US EPA RECORDS CENTER REGION 5
557259

LIMITED REMEDIAL INVESTIGATION

PIG'S EYE DUMP
RAMSEY COUNTY, MINNESOTA

VOLUME III
FINAL REPORT

Prepared for

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155

MPCA Contract Work Order No.	:	M6823
PRC Project No.	:	080-0004
Date Prepared	:	November 30, 1994
Prepared by	:	PRC Environmental Management, Inc.
PRC Project Manager	:	Thomas Wiberg
PRC Telephone No.	:	(612) 224-1149
MPCA Project Manager	:	Doug Beckwith
MPCA Telephone No.	:	(612) 296-6300

APPENDIX C

PRC STANDARD OPERATING PROCEDURES

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

PACKAGING AND SHIPPING SAMPLES

SOP NO. 019

REVISION NO. 4

Approved by:

Rick Horseman
Quality Assurance Officer

7/11/94
Date

1.0 BACKGROUND

In any sampling program, the integrity of a sample must be ensured from its point of collection to its final disposition. Procedures for classifying, handling, and shipping samples are described below. Steps in the procedure should be followed to ensure sample integrity and to protect the welfare of persons involved in shipping and receiving samples. When sent by common carrier, the packaging, labeling, and shipping of hazardous wastes and substances are regulated by the U.S. Department of Transportation [DOT, Code of Federal Regulations, Title 49, (49 CFR)].

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for packaging and shipping samples. It has been prepared in accordance with the U.S. Environmental Protection Agency (EPA)/National Enforcement Investigation Center (NEIC) "User's Guide to the EPA Contract Laboratory Program." Sample packaging and shipping procedures described in this SOP should be followed for all sample packaging and shipping unless revised by EPA. All revisions will be documented in the field logbook.

1.2 SCOPE

This SOP applies to sample classification, packaging, and shipping.

1.3 DEFINITIONS

Custody Seal – A custody seal is a tape-like seal. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been packed for shipping.

Environmental Samples – Environmental samples typically contain low concentrations of contaminants and require only limited precautionary procedures. Only those samples meeting the required specifications of the contract laboratory program (CLP) low-concentration designation should be considered environmental samples. If any doubt exists about the extent of contamination, samples should be treated as hazardous.

Hazardous Samples – Hazardous samples should be packaged and labeled according to procedures specified by the federal DOT or the state DOT, whichever is more stringent. Hazardous samples meet the required specifications of the CLP medium- or high-concentration designations. Samples containing an unknown concentration of contaminants must also be considered hazardous. DOT has established a classification and priority system for hazardous material (see Table 1). Specific chemicals can be classified by the tables in 49 CFR 172.101 or 49 CFR 172.102.

1.4 REFERENCES

U.S. Environmental Protection Agency, 1988, User's Guide to the Contract Laboratory Program. EPA Office of Emergency and Remedial Response, Washington, D.C.

TABLE 1

DOT HAZARDOUS MATERIALS CLASSIFICATION

1. Radioactive Material
2. Poison A
3. Flammable Gas
4. Nonflammable Gas
5. Flammable Liquid
6. Oxidizer
7. Flammable Solid
8. Corrosive Material (liquid)
9. Poison B
10. Corrosive Material (solid)
11. Irritating Materials
12. Combustible Liquid (in containers having a capacity exceeding 110 gallons)
13. Other Regulated Material (ORM)-B
14. ORM-A
15. Combustible Liquid (in containers having a capacity of 110 gallons or less)
16. ORM-E

Note:

PRC will not ship explosives, so they have been omitted. ORM-C and ORM-D are not relevant for hazardous waste samples.

1.5 REQUIREMENTS AND RESOURCES

The following equipment is required for proper packaging and shipping of samples:

- All normal sampling equipment (containers, labels, ice, chain-of-custody forms, vermiculite, coolers, and so on) as given in the site-specific sampling plan. Note that only inert noncombustible packing material (not plastic chips) can be used.
- Paint cans to hold sample containers
- Labels for hazardous materials, such as flammable liquid, flammable solid, and so on
- Special airbills for hazardous material shipment

2.0 PROCEDURES

The following procedures apply to handling liquid and solid samples.

2.1 PACKAGING ENVIRONMENTAL SAMPLES

Environmental samples are collected in an appropriate container, sealed, and labeled. The container is then sealed inside a ziplock polyethylene bag. The sealed package is then placed in an iced cooler, and packed to prevent breakage (for example, sample containers are surrounded with vermiculite or other inert packaging material). After chain-of-custody forms are completed, they are sealed in plastic bags and taped inside the lid of the cooler.

Custody seals will be signed and attached to the cooler so that any tampering will be detected.

2.2 CLASSIFYING HAZARDOUS SAMPLES

First, classify the hazardous samples following the priorities given in Table 1. Initially, all samples should be surveyed for radiation. If radiation levels are below 0.5 millirems per hour (mR/h) at the surface of the package material, the sample should not be shipped as radioactive. If the radiation level exceeds 0.5 mR/h, the sample should be shipped as radioactive. Consult 49 CFR 173, Subpart I, for proper definition and shipping of a radioactive sample.

Poison A is the next category on the DOT list (see Table 2). According to DOT, Poison A substances are gases or liquids that are life threatening in very small amounts (49 CFR 173.326). Many of the Poison A materials are gases or compressed gases that would not be found in drum-type containers. Liquid Poison A substances would probably be found in closed containers, a situation that presents a "worst case" scenario. Not all samples found in drums should be labeled "Poison A." Based on the information available, a judgment must be made as to the hazard class of the sample. If the sample is suspected or determined to fall within the "Poison A" classification, packaging procedures specified by DOT should be followed as specified in 49 CFR 173.326-328.

The next two classifications in the DOT series are "flammable gas" and "nonflammable gas" (49 CFR 173.300). Few, if any, gas samples are expected to be collected at uncontrolled hazardous waste sites. Use this category only when shipping containerized gases or gas samples.

The next category is "flammable liquids" (49 CFR 173.115). Hazardous samples in liquid form, unless known to fall into a lower category, should be handled, packaged, and shipped at this level of concern. Lesser categories will generally not be considered because flashpoint testing required to drop to a lower level is difficult and possibly dangerous in the field. Samples should be handled at the "flammable" level, rather than undertake a field determination of flash point.

TABLE 2

THE PHYSICAL STATE OF CLASS A POISONS AT ROOM TEMPERATURE

COMPOUND	PHYSICAL STATE
Arsine	gas
Bromoacetone	liquid
Chloropicrin and methyl chloride mixture	gas
Chloropicrin and nonflammable, nonliquified compressed gas mixture	gas
Cyanogen	gas
Cyanogen chloride	gas (above 13° C)
Gas identification set	gas
Germane	gas
Hexaethyl tetraphospate and compressed gas mixture	gas
Hydrocyanic acid (prussic solution)	liquid
Hydrocyanic acid, liquified	gas
Insecticide liquified gas (containing Poison A or Poison B material)	gas
Methydichloroarsine	liquid
Nitric oxide	gas
Nitrogen dioxide, liquid	gas
Nitrogen peroxide	gas
Nitrogen tetroxide	gas
Parathion and compressed gas mixture	gas
Phosgene (diphosgene)	gas (liquid)
Phosphine	gas
Tetraethyl dithiopyrophosphate and compressed gas mixture	gas
Tetraethyl pyrophosphate and compressed gas mixture	gas

Note:
Phosgene and diphosgene are two chemicals covered by one name in DOT regulations.

Solids samples known or suspected to be flammable should be shipped as "flammable solids" (49 CFR 173.150). Based on characteristics of the sample and DOT regulations, nonflammable solids may be shipped as "Poison B" (49 CFR 173.343), "corrosive" (49 CFR 173.240), or "irritant materials" (49 CFR 173.381).

A single package containing less than 5 pounds of solid or less than 1 pint of liquid hazardous waste may be shipped as Other Regulated Material (ORM). If the material is known, the ORM-A or ORM-B classification may be used. ORM-A and ORM-B materials are listed in 49 CFR 173, parts K and L. If the material is unknown or not listed under parts K and L, the ORM-E category may be used. The ORM-E category is used for hazardous waste liquids and solids not otherwise specified.

Because of the low levels of contamination expected at most hazardous waste sites, most samples will be treated as environmental samples.

2.3 SAMPLE PACKAGING

An overview of the procedures to follow for packaging samples is presented below. These procedures include the following:

- Collect samples in appropriate sample containers (see SOP No. 017, Sample Collection Container Requirements, or the site-specific sampling plan). When collecting a solid material, the container and its contents shall not exceed 1 pound net weight. Large quantities of solid material (up to 1 gallon) may be collected if the flash point of the sample can be determined to be 73 degrees Fahrenheit (° F) or higher. In these cases, this information should be marked on the outside of the shipping container, but only a single (1 gallon or less) bottle may be packed in each shipping container. Shipping papers must state that the flash point is 73° F or higher.

- Seal the sample container.

- Attach a completed sample identification tag (see SOP No. 018, Sample Custody, or the site-specific sampling plan).

- Place each container in a separate 2-millimeter thick (or thicker) recloseable, polyethylene bag. Position the sample identification tag so it can be read through the bag.

- Place each sealed bag inside a metal can or other DOT-approved container. Use only one bag per container. Pack metal can with enough noncombustible, absorbent, cushioning material (such as bentonite, vermiculite, or diatomaceous earth) to prevent breakage and provide for absorption of liquid. Close the metal can and secure the lid with clips, tape, or other positive means.

- Use labels supplied by the Regional Equipment Manager for each DOT-approved container. Label each container with the appropriate DOT hazardous labels. [For example, "Cargo Aircraft Only (Danger - Peligro)" and one of the following: "Flammable Liquid," "Flammable Solid," "Dangerous When Wet," or "Corrosive"]. Label conservatively and use "Flammable Liquid N.O.S. UN1922" for most liquids and "Flammable Solid N.O.S. UN1325" for most solids. If the sample is definitely not a flammable liquid or solid, use another category in the DOT hierarchy. Use "Not Otherwise Specified" (N.O.S.) when the sample is definitely not identified. Identify the sample by name and UN identifier when known.

- Place metal cans, other DOT-approved containers, or a single 1-gallon bottle into a strong outside shipping container, such as a metal picnic cooler or an approved fiberboard box. Surround with noncombustible, absorbent packing material for stability during transport. See Figure 1 for a summary of CLP hazardous sample packaging.

- Attach the same DOT labels as above; a limited quantity label; and a laboratory name and address label to the top and front of the cooler. Place "This End Up" labels on adjacent sides of the cooler. Do not allow labels to overlap or be covered by strapping tape.

- Attach custody seals, and secure the shipping container with strapping tape.

2.4 SHIPPING PAPERS

Use abbreviations only as specified below. Complete the bill of lading supplied by the carrier. Sign the certification statement. If no certification statement is provided by the carrier, use the standard industry form. Include the following information in the order listed: "Flammable Liquid, N.O.S. UN1933," "Flammable Solid, N.O.S. UN1325," "Cargo Aircraft Only," "Limited Quantity" (or "Ltd. Qty."), "Laboratory Samples," "Net Weight __" or "Net Volume __" of hazardous contents, by item, if more than one metal can is inside of the exterior container. Place the net weight or net volume just before or just after the "Flammable Liquid, N.O.S." or "Flammable Solid, N.O.S." description.

Include a complete chain-of-custody record in a recloseable, polyethylene bag in the sample container. Containers must be locked or otherwise sealed. Immediately upon shipment of samples, call the sample management office (SMO) with the site-specific information (if using the CLP RAS). If samples are shipped to a SAS or non-CLP laboratory, the laboratory should be called directly with the site-specific information. Record the communication in the field logbook. A checklist for coordinating the tasks involved in sample shipment is provided on Figure 1.

2.5 TRANSPORTATION

Hazardous or environmental samples may be transported by PRC personnel in private vehicles. Samples will be shipped by Federal Express or another common carrier; however, hazardous samples cannot be transported by any carrier that also carries passengers.

2.6 POTENTIAL PROBLEMS

The following potential problems may occur during sample shipment:

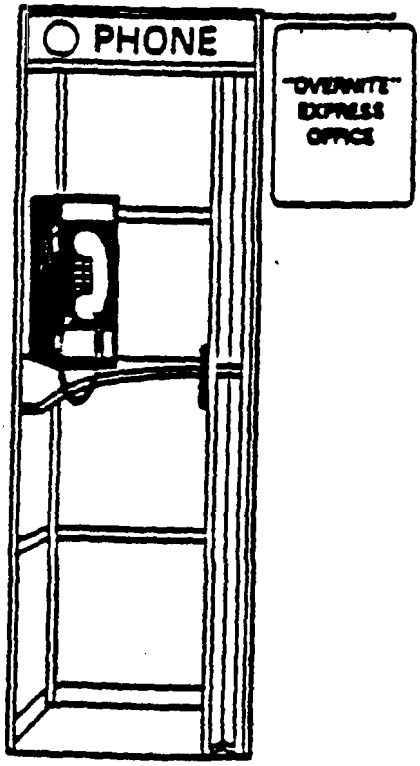
- Incorrect or incomplete paperwork
- Laboratory receipt of incorrect samples
- Insufficient volume for analysis requested
- Broken or leaking samples

If any of these problems are encountered, immediately contact SMO (if using the CLP RAS) and the PRC Project Manager. If using a SAS or non-CLP laboratory, the laboratory and PRC Project Manager should be called immediately with any problems encountered.

FIGURE 1

SAMPLE SHIPMENT COORDINATION CHECKLIST

IMMEDIATELY UPON SHIPMENT OF SAMPLES, SAMPLERS CALL SMO OR RSCC (AS APPROPRIATE)



- CASE AND/OR SAS NUMBER
- NAME OF LABORATORY
- DATE OF SHIPMENT
- CARRIER, AIRBILL (SHIPMENT) NUMBERS AND TYPE OF SERVICE
- NUMBER AND MATRICES (WATERS, SOILS, ETC.) OF SAMPLES SHIPPED
- INFORMATION ON COMPLETIONS, CHANGES, DELAYS, CONTINUATIONS, ETC., PERTINENT TO THE CASE
- SAMPLER'S NAME, REGION, AND PHONE NUMBER
- SMO MUST BE NOTIFIED BY 3:00 PM ON FRIDAY FOR SAMPLES INTENDED FOR SATURDAY DELIVERY/PICKUP

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

SAMPLE CUSTODY

SOP NO. 018

REVISION NO. 2

Approved by:

Daniel Ashenberg
Quality Assurance Officer

2/2/93
Date

1.0 BACKGROUND

In any sampling and analytical program, the integrity of a sample must be documented from its point of collection to its final disposition. The documentation of the possession and handling of samples is referred to as "chain of custody." The components of this chain, such as sample custody seals, traffic reports, field logbooks, chain-of-custody records, and sample identification tags, and the procedures for their use are described below.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for sample custody. It has been prepared in accordance with the U.S. Environmental Protection Agency (EPA)/National Enforcement Investigation Center (NEIC) User's Guide to the EPA Contract Laboratory Program (CLP). Sample custody and documentation procedures described in this SOP should be followed throughout all sample collection activities unless the procedures are revised by EPA. All revisions must be documented in the field logbook.

1.2 SCOPE

This SOP applies to sample custody and the activities associated with it.

1.3 DEFINITIONS

None.

1.4 REFERENCES

U.S. Environmental Protection Agency, 1988, User's Guide to the EPA Contract Laboratory Program. EPA Office of Emergency and Remedial Response, Washington, D.C.

1.5 REQUIREMENTS AND RESOURCES

Numerous sample identification documents are used to control sample disposition and to maintain a chain-of-custody record for all samples collected. These documents include sample container labels, identification tags, custody seals, chain-of-custody records, and traffic report forms.

2.0 PROCEDURES

The following subsections present detailed instructions for completing chain-of-custody documents, including sample container labels, sample identification tags, custody seals, chain-of-custody records, and traffic reports.

2.1 SAMPLE CONTAINER LABELS

The sample container label is an adhesive label with designated areas to indicate the station location, date and time of sample collection, analysis requested, and preservative added. Before placing the sample material in the appropriate container, the sampler should complete the label with waterproof ink and affix the label to the container. When necessary, the sample label should be protected from water and solvents with clear tape.

2.2 SAMPLE IDENTIFICATION TAGS

Sample identification tags (Figures 1 and 1A) provided by EPA are used to maintain control of laboratory samples. The PRC field team leader should distribute the tags to field team members. The EPA serial numbers should be recorded in the field notebook. Sample tags should be attached to all sample containers used. Unused tags should be returned to the field team leader. Each tag should be completed as follows:

- Space No. 1 should be completed with the case number provided by the CLP laboatory.
- Space No. 2 should be completed with the appropriate sample location number.
- Spaces No. 3A and 3B should be completed with the time and date of sample collection, respectively.
- Space No. 4 should designate whether the sample is grab or composite.
- Space No. 5 should be completed with the sampling location.
- Space No. 6 should contain the signature(s) of the sampler(s).
- Space No. 7 should designate whether a preservative has been added to the sample. If a preservative has been added to the sample, the name of the preservative should be written in the space marked "Remarks."
- Space No. 8 should designate all appropriate analyses to be performed by the laboratory.
- The remarks section should include the traffic report sample number and bottle lot number.

FIGURE 1

SAMPLE TAG

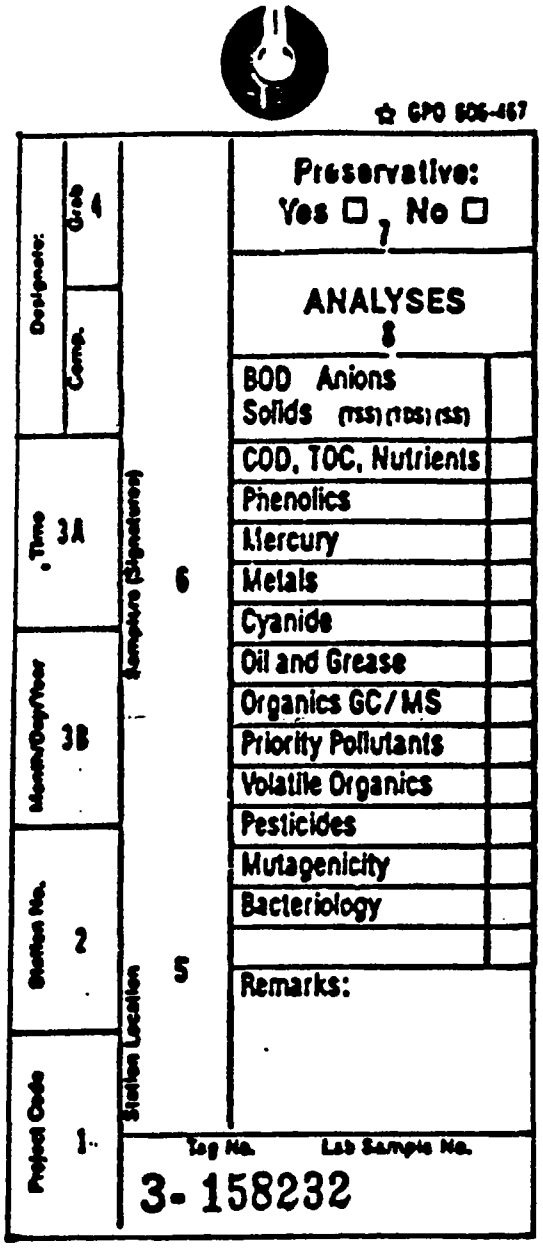
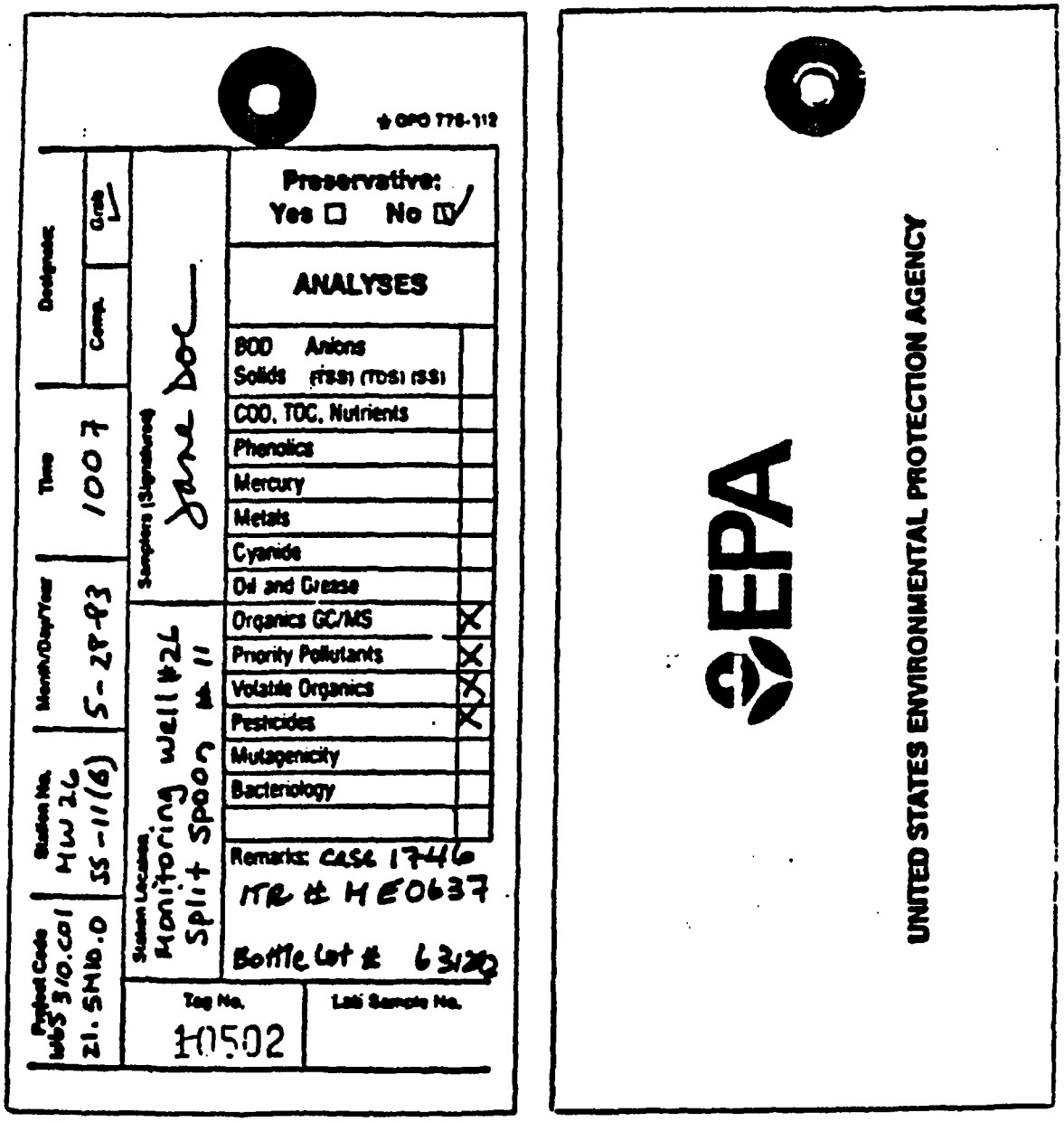


FIGURE 1A

SAMPLE TAG



2.3 CUSTODY SEALS

A custody seal is an adhesive label. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been packed for shipping. When samples are shipped to an EPA regional CLP laboratory, they must be placed in containers sealed with EPA custody seals. Custody seals differ among EPA regions; three examples are shown on Figure 2. Some custody seals are serially numbered; others are unnumbered and only provide evidence that the sample has not been tampered with. Two seals must be signed and placed on each shipping container or cooler: one at the front and one at the back as shown on Figure 3. Clear tape should be placed over the seals to help ensure that they are not accidentally broken during shipment.

2.4 CHAIN-OF-CUSTODY RECORDS

All sample shipments should be accompanied by a chain-of-custody record (see Figures 4 and 4A) that identifies their contents. The original record should accompany the shipment, and the yellow copy should be given to the PRC field team leader. Because field sample data may be the object of litigation, the custody of the samples must be documented from collection through laboratory analysis. A chain-of-custody record accompanies the samples to identify each transfer of custody. Individuals relinquishing and receiving samples should sign, date, and note the time of transfer on the record. This record should be used to document sample custody transfer from the sampler to another PRC team member, to a shipper, or to the regional or CLP laboratory. All field sampling personnel should sign the form as field samplers. The first individual to relinquish custody must sign the chain-of-custody record as a field sampler.

FIGURE 2
CUSTODY SEALS

ENVIRONMENTAL PROTECTION AGENCY

SAMPLE NO.

SIGNATURE

PRINT NAME AND TITLE (Inspector, Analyst or Technician)

SEAL BROKEN BY

DATE

EPA Form 7380-2 (10-71)

CUSTODY SEAL

Date

Signature

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

CUSTODY SEAL

Date

Signature

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SAMPLE SEAL

SAMPLE NO.

DATE

SIGNATURE

PRINT NAME AND TITLE (Inspector, Analyst or Technician)

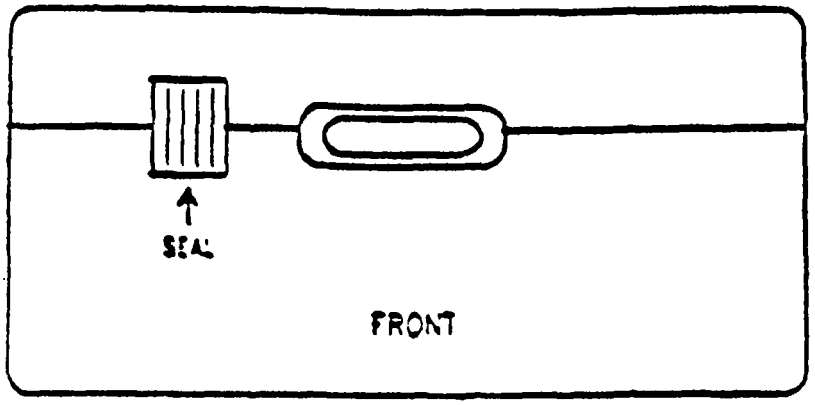
SEAL BROKEN BY

DATE

EPA FORM 7380-2 (87-78)

FIGURE 3

PLACEMENT OF SECURITY SEALS ON SHIPPING CONTAINERS AND COOLERS



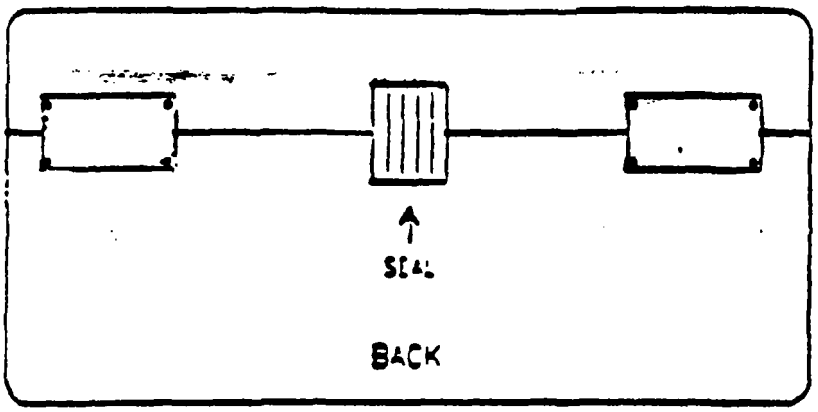


FIGURE 4

CHAIN-OF-CUSTODY RECORD

PROJ. NO. 1	PROJECT NAME 2						NO. OF CONT. CONTAINERS							REMARKS
SAMPLERS. (Signature) 3														
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION									
4	5A	5B	6A	6B	7		8	9A					9P	10

Relinquished by: (Signature)	Date / Time		Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
11	12A	12B				
Relinquished by: (Signature)	Date / Time		Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time		Received for Laboratory by: (Signature)	Date / Time	Remarks 13	

FIGURE 4A

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY RECORD

PROJ. NO.: 12-3456
PROJECT NAME: # 0123
SAMPLERS: (Signature) John Sampler

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	Total Metals	Cyanide						ITA	REMARKS Tag #
001	9/26	8:00		X	LOC-ST-010	2	X	X						ME1301	5-102501
														"	5-102502
002	9/26	11:00		X	LOC-ST-011	2	X	X						ME1302	5-102503
														"	5-102504
003	9/26	14:00		X	LOC-ST-012	2	X	X						ME1303	5-102505
														"	5-102506
004	9/26	17:00		X	LOC-ST-013	2	X	X						ME1304	5-102507
														"	5-102508
005	9/26	18:00		X	LOC-ST-014	2	X	X						ME1305	5-102509
														"	5-102510

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
John Sampler	9/26 8:00	Federal Express			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) Mary Sunshine	Date / Time 9/27 10:00	Remarks Case # 1000 Fed. Ex. # 123456789 Custody Seals # 81123 & 81123	

Samples should be packaged properly for shipment (as detailed in SOP No. 019) and should be dispatched to the appropriate laboratory for analysis. A separate chain-of-custody record should accompany each shipment.

Whenever samples are split with another party, it should be noted in the remarks section of the chain-of-custody record.

The procedure for completing the chain-of-custody record is as follows:

1. Space 1 should list the case number provided by the laboratory.
2. Space 2 should list the initials of the site name.
3. Space 3 should contain the signature(s) of the sampler(s).
4. Column 4 should list the sampling location number for each sample shipped.
5. Columns 5A and 5B should list the date and time each sample was taken.
6. Columns 6A and 6B should indicate whether each sample shipped was a composite or grab sample.
7. Column 7 should list the sampling location for each sample.
8. Column 8 should list the total number of sample containers for each sample shipped.
9. Columns 9A through 9F should indicate the type of sample shipped.
10. Column 10 should list the traffic report sample number and the sample identification tag number for each sample container shipped.
11. Space 11 should contain the signature of the sample collector.
12. Spaces 12A and 12B should list the date and time the samples were relinquished by the sample collector.

13. Space 13 should list the carrier's name and the airbill number.

14. The sample cooler should be properly packed for shipping.

15. The completed original, white copy of the chain-of-custody record, should be shipped inside the cooler, as detailed in SOP No. 019. The yellow copy should be retained by the PRC field team leader and should be placed in the project file.

If sent by mail, the package should be registered and a return receipt should be requested. If sent by common carrier, a bill of lading should be used. Air freight shipments should be sent collect. Freight bills, postal service receipts, and bills of lading should be retained as part of the chain-of-custody documentation (see Figure 5). The carrier will provide the forms and instructions for filling them out.

2.5 TRAFFIC REPORTS

Different traffic report forms are used for each of the major types of assay under the CLP. These include organic, inorganic, dioxin, and special analytical service (SAS).

2.5.1 Organic and Inorganic Traffic Reports

For samples shipped to CLP laboratories for organic and inorganic analysis, field investigation personnel should use Organic Traffic Report forms (see Figures 6 and 6A) and Inorganic Traffic Report forms (see Figures 7 and 7A) provided by EPA.

Traffic reports are preprinted forms provided by EPA's Sample Management Office (SMO). These forms are part of EPA's sample tracking system and are used to trace shipment of samples for CLP laboratory analysis.

FIGURE 5

AIRBILL

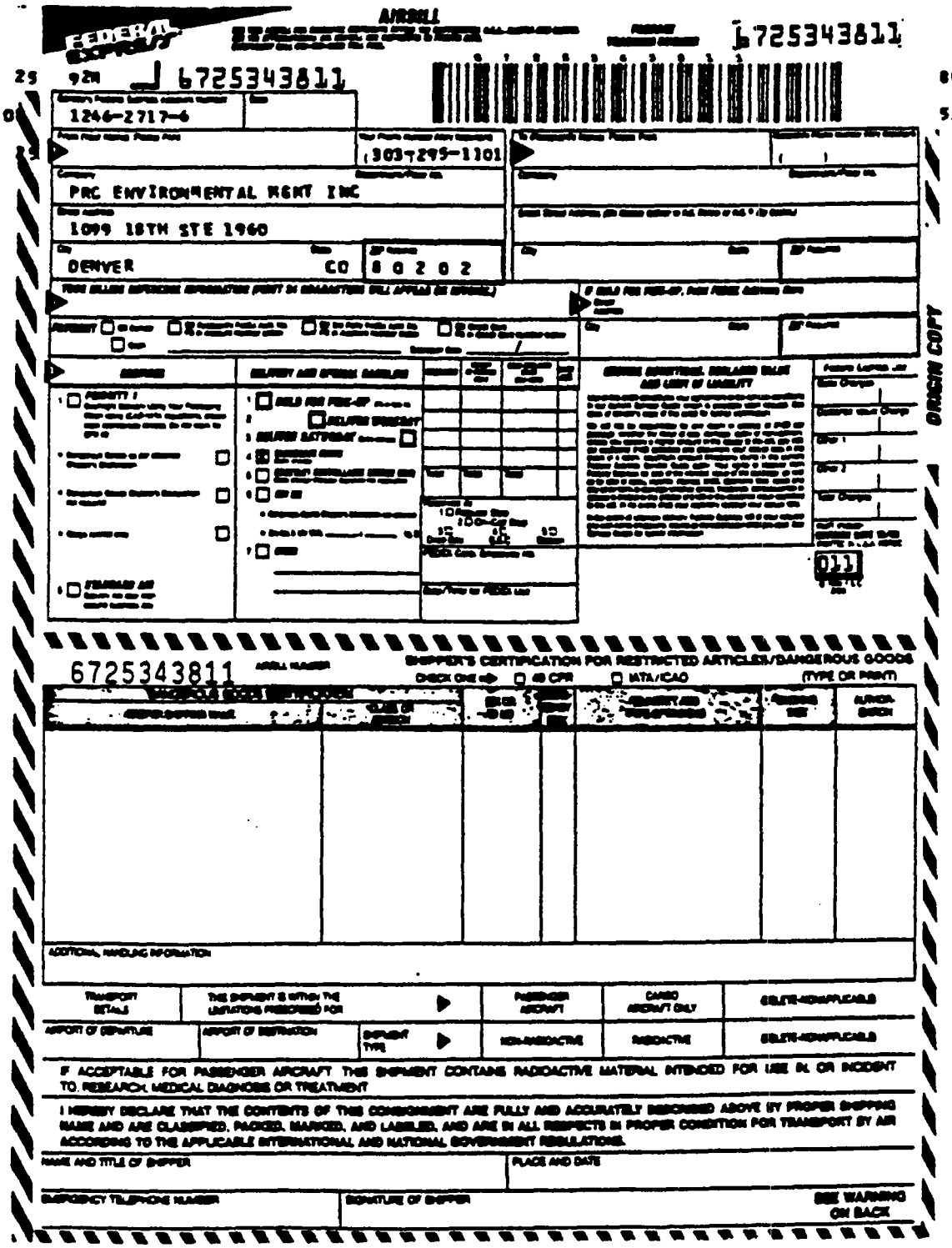


FIGURE 6

ORGANIC TRAFFIC REPORT

EPA

United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

Organic Traffic Report
(For CLP Use Only)

Case Number | SAS No. (if applicable)

1. Type of Activity (Check one): ☐ EHF ☐ HPLD ☐ PA ☐ SI ☐ SMS ☐ ER ☐ O&M ☐ RD ☐ ST ☐ Other (Specify) ☐ ESI ☐ PA ☐ RPS ☐ STPA

Non-Superfund Program

Site Name

City, State | Site Split ID

2. Region Number | Sampling Co.

Sampler (Name)

3. Ship To

4. Date Shipped | Airbill Number

Carrier

Triple volume required for matrix spike/duplicate aqueous sample.

Ship medium and high concentration samples in paint cans.

See reverse for additional instructions.

5. Sample Description (Enter in Column A)

1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (SAS)
7. Waste (SAS)
8. Other (SAS) (Specify)

CLP Sample Number (From labels)	(A) Sample Description (From Item 5)	(B) Concentration L=low M=med H=high	(C) RAS Analysis VOA	BNA	Pest/PCB	(D) Special Handling	(E) Station Location	(F) Date/Time of Sample Collection	(G) Corresponding CLP Inorganic Sample Number

EPA Form 9110-2 (9-88) Replaces EPA Form 2070-7, which may be used. Blue - SMO Copy Pink - Region Copy White - Lab Copy for Return to SMO Yellow - Lab Copy

FIGURE 6A

ORGANIC TRAFFIC REPORT

EPA — Organic Traffic Report (For CLP Use Only)

Case Number: 10001

1. Type of Activity (Check one): [ ] Other [ ] NPDES [ ] RA [ ] SI [ ] RI [ ] SMS [ ] Other (Specify) [ ] RCRA [ ] Chem [ ] RD [ ] RI [ ] Chem. [ ] PA [X] RCRA

2. Region Number: I — Sampling Co.: XYZ Co.

3. Date Shipped: 11-4-88 — AWB Number: 1234567890

Sampler (Name): Joe Sampler — Carrier: Fed Ex

Site Name: Drum Site

City, State: Anytown, MA — Site Spill ID: 03

Ship to: CLP Lab, 100 Main St., Tiny Town, ME 02294, Attn M. Spec

Single volume required for metals, cyanide/phenols, organics samples.

Ship medium and high concentration samples in point cons.

See reverse for additional instructions.

5. Sample Description (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (SAS)
7. Waste (SAS)
8. Other (SAS) (Specify)

CLP Sample Number (From Inbody)	(A) Sample Description (See Page 1)	(B) Container Volume (Liter Minimum Weight)	(C) RAS Analysis VOA	SVOA	Pest/PCB	(D) Special Handling	(E) Station Location	(F) Date/Time of Sample Collection	(G) Corresponding CLP Inorganic Sample Number
AB123	2	L	X	X	X		MW-1	11-3/0800	MAZ 221
AB124	2	L	X	X	X		MW-2	11-3/0830	MAZ 22
AB125	2	L	X	X	X		MW-3	11-3/0845	MAZ 223
AB126	2	L	X	X	X		MW-4	11-3/0900	MAZ 224
AB127	2	L	X	X	X		MW-5	11-3/1000	MAZ 225
AB128	2	L	X	X	X		MW-6	11-3/1030	MAZ 226
AB129	2	L	X	X	X		MW-7	11-3/1100	MAZ 227
AB130	2	L	X	X	X		MW-8	11-3/1130	MAZ 228
AB131	2	L	X	X	X		MW-9	11-3/1400	MAZ 229
AB132	2	L	X	X	X		MW-10	11-3/1500	MAZ 230
AB133	2	L	X	X	X		MW-11	11-3/1530	MAZ 231
AB134	2	L	X	X	X		MW-12	11-3/1600	MAZ 232
AB135	2	L	X	X	X	MS/MSD	MW-13	11-3/1700	MAZ 233
AB136	2	L	X	X	X		MW-14	11-4/0900	MAZ 234
AB137	2	L	X	X	X		MW-15	11-4/1000	MAZ 235
AB138	2	L	X	X	X		MW-16	11-4/1100	MAZ 236
— SHIPPING COMPLETE —									
No more to ship under this case no.									

EPA Form 2200-4 (8-88) Replaces EPA Form 2200-2, which may be used. White - SMO Copy Pink - Region Copy Yellow - Lab Copy for Return to SMO Yellow - Lab Copy

FIGURE 7

INORGANIC TRAFFIC REPORT

EPA

United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

Inorganic Traffic Report
(For CLP Use Only)

Case Number | SAS No. (if applicable)

1. Type of Activity (Check one)
☐ ENF ☐ NPLD ☐ RA ☐ SI ☐ STSI
☐ ER ☐ O&M ☐ RO ☐ ST ☐ Other (Specify)
☐ ESI ☐ PA ☐ RIFS ☐ STPA

Non-Superfund Program

Site Name

City, State | Site Spill ID

2. Region Number | Sampling Co.

Sampler (Name)

3. Ship To:

4. Date Shipped | Airbill Number

Carrier

Double volume required for matrix spike/duplicate aqueous sample.

Ship medium and high concentration samples in paint cans.

See reverse for additional instructions.

5. Sample Description (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (SAS)
7. Waste (SAS)
8. Other (SAS) (Specify)

CLP Sample Number (From labels)	(A) Sample Description (From box 1)	(B) Concentration L=low M=med H=high	(C) RAS Analysis: Total Metals	(C) RAS Analysis: Cyanide	(D) Special Handling	(E) Station Location	(F) Date/Time of Sample Collection	(G) Corresponding Organic Sample Number

EPA Form 9110-1 (8-88) Replaces EPA Form 2075-6, which may be used. Green - SMO Copy Pink - Region Copy White - Lab Copy for Return to SMO Yellow - Lab Copy

FIGURE 7A

INORGANIC TRAFFIC REPORT

EPA

United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

Inorganic Traffic Report
(For CLP Use Only)

Case Number: 10101
SAS No. (if applicable):

1. Type of Activity (Check one): [ ] ENF [ ] NPLD [ ] RA [X] SI [ ] STSI [ ] ER [ ] O&M [ ] RD [ ] ST [ ] Other (Specify) [ ] ESI [ ] PA [ ] RIFS [ ] STPA

2. Region Number: X
Sampling Co.: Acme Co.
Sampler (Name): Joan Sampler
Site Name: Drum Site
City, State: Green City, OR
Site Spill ID: 05

3. Ship To: Analytical Lab
100 Center Ave
Anytown, CA 94568
Attn A. Metal

4. Date Shipped: 11-4-88
Airbill Number: 0987654321
Carrier: Fed Ex

Double volume required for matrix spike/duplicate aqueous sample.
Ship medium and high concentration samples in paint cans.
See reverse for additional instructions.

5. Sample Description (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (SAS)
7. Waste (SAS)
8. Other (SAS) (Specify)

CLP Sample Number (From labels)	(A) Sample Description (From Box 1)	(B) Concentration L=low M=med H=high	(C) RAS Analysis: Total Metals	(C) RAS Analysis: Cyanide	(D) Special Handling	(E) Station Location	(F) Date/Time of Sample Collection	(G) Corresponding Organic Sample Number
MJZ 900	1	L	X	X		LOC-1	11-4/0700	JA 321
MJZ 901	1	L	X	X		LOC-2	11-4/0730	JA 322
MJZ 902	1	L	X	X		LOC-3	11-4/0800	JA 323
MJZ 903	1	L	X	X		LOC-4	11-4/0830	JA 324
MJZ 904	1	L	X	X		LOC-5	11-4/0900	JA 325
MJZ 905	1	L	X	X		LOC-6	11-4/0930	JA 326
MJZ 906	1	L	X	X		LOC-7	11-4/0945	JA 327
MJZ 907	1	L	X	X		LOC-8	11-4/1000	JA 328
MJZ 908	1	L	X	X		LOC-9	11-4/1030	JA 329
MJZ 909	1	L	X	X		LOC-10	11-4/1100	JA 330
MJZ 910	1	L	X	X		LOC-11	11-4/1130	JA 331
MJZ 911	1	L	X	X		LOC-12	11-4/1200	JA 332
MJZ 912	1	L	X	X		LOC-13	11-4/1215	JA 333
MJZ 913	1	L	X	X		LOC-14	11-4/1245	JA 334
MJZ 914	1	L	X	X		LOC-15	11-4/1300	JA 335
MJZ 915	1	L	X	X		LOC-16	11-4/1330	JA 336
MJZ 916	1	L	X	X		LOC-17	11-4/1400	JA 337
MJZ 917	1	L	X	X		LOC-18	11-4/1430	JA 338
MJZ 918	1	L	X	X		LOC-19	11-4/1500	JA 339
MJZ 920	1	L	X	X	MS / dup	LOC-20	11-4/1530	JA 340

EPA Form 9100-1 (8-88) Replaces EPA Form 2075-6, which may be used. Green - SMO Copy Pink - Region Copy White - Lab Copy for Return to SMO Yellow - Lab Copy

The CLP generates unique sample numbers for each organic and inorganic sample. The unique sample numbers are printed on adhesive labels. The sampler is responsible for assigning this critical sample number correctly and transcribing it accurately onto the traffic report. The labels should be attached to each sample container prior to shipment. Organic sample number labels have the format XX123 and have 10 labels per strip: four for extractables, two for volatile organic analyses (VOA), and four extra blanks. Inorganic sample number labels have the format MXX123 and have seven labels per strip: two for total metals, two for cyanide, and three extra blanks (see Figure 8). The unique sample number must be used only once. Unused labels should be destroyed to prevent duplication of sample numbers.

Organic and inorganic traffic reports should be completed as follows:

- The spaces indicated by case number and Special Analytical Service (SAS) number (if applicable) in the top right corner should be completed with the appropriate numbers.
- Box 1 should indicate the type of sampling activity performed, the site name, the city, the state, and the site spill identification number.
- Box 2 should indicate the EPA region number, the name of the sampling company, and the name of the sampler.
- Box 3 should indicate the name of the sample custodian or CLP contact the sample is being shipped to, the name of the CLP laboratory, and its full address.
- Box 4 should indicate the date shipped, the carrier (abbreviated), and the airbill number.
- The CLP sample number from the printed sample labels should be listed in the far left column.

FIGURE 8

SAMPLE NUMBER LABELS

INORGANIC
SAMPLE NUMBER
LABELS

MCCK	00	. Total Metals
MCCK	00	. Total Metals
MCCK	00	. Cyanide
MCCK	00	. Cyanide
MCCK	00	
MCCK	00	
MCCK	00	

ORGANIC
SAMPLE NUMBER
LABELS

CCE	20	. Extractable
CCE	20	. Extractable
CCE	20	. Extractable
CCE	20	. Extractable
CCE	20	. VOA
CCE	20	. VOA
CCE	20	
CCE	20	
CCE	20	
CCE	20	

- Column A should indicate the appropriate sample description code from box 5. Blanks should be listed as item 3, "leachate." The word "blank" should be written in column D, the special handling section. Item 6, "oil," and item 7, "waste," should be used for Routine Analytical Service (RAS) PLUS SAS projects only. Do not ship oily samples or waste without making prior arrangements with the SMO.

- Column B should indicate the concentration of the sample shipped. For organic samples, low- or medium-concentration samples should be labeled "L," and high-concentration samples should be labeled "H." For inorganic samples, low-concentration samples should be labeled "L," medium-concentration samples should be labeled "M," and high-concentration samples should be labeled "H." Do not ship high concentrated samples without making prior arrangements with the SMO.

- Column C should indicate the appropriate analytical fractions requested under RAS for each sample.

- Column D should specify any special handling instructions for each sample. Blank samples should be identified in this space. When shipping RAS PLUS SAS samples, the sampler may code SAS parameters in the blank space and enter the codes in this column.

- Column E should indicate the sampling location.

- Column F should indicate the date and time of sample collection.

- Column G should indicate the corresponding CLP sample number for organic or inorganic analysis.

The original, white copy of the traffic report should be sent to SMO, P.O. Box 818, Alexandria, Virginia 22313. The phone number of the SMO is 703/557-2490. The pink copy should be retained by the PRC field team leader. The other white copy and the yellow copy should be sent with the shipment to the laboratory. The address of the laboratory will be provided by SMO.

2.5.2 Dioxin Shipment Record

The CLP Dioxin Shipment Record, a four-part, carbonless form, is used to document samples for the dioxin program (see Figures 9 and 9A). This form must be used for any dioxin samples. The dioxin shipment record provides documentation in each shipment of dioxin samples.

The form is similar to the traffic reports described above. To provide a permanent record of each sample collected, the sampler should record the appropriate case number and batch or shipment number on each shipment record form. The sampler should record the type of sampling activity, regional information, shipping information, and analysis laboratory. For each sample, the sampler should record the sample matrix and its description, such as soil or sediment field sample or solvent rinsate, by checking the appropriate box following each sample number.

After completing the dioxin shipment record, the sampler should send the bottom two copies to the laboratory with the sample shipment. Following sample shipment, the sampler should send the top copy to the SMO and retain the remaining copy as a file copy.

2.5.3 Special Analytical Service (SAS) Packing List

For samples requiring special analytical services, samplers should use the SAS Packing List, a four-part carbonless form (see Figures 10 and 10A). The packing list provides space for up to 20 samples on one form. These samples should be numbered with the SAS number provided by the SMO. The SAS number, such as 2000E, should be followed by a hyphen and a progressive numerical designation starting with one, such as 2000E-1, 2000E-2, 2000E-3, and so on. If the sampling activity continues for several days and requires more than one list, sample numbers should not be repeated. EPA's regional office will verify with SMO that the packing list is appropriate for use in the situation.

FIGURE 9

CLP DIOXIN SHIPMENT FORM

USEPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 Alexandria, Virginia 22313
FTS 8-557-2480 703/557-2480

CASE NO:	BATCH NO:
	SAS NO: (if applicable)

CLP DIOXIN SHIPMENT RECORD

Type of Activity (circle one) ① Superfund--PA SI ESI RI RD RA BR NPLD OSM OTHER Non-Superfund--_____ Program	Region Number: ④ Sampling Contact: _____ (name) _____ (company)	Ship To: ⑥ _____ ATTN:
Site Name: ② _____ City, State _____ Site Spill ID:		
Sampling Date: ③ _____	Carrier: ⑤ _____ Airbill No: _____	Date Shipped: ⑦ _____

Sampler Instructions: 1) Ship all samples in paint cans, with sample labels affixed to outside of can.
2) Use TCE or hexane organic solvents for rinsate samples.
3) Sample Volumes Required: Soil or Sediment: 4 oz. per sample in glass jar. Aqueous: 2 Liters per sample in amber glass. Send one 4 Liter sample per Batch of aqueous samples for lab QC.
4) "Sample to spike" will be analyzed at Lab as a spiked sample only. If this sample requires analysis prior to spiking, the sampler must supply a separate sample labelled with a unique sample number.

	MATRIX (check one/sample)				DESCRIPTION			SAS ONLY
CLP SAMPLE NUMBERS (from labels)	Ⓐ SOIL OR SEDIMENT	Ⓑ AQUEOUS	Ⓒ EQUIP RINSATE (ORG SOLV)	Ⓓ OTHER (SAS ONLY)	Ⓔ SAMPLE TO SPIKE (check one)	Ⓕ SAMPLE TO DUPLICATE (check one)	Ⓖ SAMPLE LOCATION (or other field description)	Ⓗ SPECIFY ADDITIONAL SAS ANALYSES (parameters)

WHITE [illegible] Gray YELLOW Clear Gray PINK [illegible] GOLD [illegible] Gray

FIGURE 9A

CLP DIOXIN SHIPMENT FORM

USEPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 Alexandria, Virginia 22313
FTS 8-557-2400 703/557-2400

CASE NO: 5000	BATCH NO: 03
	SAS NO: (if applicable) N/A

CLP DIOXIN SHIPMENT RECORD

Type of Activity (check one): Screening — PA SI ESI TO RA OT SPLIT OSM OTHER; Non-Screening — ____ Program	Region Number: IV	Ship To: Dioxin Lab, 100 Oak Run, Tisthown, OK
Site Name: Drum Site	Sampling Contact: John Diggy (name)	
City, State: Rushville, FL Site Spill ID: 4 24	Sampling, Inc. (company)	ATTN: N. Analyst LABAT
Sampling Date: 11/1/88	Center: Fed. Ex. AWB No: 1234567389	Date Shipped: 11/2/88

Sampler Instructions: 1) Ship all samples in gold cans, with sample labels affixed to outside of can. 2) Use TCE or hexane organic solvents for rinsate samples. 3) Sample Volumes Required: Soil or Sediment: 4 oz. per sample in glass jar. Aqueous: 2 Liters per sample in amber glass. Send one 4 Liter sample per batch of aqueous samples for lab QC. 4) "Samples to spike" will be analyzed at Lab as a spiked sample pair. If this sample requires analysis prior to spiking, the sampler must supply a separate sample labelled with a unique sample number.

CLP SAMPLE NUMBERS (from labels)	MATRIX (check one/sample): SOIL OR SEDIMENT	AQUEOUS	SOLID PRODUCT (FOOD ONLY)	OTHER (SAS ONLY)	DESCRIPTION: SAMPLE TO SPIKE (check one)	SAMPLE TO DUPLICATE (check one)	SAMPLE LOCATION (or other SAS description)	SAS ONLY: SPECIFY ADDITIONAL SAS ANALYSES (if necessary)
DD011201	X						DD1-1	
DD011202	X						DD1-2	
DD011203	X						DD1-3	
DD011204	X						DD2-1	
DD011205	X						DD2-1A	
DD011206			X				DD2-2	
DD011207	X						DD2-3	
DD011208	X				X		DD3-1	
DD011209	X						DD3-2	
DD011210	X						DD3-3	
DD011211	X						DD3-4	
DD011212	X					X	DD4-1	
DD011213	X						DD4-2	
DD011214	X						DD5-1	
DD011215	X						DD5-2	
DD011216	X						DD6-1	
DD011217	X						DD6-2	
DD011218	X						DD6-3	
DD011219	X						DD7-1	
DD011220	X						DD7-2	
DD011221	X						DD8-1	
DD011222		X			X		DD9-1	
DD011223		X				X	DD9-2	
DD011224		X					DD9-3	

WHITE (SMO Copy) YELLOW (Client Copy) PINK (Lab Copy to Return to SMO) GOLD (Lab Copy)

FIGURE 10

SPECIAL ANALYTICAL SERVICE PACKING LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P.O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490 - FTS/557-2490

SAS Number

SPECIAL ANALYTICAL SERVICE
PACKING LIST

Sampling Office:	Sampling Date(s):	Ship To:	For Lab Use Only
Sampling Contact: (name)	Date Shipped:		Date Samples Rec'd:
(phone)	Site Name/Code:	Attn:	Received By:

Sample Numbers	Sample Description i.e., Analysis, Matrix, Concentration	Sample Condition on Receipt at Lab
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

For Lab Use Only

White - SMO Copy, Yellow - Region Copy, Pink - Lab Copy for return to SMO, Gold - Lab Copy

FIGURE 10A

SPECIAL ANALYTICAL SERVICE PACKING LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P.O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490 - FTS/557-2490

SAS Number: 1000 - A

SPECIAL ANALYTICAL SERVICE
PACKING LIST

Sampling Office:	Sampling Date(s):	Ship To:	For Lab Use Only
Region I	11/2 - 11/4/88	SAS LAB 100 Main Street Anytown, CO 98766	Date Samples Rec'd:
Sampling Contact: Joe Sampler (name)	Date Shipped: 11/4/88		Received By:
617/555-1234 (phone)	Site Name/Code: #01	Attn: Jim Smith	

	Sample Numbers	Sample Description Le., Analysis, Matrix, Concentration	Sample Condition on Receipt at Lab
1.	1000A - 01	LOW CONC. WATER - 2,4-D; 2,4,5-TP	
2.	1000A - 02	" "	
3.	1000A - 03	" "	
4.	1000A - 04	" "	
5.	1000A - 05	" "	
6.	1000A - 06	" "	
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

For Lab Use Only

White - SMO Copy, Yellow - Region Copy, Pink - Lab Copy for return to SMO, Gold - Lab Copy

The sampler should complete the list by recording the SAS number, site name, location, sampling date, shipment date, analysis laboratory, sampling office (the organization that did the sampling), sampler names, sampler telephone number, individual SAS sample numbers, and sample description. The description must include the sample matrix, concentration (if applicable), and analyses to be done. After completing the list, the sampler should send the bottom two copies to the laboratory with the sample shipment. Following sample shipment, the sampler should send the top copy to the SMO and should retain the second copy as a file copy.

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

SAMPLE COLLECTION CONTAINER REQUIREMENTS

SOP NO. 017

REVISION NO. 1

Approved by:

Kathleen Homer
Quality Assurance Officer

5/21/93
Date

1.0 BACKGROUND

This standard operating procedure (SOP) has been prepared in accordance with the U.S. Environmental Protection Agency/National Enforcement Investigation Center (EPA/NEIC) *User's Guide to the Contract Laboratory Program* (CLP) and other references listed below. This SOP has been developed as guidance to selecting the proper containers for use in collecting environmental samples for Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) projects as well as projects for state and local agencies and private clients.

1.1 PURPOSE

The purpose of this SOP is to present the procedure for selection of appropriate sample containers for samples collected for organic and inorganic analyses.

1.2 SCOPE

The procedure presented in this SOP must be followed when environmental sample are collected for projects governed by the quality assurance/quality control requirements of the EPA or by state and local agencies. The guidance outlined below is acceptable for the routine analytical services (RAS) and special analytical services (SAS) provided by the EPA CLP.

1.3 DEFINITIONS

Definitions are provided in the text as needed.

1.4 REFERENCES

Environmental Protection Agency (EPA). 1987. *A Compendium of Superfund Field Operations Methods*. Office of Emergency and Remedial Response. Washington, D.C. OSWER Directive 9355.0-14 EPA/540/P-87/001. December.

EPA. 1988. *User's Guide to the Contract Laboratory Program*. Office of Emergency and Remedial Response. Washington, D.C. OSWER Directive No. 9240.0-1.

EPA. 1990. "Standard Operating Procedure 2130.4A: Sample Containers, EPA Region 7." *Environmental Services Division Operations and Quality Assurance Manual*.

Federal Register. Vol. 49. No. 209.

1.5 REQUIREMENTS AND RESOURCES

A source of precleaned sample containers which have been analyzed to provide quality assurance is required for the proper containment of environmental samples. A copy of all documentation that verifies the suitability of the containers for the required analyses should be maintained in the project file.

2.0 PROCEDURE

Sample containers should be selected in accordance with the requirements listed in Table 1 and illustrated in Figures 1 through 4 at the end of this document. Container requirements are provided for organic and inorganic analyses as well as for dioxin and other high hazard samples.

Based on the sample matrices and analyses as defined in the project-specific sampling and analysis plan (SAP) or quality assurance project plan (QAPjP), the appropriate environmental sample containers may be chosen by referring to Table 1. This table lists the containers required, preservation techniques, and sample holding time restrictions. The containers specified in Figures 1 through 4 should be adequate for most RAS requests. Be sure to contact the EPA sample coordinator

or private laboratory if you are not sure of the container requirements or if modified RAS or SAS procedures are requested.

3.0 COMMON PROBLEMS

One of the most common problems encountered with the EPA CLP are region-specific variations in the sample container requirements. In most EPA regions, soil samples for volatile organic analysis may be collected in 4-ounce screw top bottles. Conversely, in EPA Region 7, soils for volatile organic analysis must be collected in 40-mL vials equipped with Teflon®-lined septa. If you are not sure of regional or project-specific variations, contact the laboratory coordinator or project manager.

In general, for water analyses, glass containers are used for organic analyses and plastic containers are used for metals analyses. Glass containers are used especially for semivolatile organic analyses of water because plasticizers (phthalates) may be leached from plastic containers and interfere with the organic analyses. Plastic is used instead of glass for metals analysis of water because metals will sorb to active sites on the glass surface. This could produce anomalously low, or false negative, results for metals in water.

Overnight shipment or quick delivery is a must to meet the holding time requirements for volatile organic analyses. Also, be aware of potentially contaminated preservatives such as nitric acid or sodium hydroxide. Always use fresh high-quality preservative reagents.

Sample duplicates, matrix spikes, and matrix spike duplicates are usually required on five to ten percent of the samples collected. In general, additional sample volume is required for these quality control samples. Be sure to obtain additional sample containers for the required quality control samples.

Biota samples may require special packaging and preservation procedures. For example, fish samples are usually wrapped in aluminum foil and shipped in coolers on dry ice. Shipping with dry ice

requires special labeling and handling procedures. Contact the sample coordinator, project manager, and shipper for these special biota sample requirements.

TABLE 1

REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container Type	Preservation	Maximum Holding Time
Semivolatile Organics			
Concentrated Waste Samples	8-oz widemouth glass jar with Teflon® liner	None	14 days
Liquid Samples: No Residual Chlorine Present	1-gal. or 2 1\2-gal. amber glass jar with Teflon® liner	Cool, 4 °C	Samples must be extracted within 7 days and extracts analyzed within 40 days
Liquid Samples: Residual Chlorine Present	1-gal. or 2 1/2-gal. amber glass jar with Teflon® liner	Add 3mL 10% sodium thiosulfate per gallon, Cool, 4°C	Samples must be extracted within 7 days and extracts analyzed within 49 days
Soil/Sediments and Sludges	8-oz widemouth glass jar with Teflon® liner	Cool, 4 °C	14 days
Volatile Organics			
Concentrated Waste Samples	8-oz widemouth glass jar with Teflon® liner	None	14 days
Liquid Samples: No Residual Chlorine Present	Two 40-mL vials with Teflon® lined septum caps	4 drops conc. HCl, Cool, 4 °C	14 days
Liquid Samples: Residual Chlorine Present	Two 40-mL vials with Teflon® lined septum caps	Collect sample in a 4 oz soil VOA container which has been prepreserved with 4 drops of 10% sodium thiosulfate. Gently mix sample and transfer to a 40-mL VOA vial that been prepreserved with 4 drops conc. HCl, Cool to 4 °C	14 days

TABLE 1 (Continued)

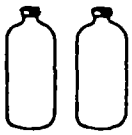
REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container Type	Preservation	Maximum Holding Time
Liquid Samples: Acrolein and Acrylonitrile	Two 40-mL vials with Teflon® lined septum caps	Adjust to pH 4-5, Cool, 4 °C	14 days
Soil/Sediments and Sludges	4-oz (120-mL) widemouth glass jar with Teflon® liner	Cool, 4 °C	14 days
Metals			
Concentrated Waste Sample	8-oz. widemouth glass with Teflon® line	None	None
Liquid Samples	1-liter cubitainer	Adjust pH to <2 with HNO_3, Cool 4°C	6 months
Soil/Sediment Studios	8-oz. widemouth glass jar	None	None

FIGURE 1

ORGANIC SAMPLE COLLECTION

Volume Requirements

WATER SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
2,3,7,8-TCDD ANALYSIS (MULTI-CONCENTRATION)	2 LITERS		2 × 1-LITER AMBER GLASS BOTTLES

SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
2,3,7,8-TCDD ANALYSIS (MULTI-CONCENTRATION)	4 OZ.		1 × 4-OZ. WIDE-MOUTH GLASS JAR
			OR 1 × 8-OZ. WIDE-MOUTH GLASS JAR

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

FIGURE 2

INORGANIC SAMPLE COLLECTION

Volume Requirements

WATER SAMPLES	REQUIRED VOLUME	CONTAINER TYPE
METALS ANALYSIS (LOW LEVEL)	1 LITER	1 × 1-LITER POLYETHYLENE BOTTLE
METALS ANALYSIS (MEDIUM LEVEL*)	16 OZ.	1 × 16-OZ. WIDE-MOUTH GLASS JAR
CYANIDE (CN^-) ANALYSIS (LOW LEVEL)	1 LITER	1 × 1-LITER POLYETHYLENE BOTTLE
CYANIDE (CN^-) ANALYSIS (MEDIUM LEVEL*)	16 OZ.	1 × 16-OZ. WIDE-MOUTH GLASS JAR

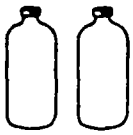
SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME	CONTAINER TYPE
METALS AND CYANIDE (CN^-) ANALYSIS (LOW OR MEDIUM LEVEL*)	6 OZ.	1 × 8-OZ. WIDE-MOUTH GLASS JAR OR 2 × 4-OZ. WIDE-MOUTH GLASS JARS

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

FIGURE 3

DIOXIN SAMPLE COLLECTION

Volume Requirements

WATER SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
2,3,7,8-TCDD ANALYSIS (MULTI-CONCENTRATION)	2 LITERS		2 × 1-LITER AMBER GLASS BOTTLES

SOIL/SEDIMENT SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
2,3,7,8-TCDD ANALYSIS (MULTI-CONCENTRATION)	4 OZ.		1 × 4-OZ. WIDE-MOUTH GLASS JAR
			OR
			1 × 8-OZ. WIDE-MOUTH GLASS JAR

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

FIGURE 4

HIGH HAZARD SAMPLE COLLECTION

Volume Requirements

LIQUID OR SOLID SAMPLES	REQUIRED VOLUME		CONTAINER TYPE
ORGANIC AND INORGANIC ANALYSIS	6 OZ.		1 × 8-OZ. WIDE-MOUTH GLASS JAR

*ALL MEDIUM LEVEL SAMPLES TO BE SEALED IN METAL PAINT CAN FOR SHIPMENT

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

SAMPLE PRESERVATION AND MAXIMUM HOLDING TIMES

SOP NO. 016

REVISION NO. 3

Approved by:

Rick Herrera 7/11/94

Quality Assurance Officer Date

1.0 BACKGROUND

Methods of preservation are generally intended to retard biological action and hydrolysis of chemical compounds and complexes. Preservation also reduces the loss of constituents by volatilization and the effects of adsorption and absorption. Preservation methods are generally limited to pH control, chemical addition, refrigeration, and freezing.

Often the sampler will need to split the sample into several different aliquots, specifying different sample containers and preservation methods for each aliquot based on the analyses of interest.

Overall, solid samples, including soils, are usually delivered to the laboratory unpreserved or after being preserved by cooling to 4 °C. Air samples are usually unpreserved. Biological samples are preserved, but their preservation methods are detailed in a separate standard operating procedure (SOP).

Recommended preservatives for various constituents in water are given in Table 1 presented at the end of this document. Preservation techniques for water samples requiring more than simple refrigeration or filtering are discussed in Section 2.0. Other information provided in Table 1 includes the suggested type of container and the maximum recommended holding times for samples that are properly preserved.

Table 2, also presented at the end of this document, includes the container size required for the different types of analyses and gives further details on sample preservation. These guidelines should be followed in all sampling events unless the client or its laboratory requests otherwise. All deviations will be noted in the site-specific sampling plan or field logbook.

1.1 PURPOSE

This SOP establishes the requirements and procedures for preserving environmental samples.

1.2 SCOPE

This SOP applies to sample preservation, maximum holding times, and container type and sizes required for environmental samples. The requirements for inorganic and organic sample preservation are described. These procedures fulfill the U.S. Environmental Protection Agency's (EPA) quality assurance/quality control (QA/QC) requirements for routine analytical services (RAS) and many special analytical services (SAS).

Largely, this SOP concerns itself with the complexities of preserving environmental water samples. Preservation of solid, soil, and air samples is discussed only in Section 2.1. Preservation of biological samples is discussed in a separate SOP.

1.3 DEFINITIONS

Environmental Samples: Environmental samples are those samples corresponding to the CLP low-concentration designation. They are generally dilute samples in terms of pollutant concentration and are typically taken in an area surrounding a spill or dump site.

Hazardous Samples: Hazardous samples correspond to the CLP medium- or high-concentration designations. Typically, they are samples collected from drums, tanks, lagoons, pits, waste piles, and fresh spills.

1.4 REFERENCES

American Public Health Association (APHA). 1989. *Standard Methods for the Examination of Water and Wastewater*. 17th ed.

U.S. Environmental Protection Agency (EPA). 1983. "Methods for the Chemical Analysis of Water and Wastes." EPA-600/4-79-020. March.

EPA. 1983. *RCRA Permit Writer's Manual: Ground-Water Protection (40 C.F.R. Part 264, Subpart F)* Geotrans, Inc. EPA Contract No. 68-01-6464.

EPA. 1984. *Federal Register*. Volume 49. Number 209. p 43260, October 26. 1984.

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EPA/National Water Well Association (NWWA). 1981. *Manual of Ground-Water Sampling Procedures*. NWWA/EPA series.

1.5 REQUIREMENTS AND RESOURCES

The following equipment may be required for sample preservation:

- Sample containers, glass or plastic, as permitted in Table 1 and specified in the site-specific sampling plan
- Preservatives, as specified in Table 1, for the samples. These may include:
  - Ice or a refrigerator (Cool, 4 °C)
  - Concentrated hydrochloric acid (HCl)
  - Concentrated nitric acid (HNO_3)
  - Concentrated phosphoric acid (H_3PO_4)
  - Concentrated sulfuric acid (S_2SO_4)
  - 10 N sodium hydroxide (NaOH) solution. Either use a commercial solution or dissolve 400 grams NaOH in water and dilute to 1 liter .
  - 2 N zinc acetate solution. Either use a commercial solution or dissolve 44 grams of zinc acetate dihydrate in water and dilute to 100 milliliter (mL).
- Pipettes and pipette bulbs for dispensing preservatives
- Containers (usually gallon ziplock bags) for ice
- Filtration apparatus, if required. An electric vacuum pump connected to disposable (single use) sterile filter systems with 0.45 micron filters is the most common type.

2.0 PROCEDURES

All samples should be preserved at low temperatures and kept from light during transport to the laboratory. Appropriate chemical preservation should be performed in the field for various analytical parameters at the time of sampling. This is particularly important for water samples. The site-specific sampling plan should detail which of the procedures outlined below will be implemented.

When selecting preservation techniques for a specific monitoring program, the sampler should refer to the guidance provided in the documentation of the analytical methods such as those listed in the reference section of this SOP. In some instances, the optimal method for sample preservation may be inappropriate because of restrictions placed by shippers on transporting certain chemicals. When shipping restrictions prevent the use of certain reagents for sample preservation, the most appropriate and permissible technique should be used. Frequently, this will require refrigeration of the sample during transit.

In general, all environmental water samples should be placed in an insulated ice chest and iced to lower the sample water temperatures to 4 °C immediately after sample collection. Hazardous samples should not be preserved in any way, including refrigeration; see SOP No. 019, "Packaging and Shipping Samples."

2.1 PRESERVATION OF SOLID, SOIL, AND AIR SAMPLES.

Preservation of solid, soil, and air samples largely depends both on what analyses are to be requested and on what the particular laboratory or program to be used requires. Sampling teams should consider the preservation requirements when preparing a quality assurance project plan before proceeding to the field.

Lacking specific guidance, however, the following general guidance should be followed. Samples of soil and other solids should be preserved by sealing them in sampling container and by storing them

on ice or by refrigerating them to 4 °C. Samples should be sent for analysis as soon as possible. Samples of air are not to be preserved but are to be analyzed as soon as possible.

2.2 PRESERVATION OF WATER SAMPLES

Preservation of water samples depends largely on what analyses are being requested and on what the laboratory or laboratory program to be used requires. The following sections, however, detail typical requirements of such laboratories and programs.

2.2.1 Preservation Procedures for Metals in Water

Before collecting the water sample, determine what type of data is needed, such as dissolved, suspended, total, or total recoverable metals. For container preference, maximum holding times, and sample preservation at time of collection, see Table 1.

<u>Dissolved Metals</u>

When the samples are to be analyzed for dissolved metals, do the following:

- Filter each sample through a 0.45 micron membrane as soon as practical after collection. Glass or plastic filtering apparatus and plain, non-grid marked membrane filters are recommended to avoid possible contamination.
- Use the first 50 to 100 mL of sample to rinse the filter flask. Discard this portion and collect the required volume of filtrate.
- Acidify the filtrate with 1:1 HNO_3 to a pH of less than 2 as soon as possible. Normally, 2 mL of 1:1 acid per liter should be sufficient to preserve the sample.
- If hexavalent chromium is to be included in the analytical scheme, a portion of the filtrate should be transferred to a separate container before acidification. Analyze this portion within the holding time requirements noted in Table 1 at the end of this SOP.
- Analyses performed on these samples will be reported as "dissolved" concentrations.

Total Metals

When samples are to be analyzed for total metals, acidify each sample at the time of collection with 2 mL of 1:1 HNO_3, per liter of sample. This will lower each sample's pH to less than 2. Do not filter the sample.

2.2.2 Preservation Procedures for Cyanide in Water

When samples are to be analyzed for cyanide, do the following:

- Add 2 mL of 10 N NaOH per liter of sample to increase the pH to greater than 12.
- Test for oxidizing agents that decompose most cyanides. Do this by placing a drop of the sample on potassium iodide-starch test paper (KI starch paper); a blue color indicates that oxidizing agents are present. If oxidizing agents are present treatment is needed. Add ascorbic acid to the sample container, a few crystals at a time, until a drop of sample produces no color on the KI starch paper. Then add an additional 0.6 gram of ascorbic acid for each liter of sample volume.
- Analyze the samples within the prescribed holding time after collection.

2.3.3 Preservation Procedures for Nitrogen in Water

Procedures for nitrogen species vary considerably between desired tests. The following three section detail those procedures.

Kjeldahl, Nitrogen Total

When samples are to be tested for nitrogen total, do the following:

- Preserve samples by adding 2 mL of concentrated H_2SO_4 per liter of sample which should lower the pH to less than 2. Store the sample at 4 °C.
- Even when preserved in this manner, conversion of organic nitrogen to ammonia may occur. Analyze the preserved samples as soon as possible.

Nitrate Plus Nitrite

When samples are to be tested for nitrate plus nitrite, then do the following:

- If analysis can be completed within 24 hours, preserve the sample by refrigeration at 4 °C.
- When samples must be stored for more than 24 hours, preserve samples with 2 mL of H_2SO_4 per liter of sample volume which should lower the pH to less than 2; then refrigerate samples at 4 °C.
- Do not preserve those samples that will be analyzed using a reduction column and mercuric chloride.

Nitrite

When samples are to be analyzed for nitrite, follow the procedure below:

- Analyze samples as soon as possible.
- If a sample must be stored for 24 to 48 hours, refrigerate it at 4 °C.

2.2.4 Preservation Procedure For Dissolved Oxygen (Procedure)

The following is the procedure for preserving samples to be analyzed for dissolved oxygen using the Winkler Method.

- Collect each sample in a 300-mL biological oxygen demand BOD incubation bottle. Take special care to avoid entrainment of atmospheric oxygen or loss of dissolved oxygen. At time of sampling, record the sample temperature.
- When samples are collected from depths of less than 5 feet, use an APHA-type sampler. Use a Kemmerer-type sampler for samples collected from depths of greater than 5 feet. (See APHA (1989) for details)).
- When a Kemmerer sampler is used, fill the BOD sample bottle until it overflows for approximately 10 seconds. Insert the outlet tube of the Kemmerer into the bottom of the BOD bottle. Take care to prevent turbulence and the formation of bubbles when filling the bottle.
- If samples must be preserved, immediately add 0.7 mL of H_2SO_4 and 1 mL of sodium azide solution to the sample bottle and mix. As soon as practical, begin the assay by adding 2 mL $MnSO_4$ solution and 3 mL alkali-iodide solution and mix. After the precipitate has settled, add 2 mL H_2SO_4 and mix to dissolve the precipitate. Complete analysis within 4 to 8 hours after sampling.

2.2.5 Preservation Procedures for Phosphorus in Water

When preserving water samples to be analyzed for phosphorus, do the following:

- If benthic deposits are present in the area being sampled, take care not to include these deposits.
- If the analysis cannot be performed the same day of collection, preserve the sample by adding 2 mL of concentrated H_2SO_4 per liter which will lower the pH to less than 2.
- Refrigerate at 4 °C.

2.2.6 Preservation Procedures for Sulphide in Water

The following procedure is used to preserve water samples to be analyzed for sulphide:

- Take samples with a minimum of aeration. Sulfide may be volatilized by aeration, and any oxygen inadvertently added to the sample may convert the sulfide to an unmeasurable form.
- If the sample is not preserved with zinc acetate and NaOH as given in Table 1, the analysis must be performed immediately. Similarly, the measurement of dissolved sulfides also must be performed immediately.

2.2.7 Preservation Procedures for Organics in Water

These procedures vary with the type of assay desired.

<u>Chemical Oxygen Demand</u>

If the assay is for chemical oxygen demand, then the following procedure is used:

- Collect samples in glass bottles with Teflon-lined caps.
- Test biologically active samples as soon as possible.
- Collecting composite samples and dividing samples into separate aliquots are generally not possible because some of the sample is lost on equipment and because of imperfect mixing.
- Preserve samples with sulfuric acid to a pH of less than 2.
- Refrigerate at 4 °C.

Oil, Grease, and Petroleum Hydrocarbons

If the assay is oil, grease, or other petroleum hydrocarbons, then do the following:

- Collect 1 liter of representative sample in a glass bottle.
- A delay between sampling and analysis of greater than 4 hours requires sample preservation. To preserve the sample, add H_2SO_4 until the pH is less than 2. A delay greater than 48 hours also requires refrigeration at 4 °C.

Organic Carbon

If the assay is organic carbon, then do the following:

- Use glass bottles for sampling and storage of samples.
- Store samples at 4 °C.
- Protect samples from sunlight and atmospheric oxygen.
- In instances where analysis cannot be performed within 2 hours of sampling, acidify samples to a pH of less than 2 with HCl or H_2SO_4.

Volatile Organics

If the assay is volatile organics, then do the following:

- Add 3 or 4 drops of concentrated hydrochloric acid to an empty 40-mL vial.
- Fill the sample vial carefully to avoid bubbles. At least two vials should be collected for each sample.
- Cap the vials carefully using caps with Teflon®-lined septa.
- Invert each vial and check for bubbles. If bubbles are present, unscrew the cap, add more water, and recap.
- Refrigerate at 4 °C.

TABLE 1

REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES

Name	Container Type[a] (plastic or glass)	Preservation	Maximum Holding Time
Bacterial Tests			
Coliform, fecal and total	P, G	Cool, 4 °C, 0.008% $NA_2S_2O_3$	6 hours
Fecal streptococci	P, G	Cool, 4 °C, 0.008% $Na_2S_2O_3$	6 hours
Inorganic Tests			
Acidity	P, G	Cool, 4 °C	14 days
Alkalinity	P, G	Cool, 4 °C	14 days
Ammonia	P, G	Cool, 4 °C, H_2SO_4 to pH<2	28 days
Biochemical oxygen demand	P, G	Cool, 4 °C	48 hours
Bromide	P, G	None required	28 days
Biochemical oxygen demand, carbonaceous	P, G	Cool, 4 °C	48 hours
Chemical oxygen demand	P, G	Cool, 4 °C, H_2SO_4 to pH<2	28 days
Chloride	P, G	None required	28 days
Chlorine, total residual	P, G	None required	Analyze immediately
Color	P, G	Cool, 4 °C	48 hours
Cyanide, total and amendable to chlorination	P, G	Cool, 4 °C, NaOH to pH>12, 0.6g ascorbic acid	14 days
Fluoride	P	None required	28 days
Hardness	P, G	HNO_3 to pH<2, H_2SO_4 to pH<2	6 months
Hydrogen ion (pH)	P, G	None required	Analyze immediately
Kjeldahl and organic nitrogen	P, G	Cool, 4 °C, H_2SO_4 to pH<2	28 days

TABLE 1 (Continued)

REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES

Name	Container Type[a] (plastic or glass)	Preservation	Maximum Holding Time
Metals			
Nitrate	P, G	Cool, 4 °C	48 hours
Nitrate-nitrite	P, G	Cool, 4 °C, H_2SO_4 to pH<2	28 days
Nitrite	P, G	Cool, 4 °C	48 hours
Oil and grease	G	Cool, 4 °C, H_2SO_4 to pH<2	28 days
Organic carbon	P, G	Cool, 4 °C, HCl or H_2SO_4 to pH<2	28 days
Inorganic Tests			
Orthophosphate	P, G	Filter immediately, cool, 4 °C	48 hours
Oxygen dissolved probe	G only	None required	Analyze immediately
Winkler	G only	Fix on site and store in dark	8 hours
Phenols	G only	Cool, 4 °C, H_2SO_4 to pH<2	28 days
Phosphorus (elemental)	G	Cool, 4 °C	48 hours
Phosphorus, total	P, G	Cool, 4 °C, H_2SO_4 to pH<2	28 days
Residue, total	P, G	Cool, 4 °C	7 days
Residue, Filterable	P, G	Cool, 4 °C	7 days
Residue, Nonfilterable (TSS)	P, G	Cool, 4 °C	7 days
Residue, settleable	P, G	Cool, 4 °C	48 hours
Residue, volatile	P, G	Cool, 4 °C	7 days
Silica	P	Cool, 4 °C	28 days
Specific conductance	P, G	Cool, 4 °C	28 days
Sulfate	P, G	Cool, 4 °C	28 days

TABLE 1 (Continued)

REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES

Name	Container Type[a] (plastic or glass)	Preservation	Maximum Holding Time
Sulfide	P, G	Cool, 4 °C, add zinc acetate plus NaOH to pH>9	7 days
Sulfite	P, G	None required	Analyze immediately
Surfactants	P, G	Cool, 4 °C	48 hours
Temperature	P, G	None required	Analyze immediately
Turbidity	P, G	Cool, 4 °C	48 hours
Metals			
Chromium VI	P, G	Cool, 4 °C	24 hours
Mercury	P, G	HNO_3 to pH<2	28 days
Metals, except chromium VI and mercury	P, G	HNO_3 to pH<2	6 months
Organic Tests			
Purgeable halocarbons	G, Teflon®-lined septum	Cool, 4 °C, 0.008% $Na_2S_2)_3$ HCL to pH <2	14 days
Purgeable aromatic hydrocarbons	G, Teflon®-lined septum	Cool, 4 °C, 0.008% $Na_2S_2O_3$ HCI to pH <2	14 days
Acrolein and acrylonitrile	G, Teflon®-lined septum	Cool, 4 °C, 0.008% $Na_2S_2O_3$ Adjust pH to 4-5	14 days
Phenols	G, Teflon®-lined cap	Cool, 4 °C, 0.008% $Na_2S_2)_3$	7 days until extraction, 40 days after extraction
Benzidines	G, Teflon®-lined cap	Cool, 4 °C, 0.008% $Na_2S_2O_3$	7 days until extraction

TABLE 1 (Continued)

REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES

Name	Container Type[a] (plastic or glass)	Preservation	Maximum Holding Time
Phthalate esters	G, Teflon®-lined cap	Cool, 4 °C	7 days until extraction 40 days after extraction
Nitrosamines	G, Teflon®-lined cap	Cool, 4 °C, store in dark, 0.008% $Na_2S_2O_3$	40 days after extraction
PCBs, acrylonitrile	G, Teflon®-lined cap	Cool, 4 °C	40 days after extraction
Nitroaromatics and isophorone	G, Teflon®-lined cap	Cool, 4 °C, 0.008% $Na_2S_2O_3$ store in dark	40 days after extraction
Polynuclear aromatic hydrocarbons	G, Teflon®-lined cap	Cool, 4 °C, 0.008% $Na_2S_2O_3$ store in dark	40 days after extraction
Haloethers	G, Teflon®-lined cap	Cool, 4 °C , 0.008% $Na_2S_2O_3$	40 days after extraction
Chlorinated hydrocarbons	G, Teflon®-lined cap	Cool, 4 °C	40 days after extraction
TCDD	G, Teflon®-lined cap	Cool, 4 °C, 0.008% $Na_2S_3O_3$	40 days after extraction
Total organic halogens	G, Teflon®-lined cap	Cool, 4 °C, H_2SO_4 to pH<2	7 days
Pesticide Tests			
Pesticides	G, Teflon®-lined cap	Cool, 4 °C, pH 5-9	40 days after extraction
Radiological Tests			
Alpha, beta and radium	P, G	HNO_3 to pH<2	6 months

Notes:

[a] Polyethylene (P) or Glass (G).

TABLE 2

REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container Type	Preservation	Maximum Holding Time
Semivolatile Organics			
Concentrated Waste Samples	8-oz widemouth glass jar with Teflon® liner	None	14 days
Liquid Samples: No Residual Chlorine Present	1-gal. or 2 1\2-gal. amber glass jar with Teflon® liner	Cool, 4 °C	Samples must be extracted within 7 days and extracts analyzed within 40 days
Liquid Samples: Residual Chlorine Present	1-gal. or 2 1/2-gal. amber glass jar with Teflon® liner	Add 3mL 10% sodium thiosulfate per gallon, Cool, 4°C	Samples must be extracted within 7 days and extracts analyzed within 49 days
Soil/Sediments and Sludges	8-oz widemouth glass jar with Teflon® liner	Cool, 4 °C	14 days
Volatile Organics			
Concentrated Waste Samples	8-oz widemouth glass jar with Teflon® liner	None	14 days
Liquid Samples: No Residual Chlorine Present	Two 40-mL vials with Teflon® lined septum caps	4 drops conc. HCI, Cool, 4 °C	14 days
Liquid Samples: Residual Chlorine Present	Two 40-mL vials with Teflon® lined septum caps	Collect sample in a 4 oz soil VOA container which has been prepreserved with 4 drops of 10% sodium thiosulfate. Gently mix sample and transfer to a 40-mL VOA vial that been prepreserved with 4 drops conc. HCI, Cool to 4 °C	14 days

TABLE 2 (Continued)

REQUIRED CONTAINER TYPES, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Name	Container Type	Preservation	Maximum Holding Time
Liquid Samples: Acrolein and Acrylonitrile	Two 40-mL vials with Teflon® lined septum caps	Adjust to pH 4-5, Cool, 4 °C	14 days
Soil/Sediments and Sludges	4-oz (120-mL) widemouth glass jar with Teflon® liner	Cool, 4 °C	14 days
Metals			
Concentrated Waste Sample	8-oz. widemouth glass with Teflon® line	None	None
Liquid Samples	1-liter cubitainer	Adjust pH to <2 with HNO_3, Cool 4°C	6 months
Soil/Sediment Studios	8-oz. widemouth glass jar	None	None

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

SAMPLING SURFACE WATER

SOP NO. 009

REVISION NO. 3

Approved by:

Kathleen Homer
Quality Assurance Officer

5/19/93
Date

1.0 BACKGROUND

Surface water sampling is conducted to determine the quality of surface water entering, leaving, or affected by a site. Surface water bodies that can be sampled include streams, rivers, and lakes. This standard operating procedure (SOP) discusses common methods of collecting grab samples that represent water quality in a water body at a particular point in time.

A series of grab samples also can be composited to represent water quality over a longer period of time. Composite samples can be flow proportional or time proportional. The details of compositing water samples are not included in this SOP.

1.1 PURPOSE

This SOP establishes the requirements and procedures for surface water sampling.

1.2 SCOPE

This SOP applies to surface water sampling and the instruments and methods used to collect the samples.

1.3 DEFINITIONS

Kemmerer Sampler: A messenger-activated water sampling device. Water flows through the device until the release mechanism is triggered to close the container.

Peristaltic Pump: A pumping device characterized by its low suction and rhythmic nature, and by the fact that the pump does not come into direct contact with the water being sampled.

Pond Sampler: A sampling device fabricated by using an adjustable beaker clamp to attach a beaker to a telescoping, heavy-duty aluminum pole.

1.4 REFERENCES

deVera, E.R., and others. 1980. "Samplers and Sampling Procedures for Hazardous Waste Streams." EPA 600-2-80-018. January.

GCA Corporation. No date. "Quality Assurance Plan, Love Canal Study - Appendix A, Sampling Procedures." Prepared under EPA Contract 68-02-3168.

U.S. Environmental Protection Agency. 1977. "Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities." EPA-530/SW-611. August.

EPA. 1984. "Characterization of Hazardous Waste Sites — A Methods Manual, Volume II. Available Sampling Methods." Second Edition. EPA-600/4-84-076. December.

1.5 REQUIREMENTS AND RESOURCES

Surface water sampling requires a variety of procedures and instruments. The choice of procedure should be determined by site-specific conditions, such as the type of surface water body, the sampling depth, and the sample location's distance from shore.

Samples can be collected from shallow depths by submerging the sample container. An intermediary disposable collection container or one constructed of a nonreactive material also may be used. A pond sampler, a peristaltic pump, or a Kemmerer sampler may be used to provide extended reach. The following equipment may be required to sample surface water:

- Decontamination materials
- Sample containers and labels
- Point-source bailer
- Dipper
- Boat
- Pond sampler
- Peristaltic pump
- Silicone tubing

- Heavy-wall Teflon® tubing
- Kemmerer sampler
- Logbook or field sheets
- Chain-of-custody documentation

2.0 PROCEDURE

Safe access, handling, and other physical limitations should be influential factors during surface water sampling. A site-specific sampling plan should delineate which of the procedures described below will be used. Any deviations from the sampling plan should be recorded in the site-specific field logbook.

The following subsections provide detailed procedures for surface water sampling using specific instruments and methods. In all cases, select a sampling location where the water quality will best represent the water chemistry of the water body. Avoid stagnant or fast-moving areas. Do not sample immediately downstream of incoming tributaries, because of the likelihood of incomplete mixing.

2.1 SAMPLING SURFACE WATER BY SUBMERGING THE SAMPLE CONTAINER

Samples from shallow depths should be collected by submerging the sample container. This method is advantageous when the sample might be significantly altered during transfer from a collection vessel into another container.

All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use. Refer to SOP No. 002, "Equipment Decontamination."

The following is the procedure for sampling surface water by submerging the sample container:

1. Place all equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container. Sample containers should be selected according to the requirements in SOP No. 017, "Sample Collection Containers Requirements."

3. Before collecting the sample, measure the temperature, pH, and specific conductivity of the water body, using procedures in SOPs No. 011, 012, and 013, respectively. Record this information on the field sheet or in the logbook.

4. For stream sampling, sample the location farthest downstream first. Orient the mouth of the sample container upstream while standing downstream so as not to stir up any sediment that would contaminate the sample.

5. For a larger body of surface water, such as a lake, collect samples near the shore, unless boats are feasible and permitted. Collect samples from shallow depths by submerging the sample container. Collect samples from deeper depths using a point-source bailer, dipper, or similar transfer device.

6. Collect surface water samples at each location before collecting sediment samples to avoid contaminating the water samples with excess suspended particles generated during sediment sampling.

7. Continue delivery of the sample until the container is almost full. Leave adequate ullage to allow for expansion. If sampling for volatile organics analysis, however, the container must be completely filled leaving no head space.

8. Ensure that a Teflon® liner is present in the cap of the sample container, if required. Secure the cap tightly. Preserve the sample according to requirements in SOP No. 016, "Sample Preservation and Maximum Holding Times."

9. Record the information in the field logbook and complete chain-of-custody documents.

2.2 SAMPLING SURFACE WATER WITH A TRANSFER DEVICE

A dipper or other device made of inert material, such as stainless steel or Teflon®, can be used to transfer liquid samples from their source to a sample container. This prevents contamination of the outside of the sample container as a result of direct immersion in surface water. Depending on the sampling application, the transfer device may be either disposed of or reused. If reused, the device should be thoroughly rinsed and decontaminated prior to sampling a different source.

A transfer device can be used in most sampling situations but should not be used in situations where aeration of the sample must be avoided, such as when sampling for volatile organic analysis, or where a significant amount of contaminants may be lost because of adhesion to the transfer device.

All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use.

Following is the procedure for sampling surface water with a dipper or other transfer device:

1. Place all equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container.

3. Before collecting the sample, measure the temperature, pH, and specific conductivity of the water body, using procedures in SOPs No. 011, 012, and 013, respectively. Record this information on the field sheet or in the logbook.

4. With minimal surface water disturbance, submerge a precleaned stainless-steel dipper or other transfer device.

5. Allow the device to fill slowly and continuously.

6. Retrieve the device from the surface water with minimal disturbance.

7. Remove the cap from the sample container. Slightly tilt the mouth of the container below the edge of the device.

8. Empty the device slowly, allowing the sample to flow gently down the inside of the container with minimal entry turbulence.

9. Continue delivery of the sample until the container is almost full. Leave adequate ullage to allow for expansion. If sampling for volatile organics analysis, however, the container must be completely filled leaving no head space.

10. Ensure that a Teflon® liner is present in the cap of the sample container, if required. Secure the cap tightly. Preserve sample according to requirements in SOP No. 016, "Sample Preservation and Maximum Holding Times."

11. Record the information in the field logbook and complete the chain-of-custody documents.

12. Decontaminate the equipment prior to reuse or storage (see SOP No. 002, "Equipment Decontamination").

2.3 SAMPLING SURFACE WATER WITH A POND SAMPLER

A pond sampler may be used to collect liquid samples from ponds, pits, and lagoons.

The pond sampler is not commercially available, but it is easily and inexpensively fabricated. To construct a pond sampler, use an adjustable clamp to attach a sampling beaker to the end of a two- or three-piece telescoping aluminum tube. The telescoping tube serves as the handle. All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use. Refer to SOP No. 002, "Equipment Contamination."

The following is the procedure for sampling surface water with a pond sampler:

1. Place all equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container.

3. Before collecting the sample, measure the temperature, pH, and specific conductivity of the water body, using procedures in SOPs No. 011, 012, and 013, respectively. Record this information on the field sheet or in the logbook.

4. Assemble the pond sampler. Ensure that the sampling beaker, bolts, and nuts securing the clamp to the pole are tightened properly.

5. Collect the sample by slowly submerging the precleaned beaker with minimal surface water disturbance.

6. Retrieve the pond sampler from the surface water with minimal disturbance.

7. Remove the cap from the sample container. Slightly tilt the mouth of the container below the edge of the beaker.

8. Empty the beaker slowly, allowing the sample to flow gently down the inside of the container with minimal entry turbulence. Continue delivery until the container is almost full. Leave adequate ullage to allow for expansion. If sampling for volatile

organics analysis, howoever, the container must be completely filled leaving no head space.

9. Ensure that a Teflon® liner is present in the cap of the sample container, if required. Secure the cap tightly. Preserve the sample according to requirements in SOP No. 016, "Sample Preservation and Maximum Holding Times."

10. Record the information in the field logbook and complete the chain-of-custody documents.

11. Decontaminate the equipment prior to reuse or storage (see SOP No. 002, "Equipment Decontamination").

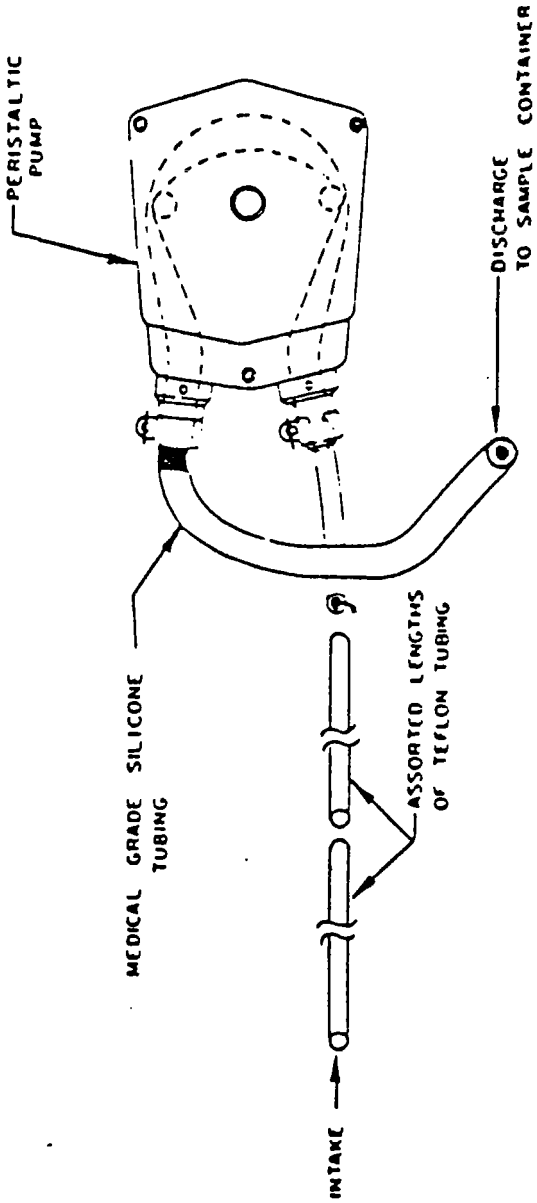
2.4 SAMPLING SURFACE WATER WITH A PERISTALTIC PUMP

To extend reach in sampling efforts, a small peristaltic pump can be used (see Figure 1). A peristaltic pump draws the sample through heavy-wall Teflon® tubing and pumps it directly into the sample container. Use of a peristaltic pump allows the operator to reach out into a liquid body, to sample from a depth or to sweep the width of a narrow stream.

If medical-grade silicone tubing is used in the peristaltic pump, it is suitable for sampling almost any parameter, including most organics. However, some volatile stripping may occur, and even though the pump may have a high flow rate, some sample material may be lost on the tubing. The pump requires electricity to operate so a battery-operated pump is preferable because it eliminates the need for a direct current generator or alternating current inverter.

FIGURE 1

PERISTALTIC PUMP FOR LIQUID SAMPLING



All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use. Refer to SOP No. 002, "Equipment Decontamination".

Following is the procedures for sampling surface water with a peristaltic pump:

1. Place all equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container.

3. Before collecting the sample, measure the temperature, pH, and specific conductivity of the water body, using procedures in SOPs No. 011, 012, and 013, respectively. Record this information on the field sheet or in the logbook.

4. Install clean, medical-grade silicone tubing in the pump head according to the manufacturer's instructions. Allow enough tubing on the discharge side to facilitate delivery of liquid into the sample container. Allow only enough tubing on the suction end for attachment to the intake line. This will minimize sample contact with the tubing.

5. Select the length of suction intake tubing needed to reach the required sample location. Attach it to the intake side of the pump tubing. Heavy-wall Teflon® tubing of a diameter equal to that of the required pump tubing suits most applications. A heavier wall will allow slightly greater lateral reach.

6. If possible, allow several liters of surface water to pass through the pump before collecting the sample. Collect this purge volume. Return it to the source after the samples have been withdrawn.

7. Fill the sample container by allowing the pump discharge to flow gently down the inside of the bottle with minimal entry turbulence.

8. Continue delivery of the sample until the container is almost full. Leave adequate ullage to allow for expansion. If sampling for volatile organics analysis, however, container must be completely filled leaving no head space.

9. Ensure that a Teflon® liner is present in the cap of the sample container, if required. Secure the cap tightly. Preserve the sample according to requirements in SOP No. 016, "Sample Preservation and Maximum Holding Times."

10. Record the information in the field logbook and complete the chain-of-custody documents.

11. Allow the pump to drain, and then disassemble it. Decontaminate the tubing before reuse (see SOP No. 002, "Equipment Decontamination") or dispose of it.

2.5 SAMPLING SURFACE WATER WITH A KEMMERER SAMPLER

The Kemmerer sampler (see Figure 2) is used to collect surface water samples when the required sample depth is greater than that which can be sampled with a pump. A Kemmerer sampler may be constructed of various materials to be compatible with the required analytical technique.

All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use. Refer to SOP No. 002, "Equipment Decontamination".

The following is the procedure for sampling surface water with a Kemmerer sampler:

1. Place all equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to the appropriate sample container.

3. Before collecting the sample, measure the temperature, pH, and specific conductivity of the water body, using procedures in SOPs No. 011, 012, and 013, respectively. Record this information on the field sheet or in the logbook.

4. Inspect the body of the Kemmerer sampler to ensure that the drain valve is closed. Measure and mark a sample line at the desired sampling depth.

5. Open the bottle by lifting the top stopper-tip head assembly.

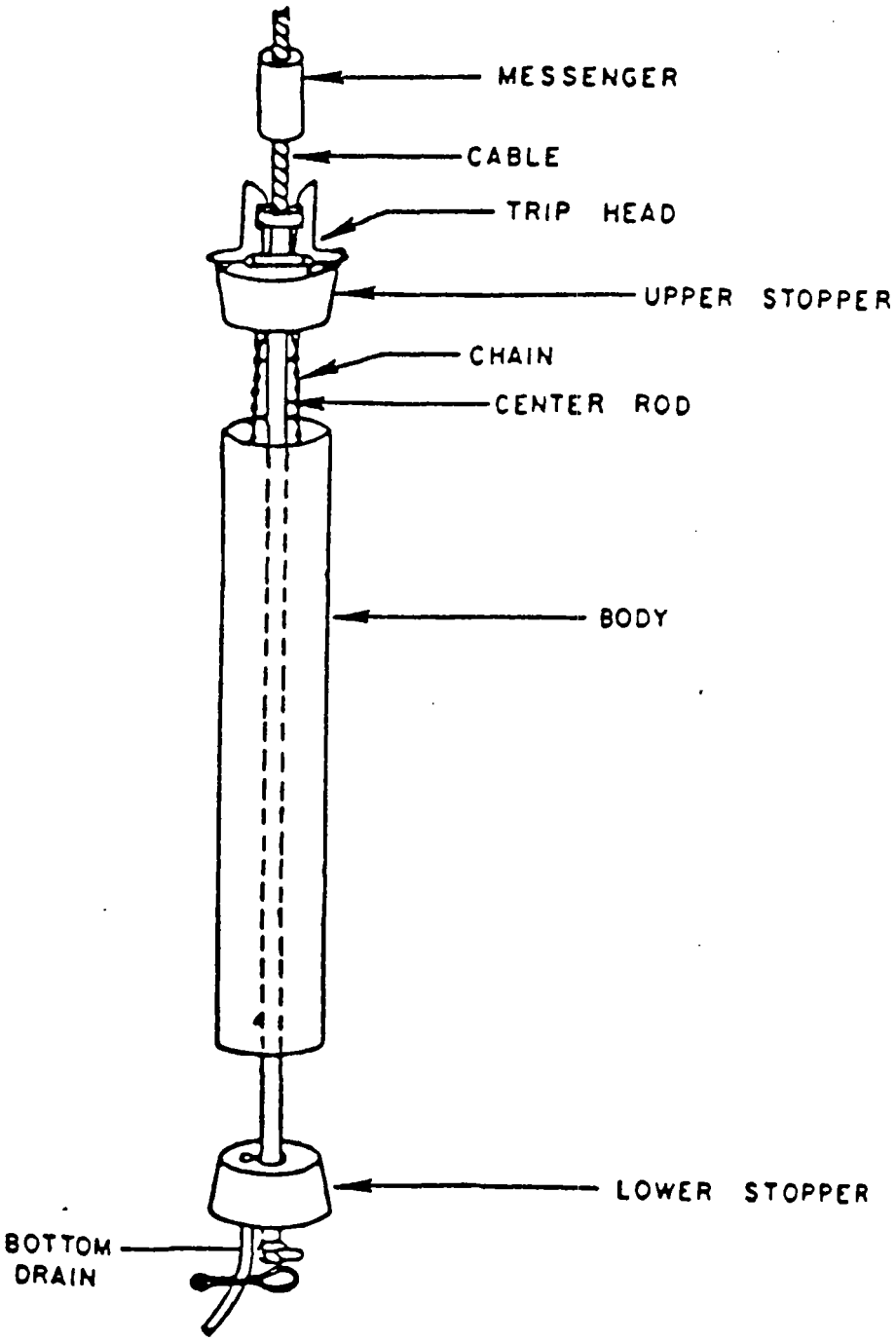
6. Gradually lower the bottle into the surface water until the sample liquid reaches the sample line.

7. Place a messenger on the sample line and release.

8. Retrieve the sampler. Prevent accidental opening of the bottom stopper by holding the center stem of the sampler.

FIGURE 2

KEMMERER SAMPLER



9. Rinse or wipe off the exterior of the sampler. Recover the sample by grasping the bottom stopper and sampler body with one hand. Transfer the sample by lifting the top stopper with the other hand and pouring the contents into the sample container. If a drain valve is present, hold the drain valve over the sample container, and open the valve to release the sample.

10. Transfer the sample slowly, allowing it to flow gently down the inside of the container with minimal entry turbulence. Continue delivery until the container is almost full.

11. Ensure that a Teflon® liner is present in the cap of the sample container, if required. Secure the cap tightly. Preserve the sample according to requirements in SOP No. 016, "Sample Presservation and Maximum Holding Times."

12. Record the information in the field logbook and complete the chain-of-custody documents.

13. Decontaminate the equipment prior to reuse or storage (see SOP No. 002, "Equipment Decontamination").

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

SAMPLING SLUDGE AND SEDIMENT

SOP NO. 006

REVISION NO. 3

Approved by:

Kathleen Horner
Quality Assurance Officer

5/18/93
Date

1.0 BACKGROUND

Sludges are semisolid materials ranging from dewatered solids to high-viscosity liquids. Sludges generally accumulate as residuals of water-bearing waste treatment or industrial process systems. Sludges typically accumulate in tanks, drums, impoundments, or other types of industrial containment systems.

Sediments generally are materials deposited in surface impoundments or in natural waterways such as lakes, streams, and rivers.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for sampling sludge and sediment.

1.2 SCOPE

This SOP applies to collection of sludge and sediment samples. It provides detailed procedures for gathering such samples with specific instruments.

1.3 DEFINITIONS

Gravity Corer: A metal tube with a replaceable, tapered nosepiece on the bottom and a check valve on the top

Phleger: A type of gravity corer

Ponar Grab Sampler: A clamshell scoop activated using a counter-lever system

1.4 REFERENCES

American Public Health Association. 1975. *Standard Methods for the Examination of Water and Wastewater*. 14th Edition. Washington DC.

U.S. Environmental Protection Agency. 1984. *Characterization of Hazardous Waste Sites -- A Methods Manual: Volume II -- Available Sampling Methods*. Second Edition. EPA-800 December.

1.5 REQUIREMENTS AND RESOURCES

The following equipment may be required to sample sludge or sediment:

- Plastic sheeting
- Field logbook
- Stainless-steel scoop or trowel
- Glass tubes
- Gravity corers
- Ponar grab sampler
- Stainless-steel or Teflon® tray
- Peristaltic pump
- Hand corer
- Nylon rope
- Sample containers and labels
- Chain-of-custody and shipping materials
- Decontamination materials

2.0 PROCEDURES FOR SLUDGE AND SEDIMENT SAMPLING

This section provides general procedures for sampling sludge and sediment. Sections 2.1 through 2.5 specify the methods and implements to be used for such sampling.

Sampling Sludge

Sludge can often be sampled using a stainless-steel scoop or trowel (see Section 2.1). Frequently sludge forms when components with higher densities settle out of a liquid. When this happens, the sludge may still have an upper liquid layer above the denser components. When the liquid layer is sufficiently shallow, the sludge may be sampled using a pond sampler (see SOP No. 009, "Sampling Surface Water") or a hand corer (see Section 2.2). Use of the hand corer is preferred because it results in less sample disturbance. The hand corer also allows for the collection of an aliquot of the overlying liquid. This prevents drying or excessive oxidation of a sample before analysis. Sludge that develops in 55-gallon drums can be collected using glass tubes provided for liquid sampling (see SOP No. 008, "Sampling Containerized Liquids"). The hand corer may be adapted to hold a brass, polycarbonate plastic, or Teflon® liner.

If a containerized sludge layer is shallow (less than 30 centimeters), hand corer penetration may damage the container liner or bottom. In this case, a Ponar grab sampler may be used because it is generally capable of penetrating only a few centimeters (see Section 2.4). Additionally, a gravity corer may be used to collect samples of most sludges and sediments (see Section 2.3). A gravity corer is capable of collecting an undisturbed sample that profiles the strata present in a sludge or sediment. Depending on the weight of the gravity corer and the density of the substrate, a gravity corer may penetrate up to 75 centimeters.

Sampling Sediment

Sediment can be sampled in much the same manner as sludge; however, a number of additional factors must be considered. In streams, lakes, and impoundments, for instance, sediment is likely to demonstrate significant variations in composition.

For stream sediment sampling, the sampling location farthest downstream should be sampled first. Sediment samples collected in upstream and downstream locations should be obtained in similar depositional environments and, whenever possible, should be obtained from slow-moving pools. In

addition, a sediment sample should be collected at approximately the same location as an associated aqueous sample. Aqueous samples should be obtained first to avoid collecting suspended particles that may result from sediment sampling. To avoid disturbing an area to be sampled, sampling locations in streams should always be approached from the downstream side.

Sediment samples collected from lakes and impoundments should also be collected at approximately the same locations as associated aqueous samples. As in stream sampling, aqueous samples should be collected first to avoid collecting suspended particles that may result from sediment sampling. Downgradient and background samples should be collected from similar depositional environments.

Exact sampling locations should be documented using triangulation with stable references on the banks of a stream or lake. In addition, the presence of rocks, debris, or organic material may complicate sampling and may preclude use or require modification of sampling implements. Sediment sampling should be conducted in a manner that reflects these and other variants.

The following subsections specify methods for sludge or sediment sampling with specific implements.

2.1 SLUDGE OR SEDIMENT SAMPLING WITH A SCOOP OR TROWEL

Sludge or sediment samples may be collected with a simple laboratory scoop or garden trowel. This method is more applicable to sludge but can also be used for sediments, provided that the water is very shallow (a few centimeters). However, using a scoop or trowel may disrupt the water-sediment interface and cause substantial sample alteration. This method provides a simple, quick means of collecting a disturbed sample of sludge or sediment.

All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use (see SOP No. 002, "Equipment Decontamination").

The following is the procedure for sampling sludge or sediment with a scoop or trowel:

1. Place all sampling equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container (see SOP No. 017, "Sample Collection Container Requirements").

3. Sketch the sampling area or note recognizable features in the field logbook for future reference. Measure and record the distance from the sampling location to fixed structures.

4. Insert a scoop or trowel into the material, and remove the sample. In the case of sludge exposed to air, remove the first 1 to 2 centimeters of material before collecting the sample.

5. When compositing a series of grab samples, use a stainless-steel bowl or Teflon® tray for mixing.

6. Place the sample in the labeled sample container using a stainless-steel laboratory spoon or the equivalent.

7. If required, ensure that a Teflon® liner is present in the sample container cap. Secure the cap tightly. Preserve samples in accordance with SOP No. 16, "Sample Preservation and Maximum Holding Times."

8. Complete all chain-of-custody documents (see SOP No. 018, "Sample Custody"), the field logbook entry, and all sample packaging requirements (see SOP No. 019, "Packaging and Shipping Samples").

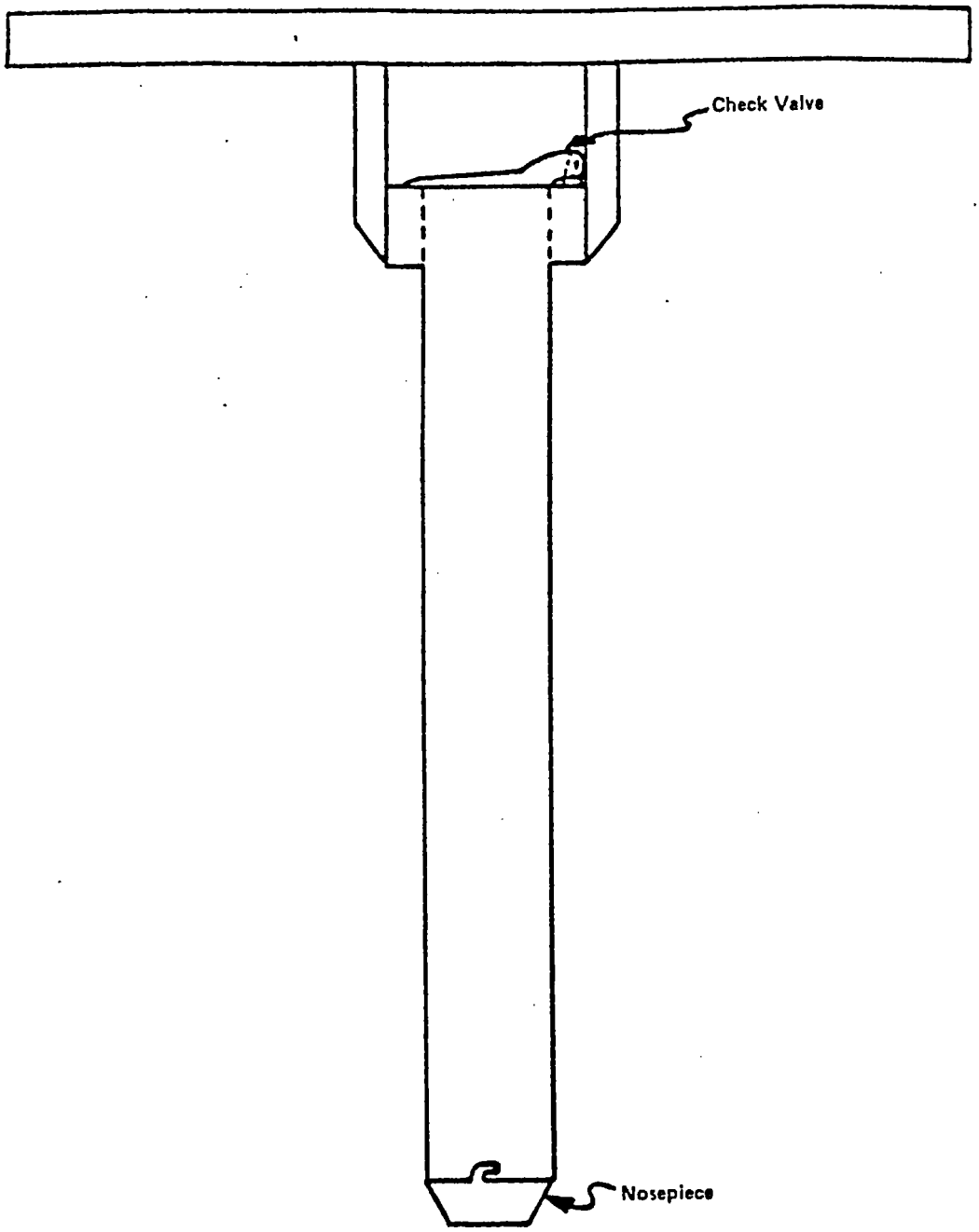
9. Decontaminate all sampling equipment before and after use and between sampling locations in accordance with SOP No. 002, "Equipment Decontamination."

2.2 SLUDGE OR SEDIMENT SAMPLING WITH A HAND CORER

A hand corer is a thin-walled corer with two additions (see Figure 1): a handle to facilitate driving the implement and a check valve on top to prevent washout when retrieving a sample through an overlying water layer.

FIGURE 1

HAND CORER



The hand corer is used in the same situations and for the same materials as those described for the use of a scoop or trowel (see Section 2.1). However, the hand corer may be used to collect an undisturbed sample that can profile any stratification resulting from changes in deposition.

Some hand corers can be fitted with extension handles that allow collection of samples underlying a shallow layer of liquid. Most hand corers can be adapted to hold liners, which are generally available in brass, polycarbonate plastic, or Teflon®. A liner material should be chosen that will not compromise the intended analytical procedures.

All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use. Liners also may require decontamination prior to use. Equipment should be decontaminated in accordance with SOP No. 002, "Equipment Decontamination."

The following is the procedure for sampling sludge or sediment with a hand corer:

1. Place all sampling equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container (see SOP No. 017, "Sample Collection Container Requirements").

3. Sketch the sampling area or note recognizable features in the field logbook for future reference. Measure and record the distance from the sampling location to fixed structures.

4. Force the hand corer into the material using a smooth, continuous motion.

5. Twist the hand corer and withdraw it in a single, smooth motion.

6. Remove the nosepiece and withdraw the sample. Place the sample on a clean stainless-steel or Teflon® tray.

7. Transfer the sample into the labeled sample container using a stainless-steel laboratory spoon or the equivalent.

8. If required, ensure that a Teflon® liner is present in the sample container cap. Secure the cap tightly. Preserve samples in accordance with SOP No. 016, "Sample Preservation and Maximum Holding Times."

9. Complete all chain-of-custody documents (see SOP No. 018, "Sample Custody"), the field logbook entry, and all sample packaging requirements (see SOP No. 019, "Packaging and Shipping Samples").

10. Decontaminate all sampling equipment before and after use and between sampling locations in accordance with SOP No. 002, "Equipment Decontamination."

2.3 BOTTOM SLUDGE OR SEDIMENT SAMPLING WITH A GRAVITY CORER

A gravity corer is a metal tube with a replaceable, tapered nosepiece on the bottom and a ball valve or other type of check valve on the top (see Figure 2). The tapered nosepiece facilitates cutting and reduces core disturbance during penetration. The check valve allows water to pass through the sample. Most gravity corers are made of brass or steel. Many can accept plastic liners and additional weights.

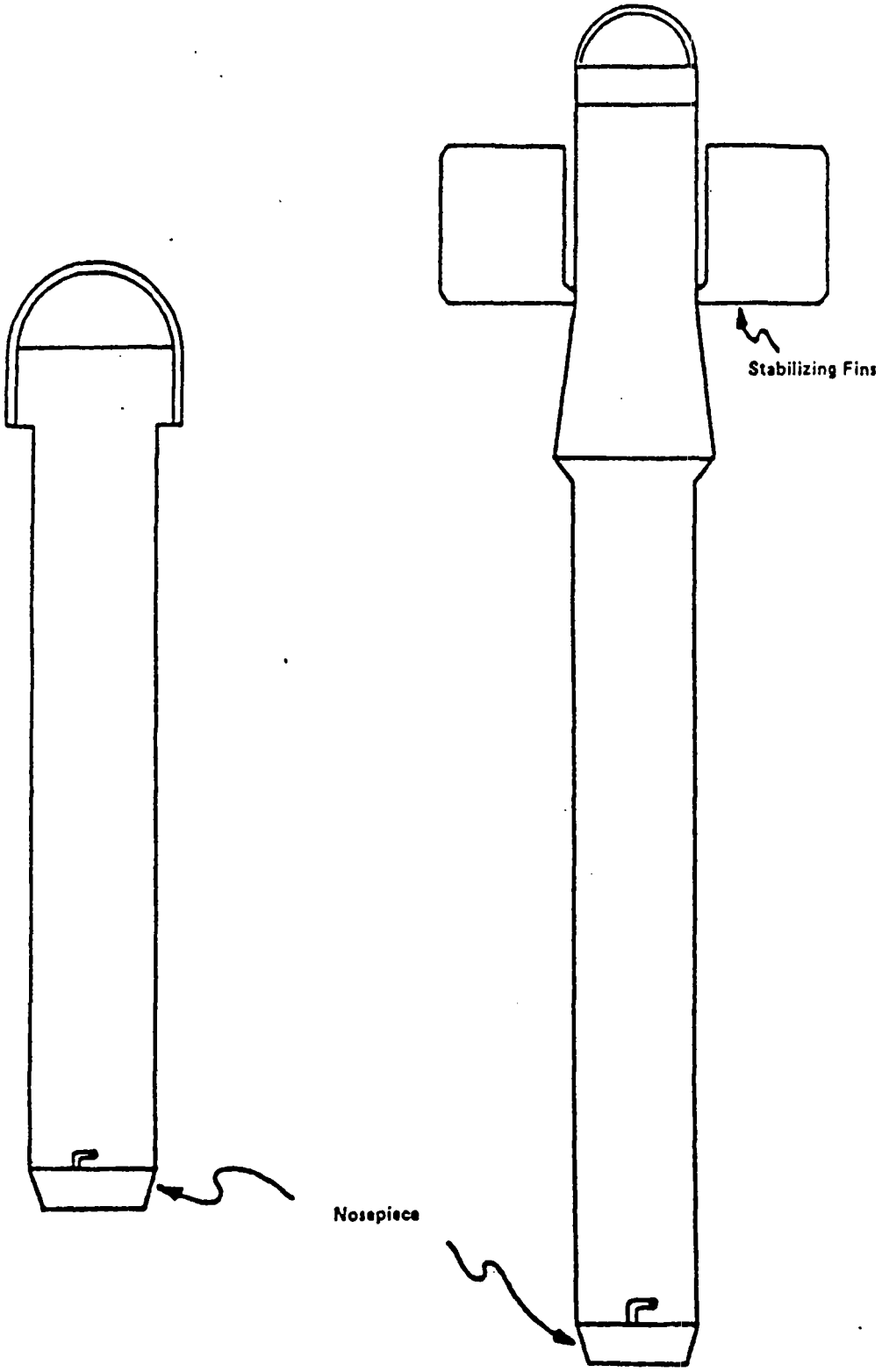
A gravity corer can collect most sludge and sediment samples. It collects essentially undisturbed samples to profile strata that may develop in sediment and sludge during variations in the deposition process. Depending on substrate density and gravity corer weight, penetration to a depth of 75 centimeters is possible.

Gravity corers should be used carefully in vessels or lagoons with liners. A gravity corer could penetrate beyond the substrate and damage liner material.

All sampling equipment should be made of inert and nonreactive materials. Nondisposable equipment should be cleaned before and after each use. Liners may also require decontamination prior to use. Equipment should be decontaminated in accordance with SOP No. 002, "Equipment Decontamination."

FIGURE 2

GRAVITY CORER



The following is the procedure for sampling bottom sludge or sediment with a gravity corer:

1. Place all equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container (see SOP No. 017, "Sample Collection Container Requirements").

3. Sketch the sampling area or note recognizable features in the field logbook for future reference. Measure and record the distance from the sampling location to fixed structures.

4. Attach a precleaned gravity corer to the required length of sample line. Solid, braided, 5-millimeter (3/16-inch) nylon line is sufficient; however, 20-millimeter (3/4-inch) nylon line, is easier to grasp during hoisting.

5. Secure the free end of the line to a fixed support to prevent accidental loss of the gravity corer.

6. Allow the gravity corer to fall freely through the liquid.

7. Retrieve the gravity corer with a smooth, continuous lifting motion. Do not bump the corer, as this may result in some sample loss.

8. Remove the nosepiece from the gravity corer. Slide the sample out of the corer into a stainless-steel or Teflon® pan.

9. Place the sample in the labeled sample container using a stainless-steel laboratory spoon or the equivalent.

10. If required, ensure that a Teflon® liner is present in the sample container cap. Secure the cap tightly. Preserve samples in accordance with SOP No. 016, "Sample Preservation and Maximum Holding Times."

11. Complete all chain-of-custody documents (see SOP No. 018, "Sample Custody"), the field logbook entry, and all packaging requirements (see SOP No. 019, "Packaging and Shipping Samples").

12. Decontaminate all sampling equipment before and after use and between sampling locations in accordance with SOP No. 002, "Equipment Decontamination."

2.4 SLUDGE OR SEDIMENT SAMPLING WITH A PONAR GRAB

A Ponar grab sampler can be used to sample most types of sludge and sediment (see Figure 3). Its penetration depth usually does not exceed several centimeters. The Ponar grab sampler, like other grab samplers, cannot collect undisturbed samples; therefore, this implement should be used only after all overlying water samples have been collected.

The following is the procedure for sampling sludge or sediment with a Ponar grab sampler:

1. Place all equipment on plastic sheeting next to the sampling location.

2. Affix a completed sample container label to an appropriate sample container (see SOP No. 017, "Sample Collection Container Requirements").

3. Sketch the sampling area or note recognizable features in the field logbook for future reference. Measure and record the distance from the sampling location to fixed structures.

4. Attach a precleaned Ponar grab sampler to the sample line. Braided, 20-millimeter (3/4-inch) nylon line is recommended for ease in hoisting.

5. Measure the distance to the bottom of the liquid overlaying the sludge or sediment. Mark this measurement on the sample line. To avoid unnecessary disturbance of the sampling area by lowering the Ponar grab sampler too quickly, a second mark indicating the proximity of the sample mark is recommended.

6. Open the Ponar sampler's jaws until they are latched. The jaws will be triggered if the Ponar sampler comes in contact with or is supported by anything other than the lift line. Tie the free end of the sample line to a fixed support.

7. Lower the Ponar sampler until the proximity sample mark is reached. Slowly lower the Ponar sampler until it touches the sludge or sediment.

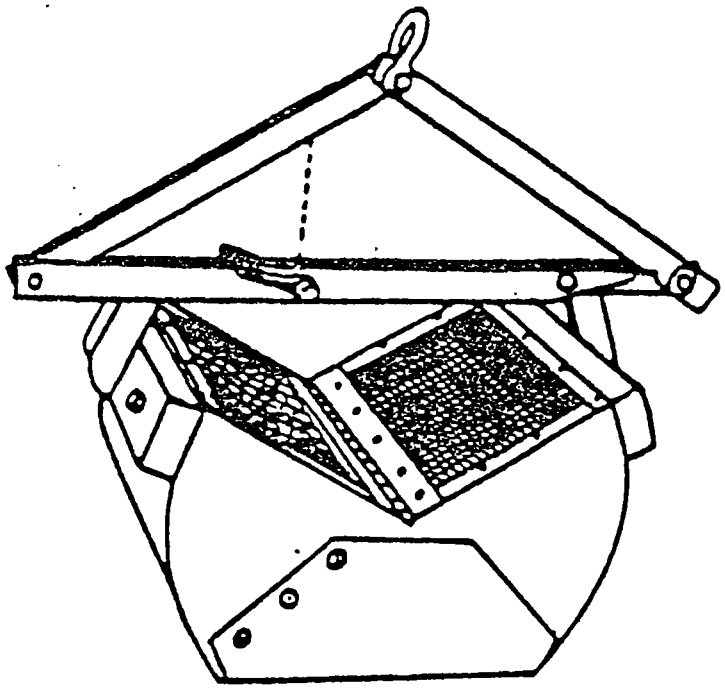
8. Allow the sample line to slacken a few inches; more slack may be required when sampling in strong currents. Release the mechanism to trap the sample and retrieve the sampler.

9. Release the contents of the Ponar sampler onto a stainless-steel or Teflon® tray.

10. Place the sample in an appropriate sample bottle using a stainless-steel laboratory spoon or the equivalent.

FIGURE 3

PONAR GRAB SAMPLER



11. If required, ensure that a Teflon® liner is present in the cap. Secure the cap tightly. Preserve samples in accordance with SOP No. 016, "Sample Preservation and Maximum Holding Times."

12. Complete all chain-of-custody documents (see SOP No. 018, "Sample Custody"), the field logbook entry, and all sample packaging requirements (see SOP No. 019, "Packaging and Shipping Samples").

13. Decontaminate all sampling equipment before and after use and between sampling locations in accordance with SOP No. 002, "Equipment Decontamination."

2.5 SLUDGE OR SEDIMENT SAMPLING WITH A PERISTALTIC PUMP

Sludge or sediment can be sampled with a peristaltic pump as described in SOP No. 009, "Sampling Surface Water." However, this method should only be used to collect slurried samples that are less than about 20 percent solid. The increased weight of more solid material greatly reduces the lift capacity of the pump; thus, it may be useful to laterally extend the reach of the sampler toward the center of a vessel. In slurries that are not fully agitated, a bias may be established toward the liquid portion of the material.

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

USING THE GEOPROBE SYSTEM

SOP NO. 054

REVISION NO. 1

Approved by:

Edward M. Hewitt

Quality Assurance Officer

3-30-94

Date

1.0 BACKGROUND

This standard operating procedure (SOP) details all procedures for using the Geoprobe System, a hydraulically operated sampling probe, and its specialized sampling tools. The procedures described within this SOP include soil gas sampling, groundwater sampling, and soil sampling procedures as well as procedures for installing piezometers and vapor sampling implants. This SOP also describes general procedures for rod removal, backfilling, and decontamination which are common elements to all sampling procedures. This SOP No. 054 replaces former draft SOP No. 054 (Geoprobe Soil Gas Sampling) and draft SOP No. 055 (Geoprobe Groundwater Sampling).

Use of the Geoprobe System is only one of many sampling techniques used by PRC Environmental Management, Inc. (PRC); however, it is a preferred sampling method when certain conditions prevail. Specifically, Geoprobe sampling should be considered when sampling is limited to relatively shallow depths and any of the following are factors: (1) costs must be kept very low, (2) the time period is short to perform the sampling, (3) maneuverability is important, and (4) the required sampling volume is limited.

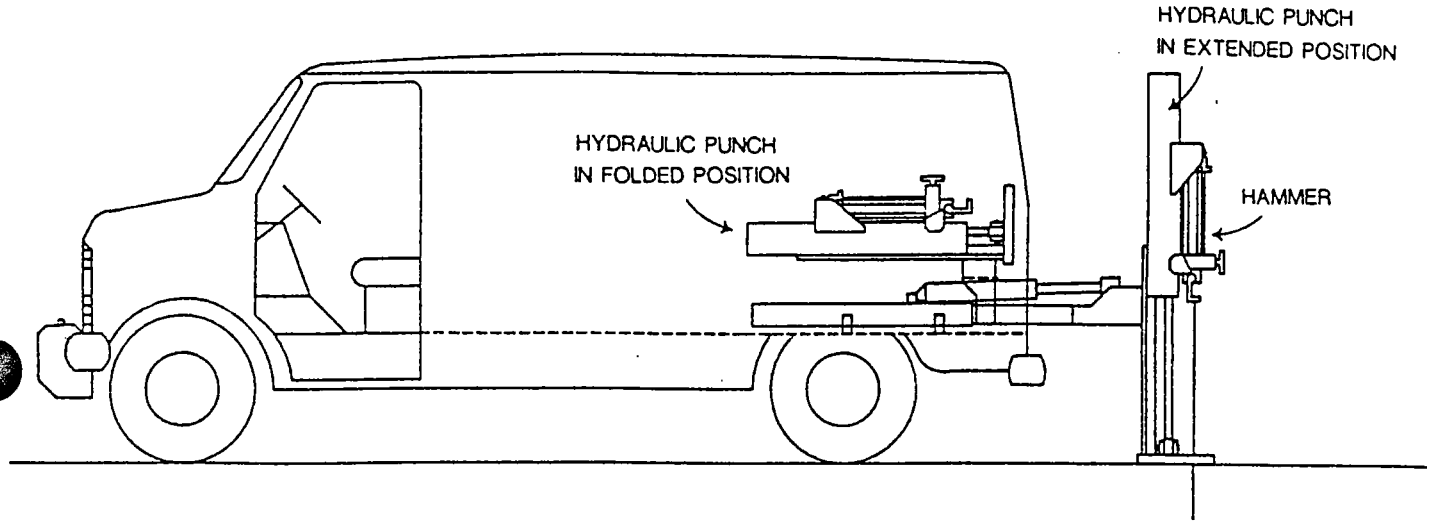
Prior to the use of the Geoprobe equipment, all buried utility lines and other underground structures must be marked because this equipment can penetrate buried piping and tanks. A diagram of the Geoprobe system is shown in Figure 1.

1.1 PURPOSE

The purpose of SOP No. 054 is to establish positioning, preparing, and sampling procedures; piezometer and vapor sampling implant installation procedures; rod removal procedures; backfilling procedures; and decontamination procedures to guide field personnel.

FIGURE 1

GEOPROBE SYSTEM



1.2 SCOPE

The procedures outlined in SOP No. 054 are applicable to all PRC personnel involved in soil gas, soil, or groundwater sampling using the Geoprobe System or any of its specialized equipment. It also is applicable to all personnel using the Geoprobe System to install piezometers and vapor sampling implants. This SOP, in fact, applies to all uses of the Geoprobe System.

1.3 DEFINITIONS

Because Geoprobe Systems is a corporation specializing in an innovative sampling process, many of the terms used to describe its equipment are specialized and specific. For this reason, familiarity with hydraulic system, soil sampling, soil gas sampling, and groundwater sampling terms is necessary. These terms are discussed below.

1.3.1 Hydraulic System Terms

The following terms are principally used to discuss the basic operation of the hydraulic punch and its major components. If terms are encountered while using this SOP that are not listed below, check Sections 1.3.2, 1.3.3, and 1.3.4 below.

Hydraulic Punch — The principal part of the Geoprobe System, the hydraulic punch, looks very much like a small mobile drilling rig and is usually attached to a truck or van. The punch's hydraulic system uses the weight of the vehicle for support and a hydraulic system installed in the vehicle to advance sampling tools into the soil (see Figure 1).

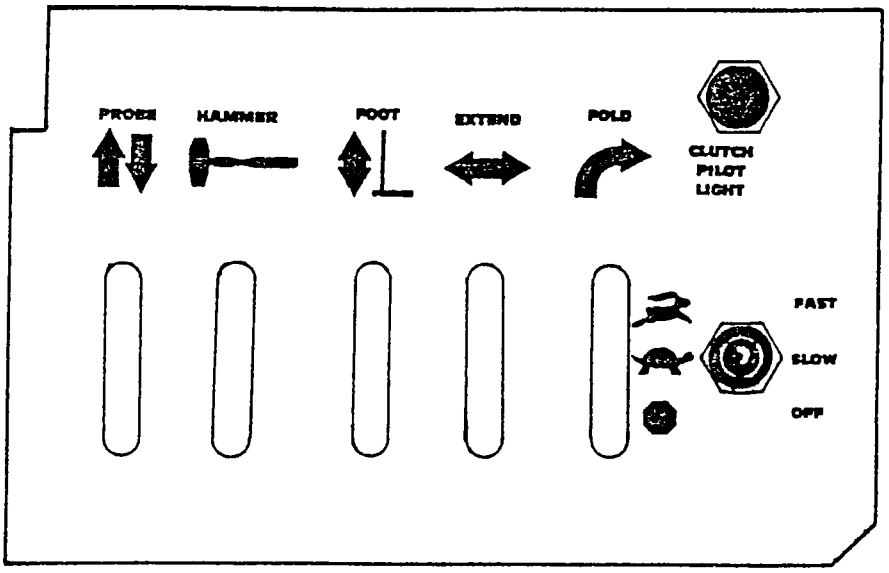
Hammer — The hydraulic hammer pounds the rods and accessories into the soil once the hydraulic punch is unable to push it farther (see Figure 1).

Control Panel — The control panel is located near the hydraulic punch and contains the levers that control the movement of the punch (see Figure 2).

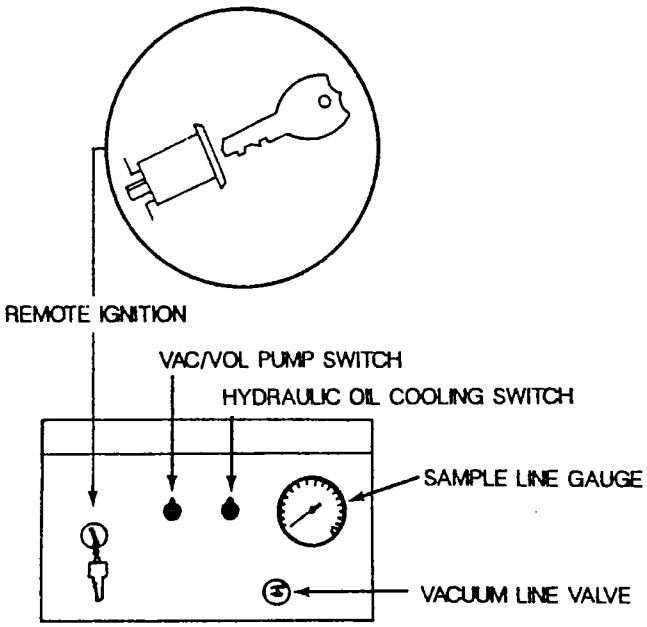
Probe Lever — This lever is found on the control panel and causes the hydraulic punch to push the drive rod and accessories into the soil. Overall, this lever controls the vertical movement of the punch (see Figure 2).

FIGURE 2

CONTROL AND VACUUM SYSTEM PANELS



CONTROL PANEL



VACUUM SYSTEM PANEL

Hammer Lever — This lever is found on the control panel and engages the hydraulic hammer when the hammer release valve is moved to its extended position (see Figure 2).

Hammer Release Valve — This lever is found on the front of the hydraulic punch and allows the hammer to work when in its extended position. If the valve is not extended, pushing the hammer lever will not engage the hammer.

Foot Lever — This lever is found on the control panel and lowers the foot of the hydraulic punch so that it rests on the ground to stabilize the punch (see Figure 2).

Extend Lever — This lever is found on the control panel and controls the horizontal movement of the hydraulic punch. The lever extends the punch out of the van or truck. It also enables the hydraulic punch to extend about 2 feet from the rear of the vehicle (see Figure 2).

Fold Lever — This lever is found on the control panel and folds and unfolds the hydraulic punch so that it can be easily moved and stored (see Figure 2). This lever enables the hydraulic punch to move from the horizontal position to the vertical position.

Electrical Control Switch — This switch is found on the control panel and turns on the Geoprobe System's hydraulic system. None of the other levers work until this switch is turned on. It has slow, fast, and off speed positions (see Figure 2).

Vacuum System Panel — The vacuum system panel is located near the right rear of the vehicle and contains the vacuum system controls, the hydraulic oil cooling switch, and the remote ignition (see Figure 2).

Remote Ignition — This device is found on the vacuum system panel and allows one to start the vehicle's engine from near the hydraulic punch instead of walking around the vehicle and climbing into the vehicle's cab (see Figure 2).

Hydraulic Oil Cooling Switch — This switch is found on the vacuum system panel and turns on the auxiliary cooling system for the hydraulic oil (see Figure 2).

Vacuum/Volume (Vac/Vol) Pump Switch — This switch is found on the vacuum system panel and allows pressure to build up in the vacuum tank (see Figure 2).

Vacuum Line Valve — This valve is found on the vacuum system panel and opens and closes the vacuum line (see Figure 2).

Sample Line Gauge — This gauge is found on the vacuum system panel and registers the sample line pressure in inches of mercury (see Figure 2).

Drive Rod — The Geoprobe drive rod (sometimes called a probe rod) is a high-strength-steel, hollow tube with a 1-inch outer diameter. Though the rods come in 1-foot, 2-foot, and 3-foot lengths, the standard length is 3 feet. Each rod is threaded on both ends and has a male end and a female end (see Figure 3).

Drive Cap — This cap is a steel cap screwed onto the male end of the drive rod so that the rod can be pushed or hammered into the soil without damaging its threads. The drive cap is always installed to the top of the drive rod before advancing probe rods or sampling tools (see Figure 3).

Pull Cap — This cap is a steel cap that screws onto the male end of the drive rod and is used to pull the drive rod from the soil once the sample has been collected (see Figure 3).

Anvil — This piece of steel is placed inside the hydraulic punch at the point where the hammer actually makes contact. The anvil transfers the force of the hammer to the drive cap (see Figure 3).

Rotary-Impact Carbide-Tipped Drill Bit — This 18-inch or 24-inch steel drill bit fits directly into the hydraulic punch and is used to drill through concrete or hard asphalt. The bit does not spin with appreciable torque but is driven by the hammer, spinning only slightly to clear itself of debris (see Figure 3).

Chain-Assisted Pull Cap — This modified pull cap is attached to the hydraulic punch with a chain. It is most useful when the drive rod, for one reason or another, is not aligned directly underneath the hydraulic punch. With this cap, the rod can still be pulled using the punch (see Figure 3).

Rod Extractor — This tool threads onto a drive rod and is sent down into the hole made by a drive rod that has broken in the soil. The rod extractor, which looks a little like a drill bit, is then hammered into the broken rod and is used to pull the broken rod from the soil (see Figure 3).

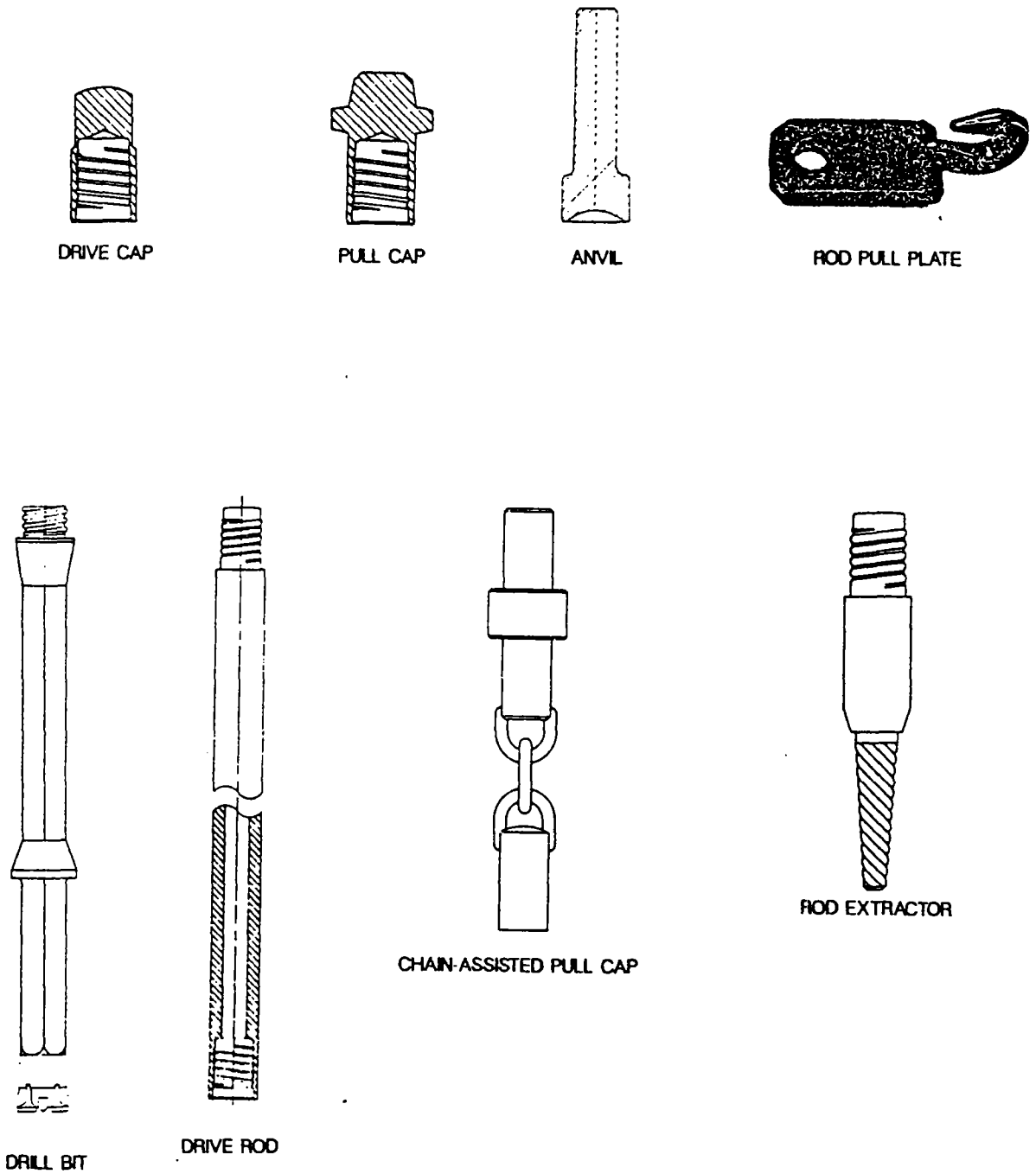
Rod Pull Plate — This steel plate has a hole in its center through which a drive rod can be fitted. It is used to extract drive rods when installing piezometers, soil gas implants, or to expose the screen to groundwater when using a screen point sampler (see Figure 3).

O-Ring — An O-ring is a rubber ring used to seal sections of drive rods or various other Geoprobe tools so that, once together, they are air- and water-tight.

Teflon Tape — This inert, sticky tape can be used to create air-tight seals when pieces of the drive rod or accessories are threaded together. The tape can replace an O-ring.

FIGURE 3

GENERAL ACCESSORY TOOLS



1.3.2 Soil Sampling Terms

These terms are usually used when discussing soil sampling using the Geoprobe System. Sometimes, though, the terms are used when discussing other sampling techniques. If terms are encountered while using this SOP that are not listed below, check Sections 1.3.1 above and Sections 1.3.3 and 1.3.4 below.

Shelby Tube — This tube is used to collect large samples of cohesive soils. Its greatest disadvantages are that it cannot be used to sample from depths greater than about 10 feet and has no mechanism to stay closed until reaching the proper depth (see Figure 4).

Shelby-Tube-Drive Head — This 2-inch diameter piece of steel attaches to the Shelby tube using hex bolts. The Shelby-tube-drive head consists of two parts: a standard 2-inch Shelby tube drive head and a Geoprobe drive rod adapter. This allows the 2-inch wide Shelby tube to be driven by the hydraulic punch, which is actually designed for 1-inch diameter drive rods (see Figure 4).

Hex Bolts — These are the bolts used to attach a Shelby tube to a drive head (see Figure 4).

Extruder Latch — This device secures the Shelby tube to the extruder rack during the extrusion process that removes the soil from the tube (see Figure 4).

Extruder Piston — This piston is threaded onto a drive rod, and with the help of the hydraulic punch, extrudes the soil sample from the Shelby tube (see Figure 4).

Probe-Drive Systems — This sampling system allows samples to be collected at deeper depths than the Shelby tube system. Each probe-drive sampler remains closed until it reaches the depth desired and then is opened by those operating the punch by removing a stop pin (see Figure 5). The sampler is then pushed through the soil at the desired depth and removed. Three types of probe-drive samplers exist: the standard sampler, the Kansas sampler, and the large bore probe-drive sampler.

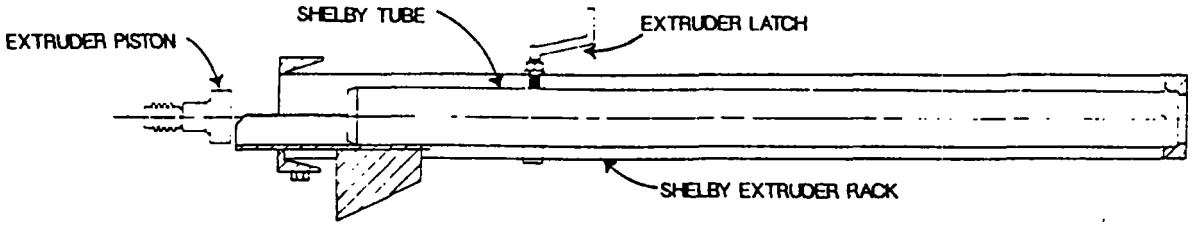
Standard Probe-Drive Sampler — This probe-drive sampler has a diameter of 1 inch and lengths of 10 or 24 inches. Its greatest difference from the other probe-drive sampler is that it does not have a removable cutting shoe (see Figure 5).

Stop Pin — This pin stops the point of a probe-drive sampler from retracting into the sampler tube. Once it is removed, the sample can be collected (see Figure 5).

Piston Rod — This rod connects the drive head of a probe-drive sampler to the sampler's point. Once the stop pin is removed, this rod slides through the sampler, allowing the point to retract inside the tube (see Figure 5).

FIGURE 4

SHELBY TUBE ACCESSORIES



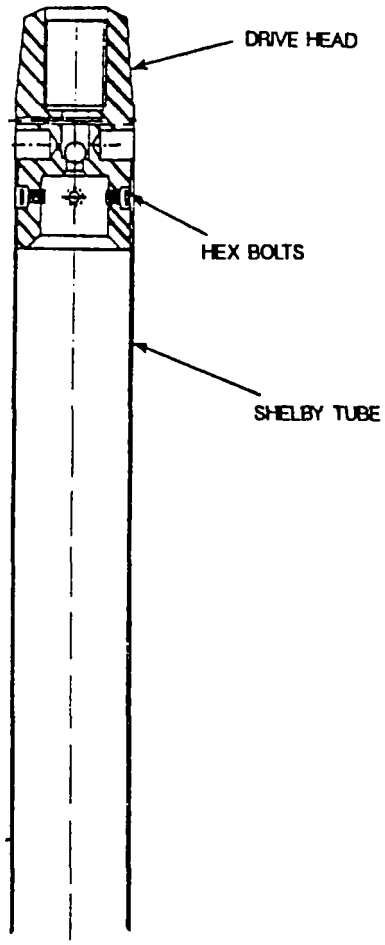
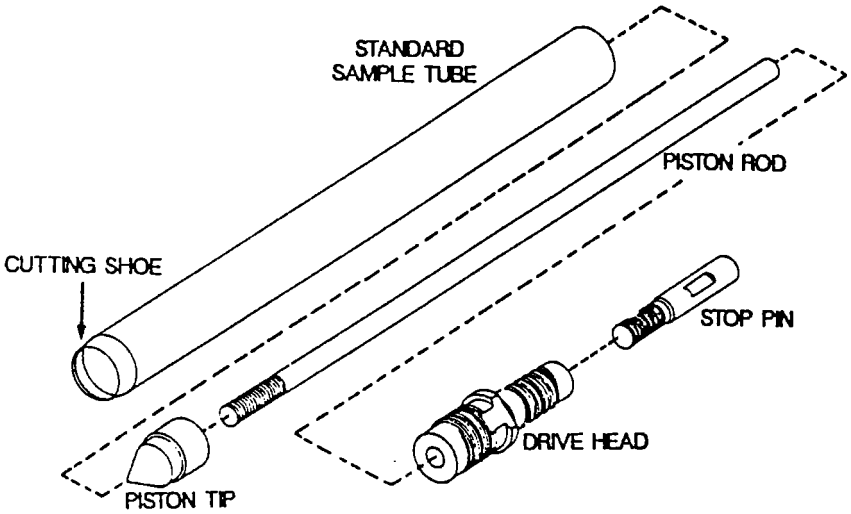
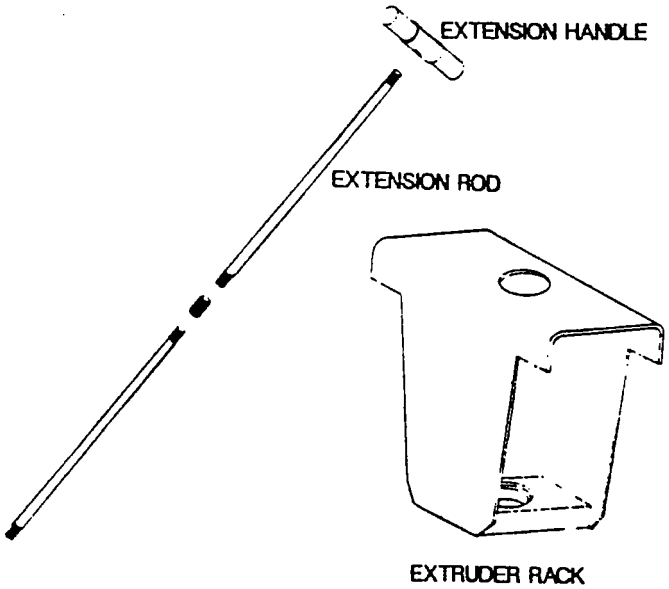


FIGURE 5

PROBE-DRIVE SYSTEM





Drive Head — This head is the top of a probe-drive sampler, which allows the piston rod to slide straight up the sample tube after the piston stop has been removed and the drive rod is advanced (see Figure 5).

Cutting Shoe — This portion of the probe-drive sampler cuts through the soil once the point is allowed to retract inside. The Kansas samplers and large-bore sampler have removable cutting shoes (see Figure 5).

Extruder Rack — This device holds soil samplers in place during extrusion. The Shelby tube extruder rack is shown in Figure 4, and the standard probe-drive extruder rack is shown in Figure 5.

Extension Rod — This long, thin, threaded, solid rod is dropped through a drive rod to the probe-drive sampler so that the stop pin can be removed. Often more than one extension rod (an extension rod string) must be put together to reach the stop pin (see Figure 5).

Extension Rod Handle — This small metal handle screws to the top of the extension rod string so that it can be turned easily while being used to remove the stop pin (see Figure 5).

Large-Bore Probe-Drive Sampler — This probe-drive sampler is 1-1/8 inches in diameter and 24 inches long. Its larger width allows for the collection of larger samples. The diameter also allows for acetate or brass liners to be used in sample collection. These liners can make viewing the sample easier and preparing it for analysis simpler.

Kansas Sampler — This specially designed probe-drive sampler has a removable cutting shoe to enable easy extraction of soil and to allow the shoe to be replaced without replacing the complete sampler.

Kansas Stainless Sampler — This sampler has a stainless-steel sampling tube. It works in the same way as the Kansas sampler.

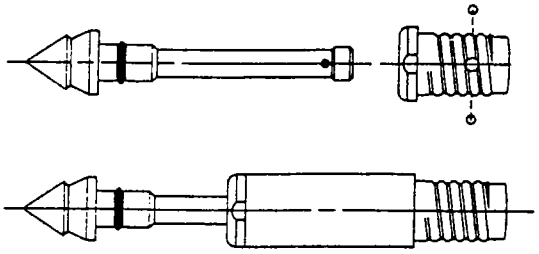
1.3.3 Soil Gas Sampling Terms

The following terms are used principally to discuss soil gas sampling. A few terms, though, are used while discussing groundwater sampling as well. If unfamiliar terms not listed below are encountered while using this SOP, check Sections 1.3.1 and 1.3.2 above and Section 1.3.4 below.

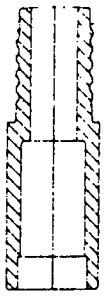
Expendable Point — These points fit into an expendable point holder that has been threaded into the lead drive rod. When the drive rod is pulled back, these points do not move with it, leaving a gap from which soil gas can be collected. The points are ultimately left in the ground (see Figure 6).

FIGURE 6

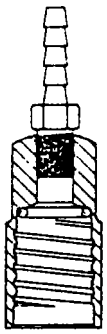
STANDARD SOIL GAS TOOLS



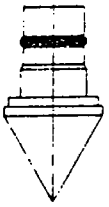
RETRACTABLE POINT HOLDER



EXPENDABLE POINT HOLDER



GAS SAMPLING CAP



EXPENDABLE POINT

Expendable Point Holder — This holder threads into the leading drive rod. It is used for driving expendable points (see Figure 6).

Retractable Point Holder — This holder lifts off its point, leaving a gap so that soil gas can be drawn, but unlike expendable points, the holder does not separate completely and ultimately is retrieved with the lead drive rod (see Figure 6).

Gas Sampling Cap — When using the standard soil gas sampling method, the gas sampling cap replaces the drive cap on top of the drive rod and allows tubing to be connected to the drive rod. A soil gas sample is drawn through the probe rod through this cap and into a sample container (see Figure 6).

Post-Run Tubing (PRT) System — This system collects soil gas drawn directly through a tube instead of through the drive rod itself. The system involves one of two specially designed point holders, each threaded on top so that an adapter that has been attached to the tube can be screwed into it after being advanced down the drive rod string. The two point holders differ in that one uses a retractable point and the other uses an expendable point (see Figure 7).

PRT Expendable Point Holder — This holder is threaded into the leading probe rod and is used for driving expendable points (see Figure 7).

PRT Adapter — The PRT adapter attaches the tubing through which the soil gas is to be drawn to the point holder, which has been driven to the proper sampling depth (see Figure 7).

Polyethylene Tubing — This tubing is the preferred tubing for connecting the PRT system to the sample container. Its stiff nature, however, sometimes makes it difficult to attach to the sample container and a coupler of Tygon tubing is necessary (see Figure 7).

Tygon Tubing — This tubing is the preferred tubing for connecting soil gas sampling containers to the drive rod and vacuum system. It often is also necessary as a coupler sample between the stiff polyethylene tubing used with PRT sampling systems and the sample container.

Glass Bulb — This bulb of glass has valves on each side and a neoprene septum through which gas can be withdrawn. The bulb is used to collect soil gas and can be used as the container in which the gas is taken for analysis (see Figure 8).

Tedlar Bag — This small bag has a valve on it. It is placed in an air-tight chamber, the air in the chamber is evacuated, and the bag fills with soil gas. The bags can then be taken for analysis.

Tedlar Bag Chamber — PRC uses these modified, air-tight kitchen containers as vacuum chambers. These chambers are modified with nipples on each side, which enable it to be attached to a vacuum pump, to a Tedlar bag, and to the Tygon tubing.

FIGURE 7

POST-RUN TUBING (PRT) SYSTEM

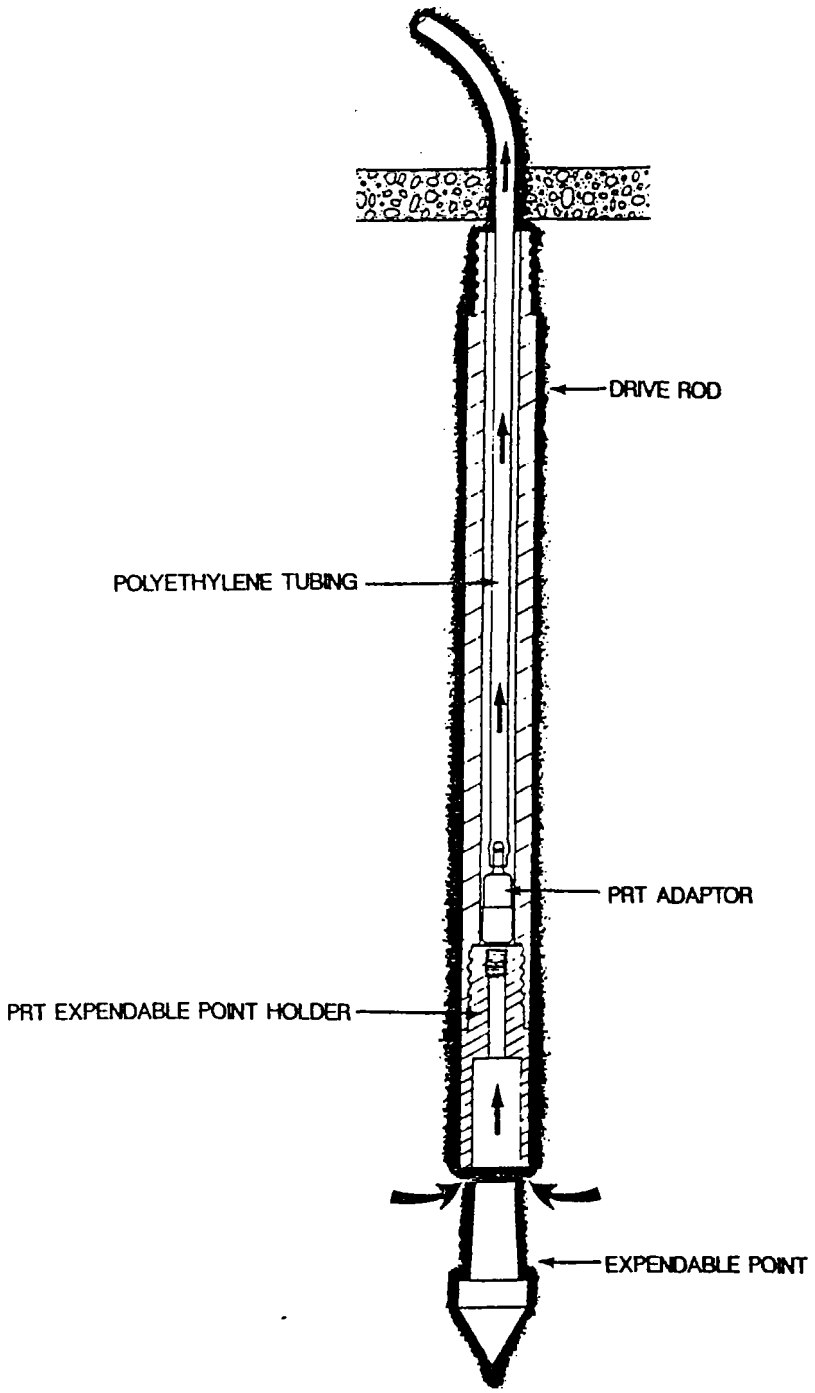
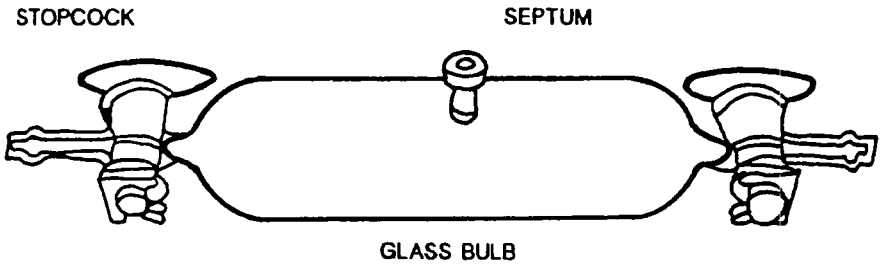


FIGURE 8

SOIL GAS SAMPLE CONTAINER



NOTE: TEDLAR BAGS ARE ALSO USED FOR COLLECTION OF SOIL GAS SAMPLES HOWEVER, THEY ARE NOT SHOWN ON THIS FIGURE

1.3.4 Groundwater Sampling Terms

The following terms are used to discuss groundwater sampling. If unfamiliar terms not listed below are encountered while using this SOP, check Sections 1.3.1, 1.3.2, and 1.3.3 above.

Mill-Slotted Well Point — This 3-foot long tube has 15 mill-cut slots in it, each 2 inches long and 0.020 inches wide. Only the bottom 2 feet of this tube is slotted, and sometimes mill-slotted well points come in two parts: a 2-foot slotted section and a 1-foot unslotted section. The slots allow groundwater to enter (see Figure 9).

Geoprobe Screen Point Sampler — This sampler has a 19-inch screen that encases a perforated stainless-steel sleeve. Once in place, the screen allows the water to enter the tube and prevents coarse sediment from entering the tube (see Figure 9).

Thieving Tube — This tube is used to extract the water from either mill-slotted well points or Geoprobe screen point samplers, PRC uses polyethylene tubing as thieving tubes. This tubing is lowered into the water, capped on top, and then extracted. The result is much like putting a straw into a glass of water, sealing the straw with a finger and lifting it. This method is used primarily for the collection of groundwater samples to be analyzed for volatile organic compounds. A check valve can also be attached to the thieving tube which seals the bottom and holds the groundwater within the tube.

Check Valve — This stainless steel valve has a small ball which, when attached to a thieving tube, floats to the top of the groundwater table and then sinks, ultimately sealing the thieving tube with groundwater. Oscillating the thieving tube will allow groundwater to rise within the tube for larger retrieval volume.

Well Mini-Bailer — This specially designed bailer drops through the drive rods and into the groundwater in the mill-slotted well point or screen point. A small ball in the bailer floats to the top and then sinks, ultimately sealing the bailer after it fills with about 40 milliliters of groundwater.

1.4 REFERENCES

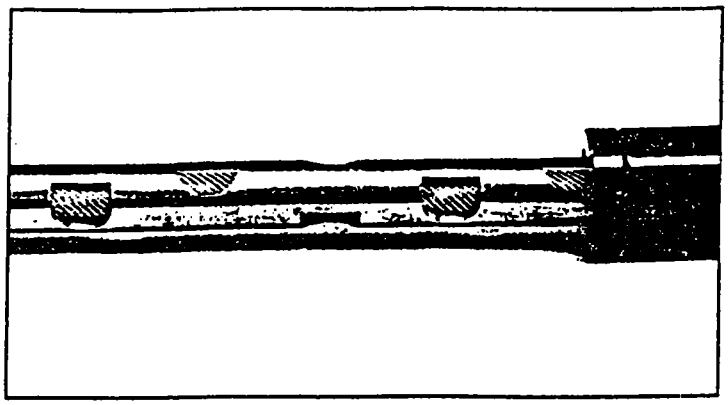
The following references were used to prepare this SOP:

Driscoll, F.G. 1987. *Groundwater and Wells*. Second Edition. Johnson Division. St. Paul, Minnesota.

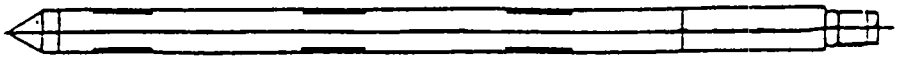
Fisher Scientific. 1991. "The Fisher Catalog of Scientific Instruments."

FIGURE 9

GROUNDWATER SAMPLING TOOLS



SCREEN POINT SAMPLER IN OPEN POSITION



MILL-SLOTTED WELL POINT

Geoprobe Systems. 1990. "8-M Operations Manual." July 27.

Geoprobe Systems. 1991. "Accessory Tools Catalog."

Geoprobe Systems. 1992. "Equipment and Tools Catalog."

2.0 POSITIONING, PREPARING AND SAMPLING PROCEDURES

The Geoprobe System uses a hydraulic punch that is usually installed in the back of a van or truck to first push and then to hammer its hollow drive rod through soils. Depending on which tools are attached to the end of the drive rod and which sampling equipment is attached to it, the Geoprobe can be used to remove soil, soil gas, or groundwater. It can also be used to drill through cement or concrete and can aid in the installation of piezometer wells and vapor sampling implants. The following sections detail the procedures for positioning the Geoprobe unit, preparing the sampling system, and sampling with the Geoprobe unit.

2.1 POSITIONING THE GEOPROBE UNIT

Before the Geoprobe System can be used, the Geoprobe hydraulic punch and accessories must be properly positioned near the sampling site. The hydraulic punch and other equipment also needs to be prepared. In cases where concrete or other hard surfaces hinder sampling, the Geoprobe must be used to reach soil. This section details methods to perform these activities.

To position and unload the Geoprobe System use the following procedures:

1. Drive the vehicle containing the Geoprobe System to the sampling location and align the center of the rear of the vehicle with the point at which the sample will be taken. The rear bumper should be 1 to 2 feet from the sampling point so that the foot of the hydraulic punch can be extended out over it.

2. Shut off the vehicle.

3. Put it in park.

4. Set the emergency brake before proceeding.

5. One person only should operate the hydraulic punch and the assembly and disassembly of probe rods and accessories. A second person is usually necessary to handle the samples and to decontaminate equipment. All personnel present must wear steel-toed shoes, gloves, and eye protection. When drilling through concrete or using the hydraulic hammer, ear protection is also necessary.

6. Once ready to take the sample, start the engine using the remote ignition located in the right rear of the vehicle. As a safety device, the remote ignition will not work unless the vehicle is in park.

7. Activate the hydraulic system by turning on the electrical control switch. The vehicle's engine must be running for the hydraulic system to work.

8. Slowly extend the Geoprobe out of the vehicle using the extend lever. Always use the slow speed on the hydraulic controls when positioning the hydraulic punch. The punch and mast should be far enough out of the van or truck so that the mast will not strike the roof when it is unfolded.

9. Unfold the hydraulic punch out of the vehicle using the fold lever. Once the punch has been lined up perpendicular to the ground surface, lower the foot of the punch using the foot lever until the vehicle itself is raised about 1 foot on its springs. This stabilizes the vehicle and punch. **Never lift the vehicle completely off the ground using the foot lever.** Doing so destabilizes the vehicle and hydraulic punch and may cause damage to equipment or injury to those nearby. Also, as pressure is placed on the rod, tools, and accessories, the foot of the punch may begin to lift. Do not allow it to lift farther than 6 inches from the ground. Allowing it to lift farther than 6 inches may throw the vehicle off balance and cause the rod to bend or break.

The Geoprobe System is now positioned. If it is necessary to drill through concrete or hard asphalt, use the following procedures:

1. Raise the hydraulic punch using the probe lever and then deactivate the hydraulic system by turning the electrical control switch to off. The hydraulic system should always be turned off when the hydraulic controls are not being used.

2. Place the drill bit into the hydraulic hammer. The bit is not used with a drive rod or anvil.

3. Activate the hammer rotation control knob, which is located on the hydraulic hammer, by turning the knob counter-clockwise. This allows the drill bit to rotate when the hammer lever on the control panel is pressed.

4. Activate the hammer release valve, which is located on the hydraulic hammer, by pulling the lever out and down.

5. To drill through solid surfaces, both the probe and hammer mechanisms of the hydraulic punch must be used. The hammer mechanism drives the drill bit in a percussion fashion and causes it to turn slightly. The probe mechanism allows the hammer and bit to be raised and lowered so that the bit can clear itself of debris. Once ready to begin, turn on the hydraulic system.

6. Fully depress the hammer lever. This lever needs to remain depressed throughout the drilling procedure and keeps the bit pounding and rotating.

7. Put pressure on the bit by pressing the probe lever down. Using this lever, advance the bit in small increments through the concrete or other hard surface. If advanced too quickly, the bit will bind and stop rotating. Should this happen, raise the punch slightly to allow the bit to rotate. If too little pressure is placed on the bit, too little percussion will occur, and drilling will be slow.

8. Continue drilling, in small increments, until soil has been reached. At that time prepare for sampling.

2.2 PREPARING THE SAMPLING SYSTEM

Before the hydraulic punch is used to sample, decisions must be made concerning which type of sample will be taken, whether several samples will be taken at varying depths, and which type of Geoprobe sampling equipment will be used. The following sections discuss preparation procedures for soil sampling, soil gas sampling, and groundwater sampling.

2.2.1 Soil Sampling

The samplers attached to the hydraulic punch for soil sampling come in two forms. The first type is the 2-inch diameter Shelby tube system that is common to other soil sampling methods. The second system uses various specially designed probe-drive systems that remain completely sealed while being pushed or driven to a particular depth. They then are opened to allow a sample to be collected. The Shelby tube and probe-drive systems are discussed below.

Shelby Tube System

The Shelby tube is a thin-walled steel tube, 2 inches in diameter and 30 inches long, with four mounting holes around its top. It allows large amounts of soil to be sampled at once, but the soil must be relatively cohesive. Because the tube remains open at all times, the tube cannot be driven to great depths and must be removed and replaced after coring 30 inches of soil. Usually, the Shelby tube system is chosen when large amounts of soil are needed at depths no deeper than 10 feet. Rocky or sandy soils are not conducive to this sampling method.

To prepare for sampling using Shelby tubes, use the following procedures:

1. First attach a Shelby tube to the Shelby-tube-drive head by putting the head's hex bolts through the holes in the tube.

2. Next, screw a Geoprobe drive rod adapter into the top of the drive head to allow the 2-inch-wide Shelby tube to be driven by the hydraulic punch and hammer, which are actually made for 1-inch outer diameter drive rods.

3. A drive cap is then screwed onto the top of Geoprobe drive rod adapter. The tube is now ready to be attached to the hydraulic punch.

4. To attach the tube, raise the hydraulic punch using the probe lever and then turn off the Geoprobe hydraulic system.

5. Lift the hammer latch and insert the anvil inside.

6. Place the assembled Shelby tube sampler so that it is aligned under the anvil.

The hydraulic punch is now ready to drive a Shelby tube and collect a sample core. For collecting soil cores at depths of greater than 30 inches, attach sections of probe rod to an assembled Shelby tube sampler and drive the sampler down the same hole using a new Shelby tube for each 30-inch increment in depth.

Probe-Drive Systems

All of the probe-drive systems work in essentially the same way. A sampler is attached to a hollow drive rod, inserted into the hydraulic punch, and punched or hammered into the soil. Once the sampler reaches the depth at which the sample is to be taken, a stop pin in the sampler is removed using an extension rod that has been dropped through the inside of the hollow drive rod. The release of the stop pin allows the point of the sampler to retract inside the sample tube as the sampler is further advanced into the soil. The probe is then punched through the soil where the sample is to be taken. The rod and probe are then pulled to the surface for sample extraction.

Currently, three types of samplers are used in the probe-drive systems: the standard probe-drive sampler, the Kansas sampler, and the large bore probe-drive sampler. Preparation of each is slightly different. Each is discussed separately below.

Standard Probe-Drive Samplers

The standard probe-drive sampler comes in 10- and 24-inch lengths. The proper length is determined by the size of the sample desired. The point of this sampler is connected to a piston rod that will slide through its length. At its top, the piston rod is connected to the drive head, which keeps it centered and holds the piston stop pin, which stops the piston from sliding.

To prepare the standard probe-drive sampler, use the following procedures:

1. Insure that the sampler is assembled and complete, and that the piston stop pin which is reverse threaded is tightly locked so that the sampler point will not slide into the sampling tube.

2. Attach a shortened Geoprobe drive rod to the sampler so that the total length is nearly the standard 3 feet. If the 10-inch sampler is used, a 2-foot drive rod should be attached, and if the 24-inch sampler is used, a 1-foot drive rod should be attached.

3. Screw a drive cap onto the top of the shortened drive rod. The sampler is now ready for attachment to the hydraulic punch.

4. To insert the probe-drive sampler, raise the hydraulic punch using the probe lever, and then turn the hydraulic system off.

5. Lift the hammer latch and insert the anvil inside.

6. Place the assembled standard probe-drive sampler and shortened drive rod directly under the anvil so that the drive cap touches the anvil and the point of the sampler is aimed at the place where the sample is to be taken. The standard probe-drive sampler and the hydraulic punch should both be vertical.

Kansas Samplers

The Kansas sampler is much like the standard probe-drive sampler. However, it has a removable hardened cutting shoe near its point that allows it to penetrate rockier soils and to be easily replaced and decontaminated. Kansas samplers come in two versions: the Kansas Stainless Sampler, which has a stainless-steel tube, and the Kansas Sampler, which has an alloy steel tube.

To prepare a Kansas sampler, use the following procedures:

1. Ensure that the hardened cutting shoe is in place.

2. Assemble and install the Kansas sampler in the same manner as the standard probe-drive sampler (see Procedures 2 through 7 above).

Large Bore Samplers

The large bore sampler, similar to both types of Kansas samplers, has a removable cutting shoe and works in the same manner. It is slightly larger than the Kansas samplers, usually 24 inches long and 1-1/8 inches wide. The larger bore allows for the use of acetate or brass liners. The soil, therefore, can be removed easily by removing the liner. The acetate liner allows for easy visual examination of the core and can be easily sliced away so that the sample can be prepared for the laboratory. The brass liners come in four 6-inch sections that allow for easy separation and packaging of 6-inch soil samples. Some laboratories accept full 6-inch brass liners, allowing the samples to be collected with a very minimal disturbance to the soil matrix.

To prepare a large-bore sampler, use the following procedures:

1. Place the desired liner into the sampler by unscrewing the cutting shoe and sampler drive head from the two ends and then inserting the liner.

2. Assemble the sampler and attach a 12-inch drive rod to the sampler.

3. Screw a drive cap onto the top of the drive rod.

4. Place the assembled sampler and drive rod under the hydraulic punch in the manner detailed in the section above for preparing standard probe-drive samplers (see Procedures 5, 6, and 7 above).

2.2.2 Soil Gas Sampling

Two main methods are used to collect soil gas using the Geoprobe system: the standard method and the PRT system.

To use the standard method, the drive rods are decontaminated and assembled in an air-tight manner as they are punched into the soil. To ensure an air-tight seal, either Teflon tape or an O-ring can be placed on the male threads of the drive rods. The probe rods are driven approximately 6 inches below the area from where the sample is to be taken. The rods are then lifted approximately 6 inches leaving the expendable point and a small opening between the point and the end of the rod behind. A gas sampling cap is then attached to the top of the rod, a vacuum pump removes the necessary volume of gas, and the sample is collected.

To collect soil gas samples using the PRT system, polyethylene tubing attached to a stainless steel adapter is pushed through the drive rod after the rod is in place. The tubing and adapter is then reverse threaded onto the top of the PRT expendable point holder, and the gas is collected through the tubing. This method increases the accuracy of soil gas sampling, eliminates the potential for leaks in the rod, and simplifies probe rod decontamination.

Standard Method

Only decontaminated drive rods can be used with the standard method. Rods should be decontaminated using the procedures in Section 6.0 of this SOP.

To prepare a decontaminated drive rod for soil gas sampling using the standard method, use the following procedures:

1. Screw an expendable point holder into the female end of a 3-foot drive rod. (Note: a retractable point can also be used with this method; however, decontamination requirements almost always preclude its use.)
2. Place an expendable point into this holder.
3. Screw a drive cap onto the male end of the drive rod.
4. Place the rod into the hydraulic punch.
5. Turn on the hydraulic system.
6. Install the anvil within the hydraulic punch's hammer by lifting the hammer latch and inserting it.
7. Place the assembled drive rod directly under the anvil so that the drive cap faces the anvil and the expendable point is aimed at the desired sampling location.
8. Push sampler and hydraulic punch through the soil to gather the sample.

PRT System

Two types of PRT systems are available. The first uses an expendable point holder and expendable point like the standard method. The second uses a retractable point holder that lifts off of the drive-point without actually separating from it. Both systems allow the threading of a PRT adapter and tubing through the drive rod so that the gas can be taken from the depth required without being sucked through the drive rod.

To prepare the drive rod and sampler for PRT soil gas sampling, use the following procedures:

1. Select the desired PRT sampler (either one with an expendable point or one with a retractable point) and ensure that the PRT adapter easily screws into the threads on top of the sampler. This step is necessary to ensure that the adapter will fit easily when it is affixed from above ground.

2. If using the sampler with an expendable point, attach the point.

3. Screw the sampler to the end of a shortened drive rod so that the total length of the sampler is nearly 3 feet.

4. Screw the drive cap to the other end of the drive rod.

5. Attach the drive rod and sampler to the hydraulic punch using the same procedures detailed in the standard method (see Procedures 4, 5, and 6 above).

2.2.3 Groundwater Sampling

The Geoprobe System offers two systems for collecting groundwater, each with several groundwater sampling options. The first method involves the use of a mill-slotted well point. The second method uses a specially designed Geoprobe screen point sampler.

<u>Mill-Slotted Well Points</u>

The mill-slotted well point is a 2- or 3-foot length of hollow steel tubing with 15-millcut slots in it, each 2 inches long and 0.020 inches wide. Once in place, groundwater enters the tube through these slots. To prepare the mill-slotted well point, use the following procedures:

1. Screw a solid drive point into the female end of the sampler.

2. If a 2-foot well point is being used, screw the sampler to a 1-foot length of drive rod.

3. Screw a drive cap to the other end of the well point or 1-foot drive rod.

4. Place the sampler and rod into the hydraulic punch by raising the punch as much as necessary and turn hydraulic system off.

5. Install the anvil within the hydraulic punch's hammer by lifting the hammer latch and inserting it.

6. Place the mill-slotted well point sampler under the anvil with the drive cap near the anvil and the point aimed at the sampling location.

<u>Geoprobe Screen Point Sampler</u>

The Geoprobe screen point sampler has a 19-inch screen encased in a perforated stainless-steel sleeve. The screen remains encased in the sleeve until the screen point sampler reaches the desired depth. The rod is then pulled back approximately 19 inches, leaving the screen exposed to the formation. Flexible tubing can be pushed through the drive rod and attached to the sampler using the adapters for the PRT soil gas system, enabling groundwater to be removed without touching the drive rod. Decontaminating the drive rod is subsequently easier.

To prepare a Geoprobe screen point sampler, use the following procedures:

1. Close the screen on the sampler.

2. Attach its expendable point.

3. Attach the sampler to a shortened drive rod so that the assembly is nearly 30 inches long.

4. Place the sampler into the hydraulic punch using the methods detailed for mill-slotted well points (see Procedures 4, 5, and 6 above).

2.3 SAMPLING

Sampling procedures for the Geoprobe hydraulic punch are similar for all samplers and sampling media. This section presents general procedures that apply to all samplers and sample types, and specific operating procedures for soil, soil gas, and groundwater.

2.3.1 General Procedures

All control panel switches have a slow and fast position. All switches should initially be set at the slow position when positioning the punch and the sampling tools. In all cases, the hydraulic system should be shut off when not in operation and when adapters and additional drive rods are put into place. The hydraulic punch should be turned off any time it is not actually in operation.

The Geoprobe hydraulic punch is designed with a key safety feature that will shut it off if the controls are released. If the operator senses that something is wrong, he or she must release the controls and stop operating the punch until all is well. At no time should the foot of the punch be allowed to lift higher than 6 inches off the ground because the punch will destabilize and may bend the drive rod or sampling tube.

Also, at no time should part of a human body be placed on top of a drive cap while the cap is near the anvil or under the foot of the hydraulic punch.

Once the assembled sampler or drive rod is under the anvil, both it and the hydraulic punch should be vertical. Positioning the drive rod and sampler is critical in order to drive the rod vertically. Not positioning the sampler or drive rod vertically will result in problems when attaching subsequent drive rods needed to reach the proper depth and with rod retrieval.

To begin probing in soils of normal texture, use the following procedures:

1. Activate the hydraulic punch and push down on the probe lever on the control panel so that the probe slowly lowers itself. Always use the slow control on the first rod or sampler.

2. Continue to press on the probe lever until the rod or sampler is completely forced into the soil. The point of the rod will then be nearly 3 feet into the soil.

Soils and other materials are often too hard for the hydraulic punch's probe mechanism to penetrate. When this occurs, the hammer on the hydraulic punch should be used in accordance with the following procedures:

1. Ensure that the hammer rotation valve is closed.

2. Use the hydraulic punch to put pressure on the rod, sampler, and soil. When the probe rod refuses to move, the foot of the hydraulic punch will begin lifting off the ground. Never allow the foot to lift more than 6 inches off the ground, but never use the hammer with the foot resting on the ground surface.

3. If the probe foot lifts off the ground, the hydraulic punch may no longer be perpendicular. If this occurs, use the machine's fold lever, which is located on the control panel, to correct the punch's position.

4. Press the hammer lever on the control panel. The rod should now advance. Never use the hammer unless there is downward pressure on the drive cap because doing so may damage the equipment.

5. Stop hammering periodically and check to see if the probe rods can be advanced using the probe mechanism only.

When samples are to be taken at depths of greater than 3 feet, additional drive rods must be added to those already in the ground. Shelby tube soil sampling procedures for adding rods are discussed in Section 2.3.2. For all other sampling methods, use the following procedures to add drive rods:

1. Using the probe lever, raise the hydraulic punch off the portion of the drive rod protruding from the ground.

2. Unscrew the drive cap from the drive rod.

3. If using the standard method of collecting soil gas or other sampling methods that will draw the sample through the length of the entire drive rod, wrap the threads of the drive rod with Teflon tape or push an O-ring over the threads to make the drive rod string air- and water-tight.

4. Screw another drive rod onto the first drive rod protruding from the ground. Tighten the rods together with a pipe wrench.

5. Screw a drive cap onto the top of the new drive rod.

6. Place the hydraulic punch over the new drive rod and push the rod farther into the ground.

As the rod string is pushed farther into the ground, it will sometimes begin to loosen. The rods should remain tight so that the threads are not damaged. Occasionally, stop probing and twist the rod string with a pipe wrench to ensure that all of the joints remain tightly sealed.

2.3.2 Soil Sampling

This section presents procedures used to sample soils using either the Shelby tube sampling method or any of the probe-drive systems. In all cases, sampling tools should never be advanced farther than their length once they are opened because the sampler will overfill. If the sampler overfills, it could be damaged or expand, causing it to fall off the drive head.

Shelby Tube Sampling Procedures

Because the Shelby tube does not remain closed until it reaches the desired sampling depth and because it is not connected to a drive rod but to a Shelby drive head, sampling procedures for Shelby tubes differ greatly from soil sampling with other methods. New drive rods cannot be continuously added. Sampling at depths of greater than 30 inches requires a step-like procedure. For example, to sample to a depth of 90 inches, three Shelby tubes are needed. The first is advanced from 0 to 30 inches and then removed. The second is pushed through the hole made by the first and advanced to a depth of 60 inches and removed. The third is also pushed through the 60-inch deep hole and advanced from 60 to 90 inches.

Samplers must be ready to change sampling methods if necessary. For example, if soils are not cohesive, they tend to drop out of the Shelby tube as it is pulled from the ground. Also, if the soils are not cohesive, they tend to collapse into the hole left by the initial tube before the second and third tubes can be pushed into place. For this reason, use of the Shelby tube method is impractical at depths of greater than 10 feet. Rocky soils are also difficult to sample with a Shelby tube sampler because they tend to destroy the sampler while it is being driven into the ground.

To sample using the Shelby tube method, use the following procedures:

1. Turn on the hydraulic system and slowly press the Shelby tube into the soil using the probe lever on the control panel.

2. Once the tube has reached the sampling depth or has been extended to nearly its full 30-inch length, stop the hydraulic punch and raise it off the drive cap and Shelby tube drive head.

3. Unscrew the drive cap.

4. Screw on a pull cap.

5. Lower the hydraulic punch and lift the hammer latch. Remove the anvil. Place the latch around the pull cap so that the latch will hold the cap to the hydraulic hammer.

6. Using the probe lever, raise the hydraulic punch to pull the Shelby tube from the ground.

If the desired sampling depth is greater than 30 inches, additional Shelby tubes and probe rods must be used. The tubes are then prepared for probing using the methods presented in Sections 2.2.1 and 2.3.1 above. To advance the Shelby tube deeper, the tubes are pushed through the hole left by the first tube using the method detailed above.

Once a Shelby tube core has been retrieved from a sampling point, it must be extruded from the Shelby tube sampler using the following procedures:

1. Lower the hydraulic punch using the probe lever so that its mast will not strike the top of the van as it is folded.

2. Lift the foot of the hydraulic punch using the foot lever.

3. Slowly and carefully fold the hydraulic punch using the fold lever.

4. Once the punch is horizontal, the Shelby tube extruder bracket can be placed onto the punch's foot. This bracket will hold the Shelby tube in place and allow the punch to push the soil out of the tube.

5. Screw an extruder piston onto a drive rod and a drive cap on the drive rod's other end.

6. Place the drive rod into place under the horizontal drive punch.

7. Place the full Shelby tube into the extruder rack and secure it with the extruder latch.

8. A pan or container should be held at the end of the Shelby tube to collect sample material as it is extruded.

9. The probe lever activates the hydraulic punch and pushes the soil from the Shelby tube.

PRC's SOPs on packaging and documenting samples, SOPs Nos. 016, 017, 018, and 019, should be used to prepare the sample for analysis.

Probe-Drive System Sampling Procedures

All three types of probe-drive samplers work in essentially the same way. The sampler is advanced to just before the proper sampling depth and then the drive point is released by removing a stop pin using solid extension rods that have been dropped through the hollow drive rod. The point is then pushed back into the body of the sampler as the sampler fills with the soil sample.

In addition to the general procedures listed in the Section 2.3.1, the probe must be stopped at just before the desired sampling depth so that the stop pin can be removed. Pushing the probe too far will require starting over.

To use the probe-drive sampling system to sample soil, use the following procedures:

1. Attach additional drive rods as discussed in the general procedures in Section 2.3.1.

2. Stop the hydraulic probe just before the desired sampling depth.

3. Raise the hydraulic punch, turn off the hydraulic system, and remove the drive cap.

4. Insert an extension rod into the drive rod and screw additional extension rods together until the assembly reaches the same depth as the sampler.

5. Attach a small extension rod handle to the top of the extension rod.

6. Rotate the extension rod handle clockwise until the leading extension rod has turned the stop pin and disengaged it.

7. Pull and unscrew each extension rod from the hollow drive rod. The stop pin should be attached to the bottom of the extension rod string. If not, repeat Procedures 1 through 6.

8. To sample, mark the drive rod with tape or chalk about 10 inches above the ground if a 10-inch sampler is used or 24 inches from the ground if a 24-inch sampler is used.

9. Replace the drive cap and start the hydraulic system.

10. Drive the rod until the tape or chalk mark touches the ground. Be careful not to overdrive the sampler. Doing so could compact the soil in the sampler or cause it to balloon outward, making soil removal and extrusion difficult.

11. Raise the hydraulic punch and replace the drive cap with the pull cap. Remove the anvil.

12. Latch the pull cap underneath the hydraulic hammer latch and pull the rods out of the ground, disassembling the rod as needed.

13. Check to ensure that a soil sample is now in the sampler.

Once a soil sample has been removed from the ground, it can be extruded using the Geoprobe. The tools supplied by Geoprobe Systems for extruding soil from probe-drive samplers do not require the Geoprobe to be folded and horizontal. If liners are used with large-bore samplers, extrusion is usually unnecessary. When extrusion is necessary for probe-drive samplers, use the following procedures:

1. Raise the foot of the hydraulic punch off the ground using the foot lever on the control panel.

2. Attach the extruder rack onto the foot of the punch so that its crossbeam rests on top of it.

3. Completely disassemble the sampler. In all cases, remove the piston, point, and drive head of the sampler. If using the Kansas and large-bore samplers, unscrew the removable cutting shoe as well.

4. Insert the sample tube into the extruder with its cutting end up.

5. Insert a disposable wooden dowel or the reusable steel piston above the soil and below the hydraulic punch so that pressure on the dowel or piston from the punch will push the soil out of the bottom of the sample tube.

6. Position proper sampling jars or trays under the sample tube and very slowly use the probe lever to force the soil out of the tube. Injury can result if the soil is quickly forced from the tube.

The soil sample is now ready for packaging or on-site laboratory analysis. For large-bore samplers, the soil may be contained in a plastic sleeve that can be sliced away once the soil is to be packaged or in a brass sleeve that may be capped on both ends and shipped to the laboratory as is. PRC's SOPs on packaging and documenting samples for analysis should be followed when collecting samples using the Geoprobe System.

2.3.3 Soil Gas Sampling Procedures

The standard method and the PRT system are used for collecting soil gas using the Geoprobe System. The standard method requires the drive rods to be sealed together with either O-rings or Teflon tape to ensure an air-tight seal so that soil gas from depths other than the bottom of the drive-rod string cannot penetrate the system.

The PRT system draws soil gas through continuous tubing that is dropped through the drive rod after the drive rod has reached the desired level. The tubing is then attached directly to the point holder at the end of the drive-rod string.

For both methods, the drive rod should be driven to the desired depth. The drive cap should be replaced by the drive pull cap, and the rod should be pulled back out of the hole approximately 6 inches. This 6-inch void is the area where the soil gas sample is collected from. A pipe wrench or

vise-grip pliers should be attached to the pipe just above the foot of the hydraulic punch so that the wrench or pliers rests on the foot to stop the drive rod from working its way back down into the hole.

Tygon tubing should be replaced between each sample for both sampling methods to avoid cross contamination.

The standard method and the PRT system sampling procedures are presented below. In addition, procedures for collecting soil gas in Tedlar bags, glass bulbs, and adsorption tubes is also presented below.

Standard Method

To gather a sample using the standard method, raise the hydraulic punch as mentioned above and replace the drive cap with a gas sampling cap. This cap is designed to fit the drive rods and is used to connect them by tube to a vacuum supply. Once the tubing has connected the gas sampling cap to the vacuum supply, remove the volume of air necessary to ensure that none of the gas being drawn was in the rod during probing, and then collect the sample in either Tedlar bags, glass bulbs, or adsorption tubes as discussed below.

PRT System

To use the PRT system (with either an expendable or a retractable point) to collect soil gas samples use the following procedures:

1. Secure the PRT adapter to the end of a piece of polyethylene tubing 1 to 2 feet longer than the total length of the drive-rod string. The adapter must fit tightly within the tubing. If it does not, tape it into place. Also, ensure that the O-ring is in place on the threaded end of the adapter.

2. Remove the drive cap from the probing rod and lower the adapter into it, holding on to the tubing.

3. Grasp the excess tubing and apply downward pressure. Turn the tubing counter-clockwise to engage the adapter threads on the sampler holder.

4. Pull up lightly on the tubing to test engagement of threads. If the adapter has not engaged, try again. If it repeatedly does not engage, soil may have intruded into the drive rod either during probing or, in the case of the retractable point, when the rod was pulled back to leave the point opening. Use the threaded extrusion rods to clean out the threads.

5. In most cases, the adapter will easily screw into place. The sampler is now ready to collect samples in either Tedlar bags, glass bulbs, or adsorption tubes using the procedures presented below. After the sample is collected and the sampler and tube is removed from the ground, the O-ring should be checked to ensure that a good seal exists between the sampler and adapter. If the O-ring is tightly smashed, the seal should be good.

6. Discard polyethylene tubing and use new polyethylene tubing for each sample.

Tedlar Bags

Soil gas can be collected for chemical analysis in a 500-cubic-centimeter Tedlar gas sampling bag by inducing a vacuum on the exterior of the bag. The following procedures should be used to collect soil gas samples in Tedlar bags:

1. For the PRT system, connect a short (6- to 12-inch) piece of Tygon tubing to the free end of the polyethylene tubing protruding out of the drive rod. For the standard method, connect the Tygon tubing to the soil gas sampling cap.

2. Attach the other end of the Tygon tubing to one end of the Tedlar bag chamber. PRC uses modified, plastic, air-tight kitchen containers for these chambers. They are inexpensive and work well.

3. Connect another piece of Tygon tubing 2 feet to 3 feet long to the other end of the Tedlar bag chamber and to the nipple on the bottom of the vacuum system panel.

4. Place the lid on the Tedlar bag chamber.

5. Turn the vacuum/volume (vac/vol) pump switch on and allow pressure to build in the vacuum tank. Make sure that the vacuum line valve is closed before turning on the pump switch.

6. Open the vacuum line valve and purge three times the volume of ambient air out of the Tedlar bag chamber and PRT tubing or probe rods. The equations for determining purge volumes are as follows:

   Probe rods or tubing

   $$V = \pi r^2 H$$

   where

   V = Volume
   π = 3.14159
   r = Radius of tube or rod
   H = Length of tube or rod

   Vacuum chamber

   $$V = LWH$$

   where

   V = Volume
   L = Length of chamber
   W = Width of chamber
   H = Height of chamber

7. Close the line valve.

8. Clamp the Tygon tubing shut with hemostats.

9. Remove the lid from the Tedlar bag chamber.

10. Connect a Tedlar gas sampling bag to the fitting inside the Tedlar bag chamber and open the valve on the gas sampling bag.

11. Place the lid back on the Tedlar bag chamber, seal it tightly, and remove the hemostats.

12. Turn the vac/vol pump switch on and open the vacuum line valve to create a vacuum in the chamber. The Tedlar bag should fill once the vacuum is created. The rate at which the Tedlar gas sampling bag fills depends on the permeability of the soil. The minimum amount of soil gas needed for analysis is approximately 0.5 liter. If less than 0.5 liter is collected after 4 minutes of sampling, raise the soil gas probe 0.5 foot and continue to evacuate the vacuum chamber for another minute. If the minimum required volume of soil gas is not collected, repeat the procedure. If the minimum required volume of soil gas is still not collected, abandon the collection process. All steps conducted should be accurately recorded in the logbook even if no samples are satisfactorily collected.

13. After the soil gas sample is collected in the Tedlar bag, clamp the Tygon tubing with hemostats.

14. Turn off the vacuum pump.

15. Remove the vacuum chamber lid.

16. Close the valve on the Tedlar gas sampling bag and remove the bag from the chamber. Label the Tedlar bag with the appropriate information.

Glass Bulbs

The following procedures should be used to collect soil gas in glass bulbs:

1. Turn the vac/vol pump switch on and allow pressure to build in the vacuum tank. Make sure that the vacuum line valve is closed before starting the vacuum pump. The inside scale of the vacuum tank gauge is calibrated in inches of mercury. The outside scale is calibrated for volume in liters (at standard temperature and pressure). Obtain the desired vacuum and turn the vacuum pump off.

2. Connect a short (6- to 12-inch) piece of Tygon tubing to the sample cap or PRT protruding from the drive rod.

3. Connect one end of the labeled glass bulb to the Tygon tubing.

4. Connect another piece of Tygon tubing 3 feet to 5 feet long to the other end of the glass bulb and to the nipple on the bottom of the vacuum system panel.

5. Open the two stopcocks on the glass bulb.

6. Turn off the vacuum pump.

7. Turn the vacuum line valve to its open position.

8. Purge three times the volume of ambient air within the rods, bulb, and tubing. Equations for figuring out volumes are presented in the Tedlar bag discussion.

9. Turn the vacuum line valve to its closed position. Allow the pressure in the sample train to equalize (the sample line gauge should read zero).

10. Close the stopcocks on the glass bulb.

11. Remove the glass bulb and label it with the appropriate information.

Adsorption Tubes

The following procedure should be used to collect soil gas in adsorption tubes:

1. Connect a short (6- to 12-inch) piece of Tygon tubing to the sample cap or PRT protruding from the drive rod.
2. Connect this piece of tubing to the nipple on the bottom of the vacuum system panel and purge three volumes of air from the drive rod or PRT system as described in the discussion of the Tedlar bag method.
3. Use hemostats to clamp the Tygon tubing attached to the drive rod or PRT.
4. Insert the adsorption tube between the Tygon tubing from the drive rod or PRT and the Tygon tubing attached to the vacuum system panel.
5. Remove the hemostats and draw the required volume of air through the adsorption tube.
6. Remove the adsorption tube and place the appropriate caps on the tube ends.
7. Clearly label package, and ship the samples as required by the laboratory or PRC and U.S. Environmental Protection Agency (EPA) SOPs.

Soil Gas Sampling Pointers

If the needle on the vacuum line valve does not move, the soil at the sampling depth may be saturated, pore space may be too tight to yield a sample, or sampling train may be plugged. If the needle moves back to zero very quickly, either the soil at the sampling depth is very permeable or a leak is present in the sampling train.

In some soils, the needle may return to zero very slowly. The time it takes for the needle to return to zero is called the "recovery" time. Recovery time should be noted for each sample taken. This information will allow relative comparison of soil permeability. Recovery times of greater than

10 minutes should be considered suspect. The effect of leakage in the sampling system increases with longer recovery times. After 10 minutes, the operator should consider either changing the sampling depth, location, or length of pullback from the sampling tip, or switching entirely from soil gas sampling to grab sampling and analysis of soil.

2.3.4 Groundwater Sampling

The two options for sampling groundwater using the Geoprobe System follow procedures similar to those presented in Sections 2.3.2 and 2.3.3 above. The sections below detail procedures for using mill-slotted well point samplers and Geoprobe screen point samplers to sample groundwater.

<u>Mill-Slotted Well Point Sampler</u>

Once the mill-slotted well point reaches groundwater, the water will begin to flow through the slots. When the sample is to be analyzed for volatile organic compounds, do not use a vacuum to suck groundwater from the drive rod. If the sample is to be analyzed for other parameters such as metals, semivolatiles, pesticides, or explosives, using a vacuum on the drive rod is acceptable. In all cases, polyethylene tubing can be used as a thieving rod by lowering its end into the drive rod, capping or sealing the tube's top, and then removing it. The preferred method for collecting samples for volatile organic analysis is to use a well mini-bailer. To collect groundwater samples with a mini-bailer, use the following procedures:

1. Raise the hydraulic punch, turn off the hydraulic system, and remove the drive cap.
2. Lower a well mini-bailer into the drive rod until it reaches the bottom. As it reaches the bottom, the check ball on the bailer's end will float in the groundwater and then slowly sink to the bottom.
3. Allow a couple of seconds for the ball to sink and set.
4. Pull the well mini-bailer out of the drive rod. The bailer should contain about 20 milliliters of groundwater.

5. Package and document the samples in accordance with PRC SOPs No. 016, 017, 018, and 019, or a similar EPA-approved procedure.

If a bailer is not required and volatile organic samples are not being collected, a foot valve sampler, vacuum trap, or peristaltic pump can be used to collect samples. Once the sample has been removed and packaged, the mill-slotted well point can be removed and decontaminated.

Geoprobe Screen Point Sampler

The Geoprobe screen point sampler contains a screen and screen plug that allows water to enter the rod. To collect groundwater samples with a Geoprobe screen point sampler, use the following procedures:

1. Push the sampler below the depth necessary to reach groundwater.

2. Raise the hydraulic punch and replace the drive cap with a pull cap. Also, remove the anvil.

3. Latch the pull cap under the hammer latch, and use the probe lever to lift the drive rod about 18 inches. Because the sampler has a expendable point, the point should stay at the deepest depth, and the screen and screen connector should fall out of the bottom of the sampler. Sometimes, however, the screen stays within the sampler and is lifted the 18 inches with the drive rod.

4. To ensure that the screen is exposed, attach a vice grip or pipe wrench to the rod above the foot of the hydraulic punch and raise the hydraulic punch. Then remove the pull cap and place an extension rod through the tubing to push the screen into place. Additional extension rods can be attached to reach the desired depth.

To remove the groundwater sample for volatile organic analysis, with a well mini-bailer, follow steps 1 through 5 under the mill-slotted well point section above. Tubing can be used as a thieving rod with or without a check valve to collect groundwater samples as well. If the sampler is supplied with the optional PRT expendable point holder, then a PRT adapter can be pushed through the drive rod and threaded into place by following the PRT system Procedures previously discussed. A vacuum trap system or peristaltic pump can then be used to withdraw the sample. The PRT system method,

however, should never be used when the sample is to be analyzed for volatile organic compounds because it involves using a vacuum to remove the sample.

3.0 PIEZOMETER AND VAPOR SAMPLING IMPLANT INSTALLATION PROCEDURES

The Geoprobe System's ability to quickly probe into soil allows for easy installation of both piezometers and vapor sampling implants. Both installation procedures are discussed below.

3.1 PIEZOMETERS INSTALLATION

Piezometers are tubes that extend to groundwater and enable easy sampling of groundwater on a routine basis (see Figure 10). In addition to installing the piezometer, piezometers must be protected from the weather and from contamination. A well-head protector must therefore be installed around them. In some soil types, preparing the well-head protector may be the first step to installing a piezometer. For this reason, the directions below should be read completely before beginning piezometer installation. If a post-hole digger is to be used for well-head protector installation, Procedure 5 should be performed first. The piezometer should then be advanced through this hole.

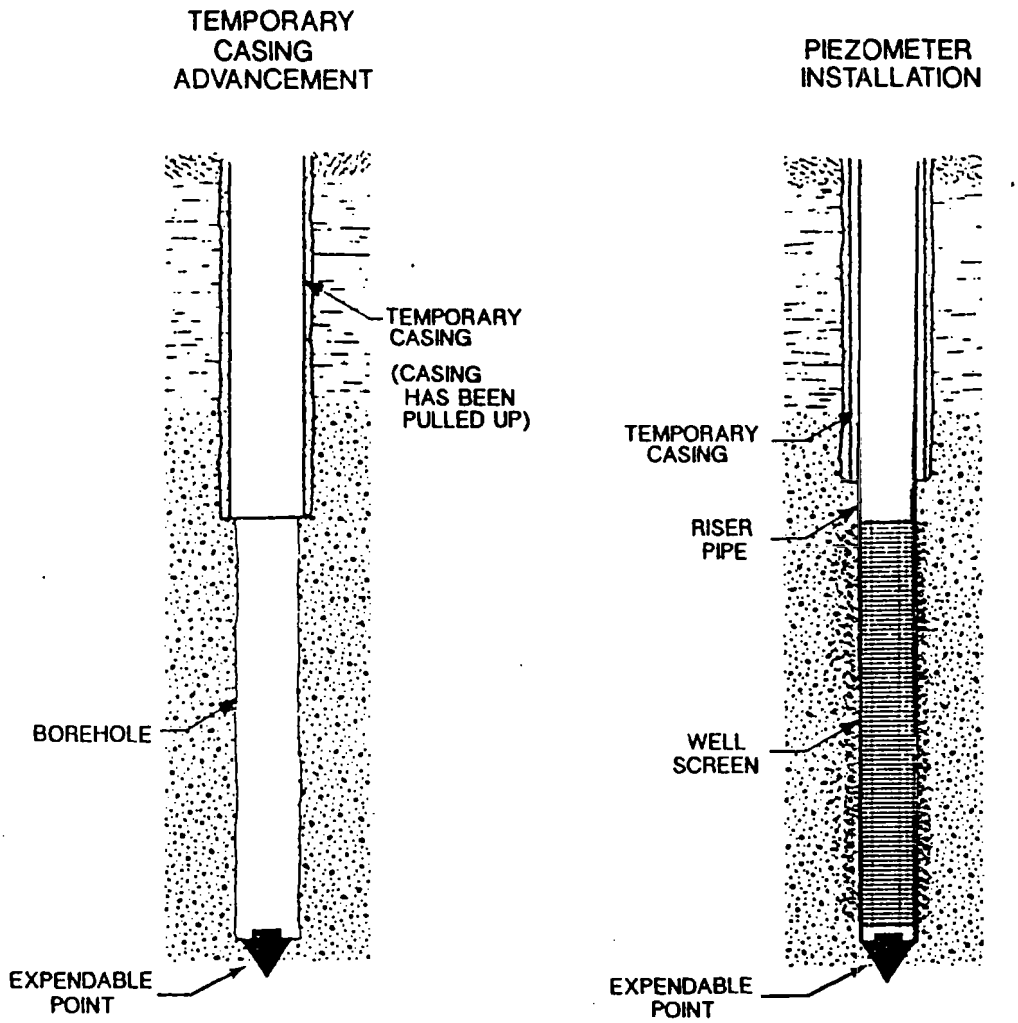
To install temporary or permanent piezometers, use the following procedures:

1. Use the hydraulic punch to drive the temporary casing to the desired piezometer installation depth. Use the general procedures outlined in Section 2.3.1 above for details on driving the piezometer casing. The different temporary casings that can be used are described below. Geoprobe Systems also manufactures special drive caps, expendable points, and pull caps that fit these types and sizes of pipe.

    a) 1-7/16-inch outside diameter by 1-3/16-inch inside diameter, RW-flush threaded pipe can be used as a temporary casing. This casing can be driven to an approximately 25- to 30-foot depth. Two sizes of piezometer wells can be installed inside of the temporary casing: (1) 3/4-inch outside diameter by 1/2-inch inside diameter, polyvinyl chloride (PVC) pipe, or (2) 1-inch outside diameter by 3/4-inch inside diameter, PVC pipe.

FIGURE 10

PIEZOMETER INSTALLATION



b) 1-13/16-inch outside diameter by 1-1/2-inch inside diameter, EW-flush threaded pipe can be used as a temporary casing. This casing can be driven to an approximately 15- to 20-foot depth. Three sizes of piezometer wells can be installed inside of the temporary casing: (1) 3/4-inch outside diameter by 1/2-inch insider diameter PVC pipe, or (2) 1-inch outside diameter by 3/4-inch inside diameter, PVC pipe, or (3) 1-1/2-inch outside diameter by 1-inch inside diameter, PVC pipe.

c) 1-1/4-inch outside diameter by 1-inch inside diameter, NPT-threaded pipe can be used as a temporary casing. This casing can be driven to an approximately 25- to 30-foot depth. Only 3/4-inch outside diameter by 1/2-inch inside diameter, PVC pipe piezometer wells can be installed inside of the temporary casing. If using NPT-threaded pipe, couplers are needed to attach each section of pipe.

2. Once the piezometer casing is at the proper depth, remove the drive cap and install the selected size piezometer pipe inside of the temporary casing.

3. Using a pull plate, remove the temporary casing.

4. If the hole stays open, attempt to install a sand pack around the slotted portion of the piezometer, and then place dry granular bentonite on top of the sand pack as a seal. One foot of bentonite is recommended for a good seal.

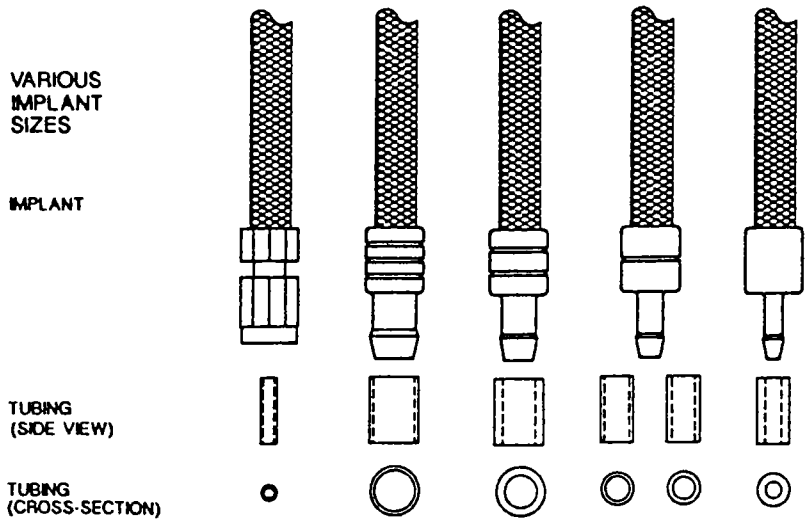
5. Dig an 8-inch nominal-diameter hole around the piezometer pipe. This hole should extend to a depth of 1.5 to 2 feet. A post-hole digger can be used for this procedure if the hole is dug prior to driving the temporary casing. The bottom 6 inches of this hole should be filled with dry granular or slurry bentonite. The remainder of the hole should be filled with concrete. A steel, locking, aboveground or flush-mount well protector should be inserted into the wet concrete to provide well-head security. A concrete pad can also be constructed around the steel well-head protector.

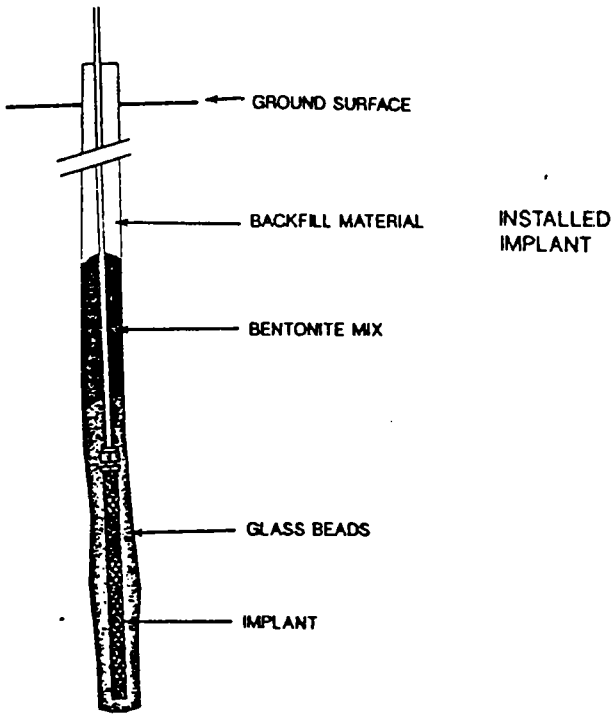
3.2 VAPOR SAMPLING IMPLANT INSTALLATION

Figure 11 presents diagrams of vapor sampling implants. To install vapor sampling implants, first punch a drive rod to the desired depth using an expendable point holder and an expendable point. Once at the desired sampling depth, use the following procedures:

FIGURE 11

VAPOR SAMPLING IMPLANTS





1. Disengage the expendable point and retract the probe rod about 1 foot by raising the hydraulic punch, replacing the drive cap with a pull cap, removing the anvil, latching the pull cap onto the hydraulic hammer using its latch, and raising the hydraulic punch again using the probe lever.

2. Lock the rod into place so that it does not sink back into the hole by using vice grip pliers or a pipe wrench.

3. Unlatch the pull cap and raise the hydraulic punch again, leaving room to work freely.

4. Remove the pull cap.

5. Attach appropriate stainless-steel tubing to the vapor implant. If tubing is precut, allow 48 inches more than the required depth of the implant.

6. Insert the implant and tubing down the inside diameter of the probe rods until it stops. Note the length of the tubing inserted to ensure that the desired depth has been reached. Allow the excess tubing to extend out of the drive rod's top.

7. Pour glass beads down the inside diameter of the probe rod using a funnel to create a permeable layer around the implant.

8. Use the tubing extending from the drive rod to stir the beads into place. Do not lift up on the tubing while doing so.

9. Position the remaining tubing through the hole on a rod pull plate, and then place the drive rod through that hole.

10. Attach the plate to the hydraulic punch using its chain and slowly pull the rod up another 18 to 24 inches. While the punch pulls the rod, push down on the tubing so that it stays in place.

11. Pour bentonite seal mixture down the inside diameter of the probe rod. Stir the mixture using the tubing as before. The initial mixture may also be topped with distilled water to initiate the bentonite seal depending on the site and on the role the vapor implant is to play.

12. Pull the drive rod from the hole using the probe rod pull plate already attached, and then plug the hole using granular bentonite or a bentonite slurry mixture.

The vapor sampling implant should now be in place and the stainless steel tubing connected to it should be protruding from the ground. The vapor implant tubing should be protected by a well-head

protector in the same manner as the top of the piezometer. Procedure 5 in Section 3.1 describes well-head protector installation.

4.0 ROD REMOVAL PROCEDURES

Throughout the above discussions, it has occasionally been necessary to remove drive rods and samplers. The standard removal procedures involve raising the hydraulic punch, turning off the hydraulic system, replacing the drive cap with a pull cap, removing the anvil, and then latching the pull cap under the hammer latch. The hydraulic punch can then be used to pull the rod from the ground.

Two deviations to this procedure often occur. The first deviation is necessary when sampling tubes are to be left inside the hole as the drive rod is removed, especially when soil gas implants or piezometers have been installed. Because of the presence of these sampling tubes, a pull cap cannot be screwed onto the top of the drive rod. Instead, a rod pull plate is used. This plate is a piece of steel with a hole in it large enough for a drive rod to fit through it. The plate has a hook on one end. The tubing and rod are pushed through the plate, and the pull plate is attached to the latch on the hydraulic punch by a chain. As the punch pulls up, the plate shifts, and the inside of the hole binds on the rod. This binding usually holds the rod to the plate and results in the rod being pulled up as the punch is raised.

The second deviation occurs when the rods have not been pushed perpendicular to the ground. In these cases, a specially designed chain-assisted pull cap is used. This cap looks like a pull cap but has a chain on it that fits under the latch of the hammer. Once the cap is screwed to the drive rod and latched to the probe, raising the probe raises the rod.

In a few cases, drive rods break while in the ground. To retrieve these rods, a rod extractor is used. This extractor looks something like a drill bit and is screwed to the end of a probe rod. A hammer is then used to pound the extractor into the top of the broken rod. The extractor joins the broken rod to the second drive rod so that they can be pulled out together.

5.0 BACKFILLING PROCEDURES

Unless otherwise specified in the site-specific sampling plan, holes made by sampling with Geoprobe System tools are to be backfilled with dry, fine, granular bentonite. Water may be added to activate the bentonite. Tops of the holes may then be filled with soil or concrete as necessary for each particular site.

6.0 DECONTAMINATION PROCEDURES

Between holes, the probe rods and sampling tools must be decontaminated. Because no provisions for decontamination are included in the Geoprobe System, a separate decontamination station must be provided. A wire brush, a barrel brush for reaming out the rods, and soft brushes will clean sticky soil from the probe rods and sampling tools. Follow PRC SOP No. 002 decontamination procedures when sampling soil or groundwater.

When sampling for soil gas by the standard method, Geoprobe rods and samplers are heated approximately 15 to 20 minutes by a 100,000-British thermal unit heater until they are too hot to touch with the bare hand. They are then allowed to cool before reuse. Do not heat the rods too much or the rod metal will fatigue.

When sampling for soil gas by the PRT method, the probe rods do not have to be decontaminated. However, the PRT expendable point holder and PRT adapter do need to be decontaminated. They can be heated on the dash of the vehicle with the defrost system or scrubbed in Alconox and water. Equipment blank samples can be collected, if necessary, as part of the quality control process.

Sampling plans may have different decontamination requirements. Most plans also require rinsate sample collection as part of the quality control process.

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

STATIC WATER LEVEL, TOTAL WELL DEPTH, AND IMMISCIBLE LAYER MEASUREMENT

SOP NO. 014

REVISION NO. 0

Approved by:

David C. Lin
Quality Assurance Officer

7/20/94
Date

1.0 BACKGROUND

Measurement of static water level, total well depth, and any immiscible layers is necessary before a well can be sampled and groundwater flow direction can be determined. If an immiscible layer is present, its depth and thickness must be determined. In addition, the static water level and total well depth of a monitoring well are needed to determine a purging volume.

1.1 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide guidelines for field personnel measuring static water levels and total water depths of monitoring wells or piezometers. This SOP also provides guidelines for measuring immiscible layers in such wells.

1.2 SCOPE

This SOP describes the methodologies for measuring static water level, total well depth, and immiscible layer depth and thickness.

1.3 DEFINITIONS

To clarify the methodologies presented in this SOP, the following definitions are presented:

Electrical Water Level Indicator -- An electrical probe used to determine the depth to fluid. The probe has a light or sound alarm connected to an open circuit. The circuit is closed and the alarm is activated when the probe contacts a conducting fluid such as water.

Immiscible Layer -- A liquid phase that cannot be uniformly mixed or blended with water. Heavy immiscible phases sink in water; light immiscible phases float on water.

Interface Probe -- An electrical probe used to determine the thicknesses of light or dense immiscible layers in the water column of a monitoring well.

Ionization Detector -- A photoionization detector (PID) or a flame ionization detector (FID) is used to measure the level of volatile organic compounds in the gaseous phase. These units are generally not compound-specific and thus measure only total volatile organic compounds. The PID generally cannot detect as complete a range of compounds as the FID. This difference is the result of the relative ionization energies of the two detectors. Most PIDs cannot detect methane, but FIDs can. The HNu and Microtip are examples of PIDs; the Foxboro organic vapor analyzer (OVA) is an example of an FID.

Static Water Level -- The level of water in a monitoring well or piezometer. This level can be measured as the depth to water or as the elevation of water relative to a reference mark or datum.

Total Well Depth -- The distance from the ground surface to the bottom of a monitoring well or piezometer

1.4 REFERENCES

SOP No. 002, General Equipment Decontamination, is referenced in this SOP.

1.5 REQUIREMENTS AND RESOURCES

The equipment required for measuring static water levels, total well depths, and immiscible layers is as follows:

- Electrical water level indicator
- Interface probe
- PID or FID

2.0 PROCEDURES

This section provides general guidance followed by specific procedures for static water level, total well depth, and immiscible layer measurement.

Techniques for measuring depth to water and depth to the bottom of a monitoring well should be identified in the planning stage of field work. Also at this stage, measuring devices should be chosen, and an individual should be assigned to take and record measurements.

All measurement instruments should be decontaminated before and after use and between measurement locations. Refer to SOP No. 002, General Equipment Decontamination.

Before initiation of any measuring activities, the ambient air at a monitoring well head should be monitored for possible emissions of volatile organic compounds. To accomplish this monitoring, a PID or an FID should be used. The health and safety plan for on-site activities should provide action levels and the rationale for selection of either detecter.

Appropriate respiratory protection equipment should be worn by the sampling team. Wells should be approached from the upwind side. When opening the monitoring well, the sampling team should systematically survey the inside of the well casing, the area from the casing to the ground, the area from above the well casing to the breathing zone, and the area around the well. Readings for comparison to action levels should be taken not within the well casing but in the breathing zone. If PID or FID readings of volatile organic compounds are above action levels, the sampling team should retreat to a safe area and put on appropriate safety gear. The site-specific health and safety plan should be consulted for action levels.

2.1 STATIC WATER LEVEL MEASUREMENT

The procedure described below should be followed to measure the static water level in a monitoring well or piezometer.

An electric water level indicator is typically used for static water level measurement. The electrical probe of the indicator should be lowered into the monitoring well until the light or sound alarm is activated, indicating that the probe has touched the water surface. The static water level should then be read directly from the indicator to the 0.01-foot fraction. If the monitoring well top is not flush with the ground surface, the distance between the static water level and the top of the riser pipe should be measured; the height of the riser pipe above ground surface should then be subtracted from the first measurement to determine the depth to static water below grade. If surveyed elevations are available, they should be used to establish the water level elevation. To ensure measurement accuracy, the probe should be left hanging above the water surface in the monitoring well; a series of three readings should be taken, and the values should be averaged. The date and time of taking the readings with the readings and average value should be recorded in a field logbook.

2.2 TOTAL WELL DEPTH MEASUREMENT

The procedure described below should be followed to measure total well depth in a monitoring well or piezometer.

Total well depth measurement can be performed also using an electric water level indicator. The electrical probe of the indicator should be lowered into the monitoring well until resistance is met, indicating that the probe has reached the bottom of the well. The total well depth should then be read directly from the indicator to the 0.01-foot fraction. If the monitoring well top is not flush with the ground surface, the distance between the bottom of the well and the top of the riser pipe should be measured; the height of the riser pipe above ground surface should then be subtracted from the first measurement to determine the depth to the bottom of the well. To ensure measurement accuracy, the

probe should be left hanging above the water surface in the monitoring well; a series of three readings should be taken, and the values should be averaged. The date and time of taking the readings with the readings and average value should be recorded in a field logbook.

2.3 IMMISCIBLE LAYER DETECTION AND MEASUREMENT

The procedure described below should be followed to detect and measure an immiscible layer in a monitoring well.

A light immiscible layer in a monitoring well can be detected by slowly lowering an interface probe to the surface of the water in the well. When the audible alarm sounds, the depth of the probe should be recorded. If the alarm is continuous, a light immiscible layer has been detected. To measure the thickness of this layer, the probe should then be lowered until the alarm changes to an oscillating signal. The oscillating alarm indicates that the probe has reached a water layer. The probe depth at the time the alarm begins oscillating should be recorded as the depth to water. The thickness of the light immiscible layer should then be determined by subtracting the depth at which a continuous alarm occurred from the depth at which the alarm began to oscillate. To ensure measurement accuracy, the interface probe should be left hanging above the water surface in the monitoring well; a series of three readings should be taken, and the depths and thicknesses measured should be averaged. The date and time of taking the readings with the depths and thicknesses should be recorded in a field logbook.

To determine whether a dense immiscible layer is present, the interface probe should be lowered further into the monitoring well. If the alarm changes from an oscillating to a continuous signal, a heavier immiscible layer has been detected, and the probe depth should be recorded at that point. Total well depth obtained in Section 2.2 should be used for calculating the thickness of the dense layer. The dense layer should be calculated by subtracting the depth at which the alarm became continuous from the total well depth. This procedure provides an estimate of the thickness of the dense layer in the monitoring well. To ensure measurement accuracy, the interface probe should be

left hanging above the water surface in the monitoring well; a series of three readings should be taken, and the depths and thicknesses measured should be averaged. The date and time of taking the readings with the depths and thicknesses should be recorded in a field logbook.

SOP APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.

STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING

SOP NO. 010

REVISION NO. 3

Approved by:

Jeffrey G. Bom
Quality Assurance Officer

2/19/93
Date

1.0 BACKGROUND

Groundwater sampling may be required for a variety of reasons, such as examining potable or industrial water supplies, checking for and tracking contaminant plume movement in the vicinity of a land disposal or spill site, RCRA compliance monitoring, or examining a site where historical information is minimal or nonexistent, but where it is thought groundwater may be contaminated.

Groundwater is usually sampled through an in-place well, either temporarily or permanently installed. However, it can also be sampled anywhere groundwater is present, such as a pit or a dug or drilled hole.

Occasionally, a well will not be in the preferred location to obtain the sample needed (for example, to track a contaminant plume). In such a case, a temporary or permanent well will have to be installed. An experienced and knowledgeable person, preferably a hydrogeologist, will need to locate the well and supervise its installation so that the samples ultimately collected will be representative of the groundwater.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedure for determining the quality of groundwater entering, leaving, or affected by site activities through groundwater sampling. The samples are obtained by retrieving water from a well placed into the underlying aquifer or aquifers at a site.

1.2 SCOPE

This SOP applies to all groundwater sampling activities conducted in the field.

1.3 DEFINITIONS

Bailer -- A cylindrical sampling device with valves on either end used to extract water from a well. Bailers are usually constructed of an inert material such as stainless steel or polytetrafluoroethylene (Teflon). The bailer is lowered and raised by means of a cable that may be cleaned and reused, or by disposable rope.

Electrical Water Level Indicator -- An electrical device that has a light or sound alarm connected to an open circuit used to determine the depth to fluid. The circuit is closed when the probe intersects a conducting fluid. The wire used to raise and lower the probe is usually graduated.

Immiscible Phase -- Liquid phases that cannot be uniformly mixed or blended with water. Heavy immiscible phases sink; light immiscible phases float on water.

Interface Probe -- An electrical probe that determines the distance from the surface to air/water, air/immiscible, or immiscible/water interfaces.

Purge Volume -- The volume of water that needs to be removed from the well to insure that a sample representative of the groundwater is taken.

Riser Pipe -- The length of well casing above the ground surface.

Total Well Depth -- The distance from the ground surface to the bottom of the well.

Water Level -- The level of water in a well. Measured as depth to water or as elevation of water, relative to a reference mark or datum.

1.4 REFERENCES

Korte, N. P. Kearl, Procedures for the Collection and Preservation of Groundwater and Surface Water Samples and for the Installation of Monitoring Wells: Second Edition, GJ/TMC-08, U.S. Department of Energy, Technical Measurements Center, Grand Junction Projects Office, 1985.

U.S. EPA, "Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities," EPA-530/SW-611, August 1977.

U.S. EPA, "Sampling at Hazardous Materials Incidents," EPA Hazardous Response Support Division, Cincinnati, 1984.

U.S.G.S., 1984, National Handbook of Recommended Methods for Water-Data Acquisition, Reston, VA.

1.5 REQUIREMENTS AND RESOURCES

There are various options available to obtain groundwater samples. The procedures are outlined in the following section. The equipment needed for these procedures includes:

- Organic vapor detector with a flame ionization detector (FID) or photoionization detector (PID)
- Pipe wrench
- Electrical water level indicator or interface probe
- Steel tape with heavy weight
- Purging device (type needed depends on well depth, casing diameter, type of sample desired - see sampling devices below)
- Sampling device (type needed depends upon depth to water and type of sample desired)
  - Teflon bailer
  - Stainless steel bailer
  - Teflon bladder pump
  - Stainless steel submersible (nonoil-bearing) pump
  - Existing dedicated equipment
  - Peristaltic pump

- Sample containers
- Wastewater containers with adequate volume
- Logbook
- Stopwatch

Additional equipment is required to complete measurement of field parameters (i.e., pH, specific conductance, and temperature) of the groundwater at the well (refer to SOP No. 061).

2.0 PROCEDURE

Prior to sampling, a site-specific sampling plan will be developed. The plan will take into consideration the site characteristics and will include:

- The specific repeatable well measurement techniques and reference points for determining the depth to water and the depth to bottom of the well
- The specific method of purging and selection of purging equipment
- The specific analytical method for measurement of field parameters and the selection of field analytical equipment
- The specific method of sample collection and selection of sampling equipment
- The order of sample bottle filling
- The sample chemical analytical parameters

2.1 APPROACHING THE WELL

In general, all wells should be assumed to pose a health and safety risk until field measurements determine otherwise. Approach wells from the upwind side. Record well appearance and general condition of the protective casing, surface seal, and surrounding area in the logbook.

Once at the well, the lead person should systematically use the organic valor detector to survey the immediate area around the well (from the breathing zone to the top of the casing to the ground). If elevated FID and PID meter readings are encountered, retreat to a safe area and instruct the sampling team to put on the appropriate level of personal protective equipment (PPE).

Upon opening the well casing, the lead person should systematically survey inside the well casing above the well casing in the breathing zone and the immediate area around the well. If elevated FID or PID meter readings in the breathing zone are encountered, (see health and safety plan for action levels) retreat and put on appropriate PPE. It is important to remember that action levels are based on readings in the breathing zone, not within the well casing. Representative organic vapor detector readings will be recorded in the logbook.

2.2 ESTABLISHING A SAMPLE PREPARATION AREA

The sample preparation area is generally located upwind or to either side of the well. If elevated readings are encountered using an organic vapor detector, this area should be taped off and the sample preparation area should be located upwind where ambient readings are found.

2.3 PRELIMINARY WELL MEASUREMENTS

Several preliminary well measurements should be made prior to initiating sampling of the well. These include determining water level and total well depth measurements, determining the presence of immiscible phases, and calculating purge volumes. All preliminary measurements will be recorded in the logbook as they are determined.

2.3.1 Water Level and Total Well Depth Measurements

PRC typically uses an electric water-level indicator for water level measurements. This device sounds an alarm or illuminates a light when the measuring probe touches the water surface, thus closing an electrical circuit. The electric cable supporting the probe is usually graduated in feet and can be read at the well site directly. The remaining fraction is measured with a steel tape graduated to 0.01 foot. The distance between the static water level and the marked or notched

location at the top of the riser pipe is measured. The height of the riser pipe above ground surface, as obtained from well location survey data, is then subtracted from the total reading to give the depth to static water. To improve the accuracy of the readings, each measurement should be for a series of three readings, and the values averaged. This helps to eliminate any errors from kinks or bends in the wires, which may change the length when the device is pulled up and let down.

The total well depth can be measured by using a steel tape with a heavy weight attached to the end. The tape is lowered into the well until resistance is met, indicating that the weight has reached the bottom of the well. The total well depth is then read directly from the steel tape to the 0.01 foot fraction. The distance between the bottom of the well and the marked or notched location on the riser pipe is measured. The height of the riser pipe above the ground surface, as obtained from well survey data, is then subtracted from the total reading to give the depth to the bottom of the well. To improve the accuracy of the readings, the weighted steel tape should be used to make a series of three readings, and the readings averaged.

2.3.2 Determining If Immiscible Phases Are Present

If immiscible phases (organic floaters or sinkers) are present, the following measurement activities should be undertaken. Organic liquids are measured by lowering an interface probe slowly to the surface of the liquid in the well. When the audible alarm sounds, record the depth. If the alarm is continuous, a floating immiscible layer has been detected. To determine the thickness of this layer, continue lowering the probe until the alarm changes to an oscillating signal. The oscillating signal indicates that the probe has detected an aqueous layer. Record this depth as the depth to water and determine the thickness and the volume of the immiscible layer.

Continue lowering the probe into the well to determine if immiscible dense phases (sinkers) are present. If the alarm signal changes from oscillating to a continuous sound, a heavier immiscible layer has been detected; record this depth.

Continue lowering the probe to the bottom of the well and record the total depth. Separate total depth measurements with a steel tape are not necessary when using an interface

probe. Calculate and record the sinker phase volume and total water volume in the well. A chart is provided in Table 1 to assist in these calculations. If immiscible phases are present, immediately refer to Sections 2.5.1 or 2.5.2 of this SOP.

2.3.3 Determination of Purging Volume

If the presence of floaters or sinkers does not need to be determined, determine the depth to water and the total depth of the well as described in Section 2.3.1. Once these measurements have been made and recorded, use Table 1 to calculate the total volume of water in the well. Multiply this volume by the purging factor to determine purging volume. The minimum purging factor is three casing volumes but may be superseded by site-specific program requirements, individual well yield characteristics or stabilization of field parameters measured during purging. Field parameters (i.e., pH, specific conductance, and temperature) should be measured in accordance with SOP No. 061 prior to purging and after each well volume. All field parameter data are recorded in the field logbook.

In Table 1, the volume of water in a 1-foot section of a 2-inch-diameter well is 0.16 gallon. This chart can easily be used for any water depth by multiplying all the values in Table 1 by the L value (depth, in feet, of water in the well).

2.4 PURGING THE WELL

Currently, PRC standards allow for six options for purging wells:

1) Teflon bailers
2) Stainless steel bailers
3) Teflon bladder pumps
4) Stainless steel submersible (nonoil-bearing) pumps

TABLE 1

LIQUID VOLUME IN A 1-FOOT SECTION OF WELL CASING

Well Casing Inside Diameter (D) (inches)	Volume of Liquid in 1-Foot well Section (gallons) $V = 0.0408\ (D^2)$
1	0.041
1.5	0.092
2	0.163
3	0.367
4	0.653

The volume of water in the well is based on the formula:

$$V = \frac{\pi \times D^2}{4} \times L$$

where:

D = the inside diameter of the well in inches
L = the depth in feet of the water in the well
V = the volume of water in the well in cubic feet

5) Existing dedicated equipment (use of these devices must be approved by on-site client representatives)

6) Peristaltic pumps (these devices are for use in shallow wells only and must be approved by the on-site client representative)

As previously stated, the established minimum purging volume is three casing volumes. The exception to this standard is in the case of low-yield wells. When purging low-yield wells, purge the well once to dryness. Samples should be collected as soon as the well recovers. When the time required for full recovery exceeds 3 hours, samples should be collected as soon as sufficient volume is available.

The well should be purged until the measured field parameters have been stabilized. If any field parameter has not stabilized, additional purging should be performed. To be considered stable, field parameters should change by no more than the tolerance levels listed on Table 2 between each well volume purged.

TABLE 2

FIELD MEASUREMENT TOLERANCE LEVELS

Field Parameter	Tolerance Level
pH	0.1 pH units
Specific Conductance	10% RPD
Temperature	1°C

RPD Relative percent difference
°C Degrees Celsius

At no time should the purging rate be high enough to cause the groundwater to cascade back into the well, resulting in excessive aeration and potential stripping of volatile constituents.

The actual volume of purged water can be measured using several acceptable methods:

- When bailers are used, the actual volume of each bailer's contents can be measured using a calibrated bucket.
- If a pump is used for purging, the pump rate can be determined by using a bucket, stopwatch, and the duration of pumping until the necessary volume is purged.

2.5 SAMPLE COLLECTION

The technique used to withdraw a groundwater sample from a well should be selected based on the parameters for which the sample will be analyzed. To ensure that the groundwater samples are representative, it is important to avoid physically altering or chemically contaminating the sample during collection, withdrawal, or containerization. If the samples are to be analyzed for volatile organic compounds, it is critical that air does not become entrained in the water column.

Acceptable sampling devices for all parameters include double check valve stainless steel or Teflon bailers, bladder pumps, low-flow positive displacement pumps, or for shallow wells peristaltic pumps. Additional field measurements should be performed at the time of sampling. Refer to SOP No. 061.

In some cases, it may become necessary to use dedicated equipment already in the well to collect samples. This is particularly true of high volume, deep wells (>150 feet) where bladder pumps are ineffective, and bailing is impractical. If existing equipment must be used, determine the make and model of the pump, and obtain information on component construction materials from the manufacturer or facility representatives. If an existing pump is to be used for sampling, make sure the flow volume can be reduced so that a reliable volatile organics analysis (VOA) sample can be taken. Record which specific port, tap, or valve sample is collected from.

General sampling procedures include the following:

- Clean sampling equipment should not be placed directly on the ground. Use a plastic drop cloth or feed line from clean reels. Never place contaminated lines back on reels.
- Check the operation of the bailer check valve assemblies to confirm free operation.
- If the bailer cable is to be decontaminated and reused, it must be made of Teflon-coated stainless steel.
- Lower sampling equipment slowly into the well to avoid degassing the water and damaging the equipment.
- Pump flow rates should be adjusted to eliminate intermittent or pulsed flow. The settings should be determined during the purging operations.
- A separate sample volume should be collected to measure field parameters. Samples should be collected and containerized in the order of the parameters' volatilization sensitivity. Table 3 lists the preferred collection order for some common groundwater parameters.

TABLE 3

ORDER OF PREFERRED SAMPLE COLLECTION

1. Volatile organics (VOA)
2. Purgeable organic halogens (POX)
3. Total organic halogens (TOX)
4. Cyanide
5. Extractable organics
6. Purgeable organic carbon (POC)
7. Total metals
8. Dissolved metals
9. Total organic carbon (TOC)
10. Phenols
11. Sulfate and chloride
12. Nitrate and ammonia
13. Radionuclides

Intermediate containers should never be used to prepare VOA samples and should be avoided for all parameters in general. All VOA containers should be filled at a single sampling point or from a single bailer volume.

2.5.1 Collection of Light Immiscible Floaters

The approach used when collecting floaters is dependent on the depth to the floating layer and the thickness of that layer. If the thickness of the floater is 2 feet or greater, a bottom-filling valve bailer should be used. Slowly lower the bailer until contact is made with the floater surface, and lower the bailer to a depth less than that of the floater/water interface depth as determined by preliminary measurements with the interface probe.

When the thickness of the floating layer is less than 2 feet and the depth to the surface of the floating layer is less than 15 feet, a peristaltic pump can be used to extract a sample.

When the thickness of the floating layer, however, is less than 2 feet and the depth to the surface of the floating layer is beyond the effective "lift" of a peristaltic pump (greater than 25 feet), a bailer can be modified to allow filling from the top only (an acceptable alternative is to use a top-loading Teflon or stainless steel bailer). Disassemble the bailer's bottom check valve and insert a piece of 2-inch-diameter Teflon sheet between the ball and ball seat. This will seal off the bottom valve. Remove the ball from the top check valve, thus allowing the sample to enter from the top. To overcome buoyancy when the bailer is lowered into the floater, place a length of one-inch stainless steel pipe on the retrieval line above the bailer (this pipe may have to be notched to allow sample entry if the pipe remains within the top of the bailer). Or, as an alternative, use a top-loading stainless steel bailer. Lower the device, carefully measuring the depth to the surface of the floating layer, until the top of the bailer is level with the top of the floating layer. Lower the bailer an additional one-half thickness of the floating layer and collect sample. This technique is the most effective method of collection if the floating layer is of only a few inches thick.

2.5.2 Collection of Heavy Immiscible Sinkers

The best method for collection of sinkers is use of a double check valve bailer. The key to collection is slow, controlled, lowering and raising of the bailer to and from the bottom of the well. Collection methods are equivalent to those described in Section 2.5.1 above. Note that both floaters and sinkers must be collected prior to any purging activities.

2.5.3 Collection of Volatile Organics Samples

This section discusses the collection of VOAs using either a bailer or bladder pump in detail. Other pumps (such as positive displacement of peristaltic) can be used. Critical to the collection of representative samples for volatile organics analysis are ensuring that no air has become entrained in the water column, low pump flow rates (less than 100 milliliter (mL) per minute, if possible), and avoiding flow surges.

2.5.3.1 Collection with Bailers

VOAs should be collected from the first bailer removed from the well after purging. The most effective means requires two people. One person should retrieve the bailer from the well and pour its contents into the appropriate number of 40-mL VOA vials held by the second person. Cap the vial and invert. If a bubble exists, discard and repeat. Do not reopen the vial and add additional sample. The sample is transferred from the bailer to the container in a manner that will limit the amount of agitation in order to reduce the loss of volatile organics from the sample.

Always fill VOA vials from a single bailer volume. If the bailer is refilled, samples are not duplicates or splits.

2.5.3.2 Collection with a Bladder Pump (Well Wizard)

To successfully perform VOA sampling with a Well Wizard bladder pump, the following steps must be completed:

1) Following manufacturer's directions, activate the Well Wizard pump. Full water flow from the discharge tubing will begin after 5 to 15 pumping cycles. These initial pumping cycles are required to purge air from the pump and discharge tubing. The discharge and recharge settings must be manually set and adjusted to pump at optimum flow rates. To activate the bladder, it is best to set the initial cycle at long discharge and recharge rates.

2) Reduce water flow rate for VOA sample collection. To reduce the water flow rate, turn the throttle control valve (located on the left side of the Well Wizard pump control panel) counterclockwise.

3) Collect VOA sample from discharge tubing. VOA vials must be placed beneath the discharge tubing while avoiding direct contact between the vials and the tubing. Never place tubing past the mouth of the VOA vial. The pump throttle control must be turned as necessary to maintain a trickle of water in order to obtain a meniscus in the vial.

4) Continue with non-VOA sampling. Increase pump flow rate by turning the throttle control knob clockwise.

APPENDIX D

SOIL BORING LOGS

COPY

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-4

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION _____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, a mixture of SILTY SAND and ASH, moist, dark brown and black	Fill			1	HSA					
3.0											
	FILL, a mixture of SANDY LEAN CLAY, LEAN CLAY and a little REFUSE MATERIAL, moist, black, white, gray and brown				2	HSA					
6.5			3	▼	3	SB					
	FILL, mostly REFUSE MATERIAL w/a few layers of soil, wet to waterbearing, multi-colored, odorous		6		4	SB					
			5		5	SB					
15.5			4		6	SB					
	SAND w/SILT, fine grained, waterbearing, very loose, gray and brownish gray, a few lenses of silty sand, sand and silt, a few pieces of wood and shells	Coarse Alluvium	3		7	SB					
19.0											
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-15	11:30	7.5'	5'	----		6.5'
8-15	12:00	11.5'	9'	----		10.5'

START 8-15-94 COMPLETE 8-15-94 @ 12:30

METHOD 4-1/4" HSA 0-20'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-5

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION _____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, mostly SILTY SAND w/a little SAND, LIMESTONE, GRAVEL, brick and cobbles, moist, black and brown	Fill			1	HSA					
3.0	FILL, mostly REFUSE MATERIAL, moist to waterbearing, multi-colored, a few layers of silty sand, organic soils at about 11.5'		5		2	SB					
			12	▼	3	SB					
			5		4	SB					
12.5											
13.5	ORGANIC SILTY CLAY, wet, very soft, dark grayish brown and black	Swamp*	5		5	SB					
15.0	SAND w/SILT, fine grained, waterbearing, loose, black and dark gray, lenses and layers of sand and silty sand	Coarse Alluvium / Mixed Alluvium	1-1/2		6	SB					
20.0	STRATIFIED mostly ORGANIC SILTY CLAY w/lenses and layers of LEAN CLAY, ORGANIC CLAY, SANDY SILT, SILT and SAND, very wet to waterbearing, very soft to soft, black and dark gray to gray, some pieces of decayed wood and other organics, a layer of mostly silty sand below about 18.5'	*Deposits	5		7	SB					
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-15	5:00	9'	7'	----		9'
8-16	8:45	17'	14.5'	----		12'

START 8-15-94 COMPLETE 8-16-94 @ 9:10

METHOD 4-1/4" HSA 0-20'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-6

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, mostly SILTY SAND w/GRAVEL, moist, dark brown, a layer of wood at about 3'	Fill			1	HSA					
3.0	FILL, mostly REFUSE MATERIAL, moist to wet, multi-colored										
			6		2	SB					
			2		3	SB					
			18	▼	4	SB					
14.0			1		5	SB					
	LEAN to SILTY CLAY, wet, very soft, black and dark gray, lenses and layers of sand, silty sand, silt and peat	Fine Alluvium	2		6	SB					
19.0			1		7	SB					
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-16	1:50	12'	10'	----		10.5'

START 8-16-94 COMPLETE 8-16-94 @ 2:40

METHOD 4-1/4" HSA 0-20'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-7

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION _____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	W	D	LL	PL	Qu or RQD
1.0	FILL, mostly SILTY SAND and GRAVEL, moist, brown and black	Fill			1	HSA					
	FILL, mostly REFUSE MATERIAL, moist to waterbearing, odorous, multi-colored, a few layers of soil		1		2	SB					
			8		3	SB					
			31	▼	4	SB					
16.0			2		5	SB					
	SILTY SAND, fine grained, waterbearing, very loose, grayish brown to black and dark gray, some pieces of wood and other organics, layers and lenses of clayey sand, lean clay and silt and sand	Coarse Alluvium	3		6	SB					
22.0			1		7	SB					
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-17	10:15	11.5'	10'	----		10.5'
8-17	2:30	22'	20'	----		10.5'

START 8-17-94 COMPLETE 8-17-94 @ 11:30

METHOD 4-1/4" HSA 0-20'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-8

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION _____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, mostly SILTY SAND, moist, brown to dark brown	Fill			1	HSA					
3.0	FILL, mostly REFUSE MATERIAL, moist to waterbearing, multi-colored										
			21		2	SB					
			11	▼	3	SB					
			66		4	SB					
			21		5	SB					
			3		6	SB					
18.0											
20.0	LEAN to SILTY CLAY, wet, very soft, dark gray and grayish brown, layers and lenses of sand, silty sand, silt and organic clay	Fine Alluvium	1		7	SB					
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-17	4:15	12'	10'	----		9'
8-18	9:00	20'	20'	----		13.5'

START 8-17-94 COMPLETE 8-17-94 @ 5:10

METHOD 4-1/4" HSA 0-20'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-9

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
1.5	FILL, mostly SILTY SAND and a little GRAVEL, moist, dark brown and brown	Fill			1	HSA					
	FILL, mostly REFUSE and demolition material, moist to waterbearing, multi-colored, a few layers of soil, very odorous below 15'										
			26		2	SB					
			1		3	SB					
			3	▼	4	SB					
			5		5	SB					
			23		6	SB					
			30		7	SB					
18.0											
	LEAN to SILTY CLAY, wet, soft, black to gray	Fine Alluvium	5		8	SB					
20.0											
	ORGANIC CLAY, wet, soft, dark grayish brown to black, lenses and laminations of peat	Swamp Deposits	6		9	SB					
22.5											
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-19	1:15	10'	7.5'	9'		8'
8-22	9:10	22.5'	20'	----		8'

START 8-19-94 COMPLETE 8-19-94 @ 3:00

METHOD 4-1/4" HSA 0-20'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-10

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, a mixture of SILT, CLAYEY SILT and SANDY SILT, moist, brown, gray and dark brown	Fill			1	HSA					
3.0	FILL, mostly REFUSE MATERIAL, moist to waterbearing, multi-colored										
			7		2	SB					
			19		3	SB					
			9		4	SB					
			50/.3		5	SB					
14.5	LEAN CLAY, wet, very soft, black and dark grayish brown	Fine Alluvium	3		6	SB					
18.5			3		7	SB					
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-18	5:10	18.5'	None	---		Well

START 8-18-94 COMPLETE 8-18-94 @ 3:00

METHOD 4-1/4" HSA 0-18'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-11

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION _____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, mostly SILTY SAND and a little GRAVEL, moist, brown and dark brown	Fill			1	HSA					
2.5	FILL, mostly REFUSE MATERIAL, moist, multi-colored										
5.0	FILL, a mixture of SILTY SAND, CLAYEY SAND and a little GRAVEL, moist, dark brown		16		2	SB					
7.0	FILL, mostly REFUSE MATERIAL, moist to waterbearing, multi-colored, a few layers of soil		7		3	SB					
			9	▼	4	SB					
			17		5	SB					
			17		6	SB					
17.0	ORGANIC LEAN CLAY, wet, very soft, black and dark grayish brown, a few lenses of peat and silty sand	Fine Alluvium	3		7	SB					
20.0											

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
5-22	3:00	15'	12.5'	----		11'

START 5-22-94 COMPLETE 5-22-94 @ 3:40

METHOD 4-1/4" HSA 0-18'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-12

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL	Fill									
4.5	FILL, mostly REFUSE MATERIAL, moist to waterbearing, multi-colored, a few layers of soil			▼							
14.5											
15.5	SAND w/SILT, fine grained, waterbearing, very loose, gray	Coarse*	4		1	SB					
	ORGANIC SILTY CLAY, wet, very soft, grayish brown to dark gray	Fine Alluvium									
18.0	End of Boring	*Alluvium									

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-23	1:45	11.5'	9.5'	----		8.5'

START 8-23-94 COMPLETE 8-23-94 @ 1:45

METHOD 4-1/4" HSA 0-18'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-13

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION _____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, mostly SILT	Fill									
4.5											
	FILL, mostly REFUSE MATERIAL, moist to wet, multi-colored		3		1	SB					
			7		2	SB					
			9		3	SB					
12.5											
	ORGANIC SILTY CLAY, wet, very soft, dark gray, a few pieces of wood and lenses of peat	Fine Alluvium	2		4	SB					
16.0			2		5	SB					
18.0	PEAT, wet, very soft, dark brown and black, a few lenses of organic clay	Swamp Deposits	2		6	SB					
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-25	10:40	9.5'	7'	----		7'

START 8-25-94 COMPLETE 8-25-94 @ 11:45

METHOD 4-1/4" HSA 0-18'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-14

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION _____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, a mixture of SILTY SAND and REFUSE MATERIAL, moist to wet, brown to multi-colored	Fill			1	HSA					
			27	▼	2	SB					
6.0	ORGANIC CLAYS, wet, very soft, dark gray, black and dark grayish brown, lenses and laminations of silty sand and a layer of muck below about 12.5'	Swamp Deposits	1		3	SB					
			1		4	SB					
			1		5	SB					
15.0	PEAT, wet, very soft, black		1-1/2		6	SB					
			1-1/2		7	SB					
20.0	MUCK, wet, very soft, dark grayish brown		1-1/2		8	SB					
22.5	SAND w/SILT, fine and fine to medium grained, waterbearing, loose, gray and grayish brown	Coarse Alluvium									
			6		9	SB					
27.1			50/.4		10	SB					
27.6	Possible WEATHERED LIMESTONE, very dense, tan	Limestone	50/.1		11	SB					
	End of Boring										

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-23	12:00	6.5'	4'	----		5'
8-23	2:45	27.4'	25'	----		11'
8-24	10:15	27.6'	27.5'	27.6'		5'

START 8-23-94 COMPLETE 8-23-94 @ 5:00

METHOD 4-1/4" HSA 0-27.5'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-15

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ____)	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	FILL, mostly CLAYEY SAND, moist, reddish brown to gray	Fill			1	HSA					
3.0	FILL, mostly REFUSE MATERIAL, moist to waterbearing, multi-colored, a few layers of soil		6		2	SB					
			50/.3		3	SB					
			4	▼	4	SB					
			8		5	SB					
15.0	LEAN CLAY, wet, very soft, gray	Fine Alluvium	3		6	SB					
17.0	ORGANIC CLAY, wet, very soft, dark grayish brown to dark gray, lenses and laminations of peat	Swamp Deposits	3		7	SB					
			3		8	SB					
22.0	PEAT, wet, very soft to soft, grayish brown to black, some lenses of organic clay		1-1/2		9	SB					
			7		10	SB					
27.0	MUCK, wet, very soft, dark grayish brown to gray, a layer of lean clay at about 30.5'		2		11	SB					
31.0			2		12	SB					
	SILTY SAND, fine grained, waterbearing, very loose, gray to grayish brown, a few lenses and layers of lean clay	Coarse Alluvium	1		13	SB					
34.0	MUCK w/shells, wet, very soft, dark grayish brown, a layer of lean clay at 37'	Swamp Deposits	3		14	SB					
37.5											

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
8-24	4:45	12'	9.5'	----		9.5'
8-25	11:30	34.5'	29.5'	----		20'
8-25	1:00	39.5'	34.5'	33'		9.5'
8-26	9:00	52'	51'	50.5'		9.5'

START 8-24-94 COMPLETE 8-25-94 @ 5:15

METHOD 4-1/4" HSA 0-51'

NORTH: EAST:

CREW CHIEF G. LeMay

twin city testing corporation

LOG OF TEST BORING

JOB NO. 4221 94-1052 VERTICAL SCALE 1" = 5' BORING NO. MW-15 CONTINUED

PROJECT MPCA - PIG'S EYE DUMP

DEPTH IN FEET	DESCRIPTION OF MATERIAL	CLASSIFICATION SYMBOL	GEOLOGIC ORIGIN	N or CR	WL	SAMPLE NO.	SAMPLE TYPE	LABORATORY TESTS W	D	LL	PL	Qu or RQD
	SAND, medium to fine grained, waterbearing, loose to medium dense, grayish brown to gray, a few lenses of lean clay and organic clay, some layers and lenses of silty sand and sand w/silt		Coarse Alluvium	15		15	SB					
				16		16	SB					
				9		17	SB					
				25		18	SB					
51.0												
52.0	LEAN CLAY, wet, firm, gray to bluish gray		Fine*									
	End of Boring		*Alluvium									

APPENDIX E

MONITORING WELL CONSTRUCTION DIAGRAMS

Installation of Monitoring Wells

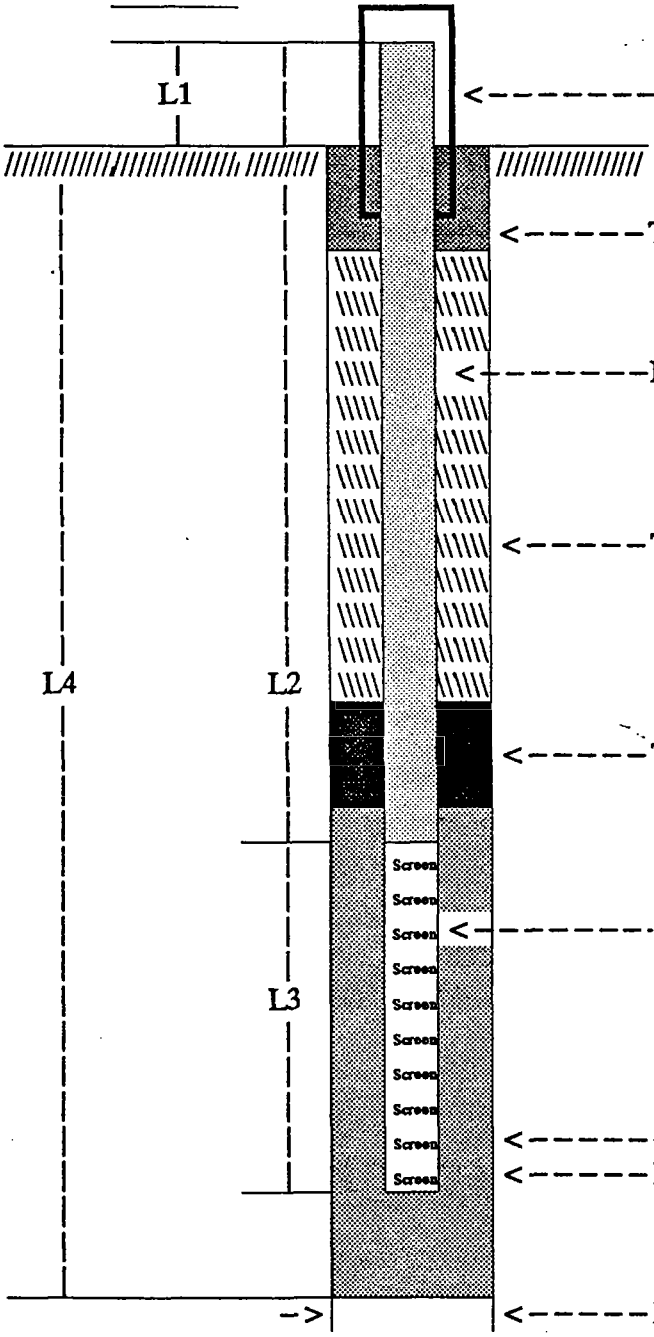
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–4

Ground Surface Elevation
703.8

Top of Riser Pipe Elevation
705.8



<----------Protective Casing	
Size	4"
Type	Steel
<-----Thickness and Type of Seal	
Type	Sacrete
Length–ft	1–½"
<-------Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	21.0
<-----Type fo Backfill Around Riser	
<-----Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	10.2
<----------Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
<----------Filter Type	45–55 Silica Sand
<-----Depth to Bottom of Screen–ft	19.0
<-----Diameter of Borehole	8" ±

L1= 2.0 Ft
L2= 21.0 Ft
L3= 5.0 Ft
L4= 20.0 Ft

INSTALLATION COMPLETED
Date 8–15–94 Time 4:00 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

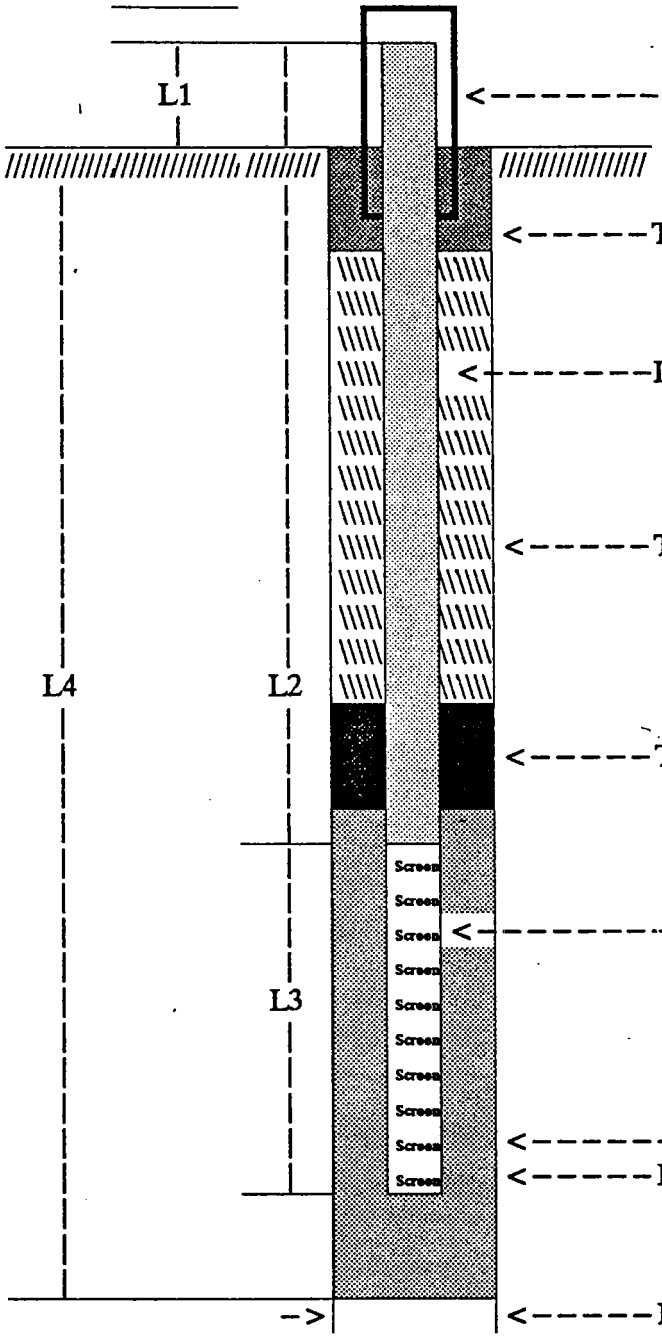
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–5

Ground Surface Elevation 702.0

Top of Riser Pipe Elevation 703.82



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	Sacrete
Length–ft	1–½"
Diameter and type of Riser Pipe	
Type	
Size–in	
Length–ft	15.0
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	10.3
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	18.0
Diameter of Borehole	

L1= 2.0 Ft
L2= 15.0 Ft
L3= 5.0 Ft
L4= 19.0 Ft

INSTALLATION COMPLETED

Date 8–11–94 Time 11:45 A.M.

MONITORING WELL WATER LEVEL MEASUREMENTS

Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

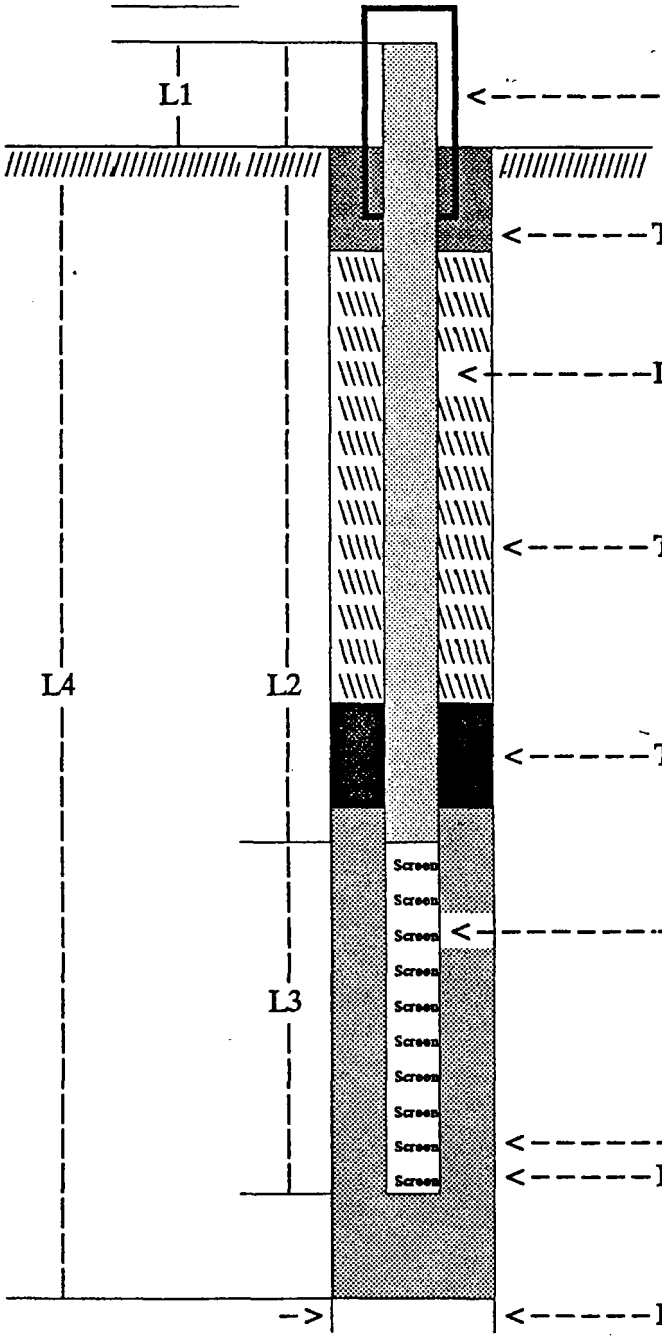
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–6

Ground Surface Elevation 703.4

Top of Riser Pipe Elevation 705.29



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	Sacrete
Length–ft	1–½"
Diameter and type of Riser Pipe	
Type	
Size–in	
Length–ft	17.2
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	11.6
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	20.2
Diameter of Borehole	8" ±

L1= 2.0 Ft
L2= 17.2 Ft
L3= 5.0 Ft
L4= 20.0 Ft

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

INSTALLATION COMPLETED

Date 8–16–94 Time 5:00 P.M.

Installation of Monitoring Wells

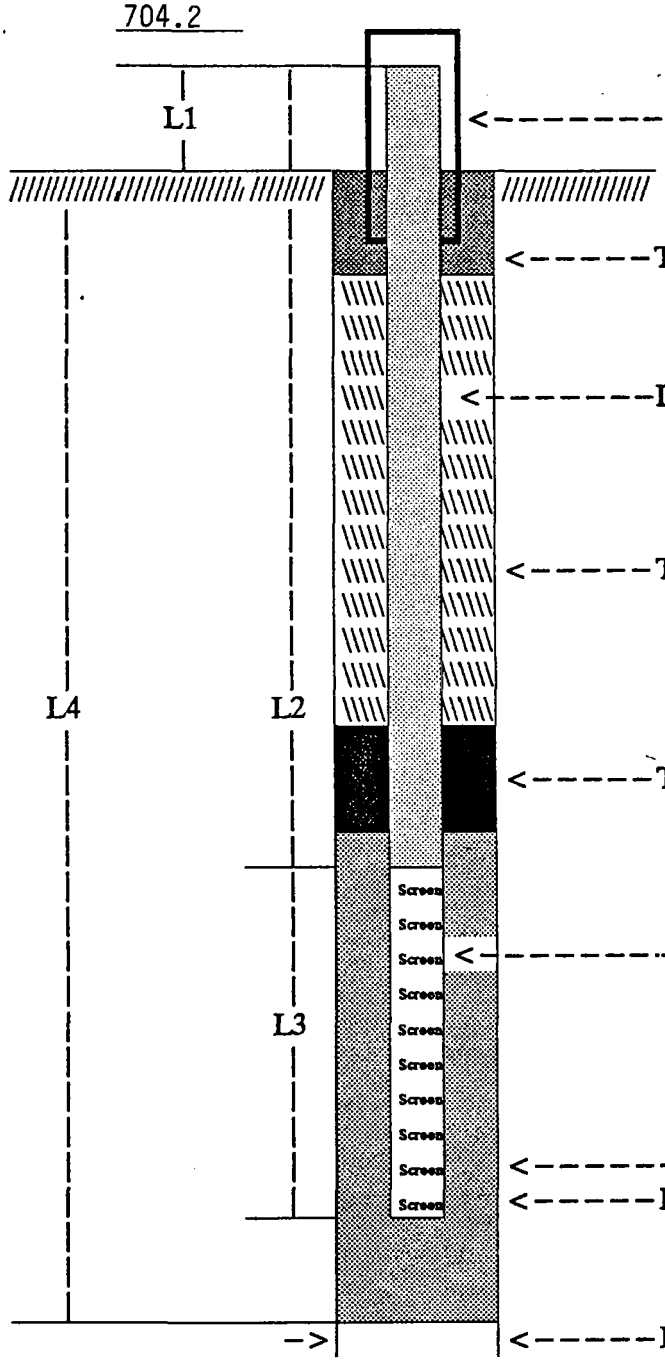
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–7

Ground Surface Elevation 704.2

Top of Riser Pipe Elevation 706.30



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	Sacrete
Length–ft	1–½"
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	11.7
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	20.0
Diameter of Borehole	8" ±

L1= 2.0 Ft
L2= Ft
L3= 5.0 Ft
L4= 20.0 Ft

INSTALLATION COMPLETED

Date 8–17–94 Time 3:00 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

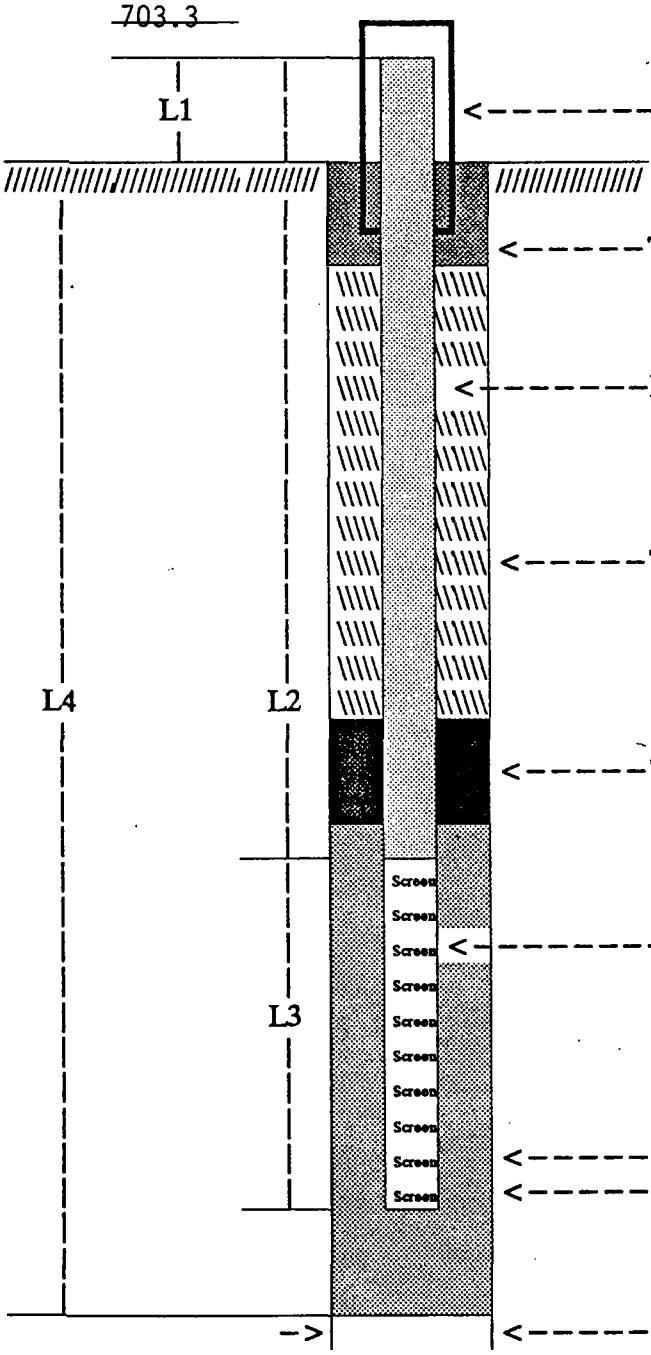
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–8

Ground Surface Elevation 703.3

Top of Riser Pipe Elevation 705.15



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	Sacrete
Length–ft	1–½"
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	15.0
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	10.1
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	18.1
Diameter of Borehole	8"

L1= 1.9 Ft
L2= 15.0 Ft
L3= 5.0 Ft
L4= 20.0 Ft

INSTALLATION COMPLETED

Date 8–18–94 Time 11:50 A.M.

MONITORING WELL WATER LEVEL MEASUREMENTS

Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

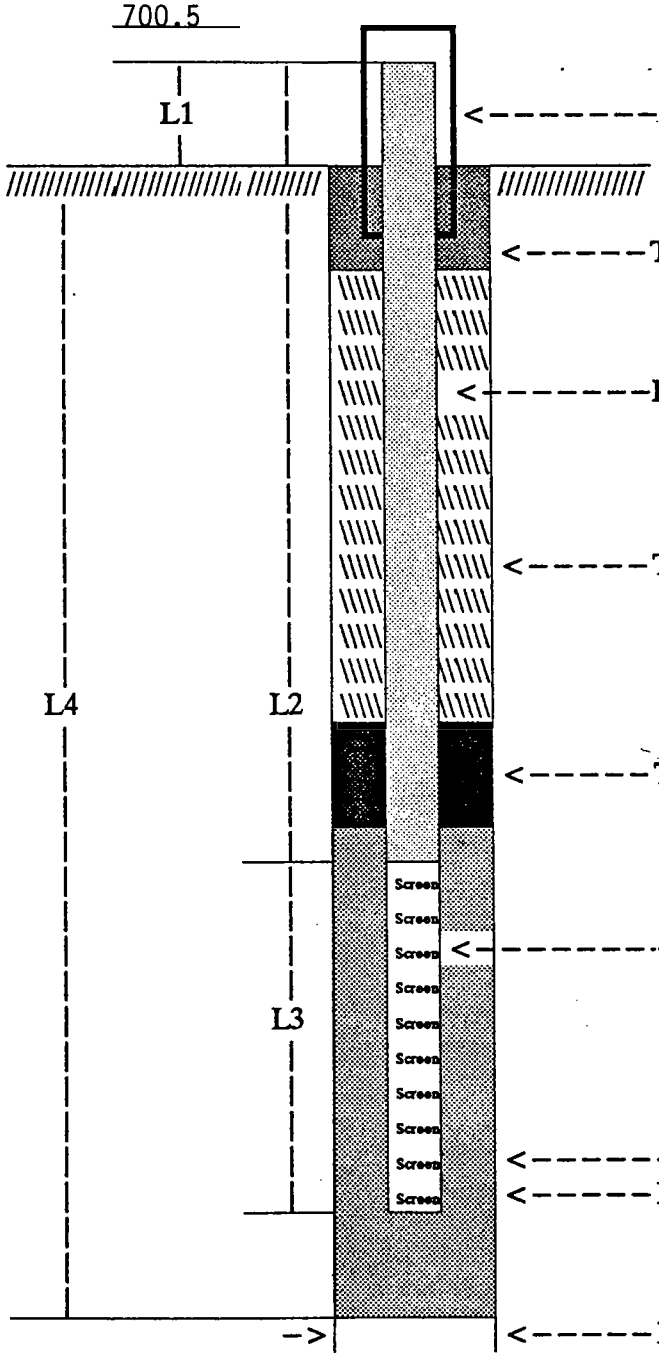
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–9

Ground Surface Elevation 700.5

Top of Riser Pipe Elevation 702.54



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	Sacrete
Length–ft	1–½"
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	15.0
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	10.7
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	18.0
Diameter of Borehole	8"

L1=	2.0	Ft
L2=	15.0	Ft
L3=	5.0	Ft
L4=	22.0	Ft

INSTALLATION COMPLETED

Date 8–22–94 Time 1:00 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

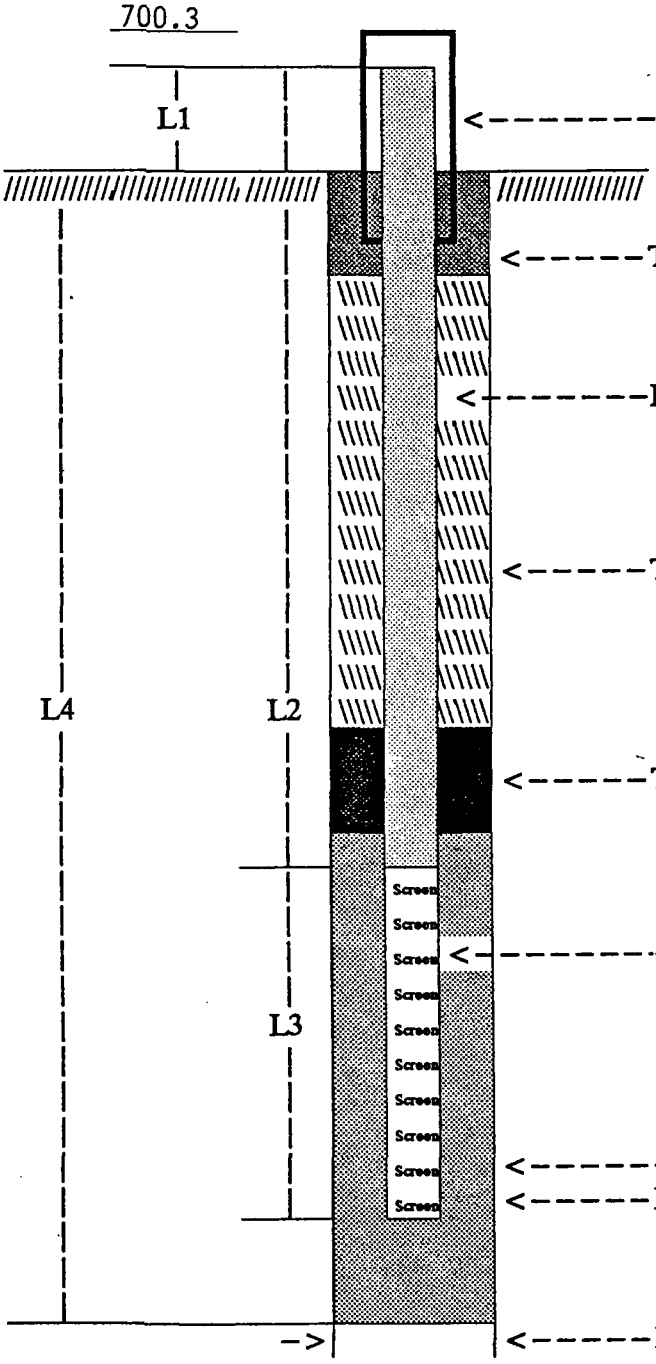
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–10

Ground Surface Elevation 700.3

Top of Riser Pipe Elevation 702.17



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	Sacrete
Length–ft	1–½"
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	15.0
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	10.1
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	18.0
Diameter of Borehole	8" ±

L1= 2.0 Ft
L2= 15.0 Ft
L3= 5.0 Ft
L4= 18.0 Ft

INSTALLATION COMPLETED

Date 8–19–94 Time 10:10 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

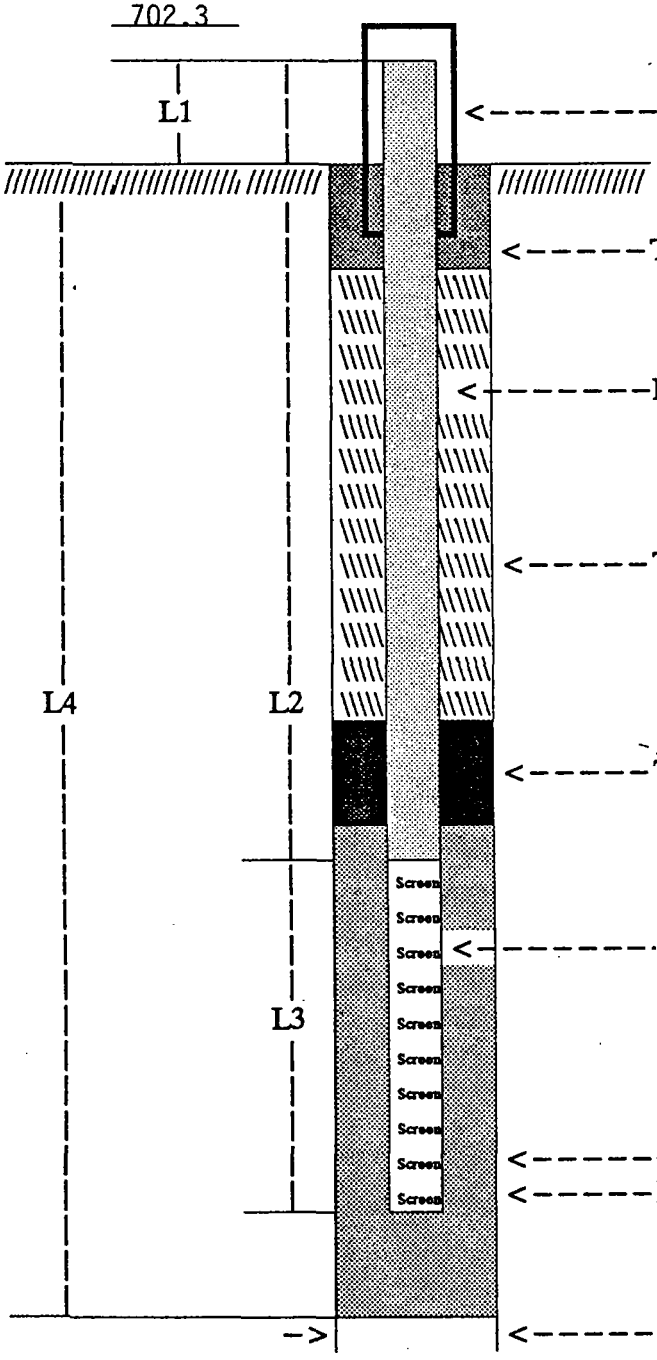
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–11

Ground Surface Elevation 702.3

Top of Riser Pipe Elevation 704.43



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	Sand, gravel, grout
Length–ft	2.0
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	15.0
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	9.8
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	18.0
Diameter of Borehole	8" ±

L1=	2.0	Ft
L2=	15.0	Ft
L3=	5.0	Ft
L4=	20.0	Ft

INSTALLATION COMPLETED

Date 8–22–94 Time 1:40 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

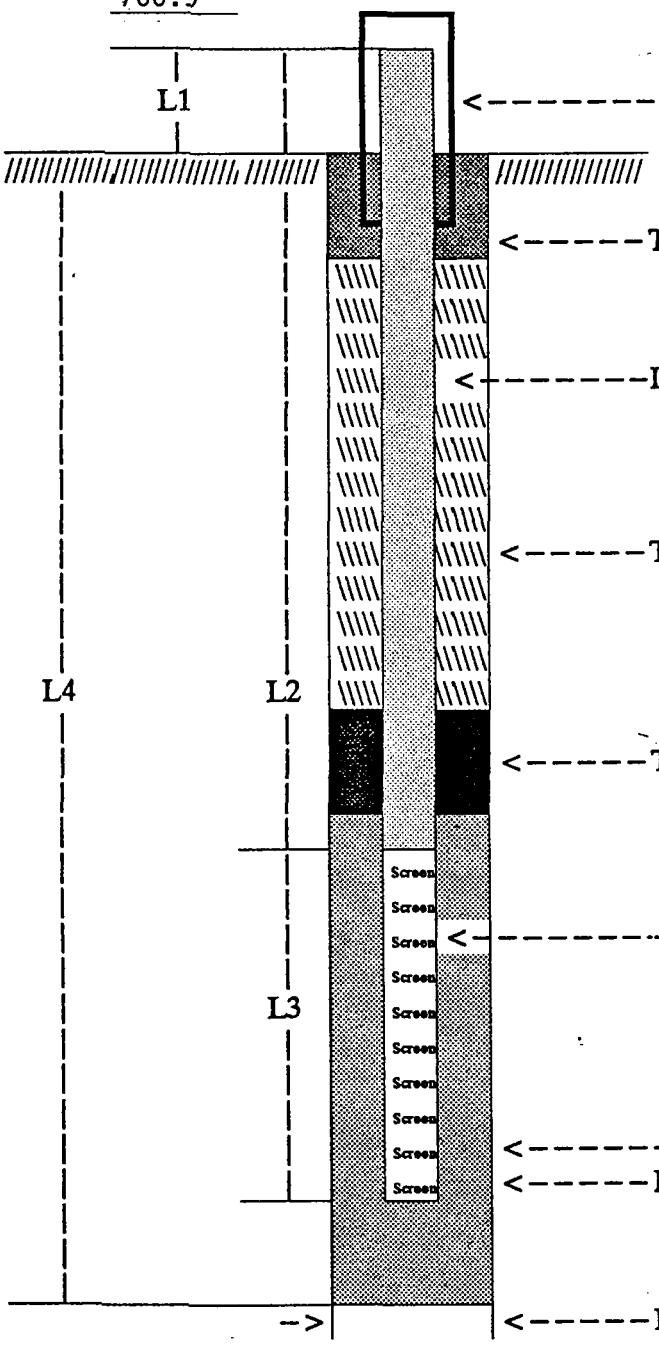
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–12

Ground Surface Elevation 700.9

Top of Riser Pipe Elevation 703.09



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	
Length–ft	
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	15.0
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	10.2
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	10.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	18.0
Diameter of Borehole	8"

L1= 2.0 Ft
L2= 15.0 Ft
L3= 5.0 Ft
L4= 18.0 Ft

INSTALLATION COMPLETED

Date 8–23–94 Time 4:45 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

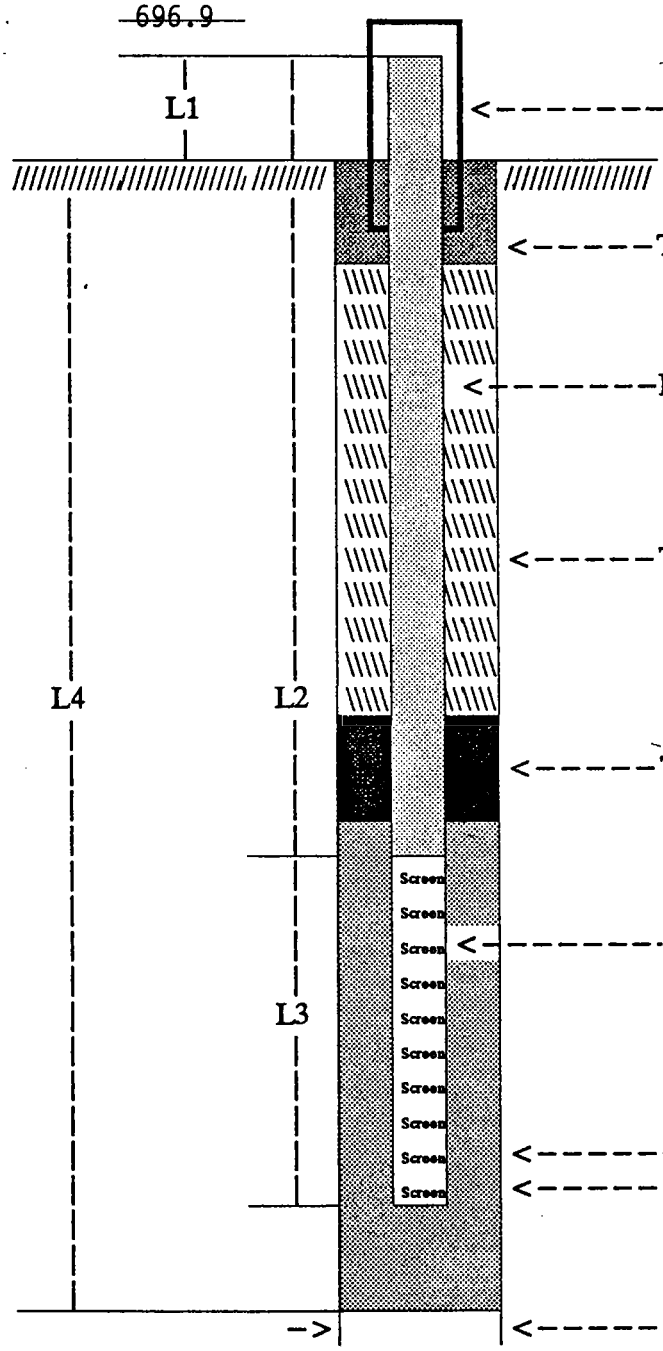
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–13

Ground Surface Elevation ~~696.9~~

Top of Riser Pipe Elevation 699.25



Protective Casing	
Size	4"
Type	Steel
Thickness and Type of Seal	
Type	
Length–ft	
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	14.0
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	9.6
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.0
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	17.0
Diameter of Borehole	8"

L1= 2.0 Ft
L2= 14.0 Ft
L3= 5.0 Ft
L4= 18.0 Ft

INSTALLATION COMPLETED

Date 8–25–94 Time 4:45 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS

Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

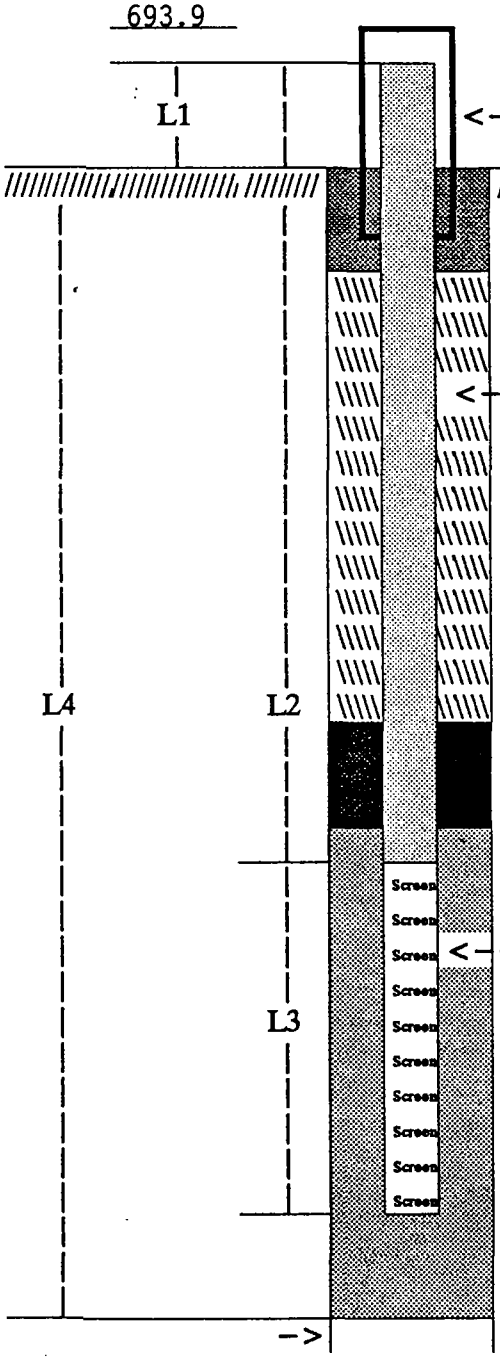
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–14

Ground Surface Elevation 693.9

Top of Riser Pipe Elevation 695.98



Protective Casing	
Size	6"
Type	Steel
Thickness and Type of Seal	
Type	
Length–ft	
Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	2.0
Length–ft	24.3
Type fo Backfill Around Riser	Neat Cement Grout
Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	19.4
Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	5.3
Diameter–in	2.0
Filter Type	45–55 Silica Sand
Depth to Bottom of Screen–ft	27.6
Diameter of Borehole	10" ±

L1= 2.0 Ft
L2= 24.3 Ft
L3= 5.3 Ft
L4= 27.6 Ft

INSTALLATION COMPLETED

Date 8–24–94 Time 3:00 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

Installation of Monitoring Wells

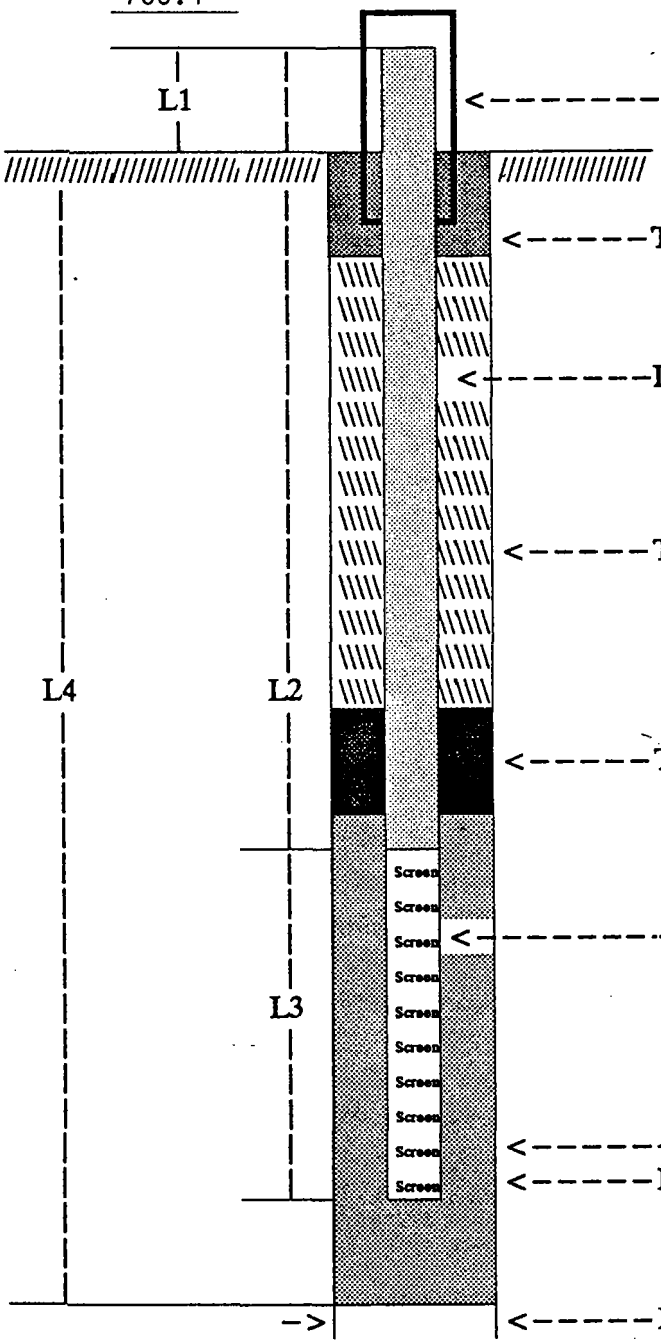
MPCA – PIG'S EYE DUMP

Job No. 4221–94–1052

Well Number MW–15

Ground Surface Elevation 700.4

Top of Riser Pipe Elevation 702.55



<----------Protective Casing	
Size	6"
Type	Steel
<------Thickness and Type of Seal	
Type	Sacrete
Length–ft	3.0
<--------Diameter and type of Riser Pipe	
Type	Stainless Steel
Size–in	4.3
Length–ft	43.5
<------Type fo Backfill Around Riser	Neat Cement Grout
<------Thickness and Type of Seal	
Type	Bentonite Pellets
Length–ft	36.8
<----------Well Screen	
Matl.	Stainless Steel
Slot Size–#	10
Length–ft	10.0
Diameter–in	4.0
<----------Filter Type	45–55 Silica Sand
<------Depth to Bottom of Screen–ft	50.5
<------Diameter of Borehole	10" ±

L1= 2.0 Ft
L2= 43.5 Ft
L3= 10.0 Ft
L4= 52.0 Ft

INSTALLATION COMPLETED

Date 8–26–94 Time 5:45 P.M.

MONITORING WELL WATER LEVEL MEASUREMENTS			
Date	Time	Bailed Depths	Water Level

APPENDIX F

CONTRACT LABORATORY PROGRAM

LABORATORY DATA SUMMARY AND DATA

CONTRACT LABORATORY PROGRAM LABORATORY DATA SUMMARY

1.0 INTRODUCTION

This appendix summarizes the analytical data for samples collected by PRC Environmental Management, Inc. (PRC), for the Minnesota Pollution Control Agency (MPCA) from the Pig's Eye Landfill (Pig's Eye) site in St. Paul, Minnesota. Analyses were conducted by the Quanterra laboratories in Arvada, Colorado, and St. Louis, Missouri. PRC did not perform a complete data validation, but instead reviewed all items likely to cause data rejection, including blank contamination, matrix spike recovery, and calibration response factors. Most checks were performed against reduced data presented in forms generated at the laboratory rather than against raw data.

As discussed below, analytical results are within normal limits, with most exceedances of quality control parameters involving the usual problem targets such as acetone, various phenols, selenium, and thallium. Contract Laboratory Program (CLP) laboratory data tables are organized by analysis and medium and summarize the evaluated results. The sections below discuss the inorganic and organic analysis results and emphasize problems that make data unusable. Performance of a complete data validation would take considerably more time and effort and is very unlikely to reveal significant differences from this evaluation.

2.0 INORGANIC ANALYSIS RESULTS

The results of the inorganic analyses for metals and cyanide are summarized in Table 1 for field blanks, Table 2 for Geoprobe™ groundwater samples, Table 3 for monitoring well groundwater samples, Table 4 for surface water samples, Table 5 for sediment samples, and Table 6 for trench soil samples. The analyses generally yielded acceptable data. Field and laboratory blanks contained some contaminants. In most cases, these contaminants were near the instrument detection limits; therefore, they had no effect on the analysis of associated samples. A few low concentration results were qualified as undetected (flagged "U") because of blank contamination, including the few positive results for copper and vanadium in groundwater and for antimony in

surface water. These samples contained copper, vanadium, and/or antimony at lower concentrations than in the associated field and laboratory blanks.

The equipment blank (EB-1), sampled on August 30, 1994, was reanalyzed by Quanterra due to high levels of target metals reported. An amended report was resubmitted by the laboratory with the reanalysis data for this sample.

For most surface water samples collected on June 9, 1994, the laboratory duplicate results of sample H1800S were poor requiring qualification as estimates (flagged "J") of all positive results for barium, calcium, iron, lead, magnesium, manganese, potassium, sodium, vanadium, zinc, and cyanide. The poor results were caused by different amounts of sediment in the sample and its duplicate.

The only other problem involved matrix spike recovery. A number of analytes, including antimony, arsenic, cyanide, lead, manganese, selenium, and thallium yielded recoveries less than the 75 to 125 percent criterion in one or more matrix spike analyses. Associated sample results are considered estimates and flagged "J" or "UJ." This problem frequently occurs with analyses involving the elements listed above. Thallium recoveries were extremely low in the matrix spikes for groundwater samples B800S and H600N — as low as 9 percent. The U.S. Environmental Protection Agency (EPA) data validation guidelines require that when the matrix spike recovery is less than 30 percent, all associated nondetect results be rejected as unusable for any purposes and flagged "R;" therefore, all thallium results for analyses conducted on samples B800S and H600N and other samples from the same analytical batch were rejected.

Groundwater sample B1800N had a less unsatisfactory matrix spike recovery of thallium (32 percent). In this analytical batch, only 1 of 12 field samples contained any measurable thallium.

3.0 ORGANIC ANALYSIS RESULTS

Organic analyses included two gas chromatography/mass spectroscopy (GC/MS) analyses, one for volatile organic compounds (VOC) and one for semivolatile organic compounds (SVOC); one

pure GC analysis for organochlorine pesticides and polychlorinated biphenyls (PCB). Tables 7, 13, and 19 include all organic analysis results for field blanks; Tables 8, 14, and 20 for Geoprobe™ groundwater samples; Tables 9, 15, and 21 for monitoring well groundwater samples; Tables 10, 16, and 22 for surface water samples; Tables 11, 17, and 23 for sediment samples; and Tables 12, 18, and 24 for trench soil samples.

Trip, field, equipment, and laboratory blanks contained methylene chloride, acetone, 2-butanone, benzene, toluene, diethylphthalate, butylbenzylphthalate and/or bis(2-ethylhexyl)phthalate. With the exception of methylene chloride, acetone, 2-butanone, and the phthalates, results for analytes detected at concentrations of less than five times the maximum concentration in the associated blank were qualified. Concentrations of methylene chloride, acetone, 2-butanone, and the phthalates of less than 10 times the maximum concentration in the associated blank were also qualified. In addition, because methylene chloride, acetone, 2-butanone, and the phthalates are considered common laboratory contaminants, concentrations of these analytes of less than 10 times the contract required quantitation limit (CRQL) were qualified as undetected at estimated detection limits (flagged "UJ"), despite their absence in the associated blanks.

For the VOC, SVOC, pesticide and PCB analyses, associated sample results were qualified as estimated (flagged "J/UJ") as a result of matrix spike recoveries and/or relative percent differences (RPD) outside the specified control limits presented in the CLP Statement Of Work prepared by the EPA and dated March 1990. Because of surrogate recovery problems in the pesticide and PCB analyses, both detected and undetected results for all target analytes were qualified as estimated (flagged "J/UJ") for some samples.

The field duplicate precision for sediment sample L1200S was poor. All results were qualified as estimated (flagged "J/UJ") because of the variation in percent moisture (28 percent to 42 percent). This problem may result from samples that were not representative of each other and/or a problem with the percent moisture determination.

The GC/MS analyses indicate up to 10 VOC and 20 SVOC nontarget compounds called tentatively identified compounds (TIC). To simplify reporting, TICs are grouped into generally similar classes in the tables.

For Pig's Eye Site, the following classes of TICs were identified:

- Artifacts - These TICs include siloxanes derived from the gas chromatography column, aldol condensation products formed in the analytical instrument from ketones, and similar laboratory artifacts. They are not reported in the tables.

- Sulfur - Elemental sulfur (S_8) is often detected, especially in soil samples.

- Hydrocarbons - These TICs include alkanes and alkenes, linear and branched, and nonaromatic cyclic hydrocarbons. They are the major constituents of petroleum products.

- Oxygenated hydrocarbons - These TICs include aldehydes, ethers, and similar compounds. A typical example is 1,1′-oxybisethane, commonly called diethyl ether, an industrial product. Other compounds are natural degradation products of hydrocarbons.

- Cyclic oxygenated hydrocarbons - These TICs include complicated chemical structures such as camphor. These TICs are both intended products and degradation products.

- Polynuclear aromatic hydrocarbons (PAH) - This class extends the target list of PAHs to compounds such as indane. All PAHs are present in soot, coal tar, some petroleum products (especially asphalt), and similar mixtures.

- Alkylaromatic hydrocarbons - These TICs mostly include chemicals such as tetramethylbenzene that are derivatives of target compounds. These compounds are usually present in petroleum products.

- Heterocyclic aromatics - These TICs include at least one noncarbon atom in an aromatic ring, such as trimethylthiazole, which has a sulfur and a nitrogen atom in a five-membered ring. These compounds are generally associated with PAHs.

- Oxygenated aromatics - These TICs include butylphenol, acetophenone, and similar compounds that are intended products, plus some degradation products of aromatic hydrocarbons.

- Halogenated aromatics - A typical example is (2-fluorophenyl)acetone. These TICs are all synthetic products and their degradation products.

- Amines and amides - These TICs include diethyltoluamide, DEET. This class also includes natural products (such as protein), synthetic products, and degradation products.

- Nitriles - These are organic, covalently-bound cyanides such as proprionitrile. All are synthetic products.

- Sulfonamides - Examples include diethylbenzenesulfonamide and the sulfa drugs. All these, too, are synthetic products.

- Phosphoric acid esters - These TICs are synthetic products that include tributyl phosphate, a solvent and plasticizer, and the organophosphate pesticides.

- Miscellaneous - This group includes chemicals that do not fit into any other category and are not known to be particularly toxic. They can be omitted from a risk assessment with negligible loss of information.

- Unknown - These chemicals must be omitted from a quantitative risk assessment. When the analysts do their work well, they are a minor group. Unknowns are a major group in the VOC and SVOC results from the monitoring wells, sediments and trench soils. The reviewer classified many of the unknowns into the classes discussed above.

Some chemicals can fit into several categories. For instance, DEET is an alkylaromatic (a toluene derivative), and an oxygenated aromatic (a benzoic acid derivative), and an amide. The selection of class was based on the functional groups most relevant to biological activity, in most cases, the most unusual or specific group. The "10 times" rule was used to qualify results for TICs also present in the associated trip, field, and/or method blanks.

TABLE 1
METAL ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	RB-1	EB-2	EB-3	EB-1	EB-2
Date Sampled	04/30/94	05/04/94	05/05/94	08/30/94	08/31/94
Aluminum	40.0 U[a]	40.0 U	92.1 U	24.9 U	39.7 J
Antimony	80.0 U	80.0 U	80.0 U	46.2 U	30.5 U
Arsenic	1.0 U	1.0 U	1.0 U	1.7 U	2.3 UJ
Barium	1.0 U	1.0 U	1.0 U	3.5 J	1.3 J
Beryllium	1.0 U	1.0 U	1.0 U	0.29 UJ	0.20 U
Cadmium	3.0 U	3.0 U	3.0 U	3.7 U	2.2 U
Calcium	119.0 J[b]	102.0 J	110.0 J	1,930 J	188 J
Chromium	8.0 U	8.0 U	8.0 U	3.4 U	3.0 U
Cobalt	7.0 U	7.0 U	7.0 U	3.2 U	3.2 U
Copper	5.0 U	6.5 J	5.0 U	137	101 J
Iron	70.0 U	70.0 U	70.0 U	36.1 UJ	141
Lead	1.0 UJ	1.0 UJ	1.0 UJ	5.4	0.70 U
Magnesium	80.0 U	103.0 J	80.0 U	536 J	187 J
Manganese	3.4 J	3.1 J	3.3 J	4.0 J	4.5 J
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	9.0 U	9.0 U	9.0 U	15.5 U	11.9 J
Potassium	579.0 J	628.0 J	400.0 U	2,710 J	2,720 U
Selenium	1.0 UJ	1.0 UJ	1.7 UJ	1.6 U	1.6 U
Silver	5.0 U	5.0 U	5.0 U	3.7 U	3.0 U
Sodium	2,000.0 U	4,230.0 J	2,000.0 U	333 UJ	102 J
Thallium	R[c]	1.0 U	R	2.7 U	2.7 U
Vanadium	5.0 U	5.0 U	5.0 U	4.9 J	6.0 UJ
Zinc	3.0 U	3.0 U	3.0 U	93.8	7.7 J
Cyanide	10.0 U	10.0 U	10.0 U	0.30 UJ	0.30 UJ

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value outside calibration range or outside quality control limits

c R = Nondetected result rejected because matrix spike recovery less than 30 percent

TABLE 2
METAL ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	D3000N	D3600N	H1600S	J1400S	J1400S-D[a]	F1600S	E1200S	D1600S	B2000S
Date Sampled	04/30/94	04/30/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
Aluminum	40.0 U[b]	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Antimony	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U
Arsenic	1.9 J[c]	1.0 U	1.3 J	1.2 J	1.0 J	1.0 U	7.9 J	3.9 J	2.1 J
Barium	383	778	422	318	312	295	41.9 J	591	277
Beryllium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Calcium	169,000	217,000	142,000	151,000	149,000	168,000	63,500	146,000	193,000
Chromium	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U
Cobalt	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	14.4 J	7.0 U
Copper	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iron	19,700	40,100	51,900	43,900	42,600	46,500	20,700	66,600	18,600
Lead	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 UJ	1.0 UJ	1.0 UJ
Magnesium	97,500	54,200	67,500	74,900	73,200	43,400	47,500	44,000	34,400
Manganese	419	497	367	287	286	764	105	206	477
Mercury	0.10 U	0.20	0.10 U	0.10 U	0.10 U	0.10 U	0.16 J	0.10 U	0.10 U
Nickel	9.0 U	9.0 U	10.1 J	18.9 J	18.8 J	9.0 U	12.3 J	251	9.2 J
Potassium	59,000	32,600	39,500	51,600	50,900	21,000	25,100	28,200	20,000
Selenium	5.5 J	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	7.0 J	1.0 UJ	1.0 J
Silver	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Sodium	106,000	54,400	150,000	148,000	149,000	127,000	1,060,000	39,500	32,300
Thallium	R[d]	R	R	R	R	R	R	R	R
Vanadium	5.0 U	5.0 U	5.0 U	5.0 U	6.0 J	5.0 U	5.0 U	5.0 U	5.0 U
Zinc	3.0 U	3.0 U	79.5	115	65.3	103	22.7	92.7	70.5
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0	10.0 U	31.7	10.0 U	10.0 U

Notes:

a Field duplicate
b U = Not detected; number is sample detection limit
c J = Concentration estimated because value outside calibration range or outside quality control limits
d R = Nondetected result rejected because matrix spike recovery less than 30 percent

TABLE 2 (Continued)
METAL ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1600S	B1200S	B800S	B00	B00-D	B400S	C400N	C800N	E00
Date Sampled	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94
Aluminum	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Antimony	80.0 U	80.0 U	80.0 U	88.4	80.0 U	96.3	80.0 U	80.0 U	80.0 U
Arsenic	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3 J	1.0 U	1.0 U	1.0 U
Barium	346	617	424	413	421	822	800	684	559
Beryllium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Calcium	141,000	136,000	208,000	142,000	143,000	165,000	169,000	174,000	130,000
Chromium	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U
Cobalt	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.4 J	7.0 U	8.3 J
Copper	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.4 U	5.0 U	5.4 U
Iron	63,600	73,000	79,000	54,800	53,300	50,000	34,100	35,500	25,500
Lead	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 UJ
Magnesium	50,500	32,200	50,300	70,800	70,000	64,200	93,300	94,300	144,000
Manganese	193	279	670	210	209	208	166	141	142
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	9.0 U	9.0 U	25.4 J	12.8 J	12.7 J	10.4 J	11.6 J	79.5	29.2 J
Potassium	41,900	13,500	25,000	74,000	74,900	63,200	70,000	66,900	271,000
Selenium	1.0 UJ	1.0 UJ	1.0 UJ	5.0 J	5.0 UJ	5.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Silver	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Sodium	52,600	19,500	39,700	268,000	270,000	98,100	199,000	125,000	726,000
Thallium	R	R	R	R	R	R	5.0 UJ	5.0 UJ	5.0 UJ
Vanadium	5.0 U	5.0 U	5.0 U	6.2 J	5.0 U	5.0 U	5.2 J	8.2 J	5.3 J
Zinc	111	52.2	43.7	16.1 J	12.7 J	284	14.9 J	17.2 J	11.8 J
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

TABLE 2 (Continued)
METAL ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1000N	B2600N	C2200N	B1400N	B1800N	B1800N-D	E600S	E600N	H600N
Date Sampled	05/04/94	05/04/94	05/04/94	05/04/94	05/04/94	05/04/94	05/03/94	05/03/94	05/04/94
Aluminum	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Antimony	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	83.0	80.0 U	93.9	80.0 U
Arsenic	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.8 J
Barium	1,100	363	606	574	490	481	570	358	1,530
Beryllium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Calcium	266,000	204,000	138,000	159,000	238,000	233,000	214,000	399,000	217,000
Chromium	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U
Cobalt	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.2 J	7.0 U	8.3 J	7.0 U
Copper	5.8 U	5.0 U	5.1 U	5.0 U	5.3 U	5.3 U	5.0 U	5.0 U	5.0 U
Iron	44,300	24,200	32,200	32,600	25,200	24,800	58,300	8,610	34,600
Lead	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Magnesium	89,000	69,300	99,700	66,200	107,000	100,000	68,300	88,000	83,500
Manganese	1,580	395	91.6	529	369	363	448	1,690	887
Mercury	0.14 J	0.39	0.10 U	0.20	0.10 U	0.10 U	0.10 U	0.10 U	0.11 J
Nickel	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.9 J
Potassium	51,000	32,500	90,600	28,800	47,700	46,200	42,200	59,500	105,000
Selenium	5.0 UJ	5.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	5.0 UJ	1.0 UJ
Silver	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Sodium	35,400	54,300	109,000	60,600	88,500	87,200	69,600	180,000	23,000
Thallium	5.0 UJ	5.0 UJ	5.0 UJ	10.5 J	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	R
Vanadium	10.6 J	8.7 J	8.1 J	7.8 J	7.1 J	9.3 J	6.4 J	6.1 J	5.0 U
Zinc	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	29.2	3.0 U	3.0 U
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

TABLE 2 (Continued)
METAL ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	J1200N	J2400N	F1600N	F3600N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94	04/28/94	04/28/94
Aluminum	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Antimony	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U
Arsenic	1.2 J	1.5 J	2.1 J	1.0 UJ	1.2 J	3.6 J	1.7 J	1.3 J	1.2 J
Barium	242	323	898	312	749	890	326	676	488
Beryllium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Calcium	249,000	128,000	115,000	345,000	64,100	121,000	138,000	144,000	146,000
Chromium	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U
Cobalt	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U	11.8 J
Copper	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iron	57,200	64,700	53,200	5,450	8,870	29,900	15,500	43,500	28,600
Lead	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 U	1.0 U
Magnesium	51,100	31,700	126,000	51,100	181,000	176,000	196,000	107,000	110,000
Manganese	3130	1660	160	1630	103	98.8	223	162	204
Mercury	0.10 J	0.15 J	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	9.0 U	9.0 U	9.2 J	9.0 U	9.0 U	9.0 U	9.9 J	11.0 J	9.0 U
Potassium	51,000	40,900	122,000	80,300	197,000	118,000	139,000	103,000	109,000
Selenium	10.0 UJ	1.0 UJ	10.0 UJ	1.0 UJ	1.0 UJ	10.0 UJ	1.0 UJ	10.0 UJ	10.0 UJ
Silver	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Sodium	147,000	58,100	715,000	29,000	178,000	167,000	289,000	156,000	125,000
Thallium	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	1.0 UJ	10.0 UJ	1.0 UJ
Vanadium	5.2 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Zinc	6.0 J	3.5 J	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	112	3.0 U
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

TABLE 2 (Continued)
METAL ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	E2600N	F3000N	F3000N-D	F2200N	H2800N	J600S	I00
Date Sampled	04/29/94	04/29/94	04/29/94	05/05/94	05/05/94	05/05/94	05/05/94
Aluminum	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	163 U
Antimony	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U
Arsenic	1.3 J	2.1 J	1.8 J	1.6 J	1.4 J	1.0 U	1.0 J
Barium	792	1,310	1,290	1,050	411	332	560
Beryllium	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Calcium	227,000	161,000	161,000	130,000	169,000	228,000	308,000
Chromium	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U
Cobalt	7.0 U	36.0 J	32.0 J	7.0 U	7.0 U	7.0 U	7.0 U
Copper	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iron	26,600	68,500	70,400	26,800	35,400	102,000	146,000
Lead	1.0 UJ	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Magnesium	164,000	73,100	74,900	161,000	120,000	36,700	142,000
Manganese	304	283	294	75	189	516	519
Mercury	6.4	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.20
Nickel	16.8 J	47.8	40.6	24.3 J	9.0 U	12.9 J	49.9
Potassium	160,000	96,500	97,500	203,000	87,000	66,900	62,400
Selenium	10.0 UJ	10.0 UJ	10.0 UJ	1.0 UJ	1.9 UJ	1.0 UJ	2.0 UJ
Silver	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 J
Sodium	360,000	138,000	139,000	816,000	241,000	102,000	165,000
Thallium	1.0 UJ	10.0 UJ	10.0 UJ	R	R	R	R
Vanadium	6.2 UJ	7.5 UJ	5.0 U	5.0 U	5.0 U	5.8 J	5.0 U
Zinc	3.0 U	6.3 J	13.4 J	3.0 U	3.0 U	45.2	196
Cyanide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U

TABLE 3
METAL ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-4	MW-5	MW-6	MW-7	MW-8	MW-10	MW-7DUP[a]	MW-11	MW-13
Date Sampled	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/31/94	08/31/94
Aluminum	34.5 U[b]	105 UJ	34.5 U	34.5 U	34.5 U	34.5 U	34.5 U	34.5 U	374 U
Antimony	39.5 J[c]	30.5 U	30.5 U	30.5 U	30.5 U	30.5 U	49.6 J	30.5 U	30.5 U
Arsenic	5.0 UJ	3.0 UJ	6.0 UJ	1.7 U	1.8 UJ	5.0 UJ	1.7 U	1.9 UJ	1.7 U
Barium	613	152	702	451	421	395	452	750	522
Beryllium	0.56 UJ	0.42 UJ	0.53 UJ	0.20 U	0.20 U	0.42 UJ	0.20 U	0.42 UJ	0.41 UJ
Cadmium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Calcium	332,000	88,700	129,000	156,000	153,000	221,000	156,000	192,000	151,000
Chromium	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.3 J
Cobalt	9.3 J	3.2 U	10.1 J	5.2 J	4.2 J	3.2 U	4.4 J	3.6 J	9.6 J
Copper	11.8 UJ	19.9 UJ	13.4 UJ	2.1 UJ	2.1 UJ	12.3 UJ	2.1 UJ	12.2 UJ	44.6 UJ
Iron	1,730	1,350	18,400	116 UJ	472	9,850	131 UJ	13,400	42,900
Lead	0.70 U	0.70 U	0.70 U	1.6 UJ	0.70 U	3.7 UJ	0.70 U	0.70 U	0.70 U
Magnesium	96,600	259,000	156,000	161,000	128,000	118,000	162,000	71,400	51,800
Manganese	1,930 J	150 J	538 J	270 J	694 J	988 J	265 J	1,830 J	2,110 J
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	13.7 UJ	11.4 U	17.0 UJ	11.4 U	11.4 U	11.4 U	11.4 U	11.4 U	35.1 UJ
Potassium	65,900	154,000	129,000	97,800	95,400	74,300	96,800	38,300	39,900
Selenium	23.9	4.4 J	2.8 J	25.4	23.2	7.1	24.4	13.6	2.2 J
Silver	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Sodium	88,400 J	283,000 J	180,000 J	159,000 J	138,000 J	103,000 J	161,000 J	63,900 J	64,300 J
Thallium	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Vanadium	22.3 UJ	19.2 UJ U	21.7 UJ	5.6 UJ	5.9 UJ	22.9 UJ	6.6 UJ	19.1 UJ	21.6 UJ
Zinc	7.6 UJ	527 J	37.4 UJ	47.0 UJ	54.0 UJ	81.8 UJ	5.2 UJ	3.8 UJ	886
Cyanide	0.30 UJ	0.30 UJ	1.5 UJ	16.3 J	1.6 UJ	5.3 J	1.9 UJ	0.30 UJ	2.9 UJ

Notes:

a Field duplicate
b U = Not detected; number is sample detection limit
c J = Concentration estimated because value outside calibration range or outside quality control limits

TABLE 3 (Continued)
METAL ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-12	MW-1	MW-2	MW-14	MW-14DUP	MW-15	MW-9
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
Aluminum	62.5 UJ	34.5 U	34.5 U	34.5 U	34.5 U	60.9 UJ	36.8 UJ
Antimony	30.5 U	32.4 J	30.5 U	30.5 U	30.5 U	30.5 U	30.5 U
Arsenic	2.3 UJ	4.2 UJ	9.4 UJ	1.7 U	1.7 U	2.9 UJ	1.7 U
Barium	460	267	519	130 J	130 J	8.3 UJ	683
Beryllium	0.41 UJ	0.43 UJ	0.42 UJ	0.27 UJ	0.20 U	0.20 U	0.69 UJ
Cadmium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Calcium	168,000	481,000	360,000	79,300	77,900	27,500	240,000
Chromium	8.8 J	3.0 U	3.0 U	3.0 U	3.0 U	4.8 J	5.3 J
Cobalt	4.1 J	3.2 U	6.1 J	3.2 U	3.2 U	3.2 U	6.0 J
Copper	21.6 UJ	18.2 UJ	17.6 UJ	12.2 UJ	9.9 UJ	12.1 UJ	21.4 UJ
Iron	28,300	6,570	28,200	596	600	28.5 UJ	69,600
Lead	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
Magnesium	72,800	231,000	123,000	29,200	28,400	3200 J	203,000
Manganese	349 J	621 J	3,820 J	348 J	356 J	29.0 J	787 J
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	11.4 U	16.4 UJ	25.0 UJ	11.4 U	11.4 U	136	16.0 UJ
Potassium	68,700	77,100	3,780 UJ	2,720 U	2,940 UJ	5,080 UJ	90,100
Selenium	1.6 U	22.7	18.5	1.6 U	1.6 U	1.6 U	1.6 U
Silver	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Sodium	88,200 J	191,000 J	174,000 J	9,690 J	9,310 J	15,000 J	143,000 J
Thallium	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	5.5 J	2.7 U
Vanadium	23.8 UJ	28.0 UJ	29.3 UJ	15.3 UJ	15.8 UJ	16.7 UJ	31.3 J
Zinc	228 UJ	60.2 UJ	12.9 UJ	3.8 UJ	5.7 UJ	100 UJ	60.6 UJ
Cyanide	1.5 UJ	0.30 UJ	60.5 J	0.30 UJ	0.30 UJ	4.7 J	0.30 UJ

TABLE 4
METAL ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	K600N	I00	I00-D[a]	K600N	E1600S	A1000S	H1800S
Date Sampled	05/05/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
Aluminum	461	132 J[b]	144 J	55.7 J	7,520	169 J	439
Antimony	80.0 U[c]	10.4 U	10.4 U	10.4 U	60.1 U	11.7 U	10.4 U
Arsenic	1.0 U	2.2 J	2.2 J	2.0 J	16.7	13.2	2.2 J
Barium	194. J	112 J	119 J	108 J	2,300 J	238 J	123 J
Beryllium	1.0 U	1.2 J	1.1 U	1.1 U	2.4 J	1.2 J	1.1 U
Cadmium	3.0 U	4.8 U	4.8 U	4.8 U	52.6	4.8 U	4.8 U
Calcium	69,900	52,800 J	53,800 J	30,800 J	290,000 J	133,000 J	55,300 J
Chromium	8.0 U	2.4 U	2.4 U	2.4 U	35.6	2.4 U	2.4 U
Cobalt	7.0 U	3.7 U	3.7 U	3.7 U	22.0 J	4.9 J	3.7 U
Copper	13.9 J	2.5 U	2.5 U	2.5 U	997	10.7 U	7.4 U
Iron	2,720	6,370 J	7,300 J	2,990 J	260,000 J	11,600 J	5,020 J
Lead	14.1	3.1 J	3.0 J	1.2 J	36.2 J	5.4 J	10.2 J
Magnesium	34,300	24,400 J	25,700 J	40,600 J	52,100 J	42,500 J	24,100 J
Manganese	141	266 J	254 J	61.5 J	2,710 J	1,340 J	326 J
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.16 J	0.10 U	0.10 U
Nickel	10.0 J	6.1 U	6.1 U	6.1 U	256	6.1 U	6.1 U
Potassium	30,000	9,000 J	10,500 J	37,300 J	18,100 J	87,500 J	8,390 J
Selenium	2.0 J	2.1 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Silver	5.0 U	6.0 U	2.5 U	3.5 U	2.7 U	2.5 U	2.5 U
Sodium	50,300	63,500 J	62,800 J	72,200 J	30,400 J	190,000 J	67,200 J
Thallium	1.0 U	5.0 UJ	5.0 UJ	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ
Vanadium	5.0 U	2.0 U	2.0 U	2.0 U	69.3	2.0 U	2.0 U
Zinc	39.0	16.6 U	23.5 U	4.3 U	9,710 J	96.2 U	58.2 U
Cyanide	10.0 U	13.0 J	10.0 U	10.0 U	10.0 U	37.0 J	26.4 J

Notes:

a Field duplicate
b J = Concentration estimated because value outside calibration range or outside quality control limits
c U = Not detected; number is sample detection limit

TABLE 5
METAL ANALYTICAL RESULTS FOR SEDIMENT
(All results in milligrams per kilogram)

Sample No.	F1400S	K600N	I00	L1200S	L1200S-D[a]	J1400S
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
Aluminum	14,300	13,400	7,400	4,830	4,470	14,700
Antimony	65.6 UJ[b]	36.4 UJ	24.8 UJ	22.2 UJ	21.0 UJ	41.3 UJ
Arsenic	11.5	11.8	3.4	3.6	2.7 J	6.2
Barium	764	575	143	78.8	75.3	204
Beryllium	1.5 J	0.65 J	0.42 J	0.32 J	0.30 J	0.77 J
Cadmium	13.7	16.7	3.5	2.6	3.3	4.2
Calcium	80,600	61,900	22,600	14,200	13,100	23,100
Chromium	65.2	329	76.2	42.3	51.2	59.3
Cobalt	16.8 J	13.7 J	7.5 J	4.9 J	4.7 J	14.1 J
Copper	189	525	104	56.6	60.5	86.4
Iron	194,000	27,500	15,200	14,500	12,300	37,300
Lead	176	463	60.6	51.0	37.6	113
Magnesium	15,500	9,410	6,540	4,990	4,140	10,700
Manganese	2,260	724	449	407	335	1,300
Mercury	0.84	0.18 J	0.08 U	0.08 U	0.07 U	0.14 U
Nickel	54.9	90.3	34.3	25.2 U	23.8 U	46.8 U
Potassium	2,260 J	1,700 J	897 J	564 J	545 J	1,500 J
Selenium	1.6 J	0.46 UJ	0.31 UJ	0.31 UJ	0.29 UJ	0.58 UJ
Silver	4.1 U	20.9	4.8	2.8 J	2.3 J	2.8 U
Sodium	2,970 J	911 U	836 J	1,150 J	705 J	1,090 U
Thallium	R[c]	R	R	R	R	R
Vanadium	59.9	30.1	27.8	19.9	18.0	56.3
Zinc	1,130	1,220	261	161	143	336
Cyanide	2.0 U	1.1 U	0.78 U	0.78 U	0.73 U	1.4 U
Percent Solids	24.4	43.9	64.4	64.3	68.1	34.6

Notes:

a Field duplicate

b U = Not detected; number is sample detection limit; J = Concentration estimated because value outside calibration range or outside quality control limits

c R = Nondetected result rejected because matrix spike recovery less than 30 percent

TABLE 5 (Continued)
METAL ANALYTICAL RESULTS FOR SEDIMENT
(All results in milligrams per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
Aluminum	18,500	22,800	18,900
Antimony	35.3 U[a]	51.9 J[b]	21.0 J
Arsenic	12.6	14.4	8.9
Barium	895	1,040	728
Beryllium	1.4 UJ	1.2 UJ	1.1 UJ
Cadmium	43.7 J	43.2 J	77.6 J
Calcium	106,000	107,000	118,000
Chromium	479	532	832
Cobalt	19.2 J	19.0 J	56.8
Copper	942	1,070	1,430
Iron	48,700	40,000	32,300
Lead	704 J	861 J	596 J
Magnesium	12,700	14,500	9,340
Manganese	1,160	971	696
Mercury	0.36 J	0.32 J	0.78 J
Nickel	200	180	255
Potassium	5,450 J	4510	2,970
Selenium	5.7 UJ	3.6 UJ	2.6 UJ
Silver	37.7	43.6	45.2
Sodium	1,940 J	1,710 J	1,100 J
Thallium	3.1 U	2.4 U	1.6 U
Vanadium	49.1 J	58.3	40.8
Zinc	1,850	2140	2,030
Cyanide	0.72 J	0.13 U	0.36 J
Percent Solids	17.3	22.8	34.7

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value outside calibration range or outside quality control limits

TABLE 6
METAL ANALYTICAL RESULTS FOR TRENCH SOIL
(All results in milligrams per kilogram)

Sample No.	T2-1	T2-1D[a]	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
Aluminum	6,540	5,340	17,000
Antimony	13.5 UJ[b]	12.3 UJ	17.0 UJ
Arsenic	4.7	2.4 J	2.7
Barium	112	99.2	520
Beryllium	0.50 UJ	0.43 UJ	0.89 UJ
Cadmium	2.3 UJ	2.4 UJ	25.4 J
Calcium	14,900	31,300	100,000
Chromium	39.1	55.9	816
Cobalt	7.0 J	5.7 J	11.1 J
Copper	422	146	764
Iron	18,200	32,000	37,900
Lead	81.4 J	100 J	506 J
Magnesium	5,130	12,600	8,150
Manganese	415 J	565 J	498 J
Mercury	0.34 J	0.36 J	0.22 J
Nickel	33.9 J	62.3 J	215 J
Potassium	1,060 UJ	1,030 UJ	804 UJ
Selenium	0.82 J	0.53 U	1.8
Silver	9.8 J	30.3 J	26.5 J
Sodium	343 J	400 J	646 J
Thallium	0.78 U	0.83 U	0.81 U
Vanadium	21.6	20.9	32.2
Zinc	393	321	1410
Cyanide	0.31 UJ	0.17 UJ	0.32 UJ
Percent Solids	80.0	75.0	76.7

Notes:

a Field duplicate

b U = Not detected; number is sample detection limit; J = Concentration estimated because value outside calibration range or outside quality control limits

TABLE 7
VOC ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	TB-1	TB-2	TB-3	TB-4	RB-1	TB-6	TB-7
Date Sampled	04/27/94	04/27/94	04/27/94	04/29/94	04/30/94	04/30/94	05/02/94
Chloromethane	10 U[a]	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 UJ	10 U	10 U	10 UJ	13 UJ	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 7 (Continued)
VOC ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	TB-1	TB-2	TB-3	TB-4	RB-1	TB-6	TB-7
Date Sampled	04/27/94	04/27/94	04/27/94	04/29/94	04/30/94	04/30/94	05/02/94
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	2 J	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (Total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 7 (Continued)
VOC ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	EB-2	TB-13	TB-16	EB-3	TB-17	TB-2	TB-3
Date Sampled	05/04/94	05/03/94	05/05/94	05/05/94	05/05/94	06/09/94	06/09/94
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	13 UJ	10 U	10 U	10 U	10 U	10 UJ	10 U
Carbon disulfide	10 U	10 U	5 U	5 U	5 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	5 U	5 U	5 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	5 U	5 U	5 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	5 U	5 U	5 U	10 U	10 U
Chloroform	10 U	10 U	5 U	5 U	5 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	5 U	5 U	5 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	5 U	5 U	5 U	10 U	10 U
Bromodichloromethane	10 U	10 U	5 U	5 U	5 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	5 U	5 U	5 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	5 U	5 U	5 U	10 U	10 U
Trichloroethene	10 U	10 U	5 U	5 U	5 U	10 U	10 U
Benzene	10 U	10 U	5 U	5 U	5 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	5 U	5 U	5 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	5 U	5 U	5 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	5 U	5 U	5 U	10 U	10 U
Bromoform	10 U	10 U	5 U	5 U	5 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	5 U	5 U	5 U	10 U	10 U

TABLE 7 (Continued)
VOC ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	TB-7	TB-1	EB-1	EB-2
Date Sampled	08/31/94	10/13/94	08/30/94	08/30/94
Tetrachloroethene	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	9 J
Chlorobenzene	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U
Xylenes (Total)	10 U	10 U	10 U	10 U

TABLE 8
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	I1200N	J2400N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94
Chloromethane	10 U[a]	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 UJ	75 UJ	32 UJ	32 UJ	20 UJ	19 UJ	23 UJ
Carbon disulfide	10 U	10 U	2 J[b]	10 U	10 U	10 U	1 J
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	22	2 J	3 J	7 J	2 J
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	I1200N	J2400N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 UJ	10 U	2 J	10 U	1 J	10 U	10 U
Chlorobenzene	10 U	10 U	27	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	7 J	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (Total)	10 U	10 U	46	10 U	10 U	10 U	10 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1600N	D1400N	F3600N	E2600N	F3000N	F3000N-DUP	D3000N
Date Sampled	04/28/94	04/28/94	04/29/94	04/29/94	04/29/94	04/29/94	04/30/94
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Acetone	10 U	41 UJ	10 UJ	29 UJ	77 UJ	28 UJ	20 UJ
Carbon disulfide	10 U	1 J	2 J	3 J	2 J	2 J	3 J
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	27 UJ	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10	2 J	14	6 J	12	12	8 J
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1600N	D1400N	F3600N	E2600N	F3000N	F3000N-DUP	D3000N
Date Sampled	04/28/94	04/28/94	04/29/94	04/29/94	04/29/94	04/29/94	04/30/94
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	1 J	10 U	2 J	16	21	10 UJ
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	44	55	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	10	14	10 U
Xylenes (Total)	10 U	10 U	12	28	240	300	35

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	D3600N	H1600S	J1400S	J1400S-DUP	F1600S	E1200S	D1600S
Date Sampled	04/30/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
Chloromethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Methylene chloride	10 UJ	10 UJ	10 U	10 U	10 U	12 UJ	10 U
Acetone	15 UJ	26 UJ	23 UJ	19 UJ	20 UJ	12 U	17 UJ
Carbon disulfide	1 J	10 U	10 U	10 U	10 U	12 U	2 J
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	12 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	12 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	12 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Benzene	6 J	6 J	9 J	11	1 J	12 UJ	13
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	12 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	12 U	10 U
4-Methyl-2-pentanone	10 U	10 U	7 J	10 U	10 U	12 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	D3600N	H1600S	J1400S	J1400S-DUP	F1600S	E1200S	D1600S
Date Sampled	04/30/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	12 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Toluene	10 U	10 UJ	10 U	10 U	10 U	12 UJ	10 UJ
Chlorobenzene	15	10 U	10 U	4 J	10 U	11 J	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	73	7 J
Styrene	10 U	10 U	10 U	10 U	10 U	12 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	10 U	12 U	10 U
Xylenes (Total)	10 U	10 U	10 U	10 U	10 U	299 J	5 J

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B2000S	B1600S	B1200S	B800S	B00	B00-DUP	B400S
Date Sampled	05/02/94	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/94
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	20	10 U	10 U	10 U
Methylene chloride	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	15 UJ	14 UJ	12 UJ	17 UJ	15 UJ	10 U	16 UJ
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	2 J	10 U
1,1-Dichloroethene	9 J	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	27	23	38	10	11	18
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B2000S	B1600S	B1200S	B800S	B00	B00-DUP	B400S
Date Sampled	05/02/94	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/04
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U
Chlorobenzene	10 U	12	10 U	10 UJ	51	54	10 U
Ethylbenzene	10 U	50	10 U	10	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (Total)	10 U	35	10 U	79	10 U	10 U	10 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	C400N	C800N	E00	F1000N	B2600N	C2200N	B1400N
Date Sampled	05/03/94	05/03/94	05/03/94	05/04/94	05/04/94	05/04/94	05/04/94
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	31 UJ	10 UJ	10 U	10 UJ	10 U	10 U
Acetone	20 UJ	32 UJ	10 U	15 UJ	10 U	17 UJ	20 UJ
Carbon disulfide	1 J	2 J	10 U	10 U	10 U	1 J	1 J
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	4 J	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	4 J	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	11	2 J	10 U	10 U	10 U	10 U
Benzene	8 J	12	10 UJ	16	10 UJ	8 J	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	C400N	C800N	E00	F1000N	B2600N	C2200N	B1400N
Date Sampled	05/03/94	05/03/94	05/03/94	05/04/94	05/04/94	05/04/94	05/04/94
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	43	6 J	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	2 J	10 U	3 J	4 J	10 U
Ethylbenzene	10 U	3 J	16	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	12	7 J	10 U	10 U	10 U	10 U
Xylenes (Total)	10 U	15	32	10 U	10 U	19	10 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1800N	B1800N-DUP	E600S	E600N	H600N	F2200N	H2800N
Date Sampled	05/04/94	05/04/94	05/03/94	05/03/94	05/04/94	05/05/94	05/05/94
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	2 J
Methylene chloride	10 U	10 UJ	10 UJ	10 UJ	14 UJ	10 UJ	10 UJ
Acetone	27 UJ	10 U	10 UJ	10 U	10 U	52 UJ	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	1 J	2 J	5 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	5 U	5 U	5 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	5 U	5 U	5 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Chloroform	10 U	10 U	10 U	10 U	5 U	5 U	5 U
2-Butanone	10 U	10 U	10 U	10 U	5 U	77 UJ	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Bromodichloromethane	10 U	10 U	10 U	10 U	5 U	5 U	5 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Trichloroethene	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Benzene	10 U	10 U	10 UJ	10 UJ	5	10	11
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	5 U	5 U	5 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Bromoform	10 U	10 U	10 U	10 U	5 U	5 U	5 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	14	2 J
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	5 U	5 U	5 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1800N	B1800N-DUP	E600S	E600N	H600N	F2200N	H2800N
Date Sampled	05/04/94	05/04/94	05/03/94	05/03/94	05/04/94	05/05/94	05/05/94
Tetrachloroethene	10 U	10 U	10 U	10 U	5 U	5 U	5 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	3 J
Toluene	10 U	10 U	10 U	10 U	1 J	6	5 U
Chlorobenzene	10 U	10 U	3 J	1 J	5 U	5 U	4 J
Ethylbenzene	10 U	10 U	10 U	10 U	5 U	8	5 U
Styrene	10 U	10 U	10 U	10 U	5 U	5 U	5 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	5 U	5 U	5 U
Xylenes (Total)	10 U	10 U	8 J	1 J	21	54	69

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	J600S	I00
Date Sampled	05/05/94	05/05/94
Chloromethane	10 U	10 U
Bromomethane	10 U	10 U
Vinyl chloride	10 U	10 U
Chloroethane	2 J	2 J
Methylene chloride	10 UJ	10 UJ
Acetone	51 UJ	40 UJ
Carbon disulfide	5 U	5 U
1,1-Dichloroethene	5 U	5 U
1,1-Dichloroethane	5 U	5 U
1,2-Dichloroethane	5 U	5 U
Chloroform	5 U	5 U
2-Butanone	14 UJ	10 U
1,1,1-Trichloroethane	5 U	5 U
Carbon tetrachloride	5 U	5 U
Bromodichloromethane	5 U	5 U
1,2-Dichloropropane	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U
Trichloroethene	5 U	5 U
Benzene	21	60
trans-1,3-Dichloropropene	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U
Chlorodibromomethane	5 U	5 U
Bromoform	5 U	5 U
4-Methyl-2-pentanone	10 U	3 J
1,1,2,2-Tetrachloroethane	5 U	5 U

TABLE 8 (Continued)
VOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	J600S	I00
Date Sampled	05/05/94	05/05/94
Tetrachloroethene	5 U	5 U
2-Hexanone	10 U	10 U
Toluene	15	7
Chlorobenzene	1 J	2 J
Ethylbenzene	18	31
Styrene	5 U	5 U
1,2-Dichloroethene (Total)	5 U	5 U
Xylenes (Total)	106	168

TABLE 9
VOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-4	MW-5	MW-6	MW-7	MW-8	MW-10	MW-7DUP
Date Sampled	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94
Chloromethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Chloroethane	5 J	10 U	10 U	10 U	50 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Acetone	45 UJ	10 UJ	45 UJ	24 UJ	410 UJ	15 UJ	16 UJ
Carbon disulfide	10 U	10 U	10 U	10 U	50 U	2 J	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	50 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	50 U	10 U	10 U
2-Butanone	11 UJ	12 UJ	10 U	10 UJ	50 U	10 UJ	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Benzene	11	10 U	20	8 J	15 J	7 J	7 J
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	50 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	50 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	50 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	50 U	10 U	10 U

TABLE 9 (Continued)
VOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-4	MW-5	MW-6	MW-7	MW-8	MW-10	MW-7DUP
Date Sampled	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94
Tetrachloroethene	10 U	10 U	10 U	10 U	50 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Toluene	10 U	10 U	10 UJ	10 U	50 U	10 U	10 U
Chlorobenzene	3 J	10 U	26	15	16 J	2 J	17
Ethylbenzene	10 U	10 U	8 J	10 U	5 J	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	50 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	50 U	10 U	10 U
Xylenes (Total)	1 J	10 U	24	4 J	120	3 J	3 J

TABLE 9 (Continued)
VOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-11	MW-13	MW-12	MW-1	MW-2	MW-14	MW-14DUP
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	5 J	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 UJ	10 UJ	10 UJ	16 UJ	16 UJ	10 U	15 UJ
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	1 J
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	15	10	53	5 J	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	2 J	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 9 (Continued)
VOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-11	MW-13	MW-12	MW-1	MW-2	MW-14	MW-14DUP
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	54	3 J	5 J	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (Total)	10 U	2 J	1 J	6 J	10 U	10 U	10 U

TABLE 9 (Continued)
VOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-15	MW-9
Date Sampled	08/31/94	08/31/94
Chloromethane	10 U	10 U
Bromomethane	10 U	10 U
Vinyl chloride	10 U	10 U
Chloroethane	10 U	3 J
Methylene chloride	10 U	10 U
Acetone	10 UJ	11 UJ
Carbon disulfide	10 UJ	10 U
1,1-Dichloroethene	10 U	10 U
1,1-Dichloroethane	10 U	10 U
1,2-Dichloroethane	10 U	10 U
Chloroform	16	10 U
2-Butanone	10 UJ	10 U
1,1,1-Trichloroethane	10 U	10 U
Carbon tetrachloride	10 U	10 U
Bromodichloromethane	2 J	10 U
1,2-Dichloropropane	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U
Trichloroethene	10 U	10 U
Benzene	10 U	25
trans-1,3-Dichloropropene	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U
Chlorodibromomethane	10 U	10 U
Bromoform	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U

TABLE 9 (Continued)
VOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-15	MW-9
Date Sampled	08/31/94	08/31/94
Tetrachloroethene	10 U	10 U
2-Hexanone	10 U	10 U
Toluene	10 UJ	10 UJ
Chlorobenzene	10 U	1 J
Ethylbenzene	10 U	1 J
Styrene	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U
Xylenes (Total)	10 U	45

TABLE 10
VOC ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	I00	I00-DUP	K600W	E1600S	A1000S	H1800S
Date Sampled	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
Chloromethane	10 U[a]	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U
Acetone	10 UJ	22 UJ	10 UJ	13 UJ	10 UJ	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	1 J[b]	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 UJ	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	1 J	10 U	5 J	10 U	4 J
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U
Chlorodibromomethane	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 10 (Continued)
VOC ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	I00	I00-DUP	K600W	E1600S	A1000S	H1800S
Date Sampled	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 UJ	10 U	10 UJ	10 UJ	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	2 J	10 U	2 J
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	1 J	1 J	10 U	10 U	10 U	10 U
1,2-Dichloroethene (Total)	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes (Total)	10 U	10 U	10 U	3 J	10 U	10 U

TABLE 11
VOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	F1400S	K600N	I00	L1200S	L1200S-DUP	J1400S
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
Chloromethane	5 J[b]	42 U	15 U	14 UJ	17 UJ	26 U
Bromomethane	22 U[a]	42 U	15 U	14 UJ	17 UJ	26 U
Vinyl chloride	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Chloroethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Methylene chloride	22 UJ	42 UJ	15 UJ	14 UJ	17 UJ	26 UJ
Acetone	190 UJ	230 UJ	31 UJ	51 UJ	100 UJ	190 UJ
Carbon disulfide	22 U	42 U	15 U	14 UJ	17 UJ	26 U
1,1-Dichloroethene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
1,1-Dichloroethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
1,2-Dichloroethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Chloroform	22 U	42 U	15 U	14 UJ	17 UJ	26 U
2-Butanone	42 UJ	42 U	15 U	14 UJ	18 UJ	40 U
1,1,1-Trichloroethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Carbon tetrachloride	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Bromodichloromethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
1,2-Dichloropropane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
cis-1,3-Dichloropropene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Trichloroethene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Benzene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
trans-1,3-Dichloropropene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
1,1,2-Trichloroethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Chlorodibromomethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Bromoform	22 U	42 U	15 U	14 UJ	17 UJ	26 U
4-Methyl-2-pentanone	22 U	42 U	15 U	14 UJ	17 UJ	26 U
1,1,2,2-Tetrachloroethane	22 U	42 U	15 U	14 UJ	17 UJ	26 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 11 (Continued)
VOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	F1400S	K600N	I00	L1200S	L1200S-DUP	J1400S
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
Tetrachloroethene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
2-Hexanone	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Toluene	22 U	42 U	15 U	101 J	180 J	26 U
Chlorobenzene	5 J	42 U	15 U	14 UJ	17 UJ	26 U
Ethylbenzene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Styrene	22 U	42 U	15 U	14 UJ	17 UJ	26 U
1,2-Dichloroethene (Total)	22 U	42 U	15 U	14 UJ	17 UJ	26 U
Xylenes (Total)	5 J	42 U	15 U	14 UJ	17 UJ	26 U

TABLE 11 (Continued)
VOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
Chloromethane	59 U	43 U	29 U
Bromomethane	59 U	43 U	29 U
Vinyl chloride	59 U	43 U	29 U
Chloroethane	59 U	43 U	29 U
Methylene chloride	59 UJ	43 UJ	29 UJ
Acetone	150 UJ	71 UJ	69 UJ
Carbon disulfide	59 U	43 U	29 U
1,1-Dichloroethene	59 U	43 U	29 U
1,1-Dichloroethane	59 U	43 U	29 U
1,2-Dichloroethane	59 U	43 U	29 U
Chloroform	59 U	43 U	29 U
2-Butanone	59 U	43 U	29 U
1,1,1-Trichloroethane	59 U	43 U	29 U
Carbon tetrachloride	59 U	43 U	29 U
Bromodichloromethane	59 U	43 U	29 U
1,2-Dichloropropane	59 U	43 U	29 U
cis-1,3-Dichloropropene	59 U	43 U	29 U
Trichloroethene	59 U	43 U	29 U
Benzene	12 J	43 U	29 U
trans-1,3-Dichloropropene	59 U	43 U	29 U
1,1,2-Trichloroethane	59 U	43 U	29 U
Chlorodibromomethane	59 U	43 U	29 U
Bromoform	59 U	43 U	29 U
4-Methyl-2-pentanone	59 U	43 U	29 U
1,1,2,2-Tetrachloroethane	59 U	43 U	29 U

TABLE 11 (Continued)
VOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
Tetrachloroethene	59 U	43 U	29 U
2-Hexanone	59 U	43 U	29 U
Toluene	59 U	43 U	5 J
Chlorobenzene	59 U	43 U	29 U
Ethylbenzene	59 U	43 U	29 U
Styrene	59 U	43 U	29 U
1,2-Dichloroethene (Total)	59 U	43 U	29 U
Xylenes (Total)	59 U	43 U	29 U

TABLE 12
VOC ANALYTICAL RESULTS FOR TRENCH SOIL
(All results in micrograms per kilogram)

Sample No.	T2-1	T2-1-DUP	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
Chloromethane	12 U	13 U	13 U
Bromomethane	12 U	13 U	13 U
Vinyl chloride	12 U	13 U	13 U
Chloroethane	12 U	13 U	13 U
Methylene chloride	12 UJ	13 UJ	13 U
Acetone	40 UJ	54 UJ	35 UJ
Carbon disulfide	12 U	13 U	13 U
1,1-Dichloroethene	12 U	13 U	13 U
1,1-Dichloroethane	12 U	13 U	13 U
1,2-Dichloroethane	12 U	13 U	13 U
Chloroform	12 U	13 U	13 U
2-Butanone	12 U	13 U	13 U
1,1,1-Trichloroethane	12 U	13 U	13 U
Carbon tetrachloride	12 U	13 U	13 U
Bromodichloromethane	12 U	13 U	13 U
1,2-Dichloropropane	12 U	13 U	13 U
cis-1,3-Dichloropropene	12 U	13 U	13 U
Trichloroethene	12 U	13 U	13 U
Benzene	12 U	13 U	13 U
trans-1,3-Dichloropropene	12 U	13 U	13 U
1,1,2-Trichloroethane	12 U	13 U	13 U
Chlorodibromomethane	12 U	13 U	13 U
Bromoform	12 U	13 U	13 U
4-Methyl-2-pentanone	12 U	13 U	13 U
1,1,2,2-Tetrachloroethane	12 U	13 U	13 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 12 (Continued)
VOC ANALYTICAL RESULTS FOR TRENCH SOIL
(All results in micrograms per kilogram)

Sample No.	T2-1	T2-DUP	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
Tetrachloroethene	12 U	13 U	13 U
2-Hexanone	12 U	13 U	13 U
Toluene	12 U	2 J	13 U
Chlorobenzene	19	20	13 U
Ethylbenzene	7 J	9 J	13 U
Styrene	12 U	13 U	13 U
1,2-Dichloroethene (Total)	12 U	13 U	13 U
Xylenes (Total)	26	17	13 U

TABLE 13
SVOC ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	RB-1	EB-2	EB-3	EB-1	EB-2
Date Sampled	04/30/94	05/04/94	05/05/94	08/30/94	08/31/94
Phenol	10 U[a]	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U
N-nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 13 (Continued)
SVOC ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	RB-1	EB-2	EB-3	EB-1	EB-2
Date Sampled	04/30/94	05/04/94	05/05/94	08/30/94	08/31/94
2,4,5-Trichlorophenol	25 U	25 U	10 U	25 U	25 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25 U	25 U	10 U	25 U	25 U
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25 U	25 U	10 U	25 U	25 U
Acenaphthene	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25 U	25 U	10 U	25 U	25 U
4-Nitrophenol	25 U	25 U	10 U	25 U	25 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25 U	25 U	10 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U	10 U	25 U	25 U
N-nitrosodiphenylamine	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	25 U	25 U	10 U	25 U	25 U
Phenanthrene	10 U	10 U	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 UJ

TABLE 13 (Continued)
SVOC ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	RB-1	EB-2	EB-3	EB-1	EB-2
Date Sampled	04/30/94	05/04/94	05/05/94	08/30/94	08/31/94
Fluoranthene	10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)phthalate	10 U	10 U	10 UJ	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U

TABLE 14
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	I1200N	J2400N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94
Phenol	10 U[a]	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	3 J	10 U	2 J[b]	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	5 J	10 U	11	14	23
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	3 J	17	10 U	1 J	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	6 J	3 J	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	I1200N	J2400N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthene	10 U	22	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	5 J	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 UJ	10 U	10 UJ	10 U	10 U
Fluorene	10 U	12	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-nitrosodiphenylamine	10 U	10 U	2 J	10 U	2 J	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	10 U	7 J	10 U	10 U	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	I1200N	J2400N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)phthalate	10 UJ	10 U	10 UJ	10 U	10 UJ	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1600N	F3600N	E2600N	F3000N	F3000N-DUP	D3000N	D3600N
Date Sampled	*04/28/94*	*04/29/94*	*04/29/94*	*04/29/94*	*04/29/94*	*04/30/94*	*04/30/94*
Phenol	10 U	10 U	10 U	10 U	10 U	10 U	40 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	40 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	40 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
1,4-Dichlorobenzene	1 J	2 J	2 J	2 J	2 J	10 U	40 U
1,2-Dichlorobenzene	10 U	10 U	10 U	2 J	2 J	2 J	40 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	40 U
bis(2-Chloroisopropyl)ether	1 J	10 U	10 U	10 U	10 U	10 U	40 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	7 J	40 U
N-nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Nitrobenzene	12	4 J	5 J	10 U	10 U	10 U	40 U
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	40 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	40 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U	40 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	40 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	40 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Naphthalene	1 J	3 J	3 J	5 J	5 J	6 J	40 U
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
4-Chloro-3-methylphenol	10 U	10 UJ	10 U	10 U	10 U	10 U	40 U
2-Methylnaphthalene	2 J	4 J	1 J	3 J	2 J	10 U	160
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	40 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1600N	F3600N	E2600N	F3000N	F3000N-DUP	D3000N	D3600N
Date Sampled	04/28/94	04/29/94	04/29/94	04/29/94	04/29/94	04/30/94	04/30/94
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	25 U	100 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
2-Nitroaniline	10 U	10 U	10 U	10 U	10 U	25 U	100 U
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	40 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
3-Nitroaniline	10 U	10 U	10 U	10 U	10 U	25 U	100 U
Acenaphthene	10 U	10 U	3 J	10 U	10 U	10 U	40 U
2,4-Dinitrophenol	10 U	10 U	10 U	10 U	10 U	25 U	100 U
4-Nitrophenol	10 U	10 U	10 U	10 U	10 U	25 U	100 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Dibenzofuran	10 U	10 U	1 J	10 U	10 U	10 U	40 U
Diethylphthalate	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 U	40 U
Fluorene	10 U	10 U	2 J	10 U	10 U	10 U	40 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	40 U
4-Nitroaniline	10 U	10 U	10 U	10 U	10 U	25 U	100 U
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	10 U	25 U	100 U
N-nitrosodiphenylamine	3 J	3 J	10 U	2 J	2 J	10 U	40 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Pentachlorophenol	10 U	10 U	10 U	10 U	10 U	25 U	100 U
Phenanthrene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Carbazole	1 J	10 U	10 U	10 U	10 U	10 U	40 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	40 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1600N	F3600N	E2600N	F3000N	F3000N-DUP	D3000N	D3600N
Date Sampled	04/28/94	04/29/94	04/29/94	04/29/94	04/29/94	04/30/94	04/30/94
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Butylbenzylphthalate	10 U	10 U	10 U	10 UJ	10 UJ	10 U	40 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
bis(2-ethylhexyl)phthalate	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	40 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	40 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U	40 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	H1600S	J1400S	J1400S-DUP	F1600S	E1200S	D1600S	B2000S
Date Sampled	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
Phenol	10 U	10 U	2 J	200 U	20 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	200 U	20 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
1,4-Dichlorobenzene	3 J	10 U	10 U	200 U	11 J	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	200 U	20 U	10 U	10 U
bis(2-Chloroisopropyl)ether	10 J	10 U	10 U	200 U	20 U	10 U	10 U
4-Methylphenol	10 U	10 U	8 J	200 U	20 U	10 U	10 U
N-nitroso-di-n-propylamine	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Isophorone	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	200 U	20 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	200 U	20 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Naphthalene	11	6 J	6 J	200 U	27	8 J	10 U
4-Chloroaniline	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2-Methylnaphthalene	2 J	1 J	2 J	200 U	5 J	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	200 U	20 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	H1600S	J1400S	J1400S-DUP	F1600S	E1200S	D1600S	B2000S
Date Sampled	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
2,4,5-Trichlorophenol	25 U	25 U	25 U	500 U	50 U	25 U	25 U
2-Chloronaphthalene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2-Nitroaniline	25 U	25 U	25 U	500 U	50 U	25 U	25 U
Dimethylphthalate	10 U	10 U	10 U	200 U	20 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
3-Nitroaniline	25 U	25 U	25 U	500 U	50 U	25 U	25 U
Acenaphthene	3 J	10 U	10 U	200 U	20 U	10 U	10 U
2,4-Dinitrophenol	25 U	25 U	25 U	500 U	50 U	25 U	25 U
4-Nitrophenol	25 U	25 U	25 U	500 U	50 U	25 U	25 U
2,4-Dinitrotoluene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Dibenzofuran	2 J	10 U	10 U	200 U	20 U	10 U	10 U
Diethylphthalate	10 U	10 UJ	10 UJ	200 U	20 U	10 U	10 U
Fluorene	2 J	10 U	10 U	200 U	20 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	200 U	20 U	10 U	10 U
4-Nitroaniline	25 U	25 U	25 U	500 U	50 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U	500 U	50 U	25 U	25 U
N-nitrosodiphenylamine	2 J	1 J	1 J	200 U	20 U	1 J	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Pentachlorophenol	25 U	25 U	25 U	500 U	50 U	25 U	25 U
Phenanthrene	9 J	10 U	10 U	200 U	20 U	10 U	10 U
Anthracene	2 J	10 U	10 U	200 U	20 U	10 U	10 U
Carbazole	5 J	2 J	2 J	200 U	20 U	2 J	10 U
Di-n-butylphthalate	10 U	10 U	10 U	200 U	20 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	H1600S	J1400S	J1400S-DUP	F1600S	E1200S	D1600S	B2000S
Date Sampled	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
Fluoranthene	5 J	10 U	10 U	200 U	20 U	10 U	10 U
Pyrene	3 J	10 U	10 U	200 U	20 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	200 U	20 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Benzo(a)anthracene	1 J	10 U	10 U	200 U	20 U	10 U	10 U
Chrysene	2 J	10 U	10 U	200 U	20 U	10 U	10 U
bis(2-ethylhexyl)phthalate	10 UJ	10 UJ	16 UJ	200 U	20 U	10 UJ	10 UJ
Di-n-octylphthalate	10 U	10 U	10 UJ	200 U	20 U	10 U	10 U
Benzo(b)fluoranthene	1 J	10 U	10 U	200 U	20 U	10 U	10 U
Benzo(k)fluoranthene	1 J	10 U	10 U	200 U	20 U	10 U	10 U
Benzo(a)pyrene	1 J	10 U	10 U	200 U	20 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	200 U	20 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	200 U	20 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1600S	B1200S	B800S	B00	B00-DUP	B400S	C400N
Date Sampled	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94
Phenol	100 U	20 U	50 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2-Chlorophenol	100 U	20 U	50 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	100 U	3 J	50 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2-Methylphenol	100 U	20 U	50 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	100 J	20 U	50 U	10 U	10 U	10 U	10 U
4-Methylphenol	100 U	20 U	20 J	10 U	10 U	10 U	10 U
N-nitroso-di-n-propylamine	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Hexachloroethane	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Nitrobenzene	100 U	3 J	50 U	10 U	10 U	10 U	10 U
Isophorone	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2-Nitrophenol	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	100 U	20 U	50 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	100 U	20 U	50 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Naphthalene	350	59	7 J	1 J	1 J	10 U	10 U
4-Chloroaniline	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	100 U	20 U	50 UJ	10 U	10 U	10 U	10 U
2-Methylnaphthalene	44 J	13 J	6 J	3 J	3 J	1 J	2 J
Hexachlorocyclopentadiene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	100 U	20 U	50 U	10 U	10 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1600S	B1200S	B800S	B00	B00-DUP	B400S	C400N
Date Sampled	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94
2,4,5-Trichlorophenol	250 U	50 U	120 U	25 U	25 U	25 U	25 U
2-Chloronaphthalene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2-Nitroaniline	250 U	50 U	120 U	25 U	25 U	25 U	25 U
Dimethylphthalate	100 U	20 U	50 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	100 U	20 U	50 U	25 U	10 U	10 U	10 U
Acenaphthylene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
3-Nitroaniline	250 U	50 U	120 U	25 U	25 U	25 U	25 U
Acenaphthene	24 J	27 J	50 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	250 U	50 U	120 U	25 U	25 U	25 U	25 U
4-Nitrophenol	250 U	50 U	120 U	25 U	25 U	25 U	25 U
2,4-Dinitrotoluene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Dibenzofuran	100 U	14 J	50 U	10 U	10 U	10 U	10 U
Diethylphthalate	100 U	20 UJ	50 UJ	10 U	10 U	10 U	10 UJ
Fluorene	16 J	17 J	50 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	100 U	20 U	50 U	10 U	10 U	10 U	10 U
4-Nitroaniline	250 U	50 U	120 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	250 U	50 U	120 U	25 U	25 U	25 U	25 U
N-nitrosodiphenylamine	100 U	20 U	50 U	2 J	2 J	10 U	3 J
4-Bromophenyl-phenylether	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Pentachlorophenol	250 U	50 U	120 U	25 U	25 U	25 U	25 U
Phenanthrene	37 J	75	50 U	10 U	10 U	10 U	10 U
Anthracene	100 U	14 J	50 U	10 U	10 U	10 U	10 U
Carbazole	100 U	20	50 U	2 J	2 J	2 J	10 U
Di-n-butylphthalate	100 U	20 U	50 U	10 U	10 U	10 U	10 UJ

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1600S	B1200S	B800S	B00	B00-DUP	B400S	C400N
Date Sampled	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94
Fluoranthene	100 U	68	50 U	10 U	10 U	10 U	10 U
Pyrene	100 U	41 J	50 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	100 U	20 U	50 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	100 U	16 J	50 U	10 U	10 U	10 U	10 U
Chrysene	100 U	24	50 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)phthalate	100 U	20 UJ	50 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Di-n-octylphthalate	100 U	20 U	50 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	100 U	17 J	50 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	100 U	16 J	50 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	100 U	18 J	50 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	100 U	13 J	50 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	100 U	5 J	50 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	100 U	14 J	50 U	10 U	10 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	C800N	E00	F1000N	B2600N	C2200N	B1400N	B1800N
Date Sampled	05/03/94	05/03/94	05/04/94	05/04/94	05/04/94	05/04/94	05/04/94
Phenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	2 J	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	21	10 U	10 U	10 U	2 J
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	2 J	1 J	10 U	10 U	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	1 J	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	C800N	E00	F1000N	B2600N	C2200N	B1400N	B1800N
Date Sampled	05/03/94	05/03/94	05/04/94	05/04/94	05/04/94	05/04/94	05/04/94
2,4,5-Trichlorophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	25 U	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	11 UJ	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
N-nitrosodiphenylamine	10 U	10 U	10 U	10 U	10 U	1 J	16
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	10 U	1 J	10 U	10 U	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	3 J	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	C800N	E00	F1000N	B2600N	C2200N	B1400N	B1800N
Date Sampled	05/03/94	05/03/94	05/04/94	05/04/94	05/04/94	05/04/94	05/04/94
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)phthalate	10 UJ	20 UJ	13 UJ	35 UJ	10 UJ	14 UJ	10 UJ
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1800N-DUP	E600S	E600N	H600N	F2200N	H2800N	J600S
Date Sampled	05/04/94	05/03/94	05/03/94	05/04/94	05/05/94	05/05/94	05/05/94
Phenol	10 U	10 U	10 U	10 U	20 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	20 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	20 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	20 U	2 J	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	20 U	10 U	1 J
bis(2-Chloroisopropyl)ether	10 U	10 U	10 U	10 U	20 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U	20 U	10 U	6 J
N-nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U	20 U	10 U	2 J
Isophorone	10 U	10 U	10 U	10 U	20 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	20 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	20 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	20 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	20 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Naphthalene	10 U	1 J	10 U	2 J	4 J	36	20
4-Chloroaniline	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	20 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	2 J	1 J	3 J	3 J	3 J
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	1 J	20 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1800N-DUP	E600S	E600N	H600N	F2200N	H2800N	J600S
Date Sampled	05/04/94	05/03/94	05/03/94	05/04/94	05/05/94	05/05/94	05/05/94
2,4,5-Trichlorophenol	25 U	25 U	25 U	1 J	20 U	10 U	10 U
2-Chloronaphthalene	10 U	10 U	10 U	1 J	3 J	10 U	10 U
2-Nitroaniline	25 U	25 U	25 U	10 U	20 U	10 U	10 U
Dimethylphthalate	10 U	10 U	10 U	10 U	20 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
3-Nitroaniline	25 U	25 U	25 U	10 U	20 U	10 U	10 U
Acenaphthene	10 U	10 U	10 U	10 U	20 U	10 U	2 J
2,4-Dinitrophenol	25 U	25 U	25 U	10 U	20 U	10 U	10 U
4-Nitrophenol	25 U	25 U	25 U	10 U	20 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	20 U	10 U	1 J
Diethylphthalate	10 U	10 UJ	10 U	10 UJ	24 UJ	10 UJ	10 UJ
Fluorene	10 U	10 U	10 U	10 U	20 U	10 U	2 J
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	20 U	10 U	10 U
4-Nitroaniline	25 U	25 U	25 U	10 U	20 U	10 U	10 U
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U	10 U	20 U	10 U	10 U
N-nitrosodiphenylamine	14	1 J	2 J	6 J	20 U	2 J	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Pentachlorophenol	25 U	25 U	25 U	50 J	20 U	10 U	10 U
Phenanthrene	10 U	10 U	10 U	10 U	20 U	10 U	1 J
Anthracene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Carbazole	10 U	1 J	1 J	10 U	20 U	10 U	3 J
Di-n-butylphthalate	10 U	10 U	10 U	10 U	20 U	10 U	10 U

TABLE 14 (Continued)
SVOC ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1800N-DUP	E600S	E600N	H600N	F2200N	H2800N	J600S
Date Sampled	05/04/94	05/03/94	05/03/94	05/04/94	05/05/94	05/05/94	05/05/94
Fluoranthene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	20 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
bis(2-ethylhexyl)phthalate	10 UJ	10 UJ	10 UJ	10 UJ	20 U	10 UJ	10 UJ
Di-n-octylphthalate	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	20 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	20 U	10 U	10 U

TABLE 15 (Continued)
SVOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-4	MW-5	MW-6	MW-7	MW-8	MW-10	MW-7DUP
Date Sampled	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)phthalate	10 UJ	10 U	10 U	10 U	10 UJ	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 15 (Continued)
SVOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-11	MW-13	MW-12	MW-1	MW-2	MW-14	MW-14DUP
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
Phenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	4 J	10 U	7 J	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	3 J	10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	8 J	10 U	3 J	10 U	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	3 J	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 15 (Continued)
SVOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-11	MW-13	MW-12	MW-1	MW-2	MW-14	MW-14DUP
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
2,4,5-Trichlorophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	10 U	2 J	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
N-nitrosodiphenylamine	10 U	10 U	3 J	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	10 U	2 J	10 U	10 U	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ	10 U

TABLE 15 (Continued)
SVOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-11	MW-13	MW-12	MW-1	MW-2	MW-14	MW-14 DUP
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-ethylhexyl)phthalate	10 UJ	10 UJ	10 UJ	10 UJ	12 UJ	10 UJ	10 UJ
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 15 (Continued)
SVOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-15	MW-9
Date Sampled	08/31/94	08/31/94
Phenol	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U
2-Chlorophenol	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U
2-Methylphenol	10 U	10 U
bis(2-Chloroisopropyl)ether	10 U	10 U
4-Methylphenol	10 U	10 U
N-nitroso-di-n-propylamine	10 U	10 U
Hexachloroethane	10 U	10 U
Nitrobenzene	10 U	10 U
Isophorone	10 U	10 U
2-Nitrophenol	10 U	10 U
2,4-Dimethylphenol	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U
2,4-Dichlorophenol	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U
Naphthalene	10 U	3 J
4-Chloroaniline	10 U	10 U
Hexachlorobutadiene	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U
2-Methylnaphthalene	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U

TABLE 15 (Continued)
SVOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-15	MW-9
Date Sampled	08/31/94	08/31/94
2,4,5-Trichlorophenol	25 U	25 U
2-Chloronaphthalene	10 U	10 U
2-Nitroaniline	25 U	25 U
Dimethylphthalate	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U
Acenaphthylene	10 U	10 U
3-Nitroaniline	25 U	25 U
Acenaphthene	10 U	10 U
2,4-Dinitrophenol	25 U	25 U
4-Nitrophenol	25 U	25 U
2,4-Dinitrotoluene	10 U	10 U
Dibenzofuran	10 U	10 U
Diethylphthalate	10 U	10 UJ
Fluorene	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U
4-Nitroaniline	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U
N-nitrosodiphenylamine	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U
Hexachlorobenzene	10 U	10 U
Pentachlorophenol	25 U	25 UJ
Phenanthrene	10 U	10 U
Anthracene	10 U	10 U
Carbazole	10 U	10 U
Di-n-butylphthalate	10 U	10 U

TABLE 15 (Continued)
SVOC ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-15	MW-9
Date Sampled	08/31/94	08/31/94
Fluoranthene	10 U	10 U
Pyrene	10 U	10 U
Butylbenzylphthalate	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U
Benzo(a)anthracene	10 U	10 U
Chrysene	10 U	10 U
bis(2-ethylhexyl)phthalate	20 UJ	15 UJ
Di-n-octylphthalate	10 UJ	10 U
Benzo(b)fluoranthene	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U
Benzo(a)pyrene	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U

TABLE 16
SVOC ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	I00	I00-DUP	K600W	E1600S	A1000S	H1800S
Date Sampled	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
Phenol	10 U[a]	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	1 J[b]
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U
N-nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 16 (Continued)
SVOC ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	I00	I00-DUP	K600W	E1600S	A1000S	H1800S
Date Sampled	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
2,4,5-Trichlorophenol	25 U	25 U	25 U	25 U	25 U	25 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	10 U	10 UJ	10 U	10 UJ	10 U	10 UJ
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	25 U	25 U	25 U	25 U	25 U	25 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U
N-nitrosodiphenylamine	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	10 U	10 U	10 U	2 J	10 U	10 U
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U	10 U	10 U	2 J
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 UJ

TABLE 16 (Continued)
SVOC ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	I00	I00-DUP	K600W	E1600S	A1000S	H1800S
Date Sampled	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
Fluoranthene	10 U	10 U	10 U	3 J	10 U	10 U
Pyrene	10 U	10 U	10 U	2 J	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U	1 J	10 U	10 U
Chrysene	10 U	10 U	10 U	2 J	10 U	10 U
bis(2-ethylhexyl)phthalate	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	2 J	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	1 J	10 U	10 U
Indeno(1,2,3-c,d)pyrene	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 17
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	*F1400S*	*K600N*	*I00*	*L1200S*	*L1200S-DUP*	*J1400S*
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
Phenol	720 UJ	1,400 U	490 U	460 UJ	570 UJ	850 U
bis(2-Chloroethyl)ether	720 U[a]	1,400 U	490 U	460 UJ	570 UJ	850 U
2-Chlorophenol	720 UJ	1,400 U	490 U	460 UJ	570 UJ	850 U
1,3-Dichlorobenzene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
1,4-Dichlorobenzene	87 J[b]	1,400 U	490 U	460 UJ	570 UJ	850 U
1,2-Dichlorobenzene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2-Methylphenol	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
bis(2-Chloroisopropyl)ether	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
4-Methylphenol	720 U	1,400 U	490 U	290 J	380 J	850 U
N-nitroso-di-n-propylamine	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Hexachloroethane	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Nitrobenzene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Isophorone	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2-Nitrophenol	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2,4-Dimethylphenol	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
bis(2-Chloroethoxy)methane	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2,4-Dichlorophenol	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
1,2,4-Trichlorobenzene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Naphthalene	83 J	1,400 U	490 U	460 UJ	570 UJ	850 U
4-Chloroaniline	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Hexachlorobutadiene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
4-Chloro-3-methylphenol	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2-Methylnaphthalene	100 J	1,400 U	490 U	460 UJ	570 UJ	850 U
Hexachlorocyclopentadiene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2,4,6-Trichlorophenol	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 17 (Continued)
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	F1400S	K600N	I00	L1200S	L1200S-DUP	J1400S
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
2,4,5-Trichlorophenol	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
2-Chloronaphthalene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2-Nitroaniline	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
Dimethylphthalate	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2,6-Dinitrotoluene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Acenaphthylene	150 J	1,400 U	490 U	69 J	81 J	850 U
3-Nitroaniline	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
Acenaphthene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
2,4-Dinitrophenol	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
4-Nitrophenol	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
2,4-Dinitrotoluene	720 UJ	1,400 U	490 U	460 UJ	570 UJ	850 U
Dibenzofuran	720 U	1,400 U	490 U	50 J	68 J	850 U
Diethylphthalate	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Fluorene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
4-Chlorophenyl-phenylether	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
4-Nitroaniline	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
4,6-Dinitro-2-methylphenol	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
N-nitrosodiphenylamine	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
4-Bromophenyl-phenylether	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Hexachlorobenzene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Pentachlorophenol	1,800 U	3,500 U	1,200 U	1,200 UJ	1,400 UJ	2,100 U
Phenanthrene	800	1,400 U	650	1,200 J	1,600 J	460 J
Anthracene	300 J	1,400 U	110 J	270 J	380 J	850 U
Carbazole	720 U	1,400 U	95 J	120 J	140 J	850 U
Di-n-butylphthalate	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U

TABLE 17 (Continued)
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	F1400S	K600N	I00	L1200S	L1200S-DUP	J1400S
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
Fluoranthene	1,600	150 J	1,400	3,000 J	3,200 J	1,400
Pyrene	1,800	1,400 U	1,200	2,100 J	2,200 J	1,300
Butylbenzylphthalate	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
3,3'-Dichlorobenzidine	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Benzo(a)anthracene	1,900	1,400 U	800	1,600 J	1,700 J	620 J
Chrysene	1,600	140 J	980	1,600 J	1,800 J	1,100
bis(2-ethylhexyl)phthalate	720 UJ	1,400 UJ	560 UJ	1,200 UJ	1,500 UJ	850 UJ
Di-n-octylphthalate	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Benzo(b)fluoranthene	1,800	140 J	1,500	2,600 J	2,400 J	1,600
Benzo(k)fluoranthene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Benzo(a)pyrene	730	1,400 U	470 J	690 J	700 J	560 J
Indeno(1,2,3-c,d)pyrene	430 J	1,400 U	330 J	470 J	460 J	370 J
Dibenzo(a,h)anthracene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U
Benzo(g,h,i)perylene	720 U	1,400 U	490 U	460 UJ	570 UJ	850 U

TABLE 17 (Continued)
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
Phenol	1,900 U	1400 U	930 U
bis(2-Chloroethyl)ether	1,900 U	1400 U	930 U
2-Chlorophenol	1,900 U	1400 U	930 U
1,3-Dichlorobenzene	1,900 U	1400 U	930 U
1,4-Dichlorobenzene	1,900 U	1400 U	930 U
1,2-Dichlorobenzene	1,900 U	1400 U	930 U
2-Methylphenol	1,900 U	1400 U	830 U
bis(2-Chloroisopropyl)ether	1,900 U	1400 U	930 U
4-Methylphenol	1,900 U	1400 U	930 U
N-nitroso-di-n-propylamine	1,900 U	1400 U	930 UJ
Hexachloroethane	1,900 U	1400 U	930 U
Nitrobenzene	1,900 U	1400 U	930 U
Isophorone	1,900 U	1400 U	930 U
2-Nitrophenol	1,900 U	1400 U	930 U
2,4-Dimethylphenol	1,900 U	1400 U	930 U
bis(2-Chloroethoxy)methane	1,900 U	1400 U	930 U
2,4-Dichlorophenol	1,900 U	1400 U	930 U
1,2,4-Trichlorobenzene	1,900 U	1400 U	930 UJ
Naphthalene	1,900 U	1400 U	930 U
4-Chloroaniline	1,900 U	1400 U	930 U
Hexachlorobutadiene	1,900 U	1400 U	930 U
4-Chloro-3-methylphenol	1,900 U	1400 U	930 U
2-Methylnaphthalene	1,900 U	1400 U	930 U
Hexachlorocyclopentadiene	1,900 U	1400 U	930 U
2,4,6-Trichlorophenol	1,900 U	1400 U	930 U

TABLE 17 (Continued)
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
2,4,5-Trichlorophenol	4,700 U	3,500 U	2,300 U
2-Chloronaphthalene	1,900 U	1,400 U	930 U
2-Nitroaniline	4,700 U	3,500 U	2,300 U
Dimethylphthalate	1,900 U	1,400 U	930 U
2,6-Dinitrotoluene	1,900 U	1,400 U	930 U
Acenaphthylene	1,900 U	1,400 U	930 U
3-Nitroaniline	4,700 U	3,500 U	2,300 U
Acenaphthene	1,900 U	1,400 U	930 U
2,4-Dinitrophenol	4,700 U	3,500 U	2,300 U
4-Nitrophenol	4,700 U	3,500 U	2,300 U
2,4-Dinitrotoluene	1,900 U	1,400 U	930 U
Dibenzofuran	1,900 U	1,400 U	930 U
Diethylphthalate	1,900 U	1,400 U	930 U
Fluorene	1,900 U	1,400 U	930 U
4-Chlorophenyl-phenylether	1,900 U	1,400 U	930 U
4-Nitroaniline	4,700 U	3,500 U	2,300 U
4,6-Dinitro-2-methylphenol	4,700 U	3,500 U	2,300 U
N-nitrosodiphenylamine	1,900 U	1,400 U	930 U
4-Bromophenyl-phenylether	1,900 U	1,400 U	930 U
Hexachlorobenzene	1,900 U	1,400 U	930 U
Pentachlorophenol	4,700 U	3,500 U	2,300 U
Phenanthrene	1,900 U	1,400 U	930 U
Anthracene	1,900 U	1,400 U	930 U
Carbazole	1,900 U	1,400 U	930 U
Di-n-butylphthalate	1,900 U	1,400 U	930 U

TABLE 17 (Continued)
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
Fluoranthene	1,900 U	1,400 U	930 U
Pyrene	1,900 U	1,400 U	930 U
Butylbenzylphthalate	1,900 U	1,400 U	930 U
3,3'-Dichlorobenzidine	1,900 U	1,400 U	930 U
Benzo(a)anthracene	1,900 U	1,400 U	930 U
Chrysene	1,900 U	1,400 U	930 U
bis(2-ethylhexyl)phthalate	1,900 U	1,400 U	930 UJ
Di-n-octylphthalate	1,900 U	1,400 U	930 U
Benzo(b)fluoranthene	1,900 U	1,400 U	930 U
Benzo(k)fluoranthene	1,900 U	1,400 U	930 U
Benzo(a)pyrene	1,900 U	1,400 U	930 U
Indeno(1,2,3-c,d)pyrene	1,900 U	1,400 U	930 U
Dibenzo(a,h)anthracene	1,900 U	1,400 U	930 U
Benzo(g,h,i)perylene	1,900 U	1,400 U	930 U

TABLE 18
SVOC ANALYTICAL RESULTS FOR TRENCH SOIL
(All results in micrograms per kilogram)

Sample No.	T2-1	T2-1-DUP	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
Phenol	410 U	440 U	420 UJ
bis(2-Chloroethyl)ether	410 U	440 U	420 UJ
2-Chlorophenol	410 U	440 U	420 UJ
1,3-Dichlorobenzene	410 U	440 U	420 UJ
1,4-Dichlorobenzene	160 J	220 J	420 UJ
1,2-Dichlorobenzene	410 U	440 U	420 UJ
2-Methylphenol	410 U	440 U	420 UJ
bis(2-Chloroisopropyl)ether	410 U	440 U	420 UJ
4-Methylphenol	410 U	440 U	420 UJ
N-nitroso-di-n-propylamine	410 U	440 U	420 UJ
Hexachloroethane	410 U	440 U	420 UJ
Nitrobenzene	410 U	440 U	420 UJ
Isophorone	410 U	440 U	420 UJ
2-Nitrophenol	410 U	440 U	420 UJ
2,4-Dimethylphenol	410 U	440 U	420 UJ
bis(2-Chloroethoxy)methane	410 U	440 U	420 UJ
2,4-Dichlorophenol	410 U	440 U	420 UJ
1,2,4-Trichlorobenzene	410 U	440 U	420 UJ
Naphthalene	69 J	440 U	420 UJ
4-Chloroaniline	410 U	440 U	420 UJ
Hexachlorobutadiene	410 U	440 U	420 UJ
4-Chloro-3-methylphenol	410 U	440 U	420 UJ
2-Methylnaphthalene	64 J	140 J	420 UJ
Hexachlorocyclopentadiene	410 U	440 U	420 UJ
2,4,6-Trichlorophenol	410 U	440 U	420 UJ

Notes:

a U = Not detected; number is sample detection limit
b J = Concentration estimated because value either outside calibration range or outside quality control limits, or blank contamination occurred

TABLE 18 (Continued)
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	T2-1	T2-1-DUP	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
2,4,5-Trichlorophenol	1,000 U	1,100 U	1,000 UJ
2-Chloronaphthalene	410 U	440 U	420 UJ
2-Nitroaniline	1,000 U	1,100 U	1,000 UJ
Dimethylphthalate	410 U	440 U	420 UJ
2,6-Dinitrotoluene	410 U	440 U	420 UJ
Acenaphthylene	410 U	440 U	420 UJ
3-Nitroaniline	1,000 U	1,100 U	1,000 UJ
Acenaphthene	410 U	76 J	420 UJ
2,4-Dinitrophenol	1,000 U	1,100 U	1,000 UJ
4-Nitrophenol	1,000 U	1,100 U	1,000 UJ
2,4-Dinitrotoluene	410 U	440 U	442 UJ
Dibenzofuran	410 U	440 U	420 UJ
Diethylphthalate	410 UJ	440 U	420 UJ
Fluorene	410 U	72 J	420 UJ
4-Chlorophenyl-phenylether	410 U	440 U	420 UJ
4-Nitroaniline	1,000 U	1,100 U	1,000 UJ
4,6-Dinitro-2-methylphenol	1,000 UJ	1,100 UJ	1,000 UJ
N-nitrosodiphenylamine	120 J	380 J	420 UJ
4-Bromophenyl-phenylether	410 UJ	440 UJ	420 UJ
Hexachlorobenzene	410 UJ	440 UJ	420 UJ
Pentachlorophenol	1,000 UJ	1,100 UJ	1,000 UJ
Phenanthrene	410 UJ	520 J	110 J
Anthracene	410 UJ	100 J	420 UJ
Carbazole	410 UJ	440 UJ	420 UJ
Di-n-butylphthalate	410 UJ	440 UJ	420 UJ

TABLE 18 (Continued)
SVOC ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	T2-1	T2-1-DUP	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
Fluoranthene	410 UJ	380 J	160 J
Pyrene	410 UJ	830 J	140 J
Butylbenzylphthalate	410 UJ	440 UJ	420 UJ
3,3'-Dichlorobenzidine	410 UJ	440 UJ	420 UJ
Benzo(a)anthracene	410 UJ	440 UJ	65 J
Chrysene	410 UJ	320 J	74 J
bis(2-ethylhexyl)phthalate	1,700 UJ	920 UJ	720 UJ
Di-n-octylphthalate	410 UJ	440 UJ	420 UJ
Benzo(b)fluoranthene	410 UJ	440 UJ	100 J
Benzo(k)fluoranthene	410 UJ	440 UJ	420 UJ
Benzo(a)pyrene	410 UJ	440 UJ	63 J
Indeno(1,2,3-c,d)pyrene	410 UJ	440 UJ	420 UJ
Dibenzo(a,h)anthracene	410 UJ	440 UJ	420 UJ
Benzo(g,h,i)perylene	410 UJ	440 UJ	420 UJ

TABLE 19
PESTICIDE ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	RB-1	EB-2	EB-3	EB-1	EB-2
Date Sampled	04/30/94	05/04/94	05/05/94	08/30/94	08/31/94
alpha-BHC	0.050 U[a]	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	0.050 U	0.050 U	0.050 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value outside calibration range or outside quality control limits

TABLE 19 (Continued)
PCB ANALYTICAL RESULTS FOR FIELD BLANKS
(All results in micrograms per liter)

Sample No.	RB-1	EB-2	EB-3	EB-1	EB-2
Date Sampled	04/30/94	05/04/94	05/05/94	08/30 94	08/31/94
Aroclor 1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1221	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor 1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1248	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

TABLE 20
PESTICIDE ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	I1200N	J2400N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94
alpha-BHC	0.059 U[a]	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
beta-BHC	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
delta-BHC	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
gamma-BHC (Lindane)	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
Heptachlor	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
Aldrin	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
Heptachlor epoxide	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
Endosulfan I	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
Dieldrin	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
4,4'-DDE	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
Endrin	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
Endosulfan II	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
4,4'-DDD	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
Endosulfan sulfate	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
4,4'-DDT	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
Methoxychlor	0.59 U	0.55 U	0.51 U	0.51 U	0.55 U	0.54 UJ	0.48 UJ
Endrin ketone	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
Endrin aldehyde	0.12 U	0.11 U	0.10 U	0.10 U	0.11 U	0.11 UJ	0.096 UJ
alpha-Chlordane	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
gamma-Chlordane	0.059 U	0.055 U	0.051 U	0.051 U	0.055 U	0.054 UJ	0.048 UJ
Toxaphene	5.9 U	5.5 U	5.1 U	5.1 U	5.5 U	5.4 UJ	4.8 UJ

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value outside calibration range or outside quality control limits

TABLE 20 (Continued)
PCB ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	A800N	A400N	L1200N	J800N	K1600N	I1200N	J2400N
Date Sampled	04/26/94	04/26/94	04/27/94	04/27/94	04/27/94	04/27/94	04/27/94
Aroclor 1016	1.2 U	1.1 U	1.0 U	1.0 U	1.1 U	1.1 UJ	0.96 UJ
Aroclor 1221	2.4 U	2.2 U	2.0 U	2.0 U	2.2 U	2.2 UJ	1.9 UJ
Aroclor 1232	1.2 U	1.1 U	1.0 U	1.0 U	1.1 U	1.1 UJ	0.96 UJ
Aroclor 1242	1.2 U	1.1 U	1.1	1.0 U	1.1 U	1.1 UJ	0.96 UJ
Aroclor 1248	1.2 U	1.1 U	1.0 U	1.0 U	1.1 U	1.1 UJ	0.96 UJ
Aroclor 1254	1.2 U	1.1 U	0.72 J	1.0 U	1.1 U	1.1 UJ	0.96 UJ
Aroclor 1260	1.2 U	1.1 U	1.0 U	1.0 U	1.1 U	1.1 UJ	0.96 UJ

TABLE 20 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1600N	F3600N	E2600N	E3000N	E3000N-DUP	D3000N	D3600N
Date Sampled	04/28/94	04/29/94	04/29/94	04/29/94	04/29/94	04/30/94	04/30/94
alpha-BHC	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
beta-BHC	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
delta-BHC	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
gamma-BHC (Lindane)	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
Heptachlor	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
Aldrin	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
Heptachlor epoxide	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
Endosulfan I	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
Dieldrin	0.095 UJ	0.10 UJ	0.10 UJ	0.20 U	0.10 U	0.11 U	0.10 UJ
4,4'-DDE	0.095 UJ	0.10 UJ	0.10 UJ	0.20 U	0.10 U	0.11 U	0.10 UJ
Endrin	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
Endosulfan II	0.095 UJ	0.10 UJ	0.10 UJ	0.20 U	0.10 U	0.11 U	0.10 UJ
4,4'-DDD	0.095 UJ	0.10 UJ	0.10 UJ	1.3	0.56	0.11 U	0.10 UJ
Endosulfan sulfate	0.095 UJ	0.10 UJ	0.10 UJ	0.20 U	0.10 U	0.11 U	0.10 UJ
4,4'-DDT	0.095 UJ	0.10 UJ	0.10 UJ	0.54	0.17	0.11 U	0.10 UJ
Methoxychlor	0.48 UJ	0.50 UJ	0.50 UJ	1.0 U	0.50 U	0.55 U	0.50 UJ
Endrin ketone	0.095 UJ	0.10 UJ	0.10 UJ	0.20 U	0.10 U	0.11 U	0.10 UJ
Endrin aldehyde	0.095 UJ	0.10 UJ	0.10 UJ	0.20 U	0.10 U	0.11 U	0.10 UJ
alpha-Chlordane	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
gamma-Chlordane	0.048 UJ	0.050 UJ	0.050 UJ	0.10 U	0.050 U	0.055 U	0.050 UJ
Toxaphene	4.8 UJ	5.0 UJ	5.0 UJ	10 U	5.0 U	5.5 U	5.0 UJ

TABLE 20 (Continued)
PCB ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	F1600N	F3600N	E2600N	E3000N	E3000N-DUP	D3000N	D3600N
Date Sampled	04/28/94	04/29/94	04/29/94	04/29/94	04/29/94	04/30/94	04/30/94
Aroclor 1016	0.95 UJ	1.0 UJ	1.0 UJ	2.0 U	1.0 U	1.1 U	1.0 UJ
Aroclor 1221	1.9 UJ	2.0 UJ	2.0 UJ	4.0 U	2.0 U	2.2 U	2.0 UJ
Aroclor 1232	0.95 UJ	1.0 UJ	1.0 UJ	2.0 U	1.0 U	1.1 U	1.0 UJ
Aroclor 1242	0.95 UJ	1.0 UJ	1.0 UJ	2.0 U	1.0 U	1.1 U	1.0 UJ
Aroclor 1248	0.95 UJ	1.0 UJ	1.0 UJ	2.0 U	1.0 U	1.1 U	1.0 UJ
Aroclor 1254	0.95 UJ	1.0 UJ	1.0 UJ	2.0 U	1.0 U	1.1 U	1.0 UJ
Aroclor 1260	0.95 UJ	1.0 UJ	1.0 UJ	2.0 U	1.0 U	1.1 U	0.86 J

TABLE 20 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	H1600S	J1400S	J1400S-DUP	F1600S	E1200S	D1600S	B2000S
Date Sampled	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
alpha-BHC	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
delta-BHC	0.050 U	0.050 U	0.050 U	0.050 UJ	0.14 J	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
Endrin	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U	0.50 UJ	2.5 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 UJ	0.50 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	0.050 UJ	0.25 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 UJ	25 U	5.0 U	5.0 U

TABLE 20 (Continued)
PCB ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	H1600S	J1400S	J1400S-DUP	F1600S	E1200S	D1600S	B2000S
Date Sampled	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94	05/02/94
Aroclor 1016	1.0 U	1.0 U	1.0 U	1.0 UJ	5.0 U	1.0 U	1.0 U
Aroclor 1221	2.0 U	2.0 U	2.0 U	2.0 UJ	10 U	2.0 U	2.0 U
Aroclor 1232	1.0 U	1.0 U	1.0 U	1.0 UJ	5.0 U	1.0 U	1.0 U
Aroclor 1242	0.95 J	0.80 J	0.51 J	1.0 UJ	5.0 U	1.0 U	1.0 U
Aroclor 1248	1.0 U	1.0 U	1.0 U	1.0 UJ	5.0 U	1.0 U	1.0 U
Aroclor 1254	1.0 U	1.0 U	1.0 U	1.0 UJ	5.0 U	1.0 U	1.0 U
Aroclor 1260	1.0 U	1.0 U	1.0 U	1.0 UJ	6.7	1.0 U	1.0 U

TABLE 20 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1600S	B1200S	B800S	B00	B00-DUP	B400S	C400N
Date Sampled	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94
alpha-BHC	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
beta-BHC	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
delta-BHC	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Heptachlor	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Aldrin	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Heptachlor epoxide	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Endosulfan I	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Dieldrin	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
4,4'-DDE	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
Endrin	0.050 UJ	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Endosulfan II	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
4,4'-DDD	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.089 J	0.10 U
Endosulfan sulfate	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
4,4'-DDT	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
Methoxychlor	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U
Endrin ketone	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
Endrin aldehyde	0.10 UJ	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
alpha-Chlordane	0.050 UJ	0.050 U	0.050 U	0.050 U	0.039 J	0.050 U	0.050 U
gamma-Chlordane	0.050 UJ	0.050 U	0.050 U	0.050 U	0.047 J	0.026 J	0.050 U
Toxaphene	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U

TABLE 20 (Continued)
PCB ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1600S	B1200S	B800S	B00	B00-DUP	B400S	C400N
Date Sampled	05/02/94	05/02/94	05/03/94	05/03/94	05/03/94	05/03/94	05/03/94
Aroclor 1016	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1221	2.0 UJ	2.0 U	2.0 U	2.0 U	2.0 UJ	2.0 U	2.0 U
Aroclor 1232	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1242	2.0 J	1.0 U	0.65 J	0.61 J	0.95 J	1.0 U	1.0 U
Aroclor 1248	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1254	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1260	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U

TABLE 20 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	C800N	E00	F1000N	B2600N	C2200N	B1400N	B1800N
Date Sampled	05/03/94	05/03/94	05/04/94	05/04/94	05/04/94	05/04/94	05/04/94
alpha-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
delta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 UJ
Aldrin	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 UJ
Heptachlor epoxide	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
Endrin	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 UJ
Methoxychlor	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 UJ	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 U	5.0 U

TABLE 20 (Continued)
PCB ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	C800N	E00	F1000N	B2600N	C2200N	B1400N	B1800N
Date Sampled	05/03/94	05/03/94	05/04/94	05/04/94	05/04/94	05/04/94	05/04/94
Aroclor 1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1221	2.0 U	2.0 U	2.0 U	5.4	1.7 J	2.0 U	2.0 U
Aroclor 1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1248	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Aroclor 1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U

TABLE 20 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1800N-DUP	E600S	E600N	H600N	F2200N	F2800N	J600S
Date Sampled	05/04/94	05/03/93	05/03/94	05/04/94	05/05/94	05/05/94	05/05/94
alpha-BHC	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
beta-BHC	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
delta-BHC	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
gamma-BHC (Lindane)	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Heptachlor	0.050 UJ	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Aldrin	0.050 UJ	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Heptachlor epoxide	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Endosulfan I	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Dieldrin	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
4,4'-DDE	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Endrin	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Endosulfan II	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
4,4'-DDD	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Endosulfan sulfate	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
4,4'-DDT	0.10 UJ	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Methoxychlor	0.50 U	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Endrin ketone	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Endrin aldehyde	0.10 U	0.10 UJ	0.10 U	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ
alpha-Chlordane	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
gamma-Chlordane	0.050 U	0.050 UJ	0.050 U	0.050 UJ	0.050 UJ	0.050 UJ	0.050 UJ
Toxaphene	5.0 U	5.0 UJ	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ

TABLE 20 (Continued)
PCB ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	B1800N-DUP	E600S	E600N	H600N	F2200N	F2800N	J600S
Date Sampled	05/04/94	05/03/94	05/03/94	05/04/94	05/05/94	05/05/94	05/05/94
Aroclor 1016	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Aroclor 1221	2.0 U	2.0 UJ	2.0 U	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Aroclor 1232	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Aroclor 1242	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Aroclor 1248	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Aroclor 1254	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Aroclor 1260	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ

TABLE 20 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	I00
Date Sampled	05/05/94
alpha-BHC	0.050 UJ
beta-BHC	0.050 UJ
delta-BHC	0.050 UJ
gamma-BHC (Lindane)	0.050 UJ
Heptachlor	0.050 UJ
Aldrin	0.050 UJ
Heptachlor epoxide	0.050 UJ
Endosulfan I	0.050 UJ
Dieldrin	0.10 UJ
4,4'-DDE	0.10 UJ
Endrin	0.050 UJ
Endosulfan II	0.10 UJ
4,4'-DDD	0.10 UJ
Endosulfan sulfate	0.10 UJ
4,4'-DDT	0.10 UJ
Methoxychlor	0.50 UJ
Endrin ketone	0.10 UJ
Endrin aldehyde	0.10 UJ
alpha-Chlordane	0.050 UJ
gamma-Chlordane	0.050 UJ
Toxaphene	5.0 UJ

TABLE 20 (Continued)
PCB ANALYTICAL RESULTS FOR GEOPROBE™ GROUNDWATER
(All results in micrograms per liter)

Sample No.	I00
Date Sampled	05/05/94
Aroclor 1016	1.0 UJ
Aroclor 1221	2.0 UJ
Aroclor 1232	1.0 UJ
Aroclor 1242	1.0 UJ
Aroclor 1248	1.0 UJ
Aroclor 1254	1.0 UJ
Aroclor 1260	1.0 UJ

TABLE 21
PESTICIDE ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-4	MW-5	MW-6	MW-7	MW-10	MW-7DUP	MW-11
Date Sampled	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/31/94
alpha-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U	0.069	0.050 U	0.14	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

TABLE 21 (Continued)
PCB ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-4	MW-5	MW-6	MW-7	MW-10	MW-7DUP	MW-11
Date Sampled	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/30/94	08/31/94
Aroclor 1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1221	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor 1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1248	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

TABLE 21 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-13	MW-12	MW-1	MW-2	MW-14	MW-14DUP	MW-15
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
alpha-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

TABLE 21 (Continued)
PCB ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-13	MW-12	MW-1	MW-2	MW-14	MW-14DUP	MW-15
Date Sampled	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94	08/31/94
Aroclor 1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1221	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor 1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1248	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

TABLE 21 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-9
Date Sampled	08/31/94
alpha-BHC	0.050 U
beta-BHC	0.050 U
delta-BHC	0.050 U
gamma-BHC (Lindane)	0.050 UJ
Heptachlor	0.050 UJ
Aldrin	0.050 UJ
Heptachlor epoxide	0.050 U
Endosulfan I	0.050 U
Dieldrin	0.10 UJ
4,4'-DDE	0.10 U
Endrin	0.10 UJ
Endosulfan II	0.10 U
4,4'-DDD	0.10 U
Endosulfan sulfate	0.10 U
4,4'-DDT	0.10 UJ
Methoxychlor	0.50 U
Endrin ketone	0.10 U
Endrin aldehyde	0.10 U
alpha-Chlordane	0.050 U
gamma-Chlordane	0.050 U
Toxaphene	5.0 U

TABLE 21 (Continued)
PCB ANALYTICAL RESULTS FOR GROUNDWATER (MONITORING WELLS)
(All results in micrograms per liter)

Sample No.	MW-9
Date Sampled	08/31/94
Aroclor 1016	1.0 U
Aroclor 1221	2.0 U
Aroclor 1232	1.0 U
Aroclor 1242	1.0 U
Aroclor 1248	1.0 U
Aroclor 1254	1.0 U
Aroclor 1260	1.0 U

TABLE 22
PESTICIDE ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	I00	I00-DUO	K600W	E1600S	A1000S	H1800S
Date Sampled	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
alpha-BHC	0.050 U[a]	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.026 J[b]
delta-BHC	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan II	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value outside calibration range or outside quality control limits

TABLE 22 (Continued)
PCB ANALYTICAL RESULTS FOR SURFACE WATER
(All results in micrograms per liter)

Sample No.	I00	I00-DUP	K600W	E1600S	A1000S	H1800S
Date Sampled	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94	06/09/94
Aroclor 1016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1221	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor 1232	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1242	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1248	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1254	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor 1260	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

TABLE 23
PESTICIDE ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	F1400S	K600N	I00	L1200S	L1200S-DUP	J1400S
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
alpha-BHC	3.7 U[a]	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
beta-BHC	3.7 U	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
delta-BHC	3.7 U	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
gamma-BHC (Lindane)	3.7 UJ	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
Heptachlor	3.7 UJ	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
Aldrin	3.7 UJ	4.8 J[b]	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
Heptachlor epoxide	3.7 U	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
Endosulfan I	3.7 U	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
Dieldrin	7.2 UJ	14 UJ	2.5 U	2.4 UJ	5.7 UJ	8.5 UJ
4,4'-DDE	23	14 UJ	4.8 J	2.8 J	5.7 J	8.5 UJ
Endrin	7.2 UJ	14 UJ	4.8 U	4.6 UJ	5.7 UJ	8.5 UJ
Endosulfan II	7.2 U	14 UJ	4.8 U	4.6 UJ	5.7 UJ	8.5 UJ
4,4'-DDD	13	9.6 J	3.1 J	4.6 UJ	5.7 UJ	8.5 UJ
Endosulfan sulfate	7.2 U	14 UJ	4.8 U	4.6 UJ	5.7 UJ	8.5 UJ
4,4'-DDT	45 J	14 UJ	4.8 U	4.6 UJ	5.7 UJ	8.5 UJ
Methoxychlor	37 U	71 UJ	25 U	24 UJ	29 UJ	44 UJ
Endrin ketone	7.2 U	14 UJ	4.8 U	4.6 UJ	5.7 UJ	8.5 UJ
Endrin aldehyde	7.2 U	14 UJ	4.8 U	4.6 UJ	5.7 UJ	8.5 UJ
alpha-Chlordane	3.7 U	7.1 UJ	2.5 U	2.4 UJ	2.9 UJ	4.4 UJ
gamma-Chlordane	3.7 U	7.1 UJ	2.5 U	1.8 J	3.6 J	2.5 J
Toxaphene	370 U	710 UJ	250 U	240 UJ	290 UJ	440 UJ

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value outside calibration range or outside quality control limits

TABLE 23 (Continued)
PCB ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	F1400S	K600N	I00	J1200S	L1200S	J1400S
Date Sampled	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94	05/05/94
Aroclor 1016	72 U	140 UJ	48 U	46 UJ	57 UJ	85 UJ
Aroclor 1221	140 U	280 UJ	98 U	93 UJ	120 UJ	170 UJ
Aroclor 1232	72 U	140 UJ	48 U	46 UJ	57 UJ	85 UJ
Aroclor 1242	72 U	140 UJ	48 U	46 UJ	57 UJ	85 UJ
Aroclor 1248	72 U	140 UJ	48 U	46 UJ	57 UJ	85 UJ
Aroclor 1254	72 U	140 UJ	48 U	46 UJ	57 UJ	85 UJ
Aroclor 1260	72 U	140 UJ	48 U	46 UJ	57 UJ	85 UJ

TABLE 23 (Continued)
PESTICIDE ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
alpha-BHC	10 U	7.4 U	4.9 U
beta-BHC	10 U	7.4 U	4.9 U
delta-BHC	10 U	7.4 U	4.9 U
gamma-BHC (Lindane)	10 U	7.4 U	4.9 U
Heptachlor	10 U	7.4 U	4.9 U
Aldrin	10 U	7.4 U	4.9 U
Heptachlor epoxide	10 U	7.4 U	4.9 U
Endosulfan I	10 U	7.4 U	4.4 U
Dieldrin	19 U	14 U	9.4 U
4,4'-DDE	19 U	14 U	9.4 U
Endrin	19 U	14 U	9.4 U
Endosulfan II	19 U	14 U	9.4 U
4,4'-DDD	19 U	14 U	9.4 U
Endosulfan sulfate	19 U	14 U	9.4 U
4,4'-DDT	19 U	14 U	9.4 U
Methoxychlor	100 U	74 U	49 U
Endrin ketone	19 U	14 U	9.4 U
Endrin aldehyde	19 U	14 U	9.4 U
alpha-Chlordane	10 U	7.4 U	4.9 U
gamma-Chlordane	10 U	7.4 U	4.9 U
Toxaphene	1000 U	740 U	190 U

TABLE 23 (Continued)
PCB ANALYTICAL RESULTS FOR SEDIMENT
(All results in micrograms per kilogram)

Sample No.	SED-1	SED-1-DUP	SED-2
Date Sampled	09/14/94	09/14/94	09/14/94
Aroclor 1016	190 U	140 U	94 U
Aroclor 1221	3900 U	290 U	190 U
Aroclor 1232	190 U	140 U	94 U
Aroclor 1242	190 U	140 U	94 U
Aroclor 1248	220 J	270 J	94 U
Aroclor 1254	240 J	140 U	94 U
Aroclor 1260	190 U	140 U	94 U

TABLE 24
PESTICIDE ANALYTICAL RESULTS FOR TRENCH SOIL
(All results in micrograms per kilogram)

Sample No.	T2-1	T2-1-DUP	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
alpha-BHC	2.1 U[a]	2.3 U	2.2 U
beta-BHC	2.1 U	2.3 U	2.2 U
delta-BHC	2.1 U	2.3 U	2.2 U
gamma-BHC (Lindane)	2.1 U	2.3 U	2.2 U
Heptachlor	2.1 U	2.3 U	2.2 U
Aldrin	2.1 U	2.3 U	2.2 UJ
Heptachlor epoxide	2.1 U	2.3 U	2.2 U
Endosulfan I	2.1 U	2.3 U	2.2 U
Dieldrin	4.1 U	4.4 U	4.3 U
4,4'-DDE	4.1 U	4.4 U	4.8 UJ
Endrin	4.1 U	4.4 U	4.3 U
Endosulfan II	4.1 U	4.4 U	4.3 U
4,4'-DDD	15 UJ[a,b]	4.4 U	15 UJ
Endosulfan sulfate	4.1 U	4.4 U	4.3 U
4,4'-DDT	11 UJ	4.4 U	4.3 U
Methoxychlor	21 U	23 U	22 U
Endrin ketone	4.1 U	4.4 U	4.3 U
Endrin aldehyde	4.1 U	4.4 U	4.3 U
alpha-Chlordane	8.6 UJ	2.4 UJ	5.7 UJ
gamma-Chlordane	5.5 UJ	2.3 U	2.3 UJ
Toxaphene	210 U	230 U	220 U

Notes:

a U = Not detected; number is sample detection limit

b J = Concentration estimated because value outside quality control limits or elevated due to PCB interferences

TABLE 24 (Continued)
PCB ANALYTICAL RESULTS FOR TRENCH SOIL
(All results in micrograms per kilogram)

Sample No.	T2-1	T2-1-DUP	T3-1
Date Sampled	10/12/94	10/12/94	10/13/94
Aroclor 1016	41 U	44 U	310
Aroclor 1221	83 U	89 U	87 U
Aroclor 1232	41 U	44 U	43 U
Aroclor 1242	41 U	44 U	43 U
Aroclor 1248	41 U	44 U	43 U
Aroclor 1254	110 J	44 U	210
Aroclor 1260	41 U	44 U	180 J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

A400N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-02

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0401590.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 463-58-1	Carbonyl sulfide	3.245	26	NJ
2. 106-97-8	Butane	3.849	12	NJ
3. 75-12-7	Formamide	6.206	6	NJ
4. 0-00-0	1-Butanamine, N-nitro-	8.284	7	NJ
5.	SILOXANE	15.473	12	UJ ~~NJ~~
6.	SILOXANE	15.522	13	UJ ~~NJ~~
7. 637-50-3	Benzene, 1-propenyl-	17.092	6	NJ
8. 124-19-6	Nonanal	17.962	12	UJ ~~NJ~~
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

A400N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0201304.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 496-11-7	Indane	7.717	8	NJ
2. 90-12-0	Naphthalene, 1-methyl-	11.372	10	NJ
3. 581-40-8	Naphthalene, 2,3-dimethyl-	12.598	2	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

A800N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0801568.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/03/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 115-07-1	Propene	3.200	6	NJ
2.	Sulfamide	4.240	15	UJ ~~NJB~~
3. 75-12-7	Formamide	6.205	7	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

A800N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0101303.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 74367-33-2	Propanoic acid, 2-methyl-, 2	11.780	2	NJ
2. 13623-11-5	Thiazole, 2,4,5-trimethyl-	14.591	2	NJ
3. 55334-18-4	9,9'-Biphenanthrene, octacos	17.070	9	NJ
4. 17334-55-3	1H-Cyclopropa[a]naphthalene,	17.274	5	NJ
5. 778-22-3	Benzene, 1,1'-(1-methylethyl	26.371	2	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOO-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-19

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1201690.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1070-71-9	Propiolonitrile	3.290	8	NJ
2. 593-70-4	Methane, chlorofluoro-	3.770	7	NJ
3.	SULFAMIDE	4.240	10	UJ ~~NJ~~
4. 60-29-7	Ethane, 1,1'-oxybis-	5.600	18	NJ
5. 1066-40-6	Siloxane	8.300	11	UJ ~~NJ~~
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RM 10-18-94

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-19

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0301364.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/07/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/31/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.008	34	UJ ~~NJB~~
2.	Oxygenated Hydrocarbon	9.390	7	NJ
3. 99-87-6	Benzene, 1-methyl-4-(1-methy	9.534	9	NJ
4.	Oxygenated Hydrocarbon	10.040	9	NJ
5. 0-00-0	4-ACETYLMORPHOLINE	10.121	16	NJ
6. 585-34-2	Phenol, m-tert-butyl-	11.246	12	NJ
7. 492-37-5	Benzeneacetic acid, .alpha.-	11.987	12	NJ
8. 1007-48-3	4-Pyridinemethanol, acetate	12.536	12	NJ
9. 102-46-5	Benzene, 4-(chloromethyl)-1,	13.009	7	NJ
10. 98-73-7	Benzoic acid, p-tert-butyl-	13.507	17	NJ
11. 126-73-8	Phosphoric acid tributyl est	13.661	9	NJ
12. 134-62-3	Diethyltoluamide	14.363	10	NJ
13. 119-39-1	Phthalazin-1-one	14.555	40	NJ
14. 126-73-8	Phosphoric acid tributyl est	14.951	36	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.156	26	NJ
16. 934-34-9	2(3H)-Benzothiazolone	15.398	47	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.705	20	NJ
18. 0-00-0	Imidazole, 4-amino-5-ethylox	16.931	11	NJ
19.	Oxygenated Hydrocarbon	19.080	8	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	20.854	10	NJ
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NM 10-13-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOO-GWFD

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-20FD

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1301691.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1070-71-9	Propiolonitrile	3.290	8	NJ
2. 593-70-4	Methane, chlorofluoro-	3.770	8	NJ
3.	Sulfamide	4.240	18	UJ ~~NJ~~
4. 60-29-7	Ethane, 1,1'-oxybis-	5.600	18	NJ
5. 1066-40-6	Siloxane	8.300	11	UJ ~~NJ~~
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WM 10-17-94

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B00-GWFD

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-20FD

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0401365.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/07/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/31/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.008	22	~~NJB~~ UJ
2.	Oxygenated Hydrocarbon	7.630	19	NJ
3. 36976-64-4	Pentanoic acid, 4,4-dimethyl	9.394	7	NJ
4. 99-87-6	Benzene, 1-methyl-4-(1-methy	9.535	11	NJ
5. 16747-50-5	Cyclopentane, 1-ethyl-1-meth	10.059	8	NJ
6. 0-00-0	4-ACETYLMORPHOLINE	10.123	12	NJ
7. 98-54-4	Phenol, p-tert-butyl-	11.247	11	NJ
8.	Oxygenated Hydrocarbon	12.540	13	NJ
9. 2870-04-4	Benzene, 2-ethyl-1,3-dimethy	13.010	7	NJ
10. 98-73-7	Benzoic acid, p-tert-butyl-	13.509	15	NJ
11. 126-73-8	Phosphoric acid tributyl est	13.675	10	NJ
12. 134-62-3	Diethyltoluamide	14.365	10	NJ
13. 119-39-1	Phthalazin-1-one	14.557	35	NJ
14. 126-73-8	Phosphoric acid tributyl est	14.953	28	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.158	24	NJ
16. 934-34-9	2(3H)-Benzothiazolone	15.413	45	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.720	18	NJ
18.	Oxygenated Hydrocarbon	16.930	9	NJ
19.	Oxygenated Hydrocarbon	19.080	10	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	20.857	8	NJ
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KM 10-13-9

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1400N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35723-09

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0401736.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/09/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	Sulfamide	4.210	14	UJ ~~NJB~~
2. 60-29-7	ETHANE,1,1'-oxybis-	7.760	8	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1400N-GW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-09

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0901540.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/10/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.570	17	UJ ~~NJ~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.970	4	NJ
3. 10471-14-4	Ethane, 1-ethoxy-1-methoxy-	8.020	5	NJ
4. 756-02-5	1,4-Pentadiene, 2,3,3-trimet	11.363	3	NJ
5. 585-34-2	Phenol, m-tert-butyl-	11.759	5	NJ
6.	Cyclic Hydrocarbon	12.490	2	NJ
7. 95-54-5	1,2-Benzenediamine	12.960	4	NJ
8. 28732-78-7	Pyrido[2,3-d]pyrimidine, 4-m	15.056	2	NJ
9. 126-73-8	Phosphoric acid, tributyl es	15.478	5	NJ
10. 80-39-7	Benzenesulfonamide, N-ethyl-	15.682	6	NJ
11. 934-34-9	2(3H)-Benzothiazolone	15.823	8	NJ
12. 80-39-7	Benzenesulfonamide, N-ethyl-	16.232	4	NJ
13. 10544-50-0	Sulfur, mol. (S8)	19.273	2	NJ
14. 80-05-7	Phenol, 4,4'-(1-methylethyli	20.052	6	NJ
15.	Saturated Hydrocarbon >C20	22.720	3	NJ
16. 646-31-1	Saturated Hydrocarbon >C20	23.580	2	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1800N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-10

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0301735.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/09/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	115-11-7	1-Propene, 2-methyl-	4.752	11	NJ
2.	75-12-7	Formamide	6.165	5	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1800N-GW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1001541.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/10/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.570	10	UJ ~~NJ~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.980	3	NJ
3. 10471-14-4	Ethane, 1-ethoxy-1-methoxy-	8.027	3	NJ
4.	Cyclic Hydrocarbon	9.510	2	NJ
5. 0-00-0	3-Methoxy-1-butene	10.107	2	NJ
6. 7058-01-7	Cyclohexane, (1-methylpropyl	10.631	4	NJ
7. 0-00-0	CYCLOHEXENE, 1,3-DIMETHYL-	11.385	3	NJ
8. 98-54-4	Phenol, p-tert-butyl-	11.768	6	NJ
9. 16957-70-3	2-Pentenoic acid, 2-methyl-,	11.922	4	NJ
10. 398-23-2	1,1'-Biphenyl, 4,4'-difluoro	12.509	2	NJ
11. 134-62-3	Diethyltoluamide	14.925	3	NJ
12. 140-66-9	Phenol, 4-(1,1,3,3-tetrameth	15.142	2	NJ
13. 126-73-8	Phosphoric acid tributyl est	15.487	6	NJ
14. 80-39-7	Benzenesulfonamide, N-ethyl-	15.692	10	NJ
15. 934-34-9	2(3H)-Benzothiazolone	15.896	50	NJ
16. 80-39-7	Benzenesulfonamide, N-ethyl-	16.254	5	NJ
17. 37052-13-4	1H-Phenanthro[9,10-d]imidazo	18.413	3	NJ
18.	Unsaturated Hydrocarbon	18.630	4	NJ
19. 538-51-2	Benzenamine, N-(phenylmethyl	19.985	3	NJ
20. 80-05-7	Phenol, 4,4'-(1-methylethyli	20.075	6	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1800N-GW-D

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-11

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0365.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1800N-GW-D

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-11

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1101542.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/10/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.570	15	UJ ~~NJ~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.977	3	NJ
3. 10471-14-4	Ethane, 1-ethoxy-1-methoxy-	8.028	4	NJ
4.	Oxygenated Hydrocarbon	10.630	4	NJ
5. 0-00-0	CYCLOHEXENE, 1,3-DIMETHYL-	11.390	3	NJ
6. 585-34-2	Phenol, m-tert-butyl-	11.770	6	NJ
7.	Oxygenated Hydrocarbon	11.920	4	NJ
8. 74367-33-2	Propanoic acid, 2-methyl-, 2	12.511	4	NJ
9.	Oxygenated Hydrocarbon	12.970	2	NJ
10. 134-62-3	Diethyltoluamide	14.926	2	NJ
11. 126-73-8	Phosphoric acid tributyl est	15.488	5	NJ
12.	Oxygenated Hydrocarbon	15.690	7	NJ
13. 934-34-9	2(3H)-Benzothiazolone	15.884	40	NJ
14. 64-77-7	Benzenesulfonamide, N-[(buty	16.242	5	NJ
15. 80-05-7	Phenol, 4,4'-(1-methylethyli	20.076	7	NJ
16. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.354	3	NJ
17.	Saturated Hydrocarbon >C20	22.250	5	NJ
18.	Saturated Hydrocarbon >C20	22.730	7	NJ
19.	Saturated Hydrocarbon >C20	23.170	6	NJ
20.	Saturated Hydrocarbon >C20	23.580	4	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B2600N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-06

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0352.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B2600N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-06

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0801407.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Oxygenated Hydrocarbon	8.140	4	NJ
2.	Oxygenated Hydrocarbon	8.330	5	NJ
3.	Oxygenated Hydrocarbon	8.780	4	NJ
4. 35194-33-3	7-Decen-2-one	8.918	7	NJ
5. 21293-01-6	2,4-Hexadiene, 3,4-dimethyl-	9.428	6	NJ
6. 756-02-5	1,4-Pentadiene, 2,3,3-trimet	10.323	4	NJ
7. 98-54-4	Phenol, p-tert-butyl-	10.668	6	NJ
8. 54376-39-5	Cyclopropane, tetramethylmet	10.987	4	NJ
9. 62238-30-6	Cyclohexane, 1-ethyl-1,4-dim	11.256	4	NJ
10.	Oxygenated Hydrocarbon	11.340	16	NJ
11. 398-23-2	1,1'-Biphenyl, 4,4'-difluoro	11.434	7	NJ
12. 1700-10-3	1,3-Cyclooctadiene	11.869	6	NJ
13. 120-33-2	Ethyl m-methylbenzoate	12.393	6	NJ
14. 0-00-0	4-Methylimino-toluene	12.712	5	NJ
15. 10544-50-0	Sulfur, mol. (S8)	13.031	5	NJ
16. 80-39-7	Benzenesulfonamide, N-ethyl-	14.501	5	NJ
17. 934-34-9	2(3H)-Benzothiazolone	14.693	10	NJ
18. 1907-65-9	Benzenesulfonamide, N-butyl-	15.050	4	NJ
19. 10544-50-0	Sulfur, mol. (S8)	17.939	42	NJ
20. 55590-77-7	Cyclohexanecarboxylic acid,	22.156	4	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B400S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-21

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1401692.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 75-07-0	Acetaldehyde	4.040	19	NJ
2.	Sulfamide	4.240	10	UJ ~~NJ~~ um 10-17-94
3. 60-29-7	Ethane,1,1'-oxybis-	5.600	18	NJ
4. 32038-83-8	2-Propynenitrile, 3-fluoro-	15.800	5	NJ
5. 565-75-3	Pentane, 2,3,4-trimethyl-	16.100	6	NJ
6. 620-14-4	Benzene, 1-ethyl-3-methyl-	16.270	9	NJ
7.	Saturated Hydrocarbon	16.510	13	NJ
8. 624-83-9	Methane, isocyanato-	16.810	9	NJ
9. 0-00-0	Lyratyl acetate	17.630	7	NJ
10. 933-98-2	Benzene, 1-ethyl-2,3-dimethy	18.280	8	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B400S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-21

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0501366.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/07/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/31/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.030	55	WJ ~~NJB~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.452	11	WJ ~~NJB~~
3. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.503	10	WJ ~~NJB~~
4. 13429-07-7	2-Propanol, 1-(2-methoxyprop	7.656	18	NJ
5.	Oxygenated Hydrocarbon	9.410	9	NJ
6.	Oxygenated Hydrocarbon	9.520	31	NJ
7. 0-00-0	4-ACETYLMORPHOLINE	10.150	8	NJ
8. 98-54-4	Phenol, p-tert-butyl-	11.260	15	NJ
9. 492-37-5	Benzeneacetic acid, .alpha.-	12.027	12	NJ
10.	Oxygenated Hydrocarbon	12.550	6	NJ
11.	Aromatic Hydrocarbon	12.860	6	NJ
12. 98-73-7	Benzoic acid, p-tert-butyl-	13.534	8	NJ
13. 0-00-0	OCTYL PHENOL ISOMER	14.582	23	NJ
14. 126-73-8	Phosphoric acid tributyl est	14.978	21	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.170	23	NJ
16. 934-34-9	2(3H)-Benzothiazolone	15.387	24	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.719	15	NJ
18.	Aromatic Hydrocarbon	16.420	8	NJ
19. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.578	34	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	20.856	9	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B800S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-17

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1001688.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-70-4	Methane, chlorofluoro-	3.770	9	NJ
2.	Sulfamide	4.260	16	UJ ~~NJ~~ wm 10-18-94
3. 64-17-5	Ethanol	5.380	14	NJ
4. 75-65-0	2-Propanol, 2-methyl-	6.840	45	NJ
5. 620-14-4	Benzene, 1-ethyl-3-methyl-	16.270	12	NJ
6. 0-00-0	6-Vinyl-2-norbornene	16.810	5	NJ
7. 104-76-7	1-Hexanol, 2-ethyl-	16.880	20	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B800S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-17

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0101380.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/07/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 107-92-6	Butanoic acid	4.340	100	NJ
2. 116-53-0	Butanoic acid, 2-methyl-	5.238	16	NJ
3. 111-76-2	Ethanol, 2-butoxy-	5.594	44	NJ
4. 4536-23-6	Hexanoic acid, 2-methyl-	6.445	37	NJ
5. 95-63-6	Benzene, 1,2,4-trimethyl-	6.928	22	NJ
6.	Unsaturated Hydrocarbon	7.030	54	NJ
7.	Oxygenated Hydrocarbon	7.090	67	NJ
8. 13429-07-7	2-Propanol, 1-(2-methoxyprop	7.220	12	NJ
9. 104-76-7	1-Hexanol, 2-ethyl-	7.424	140	NJ
10. 112-05-0	Nonanoic acid	10.539	15	NJ
11. 334-48-5	Decanoic acid	11.608	110	NJ
12. 934-34-9	2(3H)-Benzothiazolone	14.788	25	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.197	20	NJ
14. 123-66-0	Hexanoic acid, ethyl ester	15.401	21	NJ
15. 124-28-7	1-Octadecanamine, N,N-dimeth	16.692	110	NJ
16. 57-10-3	Hexadecanoic acid	17.126	18	NJ
17. 7704-34-9	Sulfur	18.097	64	NJ
18. 0-00-0	N,N-DIMETHYL-TRIDECYLAMINE	18.264	460	NJ
19. 80-05-7	Phenol, 4,4'-(1-methylethyli	18.979	42	NJ
20. 122-62-3	Decanedioic acid, bis(2-ethy	22.391	230	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1200S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-15

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0801686.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.260	21	UJ ~~NJ~~
2. 0-00-0	Unknown	12.730	6	NJ
3. 65824-17-1	8-ANTI-METHYLBICYCLO(3.2.1)O	15.060	7	NJ
4. 496-14-0	Phthalan	15.580	9	NJ
5. 108-67-8	Benzene, 1,3,5-trimethyl-	16.270	12	NJ
6. 7271-45-6	3-Mercapto-5-ethyl-1,2,4-tri	16.490	5	NJ
7. 0-00-0	.alpha.-Methoxy-.beta.-methy	16.810	7	NJ
8. 91-57-6	Naphthalene, 2-methyl-	16.990	170	NJ
9. 90-12-0	Naphthalene, 1-methyl-	17.600	320	NJ
10. 95-93-2	Benzene, 1,2,4,5-tetramethyl	18.290	5	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1200S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-15

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1401354.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.310	41	UJ ~~NJB~~
2. 526-73-8	Benzene, 1,2,3-trimethyl-	7.652	28	NJ
3. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.730	10	UJ ~~NJB~~
4. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.780	9	UJ ~~NJB~~
5. 535-77-3	Benzene, 1-methyl-3-(1-methy	9.415	8	NJ
6.	Siloxane	9.640	11	UJ ~~NJ~~
7. 1587-04-8	Benzene, 1-methyl-2-(2-prope	9.836	9	NJ
8. 68803-90-7	2-Cyclohexen-1-one, 3-(1,3-b	10.232	19	NJ
9. 103-95-7	3-(4-Isopropylphenyl)-2-meth	10.411	15	NJ
10. 90-12-0	Naphthalene, 1-methyl-	11.860	8	NJ
11. 128-37-0	Phenol, 2,6-bis(1,1-dimethyl	13.925	8	NJ
12. 126-73-8	Phosphoric acid tributyl est	15.216	24	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.459	15	NJ
14. 934-34-9	2(3H)-Benzothiazolone	15.650	19	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.995	9	NJ
16. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.804	26	NJ
17. 483-65-8	Phenanthrene, 1-methyl-7-(1-	20.149	9	NJ
18. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.110	10	NJ
19. 192-97-2	Benzo(e)pyrene	23.620	10	NJ
20. 624-03-3	Hexadecanoic acid, 1,2-ethan	27.844	10	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1600S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-14

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0701685.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 622-96-8	Benzene, 1-ethyl-4-methyl-	15.710	14	NJ
2. 620-14-4	Benzene, 1-ethyl-3-methyl-	15.770	21	NJ
3. 108-67-8	Benzene, 1,3,5-trimethyl-	16.060	14	NJ
4. 108-67-8	Benzene, 1,3,5-trimethyl-	16.270	94	NJ
5. 108-67-8	Benzene, 1,3,5-trimethyl-	16.820	43	NJ
6. 496-11-7	1H-Indene, 2,3-dihydro-	17.100	220	NJ
7. 95-93-2	Benzene, 1,2,4,5-tetramethyl	17.630	15	NJ
8. 933-98-2	Benzene, 1-ethyl-2,3-dimethy	18.200	12	NJ
9. 933-98-2	Benzene, 1-ethyl-2,3-dimethy	18.280	27	NJ
10. 2039-89-6	Benzene, 2-ethenyl-1,4-dimet	18.730	19	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B1600S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0801387.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	5.580	21	UJ ~~NJ~~
2. 95-36-3	1,2,4-Trimethylbenzene	6.915	55	NJ
3. 2039-89-6	Benzene, 2-ethenyl-1,4-dimet	9.089	26	NJ
4. 90-12-0	Naphthalene, 1-methyl-	11.086	95	NJ
5. 575-37-1	Naphthalene, 1,7-dimethyl-	12.105	25	NJ
6.	Oxygenated Hydrocarbon	14.630	23	NJ
7. 934-34-9	2(3H)-Benzothiazolone	14.760	21	NJ
8.	Unsaturated Hydrocarbon	17.070	100	NJ
9.	Unsaturated Hydrocarbon	17.280	110	NJ
10.	Unsaturated Hydrocarbon	17.520	830	NJ
11.	Polynuclear Aromatic Hydroca	17.780	77	NJ
12. 10544-50-0	Sulfur, mol. (S8)	18.090	39	NJ
13. 0-00-0	3-(N,N-Diethylamino)carbazol	18.401	38	NJ
14. 483-65-8	Phenanthrene, 1-methyl-7-(1-	19.321	160	NJ
15. 438-23-3	Androstane, (5.beta.)-	20.780	30	NJ
16.	Unsaturated Hydrocarbon >C20	23.510	23	NJ
17.	Unsaturated Hydrocarbon >C20	23.880	22	NJ
18.	Unsaturated Hydrocarbon	24.270	22	NJ
19.	Unsaturated Hydrocarbon	24.700	20	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B2000S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-13

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E2301755.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.230	26	UJ ~~NJB~~
2. 865-40-7	Methane, nitroso	5.510	10	NJ
3. 1066-40-6	Siloxane	8.230	6	UJ ~~NJ~~
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B2000S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-13

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1301353.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 15

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.310	25	UJ ~~NJB~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.715	6	UJ ~~NJ~~
3. 20324-32-7	2-Propanol,1-(2-methoxy-1-me	7.770	6	UJ ~~NJ~~
4.	Aromatic Hydrocarbon	10.410	4	NJ
5. 68803-90-7	2-Cyclohexen-1-one, 3-(1,3-b	11.140	2	NJ
6. 126-73-8	Phosphoric acid tributyl est	15.213	8	NJ
7. 80-39-7	Benzenesulfonamide, N-ethyl-	15.444	6	NJ
8. 934-34-9	2(3H)-Benzothiazolone	15.597	10	NJ
9. 80-39-7	Benzenesulfonamide, N-ethyl-	15.980	4	NJ
10.	Oxygenated Hydrocarbon	18.330	2	NJ
11. 10544-50-0	Sulfur, mol. (S8)	18.980	4	NJ
12. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.801	6	NJ
13. 483-65-8	Phenanthrene, 1-methyl-7-(1-	20.146	2	NJ
14. 39777-68-9	2,4-Di-tert-butyl-6-isopropy	21.053	3	NJ
15. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.104	4	NJ
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C400N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0701739.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/09/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	60-29-7	Ether	5.537	10	NJ
2.	4744-10-9	Propane, 1,1-dimethoxy-	8.232	11	NJ
3.	61142-25-4	Cyclopropane, 1-(1,1-dimethy	15.904	7	NJ
4.	527-84-4	Benzene, 1-methyl-2-(1-methy	17.595	6	NJ
5.	78-81-9	1-Propanamine, 2-methyl-	17.885	16	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C400N-GW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0201401.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 13429-07-7	2-Propanol, 1-(2-methoxyprop	7.030	9	NJ
2. 57706-88-4	3-Octanol, 3,7-dimethyl-, (.	8.244	26	NJ
3. 99-87-6	Benzene, 1-methyl-4-(1-methy	8.909	7	NJ
4.	Oxygenated Hydrocarbon	9.980	6	NJ
5. 85-44-9	Phthalic anhydride	10.877	15	NJ
6. 88-99-3	1,2-Benzenedicarboxylic acid	10.953	54	NJ
7. 492-37-5	Benzeneacetic acid, .alpha.-	11.388	9	NJ
8. 499-06-9	Benzoic acid, 3,5-dimethyl-	11.924	7	NJ
9. 99-87-6	Benzene, 1-methyl-4-(1-methy	12.384	7	NJ
10. 98-73-7	Benzoic acid, p-tert-butyl-	12.895	11	NJ
11.	Polynuclear Aromatic Hydroca	13.010	8	NJ
12. 134-62-3	Diethyltoluamide	13.713	8	NJ
13. 0-00-0	Phenol, 4-(2,2,4-trimethylpe	13.917	12	NJ
14. 80-39-7	Benzenesulfonamide, N-ethyl-	14.493	32	NJ
15. 934-34-9	2(3H)-Benzothiazolone	14.697	42	NJ
16. 64-77-7	Benzenesulfonamide, N-[(buty	15.042	20	NJ
17. 10544-50-0	Sulfur, mol. (S8)	17.879	26	NJ
18. 85-69-8	1,2-Benzenedicarboxylic acid	18.172	10	NJ
19. 85-69-8	1,2-Benzenedicarboxylic acid	18.288	11	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	20.281	9	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C800N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-02

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0901741.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-70-4	Methane, chlorofluoro-	3.737	9	NJ
2. 75-07-0	Acetaldehyde	4.003	6	NJ
3. 60-29-7	Ether	5.537	20	NJ
4. 00-00-00	SILOXANE	8.231	30	UJ ~~NJ~~ um 10-17-94
5. 109-99-9	Furan, tetrahydro-	8.896	9	NJ
6. 26952-21-6	Isooctanol	16.314	17	NJ
7. 0-00-0	1-(2-Hydroxyethoxy)-2-methyl	16.410	8	NJ
8. 760-20-3	1-Pentene, 3-methyl-	16.930	27	NJ
9. 124-19-6	Nonanal	17.932	12	NJ
10. 112-17-4	Acetic acid, decyl ester	18.657	7	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C800N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0301402.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/06/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Siloxane	3.920	14	UJ ~~NJ~~
2. 0-00-0	1-Acetoxy-2-propanol	5.061	55	NJ
3.	Oxygenated Hydrocarbon	8.770	60	NJ
4. 99-87-6	Benzene, 1-methyl-4-(1-methy	8.919	63	NJ
5.	Oxygenated Hydrocarbon	11.960	23	NJ
6. 98-73-7	Benzoic acid, p-tert-butyl-	12.957	24	NJ
7. 143-07-7	Dodecanoic acid	13.622	110	NJ
8. 119-39-1	Phthalazin-1-one	13.941	36	NJ
9.	Oxygenated Hydrocarbon	14.120	18	NJ
10. 126-73-8	Phosphoric acid tributyl est	14.402	26	NJ
11. 50652-82-9	2-Hexenoic acid, 2-methyl-,	14.491	35	NJ
12. 934-34-9	2(3H)-Benzothiazolone	14.772	17	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.105	17	NJ
14.	Oxygenated Hydrocarbon	15.280	44	NJ
15.	Oxygenated Hydrocarbon	16.320	160	NJ
16.	Oxygenated Hydrocarbon	16.960	19	NJ
17. 10544-50-0	Sulfur, mol. (S8)	17.990	150	NJ
18. 131-16-8	1,2-Benzenedicarboxylic acid	18.273	21	NJ
19. 84-69-5	1,2-Benzenedicarboxylic acid	18.401	35	NJ
20. 80-05-7	Phenol, 4,4'-(1-methylethyli	18.950	17	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C2200N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-07

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1401746.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 0-00-0	Sulfamide	4.232	41	UJ ~~NJB~~	um10.12.4
2. 60-29-7	ETHANE,1,1'-oxybis-	5.549	9	NJ	
3. 1066-40-6	Silanol, trimethyl-	8.244	11	UJ ~~NJ~~	um10.12.4
4. 108-87-2	Cyclohexane, methyl-	10.757	8	NJ	
5. 637-50-3	Benzene, 1-propenyl-	17.052	7	NJ	
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E600N-GW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-14

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1301544.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/10/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.590	13	UJ ~~NJ~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	8.038	7	NJ
3. 56554-53-1	Hexanoic acid, 3,5,5-trimeth	9.927	5	NJ
4. 29006-02-8	Butanoic acid, 4-methoxy-	10.629	16	NJ
5. 592-41-6	1-Hexene	11.613	6	NJ
6. 585-34-2	Phenol, m-tert-butyl-	11.792	10	NJ
7. 62338-24-3	Ethanone, 1-(4,5-diethyl-2-m	13.108	5	NJ
8.	Oxygenated Hydrocarbon	13.150	6	NJ
9. 10544-50-0	Sulfur, mol. (S8)	14.335	6	NJ
10.	Nitrogen Compound	14.690	7	NJ
11. 119-39-1	Phthalazin-1-one	15.101	42	NJ
12. 126-73-8	Phosphoric acid, tributyl es	15.523	52	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.740	32	NJ
14. 934-34-9	2(3H)-Benzothiazolone	15.906	16	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	16.277	17	NJ
16. 10544-50-0	Sulfur, mol. (S8)	19.305	10	NJ
17.	Oxygenated Hydrocarbon	19.690	12	NJ
18. 1198-37-4	Quinoline, 2,4-dimethyl-	20.071	13	NJ
19.	Oxygenated Hydrocarbon	20.890	8	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.363	11	NJ
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E2600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-15

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1601602.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 115-07-1	1-Propene	3.200	9	NJ
2. 593-70-4	Methane, chlorofluoro-	3.777	17	NJ
3.	Sulfamide	4.240	13	UJ ~~NJB~~
4. 60-29-7	Ether	5.580	26	NJ
5.	Siloxane	8.280	22	UJ ~~NJ~~
6. 109-99-9	Furan, tetrahydro-	8.940	8	NJ
7. 19549-80-5	2-Heptanone, 4,6-dimethyl-	16.260	5	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E2600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-15

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1101313.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Siloxane	4.220	17	UJ ~~NJ~~
2. 142-62-1	Hexanoic acid	7.244	13	NJ
3. 576-26-1	Phenol, 2,6-dimethyl-	8.739	15	NJ
4.	Oxygenated Hydrocarbon	8.820	10	NJ
5.	Oxygenated Hydrocarbon	9.580	25	NJ
6.	Oxygenated Hydrocarbon	10.250	16	NJ
7.	Oxygenated Hydrocarbon	10.592	7	NJ
8. 490-10-8	Nepetalactone	10.800	14	NJ
9.	Oxygenated Hydrocarbon	10.960	120	NJ
10. 98-73-7	Benzoic acid, p-tert-butyl-	13.430	12	NJ
11. 119-39-1	Phthalazin-1-one	14.477	150	NJ
12.	Oxygenated Hydrocarbon	14.640	11	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.100	51	NJ
14. 934-34-9	2(3H)-Benzothiazolone	15.307	37	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.653	30	NJ
16. 622-37-7	Benzene, azido-	16.406	27	NJ
17.	Oxygenated Hydrocarbon	16.870	43	NJ
18. 10544-50-0	Sulfur, mol. (S8)	18.668	96	NJ
19.	Siloxane	19.100	13	UJ ~~NJ~~
20. 0-00-0	1,8-DIAZA-2,9-DIKETOCYCLOTET	20.381	14	NJ
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E600S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-13

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0349.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E600S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-13

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1201543.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/10/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 95-63-6	Benzene, 1,2,4-trimethyl-	7.913	9	NJ
2. 10306-94-2	4-Octyne, 2-methyl-	9.433	5	NJ
3. 56554-53-1	Hexanoic acid, 3,5,5-trimeth	9.905	5	NJ
4.	Oxygenated Hydrocarbon	9.970	4	NJ
5. 527-84-4	Benzene, 1-methyl-2-(1-methy	10.122	6	NJ
6.	Saturated Hydrocarbon C10-C2	10.650	6	NJ
7. 105-54-4	Butanoic acid, ethyl ester	11.489	4	NJ
8. 585-34-2	Phenol, m-tert-butyl-	11.783	14	NJ
9. 934-74-7	Benzene, 1-ethyl-3,5-dimethy	13.507	3	NJ
10. 134-62-3	Diethyltoluamide	14.926	5	NJ
11. 126-73-8	Phosphoric acid tributyl est	15.500	29	NJ
12. 80-39-7	Benzenesulfonamide, N-ethyl-	15.730	24	NJ
13. 934-34-9	2(3H)-Benzothiazolone	15.909	24	NJ
14. 80-39-7	Benzenesulfonamide, N-ethyl-	16.267	12	NJ
15.	Oxygenated Hydrocarbon	17.610	10	NJ
16. 10544-50-0	Sulfur, mol. (S8)	19.308	9	NJ
17.	Oxygenated Hydrocarbon	19.680	14	NJ
18. 80-05-7	Phenol, 4,4'-(1-methylethyli	20.088	19	NJ
19. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.350	13	NJ
20.	Oxygenated Hydrocarbon	23.190	6	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E1200S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-10

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0347.D

Level: (low/med) LOW Date Received: / /

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.2

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 00-00-0	UNKNOWN	2.630	51	NJ
2. 611-14-3	BENZENE, 1-ETHYL-2-METHYL-	15.250	15	NJ
3. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	16.020	34	NJ
4. 106-46-7	BENZENE, 1,4-DICHLORO-	16.580	15	NJ
5. 622-96-8	BENZENE, 1-ETHYL-4-METHYL-	16.680	14	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E1200S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1001389.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 620-14-4	Benzene, 1-ethyl-3-methyl-	6.433	14	NJ
2. 526-73-8	Benzene, 1,2,3-trimethyl-	6.535	13	NJ
3. 95-36-3	1,2,4-Trimethylbenzene	6.916	47	NJ
4. 14979-39-6	3-Heptanol, 4-methyl-	7.221	22	NJ
5. 98-82-8	Benzene, (1-methylethyl)-	7.349	23	NJ
6. 5026-76-6	1-Heptene, 6-methyl-	7.425	80	NJ
7. 873-94-9	Cyclohexanone, 3,3,5-trimeth	7.590	15	NJ
8.	Oxygenated Hydrocarbon	7.760	16	NJ
9. 29674-47-3	Butanoic acid, 2-hydroxy-, m	8.964	20	NJ
10. 76-22-2	Camphor	9.041	100	NJ
11. 535-77-3	Benzene, 1-methyl-3-(1-methy	9.104	25	NJ
12. 85-44-9	Phthalic anhydride	11.118	14	NJ
13.	Oxygenated Hydrocarbon	12.060	13	NJ
14.	Oxygenated Hydrocarbon	12.110	46	NJ
15. 98-73-7	Benzoic acid, p-tert-butyl-	13.022	16	NJ
16. 134-62-3	Diethyltoluamide	13.890	25	NJ
17. 126-73-8	Phosphoric acid, tributyl es	14.478	31	NJ
18.	Oxygenated Hydrocarbon	14.670	37	NJ
19. 934-34-9	2(3H)-Benzothiazolone	14.861	41	NJ
20. 80-39-7	Benzenesulfonamide, N-ethyl-	15.219	24	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1000N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-05

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1201744.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 0-00-0	Sulfamide	4.232	39	UJ ~~NJB~~	NM10/7/94
2. 18641-81-1	Ether, sec-butyl isopropyl	7.760	8	NJ	
3. 1066-40-6	Silanol, trimethyl-	8.231	15	UJ ~~NJ~~	NM10/7/94
4. 763-29-1	1-Pentene, 2-methyl-	9.294	9	NJ	
5. 108-87-2	Cyclohexane, methyl-	10.744	13	NJ	
6. 110-91-8	Morpholine	16.785	5	NJ	
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1000N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-05

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0701406.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/08/94

Concentrated Extract Volume: 1.0 (ml) Date Analyzed: 06/06/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	5.420	29	UJ ~~NJB~~
2. 20324-32-7	2-Propanol,1-(2-methoxy-1-me	6.920	7	UJ ~~NJB~~
3. 13429-07-7	2-Propanol,1-(2-methoxypropo	7.060	10	UJ ~~NJB~~
4. 100-61-8	Benzenamine, N-methyl-	7.790	10	NJ
5. 646-07-1	Pentanoic acid, 4-methyl-	8.372	6	NJ
6. 51134-03-3	Benzene, chloroisocyanato-	8.717	33	NJ
7. 98-54-4	Phenol, 2-(1,1-dimethylethyl	10.671	31	NJ
8. 85-44-9	Phthalic anhydride	10.952	8	NJ
9. 719-22-2	2,5-Cyclohexadiene-1,4-dione	12.549	11	NJ
10. 98-73-7	Benzoic acid, p-tert-butyl-	12.945	23	NJ
11. 119-39-1	Phthalazin-1-one	13.929	88	NJ
12. 39379-10-7	1,4-Benzenedicarboxylic acid	14.236	11	NJ
13. 4584-63-8	2,5-Cyclohexadiene-1,4-dione	14.453	8	NJ
14. 80-39-7	Benzenesulfonamide, N-ethyl-	14.530	21	NJ
15. 934-34-9	2(3H)-Benzothiazolone	14.734	10	NJ
16. 34176-91-5	Benzonitrile, m-phenethyl-	15.092	10	NJ
17. 10544-50-0	Sulfur, mol. (S8)	17.968	73	NJ
18. 143-24-8	2,5,8,11,14-Pentaoxapentadec	18.492	10	NJ
19. 502-42-1	Cycloheptanone	19.705	8	NJ
20. 101-61-1	Benzenamine, 4,4'-methyleneb	20.025	23	NJ
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NM 10-13-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-10

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1201598.D

Level: (low/med) LOW Date Received: 04/29/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 75-45-6	Methane, chlorodifluoro-	3.281	12	NJ
2. 593-70-4	Methane, chlorofluoro-	3.765	19	NJ
3.	SULFAMIDE	4.248	28	UJ ~~NJB~~
4. 60-29-7	Ether	5.577	33	NJ
5. 4744-10-9	Propane, 1,1-dimethoxy-	8.271	16	NJ
6. 109-99-9	Furan, tetrahydro-	8.936	8	NJ
7. 108-67-8	Benzene, 1,3,5-trimethyl-	16.247	12	NJ
8. 611-15-4	Benzene, 1-ethenyl-2-methyl-	17.081	8	NJ
9. 62238-11-3	Decane, 2,3,5-trimethyl-	17.565	64	NJ
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NM 10-17-94

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-10

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0801310.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Oxygenated Hydrocarbon	8.730	6	NJ
2. 99-87-6	Benzene, 1-methyl-4-(1-methy	8.840	8	NJ
3. 99-87-6	Benzene, 1-methyl-4-(1-methy	9.340	9	NJ
4.	Oxygenated Hydrocarbon	9.880	7	NJ
5.	Oxygenated Hydrocarbon	9.940	8	NJ
6. 13674-19-6	Cyclohexanemethanol, 4-(1-me	10.800	7	NJ
7. 98-54-4	Phenol, p-tert-butyl-	11.090	11	NJ
8. 50991-13-4	1,1'-Bicyclohexyl, 2-ethyl-,	11.600	7	NJ
9. 603-79-2	Benzoic acid, 2,3-dimethyl-	11.856	11	NJ
10. 100-55-0	Nicotinyl Alcohol	12.367	8	NJ
11. 499-06-9	Benzoic acid, 3,5-dimethyl-	12.431	12	NJ
12.	Aromatic Hydrocarbon	12.900	8	NJ
13. 98-73-7	Benzoic acid, p-tert-butyl-	13.430	18	NJ
14. 17629-27-5	Pyrazole, 3-(p-chlorophenyl)	13.590	10	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.080	28	NJ
16. 934-34-9	2(3H)-Benzothiazolone	15.280	35	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.625	16	NJ
18. 81-84-5	1,8-Naphthalic anhydride	18.500	9	NJ
19. 10544-50-0	Sulfur, mol. (S8)	18.628	46	NJ
20. 7343-06-8	Phenanthrene, 3,4,5,6-tetram	19.829	11	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F2200N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-02

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0358.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 00-00-0	UNKNOWN	2.650	89	NJ
2. 00-00-0	OXYGENATED HYDROCARBON	3.870	25	NJ
3. 1066-40-6	Siloxane	6.500	24	UJ ~~NJ~~
4. 00-00-0	OXYGENATED HYDROCARBON	10.600	30	NJ
5. 00-00-0	AROMATIC HYDROCARBON	18.370	18	NJ
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NM 10-17-94

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F2200N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1301337.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/09/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/24/94

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.452	48	UJ ~~NJB~~
2. 97-61-0	Pentanoic acid, 2-methyl-	7.435	64	NJ
3. 500-00-5	Cyclohexene, 4-methyl-1-(1-m	7.614	160	NJ
4. 3173-53-3	Cyclohexane, isocyanato-	7.844	38	NJ
5. 99-86-5	1,3-Cyclohexadiene, 1-methyl	8.100	23	NJ
6. 99-87-6	Benzene, 1-methyl-4-(1-methy	8.202	54	NJ
7. 5026-76-6	1-Heptene, 6-methyl-	8.292	29	NJ
8. 873-94-9	Cyclohexanone, 3,3,5-trimeth	8.470	26	NJ
9. 108-39-4	Phenol, 3-methyl-	8.956	88	NJ
10. 1195-79-5	Bicyclo[2.2.1]heptan-2-one,	9.160	22	NJ
11.	Oxygenated Hydrocarbon	9.360	8	NJ
12. 76-22-2	Camphor	9.939	19	NJ
13. 81532-21-0	5,9,9-Trimethyltricyclo[4.4.	10.361	39	NJ
14. 0-00-0	1,2-Di-tert-butylbenzene	10.553	12	NJ
15. 1122-82-3	Cyclohexane, isothiocyanato-	11.026	8	NJ
16. 68803-90-7	2-Cyclohexen-1-one, 3-(1,3-b	11.268	13	NJ
17. 501-52-0	Benzenepropanoic acid	12.265	18	NJ
18. 126-73-8	Phosphoric acid tributyl est	15.383	34	NJ
19. 80-39-7	Benzenesulfonamide, N-ethyl-	15.613	51	NJ
20. 934-34-9	2(3H)-Benzothiazolone	15.805	37	NJ
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F3000N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-16

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1701603.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-70-4	Methane, chlorofluoro-	3.760	35	NJ
2. 0-00-0	Sulfamide	4.272	32	UJ ~~NJB~~
3. 60-29-7	Ether	5.577	26	NJ
4.	Siloxane	8.270	28	UJ ~~NJ~~
5. 109-99-9	Furan, tetrahydro-	8.937	20	NJ
6. 123-15-9	Pentanal, 2-methyl-	15.703	16	NJ
7. 108-67-8	Benzene, 1,3,5-trimethyl-	16.247	26	NJ
8.	Saturated Hydrocarbon C10-C2	16.430	10	NJ
9. 7705-14-8	Cyclohexene, 1-methyl-4-(1-m	16.585	20	NJ
10. 620-14-4	Benzene, 1-ethyl-3-methyl-	16.791	18	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F3000N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-16

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0901311.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 107-92-6	Butanoic acid	4.230	18	NJ
2. 107-92-6	Butanoic acid	4.390	28	NJ
3. 116-53-0	Butanoic acid, 2-methyl-	5.520	24	NJ
4. 506-77-4	Cyanogen Chloride	5.850	50	NJ
5. 97-61-0	Pentanoic acid, 2-methyl-	6.710	26	NJ
6. 142-62-1	Hexanoic acid	7.270	57	NJ
7. 111-14-8	Heptanoic acid	8.500	13	NJ
8. 598-61-8	Cyclobutane, methyl-	8.727	3	NJ
9. 933-98-2	Benzene, 1-ethyl-2,3-dimethy	9.340	3	NJ
10. 112-05-0	Nonanoic acid	10.797	3	NJ
11. 112-05-0	Nonanoic acid	10.874	7	NJ
12.	Oxygenated Hydrocarbon	11.820	20	NJ
13. 143-07-7	Dodecanoic acid	13.979	8	NJ
14. 126-73-8	Phosphoric acid, tributyl es	14.873	18	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.065	22	NJ
16. 934-34-9	2(3H)-Benzothiazolone	15.244	23	NJ
17. 29002-54-8	4,5,6,7-Tetramethylphthalide	15.640	20	NJ
18. 57-10-3	Hexadecanoic acid	17.582	40	NJ
19. 78-51-3	Ethanol, 2-butoxy-, phosphat	20.868	13	NJ
20.	Oxygenated Hydrocarbon	22.740	12	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F3000N-GWFD

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-17FD

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1801604.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-70-4	Methane, chlorofluoro-	3.780	35	NJ
2. 0-00-0	Sulfamide	4.272	41	UJ ~~NJB~~
3. 60-29-7	Ether	5.580	25	NJ
4.	Siloxane	8.270	17	UJ ~~NJ~~
5. 109-99-9	Furan, tetrahydro-	8.936	21	NJ
6. 611-14-3	Benzene, 1-ethyl-2-methyl-	15.655	13	NJ
7. 95-63-6	Benzene, 1,2,4-trimethyl-	16.247	31	NJ
8. 7705-14-8	Cyclohexene, 1-methyl-4-(1-m	16.585	27	NJ
9. 526-73-8	Benzene, 1,2,3-trimethyl-	16.791	21	NJ
10. 527-84-4	Benzene, 1-methyl-2-(1-methy	17.093	14	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F3000N-GWFD

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-17FD

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1001312.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2094-97-5	1,3-Oxathiolane	3.870	8	NJ
2. 107-92-6	Butanoic acid	4.330	48	NJ
3. 506-77-4	Cyanogen chloride	5.851	35	NJ
4. 97-61-0	Pentanoic acid, 2-methyl-	6.657	20	NJ
5. 142-62-1	Hexanoic acid	7.244	30	NJ
6. 95-36-3	1,2,4-Trimethylbenzene	7.526	8	NJ
7. 598-61-8	Cyclobutane, methyl-	8.730	3	NJ
8.	Oxygenated Hydrocarbon	9.200	4	NJ
9. 95-93-2	Benzene, 1,2,4,5-tetramethyl	9.340	3	NJ
10. 1696-20-4	Morpholine, 4-acetyl-	9.928	3	NJ
11. 112-05-0	Nonanoic acid	10.860	6	NJ
12. 5626-90-4	N1,N4-Diacetyl sulphanilamid	12.432	8	NJ
13. 140-76-1	Pyridine, 5-ethenyl-2-methyl	12.841	6	NJ
14. 7634-70-0	Phenethylamine, .alpha.-buty	14.617	7	NJ
15. 126-73-8	Phosphoric acid, tributyl es	14.860	21	NJ
16. 80-39-7	Benzenesulfonamide, N-ethyl-	15.052	22	NJ
17. 934-34-9	2(3H)-Benzothiazolone	15.230	20	NJ
18.	Aromatic Hydrocarbon	15.640	11	NJ
19. 78-51-3	Ethanol, 2-butoxy-, phosphat	20.850	15	NJ
20. 84018-39-3	5,7-Dimethoxy-1-(prop-2'-eny	22.742	11	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F3600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-13

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0701567.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: not dec. _____ Data Analyzed: 05/03/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.260	22	UJ ~~NJB~~
2. 98-82-8	Benzene, (1-methylethyl)-	15.027	6	NJ
3. 0-00-0	Siloxane	15.860	72	UJ ~~NJ~~
4.	Siloxane	15.945	8	UJ ~~NJ~~
5. 540-18-1	Butanoic acid, pentyl ester	16.428	6	NJ
6. 300-57-2	Benzene, 2-propenyl-	17.081	9	NJ
7. 934-80-5	Benzene, 4-ethyl-1,2-dimethy	17.613	10	NJ
8. 3290-53-7	Benzene, (2-methyl-2-propeny	17.818	8	NJ
9. 95-93-2	Benzene, 1,2,4,5-tetramethyl	18.180	9	NJ
10. 95-93-2	Benzene, 1,2,4,5-tetramethyl	18.918	14	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F3600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-13

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1001298.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Oxygenated Hydrocarbon	8.850	14	NJ
2.	Oxygenated Hydrocarbon	9.310	24	NJ
3.	Oxygenated Hydrocarbon	10.000	20	NJ
4. 4926-78-7	Cyclohexane, 1-ethyl-4-methy	10.320	14	NJ
5. 507-70-0	Borneol	10.895	12	NJ
6. 88-18-6	Phenol, 2-(1,1-dimethylethyl	11.230	380	NJ
7. 610-72-0	Benzoic acid, 2,5-dimethyl-	11.994	37	NJ
8. 695-34-1	2-Pyridinamine, 4-methyl-	12.480	10	NJ
9. 933-98-2	Benzene, 1-ethyl-2,3-dimethy	12.824	14	NJ
10. 934-74-7	Benzene, 1-ethyl-3,5-dimethy	12.991	15	NJ
11.	Aromatic Hydrocarbon	13.320	10	NJ
12. 98-29-3	1,2-Benzenediol, 4-(1,1-dime	13.630	14	NJ
13. 10544-50-0	Sulfur, mol. (S8)	13.732	10	NJ
14. 126-73-8	Phosphoric acid tributyl est	14.997	19	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	15.176	17	NJ
16. 934-34-9	2(3H)-Benzothiazolone	15.380	36	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.738	16	NJ
18. 10544-50-0	Sulfur, mol. (S8)	18.741	10	NJ
19. 80-30-8	Benzenesulfonamide, N-cycloh	19.431	12	NJ
20. 84018-39-3	5,7-Dimethoxy-1-(prop-2'-eny	22.857	11	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1600S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-09

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1901751.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 75-07-0	Acetaldehyde	4.010	23	NJ
2.	Sulfamide	4.230	24	UJ ~~NJB~~
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1600S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-09

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1101390.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 109-52-4	Pentanoic acid	5.594	64	NJ
2. 109-52-4	Pentanoic acid	7.234	89	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C2200N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-07

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0801539.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/08/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/10/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 142-62-1	Hexanoic acid	6.430	7	NJ
2. 109-52-4	Pentanoic acid	6.547	15	NJ
3.	Oxygenated Hydrocarbon	9.960	9	NJ
4.	Oxygenated Hydrocarbon	10.250	6	NJ
5. 16747-50-5	Cyclopentane, 1-ethyl-1-meth	10.620	14	NJ
6. 54411-00-6	Cyclohexane, 1-methyl-4-(1-m	10.876	7	NJ
7.	Unsaturated Hydrocarbon	11.720	15	NJ
8. 88-99-3	1,2-Benzenedicarboxylic acid	12.128	6	NJ
9. 603-79-2	Benzoic acid, 2,3-dimethyl-	12.550	12	NJ
10. 695-34-1	2-Pyridinamine, 4-methyl-	13.035	8	NJ
11.	Aromatic Hydrocarbon	13.370	6	NJ
12.	Aromatic Hydrocarbon	13.870	6	NJ
13. 98-73-7	Benzoic acid, p-tert-butyl-	14.045	8	NJ
14.	Oxygenated Hydrocarbon	15.080	8	NJ
15. 126-73-8	Phosphoric acid tributyl est	15.501	13	NJ
16. 80-39-7	Benzenesulfonamide, N-ethyl-	15.706	9	NJ
17. 934-34-9	2(3H)-Benzothiazolone	15.885	17	NJ
18. 1907-65-9	Benzenesulfonamide, N-butyl-	16.255	9	NJ
19. 1427-07-2	Benzene, 2-fluoro-1-methyl-4	17.469	8	NJ
20. 80-05-7	Phenol, 4,4'-(1-methylethyli	20.089	12	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

D1400N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-11

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1301599.D

Level: (low/med) LOW Date Received: 04/29/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 115-07-1	Propene	3.180	10	NJ
2.	Sulfamide	4.250	21	WJ ~~NJB~~
3. 60-29-7	Ether	5.589	7	NJ
4. 75-12-7	Formamide	6.217	6	NJ
5.	Siloxane	8.270	16	WJ ~~NJ~~
6. 108-87-2	Cyclohexane, methyl-	10.785	7	NJ
7. 0-00-0	1,1-Dioctyloxyoctane	17.960	5	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

D3000N-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0101679.D

Level: (low/med) LOW Date Received: 05/02/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-70-4	Methane, chlorofluoro-	3.760	83	NJ
2. 0-00-0	Sulfamide	4.260	25	NJ
3. 108-83-8	4-Heptanone, 2,6-dimethyl-	15.860	170	NJ
4. 19549-80-5	2-Heptanone, 4,6-dimethyl-	16.260	43	NJ
5. 17615-91-7	Undecane, 5,6-dimethyl-	16.460	22	NJ
6. 98-82-8	Benzene, (1-methylethyl)-	16.800	9	NJ
7. 544-76-3	Hexadecane	16.980	610	NJ
8. 21195-59-5	1,3,8-p-Menthatriene	17.620	11	NJ
9. 54823-94-8	Cyclohexane, 1-(cyclohexylme	17.830	20	NJ
10. 18435-45-5	1-Nonadecene	18.810	12	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

D3000N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0701347.D

Level: (low/med) LOW Date Received: 05/02/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.340	36	UJ ~~NJB~~
2. 815-24-7	3-Pentanone, 2,2,4,4-tetrame	7.272	13	NJ
3. 95-63-6	Benzene, 1,2,4-trimethyl-	7.642	6	NJ
4. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.732	10	UJ ~~NJ~~
5. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.783	9	UJ ~~NJ~~
6.	Oxygenated Hydrocarbon	9.110	5	NJ
7. 149-57-5	Hexanoic acid, 2-ethyl-	9.430	6	NJ
8. 78-40-0	Triethyl phosphate	9.495	6	NJ
9. 104-12-1	Benzene, 1-chloro-4-isocyana	9.610	5	NJ
10. 76-22-2	Camphor	9.789	8	NJ
11. 585-34-2	Phenol, m-tert-butyl-	11.526	7	NJ
12. 119-39-1	Phthalazin-1-one	14.798	62	NJ
13. 126-73-8	Phosphoric acid tributyl est	15.219	15	NJ
14. 80-39-7	Benzenesulfonamide, N-ethyl-	15.450	13	NJ
15. 934-34-9	2(3H)-Benzothiazolone	15.616	14	NJ
16. 80-39-7	Benzenesulfonamide, N-ethyl-	15.986	8	NJ
17.	Oxygenated Hydrocarbon	19.390	14	NJ
18. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.807	120	NJ
19.	Oxygenated Hydrocarbon	20.520	7	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.098	13	NJ
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RM 10-13-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

D3600N-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-02

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0201680.D

Level: (low/med) LOW Date Received: 05/02/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 41898-89-9	2,3-Heptadien-5-yne, 2,4-dim	15.030	42	NJ
2. 103-65-1	Benzene, propyl-	15.550	100	NJ
3. 0-00-0	Siloxane	16.030	420	UJ ~~NJ~~
4. 135-98-8	Benzene, (1-methylpropyl)-	16.470	50	NJ
5. 19781-73-8	n-Heptadecylcyclohexane	16.800	38	NJ
6. 496-11-7	1H-Indene, 2,3-dihydro-	17.090	31	NJ
7. 99-87-6	Benzene, 1-methyl-4-(1-methy	17.620	65	NJ
8. 824-63-5	1H-Indene, 2,3-dihydro-2-met	17.830	74	NJ
9. 527-53-7	Benzene, 1,2,3,5-tetramethyl	18.190	38	NJ
10. 1587-04-8	Benzene, 1-methyl-2-(2-prope	18.720	51	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

D3600N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0901388.D

Level: (low/med) LOW Date Received: 05/02/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	5.570	46	UJ ~~NJ~~
2. 1005-64-7	(E)-1-Phenyl-1-butene	9.090	25	NJ
3. 16002-93-0	trans-1-Phenyl-1-pentene	10.123	23	NJ
4. 1680-51-9	Naphthalene, 1,2,3,4-tetrahy	10.518	38	NJ
5. 90-12-0	Naphthalene, 1-methyl-	11.093	64	NJ
6. 0-00-0	1,4-Dimethyl-1,2,3,4-tetrahy	11.131	27	NJ
7.	Saturated Hydrocarbon C10-C2	11.630	29	NJ
8. 1127-76-0	Naphthalene, 1-ethyl-	11.987	65	NJ
9. 581-40-8	Naphthalene, 2,3-dimethyl-	12.281	95	NJ
10. 581-42-0	Naphthalene, 2,6-dimethyl-	12.319	42	NJ
11. 87-85-4	Benzene, hexamethyl-	12.370	23	NJ
12. 581-40-8	Naphthalene, 2,3-dimethyl-	12.498	36	NJ
13.	Saturated Hydrocarbon C10-C2	12.540	35	NJ
14. 2131-42-2	Naphthalene, 1,4,6-trimethyl	13.150	27	NJ
15. 2245-38-7	Naphthalene, 1,6,7-trimethyl	13.380	41	NJ
16. 2131-42-2	Naphthalene, 1,4,6-trimethyl	13.431	23	NJ
17. 2131-42-2	Naphthalene, 1,4,6-trimethyl	13.597	32	NJ
18. 2489-86-3	Naphthalene, 1-(2-propenyl)-	14.108	24	NJ
19.	Saturated Hydrocarbon C10-C2	14.380	30	NJ
20. 10544-50-0	Sulfur, mol. (S8)	18.110	52	NJ
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NM 10-13-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

D1600S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-11

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E2101753.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.240	18	UJ ~~NJB~~
2. 275-51-4	Azulene	11.600	20	NJ
3. 620-14-4	Benzene, 1-ethyl-3-methyl-	16.220	6	NJ
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NM 10-12-94

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

D1600S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-11

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1201352.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.315	25	UJ ~~NJB~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.732	7	UJ ~~NJ~~
3. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.783	6	UJ ~~NJ~~
4. 3274-29-1	Heptanoic acid, 2-ethyl-	9.175	3	NJ
5. 5973-11-5	Butane, 1-bromo-2-methyl-, (	9.239	3	NJ
6. 0-00-0	2-Ethyl-3-methylcyclopentene	10.427	4	NJ
7. 95-16-9	Benzothiazole	10.823	3	NJ
8. 585-34-2	Phenol, m-tert-butyl-	11.539	9	NJ
9. 26356-11-6	Benzene, (1,1,2-trimethylpro	13.252	3	NJ
10. 134-62-3	Diethyltoluamide	14.657	4	NJ
11. 119-39-1	Phthalazin-1-one	14.747	5	NJ
12. 126-73-8	Phosphoric acid tributyl est	15.232	27	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.462	20	NJ
14. 934-34-9	2(3H)-Benzothiazolone	15.692	66	NJ
15. 80-39-7	Benzenesulfonamide, N-ethyl-	16.012	12	NJ
16. 6555-29-9	Hydrocinnamic acid, p-methox	16.676	7	NJ
17. 483-78-3	Naphthalene, 1,6-dimethyl-4-	16.765	3	NJ
18. 10544-50-0	Sulfur, mol. (S8)	18.989	3	NJ
19. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.820	18	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.111	13	NJ
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NM 10-13-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E00-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-03

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0348.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E00-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-03

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0601405.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/08/94

Concentrated Extract Volume: 1.0 (ml) Date Analyzed: 06/06/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Oxygenated Hydrocarbon	8.540	20	NJ
2.	Oxygenated Hydrocarbon	8.740	13	NJ
3.	Oxygenated Hydrocarbon	8.790	18	NJ
4.	Oxygenated Hydrocarbon	8.930	13	NJ
5. 3302-10-1	Hexanoic acid, 3,5,5-trimeth	9.120	45	NJ
6.	Oxygenated Hydrocarbon	9.450	12	NJ
7. 110-54-3	Hexane	9.631	15	NJ
8. 1569-02-4	2-Propanol, 1-ethoxy-	9.720	20	NJ
9.	Oxygenated Hydrocarbon	10.450	12	NJ
10. 20324-33-8	2-Propanol, 1-[2-(2-methoxy-	10.640	24	NJ
11.	Oxygenated Hydrocarbon	10.840	24	NJ
12.	Oxygenated Hydrocarbon	12.010	52	NJ
13.	Oxygenated Hydrocarbon	12.700	23	NJ
14. 98-73-7	Benzoic acid, p-tert-butyl-	13.070	37	NJ
15.	Oxygenated Hydrocarbon	14.170	30	NJ
16. 103-14-0	Phenol, 4-[(phenylmethyl)ami	14.615	22	NJ
17. 946-80-5	Benzene, (phenoxymethyl)-	15.178	12	NJ
18. 0-00-0	Imidazole, 4-amino-5-ethylox	16.455	19	NJ
19. 0-00-0	3-(3,5-Di-tert-butyl-4-hydro	17.452	15	NJ
20. 10544-50-0	Sulfur, mol. (S8)	17.938	31	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E600N-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-14

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0350.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0357.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 80-56-8	.ALPHA.-PINENE	14.380	25	NJ
2. 99-84-3	CYCLOHEXENE, 4-METHYLENE-1-(	15.470	20	NJ
3. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	16.000	17	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0901333.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/09/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/24/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 526-73-8	Benzene, 1,2,3-trimethyl-	7.780	22	NJ
2. 1195-79-5	Bicyclo[2.2.1]heptan-2-one,	9.147	7	NJ
3. 0-00-0	ENDO-FENCHOL	9.492	9	NJ
4.	Oxygenated Hydrocarbon	9.810	8	NJ
5. 76-22-2	Camphor	9.930	6	NJ
6. 465-31-6	Bicyclo[2.2.1]heptan-2-ol, 2	9.977	8	NJ
7. 10482-56-1	1-.alpha.-Terpineol	10.475	42	NJ
8.	Cyclic Hydrocarbon	11.280	8	NJ
9.	Oxygenated Hydrocarbon	11.410	7	NJ
10. 98-54-4	Phenol, p-tert-butyl-	11.664	12	NJ
11. 4376-18-5	1,2-Benzenedicarboxylic acid	12.009	7	NJ
12. 119-39-1	Phthalazin-1-one	14.973	65	NJ
13. 126-73-8	Phosphoric acid tributyl est	15.382	150	NJ
14. 934-34-9	2(3H)-Benzothiazolone	15.842	93	NJ
15. 74764-47-9	Cyclopentane, 1-methyl-1-(2-	18.257	12	NJ
16. 15404-63-4	Naphthalene, decahydro-1,8a-	18.487	30	NJ
17. 19407-18-2	1,4a.beta.-Dimethyl-7-isopro	18.755	10	NJ
18. 10544-50-0	Sulfur, mol. (S8)	19.164	12	NJ
19. 7343-06-8	Phenanthrene, 3,4,5,6-tetram	20.288	20	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.221	16	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H2800N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-03

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0359.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 00-00-0	UNKNOWN	2.620	35	NJ
2. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	15.400	24	NJ
3. 622-96-8	BENZENE, 1-ETHYL-4-METHYL-	16.000	140	NJ
4. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	16.680	23	NJ
5. 496-11-7	1H-INDENE, 2,3-DIHYDRO-	17.020	24	NJ
6. 1758-88-9	BENZENE, 2-ETHYL-1,4-DIMETHY	17.170	16	NJ
7. 527-84-4	BENZENE, 1-METHYL-2-(1-METHY	17.630	22	NJ
8. 1758-88-9	BENZENE, 2-ETHYL-1,4-DIMETHY	17.770	19	NJ
9. 488-23-3	BENZENE, 1,2,3,4-TETRAMETHYL	18.480	23	NJ
10. 488-23-3	BENZENE, 1,2,3,4-TETRAMETHYL	19.130	24	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H2800N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-03

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1001334.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/09/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/24/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 103-65-1	Benzene, propyl-	7.180	12	NJ
2. 108-67-8	Benzene, 1,3,5-trimethyl-	7.398	17	NJ
3. 470-67-7	Isocineole	8.088	14	NJ
4. 95-36-3	1,2,4-Trimethylbenzene	8.216	21	NJ
5. 874-41-9	Benzene, 1-ethyl-2,4-dimethy	8.688	14	NJ
6. 99-87-6	Benzene, 1-methyl-4-(1-methy	8.957	19	NJ
7. 1758-88-9	Benzene, 2-ethyl-1,4-dimethy	9.072	19	NJ
8. 121-69-7	Benzenamine, N,N-dimethyl-	9.123	36	NJ
9. 95-93-2	Benzene, 1,2,4,5-tetramethyl	9.545	7	NJ
10. 824-22-6	1H-Indene, 2,3-dihydro-4-met	9.826	7	NJ
11. 25155-15-1	Benzene, methyl(1-methylethy	9.992	18	NJ
12. 16747-50-5	Cyclopentane, 1-ethyl-1-meth	10.503	7	NJ
13. 0-00-0	4-ACETYLMORPHOLINE	10.567	11	NJ
14. 499-06-9	Benzoic acid, 3,5-dimethyl-	12.432	17	NJ
15.	Oxygenated Hydrocarbon	12.970	17	NJ
16. 126-73-8	Phosphoric acid tributyl est	15.410	88	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.627	23	NJ
18. 934-34-9	2(3H)-Benzothiazolone	15.844	47	NJ
19.	Oxygenated Hydrocarbon	17.390	31	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.250	22	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H1600S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-05

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1601694.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1560-92-5	Hexadecane, 2-methyl-	16.080	43	NJ
2. 108-67-8	Benzene, 1,3,5-trimethyl-	16.270	24	NJ
3. 1678-98-4	Cyclohexane, (2-methylpropyl	16.560	68	NJ
4. 4923-79-9	Azetidine, 1-methyl-	16.810	22	NJ
5. 63366-65-4	9-Borabicyclo[3.3.1]nonane,	17.260	40	NJ
6. 79-39-0	Methacrylamide	17.400	17	NJ
7. 29812-79-1	Hydroxylamine, O-decyl-	17.490	19	NJ
8. 285-76-7	1-Azabicyclo[3.1.0]hexane	17.550	21	NJ
9. 1758-88-9	Benzene, 2-ethyl-1,4-dimethy	17.640	28	NJ
10. 4292-92-6	Cyclohexane, pentyl-	18.130	20	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H1600S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-05

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0901349.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.300	13	UJ ~~NJB~~
2. 95-36-3	1,2,4-Trimethylbenzene	7.642	12	NJ
3. 95-93-2	Benzene, 1,2,4,5-tetramethyl	9.354	4	NJ
4. 99-87-6	Benzene, 1-methyl-4-(1-methy	9.405	4	NJ
5. 0-00-0	4-ACETYLMORPHOLINE	10.364	7	NJ
6. 85-44-9	Phthalic anhydride	11.871	6	NJ
7. 1127-76-0	Naphthalene, 1-ethyl-	12.752	6	NJ
8.	Oxygenated Hydrocarbon	12.830	13	NJ
9. 134-62-3	Diethyltoluamide	14.657	6	NJ
10. 126-73-8	Phosphoric acid tributyl est	15.232	49	NJ
11. 80-39-7	Benzenesulfonamide, N-ethyl-	15.449	18	NJ
12. 934-34-9	2(3H)-Benzothiazolone	15.641	31	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.998	12	NJ
14. 544-63-8	Tetradecanoic acid	16.203	14	NJ
15. 56196-26-0	N-PHENYL,N-DEUTERO-CARBAMIC	17.187	7	NJ
16.	Aromatic Hydrocarbon	17.330	7	NJ
17. 57-10-3	Hexadecanoic acid	17.928	97	NJ
18.	Oxygenated Hydrocarbon	19.400	8	NJ
19. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.810	7	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.110	6	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-GW 000189
I00-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-07

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0363.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 611-14-3	BENZENE, 1-ETHYL-2-METHYL-	15.250	23	NJ
2. 108-67-8	BENZENE, 1,3,5-TRIMETHYL-	15.380	19	NJ
3. 622-96-8	BENZENE, 1-ETHYL-4-METHYL-	16.000	56	NJ
4. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	16.680	21	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-07

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1401338.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/09/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/24/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Siloxane	5.020	25	UJ ~~NJ~~
2. 15980-15-1	1,4-Oxathiane	6.132	170	NJ
3. 0-00-0	DIHYDRO-TERPINEOL	9.807	27	NJ
4. 576-26-1	Phenol, 2,6-dimethyl-	10.139	28	NJ
5. 103-72-0	Benzene, isothiocyanato-	10.612	26	NJ
6. 1687-64-5	Phenol, 2-ethyl-6-methyl-	11.238	23	NJ
7. 585-34-2	Phenol, m-tert-butyl-	11.660	120	NJ
8. 85-44-9	Phthalic anhydride	12.004	22	NJ
9. 134-62-3	Diethyltoluamide	14.764	78	NJ
10. 84-66-2	1,2-Benzenedicarboxylic acid	15.211	240	NJ
11. 126-73-8	Phosphoric acid, tributyl es	15.339	89	NJ
12. 80-39-7	Benzenesulfonamide, N-ethyl-	15.581	70	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	16.118	42	NJ
14. 55956-25-7	2-Propanol, 1-[1-methyl-2-(2	19.542	120	NJ
15. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.913	200	NJ
16. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.191	27	NJ
17.	Oxygenated Hydrocarbon	21.270	24	NJ
18.	Oxygenated Hydrocarbon	22.580	26	NJ
19.	Oxygenated Hydrocarbon	22.930	48	NJ
20.	Oxygenated Hydrocarbon	23.110	95	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-GWDL

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-07DL

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0601346.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/09/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 100.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 119-39-1	Phthalazin-1-one	14.658	850	NJD
2. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.741	220	NJD
3. 627-83-8	Octadecanoic acid, 1,2-ethan	25.414	660	NJD
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I1200N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-07

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0901595.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SULFAMIDE	4.260	25	UJ ~~NJ~~
2. 60-29-7	Ethane, 1,1'-oxybis-	5.578	14	NJ
3.	Siloxane	8.270	18	UJ ~~NJ~~
4. 620-14-4	Benzene, 1-ethyl-3-methyl-	16.803	7	NJ
5. 300-57-2	Benzene, 2-propenyl-	17.093	9	NJ
6. 55021-77-7	1-Butanamine, 4-(methylthio)	17.468	9	NJ
7. 874-41-9	Benzene, 1-ethyl-2,4-dimethy	17.613	12	NJ
8. 124-19-6	Nonanal	17.963	9	UJ ~~NJ~~
9. 95-93-2	Benzene, 1,2,4,5-tetramethyl	18.180	11	NJ
10. 527-53-7	Benzene, 1,2,3,5-tetramethyl	18.265	13	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I1200N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-07

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0601308.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 142-62-1	Hexanoic acid	7.100	5	NJ
2. 98-86-2	Acetophenone	8.160	26	NJ
3. 121-69-7	Benzenamine, N,N-dimethyl-	8.496	39	NJ
4.	Oxygenated Hydrocarbon	8.660	11	NJ
5. 55191-08-7	Hexanamide, 6-(heptyloxy)-	8.730	4	NJ
6.	Oxygenated Hydrocarbon	9.190	6	NJ
7.	Oxygenated Hydrocarbon	9.330	4	NJ
8.	Oxygenated Hydrocarbon	9.540	4	NJ
9.	Oxygenated Hydrocarbon	9.860	6	NJ
10.	Oxygenated Hydrocarbon	9.930	8	NJ
11.	Oxygenated Hydrocarbon	11.050	4	NJ
12. 0-00-0	2,13-DIBORA-1,3,6,9,12,14,17	11.230	3	NJ
13. 2836-82-0	(2-Fluorophenyl)acetone	12.430	34	NJ
14. 528-90-5	Benzoic acid, 2,4,5-trimethy	12.870	4	NJ
15. 98-73-7	Benzoic acid, p-tert-butyl-	13.410	21	NJ
16. 17629-27-5	Pyrazole, 3-(p-chlorophenyl)	13.590	5	NJ
17.	Oxygenated Hydrocarbon	15.690	4	NJ
18.	Oxygenated Hydrocarbon	16.390	13	NJ
19. 54308-64-4	4-Pyrimidinamine,5-methyl-2-	16.830	7	NJ
20. 10544-50-0	Sulfur, mol. (S8)	18.628	41	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J800N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-05

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0701593.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		SULFAMIDE	4.248	12	UJ ~~NJB~~
2.	109-73-9	1-Butanamine	17.284	6	NJ
3.		SILOXANE	17.357	8	UJ ~~NJ~~
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J800N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-05

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0401306.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Saturated Hydrocarbon <C10	7.120	3	NJ
2.		Unsaturated Hydrocarbon	8.250	2	NJ
3.		Oxygenated Hydrocarbon	8.480	8	NJ
4.		Oxygenated Hydrocarbon	9.190	2	NJ
5.	76-22-2	Camphor	9.280	14	NJ
6.	54845-34-0	Thiophene, 2-(3-methylbutyl)	15.691	5	NJ
7.		Aromatic Hydrocarbon	15.760	8	NJ
8.	54774-89-9	Naphthalene, 2-methyl-1-prop	16.777	7	NJ
9.		Oxygenated Hydrocarbon	16.850	22	NJ
10.		Oxygenated Hydrocarbon	16.890	9	NJ
11.		Oxygenated Hydrocarbon	16.970	4	NJ
12.	262-12-4	Dibenzo[b,e][1,4]dioxin	17.225	4	NJ
13.	0-00-0	CYCLOHEXANE, 1-TRANS-ISOPROP	17.774	4	NJ
14.		Oxygenated Hydrocarbon	18.040	3	NJ
15.	124-76-5	Isoborneol	18.119	7	NJ
16.		Oxygenated Hydrocarbon	18.430	3	NJ
17.	10544-50-0	Sulfur, mol. (S8)	18.592	6	NJ
18.		Oxygenated Hydrocarbon	18.660	5	NJ
19.		Oxygenated Hydrocarbon	18.810	5	NJ
20.	54965-08-1	Benzofuran, 2,3-dihydro-2-me	19.218	3	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J2400N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-09

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1101597.D

Level: (low/med) LOW Date Received: 04/29/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 115-07-1	Propene	3.200	6	NJ
2. 593-70-4	Methane, chlorofluoro-	3.765	5	NJ
3. 74-98-6	Propane	4.031	6	NJ
4.	SULFAMIDE	4.236	19	UJ ~~NJB~~
5. 60-29-7	Ether	5.578	10	NJ
6. 75-12-7	Formamide	6.218	5	NJ
7.	Siloxane	8.280	16	UJ ~~NJ~~
8. 109-99-9	Furan, tetrahydro-	8.937	10	NJ
9. 112-31-2	Decanal	17.963	10	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J2400N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-09

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0701309.D

Level: (low/med) LOW Date Received: 04/29/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	4.640	6	NJ
2. 100-61-8	Benzenamine, N-methyl-	8.151	33	NJ
3. 78-40-0	Phosphoric acid, triethyl es	9.020	4	NJ
4.	Oxygenated Hydrocarbon	9.190	8	NJ
5.	Oxygenated Hydrocarbon	9.540	6	NJ
6.	Cyclic Hydrocarbon	9.860	12	NJ
7. 0-00-0	4-ACETYLMORPHOLINE	9.900	13	NJ
8. 98-54-4	Phenol, p-tert-butyl-	11.080	6	NJ
9. 62338-24-3	Ethanone, 1-(4,5-diethyl-2-m	12.420	7	NJ
10. 98-73-7	Benzoic acid, p-tert-butyl-	13.351	10	NJ
11. 10544-50-0	Sulfur, mol. (S8)	13.590	5	NJ
12.	Oxygenated Hydrocarbon	14.600	4	NJ
13. 126-73-8	Phosphoric acid tributyl est	14.859	5	NJ
14. 80-39-7	Benzenesulfonamide, N-ethyl-	15.038	9	NJ
15. 934-34-9	2(3H)-Benzothiazolone	15.178	4	NJ
16. 80-39-7	Benzenesulfonamide, N-ethyl-	15.587	4	NJ
17.	Oxygenated Hydrocarbon	16.390	4	NJ
18. 10544-50-0	Sulfur, mol. (S8)	18.603	14	NJ
19. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.459	8	NJ
20.	Oxygenated Hydrocarbon	20.230	6	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J600S-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-05

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0361.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 00-00-0	UNKNOWN	2.630	110	NJ
2. 611-14-3	BENZENE, 1-ETHYL-2-METHYL-	15.250	18	NJ
3. 620-14-4	BENZENE, 1-ETHYL-3-METHYL-	16.000	31	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J600S-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-05

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1101335.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/09/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/24/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Siloxane	5.020	10	UJ ~~NJ~~
2.	Saturated Hydrocarbon <C10	6.450	17	NJ
3. 611-14-3	Benzene, 1-ethyl-2-methyl-	7.300	18	NJ
4. 108-67-8	Benzene, 1,3,5-trimethyl-	7.398	11	NJ
5. 95-63-6	Benzene, 1,2,4-trimethyl-	7.781	52	NJ
6. 95-63-6	Benzene, 1,2,4-trimethyl-	8.216	12	NJ
7. 78-40-0	Triethyl phosphate	9.672	16	NJ
8. 0-00-0	DIHYDRO-TERPINEOL	9.838	34	NJ
9. 76-22-2	Camphor	9.941	54	NJ
10. 124-07-2	Octanoic acid	10.273	16	NJ
11. 99-94-5	Benzoic acid, 4-methyl-	11.551	10	NJ
12. 20324-33-8	2-Propanol, 1-[2-(2-methoxy-	11.576	10	NJ
13. 20324-33-8	2-Propanol, 1-[2-(2-methoxy-	11.615	13	NJ
14. 585-34-2	Phenol, m-tert-butyl-	11.679	13	NJ
15. 119-39-1	Phthalazin-1-one	15.001	45	NJ
16. 126-73-8	Phosphoric acid tributyl est	15.384	40	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.628	77	NJ
18. 934-34-9	2(3H)-Benzothiazolone	15.858	82	NJ
19. 80-39-7	Benzenesulfonamide, N-ethyl-	16.177	58	NJ
20.	Oxygenated Hydrocarbon	19.530	24	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J1400S-GW

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-06

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1601748.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-70-4	Methane, chlorofluoro-	3.720	6	NJ
2. 0-00-0	Sulfamide	4.230	27	UJ ~~NJB~~
3. 60-29-7	Ethane, 1,1'-oxybis-	5.540	14	NJ
4. 620-14-4	Benzene, 1-ethyl-3-methyl-	16.220	42	NJ
5. 934-80-5	Benzene, 4-ethyl-1,2-dimethy	17.450	5	NJ
6. 95-93-2	Benzene, 1,2,4,5-tetramethyl	18.240	8	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J1400S-GW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-06

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1001350.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.300	6	UJ ~~NJB~~
2. 95-36-3	1,2,4-Trimethylbenzene	7.640	31	NJ
3. 527-84-4	Benzene, 1-methyl-2-(1-methy	9.838	6	NJ
4. 0-00-0	4-ACETYLMORPHOLINE	10.374	9	NJ
5. 585-34-2	Phenol, m-tert-butyl-	11.537	8	NJ
6. 80-46-6	Phenol, 4-(1,1-dimethylpropy	12.712	8	NJ
7.	Oxygenated Hydrocarbon	12.840	35	NJ
8.	Aromatic Hydrocarbon	13.580	4	NJ
9. 134-62-3	Diethyltoluamide	14.655	6	NJ
10. 126-73-8	Phosphoric acid tributyl est	15.230	30	NJ
11. 80-39-7	Benzenesulfonamide, N-ethyl-	15.460	24	NJ
12. 934-34-9	2(3H)-Benzothiazolone	15.638	23	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	15.996	15	NJ
14. 81-07-2	Saccharin	16.367	5	NJ
15.	Aromatic Hydrocarbon	16.670	7	NJ
16. 50-06-6	Phenobarbital	18.398	11	NJ
17. 51422-54-9	1-tert-Butoxy-2-ethoxyethane	19.390	4	NJ
18. 80-05-7	Phenol, 4,4'-(1-methylethyli	19.816	21	NJ
19. 491-07-6	Cyclohexanone, 5-methyl-2-(1	20.621	5	NJ
20. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.107	18	NJ
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J1400SGWFD

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-07FD

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1701749.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	Sulfamide	4.230	28	UJ ~~NJB~~
2. 60-29-7	Ethane, 1,1'-oxybis-	5.540	25	NJ
3. 1066-40-6	Siloxane	8.240	8	UJ ~~NJ~~
4. 103-65-1	Benzene, propyl-	15.530	7	NJ
5. 95-63-6	Benzene, 1,2,4-trimethyl-	16.220	55	NJ
6. 620-14-4	Benzene, 1-ethyl-3-methyl-	16.770	5	NJ
7. 933-98-2	Benzene, 1-ethyl-2,3-dimethy	18.240	5	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J1400S-GWFD

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-07FD

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T1101351.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 95-63-6	Benzene, 1,2,4-trimethyl-	7.640	42	NJ
2. 0-00-0	4-ACETYLMORPHOLINE	10.388	10	NJ
3.	Oxygenated Hydrocarbon	12.850	38	NJ
4. 126-73-8	Phosphoric acid tributyl est	15.256	23	NJ
5. 80-39-7	Benzenesulfonamide, N-ethyl-	15.473	30	NJ
6. 934-34-9	2(3H)-Benzothiazolone	15.665	27	NJ
7. 80-39-7	Benzenesulfonamide, N-ethyl-	16.023	17	NJ
8. 57-10-3	Hexadecanoic acid	17.927	39	NJ
9. 10544-50-0	Sulfur, mol. (S8)	19.026	17	NJ
10. 7396-38-5	Phenanthrene, 2,4,5,7-tetram	20.150	15	NJ
11. 78-51-3	Ethanol, 2-butoxy-, phosphat	21.120	18	NJ
12.	Saturated Hydrocarbon >C20	21.490	20	UJ ~~NJ~~
13.	Saturated Hydrocarbon >C20	22.010	21	UJ ~~NJ~~
14.	Saturated Hydrocarbon >C20	22.470	22	UJ ~~NJ~~
15.	Saturated Hydrocarbon >C20	22.920	11	UJ ~~NJ~~
16.	Saturated Hydrocarbon >C20	23.330	12	UJ ~~NJ~~
17.	Saturated Hydrocarbon >C20	24.130	12	NJ
18.	Saturated Hydrocarbon >C20	24.560	10	NJ
19.	Saturated Hydrocarbon >C20	25.050	11	NJ
20.	Saturated Hydrocarbon >C20	26.220	10	NJ
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UM 10-13-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

K1600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-06

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0801594.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 115-07-1	Propene	3.210	6	NJ
2. 1070-71-9	Propiolonitrile	3.281	10	NJ
3. 593-70-4	Methane, chlorofluoro-	3.765	7	NJ
4. 75-21-8	Ethylene oxide	3.849	5	NJ
5.	SULFAMIDE	4.236	18	UJ ~~NJB~~
6. 75-12-7	Formamide	6.206	7	NJ
7.	Siloxane	8.280	14	UJ ~~NJ~~
8. 124-19-6	Nonanal	17.962	7	UJ ~~NJ~~
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NM 10-17-94

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

K1600N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-06

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0501307.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Oxygenated Hydrocarbon	6.170	10	NJ
2. 110-98-5	2-Propanol, 1,1'-oxybis-	7.190	14	NJ
3. 0-00-0	2-Propanol, 1-(2-methoxy-1-m	7.260	14	UJ ~~NJ~~
4. 0-00-0	Oxygenated Hydrocarbon	8.700	10	NJ
5. 933-98-2	Benzene, 1-ethyl-2,3-dimethy	8.830	10	NJ
6.	Oxygenated Hydrocarbon	9.190	9	NJ
7. 99-87-6	Benzene, 1-methyl-4-(1-methy	9.340	12	NJ
8. 124-07-2	Octanoic Acid	9.710	12	NJ
9. 1795-15-9	Oxygenated Hydrocarbon	9.860	9	NJ
10.	Oxygenated Hydrocarbon	9.940	14	NJ
11. 105-60-2	Caprolactam	11.000	10	NJ
12. 95-54-5	1,2-Benzenediamine	12.367	12	NJ
13. 2836-82-0	(2-Fluorophenyl)acetone	12.431	18	NJ
14. 98-73-7	Benzoic acid, p-tert-butyl-	13.410	12	NJ
15. 134-62-3	Diethyltoluamide	14.271	31	NJ
16. 80-39-7	Benzenesulfonamide, N-ethyl-	15.051	14	NJ
17. 934-34-9	2(3H)-Benzothiazolone	15.230	25	NJ
18. 80-39-7	Benzenesulfonamide, N-ethyl-	15.613	9	NJ
19. 4724-89-4	1,3-Cyclohexadiene, 1,3,5,5-	16.390	10	NJ
20. 54308-64-4	4-Pyrimidinamine, 5-methyl-2	16.840	17	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

L1200N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-03

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0501591.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	Siloxane	8.270	34	UJ ~~NJ~~	um 10-28-94
2. 108-67-8	Benzene, 1,3,5-trimethyl-	16.246	30	NJ	
3. 2984-50-1	Oxirane, hexyl-	16.440	7	NJ	
4. 108-67-8	Benzene, 1,3,5-trimethyl-	16.802	17	NJ	
5. 95-93-2	Benzene, 1,2,4,5-tetramethyl	17.527	10	NJ	
6. 527-84-4	Benzene, 1-methyl-2-(1-methy	17.624	6	NJ	
7. 124-19-6	Nonanal	17.962	8	UJ ~~NJ~~	um 10-28-9
8. 21195-59-5	P-MENTHA-1,5,8-TRIENE	18.192	8	NJ	
9. 527-53-7	Benzene, 1,2,3,5-tetramethyl	18.265	7	NJ	
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

L1200N-GW

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-03

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0301305.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/01/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/19/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 95-36-3	1,2,4-Trimethylbenzene	7.080	46	NJ
2. 95-36-3	1,2,4-Trimethylbenzene	7.526	24	NJ
3.	Cyclic Hydrocarbon	7.590	12	NJ
4. 496-11-7	Indane	7.717	12	NJ
5. 99-87-6	Benzene, 1-methyl-4-(1-methy	8.318	13	NJ
6.	Oxygenated Hydrocarbon	8.500	33	NJ
7. 934-74-7	Benzene, 1-ethyl-3,5-dimethy	8.714	14	NJ
8. 527-53-7	Benzene, 1,2,3,5-tetramethyl	8.893	14	NJ
9.	Oxygenated Hydrocarbon	9.190	27	NJ
10. 2870-04-4	Benzene, 2-ethyl-1,3-dimethy	9.340	17	NJ
11. 470-65-5	p-Menthan-4-ol	9.378	13	NJ
12.	Oxygenated Hydrocarbon	9.860	10	NJ
13.	Oxygenated Hydrocarbon	9.940	29	NJ
14. 585-34-2	Phenol, m-tert-butyl-	11.050	11	NJ
15. 2836-82-0	(2-Fluorophenyl)acetone	12.419	17	NJ
16. 98-73-7	Benzoic acid, p-tert-butyl-	13.400	13	NJ
17. 80-39-7	Benzenesulfonamide, N-ethyl-	15.052	18	NJ
18. 934-34-9	2(3H)-Benzothiazolone	15.230	29	NJ
19. 80-39-7	Benzenesulfonamide, N-ethyl-	15.614	14	NJ
20. 10544-50-0	Sulfur, mol. (S8)	18.604	31	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9615

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.65	23	J
2.	UNKNOWN	8.18	9	J
3.	UNKNOWN	11.03	14	J
4.	UNKNOWN C9H12	19.81	24	J
5.	UNKNOWN C9H12	20.57	7	J
6. 106467	Benzene, 1,4-dichloro-	20.63	12	JN

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-004

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6008

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 104121	Benzene, 1-chloro-4-isocyana	10.12	11	JN
2.	UNKNOWN	11.21	13	J
3. 98544	Phenol, 4-(1,1-dimethylethyl	12.90	13	JN
4.	UNKNOWN	14.48	14	J
5.	UNKNOWN	16.72	35	J
6.	UNKNOWN	16.97	9	J
7. 119391	Phthalazin-1-one	17.21	120	JN
8.	UNKNOWN	17.32	110	J
9.	UNKNOWN	17.76	80	J
10.	UNKNOWN	17.95	150	J
11.	UNKNOWN	18.41	39	J
12. 80397	Benzenesulfonamide, N-ethyl-	18.68	99	JN
13.	UNKNOWN	20.21	20	J
14.	UNKNOWN	20.32	19	J
15.	UNKNOWN	21.93	11	J
16.	UNKNOWN	22.32	17	J
17.	UNKNOWN	22.90	14	J
18.	UNKNOWN	24.90	15	J
19.	UNKNOWN	25.26	31	J
20.	UNKNOWN	29.84	9	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-2

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9616

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.65	7	J
2.	UNKNOWN	8.18	35	J
3.	UNKNOWN	9.04	40	J
4. 91203	Naphthalene	24.33	6	JN

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-2

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-005

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6020

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/20/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	10.05	14	J
2.	UNKNOWN	15.93	6	J
3.	UNKNOWN	16.62	12	J
4.	UNKNOWN	16.84	31	J
5.	UNKNOWN	16.90	22	J
6.	UNKNOWN	17.07	10	J
7.	UNKNOWN	17.11	8	J
8.	UNKNOWN	17.67	13	J
9.	UNKNOWN	18.23	5	J
10.	UNKNOWN	18.41	12	J
11.	UNKNOWN	19.29	12	J
12.	UNKNOWN	20.04	42	J
13.	UNKNOWN	20.10	12	J
14.	UNKNOWN	20.16	13	J
15.	UNKNOWN	20.24	11	J
16.	UNKNOWN	22.28	5	J
17.	UNKNOWN	22.86	100	J
18.	UNKNOWN	24.20	12	J
19.	UNKNOWN	25.22	14	J
20.	UNKNOWN	25.29	18	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-4

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9501

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/01/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.18	20	J
2. 106467	Benzene, 1,4-dichloro-	20.61	5	JN
3.	UNKNOWN C10H14	22.18	6	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-4

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-001

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A5996

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 121697	Benzenamine, N,N-dimethyl-	9.22	6	JN
2.	UNKNOWN	9.94	8	J
3.	UNKNOWN	12.54	30	J
4.	UNKNOWN	12.66	9	J
5.	UNKNOWN	14.29	8	J
6.	UNKNOWN	14.50	21	J
7.	UNKNOWN	15.96	9	J
8.	UNKNOWN	16.70	21	J
9.	UNKNOWN	17.03	12	J
10.	UNKNOWN	17.60	22	J
11.	UNKNOWN	17.74	25	J
12.	UNKNOWN	18.23	32	J
13. 80397	Benzenesulfonamide, N-ethyl-	18.47	13	JN
14.	UNKNOWN	19.00	10	J
15.	UNKNOWN	19.34	10	J
16.	UNKNOWN	21.13	6	J
17. 10544500	Sulfur, mol. (S8)	22.17	25	JN
18.	UNKNOWN	22.88	9	J
19.	UNKNOWN	24.44	6	J
20.	UNKNOWN	25.23	9	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-5

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9502

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/01/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.17	20	J
2.	UNKNOWN	10.33	30	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-5

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A5997

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 100618	Benzenamine, N-methyl-	8.75	10	JN
2. 121697	Benzenamine, N,N-dimethyl-	9.19	55	JN
3.	UNKNOWN	11.07	4	J
4.	UNKNOWN	11.13	4	J
5.	UNKNOWN	14.44	4	J
6.	UNKNOWN	15.87	7	J
7.	UNKNOWN	15.90	3	J
8.	UNKNOWN	16.66	7	J
9.	UNKNOWN	17.68	2	J
10.	UNKNOWN	18.97	6	J
11.	UNKNOWN	19.33	3	J
12.	UNKNOWN	19.91	6	J
13.	UNKNOWN	20.88	3	J
14.	UNKNOWN	21.93	6	J
15. 10544500	Sulfur, mol. (S8)	22.16	11	JN
16.	UNKNOWN	23.72	2	J
17.	UNKNOWN	24.36	2	J
18.	UNKNOWN	24.84	3	J
19.	UNKNOWN	24.96	7	J
20.	UNKNOWN	25.03	6	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9605

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	C9H12	18.32	5	J
2.	UNKNOWN	21.07	17	J
3. 95501	Benzene, 1,2-dichloro-	21.21	6	JN
4.	UNKNOWN C10H14	21.60	9	J
5.	UNKNOWN	21.93	5	J
6.	UNKNOWN C10H14	22.20	5	J
7.	UNKNOWN C10H14	23.06	6	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-003

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A5998

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108383	Benzene, 1,3-dimethyl-	4.19	11	JN
2. 496117	1H-Indene, 2,3-dihydro-	8.05	6	JN
3.	UNKNOWN	10.16	10	J
4. 16022085	Bicyclo[3.1.1]heptan-2-one,	11.08	11	JN
5.	UNKNOWN	11.18	6	J
6.	UNKNOWN	12.89	26	J
7.	UNKNOWN	13.01	9	J
8. 610720	Benzoic acid, 2,5-dimethyl-	14.13	20	JN
9.	UNKNOWN	14.71	6	J
10.	UNKNOWN	15.11	13	J
11.	UNKNOWN	16.45	4	J
12.	UNKNOWN	17.36	5	J
13.	UNKNOWN	17.68	10	J
14.	UNKNOWN	17.75	6	J
15.	UNKNOWN	18.31	29	J
16.	UNKNOWN	21.94	12	J
17.	UNKNOWN	22.92	5	J
18.	UNKNOWN	23.07	12	J
19.	UNKNOWN	25.04	4	J
20.	UNKNOWN	25.25	6	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-7

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9503

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/01/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN C9H12	18.30	7	J
2. 106467	Benzene, 1,4-dichloro-	20.61	5	JN
3.	UNKNOWN	21.06	10	J
4.	UNKNOWN C10H14	21.59	7	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-7

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-004

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A5999

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	9.22	8	J
2.	UNKNOWN	10.04	14	J
3.	UNKNOWN	12.93	26	J
4.	UNKNOWN	13.04	12	J
5.	UNKNOWN	14.06	11	J
6. 610720	Benzoic acid, 2,5-dimethyl-	14.14	12	JN
7.	UNKNOWN	14.24	6	J
8.	UNKNOWN	15.07	8	J
9.	UNKNOWN	16.72	8	J
10.	UNKNOWN	17.66	10	J
11.	UNKNOWN	17.76	11	J
12.	UNKNOWN	18.28	30	J
13.	UNKNOWN	18.52	10	J
14.	UNKNOWN	19.02	7	J
15.	UNKNOWN	21.93	12	J
16. 10544500	Sulfur, mol. (S8)	22.18	19	JN
17.	UNKNOWN	22.45	6	J
18.	UNKNOWN	23.07	7	J
19.	UNKNOWN	23.62	7	J
20.	UNKNOWN	25.28	7	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-7DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-011

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9624

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN C9H12	18.32	8	J
2.	UNKNOWN	21.09	10	J
3.	UNKNOWN C10H14	21.60	7	J
4.	UNKNOWN C10H14	23.08	5	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-7DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-011

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6003

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	10.03	11	J
2.	UNKNOWN	12.72	29	J
3.	UNKNOWN	12.94	18	J
4.	UNKNOWN	13.04	18	J
5.	UNKNOWN	14.08	9	J
6.	UNKNOWN	14.15	11	J
7.	UNKNOWN	15.08	9	J
8.	UNKNOWN	15.34	6	J
9.	UNKNOWN	16.73	11	J
10.	UNKNOWN	17.66	9	J
11.	UNKNOWN	17.76	11	J
12.	UNKNOWN	18.29	26	J
13.	UNKNOWN	18.50	8	J
14.	UNKNOWN	19.04	12	J
15.	UNKNOWN	19.94	7	J
16.	UNKNOWN	21.16	7	J
17.	UNKNOWN	21.92	14	J
18. 10544500	Sulfur, mol. (S8)	22.17	14	JN
19.	UNKNOWN	23.07	8	J
20.	UNKNOWN	25.05	7	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-8

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9623

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: R7X 502.2 ID: 0.250 (mm) Dilution Factor: 5.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN C9H12	19.81	25	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-8

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-005

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6000

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN C8H10	4.25	67	J
2. 107926	Butanoic acid	5.02	67	JN
3.	UNKNOWN	5.73	25	J
4.	UNKNOWN	6.10	56	J
5.	UNKNOWN C9H12	6.68	31	J
6.	UNKNOWN C9H12	6.86	36	J
7.	UNKNOWN	7.00	54	J
8.	UNKNOWN	7.07	28	J
9.	UNKNOWN	7.21	71	J
10.	UNKNOWN C9H12	7.81	30	J
11.	UNKNOWN C10H14	8.37	31	J
12.	UNKNOWN	8.58	64	J
13.	UNKNOWN	8.68	26	J
14.	UNKNOWN	11.54	31	J
15. 501520	Benzenepropanoic acid	14.01	24	JN
16.	UNKNOWN	17.77	18	J
17.	UNKNOWN	18.30	39	J
18.	UNKNOWN	21.25	18	J
19.	UNKNOWN	21.41	52	J
20.	UNKNOWN	21.53	25	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-9

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-010

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9626

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.18	12	J
2.	UNKNOWN	9.78	33	J
3.	UNKNOWN C9H12	19.82	15	J
4.	UNKNOWN	20.43	6	J
5.	UNKNOWN C9H12	20.58	9	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-9

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-010

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6025

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/21/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN C8H10	4.15	15	J
2. 100618	Benzenamine, N-methyl-	8.78	20	JN
3. 121697	Benzenamine, N,N-dimethyl-	9.23	41	JN
4.	UNKNOWN	10.16	20	J
5.	UNKNOWN	12.90	51	J
6.	UNKNOWN	13.05	14	J
7.	UNKNOWN	16.19	28	J
8.	UNKNOWN	16.71	12	J
9.	UNKNOWN	17.40	350	J
10.	UNKNOWN	17.70	23	J
11.	UNKNOWN	17.89	32	J
12.	UNKNOWN	18.39	13	J
13.	UNKNOWN	18.63	22	J
14.	UNKNOWN	19.37	13	J
15.	UNKNOWN	20.12	48	J
16.	UNKNOWN	20.15	38	J
17.	UNKNOWN	22.91	180	J
18.	UNKNOWN	23.53	77	J
19.	UNKNOWN	25.30	75	J
20.	UNKNOWN	25.33	48	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-10

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-006

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9607

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-10

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-006

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6001

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 100618	Benzenamine, N-methyl-	8.79	52	JN
2. 121697	Benzenamine, N,N-dimethyl-	9.22	66	JN
3.	UNKNOWN	12.58	37	J
4.	UNKNOWN	12.98	28	J
5.	UNKNOWN	16.04	9	J
6.	UNKNOWN	16.72	15	J
7.	UNKNOWN	17.21	84	J
8.	UNKNOWN	17.65	8	J
9.	UNKNOWN	17.76	18	J
10.	UNKNOWN	18.26	14	J
11.	UNKNOWN	18.48	7	J
12.	UNKNOWN	19.04	7	J
13.	UNKNOWN	20.08	11	J
14.	UNKNOWN	21.90	7	J
15. 10544500	Sulfur, mol. (S8)	22.18	21	JN
16.	UNKNOWN	22.84	7	J
17.	UNKNOWN	22.90	16	J
18.	UNKNOWN	23.43	19	J
19.	UNKNOWN	24.36	8	J
20.	UNKNOWN	25.27	9	J

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-11

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9612

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-11

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-001

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6005

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	10.32	9	J
2.	UNKNOWN	12.38	7	J
3.	UNKNOWN	12.51	13	J
4.	UNKNOWN	12.54	19	J
5.	UNKNOWN	13.03	14	J
6.	UNKNOWN	14.14	11	J
7.	UNKNOWN	15.86	8	J
8.	UNKNOWN	16.69	18	J
9.	UNKNOWN	16.78	9	J
10.	UNKNOWN	17.56	8	J
11.	UNKNOWN	18.12	9	J
12.	UNKNOWN	18.97	6	J
13.	UNKNOWN	21.13	18	J
14. 10544500	Sulfur, mol. (S8)	22.17	12	JN
15.	UNKNOWN	23.08	6	J
16.	UNKNOWN	23.59	4	J
17.	UNKNOWN	24.70	4	J
18.	UNKNOWN	24.96	5	J
19.	UNKNOWN	25.04	6	J
20.	UNKNOWN	25.65	5	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-12

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9614

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	21.08	8	J
2.	UNKNOWN C10H14	21.59	7	J
3.	UNKNOWN C10H14	23.07	6	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-12

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-003

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6007

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 100618	Benzenamine, N-methyl-	8.77	24	JN
2. 100618	Benzenamine, N-methyl-	8.83	10	JN
3. 121697	Benzenamine, N,N-dimethyl-	9.22	80	JN
4.	UNKNOWN	9.99	5	J
5.	UNKNOWN	11.16	6	J
6.	UNKNOWN	12.57	7	J
7.	UNKNOWN	12.88	14	J
8.	UNKNOWN	13.04	11	J
9.	UNKNOWN	15.87	4	J
10.	UNKNOWN	16.70	13	J
11.	UNKNOWN	17.61	18	J
12.	UNKNOWN	17.74	28	J
13.	UNKNOWN	18.32	63	J
14. 80397	Benzenesulfonamide, N-ethyl-	18.51	14	JN
15.	UNKNOWN	20.18	4	J
16.	UNKNOWN	21.92	6	J
17.	UNKNOWN	22.90	11	J
18. 80057	Phenol, 4,4'-(1-methylethyli	23.43	26	JN
19.	UNKNOWN	25.05	5	J
20.	UNKNOWN	25.26	12	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-13

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9613

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN C9H12	18.31	6	J
2. 106467	Benzene, 1,4-dichloro-	20.61	10	JN
3.	UNKNOWN	21.08	10	J
4.	C10H14	21.59	6	J
5.	UNKNOWN C10H14	23.07	5	J
6. 91203	Naphthalene	24.34	9	JN

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-13

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6006

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/18/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	6.99	6	J
2.	UNKNOWN	9.01	7	J
3.	UNKNOWN C10H14	9.70	6	J
4.	UNKNOWN	9.78	7	J
5.	UNKNOWN	11.17	7	J
6.	UNKNOWN	11.36	22	J
7.	UNKNOWN	12.88	8	J
8.	UNKNOWN	13.02	8	J
9.	UNKNOWN	15.16	4	J
10.	UNKNOWN	15.90	11	J
11.	UNKNOWN	16.66	17	J
12.	UNKNOWN	17.58	24	J
13.	UNKNOWN	17.73	20	J
14.	UNKNOWN	18.21	29	J
15. 80397	Benzenesulfonamide, N-ethyl-	18.48	14	JN
16.	UNKNOWN	19.40	9	J
17.	UNKNOWN	21.11	7	J
18.	UNKNOWN	24.22	4	J
19.	UNKNOWN	25.05	6	J
20.	UNKNOWN	25.22	8	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-14

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9618

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-14

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-007

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6022

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/21/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	21.98	4	J
2.	UNKNOWN	24.63	8	J
3.	UNKNOWN	24.98	2	J
4.	UNKNOWN	26.98	7	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-14-DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-008

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9619

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-14-DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-008

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6023

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/21/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	18.98	5	J
2.	UNKNOWN	22.01	24	J
3.	UNKNOWN	24.12	3	J
4.	UNKNOWN	24.68	44	J
5.	UNKNOWN	26.50	4	J
6.	UNKNOWN	27.05	51	J
7.	UNKNOWN	29.18	3	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-15

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-009

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9625

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-15

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-009

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6024

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/21/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	16.59	4	J
2.	UNKNOWN	24.66	3	J
3.	UNKNOWN	25.00	3	J
4.	UNKNOWN	29.26	5	J
5.	UNKNOWN	30.59	4	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

A1000S-SW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-06

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5991.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	18.230	8	UJ ~~NJ~~
2.				
3.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

A1000S-SW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-06

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S0601607.D

Level: (low/med) LOW Date Received: 06/10/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:06/13/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108-87-2	Cyclohexane, methyl-	4.660	2	NJ
2. 108-93-0	Cyclohexanol	6.714	3	NJ
3. 621-42-1	Metacetamol	11.734	2	NJ
4. 134-62-3	Diethyltoluamide	13.056	2	NJ
5. 119-39-1	Phthalazin-1-one	13.247	3	NJ
6. 80-07-9	Benzene, 1,1'-sulfonylbis[4-	17.079	6	UJ ~~NJB~~
7. 629-92-5	Nonadecane	17.271	2	NJ
8. 791-28-6	Phosphine oxide, triphenyl-	18.446	12	UJ ~~NJB~~
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10.				
11.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E1600S-SW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-05

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5990.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	5.220	7	UJ ~~NJ~~
2.	SILOXANE	18.250	75	UJ ~~NJ~~
3.				
4.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

E1600S-SW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-05

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S0501606.D

Level: (low/med) LOW Date Received: 06/10/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:06/13/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexene	4.482	39	NJ
2. 107-92-6	Butanoic acid	5.409	12	NJ
3. 503-74-2	Butanoic acid, 3-methyl-	6.081	7	NJ
4. 621-42-1	Metacetamol	11.737	10	NJ
5. 126-73-8	Phosphoric acid tributyl est	13.416	12	NJ
6. 629-78-7	Heptadecane	13.760	8	NJ
7. 934-34-9	2(3H)-Benzothiazolone	13.850	11	NJ
8. 80-39-7	Benzenesulfonamide, N-ethyl-	14.054	9	NJ
9. 2091-29-4	9-Hexadecenoic acid	15.230	7	NJ
10. 150-86-7	2-Hexadecen-1-ol, 3,7,11,15-	16.163	7	NJ
11. 80-07-9	Benzene, 1,1'-sulfonylbis[4-	17.083	11	UJ ~~NJB~~
12. 791-28-6	Phosphine oxide, triphenyl-	18.451	20	UJ ~~NJB~~
13. 74685-30-6	5-Eicosene, (E)-	19.192	7	NJ
14. 25154-56-7	Nonacosanol	19.665	21	NJ
15. 77899-03-7	1-Heneicosyl formate	20.176	82	NJ
16. 822-20-8	1-Heptadecanol, acetate	20.764	140	NJ
17. 77899-03-7	1-Heneicosyl formate	21.416	190	NJ
18. 2004-39-9	1-Heptacosanol	22.169	110	NJ
19. 6765-39-5	1-Heptadecene	23.038	72	NJ
20. 2004-39-9	1-Heptacosanol	24.048	12	NJ
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-1800S-SW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-08

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5994.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SILOXANE	5.220	7	UJ ~~NJ~~
2.	UNKNOWN	2.550	9	NJ
3.				
4.				
5.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

H-1800S-SW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-08

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S0901610.D

Level: (low/med) LOW Date Received: 06/10/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 06/13/94

Concentrated Extract Volume: 1.0 (ml) Date Analyzed: 06/28/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1192-62-7	Ethanone, 1-(2-furanyl)-	10.558	3	NJ
2. 98-54-4	Phenol, 2-(1,1-dimethylethyl	10.902	4	NJ
3. 621-42-1	Metacetamol	11.766	40	NJ
4. 98-73-7	Benzoic acid, p-tert-butyl-	12.491	6	NJ
5. 134-62-3	Diethyltoluamide	13.092	13	NJ
6. 119-39-1	Phthalazin-1-one	13.271	13	NJ
7. 119-39-1	Phthalazin-1-one	13.373	21	NJ
8. 126-73-8	Phosphoric acid tributyl est	13.437	36	NJ
9. 54815-24-6	2(3H)-Furanone, 3-(2-bromoet	13.501	6	NJ
10. 934-34-9	2(3H)-Benzothiazolone	13.833	6	NJ
11. 934-34-9	2(3H)-Benzothiazolone	13.922	18	NJ
12. 80-39-7	Benzenesulfonamide, N-ethyl-	14.063	4	NJ
13. 80-39-7	Benzenesulfonamide, N-ethyl-	14.114	10	NJ
14. 29006-01-7	Butanoic acid, 4-methoxy-, m	16.350	9	NJ
15. 80-05-7	Phenol, 4,4'-(1-methylethyli	16.759	3	NJ
16. 80-07-9	Benzene, 1,1'-sulfonylbis[4-	17.100	12	UJ ~~NJB~~
17. 78-51-3	Ethanol, 2-butoxy-, phosphat	17.590	10	NJ
18. 6418-46-8	Eicosane, 3-methyl-	18.459	6	NJ
19. 791-28-6	Phosphine oxide, triphenyl-	18.510	18	UJ ~~NJ~~
20. 301-02-0	9-Octadecenamide, (Z)-	19.341	6	NJ
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UM 10-13-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-SW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-01

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5986.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-SW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S0201603.D

Level: (low/med) LOW Date Received: 06/10/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:06/13/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 115-18-4	3-Buten-2-ol, 2-methyl-	13.080	3	NJ
2. 119-39-1	Phthalazin-1-one	13.210	10	NJ
3. 53778-72-6	2-Butanol, 3-methoxy-	14.838	2	NJ
4. 20324-34-9	2,5,8,11-Tetraoxatetradecan-	16.333	6	NJ
5. 80-07-9	Benzene, 1,1'-sulfonylbis[4-	17.061	11	UJ ~~NJB~~
6. 791-28-6	Phosphine oxide, triphenyl-	18.416	20	UJ ~~NJB~~
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-SW-DUP

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-02FD

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5987.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-SW-DUP

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S0301604.D

Level: (low/med) LOW Date Received: 06/10/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:06/13/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 12

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2110-78-3	Propanoic acid, 2-hydroxy-2-	13.070	3	NJ
2. 119-39-1	Phthalazin-1-one	13.227	17	NJ
3. 126-73-8	Phosphoric acid tributyl est	13.392	4	NJ
4. 934-34-9	2(3H)-Benzothiazolone	13.800	2	NJ
5. 80-39-7	Benzenesulfonamide, N-ethyl-	14.029	3	NJ
6. 13588-28-8	1-Propanol, 2-(2-methoxyprop	14.807	6	NJ
7. 6795-88-6	Pentane, 2-methoxy-	16.302	9	NJ
8. 6795-87-5	Butane, 2-methoxy-	16.340	12	NJ
9. 80-07-9	Benzene, 1,1'-sulfonylbis[4-	17.068	12	UJ ~~NJB~~
10. 78-51-3	Ethanol, 2-butoxy-, phosphat	17.554	3	NJ
11. 53778-72-6	2-BUTANOL, 3-METHOXY-	17.618	8	NJ
12. 791-28-6	Phosphine oxide, triphenyl-	18.423	19	UJ ~~NJB~~
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

K600W-SW

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-04

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5989.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

K600W-SW

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-04

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S0401605.D

Level: (low/med) LOW Date Received: 06/10/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:06/13/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 06/28/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110-83-8	Cyclohexene	4.430	16	NJ
2. 119-39-1	Phthalazin-1-one	13.245	5	NJ
3. 80-39-7	Benzenesulfonamide, N-ethyl-	14.035	2	NJ
4. 6795-88-6	Pentane, 2-methoxy-	16.310	2	NJ
5. 80-07-9	Benzene, 1,1'-sulfonylbis[4-	17.064	7	UJ ~~NJB~~
6. 791-28-6	Phosphine oxide, triphenyl-	18.431	14	UJ ~~NJB~~
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AM 10-13-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1400S-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-01

Sample wt/vol: 5.0 (g/mL) G Lab File ID: J0417.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. 54 Data Analyzed: 05/14/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

F1400S-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-01

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S0201439.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 54 decanted: (Y/N) N Date Extracted: 05/12/94

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

Number TICs found: 21

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.182	44000	UJ ~~NJB~~
2. 7225-64-1	Heptadecane, 9-octyl-	18.849	2900	NJ
3.	Unsaturated Hydrocarbon	18.887	1700	NJ
4.	Saturated Hydrocarbon >20	19.568	4700	NJ
5. 80-97-7	Cholestanol	19.954	4800	NJ
6.	Saturated Hydrocarbon >20	20.069	6700	NJ
7. 57-88-5	Cholesterol	20.134	2600	NJ
8. 80-97-7	Cholestanol	20.211	5400	NJ
9. 36728-72-0	28-Nor-17.beta.(H)-hopane	20.365	4000	NJ
10. 629-73-2	1-Hexadecene	20.635	5000	NJ
11. 638-68-6	Triacontane	20.840	2100	NJ
12. 83-48-7	Stigmasterol	20.917	9100	NJ
13. 0-00-0	Z-24-Tritriaconten-2-one	21.007	2300	NJ
14.	Sterol	21.084	2300	NJ
15. 25154-56-7	Nonacosanol	21.265	6500	NJ
16.	Sterol	21.329	7000	NJ
17.	Sterol	21.431	1700	NJ
18. 83-46-5	5.ALPHA.-STIGMAST-3-ONE	21.688	2700	NJ
19.	Oxygenated Hydrocarbon	21.791	2800	NJ
20.	Unsaturated Hydrocarbon	21.855	3600	NJ
21. 1058-61-3	Stigmast-4-en-3-one	22.292	2900	NJ
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NM 10-13-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-03

Sample wt/vol: 5.0 (g/mL) G Lab File ID: J0419.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. 36 Data Analyzed: 05/14/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I00-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S0601443.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 32 decanted: (Y/N) N Date Extracted: 05/12/94

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

Number TICs found: 21

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 141-79-7	3-Penten-2-one, 4-methyl-	4.470	570	UJ ~~NJB~~
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.207	34000	UJ ~~NJB~~
3.	Saturated Hydrocarbon C>20	14.408	480	NJ
4.	Unsaturated Hydrocarbon	15.098	790	NJ
5. 629-78-7	Heptadecane	18.050	470	NJ
6.	Unsaturated Hydrocarbon	18.625	350	NJ
7. 6225-64-1	Heptadecane, 9-octyl	18.856	1200	NJ
8.	Unsaturated Hydrocarbon	18.882	2300	NJ
9. 192-97-2	Benzo[e]pyrene	19.049	600	NJ
10.	Unsaturated Hydrocarbon	19.537	1100	NJ
11. 7225-64-1	Heptadecane, 9-octyl-	19.717	1000	NJ
12. 18435-45-5	1-Nonadecene	19.781	610	NJ
13.	Unsaturated Hydrocarbon	19.859	480	NJ
14.	Saturated Hydrocarbon C>20	19.923	1800	NJ
15. 57-88-5	Cholesterol	20.128	700	NJ
16. 80-97-7	Cholestanol	20.192	490	NJ
17. 36728-72-0	28-Nor-17.beta.(H)-hopane	20.360	1300	NJ
18. 83-48-7	Stigmasterol	20.886	540	NJ
19. 83-47-6	Stigmast-5-en-3-ol, (3.beta.	21.298	1700	NJ
20. 111-02-4	2,6,10,14,18,22-Tetracosahex	21.452	880	NJ
21.	Oxygenated Hydrocarbon	22.274	810	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J1400S-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-06

Sample wt/vol: 5.0 (g/mL) G Lab File ID: J0414.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 61 Data Analyzed: 05/14/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J1400S-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-06

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S0901446.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 61 decanted: (Y/N) N Date Extracted: 05/12/94

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

Number TICs found: 21

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 141-79-7	3-Penten-2-one, 4-methyl-	4.482	990	UJ ~~NJB~~
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.220	67000	UJ ~~NJB~~
3. 2091-29-4	9-Hexadecenoic acid	14.421	1500	NJ
4.	Unsaturated Hydrocarbon	15.098	1300	NJ
5. 629-78-7	Heptadecane	18.050	1700	NJ
6. 106-28-5	2,6,10-Dodecatrien-1-ol, 3,7	18.538	2000	NJ
7. 7225-64-1	Heptadecane, 9-octyl-	18.859	4400	NJ
8. 0-00-0	Decane, 5,6-bis(2,2-dimethyl	18.897	3000	NJ
9. 7225-64-1	Heptadecane, 9-octyl-	19.720	2500	NJ
10.	Oxygenated Hydrocarbon	19.861	1300	NJ
11.	Saturated Hydrocarbon C>20	19.938	1800	NJ
12.	Unsaturated Hydrocarbon	20.067	960	NJ
13. 57-88-5	Cholesterol	20.144	3800	NJ
14. 80-97-7	Cholestanol	20.208	2000	NJ
15. 53584-60-4	28-Nor-17.alpha.(H)-hopane	20.375	4600	NJ
16.	Sterol	20.902	3500	NJ
17. 83-46-5	Stigmast-5-en-3-ol, (3.beta.	21.339	11000	NJ
18. 54832-82-5	Tricyclo[4.3.0.07,9]nonane,	21.480	2700	NJ
19. 83-46-5	5.ALPHA.-STIGMAST-3-ONE	21.699	1000	NJ
20.	Unsaturated Hydrocarbon	22.097	1500	NJ
21. 1058-61-3	Stigmast-4-en-3-one	22.316	4000	NJ
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AM 10-13-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

K600N-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-02

Sample wt/vol: 5.0 (g/mL) G Lab File ID: J0418.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. 76 Data Analyzed: 05/14/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

K600N-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S0501442.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 76 decanted: (Y/N) N Date Extracted: 05/12/94

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

Number TICs found: 21

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 141-79-7	3-Penten-2-one, 4-methyl-	4.470	1200	UJ ~~NJB~~
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.220	100000	UJ ~~NJB~~
3. 286-20-4	7-Oxabicyclo[4.1.0]heptane	5.347	1100	UJ ~~NJB~~
4.	Unsaturated Hydrocarbon	17.064	3900	NJ
5. 629-92-5	Nonadecane	18.035	1300	NJ
6. 630-03-5	Nonacosane	18.840	1500	NJ
7.	Saturated Hydrocarbon c>20	19.109	1000	NJ
8.	Saturated Hydrocarbon C>20	19.543	1500	NJ
9.	Unsaturated Hydrocarbon	19.914	1400	NJ
10.	Saturated Hydrocarbon C>20	20.042	1800	NJ
11. 57-88-5	Cholesterol	20.106	1500	NJ
12. 80-97-7	Cholestanol	20.170	1600	NJ
13.	Oxygenated Hydrocarbon	20.706	1200	NJ
14. 0-00-0	TRANS-STIGMASTA-5,22-DIEN-3B	20.860	1700	NJ
15.	Sterol	21.039	1200	NJ
16. 83-47-6	Stigmast-5-en-3-ol, (3.beta.	21.269	6100	NJ
17. 0-00-0	PROPENE, 1-CYCLOHEXYL-1-(DIC	21.639	1300	NJ
18. 6831-17-0	Aristolone	21.716	1200	NJ
19. 20475-86-9	Urs-12-en-24-oic acid, 3-oxo	21.818	1100	NJ
20. 638-95-9	.alpha.-Amyrin	22.087	1800	NJ
21. 1058-61-3	Stigmast-4-en-3-one	22.240	1700	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

L1200~~3~~5-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304 (AM 10-13-94)

Matrix: (soil/water) SOIL Lab Sample ID: 35304-04

Sample wt/vol: 5.0 (g/mL) G Lab File ID: J0420.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 28 Data Analyzed: 05/14/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

L12005-SED

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-04

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S0701444.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 28 decanted: (Y/N) N Date Extracted: 05/12/94

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

Number TICs found: 21

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.207	33000	UJ ~~NJB~~
2. 2091-29-4	9-Hexadecenoic acid	14.422	1900	NJ
3. 57-10-3	Hexadecanoic acid	14.524	810	NJ
4.	Unsaturated Hydrocarbon	15.099	730	NJ
5. 106-28-5	2,6,10-Dodecatrien-1-ol, 3,7	18.538	1700	NJ
6. 7225-64-1	Heptadecane, 9-octyl-	18.859	6000	NJ
7.	Unsaturated Hydrocarbon	18.898	2900	NJ
8.	Unsaturated Hydrocarbon	19.476	2400	NJ
9.	Saturated Hydrocarbon C>20	19.579	2800	NJ
10. 7225-64-1	Heptadecane, 9-octyl-	19.720	2100	NJ
11. 18435-45-5	1-Nonadecene	19.785	2200	NJ
12.	Unsaturated Hydrocarbon	19.952	3200	NJ
13. 57-88-5	Cholesterol	20.144	3600	NJ
14. 36728-72-0	28-Nor-17.beta.(H)-hopane	20.375	3800	NJ
15.	Unsaturated Hydrocarbon	20.530	3000	NJ
16.	Sterol	20.902	1800	NJ
17.	Sterol	21.082	1400	NJ
18. 83-47-6	Stigmast-5-en-3-ol, (3.beta.	21.339	8700	NJ
19. 6831-17-0	Aristolone	21.776	2400	NJ
20. 545-47-1	Lupeol	22.110	1600	NJ
21. 14021-26-2	Olean-12-ene, 3-methoxy-, (3	22.354	4200	NJ
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

L1200~~5~~5-SED-D

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-05FD

Sample wt/vol: 5.0 (g/mL) G Lab File ID: J0421.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 42 Data Analyzed: 05/14/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

L1200~~5~~5-SED-D

um 10-13-94

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35304 SAS No.: SDG No.: 35304

Matrix: (soil/water) SOIL Lab Sample ID: 35304-05

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S0801445.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: 42 decanted: (Y/N) N Date Extracted: 05/12/94

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/09/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

Number TICs found: 21

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.220	44000	UJ ~~NJB~~
2. 613-12-7	Anthracene, 2-methyl-	14.423	2100	NJ
3. 57-10-3	Hexadecanoic acid	14.538	1400	NJ
4.	Unsaturated Hydrocarbon	15.100	940	NJ
5. 106-28-5	2,6,10-Dodecatrien-1-ol, 3,7	18.540	2000	NJ
6. 7225-64-1	Heptadecane, 9-octyl-	18.861	7700	NJ
7.	Unsaturated Hydrocarbon	18.900	3400	NJ
8.	Unsaturated Hydrocarbon	19.478	2900	NJ
9.	Saturated Hydrocarbon C>20	19.581	3200	NJ
10. 7225-64-1	Heptadecane, 9-octyl-	19.722	2800	NJ
11.	Unsaturated Hydrocarbon	19.953	6400	NJ
12.	Unsaturated Hydrocarbon	20.069	2000	NJ
13. 57-88-5	Cholesterol	20.146	6900	NJ
14. 80-97-7	Cholestanol	20.223	2800	NJ
15. 36728-72-0	28-Nor-17.beta.(H)-hopane	20.377	4300	NJ
16.	Unsaturated Hydrocarbon	20.532	2300	NJ
17.	Sterol	20.904	2000	NJ
18. 83-47-6	Stigmast-5-en-3-ol, (3.beta.	21.328	7800	NJ
19. 6831-17-0	Aristolone	21.778	1900	NJ
20.	Unsaturated Hydrocarbon	22.112	2800	NJ
21. 1004-36-0	4H-Pyran-4-one, 2,6-dimethyl	22.318	2800	NJ
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um 10-13-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SED-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V10701 SAS No.: SDG No.: PRC002

Matrix: (soil/water) SOIL Lab Sample ID: 6107-001

Sample wt/vol: 5.00 (g/mL) G Lab File ID: E0825

Level: (low/med) LOW Date Received: 09/15/94

% Moisture: not dec. 83 Date Analyzed: 09/22/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN C9H12	20.30	32	J
2. 128370	Phenol, 2,6-bis(1,1-dimethyl	24.84	97	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SED-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S10701 SAS No.: SDG No.: PRC002

Matrix: (soil/water) SOIL Lab Sample ID: 6107-001

Sample wt/vol: 30.10 (g/mL) G Lab File ID: H0861

Level: (low/med) LOW Date Received: 09/15/94

% Moisture: 83 decanted: (Y/N) N Date Extracted: 09/23/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/05/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH:

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.50	770	~~BJ~~ UJ
2.	UNKNOWN	11.11	550	~~BJ~~ UJ
3.	UNKNOWN	23.42	510	J
4.	UNKNOWN	29.32	400	J

DM 10-21-94

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SED-1-DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V10701 SAS No.: SDG No.: PRC002

Matrix: (soil/water) SOIL Lab Sample ID: 6107-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: E0826

Level: (low/med) LOW Date Received: 09/15/94

% Moisture: not dec. 77 Date Analyzed: 09/22/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

000026

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SED-1-DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S10701 SAS No.: SDG No.: PRC002

Matrix: (soil/water) SOIL Lab Sample ID: 6107-002

Sample wt/vol: 30.20 (g/mL) G Lab File ID: H0862

Level: (low/med) LOW Date Received: 09/15/94

% Moisture: 77 decanted: (Y/N) N Date Extracted: 09/23/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/05/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH:

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.50	620	~~BJ~~ UJ
2.	UNKNOWN	11.10	420	~~BJ~~ UJ
3.	UNKNOWN	23.42	510	J
4.	UNKNOWN	30.71	790	J

RM 10-21-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SED-2

C000034

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V10701 SAS No.: SDG No.: PRC002

Matrix: (soil/water) SOIL Lab Sample ID: 6107-003

Sample wt/vol: 5.00 (g/mL) G Lab File ID: E0827

Level: (low/med) LOW Date Received: 09/15/94

% Moisture: not dec. 65 Date Analyzed: 09/22/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SED-2

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S10701 SAS No.: SDG No.: PRC002

Matrix: (soil/water) SOIL Lab Sample ID: 6107-003

Sample wt/vol: 30.30 (g/mL) G Lab File ID: H0863

Level: (low/med) LOW Date Received: 09/15/94

% Moisture: 65 decanted: (Y/N) N Date Extracted: 09/23/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 10/05/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH:

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.50	450	~~BJ~~ UJ
2.	UNKNOWN	11.11	310	~~BJ~~ UJ
3.	UNKNOWN	23.42	290	J

WM 10-21-94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

T2-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V46901 SAS No.: SDG No.: PRC004

Matrix: (soil/water) SOIL Lab Sample ID: 6469-001

Sample wt/vol: 5.00 (g/mL) G Lab File ID: B0744

Level: (low/med) LOW Date Received: 10/14/94

% Moisture: not dec. 20 Date Analyzed: 10/24/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown C9H12	20.12	100	J
2.	Unknown C9H12	20.66	65	J
3.	UNKNOWN	21.05	55	J
4. 106467	Benzene, 1,4-dichloro-	21.23	69	JN
5.	Unknown C9H12	21.31	47	J
6.	UNKNOWN	21.62	40	J
7. 95501	Benzene, 1,2-dichloro-	21.78	30	JN
8.	Unknown Alkane	21.93	40	J
9. 1195795	Fenchone	22.87	45	JN
10.	Unknown C10H14	23.61	56	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

T2-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S46901 SAS No.: SDG No.: PRC004

Matrix: (soil/water) SOIL Lab Sample ID: 6469-001

Sample wt/vol: 30.10 (g/mL) G Lab File ID: A6496

Level: (low/med) LOW Date Received: 10/14/94

% Moisture: 20 decanted: (Y/N) N Date Extracted: 10/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 11/01/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH:

Number TICs found: 22

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	14.78	420	J
2.	UNKNOWN	14.92	390	J
3.	UNKNOWN	15.46	750	J
4.	UNKNOWN	16.09	480	J
5.	UNKNOWN	16.17	590	J
6.	UNKNOWN	16.28	520	J
7.	UNKNOWN	16.37	450	J
8.	UNKNOWN	16.75	2100	J
9.	UNKNOWN	17.48	2300	J
10.	UNKNOWN	17.99	9600	J
11.	UNKNOWN	18.19	1400	J
12.	UNKNOWN	18.72	3700	J
13.	UNKNOWN	19.18	2700	J
14.	UNKNOWN	19.57	1200	J
15.	UNKNOWN	21.00	6500	J
16.	UNKNOWN	22.31	2200	J
17.	UNKNOWN	22.82	21000	J
18.	UNKNOWN	22.98	2300	J
19.	UNKNOWN	23.46	1700	J
20.	Unknown Phthalate	26.25	67000	J
21.	UNKNOWN	31.97	8200	J
22.	UNKNOWN	32.34	5300	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

T2-1-DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V46901 SAS No.: SDG No.: PRC004

Matrix: (soil/water) SOIL Lab Sample ID: 6469-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: B0728

Level: (low/med) LOW Date Received: 10/14/94

% Moisture: not dec. 25 Date Analyzed: 10/21/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Alkane	20.14	310	J
2.	Unknown Alkane	20.59	170	J
3.	UNKNOWN	21.02	270	J
4. 106467	Benzene, 1,4-dichloro-	21.21	50	JN
5.	Unknown C9H12	21.29	130	J
6.	Unknown C9H20	21.39	280	J
7.	UNKNOWN	21.74	220	J
8.	Unknown Alkane	21.94	270	J
9.	UNKNOWN	22.23	180	J
10.	Unknown Alkane	23.15	120	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

T2-1-DUP

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S46901 SAS No.: SDG No.: PRC004

Matrix: (soil/water) SOIL Lab Sample ID: 6469-002

Sample wt/vol: 30.20 (g/mL) G Lab File ID: A6497

Level: (low/med) LOW Date Received: 10/14/94

% Moisture: 25 decanted: (Y/N) N Date Extracted: 10/20/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 11/01/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH:

Number TICs found: 22

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	14.12	540	J
2.	UNKNOWN	14.74	930	J
3.	UNKNOWN	14.95	890	J
4.	UNKNOWN	15.49	1700	J
5.	UNKNOWN	16.21	2100	J
6.	UNKNOWN	16.32	730	J
7.	UNKNOWN	16.80	3600	J
8.	UNKNOWN	17.37	7300	J
9.	UNKNOWN	17.53	9100	J
10.	UNKNOWN	18.04	37000	J
11.	UNKNOWN	18.24	4600	J
12.	UNKNOWN	18.52	4800	J
13.	UNKNOWN	18.76	7200	J
14.	UNKNOWN	19.29	2600	J
15.	UNKNOWN	19.61	2400	J
16.	UNKNOWN	20.24	3400	J
17.	UNKNOWN	21.00	5400	J
18.	UNKNOWN	22.38	15000	J
19.	UNKNOWN	27.48	470	J
20.	UNKNOWN	30.35	400	J
21.	UNKNOWN	32.02	920	J
22.	UNKNOWN	32.38	430	J

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

T3-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V46901 SAS No.: SDG No.: PRC004

Matrix: (soil/water) SOIL Lab Sample ID: 6469-003

Sample wt/vol: 5.00 (g/mL) G Lab File ID: B0747

Level: (low/med) LOW Date Received: 10/14/94

% Moisture: not dec. 23 Date Analyzed: 10/24/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown C9H12	20.10	32	J
2.	UNKNOWN	20.20	23	J
3.	UNKNOWN	20.59	21	J
4.	UNKNOWN	21.06	34	J
5. 106467	Benzene, 1,4-dichloro-	21.22	5	JN
6.	Unknown C9H12	21.30	17	J
7.	UNKNOWN	21.41	15	J
8.	Unknown C10H14	21.72	21	J
9.	UNKNOWN	22.15	41	J
10.	Unknown C10H14	23.62	16	J

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

T3-1RE

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S46901 SAS No.: SDG No.. PRC004

Matrix: (soil/water) SOIL Lab Sample ID: 6469-003RE

Sample wt/vol: 30.40 (g/mL) G Lab File ID: D6085

Level: (low/med) LOW Date Received: 10/14/94

% Moisture: 23 decanted: (Y/N) N Date Extracted: 11/07/94

Concentrated Extract Volume: 500.0 (uL) Date Analyzed: 11/11/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH:

Number TICs found: 22

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	Aldol Condensation	6.19	8800	~~BJNA~~	UJ
2. 98862	Ethanone, 1-phenyl-	10.65	820	JN	NM 11-28-94
3. 90040	Benzenamine, 2-methoxy-	12.54	840	JN	
4.	UNKNOWN	22.80	1100	J	
5.	UNKNOWN	23.95	640	J	
6.	UNKNOWN	24.64	370	J	
7.	UNKNOWN	24.89	1700	J	
8.	UNKNOWN	25.44	340	J	
9.	UNKNOWN	26.05	330	J	
10.	Unknown Hydrocarbon	26.14	550	J	
11.	UNKNOWN	27.05	660	J	
12.	UNKNOWN	27.91	1200	J	
13.	UNKNOWN	28.74	930	J	
14.	UNKNOWN	29.01	340	J	
15.	UNKNOWN	29.56	1100	J	
16.	UNKNOWN	30.45	1100	J	
17.	UNKNOWN	30.72	720	~~J~~ UJ	NM 11-28-94
18.	UNKNOWN	31.45	1300	J	
19.	UNKNOWN	32.60	1000	J	
20.	UNKNOWN	33.95	840	J	
21.	UNKNOWN	35.53	560	J	
22.	UNKNOWN	35.66	530	J	

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EB-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9608

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000106

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EB-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-007

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6002

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: decanted: (Y/N) Date Extracted: 09/01/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/17/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	24.81	4	J
2.	UNKNOWN	25.02	3	J
3.	UNKNOWN	28.18	3	J
4.	UNKNOWN	28.24	4	J

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EB-2

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-15

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0355.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EB-2

Lab Name: Quanterra Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-15

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0201550.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/08/94

Concentrated Extract Volume: 1.0 (ml) Date Analyzed: 06/13/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.374	3	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EB-2

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-006

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9617

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EB-2

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: S99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-006

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A6021

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: decanted: (Y/N) Date Extracted: 09/06/94

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 09/20/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	24.98	2	J

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EB-3

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-06

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0362.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

RB-1

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-03

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0301681.D

Level: (low/med) LOW Date Received: 05/02/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 67519-35-1	2-Methyl-1,2,3,4-terahydrona	12.420	49	NJ
2. 6682-71-9	1H-Indene, 2,3-dihydro-4,7-d	13.000	110	NJ
3. 4175-53-5	1H-Indene, 2,3-dihydro-1,3-d	14.080	77	NJ
4. 22531-20-0	Naphthalene, 6-ethyl-1,2,3,4	14.900	110	NJ
5. 2809-64-5	Naphthalene, 1,2,3,4-tetrahy	14.990	140	NJ
6. 65001-56-1	2,4,6-TRIMETHYLINDANE	15.480	52	NJ
7. 769-25-5	Benzene, 2-ethenyl-1,3,5-tri	15.750	82	NJ
8. 2809-64-5	Naphthalene, 1,2,3,4-tetrahy	16.270	100	NJ
9. 91-57-6	Naphthalene, 2-methyl-	16.930	340	NJ
10. 91-57-6	Naphthalene, 2-methyl-	17.540	140	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

RB-1

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35201 SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-03

Sample wt/vol: 1000 (g/mL) ML Lab File ID: T0801348.D

Level: (low/med) LOW Date Received: 05/02/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted:05/05/94

Concentrated Extract Volume: 1.0(ml) Date Analyzed: 05/25/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	6.300	22	UJ ~~NJB~~
2. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.713	4	UJ ~~NJ~~
3. 20324-32-7	2-Propanol, 1-(2-methoxy-1-m	7.764	4	UJ ~~NJ~~
4. 0-00-0	Pentan-1,3-dioldiisobutyrate	14.710	4	UJ ~~NJ~~
5.	Saturated Hydrocarbon >C20	21.490	3	NJ
6.	Saturated Hydrocarbon >C20	21.990	5	NJ
7.	Saturated Hydrocarbon >C20	22.460	7	NJ
8.	Saturated Hydrocarbon >C20	22.910	6	NJ
9.	Saturated Hydrocarbon >C20	23.330	5	NJ
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um 10-13-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-1

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-04TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E0601592.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.250	20	UJ ~~NJB~~
2. 3659-97-0	1-Methyl-2,4,5-trioxoimidazo	11.631	6	NJ
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um 10/7/94

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-1

Lab Name: Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: TB-1

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J1153.D

Level: (low/med) LOW Date Received: 06/07/94

% Moisture: not dec. _____ Data Analyzed: 06/20/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-008

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9609

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000121

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-1

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V46901 SAS No.: SDG No.: PRC004

Matrix: (soil/water) WATER Lab Sample ID: 6469-004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E1284

Level: (low/med) LOW Date Received: 10/14/94

% Moisture: not dec. Date Analyzed: 10/18/94

GC Column: DB-624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-2

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-08TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1001596.D

Level: (low/med) LOW Date Received: 04/28/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	Sulfamide	4.308	52	UJ ~~NJB~~
2. 124-19-6	Nonanal	17.963	6	NJ
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WM 10-18-94

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-2

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-03FD

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5988.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-2

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-009

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9610

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000127

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-3

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-12TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1401600.D

Level: (low/med) LOW Date Received: 04/29/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SULFAMIDE	4.236	9	UJ ~~NJB~~
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-3

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 36090 SAS No.: SDG No.: 36090

Matrix: (soil/water) WATER Lab Sample ID: 36090-07TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E5992.D

Level: (low/med) LOW Date Received: 06/09/94

% Moisture: not dec. _____ Data Analyzed: 06/16/94

GC Column:DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-3

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5992-010

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9611

Level: (low/med) LOW Date Received: 08/31/94

% Moisture: not dec. Date Analyzed: 09/08/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

C000134

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-4

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35100 SAS No.: SDG No.: 35100

Matrix: (soil/water) WATER Lab Sample ID: 35100-14TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1901605.D

Level: (low/med) LOW Date Received: 04/30/94

% Moisture: not dec. _____ Data Analyzed: 05/04/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	SULFAMIDE	4.250	25	UJ ~~NJB~~
2.	Siloxane	8.270	6	UJ ~~NJ~~
3. 49582-62-9	2-Propenal, 3-(dimethylamino	11.631	6	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-4

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-016

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9630

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000343

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-5

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-013

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9627

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

000318

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-6

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-04

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0401682.D

Level: (low/med) LOW Date Received: 05/02/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.240	15	NJ
2. 2154-34-9	1-Pyrrolidinyloxy, 2,2,5,5-t	13.560	6	NJ
3. 0-00-0	1-Phenyl-3-methylpenta-1,2,4	14.700	5	NJ
4. 569-41-5	Naphthalene, 1,8-dimethyl-	15.830	10	NJ
5. 398-62-9	4-Fluoroveratrole	16.060	10	NJ
6. 569-41-5	Naphthalene, 1,8-dimethyl-	17.140	5	NJ
7.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-6

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-015

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9629

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-7

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-08TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1801750.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	Sulfamide	4.230	32	UJ ~~NJB~~ um 10/28/94
2.				
3.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-7

Lab Name: ITAS-ST.LOUIS Contract: 566-01

Lab Code: ITSL Case No.: V99201 SAS No.: SDG No.: PRC001

Matrix: (soil/water) WATER Lab Sample ID: 5999-014

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: F9628

Level: (low/med) LOW Date Received: 09/01/94

% Moisture: not dec. Date Analyzed: 09/09/94

GC Column: RTX-502.2 ID: 0.250 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000332

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-8

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-12TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E2201754.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	Sulfamide	4.260	50	UJ ~~NJB~~
2.	Siloxane	17.620	27	UJ ~~NJ~~
3.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-9

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-16TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0901687.D

Level: (low/med) LOW Date Received: 05/03/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.260	16	UJ ~~NJ~~
2. 91-20-3	Naphthalene	11.870	65	NJ
3. 575-41-7	Naphthalene, 1,3-dimethyl-	14.930	17	NJ
4. 582-16-1	Naphthalene, 2,7-dimethyl-	15.950	32	NJ
5. 398-62-9	4-Fluoroveratrole	16.180	7	NJ
6. 81568-10-7	Pyrimidine, 5-fluoro-2-dimet	16.990	6	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-10

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-18TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1101689.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.240	13	UJ ~~NJ~~
2. 3683-98-5	5-Isothiazolecarboxamide	11.820	7	NJ
3. 90-12-0	Naphthalene, 1-methyl-	16.970	6	NJ
4. 0-00-0	Siloxane	17.440	140	UJ ~~NJ~~
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-11

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 35201

Matrix: (soil/water) WATER Lab Sample ID: 35201-22TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1501693.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/07/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Sulfamide	4.240	16	NJ
2.				
3.				
4.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-12

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-04

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1101743.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	Sulfamide	4.220	35	UJ ~~NJB~~
2.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-13

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-16

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0351.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-14

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-08

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1501747.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/10/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0-00-0	Sulfamide	4.256	48	UJ ~~NJB~~ WM 10/12/94
2.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-15

Lab Name: QUANTERRA Denver Contract:

Lab Code: Case No.: 35273 SAS No.: SDG No.: 35273

Matrix: (soil/water) WATER Lab Sample ID: 35273-12

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0354.D

Level: (low/med) LOW Date Received: 05/05/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-16

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-04TB

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0360.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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2.				
3.				
4.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-17

Lab Name: Rocky Mountain Analytical Contract:

Lab Code: ENSECO Case No.: 35302 SAS No.: SDG No.: 35302

Matrix: (soil/water) WATER Lab Sample ID: 35302-08

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: J0364.D

Level: (low/med) LOW Date Received: 05/06/94

% Moisture: not dec. _____ Data Analyzed: 05/12/94

GC Column:DB624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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APPENDIX G

CLOSE SUPPORT LABORATORY

DATA SUMMARY AND METHOD DETECTION LIMITS

CLOSE SUPPORT LABORATORY DATA SUMMARY

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC), conducted on-site analysis of soil gas and groundwater samples collected at the Pig's Eye Landfill (Pig's Eye) site located in St. Paul, Minnesota. The analysis was conducted on site by PRC's close support laboratory (CSL) from April 18 through May 5, 1994. The CSL was used to analyze samples collected along a grid system overlaid on the site. The CSL was employed to determine concentrations of chlorinated and aromatic volatile organic compounds (VOC) in the soil gas and groundwater samples. The purpose of the on-site analysis was to identify potential sources or "hot spots" of VOC contamination. The sections below describe methods used for sample analysis, analytical results, and quality control results. All tables are presented at the end of this summary.

2.0 SAMPLE ANALYSIS

The sections below describe the sample numbering system, analytical methods, instrumentation, standards, sample preparation, and analyte identification and quantitation.

2.1 SAMPLE NUMBERING SYSTEM

The samples collected from the Pig's Eye site were identified by a unique numbering system. This system identifies a sample by its grid location. The grid nodes were spaced on 180-foot centers designated A through L in one direction and the distance in feet north or south from "0" in the other direction. For example, soil gas sample B-200N was collected at the grid location along the B line 200 feet north of the 0 line. Groundwater samples were identified with the same sample number except that the designation "GW" was placed after the identification number (for example, "D-600SGW").

Soil gas and groundwater equipment blanks were collected to evaluate the decontamination of nondisposable sampling equipment used to collect soil gas or groundwater samples. Equipment

blanks were identified as EB-1, EB-2, and so on. One equipment blank was collected per day for soil gas analysis, and one equipment rinsate blank was collected per day for groundwater analysis.

2.2 ANALYTICAL METHODS

PRC has developed standard operating guidelines (SOG) to perform field screening for environmental contaminants. These SOGs are analytical methods that define the procedures to be used for sample analysis. The SOG used for the analysis of soil gas and groundwater samples at the Pig's Eye site was PRC SOG 001, Volatile Organic Compounds in Soil Gas, Soil, and Water (see the Attachment to this Appendix).

2.3 INSTRUMENTATION

The instrumentation employed by the CSL to determine levels of VOCs for the samples collected at the Pig's Eye site included the following equipment:

- Tekmar 7000 Equilibrium Headspace Autosampler (HSA)
- Shimadzu GC-14A Gas Chromatograph (GC)
- Shimadzu C-R4A Chromatopac Data System

The HSA was used to heat the groundwater samples to volatilize the VOCs into a sample vial's headspace. A portion of the sample vial's headspace was then measured into a calibrated 2-milliliter (Ml) volume sample loop and transferred to the GC through a heated transfer line. The HSA was not used to analyze the soil gas samples because direct injections of the soil gas were made onto the GC column.

The GC was equipped with a 75-meter long DB-624 megabore capillary column to separate the individual VOCs. The GC column effluent was directed through an electron capture detector (ECD) connected in series to a flame ionization detector (FID). The FID was used to identify and quantitate the aromatic VOCs such as benzene, toluene, ethylbenzene, and xylene (BTEX) and other VOCs such as methyl ethyl ketone (MEK) and methyl isobutyl ketone (MIBK). The ECD was used to identify

and quantitate the chlorinated VOCs. One exception was vinyl chloride, which was identified and quantitated by the FID.

The identification and quantitation of the VOCs was aided by the Chromatopac Data System. This data system was used to measure peak retention times and peak areas of VOCs. The data system was also used to store chromatographic data and perform chromatographic reprocessing of sample chromatograms for baseline correction.

2.4 STANDARDS

Standards used for the analysis of samples from the Pig's Eye site included a custom chlorinated mix and a custom standard mix containing BTEX compounds. The BTEX custom mix was obtained from Ultra-Scientific and was identified as custom number 858, lot number H-0115. The mix contained benzene, toluene, ethylbenzene, all three xylenes, and all three dichlorobenzenes at 100 micrograms per liter (μg/L) each, methyl tert-butyl ether at 250 μg/L, and MEK and MIBK at 500 μg/L each. Dilutions of the custom standard were made for working standard solutions to prepare calibration samples for soil gas and groundwater sample analyses.

The custom chlorinated mix was obtained from Ultra-Scientific and was identified as custom mix number 859, lot number H-0122. The custom chlorinated mix contained 16 compounds at the following concentrations: vinyl chloride at 2,500 μg/mL; trichlorofluoromethane at 10 μg/L; 1,1-dichloroethene (DCE) at 250 μg/mL; methylene chloride at 1,000 μg/mL; trans-1,2-DCE at 1,000 μg/mL; 1,1-dichloroethane (DCA) at 1,000 μg/mL; cis-1,2-DCE at 1,000 μg/mL; chloroform at 50 μg/mL; 1,1,1-trichloroethane (TCA) at 50 μg/mL; carbon tetrachloride at 10 μg/mL; 1,2-DCA at 1,000 μg/mL; trichloroethene (TCE) at 50 μg/mL; 1,1,2-TCA at 150 μg/mL; perchloroethene (PCE) at 25 μg/mL; 1,1,1,2-perchloroethane (PCA) at 25 μg/mL; and 1,1,2,2-PCA at 100 μg/mL. Dilutions of the custom standard were made for working standard solutions to prepare calibration samples for soil gas and groundwater sample analysis.

2.4.1 Initial Calibrations

Initial calibrations (ICAL) were performed before sample analysis could begin. An ICAL was performed for soil gas analysis by directly injecting three levels of the working standard solutions onto the GC column. An ICAL for the groundwater analysis was performed by analyzing three levels of the headspace calibration standards for BTEX and chlorinated VOCs. The headspace calibration standards were prepared by adding known volumes of the working standard solutions to headspace vials containing 5.0 mL of distilled water. The low-level calibration standard was used to approximate the method detection limit (MDL) of the sample analysis. The mid-level and high-level standards were used to define the upper working range of the GC detectors.

ICALs were used to establish retention time windows for the VOCs and linearity of the calibration curves for the sample analysis. Retention time windows for the VOCs were established by calculating the mean retention time for each compound from the three levels of headspace calibration standards analyzed during the ICAL. An absolute window of plus or minus 0.10 minute was then used around the mean to define the retention time window.

Linearity of the detector response was evaluated through the use of calibration factors. Calibration factors are the response of the analyte divided by the mass of the analyte. For all the VOCs, the peak area of each individual VOC was used for the response, and the mass was the amount of each VOC added to the headspace calibration vials for groundwater analysis or the mass of compound directly injected onto the GC column for soil gas analysis.

Linearity for the calibration standards was evaluated by determining average calibration factors from each of the three concentrations of the standards. The percent relative standard deviation (%RSD) was then calculated for each compound. In order to use the average calibration factor to quantitate samples, the %RSD for each compound should be less than or equal to 25 percent. Values above 25 percent may be used when a standard curve is used for sample quantitation.

An ICAL for the soil gas analysis was performed on April 18, 1994. All VOCs exhibited %RSD values below 25 percent. An ICAL for groundwater analysis was performed on April 26, 1994. All

VOCs exhibited %RSD values below 25 percent for this analysis also. The ICALs were deemed acceptable.

2.4.2 Continuing Calibrations

Continuing calibrations (CCAL) are used to determine that instrument response is within control. A CCAL uses a mid-level standard analyzed daily to evaluate instrument response. The calibration factor for the CCAL standard is calculated and compared to the ICAL average calibration factor by calculating the relative percent difference (RPD). Generally, acceptable RPD values are less than 25 percent.

Six CCALs were performed during the analysis of the soil gas samples from April 19 through April 25, 1994. The CCALs were analyzed at the beginning of each day prior to sample analysis. The CCALs showed all RPD values equal to or less than 25 percent with the exception of vinyl chloride, which showed RPD values above 25 percent on April 22, 23, and 25, 1994. The large RPD values for vinyl chloride were the result of vinyl chloride's high volatility and volatilization into the headspace of the working standard vial. No corrective action was taken because the remainder of the RPDs were acceptable, indicating that the instrument response did not change from day to day.

Five CCALs were performed during the analysis of the groundwater samples from April 26 through May 5, 1994. The CCALs were analyzed at the beginning of each day prior to sample analysis. The CCALs showed all RPD values equal to or less than 25 percent, with the exception of vinyl chloride, which showed RPD values above 25 percent on April 30 through May 5, 1994. The large RPD values for vinyl chloride were the result of vinyl chloride's high volatility and volatilization into the headspace of the working standard vial. No corrective action was taken because the remainder of the RPDs were acceptable, indicating that the instrument response did not change from day to day.

2.5 SAMPLE PREPARATION

The soil gas samples required no sample preparation. The soil gas samples were collected in 250-mL glass bulbs. A portion of the soil gas was removed from the glass bulb with a ground-glass syringe and directly injected onto the GC column. The standard amount injected was 2.0 mL. When high

values were obtained with the hand-held photoionization detector (PID) during sample collection, smaller sample volumes were injected onto the GC column. Some samples required injection volumes as small as 0.5 mL. When the samples exhibited peaks that exceeded the response on the FID or ECD, a smaller volume of sample also was injected onto the GC column.

Groundwater samples were collected in 40-mL vials. A 5-mL aliquot of the groundwater sample was volumetrically pipetted into a 22-mL headspace vial for sample analysis. The headspace vial was then sealed with a Teflon™-lined septa and a crimp-top cap. The headspace vial was then placed into the heated platen of the HSA for analysis.

2.6 SAMPLE IDENTIFICATION AND QUANTITATION

Samples were identified as containing a specific VOC when a peak eluted within the retention time windows for any of the VOCs established during the ICAL. The identification of a specific VOC was not confirmed by a second column confirmation or by a GC mass spectrometer. Because the identification of these compounds was not confirmed, the analysis provided only a tentative identification. This tentative identification is believed to be adequate because the analytical results are not to be used for any regulatory compliance.

Samples containing any aromatic or chlorinated VOCs were quantitated by comparing the response of the sample to the average response of the compound in the three concentrations of the calibration standards analyzed during the ICAL. The response ratios were then corrected for the volume of soil gas sample or volume of groundwater sample analyzed.

The low-level standard from the ICAL was used to approximate the MDL of the analysis. The MDL for all VOCs was defined as the minimum peak area detectable by the FID or ECD divided by the average calibration factor divided by 2.0 for soil gas, which was the volume of soil gas injected, or divided by 5.0, which was the volume of water used in the headspace calibration standards. The MDL for all the VOCs is listed in Table 1.

Several samples gave responses for a VOC below the MDL in the groundwater samples. PRC felt confident that these results were real and not the result of analytical instrument carryover or cross-

contamination. Sample results below the MDL were reported as positive results. No value below one-half of the MDL was reported. These results were coded with a "J" to indicate that the reported result was below the MDL.

3.0 ANALYTICAL RESULTS

The CSL analyzed 39 groundwater samples and 105 soil gas samples during this project. Tables 5-1, 5-2, and Table 5-4 of the LRI report summarize the CSL analytical results. Tables 5-1 and 5-2 present VOC analytical results for the soil gas samples. Table 5-4 summarizes VOCs detected in groundwater samples. As discussed in Section 2.4 of this data summary, the GC was calibrated for 27 VOCs; however, many of the VOCs were not detected in any of the groundwater samples. Therefore, they are not included in Tables 5-4.

In many of the soil gas samples showing high BTEX concentrations of greater than 1,000 parts per billion (ppb), the chromatographic pattern of these samples also indicated that the sample contained a petroleum product. Petroleum also was often observed on the Geoprobe™ rods at these sampling locations. The petroleum product could not be identified or verified, however, because no petroleum standards were analyzed by the CSL.

4.0 QUALITY CONTROL RESULTS

The sections below discuss the quality control procedures used by the CSL for the analysis of soil gas and groundwater samples at the Pig's Eye site. The discussion includes the results of the method blanks, equipment blanks, laboratory duplicate samples, and matrix spike/matrix spike duplicate (MS/MSD) samples.

4.1 METHOD BLANKS

A method blank was analyzed prior to sample analysis once a day. Method blanks monitor laboratory induced contamination or interferences. To be acceptable, a method blank should not contain any target compound above its MDL.

For soil gas analysis, a method blank includes a decontaminated soil gas syringe blank and a decontaminated glass sample bulb blank. Generally, the syringes and bulbs selected for this analysis had just been decontaminated after containing the most contaminated sample the previous day. The syringes and bulbs were decontaminated by baking them overnight in an oven at 100°C. Bulbs that contained chlorinated VOCs at concentrations of greater than 50 ppb or BTEX compounds at concentrations of greater than 1,000 ppb were rinsed with methanol prior to baking. Seven syringe blanks and seven bulb blanks were analyzed during this project. All syringe and bulb blanks showed no VOCs above MDLs.

Six groundwater method blanks were analyzed during this project. The groundwater method blanks were prepared by pipetting 5 mL of distilled water into a headspace vial. The blank was analyzed using the same methods used on the other groundwater samples. All six groundwater method blanks showed no VOCs above MDLs.

4.2 EQUIPMENT BLANKS

Equipment blanks are used to evaluate the efficiency of the decontamination of sample collection equipment. The equipment blanks should not contain any target compound above MDLs. During soil gas sampling and analysis, the polyethylene tubing used for sample collection was disposed of after collection of each soil gas sample. By using the post-run-tubing (PRT) method, the point holder and PRT adapter were the only pieces of equipment that required decontamination. This equipment was decontaminated by heating them until they were hot to the touch. Any soil remaining on the outside of the steel drive rods was removed with a wire brush. The inside of the rods did not come into contact with the soil gas when the PRT system was used.

One equipment blank was collected each day by connecting two or three probe rods and a decontaminated point holder and evacuating ambient air through the rods into a glass bulb. Eight soil gas equipment blanks were collected and analyzed. No VOCs were detected above MDLs in any of the eight blanks, suggesting that the field equipment decontamination procedures were effective.

One groundwater equipment rinsate blank was collected by pouring distilled water through a decontaminated Geoprobe well screen into sample containers. This sample was sent off-site for analysis but was not analyzed by the CSL.

4.3 LABORATORY DUPLICATE SAMPLES

Laboratory duplicate samples consist of two analyses performed on the same sample. Laboratory duplicates are used to determine the precision of the analytical method. Precision is evaluated through the comparison of RPD values between the sample result and the laboratory duplicate sample result. A laboratory duplicate is analyzed with each set of 20 samples of a similar matrix prepared and analyzed together.

Seven laboratory duplicate samples were prepared and analyzed during the analysis of the Pig's Eye site samples. Five of the laboratory duplicates consisted of soil gas, and the other two consisted of groundwater. The advisory control limit was 50 percent RPD. The results from the laboratory duplicate samples showed a high degree of precision associated with these analyses because all RPD values were less than 50 percent for both the soil gas and groundwater duplicate samples.

4.4 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

MS samples were used to evaluate the efficiency of the analytical procedures used. These samples were spiked with a known amount of the target analytes. The MS samples were analyzed using the same methods used on the other samples. The amounts of target analytes in the MS samples were calculated, and the amount in the original samples was subtracted from the calculated amount. The difference was compared to the amount of target analytes added to the sample to determine the percent recovery. The percent recovery of the MS sample was then compared to acceptance criteria (PRC SOG 001). MS samples were prepared and analyzed for groundwater only; MS samples were not conducted as a quality control procedure for soil gas analysis.

The precision of the analytical procedures was evaluated through the use of an MSD. The MSD was prepared and analyzed using the same methods used for the MS samples. The percent recovery of the target analytes was calculated for the MS and MSD. These values were then compared through an

RPD calculation. The RPD values were then compared to acceptance criteria (PRC SOG 001) to determine the precision of the analytical procedures.

An MS/MSD was prepared and analyzed with each set of 20 samples of a similar matrix. Two MS/MSD samples were prepared and analyzed for the groundwater samples collected from the Pig's Eye site. One MS/MSD sample pair was spiked with the BTEX custom standard mix, and the other MS/MSD pair was spiked with the custom chlorinated standard mix. The BTEX and chlorinated VOCs were spiked at the concentration of the mid-level calibration standard.

Acceptance criteria for MS recovery is 50 to 150 percent. This range is advisory, and corrective action is usually not taken for recoveries outside this range. Only one of the 54 matrix spike recoveries was outside this advisory range, indicating that the headspace analysis adequately recovered VOCs from the groundwater matrix.

The acceptance criteria for RPD is 50 percent. This range is advisory, and corrective action is usually not taken for RPDs outside of this range. All of the 27 RPD values for the MS/MSD samples analyzed were within this range, indicating that the method was acceptable.

TABLE 1

CSL VOC METHOD DETECTION LIMITS

Compound	Soil Gas (ppb)	Water (ppb)
Vinyl chloride	100	100
Trichlorofluoromethane	1.0	1.0
1,1-Dichloroethene	50	5.0
Methylene chloride	200	10.0
trans-1,2-Dichloroethene	300	10.0
1,1-Dichloroethane	500	20.0
cis-1,2-Dichloroethene	500	20.0
Chloroform	5.0	1.0
1,1,1-Trichloroethane	2.0	1.0
Carbon tetrachloride	1.0	1.0
1,2-Dichloroethane	200	10.0
Trichloroethene	3.0	1.0
1,1,2-Trichloroethane	30	2.0
Tetrachloroethene	1.0	1.0
1,1,1,2-Tetrachloroethane	1.0	1.0
1,1,2,2-Tetrachloroethane	25	10.0
Methyl tert-butyl ether	100	5.0
Methyl ethyl ketone	100	20
Benzene	50	2.0
Methyl isobutyl ketone	100	10.0
Toluene	50	2.0
Chlorobenzene	100	2.0
Ethylbenzene	50	2.0
Total Xylenes	50	2.0
1,3-Dichlorobenzene	NA[a]	5.0
1,4-Dichlorobenzene	NA	5.0
1,2-Dichlorobenzene	NA	5.0

Note:

a NA = Not analyzed

ATTACHMENT

PRC STANDARD OPERATING GUIDELINE 001

SOG APPROVAL FORM

PRC ENVIRONMENTAL MANAGEMENT, INC.
FIELD ANALYTICAL SCREENING AND SAMPLING SERVICE
STANDARD OPERATING GUIDELINE

VOLATILE ORGANIC COMPOUNDS
IN SOIL GAS, SOIL, AND WATER

SOG 001

INITIAL ISSUE

Approved by:

Patrick Schubert
Quality Assurance Officer

10/21/92
Date

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1.0 SCOPE AND APPLICATION

This Field Analytical Screening and Sampling (FASS) service standard operating guideline (SOG) is an analytical method used to determine the concentrations of volatile organic compounds (VOC) in soil, water, and soil gas. The method is designed to be used at an on-site laboratory to give quick, accurate results. Those results then can be used to guide field sampling activities. Table 1 lists the VOCs which can be detected using this method. It also lists the practical quantitation limits (PQL) for each VOC.

2.0 SUMMARY OF METHOD

This FASS VOC guideline details how to use a gas chromatograph and other related equipment to determine parts per billion (ppb) levels of VOCs in soil, water, and soil gas. The soil and water analyses are completed by combining automated headspace sampling with gas chromatography (GC) analysis. The soil gas analysis is accomplished by a direct injection GC method. Quantitation and identification are based on relative peak areas and relative retention times using the external standard method.

2.1 SOIL AND WATER METHOD

A measured amount of a soil or water sample is placed into a headspace vial. The vials are sealed and allowed to equilibrate in the headspace analyzer at a constant temperature at or near the boiling point of the target analyte. Water samples must not be heated above 95°C to prevent sample loss and equipment damage. A headspace sample is automatically withdrawn from the headspace and injected onto a temperature-programmed gas chromatograph typically equipped with a megabore capillary column. The GC megabore capillary column effluent is directed through a photoionization detector (PID) or an electron capture detector (ECD). Sample peak patterns and peak responses are then compared to VOC standards to identify and quantitate the concentration of VOCs in the sample. The PID is used to detect aromatic and nonhalogenated VOCs, and the ECD is used to detect halogenated VOCs. The detectors may be connected in series.

TABLE 1

FASS TARGET COMPOUND LIST AND PQLs FOR VOCs IN SOIL, WATER, AND SOIL GAS

(Sheet 1 of 2)

Volatile Organic Compound	CAS Registry Number	Quantitation Limits[a] Soil (µg/kg) Water (µg/L) Soil Gas (ng/L)[b]
Benzene	71-43-2	25
Bromodichloromethane	75-25-4	1.0
Bromomethane (Methyl Bromide)	74-83-9	100
2-Butanone (Methyl Ethyl Ketone)	78-93-3	25
Chlorobenzene	108-90-7	25
(2-Chloroethoxy)ethene (2-Chloroethyl Vinyl Ether)	110-75-8	100
Chloroethylene (Vinyl Chloride)	75-01-4	100
Carbon Tetrachloride	56-23-5	1.0
Dibromochloromethane	124-48-1	1.0
1,2-Dichlorobenzene	95-50-1	25
1,3-Dichlorobenzene	541-73-1	25
1,4-Dichlorobenzene	106-46-7	25
1,1-Dichloroethane (Ethylidene Chloride)	75-34-3	25
1,2-Dichloroethane (Ethylene Dichloride)	107-06-2	25
1,1-Dichloroethene (Vinylidene Chloride)	75-35-4	25
trans-1,2-Dichloroethene (Acetylene Dichloride)	540-59-0	25
Dichloromethane (Methylene Chloride)	75-09-2	25
1,2-Dichloropropane (Propylene Dichloride)	78-87-5	25
1,3-Dichloropropene (Dichloropropylene)	542-75-6	25
o,m,p-Dimethylbenzene (Xylenes)	1330-20-7	25
Ethylbenzene	100-41-4	25
Methylbenzene (Toluene)	108-88-3	25

Notes:

[a] Specific quantitation limits are highly matrix dependent. These quantitation limits are provided for guidance and may not always be achievable. Also, they are calculated on an as-received basis.

[b] Soil gas concentrations are reported as nanograms/liter of air. One liter of air weighs approximately one gram; therefore, on a weight basis this is equivalent to parts per billion.

TABLE 1

FASS TARGET COMPOUND LIST AND PQLs FOR VOCs IN SOIL, WATER, AND SOIL GAS

(Sheet 2 of 2)

Volatile Organic Compound	CAS Registry Number	Quantitation Limits[a] Soil (µg/kg) Water (µg/L) Soil Gas (ng/L)[b]
Methyl tert-Butyl Ether	1634-04-4	25
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	108-10-1	25
2-Propenal (Acrolein, Acrylaldehyde)	107-02-8	100
2-Propenenitrile (Acrylonitrile)	107-13-1	100
Styrene	100-42-5	25
1,1,1,2-Tetrachlorethane	630-20-6	1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0
Tetrachloroethene (Tetrachloroethylene)	127-18-4	1.0
Tribromoethane (Bromoform)	75-25-2	100
1,1,1-Trichloroethane (Methyl Chloroform)	71-55-6	1.0
1,1,2-Trichloroethane (Vinyl Trichloride)	79-00-5	1.0
Trichloroethene (Trichloroethylene)	79-01-6	1.0
Trichlorofluoromethane	75-69-4	1.0
Trichloromethane (Chloroform)	67-66-3	1.0

Notes:

[a] Specific quantitation limits are highly matrix dependent. These quantitation limits are provided for guidance and may not always be achievable. Also they are calculated on an as-received basis.

[b] Soil gas concentrations are reported as nanograms/liter of air. One liter of air weighs approximately one gram; therefore, on a weight basis this is equivalent to parts per billion.

2.2 SOIL GAS METHOD

A soil gas sample is collected in a 1-liter Tedlar bag or a 250-mL gas sampling bulb. A specific volume of gas is withdrawn from the Tedlar bag or sampling bulb with a ground glass syringe and the volume is directly injected onto a temperature-programmed gas chromatograph typically equipped with a megabore capillary column. The GC megabore capillary column effluent is directed through a PID or an ECD. Sample peak patterns and peak responses are then compared to VOC standards to identify and quantitate the concentration of VOCs in the sample. The PID is used to detect aromatic and nonhalogenated VOCs, and the ECD is used to detect halogenated VOCs. The detectors may be connected in series.

3.0 INTERFERENCES

Interferences may be introduced through such means as carrier gas contamination, carryover from extremely contaminated samples, and sample matrix effects. Potential for carrier gas contamination is reduced by using ultra-high purity (UHP 99.999 percent) carrier gases. The use of carrier gas filters also will help eliminate these problems. The analysis of highly contaminated samples followed by the analysis of cleaner samples frequently results in sample carryover contamination. Sample carryover contamination can be reduced by using good laboratory techniques. This may include baking glassware, such as soil-gas sample syringes and headspace vials, in a laboratory oven before and between usage. If sampling bulbs are used for soil gas collection, they also must be decontaminated between sample collection. This is accomplished by heating the bulbs in an oven at 100°C while pulling clean air through them with a vacuum pump. Furthermore, laboratory reagent blanks are used to demonstrate the analytical system is free from contamination.

The use of syringes and other sample handling equipment containing Teflon should be avoided. Some VOCs, especially 1,1,1-trichloroethane, are strongly sorbed to Teflon surfaces. This may cause sample carryover contamination. All syringes should be properly decontaminated by flushing with a solvent such as hexane or methanol and by drying in an oven at 100°C.

4.0 APPARATUS AND MATERIALS

The analytical system used for this FASS VOC method is described in the following sections.

4.1 ANALYTICAL INSTRUMENTATION

The analytical equipment required for the FASS VOC method includes a headspace autosampler, gas chromatograph, columns, detectors, carrier gases and gas purifiers. Details on each piece of equipment are given in the following sections.

4.1.1 Headspace Autosampler

The Tekmar 7000 Headspace Autosampler (HSA) or equivalent system is used for the VOC analysis of soil and water samples. The HSA is a temperature programmable system. Samples are heated to a predetermined temperature in the sample carousel and automatically injected onto the GC column via a heated valve and transfer line. A 1-mL sample loop typically is used for most analyses, but larger volume loops may be utilized to lower detection limits.

4.1.2 Gas Chromatograph

The GC typically used for the analysis of VOCs using this method is a Shimadzu GC-14A, or equivalent. This GC is temperature programmable and includes heated injector ports and detector ports. The injectors used are designed for packed columns but are modified to accept megabore capillary columns. The GC includes pressure valves and flow control valves for the precise delivery of carrier gases. GC data is collected on a Shimadzu C-R4A data system. This data system stores chromatographic data and is able to measure peak areas and peak heights. Chromatogram comparisons and baseline correction also can be performed. The GC also includes carrier gas connection fittings, column connections and fittings, carrier gas leak detectors, septums, syringes, and all other required accessories.

4.1.3 Columns

The following analytical columns are recommended for the analysis of VOCs. The first two are megabore capillary columns; the third is a packed column. Which column is best often depends on site-specific conditions.

Column 1: DB-624, 30-meter by 0.53-mm I.D. (inner diameter) column coated with 1.4 µm of the liquid phase. (J&W Scientific)

Column 2: VOCOL, 30-meter by 0.53-mm I.D. column coated with 3.0 µm of the liquid phase. (Supelco, Inc.)

Column 3: 1% SP-1000 on 60/80 Carbopack - B 8 feet by 1/8-inch O.D.(outer diameter) stainless-steel column. (Supelco, Inc.)

4.1.4 Detectors

The detectors used for the analysis of VOCs are a PID and an ECD. A PID equipped with 10.2-eV lamp is used to detect aromatic and nonhalogenated VOCs. An ECD is used to detect halogenated VOCs. The PID is operated at a temperature of 200°C, and the ECD is operated at a temperature of 250°C. The PID is operated at a range of 1 and an attenuation of 1. The ECD is operated at a range of 1 with the current set at 0.05 milliamps and an attenuation of 6. A make-up carrier gas is supplied directly to the detectors to stabilize the detector signal.

A flame ionization detector (FID) may be used in place of the PID or ECD for select compounds. The FID also may be operated in series following the PID or ECD if required.

4.1.5 Carrier Gases And Gas Purifiers

The use of UHP carrier gases is recommended. UHP nitrogen is the preferred carrier gas. Helium also may be used. The detector make-up gas is the same as the carrier gas.

Gas purifiers are recommended to further improve the quality of the carrier gas. A water and oxygen trap may be used (Supelco's OMI-1 purifier). A hydrocarbon trap also may be used

(Supelco's HC purifier). These purifiers should be routinely changed as recommended by the manufacturer.

Flame gases for the FID are air and hydrogen. These gases are regulated through restrictors to proportion the ratio of each gas reaching the detector. Extreme caution should be employed with the use of hydrogen due to its extreme flammability. All connections should be checked with a leak detector to ensure that no leaks exist. This is especially true when the instrument is to be operated while unattended.

4.2 LABORATORY EQUIPMENT

Other associated laboratory equipment used during sample preparation and analysis is described below.

- Micro Syringes: 10-, 25-, 50-, 100-, and 500-µL
- Ground Glass Syringes: 2- and 5-mL volumes for direct injection of soil gas samples
- Gas Sampling Bulbs: 250-mL glass bulbs for collection of soil gas samples
- Tedlar Bags: 1-liter Tedlar gas sampling bags for collection of soil gas samples (Option for glass bulbs)
- Vials: 2-mL glass with Teflon-lined cap for storage of stock standards and calibration standards
- Pasteur Pipets: 5.75- and 9-inch sizes, disposable glass
- Headspace Vials: 22-mL vials with Teflon-lined septa and crimp caps
- Crimper Pliers: used to securely fasten crimp tops to headspace vials
- Spatulas: stainless-steel
- Top Loader Balance: 0.01-gram accuracy
- Vortex Mixer: high-speed, Fisher Scientific or equivalent
- Drying Oven: 200°C limit

- Teflon Squeeze Bottles: 500-mL, for cleaning spatulas and other lab-supplies
- Pipet Bulbs: both large and small sizes to fit Volumetric and Pasteur pipets
- Bubble Flow Meter: used to check GC column flows
- Labels: assorted sizes, for marking sample and standard containers
- Sharpie Markers: black, for labeling sample and standard containers
- Paper Towels: for general cleanup uses
- Gloves: polypropylene or latex, for personal protection
- Safety Glasses: for personal protection

5.0 REAGENTS

The reagents needed for sample extraction and analysis are described below.

5.1 SOLVENTS

Solvent extraction is not employed for the headspace analysis of soil or water samples for VOCs. Some common laboratory solvents may be used for preparation of calibration standards for VOC analysis. These solvents are described below.

- Hexane: pesticide quality or equivalent
- Acetone: pesticide quality or equivalent
- Methanol: pesticide quality or equivalent
- Methylene Chloride: pesticide quality or equivalent

5.2 SAMPLE PREPARATION REAGENTS

The following reagents may be used in the preparation of soil samples for VOC analysis.

- Sodium Sulfate: granular, pesticide quality or equivalent
- Deionized Water: organic free grade water or equivalent, for preparation of reagent blanks
- Sand: purified, preanalyzed sand for the preparation of reagent blanks

5.3 STOCK STANDARD SOLUTIONS

Stock standards must be purchased from reputable vendors for the VOCs listed in Table 1. Standards for individual analytes may be purchased, or commercial or custom multicomponent standards may be used. These standards come with a certificate of analysis stating the purity of each component. The standards are in a solution of methanol with VOC concentrations of 100 µg/mL to 2,000 µg/mL. The standards are received in sealed ampules. When preparing the calibration standards, the ampule is broken and the needed amount is withdrawn. The remainder of the stock standard solution is then transferred to a 2-mL glass vial with a Teflon-lined screwcap.

Stock standards are to be stored at 4°C away from light. Stock standards should be checked frequently for signs of degradation or evaporation. Stock standards should be replaced after six months. They should be replaced sooner if comparisons with check standards indicate a problem with the stock standards.

Additionally, for soil gas analysis commercially available gas standards may be used as stock standards. Only a limited number of compounds are currently available in these standards. The initial cost of the gas standards is high, but they maintain their integrity, lasting for up to two years.

5.4 CALIBRATION STANDARD SOLUTIONS

Calibration standards are prepared from the stock standard solutions at a minimum of three levels for each VOC of interest. The lowest level standard for each matrix should correspond to the PQLs presented in Table 1. The other calibration standards should define the linear range of the GC for the analytes of interest. Typically this range encompasses one order of magnitude of

concentration. The concentration of the standards will vary depending on the VOC of interest as indicated by the PQLs listed in Table 1. If site-specific data quality objectives require otherwise, other calibration ranges may be used.

Calibration standards are stored at 4°C away from light. Calibration standards should be checked frequently for signs of degradation or evaporation, especially prior to usage. Calibration standards should be replaced every six months. They should be replaced sooner if comparisons with check standards indicate a problem.

If the gas stock standards are used for calibration, the appropriate volumes of the standard are directly injected onto the GC column for analysis. The volumes injected should define the PQLs of the analytes of interest and the linear range of the GC for these compounds.

5.5 SURROGATE STANDARD SOLUTIONS

The FASS VOC method for soil and water samples can be monitored for the performance of the headspace extraction and the analytical system by using a surrogate standard. If used, the surrogate standard should be added to all standards, blanks, samples, and quality control samples. Several surrogate standards may be used for this method including 2-bromo-1-chloropropane (2BCP), bromochloromethane, 1, 4-dichlorobutane, and 4-bromofluorobenzene. The surrogate standard used will depend on the VOC analytes of interest. A stock standard of individual surrogates or a mixture of the surrogates is purchased from a reputable vendor and treated as all stock standards (see Section 5.3). The surrogate standard is added to all soil standards at the 100 µg/kg level and water standards at the 100 µg/L level. A dilution of the surrogate stock solution is made to produce a surrogate spike solution to add to the samples. This surrogate spike solution is prepared so that when it is added to a sample during the extraction process it will yield a concentration of 100 µg/kg or 100 µg/L. The concentration of the surrogate in each sample is compared to the concentration of the surrogate standard in the calibrating standards to determine the performance of the headspace autosampler and the analytical system.

Surrogate spikes may also be used when analyzing soil gas samples. The appropriate amount of the surrogate is injected into the soil gas sample bulb or Tedlar bag and allowed to equilibrate. The spike concentration should be within the calibration range.

Surrogate standard solutions are to be stored at 4°C away from light. Surrogate standard solutions should be checked frequently for signs of degradation or evaporation. The surrogate standard solutions should be replaced every six months, or sooner if comparisons to standards indicate a problem.

6.0 SAMPLE COLLECTION, PRESERVATION, HANDLING, AND DOCUMENTATION

Sample collection, preservation, handling, and documentation are described in the following sections.

6.1 SAMPLE COLLECTION

Soil and water samples will be collected in 40-mL glass vials with Teflon-lined caps. Two vials will be filled for each sample, and four vials will be filled when a sample and duplicate are required. The maximum amount of sample required for analysis is 10 grams of soil or 10 mL of water. The extra sample is collected for quality control samples and in case the sample leaks or container breaks.

Soil gas samples will be collected in either a 250-mL gas sampling bulb or a 1-liter Tedlar bag. Only one gas sampling bulb or Tedlar bag is required for each sample since multiple aliquots may be withdrawn for duplicates or quality control samples. The amount of sample required for analysis is approximately 10 mL.

6.2 SAMPLE PRESERVATION

All soil and water samples are stored at 4°C in a refrigerator or in a cooler on ice. No chemical preservatives are required for VOC analyses because the analyses are generally accomplished within 24 hours of collection. The holding time for VOCs in soil or water is 7 days.

Since this method is designed to provide results quickly, holding times should not be exceeded. If water samples are to be held longer than 48 hours or to be shipped to the laboratory, one drop of 1:1 hydrochloric acid should be added to each vial.

Soil gas samples should be stored at room temperature away from sunlight because some VOCs degrade in sunlight. The holding time for VOCs in soil gas is 12 hours. Since this method is designed to provide results quickly, holding times should not be exceeded.

6.3 SAMPLE HANDLING

Many VOCs are suspected carcinogens or are otherwise hazardous to health. Care should be taken when collecting, handling, extracting, or analyzing samples. The health and safety plan should be closely examined and adhered to by all sample collection personnel. This plan should be followed at all times by anyone involved with any portion of the project. Safety equipment, including safety glasses, gloves, lab coats, and chemical resistant clothing, should be worn at all times when handling samples.

6.4 SAMPLE DOCUMENTATION

Sample locations, numbers, times, and dates will be recorded in a field logbook at the time of collection. Soil samples will be numbered beginning with SS-001, water samples will be numbered beginning with W-001. Soil gas samples will be numbered beginning with SG-001. Duplicate samples will be assigned a "D" suffix, and field blank samples will be assigned a "B" suffix. This numbering scheme can be changed on a project specific basis. Regardless of the numbering nomenclature used, each sample collected should have a unique sample number.

An analytical logbook will be kept to record the samples turned over to the on-site laboratory. This logbook will be reviewed to ensure that all samples received were analyzed within the required holding times.

7.0 SAMPLE PREPARATION AND ANALYSIS PROCEDURE

The following sections describe the preparation procedures for soil and water samples.

7.1 SOIL AND WATER SAMPLE PREPARATION

The soil and water sample preparation for VOCs is as follows:

1. For soil analysis, weigh 5 grams (+/- 0.2 grams) of soil and place it into a tared and labeled 22-mL headspace vial. For water analysis, volumetrically pipet 5 mL of sample to the 22-mL headspace vial. Sample mass or volume may be increased to attain lower detection limits or decreased for high concentration samples. The same mass or volume should be used for standards and samples.

2. Add surrogate spike solution to all samples, and matrix spike solution to all matrix spike and matrix spike duplicate samples.

3. Cap and crimp the vials for insertion into the headspace analyzer.

4. The sample now is ready for headspace autosampling and GC analysis.

7.2 SOIL GAS SAMPLE PREPARATION

There is no sample preparation required for the analysis of soil gas samples. The soil gas samples are collected in a gas sampling bulb or Tedlar bag and delivered to the mobile lab for analysis. A ground glass syringe is used to extract 2 mL of soil gas from the sample container for direct injection onto the GC column for analysis. Larger volumes of soil gas may be injected onto the column to achieve lower detection limits or smaller volumes may be injected for highly contaminated samples. The use of larger soil gas volumes for analysis may lead to more rapid deterioration of the column liquid phase and oxidation of the ECD foil.

Surrogate spikes or matrix spikes may be prepared by injecting the appropriate amount of the analytes of interest into the gas sampling bulb or Tedlar bag. The spike concentration should fall within the instrument calibration range.

7.3 GAS CHROMATOGRAPHIC CONDITIONS

Table 2 lists the gas chromatographic conditions for each of the three columns listed in Section 4.1.2 of the FASS VOC method.

7.4 HEADSPACE AUTOSAMPLER PARAMETERS

Table 3 lists the time and temperature parameters of the HSA for the FASS VOC method.

7.5 CALIBRATION

Calibration of the analytical system is performed by using the external calibration method. This method requires the analysis of three levels of standards for each VOC of interest. The standards are evaluated for retention time criteria and linearity. The evaluation of the standards is performed through the initial calibration and the continuing calibration. Appendix A of this document shows chromatograms of chlorinated and aromatic VOCs. These chromatograms were obtained from the DB-624 column. This column was attached to a packed column injection port and was operated at the conditions listed in Table 2.

7.5.1 Initial Calibration

Initial calibration (ICAL) must be performed before the analysis of any sample. The ICAL determines the retention time windows for the analytes of interest, and it establishes the linearity of the analytical system.

The ICAL begins with the analysis of three standards which define the linear range of the GC for analytes of interest. The sequence described on Table 4 of this FASS VOC method illustrates the analytical run sequence for the analysis of VOCs. Generally, the low-level standard is analyzed first, followed by the midlevel standard and finally by the high-level standard. The concentrations of these standards were given in Section 5.4. These standards can then be used to determine the retention time windows and linearity.

TABLE 2

GAS CHROMATOGRAPHIC COLUMN CONDITIONS

GC Parameter	Column 1	Column 2	Column 3
Injector Temperature	200°C	200°C	200°C
PID Temperature	200°C	200°C	200°C
ECD Temperature	250°C	250°C	250°C
Column Flow Rate	10 mL/minute	10 mL/minute	40 mL/minute
Make-up Flow Rate	20 mL/minute	20 mL/minute	30 mL/minute
Initial Column Temperature	40°C	40°C	45°C
Initial Hold Time	7 minutes	7 minutes	3 minutes
Ramp Rate	5°C/minute	5°C/minute	8°C/minute
Final Temperature	120°C	120°C	220°C
Final Hold Time	2 minutes	2 minutes	15 minutes
Sample Injection Volume[a]	2 mL	2 mL	2 mL

Notes:

Column 1 = DB-624, J&W Scientific
Column 2 = VOCOL, Supelco, Inc.
Column 3 = 1% SP-1000 on 60/80 Carbopack-B, Supelco, Inc.

Gas chromatographic conditions may need to be optimized for each GC and analytical column used. These conditions are given only as guidelines.

[a] For headspace analysis of soil and water, the headspace sample loop controls the volume of gas injected. For analysis of soil gas, ground glass syringe is used to control the volume of gas directly injected.

TABLE 3

HEADSPACE AUTOSAMPLER PARAMETERS

HSA Parameter	Setting
Platten Temperature	65° C
Platten Equilibration	10 minutes
Sample Equilibration	20 minutes
Valve Temperature	110° C
Transfer Line Temperature	125° C
Mixer time	1 minute
Mixer power setting	3
Equilibration time	10 minutes
Vial pressurization	1.0 minute
Pressure equilibration	0.5 minute
Loop fill	0.5 minute
Sample inject	0.5 minute

Note:

HSA parameters may need to be optimized for each HSA - GC system. These parameters are given only as guidelines.

TABLE 4

ANALYTICAL RUN SEQUENCE FOR VOCs

- Method blank
- VOC standard 1, low-level[1]
- VOC standard 2, midlevel[1]
- VOC standard 3, high-level[1]
- System blank
- Sample Analysis (may continue for up to 24 hours, and may include any number of system blanks to reduce the risk of carryover from contaminated samples)
- System blank
- Continuing Calibration: VOC standard 2, midlevel[2]
- System Blank
- Sample Analysis (may continue as long as continuing calibration is acceptable)
- System blank
- Sequence may continue provided that the continuing calibration is acceptable. If continuing calibration is unacceptable a new initial calibration must be performed before sample analysis can continue.

Notes:

[1] The VOC standards will consist of site-specific analytes of interest. Commercially available multicomponent standards, custom multicomponent standards, or individual analyte standards may be used as required.

[2] Continuing calibration is performed at least once every 24 hours.

This FASS VOC method is written with the intent of conducting analyses for halogenated, nonhalogenated, and aromatic VOC groups either individually or simultaneously. Simultaneous analysis may be accomplished by connecting the PID and FID or the PID and ECD detectors in series.

Each VOC exhibits a specific retention time on the GC column used for the analysis. The detectors also exhibit varying degrees of sensitivity for each of the VOCs. The PID is very sensitive to aromatic compounds, the FID is sensitive to the aliphatic compounds, and the ECD exhibits great sensitivity to the halogenated compounds. These characteristics enable the identification of each VOC.

Retention times for each peak are determined by calculating the mean of the peak's retention time from each of the three levels of standards used in the ICAL (Equation 1). For megabore capillary columns, the retention time window is defined as plus or minus 0.05 minute from the mean retention time (Equation 2). For packed columns, the retention time window is defined as plus or minus three times the standard deviation of the peak in the three levels of standard (Equation 3). Equation 4 is that for standard deviation.

$$\text{mean RT} = (\text{RT1} + \text{RT2} + \text{RT3}) / 3 \qquad (1)$$

where

mean RT = mean retention time.

RT1 = retention time of the peak in the low-level standard.

RT2 = retention time of the peak in the midlevel standard.

RT3 = retention time of the peak in the high-level standard.

$$\text{RT window} = \text{mean RT} - 0.05, \text{ and Mean RT} + 0.05 \qquad (2)$$

where

RT window = the area of a chromatogram where an analyte peak may elute and be considered the analyte.

mean RT = the mean retention time of a peak as determined from Equation 1.

$$\text{RT window} = \text{mean RT} - (3 \times \text{SD}), \text{ and mean RT} + (3 \times \text{SD}) \quad (3)$$

where

RT window = the area of a chromatogram where an analyte peak may elute and be considered the analyte.

mean RT = the mean retention time of a peak as determined from Equation 1.

SD = the standard deviation of the retention time as determined by Equation 4.

$$\text{SD} = [\Sigma\ (\text{RT}^n - \text{mean RT})^2)\ /(n - 1)\ ]^{1/2} \quad (4)$$

where

Σ = the sum of.

RT^n = each of the three peak retention times.

mean RT = the mean retention time of a peak as determined from Equation 1.

n = the number of RT^ns used in this calculation (3).

$\frac{1}{2}$ = square root.

Alternatively, the analyte retention time window may be defined using the integrator computer software program. The average retention time of each analyte is calculated from the analysis of the three standards. This retention time is entered into the integrator program, and a three percent retention time window is chosen. A larger retention time window may be required for later eluting peaks.

Linearity for the VOC standards is determined in the ICAL sequence. The measure of linearity is found by evaluating the percent relative standard deviation (%RSD) of the three initial calibration factors (CF). The CF is calculated by using Equation 5. The same peaks used for retention time identification are used to calculate the CF.

$$\text{CF} = \text{peak response} / \text{mass injected} \quad (5)$$

where

CF = calibration factor.

peak response = peak area/height readout from integrator.

mass injected = nanograms (ng) injected.

The standards are determined to be linear if the %RSD is less than or equal to 25 percent. Each VOC analyzed during the ICAL should have an %RSD which is less than or equal to 25 percent. %RSD is determined from Equation 6.

$$\%RSD = (SD / \text{mean CF}) \times 100 \qquad (6)$$

where

%RSD = percent relative standard deviation.

SD = standard deviation of the three calibration factors.

mean CF = mean calibration factor.

If the %RSD is greater than 25 percent, a closest point calibration curve may be used in place of the average calibration factor for sample quantitation. ICALs which have %RSDs greater than 35 percent are not to be used. When %RSDs above 35 percent are encountered, the instrument must be evaluated to determine the cause of the high %RSDs. Actions which can be taken include: changing the septum, leak checking the column, cleaning the glass injection port liner, and making new standards. After the situation is corrected, a new ICAL should be performed and analyzed to ensure that the analytical system linearity is within control.

7.5.2 Continuing Calibration

Continuing calibrations (CCAL) should be performed and analyzed daily to ensure that the analytical system is in control. Continuing calibrations are performed by analyzing the midlevel standard of the VOCs of interest. The retention time windows are evaluated and adjusted as necessary. The calibration factor for each VOC is calculated to determine if instrument response is in control.

The retention time of the peak for each VOC used in the CCAL is to be examined. These peaks should fall within the retention time windows developed in the ICAL. If the peaks are outside of the retention time windows, new windows should be determined. This is performed by using the CCAL retention time as the retention time mean and using the windows found in Equation 2 or Equation 3.

The calibration factors of the CCAL VOCs are found using Equation 5. These calibration factors are compared to the average calibration factors determined from the ICAL. The relative percent difference (RPD) is determined for each VOC by using Equation 7.

$$RPD = [(CCAL\ CF - avg\ CF) / \{(CCAL\ CF + avg\ CF)/2\}] \times 100 \qquad (7)$$

where

RPD = relative percent difference.

CCAL CF = continuing calibration - calibration factor.

avg CF = average calibration factor for each VOC determined in the ICAL.

The RPD for the CCAL must be less than or equal to 25 percent to continue sample analysis. If the RPD is greater than 25 percent a new ICAL must be performed.

7.6 GAS CHROMATOGRAPHIC ANALYSIS

After completing an acceptable initial calibration, sample analysis may begin. Samples are analyzed by injecting sample headspace extracts onto the GC. Sample analysis should begin with the analysis of the method blank. Samples believed to be clean should be analyzed before those believed to be highly contaminated. The analyst may not always be able to determine clean samples from highly contaminated samples.

One method of identifying potential highly contaminated VOC samples is to have the sampling team screen each sample with a portable PID or FID (such as the Photovac Microtip, HNV Systems 101 Portable PID, or Foxboro Organic Vapor Analyzer) as each is collected. The results can be recorded on the sample label or in the logbook for the field chemist. This information may be used to determine if smaller sample mass (soil) or volume (water or soil gas) may be required to obtain results within the calibration range. Practical quantitation limits (PQL) for all of the VOCs will be adjusted by any dilution factor used for the sample.

Each day the GC system is monitored through the use of the CCAL. Retention time windows for the VOCs are adjusted, if needed. The detector response of each of the CCAL VOCs is evaluated through the comparison of peak area or height. The CCAL standards are compared to

the ICAL standards by monitoring the percent differences of the ICAL calibration factors to the CCAL calibration factors. If the CCAL data is acceptable, sample analysis may continue. If the CCAL is unacceptable a new ICAL should be performed.

7.7 CLEANUP

No sample cleanup is required; however, sodium sulfate or calcium chloride (2g) may be added to soil samples to minimize moisture collecting on the vial septa during headspace sampling.

7.8 CALCULATIONS

Sample calculations for VOCs are performed by comparing peak responses for samples to the average calibration factor found from the ICAL. The calculation for soil samples is shown in Equation 8.

$$\text{Conc.} = (\text{peak response}/\text{avg CF}) \,/\, \text{sample mass} \qquad (8)$$

where

Conc. = concentration of VOC in the soil sample (µg/kg).
peak response = peak area/height readout from integrator.
avg CF = average calibration factor for each VOC as determined in the ICAL.
sample mass = mass of soil sample (grams) in headspace vial.

The same equation is used for water sample calculation with the exceptions that concentration is in µg/L and sample volume (mL) is used in the calculation in place of sample mass.

If the same sample mass (soil) or sample volume (water) is used in the preparation of both the standards and samples, then the headspace volume cancels out in the equation. Also, since the headspace sample loop is a constant volume, this variable cancels out of the concentration calculations.

Soil gas concentrations are calculated by using Equation 9.

$$\text{Conc.} = (\text{peak response}/\text{avg CF}) / \text{sample volume} \quad (9)$$

where

Conc. = concentration of VOC in the soil gas sample (ng/L: where L = one liter of air).

peak response = peak area/height readout from integrator.

avg CF = average calibration factor for each VOC as determined in the ICAL.

sample volume = volume of soil gas sample (liters) directly injected onto the GC column.

Since one liter of air weighs approximately one gram, the units for soil gas concentration (ng/L) are approximately equal to parts per billion on a mass basis.

8.0 QUALITY CONTROL

Quality control for this FASS VOC method includes: equipment blanks, method blanks, surrogate spikes, and matrix spike-matrix spike duplicates, duplicate samples, and laboratory control samples.

8.1 METHOD BLANKS

Method blanks are analyzed with each batch of samples analyzed. A batch is defined as up to 20 samples of a similar matrix prepared and analyzed together. Method blanks monitor laboratory-induced contaminants or interferences. To be acceptable, a method blank must not contain any analyte above the PQLs. Method blanks must not have peaks which interfere with any analyte and must not have large, broad peaks present in the chromatogram. If any of these conditions are present in method blanks, the cause of the problem must be identified, and all samples extracted and analyzed with the method blanks must be analyzed again.

In soil gas analysis, a method blank includes a decontaminated soil gas syringe blank and a decontaminated soil gas sampling bulb blank. Generally, the decontaminated glass syringe and glass sample bulb that exhibited the highest sample concentration the previous day will be used for the method blank analysis to ensure decontamination was thorough.

8.2 SURROGATE SPIKE RECOVERY

Surrogate spikes may be used to determine the headspace extraction efficiency of the FASS VOC method. Surrogates are added to all standards, blanks, samples, and matrix spikes performed. The surrogate standard for headspace VOC analysis are given in Section 5.5. The CF and retention time windows for the surrogate standards are determined during the ICAL. The CF and retention time windows are monitored daily through the CCALs. RPDs for the surrogate standards must be less than or equal to 25 percent in the CCALs. The surrogate recovery for each blank and sample is calculated by Equation 10.

$$\% R = (\text{sample amt.} / \text{spiked amount}) \times 100 \qquad (10)$$

where

% R = percent recovery.
sample amt. = amount found in the sample (µg/L, or µg/kg).
spiked amount = amount spiked into sample (µg/L, or µg/kg).

The advisory control limits for the surrogate recovery in both soil and water is 50 to 150 percent. These control limits are for advisory purposes only. If surrogate recovery is frequently outside of the control limits, corrective action may be needed. Corrective action may include reextraction and reanalysis of the samples and preparing new surrogate spike standards or calibration standards. Surrogate recoveries outside of the advisory control limits need to be flagged and explained in the final report.

8.3 MATRIX SPIKE RECOVERY

Matrix spike and matrix spike duplicate samples (MS-MSD) are used to evaluate the extraction efficiency of the headspace autosampler and to evaluate the precision of the analysis. The MS-MSDs are prepared with each batch of samples. A batch is defined as up to 20 samples of a similar matrix prepared and analyzed together. The matrix spike is added to the MS-MSD samples at approximately 10 times the PQL. The concentration of the matrix spike found in the spiked samples is calculated using Equation 8 or Equation 9. The recovery of the spiked samples is calculated using Equation 11.

$$\%R = [(\text{amt. found in Sp} - \text{amt. found in sample}) / \text{amt. spiked}] \times 100 \quad (11)$$

where

%R = percent recovery for either the MS or the MSD.

amt. found in Sp = amount of VOC found in the spiked sample.

amt. found in sample = amount of VOC found in the original sample.

amt. spiked = amount of VOC added to the MS or the MSD.

The precision of the analysis may be determined through the use of the MS-MSD. The recoveries of the MS-MSD are compared, and a relative percent difference (RPD) is calculated. The RPD value obtained can be used to determine method precision. The calculation for RPD is given in Equation 12.

$$RPD = [(MS\ \%R - MSD\ \%R) / \{(MS\ \%R + MSD\ \%R) / 2\}] \times 100 \quad (12)$$

where

RPD = relative percent difference.

MS %R = matrix spike percent recovery.

MSD %R = matrix spike duplicate percent recovery.

RPD is always used as an absolute value, or a positive number. The advisory control limits for spike recovery in both soil and water are 50 to 150 percent. The advisory control limits for RPD in both soil and water are 50 percent.

The advisory control limits may not always be achievable. This may be due to the sample matrix. This is especially true for soil samples. If the spike recovery or the RPD is outside of the advisory control limits, another MS-MSD should be performed. If recovery or RPD is still outside of the advisory control limits, the values should be flagged and explained in the final sample report.

Control charts will be developed and updated yearly for the surrogate, matrix spike, and RPD control limits. The charts will be produced based on the data generated from the previous

year. These control charts will be added to this method annually as Appendix B and will be available during sample analysis.

8.4 LABORATORY CONTROL SAMPLES

Laboratory control samples (LCS) are used to evaluate the accuracy of the analysis. The LCS samples are obtained from outside sources and contain a known amount of the VOCs. These samples are analyzed following the same sample preparation and analysis procedures used for true samples. The results obtained from the analysis are then compared to the known true values. Control limits are usually provided from the supplier of the LCS. The results obtained should fall within the published range of acceptance values. When no control limits are provided, the range from 50 to 150 percent should be used. When values obtained from the LCS fall outside of the control limits, the LCS and all samples extracted and analyzed with it must be analyzed again.

LCS samples are analyzed when available. These samples are expensive and may not be readily available when VOC analysis is needed. Results from LCS sample analysis will be stored along with the final report and will be used to prepare control charts included in Appendix B.

8.5 LABORATORY DUPLICATE SAMPLES

Duplicate samples are two analyses performed on the same sample. Duplicate samples may be used to monitor the precision of the sampling and analysis procedures used. Duplicate samples are analyzed with each batch of up to 20 samples. Results from the duplicate samples are compared by evaluating the RPD of both results. Equation 13 shows the terms and the calculation for RPD.

$$RPD = [(Result\ 1 - Result\ 2) / \{(Result\ 1 + Result\ 2) / 2\}] \times 100 \qquad (13)$$

where

RPD = Relative percent difference.

Result 1 = Result from first sample analysis.

Result 2 = Result from second sample analysis.

RPD is always used as an absolute value, or a positive number. RPD values of below 50 percent are considered acceptable. This may not always be achievable. Sample matrix, nonhomogeneity, and organic content can affect the duplicate RPD. When RPD values of above 50 percent are obtained, another duplicate should be prepared and analyzed to gather more data. Usually the reported value will come from the highest result obtained.

9.0 METHOD PERFORMANCE

The FASS VOC method will be used to determine concentrations of VOCs found in soil gas, water, and soil samples. This analysis will be performed in an on-site laboratory. As more data is gathered and evaluated, the method performance will be updated and included as Appendix B of this SOG.

10.0 REFERENCES

U.S. Environmental Protection Agency

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APPENDIX A
SAMPLE CHROMATOGRAMS

APPENDIX B
CONTROL CHARTS