibrations
- Blanks
- Interference check sample (inorganics)
- Surrogates
- Matrix spike/matrix spike duplicate (MS/MSD) samples
- Laboratory control samples (LCS)
- Internal standards
- Field duplicate
- Serial dilution (inorganics)
- Target analyte identification and quantitation
- Other criteria as noted below

Data validation results are summarized on the attached reports and table. A summary of the required methods of analysis and the laboratory that performed the analysis is provided below.

*Summary of Required Analytical Methods and Laboratory*

| Analytical Method | Laboratory/ SDG | Monitoring Well | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 13MW1 | 13MW2 | 13MW3 | 13MW4 | 13MWDUP (13MW4) | 13MW5 | 13MW6 | 13MW7 |
| *8260B Volatiles* | Lancaster Laboratories, Inc./ RAD23 | X | X | X | X | X | X | X | X |
| *8270C Semivolatiles* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *6020 Inorganics (*)* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *7470A Mercury* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *8330A Explosives* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *8332 Nitroglycerin* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |
| *314.0 Perchlorate* | CompuChem/ 0910165 | X | X | X | X | X | X | X | X |

*Note: 13MW1 and 13MW2 background monitoring wells. Remaining monitoring locations are compliance wells.*
*(*) For 4Q2009, the laboratory analyzed inorganics by 6020 ICP-MS, instead of 6010B-ICP.*

Each final certificate of analysis was complete in its presentation and the data were of acceptable quality.

The chain of custody documentation was complete. The chain of custody was appropriately signed and dated by field and laboratory personnel.

Each laboratory received the samples on ice and in good condition, with custody seals intact. Applicable holding time and preservation criteria were met for all samples and methods, except where noted below. The data set demonstrated the laboratory's ability to achieve the reported permit QL, except where discussed below.

***SW-846 Method 8260B/5030B-25 ml purge volume***
***Volatile Organic Analytes***

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/field sample duplicate results, and target analyte identification and quantitation were met, except where noted below. The laboratory analyzed a passing method detection limit check sample. Although not required, the laboratory also analyzed a passing initial calibration verification standard. The MS/MSD analysis was performed on project sample 13MW5. MS/MSD criteria were met except where noted below. A trip blank was analyzed for each day of sample collection. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). Trichloroethene was detected at 1.4 µg/l in 13MW4 and in 13MWDUP. Sample/Field Sample Duplicate RPD criteria were met. Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- Toluene was reported in the trip blanks and influenced final sample results. For toluene, detected results were attributed to blank contamination and qualified as "U" to reflect the analyte was analyzed for, but not detected above the QL.

- MS/MSD recovered within laboratory control limits, with the exception of MS which recovered outside the project specified control limits for carbon tetrachloride. The MS for carbon tetrachloride recovered slightly high and detected results above the QL for carbon tetrachloride were qualified as "J" to note the result is estimated. This applied to 13MW3 only.

- The laboratory provided the analyst initial demonstration of capability data for analyst A. Sneeringer.

- Hexachloroethane was reported by Method 8260B and 8270C.

- The laboratory revised the Method 8260B certificate of analysis to include hexachloroethane.

- Performance evaluation samples were not evaluated with the sampling event.

***SW-846 Method 8270C/3510C - Semivolatile Organic Analytes***

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/field sample duplicate results, and target analyte identification and quantitation were met, except where noted below. The MS/MSD analysis was performed on project sample 13MW5. Associated blanks were interference free, except where noted below. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). No other target analytes were detected in the 13MW4 or the field duplicate. Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted, except noted below.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- The laboratory revised the certificate of analysis to include the initial demonstration of capability data for analyst 2650, the method detection limit study data and passing performance evaluation sample data.

- Hexachloroethane was reported by Method 8260B and 8270C.

- Bis(2-ethylhexyl)phthalate was reported below the QL in the blind field duplicate. Bis(2-ethylhexyl)phthalate was not detected in any project sample and no data qualification was required.

- Although listed on the certificate of analysis separately, 3-methylphenol and 4-methylphenol cannot be analyzed separately due to analytical limitations. 3-Methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total for both compounds.

- N-nitrosodiphenylamine converts to diphenylamine during analysis and cannot be resolved under the chromatographic conditions used for sample analysis. The result reported as n-nitrosodiphenylamine represents the combined total for both n-nitrosodiphenylamine and diphenylamine.

*SW-846 Method 6020/3005 – Inorganics-total*

Instrument tune, calibration, QL check standard, blank, interference check sample, MS/MSD, LCS, internal standards, serial dilution, sample/field sample duplicate results were met, except where noted below. The MS/MSD samples were analyzed on project sample 13MW5 as noted on the chain of custody. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). Barium was detected at 55.3 µg/l in 13MW4 and 56.1 µg/l in 13MWDUP. Sample/Field Sample Duplicate RPD criteria were met. Chromium was detected above the QL in 13MW4 and below the QL in the field duplicate.

Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- The internal standard relative intensity for Bi209 recovered low (68%R) in sample 13MW6. The result associated with the Bi209 internal standard (lead) was lead. Lead was not detected at or above the detection limit or QL and the QL was qualified as estimated "J" due to the observed QC deviation. Bi209 also recovered low in the ICSA and ICSAB.

- The laboratory reported the inorganic results by Method 6020, instead of Method 6010B as allowed by VDEQ. Target analyte QL were similar and reported concentrations were consistent with historical data. The laboratory was requested to analyze future project samples as noted on the chain of custody.

- The laboratory provided as a revision, the method detection limit study (MDL) and analyst initial demonstration of capability data.

*SW-846 Method 7470A – Mercury-total*

QL standard, Calibration, blank, MS/MSD, LCS, and sample/field sample duplicate results were met, except where noted below. The MS/MSD was analyzed on project sample 13MW5, as noted on the chain of custody. Mercury was not detected in the sample/field duplicate sample (13MW4/13MWDUP). Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

No deviations from specific QA/QC criteria were identified during the data review process.

- The laboratory provided as a revision, the method detection limit study (MDL) and analyst initial demonstration of capability data for analyst N. Bolton.

- Performance evaluation samples were not evaluated with the sampling event.

*SW-846 Methods 8330B/8332 - Explosives/Nitroglycerin*

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/field sample duplicate results, and target analyte identification and quantitation were met, except where noted below. The MS/MSD analysis was performed on project sample 13MW5. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). No target analytes were detected in the sample/field duplicate sample (13MW4/13MWDUP). Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

- Low surrogate recovery was observed in sample MW-2 for Methods 8330B/8332. MW-2 was re-extracted within the holding time criteria for Method 8330B (explosives) with acceptable surrogate recoveries. MW-2 was re-extracted outside the holding time criteria for Method 8332 (nitroglycerin) with acceptable recoveries. Nitroglycerin was not detected at or above the detection limit or QL in MW-2 and the nitroglycerin result was qualified as "UJ" to note that the QL is estimated due to the 7-day holding time exceedance.

- The laboratory provided as a revision the analyst initial demonstration of capability data and MDL study data.

- As per the laboratory's narrative from Second Quarter 2009, the data meets the requirements outline in SW-846 8330B. The laboratory will reference 8330B for future events.

- Performance evaluation samples were not evaluated with the sampling event.

*US EPA Method 314.0 – Perchlorate*

The instrument performance check, instrument calibration, blank, surrogate, MS/MSD, LCS, and sample/field sample duplicate results were met, except where noted below. The laboratory analyzed an initial calibration standard at 4 µg/l, the QL. The MS/MSD analysis was performed on project sample 13MW5. Sample 13MW4 was selected as the blind field duplicate (13MWDUP). Perchlorate was detected at 132.2 µg/l in 13MW4 and 140.8 µg/l in 13MWDUP. Sample/Field Sample Duplicate RPD criteria were met. Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted.

No deviations from specific QA/QC criteria were identified during the data review process.

- The laboratory provided the method detection limit study and analyst initial demonstration of capability data as a revision.

- Performance evaluation samples were not evaluated with the sampling event.

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

**This Report has been prepared by:**


Janet C. Frazier
Senior Environmental Scientist
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444,
Jfrazier@daa.com
www.daa.com


1-29-10
Date:

**This Report has been subjected to technical and quality review by:**


Srikanth Nathella, P.E.,
Project Engineer
2206 South Main Street
Blacksburg, Virginia 24060
540-552-0444
snathella@daa.com
www.daa.com


1-29-10
Date:

# Comprehensive Data Validation Report
# Monitoring Event: Fourth Quarter 2009

Draper Aden Associates
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## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 6020** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analtyical, Cary, NC*** | | | | | | | | |
| **Barium** | 13MW1 | 115 | | 115 | | 1 | 0.2 | No action taken. |
| | 13MW2 | 169 | | 169 | | 1 | 0.2 | No action taken. |
| | 13MW3 | 110 | | 110 | | 1 | 0.2 | No action taken. |
| | 13MW4 | 55.3 | | 55.3 | | 1 | 0.2 | No action taken. Blind field duplicate for 13MWDUP 56.1 ug/l. RPD <10. |
| | 13MW5 | 108 | | 108 | | 1 | 0.2 | No action taken. |
| | 13MW6 | 104 | | 104 | | 1 | 0.2 | No action taken. |
| | 13MW7 | 173 | | 173 | | 1 | 0.2 | No action taken. |
| | 13MWDUP | 56.1 | | 56.1 | | 1 | 0.2 | No action taken. Blind field duplicate for 13MW4. |
| **Chromium** | 13MW1 | 2.1 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW2 | 2.6 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW3 | 2.9 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW4 | 5.1 | | 5.1 | | 5 | 1.1 | No action taken. Blind field duplicate for 13MWDUP 4.4 B ug/l. |
| | 13MW5 | 3.9 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW6 | 1.6 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MW7 | 1.5 | B | U | | 5 | 1.1 | Result < QL. |
| | 13MWDUP | 4.4 | B | U | | 5 | 1.1 | Blind field duplicate for 13MW4. Result < QL. |
| **Lead** | 13MW6 | 5 | U | U | J | 5 | 1.5 | Analyte not detected. Internal standard (Bi_209) recoverd outside control limits (68%). |
| **Nickel** | 13MW1 | 3 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW2 | 2.4 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW3 | 1.5 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW4 | 4.5 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW5 | 2 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW6 | 2.5 | B | U | | 5 | 0.9 | Result < QL. |
| | 13MW7 | 51 | | 51 | | 5 | 0.9 | No action taken. |
| | 13MWDUP | 4 | B | U | | 5 | 0.9 | Blind field duplicate for 13MW4. Result < QL. |
| **Selenium** | 13MW1 | 3.9 | B | U | | 5 | 1 | Result < QL. |
| | 13MW5 | 1.6 | B | U | | 5 | 1 | Result < QL. |
| | 13MW6 | 3.1 | B | U | | 5 | 1 | Result < QL. |
| | 13MW7 | 1.9 | B | U | | 5 | 1 | Result < QL. |
| **Zinc** | 13MW4 | 3.9 | B | U | | 5 | 2.7 | Result < QL. |
| | 13MW6 | 6.4 | | 6.4 | | 5 | 2.7 | No action taken. |
| | 13MW7 | 7.8 | | 7.8 | | 5 | 2.7 | No action taken. |
| | 13MWDUP | 4.3 | B | U | | 5 | 2.7 | Blind field duplicate for 13MW4. Result < QL. |

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 8260B** | | | | | | | | |
| ***Laboratory: Lancaster Laboratories, Lancaster, PA*** | | | | | | | | |
| **Carbon tetrachloride** | 13MW3 | 5.7 | | 5.7 | J | 0.5 | 0.1 | Analyte not detected. MS recovered high (127%). |
| | 13MW5 | 0.2 | J | U | | 0.5 | 0.1 | Result < QL. MS recovered high (127%). |
| **Chloroform** | 13MW3 | 0.7 | | 0.7 | | 0.5 | 0.1 | No action taken. |
| **Tetrachloroethene** | 13MW7 | 0.2 | J | U | | 0.5 | 0.1 | Result < QL. |
| **Trichloroethene** | 13MW3 | 0.9 | | 0.9 | | 0.5 | 0.1 | No action taken. |
| | 13MW4 | 1.4 | | 1.4 | | 0.5 | 0.1 | No action taken. |
| | 13MW7 | 2.1 | | 2.1 | | 0.5 | 0.1 | No action taken. |
| | 13MWDUP | 1.4 | | 1.4 | | 0.5 | 0.1 | No action taken. Blind field duplicate for 13MW4. |
| **Method: 8332** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analtyical, Cary, NC*** | | | | | | | | |
| **Nitroglycerin** | 13MW2 | 16 | U | U | J | 16 | 0.77 | Analyte not detected. Surrogate recovered low, sample re-extracted outside holding time criteria with acceptable results. |
| **Method: E314.0** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analtyical, Cary, NC*** | | | | | | | | |
| **Perchlorate** | 13MW1 | 2.802 | J | U | | 4 | 2.632 | Result < QL. |
| | 13MW4 | 132.2 | | 132.2 | | 4 | 2.632 | No action taken. Blind field duplicate 140.8 ug/l. RPD < 10. |
| | 13MW6 | 5.156 | | 5.156 | | 4 | 2.632 | No action taken. |
| | 13MW7 | 3.805 | J | U | | 4 | 2.632 | Result < QL. |
| | 13MWDUP | 140.8 | | 140.8 | | 4 | 2.632 | No action taken. Blind field duplicate for 13MW4. 132.2 ug/l. RPD < 10. |

**Definitions:** **QL** Denotes quantitation limit. **DL** Denotes detection limit. **Q** Denotes data qualifier. **U** Denotes analyte not detected at or above QL.
**UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes analyte reported at or above QL and associated result is estimated due to quality control reasons.
When used with a "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated due to quality control reasons. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated due to quality control reasons. **R** Denotes result rejected.

**B or J** denotes result between detection limit and QL. Estimated result. B and J are laboratory result data qualifiers.
**Appendix IX Monitoring Events:**
For Appendix IX Monitoring Events, results are reported to the detection limit.
Appendix IX Monitoring Events: First Quarter 2006 (First Appendix IX Monitoring Event for unit). Second Quarter 2007. Second Quarter 2008. Second Quarter 2009.

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

## Radford Facility Army Ammunition Plant: HWMU-13

| Analyte | Sample ID | Result (ug/L) | Q | Result (ug/L) | Q | QL (ug/L) | DL (ug/L) | Validation Notes |
|---|---|---|---|---|---|---|---|---|
| **Method: 6020** | | | | | | | | |
| ***Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC*** | | | | | | | | |
| **Barium** | 13MW1 | 120 | | 120 | | 1 | 0.2 | No action taken. |
| | 13MW2 | 147 | | 147 | | 1 | 0.2 | No action taken. |
| | 13MW3 | 81 | | 81 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW4 | 41.5 | | 41.5 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW5 | 106 | | 106 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW6 | 75.8 | | 75.8 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MW7 | 125 | | 125 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). |
| | 13MWDUP | 41 | | 41 | J | 1 | 0.2 | Serial dilution % Difference > 10% (33%). Field duplicate for 13MW4. |
| **Chromium** | 13MW1 | 4 | B | 4 | J | 5 | 1.1 | Result < QL. |
| | 13MW2 | 1.9 | B | 1.9 | J | 5 | 1.1 | Result < QL. |
| | 13MW3 | 1.6 | B | 1.6 | J | 5 | 1.1 | Result < QL. |
| | 13MW4 | 1.6 | B | 1.6 | J | 5 | 1.1 | Result < QL. |
| | 13MW5 | 3.3 | B | 3.3 | J | 5 | 1.1 | Result < QL. |
| | 13MW6 | 1.4 | B | 1.4 | J | 5 | 1.1 | Result < QL. |
| | 13MW7 | 1.4 | B | 1.4 | J | 5 | 1.1 | Result < QL. |
| | 13MWDUP | 1.5 | B | 1.5 | J | 5 | 1.1 | Result < QL. Field duplicate for 13MW4. |
| **Nickel** | 13MW1 | 2.4 | B | 2.4 | J | 5 | 0.9 | Result < QL. |
| | 13MW2 | 2.2 | B | 2.2 | J | 5 | 0.9 | Result < QL. |
| | 13MW3 | 2.1 | B | 2.1 | J | 5 | 0.9 | Result < QL. |
| | 13MW4 | 2.6 | B | 2.6 | J | 5 | 0.9 | Result < QL. |
| | 13MW5 | 2.9 | B | 2.9 | J | 5 | 0.9 | Result < QL. |
| | 13MW6 | 3.7 | B | 3.7 | J | 5 | 0.9 | Result < QL. |
| | 13MW7 | 222 | | 222 | | 5 | 0.9 | No action taken. |
| | 13MWDUP | 2.6 | B | 2.6 | J | 5 | 0.9 | Result < QL. Field duplicate for 13MW4. |
| **Selenium** | 13MW1 | 4 | B | 4 | J | 5 | 1 | Result < QL. |
| | 13MW5 | 2.1 | B | 2.1 | J | 5 | 1 | Result < QL. |
| | 13MW6 | 3.2 | B | 3.2 | J | 5 | 1 | Result < QL. |
| | 13MW7 | 2.3 | B | 2.3 | J | 5 | 1 | Result < QL. |
| **Tin** | 13MW3 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW4 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW5 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW6 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |
| | 13MW7 | 2.1 | U | U | J | 10 | 2.1 | Target analyte not detected at or above the detection limit. MS/MSD recovered low (58%). |



*See last page of this report for definitions.*

# APPENDIX C

# CONSTITUENT BACKGROUND VALUES FOR THE COMPLIANCE GROUNDWATER MONITORING PROGRAM

**RADFORD ARMY AMMUNITION PLANT – OPEN BURNING GROUND**
**CALCULATION OF CONSTITUENT BACKGROUND VALUES FOR THE COMPLIANCE GROUNDWATER MONITORING PROGRAM CONSTITUENTS**

Draper Aden Associates calculated background values for the Compliance Groundwater Monitoring Program (CGMP) constituents for the Open Burning Ground located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. Background values were calculated for the additional CGMP constituents that are not on the Detection Groundwater Monitoring Program (DGMP) list.

Previously the background values for the DGMP constituents were calculated in May 2005. With the exceptions of carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate, the background values for each constituent listed in the DGMP were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from First Quarter 1996 through First Quarter 2005. Groundwater monitoring for carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate began in Fourth Quarter 2003; therefore, the background values for those six constituents were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from Fourth Quarter 2003 through First Quarter 2005. The background value calculations were based on site-wide 95% confidence, 95% coverage upper prediction intervals.

The background values for CGMP constituents not on the DGMP list were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from Fourth Quarter 2005 through Fourth Quarter 2006. The calculated background values for all target constituents are listed on **Table 1**.

**Background Data and Background Value Calculations**

Statistical calculations of background values were performed using the analytical data from upgradient wells 13MW1 and 13MW2 as background data. The methods of statistical analysis were dependent on the percentage of non-detects and the distribution of the background data. All CGMP constituents not on the DGMP list were 100% non-detected (<LOQ) in the background wells. The background values for these constituents were established as equal to their quantitation limits (QL). The one exception was bis(2-ethylhexyl)phthalate for which the background value was established as 6 µg/l (USEPA Maximum Contaminant Level (MCL)) whereas its LOQ is 10 µg/l. When GPS is less than the LOQ, constituent concentrations will be compared to the LOQ.

| Background Value = Quantitation Limit (QL) | | | | |
|---|---|---|---|---|
| **Constituent** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Cadmium | 10 | 100 | 1 | 1 |
| Nickel | 10 | 100 | 5 | 5 |
| Selenium | 10 | 100 | 5 | 5 |
| Zinc | 10 | 100 | 5 | 5 |
| Acetophenone | 10 | 100 | 10 | 10 |
| Benzyl chloride | 8 | 100 | 5 | 5 |
| Benzo[a]anthracene | 10 | 100 | 10 | 10 |

| Background Value = Quantitation Limit (QL) | | | | |
|---|---|---|---|---|
| **Constituent** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Benzo[b]fluoranthene | 10 | 100 | 10 | 10 |
| Benzo[k]fluoranthene | 10 | 100 | 10 | 10 |
| Benzo[a]pyrene | 10 | 100 | 10 | 10 |
| Chloromethane | 10 | 100 | 5 | 5 |
| Bis(2-ethylhexyl)phthalate | 10 | 100 | 10 | 6 |
| Butyl benzyl phthalate | 10 | 100 | 10 | 10 |
| Chloroform | 10 | 100 | 1 | 1 |
| 2-Chlorophenol | 10 | 100 | 10 | 10 |
| Dibenz(a, h)anthracene | 10 | 100 | 10 | 10 |
| Dibenzofuran | 10 | 100 | 10 | 10 |
| 1,2-Dichloroethane | 10 | 100 | 1 | 1 |
| 1,1-Dichloroethene | 10 | 100 | 1 | 1 |
| 2,4-Dichlorophenol | 10 | 100 | 10 | 10 |
| 3,3'-Dimethylbenzidine | 10 | 100 | 10 | 10 |
| Dimethyl phthalate | 10 | 100 | 10 | 10 |
| m-Dinitrobenzene | 10 | 100 | 2.5 | 2.5 |
| 2,6-Dinitrotoluene | 10 | 100 | 5 | 5 |
| Di-n-octyl phthalate | 10 | 100 | 10 | 10 |
| Fluoranthene | 10 | 100 | 10 | 10 |
| Indeno[1,2,3-cd]pyrene | 10 | 100 | 10 | 10 |
| Bromomethane | 10 | 100 | 1 | 1 |
| 3&4-Methylphenol | 10 | 100 | 20 | 20 |
| Naphthalene | 10 | 100 | 1 | 1 |
| Nitrobenzene | 10 | 100 | 10 | 10 |
| p-Nitrophenol | 10 | 100 | 20 | 20 |
| Phenol | 10 | 100 | 10 | 10 |
| Pyrene | 10 | 100 | 10 | 10 |
| Tetrachloroethene | 10 | 100 | 1 | 1 |
| Toluene | 10 | 100 | 5 | 5 |
| Trichloroethene | 10 | 100 | 1 | 1 |
| sym-Trinitrobenzene | 10 | 100 | 2.5 | 2.5 |
| Vinyl chloride | 10 | 100 | 1 | 1 |

# TABLE 1

## OPEN BURNING GROUND
## CALCULATED BACKGROUND VALUES

| Constituent | Background Value (µg/l unless otherwise noted) |
|---|---|
| **DGMP Parameters** | |
| Antimony | 6 |
| Arsenic | 5 |
| Barium | 228 |
| Chromium | 112 |
| Lead | 14.0 |
| Mercury | 2.52 |
| Silver | 2.4 |
| Acetone | 25 |
| Benzene | 5 |
| Carbon Tetrachloride | 5 |
| Chlorobenzene | 5 |
| Methyl chloride | 5 |
| Methylene chloride | 5 |
| Toluene | 5 |
| 2,4-Dinitrotoluene | 10 |
| Di-n-butylphthalate | 10 |
| Diethyl phthalate | 10 |
| Diphenylamine | 10 |
| Hexachloroethane | 10 |
| Nitroglycerine | 10 mg/l |
| Perchlorate | 4 |
| Total Phenols | 20.0 |
| Nitrate | 1,311 |
| Nitrite | 100 |
| Sulfate | 88,000 |
| Total Organic Carbon | 10,600 |
| Total Organic Halides | 54.5 |
| Specific Conductivity | 6,870 µS/cm |
| pH | 5.72 – 7.80 pH units |
| **CGMP Parameters not on DGMP List** | |
| Cadmium | 1 |
| Nickel | 5 |
| Selenium | 5 |
| Zinc | 5 |
| Acetophenone | 10 |
| Benzyl chloride | 5 |
| Benzo[a]anthracene | 10 |
| Benzo[b]fluoranthene | 10 |
| Benzo[k]fluoranthene | 10 |
| Benzo[a]pyrene | 10 |
| Chloromethane | 5 |
| Bis(2-ethylhexyl)phthalate | 6 |

| Constituent | Background Value (µg/l unless otherwise noted) |
|---|---|
| Butyl benzyl phthalate | 10 |
| Chloroform | 1 |
| 2-Chlorophenol | 10 |
| Dibenz(a, h)anthracene | 10 |
| Dibenzofuran | 10 |
| 1,2-Dichloroethane | 1 |
| 1,1-Dichloroethene | 1 |
| 2,4-Dichlorophenol | 10 |
| 3,3'-Dimethylbenzidine | 10 |
| Dimethyl phthalate | 10 |
| m-Dinitrobenzene | 2.5 |
| 2,6-Dinitrotoluene | 5 |
| Di-n-octyl phthalate | 10 |
| Fluoranthene | 10 |
| Indeno[1,2,3-cd]pyrene | 10 |
| Bromomethane | 1 |
| 3&4-Methylphenol | 20 |
| Naphthalene | 1 |
| Nitrobenzene | 10 |
| p-Nitrophenol | 20 |
| Phenol | 10 |
| Pyrene | 10 |
| Tetrachloroethene | 1 |
| Toluene | 5 |
| Trichloroethene | 1 |
| sym-Trinitrobenzene | 2.5 |
| Vinyl chloride | 1 |

# APPENDIX A

## OPEN BURNING GROUND
## BACKGROUND VALUE CALCULATIONS FOR DGMP PARAMETERS

# RADFORD ARMY AMMUNITION PLANT – OPEN BURNING GROUND CALCULATION OF CONSTITUENT BACKGROUND VALUES FOR THE DETECTION GROUNDWATER MONITORING PROGRAM

Draper Aden Associates calculated background values for each constituent listed in the Detection Groundwater Monitoring Program (DGMP) dated September 2003 for the Open Burning Ground located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. With the exceptions of carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate, the background values for each constituent listed in the DGMP were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from First Quarter 1996 through First Quarter 2005. Groundwater monitoring for carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate began in Fourth Quarter 2003; therefore, the background values for those six constituents were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from Fourth Quarter 2003 through First Quarter 2005. The background value calculations were based on site-wide 95% confidence, 95% coverage upper prediction intervals. The calculated background values are listed in **Table 1**.

## Background Data and Statistical Calculations

Statistical calculations of background values were performed using the analytical data from upgradient wells 13MW1 and 13MW2 as background data. Based on the percentage of non-detects and the distribution of the background data, methods of statistical calculations varied. Background average, standard deviation and other descriptive statistical data were computed for all constituents and are presented in **Appendix A**.

The constituents listed below were 100% non-detected (<LOQ) in the background wells. The background values for these constituents were established as equal to their quantitation limits (QL).

| Background Value = Quantitation Limit (QL) | | | | |
|---|---|---|---|---|
| **Parameter** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Acetone | 74 | 100 | 25 | 25 |
| Benzene | 74 | 100 | 5 | 5 |
| Carbon tetrachloride | 12 | 100 | 5 | 5 |
| Chlorobenzene | 12 | 100 | 5 | 5 |
| Methyl chloride | 12 | 100 | 5 | 5 |
| Methylene chloride | 12 | 100 | 5 | 5 |
| Toluene | 74 | 100 | 5 | 5 |
| 2,4-Dinitrotoluene | 74 | 100 | 10 | 10 |
| Di-n-butylphthalate | 74 | 100 | 10 | 10 |
| Diethyl phthalate | 74 | 100 | 10 | 10 |
| Diphenylamine | 74 | 100 | 10 | 10 |
| Hexachloroethane | 12 | 100 | 10 | 10 |
| Nitroglycerine | 74 | 100 | 10 mg/l | 10 mg/l |
| Perchlorate | 12 | 100 | 4 | 4 |
| Nitrite | 61 | 100 | 100 | 100 |

Non-parametric prediction intervals were computed for all of the constituents for which the data from upgradient wells 13MW1 and 13MW2 satisfied one of the following two criteria, per VDEQ regulations and guidance as well as USEPA guidance:

- Percentage of non-detects was greater than or equal to 50 and less than 100; or
- Percentage of non-detects was less than 50, but data was not normally distributed in original or log-transformed mode.

The background values for these constituents were set as equal to their upper prediction limits (UPLs), with one exception. For pH, a two-sided parametric prediction interval was computed; therefore, the background value for pH consists of a range between the lower prediction limit (LPL) and the UPL. The background and relevant statistical data for these constituents are summarized below. Associated statistical computations are presented in **Appendix A**.

| **Background Value = UPL of Non-parametric Prediction Interval<br>Background Value for pH = LPL – UPL of two-sided Prediction Interval** | | | | |
|---|---|---|---|---|
| **Parameter** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Antimony | 74 | 99 | 5 | 6 |
| Arsenic | 74 | 93 | 5 | 5 |
| Chromium | 74 | 31 | 5 | 112 |
| Lead | 74 | 69 | 5 | 14.0 |
| Mercury | 74 | 99 | 2 | 2.52 |
| Silver | 74 | 92 | 2 | 2.4 |
| Total Phenols | 74 | 97 | 5 | 20.0 |
| Total Organic Carbon | 74 | 73 | 1,000 | 10,600 |
| Total Organic Halides | 74 | 85 | 20 | 54.5 |
| Sulfate | 61 | 0 | 1,000 | 88,000 |
| pH | 62 | 0 | 0.1 pH units | 5.72 – 7.80 pH units |
| Specific Conductivity | 62 | 0 | 1 µS/cm | 6,870 µS/cm |

The following constituents exhibited normally or ln-normally distributed background data with less than 25% non-detects. One sided parametric prediction intervals were computed on the background data for each of these constituents. The background values for these constituents were set as equal to their UPLs. The background concentration calculations were based on a site wide 95% confidence, 95% coverage upper prediction intervals. When adjusted for multiple comparisons of the background data, the false positive rate was 5% (0.05). The background and relevant statistical data for these constituents are summarized below. The prediction interval computations for these constituents are presented in **Appendix A**.

| **Background Value = UPL of one-sided Prediction Interval** | | | | |
|---|---|---|---|---|
| **Parameter** | **Sample Size** | **% Non-Detects** | **QL (µg/l)** | **Background Value (µg/l)** |
| Barium | 74 | 0 | 10 | 228 |
| Nitrate | 61 | 3 | 100 | 1,311 |

# TABLE 1

## OPEN BURNING GROUND
## CALCULATED BACKGROUND VALUES

| Constituent | Background Value (µg/l unless otherwise noted) |
|---|---|
| Antimony | 6 |
| Arsenic | 5 |
| Barium | 228 |
| Chromium | 112 |
| Lead | 14.0 |
| Mercury | 2.52 |
| Silver | 2.4 |
| Acetone | 25 |
| Benzene | 5 |
| Carbon Tetrachloride | 5 |
| Chlorobenzene | 5 |
| Methyl chloride | 5 |
| Methylene chloride | 5 |
| Toluene | 5 |
| 2,4-Dinitrotoluene | 10 |
| Di-n-butylphthalate | 10 |
| Diethyl phthalate | 10 |
| Diphenylamine | 10 |
| Hexachloroethane | 10 |
| Nitroglycerine | 10 mg/l |
| Perchlorate | 4 |
| Total Phenols | 20.0 |
| Nitrate | 1,311 |
| Nitrite | 100 |
| Sulfate | 88,000 |
| Total Organic Carbon | 10,600 |
| Total Organic Halides | 54.5 |
| Specific Conductivity | 6,870 µS/cm |
| pH | 5.72 – 7.80 pH units |

# APPENDIX A

## OPEN BURNING GROUND
## BACKGROUND VALUE STATISTICAL CALCULATIONS

**RAAP - Open Burning Ground (HWMU-13) - Statistical Analysis - Background Calculation**

May 10, 2005

1) Y2K Correction dates on GRITS/STAT software are as shown in the table below.

| Actual Event Date | Date Used in Stat Software | Notes |
|---|---|---|
| 1st Quarter 2000 | 12/10/1999 | |
| 2nd Quarter 2000 | 12/11/1999 | |
| 3rd Quarter 2000 | 12/12/1999 | |
| 4th Quarter 2000 | 12/13/1999 | |
| 1st Quarter 2001 | 12/14/1999 | |
| 2nd Quarter 2001 | 12/15/1999 | |
| 3rd Quarter 2001 | 12/16/1999 | |
| 4th Quarter 2001 | 12/17/1999 | |
| 1st Quarter 2002 | 12/18/1999 | |
| 2nd Quarter 2002 | 12/19/1999 | |
| 3rd Quarter 2002 | 12/20/1999 | |
| 4th Quarter 2002 | 12/21/1999 | |
| 1st Quarter 2003 | 12/22/1999 | |
| 2nd Quarter 2003 | 12/23/1999 | |
| 3rd Quarter 2003 | 12/24/1999 | |
| 4th Quarter 2003 | 12/25/1999 | |
| 1st Quarter 2004 | 12/26/1999 | |
| 2nd Quarter 2004 | 12/27/1999 | |
| 3rd Quarter 2004 | 12/28/1999 | |
| 4th Quarter 2004 | 12/29/1999 | |
| 1st Quarter 2005 | 12/30/1999 | |

2) No adjustments for multiple comparisons could be made for non-parametric UPLs and where UPL=QL.
Any Statistically significant increase (SSI) must be confirmed by verification sampling.

3) No data available for pH and Specific conductivity from 2nd Qtr 1996 - 2nd Qtr 1997.

4) Background for chlorobenzene, Carbon tetrachloride, Methyl Chloride (Chloromethane), Methylene Chloride (Dichloromethane), Hexachloroethane and Perchlorate based on 4th Quarter 2003 to 1st Quarter 2005 data.

5) Background for all other target constituents based on 1st Quarter 1996 through 1st Quarter 2005 data.

P:\B03\200\B03204\B03204-03\WORK\[StatDate correction.xls]Statcorrection dates

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:CCl4 Carbon tetrachloride

CAS Number: 56-23-5
MCL: 5.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ChlBenz Chlorobenzene

CAS Number: 108-90-7
MCL: 100.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ChlMeth Chloromethane

CAS Number: 74-87-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DiClMe Dichloromethane

CAS Number: 75-09-2
MCL: 5.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:HClEth Hexachloroethane

CAS Number: 67-72-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 10.000 ppb | Ln Minimum: | 2.303 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 10.000 ppb | Ln Mean: | 2.303 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 10.000 ppb | Ln Minimum: | 2.303 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 10.000 ppb | Ln Mean: | 2.303 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Perchlor Perchlorate

CAS Number: - -
MCL: 0.000 ug/l
ACL: 0.000 ug/l
Detect Limit: 8.000 ug/l

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Dec 25 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 26 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 27 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 28 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 29 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 30 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 4.000 ug/l | Ln Minimum: | 1.386 |
| Maximum: | 4.000 ug/l | Ln Maximum: | 1.386 |
| Mean: | 4.000 ug/l | Ln Mean: | 1.386 |
| Std. Dev.: | 0.000 ug/l | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|

| | | |
|---|---|---|
| Dec 25 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 26 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 27 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 28 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 29 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |
| Dec 30 1999 | 4.000 ug/l | 1.386 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 4.000 ug/l | Ln Minimum: | 1.386 |
| Maximum: | 4.000 ug/l | Ln Maximum: | 1.386 |
| Mean: | 4.000 ug/l | Ln Mean: | 1.386 |
| Std. Dev.: | 0.000 ug/l | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 17:22

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sb Antimony, total

CAS Number: 7440-36-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 09 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Aug 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 23 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jul 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 08 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 10 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 11 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 12 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 14 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 15 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 16 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 17 1999 | 1.500 ppb | 0.405 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 1.500 ppb | Ln Minimum: | 0.405 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 2.730 ppb | Ln Mean: | 0.828 |
| Std. Dev.: | 1.694 ppb | Ln Std. Dev.: | 0.583 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1996 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1996 | 6.000 ppb | 1.792 |
| Mar 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jun 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Sep 30 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 31 1997 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 09 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Aug 14 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 23 1998 | 1.500 ppb | 0.405 (* Nondetect *) |
| Mar 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| May 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Jul 27 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Nov 08 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 10 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 11 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 12 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 13 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 14 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 15 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 16 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 17 1999 | 1.500 ppb | 0.405 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 1.500 ppb | Ln Minimum: | 0.405 |
| Maximum: | 6.000 ppb | Ln Maximum: | 1.792 |
| Mean: | 2.851 ppb | Ln Mean: | 0.866 |
| Std. Dev.: | 1.763 ppb | Ln Std. Dev.: | 0.599 |

Normality Tests

Report Printed: 05-10-2005 15:34

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sb Antimony, total

CAS Number: 7440-36-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 1.500 | 5.000 | 2.730 | 1.694 |
| Log: | 0.405 | 1.609 | 0.828 | 0.583 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 1.500 | 6.000 | 2.851 | 1.763 |
| Log: | 0.405 | 1.792 | 0.866 | 0.599 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 2.791 | 0.847 |
| Std Dev: | 1.718 | 0.587 |
| Skewness: | 0.578 | 0.566 |
| Kurtosis: | -1.636 | -1.673 |
| Minimum: | 1.500 | 0.405 |
| Maximum: | 6.000 | 1.792 |

CV: 0.616 0.693

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6407* | 0.9690 | 0.9560 |
| Log: | 0.6351* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

% ND = 99 %. ~~100~~

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Antimony, total(CAS Number:7440-36-0)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | ***.***% |

UL: ~~[illegible]~~ 6.0 ppb
LL: 0.000

%ND : 99%

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:22

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:As Arsenic, total

CAS Number: 7440-38-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 09 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 3.000 ppb | 1.099 |
| Mar 13 1999 | 1.000 ppb | 0.000 |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 2.000 ppb | 0.693 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 92

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 2.203 ppb | Ln Mean: | 0.220 |
| Std. Dev.: | 2.139 ppb | Ln Std. Dev.: | 1.101 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1996 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Sep 30 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 09 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Mar 13 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 1.000 ppb | 0.000 |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 2.000 ppb | 0.693 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 95

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 2.135 ppb | Ln Mean: | 0.172 |
| Std. Dev.: | 2.153 ppb | Ln Std. Dev.: | 1.101 |

Normality Tests

Report Printed: 05-10-2005 15:45

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:As Arsenic, total

CAS Number: 7440-38-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 5.000 | 2.203 | 2.139 |
| Log: | -0.693 | 1.609 | 0.220 | 1.101 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 5.000 | 2.135 | 2.153 |
| Log: | -0.693 | 1.609 | 0.172 | 1.101 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 2.169 | 0.196 |
| Std Dev: | 2.131 | 1.094 |
| Skewness: | 0.552 | 0.465 |
| Kurtosis: | -1.649 | -1.725 |
| Minimum: | 0.500 | -0.693 |
| Maximum: | 5.000 | 1.609 |

| | | |
|---|---|---|
| CV: | 0.983 | 5.572 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6615* | 0.9690 | 0.9560 |
| Log: | 0.6742* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Arsenic, total(CAS Number:7440-38-2)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

Observations (n): 74
Conf. Level (1-$\alpha$): ***.***%

UL: ~~0.500~~ 5.0 ppb
LL: 0.000

% ND: 100%.

**BACKGROUND TO COMPLIANCE WELL COMPARISON**

**Well:13MW3**

| Sample Date | Observation |
|---|---|
| 12/17/99 | ND < 1.000 ppb |

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*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ba Barium, total

CAS Number: 7440-39-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 87.000 ppb | 4.466 |
| Jun 30 1996 | 105.000 ppb | 4.654 |
| Sep 30 1996 | 90.000 ppb | 4.500 |
| Dec 31 1996 | 88.000 ppb | 4.477 |
| Mar 31 1997 | 127.000 ppb | 4.844 |
| Jun 30 1997 | 129.000 ppb | 4.860 |
| Sep 30 1997 | 154.000 ppb | 5.037 |
| Dec 31 1997 | 126.000 ppb | 4.836 |
| Mar 09 1998 | 117.000 ppb | 4.762 |
| May 14 1998 | 98.000 ppb | 4.585 |
| Aug 14 1998 | 107.000 ppb | 4.673 |
| Nov 23 1998 | 255.000 ppb | 5.541 |
| Mar 13 1999 | 178.000 ppb | 5.182 |
| May 27 1999 | 85.000 ppb | 4.443 |
| Jul 27 1999 | 103.000 ppb | 4.635 |
| Nov 08 1999 | 128.000 ppb | 4.852 |
| Dec 10 1999 | 96.000 ppb | 4.564 |
| Dec 11 1999 | 91.000 ppb | 4.511 |
| Dec 12 1999 | 81.000 ppb | 4.394 |
| Dec 13 1999 | 111.000 ppb | 4.710 |
| Dec 14 1999 | 115.000 ppb | 4.745 |
| Dec 15 1999 | 81.800 ppb | 4.404 |
| Dec 16 1999 | 112.000 ppb | 4.718 |
| Dec 17 1999 | 132.000 ppb | 4.883 |

| | | |
|---|---|---|
| Dec 18 1999 | 127.000 ppb | 4.844 |
| Dec 19 1999 | 107.000 ppb | 4.673 |
| Dec 20 1999 | 132.000 ppb | 4.883 |
| Dec 21 1999 | 143.000 ppb | 4.963 |
| Dec 22 1999 | 110.000 ppb | 4.700 |
| Dec 23 1999 | 78.000 ppb | 4.357 |
| Dec 24 1999 | 89.500 ppb | 4.494 |
| Dec 25 1999 | 120.000 ppb | 4.787 |
| Dec 26 1999 | 98.800 ppb | 4.593 |
| Dec 27 1999 | 96.300 ppb | 4.567 |
| Dec 28 1999 | 97.100 ppb | 4.576 |
| Dec 29 1999 | 106.000 ppb | 4.663 |
| Dec 30 1999 | 101.000 ppb | 4.615 |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 78.000 ppb | Ln Minimum: | 4.357 |
| Maximum: | 255.000 ppb | Ln Maximum: | 5.541 |
| Mean: | 113.581 ppb | Ln Mean: | 4.703 |
| Std. Dev.: | 32.212 ppb | Ln Std. Dev.: | 0.235 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 134.000 ppb | 4.898 |
| Jun 30 1996 | 139.000 ppb | 4.934 |
| Sep 30 1996 | 128.000 ppb | 4.852 |
| Dec 31 1996 | 110.000 ppb | 4.700 |
| Mar 31 1997 | 137.000 ppb | 4.920 |
| Jun 30 1997 | 125.000 ppb | 4.828 |
| Sep 30 1997 | 140.000 ppb | 4.942 |
| Dec 31 1997 | 141.000 ppb | 4.949 |
| Mar 09 1998 | 220.000 ppb | 5.394 |
| May 14 1998 | 159.000 ppb | 5.069 |
| Aug 14 1998 | 151.000 ppb | 5.017 |
| Nov 23 1998 | 172.000 ppb | 5.147 |
| Mar 13 1999 | 168.000 ppb | 5.124 |
| May 27 1999 | 153.000 ppb | 5.030 |
| Jul 27 1999 | 124.000 ppb | 4.820 |
| Nov 08 1999 | 146.000 ppb | 4.984 |
| Dec 10 1999 | 138.000 ppb | 4.927 |
| Dec 11 1999 | 145.000 ppb | 4.977 |
| Dec 12 1999 | 130.000 ppb | 4.868 |
| Dec 13 1999 | 135.000 ppb | 4.905 |
| Dec 14 1999 | 131.000 ppb | 4.875 |
| Dec 15 1999 | 147.000 ppb | 4.990 |
| Dec 16 1999 | 148.000 ppb | 4.997 |
| Dec 17 1999 | 155.000 ppb | 5.043 |
| Dec 18 1999 | 128.000 ppb | 4.852 |
| Dec 19 1999 | 148.000 ppb | 4.997 |
| Dec 20 1999 | 148.000 ppb | 4.997 |
| Dec 21 1999 | 142.000 ppb | 4.956 |
| Dec 22 1999 | 153.000 ppb | 5.030 |

| | | |
|---|---|---|
| Dec 23 1999 | 172.000 ppb | 5.147 |
| Dec 24 1999 | 168.000 ppb | 5.124 |
| Dec 25 1999 | 152.000 ppb | 5.024 |
| Dec 26 1999 | 174.000 ppb | 5.159 |
| Dec 27 1999 | 168.000 ppb | 5.124 |
| Dec 28 1999 | 154.000 ppb | 5.037 |
| Dec 29 1999 | 171.000 ppb | 5.142 |
| Dec 30 1999 | 180.000 ppb | 5.193 |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 110.000 ppb | Ln Minimum: | 4.700 |
| Maximum: | 220.000 ppb | Ln Maximum: | 5.394 |
| Mean: | 149.568 ppb | Ln Mean: | 4.999 |
| Std. Dev.: | 20.240 ppb | Ln Std. Dev.: | 0.130 |

Normality Tests

Report Printed: 05-10-2005 15:54

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ba Barium, total

CAS Number: 7440-39-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 78.000 | 255.000 | 113.581 | 32.212 |
| Log: | 4.357 | 5.541 | 4.703 | 0.235 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 110.000 | 220.000 | 149.568 | 20.240 |
| Log: | 4.700 | 5.394 | 4.999 | 0.130 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 131.574 | 4.851 |
| Std Dev: | 32.278 | 0.241 |
| Skewness: | 0.845 | 0.030 |
| Kurtosis: | 1.800 | -0.118 |
| Minimum: | 78.000 | 4.357 |
| Maximum: | 255.000 | 5.541 |

CV: 0.245 0.050

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.9407* | 0.9690 | 0.9560 |
| Log: | 0.9794 | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Parametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Barium, total(CAS Number:7440-39-3)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Shapiro-Francia (W): | 0.9794 |
| Critical W,$\alpha$=0.01: | 0.9560 |
| Mean: | 4.851 ln(ppb) |
| Std Dev: | 0.241 ln(ppb) |
| DF: | 73 |
| Conf. Level (1-$\alpha$): | 0.9500 |
| Future Samples (k): | 5 |
| $t_{\left[1-\frac{\alpha}{k}\right]}$: | 2.3785 |
| Kappa: | 2.3945 |
| UL: | 227.572 ppb |
| LL: | 0.000 |

%ND: 0 %

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cr Chromium, total

CAS Number: 7440-47-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 11.000 ppb | 2.398 |
| Jun 30 1996 | 13.000 ppb | 2.565 |
| Sep 30 1996 | 56.000 ppb | 4.025 |
| Dec 31 1996 | 20.000 ppb | 2.996 |
| Mar 31 1997 | 22.000 ppb | 3.091 |
| Jun 30 1997 | 19.000 ppb | 2.944 |
| Sep 30 1997 | 40.000 ppb | 3.689 |
| Dec 31 1997 | 23.000 ppb | 3.135 |
| Mar 09 1998 | 55.000 ppb | 4.007 |
| May 14 1998 | 6.000 ppb | 1.792 |
| Aug 14 1998 | 9.000 ppb | 2.197 |
| Nov 23 1998 | 112.000 ppb | 4.718 |
| Mar 13 1999 | 108.000 ppb | 4.682 |
| May 27 1999 | 3.000 ppb | 1.099 |
| Jul 27 1999 | 2.000 ppb | 0.693 |
| Nov 08 1999 | 15.000 ppb | 2.708 |
| Dec 10 1999 | 2.000 ppb | 0.693 |
| Dec 11 1999 | 2.000 ppb | 0.693 |
| Dec 12 1999 | 2.000 ppb | 0.693 |
| Dec 13 1999 | 4.000 ppb | 1.386 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 46

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 112.000 ppb | Ln Maximum: | 4.718 |
| Mean: | 15.973 ppb | Ln Mean: | 1.847 |
| Std. Dev.: | 26.511 ppb | Ln Std. Dev.: | 1.386 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 13.000 ppb | 2.565 |
| Jun 30 1996 | 10.000 ppb | 2.303 |
| Sep 30 1996 | 11.000 ppb | 2.398 |
| Dec 31 1996 | 14.000 ppb | 2.639 |
| Mar 31 1997 | 10.000 ppb | 2.303 |
| Jun 30 1997 | 10.000 ppb | 2.303 |
| Sep 30 1997 | 19.000 ppb | 2.944 |
| Dec 31 1997 | 12.000 ppb | 2.485 |
| Mar 09 1998 | 12.000 ppb | 2.485 |
| May 14 1998 | 7.000 ppb | 1.946 |
| Aug 14 1998 | 17.000 ppb | 2.833 |
| Nov 23 1998 | 20.000 ppb | 2.996 |
| Mar 13 1999 | 9.000 ppb | 2.197 |
| May 27 1999 | 6.000 ppb | 1.792 |
| Jul 27 1999 | 6.000 ppb | 1.792 |
| Nov 08 1999 | 6.000 ppb | 1.792 |
| Dec 10 1999 | 4.000 ppb | 1.386 |
| Dec 11 1999 | 6.000 ppb | 1.792 |
| Dec 12 1999 | 2.000 ppb | 0.693 |
| Dec 13 1999 | 5.000 ppb | 1.609 |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 10.700 ppb | 2.370 |
| Dec 16 1999 | 9.210 ppb | 2.220 |
| Dec 17 1999 | 7.020 ppb | 1.949 |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 57.600 ppb | 4.054 |
| Dec 22 1999 | 10.300 ppb | 2.332 |

| | | |
|---|---|---|
| Dec 23 1999 | 6.300 ppb | 1.841 |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 6.000 ppb | 1.792 |
| Dec 26 1999 | 7.600 ppb | 2.028 |
| Dec 27 1999 | 5.500 ppb | 1.705 |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 7.400 ppb | 2.001 |
| Dec 30 1999 | 7.600 ppb | 2.028 |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 16

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 57.600 ppb | Ln Maximum: | 4.054 |
| Mean: | 9.722 ppb | Ln Mean: | 2.025 |
| Std. Dev.: | 9.158 ppb | Ln Std. Dev.: | 0.733 |

Normality Tests

Report Printed: 05-10-2005 15:57

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cr Chromium, total

CAS Number: 7440-47-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 112.000 | 15.973 | 26.511 |
| Log: | -0.693 | 4.718 | 1.847 | 1.386 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 57.600 | 9.722 | 9.158 |
| Log: | -0.693 | 4.054 | 2.025 | 0.733 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 12.848 | 1.936 |
| Std Dev: | 19.947 | 1.105 |
| Skewness: | 3.603* | -0.168 |
| Kurtosis: | 13.679 | 1.161 |
| Minimum: | 0.500 | -0.693 |
| Maximum: | 112.000 | 4.718 |

| | | |
|---|---|---|
| CV: | 1.553 | 0.570 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.4961* | 0.9690 | 0.9560 |
| Log: | 0.9189* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Chromium, total(CAS Number:7440-47-3)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | ***.***% |
| UL: | ~~0.500~~ 112.0 ppb |
| LL: | 0.000 |

%ND: 31%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Pb Lead, total

CAS Number: 7439-92-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 1.000 ppb | 0.000 |
| Jun 30 1996 | 1.000 ppb | 0.000 |
| Sep 30 1996 | 2.000 ppb | 0.693 |
| Dec 31 1996 | 4.000 ppb | 1.386 |
| Mar 31 1997 | 14.000 ppb | 2.639 |
| Jun 30 1997 | 9.000 ppb | 2.197 |
| Sep 30 1997 | 8.000 ppb | 2.079 |
| Dec 31 1997 | 5.000 ppb | 1.609 |
| Mar 09 1998 | 2.000 ppb | 0.693 |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 6.000 ppb | 1.792 |
| Mar 13 1999 | 6.000 ppb | 1.792 |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 3.200 ppb | 1.163 |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 68

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 14.000 ppb | Ln Maximum: | 2.639 |
| Mean: | 3.573 ppb | Ln Mean: | 0.774 |
| Std. Dev.: | 3.027 ppb | Ln Std. Dev.: | 1.138 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.000 ppb | 0.693 |
| Jun 30 1996 | 4.000 ppb | 1.386 |
| Sep 30 1996 | 2.000 ppb | 0.693 |
| Dec 31 1996 | 6.000 ppb | 1.792 |
| Mar 31 1997 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jun 30 1997 | 7.000 ppb | 1.946 |
| Sep 30 1997 | 6.000 ppb | 1.792 |
| Dec 31 1997 | 5.000 ppb | 1.609 |
| Mar 09 1998 | 3.000 ppb | 1.099 |
| May 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Aug 14 1998 | 0.500 ppb | -0.693 (* Nondetect *) |
| Nov 23 1998 | 1.000 ppb | 0.000 |
| Mar 13 1999 | 2.000 ppb | 0.693 |
| May 27 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Jul 27 1999 | 2.000 ppb | 0.693 |
| Nov 08 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 10 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 11 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 12 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 13 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 14 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 15 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 16 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 17 1999 | 0.500 ppb | -0.693 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 70

| | | | |
|---|---|---|---|
| Minimum: | 0.500 ppb | Ln Minimum: | -0.693 |
| Maximum: | 7.000 ppb | Ln Maximum: | 1.946 |
| Mean: | 3.014 ppb | Ln Mean: | 0.657 |
| Std. Dev.: | 2.238 ppb | Ln Std. Dev.: | 1.078 |

Normality Tests

Report Printed: 05-10-2005 16:25

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Pb Lead, total

CAS Number: 7439-92-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 14.000 | 3.573 | 3.027 |
| Log: | -0.693 | 2.639 | 0.774 | 1.138 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.500 | 7.000 | 3.014 | 2.238 |
| Log: | -0.693 | 1.946 | 0.657 | 1.078 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 3.293 | 0.716 |
| Std Dev: | 2.658 | 1.102 |
| Skewness: | 0.876 | -0.314 |
| Kurtosis: | 1.714 | -1.614 |
| Minimum: | 0.500 | -0.693 |
| Maximum: | 14.000 | 2.639 |

CV: 0.807 1.540

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.8098* | 0.9690 | 0.9560 |
| Log: | 0.7963* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Lead, total(CAS Number:7439-92-1)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 14.0 ~~0.500~~ ppb |
| LL: | 0.000 |

%ND: 69%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Hg Mercury

CAS Number: 7439-97-6
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.000 ppb | Ln Maximum: | 0.693 |
| Mean: | 0.768 ppb | Ln Mean: | -1.250 |
| Std. Dev.: | 0.920 ppb | Ln Std. Dev.: | 1.450 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.520 ppb | 0.924 |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.520 ppb | Ln Maximum: | 0.924 |
| Mean: | 0.782 ppb | Ln Mean: | -1.244 |
| Std. Dev.: | 0.943 ppb | Ln Std. Dev.: | 1.459 |

Normality Tests

Report Printed: 05-10-2005 16:28

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Hg Mercury

CAS Number: 7439-97-6
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.000 | 0.768 | 0.920 |
| Log: | -2.303 | 0.693 | -1.250 | 1.450 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.520 | 0.782 | 0.943 |
| Log: | -2.303 | 0.924 | -1.244 | 1.459 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 0.775 | -1.247 |
| Std Dev: | 0.925 | 1.444 |
| Skewness: | 0.638 | 0.624 |
| Kurtosis: | -1.565 | -1.609 |
| Minimum: | 0.100 | -2.303 |
| Maximum: | 2.520 | 0.924 |

CV: 1.194 -1.158

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6336* | 0.9690 | 0.9560 |
| Log: | 0.6250* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Mercury(CAS Number:7439-97-6)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 2.52 ~~0.100~~ ppb |
| LL: | 0.000 |

%ND: ~99%.

Data Set Summary

Report Printed: 05-10-2005 17:24

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ag Silver, total

CAS Number: 7440-22-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.300 ppb | -1.204 |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 2.400 ppb | 0.875 |
| Dec 31 1996 | 0.900 ppb | -0.105 |
| Mar 31 1997 | 1.000 ppb | 0.000 |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 89

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.400 ppb | Ln Maximum: | 0.875 |
| Mean: | 0.881 ppb | Ln Mean: | -1.013 |
| Std. Dev.: | 0.930 ppb | Ln Std. Dev.: | 1.458 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1996 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1996 | 0.400 ppb | -0.916 |
| Dec 31 1996 | 0.700 ppb | -0.357 |
| Mar 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jun 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Sep 30 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 31 1997 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 09 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Aug 14 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 23 1998 | 0.100 ppb | -2.303 (* Nondetect *) |
| Mar 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| May 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Jul 27 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Nov 08 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 10 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 11 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 12 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 13 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 14 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 15 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 16 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 17 1999 | 0.100 ppb | -2.303 (* Nondetect *) |
| Dec 18 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 19 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 20 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 21 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 22 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 24 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 25 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 26 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 27 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 28 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 29 1999 | 2.000 ppb | 0.693 (* Nondetect *) |
| Dec 30 1999 | 2.000 ppb | 0.693 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 95

| | | | |
|---|---|---|---|
| Minimum: | 0.100 ppb | Ln Minimum: | -2.303 |
| Maximum: | 2.000 ppb | Ln Maximum: | 0.693 |
| Mean: | 0.792 ppb | Ln Mean: | -1.160 |
| Std. Dev.: | 0.908 ppb | Ln Std. Dev.: | 1.434 |

Normality Tests

Report Printed: 05-10-2005 16:37

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ag Silver, total

CAS Number: 7440-22-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.400 | 0.881 | 0.930 |
| Log: | -2.303 | 0.875 | -1.013 | 1.458 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 0.100 | 2.000 | 0.792 | 0.908 |
| Log: | -2.303 | 0.693 | -1.160 | 1.434 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 0.836 | -1.086 |
| Std Dev: | 0.914 | 1.438 |
| Skewness: | 0.502 | 0.376 |
| Kurtosis: | -1.683 | -1.799 |
| Minimum: | 0.100 | -2.303 |
| Maximum: | 2.400 | 0.875 |

CV: 1.092 -1.324

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.6793* | 0.9690 | 0.9560 |
| Log: | 0.6842* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Silver, total(CAS Number:7440-22-4)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-α): | ***.***% |
| UL: | ~~0.100~~ 2.4 ppb |
| LL: | 0.000 |

%ND: 92%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 16:44

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Acetone Acetone

CAS Number: 67-64-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 50.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 19 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 20 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 21 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 22 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 23 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 24 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 25 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 26 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 27 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 28 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 29 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 30 1999 | 25.000 ppb | 3.219 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 25.000 ppb | Ln Maximum: | 3.219 |
| Mean: | 12.027 ppb | Ln Mean: | 2.175 |
| Std. Dev.: | 9.680 ppb | Ln Std. Dev.: | 0.779 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 19 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 20 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 21 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 22 1999 | 25.000 ppb | 3.219 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 24 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 25 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 26 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 27 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 28 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 29 1999 | 25.000 ppb | 3.219 (* Nondetect *) |
| Dec 30 1999 | 25.000 ppb | 3.219 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 25.000 ppb | Ln Maximum: | 3.219 |
| Mean: | 12.027 ppb | Ln Mean: | 2.175 |
| Std. Dev.: | 9.680 ppb | Ln Std. Dev.: | 0.779 |

Data Set Summary

Report Printed: 05-10-2005 16:43

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Benzene Benzene

CAS Number: 71-43-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.050 ppb | Ln Minimum: | -2.996 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 1.789 ppb | Ln Mean: | -1.378 |
| Std. Dev.: | 2.396 ppb | Ln Std. Dev.: | 2.229 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | |

Data Set Summary

Report Printed: 05-10-2005 16:46

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Toluen Toluene

CAS Number: 108-88-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.200 ppb | -1.609 |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 0.050 ppb | Ln Minimum: | -2.996 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 1.793 ppb | Ln Mean: | -1.340 |
| Std. Dev.: | 2.393 ppb | Ln Std. Dev.: | 2.212 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1996 | 0.200 ppb | -1.609 |
| Sep 30 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1996 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jun 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Sep 30 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 31 1997 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 09 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Aug 14 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 23 1998 | 0.050 ppb | -2.996 (* Nondetect *) |
| Mar 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| May 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Jul 27 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Nov 08 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 10 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 11 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 12 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 13 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 14 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 15 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 16 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 17 1999 | 0.050 ppb | -2.996 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 0.050 ppb | Ln Minimum: | -2.996 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 1.793 ppb | Ln Mean: | -1.340 |
| Std. Dev.: | 2.393 ppb | Ln Std. Dev.: | 2.212 |

Data Set Summary

Report Printed: 05-10-2005 16:46

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:2,4-DNT 2,4-Dinitrotoluene

CAS Number: 121-14-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 09 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Aug 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 23 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jul 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 08 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 10 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 11 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 12 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 14 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 15 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 16 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 17 1999 | 0.040 ppb | -3.219 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.040 ppb | Ln Minimum: | -3.219 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 3.539 ppb | Ln Mean: | -1.279 |
| Std. Dev.: | 4.820 ppb | Ln Std. Dev.: | 2.672 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1996 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jun 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Sep 30 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 31 1997 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 09 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Aug 14 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 23 1998 | 0.040 ppb | -3.219 (* Nondetect *) |
| Mar 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| May 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Jul 27 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Nov 08 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 10 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 11 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 12 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 13 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 14 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 15 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 16 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 17 1999 | 0.040 ppb | -3.219 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 0.040 ppb | Ln Minimum: | -3.219 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 3.539 ppb | Ln Mean: | -1.279 |
| Std. Dev.: | 4.820 ppb | Ln Std. Dev.: | 2.672 |

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Di-N-Bu Di-n-Butylphthalate

CAS Number: 84-74-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DEthPhth Diethylphthalate

CAS Number: 84-66-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 5.135 ppb | Ln Mean: | 1.403 |
| Std. Dev.: | 3.630 ppb | Ln Std. Dev.: | 0.671 |

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DPA Diphenylamine

CAS Number: 122-39-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 6.757 ppb | Ln Mean: | 1.853 |
| Std. Dev.: | 2.420 ppb | Ln Std. Dev.: | 0.335 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 ppb | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 ppb | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 10.000 ppb | Ln Maximum: | 2.303 |
| Mean: | 6.757 ppb | Ln Mean: | 1.853 |
| Std. Dev.: | 2.420 ppb | Ln Std. Dev.: | 0.335 |

Data Set Summary

Report Printed: 05-10-2005 16:48

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:NGlycern Nitroglycerin or1,2,3-Propanetriol,trinitrate

CAS Number: 55-63-0
MCL: 0.000 mg/l
ACL: 0.000 mg/l
Detect Limit: 20.000 mg/l

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 09 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Aug 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 23 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jul 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 08 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 10 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 11 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 12 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 14 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 15 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 16 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 17 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 23 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 0.005 mg/l | Ln Minimum: | -5.298 |
| Maximum: | 10.000 mg/l | Ln Maximum: | 2.303 |
| Mean: | 3.517 mg/l | Ln Mean: | -2.628 |
| Std. Dev.: | 4.837 mg/l | Ln Std. Dev.: | 3.679 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1996 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jun 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Sep 30 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 31 1997 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 09 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Aug 14 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 23 1998 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Mar 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| May 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Jul 27 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Nov 08 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 10 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 11 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 12 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 13 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 14 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 15 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 16 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 17 1999 | 0.005 mg/l | -5.298 (* Nondetect *) |
| Dec 18 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 19 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 20 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 21 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 22 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 24 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 25 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 26 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 27 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 28 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 29 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |
| Dec 30 1999 | 10.000 mg/l | 2.303 (* Nondetect *) |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

| | | | |
|---|---|---|---|
| Minimum: | 0.005 mg/l | Ln Minimum: | -5.298 |
| Maximum: | 10.000 mg/l | Ln Maximum: | 2.303 |
| Mean: | | | |

| | | | |
|---|---|---|---|
| 3.517 mg/l | Ln Mean: | -2.628 | |
| Std. Dev.: | 4.837 mg/l | Ln Std. Dev.: | 3.679 |

Data Set Summary

Report Printed: 05-10-2005 16:59

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Phenols Phenols, total

CAS Number: 108-95-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 20.000 ppb | 2.996 |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 14.000 ppb | 2.639 |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 13.000 ppb | 2.565 |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 92

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 20.000 ppb | Ln Maximum: | 2.996 |
| Mean: | 5.865 ppb | Ln Mean: | 1.701 |
| Std. Dev.: | 3.084 ppb | Ln Std. Dev.: | 0.316 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 25 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 26 1999 | 12.000 ppb | 2.485 |
| Dec 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 28 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 29 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 30 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 12.000 ppb | Ln Maximum: | 2.485 |
| Mean: | 5.189 ppb | Ln Mean: | 1.633 |
| Std. Dev.: | 1.151 ppb | Ln Std. Dev.: | 0.144 |

Normality Tests

Report Printed: 05-10-2005 16:59

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Phenols Phenols, total

CAS Number: 108-95-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 5.000 | 20.000 | 5.865 | 3.084 |
| Log: | 1.609 | 2.996 | 1.701 | 0.316 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 5.000 | 12.000 | 5.189 | 1.151 |
| Log: | 1.609 | 2.485 | 1.633 | 0.144 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 5.527 | 1.667 |
| Std Dev: | 2.336 | 0.246 |
| Skewness: | 4.671* | 4.192* |
| Kurtosis: | 22.128 | 16.382 |
| Minimum: | 5.000 | 1.609 |
| Maximum: | 20.000 | 2.996 |

| | | |
|---|---|---|
| CV: | 0.423 | 0.148 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.2166* | 0.9690 | 0.9560 |
| Log: | 0.2249* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Phenols, total(CAS Number:108-95-2)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | ~~5.000~~ 20.0 ppb |
| LL: | 0.000 |

%ND: 97%

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:05

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1996 | 3000.000 ppb | 8.006 |
| Sep 30 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1997 | 2000.000 ppb | 7.601 |
| Sep 30 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 09 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| May 14 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Aug 14 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 23 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 13 1999 | 1725.000 ppb | 7.453 |
| May 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jul 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 08 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 10 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 11 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 12 1999 | 1550.000 ppb | 7.346 |
| Dec 13 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 14 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 15 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 16 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 17 1999 | 500.000 ppb | 6.215 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 19 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 20 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 21 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 22 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 23 1999 | 2177.000 ppb | 7.686 |
| Dec 24 1999 | 10600.000 ppb | 9.269 |
| Dec 25 1999 | 10600.000 ppb | 9.269 |
| Dec 26 1999 | 5682.000 ppb | 8.645 |
| Dec 27 1999 | 8370.000 ppb | 9.032 |
| Dec 28 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 29 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 30 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 76

| | | | |
|---|---|---|---|
| Minimum: | 500.000 ppb | Ln Minimum: | 6.215 |
| Maximum: | 10600.000 ppb | Ln Maximum: | 9.269 |
| Mean: | 1721.730 ppb | Ln Mean: | 6.861 |
| Std. Dev.: | 2653.605 ppb | Ln Std. Dev.: | 0.928 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1996 | 3000.000 ppb | 8.006 |
| Sep 30 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1996 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jun 30 1997 | 2000.000 ppb | 7.601 |
| Sep 30 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 31 1997 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 09 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| May 14 1998 | 1400.000 ppb | 7.244 |
| Aug 14 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 23 1998 | 500.000 ppb | 6.215 (* Nondetect *) |
| Mar 13 1999 | 8625.000 ppb | 9.062 |
| May 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Jul 27 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Nov 08 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 10 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 11 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 12 1999 | 1625.000 ppb | 7.393 |
| Dec 13 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 14 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 15 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 16 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 17 1999 | 500.000 ppb | 6.215 (* Nondetect *) |
| Dec 18 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 19 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 20 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 21 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 22 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 3550.000 ppb | 8.175 |
| Dec 24 1999 | 1505.000 ppb | 7.317 |
| Dec 25 1999 | 8417.000 ppb | 9.038 |
| Dec 26 1999 | 5972.000 ppb | 8.695 |
| Dec 27 1999 | 8255.000 ppb | 9.019 |
| Dec 28 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 29 1999 | 1000.000 ppb | 6.908 (* Nondetect *) |
| Dec 30 1999 | 1042.000 ppb | 6.949 |

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 70

| | | | |
|---|---|---|---|
| Minimum: | 500.000 ppb | Ln Minimum: | 6.215 |
| Maximum: | 8625.000 ppb | Ln Maximum: | 9.062 |
| Mean: | 1672.730 ppb | Ln Mean: | 6.890 |
| Std. Dev.: | 2302.313 ppb | Ln Std. Dev.: | 0.909 |

Normality Tests

Report Printed: 05-10-2005 17:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 500.000 | 10600.000 | 1721.730 | 2653.605 |
| Log: | 6.215 | 9.269 | 6.861 | 0.928 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 500.000 | 8625.000 | 1672.730 | 2302.313 |
| Log: | 6.215 | 9.062 | 6.890 | 0.909 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 1697.230 | 6.876 |
| Std Dev: | 2467.227 | 0.912 |
| Skewness: | 2.485* | 1.364* |
| Kurtosis: | 5.030 | 0.781 |
| Minimum: | 500.000 | 6.215 |
| Maximum: | 10600.000 | 9.269 |

| | | |
|---|---|---|
| CV: | 1.454 | 0.133 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.5304* | 0.9690 | 0.9560 |
| Log: | 0.7452* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Total Organic Carbon(CAS Number:- -)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | ***.***% |
| UL: | ~~16,000.0~~ ~~500.000 ppb~~ 10,600.00 ppb |
| LL: | 0.000 |

%ND: 73%.

*Report Produced by GRITS/STAT 5.01*

Normality Tests

Report Printed: 05-10-2005 17:10

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOX Total Organic Halogens, Halides

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 40.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 2.500 | 38.000 | 10.932 | 10.539 |
| Log: | 0.916 | 3.638 | 1.874 | 1.056 |

Well:13MW2 Position:Upgradient Observations:37

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 2.500 | 54.500 | 10.405 | 11.289 |
| Log: | 0.916 | 3.998 | 1.789 | 1.059 |

Pooled Statistics
Observations: 74

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 10.669 | 1.831 |
| Std Dev: | 10.849 | 1.051 |
| Skewness: | 1.378* | 0.399 |
| Kurtosis: | 2.259 | -1.616 |
| Minimum: | 2.500 | 0.916 |
| Maximum: | 54.500 | 3.998 |

CV: 1.017 0.574

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.7158* | 0.9690 | 0.9560 |
| Log: | 0.7407* | 0.9690 | 0.9560 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Data Set Summary

Report Printed: 05-10-2005 17:10

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOX Total Organic Halogens, Halides

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 40.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 9.000 ppb | 2.197 |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 5.500 ppb | 1.705 |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 25.500 ppb | 3.239 |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 6.500 ppb | 1.872 |
| Nov 08 1999 | 14.500 ppb | 2.674 |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 19 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 20 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 21 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 22 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 23 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 24 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 25 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 26 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 27 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 28 1999 | 38.000 ppb | 3.638 |
| Dec 29 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 30 1999 | 38.000 ppb | 3.638 |

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 81

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 38.000 ppb | Ln Maximum: | 3.638 |
| Mean: | 10.932 ppb | Ln Mean: | 1.874 |
| Std. Dev.: | 10.539 ppb | Ln Std. Dev.: | 1.056 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1996 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jun 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Sep 30 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 31 1997 | 2.500 ppb | 0.916 (* Nondetect *) |
| Mar 09 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 14 1998 | 6.000 ppb | 1.792 |
| Aug 14 1998 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 23 1998 | 7.500 ppb | 2.015 |
| Mar 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| May 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Jul 27 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Nov 08 1999 | 24.500 ppb | 3.199 |
| Dec 10 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 11 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 12 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 13 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 14 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 15 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 16 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 17 1999 | 2.500 ppb | 0.916 (* Nondetect *) |
| Dec 18 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 19 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 20 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 21 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 22 1999 | 20.000 ppb | 2.996 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 23 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 24 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 25 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 26 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 27 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 28 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 29 1999 | 20.000 ppb | 2.996 (* Nondetect *) |
| Dec 30 1999 | 54.500 ppb | 3.998 |

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 89

| | | | |
|---|---|---|---|
| Minimum: | 2.500 ppb | Ln Minimum: | 0.916 |
| Maximum: | 54.500 ppb | Ln Maximum: | 3.998 |
| Mean: | 10.405 ppb | Ln Mean: | 1.789 |
| Std. Dev.: | 11.289 ppb | Ln Std. Dev.: | 1.059 |

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Total Organic Halogens, Halides(CAS Number:- -)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 74 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 54.5 ~~2500~~ ppb |
| LL: | 0.000 |

%ND : 85%.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:13

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cond F Specific Conductivity, Field

CAS Number: - -
MCL: 0.000 umhos/cm
ACL: 0.000 umhos/cm
Detect Limit: 2.000 umhos/cm

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 707.500 umhos/cm | 6.562 |
| Sep 30 1997 | 717.500 umhos/cm | 6.576 |
| Dec 31 1997 | 692.500 umhos/cm | 6.540 |
| Mar 09 1998 | 660.000 umhos/cm | 6.492 |
| May 14 1998 | 590.000 umhos/cm | 6.380 |
| Aug 14 1998 | 613.000 umhos/cm | 6.418 |
| Nov 23 1998 | 660.000 umhos/cm | 6.492 |
| Mar 13 1999 | 1940.000 umhos/cm | 7.570 |
| May 27 1999 | 6870.000 umhos/cm | 8.835 |
| Jul 27 1999 | 759.000 umhos/cm | 6.632 |
| Nov 08 1999 | 896.000 umhos/cm | 6.798 |
| Dec 10 1999 | 634.000 umhos/cm | 6.452 |
| Dec 11 1999 | 599.000 umhos/cm | 6.395 |
| Dec 12 1999 | 506.000 umhos/cm | 6.227 |
| Dec 13 1999 | 871.000 umhos/cm | 6.770 |
| Dec 14 1999 | 754.000 umhos/cm | 6.625 |
| Dec 15 1999 | 457.000 umhos/cm | 6.125 |
| Dec 16 1999 | 762.000 umhos/cm | 6.636 |
| Dec 17 1999 | 730.000 umhos/cm | 6.593 |
| Dec 18 1999 | 732.000 umhos/cm | 6.596 |
| Dec 19 1999 | 665.000 umhos/cm | 6.500 |
| Dec 20 1999 | 733.000 umhos/cm | 6.597 |
| Dec 21 1999 | 729.000 umhos/cm | 6.592 |
| Dec 23 1999 | 430.000 umhos/cm | 6.064 |

| | | |
|---|---|---|
| Dec 24 1999 | 490.000 umhos/cm | 6.194 |
| Dec 25 1999 | 640.000 umhos/cm | 6.461 |
| Dec 26 1999 | 690.000 umhos/cm | 6.537 |
| Dec 27 1999 | 440.000 umhos/cm | 6.087 |
| Dec 28 1999 | 610.000 umhos/cm | 6.413 |
| Dec 29 1999 | 620.000 umhos/cm | 6.430 |
| Dec 30 1999 | 720.000 umhos/cm | 6.579 |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 430.000 umhos/cm | Ln Minimum: | 6.064 |
| Maximum: | 6870.000 umhos/cm | Ln Maximum: | 8.835 |
| Mean: | 900.564 umhos/cm | Ln Mean: | 6.586 |
| Std. Dev.: | 1136.958 umhos/cm | Ln Std. Dev.: | 0.495 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 582.500 umhos/cm | 6.367 |
| Sep 30 1997 | 567.500 umhos/cm | 6.341 |
| Dec 31 1997 | 570.000 umhos/cm | 6.346 |
| Mar 09 1998 | 568.000 umhos/cm | 6.342 |
| May 14 1998 | 573.000 umhos/cm | 6.351 |
| Aug 14 1998 | 553.000 umhos/cm | 6.315 |
| Nov 23 1998 | 560.000 umhos/cm | 6.328 |
| Mar 13 1999 | 500.000 umhos/cm | 6.215 |
| May 27 1999 | 5810.000 umhos/cm | 8.667 |
| Jul 27 1999 | 589.000 umhos/cm | 6.378 |
| Nov 08 1999 | 687.000 umhos/cm | 6.532 |
| Dec 10 1999 | 495.000 umhos/cm | 6.205 |
| Dec 11 1999 | 568.000 umhos/cm | 6.342 |
| Dec 12 1999 | 601.000 umhos/cm | 6.399 |
| Dec 13 1999 | 689.000 umhos/cm | 6.535 |
| Dec 14 1999 | 618.000 umhos/cm | 6.426 |
| Dec 15 1999 | 574.000 umhos/cm | 6.353 |
| Dec 16 1999 | 613.000 umhos/cm | 6.418 |
| Dec 17 1999 | 617.000 umhos/cm | 6.425 |
| Dec 18 1999 | 612.000 umhos/cm | 6.417 |
| Dec 19 1999 | 648.000 umhos/cm | 6.474 |
| Dec 20 1999 | 610.000 umhos/cm | 6.413 |
| Dec 21 1999 | 621.000 umhos/cm | 6.431 |
| Dec 23 1999 | 630.000 umhos/cm | 6.446 |
| Dec 24 1999 | 670.000 umhos/cm | 6.507 |
| Dec 25 1999 | 600.000 umhos/cm | 6.397 |
| Dec 26 1999 | 750.000 umhos/cm | 6.620 |
| Dec 27 1999 | 450.000 umhos/cm | 6.109 |
| Dec 28 1999 | 550.000 umhos/cm | 6.310 |
| Dec 29 1999 | 670.000 umhos/cm | 6.507 |
| Dec 30 1999 | 710.000 umhos/cm | 6.565 |

Well ID:13MW2 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 450.000 umhos/cm | Ln Minimum: | 6.109 |
| Maximum: | 5810.000 umhos/cm | Ln Maximum: | 8.667 |
| Mean: | 769.548 umhos/cm | Ln Mean: | 6.467 |
| Std. Dev.: | 937.607 umhos/cm | Ln Std. Dev.: | 0.422 |

Normality Tests

Report Printed: 05-10-2005 17:12

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cond F Specific Conductivity, Field

CAS Number: - -
MCL: 0.000 umhos/cm
ACL: 0.000 umhos/cm
Detect Limit: 2.000 umhos/cm

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 430.000 | 6870.000 | 900.564 | 1136.958 |
| Log: | 6.064 | 8.835 | 6.586 | 0.495 |

Well:13MW2 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 450.000 | 5810.000 | 769.548 | 937.607 |
| Log: | 6.109 | 8.667 | 6.467 | 0.422 |

Pooled Statistics
Observations: 62

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 835.056 | 6.527 |
| Std Dev: | 1035.592 | 0.460 |
| Skewness: | 5.111* | 3.858* |
| Kurtosis: | 25.116 | 15.873 |
| Minimum: | 430.000 | 6.064 |
| Maximum: | 6870.000 | 8.835 |

| | | |
|---|---|---|
| CV: | 1.240 | 0.071 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.2489* | 0.9640 | 0.9470 |
| Log: | 0.5030* | 0.9640 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Specific Conductivity, Field(CAS Number:- -)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 62 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 6870.0 umhos/cm |
| LL: | 0.000 |

%ND: 0

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:13

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:pH F pH, Field

CAS Number: - -
MCL: 0.000 SU
ACL: 0.000 SU
Detect Limit: 0.100 SU

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 7.100 SU | 1.960 |
| Sep 30 1997 | 7.200 SU | 1.974 |
| Dec 31 1997 | 7.200 SU | 1.974 |
| Mar 09 1998 | 6.700 SU | 1.902 |
| May 14 1998 | 6.300 SU | 1.841 |
| Aug 14 1998 | 6.500 SU | 1.872 |
| Nov 23 1998 | 7.000 SU | 1.946 |
| Mar 13 1999 | 6.700 SU | 1.902 |
| May 27 1999 | 6.990 SU | 1.944 |
| Jul 27 1999 | 7.030 SU | 1.950 |
| Nov 08 1999 | 6.950 SU | 1.939 |
| Dec 10 1999 | 6.820 SU | 1.920 |
| Dec 11 1999 | 6.600 SU | 1.887 |
| Dec 12 1999 | 6.390 SU | 1.855 |
| Dec 13 1999 | 5.720 SU | 1.744 |
| Dec 14 1999 | 7.010 SU | 1.947 |
| Dec 15 1999 | 6.480 SU | 1.869 |
| Dec 16 1999 | 6.520 SU | 1.875 |
| Dec 17 1999 | 6.690 SU | 1.901 |
| Dec 18 1999 | 6.940 SU | 1.937 |
| Dec 19 1999 | 6.570 SU | 1.883 |
| Dec 20 1999 | 6.550 SU | 1.879 |
| Dec 21 1999 | 6.650 SU | 1.895 |
| Dec 23 1999 | 6.670 SU | 1.898 |

| | | |
|---|---|---|
| Dec 24 1999 | 6.400 SU | 1.856 |
| Dec 25 1999 | 6.930 SU | 1.936 |
| Dec 26 1999 | 6.640 SU | 1.893 |
| Dec 27 1999 | 6.720 SU | 1.905 |
| Dec 28 1999 | 6.470 SU | 1.867 |
| Dec 29 1999 | 7.020 SU | 1.949 |
| Dec 30 1999 | 7.250 SU | 1.981 |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 5.720 SU | Ln Minimum: | 1.744 |
| Maximum: | 7.250 SU | Ln Maximum: | 1.981 |
| Mean: | 6.733 SU | Ln Mean: | 1.906 |
| Std. Dev.: | 0.323 SU | Ln Std. Dev.: | 0.049 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 7.400 SU | 2.001 |
| Sep 30 1997 | 7.800 SU | 2.054 |
| Dec 31 1997 | 7.200 SU | 1.974 |
| Mar 09 1998 | 6.800 SU | 1.917 |
| May 14 1998 | 6.700 SU | 1.902 |
| Aug 14 1998 | 6.700 SU | 1.902 |
| Nov 23 1998 | 7.100 SU | 1.960 |
| Mar 13 1999 | 7.700 SU | 2.041 |
| May 27 1999 | 7.180 SU | 1.971 |
| Jul 27 1999 | 7.170 SU | 1.970 |
| Nov 08 1999 | 7.090 SU | 1.959 |
| Dec 10 1999 | 6.910 SU | 1.933 |
| Dec 11 1999 | 6.960 SU | 1.940 |
| Dec 12 1999 | 6.710 SU | 1.904 |
| Dec 13 1999 | 6.200 SU | 1.825 |
| Dec 14 1999 | 7.090 SU | 1.959 |
| Dec 15 1999 | 6.830 SU | 1.921 |
| Dec 16 1999 | 6.670 SU | 1.898 |
| Dec 17 1999 | 6.790 SU | 1.915 |
| Dec 18 1999 | 7.060 SU | 1.954 |
| Dec 19 1999 | 6.840 SU | 1.923 |
| Dec 20 1999 | 6.670 SU | 1.898 |
| Dec 21 1999 | 6.710 SU | 1.904 |
| Dec 23 1999 | 7.130 SU | 1.964 |
| Dec 24 1999 | 7.030 SU | 1.950 |
| Dec 25 1999 | 7.070 SU | 1.956 |
| Dec 26 1999 | 7.020 SU | 1.949 |
| Dec 27 1999 | 7.090 SU | 1.959 |
| Dec 28 1999 | 7.220 SU | 1.977 |
| Dec 29 1999 | 6.970 SU | 1.942 |
| Dec 30 1999 | 7.500 SU | 2.015 |

Well ID:13MW2 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 6.200 SU | Ln Minimum: | 1.825 |
| Maximum: | 7.800 SU | Ln Maximum: | 2.054 |
| Mean: | 7.010 SU | Ln Mean: | 1.946 |
| Std. Dev.: | 0.322 SU | Ln Std. Dev.: | 0.046 |

Normality Tests

Report Printed: 05-10-2005 17:14

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:pH F pH, Field

CAS Number: - -
MCL: 0.000 SU
ACL: 0.000 SU
Detect Limit: 0.100 SU

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 5.720 | 7.250 | 6.733 | 0.323 |
| Log: | 1.744 | 1.981 | 1.906 | 0.049 |

Well:13MW2 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 6.200 | 7.800 | 7.010 | 0.322 |
| Log: | 1.825 | 2.054 | 1.946 | 0.046 |

Pooled Statistics
Observations: 62

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 6.871 | 1.926 |
| Std Dev: | 0.349 | 0.051 |
| Skewness: | -0.187 | -0.447 |
| Kurtosis: | 1.327 | 1.708 |
| Minimum: | 5.720 | 1.744 |
| Maximum: | 7.800 | 2.054 |

| | | |
|---|---|---|
| CV: | 0.051 | 0.027 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.9566* | 0.9640 | 0.9470 |
| Log: | 0.9489* | 0.9640 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:pH, Field(CAS Number:- -)

**TWO-TAILED PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 62 |
| Conf. Level (1-$\alpha$): | 100.000% |

UL: ~~6.990 SU~~ 7.80 SU
LL: 6.910 SU 5.72 SU

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:17

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrate Nitrate

CAS Number:14797-55-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 100.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 700.000 ppb | 6.551 |
| Jun 30 1996 | 700.000 ppb | 6.551 |
| Sep 30 1996 | 500.000 ppb | 6.215 |
| Dec 31 1996 | 600.000 ppb | 6.397 |
| Mar 31 1997 | 700.000 ppb | 6.551 |
| Jun 30 1997 | 700.000 ppb | 6.551 |
| Sep 30 1997 | 900.000 ppb | 6.802 |
| Dec 31 1997 | 700.000 ppb | 6.551 |
| Mar 09 1998 | 480.000 ppb | 6.174 |
| May 14 1998 | 360.000 ppb | 5.886 |
| Aug 14 1998 | 440.000 ppb | 6.087 |
| Nov 23 1998 | 560.000 ppb | 6.328 |
| Mar 13 1999 | 410.000 ppb | 6.016 |
| May 27 1999 | 230.000 ppb | 5.438 |
| Jul 27 1999 | 380.000 ppb | 5.940 |
| Nov 08 1999 | 430.000 ppb | 6.064 |
| Dec 10 1999 | 430.000 ppb | 6.064 |
| Dec 11 1999 | 130.000 ppb | 4.868 |
| Dec 12 1999 | 900.000 ppb | 6.802 |
| Dec 13 1999 | 310.000 ppb | 5.737 |
| Dec 14 1999 | 320.000 ppb | 5.768 |
| Dec 15 1999 | 150.000 ppb | 5.011 |
| Dec 16 1999 | 380.000 ppb | 5.940 |
| Dec 17 1999 | 400.000 ppb | 5.991 |

| | | |
|---|---|---|
| Dec 18 1999 | 340.000 ppb | 5.829 |
| Dec 19 1999 | 250.000 ppb | 5.521 |
| Dec 20 1999 | 260.000 ppb | 5.561 |
| Dec 21 1999 | 380.000 ppb | 5.940 |
| Dec 22 1999 | 300.000 ppb | 5.704 |
| Dec 23 1999 | 300.000 ppb | 5.704 |
| Dec 24 1999 | 50.000 ppb | 3.912 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 3

| | | | |
|---|---|---|---|
| Minimum: | 50.000 ppb | Ln Minimum: | 3.912 |
| Maximum: | 900.000 ppb | Ln Maximum: | 6.802 |
| Mean: | 441.613 ppb | Ln Mean: | 5.950 |
| Std. Dev.: | 212.259 ppb | Ln Std. Dev.: | 0.600 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 600.000 ppb | 6.397 |
| Jun 30 1996 | 800.000 ppb | 6.685 |
| Sep 30 1996 | 700.000 ppb | 6.551 |
| Dec 31 1996 | 800.000 ppb | 6.685 |
| Mar 31 1997 | 700.000 ppb | 6.551 |
| Jun 30 1997 | 900.000 ppb | 6.802 |
| Sep 30 1997 | 700.000 ppb | 6.551 |
| Dec 31 1997 | 600.000 ppb | 6.397 |
| Mar 09 1998 | 790.000 ppb | 6.672 |
| May 14 1998 | 380.000 ppb | 5.940 |
| Aug 14 1998 | 640.000 ppb | 6.461 |
| Nov 23 1998 | 600.000 ppb | 6.397 |
| Mar 13 1999 | 710.000 ppb | 6.565 |
| May 27 1999 | 860.000 ppb | 6.757 |
| Jul 27 1999 | 890.000 ppb | 6.791 |
| Nov 08 1999 | 920.000 ppb | 6.824 |
| Dec 10 1999 | 50.000 ppb | 3.912 (* Nondetect *) |
| Dec 11 1999 | 920.000 ppb | 6.824 |
| Dec 12 1999 | 1050.000 ppb | 6.957 |
| Dec 13 1999 | 1360.000 ppb | 7.215 |
| Dec 14 1999 | 1200.000 ppb | 7.090 |
| Dec 15 1999 | 1160.000 ppb | 7.056 |
| Dec 16 1999 | 1190.000 ppb | 7.082 |
| Dec 17 1999 | 710.000 ppb | 6.565 |
| Dec 18 1999 | 920.000 ppb | 6.824 |
| Dec 19 1999 | 750.000 ppb | 6.620 |
| Dec 20 1999 | 580.000 ppb | 6.363 |
| Dec 22 1999 | 800.000 ppb | 6.685 |
| Dec 23 1999 | 700.000 ppb | 6.551 |
| Dec 24 1999 | 441.000 ppb | 6.089 |

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND): 3

| | | | |
|---|---|---|---|
| Minimum: | 50.000 ppb | Ln Minimum: | 3.912 |
| Maximum: | 1360.000 ppb | Ln Maximum: | 7.215 |
| Mean: | 780.700 ppb | Ln Mean: | 6.562 |
| Std. Dev.: | 262.094 ppb | Ln Std. Dev.: | 0.574 |

Normality Tests

Report Printed: 05-10-2005 17:17

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrate Nitrate

CAS Number:14797-55-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 100.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 50.000 | 900.000 | 441.613 | 212.259 |
| Log: | 3.912 | 6.802 | 5.950 | 0.600 |

Well:13MW2 Position:Upgradient Observations:30

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 50.000 | 1360.000 | 780.700 | 262.094 |
| Log: | 3.912 | 7.215 | 6.562 | 0.574 |

Pooled Statistics
Observations: 61

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 608.377 | 6.251 |
| Std Dev: | 291.453 | 0.659 |
| Skewness: | 0.269 | -1.602* |
| Kurtosis: | -0.285 | 3.355 |
| Minimum: | 50.000 | 3.912 |
| Maximum: | 1360.000 | 7.215 |

| | | |
|---|---|---|
| CV: | 0.479 | 0.105 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.9813 | 0.9630 | 0.9470 |
| Log: | 0.8553* | 0.9630 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Parametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Nitrate(CAS Number:14797-55-8)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 61 |
| Shapiro-Francia (W): | 0.9813 |
| Critical W,$\alpha$=0.01: | 0.9470 |
| Mean: | 608.377 ppb |
| Std Dev: | 291.453 ppb |
| DF: | 60 |
| Conf. Level (1-$\alpha$): | 0.9500 |
| Future Samples (k): | 5 |
| $t_{\left[1-\frac{\alpha}{k}\right]}$: | 2.3901 |
| Kappa: | 2.4096 |
| UL: | 1310.672 ppb |
| LL: | -∞ |

X.ND: 3y.

*Report Produced by GRITS/STAT 5.01*

Data Set Summary

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrite Nitrite

CAS Number:14797-65-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

| | | |
|---|---|---|
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 21 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1996 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jun 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Sep 30 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 31 1997 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 09 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Aug 14 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 23 1998 | 5.000 ppb | 1.609 (* Nondetect *) |
| Mar 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| May 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Jul 27 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Nov 08 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 10 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 11 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 12 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 13 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 14 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 15 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 16 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 17 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 18 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 19 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 20 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 22 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 23 1999 | 5.000 ppb | 1.609 (* Nondetect *) |
| Dec 24 1999 | 5.000 ppb | 1.609 (* Nondetect *) |

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND):100

| | | | |
|---|---|---|---|
| Minimum: | 5.000 ppb | Ln Minimum: | 1.609 |
| Maximum: | 5.000 ppb | Ln Maximum: | 1.609 |
| Mean: | 5.000 ppb | Ln Mean: | 1.609 |
| Std. Dev.: | 0.000 ppb | Ln Std. Dev.: | 0.000 |

Data Set Summary

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sulfate Sulfate, total

CAS Number:14808-79-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 88000.000 ppb | 11.385 |
| Jun 30 1996 | 84000.000 ppb | 11.339 |
| Sep 30 1996 | 80000.000 ppb | 11.290 |
| Dec 31 1996 | 82000.000 ppb | 11.314 |
| Mar 31 1997 | 70000.000 ppb | 11.156 |
| Jun 30 1997 | 64000.000 ppb | 11.067 |
| Sep 30 1997 | 73000.000 ppb | 11.198 |
| Dec 31 1997 | 79000.000 ppb | 11.277 |
| Mar 09 1998 | 73900.000 ppb | 11.210 |
| May 14 1998 | 61500.000 ppb | 11.027 |
| Aug 14 1998 | 64100.000 ppb | 11.068 |
| Nov 23 1998 | 73300.000 ppb | 11.202 |
| Mar 13 1999 | 65000.000 ppb | 11.082 |
| May 27 1999 | 53900.000 ppb | 10.895 |
| Jul 27 1999 | 68500.000 ppb | 11.135 |
| Nov 08 1999 | 61700.000 ppb | 11.030 |
| Dec 10 1999 | 65000.000 ppb | 11.082 |
| Dec 11 1999 | 47500.000 ppb | 10.768 |
| Dec 12 1999 | 39800.000 ppb | 10.592 |
| Dec 13 1999 | 59600.000 ppb | 10.995 |
| Dec 14 1999 | 59100.000 ppb | 10.987 |
| Dec 15 1999 | 34700.000 ppb | 10.454 |
| Dec 16 1999 | 58300.000 ppb | 10.973 |
| Dec 17 1999 | 64900.000 ppb | 11.081 |

| | | |
|---|---|---|
| Dec 18 1999 | 65000.000 ppb | 11.082 |
| Dec 19 1999 | 49200.000 ppb | 10.804 |
| Dec 20 1999 | 62900.000 ppb | 11.049 |
| Dec 21 1999 | 65000.000 ppb | 11.082 |
| Dec 22 1999 | 50100.000 ppb | 10.822 |
| Dec 23 1999 | 40900.000 ppb | 10.619 |
| Dec 24 1999 | 38900.000 ppb | 10.569 |

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 34700.000 ppb | Ln Minimum: | 10.454 |
| Maximum: | 88000.000 ppb | Ln Maximum: | 11.385 |
| Mean: | 62670.957 ppb | Ln Mean: | 11.020 |
| Std. Dev.: | 13583.912 ppb | Ln Std. Dev.: | 0.235 |

Well ID:13MW2

| Sample Date | Observation | Ln |
|---|---|---|
| Mar 31 1996 | 32000.000 ppb | 10.373 |
| Jun 30 1996 | 31000.000 ppb | 10.342 |
| Sep 30 1996 | 28000.000 ppb | 10.240 |
| Dec 31 1996 | 27000.000 ppb | 10.204 |
| Mar 31 1997 | 24000.000 ppb | 10.086 |
| Jun 30 1997 | 24000.000 ppb | 10.086 |
| Sep 30 1997 | 26000.000 ppb | 10.166 |
| Dec 31 1997 | 29000.000 ppb | 10.275 |
| Mar 09 1998 | 30300.000 ppb | 10.319 |
| May 14 1998 | 30700.000 ppb | 10.332 |
| Aug 14 1998 | 26900.000 ppb | 10.200 |
| Nov 23 1998 | 27500.000 ppb | 10.222 |
| Mar 13 1999 | 26200.000 ppb | 10.174 |
| May 27 1999 | 22400.000 ppb | 10.017 |
| Jul 27 1999 | 23100.000 ppb | 10.048 |
| Nov 08 1999 | 24400.000 ppb | 10.102 |
| Dec 10 1999 | 25700.000 ppb | 10.154 |
| Dec 11 1999 | 22200.000 ppb | 10.008 |
| Dec 12 1999 | 27300.000 ppb | 10.215 |
| Dec 13 1999 | 23400.000 ppb | 10.060 |
| Dec 14 1999 | 26300.000 ppb | 10.177 |
| Dec 15 1999 | 31800.000 ppb | 10.367 |
| Dec 16 1999 | 22700.000 ppb | 10.030 |
| Dec 17 1999 | 24100.000 ppb | 10.090 |
| Dec 18 1999 | 29900.000 ppb | 10.306 |
| Dec 19 1999 | 28300.000 ppb | 10.251 |
| Dec 20 1999 | 28500.000 ppb | 10.258 |
| Dec 22 1999 | 34100.000 ppb | 10.437 |
| Dec 23 1999 | 48800.000 ppb | 10.795 |
| Dec 24 1999 | 32800.000 ppb | 10.398 |

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND): 0

| | | | |
|---|---|---|---|
| Minimum: | 22200.000 ppb | Ln Minimum: | 10.008 |
| Maximum: | 48800.000 ppb | Ln Maximum: | 10.795 |
| Mean: | 27946.664 ppb | Ln Mean: | 10.224 |
| Std. Dev.: | 5141.363 ppb | Ln Std. Dev.: | 0.162 |

Normality Tests

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sulfate Sulfate, total

CAS Number:14808-79-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 34700.000 | 88000.000 | 62670.957 | 13583.912 |
| Log: | 10.454 | 11.385 | 11.020 | 0.235 |

Well:13MW2 Position:Upgradient Observations:30

| Scale | Minimum | Maximum | Mean | Std Dev |
|---|---|---|---|---|
| Original: | 22200.000 | 48800.000 | 27946.664 | 5141.363 |
| Log: | 10.008 | 10.795 | 10.224 | 0.162 |

Pooled Statistics
Observations: 61

| Statistic | Original Scale | Log Scale |
|---|---|---|
| Mean: | 45593.438 | 10.629 |
| Std Dev: | 20283.574 | 0.449 |
| Skewness: | 0.447 | 0.144 |
| Kurtosis: | -1.253 | -1.551 |
| Minimum: | 22200.000 | 10.008 |
| Maximum: | 88000.000 | 11.385 |

| | | |
|---|---|---|
| CV: | 0.445 | 0.042 |

Shapiro-Francia Statistics

| Scale | Test Statistic | 5% Critical Value | 1% Critical Value |
|---|---|---|---|
| Original: | 0.8955* | 0.9630 | 0.9470 |
| Log: | 0.9128* | 0.9630 | 0.9470 |

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

**Nonparametric Prediction Interval**
Report Printed May 10,2005



Facility:Haz. Waste Unit 13 - RAAP
Parameter:Sulfate, total(CAS Number:14808-79-8)

**ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL**

| | |
|---|---|
| Observations (n): | 61 |
| Conf. Level (1-$\alpha$): | 100.000% |
| UL: | 88,000.0 ~~22200.000~~ ppb |
| LL: | 0.000 |

% ND: 0

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