Alliant Ammunition and Powder Company, L.L.C.

FIELD INVESTIGATION REPORT AND RISK ASSESSMENT

HAZARDOUS WASTE MANAGEMENT UNITS 5 AND 7

Radford Army Ammunition Plant,
Radford, Virginia

MARCH 2003

Draper Aden Associates
2206 South Main Street
Blacksburg, Virginia 24060
DAA Job No. B02271.01

Ltr # 03-57 2
Rec'd 07-01-2003
c: Jake
Redder
Dioria
McKenna
Env Fit.

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

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Robert G. Burnley
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June 25, 2003

Ms. C. A. Jake
Environmental Manager
Alliant Ammunition and Powder Company, LLC
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24141

Re: Radford Army Ammunition Plant (RFAAP), Radford, VA
EPA ID No. VA1210020730
Field Investigation Report and Risk Assessment for Units 5 and 7[1]
(Unit 5/S04; Unit 7/S04)

Dear Ms. Jake:

The Department of Environmental Quality, Office of Waste Permitting (the Department) has reviewed the *Field Investigation Report and Risk Assessment for Units 5 and 7* (*Report*) submitted with your correspondence of March 5, 2003. According to previous discussions and correspondence, RFAAP will attempt to remove the sources of contamination by achieving clean closure at the units. RFAAP had originally planned to revise the closure plans for HWMUs 5 and 7 based upon the results of the initial investigative sampling. Since, RFAAP believes the sampling results may already show that concentrations of contaminants are not a risk to human health or the environment, the *Report* provides a risk assessment instead of revised closure plans.

The May 27, 1988 approved closure plans for HWMUs 5 and 7 provided for closure only by landfilling (i.e., wastes in-place and capping). Therefore, if RFAAP wishes to continue pursuing clean closure of the capped units, revised closure plans that include procedures and standards for clean closure must be submitted. To assist with the revising the closure plans, an electronic copy of

[1] PCCP
Permit Event Code/NA

the Department's *Draft Guidance Manual for Closure Plans and Post-Closure Plans* (*Draft Guidance*), September 28, 2001 has been provided to Mr. J. Redder of your staff.

Concerning the *Field Investigation Report and Risk Assessment for Units 5 and 7*, the Department is providing the following comments:

1) The closure requirements for hazardous waste surface impoundments of 40 CFR 264.228(a)(1) requires the removal or decontamination of "contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate." Therefore, in order to demonstrate clean closure of these units, the soil and liner material immediately beneath the wastes must be sampled as well to determine if they meet clean closure standards.
2) EPA Region III Risk-Based Concentration (RBC) and Soil Screening Levels (SSLs) are not appropriate clean closure standards. Refer to Section 3.13 of the *Draft Guidance* for the requirements of all acceptable clean closure standards (i.e., analytical non-detection, background, and risk-based).
3) If RFAAP intends to demonstrate that clean closure may be achieved with wastes in-place, every sample of waste must not exceed the land disposal restrictions (LDRs) treatment standards specified in 40 CFR 286, Subpart D.

In addition to the above comments, the Department recommends that the revised closure plans include more than one option for meeting clean closure standards (e.g., no removal of wastes or soils, excavation and removal of contaminated materials, etc.) in order to minimize the need for future revisions. Please submit the revised closure plans within ninety (90) calendar days calendar of receipt of this letter.

The Department has also received the Professional Geologist's certification submitted with your correspondence of April 30, 2003. However, as indicated in comment 5 of the Department's October 18, 2002 letter, 40 CFR 264.115 requires that the certification be signed by an independent Professional Engineer registered in the Commonwealth of Virginia. Please provide the P.E. certification within thirty (30) calendar days of receipt of this letter.

If you have questions, please contact me at (804) 698-4131 or by e-mail at gweng@deq.state.va.us.

Sincerely,

Garwin W. Eng
Environmental Engineer Senior
Office of Waste Permitting

c: Robert N. Davie, III
Radford Army Ammunition Plant
SMARF-OP, P. O. Box 2
Radford, Virginia 24141-0099

Robert G. Thomson – EPA Region III (3HS13)
Aziz Farahmand – WCRO, DEQ
Leslie A. Romanchik – DEQ
Mark S. Leeper – DEQ
Howard F. Freeland – DEQ
Central Hazardous Waste File

Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24141
USA

April 30, 2003

Mr. Garwin Eng
Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Certification of Field Investigation Report and Risk Assessment HWMUs 5 and 7
Radford Army Ammunition Plant
Radford, Virginia
EPA ID#: VA12101020730

Dear Mr. Eng:

Enclosed is the original of the Professional Geologist's certification concerning the subject report.

If you have any questions or concerns, please contact Jerry Redder at 540/639-7536.

Sincerely,

C. A. Jake

C. A. Jake, Environmental Manager
Alliant Ammunition and Powder Company, L.L.C.

c: R. Thomson, EPA Region 3
c: Aziz Farahmand, DEQ-WCRO

Coordination: J. McKenna

bc: Administrative File
J. McKenna, ACO Staff
John Tesner, Baltimore CoE
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03-815-72
JJRedder

Rec'd ENV 4-28-03

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03-38

c: Jake
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March 5, 2003

Mr. Jerry Redder
Alliant Ammunition and Powder Company, L.L.C.
Environmental Department
P.O. Box 1
Radford Army Ammunition Plant
Radford, Virginia 24141-0100

RE: Certification of Field Investigation Report and Risk Assessment for Hazardous Waste Management Units 5 and 7, Radford Army Ammunition Plant, Radford, Virginia

Dear Mr. Redder:

This letter is to provide Virginia Professional Certification for the Field Investigation Report and Risk Assessment for Hazardous Waste Management Units 5 and 7, Radford Army Ammunition Plant, Radford, Virginia. I certify that I have prepared or supervised preparation of the aforementioned report, that the report has been prepared in accordance with industry standards and practices, and that the information contained within the report is truthful and accurate to the best of my knowledge.

Should you have any questions, please give me a call at 540/552-0444.

Sincerely,
DRAPER ADEN ASSOCIATES

Andrew E. Kassoff, P.G.
Environmental Program Manager
Virginia Professional Certification Number PG 873

Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24141
USA

April 21, 2003

Mr. Garwin Eng
Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Extra Copies of Field Investigation Report and Risk Assessment HWMUs 5 and 7
Radford Army Ammunition Plant
Radford, Virginia
EPA ID#: VA12101020730

Dear Mr. Eng:

Thank you for taking the time to discuss the subject report with our consultant Draper Aden, Jim McKenna (ACO Staff), and Jerry Redder (AAPC Environmental Engineer) April 16, 2003. Draper Aden is preparing notes from the telephone conference and meeting.

Enclosed are 4 additional copies of the subject report.

If you have any questions or concerns, please contact Jerry Redder at 540/639-7536.

Sincerely,

C. A. Jake

C. A. Jake, Environmental Manager
Alliant Ammunition and Powder Company, L.L.C.

c: R. Thomson, EPA Region 3 (w/encl.)
c: Aziz Farahmand, DEQ-WCRO (w/o encl.)

Coordination: _____
J. McKenna

bc: Administrative File
[redacted], ACO Staff
John Tesner, Baltimore CoE
J. J. Redder
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03-815-67
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COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Tayloe Murphy, Jr.
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March 10, 2003

Ms. C. A. Jake
Environmental Manager
Alliant Ammunition and Powder Company, LLC
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24141

Re: Radford Army Ammunition Plant (RFAAP), Radford, VA
EPA ID No. VA1210020730
Field Investigation Report and Risk Assessment for Units 5 and 7[1]
(Unit 5/S04; Unit 7/S04)

Dear Ms. Jake:

The Department of Environmental Quality, Office of Waste Permitting (the Department) has received your correspondence of March 5, 2003 concerning the field investigation and risk assessment for Units 5 and 7. You may expect to receive comments from the Department in May 2003.

As indicated in the Department's October 18, 2002 letter, review of this report will be coordinated with EPA Region III and the Federal Facilities Restoration Program. Therefore, please forward two (2) additional copies of the report to the Department and one (1) additional copy to Mr. Robert G. Thomson at EPA Region III.

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[1] PCCP
Permit Event Code/NA

If you have questions, please contact me at (804) 698-4131 or by e-mail at gweng@deq.state.va.us.

Sincerely,

Garwin W. Eng
Environmental Engineer Senior
Office of Waste Permitting

c: Robert N. Davie, III
Radford Army Ammunition Plant
SMARF-OP, P. O. Box 2
Radford, Virginia 24141-0099

Robert G. Thomson – EPA Region III (3HS13)
Aziz Farahmand – WCRO, DEQ
Leslie A. Romanchik – DEQ
Mark S. Leeper – DEQ
Howard F. Freeland - DEQ
Central Hazardous Waste File

Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24141
USA

March 5, 2003

Mr. Garwin Eng
Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Field Investigation Report and Risk Assessment HWMUs 5 and 7
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210102073O

Dear Mr. Eng:

Enclosed is the subject report and risk assessment. The effort was accomplished following your instructions of October 18, 2002 and our notification letter October 1, 2002.

Based on the results of the field investigation and risk assessment the residual material in HWMU-5 and in HWMU-7 is not hazardous and should be left in place. The Units are capped using impermeable PVC membranes and 2-3 feet of soil; therefore, there is no risk of exposure to human health and/or the environment through direct ingestion of the residual material or by inhalation of vapors or fugitive dusts. In addition, the concentrations of the inorganic and organic constituents detected in soil samples collected from both Units do not pose a risk to groundwater via migration from the soil. Therefore, leaving the residual material in place does not pose a threat to human health and/or the environment according to VDEQ guidelines and regulations. Accordingly, Radford AAP requests that certifications for clean closure for soil be issued for both Units.

The certification from the independent Professional Geologist will be sent under separate cover.

If you have any questions or concerns, please contact Jerry Redder at 540/639-7536.

Sincerely,

J J Redder

for C. A. Jake, Environmental Manager
Alliant Ammunition and Powder Company, LLC

c: Aziz Farahmand, DEQ-WCRO
R. N. Davie, Operations Division Chief, Radford AAP

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McKenna/Redder

Coordination: J. McKenna
J. McKenna

bc: Administrative File
L. DiIoia, ACO Staff
[redacted]
John Tesner, Baltimore CoE
J. J. Redder
A. Kassoff, P.G., Draper Aden Associates
Env. File

Alliant Ammunition and Powder Company, L.L.C.

FIELD INVESTIGATION REPORT AND RISK ASSESSMENT

HAZARDOUS WASTE MANAGEMENT UNITS 5 AND 7

Radford Army Ammunition Plant,
Radford, Virginia

MARCH 2003

Draper Aden Associates
2206 South Main Street
Blacksburg, Virginia 24060
DAA Job No. B02271.01

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1.0 INTRODUCTION/EXECUTIVE SUMMARY

Alliant Ammunition and Powder Company, L.L.C. (AAPC) retained Draper Aden Associates (DAA) to conduct subsurface evaluations to determine the nature and extent of residual material from cleanup activities contained in closed Hazardous Waste Management Units (HWMUs) 5 and 7 at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. AAPC and the United States Army intended to implement source removal activities in 2003 in support of clean closures for both Units; the results of the field investigation conducted by DAA would be used in the preparation of individual closure plans for both Units. However, the laboratory analytical data collected during the field investigation indicated that the residual material in the Units is not hazardous and does not pose a threat to human health and/or the environment according to VDEQ guidelines and regulations. Therefore, the purpose of the project shifted to compiling a quantitative risk assessment in accordance with the USEPA *Risk Assessment Guidance for Superfund* (RAGS). This document presents the results of the field investigation and the risk assessment.

1.1 DESCRIPTION OF HWMU-5

HWMU-5 is a former lined surface impoundment. A Site Plan for HWMU-5 is illustrated in **Figure 1**. HWMU-5 is located approximately 3,000 feet southwest of the New River. The Unit is located on a river terrace that slopes gently downward to the north toward the New River. The Unit was put into operation as an unlined surface impoundment in 1970. In 1981, the Unit was retrofitted with a 60-mil Hypalon Liner; the bottom of the liner was covered with approximately 12 inches of sand, and the sides were covered with approximately 6 inches of sand and six inches of rip-rap. During operation, the Unit received stormwater runoff, spilled liquids, and washdown waters from an acid tank farm. The Unit was taken out of operation in 1986, and was closed in 1989 in accordance with the VDEQ-approved Closure Plan dated May 1988. The basin was drained of all waters, the soil was treated in-place with flyash and cement kiln dust to achieve a target pH of 6.3 and 10.5, and the basin was filled with soil and stone and capped. No waste has been processed through HWMU-5 since it was closed.

1.2 DESCRIPTION OF HWMU-7

HWMU-7 is a former unlined holding and neutralization basin located on the floodplain of the New River. A Site Plan for HWMU-7 is illustrated in **Figure 2**. Intermittent drainages are located to the north and south of the Unit, and the New River is located approximately 225 feet to the west of the Unit. The Unit was put into operation in 1972. During operation, influent into HWMU-7 included: spills, runoff, and wash down waters from the Acid Tank Farms in the Oleum Plant Area; waste sulfuric acid and caustics from oleum production; and waste caustic mixed with acidic water for neutralization. The Unit was taken out of operation in 1986, and was closed in 1989 in accordance with the VDEQ-approved Closure Plan dated May 1988. The basin was drained of all waters, the soil was treated in-place with flyash and cement kiln dust to achieve a target pH of 6.3 and 10.5, and the basin was filled with soil and stone and capped. No waste has been processed through HWMU-7 since it was closed.

2.0 SUBSURFACE EVALUATIONS

2.1 FIELD INVESTIGATION PROCEDURES

On October 31 and November 1, 2002, DAA advanced 16 soil borings at each Unit using a track-mounted Geoprobe® rig. The boring locations for HWMU-5 and for HWMU-7 are illustrated in **Figure 1** and **Figure 2**, respectively. The borings were located in a pattern to best determine the horizontal and vertical extent of the residual material in each Unit. At each Unit, nine borings were advanced within the Unit boundaries, and six borings were advanced around the perimeter just outside of the Unit boundaries. One additional boring was advanced approximately 30 feet topographically upgradient from each Unit for the collection of background soil samples. Soil samples were collected continuously throughout each of the borings. The differentiation between residual material and native soil was based on visual observation. The borings were backfilled with bentonite upon completion.

The nine borings located within HWMU-5 were advanced through the cap system and residual material and were terminated in the base sand layer; the borings did not penetrate the bottom 60-mil Hypalon liner. The nine borings located within HWMU-7 were advanced through the cap system and residual material and into the clay bottom liner; four of the borings were advanced through the clay liner and into native soils. The boring logs for both Units are presented in **Appendix A**.

At each Unit, DAA randomly collected eight soil samples from the 16 borings for laboratory analysis for the USEPA Target Analyte List (TAL) inorganic compounds and for the USEPA Target Compound List (TCL) organic compounds. The laboratory analytical results were subjected to Level IV data validation. The data validation reports and laboratory analytical data are presented in **Appendix B**.

DAA collected composite soil samples Unit-5-TCLP and Unit-7-TCLP from the residual material from the borings advanced within HWMU-5 and HWMU-7, respectively. The composite soil samples were submitted to the laboratory for waste characterization analysis. The waste characterization laboratory analytical results are presented in **Appendix C**. The soil cuttings and waste Geoprobe® sample collection sleeves were containerized (one drum per Unit) and staged at a central location on-site pending proper disposal.

The geosynthetic layers within the caps of both Units were penetrated by the Geoprobe® borings. The caps were repaired in accordance with VDEQ guidance. The results of the cap restoration activities are presented in **Appendix D**.

2.2 SUBSURFACE GEOLOGY

According to the *Soil Survey of Montgomery County, Virginia* (USDA, 1985), the areas in which HWMU-5 and HWMU-7 are located are underlain by soils of the Unison-Urban Land Complex (**Figure 3**). The Unison-Urban Land Complex makes up about 40% of the surface area

of Radford AAP, and consists of about 50% deep and well drained Unison soils, 30% Urban Land, and 20% other soils. This complex of soils varies in slope from 2 to 25%. In an undisturbed area, the Unison soils have a 15-inches thick surface layer of dark brown loam and a 43-inches thick subsoil of yellowish-red, sticky plastic clay underlain by a red sandy clay loam to a depth of 58 inches. This clay-rich layer is typically underlain by a brown sand to about 10 feet below ground surface (bgs), which then grades into a brown clay. Permeability is moderate in Unison soils, natural fertility is low, and organic matter content is low to moderate. The soil is medium to strongly acidic. Urban land is covered by pavement or structures; the original soil has been physically altered or obscured so that classification is not practical.

Underlying the soils throughout most of Radford AAP is a series of dolomite, limestone and shale strata known as the Cambrian-aged Elbrook Formation. The Elbrook Formation is the major outcropping formation as well as the predominant karstic formation below the facility. Sinkholes, solution channels, pinnacled surfaces, and springs are common to the Elbrook Formation. The bedrock beneath Units 5 and 7 is generally encountered at depths ranging from approximately 28 feet to over 65 feet below ground level, although the soil/bedrock interface is gradational.

Groundwater at both Units generally is encountered within the weathered bedrock residuum. Groundwater movement beneath HWMU-5 is toward the northeast; the groundwater contours and topography in this area suggest that HWMU-5 is located on a river terrace that contains several karst features and drains north toward the New River. Groundwater movement beneath HWMU-7 is generally to the west toward the New River, and to the northeast and southwest toward intermittent drainages that flow into the New River north and south of the Unit.

2.2.1 Material Profile of HWMU-5

According to the 1989 closure documentation, the cover system installed over the neutralized residual material at HWMU-5 consisted of a two-foot clay layer overlain by a 30-mil PVC membrane, which was in turn overlain by a one-foot drainage sand layer. The drainage sand layer was overlain by a one-foot soil cover and a one-foot topsoil and grass cover. Additional elements of the cover system included rip-rap slope protection and a filter cloth underneath the rip-rap to prevent piping of the cover soil along the Unit perimeter.

At HWMU-5, the nine borings located within the Unit boundaries (5GP-1, 5GP-2, 5GP-3, 5GP-5, 5GP-6, 5GP-8, 5GP-9, 5GP-10, and 5GP-11; **Figure 1**) were advanced to depths ranging from 10 to 12 feet below ground surface (bgs). The nine borings encountered a layer of topsoil approximately 0.5 foot thick, which was underlain by red-brown sandy clay ranging in thickness from 1 foot to 2 feet. The red-brown sandy clay in turn was underlain by light gray sand (drainage layer) ranging in thickness from 0.75 foot to 1 foot. The 30-mil PVC liner was encountered beneath the drainage sand layer. The PVC liner was underlain by light gray and yellow-brown mottled clay ranging in thickness from 2.5 feet to 4 feet. The clay layer in turn was underlain by red-brown to yellow-brown silty sand with green, compacted residual material. Borings 5GP-1 and 5GP-6 were terminated in light gray sand beneath the residual material – this

sand corresponds to the sand placed above the Unit's 60-mil Hypalon liner. The thickness of the residual material ranged from 4.5 feet to 6 feet. The remaining seven borings were terminated in residual material. The 60-mil Hypalon liner was not penetrated by any of the borings. A geologic cross-section of HWMU-5 is included as **Figure 4**.

The six borings located around the perimeter of HWMU-5 (5GP-4, 5GP-7, 5GP-12, 5GP-13, 5GP-14, and 5GP-15) were advanced to a depth of 4 feet bgs each. Red-brown to brown clay with gravel was encountered in each of the perimeter borings; no residual material was encountered in these six borings.

Boring 5GP-16 was located approximately 30 feet topographically upgradient from HWMU-5 for the collection of a background soil sample. Boring 5-GP-16 was advanced to a depth of 4 feet. Brown clay and red-brown sandy clay were encountered in boring 5GP-16.

2.2.2 Material Profile of HWMU-7

According to the 1989 closure documentation, the cover system installed over the neutralized residual material at HWMU-7 consisted of a two-foot clay layer overlain by a 30-mil PVC membrane, which was in turn overlain by a one-foot drainage sand layer. The drainage sand layer was overlain by a one-foot soil cover and a one-foot topsoil and grass cover. Additional elements of the cover system included rip-rap slope protection and a filter cloth underneath the rip-rap to prevent piping of the cover soil along the Unit perimeter.

At HWMU-7, the nine borings located within the Unit boundaries (7GP-1, 7GP-2, 7GP-3, 7GP-5, 7GP-6, 7GP-8, 7GP-9, 7GP-10, and 7GP-11; **Figure 2**) were advanced to depths ranging from 12 to 20 feet below ground surface (bgs). The nine borings encountered a layer of topsoil approximately 1 foot to 1.5 feet thick, which was underlain by yellow-brown sandy clay ranging in thickness from 1.25 feet to 2 feet. The yellow-brown sandy clay in turn was underlain by light gray sand (drainage layer) ranging in thickness from 0.50 foot to 1.5 feet. The 30-mil PVC liner was encountered beneath the drainage sand layer. The PVC liner was underlain by yellow-brown silty sand with green, compacted residual material. The thickness of the residual material ranged from 5 feet to 8.5 feet. The residual material in turn was underlain by red-brown to yellow-brown sandy clay ranging in thickness from 1.75 feet to 3 feet. Borings 7GP-5, 7GP-6, 7GP-8, 7GP-10, and 7GP-11 were terminated in the sandy clay. Borings 7GP-1, 7GP-2, and 7GP-9 penetrated the sandy clay and encountered dark gray fine sand and silt with round gravel; the dark gray sand and silt exhibited an aquatic odor. The red-brown to yellow-brown sandy clay was not encountered in boring 5GP-3; the dark gray sand and silt was encountered beneath the residual material at a depth of 9.5 feet bgs in boring 7GP-3. A geologic cross-section of HWMU-7 is included as **Figure 5**.

Five of the six borings located around the perimeter of HWMU-7 (7GP-7, 7GP-12, 7GP-13, 7GP-14, and 7GP-15) were advanced to a depth of 4 feet bgs each; boring 7GP-4 was advanced to a depth of 8 feet bgs. Brown sand was encountered in each of the perimeter borings, and dark gray fine sand and silt with round gravel was encountered at a depth of 7.75 feet bgs in boring 7GP-4. No residual material was encountered in the six perimeter borings.

Boring 7GP-16 was located approximately 30 feet topographically upgradient from HWMU-7 for the collection of a background soil sample. Boring 7GP-16 was advanced to a depth of 4 feet. Brown sand was encountered in boring 7GP-16.

2.3 SOIL SAMPLE COLLECTION AND ANALYTICAL RESULTS

2.3.1 HWMU-5

On October 31, 2002, DAA randomly collected eight soil samples from the 16 borings advanced at HWMU-5. The eight samples and the material from which they were collected are listed below:

- 5GP-1 (1-2') cap material (clay and sand above the PVC membrane);
- 5GP-1 (9-10') residual material;
- 5GP-3 (9-10') residual material;
- 5GP-6 (10-11') base sand (beneath the residual material);
- 5GP-8 (7-8') residual material;
- 5GP-8 (11-12') residual material;
- 5GP-12 (3-4') soil adjacent to the Unit; and
- 5GP-16 (3-4') background soil.

Aliquots of the eight soil samples were submitted to Severn Trent Laboratories of North Canton, Ohio for analysis for the USEPA Target Analyte List (TAL) inorganic compounds. Separate aliquots of the eight soil samples were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis for the USEPA Target Compound List (TCL) organic compounds. The laboratory analytical results were subjected to Level IV data validation. The data validation reports and laboratory analytical data are presented in **Appendix B**. A summary of the TAL inorganic constituents and the TCL organic constituents detected in the eight soil samples from HWMU-5 at concentrations above the respective Limits of Quantitation (LOQs) is presented in **Table 1**.

As shown in **Table 1**, the concentrations of TAL inorganic constituents detected in the samples of residual material are comparable to the TAL inorganic constituent concentrations detected in the samples of the cap material, base sand, adjacent soil, and background soil; the highest concentrations of 10 of the 16 TAL inorganic constituents detected were observed in the samples of the cap material, base sand, or adjacent soil. Cap material sample 5GP-1 (1-2') exhibited the highest concentrations of barium (85.1 mg/kg), lead (12.9 mg/kg), potassium (1,580 mg/kg), vanadium (64.9 mg/kg), and zinc (35.3 mg/kg). Base sand sample 5GP-6 (10-11') exhibited the highest concentration of calcium (9,930 mg/kg). Adjacent soil sample 5GP-12 (3-4') exhibited the highest concentrations of aluminum (19,600 mg/kg), iron (33,400 mg/kg), magnesium (2,200 mg/kg), and manganese (457 mg/kg). Residual material sample 5GP-1 (9-10') exhibited the highest concentrations of chromium (31.7 mg/kg), cobalt (17.6 mg/kg), and copper (19.8 mg/kg). Residual material sample 5GP-8 (7-8') exhibited the highest concentrations of arsenic (4.1 mg/kg) and beryllium (1.3 mg/kg). It should be noted that

background soil sample 5GP-16 (3-4') exhibited an arsenic concentration of 4.0 mg/kg. Residual material sample 5GP-8 (11-12') exhibited an aluminum concentration of 19,600 mg/kg – the same concentration as adjacent soil sample 5GP-12 (3-4').

Only one TCL organic constituent was detected in three of the eight soil samples from HWMU-5. The pesticide 4,4-DDD was detected in residual material samples 5GP-1 (9-10') and 5GP-8 (7-8') at concentrations of 0.019 mg/kg and 0.051 mg/kg, respectively, and in base sand sample 5GP-6 (10-11') at a concentration of 0.0067 mg/kg. No other TCL organic constituents were detected in any of the soil samples from HWMU-5.

2.3.2 HWMU-7

On November 1, 2002, DAA randomly collected eight soil samples from the 16 borings advanced at HWMU-5. The eight samples and the material from which they were collected are listed below:

- 7GP-1 (1-3') cap material (clay and sand above the PVC membrane);
- 7GP-2 (8-12') residual material;
- 7GP-2 (13.5-14.5') base clay (beneath the residual material);
- 7GP-3 (10-11') native soil (beneath the Unit);
- 7GP-4 (3-4') soil adjacent to the Unit;
- 7GP-5 (6-11') residual material;
- 7GP-8 (5-8') residual material; and
- 7GP-16 (3-4') background soil.

Aliquots of the eight soil samples were submitted to Severn Trent Laboratories of North Canton, Ohio for analysis for the USEPA Target Analyte List (TAL) inorganic compounds. Separate aliquots of the eight soil samples were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis for the USEPA Target Compound List (TCL) organic compounds. The laboratory analytical results were subjected to Level IV data validation. The data validation reports and laboratory analytical data are presented in **Appendix B**. A summary of the TAL inorganic constituents and the TCL organic constituents detected in the eight soil samples from HWMU-7 is presented in **Table 2**.

As shown in **Table 2**, the concentrations of TAL inorganic constituents detected in the samples of residual material are comparable to the TAL inorganic constituent concentrations detected in the samples of the cap material, base clay, native soil, adjacent soil, and background soil; the highest concentrations of 15 of the 18 TAL inorganic constituents detected were observed in the samples of the cap material, base clay, native soil, and background soil. Cap material sample 7GP-1 (1-3') exhibited the highest concentrations of magnesium (4,290 mg/kg) and manganese (662 mg/kg). Base clay sample 7GP-2 (13.5-14.5') exhibited the highest concentrations of cobalt (16.2 mg/kg) and iron (29,300 mg/kg). Native soil sample 7GP-3 (10-11') exhibited the highest concentrations of arsenic (26.1 mg/kg), barium (229 mg/kg), beryllium (1.5 mg/kg), calcium (28,100 mg/kg), chromium (32.8 mg/kg), copper (23.2 mg/kg), lead (35.1 mg/kg), and potassium (2,970 mg/kg), as well as the only detections of selenium (3.5 mg/kg),

and cyanide (0.69 mg/kg). Background soil sample 7GP-16 (3-4') exhibited the highest concentration of zinc (39.7 mg/kg). Residual material sample 7GP-2 (8-12') exhibited the highest concentration of nickel (21.6 mg/kg). Residual material sample 7GP-8 (5-8') exhibited the highest concentrations of aluminum (22,400 mg/kg) and vanadium (61.8 mg/kg).

Only three TCL organic constituents were detected in two of the eight soil samples from HWMU-7. The pesticide 4,4-DDD was detected in base clay sample 7GP-2 (13.5-14.5') at a concentration of 0.0035 mg/kg. In native soil sample 7GP-3 (10-11'), the pesticide 4,4-DDE and the semi-volatile compound n-nitrosodiphenylamine were detected at concentrations of 0.0035 mg/kg and 0.75 mg/kg, respectively. No other TCL organic constituents were detected in any of the soil samples (including the residual material samples) from HWMU-7.

2.3.3 Waste Characterization Analytical Results

DAA collected composite soil samples Unit-5-TCLP and Unit-7-TCLP from the residual material from the borings advanced within HWMU-5 and HWMU-7, respectively. The composite soil samples were submitted to the laboratory for waste characterization analysis. The soil cuttings and waste Geoprobe® sample collection sleeves were containerized (one drum per Unit) and staged at a central location on-site pending proper disposal.

The waste characterization laboratory analytical results are presented in **Appendix C**, and summarized **Table 3**. Based on the results of the waste characterization analyses, the residual material at HWMU-5 and at HWMU-7 cannot be classified as hazardous.

3.0 RISK ASSESSMENT

The procedures used to evaluate the data gathered during the field investigations at HWMU-5 and HWMU-7 were derived from the USEPA *Soil Screening Guidance* (July 1996) and the USEPA *Risk Assessment Guidance for Superfund* (RAGS). For the purposes of the risk assessments for each Unit, the detected constituent concentrations were compared to those from background samples collected from nearby areas (boring 5GP-16 at HWMU-5 and boring 7GP-16 at HWMU-7) as well as to facility-wide background concentrations derived from the IT Corporation *Radford Army Ammunition Plant Facility-Wide Background Report* (December 2001). Due to the fact that the planned future use for the capped Units is to leave them in place, the only potential exposure pathway was determined to be through constituent migration from soil to groundwater. Therefore, following the comparison to background concentrations, any constituent concentrations that exceeded their respective background concentrations were then compared to USEPA Region III Soil-to-Groundwater soil screening levels (SSLs). In addition, although expsosure to the residual material through direct ingestion was determined to be improbable, any constituent concentrations that exceeded their respective background concentrations also were compared to USEPA Region III risk-based concentrations (RBCs) for residential soil ingestion.

As specified in the USEPA Region III Soil-to-Groundwater SSLs memo (October 27, 1999), the soil-to-groundwater SSLs used in this risk assessment were the Region III tap water (residential) RBCs multiplied by a dilution attenuation factor (DAF) of 20. The DAF of 20 was chosen because Radford AAP is an industrial facility with no users of groundwater; therefore, this was deemed protective of human health and the environment. The DAF 20's for the constituents presented in this report were derived from the latest USEPA Region III RBC Table (October 9, 2002).

The *Soil Screening Guidance* is a tool developed by the USEPA to help standardize and accelerate the evaluation and cleanup of contaminated soils at sites on the National Priorities List (NPL) where future residential land use is anticipated. The *Soil Screening Guidance* provides a methodology to calculate risk-based, site-specific SSLs for contaminants in soil that may be used to identify areas needing further investigation at NPL sites. SSLs are designed for screening purposes. Exceedances of SSLs typically indicate that more detailed assessment is necessary. Accordingly, no exceedances of SSLs would indicate that no further assessment is necessary. SSLs are not intended as cleanup levels, and are not intended as trigger levels that require remediation.

SSLs developed in accordance with the *Soil Screening Guidance* are based on future residential land use assumptions and related exposure scenarios. The Radford AAP is an industrial site and will never be used for residential purposes; however, SSLs developed in accordance with the *Soil Screening Guidance* can be used for sites with non-residential land use as a tool to conduct a conservative initial screening. As stated in the *Soil Screening Guidance: Fact Sheet* (July, 1996), "Generally, at sites where contaminant concentrations fall below SSLs, no further action or study is warranted..."

3.1 FACILITY-WIDE BACKGROUND STUDY (IT CORPORATION)

In August and September 2001, the IT Corporation conducted a Facility-Wide Background Study at the Main Manufacturing Area and the New River Unit of Radford AAP in accordance with a USEPA Region III-approved Work Plan. As stated in the *Radford Army Ammunition Plant Facility-Wide Background Report* (December 2001), the primary objective of the study was to collect soil samples representative of background conditions to establish a baseline for inorganic constituents of concern at Radford AAP. Sampling locations were positioned in tree stands to ensure associated soil samples were representative of areas that had not been affected by previous site activities or releases. Wherever possible, background sample locations were placed in tree stands estimated to predate potential construction activity at each location. The background soil samples were analyzed for the USEPA TAL inorganic compounds and for the USEPA TCL organic compounds. No TCL organic compounds were detected in the background soil samples.

Following the collection and analysis of the background soil samples, IT Corporation initially calculated facility-wide point estimates for the background soil data as confidence limits. As a result of discussions with the USEPA and VDEQ, the final facility-wide point estimates for the background soil data were calculated as tolerance limits. The use of tolerance limits rather than confidence limits evolved from comments questioning the use of the 95% upper confidence limit (UCL) as the point estimate for the background value. The 95% UCL was originally included in the Facility-Wide Background Study as a general point of reference. A confidence interval is used for comparisons within a single population. A compliance data set is then typically compared to a known standard. Using the 95% UCL as a single point comparison or background value, however, is likely to result in classifying many chemicals as greater than background when they are not. These misclassifications would be due to the 95% UCL representing an estimate of the mean. Such misclassifications could occur as often as 50% of the time. A tolerance limit is used for comparisons of similar but distinct populations. A concentration range is defined from a background data set, within which a large proportion of compliance data should fall with high probability. Therefore, it was recommended that a 95% upper tolerance limit (UTL) be developed in the Background Study for use as point-by-point comparisons.

The 95% UTLs calculated by the IT Corporation for the inorganic constituents detected in the background soil samples from the Main Manufacturing Area are summarized in **Table 4**. These facility-wide background values, in conjunction with the Unit-specific background concentrations detected in the samples from borings 5GP-16 and 7GP-16, were used in the initial comparisons to background for the inorganic constituents detected in the soil samples from HWMU-5 and HWMU-7, respectively.

3.2 HWMU-5

3.2.1 Comparison of Inorganic Constituent Concentrations to Background

The initial comparison of the detected inorganic constituent concentrations to background concentrations for the soils samples collected from HWMU-5 is summarized in **Table 5**. The maximum detected constituent concentrations were compared to those from background sample 5GP-16 (3-4') as well as to the facility-wide background concentrations. All of the maximum detected constituent concentrations exceeded the concentrations detected in background sample 5GP-16 (3-4'). However, with the exception of calcium, magnesium, and potassium, the maximum detected inorganic constituent concentrations did not exceed the facility-wide background concentrations; therefore, the detected inorganic constituents are not considered to be constituents of potential concern. Furthermore, due to the fact that calcium, magnesium, and potassium are not hazardous constituents as listed in Appendix VIII of 40 CFR Part 261, they are not considered to be constituents of potential concern even though their maximum detected concentrations exceeded their respective background concentrations.

3.2.2 Comparison to EPA Region III Residential Soil and Soil-to-Groundwater SSLs

Based on the initial comparison to background concentrations, none of the inorganic constituents detected in the soil samples from HWMU-5 were considered to be constituents of potential concern. Therefore, only the detected TCL organic constituent 4,4-DDD was compared to the USEPA Region III residential soil RBC and Soil-to-Groundwater SSL. As shown in **Table 6**, the maximum 4,4-DDD detected concentration of 0.051 mg/kg is below the residential soil RBC of 2.7 mg/kg, and below the soil-to-groundwater DAF 20 SSL of 11 mg/kg. Therefore, 4,4-DDD is not considered to be a constituent of potential concern at HWMU-5.

3.3 HWMU-7

3.3.1 Comparison of Inorganic Constituent Concentrations to Background

The initial comparison of the detected inorganic constituent concentrations to background concentrations for the soils samples collected from HWMU-7 is summarized in **Table 7**. The maximum detected constituent concentrations were compared to those from background sample 7GP-16 (3-4') as well as to the facility-wide background concentrations. With the exception of zinc, all of the maximum detected constituent concentrations exceeded the concentrations detected in background sample 7GP-16 (3-4'). The maximum detected concentrations of beryllium, calcium, magnesium, potassium, and selenium exceeded their respective facility-wide background concentrations. Due to the fact that calcium, magnesium, and potassium are not hazardous constituents as listed in Appendix VIII of 40 CFR Part 261, these three constituents are not considered to be constituents of potential concern, even though their maximum detected concentrations exceeded their respective background concentrations. However, although the only detected concentrations of beryllium and selenium were observed in native soil sample 7GP-3 (10-11'), these two constituents were retained for further comparison to the USEPA Region III Soil-to-Groundwater SSLs. The maximum detected concentrations for the remaining

inorganic constituents did not exceed their respective facility-wide background concentrations; therefore, these detected inorganic constituents are not considered to be constituents of potential concern.

3.3.2 Comparison to EPA Region III Residential Soil and Soil-to-Groundwater SSLs

Based on the initial comparison to background concentrations, the concentrations of inorganic constituents beryllium and selenium detected in native soil sample 7GP-3 (10-11') were retained for comparison to the USEPA Region III residential soil RBCs and Soil-to-Groundwater SSLs. In addition, the cyanide, 4,4-DDE, and n-nitrosodiphenylamine concentrations detected in native soil sample 7GP-3 (10-11') and the 4,4-DDD concentration detected in base clay sample 7GP-2 (13.5-14.5') were compared to the respective USEPA Region III residential soil RBCs and Soil-to-Groundwater SSLs. As shown in **Table 8**, the detected concentrations of beryllium, selenium, cyanide, 4,4-DDD, 4,4-DDE, and n-nitrosodiphenylamine are all below their respective residential soil RBCs and below their respective soil-to-groundwater DAF 20 SSLs. Furthermore, organic constituents 4,4-DDD, 4,4-DDE, and n-nitrosodiphenylamine have never been detected in the groundwater at HWMU-7 during annual monitoring for the all of the constituents listed in Appendix IX (Groundwater Monitoring List) of 40 CFR Part 264 as required by the Hazardous Waste Post-Closure Care Permit for the Unit. Therefore, beryllium, selenium, cyanide, 4,4-DDD, 4,4-DDE, and n-nitrosodiphenylamine are not considered to be constituents of potential concern at HWMU-7.

3.4 EXPOSURE ASSESSMENT

HWMU-5 and HWMU-7 are capped using impermeable PVC membranes and 2-3 feet of soil; therefore, there is no risk of exposure to human health and/or the environment through direct ingestion of the residual material or by inhalation of vapors or fugitive dusts. In addition, the constituent concentrations that exceeded their respective background concentrations were below their respective USEPA Region III risk-based concentrations (RBCs) for residential soil ingestion.

The only potential exposure pathway is through constituent migration from soil to groundwater. However, Radford AAP is an industrial facility with no users of groundwater. Furthermore, based on the comparison to the USEPA Region III Soil-to-Groundwater SSLs (derived from the Region III tap water RBCs multiplied by a DAF of 20), none of the constituents detected at HWMU-5 and at HWMU-7 at concentrations exceeding the facility-wide background concentrations are considered to be of concern. Therefore, exposure via constituent migrations from soil to groundwater is not considered to be a potential risk.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the field investigation, the residual material in HWMU-5 and in HWMU-7 is not hazardous and should be left in place. The Units are capped using impermeable PVC membranes and 2-3 feet of soil; therefore, there is no risk of exposure to human health and/or the environment through direct ingestion of the residual material or by inhalation of vapors or fugitive dusts. In addition, the concentrations of the inorganic and organic constituents detected in soil samples collected from both Units do not pose a risk to groundwater via migration from the soil. Therefore, leaving the residual material in place does not pose a threat to human health and/or the environment according to VDEQ guidelines and regulations. Accordingly, Radford AAP requests that certifications for clean closure for soil be issued for both Units.

4.1 GENERAL GROUNDWATER MONITORING PROGRAM ISSUES

The groundwater at HWMU-5 and at HWMU-7 currently is monitored in accordance with the requirements of the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Management Units 5, 7 10, and 16 (October 4, 2002). Due to the fact that the results of this investigation indicate that the residual material at both Units is not hazardous, Radford AAP desires to develop a protocol with which to cease groundwater monitoring at HWMU-5 and HWMU-7 under the Final Hazardous Waste Post-Closure Care Permit. This protocol is similar to the procedures specified in Permit Conditions V.F.1.c and V.F.2.c, wherein corrective action can be terminated if the Permittees demonstrate that the Groundwater Protection Standard has not been exceeded for three (3) consecutive years. In the event that the Groundwater Protection Standard is not exceeded for three (3) consecutive years at HWMU-5 and/or HWMU-7, Radford AAP will submit to the VDEQ a Minor Modification to the Final Hazardous Waste Post-Closure Care Permit petitioning for clean closure for groundwater at HWMU-5 and/or HWMU-7.

4.1.1 HWMU-5

Radford AAP proposes to monitor the groundwater at HWMU-5 for those inorganic constituents detected in the October 31, 2002 soil samples that are also listed in Appendix VIII (Hazardous Constituents) of 40 CFR Part 261, as well as for the one organic constituent (4,4-DDD) detected in the October 31, 2002 soil samples. Radford AAP will monitor for these constituents **in addition to** the constituents listed in the compliance groundwater monitoring list for HWMU-5 specified in the Final Hazardous Waste Post-Closure Care Permit, as appropriate. Due to the fact that no other organic constituents were detected in the soil samples from HWMU-5, any organic constituents other than 4,4-DDD detected in groundwater at HWMU-5 would have to be derived from an alternate source, and would fall under the jurisdiction of Radford AAP's USEPA Region III Corrective Action Program. Radford AAP proposes that groundwater monitoring at HWMU-5 would cease in the event that 4,4-DDD is not detected for three (3) consecutive years, and in the event that the inorganic constituents are not detected at concentrations exceeding their respective USEPA Maximum Contaminant Levels (MCLs) or VDEQ Alternate Concentration Limits (ACLs) for three (3) consecutive years. Radford AAP is

an industrial facility with no users of groundwater; therefore, the USEPA MCLs and VDEQ ACLs, which are residential drinking water standards, provide conservative standards with which to compare the inorganic constituent concentrations detected at the Unit.

Radford AAP will follow this groundwater monitoring protocol as well as the compliance groundwater monitoring protocol specified in the Final Hazardous Waste Post-Closure Care Permit until the VDEQ approves Radford AAP's petition for the cessation of groundwater monitoring and certifications for clean closure of soil and groundwater have been issued for HWMU-5. In accordance with Permit Condition I.J.1, Radford AAP will request a reduction in the post-closure period for HWMU-5 upon receipt of certification of clean closure from the VDEQ. Radford AAP assumes that certifications for clean closure of soil and groundwater will trigger the termination of the post-closure period and signify the completion of post-closure care at HWMU-5.

4.1.2 HWMU-7

Radford AAP proposes to monitor the groundwater at HWMU-7 for those inorganic constituents detected in the November 1, 2002 soil samples that are also listed in Appendix VIII (Hazardous Constituents) of 40 CFR Part 261, as well as for the three organic constituents (4,4-DDD, 4,4-DDE, and n-nitrosodiphenylamine) detected in the November 1, 2002 soil samples. Radford AAP will monitor for these constituents **in addition to** the constituents listed in the compliance groundwater monitoring list for HWMU-7 specified in the Final Hazardous Waste Post-Closure Care Permit, as appropriate. Due to the fact that no other organic constituents were detected in the soil samples from HWMU-7, any organic constituents other than 4,4-DDD, 4,4-DDE, and n-nitrosodiphenylamine detected in groundwater at HWMU-7 would have to be derived from an alternate source, and would fall under the jurisdiction of Radford AAP's USEPA Region III Corrective Action Program. Radford AAP proposes that groundwater monitoring at HWMU-7 would cease in the event that 4,4-DDD, 4,4-DDE, and n-nitrosodiphenylamine are not detected for three (3) consecutive years, and in the event that the inorganic constituents are not detected at concentrations exceeding their respective USEPA MCLs or VDEQ ACLs for three (3) consecutive years. Radford AAP is an industrial facility with no users of groundwater; therefore, the USEPA MCLs and VDEQ ACLs, which are residential drinking water standards, provide conservative standards with which to compare the inorganic constituent concentrations detected at the Unit.

Radford AAP will follow this groundwater monitoring protocol as well as the compliance groundwater monitoring protocol specified in the Final Hazardous Waste Post-Closure Care Permit until the VDEQ approves Radford AAP's petition for the cessation of groundwater monitoring and certifications for clean closure of soil and groundwater have been issued for HWMU-7. In accordance with Permit Condition I.J.1, Radford AAP will request a reduction in the post-closure period for HWMU-7 upon receipt of certification of clean closure from the VDEQ. Radford AAP assumes that certifications for clean closure of soil and groundwater will trigger the termination of the post-closure period and signify the completion of post-closure care at HWMU-7.

4.2 TRICHLOROETHENE IN GROUNDWATER AT HWMU-5

Trichloroethene (TCE) has been detected repeatedly at concentrations exceeding the USEPA Maximum Contaminant Level (MCL) of 5 µg/l in four groundwater monitoring wells within the monitoring network for HWMU-5. In correspondence to Radford AAP dated September 27, 2000, the VDEQ requested that Radford AAP implement a Corrective Action Program at HWMU-5 to address the TCE concentrations in groundwater which exceeded the USEPA MCL. During a teleconference between the VDEQ and Radford AAP on October 31, 2000, AAPC stated that, based on historical information for HWMU-5, it was believed that the wastes handled at the Unit prior to closure did not contain TCE or other organic compounds. Furthermore, TCE concentrations below the USEPA MCL had been detected in the upgradient monitoring well for the Unit during previous monitoring events. Therefore, it was believed that HWMU-5 was not the source of the TCE detected in the groundwater. In accordance with VDEQ guidance and pursuant to 40 CFR 264.99(i), AAPC chose to demonstrate that TCE was derived from a source other than HWMU-5. A copy of the Alternate Source Demonstration for Trichloroethene for HWMU-5 is included in **Appendix E**.

Historic information regarding operations at HWMU-5 prior to closure indicated that the wastes processed through the Unit did not contain TCE. A review of Radford AAP cleaning and maintenance practices in the vicinity of HWMU-5 identified areas in which chlorinated solvents had been used. An evaluation of historic waste disposal practices in these areas indicated the potential for groundwater impact from these operations. Hydrogeologic features such as fracture traces and sinkholes in this area would facilitate the transport of impacted groundwater from these potential source areas to certain monitoring wells (5W5B [shallow residuum] and nested wells 5WC21 [shallow residuum], 5WC22 [mid-depth residuum], and 5WC23 [deep residuum]) within the groundwater monitoring network for HWMU-5. Only these certain monitoring wells consistently exhibit TCE concentrations in exceedance of the USEPA MCL of 5 µg/l. In addition, TCE was detected in upgradient monitoring well 5W8B at a concentration exceeding the USEPA MCL during First Quarter 2002.

TCE was not detected in any of the soil samples collected within and around HWMU-5 during the October 31, 2002 field investigation. Based on the findings of the 2001 ASD as well as the October 31, 2002 field investigation and Year 2002 quarterly groundwater monitoring, it is Radford AAP's conclusion that the detected TCE concentrations in groundwater are derived from a source other than HWMU-5. Radford AAP assumes that remediation of TCE in groundwater in this area will fall under the jurisdiction of Radford AAP's USEPA Region III Corrective Action Program, and that TCE concentrations derived from an alternate source will not prevent HWMU-5 from receiving certification for clean closure of groundwater based on the protocol described in Section 4.1.1 of this report.

5.0 REFERENCES

Draper Aden Associates, *Alternate Source Demonstration for Trichloroethene – Hazardous Waste Management Unit 5, Radford Army Ammunition Plant, Radford, Virginia*, February 2001.

IT Corporation, *Radford Army Ammunition Plant Facility-Wide Background Study*, December 2001.

USDA, *Soil Survey of Montgomery County, Virginia*, 1985.

USEPA, *Soil Screening Guidance*, July 1996.

FIGURES

NORTH

LEGEND

5GP-15 △ GEOPROBE BORING LOCATION

A — A' CROSS SECTION LINE

M.H.

1782 1780 1778 1776 1784 1786 1772 1770 1774

5GP-14 5GP-15 5GP-11 5GP-8 5GP-4 5GP-3 5GP-2 5GP-1 5GP-5 5GP-6 5GP-7 5GP-10 5GP-9 5GP-13 5GP-12 5GP-16

HWMU 5

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

P:\B02\200\B0227*

P:\B02\200\B02271-01\CAD\271-01.dwg\B02271-01_HWMU5.dwg Dec 12, 2002 4:53pm

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DESIGNED	RGM
DRAWN	DRW
CHECKED	MDL
DATE	11/25/02

SITE PLAN - HAZARDOUS WASTE MANAGEMENT UNIT-5
RADFORD ARMY AMMUNITION PLANT
MONTGOMERY COUNTY, VIRGINIA

SCALE: 1"=20'

PLAN NO. B02271-01

FIGURE 1

LEGEND

7GP–15 △ GEOPROBE BORING LOCATION

A — A' CROSS SECTION LINE

7GP–12 7GP–13 7GP–8 7GP–10 7GP–7 7GP–6 7GP–5 7GP–1 7GP–2 7GP–3 7GP–4 7GP–9 7GP–11 7GP–14 7GP–15 7GP–16

1718.3 1711.1

HWMU 7

708 1710 1712 1714 1716 1718 1712 1714 1716 704 1702 1706 1708 1710 12 1710 1708 1710 1712 1712 1714 1716

NORTH

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

1 inch = 20 ft.

P:\B02\2001\B02271\B02...\CAD\271-01\dwg\B02271-01_HWMU7.dwg Dec 12, 2002 4:53pm

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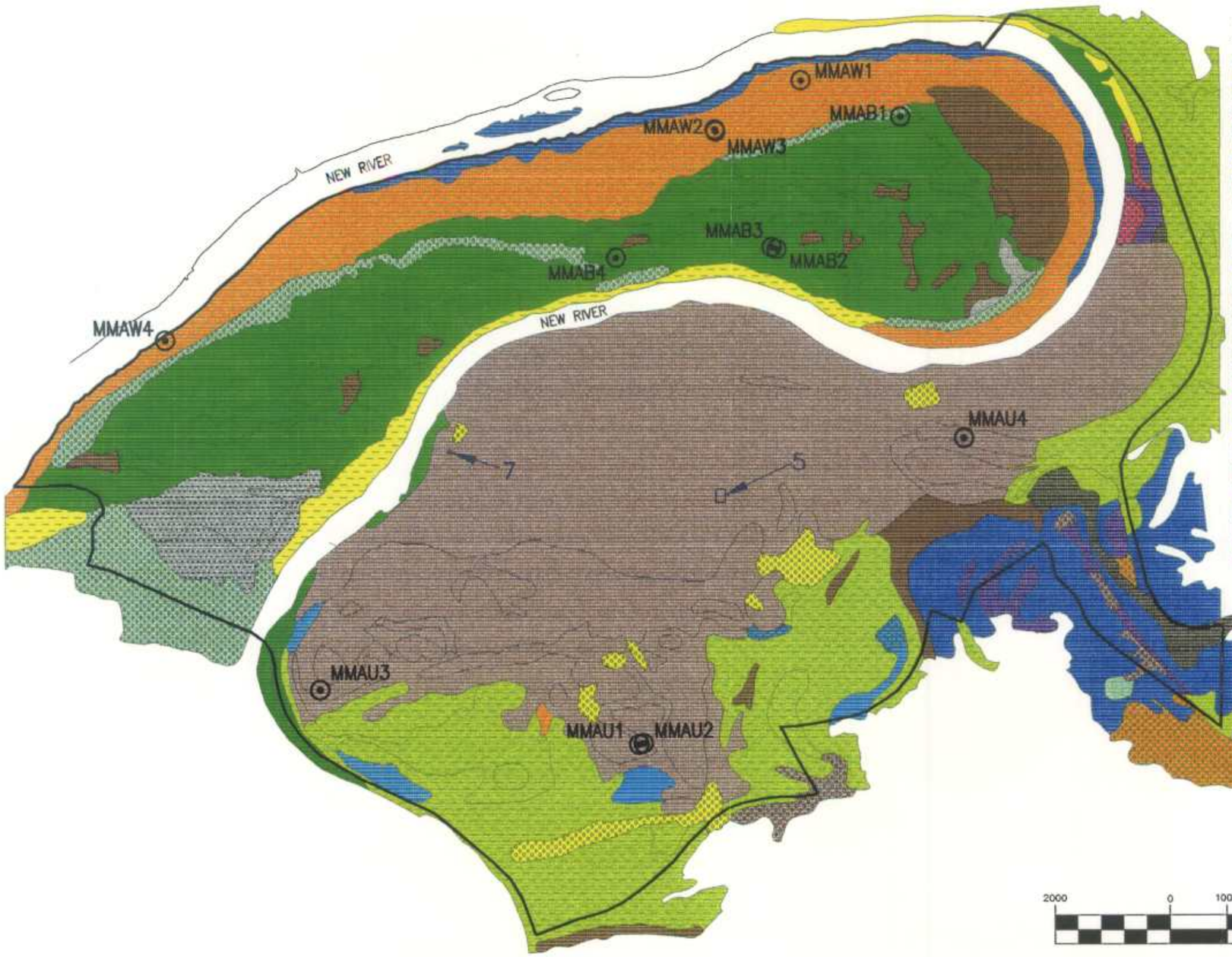
DESIGNED	RGM
DRAWN	DRW
CHECKED	MDL
DATE	12/11/02

SITE PLAN - HAZARDOUS WASTE MANAGEMENT UNIT-7
RADFORD ARMY AMMUNITION PLANT
MONTGOMERY COUNTY, VIRGINIA

SCALE: 1"=20'

PLAN NO. B02271-01

FIGURE 2



LEGEND

- BACKGROUND SAMPLE LOCATION
- INSTALLATION BOUNDARY

HORSESHOE AREA

- BRADDOCK LOAM
- CARBO–ROCK OUTCROP COMPLEX
- COTACO LOAM
- FLUVAQUENTS
- LOWELL SILT LOAM
- ROCK OUTCROP–NEWBERN–CARBO COMPLEX
- WHEELING SANDY LOAM
- WURNO–NEWBERN–FAYWOOD SILT LOAMS

MAIN MANUFACTURING AREA

- BERKS–CLYMER COMPLEX
- BERKS–GROSECLOSE COMPLEX
- BERKS–WEIKERT COMPLEX
- BERKS AND WEIKERT SOILS
- BERKS AND WEIKERT, VERY STONY SOILS
- CARBO AND CHILHOWIE SOILS
- CANEYVILLE–OPEQUON–ROCK OUTCROP COMPLEX
- CRAIGSVILLE SOIL
- FREDERICK AND VERTREES SILT LOAMS
- FRENCH SOILS
- GROSECLOSE AND POPLIMENTO
- GUERNSEY SILT LOAM
- HAYTER LOAM
- McGARY AND PURDY SOILS
- ROSS SOILS
- UDORTHENTS AND URBAN LAND
- UNISON–URBAN LAND COMPLEX
- UNISON AND BRADDOCK SOILS
- WEAVER SOILS

GRAPHIC SCALE

2000 0 1000 2000 4000 8000

(IN FEET)
1 inch = 2000ft.

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DESIGNED	RGM
DRAWN	JFF
CHECKED	AEK
DATE	12-19-02

SOILS MAPPING HWMU'S 5 AND 7
RADFORD ARMY AMMUNTION PLANT
RADFORD, VIRGINIA

SCALE: 1" = 2000'

PLAN NO. B02271-01

FIGURE 3

032A

P:\B02\200\B02271\B0...\CAD\271-01\dwg\B02271-01_SOILS.dwg Jan 06, 2003 1:14pm

FIGURE 4
HWMU – 5
CROSS–SECTION A–A'

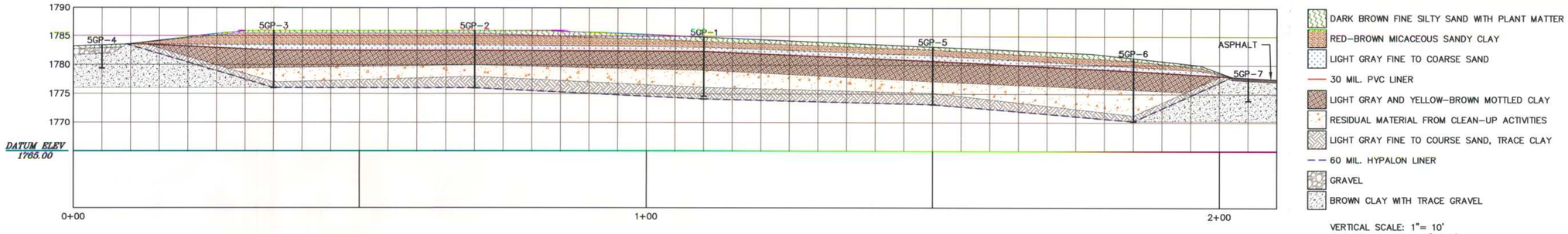
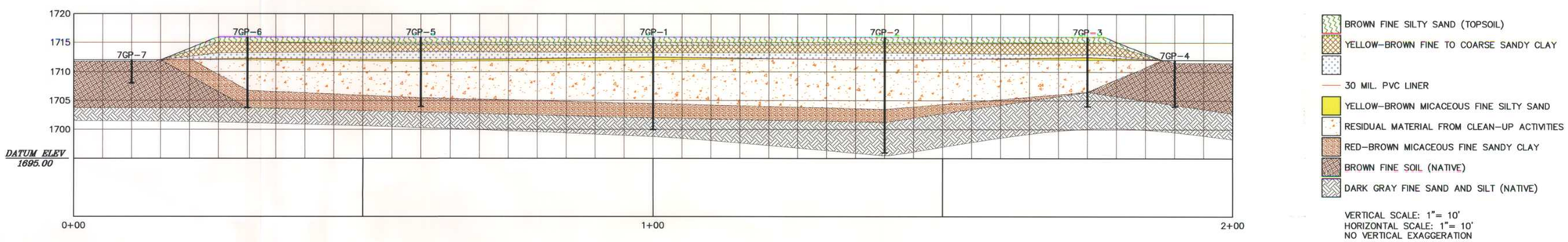


FIGURE 5
HWMU – 7
CROSS–SECTION A–A'



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CROSS SECTION A - A'
HAZARDOUS WASTE MANAGEMENT UNITS 5 & 7
RADFORD ARMY AMMUNITION PLANT
MONTGOMERY COUNTY, VIRGINIA

REVISIONS

DESIGNED BY:	MAC
DRAWN BY:	DRW
CHECKED BY:	Initials
SCALE:	1" = 10'
DATE:	11/26/2002
PROJECT NUMBER:	B02271-01

FIGURE 4 & 5

TABLES

TABLE 1

HAZARDOUS WASTE MANAGEMENT UNIT 5
SUMMARY OF TAL INORGANIC CONSTITUENTS AND TCL ORGANIC CONSTITUENTS DETECTED IN SOIL SAMPLES
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

Analyte / Sample Location	Date	Concentrations in mg/kg																
		Aluminum	Arsenic	Barium	Beryllium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Vanadium	Zinc	4,4-DDD
5GP-16 (3-4') (background)	10/31/02	17000	4	51.2	~	1020	24.4	8.2	10.6	28200	11.4	812	393	6.3	~	55.4	20.2	~
5GP-1 (1-2') (cap)	10/31/02	19200	2.2	85.1	~	1060	22.4	9	13.9	30700	12.9	1530	337	9.4	1580	64.9	35.3	~
5GP-1 (9-10') (residual material)	10/31/02	12100	3.9	47.3	1.1	~	31.7	17.6	19.8	26700	9.8	1730	360	19	851	32	20.7	0.019
5GP-3 (9-10') (residual material)	10/31/02	14800	2.6	37.2	~	866	22.8	~	9.5	24400	9.7	~	90.8	5.3	~	54.3	18.6	~
5GP-6 (10-11') (base sand)	10/31/02	19400	1.6	56.9	~	9930	17.9	~	11.6	22400	11.3	1220	154	7.9	1120	57.5	26.4	0.0067
5GP-8 (7-8') (residual material)	10/31/02	14200	4.1	46.1	1.3	~	21.6	11.6	16.8	28400	9.6	1410	242	10.7	1090	26.7	23.9	0.051
5GP-8 (11-12') (residual material)	10/31/02	19600	3.4	61.4	0.81	~	26.9	10	14.8	29000	9.6	1560	372	11	1420	55.2	33.8	~
5GP-12 (3-4') (adjacent soil)	10/31/02	19600	2.7	56.2	~	3200	27	9.1	13.6	33400	12.6	2200	457	8.2	915	61.8	32.1	~

NOTES:
~: Not detected above the Limit of Quantitation (LOQ).

TABLE 2

HAZARDOUS WASTE MANAGEMENT UNIT 7
SUMMARY OF TAL INORGANIC CONSTITUENTS AND TCL ORGANIC CONSTITUENTS DETECTED IN SOIL SAMPLES
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

Analyte / Sample Location	Date	Concentrations in mg/kg																			
		Aluminum	Arsenic	Barium	Beryllium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Vanadium	Zinc	Cyanide	4,4-DDD	4,4-DDE	N-Nitrosodiphenylamine
7GP-16 (3-4') (background)	11/01/02	6650	~	106	~	1230	11.5	~	5.1	10800	5.4	1890	422	7.7	809	~	15.4	39.7	~	~	~	~
7GP-1 (1-3') (cap)	11/01/02	11100	3.8	66.9	0.7	7490	24.1	11.5	22.8	19400	8.1	4290	662	13.5	774	~	28	17.4	~	~	~	~
7GP-2 (8-12') (residual material)	11/01/02	8790	2.7	40.9	1.2	~	22	12.5	22	23300	2.8	3140	274	21.6	1070	~	21.1	15	~	~	~	~
7GP-2 (13.5-14.5') (base clay)	11/01/02	19700	3.1	70.9	0.84	~	22.5	16.2	14.2	29300	13.6	2000	407	11.4	1390	~	57.7	32.6	~	0.0035	~	~
7GP-3 (10-11') (native soil)	11/01/02	11700	26.1	229	1.5	28100	32.8	8.1	23.2	15900	35.1	2440	145	15.9	2970	3.5	42.1	33.8	0.69	~	0.0025	0.75
7GP-4 (3-4') (adjacent soil)	11/01/02	5290	~	69.2	~	749	10.1	~	5.1	9860	5.8	1590	292	6.3	729	~	14	35	~	~	~	~
7GP-5 (6-11') (residual material)	11/01/02	20000	3.5	55.6	~	~	22.8	~	10	23600	11	787	187	7.2	732	~	60.6	24.2	~	~	~	~
7GP-8 (5-8') (residual material)	11/01/02	22400	2.4	55	~	1570	20.1	~	12.7	23200	10.3	1090	280	8.5	1040	~	61.8	28.1	~	~	~	~

NOTES:
~: Not detected above the Limit of Quantitation (LOQ).

TABLE 3

SUMMARY OF WASTE CHARACTERIZATION ANALYTICAL RESULTS
HAZARDOUS WASTE MANAGEMENT UNITS 5 AND 7
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

Analyte	Sample ID		Regulatory Thresholds	Units
	Unit-5-TCLP	Unit-7-TCLP		
1,1-Dichloroethene	U	U	0.7	mg/l
1,2-Dichloroethane	U	U	0.5	mg/l
1,4-Dichlorobenzene	U	U	7.5	mg/l
2,4,5-TP	U	U	1	mg/l
2,4,5-Trichlorophenol	U	U	400	mg/l
2,4,6-Trichlorophenol	U	U	2	mg/l
2,4-D	U	U	10	mg/l
2,4-Dinitrotoluene	U	U	0.1	mg/l
2-Butanone (methyl ethyl ketone)	U	U	200	mg/l
2-Methylphenol	U	U	200	mg/l
4-Methylphenol	U	U	200	mg/l
Arsenic	U	U	5	mg/l
Barium	0.714	0.521	100	mg/l
Benzene	U	U	0.5	mg/l
Cadmium	U	U	1	mg/l
Carbon Tetrachloride	U	U	0.5	mg/l
Chlordane	U	U	0.03	mg/l
Chlorobenzene	U	U	100	mg/l
Chloroform	U	U	6	mg/l
Chromium	U	U	5	mg/l
Cyanide (Reactivity)	U	U	250	mg/kg
Endrin	U	U	0.02	mg/l
gamma-BHC (lindane)	U	U	0.4	mg/l
Heptachlor	U	U	0.008	mg/l
Heptachlor epoxide	U	U	0.008	mg/l
Hexachlorobenzene	U	U	0.1	mg/l
Hexachlorobutadiene	U	U	0.5	mg/l
Hexachloroethane	U	U	3	mg/l
Lead	U	U	5	mg/l
Mercury	U	U	0.2	mg/l
Methoxychlor	U	U	10	mg/l
Moisture	15.3	15.5	-	%
Nitrobenzene	U	U	2	mg/l
Pentachlorophenol	U	U	100	mg/l
pH	7.38	7.15	<2 or >12.5	s.u.
Pyridine	U	U	5	mg/l
Selenium	U	U	1	mg/l
Silver	U	U	5	mg/l
Sulfide (Reactivity)	U	U	500	mg/kg
Tetrachloroethene	U	U	0.7	mg/l
Toxaphene	U	U	0.5	mg/l
Trichloroethene	U	U	0.5	mg/l
Vinyl Chloride	U	U	0.2	mg/l

TABLE 4

FACILITY-WIDE BACKGROUND CONCENTRATIONS
SUBSURFACE SOIL - MAIN MANUFACTURING AREA
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

CONSTITUENT	Frequency of Detection	Minimum Concentration	Maximum Concentration	Arithmetic Mean Concentration	Coefficient of Variation	Distribution	95% UTL of the Mean
Aluminum	22/22	8,710	47,900	21,223	0.517	Lognormal	56,307
Arsenic	20/22	1.2	35.9	7.73	1.16	Lognormal	64.5
Barium	19/22	25.2	155	71.5	0.623	Normal	176
Beryllium	11/22	0.79	5.3	1.01	1.16	Neither	1.3
Cadmium	12/22	0.57	2.5	0.778	0.805	Lognormal	3.33
Chromium	22/22	10.8	75.8	32.3	0.427	Lognormal	82.8
Cobalt	16/22	6.8	94.3	18.3	1.33	Lognormal	118
Copper	22/22	3.3	34.4	17	0.611	Normal	41.4
Iron	22/22	14,300	67,700	32,595	0.352	Normal	59,560
Lead	22/22	5.6	256	31.3	1.84	Neither	256
Manganese	22/22	39.4	1,760	428	0.939	Lognormal	3,143
Mercury	10/22	0.038	0.27	0.0729	0.865	Neither	0.154
Nickel	22/22	4.8	94.2	20.4	1.01	Lognormal	93.2
Thallium	12/22	1.4	5	1.76	0.729	Neither	2.61
Vanadium	22/22	27	114	61.9	0.329	Normal	110
Zinc	22/22	14.7	598	112	1.28	Lognormal	674

NOTES:
Source: *Radford Army Ammunition Plant Facility-Wide Background Study*, IT Corporation, December 2001.

TABLE 5

HAZARDOUS WASTE MANAGEMENT UNIT 5
COMPARISON OF INORGANIC CONSTITUENT CONCENTRATIONS
TO BACKGROUND CONCENTRATIONS
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGNIA

INORGANIC CONSTITUENTS	Facility-Wide Background Concentration[1] (mg/kg)	Unit-Specific Background Concentration [5GP-16 (3-4')] (mg/kg)	Maximum Unit-Specific Soil Concentration (mg/kg)	Constituent Of Potential Concern?
Aluminum	56307	17000	19600	no
Antimony	na	~	~	no
Arsenic	64.5	4	4.1	no
Barium	176	51.2	85.1	no
Beryllium	1.3	~	1.3	no
Cadmium	3.33	~	~	no*
Calcium	na	1020	9930	no
Chromium	82.8	24.4	31.7	no
Cobalt	118	8.2	17.6	no
Copper	41.4	10.6	19.8	no
Iron	59560	28200	33400	no
Lead	256	11.4	12.9	no
Magnesium	na	812	2200	no*
Manganese	3143	393	457	no
Mercury	0.154	~	~	no
Nickel	93.2	6.3	19	no
Potassium	na	~	1580	no*
Selenium	na	~	~	no
Silver	na	~	~	no
Sodium	na	~	~	no
Thallium	2.61	~	~	no
Vanadium	110	55.4	64.9	no
Zinc	674	20.2	35.3	no

NOTES:

[1] Facility-Wide Background Concentrations obtained from the Radford Army Ammunition Plant Facility-Wide Background Study Report prepared by IT Corporation, December 2001

na: Not applicable. A Facility-Wide Background Concentration was not calculated for this constituent.

~: Not detected above the Limit of Quantitation (LOQ).

* Although the maximum concentrations for calcium, magnesium, and potassium are greater than their respective background concentrations, they are not considered constituents of potential concern because they are not hazardous constituents as listed in Appendix VIII of 40 CFR Part 261.

TABLE 6

HAZARDOUS WASTE MANAGEMENT UNIT 5
COMPARISON OF DETECTED ORGANIC CONSTITUENT CONCENTRATIONS TO
USEPA REGION III SOIL-TO-GROUNDWATER SOIL SCREENING LEVELS
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

CONSTITUENTS	CAS No.	Risk-Based Concentration (RBC) Residential[1] (mg/kg)	USEPA Region III Groundwater DAF 20 (mg/kg)	Maximum Unit-Specific Soil Concentration (mg/kg)	Constituent Of Potential Concern?
Pesticides					
4,4-DDD	72-54-8	2.7	11	0.051	no

NOTES:
[1] USEPA Region III Risk-Based Concentration Table, October 9, 2002.
DAF 20: Dilution Attenuation Factor of 20 for constituent migration from soil to groundwater.
Obtained from USEPA Region III Risk-Based Concentration Table, October 9, 2002.

TABLE 7

HAZARDOUS WASTE MANAGEMENT UNIT 7
COMPARISON OF INORGANIC CONSTITUENT CONCENTRATIONS
TO BACKGROUND CONCENTRATIONS
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGNIA

INORGANIC CONSTITUENTS	Facility-Wide Background Concentration[1] (mg/kg)	Unit-Specific Background Concentration [7GP-16 (3-4')] (mg/kg)	Maximum Unit-Specific Soil Concentration (mg/kg)	Constituent Of Potential Concern?
Aluminum	56307	6650	22400	no
Antimony	na	~	~	no
Arsenic	64.5	~	26.1	no
Barium	176	106	229	no
Beryllium	1.3	~	1.5	yes
Cadmium	3.33	~	~	no
Calcium	na	1230	28100	no*
Chromium	82.8	11.5	32.8	no
Cobalt	118	~	16.2	no
Copper	41.4	5.1	23.2	no
Iron	59560	10800	29300	no
Lead	256	5.4	35.1	no
Magnesium	na	1890	4290	no*
Manganese	3143	422	662	no
Mercury	0.154	~	~	no
Nickel	93.2	7.7	21.6	no
Potassium	na	809	2970	no*
Selenium	na	~	3.5	yes
Silver	na	~	~	no
Sodium	na	~	~	no
Thallium	2.61	~	~	no
Vanadium	110	15.4	61.8	no
Zinc	674	39.7	33.8	no

NOTES:

[1] Facility-Wide Background Concentrations obtained from the Radford Army Ammunition Plant Facility-Wide Background Study Report prepared by IT Corporation, December 2001

na: Not applicable. A Facility-Wide Background Concentration was not calculated for this constituent.

~: Not detected above the Limit of Quantitation (LOQ).

* Although the maximum concentrations for calcium, magnesium, and potassium are greater than their respective background concentrations, they are not considered constituents of potential concern because they are not hazardous constituents as listed in Appendix VIII of 40 CFR Part 261.

TABLE 8

HAZARDOUS WASTE MANAGEMENT UNIT 7
COMPARISON OF INORGANIC CONSTITUENTS OF POTENTIAL CONCERN
AND DETECTED ORGANIC CONSTITUENT CONCENTRATIONS TO
USEPA REGION III SOIL-TO-GROUNDWATER SOIL SCREENING LEVELS
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

CONSTITUENTS	CAS No.	Risk-Based Concentration (RBC) Residential[1] (mg/kg)	USEPA Region III Groundwater DAF 20 (mg/kg)	Maximum Unit-Specific Soil Concentration (mg/kg)	Constituent Of Potential Concern?
Inorganics					
Beryllium	7440-41-7	160	1200	1.5	no
Cyanide	57-12-5	1600	150	0.69	no
Selenium	7782-49-2	390	19	3.5	no
Semivolatile Organic Compounds (SVOCs)					
N-Nitrosodiphenylamine	86-30-6	130	0.76	0.75	no
Pesticides					
4,4-DDD	72-54-8	2.7	11	0.0035	no
4,4-DDE	72-55-9	1.9	35	0.0025	no

NOTES:
[1] USEPA Region III Risk-Based Concentration Table, October 9, 2002.
DAF 20: Dilution Attenuation Factor of 20 for constituent migration from soil to groundwater.
Obtained from USEPA Region III Risk-Based Concentration Table, October 9, 2002.

APPENDIX A

BORING LOGS

DRAPER ADEN ASSOCIATES
Engineers • Geologists • Hydrologists

LOG OF: **5-GP-1** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **10.5'** Elev GS:	Reference: **Ground Surface** Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					Soil sample 5-GP-1 (1-2) submitted for analysis.
				SP. Light gray fine to coarse sand, wet.					Perched water.
				CL. Light gray and yellow-brown mottled clay, dry.					30 mil. PVC.
S-2			5						
				SM. Red-brown micaceous silty sand, dry.					Residual material.
S-3						1.8			
				SM. Yellow-brown, fine to coarse silty sand with little green gravel (compacted residual material), dry.					Soil sample 5-GP-1 (9-10) submitted for analysis.
			10	SC. Light gray fine to coarse sand, trace clay, damp.					
				Boring terminated at 10.5 feet.					
			15						
			20						

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LOG OF: **5-GP-2** (1 of 1)

4 4

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: / Logged by: **R. Miller**
Total Depth **10.0'** / Elev GS:	Reference: **Ground Surface** / Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					
				SP. Light gray fine to coarse sand, wet					Perched water.
				CL. Light gray and yellow-brown mottled clay, dry.					30 mil. PVC.
S-2			5						
				SM. Red-brown micaceous silty sand, dry.					Residual material.
S-3				SM. Yellow-brown fine to coarse silty sand with trace green gravel (compacted residual material) and little clay, damp.					
			10	Boring terminated at 10 feet.					
			15						
			20						

WELL_LOG ALLIAN .AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-3** (1 of 1)

4 5

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth **10.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
				CL. Light gray and yellow-brown mottled clay, dry.					30 mil. PVC.
S-2			5						
				SM. Red-brown micaceous silty sand, dry.					Residual material
S-3									
				2" granite gravel.					
				SM. Yellow-brown fine to coarse silty sand with trace green gravel (compacted residual material) and little clay, damp.					Soil sample 5-GP-3 (9-10) submitted for analysis.
			10	Boring terminated at 10 feet.					
			15						
			20						

WELL_LOG ALLIAN...AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-4** (1 of 1)

46

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North: East:	Logged by: **R. Miller**
Total Depth **4.0'** Elev GS: Reference: **Ground Surface**	Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil). GP. Granite gravel.					Boring backfilled with bentonite.
				CL. Red-brown to brown clay with trace gravel, moist.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN .AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-5** (1 of 1)

4 7

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **10.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					
				SP. Light gray sand, wet.					Perched water.
				CL. Light gray and yellow-brown mottled clay, dry.					30 mil. PVC.
S-2			5						
				SM. Red-brown micaceous silty sand, dry to damp.					Residual material.
S-3				SM. Yellow-brown micaceous fine to coarse silty sand, trace gravel, moist.					
			10	Boring terminated at 10 feet.					
			15						
			20						

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LOG OF: **5-GP-6** (1 of 1)

48

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **11.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown, fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					
				SP. Light gray fine to coarse sand, wet.					
				CL. Light gray and yellow-brown mottled clay, dry.					Perched water.
									30 mil. PVC.
S-2			5						
				SM. Yellow-brown micaceous silty sand, moist.					Residual material.
S-3									
			10	SC. Light gray fine to coarse sand and brown clay, damp.					Soil sample 5-GP-6 (10-11) submitted for analysis.
				Boring terminated at 11 feet.					
			15						
			20						

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LOG OF: **5-GP-7** (1 of 1)

43

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North: East:	Logged by: **R. Miller**
Total Depth **4.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt.					Boring backfilled with bentonite
				GC. Brown clay with gray gravel, moist.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN .AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-8** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North: East:	Logged by: **R. Miller**
Total Depth **12.0'** Elev GS: Reference: **Ground Surface**	Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					
				SP. Light gray fine to coarse sand, wet.					
				CL. Light gray and yellow-brown mottled clay, dry.					Perched water 30 mil. PVC.
S-2			5						Residual material.
				SC. Red-brown, micaceous clayey sand, dry.					
				SM. Yellow-brown, fine to coarse silty sand with little green gravel (compacted residual material), dry.					Soil sample 5-GP-8 (7-8) submitted for analysis.
S-3									
				2" quartz gravel.					
			10	CL. Red-brown to dark gray clay, damp.					Soil sample 5-GP-8 (11-12) submitted for analysis.
				Boring terminated at 12 feet.					
			15						
			20						

WELL_LOG ALLIAN AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-9** (1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth **10.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
				CL. Light gray yellow-brown mottled clay, dry.					30 mil. PVC.
S-2			5						
				SM. Yellow-brown, fine to coarse silty sand, trace green gravel (compacted residual material) with little clay, damp.					Residual material.
S-3				Becoming moist.					
				SC. Red-brown micaceous sandy clay, moist.					
			10	Boring terminated at 10 feet.					
			15						
			20						

WELL_LOG ALLIAN...AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-10** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North: East:	Logged by: **R. Miller**
Total Depth **10.0'** Elev GS: Reference: **Ground Surface**	Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay, moist.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
				CL. Light gray yellow-brown mottled clay, dry.					30 mil. PVC.
S-2			5						
				SM. Red-brown micaceous silty sand with black mottles, dry.					Residual material.
S-3				Trace gravel.					
			10	Boring terminated at 10 feet.					
			15						
			20						

WELL_LOG ALLIAN .AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-11** (1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **12.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Red-brown micaceous sandy clay.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
				CL. Light gray and yellow-brown mottled clay, dry.					30 mil. PVC.
S-2			5						
				SC. Red-brown micaceous clayey sand, dry.					Residual material.
S-3				SM. Yellow-brown fine to coarse silty sand with little gravel and compacted residual material fragments, dry.					
			10						
				CL. Gray clay, dry.					
				Boring terminated at 12 feet.					
			15						
			20						

WELL_LOG ALLIAN...AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-12**
(1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **4.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt.					Boring backfilled with bentonite.
				CL. Brown clay.					
				GC. Gray gravel and brown clay.					
				CL. Brown clay.					Soil sample 5-GP-12 (3-4) submitted.
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-13**
(1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North: East:	Logged by: **R. Miller**
Total Depth **4.0'** Elev GS: Reference: **Ground Surface**	Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt. SC. Red-brown fine to coarse clayey sand with brown mottles, damp to moist.					Boring backfilled with bentonite. Not waste material.
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN...AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-14**
(1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North: East:	Logged by: **R. Miller**
Total Depth **4.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				CL. Brown sandy clay, moist.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN...AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **5-GP-15**
(1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **4.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentonite.
				GC. Brown clay with gray gravel, moist.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

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LOG OF: **5-GP-16**
(1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **4.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **October 31, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Dark brown fine silty sand with plant matter, moist (topsoil).					Boring backfilled with bentinite.
				CL. Brown clay with trace gray gravel.					
				CL. Red-brown fine sandy clay, moist.					Soil sample 5-GP-16 (3-4) submitted for analysis.
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

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LOG OF: **7-GP-1** (1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **16.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					Soil sample 7-GP-1 (1-3) submitted for analysis.
				SP. Light gray fine to coarse sand, wet.					Perched water.
				SM. Yellow-brown micaceous fine silty sand, dry.					30 mil. PVC.
S-2				SM. Yellow-brown fine silty sand with trace gravel, green compacted residual material fragments, dry.					Residual material.
			5						
S-3				Some gravel.					
			10						
S-4				CL. Yellow-brown micaceous fine sandy clay with little gravel, damp.					Clay liner.
				SM. Dark gray fine sand and silt with trace round gravel, dry.					Aquatic odor.
			15	Boring terminated at 16 feet.					
			20						

WELL_LOG ALLIAN .AP.GPJ DRAPER.GDT 3/3/03

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LOG OF: **7-GP-2** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **20.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
									30 mil. PVC.
S-2				SM. Yellow-brown fine micaceous silty sand with trace gravel, green compacted residual material fragments, dry.					Residual material.
			5						
S-3				Some gravel.					Soil sample 7-GP-2 (8-12) submitted for analysis.
			10						
S-4				CL. Red-brown micaceous fine sandy clay, damp.					Clay liner.
									Soil sample 7-GP-2 (13.5-14.5) submitted for analysis.
			15	SM. Dark gray fine sandy and silt with trace round gravel, dry.					Aquatic odor.
S-5									
			20	Boring terminated at 20 feet.					

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LOG OF: **7-GP-3** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **12.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
				SM. Yellow-brown, micaceous fine silty sand, moist.					30 mil. PVC.
S-2				SM. Yellow-brown micaceous fine silty sand with trace to little gravel, green compacted residual material fragments, dry.					Residual material.
			5						
S-3									
				SM. Dark gray fine sand and silt with trace round gravel, dry.					Aquatic odor. Soil sample 7-GP-3 (10-11) submitted for analysis.
			10						
				Boring terminated at 12 feet.					
			15						
			20						

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LOG OF: **7-GP-4** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **4.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt and gravel.					Boring backfilled with bentonite.
				SW. Brown fine sand, moist to wet.					
									Soil sample 7-GP-4 (3-4) submitted for analysis.
S-2			5						
				SM. Dark gray fine sand and silt, wet.					Aquatic odor.
				Boring terminated at 8 feet.					
				No residual material encountered.					
			10						
			15						
			20						

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LOG OF: **7-GP-5** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **12.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
S-2				SM. Yellow-brown micaceous fine silty sand, moist.					30 mil. PVC.
				SM. Yellow-brown fine silty sand with trace gravel and green compacted residual material fragments, dry.					Residual material.
			5						Soil sample 7-GP-5 (6-11) submitted for analysis.
S-3									
			10						
				CL. Red-brown micaceous fine sandy clay, moist.					Clay liner.
				Boring terminated at 12 feet.					
			15						
			20						

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LOG OF: **7-GP-6** (1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **12.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
									30 mil. PVC.
				SM. Yellow-brown micaceous fine silty sand, moist.					
				SM. Yellow-brown fine silty sand with trace gravel and green compacted residual material fragments, dry.					Residual material.
			5						
				CL. Red-brown micaceous fine sandy clay, moist.					Clay liner.
			10						
				Boring terminated at 12 feet.					
			15						
			20						

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LOG OF: **7-GP-7** (1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth **4.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Gravel. SW. Brown fine sand, moist to wet.					Boring backfilled with bentonite.
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

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LOG OF: **7-GP-8** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **12.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
S-2				SM. Yellow-brown fine silty sand with trace gravel and green compacted residual material fragments, dry.					30 mil. PVC. Residual material. Soil sample 7-GP-8 (5-8) submitted for analysis.
S-3			5						
			10	CL. Red-brown micaceous fine sandy clay, moist.					Clay liner.
				Boring terminated at 12 feet.					
			15						
			20						

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LOG OF: **7-GP-9** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **12.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					Perched water.
S-2				SM. Yellow-brown fine silty sand with trace gravel and green compacted residual material fragments, dry.					30 mil. PVC. Residual material.
			5						
S-3									
				CL. Red-brown micaceous fine sandy clay, moist.					Clay liner
			10						
				SM. Dark gray fine sand and silt with trace round gravel, dry.					Aquatic odor.
				Boring terminated at 12 feet.					
			15						
			20						

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LOG OF: **7-GP-10**
(1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North: East:	Logged by: **R. Miller**
Total Depth **12.0'** Elev GS: Reference: **Ground Surface**	Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					
				SM. Yellow-brown micaceous fine silty sand, moist.					Perched water.
S-2				SM. Yellow-brown fine silty sand with trace gravel and green compacted residual material fragments, dry.					30 mil. PVC. Residual material.
			5						
S-3									
			10						
				CL. Red-brown micaceous fine sandy clay, moist.					Clay liner.
				Boring terminated at 12 feet.					
			15						
			20						

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LOG OF: **7-GP-11** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: / Logged by: **R. Miller**
Total Depth **12.0'** Elev GS:	Reference: **Ground Surface** / Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Brown fine silty sand, moist.					Boring backfilled with bentonite.
				CL. Yellow-brown fine to coarse sandy clay, damp.					
				SP. Light gray fine to coarse sand, wet.					Perched water. 30 mil. PVC.
S-2				SP-GP. Yellow-brown fine silty sand with trace to little gravel, green compacted residual material fragments, dry.					Residual material.
			5						
S-3									
			10						
				CL. Red-brown micaceous fine sandy clay, damp.					Clay liner.
				Boring terminated at 12 feet.					
			15						
			20						

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LOG OF: **7-GP-12**
(1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth **4.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt and gravel.					Boring backfilled with bentonite.
				SW. Brown fine sand, moist to wet.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

DRAPER ADEN ASSOCIATES
Engineers • Geologists • Hydrologists

LOG OF: **7-GP-13**
(1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **4.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt and gravel.					Boring backfilled with bentonite.
				SW. Brown fine sand, moist to wet.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

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LOG OF: **7-GP-14**
(1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **4.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt and gravel.					Boring backfilled with bentonite.
				SW. Brown fine sand, moist to wet.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN_AP.GPJ DRAPER.GDT 3/3/03

DRAPER ADEN ASSOCIATES
Engineers • Geologists • Hydrologists

LOG OF: **7-GP-15**
(1 of 1)

Project Number: **B02271-01**

Client:	**Alliant Ammunition and Powder Co.**	Drilling Company:	**Vironex**
Project:	**HWMUs 5 & 7 Subsurface Investigation**	Driller:	**Danny Horsting**
Location:	**Radford, Virginia**	Boring Method:	**Geoprobe**
North:	East:	Logged by:	**R. Miller**
Total Depth: **4.0'**	Elev GS: Reference: **Ground Surface**	Completion Date:	**November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt and gravel.					Boring backfilled with bentonite.
				SW. Brown fine sand, moist to wet.					
				Boring terminated at 4 feet. No residual material encountered.					
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN... AP.GPJ DRAPER.GDT 3/3/03

DRAPER ADEN ASSOCIATES
Engineers • Geologists • Hydrologists

LOG OF: **7-GP-16** (1 of 1)

Project Number: **B02271-01**

Client: **Alliant Ammunition and Powder Co.**	Drilling Company: **Vironex**
Project: **HWMUs 5 & 7 Subsurface Investigation**	Driller: **Danny Horsting**
Location: **Radford, Virginia**	Boring Method: **Geoprobe**
North:	East: Logged by: **R. Miller**
Total Depth **4.0'** Elev GS:	Reference: **Ground Surface** Completion Date: **November 1, 2002**

Samp ID	Blow Counts	N Value	Depth Scale	DESCRIPTION (USC)	Stratum Elev	PID (ppm)	WELL LOG	H2O	REMARKS
S-1				Fill. Asphalt and gravel.					Boring backfilled with bentonite.
				SW. Brown fine sand, moist to wet.					
				Boring terminated at 4 feet. No residual material encountered.					Soil sample 7-GP-16 (3-4) submitted for analysis.
			5						
			10						
			15						
			20						

WELL_LOG ALLIAN...AP.GPJ DRAPER.GDT 3/3/03

APPENDIX B

DATA VALIDATION REPORTS AND LABORATORY ANALYTICAL RESULTS

SW-846 INORGANIC DATA REVIEW SUMMARY

Draper Aden Associates (DAA) performed a limited review of the analytical results for the October 31-November 1, 2002 soil sampling event at hazardous waste management units 5 and 7, Radford Army Ammunition Plant (RAAP)/Alliant Ammunition and Powder Company, Montgomery County, Virginia. Soil samples were collected from locations 5GP-1 (1-2'), 5GP-1 (9-10'), 5GP-3 (9-10'), 5GP-6 (10-11'), 5GP-8 (7-8'), 5GP-8 (11-12'), 5 GP-12 (3-4'), 5GP-16 (3-4'), 7GP-1 (1-3'), 7GP-2 (8-12'), 7GP-2 (13.5-14.5'), 7GP-3 (10-11'), 7GP-4 (3-4'), 7GP-5 (6-11'), 7GP-8 (5-8') and 7 GP-16 (3-4').

DAA performed a limited review of the analytical results for twenty-two metal target analytes analyzed per SW-846 Method 6010B, one metal target analyte analyzed per SW-846 7471A and one metal target analyte analyzed per SW-846 9012A. Inductively coupled plasma (ICP), cold vapor atomic absorption (CVAA) and colorimetric were the techniques on which the individual analytical methods for each of the inorganics were based.

Soil samples were collected and submitted to the laboratory for analysis of the following metals: ICP Method 6010B (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc), Method 7471A (mercury) and Method 9012A (total cyanide).

Severn Trent Laboratories (STL) of North Canton, Ohio performed the inorganic analyses. On behalf of RAAP, STL submitted results to Draper Aden Associates in a final certificate of analysis which included sample analytical results as well as relevant documentation to verify and validate the results.

The evaluation of STL's compliance with inorganic analytical methods and validation of results presented here are based upon a limited review of QA/QC information including chain of custody, case narrative, holding time, preservation procedures, standards, spike analysis on sample matrix (S), blank samples analyses (method, calibration and other blanks), and duplicate analyses (SD) results. Review was limited to summary sheets provided by the laboratory, unless a notable discrepancy in the data package required review of the raw data. Additionally, sample results were recalculated and verified for arsenic and cyanide, sample 7GP-3(10-11'). A summary of data review results and any observed deviations is provided below.

STL received the samples on ice and in good condition. All technical holding time criteria were met.

Method 6010B

The original certificate of analysis appeared complete in its presentation and the data were of acceptable quality. The data set exhibited the laboratory's ability to achieve the reported limit of quantitation (LOQ) for each target parameter, as outlined by the method detection limit study.

All instrument calibration and calibration verification criteria were met. Blank samples, calibration standards, pre-digestion spikes and duplicates were analyzed as required. All laboratory control samples, pre-digestion spikes and duplicates were recovered within control limits, except where noted below. Duplicate sample results exhibited acceptable precision, where applicable. All LOQ standards exhibited acceptable recovery. Deviations from specific quality control criteria that were identified and noted during the data review process are summarized below.

The associated blanks were not interference free, however, data qualification was necessary for only antimony. Antimony was reported in all samples less than the LOQ, however, all antimony results were attributed to laboratory contamination.

Antimony, chromium, vanadium, recovered low in the matrix spike sample and all results for these target parameters were qualified as estimated and should be considered biased low.

The laboratory presented all results in mg/kg and on a dry weight basis. Except where noted above, all sample results remain as reported by the laboratory. All results unaffected by the data validation process and/or detected less than their corresponding LOQs were validated and reported as "U." Refer to the attached table titled "Data Validation Report" for a summary of results which required data validation.

Methods 7471A (CVAA/ 9012A(Colorimetric)

The original certificate of analysis appeared complete in its presentation and the data were of acceptable quality. The data set exhibited the laboratory's ability to achieve the reported limit of quantitation for mercury and cyanide, as outlined by the method detection limit study.

All instrument calibration and calibration verification criteria were met. Blank samples, LCS samples, pre-digestion spikes and spike duplicates were analyzed as required. All blank criteria were met, except where noted below. Laboratory duplicate sample results exhibited acceptable precision, where applicable. All laboratory control samples, pre-digestion spikes and duplicates were recovered within control limits. Deviations from specific quality control criteria that were identified and noted during the data review process are summarized below.

The associated blanks were not interference free, however, data qualification was necessary for only cyanide. Cyanide was reported less than the LOQ in 5 GP-1(9-10') and 5-GP-6(10-11') and results were attributed to laboratory contamination. Cyanide reported above the LOQ in 7GP-3(10-11') was not influence by the observed laboratory blank contamination and no data qualification was required.

The laboratory presented all results in mg/kg and on a dry weight basis. Except where noted above, all sample results remain as reported by the laboratory. All results unaffected by the data validation process and/or detected less than their corresponding LOQs were validated and reported as "U." Refer to the attached table titled "Data Validation Report" for a summary of results which required data validation.

INORGANIC DATA EVALUATION FOR ICP SW-846 METHOD 6010B-SOILS

Sample ID: 5GP-1 (1-2'), 5GP-1 (9-10'), 5GP-3 (9-10'), 5GP-6 (10-11'), 5GP-8 (7-8'), 5GP-8 (11-12'), 5 GP-12 (3-4'), 5GP-16 (3-4'), 7GP-1 (1-3'), 7GP-2 (8-12'), 7GP-2 (13.5-14.5'), 7GP-3 (10-11'), 7GP-4 (3-4'), 7GP-5 (6-11'), 7GP-8 (5-8'), 7 GP-16 (3-4')

QC Samples: Lab blanks, Pre-digestion spikes, Duplicates, ICS, LCS, etc.
- Matrix spike/duplicate-7GP5(6-11')

Laboratory: STL, North Canton, OH; SDG A2K040189

Does Laboratory analyte list correspond to analyte list requested by DAA? _X_ yes ___ no

"☑" denotes items reviewed. See Data Validation Summary for additional comments.

A. QC DOCUMENTATION CRITERIA

☑ Specific LODs for all target analytes
☑ Specific LOQs for all target analytes

B. TECHNICAL HOLDING TIMES AND PRESERVATION REQUIREMENTS:

☑ 6 month holding time

C. INSTRUMENT CALIBRATION CRITERIA:

☑ 1 calibration blank and at least 1 standard

D. INITIAL AND CONTINUING CALIBRATION VERIFICATION CRITERIA:

☑ 10 sample frequency
☑ Use of calibration blank and check standard
☑ %R within 90-110% range

E. BLANK SAMPLES ANALYSES CRITERIA:

- ☑ Method/Other Lab Blanks (check only if analyzed)
- ☑ Interference free
- ☑ CCB 10 sample frequency

F. INTERFERENCE CHECK SAMPLES (ICS) CRITERIA:

- ☑ ICS (80-120%)

G. DUPLICATE ANALYSES CRITERIA:

- ☑ One spike/sample duplicate per batch of samples
- ☑ %RPD ± 20% for spike/ sample values greater than 5 X LOQ
- ☑ {spike/sample ± LOQ} when spike/sample values are less than 5 X LOQ

H. SPIKED SAMPLES ANALYSES /LCS CRITERIA:

- ☑ %R within 75-125% range/ 80-120%

I. SAMPLE RESULTS CRITERIA:

- ☑ Samples fall within ICP linear concentration ranges

Revisions: No revisions were required. Prep method 3050B

DAA conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA and III) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994). Validation of this data set is limited to review of items detailed in this data review report.

Validated by: Date:

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INORGANIC DATA EVALUATION FOR MERCURY- BY COLD VAPOR AA METHOD 7471A

Sample ID: 5GP-1 (1-2'), 5GP-1 (9-10'), 5GP-3 (9-10'), 5GP-6 (10-11'), 5GP-8 (7-8'), 5GP-8 (11-12'), 5 GP-12 (3-4'), 5GP-16 (3-4'), 7GP-1 (1-3'), 7GP-2 (8-12'), 7GP-2 (13.5-14.5'), 7GP-3 (10-11'), 7GP-4 (3-4'), 7GP-5 (6-11'), 7GP-8 (5-8'), 7 GP-16 (3-4')

QC Samples: Lab blanks, Pre-digestion spikes, Duplicates, LCS, Matrix spike/duplicate-7GP5(6-11')

Laboratory: STL, North Canton, OH; SDG A2K040189

Does Laboratory analyte list correspond to analyte list requested by DAA? √yes ___no

"☑" denotes items reviewed. See Data Validation Summary for additional comments.

A. QC DOCUMENTATION CRITERIA

☑ Specific LODs for all target analytes
☑ Specific LOQs for all target analytes

B. METHOD INFORMATION DOCUMENTATION

☑ All target parameters analyzed by requested methods?

C. TECHNICAL HOLDING TIMES AND PRESERVATION REQUIREMENTS:

☑ 28 Day holding time
☑ Cool 4°C

D. INSTRUMENT CALIBRATION CRITERIA:

☑ 1 calibration blank and 5 standards
☑ Instrument calibrated for every analytical sequence for every method

E. INITIAL AND CONTINUING CALIBRATION VERIFICATION CRITERIA:

- ☑ 10 sample frequency for CCV
- ☑ %R within 90-110% range

F. BLANK SAMPLES ANALYSES CRITERIA:

- NA Trip Blank (check only if analyzed)
- NA Equipment Blank (check only if analyzed)
- ☑ Method/other laboratory blanks (check only if analyzed)
- ☑ Interference free
- ☑ CCB 10 sample frequency

G. DUPLICATE ANALYSES CRITERIA:

- ☑ One spike/sample duplicate per batch of samples
- ☑ %RPD ± 20% for spike/sample values greater than 5 X LOQ
- ☑ {spike/sample ± LOQ} when spike/sample values are less than 5 X LOQ

H. SPIKED SAMPLES ANALYSES/LCS CRITERIA:

- ☑ Pre-digestion matrix spikes for all analytes
- ☑ %R within 75-125% range/80-120%

I. SAMPLE RESULTS CRITERIA:

- ☑ Samples fall within calibration concentration range

J. Revisions: No revisions were required.

DAA conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA and III) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994). Validation of this data set is limited to review of items detailed in this data review report.

Validated by: Date:

JF 12.4.02

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INORGANIC DATA EVALUATION FOR CYANIDE BY METHOD 9012A

Sample ID: 5GP-1 (1-2'), 5GP-1 (9-10'), 5GP-3 (9-10'), 5GP-6 (10-11'), 5GP-8 (7-8'), 5GP-8 (11-12'), 5 GP-12 (3-4'), 5GP-16 (3-4'), 7GP-1 (1-3'), 7GP-2 (8-12'), 7GP-2 (13.5-14.5'), 7GP-3 (10-11'), 7GP-4 (3-4'), 7GP-5 (6-11'), 7GP-8 (5-8'), 7 GP-16 (3-4')

QC Samples: Lab blanks, Pre-digestion spikes, Duplicates, ICS, LCS, etc.
- Matrix spike/duplicate-7GP5(6-11')

Laboratory: STL, North Canton, OH; SDG A2K040189

Does Laboratory analyte list correspond to analyte list requested by DAA? X yes ___no

"☑" denotes items reviewed. See Data Validation Summary for additional comments.

A. QC DOCUMENTATION CRITERIA

☑ Specific LODs for all target analytes
☑ Specific LOQs for all target analytes

B. TECHNICAL HOLDING TIMES AND PRESERVATION REQUIREMENTS CRITERIA:

☑ 14 days holding time
☑ Cool 4° C

C. INSTRUMENT CALIBRATION CRITERIA:

☑ 6 levels plus blank

D. INITIAL AND CONTINUING CALIBRATION VALIDATION CRITERIA:

☑ 20 sample frequency
☑ Use of check standard with every batch of samples
☑ %R within 85-115% range (± 15%)

E. BLANK SAMPLES ANALYSES CRITERIA:

☑ Interference free

☑ Verification Blank analysis every 20 samples

F. DUPLICATE SAMPLE ANALYSES CRITERIA:

☑ One duplicate for every 20 samples
☑ %RPD ± 20% for sample values greater than 5 times LOQ
☑ (Sample ± LOQ) when values are less than 5 times LOQ

G. SPIKED SAMPLE ANALYSES CRITERIA:

☑ One spike for every 20 samples
☑ Spikes fall within 85-115% range

H. LCS CRITERIA:

☑ 80-120%

I. SAMPLE RESULTS CRITERIA:

☑ Samples fall within calibration concentration range

DAA conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA, and III) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994). Validation of this data set is limited to review of items detailed in this data review report.

Validated by: _____ Date: JCF 12-17-02

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SW-846 METHODS 8081A
VOLATILE DATA REVIEW SUMMARY

Draper Aden Associates (DAA) performed a limited review of the analytical results for the October 31-November 1, 2002 soil sampling event at hazardous waste management units 5 and 7, Radford Army Ammunition Plant (RAAP)/Alliant Techsystems. Soils samples were collected from sixteen sample locations (see page 3 for specific sample identifications). All soil samples were analyzed for twenty-eight (28) pesticides and polychlorinated biphenyls (PCBs) per USEPA Methods 8081A.

Lancaster Laboratories (Lancaster) of Lancaster, Pennsylvania performed the analyses. On behalf of RAAP, Lancaster submitted results to DAA in a final certificate of analysis, which included sample analytical results as well as relevant documentation to validate and verify the results.

The evaluation of laboratories' compliance with Method 8081A and validation of the results was based on a limited review of the following items: quality control (QC) deliverables package, QC history documentation, case narrative, technical holding time and preservation requirements, extraction procedures, instrument calibrations, blank analysis, surrogate spike recoveries, retention time, matrix spike (MS/MSD) analyses, laboratory control samples (LCS), and internal standards requirements, where applicable. A review of all transcriptions from instrument data to sample summary sheets was performed. Specific representative calculations were performed. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

The laboratory received the samples on ice and in good condition with custody seals intact. All technical holding time criteria were met. All sample extraction and analysis holding time criteria were met. All preservation criteria were met.

Method 8081A

The original certificate of analysis for Method 8081A was complete in its presentation and the data were of acceptable quality. The data set exhibited the laboratory's ability to achieve the reported limit of quantitation (LOQ) for each target parameter, as outlined by the method detection limit study.

All QC history documentation and QC check sample criteria were met. All initial calibration, calibration verification, breakdown check, blank, surrogate, retention time, MS/MSD and LCS 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 quality assurance and quality control criteria that were identified during the review process are summarized below.

Sample analysis by Method 8081A included PCBs. However, since the LCS and MS/MSD samples were not spiked with PCBs, all PCB results were qualified as estimated due to limited availability of quality control data.

All sample results were reported on a dry-weight basis. All samples were florisil cleaned. To obtain a final result within the instrument calibration range, sample dilutions were required, where appropriate.

Target parameters reported above the LOQ remain as reported by the laboratory. All sample results unaffected by the data validation process and/or detected less than their corresponding LOQs were validated and reported as "U" (i.e., not detected above the LOQ). Refer to the attached table titled "Data Validation Report" for a summary of results which required data validation.

SW-846 METHOD 8081A (ORGANOCHLORINE PESTICIDES/PCBs)
GC DATA VALIDATION FOR SOILS

Sample ID: 5GP-1(1-2'), 5GP-1(9-10'), 5GP-6(10-11'), 5GP-3(9-10'), 5GP-8(7-8'), 5GP-8(11-12'), 5GP-16(3-4'), 5GP-12(3-4'), 7GP-1(1-3'), 7GP-2(8-12'), 7GP-2(13.5-14.5'), 7GP-3(10-11'), 7GP-8(5-8'), 7GP-5(6-11'), 7GP-16(3-4'), 7GP-4(3-4')

QC Samples: 7GP-5(6-11') Matrix spike/Matrix spike duplicate, Extraction Blank, LCS

Laboratory: Lancaster Laboratories, Lancaster, PA, SDG RAR01-01

Comments: Method 8081A involves the extraction of samples usingSW-846 Method 3550B-ultrasonic extraction. Target parameters are separated and quantified by GC using electron capture detection (ECD). All samples were florisil cleaned.

A. QC DELIVERABLES PACKAGE:

1.	Was case narrative present and signed by a laboratory representative?	☑ YES ☐ NO
2.	Was the Chain of Custody present and signed by a laboratory representative?	☑ YES ☐ NO
3.	Were sample results included for all sample locations?	☑ YES ☐ NO
4.	Did the laboratory parameter list correspond to project specific parameter list?	☑ YES ☐ NO
5.	Were the LOQs reported on sample summary sheets supported by the MDL study?	☑ YES ☐ NO
6.	Did the electronic deliverable list the correct LOQs?	☑ YES ☐ NO

Comments: All QC deliverables requirements were met.

B. INSTRUMENT QC HISTORY DOCUMENTATION CRITERIA:

1.	Was the specific extraction method specified?	☑ YES ☐ NO
2.	Was documentation of DDT/Endrin breakdown study provided?	☑ YES ☐ NO
3.	Were instrument specific LODs for the target parameters provided?	☑ YES ☐ NO
4.	Were instrument specific LOQs for the target parameters provided?	☑ YES ☐ NO
5.	Were instrument specific working ranges for target parameters specified?	☑ YES ☐ NO
6.	Were sample analysis log sheets provided?	☑ YES ☐ NO

7. Were chromatograms and integration reports provided? ☑ YES ☐ NO

Comments: All instrument QC history criteria were met.

C. CHECK SAMPLE CRITERIA:
(Initial Demonstration of Capability)

1. Was the check sample data obtained from the instrument that was used for analysis? ☑YES ☐ NO
2. Did the check sample contain all required target parameters? ☑ YES ☐ NO
3. Were the check samples analyzed in quadruplicate? ☑ YES ☐ NO
4. Were the average recoveries of the target parameters in the check samples reported? ☑ YES ☐ NO
5. Were the standard deviations for the recoveries of target parameters quadruplicated and reported? ☑ YES ☐ NO

Comments: All check sample criteria were met.

D. TECHNICAL HOLDING TIME AND PRESERVATION CRITERIA:

1. Was the 7-day sample collection to extraction holding time met? ☑ YES ☐ NO
2. Was the 40-day extraction to analysis holding time met? ☑ YES ☐ NO
3. Were the samples received at 4°C (± 2°C)? ☑ YES ☐ NO

Comments: All preservation criteria were met. All sample extraction and analysis holding time criteria were met.

E. INITIAL GC CALIBRATION CRITERIA:

1. Were all target parameters included in the ICAL? ☑ YES ☐ NO
2. Was a minimum five-point calibration analyzed prior to analysis? ☑YES ☐ NO
3. Calibration type used by laboratory: *External.*
4. Was the % Relative Standard Deviation (%RSD) for all target parameter CFs <20% over the established working range? ☑ YES ☐ NO
5. State the Quantitation Method used by the laboratory: *Calibration Factor.*
6. List target parameters with a % RSD >20% over the established working range: *None.*
   Note: Up to 2 target parameters may exceed the 20% criteria, but must be <30%.

7. Was the lowest concentration calibration standard at or below the LOQ, MCL, regulatory compliance or action limit? ☑ YES ☐ NO
8. Were calibration standards dropped to meet calibration criteria? ☑NA ☐YES ☐ NO

Comments: All initial calibration criteria were met. The lowest calibration standard for 4,4-DDD was manually calculated to verify the calibration standard concentration was less than the LOQ.

F. DDT / ENDRIN BREAKDOWN CHECK CRITERIA:

1. Was a 4,4'-DDT and Endrin standard analyzed every 12-hours? ☑ YES ☐ NO
2. For every 12-hours, was 4,4'-DDE, 4,4'-DDD, Endrin Ketone or Endrin Aldehyde present which indicated breakdown? ☑ YES ☐ NO
3. Was the calculated % breakdown less than 15%? ☐ NA ☑ YES ☐ NO
   If no, corrective action must be taken before proceeding with analysis.

Comments: All DDT/Endrin breakdown criteria were met.

G. CALIBRATION VERIFICATION CRITERIA:

1. Was a calibration verification (CV) standard performed once every 12-hours? ☑ YES ☐ NO
2. Did target parameter responses have a % Difference (%D) within ± 15%? (For chlordane and toxaphene, qualify only 3 peaks). ☑ YES ☐ NO
   If no, was a new calibration curve prepared? *No.*
3. Was a mid-concentration standard analyzed after each group of 20 samples (10 recommended) and at the end of the analytical sequence? ☑YES ☐ NO
4. Were all target parameters and surrogates included in the CV? ☑ YES ☐ NO

Comments: All calibration verification criteria were met.

H. BLANK CRITERIA:

1. Was a blank analyzed prior to the batch samples? ☑ YES ☐ NO
2. Was a blank analyzed after 20 batch samples? ☐ NA ☑ YES ☐ NO
3. Was an extraction blank analyzed with the batch samples? ☑ YES ☐ NO

4 Was a trip blank analyzed per analytical batch? ☑ YES ☐ NO
5. List target parameters identified in the blanks: *None.*

Comments: All blank criteria were met.

I. SURROGATE CRITERIA:

1. Were all samples, standards, blanks, and checks spiked with at least 2 surrogate parameters for dual column analysis? ☑ YES ☐ NO
2. List surrogate used and laboratory's surrogate % recovery range criteria:
   tetrachloro-xylene (TCMX): 40%-130%
   decachlorobiphenyl (DCBP): 40%-130%
   4-chloro-3-nitrobenzotrifluoride (CNBT): 40%-130%
3. List samples whose surrogate % recoveries were not within the laboratory range: *None*

Comments: All surrogate recovery criteria were met.

J. RETENTION TIME CRITERIA:

1. Were the daily Retention Time (RT) windows reported? ☑ YES ☐ NO

Comments: All retention time criteria were met.

K. MATRIX SPIKE/ MATRIX SPIKE DUPLICATE CRITERIA:

1. Was a MS/MSD analyzed per sample batch or every 20 samples, whichever may occur first? ☑ YES ☐ NO
2. Did the MS/MSD contain required target parameters? See comment section
3. Was the MS/MSD analyzed on the specific project matrix? ☑ YES ☐ NO
4. List laboratory's matrix spike % recovery range criteria: *40%-130%, select analytes*
5. List matrix spike target parameters not within the recovery range criteria: None
6. Was a LCS analyzed to address failed matrix spike criteria? ☑ NA ☐ YES ☐ NO
7. Did the LCS for the failed matrix spike

parameter(s) fall within the recovery range criteria and was the problem identified as matrix interference? ☑ NA ☐ YES ☐ NO

8. Were any parameters flagged as estimated concentrations? ☐ YES ☑ NO
9. List parameters flagged as estimated concentrations:

Comments: The QC samples were not spiked with PCBs. All PCB results were qualified as estimated due to insufficient quality control data. All other matrix spike criteria were met.

L. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

1. Was a LCS included in the sample analysis? ☑ YES ☐ NO
2. Did the LCS contain all required target parameters?*select analytes* ☑ YES ☐ NO
3. List the LCS parameters and the laboratory's recovery range criteria. *See certificate of analysis.*
4. List the LCS parameters not within the recovery range criteria. *None.*

Comments: The LCS was not spiked with PCBs. All PCB results were qualified as estimated due to insufficient quality control data. All other LCS data were met.

M. TARGET PARAMETER IDENTIFICATION:

1. Were the reported parameters within the retention time windows? ☑ NA ☐ YES ☐ NO
2. Were retention time shifts observed when compared with the last calibration verification? ☐ YES ☑ NO
3. Were all reported parameters confirmed? ☑ YES ☐ NO
4. Did the initial analysis of any sample have a concentration of a target parameter which exceeded the instrument calibration range? ☑ NA ☐ YES ☐ NO
5. Were sample dilutions required? ☑ YES ☐ NO
6. Were all parameter concentrations that were recorded on the sample quantitation reports accurately transferred to the sample summary sheets? ☑ YES ☐ NO

Comments: All target parameter identification criteria were met. The 4,4"-DDD sample result for 7GP-2(8-12") was manually verified and no calculation discrepancy was observed. All results above the LOQ were verified against the instrument data, primary

and confirmation data. For results above the LOQ, the disparity between the results from both columns was acceptable (<40RPD).

N. DAA CORRECTIVE ACTION TAKEN AND GENERAL COMMENTS:

Comments: No corrective action was taken.

LIMITATIONS AND REFERENCES:

Draper Aden Associates conducted a limited data validation for the above noted data set using summary tables and raw data provided by the analyzing laboratory. Data evaluation was conducted in general accordance with 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 CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999). Validation of this data set is limited to the items detailed in this report.

Validated by: JCF

Date: 12-17-02

Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

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METHODS 8260B AND 8270C ORGANIC DATA REVIEW SUMMARY

Draper Aden Associates (DAA) performed a limited review of the analytical results for the October 31-November 1, 2002 soil sampling event at hazardous waste management units 5 and 7, Radford Army Ammunition Plant (RAAP)/Alliant Techsystems, Montgomery County, Virginia. Soil samples were collected from locations 5GP-1 (1-2'), 5GP-1 (9-10'), 5GP-3 (9-10'), 5GP-6 (10-11'), 5GP-8 (7-8'), 5GP-8 (11-12'), 5 GP-12 (3-4'), 5GP-16 (3-4'), 7GP-1 (1-3'), 7GP-2 (8-12'), 7GP-2 (13.5-14.5'), 7GP-3 (10-11'), 7GP-4 (3-4'), 7GP-5 (6-11'), 7GP-8 (5-8'), and 7 GP-16 (3-4'). Soil samples were analyzed for the 33 (thirty-three) volatile parameters by Method 8260B and 64 (sixty-four) semivolatile parameters according to Method 8270C.

Lancaster Laboratories (Lancaster) of Lancaster, Pennsylvania performed the GC/MS analysis. Lancaster Laboratories submitted results to DAA in a final certificate of analysis, which included sample analytical results as well as relevant documentation to validate and verify the results.

The evaluation of Lancaster's compliance with Methods 8260B and 8270C and validation of the results was based on a limited review of the following items: QC deliverables package, QC history documentation, case narrative, technical holding time and preservation requirements, instrument performance (tune) check, instrument calibrations, blank analysis, surrogate spike recoveries, matrix spike and matrix spike duplicate (MS/MSD) analyses, laboratory control sample (LCS) data, and internal standard requirements. A review of all transcriptions from instrument data to sample summary sheets was performed. Specific representative calculations were not performed. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

Method 8260B

The revised certificate of analysis for Method 8260B appeared complete in its presentation and the data were of acceptable quality. The data set demonstrated the laboratory's ability to achieve the reported LOQ, as outlined by the initial calibration data and the method detection limit study data. The first calibration level was less than the reported LOQ in all cases.

All sample holding time criteria, QC history documentation, instrument performance check (tuning) criteria, initial calibration, blank, and internal standard requirements were met. All sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted. Deviations from specific quality assurance/quality control (QA/QC) criteria that were identified during the data review process are discussed below.

Samples collected from HWMU 5 on October 31, 2002 were shipped on ice and under chain of custody for overnight delivery to the laboratory. Although samples were packed in ice

for shipment, the Lancaster Laboratories Sample Administration Receipt Documentation Log noted that only bagged ice was present the morning of November 1, 2002. As well, the cooler temperature bottle/blank was recorded as 7°C, which is 1 degree higher than method guidelines of 4°C (± 2°C). Sample results for HWMU-5 may be biased slightly low due to elevated sample storage temperature.

All calibration verification criteria were met except acetone, 2-butanone, 2-hexanone and 1,1,2,2-tetrachloroethane (associated with HWMU-5) and 1,1-dichloroethane (associated with HWMU-7) exceeded validation guidelines for percent drift / difference. Results for these parameter, where appropriate, were qualified as estimated

All surrogate criteria were met except for one slightly low surrogate recovery in sample 5GP-1 (1-2'). Insufficient sample was available for reanalysis. However, the matrix spike analysis for this sample had compliant surrogate recoveries. As per validation guidelines all results were qualified as estimated for this sample.

A MS, LCS and LCS duplicate were performed. Due to limited sample volume a MSD was not performed. All quality control samples were spiked with all parameters of interest. All recoveries and %RPD results, where applicable, were acceptable for all target parameters.

All target parameter identification and quantitation requirements were met. No target parameters were reported above the LOQ in any sample.

All results were reported on a dry weight basis. All sample results unaffected by the data validation process and less than their corresponding LOQs were validated and reported as "U." Refer to the attached table titled "Data Validation Report" for a summary of results which required data validation.

Method 8270C

The original certificate of analysis for Method 8270C was complete and the data were of acceptable quality. The data set demonstrated the laboratory's ability to achieve the reported LOQ, as outlined by the initial calibration data as well as the method detection limit study data.

QC history documentation were provided. Sample preservation, instrument performance check (tuning), initial calibration, calibration verification, blank, surrogate, MS/MSD, LCS and internal standard requirements were met. All 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.

METHODS 8260B AND 8270C ORGANIC DATA REVIEW SUMMARY

Draper Aden Associates (DAA) performed a limited review of the analytical results for the October 31-November 1, 2002 soil sampling event at hazardous waste management units 5 and 7, Radford Army Ammunition Plant (RAAP)/Alliant Techsystems, Montgomery County, Virginia. Soil samples were collected from locations 5GP-1 (1-2'), 5GP-1 (9-10'), 5GP-3 (9-10'), 5GP-6 (10-11'), 5GP-8 (7-8'), 5GP-8 (11-12'), 5 GP-12 (3-4'), 5GP-16 (3-4'), 7GP-1 (1-3'), 7GP-2 (8-12'), 7GP-2 (13.5-14.5'), 7GP-3 (10-11'), 7GP-4 (3-4'), 7GP-5 (6-11'), 7GP-8 (5-8'), and 7 GP-16 (3-4'). Soil samples were analyzed for the 33 (thirty-three) volatile parameters by Method 8260B and 64 (sixty-four) semivolatile parameters according to Method 8270C.

Lancaster Laboratories (Lancaster) of Lancaster, Pennsylvania performed the GC/MS analysis. Lancaster Laboratories submitted results to DAA in a final certificate of analysis, which included sample analytical results as well as relevant documentation to validate and verify the results.

The evaluation of Lancaster's compliance with Methods 8260B and 8270C and validation of the results was based on a limited review of the following items: QC deliverables package, QC history documentation, case narrative, technical holding time and preservation requirements, instrument performance (tune) check, instrument calibrations, blank analysis, surrogate spike recoveries, matrix spike and matrix spike duplicate (MS/MSD) analyses, laboratory control sample (LCS) data, and internal standard requirements. A review of all transcriptions from instrument data to sample summary sheets was performed. Specific representative calculations were not performed. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

Method 8260B

The revised certificate of analysis for Method 8260B appeared complete in its presentation and the data were of acceptable quality. The data set demonstrated the laboratory's ability to achieve the reported LOQ, as outlined by the initial calibration data and the method detection limit study data. The first calibration level was less than the reported LOQ in all cases.

All sample holding time criteria, QC history documentation, instrument performance check (tuning) criteria, initial calibration, blank, and internal standard requirements were met. All sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted. Deviations from specific quality assurance/quality control (QA/QC) criteria that were identified during the data review process are discussed below.

Samples collected from HWMU 5 on October 31, 2002 were shipped on ice and under chain of custody for overnight delivery to the laboratory. Although samples were packed in ice

for shipment, the Lancaster Laboratories Sample Administration Receipt Documentation Log noted that only bagged ice was present the morning of November 1, 2002. As well, the cooler temperature bottle/blank was recorded as 7°C, which is 1 degree higher than method guidelines of 4°C (± 2°C). Sample results for HWMU-5 may be biased slightly low due to elevated sample storage temperature. All other sample preservation criteria were met.

All calibration verification criteria were met except acetone, 2-butanone, 2-hexanone and 1,1,2,2-tetrachloroethane (associated with HWMU-5) and 1,1-dichloroethane (associated with HWMU-7) exceeded validation guidelines for percent drift / difference. Results for these parameters, where appropriate, were qualified as estimated

All surrogate criteria were met except for one slightly low surrogate recovery in sample 5GP-1(1-2'). Insufficient sample was available for reanalysis. However, the matrix spike analysis for this sample had compliant surrogate recoveries. As per validation guidelines, all results were qualified as estimated for this sample.

A MS, LCS and LCS duplicate were performed. Due to limited sample volume a MSD was not performed. All quality control samples were spiked with all parameters of interest. All recoveries and %RPD results, where applicable, were acceptable for all target parameters.

All target parameter identification and quantitation requirements were met. No target parameters were reported above the LOQ in any sample.

All results were reported on a dry weight basis. All sample results unaffected by the data validation process and less than their corresponding LOQs were validated and reported as "U." Refer to the attached table titled "Data Validation Report" for a summary of results which required data validation.

Method 8270C

The original certificate of analysis for Method 8270C was complete and the data were of acceptable quality. The data set demonstrated the laboratory's ability to achieve the reported LOQ, as outlined by the initial calibration data as well as the method detection limit study data.

QC history documentation were provided. Sample preservation, instrument performance check (tuning), initial calibration, calibration verification, blank, surrogate, MS/MSD, LCS and internal standard requirements were met. All 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.

All target parameter identification and quantitation requirements were met. All results were reported on a dry weight basis. All sample results unaffected by the data validation process and greater than their corresponding LOQs remain as reported by Lancaster Laboratories. All sample results less than their corresponding LOQs were validated and reported as "U." Refer to the attached table titled "Data Validation Report" for a summary of results which required data validation.

SW-846 METHOD 8260B (GC/MS) VOLATILE ORGANIC DATA VALIDATION

HWMU-5				
Sample ID:	5GP-1 (1-2'),	5GP-1 (9-10'),	5GP-3 (9-10'),	5GP-6 (10-11'),
	5GP-8 (7-8'),	5GP-8 (11-12'),	5 GP-12 (3-4'),	5GP-16 (3-4')
HWMU-7				
Sample ID:	7GP-1 (1-3'),	7GP-2 (8-12'),	7GP-2 (13.5-14.5'),	7GP-3 (10-11'),
	7GP-4 (3-4'),	7GP-5 (6-11'),	7GP-8 (5-8'),	7 GP-16 (3-4')

QC Samples: 5GP-1 (1-2')MS, LCS, LCS DUP, Method Blank
7GP-5 (6-11')MS, 7GP-5 (6-11')MSD, LCS, Method Blank

Laboratory: Lancaster Laboratories, Lancaster PA; SDG RAR01-01

Comment: *Method 8260B uses a purge and trap system to remove volatile organic target analytes from a 5 gram soil sample (SW-846 5035). Parameters are separated and quantified using a capillary column GC/MS.*

A. QC DELIVERABLES PACKAGE:

1. Was the case narrative present and signed by a laboratory representative? ☑ YES ☐ NO
2. Was the Chain of Custody present and signed by a laboratory representative? ☑ YES ☐ NO
3. Were the sample results included for all sample locations? ☑ YES ☐ NO
4. Did the laboratory parameter list correspond to the project specific parameter list? ☑ YES ☐ NO
5. Did the laboratory parameter list include methylene chloride and vinyl chloride for confirmational analysis? ☑ NA ☐ YES ☐ NO
6. Were all parameter LOQs reported on sample summary sheets in agreement with the instrument specific MDL study? ☑ NA☐ YES ☐ NO

Comments: All QC deliverables package requirements were met. The MDL study does not list the LOQ. However, all LOQs are supported by an acceptable MDL study. A 1 ppb standard was also analyzed and reported to support limit of detection (LOD) values.

B. QC HISTORY DOCUMENTATION CRITERIA:

1. Was an instrument specific MDL study provided, which included LOD and LOQ values for all target parameters? ☑ YES ☐ NO
2. Was the instrument specific working range for each target parameter specified? ☑ YES ☐ NO
3. Was initial demonstration of capability data provided for each target parameter? ☑ YES ☐ NO

Comments: QC history documentation criteria were met. MDL study is laboratory specific.

C. TECHNICAL HOLDING TIME AND PRESERVATION CRITERIA:

1. Was the 14-day sample collection to analysis holding time met? ☑ YES ☐ NO
2. Were the samples received at 4°C (± 2°C)? ☐ YES ☑ NO
3. Was the pH of each sample adjusted to < 2 with HCl? ☑ NA ☐ YES ☐ NO

Comments: All sample holding time criteria were met.

Samples collected from HWMU 5 on October 31, 2002 were shipped on ice and under chain of custody for overnight delivery to the laboratory. Although samples were packed in ice for shipment, the Lancaster Laboratories Sample Administration Receipt Documentation Log noted that only bagged ice was present the morning of November 1, 2002. As well, the cooler temperature bottle/blank was recorded as 7°C, which is 1 degree higher than method guidelines of 4°C (± 2°C). Sample results for HWMU-5 may be biased slightly low due to elevated sample storage temperature. All other sample preservation criteria were met.

D. GC/MS INSTRUMENT PERFORMANCE (TUNING) CHECK CRITERIA:

1. Was analysis of the instrument performance check solution performed at the beginning of each 12-hour period during which standards or samples were analyzed? ☑ YES ☐ NO
2. Was there documentation of the injection of 5-50 ng bromofluorobenzene (BFB)? ☑ YES ☐ NO
3. Were all ion abundance criteria met? ☑ YES ☐ NO
4. Were calibration, blank, and sample analyses performed within 12 hours of tuning? ☑ YES ☐ NO

Comments: All instrument performance check criteria were met.

E. INITIAL GC/MS CALIBRATION CRITERIA:

SW-846 Criteria:

1. Was the internal standard (IS) which was selected for target parameter RF calculation the IS which had the closest retention time? ☑ YES ☐ NO
2. Were all target parameters included in the ICAL? ☑ YES ☐ NO
3. Did all ICALs consist of a minimum of 5 calibration levels? ☑ YES ☐ NO
4. Was the lowest concentration calibration standard at or below the associated MCL, regulatory compliance, or action limit? ☑ NA ☐ YES ☐ NO
4. Was the calibration curve developed using the same purge volume used for sample analysis? ☑ YES ☐ NO
6. Were 8260B SPCC criteria met? ☑ YES ☐ NO
   - chloromethane (0.100)
   - 1,1-dichloroethane (0.100)
   - bromoform (0.100)
   - 1,1,2,2-tetrachloroethane (0.300)
   - chlorobenzene (0.300)

7. Were 8260B CCC criteria met? (%RSD ≤ 30%) ☑ YES ☐ NO
   - 1,1-dichloroethene
   - chloroform
   - 1,2-dichloropropane
   - toluene
   - ethylbenzene
   - vinyl chloride

8. Was each target parameter %RSD ≤ 15%? ☐ YES ☑ NO

9. Was the correlation coefficient >0.99 for target parameters with ≥15 % RSD? ☐ NA ☑ YES ☐ NO

Method Validation Performance Criteria:

1. Did target parameters and surrogates have % RSDs ≤ 15% and >0.99 correlation coefficient? ☐NA ☑ YES ☐ NO

   (Evaluate RRFs < 0.05 for potential problems.)

Comments: All initial calibration criteria were met.

F. CALIBRATION VERIFICATION CRITERIA:

SW-846 Criteria:

1. Was a calibration verification analyzed at the beginning of each 12-hour period following the analysis of the instrument performance check and prior to analysis of the method blank and samples? The calibration verification may be part of the ICAL or analyzed independently during another 12-hour analysis period. ☑ YES ☐ NO

2. Were 8260B SPCC criteria met? ☑ YES ☐ NO
   - chloromethane (0.100)
   - 1,1-dichloroethane (0.100)
   - bromoform (0.100)
   - 1,1,2,2-tetrachloroethane (0.300)
   - chlorobenzene (0.300)

3. Were 8260B CCC criteria met?
   (%Drift or % Difference (%D) within ± 20%) ☑ YES ☐ NO
   - 1,1-dichloroethene
   - chloroform
   - 1,2-dichloropropane
   - toluene
   - ethylbenzene
   - vinyl chloride

Method Validation Performance Criteria:

1. Did all target parameters and system monitoring parameters (surrogates) have the % D within ± 25.0%? ☐ YES ☑ NO
   (Evaluate RRFs < 0.05 for potential problems.)

   If "NO", list parameters that exceed these criteria:

HWMU-5

acetone %D = 26%
2- butanone %D = 41%
2-hexanone %D = 35%
1,1,2,2-tetrachloroethane %D = 28%

HWMU-7

1,1-dichloroethane %D = 26%

DAA Contractual Requirements:

1. Did all target parameters and system monitoring parameters (surrogates) have % Ds within ± 25.0%? *not applicable for this project*

2. Three parameters may fail to meet maximum % D as long as the % D is within ± 40.0%
   Did the calibration verification meet this criteria? *not applicable for this project*

Comments: All calibration verification criteria were met except acetone, 2-butanone, 2-hexanone and 1,1,2,2-tetrachloroethane (associated with HWMU-5) and 1,1-dichloroethane (associated with HWMU-7) exceeded validation guidelines for percent drift / difference. Results for these parameter, where appropriate, were qualified as estimated.

G. BLANK CRITERIA:

1. Was a method blank analyzed after the calibration standards, prior to sample analysis, and once for every 12-hour period beginning with the injection of BFB? ☑ YES ☐ NO
2. Was a trip blank analyzed with this sample batch? ☐ YES ☑ NO
3. Were the trip blanks and method blanks interference free? ☑ YES ☐ NO
4. List target parameters detected in the blanks: *none*
5. Was the level of blank contamination less than 5% of the MCL associated with the analyte? ☑ NA ☐ YES ☐ NO
6. Did any samples contain high concentrations of VOCs in excess of the linear range of the calibration curve? ☐ YES ☑ NO
7. Were one or more blanks analyzed following the high concentration sample to prevent cross contamination? ☑ NA ☐ YES ☐ NO

Comments: All blank criteria were met.

H. SURROGATE CRITERIA:

SW-846 Criteria:

1. Were the following surrogates used? ☑ YES ☐ NO
   - dibromofluoromethane (80%-120%)
   - 4-bromofluorobenzene (74%-121%)
   - toluene-d_8 (81%-117%)

- 1,2-dichloroethane-d_4 (80%-120%)

2. Were recoveries within the specified ranges? ☐ YES ☑ NO
If "NO", corrective action is required. Flagging of the data as estimated is not acceptable until corrective action has been attempted.

3. Were samples with surrogates outside the QC window reanalyzed as required? *See comment*

Comments: All surrogate criteria were met except for one slightly low surrogate recovery in sample 5GP-1 (1-2'). Insufficient sample was available for reanalysis. However, the matrix spike for this sample had compliant surrogate recoveries. As per validation guidelines, all results were qualified as estimated for this sample. All other surrogate criteria were met.

I. MATRIX SPIKE, MATRIX SPIKE DUPLICATE CRITERIA:

(MS/MSD Requirements - CLP Guidelines)

Parameter	*% R Water*	*RPD Water*
1,1-dichloroethene	61-145	14
trichloroethene	71-120	14
benzene	76-127	11
toluene	76-125	13
chlorobenzene	75-130	13

1. Was a matrix spike and matrix spike duplicate (MS/MSD) analyzed per sample batch or every 20 samples, whichever may occur first? *See comment*
2. Did the MS/MSD contain additional target parameters? *See comment*
3. Was the MS/MSD analyzed on the specific project matrix? *See comment*
4. List matrix spike target parameters not within laboratory recovery ranges: *none*
5. Was a LCS analyzed to address failed matrix spike criteria? *See comment*
6. Did the LCS for the failed matrix spike parameter(s) fall within the acceptable recovery ranges and was the problem identified as matrix interference? *NA.*
7. Were any parameters flagged as estimated concentrations? ☐ NA ☐ YES ☑ NO
8. List parameters flagged as estimated concentrations: *none*

Comments:
HWMU-5: Due to limited sample volume, a MSD was not performed. A MS, LCS and LCS Duplicate were performed. These QC samples were spiked with all parameters of interest. All recoveries and %RPD results, where applicable, were acceptable for all target parameters.
HWMU-7: All MS/MSD criteria were met. QC was performed on 7 GP-5(6-11').

J. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

1. Was a LCS included in the sample analysis? ☑ YES ☐ NO
2. Did the LCS contain all required target parameters? ☑ YES ☐ NO
3. List the LCS parameters and the laboratory's acceptable recovery range. *See page 37-38 and 137-138 of the volatile certificate of analysis.*
4. List the LCS parameters that exceeded the acceptable recovery range. *None.*

Comments: All LCS criteria were met.

K. INTERNAL STANDARDS CRITERIA:

1. Were the following internal standards used? ☑ YES ☐ NO
   - fluorobenzene
   - chlorobenzene-d_5
   - 1,4-dichlorobenzene-d_4
2. Were internal standard areas within - 50% to + 100% of the last calibration verification? ☑ YES ☐ NO
3. Were internal standard retention times within ± 30 seconds of the last calibration verification? ☑ YES ☐ NO
4. Were samples failing items 2. and/or 3. above reanalyzed as required by the method? ☑ NA ☐ YES ☐ NO

Comments: All internal standard criteria were met.

L. TARGET PARAMETER IDENTIFICATION:

1. Were the RRTs of the reported parameters within ± 0.06 RRT units of the standard RRT? ☐ NA ☑ YES ☐ NO
2. Check the sample spectra against the laboratory standard spectra to see that the following criteria were met:

- Did characteristic ions maximize in the same scan or within one scan of each other? ☐ NA ☑ YES ☐ NO
- Were all characteristic ions present in the standard spectra present in the sample spectra for parameters detected above the LOQ? ☑ NA ☐ YES ☐ NO
- Were the relative intensities of the ions between the standard and sample spectra within ± 30 %? ☐ NA ☑ YES ☐ NO

3. Were all reported parameters confirmed? ☐ NA ☑ YES ☐ NO

Comments:
HWMU-5: All target parameter identification criteria were met. Acetone was reported below the LOQ in several samples. No target parameters were reported above the LOQ in any sample.
HWMU-7: All target parameter identification criteria were met. 1,1-Dichloroethene was reported below the LOQ in 7GP-16(3-4'). No target parameters were reported above the LOQ in any sample.

M. TARGET PARAMETER QUANTITATION:

- If the %RSD of a parameter was 15% or less, then the average relative response factor should have been used for quantitation.

- If the %RSD of a parameter was greater than 15%, then the quantitation should be based on a calibration curve using the first or higher order regression fit of the five calibration points (6 calibration points for 2nd order).

1. List the detected parameters whose %RSD was >15%: *none*
   a. Was the subsequent quantitation based on a linear regression fit? ☑ NA ☐ YES ☐ NO
   b. Was the curve forced through the origin? ☑ NA ☐ YES ☐ NO
2. Did the initial analysis of any sample have a target parameter concentration that exceeded the initial calibration range? ☐ NA ☐ YES ☑ NO
   -If so, was the sample reanalyzed at a higher dilution? ☑ NA ☐ YES ☐ NO

3. Were the parameter concentrations that were recorded on the raw sample quantitation reports accurately transferred to the sample summary sheets? ☑ YES ☐ NO

Comments: All target parameter quantitation criteria were met.

N. LIBRARY SEARCHES:

Comments: Library searches were not requested with this data set.

O. DAA CORRECTIVE ACTION TAKEN AND GENERAL COMMENTS:

Comments: DAA requested, and Lancaster Laboratories provided, method detection limit study and initial demonstration of proficiency documentation.

Sample results for HWMU-5 were originally reported on an "as received" basis without dry weight factors. Lancaster Laboratories provided revised sample results including the dry weight factors.

SW-846 METHOD 8270C (GC/MS) SEMIVOLATILE ORGANIC DATA VALIDATION

Sample ID:	5GP-1 (1-2'),	5GP-1 (9-10'),	5GP-3 (9-10'),	5GP-6 (10-11'),
	5GP-8 (7-8'),	5GP-8 (11-12'),	5 GP-12 (3-4'),	5GP-16 (3-4')
	7GP-1 (1-3'),	7GP-2 (8-12'),	7GP-2 (13.5-14.5'),	7GP-3 (10-11'),
	7GP-4 (3-4'),	7GP-5 (6-11'),	7GP-8 (5-8'),	7 GP-16 (3-4')

QC Samples: 7GP-5 (6-11') MS/MSD, LCS, Extraction Blank

Laboratory: Lancaster Laboratories, Lancaster PA, SDG RAR01-01

Comment: Semivolatile (a.k.a, base/neutral and acid extractables) analysis involves sample preparation using SW-846 Method 3550B-ultrasonic extraction. The semivolatile extracts are concentrated through evaporation. Target analytes are separated and quantified using capillary column GC/MS.

A. QC DELIVERABLES PACKAGE:

1. Was the case narrative present and signed by a laboratory representative? ☑ YES ☐ NO
2. Was the Chain of Custody present and signed by a laboratory representative? ☑ YES ☐ NO
3. Were the sample results included for all sample locations? ☑ YES ☐ NO
4. Did the laboratory parameter list correspond to the project specific parameter list? ☑ YES ☐ NO
5. Were all parameter LOQs reported on sample summary sheets in agreement with the instrument specific MDL study? ☑NA☐ YES ☐NO

Comments: All QC deliverables package criteria were met. All LOQs were supported by an acceptable MDL study. Additionally, Lancaster Laboratories provided a calibration standard at 1 ppm to verify instrument sensitivity at the LOD level.

B. QC HISTORY DOCUMENTATION CRITERIA:

1. Were the instrument specific LODs for target parameters provided? ☑ YES ☐ NO
2. Were the instrument specific LOQs for target parameters provided? ☑ YES ☐ NO
3. Was the instrument specific calibration range for each target parameter specified? ☑ YES ☐ NO
4. Was initial demonstration of capability data provided for all

target parameters? ☑ YES ☐ NO

Comments: All QC history documentation criteria were met.

C. TECHNICAL HOLDING TIME AND PRESERVATION CRITERIA:

1. Was the 7-day sample collection to extraction holding time met? ☑ YES ☐ NO
2. Was the 40-day extraction to analysis holding time met? ☑ YES ☐ NO
3. Were the samples received at 4°C (± 2°C)? ☑ YES ☐ NO

Comments: The sample collection to extraction and extraction to analysis holding times were met. All preservation criteria were met.

D. GC/MS INSTRUMENT PERFORMANCE CHECK CRITERIA:
(Tuning, Injection Port And Column Performance)

1. Was analysis of the instrument performance check solution performed at the beginning of each 12-hour period of standard and/or sample analysis? ☑ YES ☐ NO
2. Was there documentation of the injection of 50 ng of DFTPP? ☑ YES ☐ NO
3. Were all ion abundance criteria met? ☑ YES ☐ NO
4. Was the injection port inertness verified by analysis of 4,4'-DDT? ☑ YES ☐ NO
   - If no, does associated data require qualification? ☑ NA ☐ YES ☐ NO
   - Was the injection port inertness check acceptable? ☐ NA ☑ YES ☐ NO
5. Was column performance checked through the analysis of peak tailing of pentachlorophenol and benzidine? ☑ YES ☐ NO
   - If no, does associated data require qualification? ☑ NA ☐ YES ☐ NO
   - Was column performance check acceptable? ☐ NA ☑ YES ☐ NO

Comments: All GC/MS instrument performance check criteria were met.

E. INITIAL GC/MS CALIBRATION CRITERIA:

SW-846 Criteria:

1. Were the initial calibrations (ICAL) and any directly associated

blanks and samples analyzed within 12-hours of the associated instrument performance (tune) check? ☑ YES ☐ NO

2. Were quantitation ions, used and listed on data, randomly checked against primary quantitation ions as required by Method 8270C and the RFP? ☑ YES ☐ NO
3. Were all target parameters included in the ICAL? ☑ YES ☐ NO
4. Did the ICAL consist of a minimum of 5 calibration levels? ☑ YES ☐ NO
5. Was the lowest concentration calibration standard at or below the associated MCL, regulatory compliance, or action limit? ☑ YES ☐ NO
6. Were calibration levels removed from the curve that would negatively impact the data integrity? ☐ YES ☑ NO
7. Were 8270C SPCC criteria met?
   (Relative Response Factor-average(RRF) ≥ 0.050) ☐ NA ☑ YES ☐ NO
   - N-nitroso-di-n-propylamine
   - Hexachlorocyclopentadiene
   - 2,4-Dinitrophenol
   - 4-nitrophenol
   -
8. Were 8270C B/N Fraction parameter criteria met?
   (% Relative Standard Deviation (%RSD) ≤ 30%) ☐ NA ☑ YES ☐ NO
   - acenaphthene
   - 1,4-dichlorobenzene
   - hexachlorobutadiene
   - N-nitrosodiphenylamine
   - Di-n-octyl phthalate
   - fluoranthene
   - benzo(a)pyrene
9. Were 8270C Acid Fraction parameter criteria met?
   (% Relative Standard Deviation (%RSD) ≤ 30%) ☐ NA ☑ YES ☐ NO
   - 4-chloro-3-methylphenol
   - 2,4-dichlorophenol
   - 2-nitrophenol
   - phenol
   - pentachlorophenol
   - 2,4,6-trichlorophenol
10. Was each target parameter %RSD ≤ 15%?
    (with the exception of SPCC/CCC compounds) ☐ NA ☑ YES ☐ NO
11. Was the correlation coefficient or coefficient of determination >0.99 for target parameters with ≥ 15 % RSD
    (with the exception of SPCC/CCC compounds)? ☑ NA ☐ YES ☐ NO

Method Validation Performance Criteria:

1. Did target parameters and surrogates (with the exception of SPCC/ CCC compounds)that have % RSDs ≥ 15% have >0.99 correlation coefficient or coefficient of determination? ☐ NA ☑ YES ☐ NO
(Evaluate RRFs < 0.05 for potential problems.)

Comments: All initial calibration criteria were met.
ICAL performed on October 15, 2002 - Instrument ID HP06754.

F. CALIBRATION VERIFICATION CRITERIA:
SW-846 Criteria:

1. Was a calibration verification analyzed at the beginning of each 12-hour period following the analysis of the instrument performance check and prior to analysis of the method blank and samples? The calibration verification may be part of the ICAL or run independently on another 12-hour analysis period. ☑ YES ☐ NO
2. Were 8270C SPCC criteria met?
(Relative Response Factor (RRF) ≥ 0.050) ☑ YES ☐ NO
3. Were all 13 8270C CCC criteria met?
(%D within ± 20%) ☑ YES ☐ NO

Method Validation Performance Criteria:

1. Did all target parameters and system monitoring parameters (surrogates) have % Ds within ± 25.0%? ☑ YES ☐ NO
(Evaluate RRFs < 0.05 for potential problems.)
If "NO", list parameters that exceed this criterion:

DAA Contractual Requirements:

1. Did all target parameters and system monitoring parameters (surrogates) have % Ds within ± 25.0%? *not applicable for this project*

2. Five parameters, in each standard mix, may fail to meet maximum % D as long the % D is within ± 40.0%
Did calibration verification meet this criteria? *not applicable for this project*
If "NO", explain.

Comments: All calibration verification criteria were met.

G. BLANK CRITERIA:

1. Was a method/extraction blank analyzed on each GC/MS system used for sample analysis? ☑ YES ☐ NO
2. Was a trip blank analyzed with this sample batch? ☐ YES ☑ NO
3. Were the blank samples interference free? ☑ YES ☐ NO
4. Was the level of blank contamination less than 5% of the MCL? ☑ NA ☐ YES ☐ NO
5. List target parameters detected in the blanks:
   none

Comments: All blank criteria were met.

H. SURROGATE CRITERIA:

1. Were the following surrogates used? ☑ YES ☐ NO
   - phenol - d_6 (24%-113%)
   - 2-fluorophenol (25%-121%)
   - 2,4,6-tribromophenol (19%-122%)
   - nitrobenzene – d_8 (23%-120%)
   - 2-fluorobiphenyl (25%-121%)
   - p-terphenyl - d_{14} (18%-137%)
2. Were recoveries within the specified ranges? ☑ YES ☐ NO
3. Were any two base/neutral or acid surrogates out of specification or did any one base/neutral or acid extractable surrogate have a recovery of less than 10%? ☐YES ☑ NO
   If yes, was a reextraction and reanalysis performed to confirm that the non-compliance was due to sample matrix effects rather than laboratory deficiencies? ☑ NA ☐ YES ☐ NO

Comments: All surrogate requirements were met. (Lancaster Laboratories used laboratory derived surrogate limits as suggested by SW-846.)

I. MATRIX SPIKE/ MATRIX SPIKE DUPLICATE CRITERIA:

(MS/MSD Requirements - CLP Guidelines)

Parameter	% R Water	% RPD Water
Phenol	12-110	42
2-Chlorophenol	27-123	40
N-Nitroso-di-n-propylamine	41-116	38
4-Chloro-3-methylphenol	23-97	42
Acenaphthene	46-118	31
4-Nitrophenol	10-80	50
2,4-Dinitrotoluene	24-96	38
Pyrene	26-127	31

1. Was a matrix spike and matrix spike duplicate (MS/MSD) analyzed per sample batch or every 20 samples, whichever may occur first? ☑ YES ☐ NO
2. Did the MS/MSD spike contain additional target parameters? ☐ YES ☑ NO
3. Was the MS/MSD analyzed on the specific project matrix? ☑ YES ☐ NO
4. List MS/MSD target parameters not within acceptable laboratory recovery ranges: *none*
5. Was a LCS analyzed to address failed matrix spike criteria? ☑ NA ☐ YES ☐ NO
6. Did the LCS for the failed matrix spike parameter(s) fall within the acceptable recovery ranges and was the problem identified as matrix interference? ☑ NA ☐ YES ☐ NO
7. Were any parameters flagged as estimated concentrations? ☐ YES ☑ NO
8. List parameters flagged as estimated concentrations: *none*

Comments: MS/MSD analyses were performed on sample 7GP-5(6-11') and all method requirements were met.

J. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

1. Was a LCS included in the sample analysis? ☑ YES ☐ NO
2. Did the LCS contain all required target parameters? ☑ YES ☐ NO
3. List the LCS target parameters and laboratory recovery range. *See page 402-403 of the semivolatile certificate of analysis.*
4. List the LCS parameters which exceeded the acceptable recovery range: *none*

Comments: All LCS criteria were met.

K. INTERNAL STANDARDS CRITERIA:

1. Were the following internal standards used? ☑ YES ☐ NO
   - 1,4-Dichlorobenzene-d_4
   - Naphthalene-d_8
   - Acenapththene-d_{10}
   - Phenanthrene-d_{10}
   - Chrysene-d_{12}
   - Perylene-d_{12}

2. Were internal standard areas within ± 50% of last calibration verification? ☑ YES ☐ NO
3. Were internal standard retention times within ± 30 seconds of last calibration verification? ☑ YES ☐ NO

Comments: All internal standard criteria were met.

L. TARGET PARAMETER IDENTIFICATION:

1. Were the RRTs of the reported parameters within ± 0.06 RRT units of the standard RRT? ☐ NA ☑YES ☐ NO

2. Check the sample spectra against the laboratory standard spectra to see that the following criteria were met:
   - Did characteristic ions maximize in the same scan or within one scan of each other? ☐ NA ☑YES ☐ NO
   - Were all characteristic ions present in the standard spectra present in the sample spectra for parameters detected above the LOQ? ☐ NA ☑YES ☐ NO
   - Were the relative intensities of the ions between the standard and sample spectra within ± 30 %? ☐ NA ☑YES ☐ NO
3. Were all reported parameters confirmed? ☐NA ☑YES ☐ NO

Comments: All target parameter identification requirements were met.

M. TARGET PARAMETER QUANTITATION:

- If the %RSD of a parameter was 15% or less, then the average relative response factor should have been used for quantitation.
- If the %RSD of a parameter was greater than 15%, then the quantitation

should be based on a calibration curve using the first or higher order regression fit of the five calibration points (6 calibration points for 2nd order).

1. List the parameters detected above the LOQ whose %RSD was >15%: *none*
   a. Was the subsequent quantitation based on a linear regression fit? ☑ NA ☐ YES ☐ NO
   b. Was the curve forced through the origin? ☑ NA ☐ YES ☐ NO

2. Did the initial analysis of any sample have a concentration of a target parameter that exceeded the initial calibration range? ☐ YES ☑ NO
   -If so, was the sample reanalyzed at a higher dilution? ☑ NA ☐ YES ☐ NO
3. Were the parameter concentrations that were recorded on the raw sample quantitation reports accurately transferred to the sample summary sheets? ☑ YES ☐ NO

Comments: Target parameter quantitation criteria were met.

N. LIBRARY SEARCHES:

Comments: Library searches were not requested with this data set.

O. DAA CORRECTIVE ACTION TAKEN AND GENERAL COMMENTS:

Comments: No corrective action was required.

LIMITATIONS AND REFERENCES:

Draper Aden Associates conducted data validation of the above noted data set using summary tables and raw data provided by the analyzing laboratory. Data validation was conducted in general accordance with 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 CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October, 1999). Validation of this data set is limited to the items detailed in this report.

Validated by: Date:

Draper Aden Associates
Engineering • Surveying • Environmental Services

JCF for 12-17-02

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Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result		LOQ	Validation Notes
6010B							
5GP-1(1-2')	Aluminum	19200	J	19200		24.7	No action taken.
5GP-1(9-10')	Aluminum	12100	J	12100		23.4	No action taken.
5GP-12(3-4')	Aluminum	19600	J	19600		25	No action taken.
5GP-16(3-4')	Aluminum	17000	J	17000		24.8	No action taken.
5GP-3(9-10')	Aluminum	14800	J	14800		24.4	No action taken.
5GP-6(10-11')	Aluminum	19400	J	19400		24.2	No action taken.
5GP-8(11-12')	Aluminum	19600	J	19600		24	No action taken.
5GP-8(7-8')	Aluminum	14200	J	14200		23.7	No action taken.
7GP-1(1-3')	Aluminum	11100	J	11100		23.5	No action taken.
7GP-16(3-4')	Aluminum	6650	J	6650		24.1	No action taken.
7GP-2(13.5-14.5')	Aluminum	19700	J	19700		24.3	No action taken.
7GP-2(8-12')	Aluminum	8790	J	8790		24.3	No action taken.
7GP-3(10-11')	Aluminum	11700	J	11700		25.3	No action taken.
7GP-4(3-4')	Aluminum	5290	J	5290		23.4	No action taken.
'GP-5(6-11')	Aluminum	20000	J	20000		24.1	No action taken.
7GP-8(5-8')	Aluminum	22400	J	22400		24.7	No action taken.
5GP-1(1-2')	Antimony	1.8	B	U	J	7.4	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-1(9-10')	Antimony	0.9	B	U	J	7	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-12(3-4')	Antimony	1.6	B	U	J	7.5	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-16(3-4')	Antimony	1.1	B	U	J	7.4	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-3(9-10')	Antimony	1.4	B	U	J	7.3	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-6(10-11')	Antimony	1.1	B	U	J	7.2	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-8(11-12')	Antimony	1.2	B	U	J	7.2	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-8(7-8')	Antimony	1.1	B	U	J	7.1	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
7GP-1(1-3')	Antimony	0.52	B	U	J	7	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
7GP-16(3-4')	Antimony	0.59	B	U	J	7.2	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
7GP-2(13.5-14.5')	Antimony	1.3	B	U	J	7.3	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result		LOQ	Validation Notes
7GP-2(8-12')	Antimony	1.1	B	U	J	7.3	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
7GP-3(10-11')	Antimony	1.1	B	U	J	7.6	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
7GP-4(3-4')	Antimony	0.77	B	U	J	7	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
7GP-5(6-11')	Antimony	1	B	U	J	7.2	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
7GP-8(5-8')	Antimony	0.8	B	U	J	7.4	Result < LOQ. Calibration blank contamination. Low matrix spike recovery. Result biased low.
5GP-1(1-2')	Arsenic	2.2		2.2		1.2	No action taken.
5GP-1(9-10')	Arsenic	3.9		3.9		1.2	No action taken.
5GP-12(3-4')	Arsenic	2.7		2.7		1.2	No action taken.
5GP-16(3-4')	Arsenic	4		4		1.2	No action taken.
5GP-3(9-10')	Arsenic	2.6		2.6		1.2	No action taken.
5GP-6(10-11')	Arsenic	1.6		1.6		1.2	No action taken.
5GP-8(11-12')	Arsenic	3.4		3.4		1.2	No action taken.
5GP-8(7-8')	Arsenic	4.1		4.1		1.2	No action taken.
7GP-1(1-3')	Arsenic	3.8		3.8		1.2	No action taken.
7GP-16(3-4')	Arsenic	1	B	U		1.2	Result < LOQ.
7GP-2(13.5-14.5')	Arsenic	3.1		3.1		1.2	No action taken.
7GP-2(8-12')	Arsenic	2.7		2.7		1.2	No action taken.
7GP-3(10-11')	Arsenic	26.1		26.1		1.3	No action taken.
7GP-4(3-4')	Arsenic	0.96	B	U		1.2	Result < LOQ.
7GP-5(6-11')	Arsenic	3.5		3.5		1.2	No action taken.
7GP-8(5-8')	Arsenic	2.4		2.4		1.2	No action taken.
Unit_5_TCLP	Arsenic	0.0091	J	U		0.1	Result < LOQ.
Unit_7_TCLP	Arsenic	0.0056	J	U		0.1	Result < LOQ.
5GP-1(1-2')	Barium	85.1	J	85.1		24.7	No action taken.
5GP-1(9-10')	Barium	47.3	J	47.3		23.4	No action taken.
5GP-12(3-4')	Barium	56.2	J	56.2		25	No action taken.
5GP-16(3-4')	Barium	51.2	J	51.2		24.8	No action taken.
5GP-3(9-10')	Barium	37.2	J	37.2		24.4	No action taken.
5GP-6(10-11')	Barium	56.9	J	56.9		24.2	No action taken.
5GP-8(11-12')	Barium	61.4	J	61.4		24	No action taken.
5GP-8(7-8')	Barium	46.1	J	46.1		23.7	No action taken.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result	LOQ	Validation Notes
7GP-1(1-3')	Barium	66.9	J	66.9	23.5	No action taken.
7GP-16(3-4')	Barium	106	J	106	24.1	No action taken.
7GP-2(13.5-14.5')	Barium	70.9	J	70.9	24.3	No action taken.
7GP-2(8-12')	Barium	40.9	J	40.9	24.3	No action taken.
7GP-3(10-11')	Barium	229	J	229	25.3	No action taken.
7GP-4(3-4')	Barium	69.2	J	69.2	23.4	No action taken.
7GP-5(6-11')	Barium	55.6	J	55.6	24.1	No action taken.
7GP-8(5-8')	Barium	55	J	55	24.7	No action taken.
Unit_5_TCLP	Barium	0.714		0.714	0.1	No action taken.
Unit_7_TCLP	Barium	0.521		0.521	0.1	No action taken.
5GP-1(1-2')	Beryllium	0.59	B	U	0.62	Result < LOQ.
5GP-1(9-10')	Beryllium	1.1		1.1	0.59	No action taken.
5GP-12(3-4')	Beryllium	0.55	B	U	0.62	Result < LOQ.
5GP-16(3-4')	Beryllium	0.4	B	U	0.62	Result < LOQ.
5GP-3(9-10')	Beryllium	0.31	B	U	0.61	Result < LOQ.
5GP-6(10-11')	Beryllium	0.41	B	U	0.6	Result < LOQ.
5GP-8(11-12')	Beryllium	0.81		0.81	0.6	No action taken.
5GP-8(7-8')	Beryllium	1.3		1.3	0.59	No action taken.
7GP-1(1-3')	Beryllium	0.7		0.7	0.59	No action taken.
7GP-16(3-4')	Beryllium	0.55	B	U	0.6	Result < LOQ.
7GP-2(13.5-14.5')	Beryllium	0.84		0.84	0.61	No action taken.
7GP-2(8-12')	Beryllium	1.2		1.2	0.61	No action taken.
7GP-3(10-11')	Beryllium	1.5		1.5	0.63	No action taken.
7GP-4(3-4')	Beryllium	0.44	B	U	0.59	Result < LOQ.
7GP-5(6-11')	Beryllium	0.35	B	U	0.6	Result < LOQ.
7GP-8(5-8')	Beryllium	0.41	B	U	0.62	Result < LOQ.
7GP-1(1-3')	Cadmium	0.027	B	U	0.59	Result < LOQ.
7GP-16(3-4')	Cadmium	0.061	B	U	0.6	Result < LOQ.
7GP-3(10-11')	Cadmium	0.16	B	U	0.63	Result < LOQ.
5GP-1(1-2')	Calcium	1060		1060	618	No action taken.
5GP-1(9-10')	Calcium	303	B	U	586	Result < LOQ.
5GP-12(3-4')	Calcium	3200		3200	624	No action taken.
5GP-16(3-4')	Calcium	1020		1020	620	No action taken.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result	LOQ	Validation Notes
5GP-3(9-10')	Calcium	866		866	609	No action taken.
5GP-6(10-11')	Calcium	9930		9930	604	No action taken.
5GP-8(11-12')	Calcium	576	B	U	599	Result < LOQ.
5GP-8(7-8')	Calcium	159	B	U	592	Result < LOQ.
7GP-1(1-3')	Calcium	7490		7490	587	No action taken.
7GP-16(3-4')	Calcium	1230		1230	603	No action taken.
7GP-2(13.5-14.5')	Calcium	480	B	U	608	Result < LOQ.
7GP-2(8-12')	Calcium	283	B	U	607	Result < LOQ.
7GP-3(10-11')	Calcium	28100		28100	631	No action taken.
7GP-4(3-4')	Calcium	749		749	586	No action taken.
7GP-5(6-11')	Calcium	259	B	U	602	Result < LOQ.
7GP-8(5-8')	Calcium	1570		1570	618	No action taken.
5GP-1(1-2')	Chromium	22.4		22.4 J	1.2	Low matrix spike recovery. Result biased low.
5GP-1(9-10')	Chromium	31.7		31.7 J	1.2	Low matrix spike recovery. Result biased low.
5GP-12(3-4')	Chromium	27		27 J	1.2	Low matrix spike recovery. Result biased low.
5GP-16(3-4')	Chromium	24.4		24.4 J	1.2	Low matrix spike recovery. Result biased low.
5GP-3(9-10')	Chromium	22.8		22.8 J	1.2	Low matrix spike recovery. Result biased low.
5GP-6(10-11')	Chromium	17.9		17.9 J	1.2	Low matrix spike recovery. Result biased low.
5GP-8(11-12')	Chromium	26.9		26.9 J	1.2	Low matrix spike recovery. Result biased low.
5GP-8(7-8')	Chromium	21.6		21.6 J	1.2	Low matrix spike recovery. Result biased low.
7GP-1(1-3')	Chromium	24.1		24.1 J	1.2	Low matrix spike recovery. Result biased low.
7GP-16(3-4')	Chromium	11.5		11.5 J	1.2	Low matrix spike recovery. Result biased low.
7GP-2(13.5-14.5')	Chromium	22.5		22.5 J	1.2	Low matrix spike recovery. Result biased low.
7GP-2(8-12')	Chromium	22		22 J	1.2	Low matrix spike recovery. Result biased low.
7GP-3(10-11')	Chromium	32.8		32.8 J	1.3	Low matrix spike recovery. Result biased low.
7GP-4(3-4')	Chromium	10.1		10.1 J	1.2	Low matrix spike recovery. Result biased low.
7GP-5(6-11')	Chromium	22.8		22.8 J	1.2	Low matrix spike recovery. Result biased low.
7GP-8(5-8')	Chromium	20.1		20.1 J	1.2	Low matrix spike recovery. Result biased low.
5GP-1(1-2')	Cobalt	9		9	6.2	No action taken.
5GP-1(9-10')	Cobalt	17.6		17.6	5.9	No action taken.
5GP-12(3-4')	Cobalt	9.1		9.1	6.2	No action taken.
5GP-16(3-4')	Cobalt	8.2		8.2	6.2	No action taken.
5GP-3(9-10')	Cobalt	3.2	B	U	6.1	Result < LOQ.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result	LOQ	Validation Notes
5GP-6(10-11')	Cobalt	5.5	B	U	6	Result < LOQ.
5GP-8(11-12')	Cobalt	10		10	6	No action taken.
5GP-8(7-8')	Cobalt	11.6		11.6	5.9	No action taken.
7GP-1(1-3')	Cobalt	11.5		11.5	5.9	No action taken.
7GP-16(3-4')	Cobalt	5.9	B	U	6	Result < LOQ.
7GP-2(13.5-14.5')	Cobalt	16.2		16.2	6.1	No action taken.
7GP-2(8-12')	Cobalt	12.5		12.5	6.1	No action taken.
7GP-3(10-11')	Cobalt	8.1		8.1	6.3	No action taken.
7GP-4(3-4')	Cobalt	5.4	B	U	5.9	Result < LOQ.
7GP-5(6-11')	Cobalt	4.5	B	U	6	Result < LOQ.
7GP-8(5-8')	Cobalt	5.4	B	U	6.2	Result < LOQ.
5GP-1(1-2')	Copper	13.9		13.9	3.1	No action taken.
5GP-1(9-10')	Copper	19.8		19.8	2.9	No action taken.
5GP-12(3-4')	Copper	13.6		13.6	3.1	No action taken.
5GP-16(3-4')	Copper	10.6		10.6	3.1	No action taken.
5GP-3(9-10')	Copper	9.5		9.5	3	No action taken.
5GP-6(10-11')	Copper	11.6		11.6	3	No action taken.
5GP-8(11-12')	Copper	14.8		14.8	3	No action taken.
5GP-8(7-8')	Copper	16.8		16.8	3	No action taken.
7GP-1(1-3')	Copper	22.8		22.8	2.9	No action taken.
7GP-16(3-4')	Copper	5.1		5.1	3	No action taken.
7GP-2(13.5-14.5')	Copper	14.2		14.2	3	No action taken.
7GP-2(8-12')	Copper	22		22	3	No action taken.
7GP-3(10-11')	Copper	23.2		23.2	3.2	No action taken.
7GP-4(3-4')	Copper	5.1		5.1	2.9	No action taken.
7GP-5(6-11')	Copper	10		10	3	No action taken.
7GP-8(5-8')	Copper	12.7		12.7	3.1	No action taken.
5GP-1(1-2')	Iron	30700		30700	12.4	No action taken.
5GP-1(9-10')	Iron	26700		26700	11.7	No action taken.
5GP-12(3-4')	Iron	33400		33400	12.5	No action taken.
5GP-16(3-4')	Iron	28200		28200	12.4	No action taken.
5GP-3(9-10')	Iron	24400		24400	12.2	No action taken.
5GP-6(10-11')	Iron	22400		22400	12.1	No action taken.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
5GP-8(11-12')	Iron	29000	29000	12	No action taken.
5GP-8(7-8')	Iron	28400	28400	11.8	No action taken.
7GP-1(1-3')	Iron	19400	19400	11.7	No action taken.
7GP-16(3-4')	Iron	10800	10800	12.1	No action taken.
7GP-2(13.5-14.5')	Iron	29300	29300	12.2	No action taken.
7GP-2(8-12')	Iron	23300	23300	12.1	No action taken.
7GP-3(10-11')	Iron	15900	15900	12.6	No action taken.
7GP-4(3-4')	Iron	9860	9860	11.7	No action taken.
7GP-5(6-11')	Iron	23600	23600	12	No action taken.
7GP-8(5-8')	Iron	23200	23200	12.4	No action taken.
5GP-1(1-2')	Lead	12.9	12.9	0.37	No action taken.
5GP-1(9-10')	Lead	9.8	9.8	0.35	No action taken.
5GP-12(3-4')	Lead	12.6	12.6	0.37	No action taken.
5GP-16(3-4')	Lead	11.4	11.4	0.37	No action taken.
5GP-3(9-10')	Lead	9.7	9.7	0.37	No action taken.
5GP-6(10-11')	Lead	11.3	11.3	0.36	No action taken.
5GP-8(11-12')	Lead	9.6	9.6	0.36	No action taken.
5GP-8(7-8')	Lead	9.6	9.6	0.36	No action taken.
7GP-1(1-3')	Lead	8.1	8.1	0.35	No action taken.
7GP-16(3-4')	Lead	5.4	5.4	0.36	No action taken.
7GP-2(13.5-14.5')	Lead	13.6	13.6	0.36	No action taken.
7GP-2(8-12')	Lead	2.8	2.8	0.36	No action taken.
7GP-3(10-11')	Lead	35.1	35.1	0.38	No action taken.
7GP-4(3-4')	Lead	5.8	5.8	0.35	No action taken.
7GP-5(6-11')	Lead	11	11	0.36	No action taken.
7GP-8(5-8')	Lead	10.3	10.3	0.37	No action taken.
Unit_5_TCLP	Lead	0.0116 J	U	0.1	Result < LOQ.
5GP-1(1-2')	Magnesium	1530	1530	618	No action taken.
5GP-1(9-10')	Magnesium	1730	1730	586	No action taken.
5GP-12(3-4')	Magnesium	2200	2200	624	No action taken.
5GP-16(3-4')	Magnesium	812	812	620	No action taken.
5GP-3(9-10')	Magnesium	597 B	U	609	Result < LOQ.
5GP-6(10-11')	Magnesium	1220	1220	604	No action taken.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
5GP-8(11-12')	Magnesium	1560	1560	599	No action taken.
5GP-8(7-8')	Magnesium	1410	1410	592	No action taken.
7GP-1(1-3')	Magnesium	4290	4290	587	No action taken.
7GP-16(3-4')	Magnesium	1890	1890	603	No action taken.
7GP-2(13.5-14.5')	Magnesium	2000	2000	608	No action taken.
7GP-2(8-12')	Magnesium	3140	3140	607	No action taken.
7GP-3(10-11')	Magnesium	2440	2440	631	No action taken.
7GP-4(3-4')	Magnesium	1590	1590	586	No action taken.
7GP-5(6-11')	Magnesium	787	787	602	No action taken.
7GP-8(5-8')	Magnesium	1090	1090	618	No action taken.
5GP-1(1-2')	Manganese	337	337	1.9	No action taken.
5GP-1(9-10')	Manganese	360	360	1.8	No action taken.
5GP-12(3-4')	Manganese	457	457	1.9	No action taken.
5GP-16(3-4')	Manganese	393	393	1.9	No action taken.
5GP-3(9-10')	Manganese	90.8	90.8	1.8	No action taken.
5GP-6(10-11')	Manganese	154	154	1.8	No action taken.
5GP-8(11-12')	Manganese	372	372	1.8	No action taken.
5GP-8(7-8')	Manganese	242	242	1.8	No action taken.
7GP-1(1-3')	Manganese	662	662	1.8	No action taken.
7GP-16(3-4')	Manganese	422	422	1.8	No action taken.
7GP-2(13.5-14.5')	Manganese	407	407	1.8	No action taken.
7GP-2(8-12')	Manganese	274	274	1.8	No action taken.
7GP-3(10-11')	Manganese	145	145	1.9	No action taken.
7GP-4(3-4')	Manganese	292	292	1.8	No action taken.
7GP-5(6-11')	Manganese	187	187	1.8	No action taken.
7GP-8(5-8')	Manganese	280	280	1.9	No action taken.
5GP-1(1-2')	Nickel	9.4	9.4	4.9	No action taken.
5GP-1(9-10')	Nickel	19	19	4.7	No action taken.
5GP-12(3-4')	Nickel	8.2	8.2	5	No action taken.
5GP-16(3-4')	Nickel	6.3	6.3	5	No action taken.
5GP-3(9-10')	Nickel	5.3	5.3	4.9	No action taken.
5GP-6(10-11')	Nickel	7.9	7.9	4.8	No action taken.
GP-8(11-12')	Nickel	11	11	4.8	No action taken.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result	LOQ	Validation Notes
5GP-8(7-8')	Nickel	10.7		10.7	4.7	No action taken.
7GP-1(1-3')	Nickel	13.5		13.5	4.7	No action taken.
7GP-16(3-4')	Nickel	7.7		7.7	4.8	No action taken.
7GP-2(13.5-14.5')	Nickel	11.4		11.4	4.9	No action taken.
7GP-2(8-12')	Nickel	21.6		21.6	4.9	No action taken.
7GP-3(10-11')	Nickel	15.9		15.9	5.1	No action taken.
7GP-4(3-4')	Nickel	6.3		6.3	4.7	No action taken.
7GP-5(6-11')	Nickel	7.2		7.2	4.8	No action taken.
7GP-8(5-8')	Nickel	8.5		8.5	4.9	No action taken.
5GP-1(1-2')	Potassium	1580	J	1580	618	No action taken.
5GP-1(9-10')	Potassium	851	J	851	586	No action taken.
5GP-12(3-4')	Potassium	915	J	915	624	No action taken.
5GP-16(3-4')	Potassium	561	B J	U	620	Result < LOQ.
5GP-3(9-10')	Potassium	500	B J	U	609	Result < LOQ.
5GP-6(10-11')	Potassium	1120	J	1120	604	No action taken.
5GP-8(11-12')	Potassium	1420	J	1420	599	No action taken.
5GP-8(7-8')	Potassium	1090	J	1090	592	No action taken.
7GP-1(1-3')	Potassium	774	J	774	587	No action taken.
7GP-16(3-4')	Potassium	809	J	809	603	No action taken.
7GP-2(13.5-14.5')	Potassium	1390	J	1390	608	No action taken.
7GP-2(8-12')	Potassium	1070	J	1070	607	No action taken.
7GP-3(10-11')	Potassium	2970	J	2970	631	No action taken.
7GP-4(3-4')	Potassium	729	J	729	586	No action taken.
7GP-5(6-11')	Potassium	732	J	732	602	No action taken.
7GP-8(5-8')	Potassium	1040	J	1040	618	No action taken.
7GP-3(10-11')	Selenium	3.5		3.5	0.63	No action taken.
5GP-6(10-11')	Sodium	80.8	B	U	604	Result < LOQ.
7GP-3(10-11')	Sodium	156	B	U	631	Result < LOQ.
7GP-16(3-4')	Thallium	0.7	B	U	1.2	Result < LOQ.
5GP-1(1-2')	Vanadium	64.9		64.9 J	6.2	Low matrix spike recovery. Result biased low.
5GP-1(9-10')	Vanadium	32		32 J	5.9	Low matrix spike recovery. Result biased low.
5GP-12(3-4')	Vanadium	61.8		61.8 J	6.2	Low matrix spike recovery. Result biased low.
5GP-16(3-4')	Vanadium	55.4		55.4 J	6.2	Low matrix spike recovery. Result biased low.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
5GP-3(9-10')	Vanadium	54.3	54.3 J	6.1	Low matrix spike recovery. Result biased low.
5GP-6(10-11')	Vanadium	57.5	57.5 J	6	Low matrix spike recovery. Result biased low.
5GP-8(11-12')	Vanadium	55.2	55.2 J	6	Low matrix spike recovery. Result biased low.
5GP-8(7-8')	Vanadium	26.7	26.7 J	5.9	Low matrix spike recovery. Result biased low.
7GP-1(1-3')	Vanadium	28	28 J	5.9	Low matrix spike recovery. Result biased low.
7GP-16(3-4')	Vanadium	15.4	15.4 J	6	Low matrix spike recovery. Result biased low.
7GP-2(13.5-14.5')	Vanadium	57.7	57.7 J	6.1	Low matrix spike recovery. Result biased low.
7GP-2(8-12')	Vanadium	21.1	21.1 J	6.1	Low matrix spike recovery. Result biased low.
7GP-3(10-11')	Vanadium	42.1	42.1 J	6.3	Low matrix spike recovery. Result biased low.
7GP-4(3-4')	Vanadium	14	14 J	5.9	Low matrix spike recovery. Result biased low.
7GP-5(6-11')	Vanadium	60.6	60.6 J	6	Low matrix spike recovery. Result biased low.
7GP-8(5-8')	Vanadium	61.8	61.8 J	6.2	Low matrix spike recovery. Result biased low.
5GP-1(1-2')	Zinc	35.3	35.3	2.5	No action taken.
5GP-1(9-10')	Zinc	20.7	20.7	2.3	No action taken.
5GP-12(3-4')	Zinc	32.1	32.1	2.5	No action taken.
5GP-16(3-4')	Zinc	20.2	20.2	2.5	No action taken.
5GP-3(9-10')	Zinc	18.6	18.6	2.4	No action taken.
5GP-6(10-11')	Zinc	26.4	26.4	2.4	No action taken.
5GP-8(11-12')	Zinc	33.8	33.8	2.4	No action taken.
5GP-8(7-8')	Zinc	23.9	23.9	2.4	No action taken.
7GP-1(1-3')	Zinc	17.4	17.4	2.3	No action taken.
7GP-16(3-4')	Zinc	39.7	39.7	2.4	No action taken.
7GP-2(13.5-14.5')	Zinc	32.6	32.6	2.4	No action taken.
7GP-2(8-12')	Zinc	15	15	2.4	No action taken.
7GP-3(10-11')	Zinc	33.8	33.8	2.5	No action taken.
7GP-4(3-4')	Zinc	35	35	2.3	No action taken.
7GP-5(6-11')	Zinc	24.2	24.2	2.4	No action taken.
7GP-8(5-8')	Zinc	28.1	28.1	2.5	No action taken.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result	LOQ	Validation Notes
7471A						
5GP-1(1-2')	Mercury	0.048	B	U	0.12	Result < LOQ.
5GP-1(9-10')	Mercury	0.12	U	U	0.12	Result < LOQ.
5GP-12(3-4')	Mercury	0.049	B	U	0.12	Result < LOQ.
5GP-16(3-4')	Mercury	0.07	B	U	0.12	Result < LOQ.
5GP-3(9-10')	Mercury	0.057	B	U	0.12	Result < LOQ.
5GP-6(10-11')	Mercury	0.043	B	U	0.12	Result < LOQ.
5GP-8(11-12')	Mercury	0.057	B	U	0.12	Result < LOQ.
5GP-8(7-8')	Mercury	0.023	B	U	0.12	Result < LOQ.
7GP-1(1-3')	Mercury	0.026	B	U	0.12	Result < LOQ.
7GP-16(3-4')	Mercury	0.12	U	U	0.12	Result < LOQ.
7GP-2(13.5-14.5')	Mercury	0.05	B	U	0.12	Result < LOQ.
7GP-2(8-12')	Mercury	0.12	U	U	0.12	Result < LOQ.
7GP-3(10-11')	Mercury	0.04	B	U	0.13	Result < LOQ.
7GP-4(3-4')	Mercury	0.12	U	U	0.12	Result < LOQ.
7GP-5(6-11')	Mercury	0.1	B	U	0.12	Result < LOQ.
7GP-8(5-8')	Mercury	0.061	B	U	0.12	Result < LOQ.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
8081A/8082					
5GP-1(1-2')	Aroclor-1016	0.0055 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-1(9-10')	Aroclor-1016	0.0056 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-12(3-4')	Aroclor-1016	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-16(3-4')	Aroclor-1016	0.0058 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-3(9-10')	Aroclor-1016	0.0058 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	Aroclor-1016	0.0055 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-8(11-12')	Aroclor-1016	0.0056 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-8(7-8')	Aroclor-1016	0.0056 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-1(1-3')	Aroclor-1016	0.0056 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-16(3-4')	Aroclor-1016	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-2(13.5-14.5')	Aroclor-1016	0.0058 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-2(8-12')	Aroclor-1016	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-3(10-11')	Aroclor-1016	0.0061 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-4(3-4')	Aroclor-1016	0.0056 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-5(6-11')	Aroclor-1016	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-8(5-8')	Aroclor-1016	0.0058 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-1(1-2')	Aroclor-1221	0.011 U	U J	0.034	Analyte not detected. Estimated due limited QC information.
5GP-1(9-10')	Aroclor-1221	0.012 U	U J	0.035	Analyte not detected. Estimated due limited QC information.
5GP-12(3-4')	Aroclor-1221	0.012 U	U J	0.036	Analyte not detected. Estimated due limited QC information.
5GP-16(3-4')	Aroclor-1221	0.012 U	U J	0.037	Analyte not detected. Estimated due limited QC information.
5GP-3(9-10')	Aroclor-1221	0.012 U	U J	0.036	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	Aroclor-1221	0.011 U	U J	0.034	Analyte not detected. Estimated due limited QC information.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result		LOQ	Validation Notes
5GP-8(11-12')	Aroclor-1221	0.012	U	U	J	0.035	Analyte not detected. Estimated due limited QC information.
5GP-8(7-8')	Aroclor-1221	0.012	U	U	J	0.035	Analyte not detected. Estimated due limited QC information.
7GP-1(1-3')	Aroclor-1221	0.012	U	U	J	0.035	Analyte not detected. Estimated due limited QC information.
7GP-16(3-4')	Aroclor-1221	0.012	U	U	J	0.036	Analyte not detected. Estimated due limited QC information.
7GP-2(13.5-14.5')	Aroclor-1221	0.012	U	U	J	0.036	Analyte not detected. Estimated due limited QC information.
7GP-2(8-12')	Aroclor-1221	0.012	U	U	J	0.036	Analyte not detected. Estimated due limited QC information.
7GP-3(10-11')	Aroclor-1221	0.013	U	U	J	0.038	Analyte not detected. Estimated due limited QC information.
7GP-4(3-4')	Aroclor-1221	0.012	U	U	J	0.035	Analyte not detected. Estimated due limited QC information.
7GP-5(6-11')	Aroclor-1221	0.012	U	U	J	0.036	Analyte not detected. Estimated due limited QC information.
7GP-8(5-8')	Aroclor-1221	0.012	U	U	J	0.036	Analyte not detected. Estimated due limited QC information.
5GP-1(1-2')	Aroclor-1232	0.0049	U	U	J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-1(9-10')	Aroclor-1232	0.005	U	U	J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-12(3-4')	Aroclor-1232	0.0051	U	U	J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-16(3-4')	Aroclor-1232	0.0052	U	U	J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-3(9-10')	Aroclor-1232	0.0052	U	U	J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	Aroclor-1232	0.0049	U	U	J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-8(11-12')	Aroclor-1232	0.005	U	U	J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-8(7-8')	Aroclor-1232	0.005	U	U	J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-1(1-3')	Aroclor-1232	0.005	U	U	J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-16(3-4')	Aroclor-1232	0.0051	U	U	J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-2(13.5-14.5')	Aroclor-1232	0.0052	U	U	J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-2(8-12')	Aroclor-1232	0.0051	U	U	J	0.02	Analyte not detected. Estimated due limited QC information.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
7GP-3(10-11')	Aroclor-1232	0.0054 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-4(3-4')	Aroclor-1232	0.005 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-5(6-11')	Aroclor-1232	0.0051 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-8(5-8')	Aroclor-1232	0.0052 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-1(1-2')	Aroclor-1242	0.0057 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-1(9-10')	Aroclor-1242	0.0059 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-12(3-4')	Aroclor-1242	0.006 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-16(3-4')	Aroclor-1242	0.0061 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-3(9-10')	Aroclor-1242	0.006 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	Aroclor-1242	0.0057 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-8(11-12')	Aroclor-1242	0.0058 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-8(7-8')	Aroclor-1242	0.0059 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-1(1-3')	Aroclor-1242	0.0058 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-16(3-4')	Aroclor-1242	0.006 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-2(13.5-14.5')	Aroclor-1242	0.006 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-2(8-12')	Aroclor-1242	0.0059 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-3(10-11')	Aroclor-1242	0.0063 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-4(3-4')	Aroclor-1242	0.0059 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-5(6-11')	Aroclor-1242	0.006 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-8(5-8')	Aroclor-1242	0.0061 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-1(1-2')	Aroclor-1248	0.0056 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-1(9-10')	Aroclor-1248	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
5GP-12(3-4')	Aroclor-1248	0.0059 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-16(3-4')	Aroclor-1248	0.006 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-3(9-10')	Aroclor-1248	0.0059 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	Aroclor-1248	0.0056 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-8(11-12')	Aroclor-1248	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-8(7-8')	Aroclor-1248	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-1(1-3')	Aroclor-1248	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-16(3-4')	Aroclor-1248	0.0059 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-2(13.5-14.5')	Aroclor-1248	0.0059 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-2(8-12')	Aroclor-1248	0.0058 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-3(10-11')	Aroclor-1248	0.0062 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-4(3-4')	Aroclor-1248	0.0057 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-5(6-11')	Aroclor-1248	0.0058 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-8(5-8')	Aroclor-1248	0.006 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-1(1-2')	Aroclor-1254	0.0065 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-1(9-10')	Aroclor-1254	0.0067 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-12(3-4')	Aroclor-1254	0.0068 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-16(3-4')	Aroclor-1254	0.0069 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-3(9-10')	Aroclor-1254	0.0069 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	Aroclor-1254	0.0065 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-8(11-12')	Aroclor-1254	0.0067 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-8(7-8')	Aroclor-1254	0.0067 U	U J	0.02	Analyte not detected. Estimated due limited QC information.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
7GP-1(1-3')	Aroclor-1254	0.0066 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-16(3-4')	Aroclor-1254	0.0068 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-2(13.5-14.5')	Aroclor-1254	0.0069 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-2(8-12')	Aroclor-1254	0.0068 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-3(10-11')	Aroclor-1254	0.0072 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-4(3-4')	Aroclor-1254	0.0067 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-5(6-11')	Aroclor-1254	0.0068 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-8(5-8')	Aroclor-1254	0.0069 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-1(1-2')	Aroclor-1260	0.005 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-1(9-10')	Aroclor-1260	0.0052 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-12(3-4')	Aroclor-1260	0.0053 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-16(3-4')	Aroclor-1260	0.0054 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-3(9-10')	Aroclor-1260	0.0053 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	Aroclor-1260	0.005 U	U J	0.019	Analyte not detected. Estimated due limited QC information.
5GP-8(11-12')	Aroclor-1260	0.0051 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
5GP-8(7-8')	Aroclor-1260	0.0052 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-1(1-3')	Aroclor-1260	0.0051 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-16(3-4')	Aroclor-1260	0.0053 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-2(13.5-14.5')	Aroclor-1260	0.0053 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-2(8-12')	Aroclor-1260	0.0052 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-3(10-11')	Aroclor-1260	0.0056 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
7GP-4(3-4')	Aroclor-1260	0.0052 U	U J	0.02	Analyte not detected. Estimated due limited QC information.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result	Validated Result	LOQ	Validation Notes
7GP-5(6-11')	Aroclor-1260	0.0052 U	U J	0.02	Analyte not detected. Estimated due limited QC information.
7GP-8(5-8')	Aroclor-1260	0.0053 U	U J	0.021	Analyte not detected. Estimated due limited QC information.
5GP-6(10-11')	delta-BHC	0.00022 J	U	0.001	Result < LOQ.
5GP-1(1-2')	Chlordane-gamma	0.00048 J	U	0.0019	Result < LOQ.
7GP-1(1-3')	Chlordane-gamma	0.00027 J	U	0.002	Result < LOQ.
7GP-16(3-4')	Chlordane-gamma	0.00026 J	U	0.002	Result < LOQ.
7GP-5(6-11')	Chlordane-gamma	0.00023 J	U	0.002	Result < LOQ.
7GP-8(5-8')	Chlordane-gamma	0.00028 J	U	0.0021	Result < LOQ.
5GP-1(9-10')	4,4-DDD	0.019	0.019	0.004	No action taken.
5GP-6(10-11')	4,4-DDD	0.0067	0.0067	0.0019	No action taken.
5GP-8(11-12')	4,4-DDD	0.00097 J	U	0.002	Result < LOQ.
5GP-8(7-8')	4,4-DDD	0.051	0.051	0.01	No action taken.
7GP-2(13.5-14.5')	4,4-DDD	0.0035	0.0035	0.0021	No action taken.
7GP-2(8-12')	4,4-DDD	0.00075 J	U	0.002	Result < LOQ.
7GP-5(6-11')	4,4-DDD	0.0006 J	U	0.002	Result < LOQ.
7GP-8(5-8')	4,4-DDD	0.00049 J	U	0.0021	Result < LOQ.
5GP-1(9-10')	4,4-DDE	0.00049 J	U	0.002	Result < LOQ.
5GP-6(10-11')	4,4-DDE	0.0017 J	U	0.0019	Result < LOQ.
5GP-8(11-12')	4,4-DDE	0.0012 J	U	0.002	Result < LOQ.
5GP-8(7-8')	4,4-DDE	0.0011 J	U	0.002	Result < LOQ.
7GP-3(10-11')	4,4-DDE	0.0025	0.0025	0.0021	No action taken.
7GP-2(13.5-14.5')	4,4-DDT	0.00067 J	U	0.0021	Result < LOQ.
5GP-1(9-10')	Endrin Aldehyde	0.0023 J	U	0.0035	Result < LOQ.
5GP-12(3-4')	Endrin Aldehyde	0.0017 J	U	0.0036	Result < LOQ.
5GP-16(3-4')	Endrin Aldehyde	0.0022 J	U	0.0037	Result < LOQ.
5GP-8(11-12')	Endrin Aldehyde	0.0017 J	U	0.0035	Result < LOQ.
7GP-2(13.5-14.5')	Endrin Aldehyde	0.0031 J	U	0.0036	Result < LOQ.
7GP-2(8-12')	Endrin Aldehyde	0.0019 J	U	0.0036	Result < LOQ.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result		LOQ	Validation Notes
8260B							
5GP-1(1-2')	Acetone	0.007	U	U	J	0.01	Estimated due to %D> 25% and one slightly low surrogate recovery.
5GP-1(9-10')	Acetone	0.007	U	U	J	0.017	Estimated due to %D> 25%.
5GP-12(3-4')	Acetone	0.011	J	U	J	0.016	Result < LOQ. Estimated due to %D> 25%.
5GP-16(3-4')	Acetone	0.009	U	U	J	0.019	Estimated due to %D> 25%.
5GP-3(9-10')	Acetone	0.008	U	U	J	0.019	Estimated due to %D> 25%.
5GP-6(10-11')	Acetone	0.013	J	U	J	0.018	Result < LOQ. Estimated due to %D> 25%.
5GP-8(11-12')	Acetone	0.016	J	U	J	0.017	Result < LOQ. Estimated due to %D> 25%.
5GP-8(7-8')	Acetone	0.008	U	U	J	0.019	Estimated due to %D> 25%.
5GP-1(1-2')	Benzene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Bromodichloromethane	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Bromoform	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Bromomethane	0.002	U	U	J	0.004	Estimated due one sligtly low surrogate recovery.
5GP-1(1-2')	2-Butanone (methyl ethyl ketone)	0.004	U	U	J	0.009	Estimated due to %D> 25% and one slightly low surrogate recovery.
5GP-1(9-10')	2-Butanone (methyl ethyl ketone)	0.004	U	U	J	0.009	Estimated due to %D> 25%.
5GP-12(3-4')	2-Butanone (methyl ethyl ketone)	0.004	U	U	J	0.008	Estimated due to %D> 25%.
5GP-16(3-4')	2-Butanone (methyl ethyl ketone)	0.005	U	U	J	0.01	Estimated due to %D> 25%.
5GP-3(9-10')	2-Butanone (methyl ethyl ketone)	0.005	U	U	J	0.01	Estimated due to %D> 25%.
5GP-6(10-11')	2-Butanone (methyl ethyl ketone)	0.005	U	U	J	0.009	Estimated due to %D> 25%.
5GP-8(11-12')	2-Butanone (methyl ethyl ketone)	0.004	U	U	J	0.009	Estimated due to %D> 25%.
5GP-8(7-8')	2-Butanone (methyl ethyl ketone)	0.005	U	U	J	0.009	Estimated due to %D> 25%.
5GP-1(1-2')	Carbon Disulfide	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Carbon Tetrachloride	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Chlorobenzene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Chloroethane	0.002	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Chloroform	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Chloromethane	0.002	U	U	J	0.004	Estimated due one sligtly low surrogate recovery.
5GP-1(1-2')	Dibromochloromethane	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	1,1-Dichloroethane	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result		LOQ	Validation Notes
7GP-1(1-3')	1,1-Dichloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%
7GP-16(3-4')	1,1-Dichloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%
7GP-2(13.5-14.5')	1,1-Dichloroethane	0.001	U	U	J	0.006	Estimated due to %D> 25%
7GP-2(8-12')	1,1-Dichloroethane	0.001	U	U	J	0.006	Estimated due to %D> 25%
7GP-3(10-11')	1,1-Dichloroethane	0.001	U	U	J	0.006	Estimated due to %D> 25%
7GP-4(3-4')	1,1-Dichloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%
7GP-5(6-11')	1,1-Dichloroethane	0.001	U	U	J	0.006	Estimated due to %D> 25%
7GP-8(5-8')	1,1-Dichloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%
5GP-1(1-2')	1,2-Dichloroethane	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	1,1-Dichloroethene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
7GP-16(3-4')	1,1-Dichloroethene	0.001	J	U		0.005	Result < LOQ.
5GP-1(1-2')	cis-1,2-Dichloroethene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	trans-1,2-Dichloroethene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	1,2-Dichloropropane	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	cis-1,3-Dichloropropene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	trans-1,3-Dichloropropene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Ethylbenzene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	2-Hexanone	0.003	U	U	J	0.009	Estimated due to %D> 25% and one slightly low surrogate recovery.
5GP-1(9-10')	2-Hexanone	0.004	U	U	J	0.009	Estimated due to %D> 25%.
5GP-12(3-4')	2-Hexanone	0.002	U	U	J	0.008	Estimated due to %D> 25%.
5GP-16(3-4')	2-Hexanone	0.004	U	U	J	0.01	Estimated due to %D> 25%.
5GP-3(9-10')	2-Hexanone	0.004	U	U	J	0.01	Estimated due to %D> 25%.
5GP-6(10-11')	2-Hexanone	0.003	U	U	J	0.009	Estimated due to %D> 25%.
5GP-8(11-12')	2-Hexanone	0.004	U	U	J	0.009	Estimated due to %D> 25%.
5GP-8(7-8')	2-Hexanone	0.004	U	U	J	0.009	Estimated due to %D> 25%.
5GP-1(1-2')	4-Methyl-2-pentanone (methyl isobutyl ketone)	0.003	U	U	J	0.009	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Methylene Chloride	0.002	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Styrene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.007	Estimated due to %D> 25% and one slightly low surrogate recovery.
5GP-1(9-10')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.004	Estimated due to %D> 25%.
5GP-12(3-4')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.004	Estimated due to %D> 25%.

Data Validation Report. All soil results in mg/kg/dry weight basis.

Alliant-Hazardous Waste Management Unit 5 and 7 Event Date: 10/31/02-11/1/02

Sample ID	Analyte	Laboratory Result		Validated Result		LOQ	Validation Notes
5GP-16(3-4')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%.
5GP-3(9-10')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%.
5GP-6(10-11')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%.
5GP-8(11-12')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.004	Estimated due to %D> 25%.
5GP-8(7-8')	1,1,2,2-Tetrachloroethane	0.001	U	U	J	0.005	Estimated due to %D> 25%.
5GP-1(1-2')	Tetrachloroethene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Toluene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	1,1,1-Trichloroethane	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	1,1,2-Trichloroethane	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Trichloroethene	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
5GP-1(1-2')	Vinyl Chloride	0.001	U	U	J	0.004	Estimated due one sligtly low surrogate recovery.
5GP-1(1-2')	Total Xylenes	0.001	U	U	J	0.004	Estimated due one slightly low surrogate recovery.
8270C							
5GP-8(7-8')	bis-(2-Ethylhexyl)phthalate	0.092	J	U		0.39	Result < LOQ.
7GP-3(10-11')	bis-(2-Ethylhexyl)phthalate	0.09	J	U		0.42	Result < LOQ.
5GP-6(10-11')	N-Nitrosodiphenylamine	0.063	J	U		0.38	Result < LOQ.
5GP-8(11-12')	N-Nitrosodiphenylamine	0.082	J	U		0.39	Result < LOQ.
7GP-3(10-11')	N-Nitrosodiphenylamine	0.75		0.75		0.42	No action taken.
9012A							
5GP-1(9-10')	Cyanide	0.13	B	U		0.59	Result < LOQ. Result attributed to blank contamination (<5Xpreparation blank concentration).
5GP-6(10-11')	Cyanide	0.11	B	U		0.6	Result < LOQ. Result attributed to blank contamination (<5Xpreparation blank concentration).
7GP-3(10-11')	Cyanide	0.69		0.69		0.63	No action taken.

Data Validation Qualifier Definitions:

U- Denotes the analyte was analyzed for, but was not detected above the laboratory limit of quantitation (LOQ).

J- Denotes an estimated value. See sample specific note presented on data validation report table for further explanation.

UJ- The LOQ should be considered estimated. See sample specific note presented on data validation report table for further explanation.

R- Denotes sample result was rejected. See sample specific note presented on data validation report table for further explanation.

NOTE: The table summaries all detected results and results which required qualification based on data validation. All Results reported on a dryweight basis.
See laboratory report for definition of laboratory result qualifiers, if needed.

CHAIN OF CUST[illegible] RECORD

Laboratory: Lancaster Laboratories, Inc. 2425 New Holland Pike, Lancaster, PA 17605-2425 (717) 656-2300

Client:	Draper Aden Associates	Consultant:	Draper Aden Associates	Sample Site:	RFAAP
Attn:	Andy Kassoff/ Ross Miller	Attn:	Janet C. Frazier	Location:	Montgomery County, Virginia
Address:	2206 South Main Street Blacksburg, Virginia 24060	Address:	2206 South Main Street Blacksburg, Virginia 24060	Event:	HWMU-5 and HWMU-7 Investigation
Phone:	(540) 552-0444	Phone:	(540) 552-0444	DAA JN:	B02271-01
Fax:	(540) 552-0291	Fax:	(540) 552-0291	Lab JN:	
Fax:	(540) 552-0291				

Project Specific (PS) or Batch (B) QC: ☑PS ☐B
Sample Collection for Project Complete? (See Note 1) ☑YES ☐NO
Carrier: FED EX
Tracking Number:

Box 1: Matrix — SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative — A HCL; B HNO_3; C H_2SO_4; D NaHSO4; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered — F Filtered; U Unfiltered

Box 4: Sample Type — G Grab; C Composite

Box 5: Sample Container Type — P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice — Copy to Consultant: ☐NO; Bill: ☑Client ☐Consultant; Preserved and shipped on ice: ☑YES Bo ☐NO

Box 4 - Sample Type					G	G	C							GENERAL NOTES: See attached target analyte list. Full TCL List for all analytes, using SW846 Test Methods (8270C, 8081A, 8082)
Box 3 - Filtered/Unfiltered					U	U	U							
Required pH of Sample					-	-	-							
Box 2 - Preservative					D	H	H							
Box 5 - Sample Container Type					VOA	1-500ml G	500ml G							
Sample ID	Date: 2002	Time	Box 1: Matrix	Number of Bottles	Volatiles	Semivolatiles/Pest/PCB	Full Characterization TCLP Corrosivity Reactivity Ignitability							
-2' 5GP-1 ✓	10/31	13:10	S	1		X								5GP-1 (1-2')
7-10' 5GP-1 ✓	10/31	13:10	S	1		X								5GP-1 (9-10)
0-11' 5GP-6 ✓	10/31	13:50	S	1		X								5GP-6 (10-11')
-10' 5GP-3 ✓		14:30	S	1		X								5GP-3 (9-10')
-8' 5GP-8 ✓		15:50	S	1		X								5GP-8 (7-8')
-12' 5GP-8 ✓		16:05	S	1		X								5GP-8 (11-12')
-4' 5GP-12 ✓		16:40	S	1		X								5GP-12 (3-4')
-4' 5GP-16 ✓	10/31	17:00	S	1		X								5GP-16 (3-4')
FULL TCLP	11/1	13:55	S	1			X							FULL CHARACTERIZATION TCLP
↳ HWMU-5 ✓														IGNITABILITY, CORROSIVITY, REACTIVITY

Clients Special Instructions:

Received by lab in Good Condition ____ Yes ____ No Custody Seal Intact ____ Yes ____ No Temperature upon arrival ____ Received on Ice ____ Yes ____ No
Describe problems, if any:

Sampler Name (Print): DARREN FIDWELL	Date: 11/1/02	#1 Relinquished by (Signature): Darren Fidwell	Date: 11/1/02	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature: Darren Fidwell	Time: 16:30	Company Name: DAA	Time: 17:30	Company Name:	Time:	
Sampler Name (Print):	Date:	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time:	Company Name:	Time:	Company Name:	Time:	

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CHAIN OF CUS Y RECORD

Laboratory: Lancaster Laboratories, Inc. 2425 New Holland Pike, Lancaster, PA 17605-2425 (717) 656-2300

Client:	Draper Aden Associates	**Consultant:**	Draper Aden Associates	**Sample Site:**	RFAAP
Attn:	Andy Kassoff/ Ross Miller	**Attn:**	Janet C. Frazier		
Address:	2206 South Main Street Blacksburg, Virginia 24060	**Address:**	2206 South Main Street Blacksburg, Virginia 24060	**Location:**	Montgomery County, Virginia
Phone:	(540) 552-0444	**Phone:**	(540) 552-0444	**Event:**	HWMU-5 and HWMU-7 Investigation
Fax:	(540) 552-0291	**Fax:**	(540) 552-0291	**DAA JN:**	B02271-01
Fax:	(540) 552-0291			**Lab JN:**	

Project Specific (PS) or Batch (B) QC: ☑PS ☐B
Sample Collection for Project Complete? (See Note 1) ☑YES ☐NO
Carrier: FED EX
Tracking Number: _____

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D NaHSO4; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: ☑YES ☐NO
Bill: ☑Client ☐Consultant
Preserved and shipped on ice: ☑YES Bo ☐NO

Box 4 - Sample Type					G	G	C						
Box 3 - Filtered/Unfiltered					U	U	U						
Required pH of Sample					-	-	-						
Box 2 - Preservative					D	H	2 H						
Box 5 - Sample Container Type					VOA	1-500ml G	500ML G						
Sample ID	Date: 2002	Time	Box 1: Matrix	Number of Bottles	Volatiles 8260B/ 5035	Semivolatiles/Pests/PCB	FULL CHARACTERIZATION TCLP						
(1-3') 7GP- 1 ✓	11/1	10:00	S	4	X	X							
(8-12') 7GP- 2 ✓		10:40	S		X	X							
(13.5-14.5) 7GP- 2 ✓		11:05	S		X	X							
(10-11) 7GP- 3 ✓		11:25	S		X	X							
(5-8') 7GP- 8 ✓		12:15	S		X	X							
(10-11') 7GP- 5 ✓		12:50	S	2	X	X							+ MS/MSD
(3-4') 7GP- 16 ✓		13:30	S		X	X							
(3-4') 7GP- 4 ✓		13:45	S	4	X	X							
UNIT 7 TCLP	11/1	14:00	S	1			X ✓						FULL CHARACTERIZATION TCLP, IGNITABILITY, CORROSIVITY, REACTIVITY

GENERAL NOTES: See attached target analyte list. Full TCL List for all analytes, using SW846 Test Methods (8270C, 8081A, 8082)

Clients Special Instructions:

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No
Describe problems, if any:

Sampler Name (Print): DARREN KIDWELL	Date: 11/1/02	#1 Relinquished by (Signature): Darren Kidwell	Date: 11/1/02	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature: Darren Kidwell	Time: 16:30	Company Name: DAA	Time: 17:30	Company Name:	Time:	
Sampler Name (Print):	Date:	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time:	Company Name:	Time:	Company Name:	Time:	

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For Lancaster Laboratories use only

Acct. #_____ Group#_____ Sample #_____

COC # 0004027

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: P.W.R ADEN ASSOC. Acct. #: _____

Project Name/#: RMP - UNIT 5 CLOSURE PWSID #: _____

Project Manager: ROSS MILLER P.O.#: _____

Sampler: DAREN KIDWELL Quote #: _____

Name of state where samples were collected: VA.

(2) Sample Identification | Date Collected | Time Collected | (3) Grab | Composite | (4) Matrix: Soil | Water | Other (Potable ☐ NPDES ☐ Check if Applicable) | Total # of Containers | (5) Analyses Requested: VOLATILES 8260/5035 | Remarks

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Other	Total # of Containers	Remarks
SGP-1 (1-2') ✓	10/31/02	13:10	X		X			3	SEE ATTACHED ANALYTE
SGP-1 (9-10') ✓		13:10							LIST FOR TCL VOLATILES
SGP-6 (10-11') ✓		13:50							
SGP-3 (9-10') ✓		14:30							
SGP-8 (7-8') ✓		15:50							
SGP-9 (11-12') ✓		16:05							
SGP-12 (3-4') ✓		16:40							
SGP-16 (3-4') ✓	10/31/02	17:00	X		X			3	

For Lab Use Only
FSC: _____
SCR #: _____

(6) Temperature of samples upon receipt (if requested)

(7) **Turnaround Time Requested** (TAT) (please circle): (Normal) Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed: [redacted]
Rush results requested by (please circle): Phone Fax E-mail
Phone #: _____ Fax #: _____
E-mail address: _____

(8) **Data Package Options** (please circle if required)

QC Summary	Type VI (Raw Data)	SDG Complete? Yes No
Type I (Tier I)	GLP	State-specific QC required? Yes No
Type II (Tier II)	Other	(If yes, indicate QC sample and submit triplicate volume.)
Type III (NJ Red. Del.)		Internal Chain of Custody required? Yes No
Type IV (CLP)		

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Daren Kidwell	10/31/02	19:00			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Analysis Report

REPRINT 139

Lancaster Laboratories

ANALYTICAL RESULTS

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

540-552-0444

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

SAMPLE GROUP

The sample group for this submittal is 829085. Samples arrived at the laboratory on Friday, November 01, 2002. The PO# for this group is B02271-01.

Client Description	Lancaster Labs Number
5GP-1 (1-2') Grab Soil Sample	3931702
5GP-1 (9-10') Grab Soil Sample	3931703
5GP-6 (10-11') Grab Soil Sample	3931704
5GP-3 (9-10') Grab Soil Sample	3931705
5GP-8 (7-8') Grab Soil Sample	3931706
5GP-8 (11-12') Grab Soil Sample	3931707
5GP-12 (3-4') Grab Soil Sample	3931708
5GP-16 (3-4') Grab Soil Sample	3931709

METHODOLOGY

The specific methodologies used in obtaining the enclosed analytical results are indicated on the laboratory chronicles.

1 COPY TO	Draper Aden Associates, Inc.	Attn: Ms. Janet Frazier
1 COPY TO	Data Package Group	

Analysis Report

Lancaster Laboratories

REPRINT
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Questions? Contact your Client Services Representative
Michael E McAdams at (717) 656-2300.

Respectfully Submitted,

Robert E. Mellinger
Sr Chemist/Coordinator

MEMBER ACIL

Lancaster Laboratories, Inc.
2425 New Holland Pike
PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

Lancaster Laboratories

'4 (

REPRINT

Lancaster Laboratories Sample No. SW 3931702

Collected:10/31/2002 13:10 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:00
Discard: 03/31/2003
5GP-1 (1-2') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP11 SDG#: RAR02-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	12.2	0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.					
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.88
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.88
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.88
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.88
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.88
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.88
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.88
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.88
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.88
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.88
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.88
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.88
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.88
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.88
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.88
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.88
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.88
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.88
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.88
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.88
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.88
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.88
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.88
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.88
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.88
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.88
06293	Acetone	67-64-1	N.D.	7.	ug/kg	0.88
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.88

Lancaster Laboratories

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REPRINT

Lancaster Laboratories Sample No. SW 3931702

Collected:10/31/2002 13:10 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:00
Discard: 03/31/2003
5GP-1 (1-2') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP11 SDG#: RAR02-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.88
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.88
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.88
06299	4-Methyl-2-pentanone	108-10-1	N.D.	3.	ug/kg	0.88
06300	2-Hexanone	591-78-6	N.D.	3.	ug/kg	0.88
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.88

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Poor surrogate recovery was observed for 1,2-dichloroethane-d4 in the GC/MS volatile fraction. The percent recovery was 79%. The sample was reanalyzed as a matrix spike, and 1,2-dichloroethane-d4 was 86% recovery which was within the QC limits. Another vial of the sample was not available for further analysis.

Paired with 5GP-1 (1-2') for % MOS result. See SW3933074

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 14:18	Roy R Mellott Jr	0.88
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:18	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:05	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:06	Medina A Long	n.a.

Analysis Report

Lancaster Laboratories

REPRINT 143

Lancaster Laboratories Sample No. SW 3931703

Collected:10/31/2002 13:10 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-1 (9-10') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP19 SDG#: RAR02-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	14.6	0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.					
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.86
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.86
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.86
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.86
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.86
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.86
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.86
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.86
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.86
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.86
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.86
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.86
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.86
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.86
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.86
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.86
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.86
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.86
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.86
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.86
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.86
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.86
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.86
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.86
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.86
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.86
06293	Acetone	67-64-1	N.D.	7.	ug/kg	0.86
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.86

MEMBER ACIL

Lancaster Laboratories, Inc.
2425 New Holland Pike
PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

Lancaster Laboratories

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REPRINT

Lancaster Laboratories Sample No. SW 3931703

Collected:10/31/2002 13:10 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-1 (9-10') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP19 SDG#: RAR02-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	4.	ug/kg	0.86
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.86
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.86
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.86
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.86
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.86

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Paired with 5GP-1 (9-10') for % MOS result. See SW3933075

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 15:24	Roy R Mellott Jr	0.86
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:16	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:07	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:08	Medina A Long	n.a.

Analysis Report

Lancaster Laboratories

REPRINT 145

Lancaster Laboratories Sample No. SW 3931704

Collected:10/31/2002 13:50 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-6 (10-11') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP6- SDG#: RAR02-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	12.7		0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.						
06292	*TCL by 8260 (soil)*						
05444	Chloromethane	74-87-3	N.D.		2.	ug/kg	0.91
05445	Vinyl Chloride	75-01-4	N.D.		1.	ug/kg	0.91
05446	Bromomethane	74-83-9	N.D.		2.	ug/kg	0.91
05447	Chloroethane	75-00-3	N.D.		2.	ug/kg	0.91
05449	1,1-Dichloroethene	75-35-4	N.D.		1.	ug/kg	0.91
05450	Methylene Chloride	75-09-2	N.D.		2.	ug/kg	0.91
05451	trans-1,2-Dichloroethene	156-60-5	N.D.		1.	ug/kg	0.91
05452	1,1-Dichloroethane	75-34-3	N.D.		1.	ug/kg	0.91
05454	cis-1,2-Dichloroethene	156-59-2	N.D.		1.	ug/kg	0.91
05455	Chloroform	67-66-3	N.D.		1.	ug/kg	0.91
05457	1,1,1-Trichloroethane	71-55-6	N.D.		1.	ug/kg	0.91
05458	Carbon Tetrachloride	56-23-5	N.D.		1.	ug/kg	0.91
05460	Benzene	71-43-2	N.D.		1.	ug/kg	0.91
05461	1,2-Dichloroethane	107-06-2	N.D.		1.	ug/kg	0.91
05462	Trichloroethene	79-01-6	N.D.		1.	ug/kg	0.91
05463	1,2-Dichloropropane	78-87-5	N.D.		1.	ug/kg	0.91
05465	Bromodichloromethane	75-27-4	N.D.		1.	ug/kg	0.91
05466	Toluene	108-88-3	N.D.		1.	ug/kg	0.91
05467	1,1,2-Trichloroethane	79-00-5	N.D.		1.	ug/kg	0.91
05468	Tetrachloroethene	127-18-4	N.D.		1.	ug/kg	0.91
05470	Dibromochloromethane	124-48-1	N.D.		1.	ug/kg	0.91
05472	Chlorobenzene	108-90-7	N.D.		1.	ug/kg	0.91
05474	Ethylbenzene	100-41-4	N.D.		1.	ug/kg	0.91
05477	Styrene	100-42-5	N.D.		1.	ug/kg	0.91
05478	Bromoform	75-25-2	N.D.		1.	ug/kg	0.91
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		1.	ug/kg	0.91
06293	Acetone	67-64-1	13.	J	7.	ug/kg	0.91
06294	Carbon Disulfide	75-15-0	N.D.		1.	ug/kg	0.91

MEMBER ACIL
Lancaster Laboratories, Inc.
2425 New Holland Pike
PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

Lancaster Laboratories

REPRINT 146

Lancaster Laboratories Sample No. SW 3931704

Collected:10/31/2002 13:50 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-6 (10-11') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP6- SDG#: RAR02-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.91
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.91
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.91
06299	4-Methyl-2-pentanone	108-10-1	N.D.	3.	ug/kg	0.91
06300	2-Hexanone	591-78-6	N.D.	3.	ug/kg	0.91
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.91

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Paired with 5GP-6 (10-11') for % MOS result. See SW3933076

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 15:56	Roy R Mellott Jr	0.91
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:14	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:09	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:10	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3931705

Collected:10/31/2002 14:30 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-3 (9-10') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP39 SDG#: RAR02-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	17.2	0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.					
)6292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.97
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.97
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.97
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.97
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.97
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.97
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.97
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.97
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.97
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.97
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.97
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.97
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.97
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.97
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.97
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.97
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.97
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.97
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.97
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.97
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.97
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.97
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.97
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.97
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.97
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.97
06293	Acetone	67-64-1	N.D.	8.	ug/kg	0.97
6294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.97

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REPRINT

Lancaster Laboratories Sample No. SW 3931705

Collected:10/31/2002 14:30 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-3 (9-10') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP39 SDG#: RAR02-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.97
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.97
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.97
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.97
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.97
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.97

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Paired with 5GP-3 (9-10') for % MOS result. See SW3933077

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 16:29	Roy R Mellott Jr	0.97
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:08	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:11	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:12	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3931706

Collected:10/31/2002 15:50 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-8 (7-8') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP87 SDG#: RAR02-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	14.6	0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.					
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.94
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.94
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.94
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.94
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.94
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.94
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.94
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.94
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.94
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.94
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.94
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.94
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.94
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.94
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.94
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.94
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.94
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.94
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.94
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.94
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.94
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.94
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.94
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.94
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.94
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.94
06293	Acetone	67-64-1	N.D.	8.	ug/kg	0.94
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.94

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REPRINT 1st

Lancaster Laboratories Sample No. SW 3931706

Collected:10/31/2002 15:50 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-8 (7-8') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP87 SDG#: RAR02-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.94
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.94
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.94
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.94
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.94
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.94

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Paired with 5GP-8 (7-8') for % MOS result. See SW3933078

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 17:02	Roy R Mellott Jr	0.94
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:10	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:13	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:14	Medina A Long	n.a.

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REPRINT (5-1)

Lancaster Laboratories Sample No. SW 3931707

Collected:10/31/2002 16:05 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-8 (11-12') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP8- SDG#: RAR02-06

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	14.5		0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.						
06292	TCL by 8260 (soil)						
05444	Chloromethane	74-87-3	N.D.		2.	ug/kg	0.86
05445	Vinyl Chloride	75-01-4	N.D.		1.	ug/kg	0.86
05446	Bromomethane	74-83-9	N.D.		2.	ug/kg	0.86
05447	Chloroethane	75-00-3	N.D.		2.	ug/kg	0.86
05449	1,1-Dichloroethene	75-35-4	N.D.		1.	ug/kg	0.86
05450	Methylene Chloride	75-09-2	N.D.		2.	ug/kg	0.86
05451	trans-1,2-Dichloroethene	156-60-5	N.D.		1.	ug/kg	0.86
05452	1,1-Dichloroethane	75-34-3	N.D.		1.	ug/kg	0.86
05454	cis-1,2-Dichloroethene	156-59-2	N.D.		1.	ug/kg	0.86
05455	Chloroform	67-66-3	N.D.		1.	ug/kg	0.86
05457	1,1,1-Trichloroethane	71-55-6	N.D.		1.	ug/kg	0.86
05458	Carbon Tetrachloride	56-23-5	N.D.		1.	ug/kg	0.86
05460	Benzene	71-43-2	N.D.		1.	ug/kg	0.86
05461	1,2-Dichloroethane	107-06-2	N.D.		1.	ug/kg	0.86
05462	Trichloroethene	79-01-6	N.D.		1.	ug/kg	0.86
05463	1,2-Dichloropropane	78-87-5	N.D.		1.	ug/kg	0.86
05465	Bromodichloromethane	75-27-4	N.D.		1.	ug/kg	0.86
05466	Toluene	108-88-3	N.D.		1.	ug/kg	0.86
05467	1,1,2-Trichloroethane	79-00-5	N.D.		1.	ug/kg	0.86
05468	Tetrachloroethene	127-18-4	N.D.		1.	ug/kg	0.86
05470	Dibromochloromethane	124-48-1	N.D.		1.	ug/kg	0.86
05472	Chlorobenzene	108-90-7	N.D.		1.	ug/kg	0.86
05474	Ethylbenzene	100-41-4	N.D.		1.	ug/kg	0.86
05477	Styrene	100-42-5	N.D.		1.	ug/kg	0.86
05478	Bromoform	75-25-2	N.D.		1.	ug/kg	0.86
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		1.	ug/kg	0.86
06293	Acetone	67-64-1	16.	J	7.	ug/kg	0.86
06294	Carbon Disulfide	75-15-0	N.D.		1.	ug/kg	0.86

Lancaster Laboratories

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REPRINT

Lancaster Laboratories Sample No. SW 3931707

Collected:10/31/2002 16:05 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-8 (11-12') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP8- SDG#: RAR02-06

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	4.	ug/kg	0.86
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.86
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.86
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.86
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.86
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.86

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Paired with 5GP-8 (11-12') for % MOS result. See SW3933079

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 17:34	Roy R Mellott Jr	0.86
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:12	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:15	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:16	Medina A Long	n.a.

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Lancaster Laboratories

REPRINT

Lancaster Laboratories Sample No. SW 3931708

Collected:10/31/2002 16:40 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-12 (3-4') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP12 SDG#: RAR02-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	16.3		0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.						
06292	TCL by 8260 (soil)						
05444	Chloromethane	74-87-3	N.D.		2.	ug/kg	0.81
05445	Vinyl Chloride	75-01-4	N.D.		1.	ug/kg	0.81
05446	Bromomethane	74-83-9	N.D.		2.	ug/kg	0.81
05447	Chloroethane	75-00-3	N.D.		2.	ug/kg	0.81
05449	1,1-Dichloroethene	75-35-4	N.D.		1.	ug/kg	0.81
05450	Methylene Chloride	75-09-2	N.D.		2.	ug/kg	0.81
05451	trans-1,2-Dichloroethene	156-60-5	N.D.		1.	ug/kg	0.81
05452	1,1-Dichloroethane	75-34-3	N.D.		1.	ug/kg	0.81
05454	cis-1,2-Dichloroethene	156-59-2	N.D.		1.	ug/kg	0.81
05455	Chloroform	67-66-3	N.D.		1.	ug/kg	0.81
05457	1,1,1-Trichloroethane	71-55-6	N.D.		1.	ug/kg	0.81
05458	Carbon Tetrachloride	56-23-5	N.D.		1.	ug/kg	0.81
05460	Benzene	71-43-2	N.D.		1.	ug/kg	0.81
05461	1,2-Dichloroethane	107-06-2	N.D.		1.	ug/kg	0.81
05462	Trichloroethene	79-01-6	N.D.		1.	ug/kg	0.81
05463	1,2-Dichloropropane	78-87-5	N.D.		1.	ug/kg	0.81
05465	Bromodichloromethane	75-27-4	N.D.		1.	ug/kg	0.81
05466	Toluene	108-88-3	N.D.		1.	ug/kg	0.81
05467	1,1,2-Trichloroethane	79-00-5	N.D.		1.	ug/kg	0.81
05468	Tetrachloroethene	127-18-4	N.D.		1.	ug/kg	0.81
05470	Dibromochloromethane	124-48-1	N.D.		1.	ug/kg	0.81
05472	Chlorobenzene	108-90-7	N.D.		1.	ug/kg	0.81
05474	Ethylbenzene	100-41-4	N.D.		1.	ug/kg	0.81
05477	Styrene	100-42-5	N.D.		1.	ug/kg	0.81
05478	Bromoform	75-25-2	N.D.		1.	ug/kg	0.81
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		1.	ug/kg	0.81
06293	Acetone	67-64-1	11.	J	7.	ug/kg	0.81
06294	Carbon Disulfide	75-15-0	N.D.		1.	ug/kg	0.81

Lancaster Laboratories Sample No. SW 3931708

Collected:10/31/2002 16:40 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-12 (3-4') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP12 SDG#: RAR02-07

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	4.	ug/kg	0.81
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.81
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.81
06299	4-Methyl-2-pentanone	108-10-1	N.D.	2.	ug/kg	0.81
06300	2-Hexanone	591-78-6	N.D.	2.	ug/kg	0.81
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.81

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Paired with 5GP-12 (3-4') for % MOS result. See SW3933080

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 18:07	Roy R Mellott Jr	0.81
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:04	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:17	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:18	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3931709

Collected:10/31/2002 17:00 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-16 (3-4') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP16 SDG#: RAR02-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
07801	Moisture (Re-Entry)	n.a.	17.9	0.060	%	1
	The moisture result above was taken from a sample aliquot which was submitted to the laboratory under a separate chain of custody (SDG#RAR-01). The moisture result was used for dry weight calculations. See General Comments for paired sample number reference.					
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.97
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.97
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.97
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.97
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.97
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.97
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.97
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.97
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.97
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.97
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.97
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.97
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.97
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.97
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.97
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.97
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.97
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.97
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.97
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.97
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.97
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.97
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.97
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.97
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.97
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.97
06293	Acetone	67-64-1	N.D.	9.	ug/kg	0.97
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.97

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REPRINT

Lancaster Laboratories Sample No. SW 3931709

Collected:10/31/2002 17:00 by DK

Account Number: 11200

Submitted: 11/01/2002 09:20
Reported: 02/28/2003 at 12:01
Discard: 03/31/2003
5GP-16 (3-4') Grab Soil Sample
RAAP-Unit 5 Closure

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5GP16 SDG#: RAR02-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.97
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.97
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.97
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.97
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.97
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.97

A site-specific MSD sample was not submitted for the project. A LCS/LCSD was performed to demonstrate precision and accuracy at a batch level.

Paired with 5GP-16 (3-4') for % MOS result. See SW3933081

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
07801	Moisture (Re-Entry)	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/04/2002 18:40	Roy R Mellott Jr	0.97
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/01/2002 18:06	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/01/2002 17:19	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/01/2002 17:20	Medina A Long	n.a.

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829085
Reported: 02/28/03 at 12:02 PM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: K023081AA	Sample number(s): 3931702-3931709							
Chloromethane	N.D.	2.	ug/kg	111	106	47-133	4	30
Vinyl Chloride	N.D.	1.	ug/kg	105	99	57-132	5	30
Bromomethane	N.D.	2.	ug/kg	88	82	54-129	7	30
Chloroethane	N.D.	2.	ug/kg	101	94	66-130	7	30
1,1-Dichloroethene	N.D.	1.	ug/kg	98	91	77-139	7	30
Methylene Chloride	N.D.	2.	ug/kg	92	92	76-129	0	30
trans-1,2-Dichloroethene	N.D.	1.	ug/kg	95	91	78-131	5	30
1,1-Dichloroethane	N.D.	1.	ug/kg	107	104	82-130	2	30
cis-1,2-Dichloroethene	N.D.	1.	ug/kg	97	96	85-127	2	30
Chloroform	N.D.	1.	ug/kg	98	97	79-126	2	30
1,1,1-Trichloroethane	N.D.	1.	ug/kg	101	98	69-133	3	30
Carbon Tetrachloride	N.D.	1.	ug/kg	97	93	68-137	4	30
Benzene	N.D.	1.	ug/kg	100	99	85-125	2	30
1,2-Dichloroethane	N.D.	1.	ug/kg	105	113	75-132	7	30
Trichloroethene	N.D.	1.	ug/kg	99	95	81-124	4	30
1,2-Dichloropropane	N.D.	1.	ug/kg	102	104	81-126	2	30
Bromodichloromethane	N.D.	1.	ug/kg	95	97	80-123	1	30
Toluene	N.D.	1.	ug/kg	100	95	81-116	6	30
1,1,2-Trichloroethane	N.D.	1.	ug/kg	89	94	77-116	6	30
Tetrachloroethene	N.D.	1.	ug/kg	99	94	79-128	6	30
Dibromochloromethane	N.D.	1.	ug/kg	86	89	73-116	4	30
Chlorobenzene	N.D.	1.	ug/kg	95	91	81-112	4	30
Ethylbenzene	N.D.	1.	ug/kg	98	95	82-115	3	30
Styrene	N.D.	1.	ug/kg	90	88	79-116	1	30
Bromoform	N.D.	1.	ug/kg	77	86	64-121	11	30
1,1,2,2-Tetrachloroethane	N.D.	1.	ug/kg	71	80	64-121	13	30
Acetone	N.D.	7.	ug/kg	57	70	51-178	20	30
Carbon Disulfide	N.D.	1.	ug/kg	105	100	72-144	5	30
2-Butanone	N.D.	4.	ug/kg	71	77	58-155	9	30
trans-1,3-Dichloropropene	N.D.	1.	ug/kg	92	96	75-113	4	30
cis-1,3-Dichloropropene	N.D.	1.	ug/kg	97	97	82-122	1	30
4-Methyl-2-pentanone	N.D.	3.	ug/kg	69	86	56-144	21	30
2-Hexanone	N.D.	3.	ug/kg	65	80	51-142	21	30
Xylene (Total)	N.D.	1.	ug/kg	96	94	82-117	3	30

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

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2425 New Holland Pike
PO Box 12425
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717-656-2300 Fax: 717-656-2681

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829085
Reported: 02/28/03 at 12:02 PM

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: K023081AA	Sample number(s): 3931702-3931709								
Chloromethane	114		14-144						
Vinyl Chloride	111		20-146						
Bromomethane	88		24-140						
Chloroethane	104		33-147						
1,1-Dichloroethene	91		43-153						
Methylene Chloride	80		49-145						
trans-1,2-Dichloroethene	85		49-143						
1,1-Dichloroethane	96		51-147						
cis-1,2-Dichloroethene	87		54-139						
Chloroform	88		57-135						
1,1,1-Trichloroethane	96		47-143						
Carbon Tetrachloride	91		43-144						
Benzene	89		52-141						
1,2-Dichloroethane	92		57-137						
Trichloroethene	87		47-140						
1,2-Dichloropropane	93		55-138						
romodichloromethane	83		55-131						
oluene	88		41-147						
1,1,2-Trichloroethane	75		45-150						
Tetrachloroethene	95		42-157						
Dibromochloromethane	72		46-137						
Chlorobenzene	84		48-132						
Ethylbenzene	89		44-142						
Styrene	80		30-144						
Bromoform	63		32-139						
1,1,2,2-Tetrachloroethane	60		23-180						
Acetone	141		6-214						
Carbon Disulfide	97		29-162						
2-Butanone	107		22-181						
trans-1,3-Dichloropropene	80		46-130						
cis-1,3-Dichloropropene	83		50-129						
4-Methyl-2-pentanone	60		40-154						
2-Hexanone	86		28-170						
Xylene (Total)	87		47-139						

Surrogate Quality Control

Analysis Name: TCL by 8260 (soil)
Batch number: K023081AA

Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

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Lancaster, PA 17605-2425
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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829085
Reported: 02/28/03 at 12:02 PM

Surrogate Quality Control

3931702	92	79*	107	100
3931703	95	83	104	104
3931704	95	83	106	103
3931705	96	82	104	102
3931706	98	84	105	104
3931707	94	81	110	99
3931708	97	80	106	102
3931709	95	80	105	102
Blank	98	92	102	105
LCS	98	91	106	110
LCSD	100	96	105	111
MS	96	86	109	107
Limits:	80-120	80-120	81-117	74-121

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

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ANALYTICAL RESULTS

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

540-552-0444

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

SAMPLE GROUP

The sample group for this submittal is 829270. Samples arrived at the laboratory on Saturday, November 02, 2002. The PO# for this group is B02271-01.

Client Description	Lancaster Labs Number
(1-3')7GP-1 Grab Soil Sample	3933061
(8-12')7GP-2 Grab Soil Sample	3933062
(13.5-14.5')7GP-2 Grab Soil Sample	3933063
(10-11')7GP-3 Grab Soil Sample	3933064
(5-8')7GP-8 Grab Soil Sample	3933065
(6-11')7GP-5 Unspiked Grab Soil Sample	3933066
(6-11')7GP-5 Matrix Spike Grab Soil Sample	3933067
(6-11')7GP-5 Matrix Spike Dup/Dup Grab Soil Sample	3933068
(3-4')7GP-16 Grab Soil Sample	3933069
(3-4')7GP-4 Grab Soil Sample	3933070
Unit 7 TCLP Composite Soil Sample	3933071
Unit 7 TCLP Composite Soil Sample	3933072
Unit 7 TCLP Composite Soil Sample	3933073
(1-2')5GP-1 Grab Soil Sample	3933074
(9-10')5GP-1 Grab Soil Sample	3933075
(10-11')5GP-6 Grab Soil Sample	3933076
(9-10')5GP-3 Grab Soil Sample	3933077
(7-8')5GP-8 Grab Soil Sample	3933078
(11-12')5GP-8 Grab Soil Sample	3933079
(3-4')5GP-12 Grab Soil Sample	3933080
(3-4')5GP-16 Grab Soil Sample	3933081
HWMU-5 Composite Soil Sample	3933082
HWMU-5 Composite Soil Sample	3933083
HWMU-5 Composite Soil Sample	3933084

METHODOLOGY

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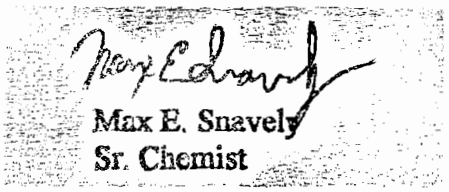
The specific methodologies used in obtaining the enclosed analytical results are indicated on the laboratory chronicles.

1 COPY TO	Draper Aden Associates, Inc.	Attn: Ms. Janet Frazier
1 COPY TO	Data Package Group	

Questions? Contact your Client Services Representative
Michael E McAdams at (717) 656-2300.

Respectfully Submitted,



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Lancaster Laboratories Sample No. SW 3933061

Collected:11/01/2002 10:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(1-3')7GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

137-P SDG#: RAR01-01

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	13.7		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.42	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.38	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.41	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.6	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.38	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.		0.38	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.38	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.38	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.		1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.6	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.0	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		5.8	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.7	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.6	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.1	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.38	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	0.27	J	0.20	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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REPRINT

Lancaster Laboratories Sample No. SW 3933061

Collected:11/01/2002 10:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(1-3')7GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

137-P SDG#: RAR01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	38.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	38.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	38.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	38.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	38.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	78.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	38.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	38.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	38.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	38.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	38.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	38.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	38.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	38.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	38.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	38.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	38.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	38.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	78.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	38.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	38.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	78.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	38.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	38.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	78.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	38.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	38.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	38.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933061

Collected:11/01/2002 10:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(1-3')7GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

137-P SDG#: RAR01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	38.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	38.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	78.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	38.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	780.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	38.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	38.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	38.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	78.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	38.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	38.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	38.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	38.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	38.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	78.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	38.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	78.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	38.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	38.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	78.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	78.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	78.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	38.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	38.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	38.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	38.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	38.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	38.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933061

Collected:11/01/2002 10:00

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Submitted: 11/02/2002 10:20
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Discard: 12/26/2002
(1-3')7GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

137-P SDG#: RAR01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	78.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	38.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	78.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	38.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.88
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.88
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.88
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.88
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.88
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.88
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.88
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.88
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.88
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.88
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.88
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.88
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.88
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.88
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.88
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.88
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.88
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.88
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.88
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.88
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.88
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.88
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.88
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.88
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.88
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.88
06293	Acetone	67-64-1	N.D.	7.	ug/kg	0.88
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.88
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.88
6297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.88

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(1-3')7GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

137-P SDG#: RAR01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.88
06299	4-Methyl-2-pentanone	108-10-1	N.D.	3.	ug/kg	0.88
06300	2-Hexanone	591-78-6	N.D.	3.	ug/kg	0.88
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.88

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 03:06	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 04:33	Linda M Hartenstine	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 04:33	Linda M Hartenstine	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/06/2002 02:11	Ryan V Nolt	0.88
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:30	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:42	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:43	Medina A Long	n.a.

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Lancaster Laboratories Sample No. SW 3933062

Collected:11/01/2002 10:40

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(8-12')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

81272 SDG#: RAR01-02

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	15.9		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.43	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.42	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.8	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.39	ug/kg	1
01986	p,p-DDD	72-54-8	0.75	J	0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	1.9	J	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.7	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.1	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		5.9	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.8	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.8	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.2	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.20	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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Lancaster Laboratories Sample No. SW 3933062

Collected:11/01/2002 10:40

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(8-12')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

81272 SDG#: RAR01-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	80.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	80.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	80.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	80.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1

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2206 South Main Street
Blacksburg VA 24060

81272 SDG#: RAR01-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	39.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	80.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	800.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	80.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	80.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	80.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	80.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	80.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	80.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	39.	ug/kg	1

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81272 SDG#: RAR01-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	80.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	80.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	39.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.98
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.98
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.98
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.98
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.98
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.98
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.98
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.98
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.98
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.98
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.98
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.98
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.98
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.98
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.98
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.98
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.98
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.98
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.98
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.98
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.98
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.98
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.98
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.98
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.98
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.98
06293	Acetone	67-64-1	N.D.	8.	ug/kg	0.98
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.98
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.98
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.98

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REPRINT

Lancaster Laboratories Sample No. SW 3933062

Collected:11/01/2002 10:40

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(8-12')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Account Number: 11200

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

81272 SDG#: RAR01-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.98
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.98
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.98
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.98

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 03:26	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 05:31	Linda M Hartenstine	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 05:31	Linda M Hartenstine	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/05/2002 23:58	Ryan V Nolt	0.98
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:29	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:44	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:45	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3933063

Collected:11/01/2002 11:05

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(13.5-14.5')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

13572 SDG#: RAR01-03

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	17.2		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
1218	Gamma BHC - Lindane	58-89-9	N.D.		0.21	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.21	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.21	ug/kg	1
01221	p,p-DDT	50-29-3	0.67	J	0.43	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.40	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.42	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.8	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.21	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.21	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.21	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.21	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.40	ug/kg	1
01986	p,p-DDD	72-54-8	3.5		0.40	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.21	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.40	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.40	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	3.1	J	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.8	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.2	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		6.0	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.9	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.9	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.3	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.40	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.21	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.21	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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REPRINT

Lancaster Laboratories Sample No. SW 3933063

Collected:11/01/2002 11:05

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(13.5-14.5')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

13572 SDG#: RAR01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	40.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	40.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	40.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	40.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	40.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	81.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	40.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	40.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	40.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	40.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	40.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	40.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	40.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	40.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	40.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	40.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	40.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	40.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	81.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	210.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	40.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	40.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	81.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	40.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	40.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	81.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	40.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	40.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	40.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933063

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(13.5-14.5')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

13572 SDG#: RAR01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	40.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	40.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	210.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	81.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	210.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	40.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	810.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	210.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	40.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	40.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	40.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	81.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	40.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	40.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	40.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	40.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	40.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	81.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	40.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	81.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	40.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	40.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	81.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	81.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	81.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	40.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	40.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	40.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	40.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	40.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	40.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933063

Collected:11/01/2002 11:05

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(13.5-14.5')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

13572 SDG#: RAR01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	81.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	40.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	81.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	40.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.95
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.95
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.95
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.95
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.95
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.95
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.95
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.95
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.95
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.95
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.95
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.95
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.95
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.95
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.95
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.95
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.95
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.95
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.95
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.95
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.95
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.95
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.95
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.95
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.95
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.95
06293	Acetone	67-64-1	N.D.	8.	ug/kg	0.95
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.95
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.95
6297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.95

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REPRINT

Lancaster Laboratories Sample No. SW 3933063

Collected:11/01/2002 11:05

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(13.5-14.5')7GP-2 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

13572 SDG#: RAR01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.95
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.95
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.95
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.95

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 03:47	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 06:30	Linda M Hartenstine	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 06:30	Linda M Hartenstine	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/06/2002 00:31	Ryan V Nolt	0.95
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:28	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:40	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 20:41	Medina A Long	n.a.

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Lancaster Laboratories Sample No. SW 3933064

Collected:11/01/2002 11:25

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(10-11')7GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10-73 SDG#: RAR01-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	20.8	0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.					
01225	TCL Pesticides in Solids					
01218	Gamma BHC - Lindane	58-89-9	N.D.	0.21	ug/kg	1
01219	Heptachlor	76-44-8	N.D.	0.21	ug/kg	1
01220	Aldrin	309-00-2	N.D.	0.21	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.	0.45	ug/kg	1
01222	Dieldrin	60-57-1	N.D.	0.42	ug/kg	1
01223	Endrin	72-20-8	N.D.	0.44	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.	5.1	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.	0.21	ug/kg	1
01982	Beta BHC	319-85-7	N.D.	0.21	ug/kg	1
01983	Delta BHC	319-86-8	N.D.	0.21	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.	0.21	ug/kg	1
01985	p,p-DDE	72-55-9	2.5	0.42	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.	0.42	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.	14.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.	0.21	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.	0.42	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.	0.42	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.	1.3	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.	6.1	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.	13.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.	5.4	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.	6.3	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.	6.2	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.	7.2	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.	5.6	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.	0.42	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.	0.21	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.	0.21	ug/kg	1
	Heptachlor was detected in the method blank above the method detection					

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REPRINT

Lancaster Laboratories Sample No. SW 3933064

Collected:11/01/2002 11:25

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(10-11')7GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10-73 SDG#: RAR01-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	42.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	42.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	42.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	42.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	42.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	85.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	42.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	42.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	42.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	42.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	42.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	42.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	42.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	42.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	42.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	42.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	42.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	42.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	85.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	210.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	42.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	42.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	85.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	42.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	42.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	85.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	42.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	42.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	42.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933064

Collected:11/01/2002 11:25

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(10-11')7GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10-73 SDG#: RAR01-04

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.		42.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil						
01191	Acenaphthene	83-32-9	N.D.		42.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.		210.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.		85.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.		210.	ug/kg	1
01195	Pyrene	129-00-0	N.D.		42.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.		850.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.		210.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.		42.	ug/kg	1
03768	Fluorene	86-73-7	N.D.		42.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.		42.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.		85.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	750.		42.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.						
03773	4-Bromophenyl-phenylether	101-55-3	N.D.		42.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.		42.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.		42.	ug/kg	1
03776	Anthracene	120-12-7	N.D.		42.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.		85.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.		42.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.		85.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.		42.	ug/kg	1
03782	Chrysene	218-01-9	N.D.		42.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.		85.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	90.	J	85.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.		85.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.		42.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.		42.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.		42.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		42.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.		42.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.		42.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933064

Collected:11/01/2002 11:25

Account Number: 11200

Submitted: 11/02/2002 10:20
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Discard: 12/26/2002
(10-11')7GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10-73 SDG#: RAR01-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	85.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	42.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	85.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	42.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	3.	ug/kg	0.95
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.95
05446	Bromomethane	74-83-9	N.D.	3.	ug/kg	0.95
05447	Chloroethane	75-00-3	N.D.	3.	ug/kg	0.95
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.95
05450	Methylene Chloride	75-09-2	N.D.	3.	ug/kg	0.95
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.95
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.95
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.95
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.95
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.95
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.95
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.95
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.95
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.95
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.95
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.95
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.95
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.95
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.95
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.95
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.95
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.95
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.95
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.95
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.95
06293	Acetone	67-64-1	N.D.	9.	ug/kg	0.95
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.95
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.95
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.95

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Lancaster Laboratories Sample No. SW 3933064

Collected:11/01/2002 11:25

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:33
Discard: 12/26/2002
(10-11')7GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10-73 SDG#: RAR01-04

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.95
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.95
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.95
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.95

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 04:08	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 08:44	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 08:44	Brian K Graham	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/06/2002 01:04	Ryan V Nolt	0.95
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:26	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:38	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:39	Medina A Long	n.a.

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Lancaster Laboratories Sample No. SW 3933065

Collected:11/01/2002 12:15

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(5-8')7GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

58-78 SDG#: RAR01-05

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	17.7		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
1218	Gamma BHC - Lindane	58-89-9	N.D.		0.21	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.21	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.21	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.44	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.40	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.43	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.9	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.21	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.21	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.21	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.21	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.40	ug/kg	1
01986	p,p-DDD	72-54-8	0.49	J	0.40	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.21	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.40	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.40	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.		1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.8	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.2	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		6.1	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		6.0	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.9	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.3	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.40	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.21	ug/kg	1
03026	Gamma Chlordane	5103-74-2	0.28	J	0.21	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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Lancaster Laboratories Sample No. SW 3933065

Collected:11/01/2002 12:15

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Discard: 12/26/2002
(5-8')7GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

58-78 SDG#: RAR01-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	40.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	40.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	40.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	40.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	40.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	81.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	40.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	40.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	40.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	40.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	40.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	40.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	40.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	40.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	40.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	40.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	40.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	40.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	81.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	210.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	40.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	40.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	81.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	40.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	40.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	81.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	40.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	40.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	40.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933065

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Discard: 12/26/2002
(5-8')7GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Account Number: 11200

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

58-78 SDG#: RAR01-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	40.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	40.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	210.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	81.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	210.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	40.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	810.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	210.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	40.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	40.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	40.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	81.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	40.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	40.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	40.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	40.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	40.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	81.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	40.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	81.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	40.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	40.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	81.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	81.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	81.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	40.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	40.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	40.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	40.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	40.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	40.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933065

Collected:11/01/2002 12:15

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(5-8')7GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

58-78 SDG#: RAR01-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	81.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	40.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	81.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	40.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.81
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.81
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.81
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.81
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.81
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.81
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.81
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.81
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.81
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.81
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.81
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.81
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.81
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.81
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.81
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.81
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.81
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.81
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.81
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.81
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.81
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.81
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.81
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.81
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.81
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.81
06293	Acetone	67-64-1	N.D.	7.	ug/kg	0.81
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.81
06296	2-Butanone	78-93-3	N.D.	4.	ug/kg	0.81
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.81

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Lancaster Laboratories Sample No. SW 3933065

Collected:11/01/2002 12:15

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(5-8')7GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Account Number: 11200

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

58-78 SDG#: RAR01-05

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.81
06299	4-Methyl-2-pentanone	108-10-1	N.D.	2.	ug/kg	0.81
06300	2-Hexanone	591-78-6	N.D.	2.	ug/kg	0.81
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.81

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 04:29	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 09:37	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 09:37	Brian K Graham	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/06/2002 01:37	Ryan V Nolt	0.81
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:25	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:36	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:37	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3933066

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Unspiked Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06BKG

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	16.0		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.43	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.42	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.8	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.39	ug/kg	1
01986	p,p-DDD	72-54-8	0.60	J	0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.		1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.7	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.1	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		6.0	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.8	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.8	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.2	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	0.23	J	0.20	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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REPRINT

Lancaster Laboratories Sample No. SW 3933066

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Unspiked Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06BKG

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	80.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	80.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	80.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	80.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933066

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Unspiked Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06BKG

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	39.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	80.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	800.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	80.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	80.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	80.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	80.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	80.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	80.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	39.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933066

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Unspiked Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06BKG

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	80.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	80.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	39.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.97
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.97
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.97
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.97
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.97
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.97
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.97
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.97
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.97
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.97
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.97
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.97
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.97
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.97
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.97
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.97
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.97
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.97
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.97
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.97
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.97
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.97
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.97
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.97
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.97
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.97
06293	Acetone	67-64-1	N.D.	8.	ug/kg	0.97
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.97
06296	2-Butanone	78-93-3	N.D.	5.	ug/kg	0.97
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.97

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Lancaster Laboratories Sample No. SW 3933066

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Unspiked Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06BKG

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.97
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.97
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.97
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.97

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 02:04	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 01:37	Linda M Hartenstine	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 01:37	Linda M Hartenstine	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/05/2002 20:40	Ryan V Nolt	0.97
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 18:24	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:34	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:35	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3933067

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Matrix Spike Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
00118	Moisture	n.a.	16.0	0.50	%	1
01225	TCL Pesticides in Solids					
01218	Gamma BHC - Lindane	58-89-9	4.0	0.20	ug/kg	1
01219	Heptachlor	76-44-8	4.0	0.20	ug/kg	1
01220	Aldrin	309-00-2	3.9	0.20	ug/kg	1
01221	p,p-DDT	50-29-3	9.2	0.43	ug/kg	1
01222	Dieldrin	60-57-1	8.1	0.39	ug/kg	1
01223	Endrin	72-20-8	8.3	0.42	ug/kg	1
01859	Methoxychlor	72-43-5	43.	4.8	ug/kg	1
01981	Alpha BHC	319-84-6	3.8	0.20	ug/kg	1
01982	Beta BHC	319-85-7	4.0	0.20	ug/kg	1
01983	Delta BHC	319-86-8	4.4	0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	4.0	0.20	ug/kg	1
01985	p,p-DDE	72-55-9	8.8	0.39	ug/kg	1
01986	p,p-DDD	72-54-8	8.9	0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.	13.	ug/kg	1
01989	Endosulfan I	959-98-8	3.9	0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	8.0	0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	7.0	0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	6.2	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.	5.7	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.	12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.	5.1	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.	6.0	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.	5.8	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.	6.8	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.	5.2	ug/kg	1
03017	Endrin Ketone	53494-70-5	7.9	0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	4.2	0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	4.2	0.20	ug/kg	1

Heptachlor was detected in the method blank above the method detection limit. No heptachlor was detected in the sample, therefore the data is reported.

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REPRINT

Lancaster Laboratories Sample No. SW 3933067

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Matrix Spike Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	3,400.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	3,500.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	3,200.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	3,500.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	3,400.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	3,800.	80.	ug/kg	1
03746	2-Nitrophenol	88-75-5	3,800.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	3,700.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	3,600.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	3,500.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	3,300.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	3,300.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	3,200.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	3,300.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	3,800.	39.	ug/kg	1
03759	Isophorone	78-59-1	3,500.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	3,800.	39.	ug/kg	1
03761	Naphthalene	91-20-3	3,500.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	3,700.	80.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	7,900.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	3,600.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	3,400.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	3,800.	80.	ug/kg	1
04690	2-Methylphenol	95-48-7	3,400.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	4,100.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	3,300.	80.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	2,800.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	3,700.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	3,700.	39.	ug/kg	1
04696	2-Nitroaniline	88-74-4	3,800.	39.	ug/kg	1

04689 TCL SW846 Semivolatiles/Soil

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REPRINT

Lancaster Laboratories Sample No. SW 3933067

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Discard: 12/26/2002
(6-11')7GP-5 Matrix Spike Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06MS

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
01191	Acenaphthene	83-32-9	4,000.		39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	3,700.		200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	4,100.		80.	ug/kg	1
01194	Pentachlorophenol	87-86-5	2,800.		200.	ug/kg	1
01195	Pyrene	129-00-0	3,900.		39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	1,600.	J	800.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	2,500.		200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	3,600.		39.	ug/kg	1
03768	Fluorene	86-73-7	3,700.		39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	3,800.		39.	ug/kg	1
03770	Diethylphthalate	84-66-2	3,900.		80.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	3,400.		39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.						
03773	4-Bromophenyl-phenylether	101-55-3	3,800.		39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	3,900.		39.	ug/kg	1
03775	Phenanthrene	85-01-8	3,900.		39.	ug/kg	1
03776	Anthracene	120-12-7	3,900.		39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	3,800.		80.	ug/kg	1
03778	Fluoranthene	206-44-0	3,600.		39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	3,800.		80.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	3,800.		39.	ug/kg	1
03782	Chrysene	218-01-9	3,800.		39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	2,600.		80.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	3,700.		80.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	3,700.		80.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	3,800.		39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	3,900.		39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	4,000.		39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	3,800.		39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	4,100.		39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	3,800.		39.	ug/kg	1
04697	3-Nitroaniline	99-09-2	3,500.		80.	ug/kg	1
04698	Dibenzofuran	132-64-9	3,700.		39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	3,200.		80.	ug/kg	1

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Discard: 12/26/2002
(6-11')7GP-5 Matrix Spike Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04702	Carbazole	86-74-8	3,700.	39.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	22.	2.	ug/kg	0.83
05445	Vinyl Chloride	75-01-4	21.	1.	ug/kg	0.83
05446	Bromomethane	74-83-9	16.	2.	ug/kg	0.83
05447	Chloroethane	75-00-3	19.	2.	ug/kg	0.83
05449	1,1-Dichloroethene	75-35-4	20.	1.	ug/kg	0.83
05450	Methylene Chloride	75-09-2	18.	2.	ug/kg	0.83
05451	trans-1,2-Dichloroethene	156-60-5	19.	1.	ug/kg	0.83
05452	1,1-Dichloroethane	75-34-3	22.	1.	ug/kg	0.83
05454	cis-1,2-Dichloroethene	156-59-2	19.	1.	ug/kg	0.83
05455	Chloroform	67-66-3	20.	1.	ug/kg	0.83
05457	1,1,1-Trichloroethane	71-55-6	21.	1.	ug/kg	0.83
05458	Carbon Tetrachloride	56-23-5	20.	1.	ug/kg	0.83
05460	Benzene	71-43-2	20.	1.	ug/kg	0.83
05461	1,2-Dichloroethane	107-06-2	22.	1.	ug/kg	0.83
05462	Trichloroethene	79-01-6	19.	1.	ug/kg	0.83
05463	1,2-Dichloropropane	78-87-5	21.	1.	ug/kg	0.83
05465	Bromodichloromethane	75-27-4	19.	1.	ug/kg	0.83
05466	Toluene	108-88-3	21.	1.	ug/kg	0.83
05467	1,1,2-Trichloroethane	79-00-5	18.	1.	ug/kg	0.83
05468	Tetrachloroethene	127-18-4	21.	1.	ug/kg	0.83
05470	Dibromochloromethane	124-48-1	18.	1.	ug/kg	0.83
05472	Chlorobenzene	108-90-7	19.	1.	ug/kg	0.83
05474	Ethylbenzene	100-41-4	20.	1.	ug/kg	0.83
05477	Styrene	100-42-5	18.	1.	ug/kg	0.83
05478	Bromoform	75-25-2	15.	1.	ug/kg	0.83
05480	1,1,2,2-Tetrachloroethane	79-34-5	15.	1.	ug/kg	0.83
06293	Acetone	67-64-1	110.	7.	ug/kg	0.83
06294	Carbon Disulfide	75-15-0	21.	1.	ug/kg	0.83
06296	2-Butanone	78-93-3	100.	4.	ug/kg	0.83
06297	trans-1,3-Dichloropropene	10061-02-6	20.	1.	ug/kg	0.83
06298	cis-1,3-Dichloropropene	10061-01-5	18.	1.	ug/kg	0.83
06299	4-Methyl-2-pentanone	108-10-1	69.	2.	ug/kg	0.83
06300	2-Hexanone	591-78-6	67.	2.	ug/kg	0.83

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Lancaster Laboratories Sample No. SW 3933067

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:34
Discard: 12/26/2002
(6-11')7GP-5 Matrix Spike Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06301	Xylene (Total)	1330-20-7	59.	1.	ug/kg	0.83

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00118	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 02:24	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 02:35	Linda M Hartenstine	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 02:35	Linda M Hartenstine	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/05/2002 21:13	Ryan V Nolt	0.83
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:23	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:32	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:33	Medina A Long	n.a.

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Lancaster Laboratories Sample No. SW 3933068

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

(6-11')7GP-5 Matrix Spike Dup/Dup Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

61175 SDG#: RAR01-06MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
00118	Moisture	n.a.	16.0	0.50	%	1
00121	Moisture Duplicate	n.a.	16.2	0.50	%	1
	The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.					
01225	TCL Pesticides in Solids					
01218	Gamma BHC - Lindane	58-89-9	3.9	0.20	ug/kg	1
01219	Heptachlor	76-44-8	4.0	0.20	ug/kg	1
01220	Aldrin	309-00-2	3.8	0.20	ug/kg	1
01221	p,p-DDT	50-29-3	9.4	0.43	ug/kg	1
01222	Dieldrin	60-57-1	8.1	0.39	ug/kg	1
01223	Endrin	72-20-8	8.3	0.42	ug/kg	1
01859	Methoxychlor	72-43-5	44.	4.8	ug/kg	1
01981	Alpha BHC	319-84-6	3.6	0.20	ug/kg	1
01982	Beta BHC	319-85-7	4.0	0.20	ug/kg	1
01983	Delta BHC	319-86-8	4.3	0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	4.0	0.20	ug/kg	1
01985	p,p-DDE	72-55-9	8.8	0.39	ug/kg	1
01986	p,p-DDD	72-54-8	8.9	0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.	13.	ug/kg	1
01989	Endosulfan I	959-98-8	3.8	0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	8.1	0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	6.9	0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	7.5	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.	5.7	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.	12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.	5.1	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.	6.0	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.	5.8	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.	6.8	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.	5.2	ug/kg	1
03017	Endrin Ketone	53494-70-5	7.9	0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	4.2	0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	4.3	0.20	ug/kg	1

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Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

(6-11')7GP-5 Matrix Spike Dup/Dup Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

61175 SDG#: RAR01-06MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	Heptachlor was detected in the method blank above the method detection limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	3,400.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	3,600.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	3,200.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	3,400.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	3,400.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	3,800.	80.	ug/kg	1
03746	2-Nitrophenol	88-75-5	3,700.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	3,600.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	3,500.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	3,400.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	3,200.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	3,300.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	3,300.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	3,300.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	3,600.	39.	ug/kg	1
03759	Isophorone	78-59-1	3,500.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	3,800.	39.	ug/kg	1
03761	Naphthalene	91-20-3	3,400.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	3,700.	80.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	7,600.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	3,600.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	3,300.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	3,700.	80.	ug/kg	1
04690	2-Methylphenol	95-48-7	3,400.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	4,200.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	3,300.	80.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	3,000.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	3,600.	39.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933068

Collected:11/01/2002 12:50

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Submitted: 11/02/2002 10:20
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Discard: 12/26/2002

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

(6-11')7GP-5 Matrix Spike Dup/Dup Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

61175 SDG#: RAR01-06MSD

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
04695	2,4,5-Trichlorophenol	95-95-4	3,600.		39.	ug/kg	1
04696	2-Nitroaniline	88-74-4	3,900.		39.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil						
01191	Acenaphthene	83-32-9	3,900.		39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	3,600.		200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	4,000.		80.	ug/kg	1
01194	Pentachlorophenol	87-86-5	2,800.		200.	ug/kg	1
01195	Pyrene	129-00-0	3,900.		39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	1,500.	J	800.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	2,500.		200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	3,700.		39.	ug/kg	1
03768	Fluorene	86-73-7	3,600.		39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	3,600.		39.	ug/kg	1
03770	Diethylphthalate	84-66-2	3,900.		80.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	3,400.		39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.						
03773	4-Bromophenyl-phenylether	101-55-3	3,800.		39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	3,900.		39.	ug/kg	1
03775	Phenanthrene	85-01-8	3,700.		39.	ug/kg	1
03776	Anthracene	120-12-7	3,700.		39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	3,700.		80.	ug/kg	1
03778	Fluoranthene	206-44-0	3,400.		39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	3,900.		80.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	3,800.		39.	ug/kg	1
03782	Chrysene	218-01-9	3,900.		39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	2,900.		80.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	3,800.		80.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	3,600.		80.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	4,000.		39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	3,900.		39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	4,000.		39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	3,900.		39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	4,100.		39.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933068

Collected:11/01/2002 12:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
(6-11')7GP-5 Matrix Spike Dup/Dup Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
03791	Benzo(g,h,i)perylene	191-24-2	3,800.	39.	ug/kg	1
04697	3-Nitroaniline	99-09-2	3,500.	80.	ug/kg	1
04698	Dibenzofuran	132-64-9	3,600.	39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	3,400.	80.	ug/kg	1
04702	Carbazole	86-74-8	3,600.	39.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	21.	2.	ug/kg	0.86
05445	Vinyl Chloride	75-01-4	20.	1.	ug/kg	0.86
05446	Bromomethane	74-83-9	15.	2.	ug/kg	0.86
05447	Chloroethane	75-00-3	18.	2.	ug/kg	0.86
05449	1,1-Dichloroethene	75-35-4	21.	1.	ug/kg	0.86
05450	Methylene Chloride	75-09-2	19.	2.	ug/kg	0.86
05451	trans-1,2-Dichloroethene	156-60-5	19.	1.	ug/kg	0.86
05452	1,1-Dichloroethane	75-34-3	22.	1.	ug/kg	0.86
05454	cis-1,2-Dichloroethene	156-59-2	20.	1.	ug/kg	0.86
05455	Chloroform	67-66-3	20.	1.	ug/kg	0.86
05457	1,1,1-Trichloroethane	71-55-6	21.	1.	ug/kg	0.86
05458	Carbon Tetrachloride	56-23-5	20.	1.	ug/kg	0.86
05460	Benzene	71-43-2	20.	1.	ug/kg	0.86
05461	1,2-Dichloroethane	107-06-2	23.	1.	ug/kg	0.86
05462	Trichloroethene	79-01-6	20.	1.	ug/kg	0.86
05463	1,2-Dichloropropane	78-87-5	21.	1.	ug/kg	0.86
05465	Bromodichloromethane	75-27-4	19.	1.	ug/kg	0.86
05466	Toluene	108-88-3	21.	1.	ug/kg	0.86
05467	1,1,2-Trichloroethane	79-00-5	18.	1.	ug/kg	0.86
05468	Tetrachloroethene	127-18-4	22.	1.	ug/kg	0.86
05470	Dibromochloromethane	124-48-1	18.	1.	ug/kg	0.86
05472	Chlorobenzene	108-90-7	20.	1.	ug/kg	0.86
05474	Ethylbenzene	100-41-4	21.	1.	ug/kg	0.86
05477	Styrene	100-42-5	19.	1.	ug/kg	0.86
05478	Bromoform	75-25-2	15.	1.	ug/kg	0.86
05480	1,1,2,2-Tetrachloroethane	79-34-5	15.	1.	ug/kg	0.86
06293	Acetone	67-64-1	100.	7.	ug/kg	0.86
06294	Carbon Disulfide	75-15-0	21.	1.	ug/kg	0.86
06296	2-Butanone	78-93-3	97.	4.	ug/kg	0.86

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Discard: 12/26/2002
(6-11')7GP-5 Matrix Spike Dup/Dup Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

61175 SDG#: RAR01-06MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06297	trans-1,3-Dichloropropene	10061-02-6	19.	1.	ug/kg	0.86
06298	cis-1,3-Dichloropropene	10061-01-5	19.	1.	ug/kg	0.86
06299	4-Methyl-2-pentanone	108-10-1	66.	4.	ug/kg	0.86
06300	2-Hexanone	591-78-6	67.	4.	ug/kg	0.86
06301	Xylene (Total)	1330-20-7	61.	1.	ug/kg	0.86

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00118	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
00121	Moisture Duplicate	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 02:45	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 03:34	Linda M Hartenstine	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 03:34	Linda M Hartenstine	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/05/2002 21:46	Ryan V Nolt	0.86
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:22	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:30	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:31	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3933069

Collected:11/01/2002 13:30

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
(3-4')7GP-16 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34716 SDG#: RAR01-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	16.4		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.43	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.42	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.8	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.39	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.		0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.		1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.7	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.1	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		6.0	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.9	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.8	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.3	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	0.26	J	0.20	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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(3-4')7GP-16 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34716 SDG#: RAR01-07

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	80.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	80.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	80.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	80.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1

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HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34716 SDG#: RAR01-07

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	39.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	80.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	800.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	80.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	80.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	80.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	80.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	80.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	80.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	39.	ug/kg	1

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Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34716 SDG#: RAR01-07

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.		80.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.		39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.		80.	ug/kg	1
04702	Carbazole	86-74-8	N.D.		39.	ug/kg	1
06292	TCL by 8260 (soil)						
)5444	Chloromethane	74-87-3	N.D.		2.	ug/kg	0.84
05445	Vinyl Chloride	75-01-4	N.D.		1.	ug/kg	0.84
05446	Bromomethane	74-83-9	N.D.		2.	ug/kg	0.84
05447	Chloroethane	75-00-3	N.D.		2.	ug/kg	0.84
05449	1,1-Dichloroethene	75-35-4	1.	J	1.	ug/kg	0.84
05450	Methylene Chloride	75-09-2	N.D.		2.	ug/kg	0.84
05451	trans-1,2-Dichloroethene	156-60-5	N.D.		1.	ug/kg	0.84
05452	1,1-Dichloroethane	75-34-3	N.D.		1.	ug/kg	0.84
05454	cis-1,2-Dichloroethene	156-59-2	N.D.		1.	ug/kg	0.84
05455	Chloroform	67-66-3	N.D.		1.	ug/kg	0.84
05457	1,1,1-Trichloroethane	71-55-6	N.D.		1.	ug/kg	0.84
05458	Carbon Tetrachloride	56-23-5	N.D.		1.	ug/kg	0.84
05460	Benzene	71-43-2	N.D.		1.	ug/kg	0.84
05461	1,2-Dichloroethane	107-06-2	N.D.		1.	ug/kg	0.84
05462	Trichloroethene	79-01-6	N.D.		1.	ug/kg	0.84
05463	1,2-Dichloropropane	78-87-5	N.D.		1.	ug/kg	0.84
05465	Bromodichloromethane	75-27-4	N.D.		1.	ug/kg	0.84
05466	Toluene	108-88-3	N.D.		1.	ug/kg	0.84
05467	1,1,2-Trichloroethane	79-00-5	N.D.		1.	ug/kg	0.84
05468	Tetrachloroethene	127-18-4	N.D.		1.	ug/kg	0.84
05470	Dibromochloromethane	124-48-1	N.D.		1.	ug/kg	0.84
05472	Chlorobenzene	108-90-7	N.D.		1.	ug/kg	0.84
05474	Ethylbenzene	100-41-4	N.D.		1.	ug/kg	0.84
05477	Styrene	100-42-5	N.D.		1.	ug/kg	0.84
05478	Bromoform	75-25-2	N.D.		1.	ug/kg	0.84
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		1.	ug/kg	0.84
06293	Acetone	67-64-1	N.D.		7.	ug/kg	0.84
06294	Carbon Disulfide	75-15-0	N.D.		1.	ug/kg	0.84
06296	2-Butanone	78-93-3	N.D.		4.	ug/kg	0.84
)6297	trans-1,3-Dichloropropene	10061-02-6	N.D.		1.	ug/kg	0.84

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(3-4')7GP-16 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34716 SDG#: RAR01-07

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.84
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.84
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.84
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.84

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 04:49	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 10:31	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 10:31	Brian K Graham	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/05/2002 22:19	Ryan V Nolt	0.84
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:21	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:28	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:29	Medina A Long	n.a.

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Lancaster Laboratories Sample No. SW 3933070

Collected:11/01/2002 13:45

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
(3-4')7GP-4 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

3474- SDG#: RAR01-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	14.7	0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.					
01225	TCL Pesticides in Solids					
1218	Gamma BHC - Lindane	58-89-9	N.D.	0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.	0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.	0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.	0.42	ug/kg	1
01222	Dieldrin	60-57-1	N.D.	0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.	0.41	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.	4.7	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.	0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.	0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.	0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.	0.20	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.	0.39	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.	0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.	13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.	0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.	0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.	0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.	5.6	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.	12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.	5.0	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.	5.9	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.	5.7	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.	6.7	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.	5.2	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.	0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.	0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.	0.20	ug/kg	1
	Heptachlor was detected in the method blank above the method detection					

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Lancaster Laboratories Sample No. SW 3933070

Collected:11/01/2002 13:45

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
(3-4')7GP-4 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

3474- SDG#: RAR01-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	79.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	79.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	79.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	79.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933070

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Submitted: 11/02/2002 10:20
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Discard: 12/26/2002
(3-4')7GP-4 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

3474- SDG#: RAR01-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	39.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	79.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	790.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	79.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	79.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	79.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	79.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	79.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	79.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	39.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933070

Collected:11/01/2002 13:45

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
(3-4')7GP-4 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

3474- SDG#: RAR01-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	79.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	79.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	39.	ug/kg	1
06292	TCL by 8260 (soil)					
05444	Chloromethane	74-87-3	N.D.	2.	ug/kg	0.86
05445	Vinyl Chloride	75-01-4	N.D.	1.	ug/kg	0.86
05446	Bromomethane	74-83-9	N.D.	2.	ug/kg	0.86
05447	Chloroethane	75-00-3	N.D.	2.	ug/kg	0.86
05449	1,1-Dichloroethene	75-35-4	N.D.	1.	ug/kg	0.86
05450	Methylene Chloride	75-09-2	N.D.	2.	ug/kg	0.86
05451	trans-1,2-Dichloroethene	156-60-5	N.D.	1.	ug/kg	0.86
05452	1,1-Dichloroethane	75-34-3	N.D.	1.	ug/kg	0.86
05454	cis-1,2-Dichloroethene	156-59-2	N.D.	1.	ug/kg	0.86
05455	Chloroform	67-66-3	N.D.	1.	ug/kg	0.86
05457	1,1,1-Trichloroethane	71-55-6	N.D.	1.	ug/kg	0.86
05458	Carbon Tetrachloride	56-23-5	N.D.	1.	ug/kg	0.86
05460	Benzene	71-43-2	N.D.	1.	ug/kg	0.86
05461	1,2-Dichloroethane	107-06-2	N.D.	1.	ug/kg	0.86
05462	Trichloroethene	79-01-6	N.D.	1.	ug/kg	0.86
05463	1,2-Dichloropropane	78-87-5	N.D.	1.	ug/kg	0.86
05465	Bromodichloromethane	75-27-4	N.D.	1.	ug/kg	0.86
05466	Toluene	108-88-3	N.D.	1.	ug/kg	0.86
05467	1,1,2-Trichloroethane	79-00-5	N.D.	1.	ug/kg	0.86
05468	Tetrachloroethene	127-18-4	N.D.	1.	ug/kg	0.86
05470	Dibromochloromethane	124-48-1	N.D.	1.	ug/kg	0.86
05472	Chlorobenzene	108-90-7	N.D.	1.	ug/kg	0.86
05474	Ethylbenzene	100-41-4	N.D.	1.	ug/kg	0.86
05477	Styrene	100-42-5	N.D.	1.	ug/kg	0.86
05478	Bromoform	75-25-2	N.D.	1.	ug/kg	0.86
05480	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	1.	ug/kg	0.86
06293	Acetone	67-64-1	N.D.	7.	ug/kg	0.86
06294	Carbon Disulfide	75-15-0	N.D.	1.	ug/kg	0.86
06296	2-Butanone	78-93-3	N.D.	4.	ug/kg	0.86
06297	trans-1,3-Dichloropropene	10061-02-6	N.D.	1.	ug/kg	0.86

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Lancaster Laboratories Sample No. SW 3933070

Collected:11/01/2002 13:45

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
(3-4')7GP-4 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

3474- SDG#: RAR01-08

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
06298	cis-1,3-Dichloropropene	10061-01-5	N.D.	1.	ug/kg	0.86
06299	4-Methyl-2-pentanone	108-10-1	N.D.	4.	ug/kg	0.86
06300	2-Hexanone	591-78-6	N.D.	4.	ug/kg	0.86
06301	Xylene (Total)	1330-20-7	N.D.	1.	ug/kg	0.86

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 05:10	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 11:25	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 11:25	Brian K Graham	1
06292	TCL by 8260 (soil)	SW-846 8260B	1	11/05/2002 22:52	Ryan V Nolt	0.86
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1
08389	Low/High Encore Prep Tracking	SW-846 5035	1	11/05/2002 15:20	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	2	11/02/2002 23:26	Medina A Long	n.a.
08389	Low/High Encore Prep Tracking	SW-846 5035	3	11/02/2002 23:27	Medina A Long	n.a.

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REPRINT

Lancaster Laboratories Sample No. SW 3933074

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(1-2')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

125GP SDG#: RAR01-12

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	12.2		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.19	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.19	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.19	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.41	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.38	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.40	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.6	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.19	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.19	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.19	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.19	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.38	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.		0.38	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.19	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.38	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.38	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.		1.1	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.5	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		11.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		4.9	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		5.7	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.6	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.5	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.0	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.38	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.19	ug/kg	1
03026	Gamma Chlordane	5103-74-2	0.48	J	0.19	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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REPRINT

Lancaster Laboratories Sample No. SW 3933074

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(1-2')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

125GP SDG#: RAR01-12

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	38.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	38.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	38.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	38.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	38.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	76.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	38.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	38.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	38.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	38.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	38.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	38.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	38.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	38.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	38.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	38.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	38.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	38.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	76.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	190.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	38.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	38.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	76.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	38.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	38.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	76.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	38.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	38.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	38.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933074

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(1-2')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

125GP SDG#: RAR01-12

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	38.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	38.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	190.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	76.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	190.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	38.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	760.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	190.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	38.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	38.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	38.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	76.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	38.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	38.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	38.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	38.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	38.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	76.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	38.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	76.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	38.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	38.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	76.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	76.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	76.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	38.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	38.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	38.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	38.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	38.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	38.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933074

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(1-2')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

125GP SDG#: RAR01-12

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	76.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	38.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	76.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	38.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 05:31	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 12:18	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 12:18	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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Lancaster Laboratories Sample No. SW 3933075

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(9-10')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105- SDG#: RAR01-13

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	14.6		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.42	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.41	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.7	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	0.49	J	0.39	ug/kg	1
01986	p,p-DDD	72-54-8	19.		0.77	ug/kg	2
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	2.3	J	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.6	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.0	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		5.9	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.7	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.7	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.2	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.20	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933075

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(9-10')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105- SDG#: RAR01-13

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	78.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	78.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	78.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	78.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1
04696	2-Nitroaniline	88-74-4	N.D.	39.	ug/kg	1

04689 TCL SW846 Semivolatiles/Soil

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Lancaster Laboratories Sample No. SW 3933075

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(9-10')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105- SDG#: RAR01-13

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
01191	Acenaphthene	83-32-9	N.D.	39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	78.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	780.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	78.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	78.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	78.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	78.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	78.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	78.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	39.	ug/kg	1
04697	3-Nitroaniline	99-09-2	N.D.	78.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	78.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933075

Collected:10/31/2002 13:10

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(9-10')5GP-1 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105- SDG#: RAR01-13

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04702	Carbazole	86-74-8	N.D.	39.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 05:52	Douglas D Seitz	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/07/2002 20:21	Douglas D Seitz	2
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 13:11	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 13:11	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933076

Collected:10/31/2002 13:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(10-11')5GP-6 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10115 SDG#: RAR01-14

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	12.7		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.19	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.19	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.19	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.41	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.38	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.40	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.6	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.19	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.19	ug/kg	1
01983	Delta BHC	319-86-8	0.22	J	0.19	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.19	ug/kg	1
01985	p,p-DDE	72-55-9	1.7	J	0.38	ug/kg	1
01986	p,p-DDD	72-54-8	6.7		0.38	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.19	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.38	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.38	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.		1.1	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.5	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		11.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		4.9	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		5.7	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.6	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.5	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.0	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.38	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.19	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.19	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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Lancaster Laboratories Sample No. SW 3933076

Collected:10/31/2002 13:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(10-11')5GP-6 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10115 SDG#: RAR01-14

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	38.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	38.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	38.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	38.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	38.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	77.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	38.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	38.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	38.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	38.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	38.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	38.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	38.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	38.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	38.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	38.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	38.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	38.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	77.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	190.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	38.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	38.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	77.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	38.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	38.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	77.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	38.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	38.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	38.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933076

Collected:10/31/2002 13:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(10-11')5GP-6 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10115 SDG#: RAR01-14

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.		38.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil						
01191	Acenaphthene	83-32-9	N.D.		38.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.		190.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.		77.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.		190.	ug/kg	1
01195	Pyrene	129-00-0	N.D.		38.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.		770.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.		190.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.		38.	ug/kg	1
03768	Fluorene	86-73-7	N.D.		38.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.		38.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.		77.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	63.	J	38.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.						
03773	4-Bromophenyl-phenylether	101-55-3	N.D.		38.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.		38.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.		38.	ug/kg	1
03776	Anthracene	120-12-7	N.D.		38.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.		77.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.		38.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.		77.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.		38.	ug/kg	1
03782	Chrysene	218-01-9	N.D.		38.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.		77.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.		77.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.		77.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.		38.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.		38.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.		38.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		38.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.		38.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.		38.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933076

Collected:10/31/2002 13:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
(10-11')5GP-6 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

10115 SDG#: RAR01-14

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	77.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	38.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	77.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	38.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 06:13	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 14:05	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 14:05	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933077

Collected:10/31/2002 14:30

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(9-10')5GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105G SDG#: RAR01-15

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	17.2	0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.					
01225	TCL Pesticides in Solids					
01218	Gamma BHC - Lindane	58-89-9	N.D.	0.21	ug/kg	1
01219	Heptachlor	76-44-8	N.D.	0.21	ug/kg	1
01220	Aldrin	309-00-2	N.D.	0.21	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.	0.43	ug/kg	1
01222	Dieldrin	60-57-1	N.D.	0.40	ug/kg	1
01223	Endrin	72-20-8	N.D.	0.42	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.	4.8	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.	0.21	ug/kg	1
01982	Beta BHC	319-85-7	N.D.	0.21	ug/kg	1
01983	Delta BHC	319-86-8	N.D.	0.21	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.	0.21	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.	0.40	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.	0.40	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.	13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.	0.21	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.	0.40	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.	0.40	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.	5.8	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.	12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.	5.2	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.	6.0	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.	5.9	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.	6.9	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.	5.3	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.	0.40	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.	0.21	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.	0.21	ug/kg	1
	Heptachlor was detected in the method blank above the method detection					

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REPRINT

Lancaster Laboratories Sample No. SW 3933077

Collected:10/31/2002 14:30

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(9-10')5GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105G SDG#: RAR01-15

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	40.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	40.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	40.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	40.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	40.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	81.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	40.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	40.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	40.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	40.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	40.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	40.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	40.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	40.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	40.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	40.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	40.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	40.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	81.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	210.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	40.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	40.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	81.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	40.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	40.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	81.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	40.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	40.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	40.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933077

Collected:10/31/2002 14:30

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(9-10')5GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105G SDG#: RAR01-15

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	40.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	40.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	210.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	81.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	210.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	40.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	810.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	210.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	40.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	40.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	40.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	81.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	40.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	40.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	40.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	40.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	40.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	81.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	40.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	81.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	40.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	40.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	81.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	81.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	81.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	40.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	40.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	40.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	40.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	40.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	40.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933077

Collected:10/31/2002 14:30

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(9-10')5GP-3 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

9105G SDG#: RAR01-15

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	81.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	40.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	81.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	40.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 06:34	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 14:58	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 14:58	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933078

Collected:10/31/2002 15:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(7-8')5GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

785GP SDG#: RAR01-16

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	14.6		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.42	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.41	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.7	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	1.1	J	0.39	ug/kg	1
01986	p,p-DDD	72-54-8	51.		1.9	ug/kg	5
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	N.D.		1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.6	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.0	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		5.9	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.7	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.7	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.2	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.20	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933078

Collected:10/31/2002 15:50

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(7-8')5GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

785GP SDG#: RAR01-16

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	78.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	78.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	78.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	78.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1
04696	2-Nitroaniline	88-74-4	N.D.	39.	ug/kg	1

04689 TCL SW846 Semivolatiles/Soil

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REPRINT

Lancaster Laboratories Sample No. SW 3933078

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(7-8')5GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

785GP SDG#: RAR01-16

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
01191	Acenaphthene	83-32-9	N.D.		39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.		200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.		78.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.		200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.		39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.		780.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.		200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.		39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.		39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.		39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.		78.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.		39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.						
03773	4-Bromophenyl-phenylether	101-55-3	N.D.		39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.		39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.		39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.		39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.		78.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.		39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.		78.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.		39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.		39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.		78.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	92.	J	78.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.		78.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.		39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.		39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.		39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.		39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.		39.	ug/kg	1
04697	3-Nitroaniline	99-09-2	N.D.		78.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.		39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.		78.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933078

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Reported: 11/25/2002 at 14:37
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(7-8')5GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

785GP SDG#: RAR01-16

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04702	Carbazole	86-74-8	N.D.	39.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
01111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 06:55	Douglas D Seitz	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/07/2002 20:42	Douglas D Seitz	5
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 15:52	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 15:52	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933079

Collected:10/31/2002 16:05

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(11-12')5GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

11125 SDG#: RAR01-17

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	14.5		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.42	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.41	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.7	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	1.2	J	0.39	ug/kg	1
01986	p,p-DDD	72-54-8	0.97	J	0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	1.7	J	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.6	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.0	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		5.8	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.7	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.7	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.1	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.20	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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(11-12')5GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

11125 SDG#: RAR01-17

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	78.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	78.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	78.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	78.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1

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HWMU-5 & HWMU-7 Investigation

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Blacksburg VA 24060

11125 SDG#: RAR01-17

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.		39.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil						
01191	Acenaphthene	83-32-9	N.D.		39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.		200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.		78.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.		200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.		39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.		780.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.		200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.		39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.		39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.		39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.		78.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	82.	J	39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.						
03773	4-Bromophenyl-phenylether	101-55-3	N.D.		39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.		39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.		39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.		39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.		78.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.		39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.		78.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.		39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.		39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.		78.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.		78.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.		78.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.		39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.		39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.		39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.		39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.		39.	ug/kg	1

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Lancaster Laboratories Sample No. SW 3933079

Collected:10/31/2002 16:05

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Submitted: 11/02/2002 10:20
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(11-12')5GP-8 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

11125 SDG#: RAR01-17

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	78.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	78.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	39.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 07:15	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 16:45	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 16:45	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933080

Collected:10/31/2002 16:40

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(3-4')5GP-12 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34512 SDG#: RAR01-18

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	16.3		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.20	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.20	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.20	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.43	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.39	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.42	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.8	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.20	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.20	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.20	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.20	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.39	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.		0.39	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.20	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.39	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.39	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	1.7	J	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.7	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.1	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		6.0	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		5.9	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.8	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.3	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.39	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.20	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.20	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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REPRINT

Lancaster Laboratories Sample No. SW 3933080

Collected:10/31/2002 16:40

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(3-4')5GP-12 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34512 SDG#: RAR01-18

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	39.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	39.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	39.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	39.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	39.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	80.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	39.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	39.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	39.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	39.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	39.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	39.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	39.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	39.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	39.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	39.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	39.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	39.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	80.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	200.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	39.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	39.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	80.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	39.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	39.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	80.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	39.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	39.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	39.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933080

Collected:10/31/2002 16:40

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(3-4')5GP-12 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34512 SDG#: RAR01-18

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	39.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	39.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	200.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	80.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	200.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	39.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	800.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	200.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	39.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	39.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	39.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	80.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	39.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	39.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	39.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	39.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	39.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	80.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	39.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	80.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	39.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	39.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	80.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	80.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	80.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	39.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	39.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	39.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	39.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	39.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	39.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933080

Collected:10/31/2002 16:40

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(3-4')5GP-12 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34512 SDG#: RAR01-18

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	80.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	39.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	80.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	39.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 07:36	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 17:39	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 17:39	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933081

Collected:10/31/2002 17:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(3-4')5GP-16 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34516 SDG#: RAR01-19

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	17.9		0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.						
01225	TCL Pesticides in Solids						
01218	Gamma BHC - Lindane	58-89-9	N.D.		0.21	ug/kg	1
01219	Heptachlor	76-44-8	N.D.		0.21	ug/kg	1
01220	Aldrin	309-00-2	N.D.		0.21	ug/kg	1
01221	p,p-DDT	50-29-3	N.D.		0.44	ug/kg	1
01222	Dieldrin	60-57-1	N.D.		0.40	ug/kg	1
01223	Endrin	72-20-8	N.D.		0.43	ug/kg	1
01859	Methoxychlor	72-43-5	N.D.		4.9	ug/kg	1
01981	Alpha BHC	319-84-6	N.D.		0.21	ug/kg	1
01982	Beta BHC	319-85-7	N.D.		0.21	ug/kg	1
01983	Delta BHC	319-86-8	N.D.		0.21	ug/kg	1
01984	Heptachlor Epoxide	1024-57-3	N.D.		0.21	ug/kg	1
01985	p,p-DDE	72-55-9	N.D.		0.40	ug/kg	1
01986	p,p-DDD	72-54-8	N.D.		0.40	ug/kg	1
01988	Toxaphene	8001-35-2	N.D.		13.	ug/kg	1
01989	Endosulfan I	959-98-8	N.D.		0.21	ug/kg	1
01990	Endosulfan II	33213-65-9	N.D.		0.40	ug/kg	1
01991	Endosulfan Sulfate	1031-07-8	N.D.		0.40	ug/kg	1
01992	Endrin Aldehyde	7421-93-4	2.2	J	1.2	ug/kg	1
01993	PCB-1016	12674-11-2	N.D.		5.8	ug/kg	1
01994	PCB-1221	11104-28-2	N.D.		12.	ug/kg	1
01995	PCB-1232	11141-16-5	N.D.		5.2	ug/kg	1
01996	PCB-1242	53469-21-9	N.D.		6.1	ug/kg	1
01997	PCB-1248	12672-29-6	N.D.		6.0	ug/kg	1
01998	PCB-1254	11097-69-1	N.D.		6.9	ug/kg	1
01999	PCB-1260	11096-82-5	N.D.		5.4	ug/kg	1
03017	Endrin Ketone	53494-70-5	N.D.		0.40	ug/kg	1
03025	Alpha Chlordane	5103-71-9	N.D.		0.21	ug/kg	1
03026	Gamma Chlordane	5103-74-2	N.D.		0.21	ug/kg	1
	Heptachlor was detected in the method blank above the method detection						

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REPRINT

Lancaster Laboratories Sample No. SW 3933081

Collected:10/31/2002 17:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(3-4')5GP-16 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34516 SDG#: RAR01-19

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
	limit. No heptachlor was detected in the sample, therefore the data is reported.					
04688	TCL SW846 Semivolatiles Soil					
01185	Phenol	108-95-2	N.D.	40.	ug/kg	1
01186	2-Chlorophenol	95-57-8	N.D.	40.	ug/kg	1
01187	1,4-Dichlorobenzene	106-46-7	N.D.	40.	ug/kg	1
01188	N-Nitroso-di-n-propylamine	621-64-7	N.D.	40.	ug/kg	1
01189	1,2,4-Trichlorobenzene	120-82-1	N.D.	40.	ug/kg	1
01190	4-Chloro-3-methylphenol	59-50-7	N.D.	82.	ug/kg	1
03746	2-Nitrophenol	88-75-5	N.D.	40.	ug/kg	1
03747	2,4-Dimethylphenol	105-67-9	N.D.	40.	ug/kg	1
03748	2,4-Dichlorophenol	120-83-2	N.D.	40.	ug/kg	1
03749	2,4,6-Trichlorophenol	88-06-2	N.D.	40.	ug/kg	1
03753	bis(2-Chloroethyl)ether	111-44-4	N.D.	40.	ug/kg	1
03754	1,3-Dichlorobenzene	541-73-1	N.D.	40.	ug/kg	1
03755	1,2-Dichlorobenzene	95-50-1	N.D.	40.	ug/kg	1
03757	Hexachloroethane	67-72-1	N.D.	40.	ug/kg	1
03758	Nitrobenzene	98-95-3	N.D.	40.	ug/kg	1
03759	Isophorone	78-59-1	N.D.	40.	ug/kg	1
03760	bis(2-Chloroethoxy)methane	111-91-1	N.D.	40.	ug/kg	1
03761	Naphthalene	91-20-3	N.D.	40.	ug/kg	1
03762	Hexachlorobutadiene	87-68-3	N.D.	82.	ug/kg	1
03763	Hexachlorocyclopentadiene	77-47-4	N.D.	210.	ug/kg	1
03764	2-Chloronaphthalene	91-58-7	N.D.	40.	ug/kg	1
03765	Acenaphthylene	208-96-8	N.D.	40.	ug/kg	1
03766	Dimethylphthalate	131-11-3	N.D.	82.	ug/kg	1
04690	2-Methylphenol	95-48-7	N.D.	40.	ug/kg	1
04691	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	40.	ug/kg	1
04692	4-Methylphenol	106-44-5	N.D.	82.	ug/kg	1
	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 of both compounds.					
04693	4-Chloroaniline	106-47-8	N.D.	40.	ug/kg	1
04694	2-Methylnaphthalene	91-57-6	N.D.	40.	ug/kg	1
04695	2,4,5-Trichlorophenol	95-95-4	N.D.	40.	ug/kg	1

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REPRINT

Lancaster Laboratories Sample No. SW 3933081

Collected:10/31/2002 17:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:37
Discard: 12/26/2002
(3-4')5GP-16 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34516 SDG#: RAR01-19

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04696	2-Nitroaniline	88-74-4	N.D.	40.	ug/kg	1
04689	TCL SW846 Semivolatiles/Soil					
01191	Acenaphthene	83-32-9	N.D.	40.	ug/kg	1
01192	4-Nitrophenol	100-02-7	N.D.	210.	ug/kg	1
01193	2,4-Dinitrotoluene	121-14-2	N.D.	82.	ug/kg	1
01194	Pentachlorophenol	87-86-5	N.D.	210.	ug/kg	1
01195	Pyrene	129-00-0	N.D.	40.	ug/kg	1
03750	2,4-Dinitrophenol	51-28-5	N.D.	820.	ug/kg	1
03751	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	210.	ug/kg	1
03767	2,6-Dinitrotoluene	606-20-2	N.D.	40.	ug/kg	1
03768	Fluorene	86-73-7	N.D.	40.	ug/kg	1
03769	4-Chlorophenyl-phenylether	7005-72-3	N.D.	40.	ug/kg	1
03770	Diethylphthalate	84-66-2	N.D.	82.	ug/kg	1
03772	N-Nitrosodiphenylamine	86-30-6	N.D.	40.	ug/kg	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.					
03773	4-Bromophenyl-phenylether	101-55-3	N.D.	40.	ug/kg	1
03774	Hexachlorobenzene	118-74-1	N.D.	40.	ug/kg	1
03775	Phenanthrene	85-01-8	N.D.	40.	ug/kg	1
03776	Anthracene	120-12-7	N.D.	40.	ug/kg	1
03777	Di-n-butylphthalate	84-74-2	N.D.	82.	ug/kg	1
03778	Fluoranthene	206-44-0	N.D.	40.	ug/kg	1
03780	Butylbenzylphthalate	85-68-7	N.D.	82.	ug/kg	1
03781	Benzo(a)anthracene	56-55-3	N.D.	40.	ug/kg	1
03782	Chrysene	218-01-9	N.D.	40.	ug/kg	1
03783	3,3'-Dichlorobenzidine	91-94-1	N.D.	82.	ug/kg	1
03784	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	82.	ug/kg	1
03785	Di-n-octylphthalate	117-84-0	N.D.	82.	ug/kg	1
03786	Benzo(b)fluoranthene	205-99-2	N.D.	40.	ug/kg	1
03787	Benzo(k)fluoranthene	207-08-9	N.D.	40.	ug/kg	1
03788	Benzo(a)pyrene	50-32-8	N.D.	40.	ug/kg	1
03789	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	40.	ug/kg	1
03790	Dibenz(a,h)anthracene	53-70-3	N.D.	40.	ug/kg	1
03791	Benzo(g,h,i)perylene	191-24-2	N.D.	40.	ug/kg	1

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Lancaster Laboratories
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REPRINT

Lancaster Laboratories Sample No. SW 3933081

Collected:10/31/2002 17:00

Account Number: 11200

Submitted: 11/02/2002 10:20
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Discard: 12/26/2002
(3-4')5GP-16 Grab Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

34516 SDG#: RAR01-19

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
04697	3-Nitroaniline	99-09-2	N.D.	82.	ug/kg	1
04698	Dibenzofuran	132-64-9	N.D.	40.	ug/kg	1
04700	4-Nitroaniline	100-01-6	N.D.	82.	ug/kg	1
04702	Carbazole	86-74-8	N.D.	40.	ug/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00111	Moisture	EPA 160.3 modified	1	11/05/2002 08:39	Helen L Schaeffer	1
01225	TCL Pesticides in Solids	SW-846 8081A/8082	1	11/06/2002 07:57	Douglas D Seitz	1
04688	TCL SW846 Semivolatiles Soil	SW-846 8270C	1	11/06/2002 18:33	Brian K Graham	1
04689	TCL SW846 Semivolatiles/Soil	SW-846 8270C	1	11/06/2002 18:33	Brian K Graham	1
00381	BNA Soil Extraction	SW-846 3550B	1	11/05/2002 17:40	Amy M Strocko	1
00819	Solid Sample Pesticide Extract	SW-846 3550B	1	11/05/2002 00:30	Darin P Wagner	1

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REPRINT

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 023080021A	Sample number(s): 3933061-3933070,3933074-3933081							
Gamma BHC - Lindane	N.D.	.17	ug/kg	103		58-149		
Heptachlor	0.18 J	.17	ug/kg	106		57-156		
Aldrin	N.D.	.17	ug/kg	100		54-151		
p,p-DDT	N.D.	.36	ug/kg	115		53-187		
Dieldrin	N.D.	.33	ug/kg	100		58-157		
Endrin	N.D.	.35	ug/kg	103		65-183		
Methoxychlor	N.D.	4.	ug/kg	109		53-197		
Alpha BHC	N.D.	.17	ug/kg	97		47-149		
Beta BHC	N.D.	.17	ug/kg	106		61-148		
Delta BHC	N.D.	.17	ug/kg	109		49-171		
Heptachlor Epoxide	N.D.	.17	ug/kg	103		63-149		
p,p-DDE	N.D.	.33	ug/kg	104		50-177		
p,p-DDD	N.D.	.33	ug/kg	106		49-182		
Toxaphene	N.D.	11.	ug/kg					
Endosulfan I	N.D.	.17	ug/kg	100		56-150		
Endosulfan II	N.D.	.33	ug/kg	101		58-158		
ıdosulfan Sulfate	N.D.	.33	ug/kg	91		57-170		
₋ndrin Aldehyde	N.D.	1.	ug/kg	104		47-145		
PCB-1016	N.D.	4.8	ug/kg					
PCB-1221	N.D.	10.	ug/kg					
PCB-1232	N.D.	4.3	ug/kg					
PCB-1242	N.D.	5.	ug/kg					
PCB-1248	N.D.	4.9	ug/kg					
PCB-1254	N.D.	5.7	ug/kg					
PCB-1260	N.D.	4.4	ug/kg					
Endrin Ketone	N.D.	.33	ug/kg	103		70-143		
Alpha Chlordane	N.D.	.17	ug/kg	106		69-138		
Gamma Chlordane	N.D.	.17	ug/kg	103		63-145		
Batch number: 02308SLA026	Sample number(s): 3933061-3933070,3933074-3933081							
Phenol	N.D.	33.	ug/kg	87		59-121		
2-Chlorophenol	N.D.	33.	ug/kg	91		71-114		
1,4-Dichlorobenzene	N.D.	33.	ug/kg	83		61-110		
N-Nitroso-di-n-propylamine	N.D.	33.	ug/kg	88		62-118		
1,2,4-Trichlorobenzene	N.D.	33.	ug/kg	90		63-116		
4-Chloro-3-methylphenol	N.D.	67.	ug/kg	98		72-123		
Acenaphthene	N.D.	33.	ug/kg	102		70-115		
4-Nitrophenol	N.D.	170.	ug/kg	99		63-138		
2,4-Dinitrotoluene	N.D.	67.	ug/kg	103		70-130		
Pentachlorophenol	N.D.	170.	ug/kg	72		52-112		
Pyrene	N.D.	33.	ug/kg	98		67-123		
2-Nitrophenol	N.D.	33.	ug/kg	99		76-114		
2,4-Dimethylphenol	N.D.	33.	ug/kg	91		60-110		

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
2,4-Dichlorophenol	N.D.	33.	ug/kg	92		71-118		
2,4,6-Trichlorophenol	N.D.	33.	ug/kg	91		72-118		
2,4-Dinitrophenol	N.D.	670.	ug/kg	59		32-125		
4,6-Dinitro-2-methylphenol	N.D.	170.	ug/kg	71		52-125		
bis(2-Chloroethyl)ether	N.D.	33.	ug/kg	82		66-114		
1,3-Dichlorobenzene	N.D.	33.	ug/kg	87		60-110		
1,2-Dichlorobenzene	N.D.	33.	ug/kg	83		64-107		
Hexachloroethane	N.D.	33.	ug/kg	87		48-121		
Nitrobenzene	N.D.	33.	ug/kg	99		65-116		
Isophorone	N.D.	33.	ug/kg	92		64-108		
bis(2-Chloroethoxy)methane	N.D.	33.	ug/kg	99		68-122		
Naphthalene	N.D.	33.	ug/kg	87		65-113		
Hexachlorobutadiene	N.D.	67.	ug/kg	98		61-121		
Hexachlorocyclopentadiene	N.D.	170.	ug/kg	109		5-226		
2-Chloronaphthalene	N.D.	33.	ug/kg	93		69-114		
Acenaphthylene	N.D.	33.	ug/kg	89		72-117		
Dimethylphthalate	N.D.	67.	ug/kg	99		72-119		
2,6-Dinitrotoluene	N.D.	33.	ug/kg	97		74-115		
luorene	N.D.	33.	ug/kg	94		65-119		
-Chlorophenyl-phenylether	N.D.	33.	ug/kg	95		64-119		
Diethylphthalate	N.D.	67.	ug/kg	103		71-121		
N-Nitrosodiphenylamine	N.D.	33.	ug/kg	86		60-120		
4-Bromophenyl-phenylether	N.D.	33.	ug/kg	99		71-115		
Hexachlorobenzene	N.D.	33.	ug/kg	101		62-128		
Phenanthrene	N.D.	33.	ug/kg	99		64-116		
Anthracene	N.D.	33.	ug/kg	98		64-116		
Di-n-butylphthalate	N.D.	67.	ug/kg	95		72-119		
Fluoranthene	N.D.	33.	ug/kg	91		65-115		
Butylbenzylphthalate	N.D.	67.	ug/kg	103		59-150		
Benzo(a)anthracene	N.D.	33.	ug/kg	97		69-115		
Chrysene	N.D.	33.	ug/kg	100		67-119		
3,3'-Dichlorobenzidine	N.D.	67.	ug/kg	40		21-104		
bis(2-Ethylhexyl)phthalate	N.D.	67.	ug/kg	99		56-138		
Di-n-octylphthalate	N.D.	67.	ug/kg	96		69-131		
Benzo(b)fluoranthene	N.D.	33.	ug/kg	103		66-122		
Benzo(k)fluoranthene	N.D.	33.	ug/kg	105		66-122		
Benzo(a)pyrene	N.D.	33.	ug/kg	98		72-118		
Indeno(1,2,3-cd)pyrene	N.D.	33.	ug/kg	103		73-118		
Dibenz(a,h)anthracene	N.D.	33.	ug/kg	107		78-126		
Benzo(g,h,i)perylene	N.D.	33.	ug/kg	99		73-119		
2-Methylphenol	N.D.	33.	ug/kg	84		66-111		
2,2'-oxybis(1-Chloropropane)	N.D.	33.	ug/kg	104		65-139		
4-Methylphenol	N.D.	67.	ug/kg	85		22-171		
4-Chloroaniline	N.D.	33.	ug/kg	35		1-103		
2-Methylnaphthalene	N.D.	33.	ug/kg	94		65-108		

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
2,4,5-Trichlorophenol	N.D.	33.	ug/kg	98		74-117		
2-Nitroaniline	N.D.	33.	ug/kg	102		78-122		
3-Nitroaniline	N.D.	67.	ug/kg	71		17-107		
Dibenzofuran	N.D.	33.	ug/kg	93		66-111		
4-Nitroaniline	N.D.	67.	ug/kg	76		48-116		
Carbazole	N.D.	33.	ug/kg	94		71-114		
Batch number: 02309039401A	Sample number(s): 3933071,3933082							
pH				100		99-101		
Corrosivity				100		98-102		
Batch number: 02309820003A	Sample number(s): 3933061-3933065,3933081							
Moisture				100		99-101		
Batch number: 02309820003B	Sample number(s): 3933066-3933070,3933074-3933080							
Moisture				100		99-101		
Batch number: 023110015A	Sample number(s): 3933072,3933083							
amma BHC - Lindane	N.D.	.012	ug/l	120		65-144		
eptachlor	N.D.	.01	ug/l	86		45-130		
Heptachlor Epoxide	N.D.	.016	ug/l	114		73-141		
Methoxychlor	N.D.	.1	ug/l	105		72-160		
Endrin	N.D.	.024	ug/l	120		74-159		
Chlordane	N.D.	.25	ug/l					
Toxaphene	N.D.	1.5	ug/l					
Batch number: 023110027A	Sample number(s): 3933072,3933083							
2,4-D	N.D.	2.	ug/l	66		53-145		
2,4,5-TP	N.D.	.2	ug/l	82		55-128		
Batch number: 023115705005	Sample number(s): 3933072,3933083							
Arsenic	N.D.	.0049	mg/l	95		90-110		
Selenium	N.D.	.0048	mg/l	93		90-110		
Barium	N.D.	.00044	mg/l	101		93-109		
Cadmium	N.D.	.00094	mg/l	101		94-110		
Chromium	N.D.	.002	mg/l	98		95-110		
Lead	N.D.	.0089	mg/l	99		94-110		
Silver	0.0020 J	.0014	mg/l	101		94-110		
Batch number: 023115713001	Sample number(s): 3933072,3933083							
Mercury	N.D.	.000079	mg/l	92		84-124		
Batch number: 02311820003A	Sample number(s): 3933071,3933082							
Moisture				100		99-101		

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 02311WAG026	Sample number(s): 3933072,3933083							
Pyridine	N.D.	.004	mg/l	65		35-92		
1,4-Dichlorobenzene	N.D.	.002	mg/l	66		38-99		
2-Methylphenol	N.D.	.002	mg/l	79		64-102		
4-Methylphenol	N.D.	.004	mg/l	75		35-124		
Hexachloroethane	N.D.	.002	mg/l	57		20-97		
Nitrobenzene	N.D.	.002	mg/l	90		74-116		
Hexachlorobutadiene	N.D.	.002	mg/l	62		18-103		
2,4,6-Trichlorophenol	N.D.	.002	mg/l	92		66-125		
2,4,5-Trichlorophenol	N.D.	.002	mg/l	91		70-122		
2,4-Dinitrotoluene	N.D.	.002	mg/l	103		75-129		
Hexachlorobenzene	N.D.	.002	mg/l	87		65-128		
Pentachlorophenol	N.D.	.006	mg/l	76		43-127		
Batch number: 02319104201A	Sample number(s): 3933071,3933082							
Cyanide (Reactivity)	N.D.	100.	mg/kg	96		88-114		
Batch number: 02319112101A	Sample number(s): 3933071,3933082							
ılfide (Reactivity)	N.D.	27.	mg/kg	95		77-103		
Batch number: K023091AA	Sample number(s): 3933061-3933070							
Chloromethane	N.D.	2.	ug/kg	107		47-133		
Vinyl Chloride	N.D.	1.	ug/kg	99		57-132		
Bromomethane	N.D.	2.	ug/kg	74		54-129		
Chloroethane	N.D.	2.	ug/kg	95		66-130		
1,1-Dichloroethene	N.D.	1.	ug/kg	93		77-139		
Methylene Chloride	N.D.	2.	ug/kg	90		76-129		
trans-1,2-Dichloroethene	N.D.	1.	ug/kg	94		78-131		
1,1-Dichloroethane	N.D.	1.	ug/kg	110		82-130		
cis-1,2-Dichloroethene	N.D.	1.	ug/kg	98		85-127		
Chloroform	N.D.	1.	ug/kg	101		79-126		
1,1,1-Trichloroethane	N.D.	1.	ug/kg	106		69-133		
Carbon Tetrachloride	N.D.	1.	ug/kg	100		68-137		
Benzene	N.D.	1.	ug/kg	102		85-125		
1,2-Dichloroethane	N.D.	1.	ug/kg	112		75-132		
Trichloroethene	N.D.	1.	ug/kg	100		81-124		
1,2-Dichloropropane	N.D.	1.	ug/kg	108		81-126		
Bromodichloromethane	N.D.	1.	ug/kg	97		80-123		
Toluene	N.D.	1.	ug/kg	100		81-116		
1,1,2-Trichloroethane	N.D.	1.	ug/kg	91		77-116		
Tetrachloroethene	N.D.	1.	ug/kg	101		79-128		
Dibromochloromethane	N.D.	1.	ug/kg	88		73-116		
Chlorobenzene	N.D.	1.	ug/kg	97		81-112		
Ethylbenzene	N.D.	1.	ug/kg	100		82-115		
Styrene	N.D.	1.	ug/kg	93		79-116		

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Bromoform	N.D.	1.	ug/kg	81		64-121		
1,1,2,2-Tetrachloroethane	N.D.	1.	ug/kg	82		64-121		
Acetone	N.D.	7.	ug/kg	68		51-178		
Carbon Disulfide	N.D.	1.	ug/kg	105		72-144		
2-Butanone	N.D.	4.	ug/kg	74		58-155		
trans-1,3-Dichloropropene	N.D.	1.	ug/kg	96		75-113		
cis-1,3-Dichloropropene	N.D.	1.	ug/kg	99		82-122		
4-Methyl-2-pentanone	N.D.	3.	ug/kg	83		56-144		
2-Hexanone	N.D.	3.	ug/kg	77		51-142		
Xylene (Total)	N.D.	1.	ug/kg	97		82-117		
Batch number: N023141AB	Sample number(s): 3933073,3933084							
Vinyl Chloride	N.D.	20.	ug/l	79		59-129		
1,1-Dichloroethene	N.D.	16.	ug/l	104		67-140		
Chloroform	N.D.	16.	ug/l	105		86-124		
Carbon Tetrachloride	N.D.	20.	ug/l	98		77-130		
Benzene	N.D.	10.	ug/l	104		85-117		
1,2-Dichloroethane	N.D.	20.	ug/l	102		77-132		
richloroethene	N.D.	20.	ug/l	96		87-117		
etrachloroethene	N.D.	16.	ug/l	104		79-136		
Chlorobenzene	N.D.	16.	ug/l	100		85-115		
2-Butanone	N.D.	60.	ug/l	84		58-141		

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 023080021A	Sample number(s): 3933061-3933070,3933074-3933081								
Gamma BHC - Lindane	103	100	43-154	3	35				
Heptachlor	103	103	70-138	0	35				
Aldrin	100	97	65-134	3	35				
p,p-DDT	115	118	62-166	3	35				
Dieldrin	101	101	68-139	0	35				
Endrin	104	104	48-188	0	35				
Methoxychlor	109	112	74-162	3	35				
Alpha BHC	97	91	64-134	6	35				
Beta BHC	103	103	31-176	0	35				
Delta BHC	112	109	29-191	3	35				
Heptachlor Epoxide	103	103	69-133	0	35				
p,p-DDE	110	110	48-175	0	35				
p,p-DDD	104	104	52-181	0	35				

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Endosulfan I	100	97	62-133	3	35				
Endosulfan II	100	101	65-144	1	35				
Endosulfan Sulfate	88	87	65-154	2	35				
Endrin Aldehyde	78	94	63-125	19	35				
Endrin Ketone	99	99	33-173	0	50				
Alpha Chlordane	106	106	65-147	0	50				
Gamma Chlordane	100	103	30-157	3	50				
Batch number: 02308SLA026	Sample number(s): 3933061-3933070,3933074-3933081								
Phenol	85	85	29-139	0	30				
2-Chlorophenol	88	91	38-136	3	30				
1,4-Dichlorobenzene	81	81	22-131	0	30				
N-Nitroso-di-n-propylamine	88	87	36-137	2	30				
1,2,4-Trichlorobenzene	86	86	50-124	0	30				
4-Chloro-3-methylphenol	97	95	33-150	1	30				
Acenaphthene	100	99	36-140	1	30				
4-Nitrophenol	93	92	5-170	1	30				
,4-Dinitrotoluene	103	101	34-150	2	30				
entachlorophenol	71	70	5-144	2	30				
Pyrene	98	99	19-152	1	30				
2-Nitrophenol	96	94	29-145	3	30				
2,4-Dimethylphenol	93	90	21-143	3	30				
2,4-Dichlorophenol	92	88	29-145	4	30				
2,4,6-Trichlorophenol	89	86	27-150	3	30				
2,4-Dinitrophenol	41	38	20-150	6	30				
4,6-Dinitro-2-methylphenol	63	63	5-160	1	30				
bis(2-Chloroethyl)ether	84	81	34-139	3	30				
1,3-Dichlorobenzene	84	83	39-122	2	30				
1,2-Dichlorobenzene	82	82	22-134	1	30				
Hexachloroethane	82	84	11-140	2	30				
Nitrobenzene	95	91	35-138	3	30				
Isophorone	88	89	38-133	1	30				
bis(2-Chloroethoxy)methane	95	97	58-132	2	30				
Naphthalene	87	87	24-144	1	30				
Hexachlorobutadiene	93	92	32-136	1	30				
Hexachlorocyclopentadiene	99	95	5-176	4	30				
2-Chloronaphthalene	92	91	32-141	1	30				
Acenaphthylene	86	83	37-142	3	30				
Dimethylphthalate	95	92	35-144	3	30				
2,6-Dinitrotoluene	91	94	39-138	3	30				
Fluorene	92	90	28-151	3	30				
4-Chlorophenyl-phenylether	95	92	36-140	4	30				
Diethylphthalate	98	97	37-145	1	30				
N-Nitrosodiphenylamine	86	86	48-136	0	30				

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
4-Bromophenyl-phenylether	95	96	36-144	1	30				
Hexachlorobenzene	98	97	32-146	1	30				
Phenanthrene	98	94	20-147	4	30				
Anthracene	98	93	29-141	5	30				
Di-n-butylphthalate	96	93	30-147	3	30				
Fluoranthene	92	87	21-141	5	30				
Butylbenzylphthalate	96	97	28-160	1	30				
Benzo(a)anthracene	95	96	22-151	1	30				
Chrysene	95	98	22-149	4	30				
3,3'-Dichlorobenzidine	65	74	3-123	12	30				
bis(2-Ethylhexyl)phthalate	94	95	26-160	1	30				
Di-n-octylphthalate	93	91	24-164	2	30				
Benzo(b)fluoranthene	96	100	23-146	4	30				
Benzo(k)fluoranthene	99	98	27-149	1	30				
Benzo(a)pyrene	100	100	25-149	0	30				
Indeno(1,2,3-cd)pyrene	96	98	13-157	2	30				
Dibenz(a,h)anthracene	104	102	14-170	2	30				
enzo(g,h,i)perylene	97	97	11-158	0	30				
-Methylphenol	84	86	26-139	1	30				
2,2'-oxybis(1-Chloropropane)	104	105	50-145	2	30				
4-Methylphenol	83	83	9-170	1	30				
4-Chloroaniline	71	76	1-127	7	30				
2-Methylnaphthalene	94	90	22-145	4	30				
2,4,5-Trichlorophenol	93	91	33-147	2	30				
2-Nitroaniline	97	98	31-156	1	30				
3-Nitroaniline	89	88	2-135	2	30				
Dibenzofuran	93	91	27-144	2	30				
4-Nitroaniline	81	85	11-141	6	30				
Carbazole	93	92	32-144	2	30				
Batch number: 02309039401A	Sample number(s): 3933071,3933082								
pH						7.33	7.33	0	1
Corrosivity						7.3	7.3	0	2
Batch number: 02309820003A	Sample number(s): 3933061-3933065,3933081								
Moisture						19.2	18.0	6	15
Batch number: 02309820003B	Sample number(s): 3933066-3933070,3933074-3933080								
Moisture						16.0	16.2	1	15
Batch number: 023110015A	Sample number(s): 3933072,3933083								
Gamma BHC - Lindane	120	116	67-151	3	30				
Heptachlor	98	98	37-145	0	30				
Heptachlor Epoxide	113	112	62-150	1	30				

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Methoxychlor	100	100	63-185	0	30				
Endrin	120	120	61-179	0	30				
Batch number: 023110027A	Sample number(s): 3933072,3933083								
2,4-D	73	75	38-176	3	30				
2,4,5-TP	78	81	50-134	4	30				
Batch number: 023115705005	Sample number(s): 3933072,3933083								
Arsenic	87	88	86-119	1	20	N.D.	N.D.	0 (1)	20
Selenium	86	88	75-125	3	20	0.0074 J	0.0088 J	17 (1)	20
Barium	81*	83	82-113	3	20	0.690	0.669	3	20
Cadmium	84	84	78-121	1	20	0.0077 J	0.0078 J	0 (1)	20
Chromium	84	82	80-119	1	20	1.85	1.86	1	20
Lead	(2)	(2)	75-125	1	20	260.	257.	1	20
Silver	48*	50*	75-125	3	20	0.0024 J	N.D.	200* (1)	20
Batch number: 023115713001	Sample number(s): 3933072,3933083								
Mercury	79*	79*	80-120	0	20	N.D.	N.D.	76* (1)	20
Batch number: 02311820003A	Sample number(s): 3933071,3933082								
Moisture						20.2	19.6	3	15
Batch number: 02311WAG026	Sample number(s): 3933072,3933083								
Pyridine	65	61	22-100	7	30				
1,4-Dichlorobenzene	69	70	44-104	1	30				
2-Methylphenol	80	80	27-130	0	30				
4-Methylphenol	76	76	19-132	1	30				
Hexachloroethane	58	56	25-110	3	30				
Nitrobenzene	95	91	30-153	5	30				
Hexachlorobutadiene	63	64	21-124	2	30				
2,4,6-Trichlorophenol	92	95	40-144	3	30				
2,4,5-Trichlorophenol	91	92	53-134	1	30				
2,4-Dinitrotoluene	100	101	47-148	1	30				
Hexachlorobenzene	88	92	46-139	4	30				
Pentachlorophenol	86	87	3-150	2	30				
Batch number: 02319104201A	Sample number(s): 3933071,3933082								
Cyanide (Reactivity)	3	2	0-5	40*	19				
Batch number: 02319112101A	Sample number(s): 3933071,3933082								
Sulfide (Reactivity)	63	64	26-99	3	26				
Batch number: K023091AA	Sample number(s): 3933061-3933070								
Chloromethane	109	102	14-144	4	30				

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Vinyl Chloride	105	97	20-146	6	30				
Bromomethane	79	75	24-140	3	30				
Chloroethane	97	90	33-147	5	30				
1,1-Dichloroethene	100	101	43-153	4	30				
Methylene Chloride	92	91	49-145	2	30				
trans-1,2-Dichloroethene	96	94	49-143	1	30				
1,1-Dichloroethane	109	108	51-147	1	30				
cis-1,2-Dichloroethene	96	98	54-139	5	30				
Chloroform	100	100	57-135	2	30				
1,1,1-Trichloroethane	106	105	47-143	1	30				
Carbon Tetrachloride	102	99	43-144	0	30				
Benzene	101	100	52-141	2	30				
1,2-Dichloroethane	112	111	57-137	2	30				
Trichloroethene	97	99	47-140	4	30				
1,2-Dichloropropane	104	103	55-138	1	30				
Bromodichloromethane	95	95	55-131	2	30				
Toluene	104	105	41-147	3	30				
,1,2-Trichloroethane	90	88	45-150	0	30				
etrachloroethene	105	107	42-157	5	30				
Dibromochloromethane	89	87	46-137	1	30				
Chlorobenzene	97	98	48-132	4	30				
Ethylbenzene	102	104	44-142	4	30				
Styrene	90	93	30-144	6	30				
Bromoform	74	74	32-139	1	30				
1,1,2,2-Tetrachloroethane	76	75	23-180	1	30				
Acetone	71	68	6-214	2	30				
Carbon Disulfide	106	104	29-162	1	30				
2-Butanone	68	64	22-181	4	30				
trans-1,3-Dichloropropene	98	95	46-130	1	30				
cis-1,3-Dichloropropene	92	96	50-129	6	30				
4-Methyl-2-pentanone	69	65	40-154	3	30				
2-Hexanone	67	66	28-170	1	30				
Xylene (Total)	98	100	47-139	5	30				
Batch number: N023141AB	Sample number(s): 3933073,3933084								
Vinyl Chloride	83	83	54-144	1	30				
1,1-Dichloroethene	90	91	69-151	1	30				
Chloroform	98	95	77-133	3	30				
Carbon Tetrachloride	87	86	73-144	1	30				
Benzene	95	94	78-134	1	30				
1,2-Dichloroethane	99	98	73-136	1	30				
Trichloroethene	88	87	75-135	1	30				
Tetrachloroethene	86	86	74-149	1	30				
Chlorobenzene	91	90	81-125	2	30				

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

MEMBER ACIL
Lancaster Laboratories, Inc.
2425 New Holland Pike
PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Sample Matrix Quality Control

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
2-Butanone	80	78	47-143	3	30				

Surrogate Quality Control

Analysis Name: TCL Pesticides in Solids
Batch number: 023080021A

	Tetrachloro-m-xylene	Decachlorobiphenyl
3933061	91	105
3933062	91	105
3933063	97	112
3933064	89	105
3933065	97	113
3933066	98	110
933067	91	106
933068	96	109
3933069	99	110
3933070	98	108
3933074	98	108
3933075	95	109
3933076	98	108
3933077	92	105
3933078	96	110
3933079	92	108
3933080	95	112
3933081	94	111
Blank	94	105
LCS	92	106
MS	91	106
MSD	96	109
Limits:	58-149	62-159

Analysis Name: TCL SW846 Semivolatiles Soil
Batch number: 02308SLA026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5
3933061	83	80	98	94
3933062	87	84	103	99
3933063	86	82	104	95
3933064	83	77	88	95

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Surrogate Quality Control

3933065	88	83	101	95
3933066	86	84	111	100
3933067	88	87	108	101
3933068	88	87	108	96
3933069	88	81	106	97
3933070	88	84	104	92
3933074	86	83	97	98
3933075	88	88	107	98
3933076	88	86	100	99
3933077	83	78	104	96
3933078	87	84	102	93
3933079	87	84	101	93
3933080	84	81	95	90
3933081	85	82	98	95
Blank	89	87	105	100
LCS	90	89	113	103
MS	88	87	108	101
MSD	88	87	108	96
Limits:	46-120	46-122	37-139	50-132

	2-Fluorobiphenyl	Terphenyl-d14
3933061	92	93
3933062	100	104
3933063	97	103
3933064	90	97
3933065	92	100
3933066	98	100
3933067	97	98
3933068	97	99
3933069	97	95
3933070	95	100
3933074	91	94
3933075	103	97
3933076	103	96
3933077	95	88
3933078	99	96
3933079	96	96
3933080	89	89
3933081	92	95
Blank	100	92
LCS	98	101
MS	97	98
MSD	97	99
Limits:	57-123	48-141

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Surrogate Quality Control

Analysis Name: TCLP Pesticides
Batch number: 023110015A

	Tetrachloro-m-xylene	Decachlorobiphenyl
3933072	85	116
3933083	78	107
Blank	75	103
LCS	77	117
MS	76	96
MSD	77	99
Limits:	40-135	36-156

Analysis Name: TCLP Herbicides
Batch number: 023110027A

	2,4-Dichlorophenylacetic acid
3933072	82
3933083	80
Blank	85
LCS	79
MS	79
MSD	82
Limits:	40-154

Analysis Name: TCLP Acid Base/Neutrals
Batch number: 02311WAG026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14	Phenol-d6
3933072	90	89	84	41
3933083	91	87	84	41
Blank	95	87	92	41
LCS	93	93	93	44
MS	97	87	72	45
MSD	93	87	83	44
Limits:	45-139	61-119	46-136	10-87

	2-Fluorophenol	2,4,6-Tribromophenol
3933072	62	105
3933083	61	106
Blank	63	107
LCS	65	108
MS	66	111

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(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

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Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 829270
Reported: 11/25/02 at 02:38 PM

Surrogate Quality Control

MSD	64	111		
Limits:	22-96	36-147		

Analysis Name: TCL by 8260 (soil)
Batch number: K023091AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
3933061	97	80	107	99
3933062	96	81	106	103
3933063	97	81	104	100
3933064	92	83	106	92
3933065	98	82	103	99
3933066	97	81	103	99
3933067	99	85	112	111
3933068	96	86	113	103
3933069	96	83	111	89
3933070	96	82	109	97
Blank	94	88	101	102
LCS	100	97	105	107
MS	99	85	112	111
SD	96	86	113	103
Limits:	80-120	80-120	81-117	74-121

Analysis Name: TCLP by 8260
Batch number: N023141AB

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
3933073	98	100	95	90
3933084	98	99	94	89
Blank	98	98	96	93
LCS	95	99	103	106
MS	94	98	100	104
MSD	95	98	101	105
Limits:	86-118	80-120	88-110	86-115

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The background result was more than four times the spike added.

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CHAIN OF CUSTODY RECORD

Laboratory: Severn Trent Laboratories, 4101 Shuffel Drive, NW, North Canton, OH 44720 (303) 497-9396

Client: Draper Aden Associates	Consultant: Draper Aden Associates	Sample Site: RFAAP	Project Specific (PS) or Batch (B) QC: ☑PS ☐B
Attn: Andy Kassoff/ Ross Miller	Attn: Janet C. Frazier	Location: Montgomery County, Virginia	Sample Collection for Project Complete? (See Note 1) ☑Yes ☐No
Address: 2206 South Main Street, Blacksburg, Virginia 24060	Address: 2206 South Main Street, Blacksburg, Virginia 24060	Event: HWMU-5 and HWMU-7 Investigation	Carrier: FED EX
Phone: (540) 552-0444	Phone: (540) 552-0444	DAA JN: 902271-01	Tracking Number:
Fax: (540) 552-0291	Fax: (540) 552-0291	Lab JN:	
Fax: (540) 552-0291			

Box 1: Matrix		Box 2: Preservative		Box 3: Filtered/Unfiltered	Box 4: Sample Type	Invoice
SW Surface Water	T Trip Blank	A HCL	E NaOH	F Filtered	G Grab	Copy to Consultant: ☑Yes ☐No
GW Groundwater	E Equipment Blank	B HNO_3	F ZnAc	U Unfiltered	C Composite	Bill: ☑Client ☐Consultant
L Leachate	P Product	C H_2SO_4	G Other (Specify)	Box 5: Sample Container Type		Preserved and shipped on ice: ☑Yes ☐No
S Soil	O Other	D NaHSO4	H None	P Plastic V VOA AG Amber Glass CG Clear Glass		

Box 4 - Sample Type					G								
Box 3 - Filtered/Unfiltered					U								
Required pH of Sample					-								
Box 2 - Preservative					H								
Box 5 - Sample Container Type					4oz. G								
Sample ID	Date: 2002	Time	Box 1: Matrix	Number of Bottles	Metals								
(1-3') 7GP-1	11/1	10:00	S	1	X								
(8-12') 7GP-2		10:40	S	1	X								
(13.5-14.5') 7GP-2		11:05	S	1	X								
(10-11') 7GP-3		11:25	S	1	X								
(5-8') 7GP-8		12:15	S	1	X								
(6-11') 7GP-5		12:50	S	1	X								
(3-4') 7GP-16		13:30	S	1	X								
(3-4') 7GP-4	11/1	13:45	S	1	X								
(6-11') 7GP-5MS	11/1	12:50	S	1	X								
(6-11') 7GP-5MSD	11/1	12:50	S	1	X								

GENERAL NOTES: See attached target analyte list. Full TAL List for all analytes, using SW846 Test Methods

7GP-1 (1-3')
7GP-2 (8-12')
7GP-2 (13.5-14.5')
7GP-3 (10-11')
7GP-8 (5-8')
7GP-5 (6-11')
7GP-16 (3-4')
7GP-4 (3-4')
7GP-5 (6-11') MS
7GP-5 (6-11') MSD

Clients Special Instructions:

Received by lab in Good Condition ____ Yes ____ No Custody Seal Intact ____ Yes ____ No Temperature upon arrival ____ Received on Ice ____ Yes ____ No
Describe problems, if any:

Sampler Name (Print): DARREN KIDWELL	Date: 11/1/02	#1 Relinquished by (Signature): Darren Kidwell	Date: 11/1/02	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested: 30 DYS ORG/6 MTHS INORG
Sampler Signature: Darren Kidwell	Time: 16:30	Company Name: DAA	Time: 17:30	Company Name:	Time:	
Sampler Name (Print):	Date:	#1 Received by (Signature):	Date: 11-2-02	#2 Received by (Signature):	Date:	
Sampler Signature:	Time:	Company Name: STL	Time: 1000	Company Name:	Time:	

STL North Canton

CHAIN OF CUSTODY RECORD

Laboratory: Severn Trent Laboratories, 4101 Shuffel Drive, NW, North Canton, OH 44720 (303) 497-9396

Client:	Draper Aden Associates	Consultant:	Draper Aden Associates	Sample Site:	RFAAP
Attn:	Andy Kassoff/ Rose Miller	Attn:	Janet C. Frazier	Location:	Montgomery County, Virginia
Address:	2206 South Main Street, Blacksburg, Virginia 24060	Address:	2206 South Main Street, Blacksburg, Virginia 24060	Event:	HWMU-5 and HWMU-7 Investigation
Phone:	(540) 552-0444	Phone:	(540) 552-0444	DAA JN:	B02271-01
Fax:	(540) 552-0291	Fax:	(540) 552-0291	Lab JN:	
Fax:	(540) 552-0291				

Project Specific (PS) or Batch (B) QC: ☑PS ☐B

Sample Collection for Project Complete? (See Note 1) ☑Yes ☐No

Carrier: FED EX

Tracking Number:

Box 1: Matrix — SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative — A HCL; B HNO_3; C H_2SO_4; D NaHSO4; E NeOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered — F Filtered; U Unfiltered

Box 4: Sample Type — G Grab; C Composite

Box 5: Sample Container Type — P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice — Copy to Consultant: ☑Yes ☐No; Bill: ☑Client ☐Consultant; Preserved and shipped on ice: ☑Yes ☐No

		Sample ID	Date: 2002	Time	Box 1: Matrix	Number of Bottles	Metals								
Box 4 - Sample Type							G								
Box 3 - Filtered/Unfiltered							U								
Required pH of Sample							-								
Box 2 - Preservative							H								
Box 5 - Sample Container Type							4oz. G								
✓	1-2'	SGP-1	10/31	13:10	S	1	X								SGP-1 (1-2')
✓	9-10'	SGP-1	10/31	13:10	S	1	X								SGP-1 (9-10')
✓	10-11'	SGP-6	10/31	13:50	S	1	X								SGP-6 (10-11')
✓	9-10'	SGP-3	10/31	14:30	S	1	X								SGP-3 (9-10')
✓	7-8'	SGP-8	10/31	15:50	S	1	X								SGP-8 (7-8')
✓	11-12'	SGP-8	10/31	16:05	S	1	X								SGP-8 (11-12')
✓	3-4'	SGP-16	10/31	17:00	S	1	X								SGP-16 (3-4')
✓	3-4'	SGP-12	10/31	16:40	S	1	X								SGP-12 (3-4')

GENERAL NOTES: See attached target analyte list. Full TAL List for all analytes, using SW846 Test Methods

Clients Special Instructions:

Received by lab in Good Condition ____ Yes ____ No Custody Seal Intact ____ Yes ____ No Temperature upon arrival ____ Received on Ice ____ Yes ____ No

Describe problems, if any:

Sampler Name (Print): DARREN KIDWELL	Date: 11/1/02	#1 Relinquished by (Signature): Darren Kidwell	Date: 11/1/02	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested: 30 DYS OR 6/5 MTHS INORG
Sampler Signature: Darren Kidwell	Time: 16:30	Company Name: DAA	Time: 1730	Company Name:	Time:	
Sampler Name (Print)	Date:	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date:	
Sampler Signature:	Time:	Company Name: STL	Time: 1000	Company Name:	Time:	

STL North Canton

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-1(1-3')

TOTAL Metals

Lot-Sample #...: A2K040189-001 **Matrix.....:** SO
Date Sampled...: 11/01/02 10:00 **Date Received..:** 11/02/02
% Moisture.....: 15

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**11100 J**	**23.5**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AG**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**3.8**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AC**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**8.1**	**0.35**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AD**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**0.52 B**	**7.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AH**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**66.9 J**	**23.5**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AJ**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.59	mg/kg	SW846 6010B	11/07-11/12/02	FCDAQ1AE
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.70**	**0.59**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AK**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDAQ1AF
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	**0.027 B**	**0.59**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AL**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**7490**	**587**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AM**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				

(Continued on next page)

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-1(1-3')

TOTAL Metals

Lot-Sample #...: A2K040189-001 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**24.1**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AN**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**11.5**	**5.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AP**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**22.8**	**2.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AQ**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**19400**	**11.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AR**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**4290**	**587**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AT**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**662**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AU**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**13.5**	**4.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AV**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**774 J**	**587**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1AW**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDAQ1AX
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	587	mg/kg	SW846 6010B	11/07-11/12/02	FCDAQ1A0
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-1(1-3')

TOTAL Metals

Lot-Sample #...: A2K040189-001 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**28.0**	**5.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1A1**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	**17.4**	**2.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDAQ1A2**
		Dilution Factor: 1		Analysis Time..: 15:58	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.026 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDAQ1A3**
		Dilution Factor: 1		Analysis Time..: 11:10	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(8-12')

TOTAL Metals

Lot-Sample #...: A2K040189-002 **Matrix.....:** SO
Date Sampled...: 11/01/02 10:40 **Date Received..:** 11/02/02
% Moisture.....: 18

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**8790 J**	**24.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51A8**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**2.7**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51AU**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**2.8**	**0.36**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51AX**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.1 B**	**7.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51CC**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**40.9 J**	**24.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51CF**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.61	mg/kg	SW846 6010B	11/07-11/12/02	FCDA51A2
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**1.2**	**0.61**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51CJ**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDA51A5
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.61	mg/kg	SW846 6010B	11/07-11/12/02	FCDA51CM
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**283 B**	**607**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51CQ**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(8-12')

TOTAL Metals

Lot-Sample #...: A2K040189-002 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**22.0**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51CU**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**12.5**	**6.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51CX**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**22.0**	**3.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51C2**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**23300**	**12.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51C5**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**3140**	**607**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51C8**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**274**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51DC**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**21.6**	**4.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51DF**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**1070 J**	**607**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51DJ**
		Dilution Factor: 1		**Analysis Time..: 16:03**	**Analyst ID.....: 002260**	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDA51DM
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	607	mg/kg	SW846 6010B	11/07-11/12/02	FCDA51AA
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(8-12')

TOTAL Metals

Lot-Sample #...: A2K040189-002 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**21.1**	**6.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51AE**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	**15.0**	**2.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA51AH**
		Dilution Factor: 1		Analysis Time..: 16:03	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	ND	0.12	mg/kg	SW846 7471A	11/07-11/08/02	FCDA51AL
		Dilution Factor: 1		Analysis Time..: 11:13	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(13.5-14.5')

TOTAL Metals

Lot-Sample #...: A2K040189-003 **Matrix.....:** SO
Date Sampled...: 11/01/02 11:05 **Date Received..:** 11/02/02
% Moisture.....: 18

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**19700 J**	**24.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AM**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**3.1**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AH**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**13.6**	**0.36**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AJ**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.3 B**	**7.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AN**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**70.9 J**	**24.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AP**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.61	mg/kg	SW846 6010B	11/07-11/12/02	FCDA71AK
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.84**	**0.61**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AQ**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDA71AL
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.61	mg/kg	SW846 6010B	11/07-11/12/02	FCDA71AR
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**480 B**	**608**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AT**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(13.5-14.5')

TOTAL Metals

Lot-Sample #...: A2K040189-003 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**22.5**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AU**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**16.2**	**6.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AV**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**14.2**	**3.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AW**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**29300**	**12.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AX**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**2000**	**608**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71A0**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**407**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71A1**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**11.4**	**4.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71A2**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**1390 J**	**608**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71A3**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDA71A4
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	608	mg/kg	SW846 6010B	11/07-11/12/02	FCDA71AA
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(13.5-14.5')

TOTAL Metals

Lot-Sample #...: A2K040189-003 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**57.7**	**6.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDA71AC**
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	32.6	2.4	mg/kg	SW846 6010B	11/07-11/12/02	FCDA71AD
		Dilution Factor: 1		Analysis Time..: 16:08	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.050 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDA71AE**
		Dilution Factor: 1		Analysis Time..: 11:14	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-3(10-11')

TOTAL Metals

Lot-Sample #...: A2K040189-004 **Matrix.....:** SO
Date Sampled...: 11/01/02 11:25 **Date Received..:** 11/02/02
% Moisture.....: 21

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**11700 J**	**25.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AM**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**26.1**	**1.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AH**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**35.1**	**0.38**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AJ**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.1 B**	**7.6**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AN**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**229 J**	**25.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AP**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	**3.5**	**0.63**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AK**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**1.5**	**0.63**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AQ**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.3	mg/kg	SW846 6010B	11/07-11/12/02	FCDCC1AL
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	**0.16 B**	**0.63**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AR**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**28100**	**631**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AT**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-3(10-11')

TOTAL Metals

Lot-Sample #...: A2K040189-004 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**32.8**	**1.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AU**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**8.1**	**6.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AV**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**23.2**	**3.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AW**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**15900**	**12.6**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AX**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**2440**	**631**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1A0**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**145**	**1.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1A1**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**15.9**	**5.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1A2**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**2970 J**	**631**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1A3**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	**ND**	**1.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1A4**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	**156 B**	**631**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AA**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-3(10-11')

TOTAL Metals

Lot-Sample #...: A2K040189-004 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**42.1**	**6.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCC1AC**
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	33.8	2.5	mg/kg	SW846 6010B	11/07-11/12/02	FCDCC1AD
		Dilution Factor: 1		Analysis Time..: 16:13	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.040 B**	**0.13**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDCC1AE**
		Dilution Factor: 1		Analysis Time..: 11:18	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-8(5-8')

TOTAL Metals

Lot-Sample #...: A2K040189-005 **Matrix.....:** SO
Date Sampled...: 11/01/02 12:15 **Date Received..:** 11/02/02
% Moisture.....: 19

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**22400 J**	**24.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AM**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**2.4**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AH**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**10.3**	**0.37**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AJ**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**0.80 B**	**7.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AN**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**55.0 J**	**24.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AP**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDCE1AK
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.41 B**	**0.62**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AQ**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCE1AL
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDCE1AR
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**1570**	**618**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AT**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-8(5-8')

TOTAL Metals

Lot-Sample #...: A2K040189-005 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**20.1**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AU**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**5.4 B**	**6.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AV**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**12.7**	**3.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AW**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**23200**	**12.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AX**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**1090**	**618**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1A0**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**280**	**1.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1A1**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**8.5**	**4.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1A2**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**1040 J**	**618**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1A3**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCE1A4
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	618	mg/kg	SW846 6010B	11/07-11/12/02	FCDCE1AA
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-8(5-8')

TOTAL Metals

Lot-Sample #...: A2K040189-005 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**61.8**	**6.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AC**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	**28.1**	**2.5**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCE1AD**
		Dilution Factor: 1		Analysis Time..: 16:18	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.061 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDCE1AE**
		Dilution Factor: 1		Analysis Time..: 11:19	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-5(6-11')

TOTAL Metals

Lot-Sample #...: A2K040189-006 **Matrix.....:** SO
Date Sampled...: 11/01/02 12:50 **Date Received..:** 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**20000 J**	**24.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1A8**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**3.5**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1AU**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**11.0**	**0.36**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1AX**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.0 B**	**7.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1CC**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**55.6 J**	**24.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1CF**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.60	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1A2
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.35 B**	**0.60**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1CJ**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1A5
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.60	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1CM
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**259 B**	**602**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1CQ**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-5(6-11')

TOTAL Metals

Lot-Sample #...: A2K040189-006 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**22.8**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1CU**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	4.5 B	6.0	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1CX
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	10	3.0	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1C2
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	23600	12.0	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1C5
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	787	602	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1C8
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	187	1.8	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1DC
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	7.2	4.8	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1DF
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	732 J	602	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1DJ
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1DM
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	602	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1AA
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-5(6-11')

TOTAL Metals

Lot-Sample #...: A2K040189-006 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**60.6**	**6.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCG1AE**
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	24.2	2.4	mg/kg	SW846 6010B	11/07-11/12/02	FCDCG1AH
		Dilution Factor: 1		Analysis Time..: 16:23	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.10 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDCG1AL**
		Dilution Factor: 1		Analysis Time..: 11:20	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-16(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-007 **Matrix.....:** SO
Date Sampled...: 11/01/02 13:30 **Date Received..:** 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**6650 J**	**24.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AM**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**1.0 B**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AH**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**5.4**	**0.36**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AJ**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**0.59 B**	**7.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AN**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**106 J**	**24.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AP**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.60	mg/kg	SW846 6010B	11/07-11/12/02	FCDCL1AK
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.55 B**	**0.60**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AQ**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	**0.70 B**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AL**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	**0.061 B**	**0.60**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AR**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**1230**	**603**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AT**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-16(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-007 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**11.5**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AU**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**5.9 B**	**6.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AV**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**5.1**	**3.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AW**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**10800**	**12.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AX**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**1890**	**603**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1A0**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**422**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1A1**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**7.7**	**4.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1A2**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**809 J**	**603**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1A3**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCL1A4
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	603	mg/kg	SW846 6010B	11/07-11/12/02	FCDCL1AA
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-16(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-007 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**15.4**	**6.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AC**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	**39.7**	**2.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCL1AD**
		Dilution Factor: 1		Analysis Time..: 16:51	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	ND	0.12	mg/kg	SW846 7471A	11/07-11/08/02	FCDCL1AE
		Dilution Factor: 1		Analysis Time..: 11:24	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-4(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-008 **Matrix.....:** SO
Date Sampled...: 11/01/02 13:45 **Date Received..:** 11/02/02
% Moisture.....: 15

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**5290 J**	**23.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AM**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**0.96 B**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AH**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**5.8**	**0.35**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AJ**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**0.77 B**	**7.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AN**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**69.2 J**	**23.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AP**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.59	mg/kg	SW846 6010B	11/07-11/12/02	FCDCP1AK
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.44 B**	**0.59**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AQ**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCP1AL
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.59	mg/kg	SW846 6010B	11/07-11/12/02	FCDCP1AR
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**749**	**586**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AT**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-4(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-008 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**10.1**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AU**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**5.4 B**	**5.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AV**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**5.1**	**2.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AW**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**9860**	**11.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AX**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**1590**	**586**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1A0**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**292**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1A1**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**6.3**	**4.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1A2**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**729 J**	**586**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1A3**
		Dilution Factor: 1		**Analysis Time..: 16:56**	**Analyst ID.....: 002260**	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCP1A4
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	586	mg/kg	SW846 6010B	11/07-11/12/02	FCDCP1AA
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-4(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-008 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**14.0**	**5.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AC**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	35.0	2.3	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCP1AD**
		Dilution Factor: 1		Analysis Time..: 16:56	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	ND	0.12	mg/kg	SW846 7471A	11/07-11/08/02	FCDCP1AE
		Dilution Factor: 1		Analysis Time..: 11:27	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: SGP-1(1-2')

TOTAL Metals

Lot-Sample #...: A2K040189-009 **Matrix.....:** SO
Date Sampled...: 10/31/02 13:10 **Date Received..:** 11/02/02
% Moisture.....: 19

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**19200 J**	**24.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AM**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**2.2**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AH**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**12.9**	**0.37**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AJ**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.8 B**	**7.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AN**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**85.1 J**	**24.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AP**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDCQ1AK
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.59 B**	**0.62**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AQ**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCQ1AL
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDCQ1AR
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**1060**	**618**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AT**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: SGP-1(1-2')

TOTAL Metals

Lot-Sample #...: A2K040189-009 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**22.4**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AU**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**9.0**	**6.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AV**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**13.9**	**3.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AW**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**30700**	**12.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AX**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**1530**	**618**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1A0**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**337**	**1.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1A1**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**9.4**	**4.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1A2**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**1580 J**	**618**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1A3**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCQ1A4
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	618	mg/kg	SW846 6010B	11/07-11/12/02	FCDCQ1AA
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-1(1-2')

TOTAL Metals

Lot-Sample #...: A2K040189-009 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**64.9**	**6.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AC**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	35.3	2.5	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCQ1AD**
		Dilution Factor: 1		Analysis Time..: 17:01	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.048 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDCQ1AE**
		Dilution Factor: 1		Analysis Time..: 11:26	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-1(9-10')

TOTAL Metals

Lot-Sample #...: A2K040189-010 **Matrix.....:** SO
Date Sampled...: 10/31/02 13:10 **Date Received..:** 11/02/02
% Moisture.....: 15

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**12100 J**	**23.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AM**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**3.9**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AH**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**9.8**	**0.35**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AJ**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**0.90 B**	**7.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AN**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**47.3 J**	**23.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AP**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.59	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AK
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**1.1**	**0.59**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AQ**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AL
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.59	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AR
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**303 B**	**586**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AT**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-1(9-10')

TOTAL Metals

Lot-Sample #...: A2K040189-010 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	31.7	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AU
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	17.6	5.9	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AV
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	19.8	2.9	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AW
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	26700	11.7	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AX
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	1730	586	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1A0
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	360	1.8	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1A1
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	19.0	4.7	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1A2
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	851 J	586	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1A3
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1A4
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	586	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AA
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-1(9-10')

TOTAL Metals

Lot-Sample #...: A2K040189-010 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**32.0**	**5.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCT1AC**
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	20.7	2.3	mg/kg	SW846 6010B	11/07-11/12/02	FCDCT1AD
		Dilution Factor: 1		Analysis Time..: 17:06	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	ND	0.12	mg/kg	SW846 7471A	11/07-11/08/02	FCDCT1AE
		Dilution Factor: 1		Analysis Time..: 11:29	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: SGP-6(10-11')

TOTAL Metals

Lot-Sample #...: A2K040189-011 **Matrix.....:** SO
Date Sampled...: 10/31/02 13:50 **Date Received..:** 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**19400 J**	**24.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AM**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**1.6**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AH**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**11.3**	**0.36**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AJ**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.1 B**	**7.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AN**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**56.9 J**	**24.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AP**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.60	mg/kg	SW846 6010B	11/07-11/12/02	FCDCW1AK
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.41 B**	**0.60**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AQ**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCW1AL
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.60	mg/kg	SW846 6010B	11/07-11/12/02	FCDCW1AR
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**9930**	**604**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AT**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-6(10-11')

TOTAL Metals

Lot-Sample #...: A2K040189-011 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**17.9**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AU**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**5.5 B**	**6.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AV**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**11.6**	**3.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AW**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**22400**	**12.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AX**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**1220**	**604**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1A0**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**154**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1A1**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**7.9**	**4.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1A2**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**1120 J**	**604**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1A3**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCW1A4
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	**80.8 B**	**604**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCW1AA**
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-6(10-11')

TOTAL Metals

Lot-Sample #...: A2K040189-011 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	57.5	6.0	mg/kg	SW846 6010B	11/07-11/12/02	FCDCW1AC
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	26.4	2.4	mg/kg	SW846 6010B	11/07-11/12/02	FCDCW1AD
		Dilution Factor: 1		Analysis Time..: 17:11	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	0.043 B	0.12	mg/kg	SW846 7471A	11/07-11/08/02	FCDCW1AE
		Dilution Factor: 1		Analysis Time..: 11:28	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-3(9-10')

TOTAL Metals

Lot-Sample #...: A2K040189-012 **Matrix.....:** SO
Date Sampled...: 10/31/02 14:30 **Date Received..:** 11/02/02
% Moisture.....: 18

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**14800 J**	**24.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AM**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**2.6**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AH**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**9.7**	**0.37**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AJ**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.4 B**	**7.3**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AN**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**37.2 J**	**24.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AP**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.61	mg/kg	SW846 6010B	11/07-11/12/02	FCDCX1AK
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.31 B**	**0.61**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AQ**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCX1AL
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.61	mg/kg	SW846 6010B	11/07-11/12/02	FCDCX1AR
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**866**	**609**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AT**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-3(9-10')

TOTAL Metals

Lot-Sample #...: A2K040189-012 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**22.8**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AU**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**3.2 B**	**6.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AV**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**9.5**	**3.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AW**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**24400**	**12.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AX**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**597 B**	**609**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1A0**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**90.8**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1A1**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**5.3**	**4.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1A2**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**500 B,J**	**609**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1A3**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDCX1A4
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	609	mg/kg	SW846 6010B	11/07-11/12/02	FCDCX1AA
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-3(9-10')

TOTAL Metals

Lot-Sample #...: A2K040189-012 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**54.3**	**6.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AC**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	**18.6**	**2.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDCX1AD**
		Dilution Factor: 1		Analysis Time..: 17:16	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.057 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDCX1AE**
		Dilution Factor: 1		Analysis Time..: 11:35	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(7-8')

TOTAL Metals

Lot-Sample #...: A2K040189-013 **Matrix.....:** SO
Date Sampled...: 10/31/02 15:50 **Date Received..:** 11/02/02
% Moisture.....: 16

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**14200 J**	**23.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AM**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**4.1**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AH**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**9.6**	**0.36**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AJ**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.1 B**	**7.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AN**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**46.1 J**	**23.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AP**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.59	mg/kg	SW846 6010B	11/07-11/12/02	FCDC01AK
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**1.3**	**0.59**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AQ**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC01AL
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.59	mg/kg	SW846 6010B	11/07-11/12/02	FCDC01AR
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**159 B**	**592**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AT**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(7-8')

TOTAL Metals

Lot-Sample #...: A2K040189-013 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**21.6**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AU**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**11.6**	**5.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AV**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**16.8**	**3.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AW**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**28400**	**11.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AX**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**1410**	**592**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01A0**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**242**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01A1**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**10.7**	**4.7**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01A2**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**1090 J**	**592**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01A3**
		Dilution Factor: 1		**Analysis Time..: 17:21**	**Analyst ID.....: 002260**	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC01A4
		Dilution Factor: 1		Analysis Time..: 17:21	**Analyst ID.....: 002260**	
		Instrument ID..: I5				
Sodium	ND	592	mg/kg	SW846 6010B	11/07-11/12/02	FCDC01AA
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(7-8')

TOTAL Metals

Lot-Sample #...: A2K040189-013 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**26.7**	**5.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AC**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	**23.9**	**2.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC01AD**
		Dilution Factor: 1		Analysis Time..: 17:21	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.023 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDC01AE**
		Dilution Factor: 1		Analysis Time..: 11:33	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(11-12')

TOTAL Metals

Lot-Sample #...: A2K040189-014 **Matrix.....:** SO
Date Sampled...: 10/31/02 16:05 **Date Received..:** 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**19600 J**	**24.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AM**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**3.4**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AH**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**9.6**	**0.36**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AJ**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.2 B**	**7.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AN**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**61.4 J**	**24.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AP**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.60	mg/kg	SW846 6010B	11/07-11/12/02	FCDC11AK
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.81**	**0.60**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AQ**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC11AL
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.60	mg/kg	SW846 6010B	11/07-11/12/02	FCDC11AR
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**576 B**	**599**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AT**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(11-12')

TOTAL Metals

Lot-Sample #...: A2K040189-014 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**26.9**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AU**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**10.0**	**6.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AV**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**14.8**	**3.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AW**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**29000**	**12.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11AX**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**1560**	**599**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11A0**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**372**	**1.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11A1**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**11.0**	**4.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11A2**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**1420 J**	**599**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC11A3**
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC11A4
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	599	mg/kg	SW846 6010B	11/07-11/12/02	FCDC11AA
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(11-12')

TOTAL Metals

Lot-Sample #...: A2K040189-014 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	55.2	6.0	mg/kg	SW846 6010B	11/07-11/12/02	FCDC11AC
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	33.8	2.4	mg/kg	SW846 6010B	11/07-11/12/02	FCDC11AD
		Dilution Factor: 1		Analysis Time..: 17:26	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	0.057 B	0.12	mg/kg	SW846 7471A	11/07-11/08/02	FCDC11AE
		Dilution Factor: 1		Analysis Time..: 11:36	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-16(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-015 **Matrix.....:** SO
Date Sampled...: 10/31/02 17:00 **Date Received..:** 11/02/02
% Moisture.....: 19

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**17000 J**	**24.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AM**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**4.0**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AH**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**11.4**	**0.37**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AJ**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.1 B**	**7.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AN**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**51.2 J**	**24.8**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AP**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDC21AK
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.40 B**	**0.62**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AQ**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC21AL
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDC21AR
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**1020**	**620**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AT**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-16(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-015 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**24.4**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AU**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	**8.2**	**6.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AV**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	**10.6**	**3.1**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AW**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	**28200**	**12.4**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AX**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	**812**	**620**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21A0**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	**393**	**1.9**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21A1**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	**6.3**	**5.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21A2**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	**561 B,J**	**620**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21A3**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC21A4
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	620	mg/kg	SW846 6010B	11/07-11/12/02	FCDC21AA
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-16(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-015 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**55.4**	**6.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC21AC**
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	20.2	2.5	mg/kg	SW846 6010B	11/07-11/12/02	FCDC21AD
		Dilution Factor: 1		Analysis Time..: 17:44	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	0.070 B	0.12	mg/kg	SW846 7471A	11/07-11/08/02	FCDC21AE
		Dilution Factor: 1		Analysis Time..: 11:37	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-12(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-016 **Matrix.....:** SO
Date Sampled...: 10/31/02 16:40 **Date Received..:** 11/02/02
% Moisture.....: 20

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 2311117						
Aluminum	**19600 J**	**25.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AM**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Arsenic	**2.7**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AH**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Lead	**12.6**	**0.37**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AJ**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Antimony	**1.6 B**	**7.5**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AN**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Barium	**56.2 J**	**25.0**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AP**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Selenium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AK
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Beryllium	**0.55 B**	**0.62**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AQ**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Thallium	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AL
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cadmium	ND	0.62	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AR
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Calcium	**3200**	**624**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AT**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-12(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-016 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Chromium	**27.0**	**1.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AU**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Cobalt	9.1	6.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AV
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Copper	13.6	3.1	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AW
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Iron	33400	12.5	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AX
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Magnesium	2200	624	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41A0
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Manganese	457	1.9	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41A1
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Nickel	8.2	5.0	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41A2
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Potassium	915 J	624	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41A3
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Silver	ND	1.2	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41A4
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Sodium	ND	624	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AA
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				

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DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-12(3-4')

TOTAL Metals

Lot-Sample #...: A2K040189-016 **Matrix.....:** SO

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Vanadium	**61.8**	**6.2**	**mg/kg**	**SW846 6010B**	**11/07-11/12/02**	**FCDC41AC**
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Zinc	32.1	2.5	mg/kg	SW846 6010B	11/07-11/12/02	FCDC41AD
		Dilution Factor: 1		Analysis Time..: 17:49	Analyst ID.....: 002260	
		Instrument ID..: I5				
Mercury	**0.049 B**	**0.12**	**mg/kg**	**SW846 7471A**	**11/07-11/08/02**	**FCDC41AE**
		Dilution Factor: 1		Analysis Time..: 11:38	Analyst ID.....: 001644	
		Instrument ID..: H1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B Estimated result. Result is less than RL.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-1(1-3')

General Chemistry

Lot-Sample #...: A2K040189-001 **Work Order #...:** FCDAQ **Matrix.....:** SO
Date Sampled...: 11/01/02 10:00 **Date Received..:** 11/02/02
% Moisture.....: 15

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.59	mg/kg	SW846 9012A	11/09/02	2313125
	Dilution Factor: 1					
Percent Solids	**85.3 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(8-12')

General Chemistry

Lot-Sample #...: A2K040189-002 **Work Order #...:** FCDA5 **Matrix.....:** SO
Date Sampled...: 11/01/02 10:40 **Date Received..:** 11/02/02
% Moisture.....: 18

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.61	mg/kg	SW846 9012A	11/09/02	2313125
		Dilution Factor: 1				
Percent Solids	**82.3 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
		Dilution Factor: 1				

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-2(13.5-14.5')

General Chemistry

Lot-Sample #...: A2K040189-003 **Work Order #...:** FCDA7 **Matrix.....:** SO
Date Sampled...: 11/01/02 11:05 **Date Received..:** 11/02/02
% Moisture.....: 18

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.61	mg/kg	SW846 9012A	11/09/02	2313125
		Dilution Factor: 1				
Percent Solids	**82.3 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
		Dilution Factor: 1				

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-3(10-11')

General Chemistry

Lot-Sample #...: A2K040189-004 **Work Order #...:** FCDCC **Matrix.....:** SO
Date Sampled...: 11/01/02 11:25 **Date Received..:** 11/02/02
% Moisture.....: 21

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	0.69	0.63	mg/kg	SW846 9012A	11/09/02	2313125
	Dilution Factor: 1					
Percent Solids	79.2 J	10.0	%	MCAWW 160.3 MOD	11/05-11/06/02	2310319
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-8(5-8')

General Chemistry

Lot-Sample #...: A2K040189-005 **Work Order #...:** FCDCE **Matrix.....:** SO
Date Sampled...: 11/01/02 12:15 **Date Received..:** 11/02/02
% Moisture.....: 19

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.62	mg/kg	SW846 9012A	11/09/02	2313125
	Dilution Factor: 1					
Percent Solids	**80.9 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-5(6-11')

General Chemistry

Lot-Sample #...: A2K040189-006 **Work Order #...:** FCDCG **Matrix.....:** SO
Date Sampled...: 11/01/02 12:50 **Date Received..:** 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.60	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	**83.0 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-16(3-4')

General Chemistry

Lot-Sample #...: A2K040189-007 **Work Order #...:** FCDCL **Matrix.....:** SO
Date Sampled...: 11/01/02 13:30 **Date Received..:** 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.60	mg/kg	SW846 9012A	11/09/02	2313125
		Dilution Factor: 1				
Percent Solids	83.0 J	10.0	%	MCAWW 160.3 MOD	11/05-11/06/02	2310319
		Dilution Factor: 1				

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 7GP-4(3-4')

General Chemistry

Lot-Sample #...: A2K040189-008 **Work Order #...:** FCDCP **Matrix.....:** SO
Date Sampled...: 11/01/02 13:45 **Date Received..:** 11/02/02
% Moisture.....: 15

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.59	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	**85.4 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-1(1-2')

General Chemistry

Lot-Sample #...: A2K040189-009 **Work Order #...:** FCDCQ **Matrix.....:** SO
Date Sampled...: 10/31/02 13:10 **Date Received..:** 11/02/02
% Moisture.....: 19

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.62	mg/kg	SW846 9012A	11/11-11/12/02	2315220
		Dilution Factor: 1				
Percent Solids	80.9 J	10.0	%	MCAWW 160.3 MOD	11/05-11/06/02	2310319
		Dilution Factor: 1				

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-1(9-10')

General Chemistry

Lot-Sample #...: A2K040189-010 **Work Order #...:** FCDCT **Matrix.....:** SO
Date Sampled...: 10/31/02 13:10 **Date Received..:** 11/02/02
% Moisture.....: 15

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	0.13 B	0.59	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	85.4 J	10.0	%	MCAWW 160.3 MOD	11/05-11/06/02	2310319
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-6(10-11')

General Chemistry

Lot-Sample #...: A2K040189-011 Work Order #...: FCDCW Matrix.....: SO
Date Sampled...: 10/31/02 13:50 Date Received..: 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	0.11 B	0.60	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	82.8 J	10.0	%	MCAWW 160.3 MOD	11/05-11/06/02	2310319
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-3(9-10')

General Chemistry

Lot-Sample #...: A2K040189-012 **Work Order #...:** FCDCX **Matrix.....:** SO
Date Sampled...: 10/31/02 14:30 **Date Received..:** 11/02/02
% Moisture.....: 18

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.61	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	**82.1 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(7-8')

General Chemistry

Lot-Sample #...: A2K040189-013 **Work Order #...:** FCDC0 **Matrix.....:** SO
Date Sampled...: 10/31/02 15:50 **Date Received..:** 11/02/02
% Moisture.....: 16

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.59	mg/kg	SW846 9012A	11/11-11/12/02	2315220
		Dilution Factor: 1				
Percent Solids	**84.5 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
		Dilution Factor: 1				

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-8(11-12')

General Chemistry

Lot-Sample #...: A2K040189-014 **Work Order #...:** FCDC1 **Matrix.....:** SO
Date Sampled...: 10/31/02 16:05 **Date Received..:** 11/02/02
% Moisture.....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.60	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	**83.5 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-16(3-4')

General Chemistry

Lot-Sample #...: A2K040189-015 **Work Order #...:** FCDC2 **Matrix.....:** SO
Date Sampled...: 10/31/02 17:00 **Date Received..:** 11/02/02
% Moisture.....: 19

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.62	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	**80.7 J**	**10.0**	**%**	**MCAWW 160.3 MOD**	**11/05-11/06/02**	**2310319**
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

DRAPER ADEN & ASSOCIATES INC

Client Sample ID: 5GP-12(3-4')

General Chemistry

Lot-Sample #...: A2K040189-016 **Work Order #...:** FCDC4 **Matrix.....:** SO
Date Sampled...: 10/31/02 16:40 **Date Received..:** 11/02/02
% Moisture.....: 20

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Cyanide, Total	ND	0.62	mg/kg	SW846 9012A	11/11-11/12/02	2315220
	Dilution Factor: 1					
Percent Solids	80.1 J	10.0	%	MCAWW 160.3 MOD	11/05-11/06/02	2310319
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

APPENDIX C

WASTE CHARACTERIZATION LABORATORY ANALYTICAL RESULTS

CHAIN OF CUSTODY RECORD

Laboratory: Lancaster Laboratories, Inc. 2425 New Holland Pike, Lancaster, PA 17605-2425 (717) 656-2300

Client:	Draper Aden Associates	Consultant:	Draper Aden Associates	Sample Site:	RFAAP
Attn:	Andy Kassoff/ Ross Miller	Attn:	Janet C. Frazier	Location:	Montgomery County, Virginia
Address:	2206 South Main Street, Blacksburg, Virginia 24060	Address:	2206 South Main Street, Blacksburg, Virginia 24060	Event:	HWMU-5 and HWMU-7 Investigation
Phone:	(540) 552-0444	Phone:	(540) 552-0444	DAA JN:	B02271-01
Fax:	(540) 552-0291	Fax:	(540) 552-0291	Lab JN:	

Project Specific (PS) or Batch (B) QC: ☑ PS ☐ B
Sample Collection for Project Complete? (See Note 1) ☑ YES ☐ NO
Carrier: FED EX
Tracking Number:

Box 1: Matrix — SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative — A HCL; B HNO_3; C H_2SO_4; D NaHSO4; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered — F Filtered; U Unfiltered

Box 4: Sample Type — G Grab; C Composite

Box 5: Sample Container Type — P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: ☑ YES ☐ NO
Bill: ☑ Client ☐ Consultant
Preserved and shipped on ice: ☑ YES Bo ☐ NO

Box 4 - Sample Type					G	G	C						
Box 3 - Filtered/Unfiltered					U	U	U						
Required pH of Sample					-	-							
Box 2 - Preservative					D	H	H						
Box 5 - Sample Container Type					VOA	1-500ml G	500ml G						
Sample ID	Date: 2002	Time	Box 1: Matrix	Number of Bottles	Aluminum, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Nickel, Silver, Vanadium, Zinc	Semivolatiles/Pests/PCB	FULL CHARACTERIZATION TCLP CORROSIVITY, REACTIVITY, IGNITABILITY						
1-2' SGP-1	10/31	13:10	S	1		X							
9-10' SGP-1	10/31	13:10	S	1		X							
10-11' SGP-6	10/31	13:50	S	1		X							
9-10' SGP-3		14:30	S	1		X							
7-8' SGP-8		15:50	S	1		X							
11-12' SGP-8		16:05	S	1		X							
3-4' SGP-12		16:40	S	1		X							
3-4' SGP-16	10/31	17:00	S	1		X							
FULL TCLP	11/1	13:55	S	1			X						
LD HWMU-5													

GENERAL NOTES: See attached target analyte list. Full TCL List for all analytes, using SW846 Test Methods (8270C, 8081A, 8082)

SGP-1 (1-2')
SGP-1 (9-10')
SGP-6 (10-11')
SGP-3 (9-10')
SGP-8 (7-8')
SGP-8 (11-12')
SGP-12 (3-4')
SGP-16 (3-4')
FULL CHARACTERIZATION TCLP
IGNITABILITY, CORROSIVITY, REACTIVITY

Clients Special Instructions:

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No
Describe problems, if any

Sampler Name (Print)	DARREN FRAZELL	Date: 11/1/02	#1 Relinquished by (Signature):	Date: 11/1/02	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested
Sampler Signature		Time: 16:30	Company Name: DAA	Time: 17:30	Company Name:	Time:	30 DYS ORG/6 MTHS INORG
Sampler Name (Print)		Date:	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date:	
Sampler Signature		Time:	Company Name:	Time:	Company Name:	Time:	

CHAIN OF CUST Y RECORD

Laboratory: Lancaster Laboratories, Inc. 2425 New Holland Pike, Lancaster, PA 17605-2425 (717) 656-2300

Client:	Draper Aden Associates	Consultant:	Draper Aden Associates	Sample Site:	RFAAP
Attn:	Andy Kassoff/ Ross Miller	Attn:	Janet C. Frazier	Location:	Montgomery County, Virginia
Address:	2206 South Main Street Blacksburg, Virginia 24060	Address:	2206 South Main Street Blacksburg, Virginia 24060	Event:	HWMU-5 and HWMU-7 Investigation
Phone:	(540) 552-0444	Phone:	(540) 552-0444	DAA JN:	B02271-01
Fax:	(540) 552-0291	Fax:	(540) 552-0291	Lab JN:	
Fax:	(540) 552-0291				

Project Specific (PS) or Batch (B) QC: ☑ PS ☐ B
Sample Collection for Project Complete? (See Note 1) ☑ YES ☐ NO
Carrier: FED EX
Tracking Number: _____

Box 1: Matrix — SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative — A HCL; B HNO_3; C H_2SO_4; D NaHSO4; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered — F Filtered; U Unfiltered

Box 4: Sample Type — G Grab; C Composite

Box 5: Sample Container Type — P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice — Copy to Consultant: ☑ YES ☐ NO; Bill: ☑ Client ☐ Consultant; Preserved and shipped on ice: ☑ YES Bo ☐ NO

Box 4 - Sample Type					G	G	C							GENERAL NOTES: See attached target analyte list. Full TCL List for all analytes, using SW846 Test Methods (8270C, 8081A, 8082)
Box 3 - Filtered/Unfiltered					U	U	U							
Required pH of Sample					-	-	-							
Box 2 - Preservative					D	H	2 H							
Box 5 - Sample Container Type					VOA	1-500ml G	500mL G							
Sample ID	Date: 2002	Time	Box 1: Matrix	Number of Bottles	Volatiles 8260B/ 5035	Semivolatiles/Pests/PCB	FULL CHARACTERIZATION TCLP							
(1-3') 7GP-1 ✓	11/1	10:00	S	4	X	X								
(8-12') 7GP-2 ✓	|	10:40	S	|	X	X							
(13.5-14.5) 7GP-2 ✓	|	11:05	S	|	X	X							
(10-11) 7GP-3 ✓	|	11:25	S	|	X	X							
(5-8') 7GP-8 ✓	|	12:15	S	|	X	X							
(10-11') 7GP-5 ✓	|	12:50	S	12	X	X								+ MS/MSD
(3-4') 7GP-16 ✓	|	13:30	S	|	X	X							
(3-4') 7GP-4 ✓	|	13:45	S	4	X	X								
UNIT 7 TCLP	11/1	14:00	S	1			X ✓							FULL CHARACTERIZATION TCLP, IGNITABILITY, CORROSIVITY, REACTIVITY

Clients Special Instructions:

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on ice _____ Yes _____ No
Describe problems, if any:

Sampler Name (Print): DARREN KIDWELL	Date: 11/1/02	#1 Relinquished by (Signature): Darren Kidwell	Date: 11/1/02	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested
Sampler Signature: Darren Kidwell	Time: 16:30	Company Name: DAA	Time: 17:36	Company Name:	Time:	
Sampler Name (Print)	Date:	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date:	30 DYS ORG & MTHS INORG
Sampler Signature	Time:	Company Name:	Time:	Company Name:	Time:	

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REPRINT

Lancaster Laboratories Sample No. SW 3933082

Collected:11/01/2002 13:55

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:38
Discard: 12/26/2002
HWMU-5 Composite Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

MWMU5 SDG#: RAR01-20

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	15.3	0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.					
00394	pH	n.a.	7.38	0.010		1
	The pH was performed on a 1:1 slurry (25 gms. of sample and 25 ml. of deionized water) after being tumbled for 30 min.					
00496	Corrosivity	n.a.	See Below		See Below	1
	Corrosivity: The pH of a 1:1 slurry (with deionized water) was 7.38 indicating that the waste is not corrosive. A waste is corrosive if it exhibits a pH equal to or less than 2 or equal to or greater than 12.5.					
00542	Ignitability	n.a.	See Below		See Below	1
	The sample did not spontaneously ignite when exposed to air or water. The sample did not ignite by friction. The sample vapors did not ignite when exposed to a flame using a closed cup apparatus.					
01121	Reactivity	n.a.	See Below		See Below	1
	Reactivity: The sample was extracted by the interim method described in SW 846, Chapter 7.3. This solution was analyzed for cyanide and sulfide. This waste is not considered reactive and hazardous because it does not generate a quantity of hydrogen cyanide exceeding 250 mg/kg or hydrogen sulfide exceeding 500 mg/kg. These interim threshold limits were established by the Solid Waste Branch of EPA, July, 1992. These results do not reflect total cyanide or total sulfide.					
01122	Sulfide (Reactivity)	n.a.	N.D.	27.	mg/kg	1
01123	Cyanide (Reactivity)	n.a.	N.D.	98.	mg/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor

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Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

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REPRINT

Lancaster Laboratories Sample No. SW 3933082

Collected:11/01/2002 13:55

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:38
Discard: 12/26/2002
HWMU-5 Composite Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

MWMU5 SDG#: RAR01-20

00111	Moisture	EPA 160.3 modified	1	11/07/2002 09:55	Nadine Fegley	1
00394	pH	SW-846 9045C (modified)	1	11/05/2002 16:35	Luz M Groff	1
00496	Corrosivity	SW-846 Chapter 7	1	11/05/2002 16:35	Luz M Groff	1
00542	Ignitability	40 CFR 261.21	1	11/15/2002 18:50	Justin M Bowers	1
01121	Reactivity	SW-846 Chapter 7.3	1	11/15/2002 07:40	Susan E Hibner	1
01122	Sulfide (Reactivity)	SW-846 9034	1	11/15/2002 07:40	Susan E Hibner	1
01123	Cyanide (Reactivity)	SW-846 9012A (modified)	1	11/15/2002 21:03	Venia B McFadden	1

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REPRINT

Lancaster Laboratories Sample No. TL 3933083

Collected:11/01/2002 13:55

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:38
Discard: 12/26/2002
HWMU-5 Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

M5NVE SDG#: RAR01-21

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
00259	Mercury	7439-97-6	N.D.	0.000079	mg/l	1
	The metal analyses were performed on a non-volatile leachate prepared according to the procedure specified in SW-846, Chapter 7.4 (Revision 3, December, 1994). A sample is considered to have failed the Toxicity Characteristic (TC) test and is considered a hazardous waste if any of the metal concentrations (mg/l) in the leachate exceed the following maxima (100 times the Primary Drinking Water Standards):					
	Arsenic 5.0 Cadmium 1.0 Lead 5.0 Selenium 1.0					
	Barium 100.0 Chromium 5.0 Mercury 0.2 Silver 5.0					
01335	Arsenic	7440-38-2	0.0091 J	0.0049	mg/l	1
01336	Selenium	7782-49-2	N.D.	0.0048	mg/l	1
01746	Barium	7440-39-3	0.714	0.00044	mg/l	1
01749	Cadmium	7440-43-9	N.D.	0.00094	mg/l	1
01751	Chromium	7440-47-3	N.D.	0.0020	mg/l	1
01755	Lead	7439-92-1	0.0116 J	0.0089	mg/l	1
01766	Silver	7440-22-4	N.D.	0.0014	mg/l	1
00950	TCLP Pesticides					
01972	Gamma BHC - Lindane	58-89-9	N.D.	0.000012	mg/l	1
01973	Heptachlor	76-44-8	N.D.	0.000010	mg/l	1
01974	Heptachlor Epoxide	1024-57-3	N.D.	0.000016	mg/l	1
01975	Methoxychlor	72-43-5	N.D.	0.00010	mg/l	1
01976	Endrin	72-20-8	N.D.	0.000024	mg/l	1
01977	Chlordane	57-74-9	N.D.	0.00025	mg/l	1
01978	Toxaphene	8001-35-2	N.D.	0.0015	mg/l	1
00952	TCLP Herbicides					
01979	2,4-D	94-75-7	N.D.	0.0020	mg/l	1
01980	2,4,5-TP	93-72-1	N.D.	0.00020	mg/l	1
00949	TCLP Acid Base/Neutrals					
03324	Pyridine	110-86-1	N.D.	0.0040	mg/l	1

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REPRINT

Lancaster Laboratories Sample No. TL 3933083

Collected:11/01/2002 13:55

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:38
Discard: 12/26/2002
HWMU-5 Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

M5NVE SDG#: RAR01-21

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
03325	1,4-Dichlorobenzene	106-46-7	N.D.	0.0020	mg/l	1
03326	2-Methylphenol	95-48-7	N.D.	0.0020	mg/l	1
03327	4-Methylphenol	106-44-5	N.D.	0.0040	mg/l	1
	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 of both compounds.					
03328	Hexachloroethane	67-72-1	N.D.	0.0020	mg/l	1
03329	Nitrobenzene	98-95-3	N.D.	0.0020	mg/l	1
03330	Hexachlorobutadiene	87-68-3	N.D.	0.0020	mg/l	1
03331	2,4,6-Trichlorophenol	88-06-2	N.D.	0.0020	mg/l	1
03332	2,4,5-Trichlorophenol	95-95-4	N.D.	0.0020	mg/l	1
03333	2,4-Dinitrotoluene	121-14-2	N.D.	0.0020	mg/l	1
03334	Hexachlorobenzene	118-74-1	N.D.	0.0020	mg/l	1
03335	Pentachlorophenol	87-86-5	N.D.	0.0060	mg/l	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00259	Mercury	SW-846 7470A	1	11/08/2002 06:52	Deborah A Krady	1
01335	Arsenic	SW-846 6010B	1	11/11/2002 03:40	Donna R Sackett	1
01336	Selenium	SW-846 6010B	1	11/12/2002 06:42	Donna R Sackett	1
01746	Barium	SW-846 6010B	1	11/11/2002 03:40	Donna R Sackett	1
01749	Cadmium	SW-846 6010B	1	11/12/2002 06:42	Donna R Sackett	1
01751	Chromium	SW-846 6010B	1	11/12/2002 06:42	Donna R Sackett	1
01755	Lead	SW-846 6010B	1	11/12/2002 06:42	Donna R Sackett	1
01766	Silver	SW-846 6010B	1	11/11/2002 03:40	Donna R Sackett	1
00950	TCLP Pesticides	SW-846 8081A	1	11/08/2002 13:04	Douglas D Seitz	1
00952	TCLP Herbicides	SW-846 8151A	1	11/09/2002 02:40	Michele D Hamilton	1
00949	TCLP Acid Base/Neutrals	SW-846 8270C	1	11/08/2002 15:54	Chad A Moline	1
00816	Water Sample Herbicide Extract	SW-846 8151A	1	11/08/2002 08:25	Amanda W Herr	1
00817	Water Sample Pest. Extraction	SW-846 3510C	1	11/07/2002 23:00	Sharon L Jones	1
00947	TCLP Non-volatile Extraction	SW-846 1311	1	11/06/2002 13:40	Carlene A Landis	n.a.

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Lancaster Laboratories Sample No. TL 3933083

Collected:11/01/2002 13:55

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:38
Discard: 12/26/2002
HWMU-5 Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

M5NVE SDG#: RAR01-21

04731	TCLP Leachate Extraction	SW-846 3510C	1	11/07/2002 17:25	JoElla L Rice	1
05705	WW/TL SW 846 ICP Digest (tot)	SW-846 3010A	1	11/07/2002 22:10	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	11/07/2002 20:21	Nelli S Markaryan	1

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REPRINT

Lancaster Laboratories Sample No. TL 3933084

Collected:11/01/2002 13:55

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:38
Discard: 12/26/2002
HWMU-5 Composite Soil Sample
TCLP ZERO HEADSPACE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

M5ZHE SDG#: RAR01-22*

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
03636	TCLP by 8260					
05386	Vinyl Chloride	75-01-4	N.D.	0.020	mg/l	20
05390	1,1-Dichloroethene	75-35-4	N.D.	0.016	mg/l	20
05396	Chloroform	67-66-3	N.D.	0.016	mg/l	20
05399	Carbon Tetrachloride	56-23-5	N.D.	0.020	mg/l	20
05401	Benzene	71-43-2	N.D.	0.010	mg/l	20
05402	1,2-Dichloroethane	107-06-2	N.D.	0.020	mg/l	20
05403	Trichloroethene	79-01-6	N.D.	0.020	mg/l	20
05409	Tetrachloroethene	127-18-4	N.D.	0.016	mg/l	20
05413	Chlorobenzene	108-90-7	N.D.	0.016	mg/l	20
06305	2-Butanone	78-93-3	N.D.	0.060	mg/l	20

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
03636	TCLP by 8260	SW-846 8260B	1	11/10/2002 19:54	Susan McMahon-Luu	20
00946	TCLP Zero Headspace Extraction	SW-846 1311	1	11/04/2002 12:45	David G Splain Jr	n.a.
01163	GC/MS VOA Water Prep	SW-846 5030B	1	11/10/2002 19:54	Susan McMahon-Luu	n.a.

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PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

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REPRINT

332

Lancaster Laboratories Sample No. SW 3933071

Collected:11/01/2002 14:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
Unit 7 TCLP Composite Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

UNIT7 SDG#: RAR01-09

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Units	Dilution Factor
00111	Moisture	n.a.	15.5	0.50	%	1
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported above is on an as-received basis.					
00394	pH	n.a.	7.15	0.010		1
	The pH was performed on a 1:1 slurry (25 gms. of sample and 25 ml. of deionized water) after being tumbled for 30 min.					
00496	Corrosivity	n.a.	See Below		See Below	1
	Corrosivity: The pH of a 1:1 slurry (with deionized water) was 7.15 indicating that the waste is not corrosive. A waste is corrosive if it exhibits a pH equal to or less than 2 or equal to or greater than 12.5.					
00542	Ignitability	n.a.	See Below		See Below	1
	The sample did not spontaneously ignite when exposed to air or water. The sample did not ignite by friction. The sample vapors did not ignite when exposed to a flame using a closed cup apparatus.					
01121	Reactivity	n.a.	See Below		See Below	1
	Reactivity: The sample was extracted by the interim method described in SW 846, Chapter 7.3. This solution was analyzed for cyanide and sulfide. This waste is not considered reactive and hazardous because it does not generate a quantity of hydrogen cyanide exceeding 250 mg/kg or hydrogen sulfide exceeding 500 mg/kg. These interim threshold limits were established by the Solid Waste Branch of EPA, July, 1992. These results do not reflect total cyanide or total sulfide.					
01122	Sulfide (Reactivity)	n.a.	N.D.	27.	mg/kg	1
01123	Cyanide (Reactivity)	n.a.	N.D.	100.	mg/kg	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor

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Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

Lancaster Laboratories
Where quality is a science.

REPRINT

333

Lancaster Laboratories Sample No. SW 3933071

Collected:11/01/2002 14:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:35
Discard: 12/26/2002
Unit 7 TCLP Composite Soil Sample
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

UNIT7 SDG#: RAR01-09

00111	Moisture	EPA 160.3 modified	1	11/07/2002 09:55	Nadine Fegley	1
00394	pH	SW-846 9045C (modified)	1	11/05/2002 16:35	Luz M Groff	1
00496	Corrosivity	SW-846 Chapter 7	1	11/05/2002 16:35	Luz M Groff	1
00542	Ignitability	40 CFR 261.21	1	11/15/2002 18:50	Justin M Bowers	1
01121	Reactivity	SW-846 Chapter 7.3	1	11/15/2002 07:40	Susan E Hibner	1
01122	Sulfide (Reactivity)	SW-846 9034	1	11/15/2002 07:40	Susan E Hibner	1
01123	Cyanide (Reactivity)	SW-846 9012A (modified)	1	11/15/2002 21:01	Venia B McFadden	1

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RE-PRINT

534

Lancaster Laboratories Sample No. TL 3933072

Collected:11/01/2002 14:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
Unit 7 TCLP Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

U7NVE SDG#: RAR01-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
00259	Mercury	7439-97-6	N.D.	0.000079	mg/l	1
	The metal analyses were performed on a non-volatile leachate prepared according to the procedure specified in SW-846, Chapter 7.4 (Revision 3, December, 1994). A sample is considered to have failed the Toxicity Characteristic (TC) test and is considered a hazardous waste if any of the metal concentrations (mg/l) in the leachate exceed the following maxima (100 times the Primary Drinking Water Standards):					
	Arsenic 5.0 Cadmium 1.0 Lead 5.0 Selenium 1.0 Barium 100.0 Chromium 5.0 Mercury 0.2 Silver 5.0					
01335	Arsenic	7440-38-2	0.0056 J	0.0049	mg/l	1
01336	Selenium	7782-49-2	N.D.	0.0048	mg/l	1
01746	Barium	7440-39-3	0.521	0.00044	mg/l	1
01749	Cadmium	7440-43-9	N.D.	0.00094	mg/l	1
01751	Chromium	7440-47-3	N.D.	0.0020	mg/l	1
01755	Lead	7439-92-1	N.D.	0.0089	mg/l	1
01766	Silver	7440-22-4	N.D.	0.0014	mg/l	1
00950	TCLP Pesticides					
01972	Gamma BHC - Lindane	58-89-9	N.D.	0.000012	mg/l	1
01973	Heptachlor	76-44-8	N.D.	0.000010	mg/l	1
01974	Heptachlor Epoxide	1024-57-3	N.D.	0.000016	mg/l	1
01975	Methoxychlor	72-43-5	N.D.	0.00010	mg/l	1
01976	Endrin	72-20-8	N.D.	0.000024	mg/l	1
01977	Chlordane	57-74-9	N.D.	0.00025	mg/l	1
01978	Toxaphene	8001-35-2	N.D.	0.0015	mg/l	1
00952	TCLP Herbicides					
01979	2,4-D	94-75-7	N.D.	0.0020	mg/l	1
01980	2,4,5-TP	93-72-1	N.D.	0.00020	mg/l	1
00949	TCLP Acid Base/Neutrals					
03324	Pyridine	110-86-1	N.D.	0.0040	mg/l	1

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Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

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REPRINT

Lancaster Laboratories Sample No. TL 3933072

Collected:11/01/2002 14:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
Unit 7 TCLP Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

U7NVE SDG#: RAR01-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
03325	1,4-Dichlorobenzene	106-46-7	N.D.	0.0020	mg/l	1
03326	2-Methylphenol	95-48-7	N.D.	0.0020	mg/l	1
03327	4-Methylphenol	106-44-5	N.D.	0.0040	mg/l	1
	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 of both compounds.					
03328	Hexachloroethane	67-72-1	N.D.	0.0020	mg/l	1
03329	Nitrobenzene	98-95-3	N.D.	0.0020	mg/l	1
03330	Hexachlorobutadiene	87-68-3	N.D.	0.0020	mg/l	1
03331	2,4,6-Trichlorophenol	88-06-2	N.D.	0.0020	mg/l	1
03332	2,4,5-Trichlorophenol	95-95-4	N.D.	0.0020	mg/l	1
03333	2,4-Dinitrotoluene	121-14-2	N.D.	0.0020	mg/l	1
03334	Hexachlorobenzene	118-74-1	N.D.	0.0020	mg/l	1
03335	Pentachlorophenol	87-86-5	N.D.	0.0060	mg/l	1

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
00259	Mercury	SW-846 7470A	1	11/08/2002 06:46	Deborah A Krady	1
01335	Arsenic	SW-846 6010B	1	11/11/2002 03:23	Donna R Sackett	1
01336	Selenium	SW-846 6010B	1	11/12/2002 06:29	Donna R Sackett	1
01746	Barium	SW-846 6010B	1	11/11/2002 03:23	Donna R Sackett	1
01749	Cadmium	SW-846 6010B	1	11/12/2002 06:29	Donna R Sackett	1
01751	Chromium	SW-846 6010B	1	11/12/2002 06:29	Donna R Sackett	1
01755	Lead	SW-846 6010B	1	11/12/2002 06:29	Donna R Sackett	1
01766	Silver	SW-846 6010B	1	11/11/2002 03:23	Donna R Sackett	1
00950	TCLP Pesticides	SW-846 8081A	1	11/08/2002 12:23	Douglas D Seitz	1
00952	TCLP Herbicides	SW-846 8151A	1	11/08/2002 23:24	Michele D Hamilton	1
00949	TCLP Acid Base/Neutrals	SW-846 8270C	1	11/08/2002 13:59	Chad A Moline	1
00816	Water Sample Herbicide Extract	SW-846 8151A	1	11/08/2002 08:25	Amanda W Herr	1
00817	Water Sample Pest. Extraction	SW-846 3510C	1	11/07/2002 23:00	Sharon L Jones	1
00947	TCLP Non-volatile Extraction	SW-846 1311	1	11/06/2002 13:40	Carlene A Landis	n.a.

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REPRINT

Lancaster Laboratories Sample No. TL 3933072

Collected:11/01/2002 14:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
Unit 7 TCLP Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

U7NVE SDG#: RAR01-10

04731	TCLP Leachate Extraction	SW-846 3510C	1	11/07/2002 17:25	JoElla L Rice	1
05705	WW/TL SW 846 ICP Digest (tot)	SW-846 3010A	1	11/07/2002 22:10	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	11/07/2002 20:21	Nelli S Markaryan	1

MEMBER ACIL
Lancaster Laboratories, Inc.
2425 New Holland Pike
PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

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REPRINT

Lancaster Laboratories Sample No. TL 3933073

Collected:11/01/2002 14:00

Account Number: 11200

Submitted: 11/02/2002 10:20
Reported: 11/25/2002 at 14:36
Discard: 12/26/2002
Unit 7 TCLP Composite Soil Sample
TCLP ZERO HEADSPACE EXTRACTION
HWMU-5 & HWMU-7 Investigation

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

U7ZHE SDG#: RAR01-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
03636	TCLP by 8260					
05386	Vinyl Chloride	75-01-4	N.D.	0.020	mg/l	20
05390	1,1-Dichloroethene	75-35-4	N.D.	0.016	mg/l	20
05396	Chloroform	67-66-3	N.D.	0.016	mg/l	20
05399	Carbon Tetrachloride	56-23-5	N.D.	0.020	mg/l	20
05401	Benzene	71-43-2	N.D.	0.010	mg/l	20
05402	1,2-Dichloroethane	107-06-2	N.D.	0.020	mg/l	20
05403	Trichloroethene	79-01-6	N.D.	0.020	mg/l	20
05409	Tetrachloroethene	127-18-4	N.D.	0.016	mg/l	20
05413	Chlorobenzene	108-90-7	N.D.	0.016	mg/l	20
06305	2-Butanone	78-93-3	N.D.	0.060	mg/l	20

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
03636	TCLP by 8260	SW-846 8260B	1	11/10/2002 19:28	Susan McMahon-Luu	20
00946	TCLP Zero Headspace Extraction	SW-846 1311	1	11/04/2002 12:45	David G Splain Jr	n.a.
01163	GC/MS VOA Water Prep	SW-846 5030B	1	11/10/2002 19:28	Susan McMahon-Luu	n.a.

MEMBER ACIL
Lancaster Laboratories, Inc.
2425 New Holland Pike
PO Box 12425
Lancaster, PA 17605-2425
717-656-2300 Fax: 717-656-2681

APPENDIX D

HAZARDOUS WASTE MANAGEMENT UNIT CAP REPAIR DOCUMENTATION

Draper Aden Associates
Engineering • Surveying • Environmental Services

8090 Villa Park Drive
Richmond, Virginia 23228
(804) 264-2228 • Fax: (804) 264-8773
daa@daa.com • www.daa.com

337

January 3, 2003

Mr. Jerome Redder
Alliant Ammunition and Powder Company, LLC
P.O. Box 1
RAAP
Radford, Virginia 24141

RE: Radford Army Ammunitions Plant PVC Cap Repair – HWMU 7
DAA No. R02564-01

Dear Mr. Redder:

From December 19, to December 20, 2002 Draper Aden Associates (DAA) conducted PVC liner repair inspection for the above noted project. Site visit reports, photographs, and repair location sketches are attached for work performed during this period. The work was performed by Landsaver Environmental (Landsaver). The work performed at each repair location was in accordance with the approved VDEQ closure plan dated May 27, 1988 and the attached VDEQ comments. Each repair was conducted as follows:

- Excavated the topsoil and cover soil (3' thick); no filter fabric was encountered
- Excavated the sand drainage layer (1' thick)
- The existing 30 mil PVC liner was wiped free of dirt and dust
- Applied a bonding adhesive to the existing 30 mil PVC Liner
- Installed a new 30 mil PVC patch with a minimum 6" overlap in all directions
- Applied a bonding adhesive to the overlap (minimum 2" perimeter bonding area) and applied pressure to the two bonding surfaces
- After allowing the adhesive to cure, the patch was Air Lance Tested in accordance with ASTM D4437-99
- The repair location was backfilled and compacted with a 1 foot layer of sand drainage layer and 3' of topsoil/cover soil material. Topsoil/cover soil material was compacted in 1 foot lifts with use of a hand tamper and the excavator bucket. The compaction of each lift was verified with the use of a probe rod.

Based on our field observations and documentation, laboratory test results and geotechnical engineering experience, we conclude that the liner installation and repairs

3 4 C

on the above referenced project site has been completed in accordance with industry standard and acceptable engineering practices.

If you should have any further questions, please feel free to contact Ken Piazza or myself at (804) 264-2228.

Sincerely,
DRAPER ADEN ASSOCIATES

Robert H. Vester, Jr., P.E.
Project Manager

Attachments:

DAA Site visit Reports
Construction Photos
Repair Location Sketch
Landsaver Environmental Repair Log
VDEQ Comments

cc: Mr. Andrew Kassoff
File

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project: Radford Ammunition Plant

Job No.: R02564-01 | **Date:** 19-Dec-02

Location: Radford, VA

Visit by: RLS | **Page:** 1 **of** 2

Personnel - Construction

Contractor / Subcontractor:

Andrew - Landsaver

Personnel - Inspection / Other

Engineer (QA / QC):

Ryan Sadler	DAA
Ross Miller	DAA

Owner Representatives:

Jerry Redder	Alliant

Visitors:

Equipment

Description	No. on Site	No. in Use
Trackhoe		
Bobcat Backhoe	1	1
Dozer		
Front End Loader		
Track Loader		
Pan / Scraper		
Grader		
Sheepsfoot Roller		
Smooth Drum Roller		
Dump Truck		
Hand Tamp	1	1

Materials Delivered

Description	Quantity

Weather Conditions

Morning: Cool

Temp: 42

Noon: Cool

Temp: 56

Evening: Cool

Temp: 52

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project No.: R02564-01

Page 2 of 2

Date: 19-Dec-02

Arrived on-site @ 8:00 am and proceeded to get a visitor's pass at the gate. Landsaver was late and arrived around 10:30. Ross, myself, and the two Landsaver guys proceeded to the Administration building where we waited for Mr. Redder for approximately 30 minutes. Another half-hour was spent getting a camera pass for the site. Next we went to Shipping and Receiving to pick up the hand tamper and the Bobcat. The Bobcat had to be driven from S & R to the project site. We started with HWMU 7 by the river. The holes were marked by flagging so we proceeded to dig with the Bobcat down to the liner. Approx. 3 feet of soil covered the liner on top of a 1 foot drainage layer of a fine stone. The holes were cleared enough to make room for the patches and air lance testing. Four holes were dug and patched today. No air testing was performed. Holes 2,3,10 & 11 were patched today. Patching consisted of cleaning the area - cutting a round patch to cover the hole - then a pvc cement was applied beneath the patch - pressure was applied to the patch to assure a good bond.

Signature

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project: Radford Ammunition Plant

Job No.: R02564-01 | **Date:** 20-Dec-02

Location: Radford, VA

Visit by: RLS | **Page:** 1 **of** 2

Personnel - Construction

Contractor / Subcontractor:

Andrew - Landsaver

Personnel - Inspection / Other

Engineer (QA / QC):

Ryan Sadler	DAA
Ross Miller	DAA

Owner Representatives:

Jerry Redder	Alliant

Visitors:

Equipment

Description	No. on Site	No. in Use
Trackhoe		
Bobcat Backhoe	1	1
Dozer		
Front End Loader		
Track Loader		
Pan / Scraper		
Grader		
Sheepsfoot Roller		
Smooth Drum Roller		
Dump Truck		
Hand Tamp	1	1

Materials Delivered

Description	Quantity

Weather Conditions

Morning: Cool

Temp: 42

Noon: Cool

Temp: 56

Evening: Cool

Temp: 52

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project No.: R02564-01

Date: 20-Dec-02

Arrived on-site @ 8:00 am. Ross, Landsaver, and myself proceeded through the security check points and over to HWMU 7. We finished uncovering and patching the remaining holes in the morning. After a lunch break the patches were air lance tested to assure a good bond. All testing passed and the holes were backfilled and compacted. The equipment was then loaded up and we headed over to HWMU 5. Upon leaving today four of the holes were patched and all of the holes were excavated. No air testing was attempted today on HWMU 5. Patching consisted on cleaning the repair area - cutting a rounded patch to cover the area - placing a pvc cement down under the patch - applying pressure to assure a good bond. Air testing consisted of shooting a concentrated stream of compressed air around the edge of the patch and visually observing for the patch to bubble up as a result of an unsuitable bond. Failing air tests were repaired accordingly before backfilling.

Signature:

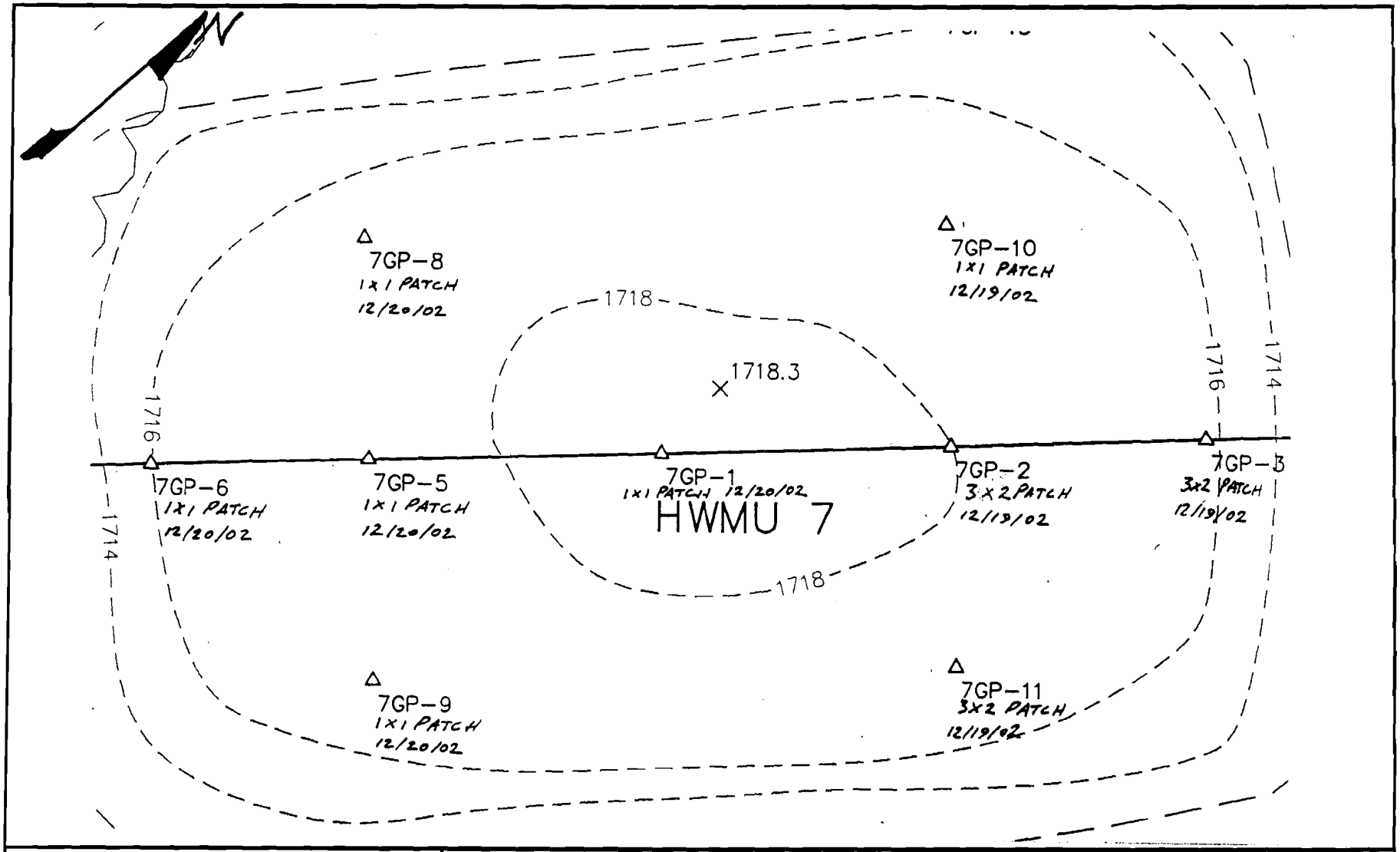
EXCAVATION OF SOIL CAP AT REPAIR LOCATON (ABOVE)
EXCAVATION OF SOIL CAP AT REPAIR LOCATION (BELOW)

HAND EXCAVATION OF SOIL CAP NEAR MEMBRANE INTERFACE (ABOVE)
EXCAVATED REPAIR AREA PRIOR TO PATCHING (BELOW)

INSTALLATION OF 30 MIL PVC PATCH AND APPLICATION OF ADHESIVE (ABOVE)
APPLICATION OF PRESSURE TO ENSURE STRONG BOND (BELOW)

AIR LANCE SEAM TESTING (ABOVE)
BACKFILLING OF REPAIR LOCATION WITH A HAND TAMPER (BELOW)

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services



Cap Repair Locations HWMU 7	Radford Army Ammunitions Plant PVC Cap Repair Radford, Virginia DAA# R02564-01	**Draper Aden Associates** Blacksburg • Richmond, Virginia Engineering • Surveying • Environmental Services

LANDSAVER ENVIRONMENTAL
2831 Cardwell Rd.
Richmond, VA 23234
(800) 588-9223 Fax: (804) 271-8044

Job Name: Radford Army Ammunition Plant Cap Repair **Contractor:** Draper Aden

Job Location: Radford VA **Engineer:**

Date: 12-19-02 12-20-02 **QA/QC:**

GEOMEMBRANE REPAIR LOG

Repair ID No.	Repair Location: Seam, Panel or Repair No.	Repair Location: Repair Location Description	Repair type	Log Date	Recorded by	Comments	Repair Date	Test Date	Airlance Pass/ Failed
R- 10	7GP-2	3'X2'	P	12/19	AR		12/19	12/19	P
- 11	7GP-3	3'X2'	P	12/19	AR		12/19	12/19	P
- 12	7GP-10	1'X1'	P	12/19	AR		12/19	12/19	P
R- 13	7GP-11	3'X2'	P	12/19	AR		12/19	12/19	P
R- 14	7GP-1	1'X1'	P	12/20	AR		12/20	12/20	P
- 15	7GP-5	1'X1'	P	12/20	AR		12/20	12/20	P
- 16	7GP-6	1'X1'	P	12/20	AR		12/20	12/20	P
R- 17	7GP-8	1'X1'	P	12/20	AR		12/20	12/20	P
- 18	7GP-9	1'X1'	P	12/20	AR		12/20	12/20	P
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DEQ CRITERIA

The Department's Office of Waste Permitting (the Department) would like to provide the following comments concerning the development of the removal activities for Units 5 and 7:

1. Task 1, Subsurface Evaluation, paragraph 1 – In addition to the subsurface evaluations, the Department also recommends reviewing the plans and drawings provided in the approved post-closure reports to assist in determining the nature of wastes closed in place and the approximate limits and final grades of the closed units.

2. During the telephone conference, it was indicated that the sample locations would be backfilled with bentonite to the level of the existing geomembrane liner. This method of restoring the low permeability layer beneath the geomembrane liner is acceptable.

3. Task 1, Subsurface Evaluation, paragraph 2 – Any penetrations of or damage to the existing liner must be repaired as soon as practicable after the sample is collected. The repairs shall be made using new liner material that is, at least, of equivalent grade as and compatible with the existing liner. The method of repair (e.g., weld, glue, etc.) shall be such that the integrity of the existing liner or patch will not be compromised over the anticipated life of the cover (at minimum, the current remaining post-closure care period of that unit). All of the manufacturer's QA/QC procedures (e.g., test seams/patches, destructive testing, non-destructive testing, certified/trained installers, etc.) shall be followed in making the repairs. Also, RFAAP shall comply with the most up-to-date versions of the QA/QC procedures specified in the approved closure plan (e.g., ASTM D4437-99 as opposed to D4437) for field seaming of the geomembrane.

4. Task 1, Subsurface Evaluation, paragraph 2 – The soil cover overlying the geomembrane liner shall be restored with like materials (i.e., one foot drainage sand layer, filter fabric, one foot cover soil, and one foot of topsoil with grass cover), placed and compacted, and revegetated to the requirements of the approved closure plan. The filter fabric shall be repaired in accordance with manufacturer recommendations and the approved closure plan.

5. Since the final covers will be disturbed and then repaired, RFAAP must provide for each unit a certification that the unit has been repaired to meet the design standards specified in the approved closure plan. Pursuant to 40 CFR 264.115, the certification must be signed by an independent P.E. registered in the Commonwealth of Virginia and the owner or operator.

6. Task 1, Subsurface Evaluation, paragraph 3 – Although the Department is aware that RFAAP must analyze for CERCLA TAL/TCL constituents, we recommend that the following constituents be included in the initial study/investigation phase:
   a. all hazardous waste constituents that were handled at the unit (this list may be found in the approved closure plan); and
   b. all groundwater monitoring constituents that have been detected above background levels.

Draper Aden Associates
Engineering • Surveying • Environmental Services

8090 Villa Park Drive
Richmond, Virginia 23228
(804) 264-2228 • Fax: (804) 264-8773
daa@daa.com • www.daa.com

January 3, 2002

Mr. Jerome Redder
Alliant Ammunition and Powder Company, LLC
P.O. Box 1
RAAP
Radford, Virginia 24141

RE: Radford Army Ammunitions Plant PVC Cap Repair – HWMU 5
DAA No. R02564-01

Dear Mr. Redder:

From December 20, to December 22, 2002 Draper Aden Associates (DAA) conducted PVC liner repair inspection for the above noted project. Site visit reports, photographs, and repair location sketches are attached for work performed during this period. The work was performed by Landsaver Environmental (Landsaver). The work performed at each repair location was in accordance with the approved VDEQ closure plan dated May 27, 1988 and the attached VDEQ comments. The each repair was conducted as follows:

- Excavated the topsoil and cover soil (3' thick); no filter fabric was encountered
- Excavated the sand drainage layer (1' thick)
- The existing 30 mil PVC liner was wiped free of dirt and dust
- Applied a bonding adhesive to the existing 30 mil PVC Liner
- Installed a new 30 mil PVC patch with a minimum 6" overlap in all directions
- Applied a bonding adhesive to the overlap (minimum 2" perimeter bonding area) and applied pressure to the two bonding surfaces
- After allowing the adhesive to cure, the patch was Air Lance Tested in accordance with ASTM D4437-99
- The repair location was backfilled and compacted with a 1 foot layer of sand drainage layer and 3' of topsoil/cover soil material. Topsoil/cover soil material was compacted in 1 foot lifts with use of a hand tamper and the excavator bucket. The compaction of each lift was verified with the use of a probe rod.

Based on our field observations and documentation, laboratory test results and geotechnical engineering experience, we conclude that the liner installation and repairs

on the above referenced project site has been completed in accordance with industry standard and acceptable engineering practices.

If you should have any further questions, please feel free to contact Ken Piazza or myself at (804) 264-2228.

Sincerely,
DRAPER ADEN ASSOCIATES

Robert H. Vester, Jr., P.E.
Project Manager

Attachments:

DAA Site visit Reports
Construction Photos
Repair Location Sketch
Landsaver Environmental Repair Log
VDEQ Comments

cc: Mr. Andrew Kassoff
File

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project: Radford Ammunition Plant

Job No.: R02564-01	**Date:** 20-Dec-02
Location: Radford, VA	
Visit by: RLS	**Page:** 1 **of** 2

Personnel - Construction

Contractor / Subcontractor:

Andrew - Landsaver

Personnel - Inspection / Other

Engineer (QA / QC):

Ryan Sadler	DAA
Ross Miller	DAA

Owner Representatives:

Jerry Redder	Alliant

Visitors:

Equipment

Description	No. on Site	No. in Use
Trackhoe		
Bobcat Backhoe	1	1
Dozer		
Front End Loader		
Track Loader		
Pan / Scraper		
Grader		
Sheepsfoot Roller		
Smooth Drum Roller		
Dump Truck		
Hand Tamp	1	1

Materials Delivered

Description	Quantity

Weather Conditions

Morning: Cool

Temp: 42

Noon: Cool

Temp: 56

Evening: Cool

Temp: 52

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project No.: R02564-01

Page 2 of 2

Date: 20-Dec-02

Arrived on-site @ 8:00 am. Ross, Landsaver, and myself proceeded through the security check points and over to HWMU 7. We finished uncovering and patching the remaining holes in the morning. After a lunch break the patches were air lance tested to assure a good bond. All testing passed and the holes were backfilled and compacted. The equipment was then loaded up and we headed over to HWMU 5. Upon leaving today four of the holes were patched and all of the holes were excavated. No air testing was attempted today on HWMU 5. Patching consisted on cleaning the repair area - cutting a rounded patch to cover the area - placing a pvc cement down under the patch - applying pressure to assure a good bond. Air testing consisted of shooting a concentrated stream of compressed air around the edge of the patch and visually observing for the patch to bubble up as a result of an unsuitable bond. Failing air tests were repaired accordingly before backfilling.

Signature

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project: Radford Army Ammunition Plant Cap Repair

Job No.: R02564-01 **Date:** 12/22/02

Location: Radford Ammunition, Blacksburg VA

Visit by: Darren Spier **Page:** 1 **of** 2

Personnel - Construction

Contractor / Subcontractor:

~~ACE~~ Landsaver

Personnel - Inspection / Other

Engineer (QA / QC):

Darren Spier DAA

Owner Representatives:

Jerry Rodder

Visitors:

Equipment

Description	No. on Site	No. in Use
Trackhoe	\	
Rubber Tired Backhoe		
Dozer		
Front End Loader		
Track Loader		
Pan / Scraper		
Grader		
Sheepsfoot Roller		
Smooth Drum Roller		
Dump Truck		

Materials Delivered

Description	Quantity

Weather Conditions

Morning: PC

Temp: 45

Noon: wind

Temp:

Evening:

Temp:

Draper Aden Associates
Blacksburg • Richmond, Virginia
Engineering • Surveying • Environmental Services

Site Visit Report

Project No.: R02564-01

Page 2 of 2

Date: 12/22/02

The nine boring holes for the second closure had been excavated the previous workday. Excavations where the liner puncture had not been located were hand dug near the liner to avoid further damage.

The boring punctures were then cleaned with solvent roughly 8 inches in radius. Any crust tears due to shovel excavation were treated the same as bore punctures and dressed in the same fashion. Glue was then applied and a patch of 30 mil PVC was cut to a size and shape so as to cover damaged liner. At least one foot diameter patches were used. The patches were then set with a hand roller.

After 30 minutes of curing the patches were air lanced around their entire perimeters. No bubbling indicating failure was found.

The cuts were then backfilled in roughly one foot lifts and compacted with the bucket of the backhoe. I probed each lift with a rod to ensure compaction. The final lift was tracked with the backhoe to compact.

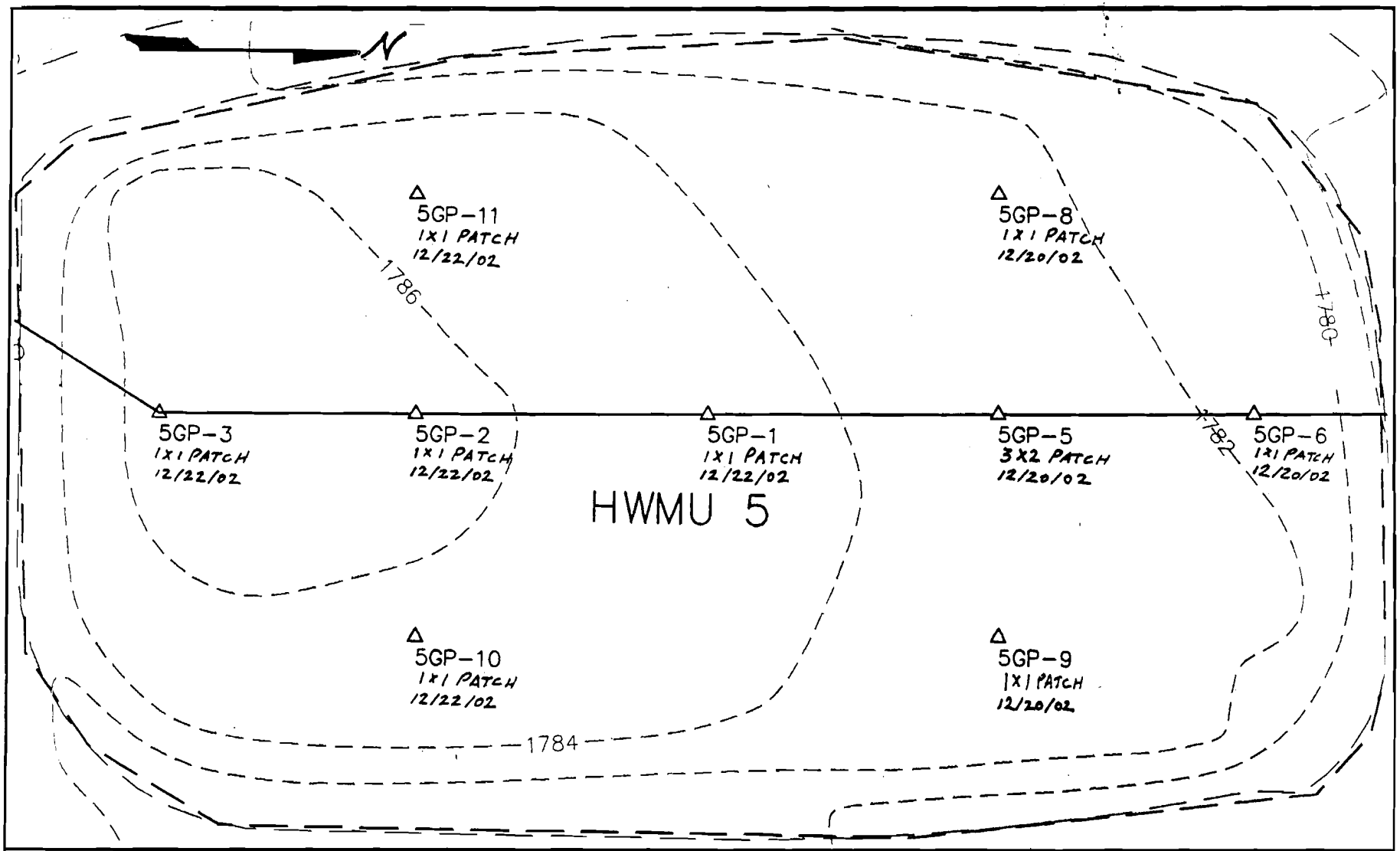
Signature: Darren Beer

EXCAVATION OF SOIL CAP AT REPAIR LOCATON (ABOVE)
EXCAVATION OF SOIL CAP AT REPAIR LOCATION (BELOW)

HAND EXCAVATION OF SOIL CAP NEAR MEMBRANE INTERFACE (ABOVE)
EXCAVATED REPAIR AREA PRIOR TO PATCHING (BELOW)

INSTALLATION OF 30 MIL PVC PATCH AND APPLICATION OF ADHESIVE (ABOVE)
APPLICATION OF PRESSURE TO ENSURE STRONG BOND (BELOW)

AIR LANCE SEAM TESTING (ABOVE)
BACKFILLING OF REPAIR LOCATION WITH A HAND TAMPER (BELOW)



Cap Repair Locations HWMU 5	Radford Army Ammunitions Plant PVC Cap Repair Radford, Virginia DAA# R02564-01	Draper Aden Associates Blacksburg • Richmond, Virginia Engineering • Surveying • Environmental Services

LANDSAVER ENVIRONMENTAL
2831 Cardwell Rd.
Richmond, VA 23234
(800) 588-9223 Fax: (804) 271-8044

Job Name: Radford Army Ammunition Plant Cap Repair **Contractor:** Draper Aden

Job Location: Radford VA **Engineer:**

Date: 12-20-02 12-22-02 **QA/QC:**

GEOMEMBRANE REPAIR LOG

Repair ID No.	Repair Location: Seam, Panel or Repair No.	Repair Location: Repair Location Description	Repair type	Log Date	Recorded by	Comments	Repair Date	Airlance Test Date	Airlance Pass/ Failed
R- 1	5GP-5	3'X2'	P	12/20	AR		12/20	12/20	P
R- 2	5GP-6	1'X1'	P	12/20	AR		12/20	12/20	P
R- 3	5GP-8	1'X1'	P	12/20	AR		12/20	12/20	P
R- 4	5GP-9	1'X1'	P	12/20	AR		12/20	12/20	P
R- 5	5GP-1	1'X1'	P	12/22	AR		12/22	12/22	P
R- 6	5GP-2	1'X1'	P	12/22	AR		12/22	12/22	P
R- 7	5GP-3	1'X1'	P	12/22	AR		12/22	12/22	P
R- 8	5GP-10	1'X1'	P	12/22	AR		12/22	12/22	P
R- 9	5GP-11	1'X1'	P	12/22	AR		12/22	12/22	P

DEQ CRITERIA

The Department's Office of Waste Permitting (the Department) would like to provide the following comments concerning the development of the removal activities for Units 5 and 7:

1. Task 1, Subsurface Evaluation, paragraph 1 – In addition to the subsurface evaluations, the Department also recommends reviewing the plans and drawings provided in the approved post-closure reports to assist in determining the nature of wastes closed in place and the approximate limits and final grades of the closed units.

2. During the telephone conference, it was indicated that the sample locations would be backfilled with bentonite to the level of the existing geomembrane liner. This method of restoring the low permeability layer beneath the geomembrane liner is acceptable.

3. Task 1, Subsurface Evaluation, paragraph 2 – Any penetrations of or damage to the existing liner must be repaired as soon as practicable after the sample is collected. The repairs shall be made using new liner material that is, at least, of equivalent grade as and compatible with the existing liner. The method of repair (e.g., weld, glue, etc.) shall be such that the integrity of the existing liner or patch will not be compromised over the anticipated life of the cover (at minimum, the current remaining post-closure care period of that unit). All of the manufacturer's QA/QC procedures (e.g., test seams/patches, destructive testing, non-destructive testing, certified/trained installers, etc.) shall be followed in making the repairs. Also, RFAAP shall comply with the most up-to-date versions of the QA/QC procedures specified in the approved closure plan (e.g., ASTM D4437-99 as opposed to D4437) for field seaming of the geomembrane.

4. Task 1, Subsurface Evaluation, paragraph 2 – The soil cover overlying the geomembrane liner shall be restored with like materials (i.e., one foot drainage sand layer, filter fabric, one foot cover soil, and one foot of topsoil with grass cover), placed and compacted, and revegetated to the requirements of the approved closure plan. The filter fabric shall be repaired in accordance with manufacturer recommendations and the approved closure plan.

5. Since the final covers will be disturbed and then repaired, RFAAP must provide for each unit a certification that the unit has been repaired to meet the design standards specified in the approved closure plan. Pursuant to 40 CFR 264.115, the certification must be signed by an independent P.E. registered in the Commonwealth of Virginia and the owner or operator.

6. Task 1, Subsurface Evaluation, paragraph 3 – Although the Department is aware that RFAAP must analyze for CERCLA TAL/TCL constituents, we recommend that the following constituents be included in the initial study/investigation phase:
   a. all hazardous waste constituents that were handled at the unit (this list may be found in the approved closure plan); and
   b. all groundwater monitoring constituents that have been detected above background levels.

APPENDIX E

ALTERNATE SOURCE DEMONSTRATION FOR TRICHLOROETHENE HAZARDOUS WASTE MANAGEMENT UNIT 5

ALTERNATE SOURCE DEMONSTRATION
FOR
TRICHLOROETHENE

HAZARDOUS WASTE MANAGEMENT UNIT 5
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 Ammunition and Powder Company, L.L.C.
Radford Army Ammunition Plant
Route 114
Radford, Virginia 24141-0100

Prepared by:

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2206 South Main Street
Blacksburg, Virginia 24060
(540) 552-0444

February 2001
DAA Job No. B00316

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

This report presents the results of the Alternate Source Demonstration for Trichloroethene conducted for Hazardous Waste Management Unit 5 (HWMU-5) at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. Trichloroethene (TCE) has been detected repeatedly at concentrations exceeding the USEPA Maximum Contaminant Level (MCL) of 5 µg/l in four groundwater monitoring wells within the monitoring network for HWMU-5. In correspondence to Alliant Ammunition and Powder Company, L.L.C. (Alliant) dated September 27, 2000, the Virginia Department of Environmental Quality (VDEQ) requested that Alliant implement a Corrective Action Program at HWMU-5 to address the TCE concentrations in groundwater which exceeded the USEPA MCL. During a teleconference between the VDEQ, Alliant, and the Army on October 31, 2000, Alliant stated that, based on historical information for HWMU-5, it was believed that the wastes handled at the Unit prior to closure did not contain TCE or other organic compounds. Furthermore, TCE concentrations below the USEPA MCL had been detected in the upgradient monitoring well for the Unit during previous monitoring events. Therefore, it was believed that HWMU-5 was not the source of the TCE detected in the groundwater. In accordance with VDEQ guidance and pursuant to 40 CFR 264.99(i), Alliant has chosen to demonstrate that TCE was derived from a source other than HWMU-5. Accordingly, if it is demonstrated that TCE was derived from an alternate source, then any corrective action for the TCE would fall under the jurisdiction of Radford AAP's USEPA Region III Corrective Action Program instead of the VDEQ, and TCE would be removed from the list of the constituents of concern in the Permit for HWMU-5.

This Alternate Source Demonstration for TCE provides a description of HWMU-5, including the Unit's historic operations and the wastes processed. In addition, the facility buildings and areas in the vicinity of HWMU-5 where TCE is and/or may have been used are identified. The Demonstration describes the hydrogeologic framework of the area of concern, including karst conduits that may facilitate TCE migration in groundwater, as it relates to the potential sources of TCE. Historic detections of TCE concentrations within the monitoring well network for HWMU-5 are evaluated, along with a discussion of the analysis of groundwater samples collected on December 12-14, 2000 in support of the TCE Alternate Source Demonstration.

2.0 SITE DESCRIPTION

2.1 FACILITY DESCRIPTION

The Radford AAP is located in the mountains of southwest Virginia within Pulaski and Montgomery Counties. A Site Location Map is presented as **Figure 1**. The facility is situated in one of a series of narrow valleys typical of the Valley and Ridge physiographic province of the Appalachian Highland Region of North America. Oriented in a northeast-southwest direction, the valley is approximately 25 miles long. The valley has a width of approximately eight miles at the southwest end and narrows to approximately two miles at the northeast end. Radford AAP lies along the New River in the relatively narrow northeast corner of the valley. The maximum elevation at Radford AAP is 2,225 feet above mean sea level (amsl) in the southeast corner and the minimum elevation is approximately 1,675 feet amsl along the New River at the northern property boundary. Radford AAP is divided by the New River into two sections. The southern section, which comprises approximately two-thirds of Radford AAP, is called the "Main Plant." The remaining northern one-third section is called the "Horseshoe Area." HWMU-5 is located in the Main Plant area.

2.2 TCE AREA OF CONCERN

2.2.1 Hazardous Waste Management Unit 5

HWMU-5 is a former lined surface impoundment. As shown on the Site Location Map (**Figure 1**), HWMU-5 is located approximately 3,000 feet southwest of the New River. The Unit is located on a river terrace which slopes gently downward to the north toward the New River. The Unit was put into operation as an unlined surface impoundment in 1970, and was retrofitted with a liner in 1981. The dimensions of the Unit measured approximately 150 feet by 100 feet along the top of the berm, with a total embankment height of 10 feet above the base of the impoundment. The Unit was taken out of operation in 1986, and was closed in 1989 in accordance with the VDEQ-approved Closure Plan dated June 1985.

During operation, the Unit received runoff, spill, and washdown waters from the acid tank farm (nitric and sulfuric acids). Prior to 1983, the Unit also received process wastewater containing low concentrations of nitrocellulose. Based on historical information, the wastes handled at HWMU-5 did not contain TCE or other organic compounds.

2.2.2 Cleaning Solvents Used in Facility Operations

Several solvents are used for equipment cleaning purposes in certain areas of the Radford AAP facility. According to Alliant Procedure No. 4-27-078, Revision No. 5 (dated January 13, 1999), the following cleaning solvents are approved for use at the facility:

- Stoddard Type Solvents (clear, colorless liquids of the kerosenenaptha class; used as an oil and grease remover);

- 1,1,1-Trichloroethane (inhibited);
- DuPont Cleaning Solvent #49 (70% Stoddard Solvent, 25% methylene chloride, 5% perchloroethylene; used in electric motor cleaning);
- Acetone;
- Ethyl Alcohol;
- Inhibisol (colorless liquid of chlorinated solvents; chemical formula CCl_4);
- Nitroglycerin Remover (mixture of sodium sulfide, alcohol, acetone, and water);
- "Gunk" (degreasing-cleaning solvent; approximately 16% cresole; used in a vat or tank in the Degreasing Shop to clean and paint strip scales for overhaul);
- Butyl Alcohol (used by the Electronic Shop for strain gauge maintenance);
- Intex #8793 - Paint Stripper (used in Degreasing Shop for paint removal);
- Intex #827 - Safety Solvent (used in Degreasing Shop for paint removal and cleaning purposes);
- Lectra Clean (used in Electric Shop for cleaning and degreasing electrical equipment);
- Voltz (used in Electric Shop motor cleaning vat).

These solvents are used primarily for tasks involving operations and maintenance of motors, valves, and gauges. There is no record or operational indications that any of these solvents could have come into contact with wastewater influent to HWMU-5.

2.2.3 Potential Source Areas for TCE

As part of the TCE Alternate Source Demonstration, Alliant identified facility buildings in the vicinity of HWMU-5 where chlorinated solvents currently are used or have been used in the past. These buildings and their spatial relationships to HWMU-5 are illustrated in **Figure 2**.

Building 1549 is an Area Maintenance Shop located approximately 300 feet southeast of HWMU-5. According to Area Mechanics who worked in facility B-Line Maintenance, the cleaning of equipment in the 1960's and 1970's involved the use of Varsol and WD-40. Disposal of the used solvents consisted of pouring the solvents down the nearest floor drain. This disposal practice was later discontinued; after that time, the spent solvents were collected in a barrel to be transported by the Roads and Grounds department to a collection area for disposal.

Building 1034 formerly housed a facility laboratory. The building currently houses the Electric and Refrigeration Shop. Building 1034 is located approximately 950 feet southeast of HWMU-5. DuPont Cleaning Solvent #49, one of the solvents commonly used in electric motor cleaning, contains perchloroethylene (PCE). TCE is a daughter product of the degradation of PCE.

Building 1041 is the Degreasing Shop. The building is located approximately 980 feet southeast of HWMU-5. The building formerly contained a dip tank, which now is filled with concrete. Currently, a grate-covered pit in the floor drains to an outside underground storage tank. According to a Senior Instrument Mechanic, the Scale Shop used this building in the past for the cleaning of scales. At times, the scales would be taken outside of the building to be washed off; the wash liquids would be allowed to drain onto the ground surface. According to

the Radford AAP Sewers and Drains Atlas, a four-inch terra cotta pipe runs westward from the western end of Building 1041.

Building 2549 is another Area Maintenance Shop. The building is located approximately 450 feet southwest of HWMU-5.

Building 2570 is an Area Cleaning Station. The building is located approximately 620 feet west of HWMU-5.

Building 525 is the Tractor Steaming Station. The building is located approximately 720 feet southwest of HWMU-5.

3.0 HYDROGEOLOGIC FRAMEWORK

3.1 TOPOGRAPHY

The TCE Area of Concern is located approximately 3,000 feet southwest of the New River. The Area is located on a river terrace which slopes gently downward to the north toward the New River. Surface drainage boundaries are illustrated in **Figure 2**. As shown on **Figure 2**, a surface drainage divide separates Buildings 1034 and 1041 from the other potential source buildings in the TCE Area of Concern and HWMU-5. Surface drainage in the vicinity of Buildings 1034 and 1041 flows to the northeast, while the surface drainage in the vicinity of the other potential source buildings in the TCE Area of Concern and HWMU-5 flows to the north-northwest.

3.2 GEOLOGIC SETTING

The Valley and Ridge physiographic province consists of folded and thrust-faulted Paleozoic sedimentary rocks ranging in age from Cambrian to Mississippian. Post-deformation weathering of these thrust-faulted and overturned Paleozoic rocks has resulted in the formation of resistant sandstone and dolomite ridges separated by valleys underlain by more easily eroded shale and limestone. Well developed karst features such as sinkholes and caves are common in the Valley and Ridge.

The general geology at Radford AAP consists of limestone/dolomite bedrock covered by weathered residual deposits and/or alluvial deposits. The alluvial deposits consist of typical fluvial deposits of interbedded clay, silt, and sand/gravel deposits with cobble lenses. The thickness of the alluvial deposits ranges from a few feet to approximately 50 feet, with an average thickness of 20 feet. The residual deposits consist of clay, silt, and clasts resulting from the physical and chemical weathering of the parent bedrock. The residual deposits typically underlie the alluvium, except in locations where the residuum has been eroded to bedrock and replaced by alluvium. The thickness of the residual deposits ranges from a few feet to approximately 40 feet. Underlying the alluvium and residuum throughout most of Radford AAP is a series of dolomite, limestone and shale strata known as the Cambrian-aged Elbrook Formation. The Elbrook Formation is the major outcropping formation as well as the predominant karstic formation below the facility. Sinkholes, solution channels, pinnacled surfaces, and springs are common to the Elbrook Formation.

The Boring Logs/Well Construction Diagrams for the monitoring network at HWMU-5 are included in **Appendix A**. A Cross-Section Location Map for HWMU-5 is presented as **Figure 3**. Geologic cross-sections derived from the boring logs for the Unit's monitoring wells are presented as **Figures 4, 5,** and **6**. The area surrounding HWMU-5 is underlain by unconsolidated alluvial sediments and weathered bedrock residuum, which are in turn underlain by carbonate bedrock of the Elbrook Formation. The bedrock beneath this area is generally encountered at depths ranging from approximately 28 feet to over 56 feet below ground level, although the soil/bedrock interface is gradational. In general, the bedrock in the vicinity of

monitoring wells 5W8B, 5WC11, 5WC12, and S5W8 slopes downward to the north-northeast, while the bedrock in the vicinity of monitoring wells S5W6 and 5W9A slopes downward to the southwest. This appears to indicate the development of a karst solutional feature in the bedrock in the vicinity of monitoring wells 5W5B, 5WCA, and well cluster 5WC21, 5WC22 and 5WC23.

3.3 KARST HYDROLOGY

3.3.1 Fracture Trace Analysis

A total of 66 fracture traces were identified within and around Radford AAP in a photogeologic study conducted by the USEPA's Environmental Photographic Interpretation Center (EPIC) in 1992. Fracture traces are linear features identified in aerial photographs that represent the surface expression of primary joint sets, major fractures, and/or zones of fracturing in the subsurface. These features may be expressed as soil-tonal variations and vegetational and topographical alignments, and are significant in consideration of groundwater flow at Radford AAP. The fractures and joint sets can act as discrete conduits for groundwater flow, increasing flow rates, and in some cases, redirecting flow away from the expected flow direction. In karst terrains, such features are environmentally significant because solutionization and resulting conduits develop along bedding planes as well as fractures and joints (USEPA, 1992).

The primary fracture traces identified by the 1992 USEPA EPIC study in the vicinity of the TCE Area of Concern are illustrated in **Figure 2**. The fracture lineations appear to be oriented radially, with trends ranging from northeast-southwest to northwest-southeast in the TCE Area of Concern.

3.3.2 Sinkhole Delineation

The locations of sinkholes at Radford AAP were also mapped during the 1992 USEPA EPIC study. In the vicinity of Radford AAP, the strike of bedding in the Elbrook Formation is roughly west/southwest to east/northeast, with dips to the south/southeast. Most of the sinkholes in the vicinity of Radford AAP are oval shaped and elongated with respect to the strike of bedding planes. In some instances, the sinkholes appear to align with respect to the fracture traces. The sinkholes most likely represent bedrock units with a greater carbonate content and lower shale content within the underlying Elbrook Formation (USEPA, 1992).

As mapped by the 1992 USEPA EPIC study, the area surrounding the TCE Area of Concern is characterized by the development of sinkholes without any apparent alignment or preferred orientation (**Figure 2**). Many of these sinkholes were filled during historic site development; at present, several facility structures are now located on these historic sinkholes. It is probable that there are well developed karst conduits which connect these sinkholes and which convey groundwater as well as aerated surface water during precipitation events at relatively rapid velocities through solution-enhanced fractures and joints.

3.4 OCCURRENCE OF GROUNDWATER

The general hydrogeologic setting for Radford AAP is characterized by porous alluvial sediments overlying weathered and unweathered dolomite and limestone. In areas where the porous alluvial sediments are the uppermost water-bearing zone, groundwater flow is generally from topographically high areas to topographically low areas. In some areas of Radford AAP, the uppermost water-bearing zone is within the limestone and dolomite bedrock. The karst features within the bedrock aquifer can provide conduits for rapid transport of groundwater to the New River, which is the discharge area for regional groundwater flow.

Seasonal variations in precipitation can affect the direction of groundwater flow within the bedrock aquifer at Radford AAP. During wet seasons (high flow conditions), groundwater flow may occur in higher elevation conduits that are not normally saturated during dry seasons (low flow conditions). As a result, flow directions may change significantly as different conduits are accessed. Additionally, flow may short-circuit the predominant flow paths and be redirected, discharging in unexpected areas.

In addition to seasonal variations, groundwater levels within the bedrock aquifer may fluctuate dramatically during heavy precipitation events. Groundwater levels in the karst bedrock aquifer generally respond to heavy precipitation within approximately 14 hours, and may rise several feet in a short time (Engineering-Science, 1994). This condition exists throughout Radford AAP, especially in areas where surface water infiltrates through sinkholes. Stormwater that flows into the sinkholes travels downward rapidly through conduits into the bedrock aquifer. Because groundwater may flow very quickly through these conduits, stormwater infiltrating in the uplands of the facility may discharge to the New River in a matter of a few days following a storm event. The turbulent flow created by these conditions aerates the infiltrating water. The increased O_2 content can significantly affect the chemistry of the groundwater, increasing the concentration of many commonly occurring inorganic analytes. It is this direct connection between surface water and groundwater and the rapid movement of groundwater through the aquifer that is vital to interpreting the migration of both naturally occurring and released constituents in the groundwater at Radford AAP.

The monitoring wells at HWMU-5 are screened entirely within either weathered carbonate bedrock residuum or alluvium, or across the weathered residuum/carbonate bedrock interface. Static water levels measured during the Fourth Quarter 2000 monitoring event ranged from 1754.07 feet to 1772.49 feet above mean sea level. As shown on the Potentiometric Surface Map (**Figure 7**), groundwater movement beneath the site is generally to the northeast. The groundwater contours and the topography in this area suggest that the TCE Area of Concern is located on a river terrace that contains several karst features and drains north toward the New River.

3.5 RELATION OF HYDROGEOLOGIC FEATURES TO POTENTIAL SOURCES OF TCE

Area Maintenance Shop Building 1549 is located on a large historic sinkhole measuring approximately 430 feet by 200 feet (**Figure 2**). A smaller historic sinkhole (approximately 150 feet by 130 feet) is located approximately 80 feet north of the large sinkhole. Monitoring wells 5WCA, 5W5B, and nested wells 5WC21, 5WC22, and 5WC23 are located within this smaller sinkhole. It is likely that these two sinkholes are connected by well-developed karst conduits. According to facility personnel, past disposal practices at Building 1549 involved pouring used solvents into floor drains. Liquids released to the subsurface through floor drains or spilled on the ground surface in the vicinity of Building 1549 would percolate to the groundwater through the soil filling the large sinkhole. Karst conduits would convey groundwater from the larger sinkhole to the smaller sinkhole containing monitoring wells 5WCA, 5W5B, and nested wells 5WC21, 5WC22, and 5WC23. As discussed in Section 4.0, these are the wells that consistently exhibit TCE concentrations in exceedance of the USEPA MCL of 5 µg/l.

Electric and Refrigeration Shop Building 1034 and Degreasing Shop Building 1041 are separated from the TCE Area of Concern by a surface drainage divide. However, as shown on **Figure 2**, Buildings 1034 and 1041 are located near two fracture traces which trend through the large sinkhole upon which Building 1549 is located. As indicated by facility personnel, past practices at Building 1041 included cleaning scales by washing them outside of the building, with the wash liquids allowed to drain to the ground surface. Liquids released to the subsurface through floor drains, the UST system and/or the former dip tank associated with Building 1041, or spilled on the ground surface in the vicinity of Buildings 1034 and 1041 would flow northeastward and percolate through the soil to the groundwater. Any subsurface flow from the vicinity of these buildings possibly would be intercepted by the fracture trace located to the northeast and conveyed to the sinkhole underlying Building 1549, and be conveyed to the sinkhole containing monitoring wells 5WCA, 5W5B, and nested wells 5WC21, 5WC22, and 5WC23. Furthermore, waste solvents could be conveyed by the four-inch terra cotta pipe running westward from the western end of Building 1041, released to the subsurface and intercepted by the fracture trace located to the west of the buildings. This fracture trace also would convey any liquids to the large sinkhole underlying Building 1549.

Buildings 525, 2549, and 2570 are not expected to have contributed to the TCE concentrations detected at the site. The anticipated groundwater flow direction in the vicinity of these three buildings is to the north-northeast, away from HWMU-5. As shown on **Figure 2,** there are no karst conduits interpreted to be in the vicinity that would intercept groundwater flow from the area of these buildings.

4.0 GROUNDWATER ANALYTICAL RESULTS

4.1 HISTORIC TCE CONCENTRATIONS

Graphs of the historic TCE concentrations detected in the monitoring network for HWMU-5 are presented in **Appendix B**. The graphs were compiled using quarterly groundwater monitoring data from First Quarter 1995 through Fourth Quarter 2000. As shown on the graphs, TCE has been detected repeatedly at concentrations exceeding the USEPA MCL of 5 µg/l in downgradient monitoring wells 5W5B, 5WC21, 5WC22, and 5WC23. During First Quarter 1999, TCE was detected at a concentration of 7.4 µg/l in downgradient well 5W10A; however, this detection is considered to be an anomaly, as TCE has never been detected in well 5W10A at any other time. Minor detections of TCE at concentrations less than 1 µg/l have been observed occasionally in upgradient well 5W8B and in downgradient wells 5W7B and 5W9A. TCE has never been detected in monitoring wells S5W5, S5W7, or 5W11A; it should be noted that these three wells are located on the opposite sides of fracture traces from the remaining wells in the monitoring network (**Figure 2**).

4.2 DECEMBER 12-14, 2000 GROUNDWATER SAMPLING EVENT

On December 12-14, 2000, groundwater samples were collected from nine (9) monitoring wells at HWMU-5 in support of the TCE Alternate Source Demonstration. Five of the monitoring wells sampled (upgradient well 5W8B, downgradient well 5W5B, and nested wells 5WC21, 5WC22, and 5WC23) are part of the current monitoring network for the Unit. In addition, four observation wells (upgradient wells 5WC11, 5WC22, and S5W8 and sidegradient well 5WCA) were also sampled. These observation wells were included in this sampling event as part of the effort to determine whether the TCE concentrations detected in wells 5W5B, 5WC21, 5WC22, and 5WC23 were from a source upgradient and/or sidegradient from HWMU-5.

The groundwater samples were submitted to REI Consultants Inc. (REIC) in Beaver, West Virginia for analysis for volatile organic compounds using SW846 Method 8260B. Validation of the laboratory data by Draper Aden Associates revealed that the laboratory failed to meet mandatory instrument tuning and calibration requirements. The laboratory's failure to identify and address these deficiencies resulted in compromised data for the sampling event. As a result, the analytical data had to be rejected. Alliant plans to resample the nine wells in support of the TCE Alternate Source Demonstration in March 2001; the validated data from that event will be forwarded to the VDEQ when it becomes available.

Although the analytical results for the December 12-14, 2000 sampling event were rejected, it was determined that the data could be used to provide a non-quantitative determination of the presence or absence of volatile organic compounds. Of the volatile compounds for which the samples were analyzed, only TCE was detected. TCE was detected in monitoring wells 5WCA, 5W5B, and nested wells 5WC21, 5WC22, and 5WC23, all of which

are located in a historic sinkhole. TCE was not detected in upgradient wells 5W8B, 5WC11, 5WC12, and S5W8.

5.0 CONCLUSIONS

Historic information regarding operations at HWMU-5 prior to closure indicates that the wastes processed through the Unit did not contain TCE. A review of Radford AAP cleaning and maintenance practices in the vicinity of HWMU-5 has identified areas in which chlorinated solvents have been used. An evaluation of historic waste disposal practices in these areas indicates the potential for groundwater impact from these operations. Hydrogeologic features such as fracture traces and sinkholes in this area would be conducive to the transport of impacted groundwater from these potential source areas to certain monitoring wells within the groundwater monitoring network for HWMU-5. Only these certain monitoring wells (5W5B, 5WC21, 5WC22, and 5WC23) consistently exhibit TCE concentrations in exceedance of the USEPA MCL of 5 µg/l.

Based on these factors, it is Alliant's conclusion that the detected TCE concentrations are derived from a source other than HWMU-5. As a result, Alliant respectfully requests that TCE be removed from the list of constituents of concern in the Post-Closure Permit for HWMU-5. Remediation of TCE in groundwater in this area will fall under the jurisdiction of Radford AAP's USEPA Region III Corrective Action Program. With this TCE Alternate Source Demonstration, Alliant hereby provides USEPA Region III with notice of a new Area of Concern at Radford AAP.

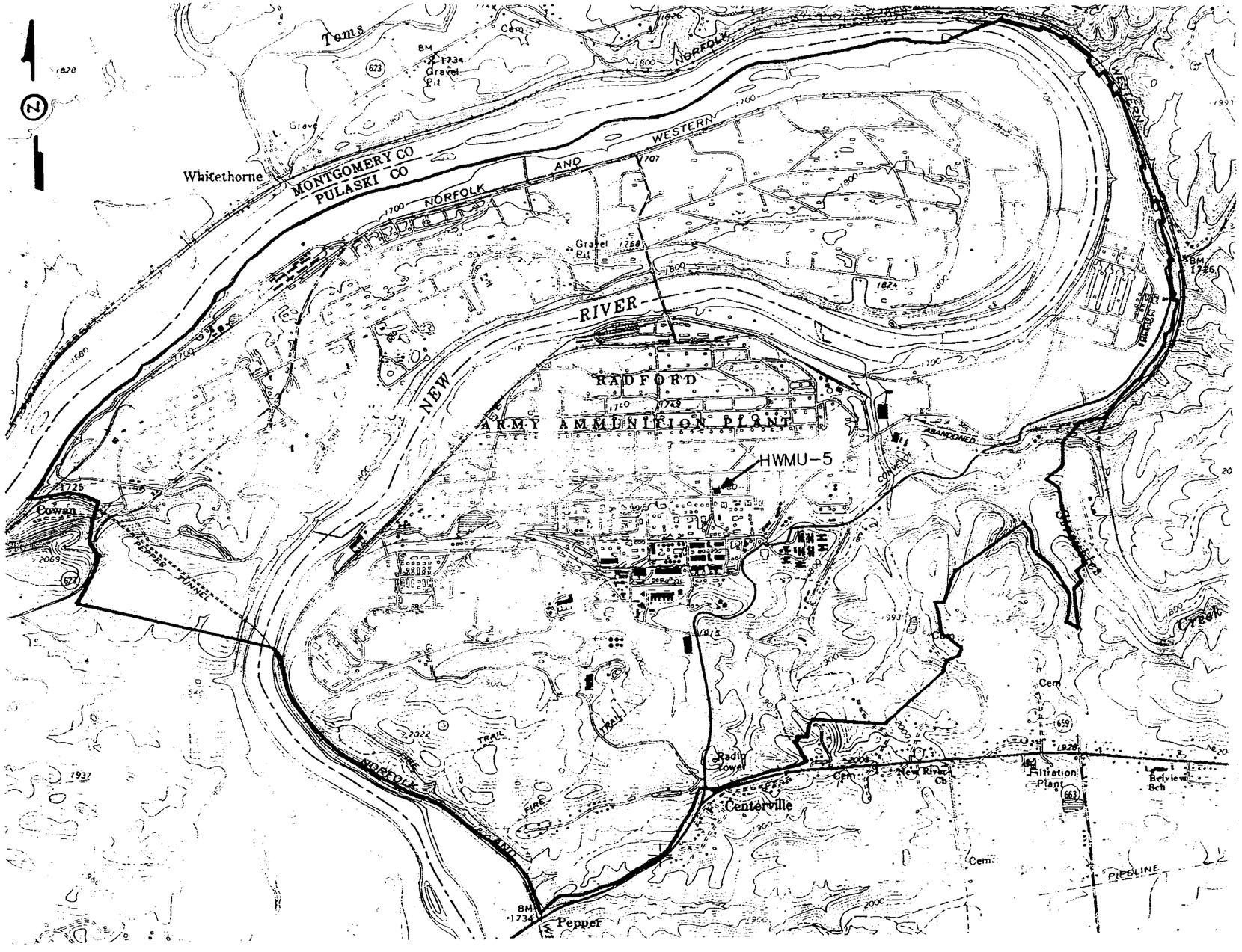
6.0 REFERENCES

Engineering-Science, Inc. March 1994. Dye-Tracing Study Report, Radford Army Ammunition Plant. Prepared for the U.S. Army Environmental Center.

Radford North, Virginia 7.5-minute topographic quadrangle map. 1984. USGS. Reston, VA.

U.S. Environmental Protection Agency (USEPA). 1992. Installation Assessment, Radford Army Ammunition Plant, Radford, Virginia. Environmental Photographic Interpretation Center.

FIGURES



LEGEND

——— PROPERTY LINE

APPENDIX G

Draper Aden Associates CONSULTING ENGINEERS Blacksburg, Virginia – Richmond, Virginia – Nashville, Tennessee	DESIGNED RGM DRAWN JFF CHECKED AEK DATE 6-11-97	SITE LOCATION MAP RADFORD ARMY AMMUNITION PLANT MONTGOMERY COUNTY, VIRGINIA	SCALE: 1" = 2000' PLAN NO. B00316	FIGURE 1

LEGEND

- HWMU 5 — HAZARDOUS WASTE MANAGEMENT UNIT 5
- DEGREASING BUILDING 1041
- FORMER LABORATORY BUILDING 1034
  EXISTING ELECTRIC REFRIGERATION SHOP
- CLEANING RELATED BUILDINGS 525, 2570
- MAINTENANCE RELATED BUILDINGS 2549, 1549
- HISTORIC SINKHOLE LOCATIONS MAPPED BY THE USEPA ENVIRONMENTAL PHOTOGRAPHIC ITERPPRETATION CENTER (1992)
- FRACTURE TRACES MAPPED BY THE USEPA ENVIRONMENTAL PHOTOGRAPHIC INTERPPRETATION CENTER (1992)
- 5W10A ◎ — MONITORING WELL
- SURFACE DRAINAGE BOUNDARIES

NOTE: MAP AREA IS UNDERLAIN BY THE CAMBRIAN AGED ELBROOK FORMATION

Draper Aden Associates
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Charlottesville, VA
Hampton Roads, VA
Raleigh-Durham, NC

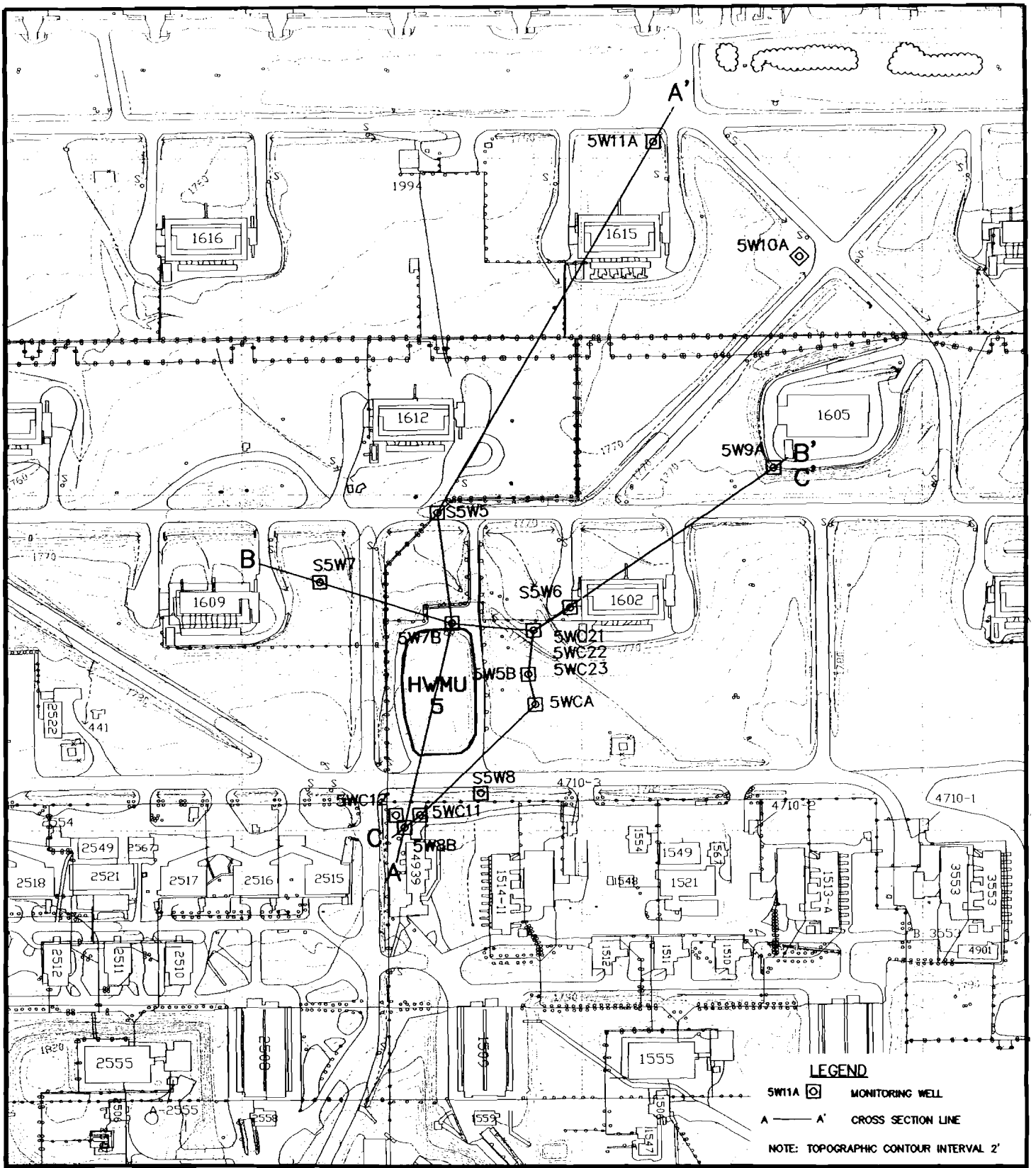
SITE MAP / GEOLOGICAL FEATURES MAP
HWMU-5 TCE ALTERNATE SOURCE DEMONSTRATION
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

REVISIONS

DESIGNED BY:	RGM
DRAWN BY:	JFF
CHECKED BY:	AEK
SCALE:	1" = 100'
DATE:	02-06-01
PROJECT NUMBER:	B00316

FIGURE 2

373A

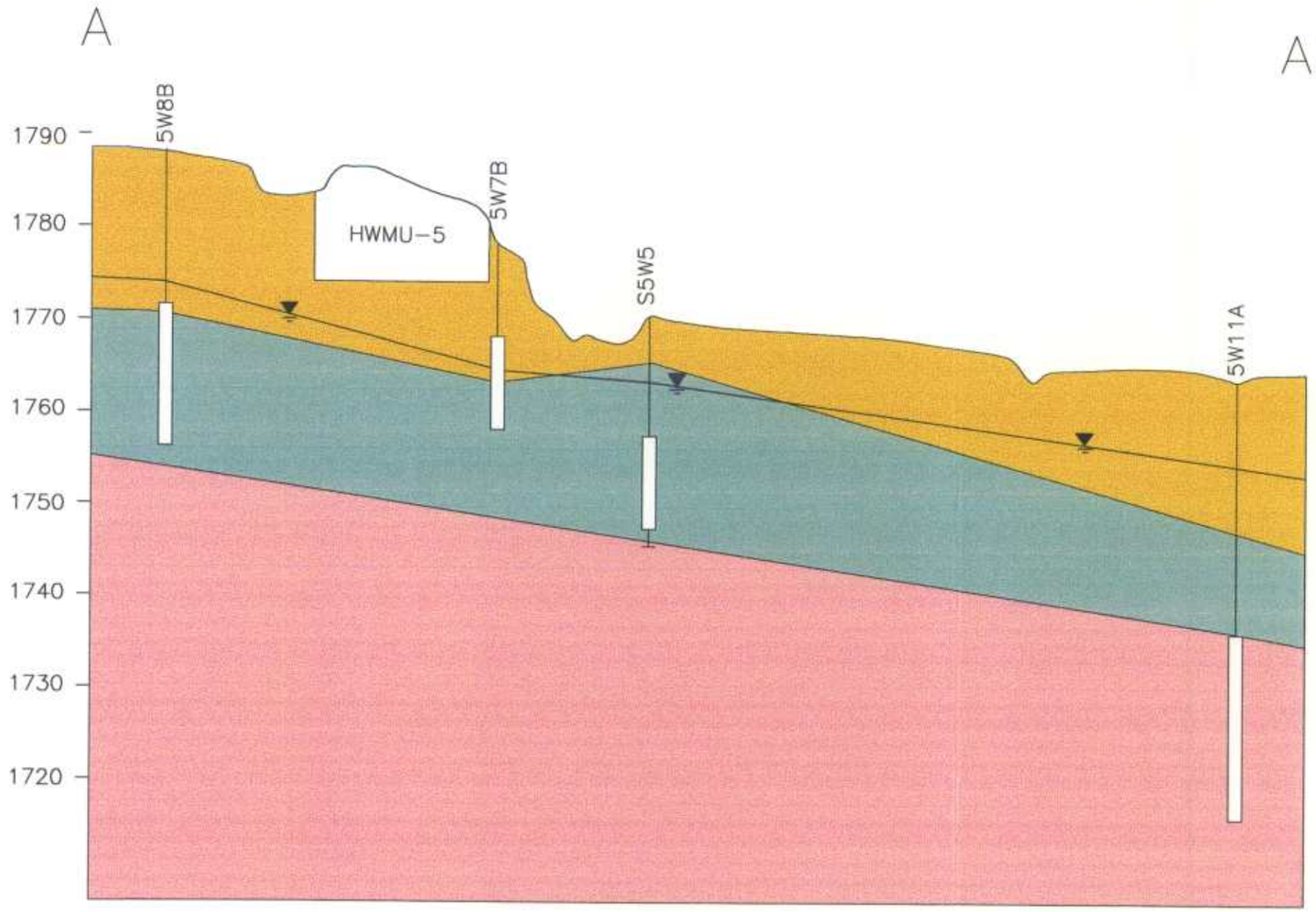


CROSS SECTION LOCATION MAP
HWMU–5 TCE ALTERNATE SOURCE DEMONSTRATION

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Draper Aden Associates
CONSULTING ENGINEERS
Blacksburg, VA - Richmond, VA

JOB No.	DATE:	SCALE:	FIGURE
B00316	02–06–01	1" = 200'	3



LEGEND

- ALLUVIUM (SILT, SAND, AND GRAVEL)
- WEATHERED BEDROCK (SANDY SILT AND CLAY, RELICT ROCK TEXTURE)
- ELBROOK FORMATION (LIMESTONE AND SHALE, BRECCIATED)
- GROUNDWATER MONITORING WELL
- SCREENED INTERVAL
- BOTTOM OF WELL
- BORING TERMINATION
- POTENTIOMETRIC SURFACE

VERTICAL EXAGGERATION = 10X

NOTE: 5WC21, 5WC22, AND 5WC23 ARE THREE NESTED WELLS

B00316-CRS-X2.DWG

Draper Aden Associates
CONSULTING ENGINEERS
Blacksburg, Virginia – Richmond, Virginia

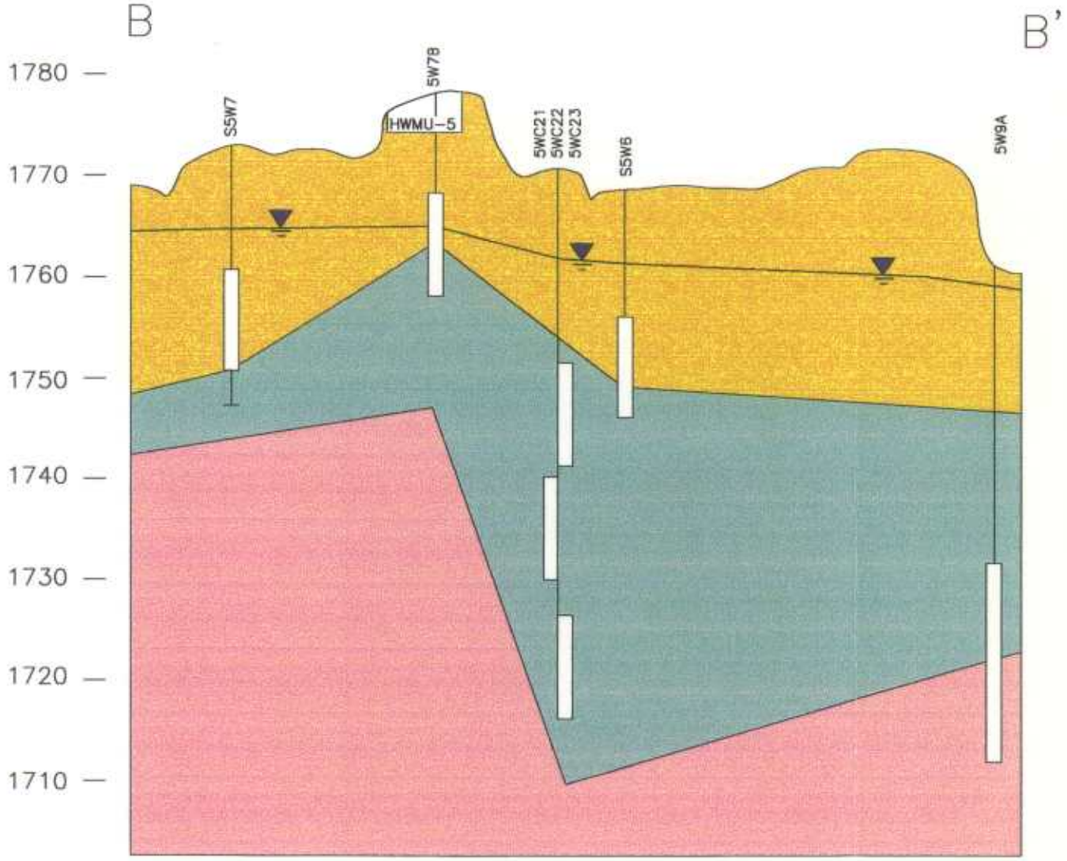
DESIGNED	RGM
DRAWN	BTM
CHECKED	AEK
DATE	02-10-01

GEOLOGIC CROSS-SECTION A-A' – HWMU 5 TCE ALTERNATE SOURCE DEMONSTRATION
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

SCALE: H:1"=150' V:1"=15'

PLAN NO. B00316

FIGURE 4



LEGEND

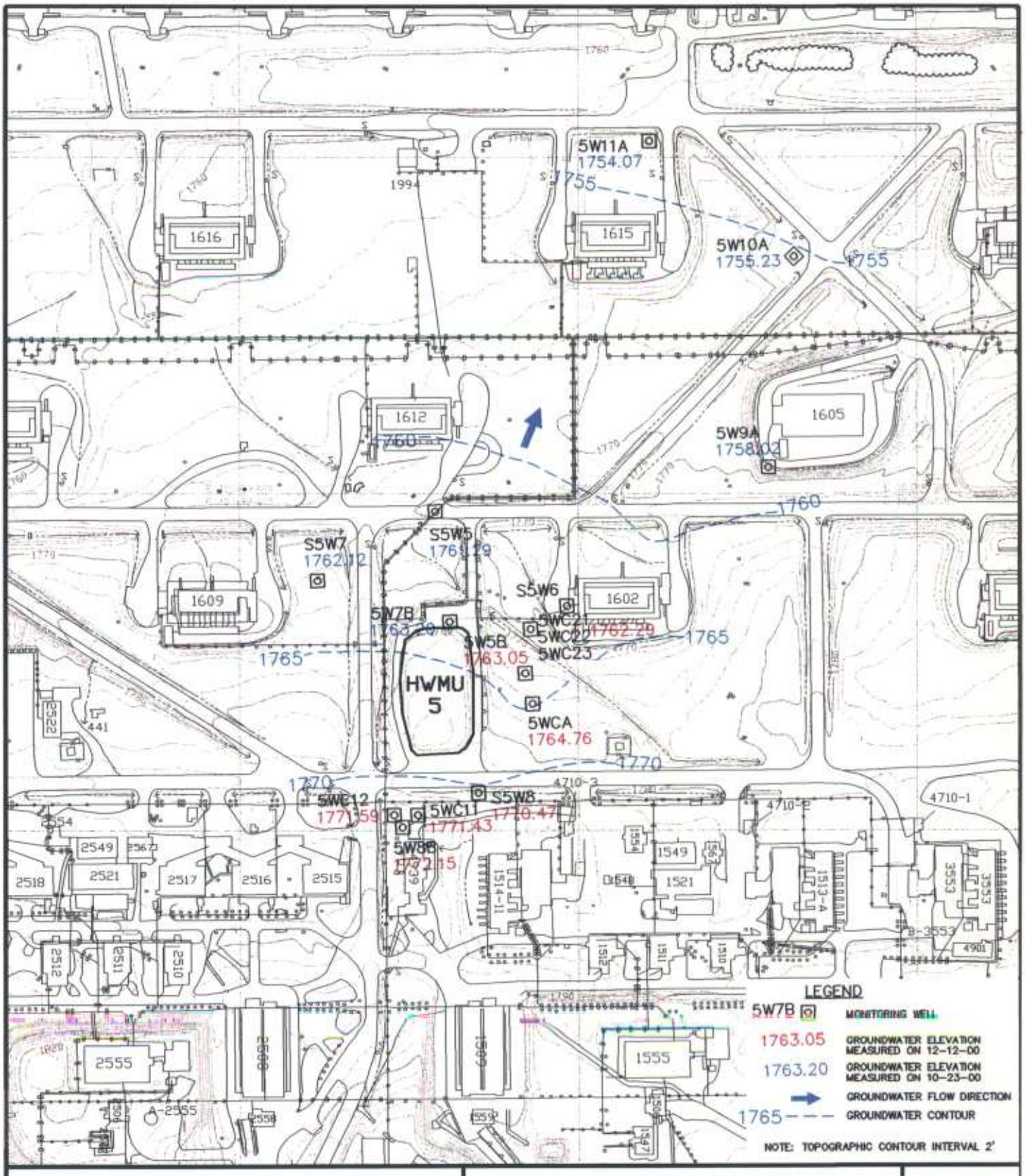
- ALLUVIUM (SILT, SAND, AND GRAVEL)
- WEATHERED BEDROCK (SANDY SILT AND CLAY, RELICT ROCK TEXTURE)
- ELBROOK FORMATION (LIMESTONE AND SHALE, BRECCIATED)
- GROUNDWATER MONITORING WELL
  - SCREENED INTERVAL
  - BOTTOM OF WELL
  - BORING TERMINATION
- POTENTIOMETRIC SURFACE

VERTICAL EXAGGERATION = 10X

NOTE: 5WC21, 5WC22, AND 5WC23 ARE THREE NESTED WELLS

B00316-CRS-01.DWG

Draper Aden Associates CONSULTING ENGINEERS Blacksburg, Virginia – Richmond, Virginia	DESIGNED RGM DRAWN BTM CHECKED AEK DATE 02-10-01	GEOLOGIC CROSS-SECTION B-B' -HWMU 5 TCE ALTERNATE SOURCE DEMONSTRATION RADFORD ARMY AMMUNITION PLANT RADFORD, VIRGINIA	SCALE: H:1"=150' V:1"=15' PLAN NO. B00316	FIGURE 5



POTENTIOMETRIC SURFACE MAP
HWMU-5 TCE ALTERNATE SOURCE DEMONSTRATION

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Draper Aden Associates
CONSULTING ENGINEERS
Blacksburg, VA - Richmond, VA

JOB No.	DATE:	SCALE:	FIGURE
B00316	02-06-01	1" = 200'	7

375C

APPENDIX A

MONITORING WELL BORING LOGS/CONSTRUCTION DIAGRAMS

HWMU 5

RAAP

UNIT 5

02/07/95

WELLS	TYPE	STATUS	TD	DATE DRILLED	BORING LOG	COMPLETIO DIAGRAM	DATUM		SCREEN			
							G.L.	T.O.C.	LENGTH	SIZE	SLOT	TYPE
W8-B	UP/BG	ACTIVE	31.50	02/16/83	YES	YES	1787.58	1789.55	15.00	2.00	0.01	PVC
5WC2-1	POC	ACTIVE					1772.10	1774.43				
W5-B	POC	ACTIVE			YES	YES	1773.13	1775.08	10.00	2.00	0.01	PVC
W7-B	POC	ACTIVE	20.00		YES	YES	1772.78	1774.90	10.00	2.00	0.01	PVC
5WC2-2	ASMT	ACTIVE					1771.99	1774.45				
5WC2-3	ASMT	ACTIVE					1771.28	1773.84				
S5W-5	ASMT	ACTIVE	25.00	04/05/81	YES	YES	1769.81	1771.74	10.00	2.00	PVC40	
S5W-6	ASMT	ACTIVE					1769.42	1771.43				
S5W-7	ASMT	ACTIVE	26.00	04/05/81	YES	YES	1773.08	1775.06	10.00	2.00	PVC40	
W10-A	ASMT	ACTIVE			YES		1768.42	1770.79	20.00			TEFLON
W11-A	ASMT	ACTIVE			YES		1764.70	1765.90				
W9-A	ASMT	ACTIVE			YES		1761.07	1761.82				
5WC1-2		SWL					1787.43	1789.89				
5WCA	POC	SWL					1777.37	1779.96				
5WC1-1	UP	SWL					1787.55	1789.99				
S5W-8	UP	SWL	34.00	04/05/81	YES		1783.51	1784.77	5.00	2.00	PVC40	
S5W-8	UP	SWL					1787.02	1785.28				

RAAP

UNIT 5

WELLS			GROUT		ANNULAR SEALANT		FILTER PACK		hydraulic conductivity	
	TOP	BASE	TOP	BASE	TOP	BASE	TOP	BASE	K (ft/sec)	K (cm/sec)
W8-B	16.50	31.50							3.84E-04	1.17E-02
5WC2-1	(1749.80)								3.14E-06	9.58E-05
W5-B	10.00	20.00	0.00	6.00	8.00	10.00	8.00	20.00		
W7-B	10.00	20.00								
5WC2-2	(1749.80)								2.52E-05	7.69E-04
5WC2-3	(1725.39)								2.76E-05	8.42E-04
S5W-5	13.00	23.00								
S5W-6	(1755.42)									
S5W-7	12.00	22.00								
W10-A	(1745.77)									
W11-A	(1735.90)									
W9-A	(1729.85)									
5WC1-2	(1721.63)								1.10E-06	3.36E-05
5WCA	(1747.27)								2.37E-07	7.23E-06
5WC1-1	(1745.25)								9.60E-06	2.93E-04
S5W-8	29.00	34.00								
S5W-8	(1757.52)									

Betz-Converse-Murdoch-Inc. BCM

UNIT 5
W-9B

Drilling Log

Well Number W-8-B

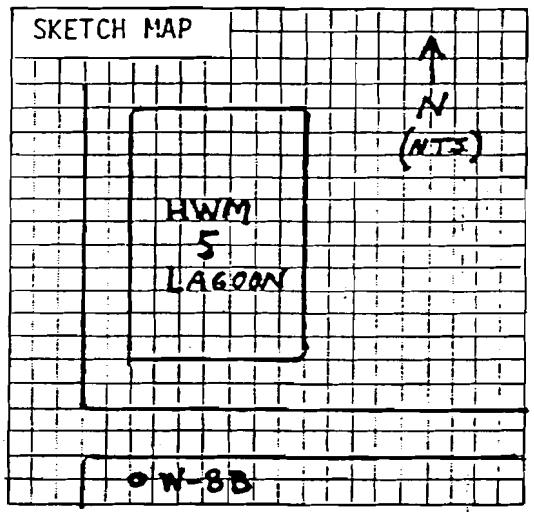
Client Corps of Engineers/Radford AAP
Project No. 00-0008-01
Well Location upgradient from lagoon No. 5
Driller/Company Dean/Cunningham
Drilling Method NX core
Hole Diameter nominal 4"
Date(s) Drilled 2/15 - 16/83
Sample Type split spoon/core
Sample Interval 5' spoon
No. Samples Retained 7
Surface Elevation 1787.58'
Casing Top Elevation 1789.55'
Total Well Depth 31.5
Casing Material and Size 2" ID PVC threaded couples
Cased Interval(s) 0 - 16.5 (+2'
Grouting Type sand cement
Grouted Interval 0-15.5 incl.1'
Screening Material and Size 2" ID PVC 0.010" slots
Screened Interval(s) 16.5 - 31.5
Packing Material and Size No. 1 sand
Packed Interval 15.5 - 31.5
Depth to Static Water 17'4"*
Date 2/18/83
Approx Well Yield <0.25 gpm
Development Method air
Development Time 3 hours
Logged by: Peter R. Jacobson

Comments

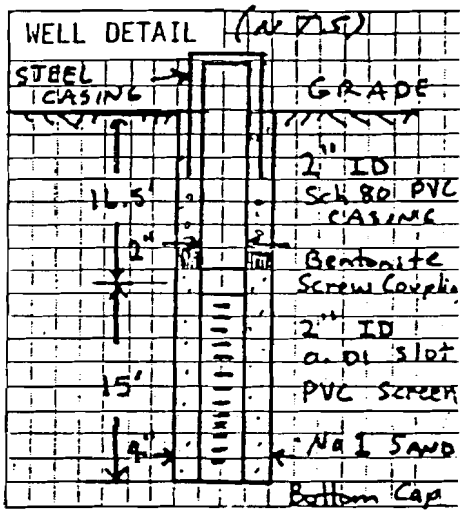
no core recovery

* measured from top of casing

SKETCH MAP



WELL DETAIL (NOT TO SCALE)



Depth Scale	Sample	Spoon Blows	Description of Materials
0 - 1.5	spoon	1-5-6	medium brown to orange brown silty clay with angular pebbles
5 - 6.5	spoon	1-2-2	medium orange brown silty clay with minor fine sand
10 - 11.5	spoon	3-6-14	slightly moist mottled orange brown clay, minor silt and fine sand
14'4"			coarse sand and gravel layer
15 - 16.5	spoon	11-17-45	poorly sorted mix of sand silt gravel clay; coarsening downward; gravel ends at 17.5'
20 - 21.5	spoon	5-5-8	mottled orange/red brown clay, moist
25 - 26.5	spoon	1-2-2	wet soft brown clay with silt and fine sand
30 - 31.5	spoon	1-3-2	wet medium orange brown silty clay, minor sand
end of hole at 31.5'			

Betz-Converse-Murdoch-Inc. BCM

UNIT 5
W-5B

Drilling Log

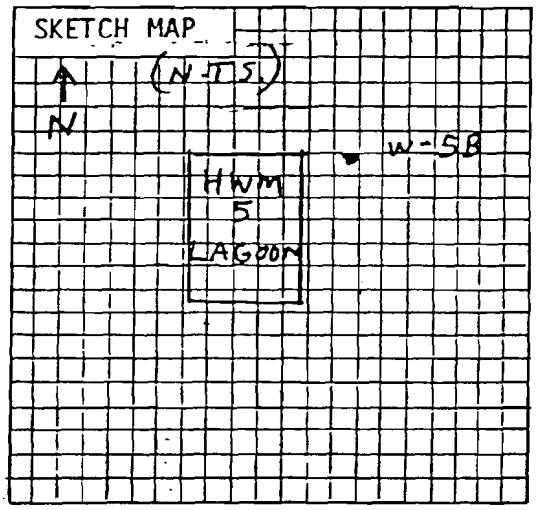
Well Number W-5B

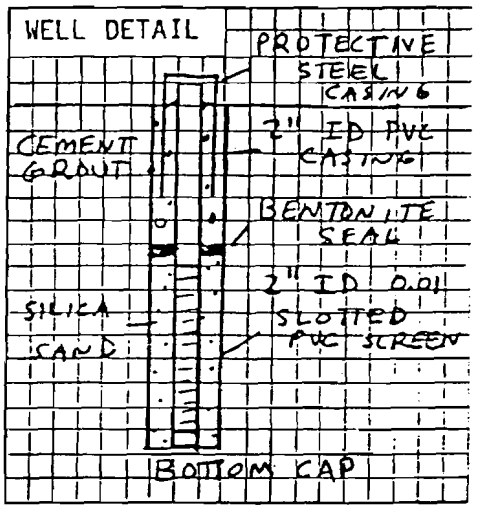
Client Corps of Engineers, RAAP, Radford, VA — Project No. 00-0008-01
Well Location East of HWM 5 Lagoon
Driller/Company M. Dean, Cunningham Core Drilling and Grouting Corp, Salem, VA
Drilling Method Fishtail — Hole Diameter 4.5" — Date(s) Drilled 8/17-18/83
Sample Type Split Spoon — Sample Interval 5' — No. Samples Retained 4
Surface Elevation 1773.13 — Casing Top Elevation 1775.08'* — Total Well Depth 22'
Casing Material and Size 2" ID Sch. 80 PVC — Cased Interval(s) 0-10'
Grouting Type Portland Cement with Sand — Grouted Interval 0-6'
Screening Material and Size 2" ID 0.01 Slotted PVC — Screened Interval(s) 10-20'
Packing Material and Size Fine to Coarse Silica Sand — Packed Interval 8-20'
Depth to Static Water 14.31 (T.O.C.) Date 8/19/83 — Approx Well Yield < 1 gpm
Development Method Air — Development Time 4 hours
Logged by: D. J. Varner

Comments

1) Drilling water obtained from RAAP hydrants
2) Replaces well W-5
3) Bentonite pellet seal in the 8-10' annular interval
*) Depth to water table measured from the top of the steel casing

*Top of steel casing





Depth Scale	Sample	Spoon Blows	Description of Materials
5-6.5	Spoon	2-3-4	Somewhat mottled buff to orange-brown fine sandy and silty clay
10-11.5	Spoon	4-7-9	Tan Clay with fine to coarse sand
15-16.5	Spoon	4-5-7	Tan clay with scattered sand
20-21.5	Spoon	2-2-4	Brown sandy clay
22			End of hole

Betz·Converse·Murdoch·Inc. BCM

UNIT 5
W-7B

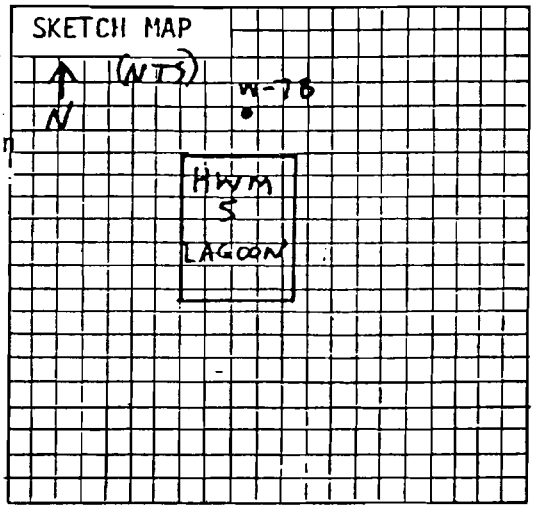
Drilling Log

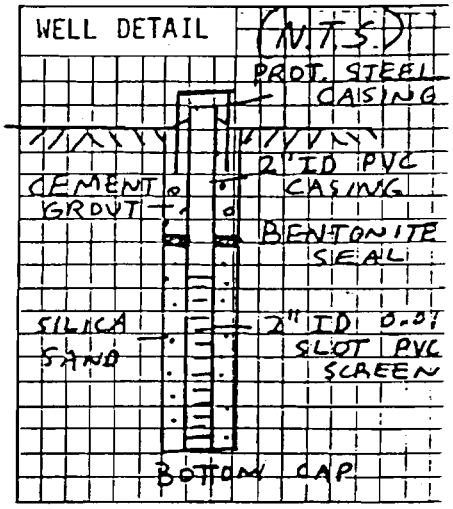
Well Number W-7B

Client Corps of Engineers, RAAP, Radford, VA — Project No. 00-0008-01
Well Location North of HWM5 Lagoon
Driller/Company M. Dean, Cunningham Core Drilling and Grouting Corp, Salem, VA
Drilling Method Fishtail/Core — Hole Diameter 4.5" — Date(s) Drilled 8/18/83
Sample Type Split Spoon — Sample Interval 5' — No. Samples Retained 4
Surface Elevation 1772.78 — Casing Top Elevation 1774.90'* — Total Well Depth 20'
Casing Material and Size 2" ID Sch. 80 PVC — Cased Interval(s) 0-10'
Grouting Type Portland Cement with Sand — Grouted Interval 0-6'
Screening Material and Size 2" ID 0.01 Slotted PVC — Screened Interval(s) 10-20'
Packing Material and Size Fine to coarse silica sand — Packed Interval 8-20'
Depth to Static Water 13.58'(T.O.C.) Date 8/19/83 — Approx Well Yield < 1 gpm
Development Method Air — Development Time 4 hours
Logged by: D. J. Varner

Comments
1) Drilling water obtained from RAAP hydrants
2) Replaces well W-7
3) Bentonite pellet seal in the 6-8' annular interval
4) Depth to water table measured from the top of the steel casing
5) Core size: HW

*Top of steel casing





Depth Scale	Sample	Spoon Blows	Description of Materials
5-6.5	Spoon	5-7-4	Light reddish-brown very silty fine sand with mica, black lignite, and some clay
10-11.5	Spoon	2-3-4	Light reddish-brown very silty fine sand with mica, black lignite, and some clay
15-16.5	Spoon	6-9-19	Orange-red and tan brecciated decomposed shale with a clay matrix and some lignite
20-21.5	Spoon	5-2-4	Orange-red and tan brecciated decomposed shale with a clay matrix and some lignite.
20			End of hole.

W-7B

Betz·Converse·Murdoch·Inc. BCM

Drilling Log

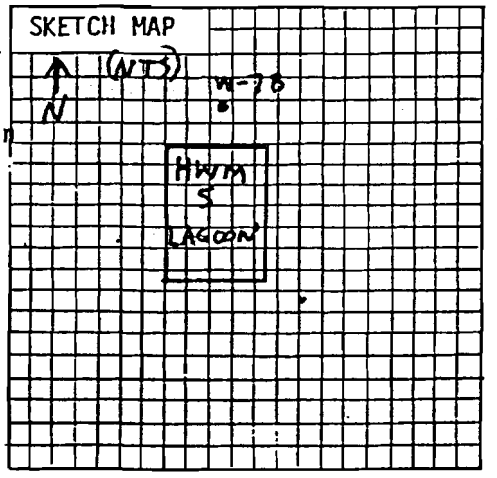
Well Number W-7B

Client Corps of Engineers, RAAP, Radford, VA — Project No. 00-0008-01
Well Location North of HWM5 Lagoon
Driller/Company M. Dean, Cunningham Core Drilling and Grouting Corp, Salem, VA
Drilling Method Fishtail/Core — Hole Diameter 4.5" — Date(s) Drilled 8/18/83
Sample Type Split Spoon — Sample Interval 5' — No. Samples Retained 4
Surface Elevation 1772.78 — Casing Top Elevation 1774.90'* — Total Well Depth 20'
Casing Material and Size 2" ID Sch. 80 PVC — Cased Interval(s) 0-10'
Grouting Type Portland Cement with Sand — Grouted Interval 0-6'
Screening Material and Size 2" ID 0.01 Slotted PVC — Screened Interval(s) 10-20'
Packing Material and Size Fine to coarse silica sand — Packed Interval 8-20'
Depth to Static Water 13.58'(T.O.C.) Date 8/19/83 — Approx Well Yield < 1 gpm
Development Method Air — Development Time 4 hours
Logged by: D. J. Varner

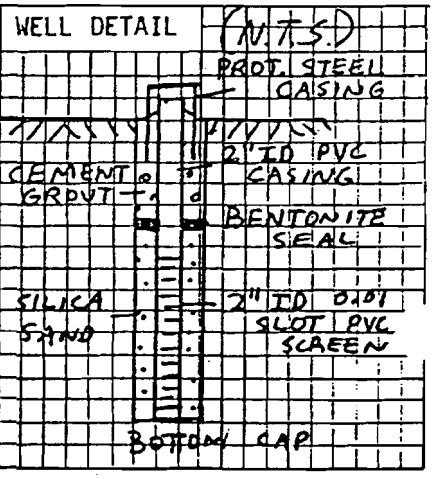
Comments
1) Drilling water obtained from RAAP hydrants
2) Replaces well W-7
3) Bentonite pellet seal in the 6-8' annular interval
4) Depth to water table measured from the top of the steel casing
5) Core size: HW

*Top of steel casing

SKETCH MAP



WELL DETAIL (N.T.S.)



Depth Scale	Sample	Spoon Blows	Description of Materials
5-6.5	Spoon	5-7-4	Light reddish-brown very silty fine sand with mica, black lignite, and some clay
10-11.5	Spoon	2-3-4	Light reddish-brown very silty fine sand with mica, black lignite, and some clay
15-16.5	Spoon	6-9-19	Orange-red and tan brecciated decomposed shale with a clay matrix and some lignite
20-21.5	Spoon	5-2-4	Orange-red and tan brecciated decomposed shale with a clay matrix and some lignite.
20			End of hole.

55W5
MW-5

US ARMY ENVIRONMENTAL HYGIENE AGENCY

Army Pollution Abatement Program Study, Installation of MOnitoring Wells, Radfórd Army Ammunition Plant, Rádford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

DRILLING LOG

PROJECT RAAP 81-26-8251-81

DATE 5 April 81

LOCATION Site 5, north of lagoon next to building SR 1612

DRILLERS Smithson, Hoddinott
Craig, Gates (logger)

DRILL RIG Acker II, w/ 4 in continuous flight auger

BORE HOLE MW 5

TD= 25ft.
water level
initial 7' 5"
24 hr. 8' 10"

DEPTH	SAMPLE TYPE & BLOWS PER 6 IN.	DESCRIPTION	REMARKS	
		Brown sandy silt with some gravel wet, plastic		13 ft of schedule 40, 2 in ID PVC casing
		Perched lense of water	10 ft of Concrete grout	
5 ft.				
	MB 5-10	Yellowish brown silty clay w/ some mica flakes		
10 ft				
		same material	Bentonite	
	MB 10-15		sand pack	
				screen
15 ft				

USAEHA Form 95, 12 Aug 74

US ARMY ENVIRONMENTAL HYGIENE AGENCY

Army Pollution Abatement Program Study, Installation of Monitoring Wells, Radford Army Ammunition Plant, Radford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

DRILLING LOG

PROJECT RAAP 81-26-8251-81 DATE 5 April 81

LOCATION Site 5, north of lagoon next to building S.R.1612 DRILLERS Smithson, Haddinott; Craig, Gates (logger)

DRILL RIG Acker II, w/ 4 in continuous flight auger BORE HOLE MW 5

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN	DESCRIPTION	REMARKS
	MB 10-20		10 ft of slotted 2 in ID, schedule 40, PVC screen (0.008-0.01")
20 ft		water at 20 ft yellow coarse medium sand - saturated	
		change in engine pitch Elbrook FM	2 ft of trap
25 ft		TD 25 feet	Depth of well 25 ft
30 ft			

USAEHA Form 95, 12 Aug 74

5506
MW-6

Army Pollution Abatement Program Study, Installation of Monitoring Wells, Radford Army Ammunition Plant, Radford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

PROJECT RAAP 81-26-8251-81

DATE 5 April 81

LOCATION Site 6, northwest of lagoon next to building S.R. 1602

DRILLERS Smithson, Hoddinott
Craig, Gates (logger)

DRILL RIG Acker II w/ 4 in continuous flight auger

BORE HOLE MW 6

TD= 25.5 ft

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN	DESCRIPTION	Water level initial 9.5 ft 24 hr. 9' 7" REMARKS	
		Brown silty clay, damp plastic	7 ft of concrete grout	13.5 ft of schedule 40, 2 in ID PVC casing
5 ft	MB 5-10	Reddish brown silty clay--slightly damp, tight drilling	4.5 ft of Bentonite (may have a void above sand next to water table)	
10 ft		softer drilling, same material, getter wetter	11.5 ft of sand pack	
		saturated		screen
15 ft				

HSE-ES Form 78, 1 Jun 80

Replaces USAEHA Form 95, 12 Aug 74, which will be used.

US ARMY ENVIRONMENTAL HYGIENE AGENCY

Army Pollution Abatement Program Study, Installation of Monitoring Wells, Radford Army Ammunition Plant, Radford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

DRILLING LOG

PROJECT RAAP 81-26-8251-81 DATE 5 April 81

LOCATION Site 5,northeast : of lagoon next to building S.R. 1602 DRILLERS Smithson, Hoddinott Craig, Gates (logger)

DRILL RIG Acker II, w/ 4 in continuous flight Auger BORE HOLE MW 6

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN.	DESCRIPTION	REMARKS	
		Reddish brown silty coarse to medium sand, saturated (water is flowing)	Sand pack	10 ft of slotted schedule 40, 2 in ID PVC screen ((0.008-0.010")
20 ft		Weathered Elbrook FM (red gray clay residuum over dolomite)		
				2 ft of sediment trap
25 ft		25.5 ft TD		Bottom of well 25.5 ft
30 ft				

USAEHA Form 95, 12 Aug 74

5507

MW-7

US ARMY ENVIRONMENTAL HYGIENE AGENCY

Army Pollution Abatement Program Study, Installation of Monitoring Wells, Radford Army Ammunition Plant, Radford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

DRILLING LOG

PROJECT RAAP 81-26-8251-81 DATE 5 April 81

LOCATION Site 5, west of lagoon next to building S.R. 1603 DRILLERS Smithson, Hoddinott Craig, Gates (logger)

DRILL RIG Acker II, w/ 4 in continuous flight Auger BORE HOLE MW 7 TD=26 ft

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN.	DESCRIPTION	water level initial=14'10" 24 hr =10'10" REMARKS
		Reddish brown silty clay dampmed plastic	Concrete Bentonite 24.5 ft of sand pack 12 ft of schedule 40, 2 in ID PVC casing
5ft	MB 5-10	same material getting damper and more plastic	
10 ft			
15 ft	▼	saturated silty medium coarse sand return on Auger- may have hit a lense of gravel	10 ft of slotted 2 in ID schedule 40 PVC screen

USAEHA Form 95, 12 Aug 74

US ARMY ENVIRONMENTAL HYGIENE AGENCY

Army Pollution Abatement Program Study, Installation of Monitoring Wells, Radford Army Ammunition Plant, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

DRILLING LOG

PROJECT RAAP 81-26-8251-81

DATE 5 April 81

LOCATION Site 5, west of lagoon next to building S.R. 1603

DRILLERS Smithson, Hoddinott
Craig, Gates (logger)

DRILL RIG Acker II, w/ 4 in continuous flight Auger

BORE HOLE MW 7

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN	DESCRIPTION	REMARKS
	MB 15-20	same material saturated	screen
20 ft			
			3 ft of sediment trap
25 ft		Elbrook FM (weathered gray clay residuum)	depth of well 26 feet
		26 ft TD	
30 ft			

USAEHA Form 95, 12 Aug 74

5508

MW-8

Army Pollution Abatement Program Study, Installation of Monitoring Wells, Radford Army Ammunition Plant, Radford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

PROJECT RAAP 81-26-8251-81 DATE 5 April 81

LOCATION Site 5, Background well, south of lagoon DRILLERS Smithson Hoddinott Craig, Gates (logger)

DRILL RIG Acker II, w/ 4 in continuous flight Auger BORE HOLE MW 8 TD= 34ft

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN	DESCRIPTION	water level initial=24 ft 24 hr.=14'11" REMARKS	
		gravel fill for road		29 ft of schedule 40, 2 in ID PVC casing
		Reddish brown sandy clay with some small gravels	8 ft of concrete grout	
5 ft				
		same material, wet, med plastic	5 ft of Bentonite	
10 ft				
		same material, getting wetter & sticky		
15 ft			sand pack	

HSE-ES Form 78, 1 Jun 80

Replaces USAEHA Form 95, 12 Aug 74, which will be used.

Army Pollution Abatement Program Study, Installation of Monitoring Wells, Radford Army Ammunition Plant, Radford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

PROJECT RAAP 81-26-8251-81 DATE 5 April 81

LOCATION Site 5, background south of lagoon DRILLERS Smithson, Hoddinott Craig, Gates (logger)

DRILL RIG Acker II, w/ 4 in continuous flight Auger BORE HOLE MW 8

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN	DESCRIPTION	REMARKS	
	MB 15-20	same material	21 ft of sandpack	PVC casing
20 ft				
		same material		
25 ft				
30 ft				

HSE-ES Form 78, 1 Jun 80

Replaces USAEHA Form 95, 12 Aug 74, which will be used.

Army Pollution Abatement Program Study, Installation of MOnitoring Wells, Radford Army Ammunition Plant, Radford, VA, 3-9 April 1981, (USAEHA Control No. 81-26-8251-81)

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

PROJECT RAAP 81-26-8251-81 DATE 5 Apr 81

LOCATION Site 5, background south of lagoon DRILLERS Smithson, Hoddinott Craig, Gates (logger)

DRILL RIG Acker II. w/ 4 in continuous flight Auger BORE HOLE MW 8

DEPTH	SAMPLE TYPE / BLOWS PER 6 IN	DESCRIPTION	REMARKS
		same material	5 ft of slotted schedule 40, 2 in ID PVC screen
35 ft		Refusal Elbrook FM Note: ran short of screen, therefore, 5 ft of screen was installed in the saturated zone instead of 10 feet.	bottom of well 34 ft.
40 ft			

HSE-ES Form 78, 1 Jun 80

Replaces USAEHA Form 95, 12 Aug 74, which will be used.

W9A
HWMU-5

Form No. 500

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.

ENGINEERS AND CHEMISTS

ONE HUNDRED YEARS OF SERVICE

DATE November, 1985

Report No. ROM-62085

Client. Hercules, Inc.

Project Monitoring Wells Radford Army Ammunition Plant Radford, Virginia

Boring No. W-9-A | Total Depth: 49.0' | Elevation: --- | Location: See plan

Type of Boring Hollow stem auger | Started: 11-6-85 | Completed: 11-6-85 | Driller. W. Simmons, Sr.

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	0.0	Asphalt and crushed stone				GROUNDWATER DATA
	1.5	Loose to medium dense brown fine sandy SILT little clay -ALLUVIUM-		4.5		
			5 7 9	6.0		
				8.5		
			3 8 1	10.0		
	13.0	Soft orange-brown silty CLAY to clayey SILT (CL/ML) Relict structure -RESIDUUM-		13.5		
			2 1 1	15.0		Water level @ 16.0' Development Data: Sloshed for 2 hrs. Bailed down to 21'. Water level re-established at 16.0' after 1.5 hrs.
	39.0			39.0		Auger refusal @ 39.0'
	40.0					

"N" No. of blows required for a 140 lb. hammer dropping 30 in. to drive 2 in. O.D. 1 3/8 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1" = 5' unless otherwise noted

Form No 500

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
EARTH LABORATORIES • ENGINEERING • CHEMICAL
ONE HUNDRED YEARS OF SERVICE

Report No ROM-62085 DATE November, 1985

Client: Hercules, Inc.

Project: Monitoring Wells Radford Army Ammunition Plant Radford, Virginia

Boring No.: W-9-A cont. | Total Depth: 49.0' | Elevation: --- | Location: See plan

Type of Boring: Hollow stem auger | Started: 11-6-85 | Completed: 11-6-85 | Driller: W. Simmons, Sr.

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	RQD %	REMARKS
	40.0	Brown fine to medium grained SANDSTONE, changing to blue-gray fractured saccharoidal LIMESTONE and DOLOMITE			20%	0%	GROUNDWATER DATA
				44.0			
					30%	0%	
	49.0			49.0			
		Coring terminated @ 49.0'					

- 20' TEFLON SCREEN
- 10' PVC. 80
- ADAPTER
- 25' PVC. 40 (3' CUTOFF)

*No. of blows req'd. for a 140 lb. hammer dropping 30 in. to drive 2 in O.D. 1.375 in I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1" = 5' unless otherwise noted

W10A
HWMU-5

Form No 500

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.

ENGINEERING, CHEMICAL

ONE HUNDRED YEARS OF SERVICE

Report No ROM-62085 DATE November, 1985

Client: Hercules, Inc.

Project: Monitoring Wells Radford Army Ammunition Plant Radford, Virginia

Boring No.: W-10-A | Total Depth: 45.0' | Elevation: --- | Location: See plan

Type of Boring: Hollow stem auger | Started: 11-6-85 | Completed: 11-6-85 | Driller: W. Simmons, Sr.

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	RQD %	REMARKS
	0.0						GROUNDWATER DATA
	1.0	Brown fine sandy SILT; roots, organics					
		Loose to medium-dense red brown fine sandy SILT with occasional cobble layers (ML)		4.5			
		-ALLUVIUM-	5 10 10	6.0			
				8.5			
			7 5 5	10.0			
				13.5			
			12 11 12	15.0			Water level @ 14.8'
	17.0						Development Data: Sloshed for 2 hrs. Bailed down for 1/2 hr. No change in water level.
		Medium-stiff gray-brown silty CLAY to clayey SILT, shale fragments, relict structure		18.5			
		-RESIDUUM-	3 3 3	20.0			
				28.5	28.5		
			30 * *				* 50/0.5'
	30.0			30.0			
		Gray green brecciated LIMESTONE and DOLOMITE, numerous calcite-healed fractures			20%	0%	
				35.0			
					12%	0%	
	40.0			40.0			

No. of blows req'd for a 140 lb. hammer dropping 30 in. to drive 2 in O.D. 1.375 in I.D. sampler a total of 18 inches in three 6 inch increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1" = 5' unless otherwise noted

Form No 500

BORING LOG

SINCE
1881
FROEHLING & ROBERTSON, INC.
ENGINEERS, ARCHITECTS, SURVEYORS
ONE HUNDRED YEARS OF SERVICE

Report No ROM-62085 DATE November, 1985

Client: Hercules, Inc.

Project: Monitoring Wells Radford Army Ammunition Plant Radford, Virginia

Boring No: W-10-A cont | Total Depth: 45.0' | Elevation: --- | Location: See plan

Type of Boring: Hollow stem auger | Started: 11-6-85 | Completed: 11-6-85 | Driller: W. Simmons, Sr.

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	40.0	Gray sandy LIMESTONE (Calcarenite)			42%	GROUNDWATER DATA 16%
	45.0			45.0		
		Boring terminated @ 45.0'				

- 20' TEFLON SCREEN
- 10' PVC-80
- ADAPTER
- 15' PVC-40

No. of blows req'd for a 140 lb. hammer dropping 30 in. to drive 2 in O.D. 1.375 in I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1" = 5' unless otherwise noted

W11A
HWMU-5

Form No. 500

BORING LOG

FROEHLING & ROBERTSON, INC.
ONE HUNDRED YEARS OF SERVICE

Report No. ROM-62085 DATE November, 1985

Client: Hercules, Inc.

Project: Monitoring Wells Radford Army Ammunition Plant Radford, Virginia

Boring No.: W-11-A | Total Depth: 48.0' | Elevation: --- | Location: See plan

Type of Boring: Hollow stem auger | Started: 11-6-85 | Completed: 11-6-85 | Driller: W. Simmons, Sr.

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	RQD %	REMARKS
	0.0	Brown fine sandy SILT; roots, organics					GROUNDWATER DATA
	1.0	Medium-dense to dense brown fine sandy SILT to silty fine SAND (ML/SM) -ALLUVIUM-	9 11 11	4.5 6.0			
			4 9 22	8.5 10.0			
			12 7 11	13.5 15.0			Water level @ 14.8'
	17.0	Very soft yellow-brown coarse to fine sandy CLAY, some silt (CL) relict structure -RESIDUUM-	1 1 1	18.5 20.0			Development Data: Sloshed 2 hours. Bailed down to 19.0'. Recovered to 14.8' after 1.5 hrs.
	28.0	Gray-brown vuggy LIMESTONE, calcite healed fractures interbedded with gray-green -FAULT BRECCIA-		28.0	72%	30%	
				33.0	33%	7%	
	40.0			38.0			

No. of blows req'd for a 140 lb. hammer dropping 30 in. to drive 2 in. O.D. 1 3/8 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1" = 5' unless otherwise noted

Form No 500

BORING LOG

FROEHLING & ROBERTSON, INC.

ONE HUNDRED YEARS OF SERVICE

Report No ROM-62085 DATE November, 1985

Client: Hercules, Inc.

Project: Monitoring Wells Radford Army Ammunition Plant Radford, Virginia

Boring No W-11-A cont | Total Depth: 48.0' | Elevation: --- | Location: See plan

Type of Boring: Hollow stem auger | Started: 11-6-85 | Completed: 11-6-85 | Driller: W. Simmons, Sr.

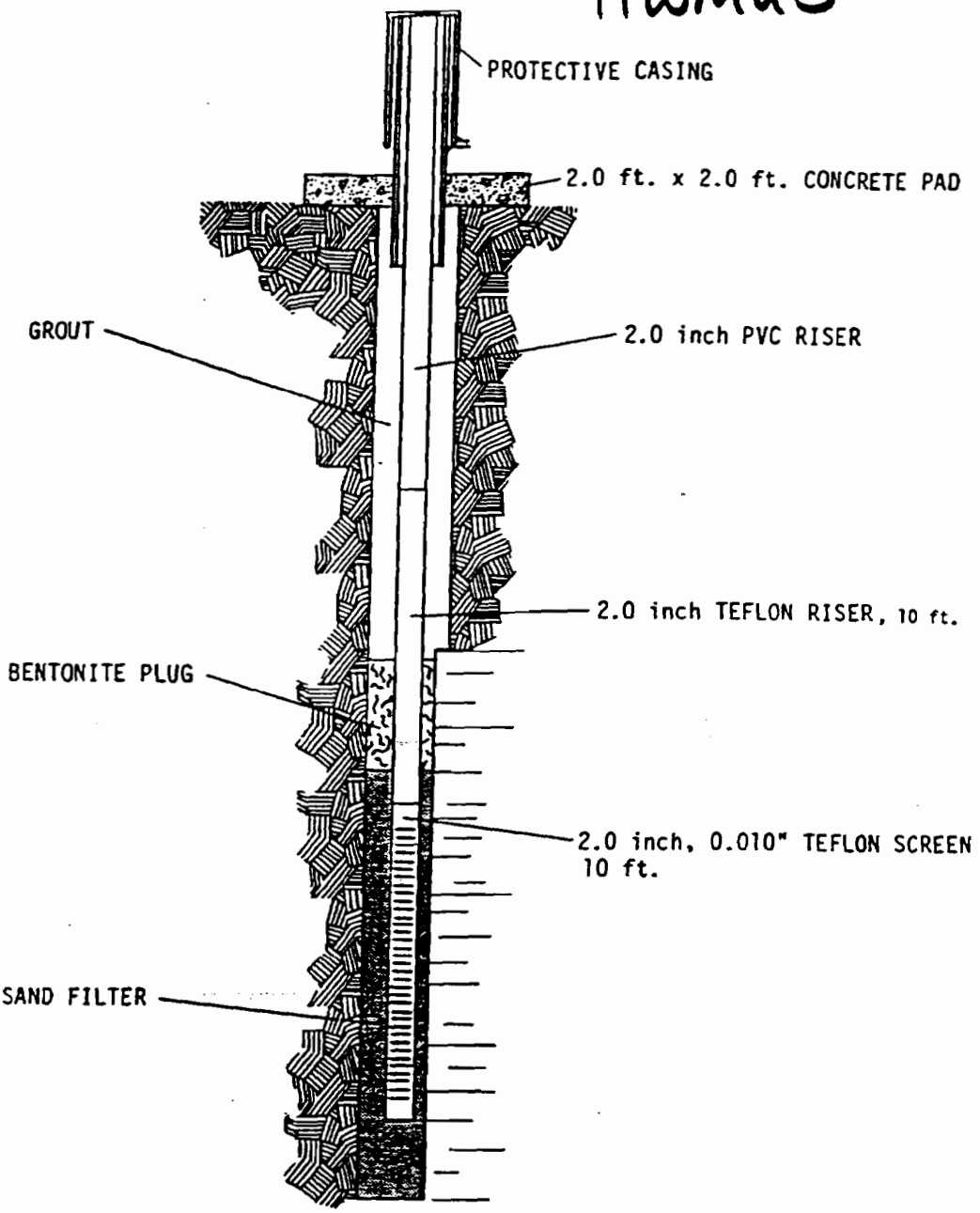
Elevation	Depth 40.0	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	RQD %	REMARKS
					23%	0%	GROUNDWATER DATA
		Dark gray saccharoidal LIMESTONE		43.0			
					53%	0%	
	48.0			48.0			
		Coring terminated @ 48.0'					

- 20' PVC Screen
- 30' PVC Riser

*No. of blows req'd. for a 140 lb. hammer dropping 30 in. to drive 2 in O.D., 1.375 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale: 1" = 5' unless otherwise noted

HWMU5



SINCE F&R 1881 FROEHLING & ROBERTSON, INC. FULL SERVICE LABORATORIES • ENGINEERS & CHEMISTS	DATE: May, 1987	
	SCALE: Not to Scale	
	DRWN: CJS	
RADFORD ARMY AMMUNITION PLANT HERCULES, INC. RADFORD, VIRGINIA	TYPICAL WELL CONSTRUCTION DIAGRAM	DWG. NO. 3

FORM NO. 103

HWMUS\5-WC1-1

Form No. 500

BORING LOG

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING/CHEMICA
"ONE HUNDRED YEARS OF SERVICE"
1881

Report No. G-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No: 5-WC1-1 | Total Depth: 53.5 ft. | Elevation: -------- | Location: See Location Plan

Type of Boring: Hollow Stem Auger | Started: 5/5/87 | Completed: 5/5/87 | Driller: W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	40.0				45.0	GROUNDWATER DATA
		5-WC1-1 continued		43.5		RQD = 23
					36.7	RQD = 7
				48.5		
					61.7	RQD = 0
	53.5			53.5		
		Boring terminated at 53.5 ft.				

*No. of blows req'd. for a 140 lb. hammer dropping 30 in. to drive 2 in O.D., 1.375 in I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1" = 5' unless otherwise noted

Form No 500

BORING LOG

SINCE 1881
FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING/CHEMIC.
"ONE HUNDRED YEARS OF SERVICE"

Report No. Q-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No.: 5-WC1-1 | Total Depth: 53.5 ft. | Elevation: -------- | Location: See Location Plan

Type of Boring: Hollow Stem Auger | Started: 5/5/87 | Completed: 5/5/87 | Driller: W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	0.0					GROUNDWATER DATA
		No sampling conducted, see 5-WC1-2 for subsurface conditions				
		Cobbles encountered at 13.0 ft. and 17.0 ft.				
	33.5	Auger refusal at 33.5 ft.		33.5		
		Hard light gray dolomite, fractured and vuggy abundant calcareous infill, occasional shale infill: dolomite clasts in calcareous matrix: Probable slump structure			21 7	RQD - 0
				38.5		

*No. of blows req'd. for a 140 lb. hammer dropping 30 in. to drive 2 in O.D., 1.375 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

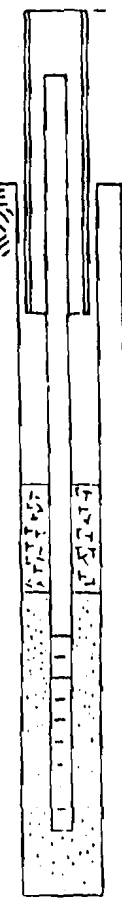
Scale 1" = 5' unless otherwise noted

Project: Radford Army Ammunition Plant	Driller: Simmons	WELL No. 5-WC1-1
Location: Radford, Virginia	Inspector: Smith	
Client: Hercules Inc.	Date Installed: 5/5/87	
Screen Description: 0.010" slot, 2.0" I.D. Teflon Screen @(10')	Sand Size: D(10)= 0.45-0.55 mm	
Riser Description: 2.0" I.D. Teflon Riser and PVC Riser	Bore/ Core Size: 6 inch/ NX	

Subsurface Conditions Summary

See 5-WC1-2 for Conditions

Cobbles encountered at; 13.0 ft, 16.0 ft.



Casing Stickup (ft.)= 3.0 ft.

Elev. =

Riser Stickup (ft.) = 3.0 ft.

Elev. =

Ground Elev.=

Depth to Bentonite (ft.)= ---------

Elev. =

Depth to Sand Filter(ft.)= ---------

Elev. =

Depth to Well Bottom(ft.)= 49.3 ft.

Elev. =

Depth of Hole (ft.) = 53.5 ft.

Elev. =

HWMU 5 WC1-1

HWMU 5\5-WC1-2

Form No. 500

BORING LOG

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING • CHEMICA
"ONE HUNDRED YEARS OF SERVICE"
1881

Report No. Q-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No.: 5-WC1-2 | Total Depth: 76.8 ft. | Elevation: -------- | Location: See Location Plan

Type of Boring: Hollow Stem Auger | Started: 5/1/87 | Completed: 5/1/87 | Driller: W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	0.0					GROUNDWATER DATA
		Very loose yellow brown silty medium to fine SAND (SM)				
		-to-	1 1	4.5		
		Loose tan to red brown clayey medium to fine SAND, trace rounded coarse sand (SC)		6.0		
			2 2 7	8.5		
		-ALLUVIUM-		10.0		
			11 13 16	13.5		
				15.0		
	16.5					
		Loose orange brown medium to fine sandy SILT, trace angular coarse sand (rock fragments), manganese stains (ML)	6 7 3	18.5		
				20.0		
		-to-		23.5		
		Medium stiff orange brown clayey SILT, little medium to fine sand (rock fragments) (ML/MH)	2 1 3	25.0		
		-RESIDUUM-	15 4	28.5		
				30.0		
				33.5		
			1 1 2	35.0		Subsurface water at 34.5 ft. depth at 11:30 a.m. on May 1, 1987
	39.3	Auger refusal at 39.3 ft.		39.3		

*No. of blows req'd. for a 140 lb. hammer dropping 30 in. to drive 2 in O.D., 1.375 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1"=5' unless otherwise noted

Form No 500

BORING LOG

SINCE 1881

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING/CHEMICAL
"ONE HUNDRED YEARS OF SERVICE"

Report No. 0-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No.: 5-WC1-2 | Total Depth: 76.8 ft. | Elevation: -------- | Location: See Location Plan

Type of Boring: Hollow Stem Auger | Started: 5/1/87 | Completed: 5/1/87 | Driller: W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	40.0				35.8	GROUNDWATER DATA
		Hard light gray dolomite, vuggy, fractured, with calcareous infilling, some with moderately developed crystals, occasional shale infill: occasional dolomite clasts in a calcareous matrix: probable flow structure		44.3		RQD = 0
					46.7	RQD = 7
				49.3		
					34.9	RQD = 0
				54.8		
					33.3	RQD = 0
				59.8		
					25.8	RQD = 0
				64.8		
					19.2	RQD = 0
				69.8		
					88.3	RQD = 10
				74.8		
					33.3	RQD = 0
	76.8			76.8		
		Boring terminated at 76.8 ft.				

*No. of blows req'd for a 140 lb. hammer dropping 30 in. to drive 2 in O.D., 1.375 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Scale 1" = 5' unless otherwise noted

Project: Radford Army Ammunition Plant	Driller: Simmons	WELL No.
Location: Radford, Virginia	Inspector: Smith	5-WC1-2
Client: Hercules Inc.	Date Installed: 5/1/87	
Screen Description: 0.010" slot, 2.0" I.D. Teflon Screen	Sand Size: D(10)= 0.45-0.55 mm	
Riser Description: 2.0" I.D. Teflon Riser and PVC Riser	Bore/ Core Size: 6 inch/ NX	

Subsurface Conditions Summary

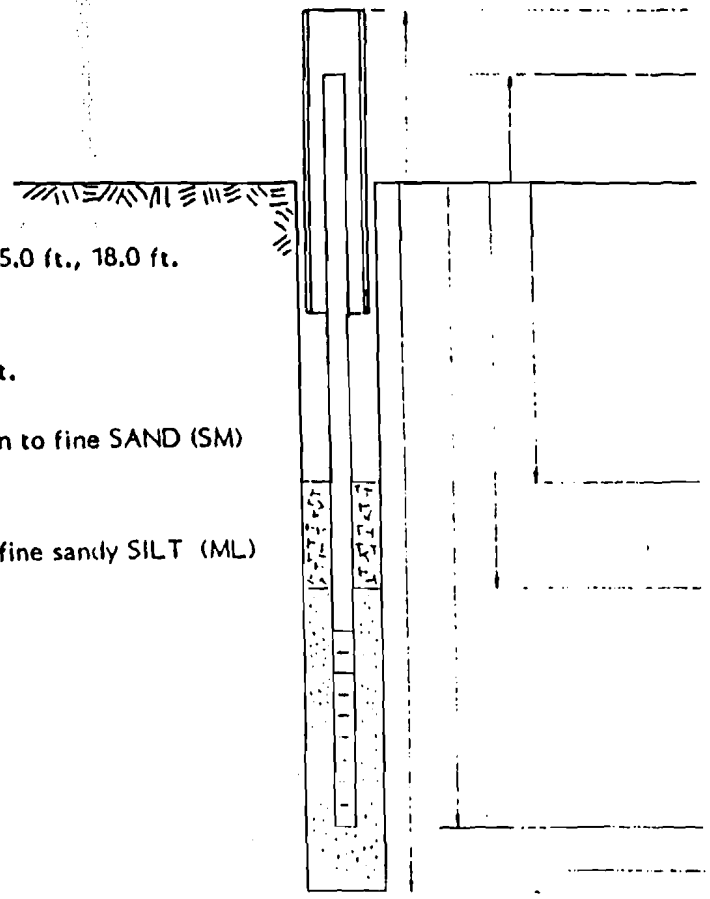
Cobbles encountered at; 15.0 ft., 18.0 ft.

Subsurface water at 34.5 ft.

Yellow Brown silty medium to fine SAND (SM)

to

Orange Brown medium to fine sandy SILT (ML)



Casing Stickup (ft.)= 3.0 ft.

Elev. = _____

Riser Stickup (ft.) = 3.0 ft.

Elev. = _____

Ground Elev.= _____

Depth to Bentonite (ft.)= --------

Elev. = _____

Depth to Sand Filter(ft.)= --------

Elev. = _____

Depth to Well Bottom(ft.)= 72.8 ft.

Elev. = _____

Depth of Hole (ft.) = 76.8 ft.

Elev. = _____

HWMU 5\5-WC2-1

Form No. 500

BORING LOG

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING/CHEMIC
"ONE HUNDRED YEARS OF SERVICE"
1891

Report No. Q-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No.: 5-WC2-1 | Total Depth: 31.8 ft. | Elevation: -------- | Location: See Location Plan

Type of Boring: Hollow Stem Auger | Started: 5/5/87 | Completed: 5/5/87 | Driller: W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	0.0	Medium dense red brown silty fine SAND, trace mica (SM)	3 6 10	1.5		GROUNDWATER DATA
				3.0		
				4.5		
			4 5 9			
		-to-		6.0		
		Very loose to medium dense yellow brown silty medium to fine SAND (SM)		8.5		
			2 2 2			
				10.0		
		-ALLUVIUM-				
				13.5		
			2 14 6			
				15.0		
	16.5					
		Medium dense to very loose yellow brown silty coarse to fine SAND (angular rock Fragments) (SM)		18.5		
			9 14 8			Subsurface water at: 22 ft. May 5, 1987 at 4:00 p.m. 29 ft, May 5, 1987 4:10 p.m.
				20.0		
		-RESIDUUM-		23.5		
			* * 1			*Weight of hammer
				25.0		
				28.5		
			1 2 3			
				30.0		
	31.8					
		Boring terminated at 31.8 ft.				

*No. of blows req'd. for a 140 lb. hammer dropping 30 in. to drive 2 in O.D., 1.375 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N

Scale 1"=5' unless otherwise noted

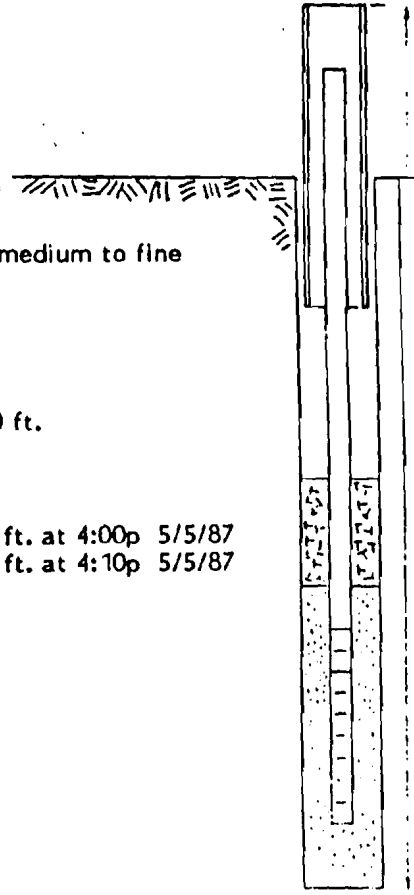
Project: Radford Army Ammunition Plant	Driller: Simmons	WELL No. 5-WC2-1
Location: Radford, Virginia	Inspector: Smith	
Client: Hercules Inc.	Date Installed: 5/6/87	
Screen Description: 0.010" slot, 2.0" I.D. Teflon Screen	Sand Size: D(10)= 0.45-0.55 mm	
Riser Description: 2.0" I.D. Teflon Riser and PVC Riser	Bore/ Core Size: 6 inch/ NX	

Subsurface Conditions Summary

Yellow to Red Brown silty medium to fine SAND (SM)

Cobbles encountered at 8.0 ft.

Subsurface water at; 22.0 ft. at 4:00p 5/5/87
29.0 ft. at 4:10p 5/5/87



Casing Stickup (ft.)= 3.0 ft.
Elev. =
Riser Stickup (ft.) = 3.0 ft.
Elev. =
Ground Elev.=

Depth to Bentonite (ft.)= 14.8 ft.
Elev. =
Depth to Sand Filter(ft.)= --------
Elev. =

10' Screen

Depth to Well Bottom(ft.)= 29.3 ft.
Elev. =
Depth of Hole (ft.) = 31.8 ft.
Elev. =

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HWMUS\5-WC2-2

Form No. 500

BORING LOG

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING • CHEMICA
"ONE HUNDRED YEARS OF SERVICE"
1881

Report No. 0-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No.: 5-WC2-2 | Total Depth: 43.5 ft. | Elevation: -------- | Location: See Location Plan

Type of Boring: Hollow Stem Auger | Started: 5/6/87 | Completed: 5/6/87 | Driller: W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows*	Sample Depth (Feet)	% Core Recovery	REMARKS
	0.0	No sampling conducted, see 5-WC2-1 for subsurface condictions				GROUNDWATER DATA
		Cobbles encountered at 15 ft.				
		Difficult augering at 35 ft. - 40 ft.				
		Boring terminated at 43.5 ft.				

*No. of blows req'd. for a 140 lb. hammer dropping 30 in. to drive 2 in. O.D., 1.375 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

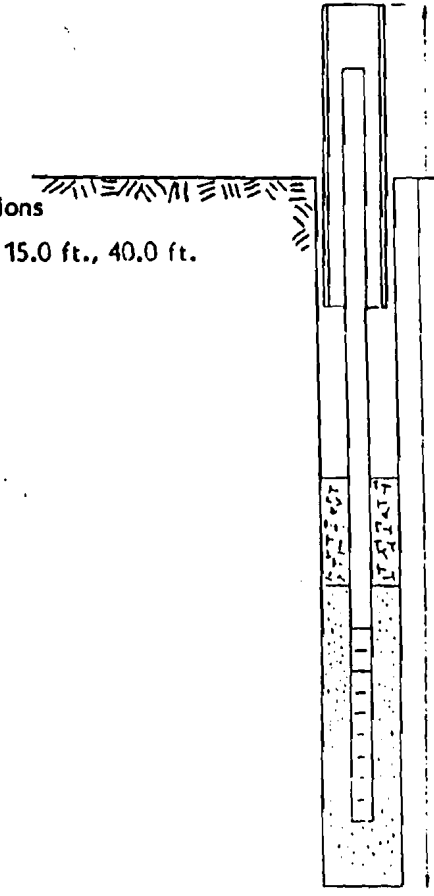
Scale 1" = 5' unless otherwise noted

Project: Radford Army Ammunition Plant	Driller: Simmons	WELL No.
Location: Radford, Virginia	Inspector: Smith	5-WC2-2
Client: Hercules Inc.	Date Installed: 5/6/87	
Screen Description: 0.010" slot, 2.0" I.D. Teflon Screen		Sand Size: D(10)= 0.45-0.55 mm
Riser Description: 2.0" I.D. Teflon Riser and PVC Riser		Bore/ Core Size: 6 inch/ NX

Subsurface Conditions Summary

See 5-WC2-1 for Conditions

Cobbles encountered at; 15.0 ft., 40.0 ft.



Casing Stickup (ft.)= 3.0 ft.

Elev. = _____

Riser Stickup (ft.) = 3.0 ft.

Elev. = _____

Ground Elev.= _____

Depth to Bentonite (ft.)= 28.0 ft.

Elev. = _____

Depth to Sand Filter(ft.)= -------

Elev. = _____

Depth to Well Bottom(ft.)= 40.5 ft.

Elev. = _____

Depth of Hole (ft.) = 43.5 ft.

Elev. = _____

HWMU 5 \ 5-WC2-3

Form No. 300

BORING LOG

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING/CHEMICA
"ONE HUNDRED YEARS OF SERVICE"
1881

Report No. O-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No.	Total Depth	Elevation	Location
5-WC2-3	55.3 ft.	--------	See Location Plan

Type of Boring	Started	Completed	Driller
Hollow Stem Auger	5/6/87	5/6/87	W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows	Sample Depth (Feet)	% Core Recovery	REMARKS
	0.0					GROUNDWATER DATA
		No sampling conducted, see 5-WC2-1 for subsurface conditions				
		Cobbles encountered at 15.0 ft.				
		Difficult augering at 53.0 ft. - 55.0 ft.				
		Boring terminated at 55.3 ft.				

*No. of blows required for a 140 lb. hammer dropping 30 in. to drive 2 in. O.D., 1.375 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

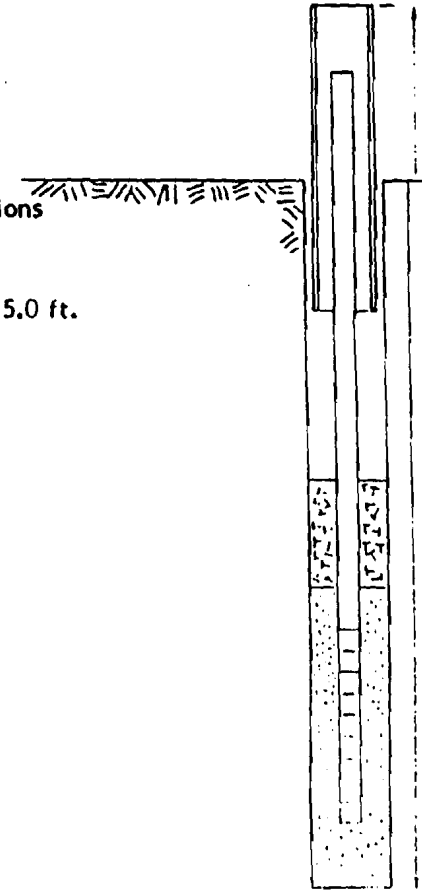
Scale 1" = 5' unless otherwise noted

Project: Radford Army Ammunition Plant	Driller: Simmons	WELL No. 5-WC2-3
Location: Radford, Virginia	Inspector: Smith	
Client: Hercules Inc.	Date Installed: 5/6/87	
Screen Description: 0.010" slot, 2.0" I.D. Teflon Screen	Sand Size: D(10)= 0.45-0.55 mm	
Riser Description: 2.0" I.D. Teflon Riser and PVC Riser	Bore/ Core Size: 6 inch/ NX	

Subsurface Conditions Summary

See 5-WC2-3 for Conditions

Cobbles encountered at 15.0 ft.



Casing Stickup (ft.)= 3.0 ft.

Elev. = _____

Riser Stickup (ft.) = 3.0 ft.

Elev. = _____

Ground Elev.= _____

Depth to Bentonite (ft.)= --------

Elev. = _____

Depth to Sand Filter(ft.)= --------

Elev. = _____

10' SCREEN

Depth to Well Bottom(ft.)= 53.6 ft.

Elev. = ~~55.3 ft.~~

Depth of Hole (ft.) = 55.3ft

Elev. = _____

HWMU 5 1 5 - WCA

Form No. 500

BORING LOG

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERING • CHEMICAL
"ONE HUNDRED YEARS OF SERVICE"
1881

Report No. Q-62084 DATE May 1987

Client: Hercules Inc.

Project: Radford Army Ammunition Plant Radford, Virginia

Boring No.: 5-WCA | Total Depth: 40 ft. | Elevation: -------- | Location: See Location Plan

Type of Boring: Hollow Stem Auger | Started: 5/7/87 | Completed: 5/11/87 | Driller: W. Simmons

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample Blows*	Sample Depth (Feet)	% Core Recovery	REMARKS
	0.0					GROUNDWATER DATA
		Very loose gray brown medium to fine sandy SILT, trace coarse subrounded sand (ML)	3_2	1.5		
				3.0		
				4.5		
		Very loose gray braown fine sandy SILT (ML)	2_1	6.0		
		-ALLUVIUM-				
			2_4	8.5		
				10.0		
	11.5					
				13.5		
		Medium stiff gray to tan clayey SILT, manganese stains (ML)	2_4	15.0		
				18.5		
			2_3	20.0		
		Medium stiff to stiff mottled to gray silty fine SAND (SM) manganese stains		23.5		
			2_6	25.0		
		-grading to-				
		Stiff mottled to gray silty CLAY/clayey SILT (CL/ML)	3_7	28.5		
				30.0		
		-RESIDUUM-				
				33.5		
			3_9	35.0		
				38.5		
	40.0	Boring terminated at 40.0 ft.	***	40.0		*Weight of Hammer

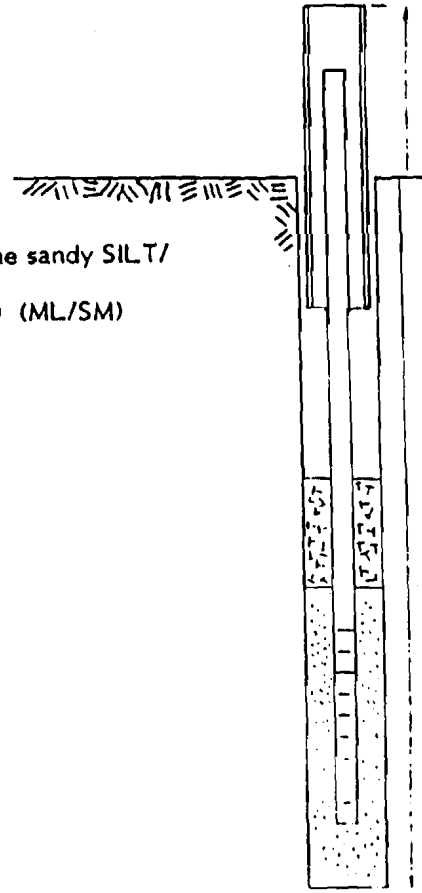
*No. of blows req'd for a 140 lb. hammer dropping 30 in. to drive 2 in. O.D., 1 3/8 in. I.D. sampler a total of 18 inches in three 6 in. increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N

Scale 1"=5' unless otherwise noted

Project: Radford Army Ammunition Plant	Driller: Simmons	WELL No.
Location: Radford, Virginia	Inspector: Smith	5-WCA
Client: Hercules Inc.	Date Installed: 5/11/87	
Screen Description: 0.010" slot, 2.0" I.D. Teflon Screen	Sand Size: D(10)= 0.45-0.55 mm	
Riser Description: 2.0" I.D. Teflon Riser and PVC Riser	Bore/ Core Size: 6 inch/ NX	

Subsurface Conditions Summary

Gray Brown medium to fine sandy SILT/ silty medium to fine SAND (ML/SM)



Casing Stickup (ft.)= 3.0 ft.

Elev. = _____

Riser Stickup (ft.) = 3.0 ft.

Elev. = _____

Ground Elev.= _____

Depth to Bentonite (ft.)= 4.0 ft.

Elev. = _____

Depth to Sand Filter(ft.)= 25.8 ft.

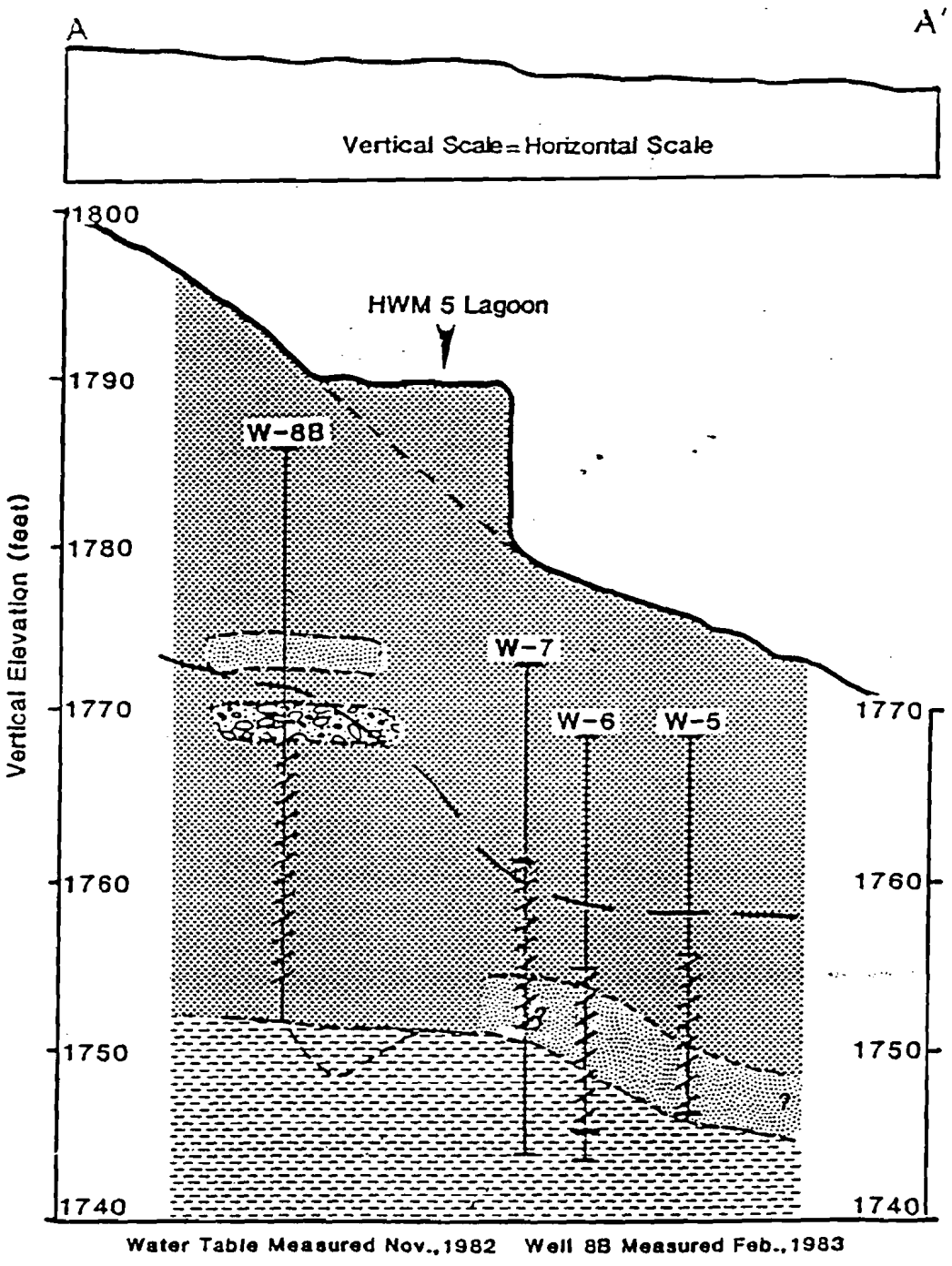
Elev. = _____

Depth to Well Bottom(ft.)= 37.1 ft.

Elev. = _____

Depth of Hole (ft.) = 40.0 ft.

Elev. = _____



HORIZONTAL SCALE

0 200'

LEGEND

- Sandy Silt
- Sand with Silt and Gravel
- Sand, Gravel and Cobbles
- Bedrock
- Water Table

Monitoring Well Profile

Screened Interval

BCM Betz·Converse·Murdoch·Inc.
Engineers, Planners and Scientists

RAAP HWM 5

Geology and Groundwater Profile

FIGURE 2

RA-152 (Rev. 7/85)

413

ENGINEERING DEPARTMENT FILE

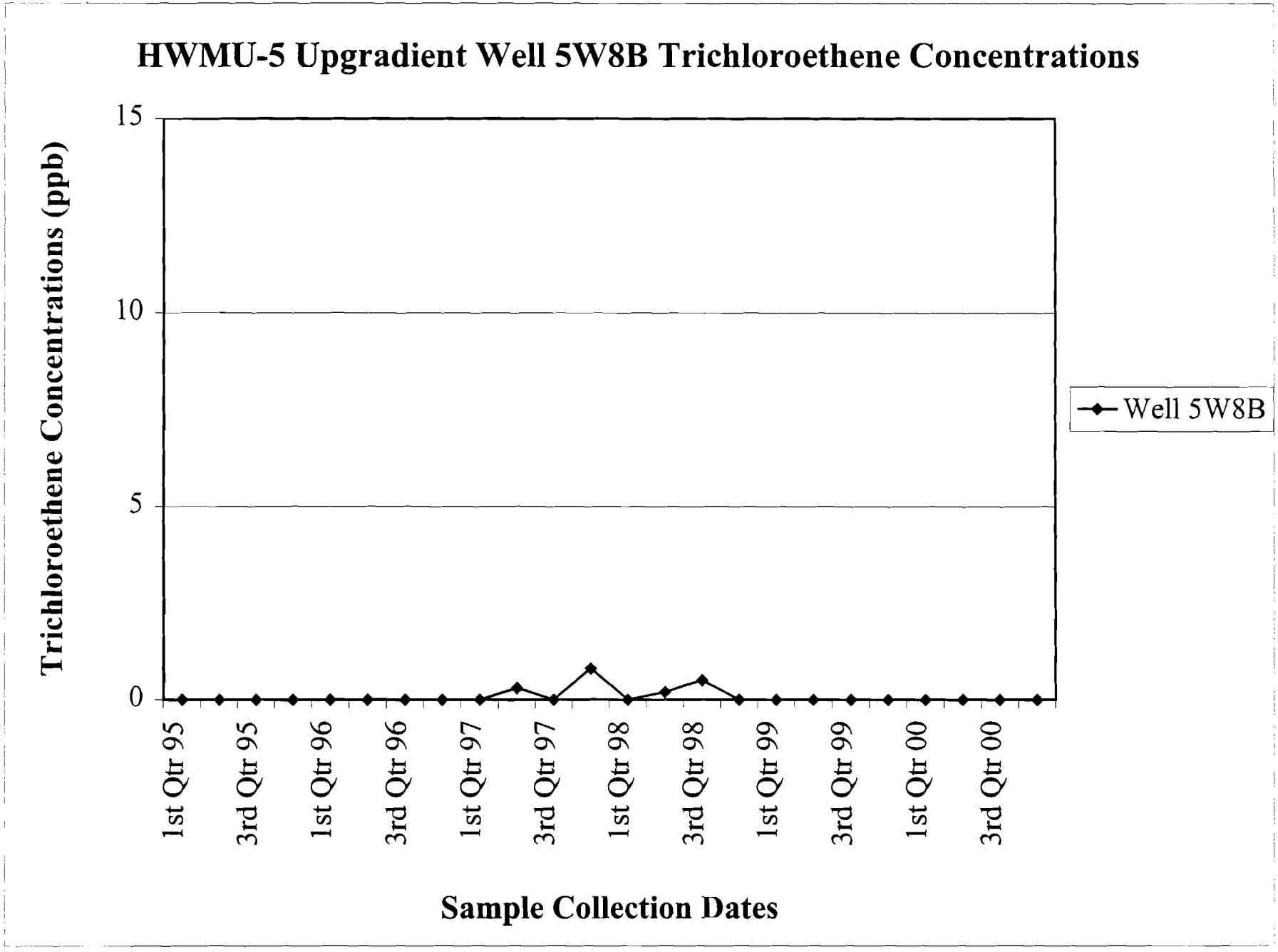
PLANT RAAP PROJECT No. _____ DATE 6/3/92 AUTHOR R. C. Wells

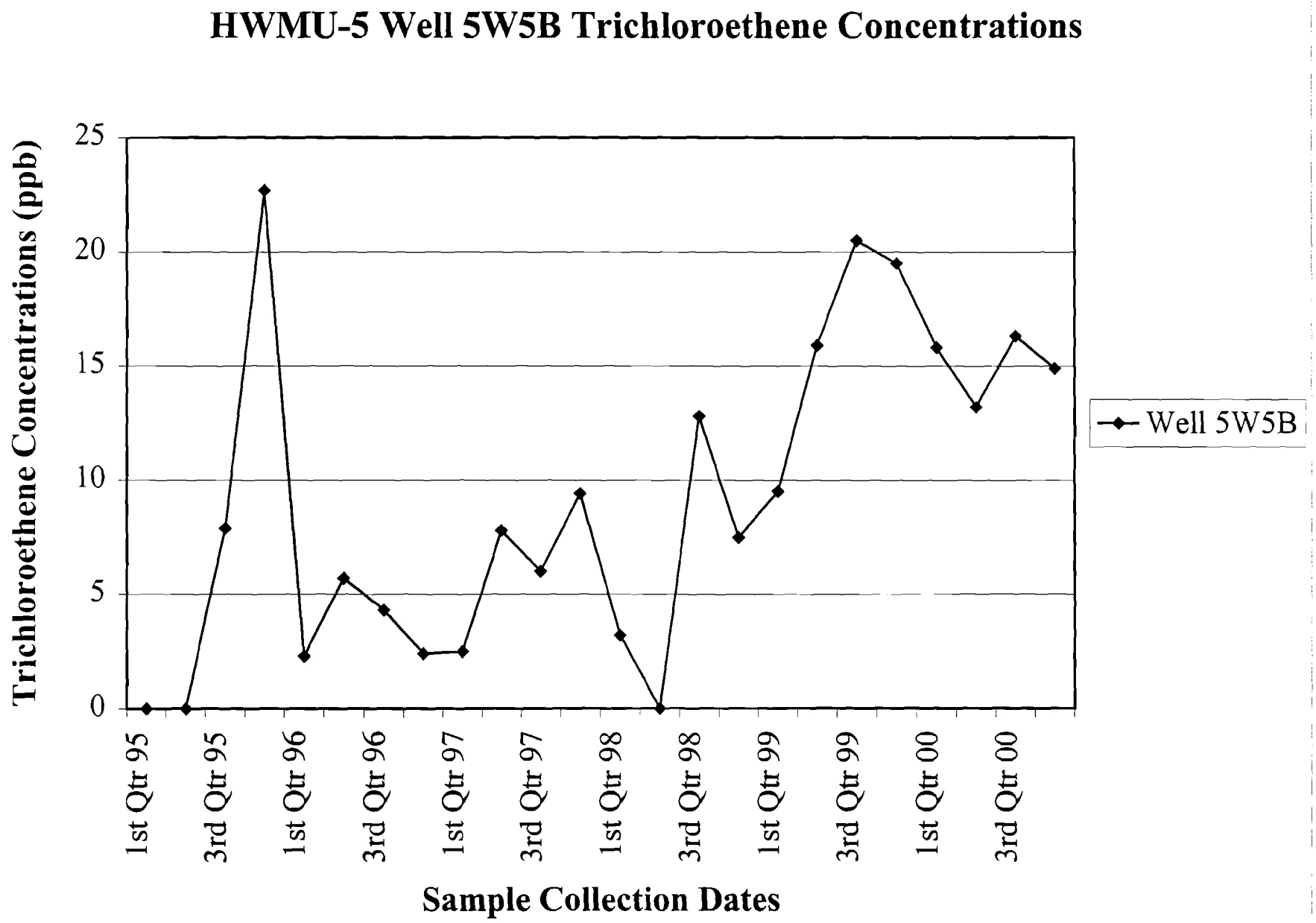
TITLE Survey Information - Groundwater Monitori...
Wells at HWM 5

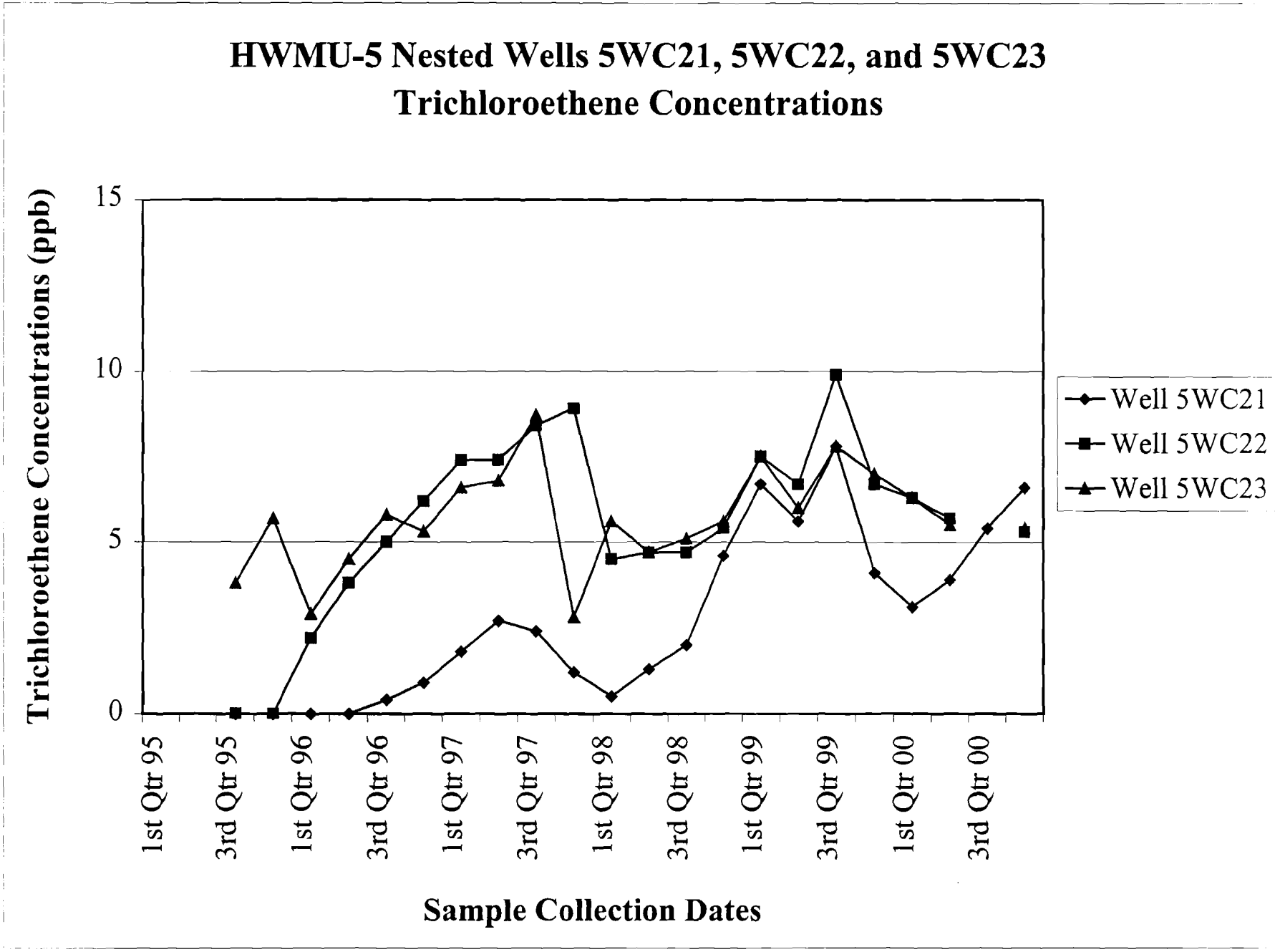
Well No.	Plant Coordinates North	Plant Coordinates West	Monitoring Well Elevations Conc. Pad	Monitoring Well Elevations Top of Casing	Ground Water Elevation	Date G. Water E. Measu...
W-6	1078.8	592.7	1772.93	1774.98	1766.6	8/20...
5WC2-3	1001.0	641.7	1771.28	1773.87		
5WC2-2	1006.1	652.7	1771.99	1778.85		
5WC2-1	1010.9	663.9	1772.10	1774.83		
W5B	951.5	658.6	1772.68	1774.80	1766.0	8/20...
5WCA	865.6	650.0	1777.37	1779.96		
W-8	713.9	726.7	1787.02	1788.28	1796.0	8/2...
W-7	1032.5	917.1	1776.59	1778.59	1765.0	8/20...
W-7B	1006.5	717.9	1772.59	1774.86	1765.0	8/20...
W-5	1153.9	776.0	1773.32	1775.25		
5WC1-2	671.7	773.2	1787.83	1789.89		
5WC1-1	685.1	782.6	1787.55	1789.95		
W8B	671.7	783.7	1787.58	1789.55	1738.35	8/20/...
W9A	1190	231	1761.07	1761.82	1760.3	8/2...
W10A	1518	223	1768.82	1770.75	1758.8	8/20/...
W11A	1678	835	1768.70	1765.90	1756.7	8/20/...

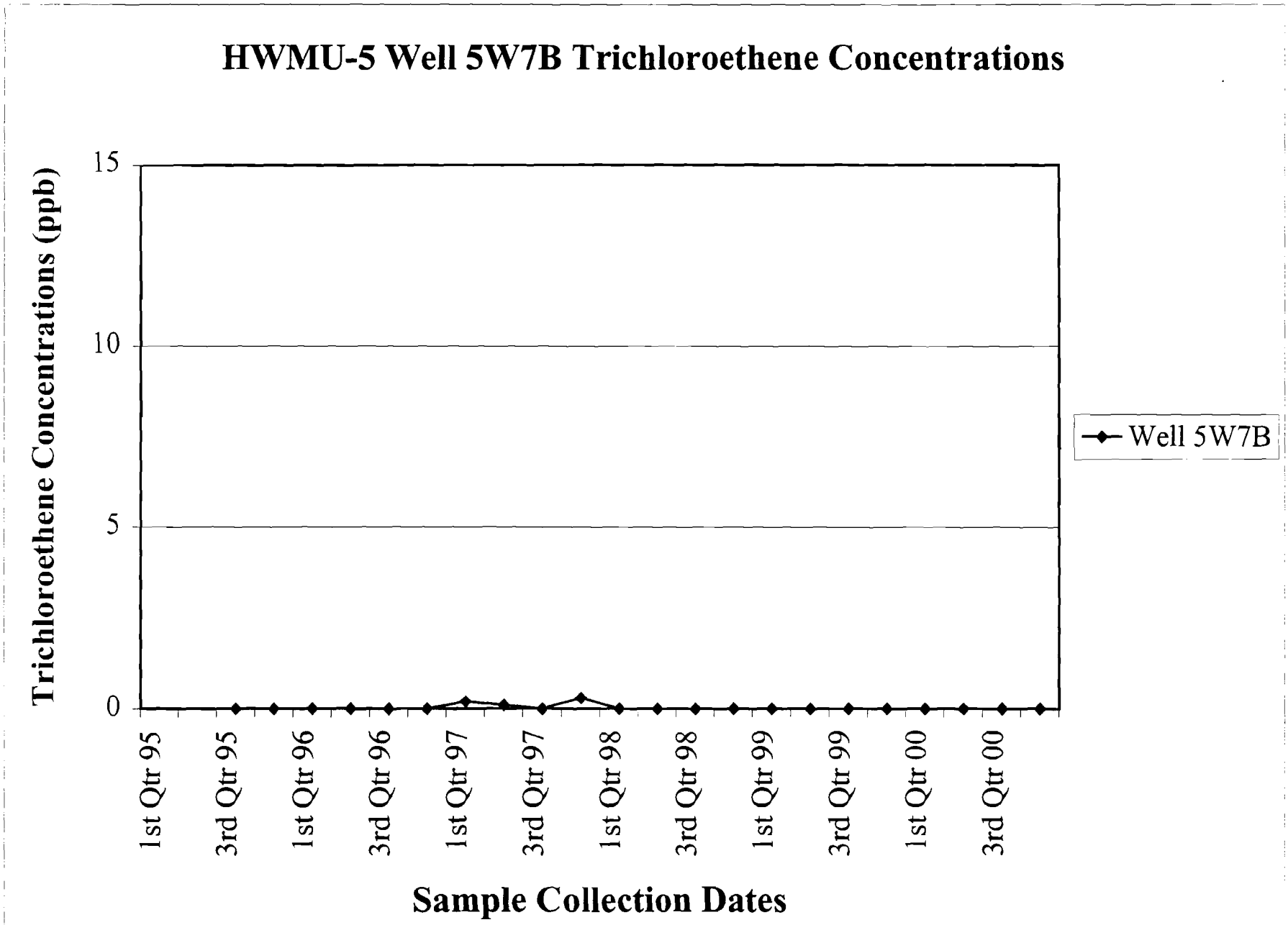
APPENDIX B

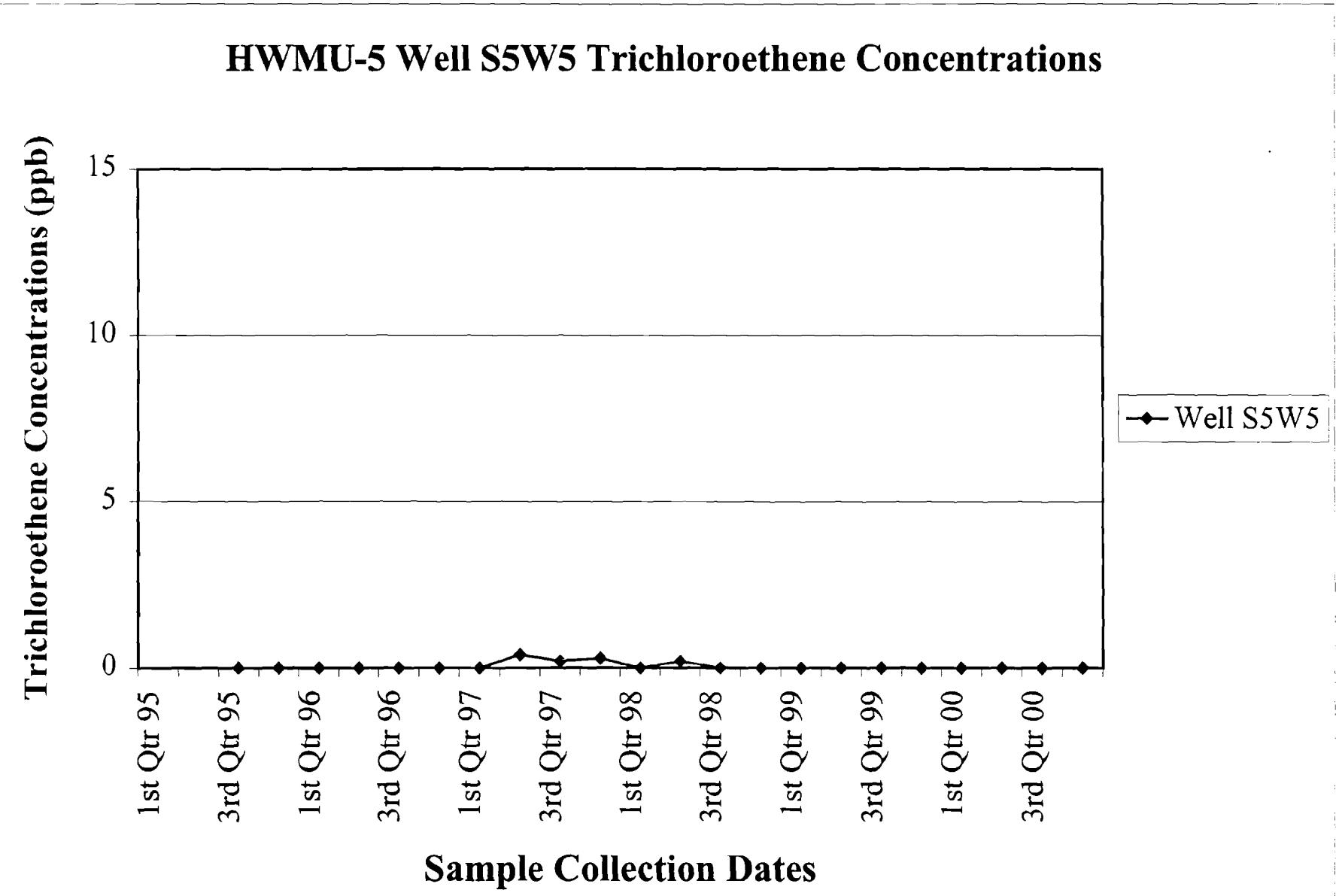
TRICHLOROETHENE HISTORIC CONCENTRATION GRAPHS

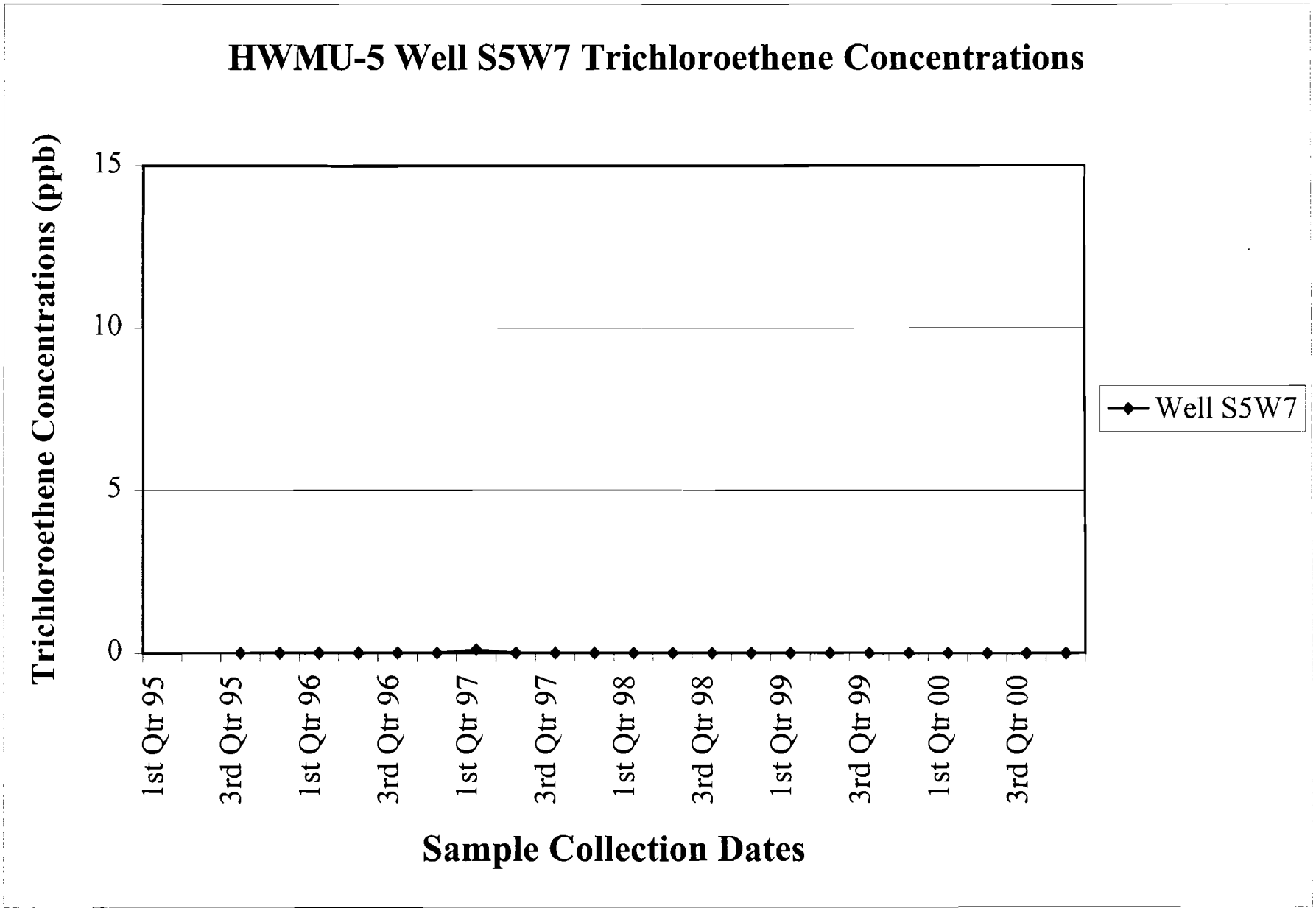

HWMU-5 Upgradient Well 5W8B Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well 5W8B

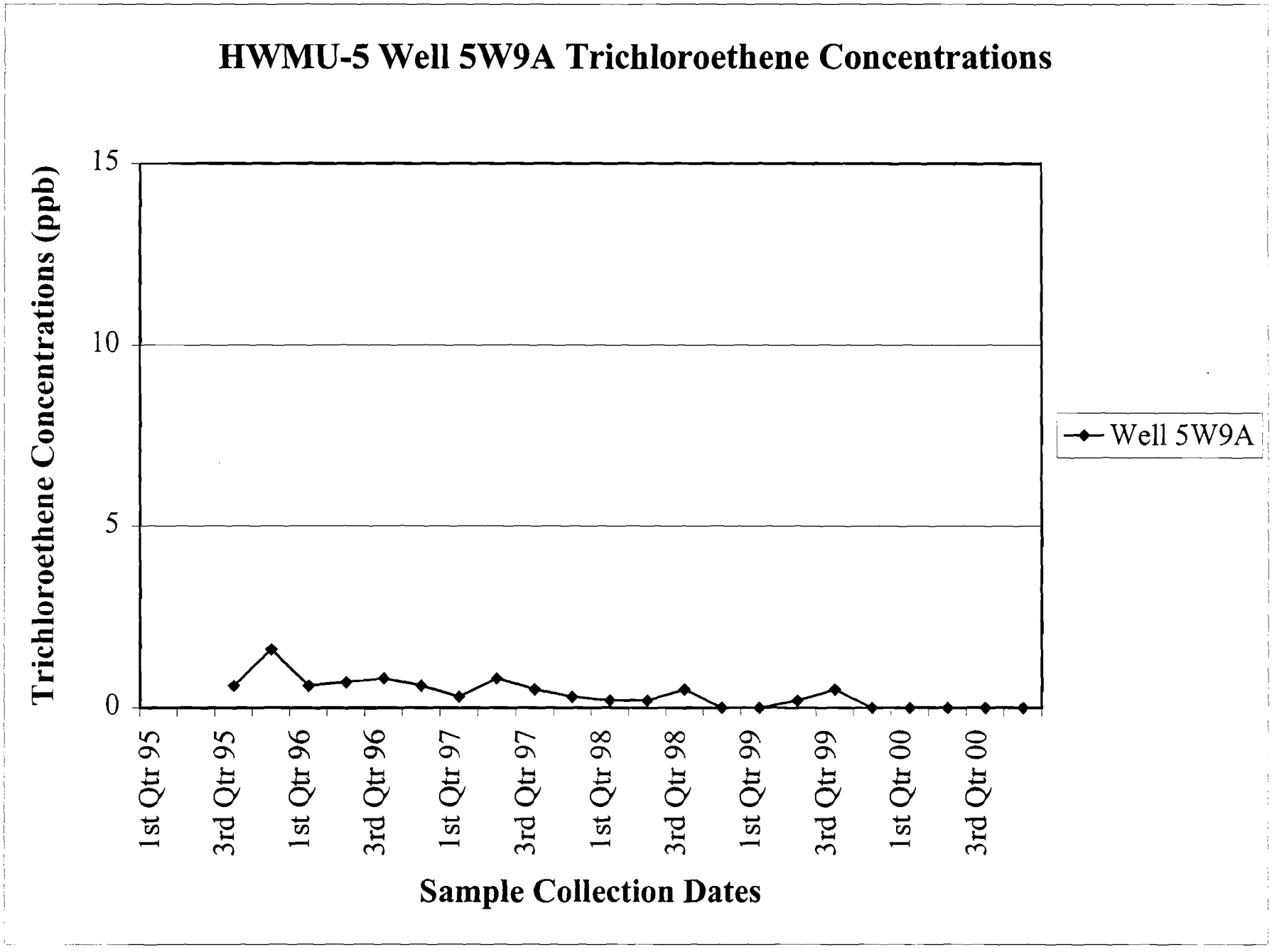

HWMU-5 Well 5W5B Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
25
20
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well 5W5B

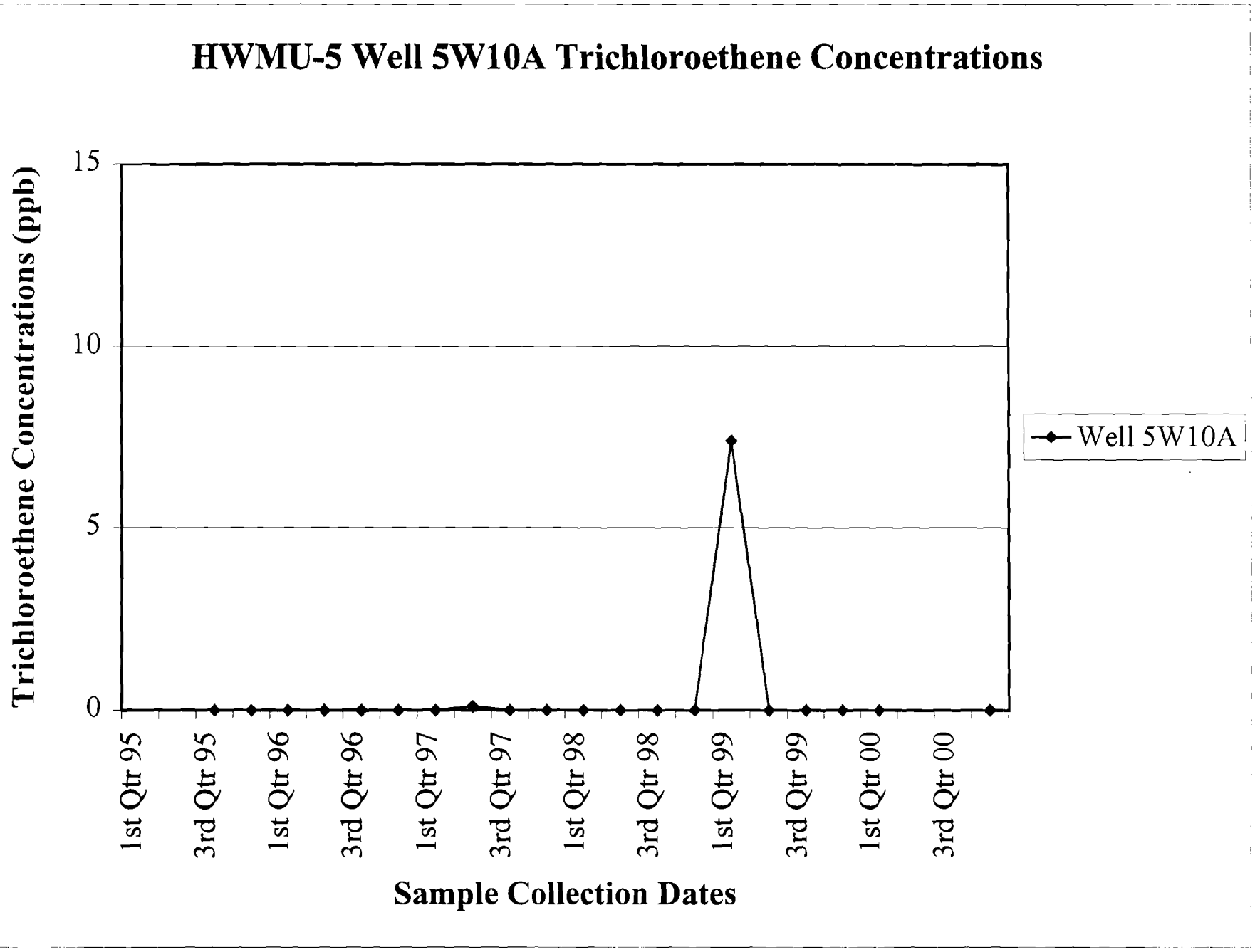

HWMU-5 Nested Wells 5WC21, 5WC22, and 5WC23
Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well 5WC21
Well 5WC22
Well 5WC23

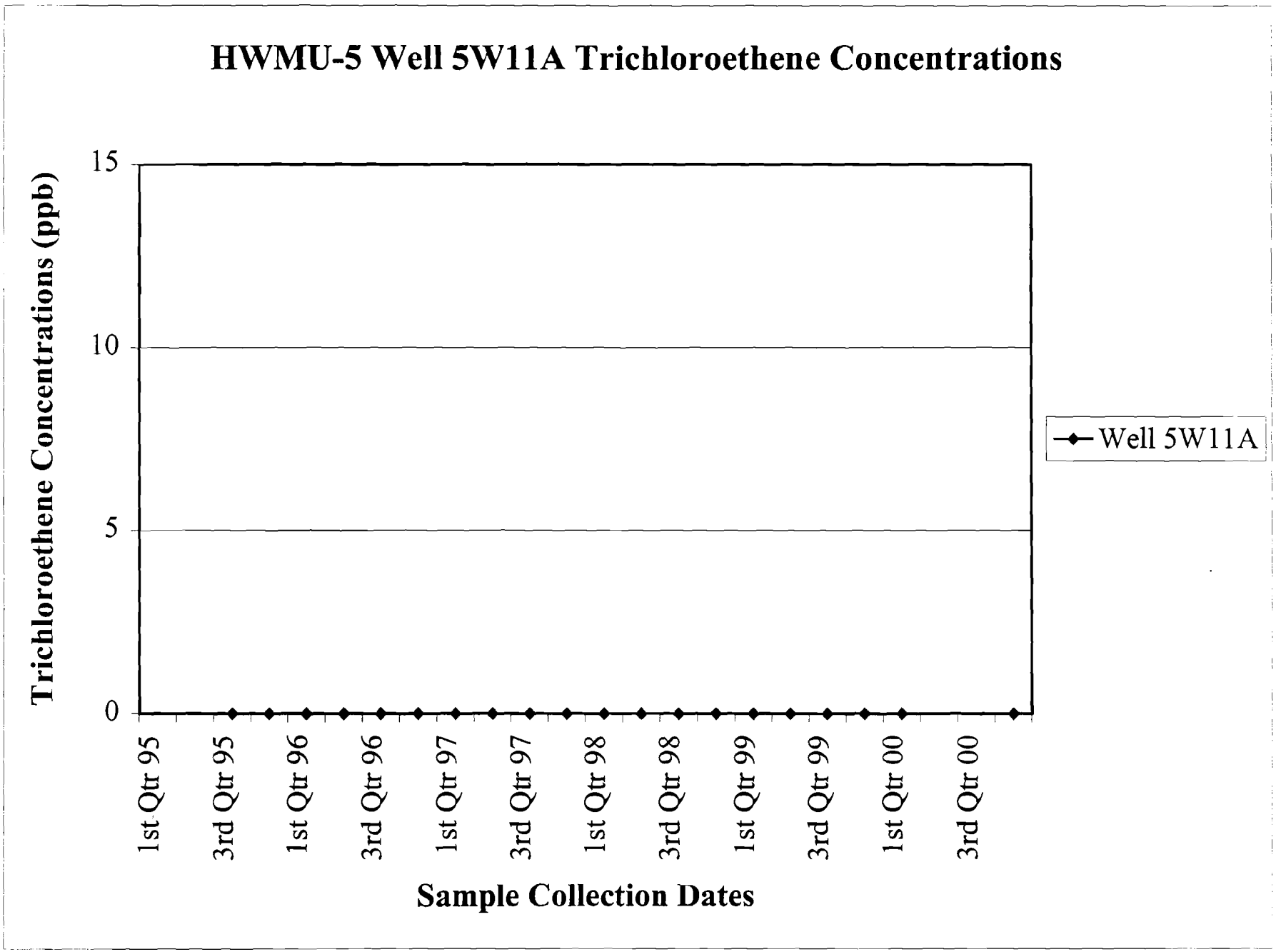

HWMU-5 Well 5W7B Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well 5W7B


HWMU-5 Well S5W5 Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well S5W5


HWMU-5 Well S5W7 Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well S5W7


HWMU-5 Well 5W9A Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well 5W9A


HWMU-5 Well 5W10A Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well 5W10A


HWMU-5 Well 5W11A Trichloroethene Concentrations
Trichloroethene Concentrations (ppb)
15
10
5
0
1st Qtr 95
3rd Qtr 95
1st Qtr 96
3rd Qtr 96
1st Qtr 97
3rd Qtr 97
1st Qtr 98
3rd Qtr 98
1st Qtr 99
3rd Qtr 99
1st Qtr 00
3rd Qtr 00
Sample Collection Dates
Well 5W11A

RADFORD AAP
HAZARDOUS WASTE MANAGEMENT UNITS 5 AND 7
RESPONSE TO VDEQ COMMENTS – JUNE 25, 2003

The VDEQ comments and DAA's responses are detailed below.

1) "...in order to demonstrate clean closure of these units, the soil and liner material immediately beneath the wastes must be sampled as well to determine if they meet clean closure standards."

A sample of the base sand beneath the residual material and above the bottom liner was collected at HWMU-5 [sample 5GP-6 (10-11')]. Samples were not collected from beneath the liner because it would have been impossible to patch the bottom liner without excavating to a depth of approximately 12 feet below ground surface (through approximately 5'-8'of residual material) in order to install the type of liner patch specified by the VDEQ. If samples are to be collected from the soils beneath the Unit, the VDEQ must approve the use of bentonite for patching the bottom liner. If the VDEQ approves the use of bentonite as a patching method, then DAA recommends the collection of two (2) soil samples from beneath the bottom liner at HWMU-5.

A sample of the base clay liner beneath the residual material was collected at HWMU-7 [sample 7GP-2 (13.5-14.5')]. A sample of the native soil beneath the residual material also was collected [sample 7GP-3 (10-11')]. Therefore, DAA does not recommend the collection of additional samples from beneath HWMU-7.

2) "Refer to Section 3.13 of the *Draft Guidance* for the requirements of all acceptable clean closure standards (i.e., analytical non-detection, background, and risk-based)."

The VDEQ comment letter did not include the referenced *Draft Guidance Manual for Closure Plans and Post-Closure Plans*. Based on previous discussions between Radford AAP and VDEQ, it is assumed that the VDEQ clean closure standards will be based on REAMS, and that VDEQ will not approve the use of USEPA Region III RBCs.

3) "...every sample of waste must not exceed the land disposal restrictions (LDRs) treatment standards specified in 40 CFR 286 [should be 268], Subpart D."

40 CFR 268 Subpart D – Treatment Standards

§268.40(e) For characteristic wastes (D001-D043) that are subject to treatment standards in the following table "Treatment Standards for Hazardous Wastes," and are not managed in a wastewater treatment system that is regulated under the Clean Water Act (CWA), that is CWA-equivalent, or that is injected into a Class I nonhazardous deep injection well, **all underlying hazardous constituents (as defined in §268.2(i)) must meet Universal Treatment Standards**, found in §268.48, Table Universal Treatment Standards, prior to land disposal as defined in §268.2(c) of this part.

§268.2(i) *Underlying hazardous constituent* means any constituent listed in §268.48, Table UTS – Universal Treatment Standards, **except fluoride, selenium, sulfides, vanadium, and zinc**, which can reasonably be expected to be present at the point of generation of the hazardous waste at a concentration above the constituent-specific UTS treatment standards.

§268.2(c) *Land disposal* means placement in or on the land, except in a corrective action management unit, and includes, but is not limited to, placement in a landfill, **surface impoundment**, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault, or bunker intended for disposal purposes.

Treatment Standards for Hazardous Wastes (§268.40)

D002–Corrosive Characteristic Wastes (Nonwastewaters): DEACT and meet §268.48 standards.

Comparison of Waste Material Samples to Universal Treatment Standards (§268.48)

See Table 1 (HWMU-5 TAL/TCL Detections), Table 2 (HWMU-7 TAL/TCL Detections), and Table 3 (TCLP Results – HWMUs 5 and 7).

Please note: Waste Characterization samples from HWMUs 5 and 7 were analyzed for standard TCLP constituents. These samples were not analyzed for TCLP antimony, beryllium, nickel, and thallium, which are listed in §268.48 – Table Universal Treatment Standards. However, the individual residual material samples were analyzed for antimony, beryllium, nickel, and thallium in total concentrations. In each case, the detected concentrations of these constituents were less than the respective TCLP threshold values; therefore, the residual material should meet the LDR criteria.

TABLE 1

HAZARDOUS WASTE MANAGEMENT UNIT 5
SUMMARY OF TAL INORGANIC CONSTITUENTS AND TCL ORGANIC CONSTITUENTS DETECTED IN RESIDUAL MATERIAL
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

Analyte / Sample Location	Date	Concentrations in mg/kg																
		Aluminum	Arsenic	Barium	Beryllium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Vanadium	Zinc	4,4-DDD
5GP-1 (9-10') (residual material)	10/31/02	12100	3.9	47.3	1.1	~	31.7	17.6	19.8	26700	9.8	1730	360	19	851	32	20.7	0.019
5GP-3 (9-10') (residual material)	10/31/02	14800	2.6	37.2	~	866	22.8	~	9.5	24400	9.7	~	90.8	5.3	~	54.3	18.6	~
5GP-8 (7-8') (residual material)	10/31/02	14200	4.1	46.1	1.3	~	21.6	11.6	16.8	28400	9.6	1410	242	10.7	1090	26.7	23.9	0.051
5GP-8 (11-12') (residual material)	10/31/02	19600	3.4	61.4	0.81	~	26.9	10	14.8	29000	9.6	1560	372	11	1420	55.2	33.8	~
40 CFR 264.48 Universal Treatment Standards		na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	0.087

NOTES:
~: Not detected above the Limit of Quantitation (LOQ).
na: Not applicable. Universal Treatment Standards for Inorganic constituents in soil are TCLP standards.

TABLE 2

HAZARDOUS WASTE MANAGEMENT UNIT 7
SUMMARY OF TAL INORGANIC CONSTITUENTS AND TCL ORGANIC CONSTITUENTS DETECTED IN RESIDUAL MATERIAL
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

Analyte / Sample Location	Date	Concentrations in mg/kg																				
		Aluminum	Arsenic	Barium	Beryllium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Vanadium	Zinc	Cyanide	4,4-DDD	4,4-DDE	N-Nitrosodiphenylamine
7GP-2 (8-12') (residual material)	11/01/02	8790	2.7	40.9	1.2	~	22	12.5	22	23300	2.8	3140	274	21.6	1070	~	21.1	15	~	~	~	~
7GP-5 (5-11') (residual material)	11/01/02	20000	3.5	55.6	~	~	22.8	~	10	23600	11	787	187	7.2	732	~	60.6	24.2	~	~	~	~
7GP-8 (5-8') (residual material)	11/01/02	22400	2.4	55	~	1570	20.1	~	12.7	23200	10.3	1090	280	8.5	1040	~	61.8	28.1	~	~	~	~
40 CFR 264.48 Universal Treatment Standards		na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	590	0.087	0.087	13

NOTES:
~: Not detected above the Limit of Quantitation (LOQ).
na: Not applicable. Universal Treatment Standards for Inorganic constituents in soil are TCLP standards.

TABLE 3

SUMMARY OF WASTE CHARACTERIZATION ANALYTICAL RESULTS - INORGANICS
HAZARDOUS WASTE MANAGEMENT UNITS 5 AND 7
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

Analyte	Sample ID		Regulatory Thresholds	40 CFR 268.48 UTS	Units
	Unit-5-TCLP	Unit-7-TCLP			
Arsenic	U	U	5	5	mg/l
Barium	0.714	0.521	100	21	mg/l
Cadmium	U	U	1	0.11	mg/l
Chromium	U	U	5	0.6	mg/l
Lead	U	U	5	0.75	mg/l
Mercury	U	U	0.2	0.2	mg/l
Selenium*	U	U	1	5.7	mg/l
Silver	U	U	5	0.14	mg/l

NOTES:

*: Selenium is not an "underlying hazardous constituent" in characateristic wastes, according to the definition at 40 CFR 268.2(i).

U: Not detected above the Limit of Quantitation (LOQ).

Presentation of Estimated Costs: Closure Planning and Evaluation - HWMU 5 and 7

TASK	DESCRIPTION	COSTS
1	Revise Closure Plans for HWMU-5 and HWMU-7 (Cost for Two Plans including mtgs.)	9,660
2	Environmental Subsurface Investigation (HWMU-5 Additional Samples - Includes Data Validation)	7,250

TOTAL PROJECT ESTIMATE	$ 16,910

TASK BREAKDOWN

			Task 1		Task 2				
Classification	Units	Rate ($)	No. Units	Cost	No. Units	Cost			
Program Manager I	Hr	**110**	12	*1,320*	8	*880*			
Senior Eng./Geol.	Hr	**90**	12	*1,080*	0	*0*			
Project Eng./Geologist	Hr	**70**	24	*1,680*	12	*840*			
Environmental Scientist	Hr	**70**	0	*0*	12	*840*			
Drafting	Hr	**55**	6	*330*	0	*0*			
Environmental Technician	Hr	**45**	0	*0*	10	*450*			
Clerical	Hr	**40**	8	*320*	6	*240*			
Reimbusables	LS			100		4,000			
Task Totals			per plan	**4,830**		**7,250**			

Breakdown of Reimbursable Costs Task II:

Item	Unit	No. Units	Cost	Total Cost
Geoprobe	day	1	2000	2,000
Laboratory	see estimate	1	2,000	2,000
		TOTAL REIMBURSABLES		4,000

Laboratory Estimate

Test	Type	Cost	No. Units	Total Cost
TAL	Soil	500	2	1,000
TCL	Soil	500	2	1,000
			TOTAL	**2,000**