



EPA Region X
START

Superfund Technical Assessment and Response Team

*Camp Abbot FUDS
Preliminary Assessment/Site Inspection Report*

TDD: 01-08-0006

EPA Contract: 68-S0-01-02

April 2005



Weston Solutions, Inc. • 190 Queen Anne Avenue North • Seattle, WA 98109-4926



Weston Solutions, Inc.
Suite 200
190 Queen Anne Avenue North
Seattle, Washington 98109-4926
206-521-7600 • Fax 206-521-7601
www.westonsolutions.com

13 April 2005

Ken Marcy, Task Monitor
United States Environmental Protection Agency
1200 Sixth Avenue, M/S ECL-115
Seattle, WA 98101

WO# 12644-001-002-0110-29

RE: Camp Abbot FUDS Preliminary Assessment/Site Inspection Draft Report
Contract No. 68-S0-01-02
TDD: 01-08-0006
Document Control Number: 12644-001-002- AAYO

Dear Mr. Marcy:

Enclosed please find five copies of the Preliminary Assessment/Site Inspection report for the Camp Abbot Formerly Used Defense Site (FUDS), located in Sunriver, Oregon. In addition, two copies of addenda sheets are enclosed to update the subject report dated January 28, 2005.

If you have questions or comments, please contact me at (206) 521-7659 or e-mail at Kevin.Broom@westonsolutions.com.

Sincerely,

Weston Solutions, Inc.

Kevin Broom, R.G.
START Site Leader

Enclosures

cc: Greg Stuesse, Weston, START Project Manager, Seattle, Washington



PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT

Camp Abbot Formerly Used Defense Site Preliminary Assessment/Site Investigation
Sunriver, Deschutes County, Oregon

TDD: 01-08-0006

Submitted To:

Ken Marcy, Task Monitor
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

Prepared By:

Weston Solutions, Inc
190 Queen Anne Avenue North, Suite 200
Seattle, WA 98109

April 2005

Contract No.: 68-S0-01-02
Weston Work Order No.: 12644-001-002-0110-29
Weston Document Control No.: 12644-001-002- AAYO

APPROVALS			
TITLE	NAME	SIGNATURE	DATE
EPA Task Monitor	Ken Marcy		
START Project Manager	Greg Stuesse	<i>GS FOR</i>	04/17/05
START QA Officer	Paul Swift	<i>PS</i>	04/12/05

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. INTRODUCTION	1-1
2. SITE BACKGROUND.....	2-1
2.1 SITE DESCRIPTION AND BACKGROUND INFORMATION	2-1
2.1.1 Site Location	2-1
2.1.2 Site Description	2-2
2.1.3 Site Ownership	2-2
2.1.4 Site Operations and Source Characteristics	2-2
2.2 SITE CHARACTERIZATION	2-3
2.2.1 Previous Site Investigations	2-3
2.3 WASTE SOURCE AREAS AND SITE CONCERNS	2-4
2.3.1 Known and Potential Source Areas	2-5
2.3.2 Potential Receptors.....	2-5
3. FIELD ACTIVITIES AND ANALYTICAL PROTOCOL	3-1
3.1 SAMPLING DESIGN (TYPES, NUMBERS, AND RATIONALE).....	3-1
3.1.1 Potential Sources	3-2
3.1.2 Target Samples	3-2
3.1.3 Background Samples	3-3
3.2 SAMPLING METHODS	3-3
3.2.1 Surface Soil Sampling	3-3
3.2.2 XRF Screening Methodology	3-3
3.2.3 Sediment Sampling.....	3-4
3.2.4 Surface Water Sampling	3-4
3.2.5 Groundwater Sampling	3-4
3.3 ANALYTICAL PROTOCOL	3-4
3.4 SAMPLE GLOBAL POSITIONING SYSTEM LOCATIONS	3-5
3.5 INVESTIGATION DERIVED WASTE	3-5
3.6 SAMPLE HANDLING AND CUSTODY	3-5
3.7 SAMPLE IDENTIFICATION	3-5
4. QUALITY ASSURANCE/QUALITY CONTROL.....	4-1
4.1 SATISFACTION OF DATA QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA.....	4-2
4.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES	4-2
4.3 PROJECT-SPECIFIC DATA QUALITY OBJECTIVES	4-2
4.3.1 Precision.....	4-3
4.3.2 Accuracy	4-3
4.3.3 Representativeness	4-4
4.3.4 Comparability.....	4-4
4.3.5 Completeness	4-4

TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
4.4	LABORATORY QUALITY ASSURANCE/QUALITY CONTROL
	PARAMETERS..... 4-5
4.4.1	Holding Times..... 4-5
4.4.2	Blank Sample Results..... 4-5
4.4.3	Calibration Check Sample Analysis..... 4-6
4.4.4	Laboratory Control Sample Analysis 4-6
4.4.5	Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES)—Interference Check Sample (ICS) Analysis 4-6
4.4.6	Serial Dilutions..... 4-6
4.4.7	Duplicate Sample Analysis 4-7
4.4.8	Matrix Spike Sample Analysis..... 4-7
4.4.9	System Monitoring Compound (Surrogate) Spike Analysis 4-7
4.4.10	Internal Standard Analysis..... 4-7
4.4.11	Detection Limits..... 4-7
4.4.12	Other Data Assessment..... 4-7
5.	ANALYTICAL RESULTS REPORTING AND BACKGROUND SAMPLES..... 5-1
5.1	ANALYTICAL RESULTS EVALUATION CRITERIA 5-1
5.2	BACKGROUND SAMPLE LOCATION AND ANALYTICAL RESULTS..... 5-1
5.2.1	Background Sample Locations 5-2
5.2.2	Background Sample Results 5-2
6.	POTENTIAL SOURCE CHARACTERIZATION..... 6-1
6.1	POTENTIAL SOURCE SAMPLING LOCATIONS AND ANALYTICAL RESULTS..... 6-1
6.1.1	Source Description 6-1
6.1.2	Sample Locations 6-2
6.1.3	Sample Results 6-3
7.	MIGRATION/EXPOSURE PATHWAYS AND TARGETS 7-1
7.1	GROUNDWATER MIGRATION PATHWAY 7-1
7.1.1	Groundwater Pathway Targets..... 7-1
7.1.2	Groundwater Sample Location and Results..... 7-1
7.2	SURFACE WATER MIGRATION PATHWAY 7-2
7.2.1	Surface Water Pathway Targets..... 7-3
7.2.2	Target Sample Locations 7-4
7.2.3	Target Samples Analytical Results..... 7-4
7.3	SOIL EXPOSURE PATHWAY..... 7-5
7.4	AIR MIGRATION PATHWAY 7-6
8.	SUMMARY AND CONCLUSIONS..... 8-1

TABLE OF CONTENTS *(Continued)*

<u>Section</u>	<u>Page</u>
9. REFERENCES.....	9-1
APPENDIX A PHOTOGRAPHIC DOCUMENTATION	
APPENDIX B SURFICIAL CLEANUP OF ASBESTOS-CONTAINING-MATERIAL REPORT	
APPENDIX C CORRECTED AND UNCORRECTED GPS COORDINATES	
APPENDIX D DATA VALIDATION MEMORANDA AND LABORATORY SHEETS	
APPENDIX E SUNRIVER WATER LLC MUNICIPAL WELL #2 HISTORICAL ANALYTICAL DATA	

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>
2-1	Site Location Map
2-2	Site Plan
3-1	Site Overview and Sample Location Map
3-2	Landfill Features and Sample Location Map
3-3	Machine Gun Range Features and Sample Location Map
3-4	Northern Rifle Range Features and Sample Location Map
3-5	Southern Rifle Range Features and Sample Location Map
3-6	Grenade Court Features and Sample Location Map
3-7	Demolition Pits Features and Sample Location Map
7-1	4-Mile Target Distance Limit (TDL) Map
7-2	15-Mile Target Distance Limit (TDL) Map

LIST OF TABLES

<u>Table</u>	<u>Title</u>
3-1	Sample Collection and Analyses Summary
3-2	Sample Coding
6-1	Potential Sources: Landfill Analytical Results
6-2	Potential Sources: Machine Gun Range and Rifle Ranges Analytical Results
6-3	Potential Sources: Grenade Court and Demolition Pits Analytical Results
7-1	Groundwater Wells and Associated Population Within the 4-Mile TDL
7-2	Sunriver Water LLC Municipal Well #2 Analytical Results
7-3	Target Sediment Samples Analytical Results
7-4	Landfill Surface Water Sample Analytical Results
7-5	Resident Population and Wetlands Within the 4-Mile TDL

LIST OF ACRONYMS

<u>Acronym</u>	<u>Definition</u>
AES	Atomic Emission Spectroscopy
ASTM	American Association for Testing and Material Standard
BD/DR	Building Demolition/Debris Removal
bgs	below ground surface
BHC	Beta-hexachlorocyclohexane
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cfs	cubic feet per second
CLP	Contract Laboratory Program
CLPAS	Contract Laboratory Program Analytical Service
cm/sec	centimeters per second
COC	Contaminant of Concern
CRQL	Contract-Required Quantitation Limit
DERP	Defense Environmental Restoration Program
DOA	Department of the Army
DQI	Data Quality Indicators
DQO	Data Quality Objectives
EPA	United States Environmental Protection Agency
ERTC	Engineer Replacement Training Center
FEMA	Federal Emergency Management Agency
FUDS	Formerly Used Defense Site
GC	Gas Chromatography
GPS	Global Positioning System
HRS	Hazard Ranking System
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
IDW	Investigation Derived Waste
LCS	laboratory control sample

LIST OF ACRONYMS *(Continued)*

<u>Acronym</u>	<u>Definition</u>
LTL	Laucks Testing Laboratories
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
µg/L	microgram per liter
MCL	Maximum Contaminant Level
MDL	method detection limit
MEL	Manchester Environmental Laboratory
MQO	Method Quality Objectives
MS	Mass Spectrometry
NBEC	Nitrogen Base Explosive Compound
NPL	National Priorities List
NWI	National Wetland Inventory
ODFW	Oregon Department of Fish and Wildlife
ODGMI	Oregon Department of Geology and Mineral Industries
ODHS	Oregon Department of Health Services
OEW	Ordnance and Explosive Waste
ONHIC	Oregon Natural Heritage Information Center
OWRD	Oregon Water Resource Department
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PPE	Probable Point of Entry
ppb	parts per billion
ppm	parts per million
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
RPD	relative percent difference
RSCC	Regional Sample Control Coordinator
SARA	Superfund Amendments and Reauthorization Act

LIST OF ACRONYMS *(Continued)*

<u>Acronym</u>	<u>Definition</u>
SCDM	Superfund Chemical Data Matrix
SDWIS	Safe Drinking Water Information System
SI	Site Inspection
SOC	Synthetic Organic Compounds
SOP	Standard operating procedure
SOW	Statement of Work
SQAP	Sampling and Quality Assurance Plan
SQL	Sample Quantitation Limit
START	Superfund Technical Assessment and Response Team
SVOC	Semi Volatile Organic Compound
TAL	Target Analyte List
TDD	Technical Direction Document
TDL	Target Distance Limit
TIC	Tentatively Identified Compounds
TNT	Trinitrotoluene
USACE	United States Army Corps of Engineers
USCB	United States Census Bureau
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USFS	United States Forest Service
USGS	United States Geological Survey
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
Weston	Weston Solutions, Inc.
WRCC	Western Regional Climate Center
XRF	X-Ray Fluorescence

SECTION 1

INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the 1986 Superfund Amendments and Reauthorization Act (SARA), Weston Solutions, Inc. (Weston) has completed a combined Preliminary Assessment/ Site Inspection (PA/SI) at the Camp Abbot Formerly Used Defense Site (FUDS; CERCLIS ID No. ORN001002541) located in Sunriver, Deschutes County, Oregon. The United States Environmental Protection Agency (EPA) Region 10 retained Weston to complete this PA/SI pursuant to the EPA Superfund Technical Assessment and Response Team (START) Contract No. 68-S0-01-02 and Technical Direction Document (TDD) No. 01-08-0006. The purpose of this report is to provide the EPA with the background information collected for the site, to discuss the sampling activities conducted and the data collected during the PA/SI, and to present the analytical results from the data obtained as part of the investigation.

The PA and SI are generally the first and second screening investigations, respectively, in a series of assessments the EPA may complete at a known or potential hazardous waste site that is being investigated under CERCLA/SARA. The combined PA/SI integrates activities typically conducted during the PA (e.g. information gathering, site reconnaissance) with activities typically conducted during the SI (e.g. development of a site-specific Sampling Quality and Analyses Plan [SQAP], field sampling, filling data gaps) to achieve one continuous site investigation. The main objectives for the PA/SI activities are to:

- Collect and analyze samples to characterize the potential sources discussed in Section 2.3 or the report.
- Determine off-site migration of contaminants.
- Provide EPA with adequate information to determine whether further action under CERCLA is necessary.
- Document any threat or potential threat to public health or the environment posed by the site.

Any use of this document or the information contained herein by persons or entities other than the EPA Region 10 shall be at the sole risk and liability of said person or entity. START, therefore, expressly disclaims any liability to persons other than the EPA Region 10 who may use or rely upon this report in any way or for any purpose.

SECTION 2
SITE BACKGROUND

2.1 SITE DESCRIPTION AND BACKGROUND INFORMATION

Information presented in this section is based on a review of United States Army Corp of Engineers (USACE) files, site background information, and Weston's field sampling investigation conducted in May 2004.

This section describes the site location, site description, ownership history, and operational history of the Camp Abbot FUDS. Photographs of site features taken during the field effort are included in Appendix A.

2.1.1 Site Location

Site Name:	Camp Abbot FUDS
CERCLIS ID No.:	ORN001002541
USACE Site No.:	F10OR004100
Location:	River Road Sunriver, Oregon
Legal Description:	Sections 19, 31, and 32, Township 19S, Range 11E, Willamette Meridian Section 6, Township 20S, Range 11E, Willamette Meridian
County:	Deschutes County, Oregon
Property Owner(s):	Sunriver Nature Center, Inc. PO Box 3533 Sunriver, Oregon 97707 Sunriver Owners Association PO Box 3278 Sunriver, Oregon 97707 Sunriver Resort Limited Partnership PO Box 3589 Sunriver, Oregon 97707 United States Forrest Service (USFS)

Property Contact(s): Kathryn L. Pazera, Executive Director Sunriver Nature Center, Inc.
(541) 593-4442

Kelly J. Walker, Environmental Manager Sunriver Owners
Association
(541) 593-2411

Tom Keith, Vice President Sunriver Resort Limited Partnership
(541) 593-3766

2.1.2 Site Description

The Camp Abbot FUDS was established as a World War II Army Engineering Replacement Training Center (ERTC) located approximately 15 miles south of Bend, Oregon at an elevation of approximately 4,100 feet (Figure 2-1). The site was active for approximately 14 months, during which a total of 90,000 soldiers were trained. The site consisted of several small arms firing ranges, grenade and artillery ranges, ordnance storage magazines, a chemical training area, an obstacle course, anti-tank demonstration area, fortification obstacles, and support facilities (USACE, 1995a). The areas that were investigated during this PA/SI included a grenade court, two rifle ranges, a machine gun range, a landfill, and demolition pits (Figure 2-2).

The former Camp Abbot is now a resort and residential community called Sunriver. The area to the east of the Deschutes River is owned by private parties and is developed with residential homes, condominiums, an airport, golf courses, bike paths, and a nature center and observatory. The area to the west of the Deschutes River is managed by the USFS and is virtually undeveloped.

2.1.3 Site Ownership

The Department of the Army (DOA) obtained 8,672.45 acres of land in October 1942 from the United States Department of Agriculture (USDA). Additionally, 984.84 acres of fee land and 29.12 acres of easements were acquired from private parties. In April 1946, the Army declared the property as surplus and the fee and easement land was transferred to the War Assets Administration for disposal. This land was purchased by Hudspeth Land and Livestock Company who developed the land as the Sunriver Resort after 1969 (Sunriver Area Chamber of Commerce, 2003). In November 1947, the 8,672.45 acres of permitted land were returned to the USDA (USACE, 1986). The land west of the Deschutes River is under control of the Forest Service and is virtually undeveloped (USACE, 1995a).

2.1.4 Site Operations and Source Characteristics

Camp Abbot was established as an ERTC in 1943. A total of 90,000 soldiers were trained at the camp during the 14 months of operation. Each training session took 17 weeks and was divided into three distinct phases. The first phase included training in hand grenade and anti-tank grenades; defense against chemical, air, and mechanized attack; and rifle marksmanship. The second phase of training provided soldiers with demolition training during which, nitrostarch and other explosives were used to blast bridges. The third phase of the program was a three week

field maneuver spent under combat zone conditions (USACE, 1995a). Camp Abbot also served as the headquarters for the Oregon Maneuver War Games in 1943 (USACE, 1995a).

Camp facilities included barracks, a tactical training area, a night training area, grenade courts, and anti-aircraft range, a field target range, a sub-machine gun range, a demolition area, ordnance magazines, an anti-tank demonstration area, a gas chamber, a landfill, and two rifle ranges (USACE, 1995a). Ordnance and chemical munitions employed at Camp Abbot included small arms, artillery, shoulder fired rockets, mortars, grenades, mines, and chemicals such as mustard gas, chlorine, and white phosphorous (USACE, 1995a).

Camp Abbot ceased operations in June 1944. The camp was investigated for poisonous gases in September of 1946 and the chemical officer of the 6th Division of the United States Army determined the land was free from any such contamination (USACE, 1995a). In November 1947, Camp Abbot was examined and cleared of all explosives or explosive objects reasonably possible to detect by visual inspection (USACE, 1995a). Evidently, a group of youths found bazooka rockets, bullets, parts of hand grenades, and barbed wire that were attributable to Camp Abbot activities (USACE, 1995a). Additionally, an artillery round and a bazooka round were found west of the Sunriver Resort and were reported to the Deschutes County Sheriffs Department (USACE, 1995a). The exact dates of these findings are unknown, but suggest that the previous actions to clear the site of ordnance were to some degree, ineffective.

Contaminants of concern (COC) associated with site activities include Target Analyte List (TAL) metals, nitrogen based explosive compounds (NBECs), and perchlorate, which are remnant of the artillery and ordnance used at Camp Abbot; and semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs), which may be associated with the former landfill.

2.2 SITE CHARACTERIZATION

2.2.1 Previous Site Investigations

Weston conducted a file review at USACE Northwest Regional Office on August 22, 2003. The previous investigations conducted at Camp Abbot FUDS are summarized below.

- **January 31, 1986 Findings and Determination of Eligibility.** The USACE, under the purview of the Defense Environmental Restoration Program (DERP) for FUDS proposed a debris removal action at Camp Abbot. The proposed project involved the removal of several concrete building foundations, a small concrete and wood bridge, and a concrete bridge abutment. The USACE reported the decaying bridge, bridge abutment, and building foundations were considered to be a threat to the health and safety of the public visiting this portion of the Deschutes National Forest (USACE, 1986).
- **May 24, 1993 USACE Site Inspection.** The USACE under the purview of the DERP for FUDS conducted a site inspection at Camp Abbot in May 1993. Based on the site inspection, the USACE determined that the portion of the site contained a collapsing wood stringer bridge and a bridge abutment with protruding steel anchor pins (USACE, 1994). Both were considered a potential human hazard. The USACE also determined

Ordnance and Explosive Waste (OEW) may have been present on-site due to the evidence of former small arms, artillery, and grenade practice ranges (USACE, 1994).

The removal of the wood stringer bridge and bridge abutment was investigated. The structures were determined to be located on Federal Land and were therefore not eligible for further action. A Building Demolition/Debris Removal (BD/DR) was not proposed for the site (USACE, 1994).

The USACE determined the small arms, artillery, and grenade ranges should undergo further action as the area was used by the Army for training of engineer troops and was eligible for investigation.

- **October 14, 1993 USACE Risk Assessment For Ordnance and Explosive Waste Sites.** A Risk Assessment was prepared in conjunction with the 1993 site investigation. The hazard severity of the site was determined to be critical. This was based on the evidence of an artillery round and bazooka round found west of the Sunriver Resort. Additionally, spent mortar and rocket rounds were found northwest of the Sunriver airstrip (USACE, 1993). It was also determined that additional hazards were present due to the accessibility to the site by vacation and permanent residences at Sunriver Resort (USACE, 1993). Further investigation regarding the extent of OEW contamination was recommended as a high priority (USACE, 1993).
- **July 1995 Archives Search Report.** The USACE conducted an Archives Search Report for Camp Abbot. The archives search was conducted in order to compile information obtained through historical research at various archives and records holding facilities, interviews with persons associated with the site or its operations, and a USACE site visit. The USACE determined that there was the possibility of OEW contamination at Camp Abbot (USACE, 1995a). Based on the USACE site inspection, four areas were determined to be of concern. They included the cliffs northwest of the Sunriver Airport across from Cardinal Landing Bridge, the former grenade range, the suspected demolition/assault range, and the landfill (USACE, 1995b).
- **October 2004 Surficial Cleanup of Asbestos-Containing-Material (ACM).** The Sunriver Owners Association had an asbestos abatement project conducted at the Amphitheater site by Cascade Insulation, Inc. The project included surficial cleanup and disposal of approximately 5 cubic yards of asbestos debris (mainly [99%] cement asbestos board with minor [<1%] cloth, aircell, and magnesia block). Certain sections of the cleanup area contained subgrade debris that was not removed (Cascade Insulation, Inc., 2004). The site is listed in ODEQ's Environmental Cleanup Site Information (ECSI) Database, Site Number 4179. A copy of the asbestos report is attached for consideration in Appendix B. This information, while not expanded upon in the following sections of this report, will be used by EPA in the overall evaluation of this site.

2.3 WASTE SOURCE AREAS AND SITE CONCERNS

Sampling during the PA/SI was conducted at potentially contaminated source areas and from areas that may have been potentially contaminated by the migration of hazardous substances

from the sources. A discussion of the waste source areas and site concerns is presented below. Site features are presented in Figure 2-2.

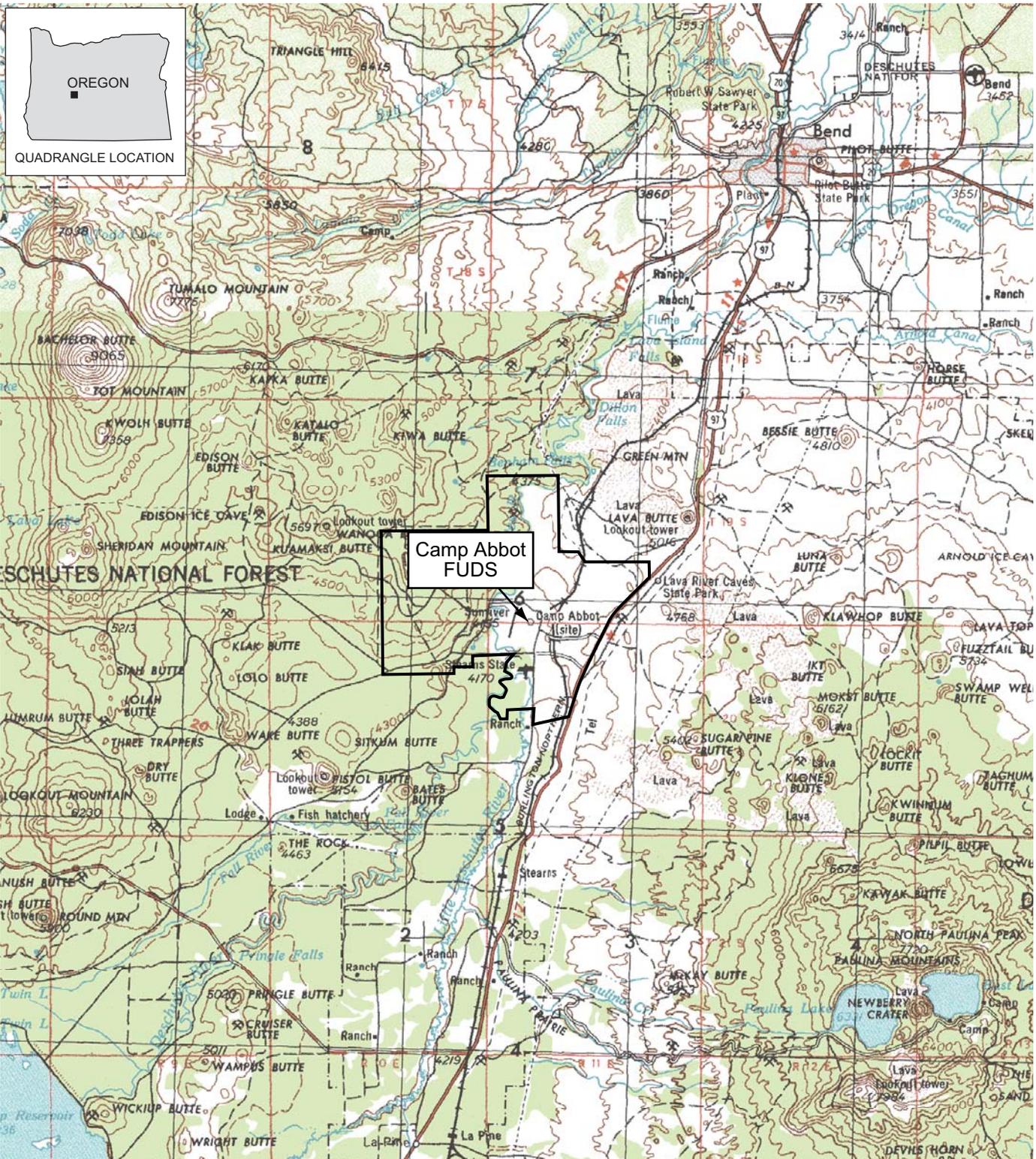
2.3.1 Known and Potential Source Areas

Based on background information obtained from the USACE and observations during the PA/SI the former landfill, two rifle ranges, a machine gun range, a grenade court, and suspected demolition pits were identified as the potential site sources as discussed below.

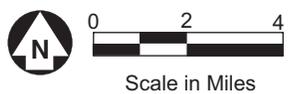
- **Former Landfill**—The former landfill is located on the Sunriver Nature Center property on the east side of the Deschutes River. It is unknown what type of waste was buried in the landfill. Based on the USACE 1995 Archives Search, “The landfill would be the most probable location of any containerized agent.” Potential COC include TAL metals, SVOCs, pesticides, and PCBs.
- **Rifle Ranges**—There are two rifle ranges located on the east side of the Deschutes River at the Sunriver Airport and golf course. Potential COCs include TAL metals.
- **Machine Gun Range**—There is a machine gun range located north of the rifle ranges on the east side of the Deschutes River. Potential COCs include TAL metals.
- **Grenade Court**—A grenade court is located on the west side of the Deschutes River. Potential COCs include TAL metals and OEW.
- **Demolition Pits**—The demolition pits are located on the west side of the Deschutes River on USFS property. Potential COCs include TAL metals and OEW.

2.3.2 Potential Receptors

- **Groundwater**—Potential COCs associated with Camp Abbot FUDS may have potentially migrated to groundwater. Sunriver has a population of approximately 3,900 people and all are supplied with drinking water from either domestic or municipal groundwater wells. There are approximately 5,000 people using groundwater drinking water within the 4-mile TDL.
- **Deschutes River**—There is a potential that contaminants associated with activities at Camp Abbot have migrated to the Deschutes River, potentially impacting sediment and aquatic organisms such as fish.
- **Wetlands**—Wetlands contiguous with the Deschutes River are located west of the landfill and west of the northern rifle range. The organisms inhabiting the wetlands may be impacted by potential contamination.

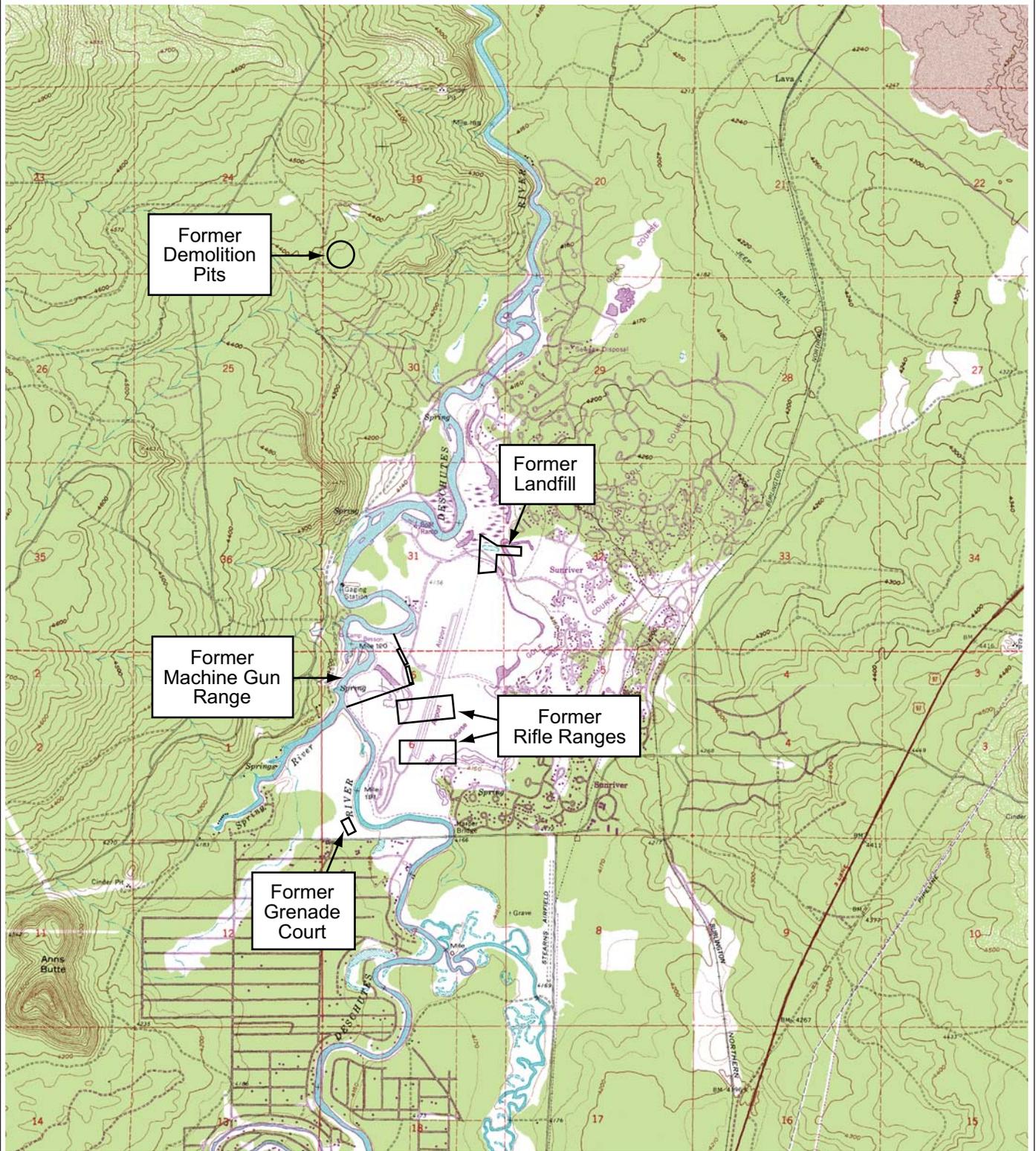


Source: USGS 1:250,000 Scale Topo, Bend-OR, 1955 (1971) and Crescent-OR, 1955 (1970).



— Former Property Boundary

Site Location Map Camp Abbot FUDS PA/SI Sunriver, Oregon



Source: USGS 7.5' Series Topo, Anns Butte-OR, 1963 (1981) and Benham Falls-OR, 1963 (1981).

Note: All locations are approximate.



Site Plan Camp Abbot FUDS PA/SI Sunriver, Oregon

SECTION 3

FIELD ACTIVITIES AND ANALYTICAL PROTOCOL

Weston developed a SQAP for Camp Abbot FUDS in May 2004 prior to conducting any field activities (Weston, 2004). The SQAP was developed based on a review of site background information and the Achieves Search Report conducted by USACE in 1995. The SQAP described the sampling strategy, sampling methods, and analytical protocols used to investigate potential hazardous substance sources and potential targets at the site and vicinity. With few exceptions, the PA/SI field activities were conducted in accordance with the approved SQAP. Deviations from the SQAP are described when applicable in the sampling location discussions in Section 6 (source areas) and Section 7 (target areas). Sample locations are presented in Figures 3-1 through 3-7. A summary of the samples collected for laboratory analysis during the PA/SI is presented in Table 3-1. Table 3-2 summarizes the field sample code. Photographic documentation of the PA/SI field activities is presented in Appendix A.

3.1 SAMPLING DESIGN (TYPES, NUMBERS, AND RATIONALE)

Field activities were conducted on May 14-16, 2004 and included the collection of 28 samples as described below (Figures 3-1 through 3-7; Table 3-1):

Source Samples:

- One surface soil and one below surface soil sample at the landfill (SS-LF001 and SS-LF002; Figure 3-2).
- Three surface soil samples at the machine gun range (SS-MR001 through SS-MR003; Figure 3-3).
- Three surface soil samples at the northern rifle range (SS-RR001 through SS-RR003; Figure 3-4) and three surface soil samples at the southern rifle range (SS-RR004-SS-RR006; Figure 3-5).
- Three surface soil samples collected from the grenade court (SS-GC001 through SS-GC003; Figure 3-6).
- Three surface soil samples collected from the demolition pits (SS-DP001 through SS-DP003; Figure 3-7).

Target Samples:

- One surface water and one collocated sediment sample at a pond on top of the landfill (SW-LF001 and SD-LF001; Figure 3-2).
- A sediment sample collected in the Deschutes River as the probable point of entry (PPE) for the machine gun range (SD-MR001; Figure 3-3).

- A sediment sample collected in a drainage ditch that drains the northern rifle range (SD-RR001; Figure 3-4) and a sediment sample collected in the wetland that runoff from the southern rifle range drains (SD-RR002; Figure 3-5).
- A sediment sample collected from the Deschutes River as the PPE for the grenade court (SD-GC001; Figure 3-6).
- A sediment sample collected from the wetland in which surface water drainage from the demolition pits drains (SD-DP001; Figure 3-1).
- A groundwater sample collected at the Sunriver Municipal Well #2 (GW-MW001; Figure 3-1).

Background Samples:

- One surface soil sample (SS-BK001), one surface water sample (SW-BK001), and one sediment sample (SD-BK001) was collected to show a representation of background conditions (Figure 3-1).

The following sections present the rationale used in the selection of the PA/SI sample locations. As shown in Table 3-1, all samples collected for the Camp Abbot FUDS PA/SI were assigned internal Weston sample identification numbers, Contract Laboratory Program (CLP) sample numbers, and EPA sample identification numbers. For simplicity, samples discussed in this report will be referred to using their Weston station IDs (e.g., sample SS-LF001 refers to Weston sample ID CAFD-SS-LF001-0000). The Weston sample designation code is presented in the Table 3-2.

3.1.1 Potential Sources

Samples were collected from the landfill, machine gun range, two rifle ranges, the grenade court, and the demolition pits in order to characterize potential contamination at the site source. The source samples at the landfill were collected based on visual reconnaissance of site features. The source samples collected at the machine gun range, both rifle ranges, and the grenade courts were based on screening results from the X-Ray Fluorescence (XRF) spectrometer. The source samples at the demolition pits were sampled based on the results of trinitrotoluene (TNT) field kits. Six pits were tested and the three pits showing a positive result of TNT were sampled.

3.1.2 Target Samples

A target/PPE sample was collected for each of the potential sources. A surface water and sediment sample were collected from the pond on top of the landfill. In times of heavy rainfall the pond drains to wetlands which are contiguous with the Deschutes River. A sediment sample was collected from the Deschutes River where drainage from the machine gun range enters the Deschutes River. A sediment sample was collected in a wetland contiguous with the Deschutes River which receives surface water flow from the northern rifle range. A sediment sample was collected in the drainage ditch that drains the southern rifle range. This drainage ditch runs directly to the Deschutes River. A sediment sample was collected from the Deschutes River where surface water runoff from the grenade court enters the Deschutes River. A sediment sample was collected from the wetland in which surface water drainage from the demolition pits

drains. In addition to the PPE samples collected, a groundwater sample was collected from a Sunriver Municipal Well. Figure 3-1 illustrates target sample locations. All target samples were collected to assess whether hazardous substances identified at the site sources are migrating and potentially impacting targets.

3.1.3 Background Samples

One collocated background surface water and sediment sample was collected from the Deschutes River upstream of Harper Bridge (Figure 3-1). One background soil sample (SS-BK001) was collected just north of Upper Deschutes Road and west of National Forest Develop Road 41 (Figure 3-1).

3.2 SAMPLING METHODS

Site-specific conditions (i.e., topography, accessibility issues, and visual evidence of contamination) were incorporated, when applicable, into the placement of sampling locations. There were no deviations from the planned number of samples to be collected during the field effort. This section presents a brief summary of field methods and procedures used during the Camp Abbot FUDS PA/SI field effort. All samples were collected in accordance with Weston's Standard Operating Procedures (SOPs) and the site-specific SQAP (Weston, 2004).

3.2.1 Surface Soil Sampling

Surface soil (0 to 6 inches below ground surface [bgs]) was collected in accordance with Weston SOP RFW/R10-001. The sand-sized and finer fractions of the soil and ore were targeted for collection and material unsuitable for analysis, such as grass, leaves, other vegetative materials, and rocks were removed from the sample material before placement into sample containers. The surface soil samples were collected using dedicated plastic scoops and dedicated stainless steel spoons, homogenized in dedicated plastic and stainless steel bowls (plastic was used for inorganic analyses and stainless steel was used for organic analyses), and classified according to the Unified Soil Classification System (USCS; American Association for Testing and Material Standard [ASTM] 2488). Sampling information and the sample description were recorded on a standardized field sampling form. A representative sample was placed into a pre-labeled sample container and any excess sample material was returned to the sampling location. Samples were stored in an iced cooler and remained under Weston personnel custody prior to shipment to the analytical laboratory. Any evidence of contamination observed during collection (e.g., staining, oily sheen, free product, or odor) was noted on the field sampling form.

3.2.2 XRF Screening Methodology

During the field sampling event, a maximum of 30 randomly-selected locations at the two rifle ranges, the machine gun range, and the grenade court were screened using a portable XRF in order to determine the worst case area for sampling locations. The sand-sized and finer fractions of soil were targeted for screening. The three screening locations that showed the highest concentrations of metals were selected as the sampling location, and each location and result was

recorded in the logbook. The latitude/longitude coordinates at the four corners of the screening grid were located using a handheld Global Positioning System (GPS) unit.

3.2.3 Sediment Sampling

Surface sediment samples (0 to 6 inches bgs) were collected in accordance with Weston SOP RFW/R10-003. To minimize cross-contamination, samples were collected from the downstream reaches of the creek, working back upstream. The samples were collected using dedicated plastic scoops and/or dedicated stainless steel spoons and were homogenized in a dedicated plastic bowl and/or dedicated stainless steel bowl (plastic was used for inorganic analyses and stainless steel was used for organic analyses). A physical description of the sample material was recorded on a surface sediment field sampling record form. The physical description included estimated grain size proportions (percent clay, silt, sand, and gravel), organic content, color, odor, etc. Any excess sample material collected was returned to the sampling location. Samples were stored in an iced cooler prior to shipment to the analytical laboratory.

3.2.4 Surface Water Sampling

Surface water samples were collected using the grab sample technique in accordance with Weston SOP W/R10-004, Revision 1. The water sample was collected by opening the sample container below the surface of the water body, allowing the container to fill, then capping the container while it was fully immersed. Only stations with water depth sufficient to allow submersion of the mouth of the sample container were considered suitable for sampling. The water samples for TAL analyses were preserved with nitric acid to a pH of less than two. Samples were stored in an iced cooler prior to shipment to the analytical laboratory.

3.2.5 Groundwater Sampling

The municipal drinking water well sample was collected from a spigot and no filtration or treatment was used on the water. The sample was collected in accordance with SOP RFW/R10-002.

3.3 ANALYTICAL PROTOCOL

Discrete soil, sediment, and surface water samples analyzed for TAL metal including mercury were submitted to an off-site, fixed laboratory (Contract Laboratory Program Analytical Service [CLPAS] ILM05.3). Discrete soil, sediment, and surface water samples analyzed for SVOCs and pesticides/PCBs were submitted to an off-site, fixed laboratory (CLPAS OLM04.3). The groundwater sample analyzed for perchlorate was submitted to an off-site, fixed laboratory (EPA 314.0). The discrete soil, sediment, and groundwater samples analyzed for NBECs were submitted to an off-site, commercial laboratory (SW846 8330). All analyses were conducted following EPA protocols.

3.4 SAMPLE GLOBAL POSITIONING SYSTEM LOCATIONS

A Trimble GeoExplorer GPS unit with data logger was used to record the coordinates of the PA/SI sample locations. Location data for each station was stored in individual files within the GPS unit and were recorded on the appropriate field sampling record. Data from the GPS unit was downloaded by Weston personnel and e-mailed to Mr. Matt Gubitosa at the EPA. Mr. Gubitosa conducted differential corrections of the data to improve location accuracy. Corrected and uncorrected GPS coordinates are provided in Appendix C.

3.5 INVESTIGATION DERIVED WASTE

Investigation Derived Waste (IDW) generated during the PA/SI sampling effort consisted of solid disposable sampling equipment and personal protective equipment. All IDW generated during the PA/SI activities was double bagged in opaque plastic garbage bags and disposed as solid waste. No IDW or general trash generated by Weston personnel remains at the site.

3.6 SAMPLE HANDLING AND CUSTODY

All chain-of-custody requirements complied with Weston's SOPs for sample handling and sample control. Chain-of-custody procedures followed the *Contract Laboratory Program Guidance for Field Samplers* (EPA, 2001a). Information obtained during sampling was recorded in the project logbook and/or data forms in accordance with the SQAP. Samples were also documented with photographs including sampling location and site features as deemed appropriate.

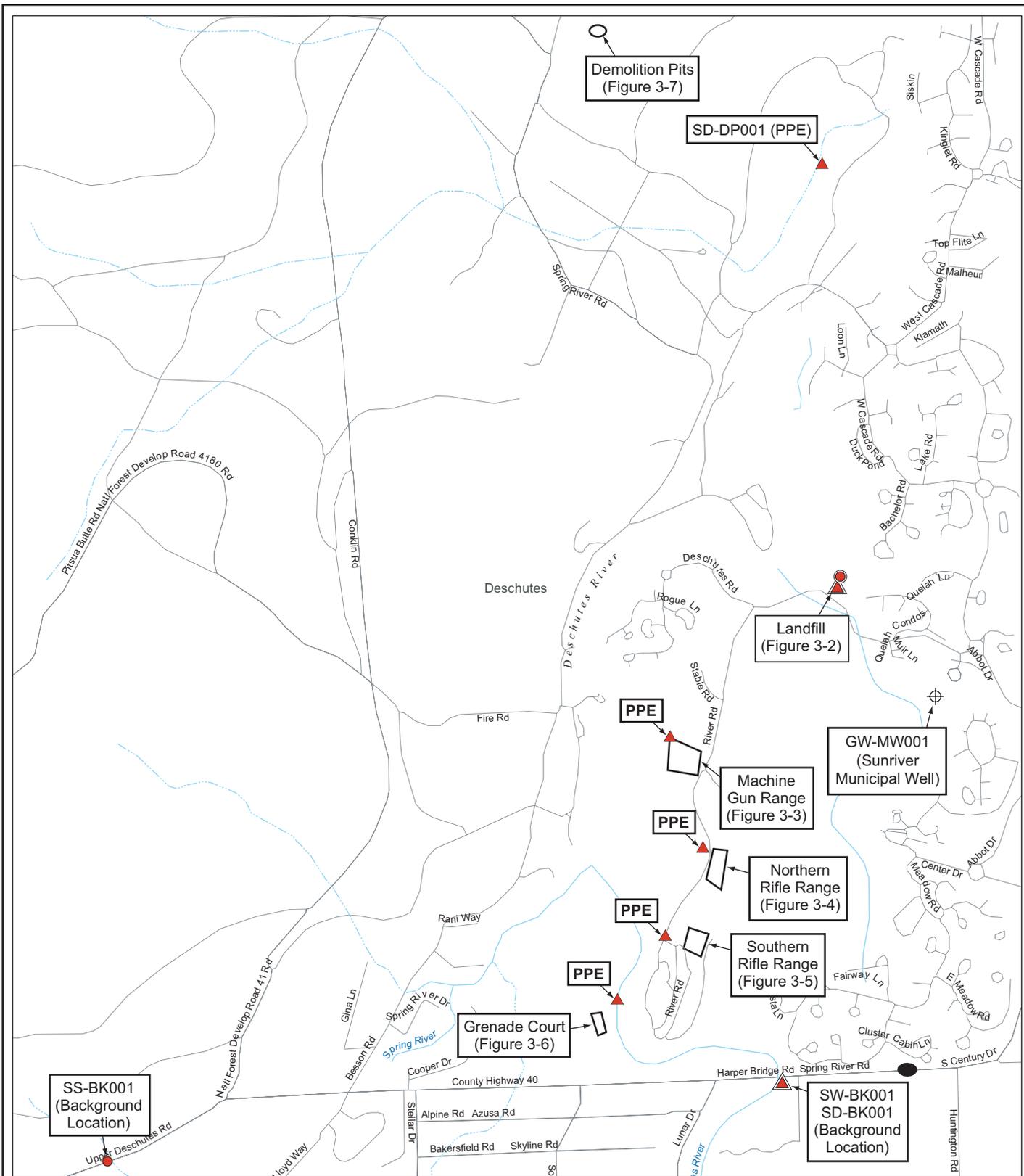
3.7 SAMPLE IDENTIFICATION

All samples were identified using the sample numbers assigned by the EPA Regional Sample Control Coordinator (RSCC); however, in addition to the EPA sample numbers, all samples collected were assigned a unique Weston identification code based on a consistent sample designation scheme that was used internally by Weston and in this report. The sample designation scheme is designed to suit the needs of the field staff, data management and data users and was not provided to the analytical laboratory.

The Weston sample ID consists of four components separated by a dash. These components are site ID, media code, station code, and sample type:

Site ID	Media Code	Station Code	Sample Type
SSSS	- MM	- SSsss	- t [ddd]

Table 3-2 presents the codes used during the Camp Abbot FUDS PA/SI. The media and station designation codes will be used in the results discussions in Sections 5 through 8.



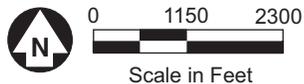
Site Overview and Sample Location Map

Camp Abbot FUDS PA/SI

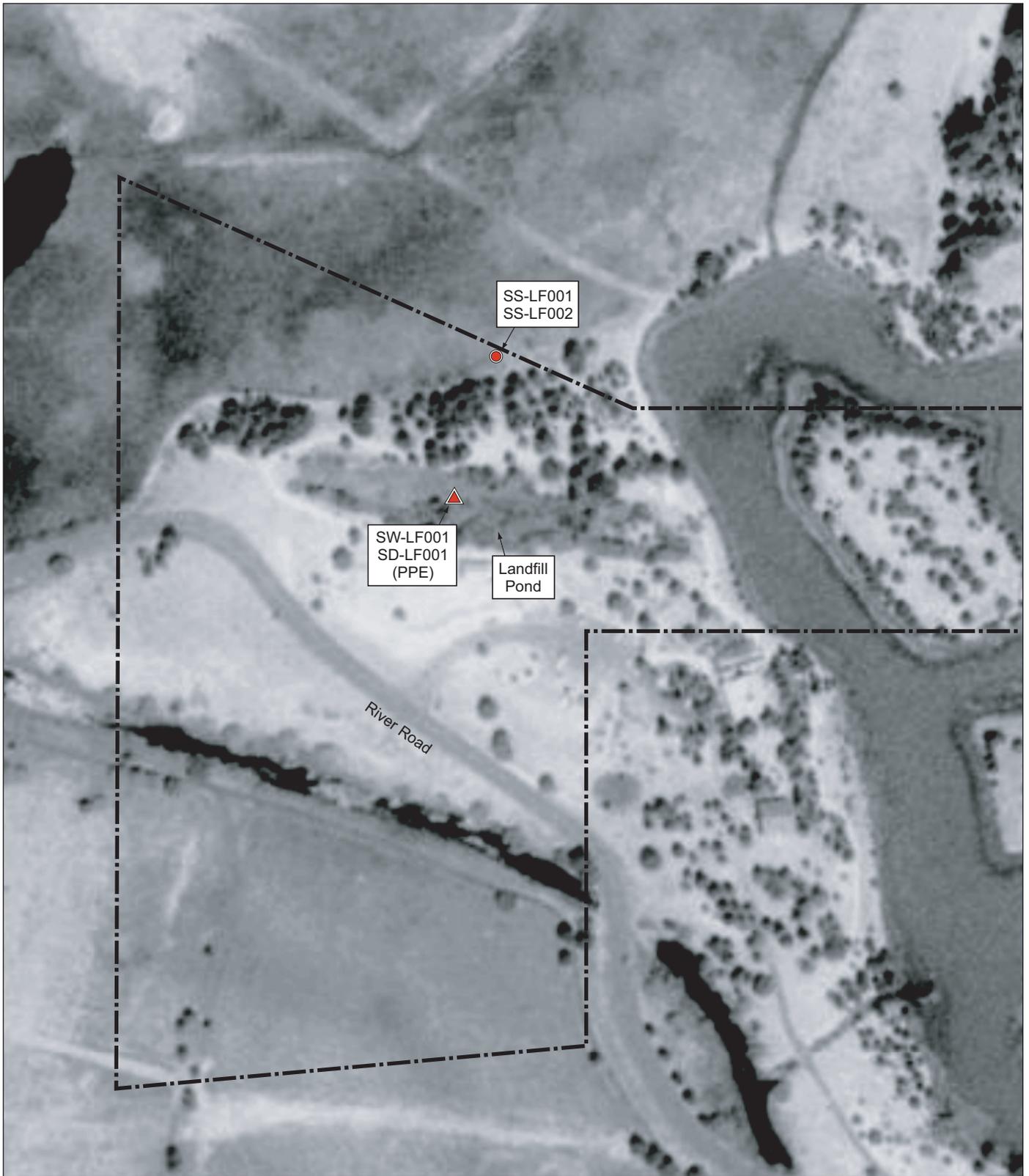
Sunriver, Oregon

Figure

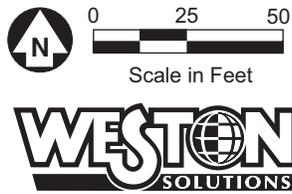
3-1



- Soil Sample Location
- Subsurface Soil Sample
- ▲ Sediment Sample Location
- △ Surface Water Sample
- ⊕ Groundwater Sample Location

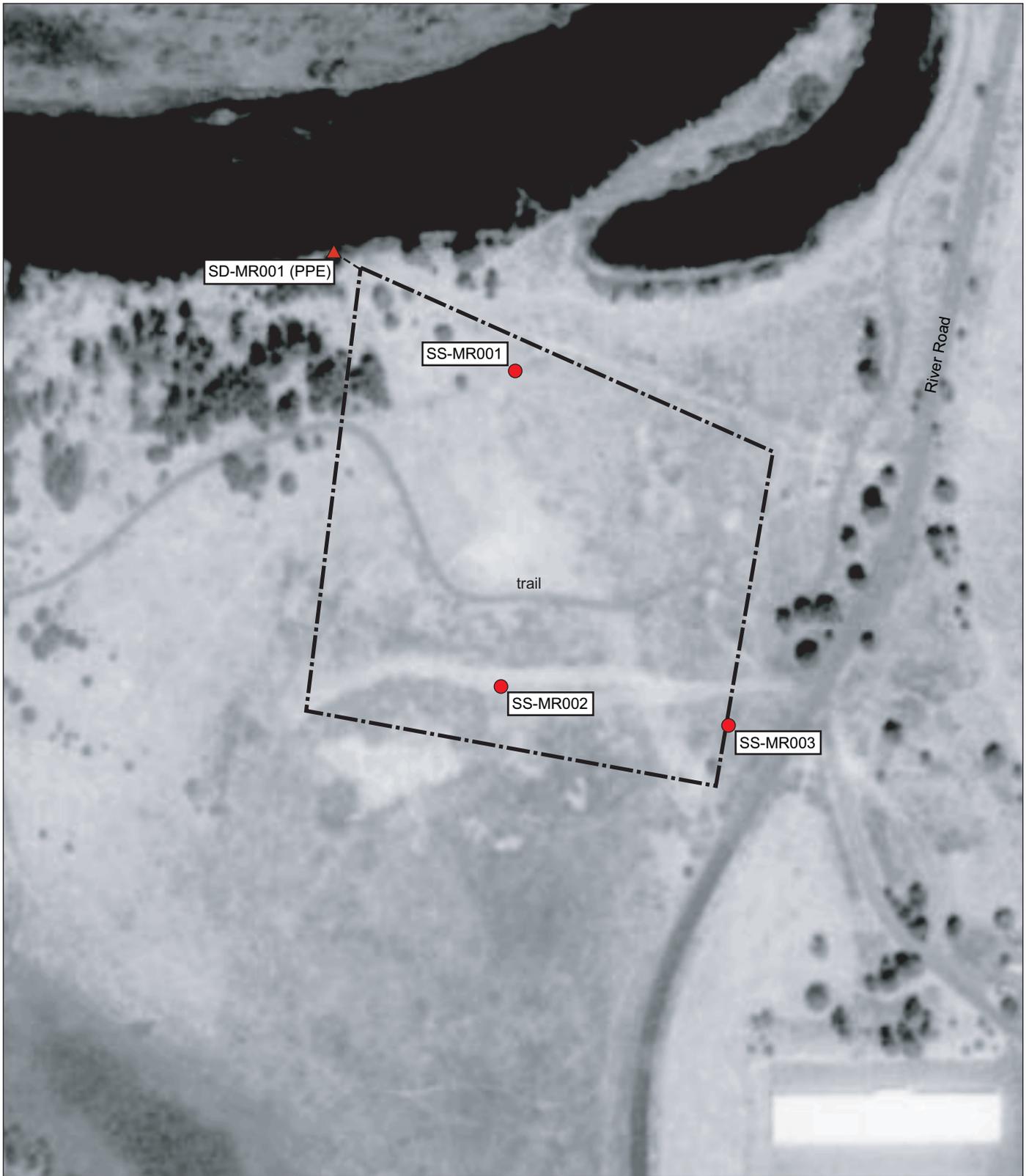


Landfill Features and Sample Location Map Camp Abbot FUDS PA/SI Sunriver, Oregon

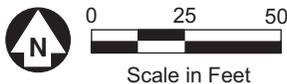


- Soil Sample Location
- Subsurface Soil Sample
- ▲ Sediment Sample Location
- △ Surface Water Sample
- PPE Probable Point of Entry
- - - - - Approximate Location of Former Landfill

Figure



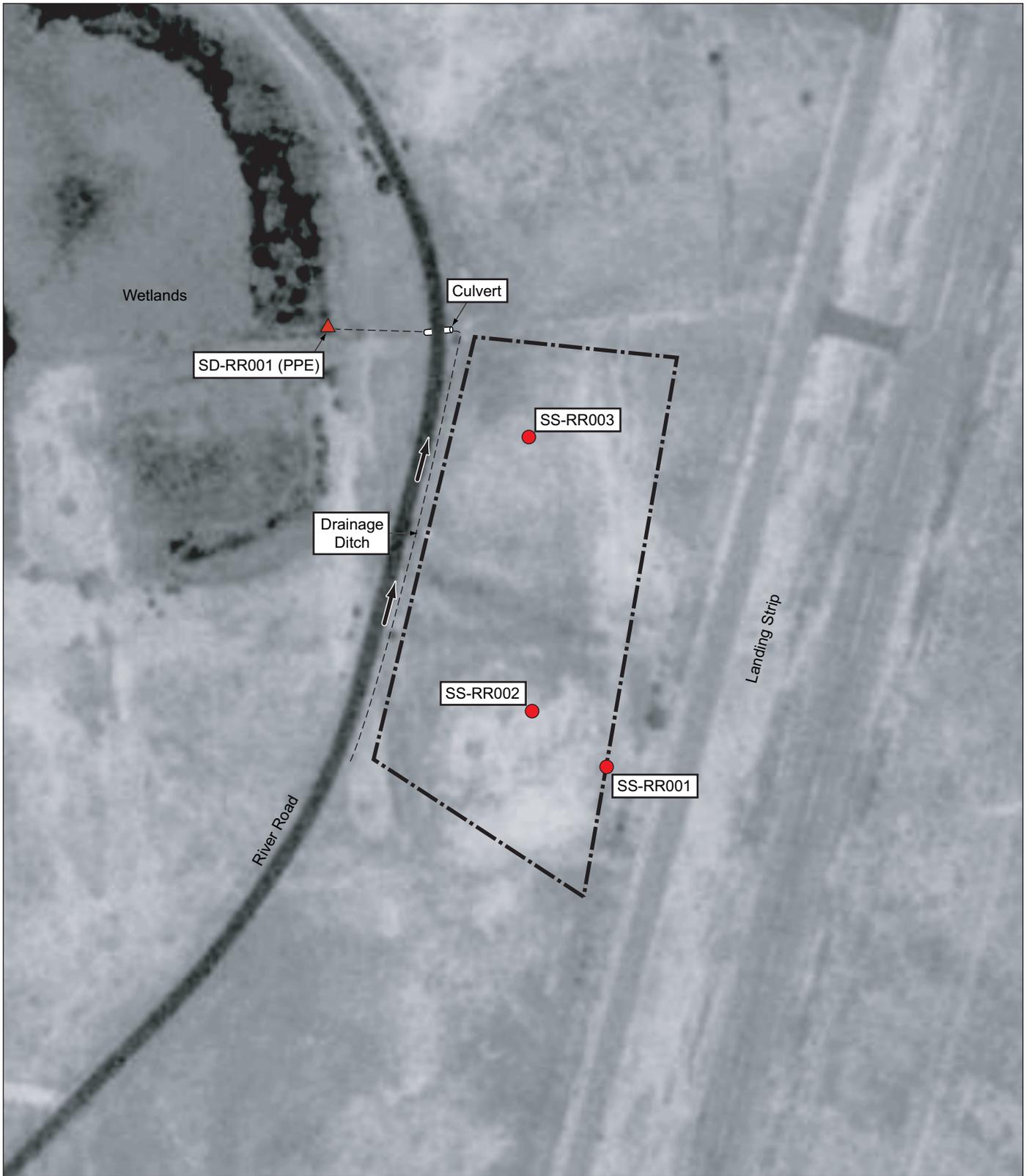
Machine Gun Range Features and Sample Location Map Camp Abbot FUDS PA/SI Sunriver, Oregon



- ▲ Sediment Sample Location
- Soil Sample Location
- XRF Screening Area
- Overland Flow Pathway
- PPE Probable Point of Entry

Figure

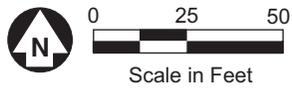
3-3



Northern Rifle Range Features and Sample Location Map

Camp Abbot FUDS PA/SI

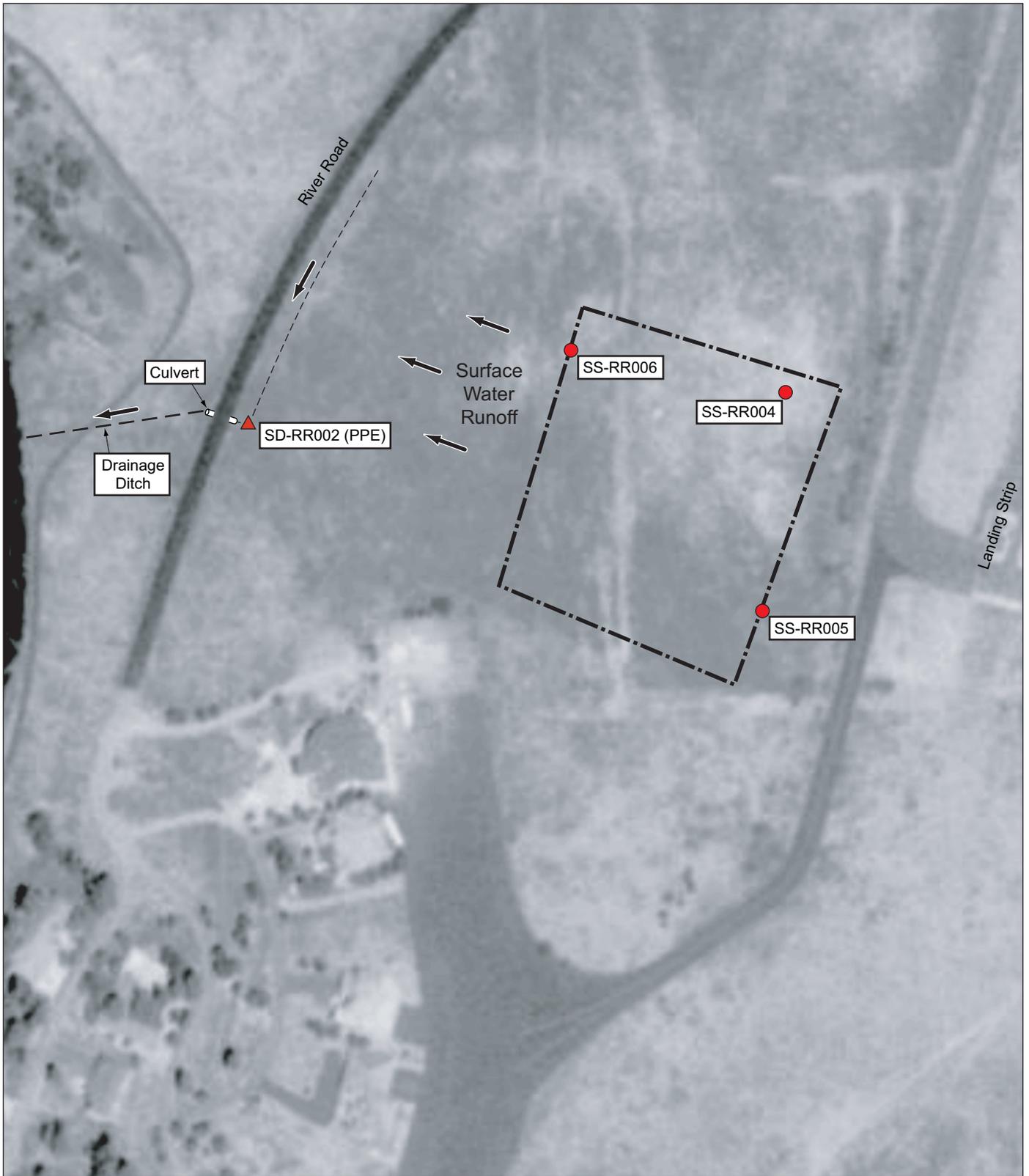
Sunriver, Oregon



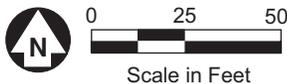
- ▲ Sediment Sample Location
- Soil Sample Location
- - - - XRF Screening Area
- - - - Overland Flow Pathway
- PPE Probable Point of Entry
- Flow Direction

Figure

3-4



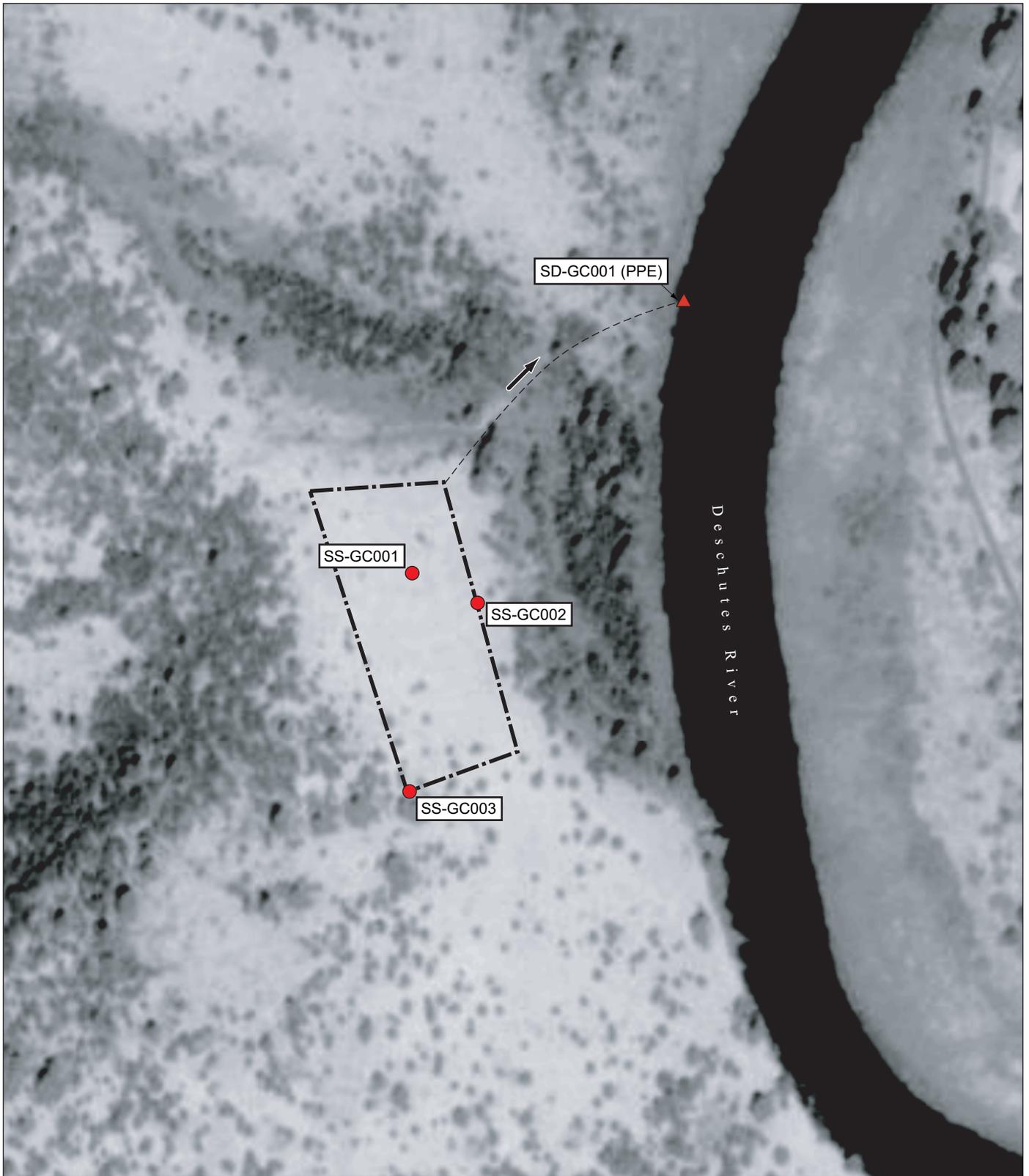
Southern Rifle Range Features and Sample Location Map Camp Abbot FUDS PA/SI Sunriver, Oregon



- ▲ Sediment Sample Location
- Soil Sample Location
- XRF Screening Area
- .-.- Overland Flow Pathway
- PPE Probable Point of Entry
- Flow Direction

Figure

3-5



Grenade Court Features and Sample Location Map Camp Abbot FUDS PA/SI Sunriver, Oregon

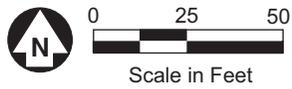
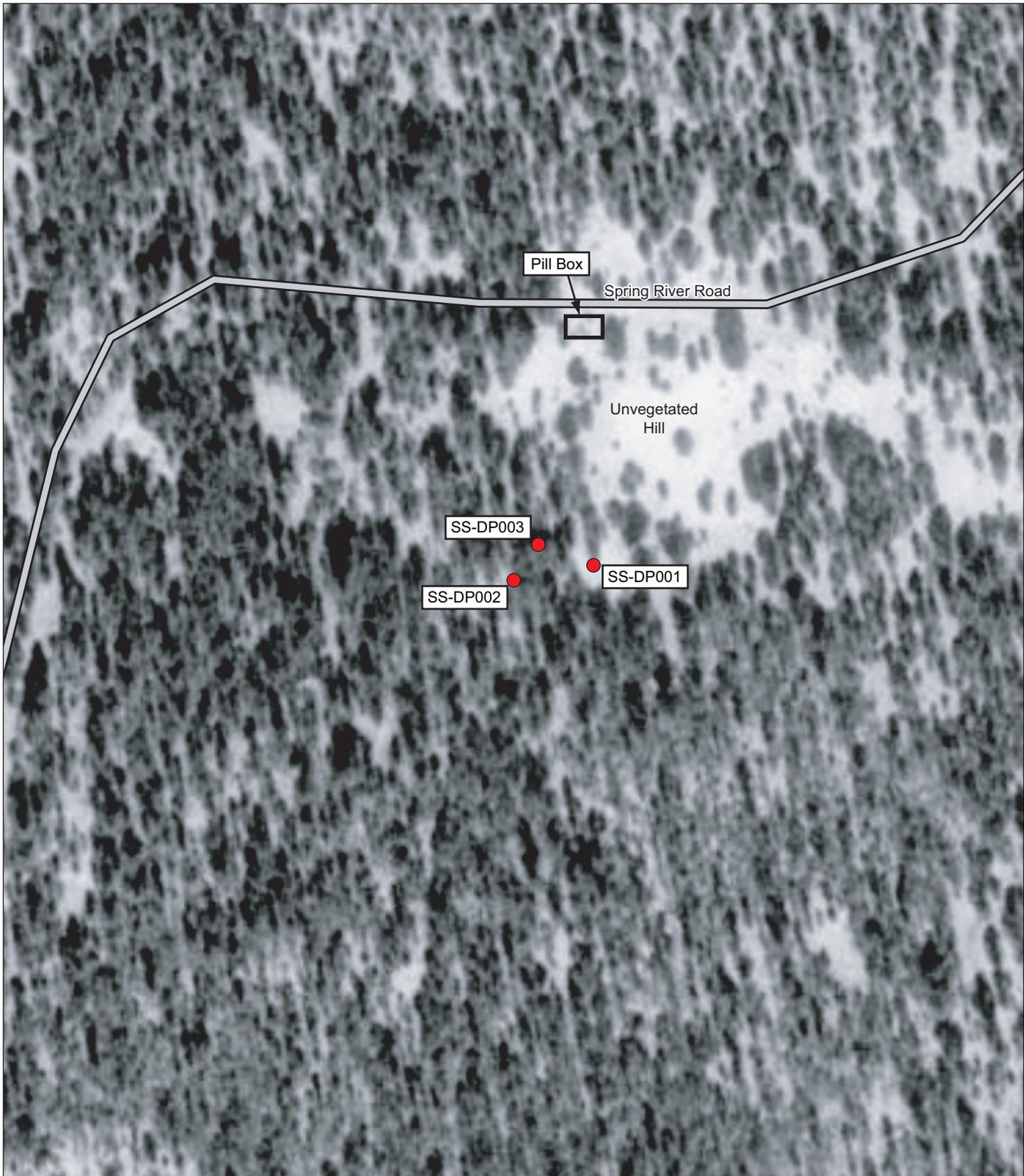


 Scale in Feet



- ▲ Sediment Sample Location
- Soil Sample Location
- XRF Screening Area
- .-.- Overland Flow Pathway
- PPE
- Flow Direction

Figure
3-6



Scale in Feet



● Soil Sample Location

Demolition Pits Features and Sample Location Map

Camp Abbot FUDS PA/SI

Sunriver, Oregon

Figure

3-7

Table 3-1—Sample Collection And Analyses Summary
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon

Weston Sample ID	Sample Depth	CLP Number	Regional Tracking	Sample Date	Sample Time	Analysis Conducted					Notes
						TAL Metals + Hg	Pesticides/PC Bs	SVOCs	NBEC	Perchlorate	
Landfill Source Samples											
CAFD-SS-LF001-0000	0-6"	MJ2C82 J2C82	04204000	5/14/2004	900	x	x	x			Potential Source - Discrete
CAFD-SS-LF002-0000	6-24"	MJ2C83 J2C83	04204001	5/14/2004	915	x	x	x			Potential Source - Discrete
Machine Gun Range Source Samples											
CAFD-SS-MR001-0000	0-6"	MJ2C86	04204004	5/14/2004	1255	x					Potential Source - Discrete
CAFD-SS-MR002-0000	0-6"	MJ2C87	04204005	5/14/2004	1300	x					Potential Source - Discrete
CAFD-SS-MR003-0000	0-6"	MJ2C88	04204006	5/14/2004	1310	x					Potential Source - Discrete
North Rifle Range Source Samples											
CAFD-SS-RR001-0000	0-6"	MJ2C89	04204008	5/14/2004	1725	x					Potential Source - Discrete
CAFD-SS-RR002-0000	0-6"	MJ2C90	04204009	5/14/2004	1735	x					Potential Source - Discrete
CAFD-SS-RR003-0000	0-6"	MJ2C91	04204010	5/14/2004	1745	x					Potential Source - Discrete
South Rifle Range Source Samples											
CAFD-SS-RR004-0000	0-6"	MJ2C95	04214000	5/16/2004	1015	x					Potential Source - Discrete
CAFD-SS-RR005-0000	0-6"	MJ2C96	04214001	5/16/2004	1025	x					Potential Source - Discrete
CAFD-SS-RR006-0000	0-6"	MJ2C97	04214002	5/16/2004	1035	x					Potential Source - Discrete
Demolition Pits Source Samples											
CAFD-SS-DP001-0000	0-6"	MJ2C92	04204011	5/15/2004	1740	x			x		Potential Source - Discrete
CAFD-SS-DP002-0000	0-3"	MJ2C93	04204012	5/15/2004	1750	x			x		Potential Source - Discrete
CAFD-SS-DP003-0000	0-4"	MJ2C94	04204013	5/15/2004	1800	x			x		Potential Source - Discrete
Grenade Court Source Samples											
CAFD-SS-GC001-0000	0-3"	MJ2CA3	04214008	5/16/2004	1700	x			x		Potential Source - Discrete
CAFD-SS-GC002-0000	0-3"	MJ2CA4	04214009	5/16/2004	1710	x			x		Potential Source - Discrete
CAFD-SS-GC003-0000	0-3"	MJ2CA5	04214010	5/16/2004	1720	x			x		Potential Source - Discrete
Target Samples											
CAFD-SW-LF001-0000	0-3"	MJ2C84 J2C84	04204002	5/14/2004	930	x	x	x			Target Surface Water Sample at Landfill
CAFD-SD-LF001-0000	0-6"	MJ2C85 J2C85	04204003	5/14/2004	945	x	x	x			Target Sediment Sample at Landfill
CAFD-SD-DP001-0000	0-3"	MJ2C98	04214003	5/16/2004	1315	x			x		Demolition Pits PPE Sample in Wetland
CAFD-SD-MR001-0000	0-3"	MJ2C99	04214004	5/16/2004	1410	x					Machine Gun Range PPE Sample in the Deschutes River
CAFD-SD-RR001-0000	0-3"	MJ2CA0	04214005	5/16/2004	1435	x					Northern Rifle Range PPE Sample in Culvert That Drains Range Area
CAFD-SD-RR002-0000	0-3"	MJ2CA1	04214006	5/16/2004	1500	x					Southern Rifle Range PPE Sample in Drainage Ditch That Drains Range Area
CAFD-SD-GC001-0000	0-2"	MJ2CA2	04214007	5/16/2004	1600	x			x		Grenade Court PPE Sample in the Deschutes River
CAFD-GW-MW001-0000	NA	NA	04204007	5/14/2004	1355				x	x	Groundwater Sample At Municipal Well
Background Samples											
CAFD-SW-BK001-0000	0-8"	MJ2CA6 J2CA6	04214011	5/16/2004	1800	x	x	x			Background Surface Water Sample
CAFD-SD-BK001-0000	0-3"	MJ2CA7 J2CA7	04214012	5/16/2004	1815	x	x	x	x		Background Sediment Sample
CAFD-SS-BK001-0000	0-4"	MJ2CA8 J2CA8	04214013	5/16/2004	1845	x	x	x	x		Background Soil Sample

**Table 3-2—Sample Coding
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Digits	Descriptions	Code Example
1,2,3,4	Site ID	CAFD (Camp Abbot Formerly Used Defense Site)
5,6	Media Code	GW (Groundwater)
		SD (Surface Sediment)
		SS (Surface Soil)
		SW (Surface Water)
7,8	Station Code	BK (Background)
		DP (Demolition Pit)
		GC (Grenade Court)
		LF (Landfill)
		MR (Machine Gun Range)
		MW (Municipal Well)
		RR (Rifle Range)
9,10,11	Consecutive Sample Number	001 (First Sample of Station Code)
12	Sample Type	0 (Field Sample)
12,13,14	Sample Depth (feet bgs)	000 (0 ft bgs = surface sample)
		005 (0.5 ft bgs)

SECTION 4

QUALITY ASSURANCE/QUALITY CONTROL

In order to ensure data quality objectives are met, data quality indicators are evaluated to determine sample and laboratory performance. These data, known as Quality Assurance/Quality Control (QA/QC) data, are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents due to sample collection, preparation, and analysis activities.

Specific QC requirements for laboratory analyses are incorporated in the *USEPA Contract Laboratory Program Statement of Work (CLP-SOW) for Inorganic Analysis ILM05.3* (EPA, 2004a), the *USEPA Contract Laboratory Program Statement of Work (CLP-SOW) for Organic Analysis OLM04.3* (EPA, 2003a), the *USEPA Methods for the Determination of Organic and Inorganic Compounds in Drinking Water* (EPA, 2000a), the *USEPA Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods SW-846* (EPA, 1997), and in the individual laboratory standard operating procedures.

The QC requirements or scope of work requirements were followed for analytical results reported for the *Camp Abbott FUDS PA/SI SQAP* (Weston, 2004). This section describes the QA/QC measures followed for sample analysis associated with the PA/SI and provides an evaluation for the end-user regarding usability of the data presented in this report.

All samples were collected following the procedures outlined in the site-specific SQAP prepared for this PA/SI (Weston, 2004). Four laboratories conducted the chemical analysis of samples collected during the PA/SI.

- Chemtech Consulting Group, located in Mountainside, New Jersey, analyzed two water and 25 soil/sediment samples for TAL metals following specifications in the *USEPA CLP-SOW for Inorganic Analysis ILM05.3* (EPA, 2004a)
- Ceimic Corporation, located in Narragansett, Rhode Island, analyzed two water and five soil/sediment samples for SVOCs and pesticides/PCBs following specifications in the *USEPA CLP-SOW for Organic Analysis OLM04.3* (EPA, 2003a)
- EPA Region 10 Manchester Environmental Laboratory (MEL) located in Port Orchard, Washington, analyzed one water sample for perchlorate following *USEPA Method 314.0 Determination of Perchlorate in Drinking Water by Ion Chromatography* (EPA, 2000a)
- Laucks Testing Laboratories (LTL), located in Seattle, Washington, analyzed one water and ten soil/sediment samples for NBECs following *USEPA SW-846 Method 8330 Determination of Nitroaromatics and Nitramines by High Performance Liquid Chromatography* (EPA, 1997)

MEL chemists reviewed all data from the perchlorate analysis performed by MEL, EPA quality assurance chemists reviewed all data from analyses performed by CLP, and Weston reviewed all data from analyses performed by LTL. Weston validated all data relative to project data quality

objectives (DQOs). Data qualifiers were applied following the *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (with exceptions noted in Section 4.4.12; EPA, 2002a), *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 1999), and/or criteria specified in the individual analytical methods.

4.1 SATISFACTION OF DATA QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

The project data quality objectives for the field effort were designed to produce data of known and documented quality in order to characterize sources, determine off-site migration of contaminants, determine whether the site is eligible for placement on the National Priorities List (NPL), and to document threat(s) or potential threat(s) to public health or the environment posed by the site. The DQO process applied to this project followed that described in the EPA document, *Guidance for the Data Quality Objectives Process EPA QA/G-4*, (EPA, 2000b).

All samples collected during the PA/SI investigation were analyzed using definitive analytical methods, and EPA accepted all analytical methods employed for this project. The data generated for this project met or exceeded requirements for the definitive data category as defined in the EPA document, *Guidance for the Data Quality Objectives Process for Hazardous Waste Site Operations EPA QA/G-4HW*, (EPA, 2000c).

A detailed discussion of the project quality objectives achieved during the PA/SI is presented in the following sections.

4.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Quality control checks for sample collection were evaluated by a combination of Chain-of-Custody protocols and laboratory quality assurance as prescribed in the sampling or analytical methods. Quality control samples (e.g., matrix spike/duplicate/duplicate spike samples, blank spike/laboratory control samples, equipment blank samples, ambient/field blank sample) at a frequency of one per 20 samples (or per method) per media were collected during the PA/SI field effort. Results from these samples were compared to each method's criteria and to criteria specified in the SQAP (Weston, 2004).

All of the analyses conducted during this project yielded definitive data. Data quality indicator targets for this project are specified below—DQOs are summarized in the SQAP. Bias on estimated, qualified data was determined and/or confirmed through the validation process. The laboratories' DQO for completeness was 90% for all samples. Precision and accuracy requirements are also outlined in the SQAP (Weston, 2004).

4.3 PROJECT-SPECIFIC DATA QUALITY OBJECTIVES

Data quality indicator (DQI) goals—precision, accuracy, representativeness, comparability, and completeness—for this project were developed following guidelines presented in EPA *Guidance*

for *Quality Assurance Project Plans, EPA QA/G-5* (EPA, 2002a). The basis for assessing each of the elements of data quality is discussed in the following subsections. Quality assurance objectives for measurement of analytical data (Method Quality Objectives [MQOs]) and QC guidelines for precision and accuracy are presented in the SQAP (Weston, 2004). Other DQI goals are included in EPA analytical methods employed (EPA, 2004a; EPA, 2003a; EPA, 2000a; and EPA, 1997).

The laboratory and field team were able to meet overall project DQO goals.

4.3.1 Precision

Precision measures the reproducibility of measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions.

Analytical precision is the measurement of the variability associated with duplicate (two) or replicate (more than two) analyses. When recovery results between different analytical delivery groups are compared, the laboratory control sample (LCS) may be used to determine the precision of the analytical method. In this case, the comparison is not between a sample and a duplicate sample analyzed in the same batch. Rather, the comparison is between the sample and samples analyzed in previous delivery groups. A LCS may be prepared and analyzed within a given batch; in this case, the analytical precision is associated with a particular preparation and analysis sequence.

Total precision is the measurement of the variability associated with the entire sampling and analysis process for one sampling event. It is determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations. Field duplicate samples and matrix duplicate spiked samples may be analyzed to assess field and analytical precision, and the precision measurement is determined using the relative percent difference (RPD) between the duplicate sample results.

The laboratory was able to meet project DQOs, with the exceptions listed in Section 4.4 below.

4.3.2 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and systemic error. It reflects the total error associated with a measurement. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard. Analytical accuracy is measured by comparing the percent recovery of analytes spiked into an LCS (blank spike) or into a field sample (to prepare a matrix-spiked sample or matrix-spiked duplicate sample) to a control limit.

The laboratory was able to meet project DQOs, with the exceptions listed in Section 4.4 below.

4.3.3 Representativeness

Representativeness is a measure of the degree to which data accurately and precisely represent a population, including a sampling point, a process condition, or an environmental condition. Representativeness is the qualitative term that should be evaluated to determine that measurements are made and physical samples collected at locations and in a manner resulting in characterizing a matrix or media. Subsequently, representativeness is used to ensure that a sampled population represents the target population and an aliquot represents a sampling unit.

The field team was able to meet project DQOs.

4.3.4 Comparability

Comparability is the qualitative term that expresses the measure of confidence that two data sets or delivery groups can contribute to a common analysis and evaluation. Comparability with respect to laboratory analyses pertains to method type comparison, holding times, stability issues, and aspects of overall analytical quantitation. The following items are evaluated when assessing data comparability:

- Determining if two data sets or delivery groups contain the same set of parameters.
- Determining if the units used for each data set are convertible to a common metric.
- Determining if similar analytical procedures and quality assurance were used to collect data for both data sets.
- Determining if the analytical instruments used for both data sets have approximately similar detection levels.
- Determining if samples within data sets were selected and collected in a similar manner.

To ensure comparability of data collected during this investigation to other data that may have been or may be collected for the site, standard sample collection and measurement techniques were used.

The field team was able to meet project DQOs.

4.3.5 Completeness

Completeness is calculated for the aggregation of data for each analyte measured for any particular sampling event or other defined set of samples. Completeness is calculated and reported for each method, matrix, and analyte combination. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. For completeness requirements, valid results are all results not rejected through data validation. The requirement for completeness for this project is 90% for all samples.

The following formula is used to calculate completeness:

$$\% \text{ completeness} = \frac{\text{number of valid results}}{\text{number of possible results}}$$

For this investigation, all samples are considered critical. Therefore, standard collection and measurement methods will be used to achieve the completeness goal. All laboratory data were reviewed for usability, and all project data were determined to be useable.

The project DQO of 90% for completeness was met.

4.4 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PARAMETERS

The laboratory data also were reviewed for technical holding time compliance, blank samples contamination, laboratory control sample recovery, interference check sample recovery, duplicate sample analysis, matrix spike/duplicate spike sample analysis, and serial dilution performance.

These parameters are described below in more detail, and sample-specific detail (including qualification of individual analyte results for associated samples) is provided in the data validation memoranda. Direction of bias is also described in the individual data review memoranda (Appendix D).

4.4.1 Holding Times

All analyses were completed within the technical holding times, with the following exceptions.

- Several samples submitted for pesticides analysis exhibited potential laboratory cross-contamination from other samples in the analytical group. These samples were re-extracted outside the technical holding time and reanalyzed. In the professional judgment of EPA reviewer, detected results for 4,4-DDT should be utilized as estimated concentrations (J), potential low bias (L).
- In the professional judgment of EPA reviewer, the detected result for 4,4-DDT in one sample was not reliable following re-extraction and analysis, and the result was rejected (R) for any use.

4.4.2 Blank Sample Results

All blank sample analyses met the frequency and recovery criteria, with the following exceptions.

- Arsenic, barium, and lead were detected in one or more calibration blank check samples at concentrations above the acceptance criterion. Results for these metals in the associated samples were qualified as non-detected (U) at the reported concentration.

- Aluminum was detected in one or more preparation blank samples. Aluminum results in associated samples that were less than ten-times the blank concentration were qualified as non-detected (U) at the reported concentrations.
- Cadmium, copper, mercury and zinc were detected in one or more blank samples at negative concentrations, with absolute concentration values greater than their method detection limits (MDLs). Associated sample results were qualified as non-detected (U) at estimated concentrations (J), unknown bias (K).
- 4,4'-DDT was detected in one or more method blank samples extracted on 05/20/04. All results associated with this extraction group were rejected for use (R). Samples were re-extracted and analyzed outside the technical holding time (see Section 4.4.1). Results for 4,4'-DDT were reported from the analysis of all but one of the re-extracted samples, and were qualified as estimated concentrations (J), possible low bias (L), due to holding time exceedance. The remaining 4,4'-DDT sample result was rejected for use (R) based on the professional judgment of the EPA reviewer.

4.4.3 Calibration Check Sample Analysis

All calibration check sample analyses met acceptance criteria for frequency and recovery.

4.4.4 Laboratory Control Sample Analysis

All laboratory control samples analyzed met frequency and recovery criteria.

4.4.5 Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES)— Interference Check Sample (ICS) Analysis

All ICP-AES interference check sample analyses met frequency and recovery criteria, with the following exceptions.

- All recovery criteria were met for the reported analytes in the interference check sample analyses. In the professional opinion of the EPA reviewer, aluminum and/or iron were present in several field samples. As a result, arsenic results from one or more samples were qualified as estimated (J), unknown bias (K). Cadmium and thallium results from one or more samples were qualified as non-detected (U) at an estimated concentration (J), unknown bias (K).

4.4.6 Serial Dilutions

Serial dilution analysis met all frequency and recovery criteria, with the following exception.

- Potassium and copper serial dilution precision failed to meet the acceptance criterion for percent difference. All associated results were qualified as estimated concentrations (J), unknown bias (K).

4.4.7 Duplicate Sample Analysis

Duplicate sample analysis was performed for metals and perchlorate. All frequency and precision criteria were met.

4.4.8 Matrix Spike Sample Analysis

All matrix spike analyses met frequency and recovery criteria, with the following exceptions.

- Recovery of silver was less than the lower control limit from one or more matrix spike samples. Stabilization of silver in sample digestates is known to be problematic, as it forms an insoluble oxide compound. All associated sample results for silver were qualified as estimated (J). Detected silver results were qualified as possible low bias (L); non-detected silver results for the associated samples were qualified by this reviewer as unknown bias (K).
- Recoveries of nearly all pesticides from one matrix spike and duplicate spike sample pair were less than their respective lower control limits. Since pesticide results for the associated samples were qualified previously due to holding time exceedance, no additional qualification of the pesticides results was necessary.

4.4.9 System Monitoring Compound (Surrogate) Spike Analysis

Surrogate spike recoveries met method acceptance criteria, with the following exception.

- Surrogate recoveries from several samples analyzed for SVOC exceeded their respective upper control limits. Since SVOC were not detected in the associated samples, no qualification of the associated SVOC results was necessary.

4.4.10 Internal Standard Analysis

Internal standard recoveries associated with the gas chromatography/mass spectroscopy (GC/MS) analyses met method acceptance criteria.

4.4.11 Detection Limits

Sample results that fall between the MDL and the Practical Quantitation Limit (PQL) are flagged as estimated concentrations (J), with an additional concentration qualifier 'B' for inorganic analytes and 'Q' for organic analytes. This is described further in Section 4.4.12.

All detection limits met project data quality objectives.

4.4.12 Other Data Assessment

For ILM05.3, the laboratory is required to flag all detected results below the Contract Required Quantitation Limit (CRQL) with a 'J' concentration qualifier (result below the CRQL but above the MDL). For consistency with previous START PA/SI reports, and as an aid in the Hazard Ranking System (HRS) scoring, the 'J' concentration qualifier is amended with the 'B' data validation qualifier.

For the Inorganic Functional Guidelines review, the '+' and '-' bias flags are replaced with 'H' and 'L' flags to indicate potential high and low bias, respectively. The 'K' flag is used to indicate unknown bias. This approach is consistent with EPA Region 10 policy.

Bias associated with estimated, non-detected values is unknown and flagged as such, since the reporting limit cannot be determined.

All SVOC results reported as Tentatively Identified Compounds (TIC) were rejected for use (R) in HRS scoring.

The data, as qualified, are ACCEPTABLE and can be used for all purposes specified in the SQAP (Weston, 2004).

SECTION 5

ANALYTICAL RESULTS REPORTING AND BACKGROUND SAMPLES

The following sections present the reporting criteria and reporting methods applied to the PA/SI data set. This section also presents the locations, analyses conducted, and analytical results of designated background samples collected during the PA/SI. Background sampling locations are presented in Figure 3-1. Tables 6-1, 7-3, and 7-4 present the analytical results for the surface soil, sediment, and surface water background samples, respectively. Data validation memoranda and Form I Analytical Results are included in Appendix D.

5.1 ANALYTICAL RESULTS EVALUATION CRITERIA

Analytical results of samples collected during this PA/SI are presented in summary tables in Sections 6 (source sample reporting) and 7 (migration exposure pathways and targets). The first column of each analytical summary table presents background sample concentrations (where appropriate) followed by the analytical results of samples collected for that particular media. The background sample concentrations were used for comparison purposes to determine detections at or above background. Concentrations of analytes detected above their respective sample quantitation limits (SQLs) are presented in bold typeface. Analytical results indicating significant concentrations in source samples (Section 6) with respect to background concentrations are underlined in addition to the bolding. Similarly, analytical results indicating elevated concentrations of contaminants in target samples (Section 7) with respect to background concentrations are also underlined in addition to the bolding. For target sample locations, only those analytes that were also detected in a source at the site were evaluated to determine whether their concentrations were elevated. For the purposes of this investigation, significant/elevated concentrations are:

- Equal to or greater than the SQL if the analyte was not detected in the background samples collected for that media.
- Equal to or greater than the background sample's SQL when background concentrations were detected below the SQL.
- At least three times greater than the background concentration when the background concentration equals or exceeds the SQL.

Based on EPA Region 10 policy regarding common earth crust elements, aluminum, calcium, iron, magnesium, potassium, and sodium are listed in the tables if detected; however, the concentrations were not evaluated or discussed in the text.

5.2 BACKGROUND SAMPLE LOCATION AND ANALYTICAL RESULTS

For PA/SIs, background samples are collected for each of the naturally occurring media from which samples were collected. Background samples were collected for soil, sediment, and

surface water. Background samples were not collected for groundwater as it is assumed that perchlorate and NBECs are not naturally occurring. Results for the appropriate background samples appear in the first columns of the analytical results summary tables included in Sections 6 and 7 to be used for comparison against source and target results.

All soil and sediment samples analyzed for TAL metals including mercury and NBECs results are reported in milligrams per kilogram (mg/kg), which is equivalent to parts per million (ppm). All soil and sediment samples analyzed for SVOCs and pesticides/PCBs results are reported in micrograms per kilogram ($\mu\text{g}/\text{kg}$), which is equivalent to parts per billion (ppb). All water sample results are reported in micrograms per liter ($\mu\text{g}/\text{L}$), which is equivalent to ppb.

5.2.1 Background Sample Locations

As previously presented in Section 3.1, one background soil sample (SS-BK001) was collected during the PA/SI. The soil background sample was collected off of Upper Deschutes Road (Figure 3-1).

The background surface water and sediment sample (SW-BK001 and SD-BK001) were collected upstream of Harper Bridge (Figure 3-1).

5.2.2 Background Sample Results

The soil background sample SS-BK001 showed concentrations of barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc detected above their respective SQLs. Concentrations of NBECs, SVOCs, and pesticides/PCBs were not detected above their respective MDLs. The soil sample consisted of reddish brown silty sand with occasional fine organic roots. Analytical results for sample SS-BK001 are presented in Tables 6-1, 6-2, and 6-3.

The surface water background sample SW-BK001 showed a concentration of manganese (15.5 $\mu\text{g}/\text{L}$) detected above the SQL. Concentrations of SVOCs and pesticides/PCBs were not detected above their respective MDLs. The surface water sample was slightly turbid. Analytical results for sample SW-BK001 are presented in Table 7-4.

The sediment background sample SD-BK001 showed concentrations of barium, chromium, cobalt, copper, manganese, nickel, vanadium, and zinc detected above their respective SQLs. Concentrations of NBECs, SVOCs, and pesticide/PCBs were not detected above their respective MDLs. The sediment sample consisted of dark brown silty sand with gravel. Analytical results for sample SD-BK001 are presented in Table 7-3.

SECTION 6

POTENTIAL SOURCE CHARACTERIZATION

The following section presents the locations, analyses conducted, and analytical results of samples collected from the Camp Abbot FUDS PA/SI, as well as comparisons to background concentrations. Source and background sampling locations are presented in Figures 3-1 through 3-7. Table 6-1 presents the analytical results of the discrete source samples collected at the landfill. Table 6-2 presents the analytical results of the discrete source samples collected at the machine gun range and the northern and southern rifle ranges and a comparison to background concentrations. Table 6-3 presents the analytical results of the discrete source samples collected at the grenade court and the demolition pits and a comparison to background concentrations. Data review memoranda and Form I Analytical Results are included in Appendix D.

6.1 POTENTIAL SOURCE SAMPLING LOCATIONS AND ANALYTICAL RESULTS

The landfill, the machine gun range, the northern and southern rifle ranges, the grenade court, and the demolition pits were the potential source areas investigated during the PA/SI (Figure 2-2). Potential source samples were collected on May 14-16, 2004. Sampling locations were selected at those places most likely to contain detectable concentrations of hazardous substances.

6.1.1 Source Description

- **Landfill**—The former landfill is located on the east side of the Deschutes River (Figure 3-2). The current River Road apparently was built over the former landfill. Aspen Lake, located at the landfill's eastern boundary, was dredged sometime after 1969 in order to construct the golf course. Reportedly no debris or garbage was uncovered during the dredging (Sunriver Water LLC, Environmental LLC, 2004). Currently the area is used as a nature center including a botanical garden, nature trail, and a public observatory.
- **Machine Gun Range**—The machine gun range is located northwest of the rifle ranges, east of the Deschutes River and west of River Road (Figure 3-3). The area is currently used for hiking and horse trails, but is relatively undeveloped. A structure constructed of large concrete blocks approximately 40 feet long and 20 feet wide was located in the northwestern corner of the range (Appendix A, photos 3 and 4). It is unknown whether the concrete structure was associated with the range. It is possible that bridge demolition occurred in this area and this structure may be associated with that activity.
- **Northern Rifle Range**—The northern rifle range is located on the east side of the Deschutes River. The original range extended over what is currently a field used for livestock grazing, the Sunriver Airport landing strip, and a golf course. The area in-between the landing strip and River Road was targeted for screening, because it seemed to be the least disturbed area without asphalt or landscaping (Figure 3-4).
- **Southern Rifle Ranges**—The southern rifle range is located on the east side of the Deschutes River and east of River Road. The original range extended over what is

currently a livestock grazing field, the Sunriver Airport landing strip, and a golf course (Figure 3-5). The field was targeted for screening because it seemed to be the least disturbed area without asphalt or landscaping.

- **Grenade Court**—A grenade court is located on the west side of the Deschutes River and north of Spring River Road (Figure 3-6). The grenade court had little to no vegetation in a relatively densely packed forest. Many metal fragments were observed at the grenade court.
- **Demolition Pits**—The demolition pits are located on the west side of the Deschutes River off National Forest Develop Road 41 on Spring River Road on USFS property (Figure 3-7). Located at the site was a small concrete pill box and an unvegetated hillside with several depressions at the bottom of the hill, which are the demolition pits.

There are no liners, active run-on/runoff control systems, functioning leachate collection systems, and/or maintained engineered covered associated with the source areas.

6.1.2 Sample Locations

- **Landfill**—A colocated surface and below surface soil sample (SS-LF001 and SS-LF002) was collected at the northern boundary of the landfill (Figure 3-2). Sample SS-LF001 was collected at the surface and SS-LF002 was collected between 6 and 24 inches bgs. Sample SS-LF001 consisted of dark brown sandy silt with organic material such as roots. Sample SS-LF002 consisted of 100% silt with diatomaceous earth and was grey-tan in color. The samples were submitted for TAL metals, SVOCs, pesticides, and PCBs analysis.
- **Machine Gun Range**—Thirty locations were screened using the XRF spectrometer at the machine gun range. Three sample locations (SS-MR001 through SS-MR003) were selected for sampling based on screening results showing relatively higher concentrations of chromium, lead, and zinc compared to the other screening locations. These locations are illustrated in Figure 3-3. The samples consisted of light grey silt with a little gravel and organic material such as bark and roots. The samples were submitted for TAL metals analysis.
- **Northern Rifle Range**—Thirty locations were screened using the XRF spectrometer at the northern rifle range. Three sample locations (SS-RR001 through SS-RR003) were selected for sampling based on screening results showing relatively higher concentrations of chromium, lead, and zinc compared to the other screening locations. These locations are illustrated in Figure 3-4. Sample SS-RR001 consisted of 10% fine gravel, 75% fine sand, and 15% silt and was light grey in color. Samples SS-RR002 and SS-RR003 consisted of 85% fine sand, 15% silt, had organic material such as roots and grass and was moist. The samples were submitted for TAL metals analysis.
- **Southern Rifle Ranges**—Thirty locations were screened using the XRF spectrometer at the southern rifle range. Three sample locations (SS-RR004 through SS-RR006) were selected for sampling based on relatively higher concentrations of chromium, lead, and zinc compared to the other screening locations. These locations are illustrated in Figure 3-5. Samples SS-RR004 and SS-RR005 consisted of 30% fine sand and 70% silt, dark brown in color, and had organic material such as roots. Sample SS-RR006 consisted of 10% fine

gravel, 75% coarse-medium sand, 15% silt and was light brown in color. The samples were submitted for TAL metals analysis.

- **Grenade Court**—The grenade court was screened by a Weston Unexploded Ordnance (UXO) trained technician and deemed safe. Twelve locations were screened using the XRF spectrometer at the grenade court. Three locations (SS-GC001 through SS-GC003) were selected for sampling based on relatively high concentrations of chromium, lead, and zinc compared to the other screening locations (Figure 3-6). A metal fragment located at sample location SS-GC003 was identified as a grenade pin (Appendix A, Photo 22). The samples consisted of 15% fine gravel, 75% medium-fine sand, 10% silt, reddish brown in color, and had organic material such as roots. The samples were submitted for TAL metals and NBECs.
- **Demolition Pits**—Several demolition pits were located east and downhill of a pill box located just east of Spring River Road (Figure 3-7). Six pits were screened by a Weston UXO trained technician and deemed safe. The pits were tested for TNT using TNT field kits and three of the pits showed TNT at concentrations below 1.5 mg/kg and three pits showed no detected concentrations of TNT. These three pits showing a concentration of TNT were selected for sampling (SS-DP001 through SS-DP003), however as discussed in Section 6.1.2 there were no detected concentrations of NBECs which includes TNT, therefore the field kits produced false positives. The samples consisted of 15% fine gravel, 70% coarse-medium sand, 15% silt, reddish brown in color and had organic material such as roots. The samples were submitted for TAL metals and NBECs analysis.

6.1.3 Sample Results

- **Landfill**—The samples collected from the landfill were analyzed for TAL metals, SVOCs, and pesticides/PCBs. The laboratory results indicate barium, chromium, cobalt, copper, manganese, nickel, vanadium, and zinc were detected above the SQL in at least one sample at the landfill (Table 6-1). No metals were detected at significant concentrations. The two soil samples showed no detectable concentrations of SVOCs or pesticides/PCBs (Table 6-1).
- **Machine Gun Range**— The soil samples collected from the machine gun range (SS-MR001 through SS-MR003) were analyzed for TAL metals. The laboratory results indicate that arsenic, barium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium, and zinc were detected in at least one sample location at the machine gun range above the SQL. Arsenic (1.5 mg/kg), lead (24.0 mg/kg), and mercury (0.96 mg/kg) were detected at concentrations significantly above background at one sample location (Table 6-2).
- **Northern Rifle Range**— The soil samples collected from the northern rifle range (SS-RR001 through SS-RR003) were analyzed for TAL metals. The laboratory results indicate arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, silver, vanadium, and zinc were detected above the SQL in at least one sample location at the northern Rifle Range. Arsenic (3.1-5.2 mg/kg) was detected at significant concentrations in all three samples and silver (6.1 mg/kg) was detected at a significant concentration in one sample (Table 6-2).

- **Southern Rifle Ranges**— The soil samples collected from the southern rifle range (SS-RR004 through SS-RR006) were analyzed for TAL metals. The laboratory results indicate arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc were detected above the SQL in at least one sample location at the southern rifle range. Arsenic (1.7-4.8 mg/kg) was detected at significant concentrations in all three samples (Table 6-2).
- **Grenade Court**— The soil samples collected at the grenade court (SS-GC001 through SS-GC003) were analyzed for TAL metals and NBECs. The laboratory results indicate barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc were detected above the SQL in at least one sample location at the grenade court (Table 6-3). None of the metals were detected at significant concentrations above background. The three soil samples showed no detected concentrations of NBECs (Table 6-3).
- **Demolition Pits**— The samples collected from the demolition pits (SS-DP001 through SS-DP003) and were analyzed for TAL metals and NBECs. The laboratory results indicate arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc were detected above the SQL in at least one sample at the demolition pits (Table 6-3). Arsenic (1.5 mg/kg) was detected at a significant concentration in one sample. The three soil samples showed no detected concentrations of NBECs (Table 6-3).

**Table 6-1—Potential Sources: Landfill Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Potential Source	
Field Number	SS-BK001	SS-LF001	SS-LF002
EPA Number	04214013	04204000	04204001
CLP Number	M/J2CA8	M/J2C82	M/J2C83
Location	Background Soil	Surface Soil at Landfill	Subsurface Soil at Landfill
Inorganics (mg/kg)			
Aluminum	20100	14600	5950
Antimony	7.2 U	9.5 U	10.1 U
Arsenic	0.91 UJK	0.53 U	1.9 U
Barium	130	79.7	55.1
Beryllium	0.51 BJK	0.29 BJK	0.18 BJK
	SQL = 0.6		
Cadmium	0.60 UJK	0.79 UJK	0.84 UJK
Calcium	2030	6140	1900
Chromium	11.0	17.5	9.2
Cobalt	11.8	16.7	3.8 BJK
Copper	14.3 JK	19.4 JK	17.2 JK
Iron	19000	21200	4550
Lead	2.9	1.6 U	1.2 U
Magnesium	3630	8560	734 BJK
Manganese	574	211	9.9
Mercury	0.030 BJK	0.050 BJK	0.16 U
	SQL = 0.12		
Nickel	25.5	58.1	20.9
Potassium	547 BJK	709 BJK	121 BJK
Selenium	4.2 U	5.5 U	5.9 U
Silver	1.2 UJK	1.6 UJK	1.7 UJK
Sodium	198 BJK	1200	231 BJK
Thallium	3.0 UJK	3.9 U	4.2 U
Vanadium	45.5	61.6	53.9
Zinc	40.2	34.5	5.9 BJK
Semivolatile Organic Compounds (µg/kg)			
Benzaldehyde	390 U	540 U	730 U
Phenol	390 U	540 U	730 U
Bis-(2-chloroethyl)ether	390 U	540 U	730 U
2-Chlorophenol	390 U	540 U	730 U
2-Methylphenol	390 U	540 U	730 U
2,2'-Oxybis(1-chloropropane)	390 U	540 U	730 U
Acetophenone	390 U	540 U	730 U
4-Methylphenol	390 U	540 U	730 U
N-Nitroso-di-n propylamine	390 U	540 U	730 U
Hexachloroethane	390 U	540 U	730 U
Nitrobenzene	390 U	540 U	730 U
Isophorone	390 U	540 U	730 U
2-Nitrophenol	390 U	540 U	730 U
2,4-Dimethylphenol	390 U	540 U	730 U
Semivolatile Organic Compounds (µg/kg)			
Bis(2-chloroethoxy)methane	390 U	540 U	730 U
2,4-Dichlorophenol	390 U	540 U	730 U
Naphthalene	390 U	540 U	730 U
4-Chloroaniline	390 U	540 U	730 U
Hexachlorobutadiene	390 U	540 U	730 U
Caprolactam	390 U	540 U	730 U
4-Chloro-3-methylphenol	390 U	540 U	730 U
2-Methylnaphthalene	390 U	540 U	730 U

**Table 6-1—Potential Sources: Landfill Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Potential Source	
		SS-LF001	SS-LF002
Field Number	SS-BK001	SS-LF001	SS-LF002
EPA Number	04214013	04204000	04204001
CLP Number	M/J2CA8	M/J2C82	M/J2C83
Location	Background Soil	Surface Soil at Landfill	Subsurface Soil at Landfill
Hexachlorocyclo-pentadiene	390 U	540 U	730 U
2,4,6-Trichlorophenol	390 U	540 U	730 U
2,4,5-Trichlorophenol	970 U	1400 U	1800 U
1,1'-Biphenyl	390 U	540 U	730 U
2-Chloronaphthalene	390 U	540 U	730 U
2-Nitroaniline	970 U	1400 U	1800 U
Dimethylphthalate	390 U	540 U	730 U
2,6-Dinitrotoluene	390 U	540 U	730 U
Acenaphthylene	390 U	540 U	730 U
3-Nitroaniline	970 U	1400 U	1800 U
Acenaphthene	390 U	540 U	730 U
2,4-Dinitrophenol	970 U	1400 U	1800 U
4-Nitrophenol	970 U	1400 U	1800 U
Dibenzofuran	390 U	540 U	730 U
2,4-Dinitrotoluene	390 U	540 U	730 U
Diethylphthalate	390 U	540 U	730 U
Fluorene	390 U	540 U	730 U
4-Chlorophenyl-phenyl ether	390 U	540 U	730 U
4-Nitroaniline	970 U	1400 U	1800 U
4,6-Dinitro-2-methylphenol	970 U	1400 U	1800 U
N-Nitroso diphenylamine	390 U	540 U	730 U
4-Bromophenyl-phenylether	390 U	540 U	730 U
Hexachlorobenzene	390 U	540 U	730 U
Atrazine	390 U	540 U	730 U
Pentachlorophenol	970 U	1400 U	1800 U
Phenanthrene	390 U	540 U	730 U
Anthracene	390 U	540 U	730 U
Carbazole	390 U	540 U	730 U
Di-n-butylphthalate	390 U	540 U	730 U
Fluoranthene	390 U	540 U	730 U
Pyrene	390 U	540 U	730 U
Butylbenzylphthalate	390 U	540 U	730 U
Semivolatile Organic Compounds (µg/kg)			
3,3'-Dichlorobenzidine	390 U	540 U	730 U
Benzo(a)anthracene	390 U	540 U	730 U
Chrysene	390 U	540 U	730 U
Bis(2-ethylhexyl)phthalate	390 U	540 U	730 U
Di-n-octylphthalate	390 U	540 U	730 U
Benzo(b)fluoranthene	390 U	540 U	730 U
Benzo(k)fluoranthene	390 U	540 U	730 U
Benzo(a)pyrene	390 U	540 U	730 U
Indeno(1,2,3-cd)-pyrene	390 U	540 U	730 U
Dibenzo(a,h)-anthracene	390 U	540 U	730 U
Benzo(g,h,i)perylene	390 U	540 U	730 U

**Table 6-1—Potential Sources: Landfill Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Potential Source	
Field Number	SS-BK001	SS-LF001	SS-LF002
EPA Number	04214013	04204000	04204001
CLP Number	M/J2CA8	M/J2C82	M/J2C83
Location	Background Soil	Surface Soil at Landfill	Subsurface Soil at Landfill
Pesticides/Polychlorinated Biphenyls (µg/kg)			
Alpha-BHC	2.0 U	2.8 U	3.8 U
Beta-BHC	2.0 U	2.8 U	3.8 U
Delta-BHC	2.0 U	2.8 U	3.8 U
Gamma-BHC (Lindane)	2.0 U	2.8 U	3.8 U
Heptachlor	2.0 U	2.8 U	3.8 U
Aldrin	2.0 U	2.8 U	3.8 U
Heptachlor epoxide	2.0 U	2.8 U	3.8 U
Endosulfan I	2.0 U	2.8 U	3.8 U
Dieldrin	3.9 U	5.5 U	7.3 U
4,4'-DDE	3.9 U	5.5 U	7.3 U
Endrin	3.9 U	5.5 U	7.3 U
Endosulfan II	3.9 U	5.5 U	7.3 U
4,4'-DDD	3.9 U	5.5 U	7.3 U
Endosulfan sulfate	3.9 U	5.5 U	7.3 U
4,4'-DDT	3.9 UJK	26.0 R	7.2 UJK
Methoxychlor	20.0 U	28.0 U	38.0 U
Endrin ketone	3.9 U	5.5 U	7.3 U
Endrin aldehyde	3.9 U	5.5 U	7.3 U
Alpha-chlordane	2.0 U	2.8 U	3.8 U
Gamma-chlordane	2.0 U	2.8 U	3.8 U
Toxaphene	200 U	280 U	380 U
Aroclor-1016	39.0 U	55.0 U	73.0 U
Aroclor-1221	79.0 U	110 U	150 U
Aroclor-1232	39.0 U	55.0 U	73.0 U
Aroclor-1242	39.0 U	55.0 U	73.0 U
Aroclor-1248	39.0 U	55.0 U	73.0 U
Aroclor-1254	39.0 U	55.0 U	73.0 U
Aroclor-1260	39.0 U	55.0 U	73.0 U

Notes:

Bold type indicates the sample concentration above the Sample Quantitation Limit (SQL).

Bold underline type indicates a sample concentration that is significant as defined in Section 5.

BK: Background

CLP: Contract Laboratory Program

EPA: United States Environmental Protection Agency

mg/kg: milligram per kilogram

RA: Retort Area

SS: Surface Soil

Data Qualifiers:

B:

JH: The analyte was positively identified. The associated numerical value is a high-bias estimate.

JK: The analyte was positively identified. The associated numerical value is an unknown bias estimate.

JL: The analyte was positively identified. The associated numerical value is a low-bias estimate.

U: The analyte was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

UJK: The analyte was analyzed for but not detected. The associated numerical value is an unknown bias estimate.

**Table 6-2—Potential Sources: Machine Gun Range and Rifle Ranges Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Potential Source						Potential Source		
		SS-MR001	SS-MR002	SS-MR003	SS-RR001	SS-RR002	SS-RR003	SS-RR004	SS-RR005	SS-RR006
Field Number	SS-BK001	SS-MR001	SS-MR002	SS-MR003	SS-RR001	SS-RR002	SS-RR003	SS-RR004	SS-RR005	SS-RR006
EPA Number	04214013	04204004	04204005	04204006	04204008	04204009	04204010	04214000	04214001	04214002
CLP Number	MJ2CA8	MJ2C86	MJ2C87	MJ2C88	MJ2C89	MJ2C90	MJ2C91	MJ2C95	MJ2C96	MJ2C97
Location	Background Soil	Machine Gun Range Sample 1	Machine Gun Range Sample 2	Machine Gun Range Sample 3	North Rifle Range Sample 1	North Rifle Range Sample 2	North Rifle Range Sample 3	South Rifle Range Sample 1	South Rifle Range Sample 2	South Rifle Range Sample 3
Inorganics (mg/kg)										
Aluminum	20100	11100	10900	12400	12300	10800	10900	10400	7580	11300
Antimony	7.2 U	6.9 U	7.9 U	0.77 BJK	0.79 BJK	8.5 U	10.1 U	9.3 U	10.2 U	3.0 BJK
Arsenic	0.91 UJK	0.51 U	1.1 BJK	1.5	3.1	5.2	3.2	4.8	4.1	1.7
Barium	130	66.3	128	105	93.6	97.9	111	92.3	88.7	67.6
Beryllium	0.51 BJK	0.16 BJK	0.28 BJK	0.28 BJK	0.29 BJK	0.28 BJK	0.27 BJK	0.23 BJK	0.22 BJK	0.26 BJK
	SQL = 0.6									
Cadmium	0.60 UJK	0.58 UJK	0.66 UJK	0.63 UJK	0.57 UJK	0.71 UJK	0.84 UJK	0.77 UJK	0.85 UJK	0.63 UJK
Calcium	2030	6460	9440	5810	6330	7510	8470	11700	7500	5860
Chromium	11.0	11.3	10.5	13.2	14.3	13.4	13.0	12	10.3	14.9
Cobalt	11.8	8.1	9.0	11.6	9.7	8.1	7.3 BJK	9.0	5.2 BJK	13.4
Copper	14.3 JK	16 JK	19.1 JK	27.2 JK	26.8 JK	20.7 JK	22.2 JK	23.4 JK	23.1 JK	24.0 JK
Iron	19000	10100	14700	17900	13300	9690	10900	8280	5470	17700
Lead	2.9	4.8	6.3	24.0	2.2	2.6	2.4	2.9	3.5	1.7
Magnesium	3630	3500	2560	2950	2110	1430	2730	2760	1950	8170
Manganese	574	214	429	374	145	175	145	215	87.2	252
Mercury	0.030 BJK	0.96	0.060 BJK	0.13 U	0.070 BJK	0.10 BJK	0.15 U	0.07 BJK	0.11 BJK	0.10 BJK
	SQL = 0.12									
Nickel	25.5	23.9	20.1	23.4	23.6	16.9	21.3	24.1	20.3	38.1
Potassium	547 BJK	751 JK	2480 JK	1660 JK	868 JK	972 JK	900 JK	502 BJK	951 JK	964 JK
Selenium	4.2 U	4.0 U	4.6 U	4.4 U	4.0 U	5.0 U	5.9 U	5.4 U	6.0 U	4.4 U
Silver	1.2 UJK	1.2 UJK	1.3 UJK	1.3 UJK	1.1 UJK	1.4 UJK	6.1 JL	1.5 UJK	1.7 UJK	1.3 UJK
Sodium	198 BJK	1050	491 BJK	648	606	602 BJK	1010	695 BJK	535 BJK	909
Thallium	3.0 UJK	2.9 U	3.3 U	3.1 U	2.9 U	3.6 U	4.2 U	3.9 U	4.3 U	3.1 U
Vanadium	45.5	38.6	42.1	61.4	63.8	84.8	71.4	87.8	65.7	58.0
Zinc	40.2	27.2	72.8	65.7	54.9	36.4	33.0	39.1	29.6	45.8

Notes:

Bold type indicates the sample concentration above the Sample Quantitation Limit (SQL)

Bold underline type indicates a sample concentration that is significant as defined in Section 5.

BK: Background

CLP: Contract Laboratory Program

EPA: United States Environmental Protection Agency

mg/kg: milligram per kilogram

RA: Retort Area

SS: Surface Soil

Data Qualifiers:

JH: The analyte was positively identified. The associated numerical value is a high-bias estimate.

JK: The analyte was positively identified. The associated numerical value is an unknown bias estimate.

JL: The analyte was positively identified. The associated numerical value is a low-bias estimate.

U: The analyte was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

UJK: The analyte was analyzed for but not detected. The associated numerical value is an unknown bias estimate.

**Table 6-3—Potential Sources: Grenade Court and Demolition Pits Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Potential Source					
		SS-DP001	SS-DP002	SS-DP003	SS-GC001	SS-GC002	SS-GC001
Field Number	SS-BK001	SS-DP001	SS-DP002	SS-DP003	SS-GC001	SS-GC002	SS-GC001
EPA Number	04214013	04204011	04204012	04204013	04214008	04214009	04214010
CLP Number	MJ2CA8	MJ2C92	MJ2C93	MJ2C94	MJ2CA3	MJ2CA4	MJ2CA5
Location	Background Soil	Demolition Pit Sample 1	Demolition Pit Sample 2	Demolition Pit Sample 3	Grenade Court Sample 1	Grenade Court Sample 2	Grenade Court Sample 3
<i>Inorganics (mg/kg)</i>							
Aluminum	20100	22500	18200	24200	15800	14100	14700
Antimony	7.2 U	1.7 BJK	7.5 U	0.82 BJK	6.8 U	6.3 U	6.7 U
Arsenic	0.91 UJK	1.5	1.2 BJK	1.3 U	0.91 U	0.62 UJK	0.89 UJK
Barium	130	191	145	262	118	102	119
Beryllium	0.51 BJK	0.61 BJK	0.44 BJK	0.6 BJK	0.37 BJK	0.33 BJK	0.35 BJK
	SQL = 0.6						
Cadmium	0.6 UJK	0.63 UJK	0.63 UJK	0.6 UJK	0.57 UJK	0.53 UJK	0.56 UJK
Calcium	2030	1810	1670	2170	2870	2890	3170
Chromium	11.0	13.9	8.8	13.5	11.5	13.9	12.5
Cobalt	11.8	14.4	9.7	13.9	11.7	13.8	12.9
Copper	14.3 JK	19.7 JK	13.9 JK	20.4 JK	15.6 JK	15.8 JK	16.0 JK
Iron	19000	23400	15300	20800	16500	19100	18500
Lead	2.9	3.0	3.5	3.7	2.0 JK	1.5 UJK	2.0 UJK
Magnesium	3630	3690	2340	2140	4980	6180	5810
Manganese	574	524	523	645	303	318	392
Mercury	0.03 BJK	0.12 U	0.13 U	0.12 U	0.11 U	0.10 U	0.11 U
	SQL = 0.12						
Nickel	25.5	26.4	16.6	19.3	30.2	35.9	32.7
Potassium	547 BJK	662 JK	360 BJK	656 JK	427 BJK	478 BJK	586 JK
Selenium	4.2 U	4.4 U	4.4 U	4.2 U	4.0 U	3.7 U	3.9 U
Silver	1.2 UJK	1.3 UJK	1.3 UJK	1.2 UJK	1.1 UJK	1.1 UJK	1.1 UJK
Sodium	198 BJK	272 BJK	170 BJK	252 BJK	304 BJK	395 BJK	351 BJK
Thallium	3.0 UJK	3.1 UJK	3.1 UJK	3.0 UJK	2.9 UJK	2.6 UJK	2.8 UJK
Vanadium	45.5	65.0	40.1	59.0	47.4	52.3	49.2
Zinc	40.2	38.8	38.1	48.1	31.1	34.2	31.3

**Table 6-3—Potential Sources: Grenade Court and Demolition Pits Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Potential Source					
		SS-DP001	SS-DP002	SS-DP003	SS-GC001	SS-GC002	SS-GC001
Field Number	SS-BK001	SS-DP001	SS-DP002	SS-DP003	SS-GC001	SS-GC002	SS-GC001
EPA Number	04214013	04204011	04204012	04204013	04214008	04214009	04214010
CLP Number	MJ2CA8	MJ2C92	MJ2C93	MJ2C94	MJ2CA3	MJ2CA4	MJ2CA5
Location	Background Soil	Demolition Pit Sample 1	Demolition Pit Sample 2	Demolition Pit Sample 3	Grenade Court Sample 1	Grenade Court Sample 2	Grenade Court Sample 3
<i>Nitrate Base Explosive Compounds (mg/kg)</i>							
1,3,5-Trinitrobenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dinitrobenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,4,6-Trinitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,4-Dinitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,6-Dinitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Amino-4,6-Dinitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Nitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
3-Nitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Amino-2,6-Dinitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Nitrotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
HMX	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nitrobenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
RDX	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetryl	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Notes:

Bold type indicates the sample concentration above the Sample Quantitation Limit (SQL).

Bold underline type indicates a sample concentration that is significant as defined in Section 5.

BK: Background

CLP: Contract Laboratory Program

EPA: United States Environmental Protection Agency

mg/kg: milligram per kilogram

RA: Retort Area

SS: Surface Soil

Data Qualifiers:

JH: The analyte was positively identified. The associated numerical value is a high-bias estimate.

JK: The analyte was positively identified. The associated numerical value is an unknown bias estimate.

JL: The analyte was positively identified. The associated numerical value is a low-bias estimate.

U: The analyte was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

UJK: The analyte was analyzed for but not detected. The associated numerical value is an unknown bias estimate.

SECTION 7

MIGRATION/EXPOSURE PATHWAYS AND TARGETS

7.1 GROUNDWATER MIGRATION PATHWAY

Camp Abbot FUDS is located in a broad relatively flat area between Newberry Volcano and the High Cascades mountain range in the southern part of Deschutes County (Oregon Department of Geology and Mineral Industries [ODGMI], 1976). Alluvium and surficial deposits from the late Pleistocene and Holocene periods characterize the geology in this area (Groh, 1974). The near surface deposits consist of a few feet of soil containing a mixture of pumice and reddish-black ash and cinders from the Holocene eruptions on Newberry's flanks; the underlining sediments are a crudely layered sand, silt, and gravel sequence that typically contains large percentages of fine brownish pumice-cinder matrix with rounded pebbles of scoria and volcanic rocks (ODGMI, 1976).

Depth to groundwater near the site occurs between 56 and 70 feet bgs (Oregon Water Resources Department [OWRD], 2004). Depth to contamination in the site vicinity, if present, is unknown. The 4-mile TDL is presented on Figure 7-1. The site is located in a wellhead protection area. The mean annual precipitation for Bend, Oregon, located approximately 15 miles northeast of Camp Abbot, is 11.6 inches (Western Regional Climate Center [WRCC], 2004a).

7.1.1 Groundwater Pathway Targets

Groundwater is highly utilized in the Deschutes Basin because surface water resources in the region have been fully appropriated for many years and streamflows are locally below legally set minimums at certain times of the year (United States Geologic Survey [USGS], 1999). Because surface water rights are no longer available, virtually all new development relies on groundwater (USGS, 1999). According to the OWRD, there are approximately 1,080 private domestic water wells within the 4-mile target distance limit (TDL; OWRD, 2004). Based on the assumption that one household utilizes one domestic well and the average number of people per household for Deschutes County is 2.5, it is assumed that 2,700 people utilize domestic wells within the 4-mile TDL (United States Census Bureau [USCB], 2004). There are three groundwater municipal wells utilized within the 4-mile TDL. The wells are owned by Sunriver Water LLC and serve a population of approximately 2,500 people (Oregon Department of Human Services [ODHS], 2004; Sunriver Water LLC, Environmental LLC, 2004). The combined total population served by groundwater for drinking water within the 4-mile TDL is 5,200 people. Groundwater is also utilized for irrigation and industry within the 4-mile TDL (OWRD, 2004). The number of wells and their associated population (organized by distance rings) are provided in Table 7-1.

7.1.2 Groundwater Sample Location and Results

Of the three municipal wells located at Sunriver, the groundwater well closest to any site sources is Well #2, as designated by Sunriver Water LLC. This well is located approximately 0.75 mile east of the machine gun range and approximately 0.40 mile southeast of the southern boundary

of the landfill and is upgradient of all sources (Figure 3-1). However it was still sampled to characterize the condition of this drinking water source. The sample was analyzed for perchlorate and NBECs. The groundwater sample showed no detected concentrations of perchlorate or NBECs (Table 7-2).

At the time of the site visit, Sunriver Water LLC provided Weston with historical sampling data for Well # 2. In October 2000 the well was sampled and analyzed for volatile organic compounds (VOCs), unregulated VOCs, inorganic compounds, synthetic organic compounds (SOCs), and unregulated SOCs. Of all the analyses conducted, sodium, fluoride, nitrate, nitrite, and sulfate were the only analytes detected in the groundwater sample. Sample results are in Appendix E.

In October 2003 the well was sampled and analyzed for VOCs, unregulated VOCs, SOCs, unregulated SOCs and arsenic. Arsenic was detected above the SQL at a concentration of 4.31 ug/L, which does not exceed the Maximum Contaminant Level (MCL) of 10.0 ug/L (Superfund Chemical Data Matrix [SCDM], 2004). Sample results are in Appendix E.

7.2 SURFACE WATER MIGRATION PATHWAY

Generally surface water runoff flows across the site sources into the Deschutes River. The former grenade court is the farthest upstream source and the demolition pits are the most downstream source.

The grenade court is located approximately 60 feet west of the Deschutes River. Surface water runoff drains over the grenade court in a northwesterly direction in a small drainage that drains to the Deschutes River. This overland flow segment is approximately 110 feet long. The point where the overland flow segment enters the Deschutes River is the most upstream probable point of entry (PPE; Figure 3-1 and 3-6).

Surface water runoff flows across the southern rifle range in a westerly direction to a drainage ditch that runs parallel with River Road. Surface water from the drainage ditch flows through a culvert that drains under River Road to an established drainage ditch that flows approximately 200 feet due west to the Deschutes River. The PPE sample for the southern rifle range was collected in the drainage ditch just upstream of the culvert on the east side of River Road (Figure 3-1 and 3-5).

Surface water runoff flows across the northern rifle range in a westerly direction to a drainage ditch that runs parallel with River Road. Surface water from the drainage ditch flows through a culvert that runs under River Road and drains to a wetland that is contiguous with the Deschutes River. The PPE sample was collected in the wetland (Figure 3-1 and 3-4).

The machine gun range is adjacent to the Deschutes River. Surface water flows across the range in a northwesterly direction directly to the Deschutes River. The PPE sample was collected in the Deschutes River adjacent to the northwestern boundary of the machine gun range (Figure 3-1 and 3-3).

The landfill is located in a wetland contiguous to the Deschutes River. During the PA/SI site visit a pond was observed on top of the landfill and in heavy rains it drains to the wetlands that are contiguous with the Deschutes River. The PPE sample was collected in the pond on top of the landfill (Figures 3-1 and 3-2).

Surface water runoff flows across the demolition pits in an easterly direction to a drainage that eventually drains to a wetland. The wetland is in a low spot surrounded with trees. The wetland was not contiguous to the Deschutes River, but may drain to the Deschutes in heavy rain. The PPE sample was collected within this wetland (Figure 3-1 and 7-2).

The TDL begins at the former grenade court PPE, continues downstream for 4.88 miles until the point where the demolition pits wetlands drain to the Deschutes River and from this point continues an additional 15 miles downstream along the Deschutes River (Figure 7-2). Therefore, the entire TDL is 19.88 miles long. The average flow rate recorded for the Deschutes River below Bend, Oregon is 213 cubic feet per second (cfs; USGS, 2004).

Surface soils at Camp Abbot FUDS generally consist of Sunriver sandy loams (USDA, 2003). The Sunriver sandy loams are characterized by somewhat poorly drained shallow alluvial soils with 0 to 3 percent slopes (USDA, 2003). The 2-year, 24-hour rainfall is 1.6 inches (WRCC, 2004b). There are approximately 1,722 acres of upland drainage associated with the site sources at Camp Abbot FUDS (USGS, 1963a, b). Camp Abbot is located in a 100-year floodplain (Federal Emergency Management Agency [FEMA], 2003).

7.2.1 Surface Water Pathway Targets

The primary targets for the surface water migration pathway are wetlands, sensitive environments, and the human food chain individual.

Based on an evaluation of National Wetland Inventory (NWI) maps, Weston estimates there are approximately 12.23 miles of HRS designated wetland frontage within the 15-mile TDL (United States Fish and Wildlife Service [USFWS], 1995a, b).

The upper Deschutes River (upstream of Benham Falls) has been designated a Federal Wild and Scenic River (Oregon Department Fish and Wildlife [ODFW], 1996). Redband trout (*Oncorhynchus mykiss gibbsi*) and whitefish (*Prosopium williamsoni*) are indigenous game fish in the upper Deschutes River (ODFW, 1996). Introduced species include brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), tui chub (*Gila bicolor*), kokanee (*Oncorhynchus nerka kennerlyi*), coho salmon (*Oncorhynchus kisutch*), and three-spined stickleback (*Gasterosteus aculeatus*) (ODFW, 1996). The upper Deschutes River is stocked with rainbow trout. In 1994, 35,000 legal size (approximately 3 pounds per fish) rainbow trout were stocked in the Deschutes River from Wickiup Dam to Benham Falls (ODFW, 1996). The TDL for Camp Abbot makes up approximately 30% of this water segment. Therefore approximately 10,500 fish are subject to potential contamination from Camp Abbot FUDS. It is assumed that at least 3% of the stocked trout within the TDL are caught for consumption. Therefore, it is estimated that 945 pounds of fish (315 fish at 3 pounds each) are caught for human consumption.

Based on a data search conducted by the Oregon Natural Heritage Information Center (ONHIC), there are no federal or state listed threatened or endangered species present along the 15-mile TDL (ONHIC, 2003).

There are no domestic or municipal surface water intakes along the 15-mile TDL, however surface water is used for irrigation within the TDL (OWRD, 2003).

7.2.2 Target Sample Locations

A sediment sample (SD-GC001) was collected at the grenade court PPE located at the point where the overland flow segment enters the Deschutes River (Figure 3-6). The sample was submitted for TAL metals and NBECs. The sample consisted of 15% fine sand and 85% silt, was dark brown in color, was wet, and had occasional fine roots.

A sediment sample (SD-RR002) was collected from the drainage ditch that runs parallel with River Road and drains the southern rifle range (Figure 3-5). The sample was submitted for TAL metals and consisted of 75% fine sand and 25% silt, was light brown in color, was dry, and had occasional roots.

A sediment sample (SD-RR001) was collected at the point where the drainage ditch that drains the northern rifle range runs into the wetland contiguous with the Deschutes River (Figure 3-4). The sample was submitted for TAL metals and consisted of 35% medium-fine sand, 65% silt, was dark brown in color, was saturated and had some fine roots.

A sediment sample (SD-MR001) was collected at the PPE for the machine gun range on the Deschutes River (Figure 3-3). The sample was submitted for TAL metals and consisted of 10% fine gravel, 80% medium-fine sand, and 10% silt, was wet and dark brown in color.

A colocated surface water and sediment sample (SW-LF001 and SD-LF001) was collected at the pond on top of the landfill (Figure 3-2). The samples were submitted for TAL metals, SVOCs, pesticides/PCBs. SW-LF001 was clear with a yellow tint and had organic material such as insects and plant matter. SD-LF001 consisted of 15% fine gravel, 60% medium-fine sand, 40% silt, was grayish-brown in color, was wet, and had organic material such as roots.

A sediment sample (SD-DP001) was collected at the wetland in which surface water runoff from the demolition pits drains (Figure 7-2). The sample was submitted for TAL metals and NBECs and consisted of 35% fine sand, 65% silt, was wet and dark brown in color, and had organic material such as roots.

7.2.3 Target Samples Analytical Results

The grenade court PPE sediment sample (SD-GC001) was analyzed for TAL metals and NBECs. Barium, chromium, copper, manganese, nickel, vanadium, and zinc were detected above the SQL. No metals were detected at elevated concentrations. No NBECs were detected above their respective MDLs in the sample (Table 7-3).

The southern rifle range PPE sediment sample (SD-RR002) was analyzed for TAL metals. Arsenic, barium, chromium, copper, lead, manganese, nickel, vanadium, and zinc were detected above their respective SQL. Arsenic (5.4 mg/kg) and lead (3.3 mg/kg) were detected at a concentration elevated above background (Table 7-3).

The northern rifle range PPE sediment sample (SD-RR001) was analyzed for TAL metals. Barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc were detected above their respective SQL. Lead (2.2 mg/kg) was detected at a concentration elevated above background (Table 7-3).

The machine gun range PPE sediment sample (SD-MR001) was analyzed for TAL metals. Barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc were detected above their respective SQL. Lead (352.0 mg/kg) was detected at a concentration elevated above background (Table 7-3). The reported lead concentration at the machine gun range PPE (352 mg/kg) is not in line with concentrations reported from localized source area samples (maximum value reported: 24.0 mg/kg). As a result, the lead concentration at the PPE is considered to be an outlier which is not associated with the machine gun range and therefore is not attributable to the FUDS.

The surface water and sediment sample (SW-LF001 and SD-LF001) collected at the landfill were analyzed for TAL metals, SVOCs, and pesticides/PCBs. The surface water sample (SW-LF001) showed a detection of manganese (84.5 ug/L) elevated above background. No SVOCs or pesticides/PCBs were detected above their respective MDLs (Table 7-4). The sediment sample (SD-LF001) showed chromium, cobalt, copper, manganese, nickel, vanadium, and zinc detected above their respective SQL (Table 7-3). No metals were detected at concentrations elevated above background. Beta-hexachlorocyclohexane (BHC; 2.9 ug/kg) was detected at a concentration elevated above background. The other pesticides/PCBs and SVOCs were not detected above their respective MDLs.

The sediment sample (SD-DP001) collected at the demolition pits PPE was analyzed for TAL metals and NBECs. Chromium, copper, lead, manganese, nickel, and vanadium were detected above their respective SQL. Lead (2.9 mg/kg) was detected at a concentration elevated above background. No NBECs were detected above their respective MDLs (Table 7-3).

7.3 SOIL EXPOSURE PATHWAY

Access to the site sources at Camp Abbot FUDS is unrestricted and the area is heavily utilized for recreation. The landfill is located at the Sunriver Nature Center and Observatory, which has frequent tours and outdoor activities. The rifle ranges and the machine gun range are located near the Sunriver Airport, golf course, and public open spaces. The grenade court and demolition pits are located on Forrest Service Property, which is occasionally used for hiking and recreational activities.

Observed contamination was not within the property boundary of a residence, school, or day care center and within 200 feet of the respective residence, school, or day care center, or within a workplace property boundary and within 200 feet of a workplace. There are no schools within 1

mile of any site sources (EPA, 2004b; Schoolbug.org, 2004). There are approximately 794 people living within 1 mile of the site (Table 7-5). There are approximately 6 acres of HRS-designated wetlands present onsite. There are wetlands present at the landfill, rifle ranges, and the machine gun range. Table 7-5 provides resident population data and summarizes wetland acreage within the 4-mile TDL.

No commercial agriculture or commercial livestock production are known to occur onsite.

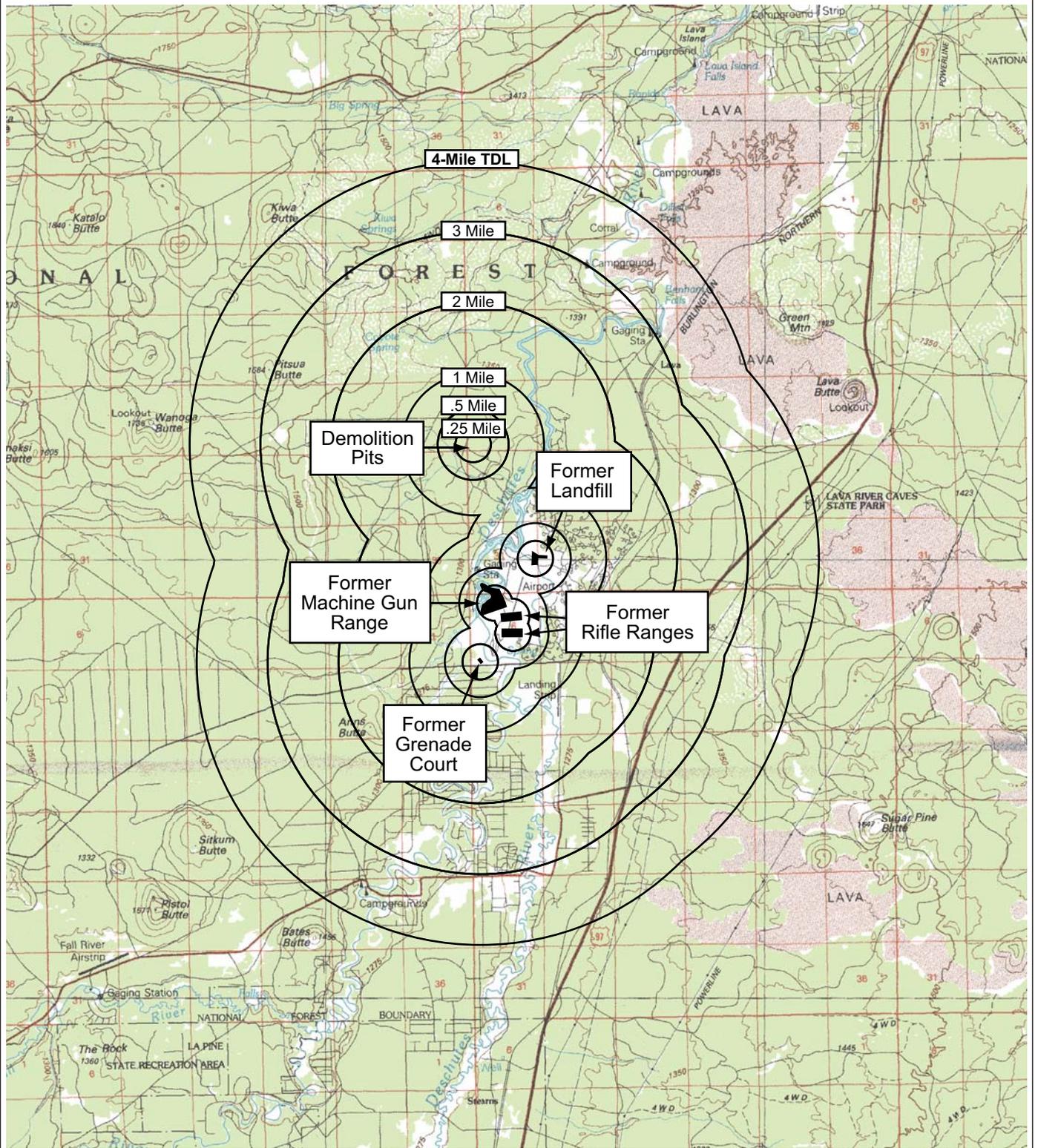
7.4 AIR MIGRATION PATHWAY

No known air releases have occurred from the site and no complaints have been filed regarding emissions from the property. The COCs at Camp Abbot are generally non-volatile; therefore the potential for release at Camp Abbot stems from the potential to release by particulate migration.

The nearest individuals are located between 0 - ¼ mile from the southern rifle range. There are approximately 5 employees working at the Sunriver Nature Center and therefore at the landfill. There is one school within the 4-mile TDL with a total of 319 students and 17 teachers (Schoolbug.org, 2004). There are approximately 4,151 people living within the 4-mile TDL (Table 7-5).

Based on an evaluation of NWI maps, Weston estimates that there are 484 acres of HRS designated wetlands within a 4-mile radius of the site (United States Fish and Wildlife Service [USFWS], 1995a, b). Table 7-5 summarizes the wetland acreage present within 4 miles of the site. Based on a rare, threatened and endangered species data search conducted by the ONHIC, there are no federal or state listed threatened or endangered species present within the 4-mile TDL (ONHIC, 2003).

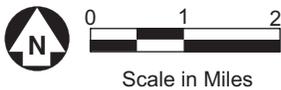
It is assumed that commercial agriculture and commercial silviculture occur within ½ mile of the site sources.



Source: USGS 1:100,000 Scale Topo, La Pine-OR, 1986.

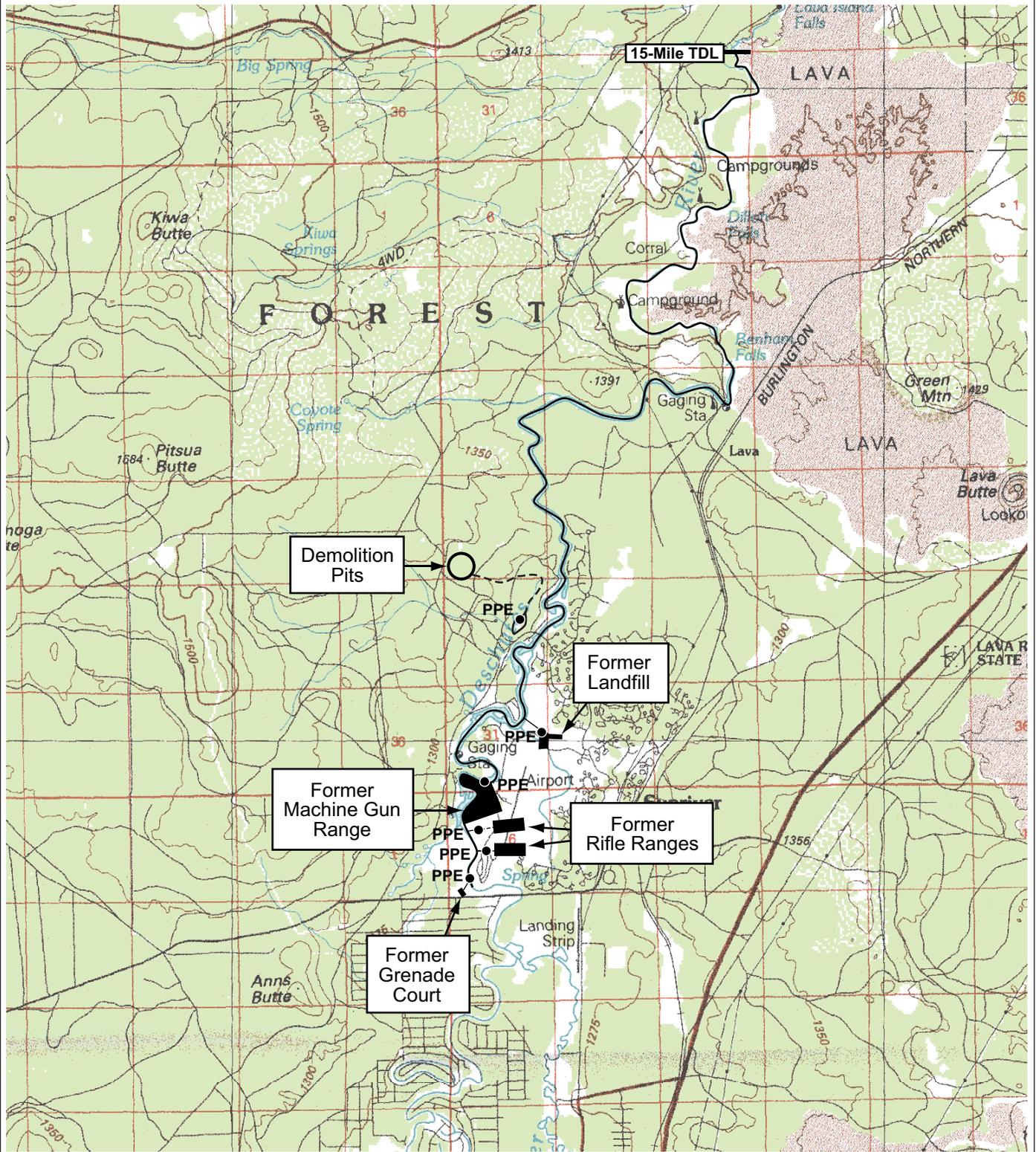
Note: All locations are approximate.

4-Mile Target Distance Limit (TDL) Map Camp Abbot FUDS PA/SI Sunriver, Oregon



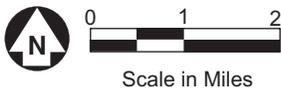
Figure

7-1



Source: USGS 1:100,000 Scale Topo, La Pine-OR, 1986.

15-Mile Target Distance Limit (TDL) Map Camp Abbot FUDS PA/SI Sunriver, Oregon



- Overland Flow Pathway
- Probable Point of Entry



Figure

7-2

**Table 7-1—Groundwater Wells and Associated Population Within the 4-Mile TDL
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Distance (miles)	Type and Number of Wells^a	Well Population^{b, c}
Onsite	Domestic: 0	0
0 to ¼	Domestic: 84	210
	Municipal: 3	833
¼ to ½	Domestic: 114	285
½ to 1	Domestic: 313	783
1 to 2	Domestic: 314	785
	Municipal: 2	1,667
2 to 3	Domestic: 162	405
3 to 4	Domestic: 93	232
Total	1,083	5,200

Notes:

^aOWRD, 2004.

^bDomestic well population is based on one household using one domestic well and 2.50 persons per household for Deschutes County. USCB, 2004.

^cThe EPA Safe Drinking Water Information System (SDWIS) provides municipal well population. EPA, 2003.

**Table 7-2—Sunriver Water LLC Municipal Well Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Target
Field Number	GW-MW001
EPA Number	04204007
CLP Number	NA
Location	Municipal Well # 2
Perchlorate (ug/L)	2.0 U
Nitrate Base Explosive Compounds (ug/L)	
1,3,5-Trinitrobenzene	0.49 U
1,3-Dinitrobenzene	0.49 U
2,4,6-Trinitrotoluene	0.49 U
2,4-Dinitrotoluene	0.49 U
2,6-Dinitrotoluene	0.49 U
2-Amino-4,6-Dinitrotoluene	0.49 U
2-Nitrotoluene	0.49 U
3-Nitrotoluene	0.49 U
4-Amino-2,6-Dinitrotoluene	0.49 U
4-Nitrotoluene	0.49 U
HMX	0.49 U
Nitrobenzene	0.49 U
RDX	0.49 U
Tetryl	0.49 U

Table 7-3—Target Sediment Samples Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon

Description	Targets						
	Background	SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
Field Number	SD-BK001	SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
EPA Number	04214012	04204003	04214003	04214004	04214005	04214006	04214007
CLP Number	M/J2CA7	M/J2C85	M/J2C98	M/J2C99	MJ2CA0	MJ2CA1	MJ2CA2
Location	Background Sediment	Landfill PPE in Pond	Demolition Pit PPE in Wetland	Machine Gun Range PPE in Deschutes River	Northern Rifle Range PPE in Drainage Ditch	Southern Rifle Range PPE in Drainage Ditch	Grenade Court PPE in Deschutes River
Inorganics (mg/kg)							
Aluminum	10400	10900	6220	11700	18600	9510	16100
Antimony	8.2 U	8.3 U	13.5 U	4.4 BJK	12.3 U	8.5 U	1.2 BJK
Arsenic	1.4 U	0.53 U	1.4 U	1.5 U	1.7 U	5.4	1.4 U
Barium	67.0	92.4	43.3 BJK	79.5	92.2	70.9	89.6
Beryllium	0.18 BJK	0.24 BJK	0.15 BJK	0.28 BJK	0.29 BJK	0.25 BJK	0.34 BJK
Cadmium	0.68 UJK	0.69 UJK	1.1 UJK	0.70 UJK	1.0 UJK	0.71 UJK	0.93 UJK
Calcium	4740	4460	3920	5000	10500	6580	6400
Chromium	12.9	14.4	7.4	13.1	28.4	12.2	21.1
Cobalt	10.3	13.7	1.9 BJK	10.3	12.6	6.8 BJK	7.9 BJK
Copper	10.3 JK	15.5 JK	21.2 JK	24.7 JK	27.4 JK	20.7 JK	27.5 JK
Iron	13400	18800	2830	17900	18100	7980	15500
Lead	3.1 U	1.4 U	2.9	352	2.2	3.3	0.79 U
Magnesium	4420	7260	733 BJK	2970	6690	1890	1900
Manganese	187	178	20.1	213	197	86.4	85.2
Mercury	0.14 U	0.14 U	0.11 BJK	0.070 BJK	0.21 U	0.14 U	0.19 U
Nickel	30.5	48.5	13.2	27.2	30.6	23.7	34.4
Potassium	358 BJK	581 BJK	335 BJK	474 BJK	761 BJK	599 BJK	399 BJK
Selenium	4.8 U	4.8 U	1.4 BJK	4.9 U	7.2 U	4.9 U	6.5 U
Silver	1.4 UJK	1.4 UJK	2.3 UJK	1.4 UJK	2.0 UJK	1.4 UJK	1.9 UJK
Sodium	687	898	1130 U	943	2190	758	892 BJK
Thallium	3.4 U	3.5 U	5.6 U	3.5 U	5.1 U	3.5 U	4.7 U
Vanadium	50.3	54.5	68.6	57.5	70.4	74.8	59.2
Zinc	27.3	28.4	10.6 BJK	28.3	52.2	36.5	21.9
Nitrate Base Explosive Compounds (mg/kg)							
1,3,5-Trinitrobenzene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
1,3-Dinitrobenzene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
2,4,6-Trinitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
2,4-Dinitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
2,6-Dinitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
2-Amino-4,6-Dinitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
2-Nitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
3-Nitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
4-Amino-2,6-Dinitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
4-Nitrotoluene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
HMX	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
Nitrobenzene	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
RDX	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U
Tetryl	0.2 U	NA	0.2 U	NA	NA	NA	0.2 U

Table 7-3—Target Sediment Samples Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon

Description	Background	Targets					
		SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
Field Number	SD-BK001	SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
EPA Number	04214012	04204003	04214003	04214004	04214005	04214006	04214007
CLP Number	M/J2CA7	M/J2C85	M/J2C98	M/J2C99	MJ2CA0	MJ2CA1	MJ2CA2
Location	Background Sediment	Landfill PPE in Pond	Demolition Pit PPE in Wetland	Machine Gun Range PPE in Deschutes River	Northern Rifle Range PPE in Drainage Ditch	Southern Rifle Range PPE in Drainage Ditch	Grenade Court PPE in Deschutes River
Semivolatile Organic Compounds (µg/kg)							
Benzaldehyde	440 U	390 U	NA	NA	NA	NA	NA
Phenol	440 U	390 U	NA	NA	NA	NA	NA
Bis-(2-chloroethyl)ether	440 U	390 U	NA	NA	NA	NA	NA
2-Chlorophenol	440 U	390 U	NA	NA	NA	NA	NA
2-Methylphenol	440 U	390 U	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	440 U	390 U	NA	NA	NA	NA	NA
Acetophenone	440 U	390 U	NA	NA	NA	NA	NA
4-Methylphenol	440 U	390 U	NA	NA	NA	NA	NA
N-Nitroso-di-n propylamine	440 U	390 U	NA	NA	NA	NA	NA
Hexachloroethane	440 U	390 U	NA	NA	NA	NA	NA
Nitrobenzene	440 U	390 U	NA	NA	NA	NA	NA
Isophorone	440 U	390 U	NA	NA	NA	NA	NA
2-Nitrophenol	440 U	390 U	NA	NA	NA	NA	NA
2,4-Dimethylphenol	440 U	390 U	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	440 U	390 U	NA	NA	NA	NA	NA
2,4-Dichlorophenol	440 U	390 U	NA	NA	NA	NA	NA
Naphthalene	440 U	390 U	NA	NA	NA	NA	NA
4-Chloroaniline	440 U	390 U	NA	NA	NA	NA	NA
Hexachlorobutadiene	440 U	390 U	NA	NA	NA	NA	NA
Caprolactam	440 U	390 U	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	440 U	390 U	NA	NA	NA	NA	NA
2-Methylnaphthalene	440 U	390 U	NA	NA	NA	NA	NA
Hexachlorocyclo-pentadiene	440 U	390 U	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	440 U	390 U	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	1100 U	990 U	NA	NA	NA	NA	NA
1,1'-Biphenyl	440 U	390 U	NA	NA	NA	NA	NA
2-Chloronaphthalene	440 U	390 U	NA	NA	NA	NA	NA
2-Nitroaniline	1100 U	990 U	NA	NA	NA	NA	NA
Dimethylphthalate	440 U	390 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	440 U	390 U	NA	NA	NA	NA	NA
Acenaphthylene	440 U	390 U	NA	NA	NA	NA	NA
3-Nitroaniline	1100 U	990 U	NA	NA	NA	NA	NA
Acenaphthene	440 U	390 U	NA	NA	NA	NA	NA
2,4-Dinitrophenol	1100 U	990 U	NA	NA	NA	NA	NA
4-Nitrophenol	1100 U	990 U	NA	NA	NA	NA	NA
Dibenzofuran	440 U	390 U	NA	NA	NA	NA	NA

**Table 7-3—Target Sediment Samples Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Targets						
	Background	SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
Field Number	SD-BK001	SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
EPA Number	04214012	04204003	04214003	04214004	04214005	04214006	04214007
CLP Number	M/J2CA7	M/J2C85	M/J2C98	M/J2C99	MJ2CA0	MJ2CA1	MJ2CA2
Location	Background Sediment	Landfill PPE in Pond	Demolition Pit PPE in Wetland	Machine Gun Range PPE in Deschutes River	Northern Rifle Range PPE in Drainage Ditch	Southern Rifle Range PPE in Drainage Ditch	Grenade Court PPE in Deschutes River
2,4-Dinitrotoluene	440 U	390 U	NA	NA	NA	NA	NA
Diethylphthalate	440 U	390 U	NA	NA	NA	NA	NA
Fluorene	440 U	390 U	NA	NA	NA	NA	NA
4-Chlorophenyl-phenyl ether	440 U	390 U	NA	NA	NA	NA	NA
4-Nitroaniline	1100 U	990 U	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	1100 U	990 U	NA	NA	NA	NA	NA
N-Nitroso diphenylamine	440 U	390 U	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	440 U	390 U	NA	NA	NA	NA	NA
Hexachlorobenzene	440 U	390 U	NA	NA	NA	NA	NA
Atrazine	440 U	390 U	NA	NA	NA	NA	NA
Pentachlorophenol	1100 U	990 U	NA	NA	NA	NA	NA
Phenanthrene	440 U	390 U	NA	NA	NA	NA	NA
Anthracene	440 U	390 U	NA	NA	NA	NA	NA
Carbazole	440 U	390 U	NA	NA	NA	NA	NA
Di-n-butylphthalate	440 U	390 U	NA	NA	NA	NA	NA
Fluoranthene	440 U	390 U	NA	NA	NA	NA	NA
Pyrene	440 U	390 U	NA	NA	NA	NA	NA
Butylbenzylphthalate	440 U	390 U	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	440 U	390 U	NA	NA	NA	NA	NA
Benzo(a)anthracene	440 U	390 U	NA	NA	NA	NA	NA
Chrysene	440 U	390 U	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	440 U	390 U	NA	NA	NA	NA	NA
Di-n-octylphthalate	440 U	390 U	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	440 U	390 U	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	440 U	390 U	NA	NA	NA	NA	NA
Benzo(a)pyrene	440 U	390 U	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)-pyrene	440 U	390 U	NA	NA	NA	NA	NA
Dibenzo(a,h)-anthracene	440 U	390 U	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	440 U	390 U	NA	NA	NA	NA	NA
Pesticides/Polychlorinated Biphenyls (ug/kg)							
Alpha-BHC	2.3 U	2.0 U	NA	NA	NA	NA	NA
Beta-BHC	2.3 U	2.9	NA	NA	NA	NA	NA
Delta-BHC	2.3 U	2.0 U	NA	NA	NA	NA	NA
Gamma-BHC (Lindane)	2.3 U	2.0 U	NA	NA	NA	NA	NA
Heptachlor	2.3 U	2.0 U	NA	NA	NA	NA	NA
Aldrin	2.3 U	2.0 U	NA	NA	NA	NA	NA
Heptachlor epoxide	2.3 U	2.0 U	NA	NA	NA	NA	NA
Endosulfan I	2.3 U	2.0 U	NA	NA	NA	NA	NA
Dieldrin	4.4 U	3.9 U	NA	NA	NA	NA	NA
4,4'-DDE	4.4 U	3.9 U	NA	NA	NA	NA	NA
Endrin	4.4 U	3.9 U	NA	NA	NA	NA	NA
Endosulfan II	4.4 U	3.9 U	NA	NA	NA	NA	NA
4,4'-DDD	4.4 U	3.9 U	NA	NA	NA	NA	NA

**Table 7-3—Target Sediment Samples Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Targets						
	Background	SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
Field Number	SD-BK001	SD-LF001	SD-DP001	SD-MR001	SD-RR001	SD-RR002	SD-GC001
EPA Number	04214012	04204003	04214003	04214004	04214005	04214006	04214007
CLP Number	MJ2CA7	MJ2C85	MJ2C98	MJ2C99	MJ2CA0	MJ2CA1	MJ2CA2
Location	Background Sediment	Landfill PPE in Pond	Demolition Pit PPE in Wetland	Machine Gun Range PPE in Deschutes River	Northern Rifle Range PPE in Drainage Ditch	Southern Rifle Range PPE in Drainage Ditch	Grenade Court PPE in Deschutes River
Endosulfan sulfate	4.4 U	3.9 U	NA	NA	NA	NA	NA
4,4'-DDT	98 R	3.9 UJK	NA	NA	NA	NA	NA
Methoxychlor	23 U	20 U	NA	NA	NA	NA	NA
Endrin ketone	4.4 U	3.9 U	NA	NA	NA	NA	NA
Endrin aldehyde	4.4 U	3.9 U	NA	NA	NA	NA	NA
Alpha-chlordane	2.3 U	2.0 U	NA	NA	NA	NA	NA
Gamma-chlordane	2.3 U	2.0 U	NA	NA	NA	NA	NA
Toxaphene	230 U	200 U	NA	NA	NA	NA	NA
Aroclor-1016	44 U	39 U	NA	NA	NA	NA	NA
Aroclor-1221	89 U	78 U	NA	NA	NA	NA	NA
Aroclor-1232	44 U	39 U	NA	NA	NA	NA	NA
Aroclor-1242	44 U	39 U	NA	NA	NA	NA	NA
Aroclor-1248	44 U	39 U	NA	NA	NA	NA	NA
Aroclor-1254	44 U	39 U	NA	NA	NA	NA	NA
Aroclor-1260	44 U	39 U	NA	NA	NA	NA	NA

Notes:

Bold type indicates the sample concentration above the detection limit.

Bold underline type indicates a sample concentration that is significant as defined in Section 5.

BK: Background

CC: Calapooya Creek

CLP: Contract Laboratory Program

CS: City of Sutherlin

EPA: United States Environmental Protection Agency

LV: Long Valley Creek

PPE: Probable Point of Entry

SL: Salt Lick Creek

SW: Surface Water

ug/L: micrograms per liter

Data Qualifiers:

JK: The analyte was positively identified. The associated numerical value is an unknown bias estimate.

U: The analyte was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

UJK: The analyte was analyzed for but not detected. The associated numerical value is an unknown bias estimate.

**Table 7-4—Landfill Surface Water Sample Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Target
Field Number	SW-BK001	SW-LF001
EPA Number	04214011	04204002
CLP Number	M/J2CA6	M/J2C84
Location	Background Surface Water	Surface Water Sample at Landfill
<i>Inorganics (µg/L)</i>		
Aluminum	118 U	55.9 U
Antimony	60.0 U	60.0 U
Arsenic	10.0 U	10.0 U
Barium	200 U	18.1 U
Beryllium	5.0 U	5.0 U
Cadmium	5.0 U	5.0 U
Calcium	5640	16800
Chromium	1.2 BJK	10.0 U
Cobalt	50.0 U	50.0 U
Copper	25.0 UJK	25.0 UJK
Iron	216	134
Lead	10.0 U	10.0 U
Magnesium	2310 BJK	55000
Manganese	15.5	84.5
Mercury	0.20 UJK	0.20 UJK
Nickel	40.0 U	5.1 BJK
Potassium	993 BJK	7140 JK
Selenium	35.0 U	35.0 U
Silver	10.0 UJK	10.0 UJK
Sodium	3410 BJK	10900
Thallium	25.0 U	25.0 U
Vanadium	6.8 BJK	0.92 BJK
Zinc	9.7 BJK	15.6 BJK
<i>Semivolatile Organic Compounds (µg/L)</i>		
Benzaldehyde	10 U	10 U
Phenol	10 U	10 U
Bis-(2-chloroethyl)ether	10 U	10 U
2-Chlorophenol	10 U	10 U
2-Methylphenol	10 U	10 U
2,2'-Oxybis(1-chloropropane)	10 U	10 U
Acetophenone	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
Naphthalene	10 U	10 U
4-Chloroaniline	10 U	10 U
Hexachlorobutadiene	10 U	10 U
Caprolactam	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U
2-Methylnaphthalene	10 U	10 U
Hexachlorocyclo-pentadiene	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U
2,4,5-Trichlorophenol	25 U	25 U
1,1'-Biphenyl	10 U	10 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

**Table 7-4—Landfill Surface Water Sample Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Target
Field Number	SW-BK001	SW-LF001
EPA Number	04214011	04204002
CLP Number	M/J2CA6	M/J2C84
Location	Background Surface Water	Surface Water Sample at Landfill
3-Nitroaniline	25 U	25 U
Acenaphthene	10 U	10 U
2,4-Dinitrophenol	25 U	25 U
4-Nitrophenol	25 U	25 U
Dibenzofuran	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U
Diethylphthalate	10 U	10 U
Fluorene	10 U	10 U
4-Chlorophenyl-phenyl ether	10 U	10 U
4-Nitroaniline	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	25 U
N-Nitroso diphenylamine	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U
Hexachlorobenzene	10 U	10 U
Atrazine	10 U	10 U
Pentachlorophenol	25 U	25 U
Phenanthrene	10 U	10 U
Anthracene	10 U	10 U
Carbazole	10 U	10 U
Di-n-butylphthalate	10 U	10 U
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	10 U	10 U
Di-n-octylphthalate	10 U	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-cd)-pyrene	10 U	10 U
Dibenzo(a,h)-anthracene	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U
Pesticides/Polychlorinated Biphenyls (µg/L)		
Alpha-BHC	0.050 U	0.050 U
Beta-BHC	0.050 U	0.050 U
Delta-BHC	0.050 U	0.050 U
Gamma-BHC (Lindane)	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U
Endrin	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U
Endrin ketone	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.10 U
Alpha-chlordane	0.050 U	0.050 U
Gamma-chlordane	0.050 U	0.050 U

**Table 7-4—Landfill Surface Water Sample Analytical Results
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Description	Background	Target
Field Number	SW-BK001	SW-LF001
EPA Number	04214011	04204002
CLP Number	M/J2CA6	M/J2C84
Location	Background Surface Water	Surface Water Sample at Landfill
Toxaphene	5.0 U	5.0 U
Aroclor-1016	1.0 U	1.0 U
Aroclor-1221	2.0 U	2.0 U
Aroclor-1232	1.0 U	1.0 U
Aroclor-1242	1.0 U	1.0 U
Aroclor-1248	1.0 U	1.0 U
Aroclor-1254	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U

Notes:

Bold type indicates the sample concentration above the detection limit.

Bold underline type indicates a sample concentration that is significant as defined in Section 5.

BK: Background

CC: Calapooya Creek

CLP: Contract Laboratory Program

EPA: United States Environmental Protection Agency

LV: Long Valley Creek

mg/kg: milligram per kilogram

NA: Not Applicable

PPE: Probable Point of Entry

SD: Sediment

SL: Salt Lick Creek

Data Qualifiers:

JH: The analyte was positively identified. The associated numerical value is a high-bias estimate.

JK: The analyte was positively identified. The associated numerical value is an unknown bias estimate.

JL: The analyte was positively identified. The associated numerical value is a low-bias estimate.

U: The analyte was analyzed for but not detected. The associated numerical value is the sample quantitation limit.

UJK: The analyte was analyzed for but not detected. The associated numerical value is an unknown bias estimate.

**Table 7-5—Resident Population and Wetlands Within the 4-Mile TDL
Camp Abbot FUDS PA/SI
Sunriver, Deschutes County, Oregon**

Distance Ring (Miles)	Resident Population	Wetlands (Acreage)^c
Onsite	0	6
0-0.25	210 ^a	87
0.25-0.5	285 ^a	
0.5-1	299 ^b	
1-2	801 ^b	144
2-3	1691 ^b	154
3-4	865 ^b	93
Total	3,925	484

Source:

^aBased on domestic groundwater well population OWRD, 2004.

^bMABEL, 2000.

^cUSFWS, 1995a, b

SECTION 8

SUMMARY AND CONCLUSIONS

In 1943 Camp Abbot FUDS was established as a World War II Army ERTC. The site was active for approximately 14 months, during which a total of 90,000 soldiers were trained. The site consisted of several small arms firing ranges, grenade and artillery ranges, ordnance storage magazines, a chemical training area, an obstacle course, anti-tank demonstration area, fortification obstacles, and support facilities (USACE, 1995a). The areas that were investigated during this PA/SI included a grenade court, two rifle ranges, a machine gun range, a landfill, and demolition pits.

The former Camp Abbot is now a resort and residential community called Sunriver. The area to the east of the Deschutes River is owned by private parties and is developed with residential homes, condominiums, an airport, golf courses, bike paths, and a nature center and observatory. The area to the west of the Deschutes River is managed by the USFS and is virtually undeveloped.

Analytical results of soil samples collected from site sources show arsenic, lead, and mercury detected at significant concentrations at the machine gun range; arsenic and silver were detected at significant concentrations at the northern rifle range; arsenic was detected at significant concentrations at the southern rifle range; and arsenic was detected at a significant concentration in one of the demolition pits.

During the PA/SI site visit a groundwater sample was collected from the Sunriver Municipal Well #2 and analyzed for NBECs and perchlorate. Laboratory analysis showed no detected concentrations of NBECs or perchlorate. In October 2003, arsenic was detected in this well above the SQL at a concentration of 4.31 ug/L, but the concentration did not exceed the MCL of 10.0 ug/L (SCDM, 2004).

The surface water pathway is the most notable pathway as lead was detected at concentrations elevated above background at the PPEs for the southern rifle range, the northern rifle range, the machine gun range, and the demolition pits; arsenic was detected at a concentration elevated above background at the PPE for the southern rifle range; manganese was detected at an elevated concentration in the surface water sample collected at the landfill. Lead, arsenic, and manganese were attributable to their respective site sources.

Surface water is not utilized for drinking water purposes with the 15-mile TDL, but is used for irrigation purposes. The Deschutes River is open to recreational fishing and is stocked with rainbow trout. It is estimated that 945 pounds of fish (315 fish at 3 pounds each) are caught for human consumption within the TDL.

The Deschutes River is a designated Federal Wild and Scenic River and it is estimated that approximately 12.23 miles of HRS designated wetland frontage occur within the 15-mile TDL. There are approximately 6 acres of wetlands that occur on-site.

SECTION 9

REFERENCES

Cascade Insulation, Inc. 2004. Asbestos Abatement Project: Amphitheater Site—Closing Report. Prepared for the Sunriver Owners Association, Sunriver, OR. October.

EPA (United States Environmental Protection Agency). 2004a. *Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-Media, Multi-Concentration, ILM05.3*, Superfund Analytical Services/Contract Laboratory Program, United States Environmental Protection Agency. March 2004.

EPA. 2004b. EPA Geographic Information Query System Request for Camp Abbot FUDS. 22 March 2004.

EPA. 2003a. *Contract Laboratory Program Statement of Work for Organic Analyses, Multi-Media, Multi-Concentration, OLM04.3*, Superfund Analytical Services/Contract Laboratory Program, United States Environmental Protection Agency. March 2004.

EPA. 2003b. EPA Safe Drinking Water Information System (SDWIS).
http://oaspub.epa.gov/enviro/sdw_query.get_list?wsys_name=&fac_search=fac_beginning&fac_county=DESCHUTES&pop_serv=500&pop_serv=3300&pop_serv=10000&pop_serv=100000&pop_serv=100001&sys_status=active&pop_serv=&wsys_id=&fac_state=OR&last_fac_name=&page=1&query_results=&total_rows_found=.

EPA. 2002a. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-01/008 Office of Emergency and Remedial Response, United States Environmental Protection Agency, Washington, D.C. July 2002.

EPA. 2002b. *Guidance for Quality Assurance Project Plans, EPA QA/G- D*, EPA/240/R-02/009, Office of Research and Development, United States Environmental Protection Agency, Washington, D.C. December 2002.

EPA. 2001. *Contract Laboratory Program Guidance for Field Samplers*. EPA/540/R-00/003.

EPA. 2000a. *Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1: Method 314.0 Determination of Perchlorate in Drinking Water by Ion Chromatography*, EPA815-R-00-014. Office of Groundwater and Drinking Water. August 2000.

EPA. 2000b. *Guidance for the Data Quality Objectives Process EPA QA/G-4*, EPA/600/R-96/055. Quality Staff, Office of Environmental Information, United States Environmental Protection Agency, Washington, D.C.

EPA. 2000c. *Guidance for the Data Quality Objectives Process for Hazardous Waste Site Investigations EPA QA/G-4HW*, EPA/600/R-00/007, Quality Staff, Office of Environmental Information, United States Environmental Protection Agency, Washington, D.C. January.

EPA. 1999. *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA 540/R-99/08. Office of Emergency and Remedial Response, United States Environmental Protection Agency, Washington, D.C. October.

EPA 1997. *Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods SW-846* (through update III), Office of Solid Waste and Emergency Response, United States Environmental Protection Agency. December.

FEMA (Federal Emergency Management Agency). 2003. Interactive Mapping Floodplain Query. <http://mapserver2.esri.com/cgi-bin/hazard.adol?s=0&cd=x&p=2&c=-121.438787,43.888759=2&cd=z&d=0>.

Groh, Edward A. and Peterson, Norman V. 1974. Geologic Compilation Map of Deschutes County, Oregon.

MABLE. 2000. MABLE/Geocorr2K: Geographic Correspondence Engine with Census 2000 Geography. <http://mcdc2.missouri.edu/websas/geocorr2k.html#INOPTS>.

ODFW (Oregon Department of Fish and Wildlife). 1996. Upper Deschutes River Subbasin Fish Management Plan, October 1996.

ODGMI (Oregon Department of Geology and Mineral Industries). 1976. Geology and Mineral Resources of Deschutes County, Oregon, Bulletin 89.

ODHS (Oregon Department of Human Services). 2004. Public Health Services Drinking Water Data Online. <http://170.104.158.16/namelook.php3>.

ONHIC (Oregon Natural Heritage Information Center). 2003. Data System Search for Rare, Threatened, or Endangered Species. September 10, 2003.

OWRD (Oregon Water Resources Department). 2004. Web Query Application for Groundwater Wells, Deschutes County, Oregon. http://stamp.wrd.state.or.us/apps/gw/well_log/well_log.php.

OWRD. 2003. Surface Water Rights Maps. <http://www.wrd.state.or.us/maps/wr-map.shtml>

SCDM (Superfund Chemical Data Matrix). 2004.

Schoolbug.org. 2004. Sunriver, Oregon Schools Query, Three Rivers Elementary School. <http://schoolbug.org/school-410198001350.html>.

Sunriver Area Chamber of Commerce. 2003. A Brief History of Sunriver. <http://www.sunriverchamber.com/history.htm>.

Sunriver Water LLC, Environmental LLC. 2004. Telephone conversation between Terry Penhollow representing Sunriver Water LLC, Environmental LLC and Adrienne Barnes representing Weston. October 22, 2004.

USACE (United States Army Corps of Engineers). 1995a. Archives Search Report, Findings, Camp Abbot, Deschutes County, OR., Project No. F10OR004102. July 1995.

USACE (United States Army Corps of Engineers). 1995b. Archives Search Report, Conclusions and Recommendations, Camp Abbot, Deschutes County, OR., Project No. F10OR004102. July 1995.

USACE. 1994. Site Survey Summary Sheet for DEPR-FUDS Site No. F10OR004100, Camp Abbot, OR. 13 October 1993, revised September 21, 1994.

USACE. 1993. Risk Assessment For Ordnance and Explosive Waste (OEW) Sites, Camp Abbot, DEPR No. F100OR004102.

USACE. 1986. DERP-FUDS Finding and Determination of Eligibility, Deschutes National Forest (Camp Abbot), Bend, OR, Site No. F100OR004100.

USCB (United States Census Bureau). 2004. State and County Quick Facts for Deschutes County, Oregon. <http://quickfacts.census.gov/qfd/states/41/41017.html>.

USDA (United States Department of Agriculture). 2003. USDA NRCS (Natural Resources Conservation Center) OR620 Soil Survey for Upper Deschutes River Area, Oregon. www.or.nrcs.usda.gov/pnw_soil/oregon/or620.html.

USFWS (United States Fish and Wildlife Service). 1995a. Anns Butte, Oregon, Quadrangle. 7.5-minute series National Wetland Inventory Map.

USFWS. 1995b. Benham Falls, Oregon, Quadrangle. 7.5-minute series National Wetland Inventory Map.

USGS (United States Geological Survey). 2004. Calendar Year Streamflow Statistics for Oregon, USGS 14070500 Deschutes River Below Bend, Oregon. March 18, 2004.

USGS. 1999. OR161 Groundwater Resource in the Deschutes Basin. April 29, 1999. http://oregon.usgs.gov/projs_dir/or161/or161.htm.

USGS. 1963a. Anns Butte, Oregon, Quadrangle. 7.5-minute series (topographic).

USGS. 1963b. Benham Falls, Oregon, Quadrangle. 7.5-minute series (topographic).

Weston (Weston Solutions, Inc.). 2004. Camp Abbot FUDS Preliminary Assessment/Site Inspection Sampling Quality and Assurance Plan (SQAP). May 2004.

WRCC (Western Regional Climate Center). 2004a. Period of Record Monthly Climate Summary—Bend, Oregon. <http://www.wrcc.dri.edu/cgi-bin/cliREctM.pl?orbend>. March 17, 2004.

WRCC . 2004b. Two Year, 24-Hour Rainfall, Sunriver, Oregon. <http://www.wrcc.dri.edu//or2y24.gif>

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

photo 1



View of landfill from sample location facing south.

photo 2



View of pond on top of landfill facing southwest.

Photolog



Photolog
A-1

photo 3



Concrete structure at machine gun range facing east.

photo 4



Concrete structure at machine gun range facing west with Deschutes River in background.

Photolog



Photolog
A-2

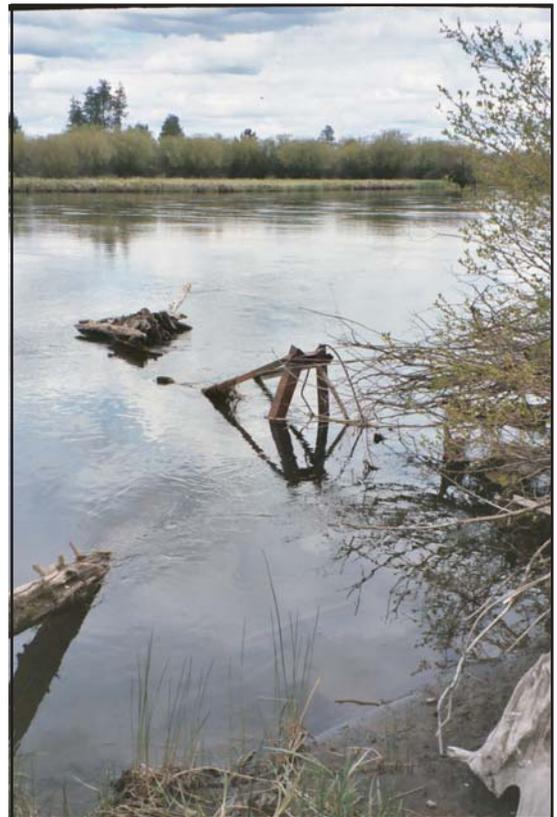
photo 5



General view of machine gun range facing east.

photo 6

Machine gun range PPE on Deschutes River with bridge structure in foreground, facing northeast.



Photolog

photo 7



View of north rifle range with airstrip in background, facing northeast.

photo 8



View of north rifle range with airstrip in background, facing east.

Photolog



Photolog
A-4

photo 9



Culvert that drains north rifle range.

photo 10



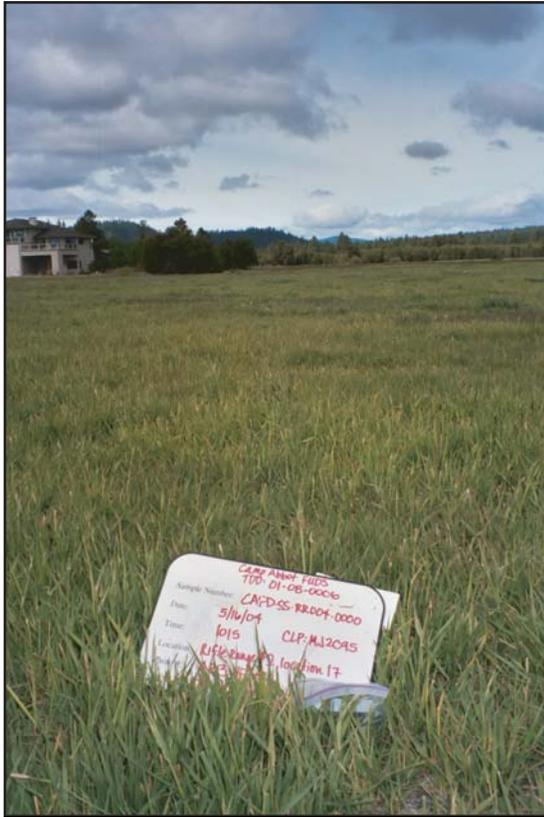
Culvert that drains north rifle range drains into this wetland which is contiguous with the Deschutes River.

Photolog



Photolog
A-5

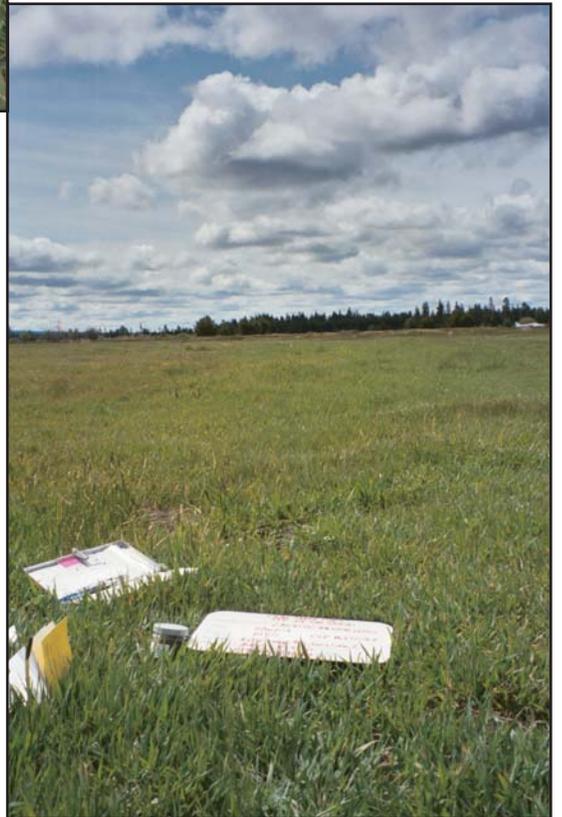
photo 11



View of southern rifle range with residence in background, facing south.

photo 12

View of southern rifle.



Photolog

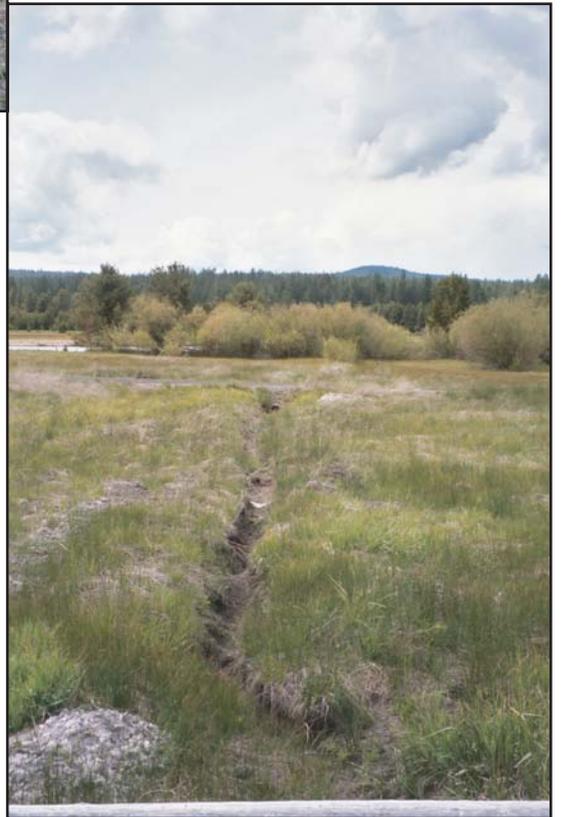
photo 13



Weston employee samples PPE for southern rifle range in small drainage ditch.

photo 14

The southern rifle range drains into this drainage ditch which runs to the Deschutes River, facing west.



Photolog



Photolog
A-7

photo 15



Pill box at the demolition pits.

photo 16



Pill box and unvegetated hill at demolition pits, facing west.

Photolog

photo 17



Suspected demolition pit.

photo 18



Suspected demolition pit.

Photolog



Photolog
A-9

photo 19



Suspected demolition pit

photo 20



Runoff from the demolition pits drain to this wetland, facing south.

Photolog

photo 21



View of grenade court facing north.

photo 22



Grenade pin at grenade court.

Photolog

photo 23



Grenade court PPE on the Deschutes River, facing north.

photo 24



Background surface water and sediment sample location at Harper Bridge, facing south.

Photolog



Photolog
A-12

photo 25



Background surface soil sample.

photo 26



Location of groundwater municipal well.

Photolog

APPENDIX B

SURFICIAL CLEANUP OF ASBESTOS-CONTAINING MATERIAL REPORT



Oregon

Theodore R. Kulongoski, Governor

Department of Environmental Quality

2146 NE 4th Street, Suite 104

Bend, OR 97701

(541) 388-6146

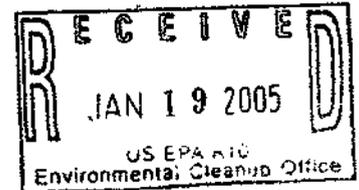
Eastern Region

Bend Office

January 14, 2005

Ken Marcy
United States Environmental Protection Agency
1200 Sixth Avenue, ELC-115
Seattle, WA 98101

**Re: Closing Report for Sunriver Owners Association
Asbestos Abatement Project
Amphitheater Site
ECSI # 4179**



Dear Mr. Marcy:

Pursuant to your request, enclosed is the report provided to DEQ concerning the surficial cleanup of asbestos-containing-material (ACM). DEQ received this report on January 13, 2005.

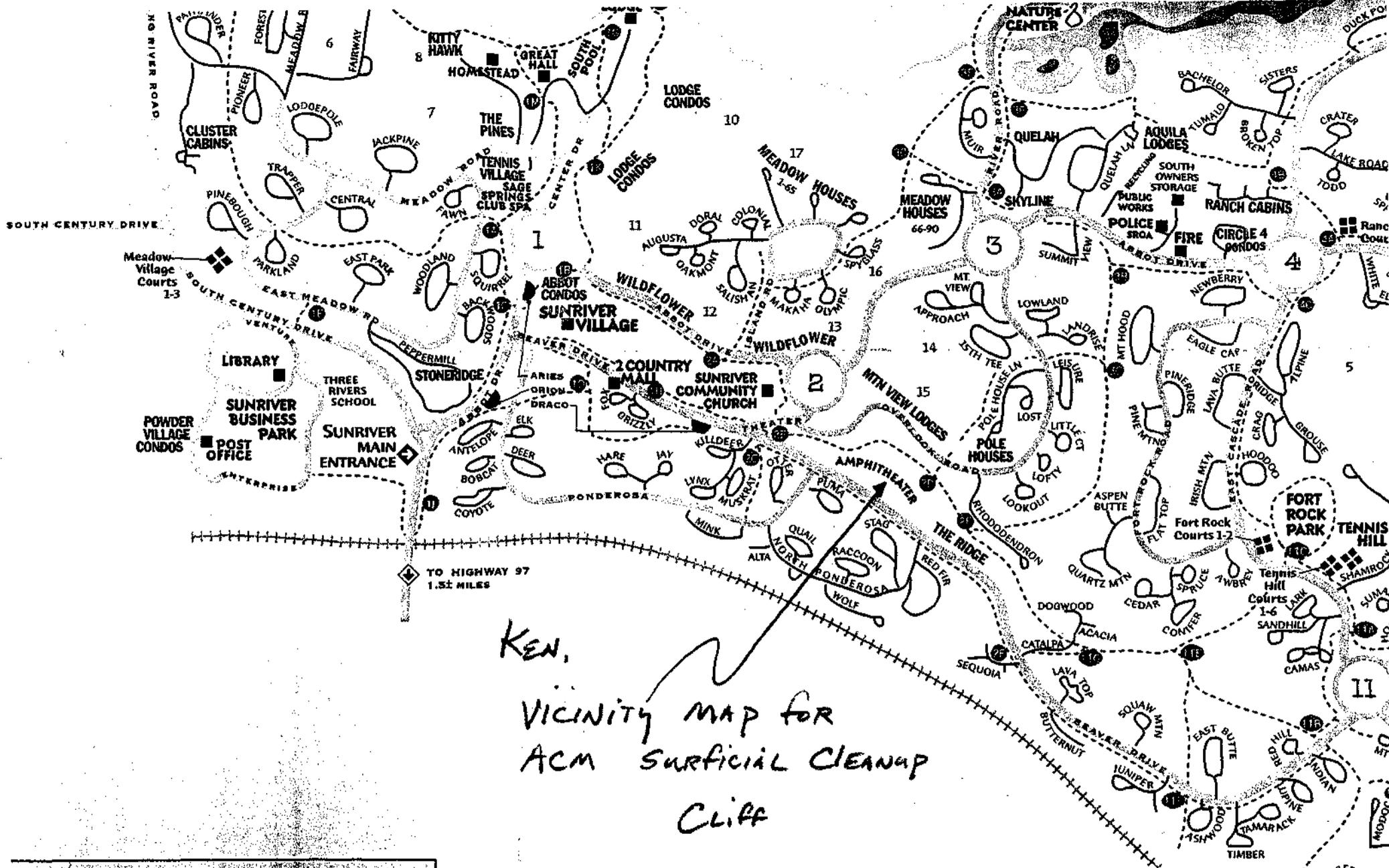
Please contact me at (541) 388-6146, extension 224 if you wish to discuss this removal action and/or the report in more detail.

Sincerely,

William C. Walkey
Hydrogeologist

Encl: Cascade Insulation, Inc. report

C: William Chapman, Sunriver Owners Association
File/LQD/Bend/VCP



KEN.
VICINITY MAP FOR
ACM SURFICIAL CLEANUP
CLIFF

SUNRIVER Pathway Rules

- 1 Ride only on surfaced paths & permitted roads.
- 2 Non-motorized cycle & pedestrian use only.
- 3 Helmets required for riders and passengers

Pathway Locator System

Each Pathway Junction Locator is unique.
To relate the Locator with roadways, the nearest roadway
Circle number is given, followed by a letter, with "A" being
closest to the Circle.

Pathway Distances (mi.)

SUNRIVER VILLAGE TO...
South Pool

4.6



Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

CLOSING REPORT FOR

Sunriver Owners Association *Asbestos Abatement Project* *Amphitheater Site* *Sunriver, Oregon*

Prepared for:
William Chapman
Sunriver Owners Association
PO Box 3278
Sunriver OR 97707

PREPARED BY:
Cascade Insulation, Inc.
OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125
E-mail: areed@cascadeinsulation.com
22356 NELSON ROAD, BEND OR 97701

PAULSEN ENVIRONMENTAL CONSULTING, INC.

2019 GRAHAM BOULEVARD
VALE, OREGON 97918-5355
TEL 541-473-2243
FAX 541-473-4226
CCB# 114502



December 6, 2004

William Chapman
SUNRIVER OWNERS ASSOCIATION
P.O. Box 3278
SUNRIVER, OREGON 97707

Dear Mr. Chapman,

This letter will serve as the report for the Project Management conducted by Steven Paulsen of Paulsen Environmental Consulting, Inc. (PECI) for the Sunriver Owners Association (SROA) Amphitheater site asbestos cleanup operation.

Specifications written by Peci were followed by Cascade Insulation in the cleanup of asbestos debris on the Amphitheater site. The debris consisted of cement asbestos board (99% of debris) and other asbestos debris; i.e cloth, aircell, magnesia block (less than 1% of debris). Steven Paulsen inspected the site on the second day that Cascade Insulation crew was on site. The remote decon was in place and the crew was setting up the grid system. There was discussion of set up and methodology of cleanup.

An inspection was conducted at the end of the first week of cleanup and the crew was proficiently clearing each section of grid as they went through their operation. During the fourth week of cleanup another inspection was conducted of completed sections of the grid. This inspector located some minor areas which needed recleaning, but overall the project was conducted professionally.

A final inspection was completed, during which there was discussion of certain grid sections which had much more debris buried and the scope of this project was superficial clean up. The conclusion was to map these areas onto the site map and identify the grid sections for future discussion of abatement options.

PAULSEN ENVIRONMENTAL CONSULTING, INC.

2019 GRAHAM BOULEVARD
VALE, OREGON 97918-5355
TEL 541-473-2243
FAX 541-473-4226
CCB# 114502



This clean up operation was successful in completing operations as outlined in the project specifications.

Sincerely,
Paulsen Environmental Consulting, Inc.

A handwritten signature in black ink, appearing to read "Steven M. Paulsen". The signature is written in a cursive, flowing style with a long horizontal stroke at the end.

Steven M. Paulsen
Secretary-Treasurer

SUNRIVER OWNERS ASSOCIATION

FAX COVER SHEET

DATE: September 7, 2004 **PAGES:** 5

TO: Cascade Insulation, Inc.
22356 Nelson Road
Bend, OR 97701
(541) 388-2600
(541) 388-2635 (FAX)

FROM: William D. Chapman
P.O. Box 3278
Sunriver, Or 97707
(541) 593-2411
(541) 593-5669 (FAX)

RE: Standard Contract

I am sending a review copy of the SROA standard contract. You should already have copies of all the contract documents that will be bound with the signature copies of the contract. Our Board of Directors will be approving the contract on Saturday and the SROA President will sign them during the meeting.

Sections 9 and 10 of the contract contain our requirements for insurance coverages and certifications. This information is more detailed than what Steve had put in the quote package.

I will ask Steve Runner, our Public Works Director to represent SROA next Monday when we begin work. He will have two copies of the signed contracts. Please have Alan sign both copies. One will be for your files, and Steve will retain one for us.

Please call if you have any questions.

SUNRIVER OWNERS ASSOCIATION STANDARD CONTRACT

THIS AGREEMENT ("Agreement") is entered into as of the 15 day of Sept., 2004, by and between Cascade Insulation, Inc. ("Contractor") and Sunriver Owners Association ("SROA").

In consideration of the mutual promises and covenants contained herein, the parties hereto, intending to be legally bound, hereby agree as follows:

1. **Scope of Work.** Contractor agrees and covenants with SROA to:
 - a. Clean up all contaminated areas of the Amphitheater Site by removing and disposing of asbestos containing materials and asbestos contaminated waste in accordance with all applicable federal, state and local regulations at a total cost to SROA of \$13,700.00; and
 - b. Supply all material, labor, and equipment as may be necessary to complete the faithful and workmanlike performance of this Agreement and as may be required by SROA in accordance with the specifications designated "Contract Documents" and hereby identified as:

Quote (dated 8/26/04), Pre-Quote Meeting Notes, Sunriver Rules Applicable to Construction Activities, Specifications (Part 1 - Part 10), all of which are attached hereto and incorporated by reference herein; and
 - c. Obtain all permits and other approvals necessary to perform the work provided for in this Agreement.
2. **Project Completion.** Contractor agrees to complete full performance hereunder in accordance with all specifications by October 1, 2004.
3. **Payment of Amounts Due.** Contractor shall pay promptly, as due, all persons supplying labor or material for the work provided for in this Agreement and shall be responsible for such persons supplying labor or material to any subcontractor.
4. **Liens.** Contractor shall assume responsibility for satisfaction of any lien or claim filed or prosecuted against SROA on account of any labor or material furnished, and shall defend, indemnify and hold SROA harmless against any such lien or claim.
5. **Compliance with Laws.** Contractor agrees to comply with all federal, state and local laws, rules and regulations that are applicable to the work provided for in this Agreement. Contractor agrees to make all provisions of this Agreement applicable to any subcontractor performing work under the Agreement.

6. **Independent Contractor Status.** The performance of this Agreement is at Contractor's sole risk. All services rendered by Contractor hereunder shall be provided as an independent contractor and not as an employee or agent of SROA.
7. **Work Standard.** Contractor shall be solely responsible for and shall have control over the means, methods, techniques, sequences and procedures of performing the work, subject to the Contract Documents, and shall be solely responsible for the errors and omissions of its employees, subcontractors and agents.
8. **Indemnification.** Contractor shall indemnify, defend and hold SROA, its Board of Directors, officers, agents and employees harmless from and against any and all liability arising out of the performance by Contractor of its responsibilities under this Agreement.
9. **Insurance.** Contractor shall maintain a policy of comprehensive general liability insurance with limits of not less than \$1,000,000 for injury to one person, \$1,000,000 for injury to two or more persons in one occurrence, and \$300,000 for damage to property, OR a single limit policy of not less than \$1,000,000 covering all claims per occurrence. Said policy shall name SROA, its Board of Directors, officers, agents and employees as additional insureds and shall provide coverage for Contractor's indemnity obligations assumed under Section 8 above. Contractor shall also provide a certificate of insurance giving SROA 10 days notice prior to cancellation or material changes to coverage. Contractor shall furnish proof of workers' compensation insurance coverage. Insurance coverages required under this Agreement shall be obtained from insurance companies authorized to do business in the State of Oregon.
10. **Continuation of Insurance Coverage.** Contractor shall not cancel, materially change, or not renew insurance coverages during the term of this Agreement. Should any policy be canceled before final payment by SROA to the Contractor and should the Contractor fail to immediately procure other insurance as specified, SROA reserves the right to procure such insurance and to deduct the cost thereof from any sum due the Contractor under this Agreement. Nothing contained in this insurance requirement is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from the Contractor's operation under this Agreement.
11. **Termination.** This Agreement may be canceled at the election of SROA for any material breach, willful failure or refusal on the part of the Contractor to faithfully perform the Agreement according to its terms. SROA shall reimburse the Contractor for any unpaid labor and materials expended through the date of termination.
12. **Assignment.** Contractor may not assign this Agreement or any payments due hereunder without the prior written consent of SROA. Any assignment in violation of this section shall be null and void. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and each of their respective successors and permitted assigns.

13. **Attorney Fees.** In any arbitration or litigation concerning this Agreement, the prevailing party shall be entitled to recover all reasonable expenses of arbitration or litigation, including reasonable attorney fees at arbitration, at trial and on any appeal or petition for review.
14. **Arbitration.** Notwithstanding anything contained herein to the contrary, any dispute arising under this Agreement shall be promptly submitted to and heard by the Arbitration Service of Portland, Inc., or by any other arbitrator mutually agreed upon between the parties to the dispute. Unless the parties mutually agree otherwise, the arbitration shall take place in Deschutes County. The determination of the arbitrator shall be binding upon the parties hereto, and judgement upon the award rendered may be entered in any court having jurisdiction thereof. The prevailing party in such arbitration shall be entitled to recover from the other party all expenses incurred in connection with the arbitration, including attorney's fees.
15. **Headings.** Headings in this Agreement are for convenience only and shall not affect its meaning.
16. **Severability.** If any term or provision of this Agreement or the application thereof to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Agreement and the application of such term or provision to persons or circumstances other than those to which it is held invalid or unenforceable shall not be affected thereby, and each term or provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.
17. **Modification and Waiver.** This Agreement may be amended only by a writing signed by both parties. The observance of any term of this Agreement shall not be deemed to have been waived except by a writing signed by the party to be bound by such waiver. No waiver of a breach of any covenant, term or condition of this Agreement shall be a waiver of any other or subsequent breach of the same or any other covenant, term or condition or as a waiver of the covenant, term or condition itself.
18. **Entire Agreement.** This Agreement constitutes the entire agreement and understanding between the parties with respect to its subject matter and supersedes any prior agreement or understanding pertaining thereto.

IN WITNESS WHEREOF, the parties hereto have entered into this Agreement effective as of the date first written above.

"Contractor"

"SROA"

Cascade Insulation, Inc.

Sunriver Owners Association, an Oregon nonprofit association

By: 

By: John H. Salzer, President

Title: Sec/Team

Business ID: 93-0655282

Contractor's License No: 63085

QUOTE

Quote Page 1

Quoter's Employer ID or Social Security Number:

93-0655282

To: SROA Board of Directors

Date: 8~~8~~26~~8~~04

The undersigned proposes to furnish in the time specified the services described in the specifications of this Quote.

Total Quote \$ 13,700.00

Thirteen thousand seven hundred

dollars

SUNRIVER OWNERS ASSOCIATION

Amphitheater Asbestos Removal Project

Work Plan

Scope of Work

This is an asbestos abatement project to complete a surficial clean up of all contaminated areas of the Amphitheater Site by removing and disposing of asbestos containing materials (ACM) and asbestos contaminated waste.

Camp Abbot, a WWII training facility, occupied a portion of what is now Sunriver. Remains of the camp were demolished by the original developer of Sunriver in the mid to late 1960s. The 20 acre Amphitheater Site has three areas that appear to have been involved in demolition work. Other portions of the site contain vegetation and physical features that pre-date the demolition work.

The area to be cleaned up was used as a staging area for the demolition of building materials which were subsequently buried in two manmade earthen structures. The area of visible contamination is approximately 4 acres. This area, plus the area between it and the earthen structures, a total area of approximately 6 acres, constitutes the Cleanup Area. An additional 4 acres covering the manmade structures and the area between them constitutes the Inspection Area. Please see the attached map showing the boundaries of these areas.

General Requirements

1. The Contractor shall supply all utility needs at the cleanup site.
2. The required worker decontamination unit should be located so as to be less visible to Beaver Drive; the area around the opening to the amphitheater was discussed as a possible site.
3. Initial worker protection shall consist of half-face dual HEPA cartridge respirators and disposable coveralls and booties. After analysis of initial samples of ACM, the Contractor may determine, in consultation with OSHA, an appropriate level of worker protection equipment different than the initial equipment requirement.
4. Initial cleanup will begin on the western side of the site and proceed to Beaver Drive.
5. Restrictive barriers consisting of banner tape and warning signs shall be maintained around the perimeter of the daily work area.
6. Dust resulting from cleanup activities shall be suppressed using methods provided for in the contract specifications.

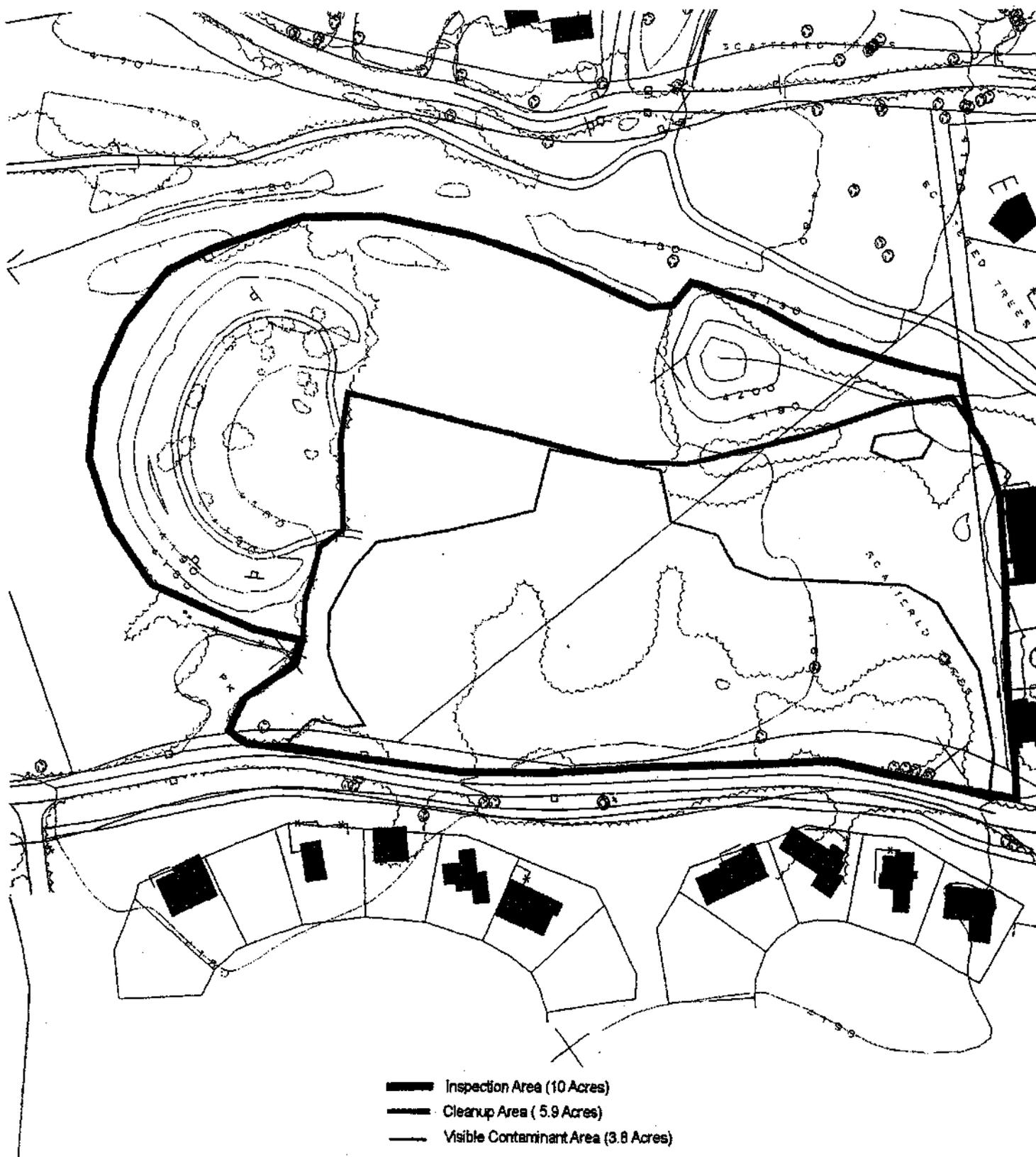
Cleanup Area (approximately 6 acres)

1. Contractor shall establish a fifty foot by fifty foot grid system within the cleanup area perimeter with taut lines as dividers.
2. Cleanup on the north boundary shall go to the edge of man-made improvements, including landscaping, of The Ridge development.
3. One square of the grid shall be thoroughly inspected and all man-made materials (e.g. concrete debris, brick, metal, glass) removed from the square and placed on plastic sheeting before moving to another square.

4. Vegetation does not need to be removed, but shall be carefully inspected for debris.
5. Excavation is not a part of this project, but some raking may be necessary to obtain complete removal of debris in places of high concentration.
6. Pine litter and bark chips do not need to be raked or removed unless adjacent to an area with significant quantities of debris.
7. "Hot spots" with high concentrations of debris or with local conditions that make it likely that all material was not removed should be monumented with a steel pipe and located on a map, preferably with GPS coordinates.
8. All ACM shall be double bagged into asbestos labeled waste bags, placed into a waste container and disposed of by the Contractor in accordance with the contract specifications.
9. All other man-made materials will be disposed of by Sunriver Owners Association.
10. The Contractor shall obtain visual clearance from Paulsen Environmental Consulting, Inc. prior to dismantling the grid system.

Inspection Area (approximately 4 acres)

1. Contractor shall visibly inspect area outside grid system to determine the presence of ACM.
2. Contractor shall cleanup ACM, but not other man-made materials in this area.
3. Contractor shall bring any areas of substantial contamination to the attention of Paulsen Environmental Consulting, Inc. so a cleanup methodology may be devised in cooperation with DEQ officials.



SUNRIVER OWNERS ASSOCIATION
Quote Signature Sheet

Quote Page 2

SIGNATURE FOR INDIVIDUAL

Name of Company

SIGNATURE OF INDIVIDUAL

Address

Name of Individual (Please Print)

City/State/Zip Code

Telephone

SIGNATURE FOR PARTNERSHIP

Name of Partnership

Name of Partners (1)

Address

(2)

City/State/Zip Code

(3)

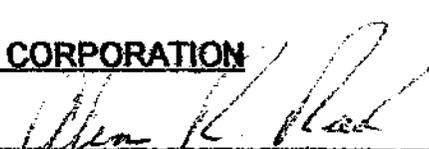
Telephone

SIGNATURE OF ONE PARTNER

SIGNATURE FOR CORPORATION

Cascade Insulation, Inc.

Name of Corporation



SIGNATURE OF INDIVIDUAL

22356 Nelson Rd.

Address

President
Office/Title or Officer/Agent

Bend, Or. 97701

City/State/Zip Code

(541) 388-2600

Telephone

CONTACT PERSON

Alan Reed

Please Print

(541) 388-2600

Telephone

NOTIFICATION



AIR MONITORING



CASCADE INSULATION, INC.

MECHANICAL
INSULATION

CCB #63085

ASBESTOS
ABATEMENT

JOB NAME Summer Cab Pickup

JOB NUMBER _____

NAME	DATE	TIME		RESPIRATOR		PER MON SAMP #	ACTIVITY
		In	Out	*Type	**Test		
A. Reed	9-15	0900	1200	1	2		Pickup Cab
R. Weaver			1155				
J. Berado			1205			X	
T. Reed			1150				
A. Reed		1245	1650				
R. Weaver			1655				
J. Berado			1645			X	
T. Reed			1700				
A. Reed	9-16	0800	1150				
R. Weaver			1155			X	
J. Berado			1145				
A. Young			1140				
A. Reed		1230	1630				
R. Weaver			1635			X	
J. Berado			1640				
A. Reed	9-17	0800	1200				
J. Berado			1155				
R. Weaver			1150				
A. Young			1145			X	
A. Reed		1245	1640				
R. Weaver			1645				
A. Young			1650			X	
J. Berado			1655				
A. Reed	9-20	0800	1155			X	
J. Berado			1200				
R. Weaver			1150				
A. Reed		1245	1650			X	
J. Berado			1655				
R. Weaver			1700				

*TYPE
1. 1/2 Face Cartridge
2. PAPR
3. Type "C"

**TEST
1. Qualitative Pos/Neg
2. Qualitative - Smoke
3. Quantitative (Chamber)

CASCADE INSULATION, INC.

MECHANICAL
INSULATION

CCB #63085

ASBESTOS
ABATEMENT

JOB NAME Summer Cab

JOB NUMBER _____

NAME	DATE	TIME		RESPIRATOR		PER MON SAMP #	ACTIVITY
		In	Out	*Type	**Test		
A. Reed	9-21	0800	1145	1	2		Pickup Cab
J. Berado			1150				
R. Weaver			1155				
A. Young			1200				
A. Reed		1230	1650				
J. Berado			1655				
R. Weaver			1645				
A. Young			1700				
A. Reed	9-22	0800	1155				
J. Berado			1150				
A. Young			1145				
R. Weaver			1140				
A. Reed		1230	1655				
J. Berado			1650				
A. Young			1645				
R. Weaver			1640				
A. Reed	9-23	0800	1145				
J. Berado			1150				
R. Weaver			1155				
A. Young			1200				
J. Berado		1245	1645				
A. Reed			1650				
R. Weaver			1655				
A. Young			1700				
A. Reed	9-24	0800	1140				
T. Reed			1145				
R. Weaver			1150				
J. Berado			1155				
A. Young			1200				

*TYPE
1. 1/2 Face Cartridge
2. PAPR
3. Type "C"

**TEST
1. Qualitative Pos/Neg
2. Qualitative - Smoke
3. Quantitative (Chamber)

CASCADE INSULATION, INC.

MECHANICAL
INSULATION

CCB #63085

ASBESTOS
ABATEMENT

JOB NAME Summer CAB

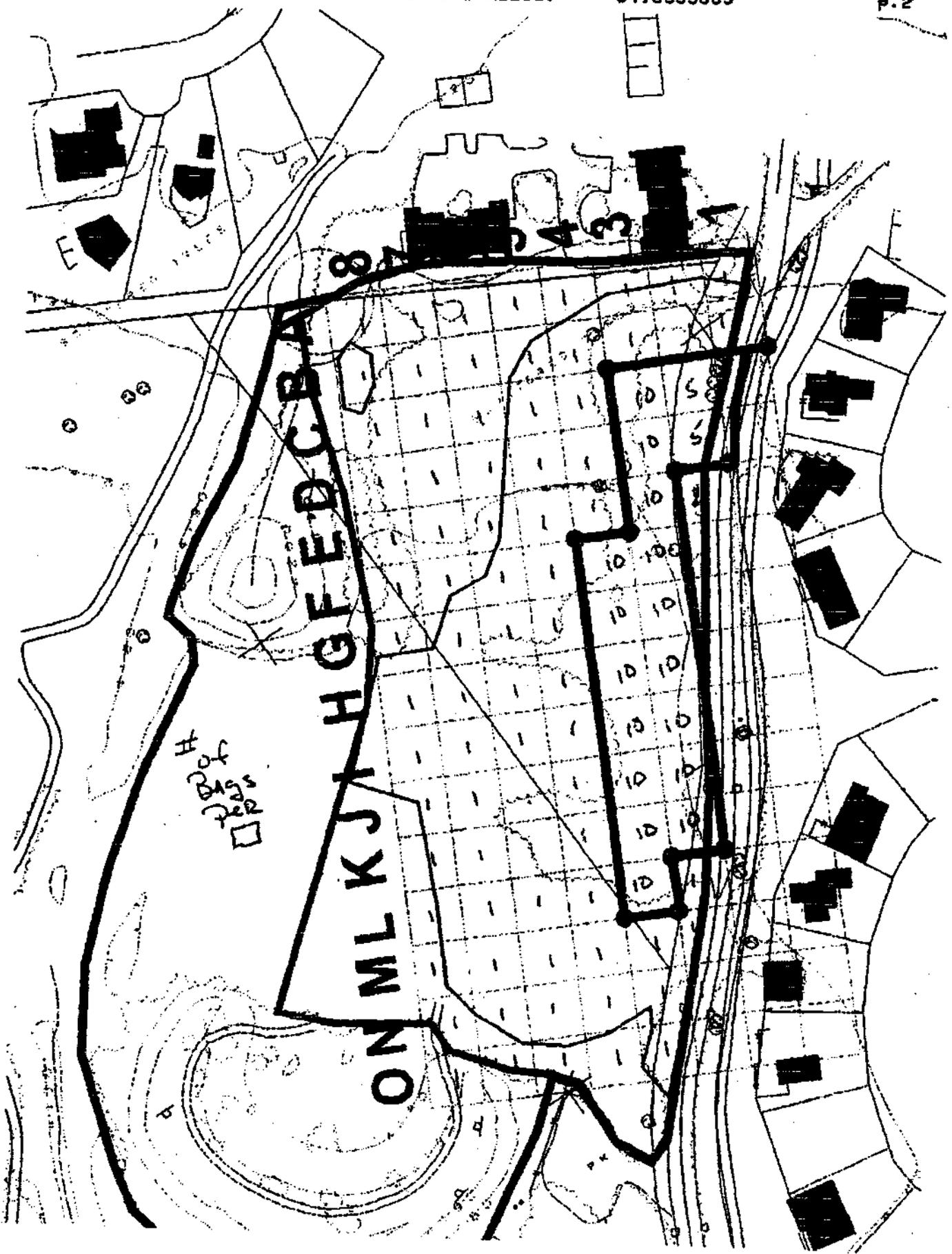
JOB NUMBER _____

NAME	DATE	TIME		RESPIRATOR		PER MON SAMP #	ACTIVITY
		In	Out	*Type	**Test		
A. Reed	9-24	1245	1640	1	2		Pickup CAB
J. Berado			1645				
J. Reed			1650				
R. Weaver			1655				
A. Young			1700				
A. Reed	9-27	0800	1145				
J. Berado			1150				
A. Young			1155				
R. Weaver			1200				
A. Reed		1230	1645				
J. Berado			1650				
A. Young			1655				
R. Weaver			1700				
A. Reed	9-28	0800	1200				
J. Berado			1150				
A. Young			1155				
R. Weaver			1205				
A. Reed		1245	1655				
J. Berado			1645				
A. Young			1650				
R. Weaver			1700				
A. Reed	9-29	0800	1205				
J. Berado			1200				
A. Young			1155				
R. Weaver			1120				
A. Reed		1230	1640				
J. Berado			1645				
A. Young			1650				
R. Weaver			1655				

*TYPE
1. 1/2 Face Cartridge
2. PAPR
3. Type "C"

**TEST
1. Qualitative Pos/Neg
2. Qualitative - Smoke
3. Quantitative (Chamber)

LANDFILL



ASN 4 ASBESTOS WASTE SHIPMENT REPORT FORM



PLEASE PRINT OR TYPE! If you have questions, contact your local DEQ Regional Office in Portland at (503) 229-5364, Salem at (503) 378-8240 ext. 272, Medford at (541) 776-6010 ext. 235, or Bend at (541) 388-6146 ext. 226, OR call (800) 452-4011 for the location of your local regional DEQ office.

WASTE GENERATOR: (Contractor, Facility, or Operator)

1. Asbestos removal site name and address: Sun River Amphitheater
Beaver Dr Seaside OR Deschutes 97701
Street City/State County Zip

Contact person: Alan R. Reed Phone: 541 388 2600

2. Operator's name and address: Cascade Insulation, Inc. Phone: 541-388-2600
22356 Nelson RD Bend Deschutes 97701
Street City/State County Zip

3. Waste disposal site: Crook County Landfill Phone: 541-447-2398
PO Box J Prineville Crook County 97754
Street City/State County Zip

4. Describe asbestos materials: CA3
5. Containers: Number: 250 Type: SA
6. Total quantity (cubic yards): 5

7. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by highway according to all government regulations. All movement of this asbestos-containing material is recorded on this Waste Shipment Record Form.
Name: Alan R. Reed Company: CASCADE Insulation
Signature: Alan R. Reed Date: 10-1-04

TRANSPORTER(S):

8. Transporter #1: (Acknowledgment of receipt of materials)
Agent: Alan R. Reed Company Cascade Insulation, Inc.
Address: 22356 Nelson Rd Bend OR 97701 Phone: 541-388-2600
Signature: Alan R. Reed Date: 10-20-04

9. Transporter #2: (Acknowledgment of receipt of materials)
Agent: _____ Company: _____
Address: _____ Phone: _____
Signature: _____ Date: _____

DISPOSAL: (Certification of receipt of asbestos materials covered by this manifest, except as noted in item 11 below.)

10. Waste Disposal Site: CROOK COUNTY LANDFILL
Name and Title: Susan Walsh Secretary Date: 10-20-04
Signature: Susan Walsh Phone: 541-447-2398

11. DISCREPANCY SPACE: (Add attachments as needed)

ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
09/07/2004

PRODUCER (503)239-4116 FAX (503)231-9021
LaPorte & Associates, Inc.
5515 S.E. Milwaukie Avenue
Portland, OR 97202
Patricia Messick

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED Cascade Insulation, Inc
22356 Nelson Road
Bend, OR 97701

INSURERS AFFORDING COVERAGE	NAIC #
INSURER A: Everest Indemnity Insurance Co	
INSURER B: American States Ins. Co	
INSURER C: SAIF Corporation	
INSURER D:	
INSURER E:	

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR	4000003013041	05/01/2004	05/01/2005	EACH OCCURRENCE \$ 1,000,000
	DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 50,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 1,000,000 PRODUCTS - COMPROP AGG \$ 1,000,000				
B	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS	01CG3427282	05/01/2004	05/01/2005	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000
	BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$				
	GARAGE LIABILITY <input type="checkbox"/> ANY AUTO				AUTO ONLY - EA ACCIDENT \$ OTHER THAN AUTO ONLY: EA ACC \$ AGG \$
	EXCESS/UMBRELLA LIABILITY <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> DEDUCTIBLE <input type="checkbox"/> RETENTION \$				EACH OCCURRENCE \$ AGGREGATE \$ \$ \$ \$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below	C512223R142	10/01/2003	10/01/2004	WC STATUTORY LIMITS OTH-ER \$
	OTHER				E.L. EACH ACCIDENT \$ 500,000 E.L. DISEASE - EA EMPLOYEE \$ 500,000 E.L. DISEASE - POLICY LIMIT \$ 500,000

COPY

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS
Sunriver Owners Association is included as an additional insured per CG2010(10-01) attached to policy.

CERTIFICATE HOLDER	CANCELLATION
Sunriver Owners Association Sunriver, OR 97707	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL <u>30</u> DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES. AUTHORIZED REPRESENTATIVE Christopher Wilson/PAT <i>Christopher N. Wilson</i>

Sunriver Owners Association

Certificate issued to Sunriver Owners Association
LaPorte & Associates, Inc.

09/07/2004

09/07/2004

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY

CG 20 10 10 01

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED - OWNERS, LESSEES OR CONTRACTORS - SCHEDULED PERSON OR ORGANIZATION
This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name of Person or Organization: Sunriver Owners Association

Any person or organization that is:

1. An owner of real or personal property on which you are performing operations, or
2. A contractor on whose behalf you are performing operations, but only at the specific written request by that person or organization to you, and if:
 1. That request is made prior to the date your operations for that person or organization commenced; and
 2. A certificate of insurance evidencing that request is on file with, or received by, us prior to sixty days after the end of the policy period for this insurance.

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

A. Section II - Who Is An Insured is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of your ongoing operations performed for that insured.

B. With respect to the insurance afforded to these additional insureds, the following exclusion is added:

2. Exclusions

This insurance does not apply to "bodily in-jury" or "property damage" occurring after:

(1) All work, including materials, parts or equipment furnished in connection with such work, on the project (other than Service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the site of the covered operations has been completed;

or

(2) That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

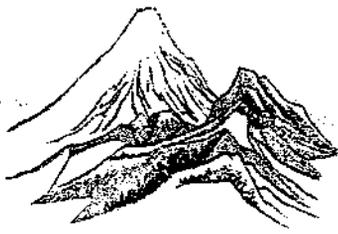
IMPORTANT

If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.



Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

Employee Certification

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY Certified Supervisor For Asbestos Abatement Projects	
	NAME Alan R. Reed
	CERTIFICATION NO. J0344
	EXPIRATION DATE 21 Nov 05
	TRAINING COURSE DATES 15 Oct 04 - 15 Oct 04
TRAINER, ADDRESS AND TELEPHONE NO. Asbestos Training Project Watchdog Resources, Inc. 1801 S.E. Furbering Portland, OR 97216-2940 503.520-7700	
<small>The person assigned this certificate has completed the required training for asbestos certification and is certified by the Department of Environmental Quality under OAR Chapter 340, Division 53 and under TSCA Title II.</small>	
Certificate of Completion Alan R. Reed has successfully completed the requisite training and examination for accreditation under TSCA Title II EPA AHERA/ASPHARA Model Accreditation Program requirements for the AHERA Building Inspector course as presented by Chytos Group Services 1800 NE Irving, Suite 440, Portland, OR 97232 971.244.1200	

OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125

E-mail: areed@cascadeinsulation.com

22356 NELSON ROAD, BEND OR 97701



Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

Employee Certification

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY Certified Worker For Asbestos Abatement Projects		
	NAME Tracy J. Read	
	CERTIFICATE NO. F12326	EXPIRATION DATE 03Oct04
	TRAINING COURSE DATES 03Oct03	EXAMINATION DATE 03Oct03
	TRAINER, ADDRESS AND TELEPHONE NO. Asbestos Training Project Weather Resources, Inc. 1905 E. Parkside Portland, OR 97202-2924 (503) 552-7707	
The person assigned this certificate has completed the required training for asbestos certification and is certified by the Department of Environmental Quality under OAR Chapter 340, Division 33 and under TSCA Title K.		

OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125

E-mail: areed@cascadeinsulation.com

22356 NELSON ROAD, BEND OR 97701

Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

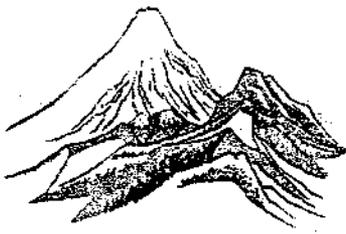
Employee Certification

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY Certified Worker For Asbestos Abatement Projects	
NAME Jacob H. Berado	
CERTIFICATE ID F 13042	EXPIRES DATE 10Oct05
ISSUE DATE 24Sep04	RENEWAL DATE 24Sep04
TRAINING ADDRESS AND TELEPHONE NO. Asbestos Training Facility Workplace Resources, Inc. 1948 E. St. Pauling Portland, OR 97208-8000 503 232-7101	
The person pictured this certificate has completed the required testing for asbestos certification and is certified by the Department of Environmental Quality under OAR Chapter 340, Division 33 and under TSCA Title II.	

OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125

E-mail: areed@cascadeinsulation.com

22356 NELSON ROAD, BEND OR 97701



Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

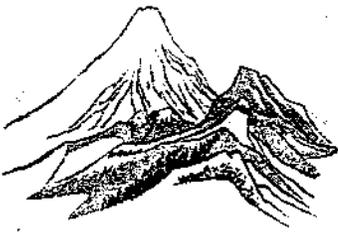
Employee Certification

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY Certified Worker For Asbestos Abatement Projects	
NAME Ross M. Weaver	
CERTIFICATION NUMBER F12546	ISSUANCE DATE 14Feb05
TRAINING COURSE DATES 27Jan04	EXPIRATION DATE 27Jan04
TRAINING ADDRESS AND TELEPHONE NO. Asbestos Training Program Washington Insulation, Inc. 100 S.E. Portland Portland, OR 97202-2248 (503) 232-7709	
The person specified on this certificate has completed the required training for asbestos certification and is certified by the Department of Environmental Quality under OAR, Chapter 340, Division 33 and under TSCA Title II.	

OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125

E-mail: areed@cascadeinsulation.com

22356 NELSON ROAD, BEND OR 97701



Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

Employee Certification

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY Certified Worker For Asbestos Abatement Projects	
	<p>NAME Austin L. Young</p>
CERTIFICATION F12834	EXPIRATION DATE 21May05
TRAINING COURSE DATES 18-21May04	EXAMINATION DATE 21May04
TRAINER, ADDRESS AND TELEPHONE NO. Asbestos Training Project Workplace Solutions, Inc. 1904 E.E. Portland Portland, OR 97208-8340 503-322-7297	
The person assigned this certificate has completed the required training for asbestos certification and is certified by the Department of Environmental Quality under OAR Chapter 340, Division 33 and under TSCA Title II.	

OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125

E-mail: areed@cascadeinsulation.com

22356 NELSON ROAD, BEND OR 97701



FULL SCALE ASBESTOS ABATEMENT CONTRACTOR LICENSE

Department of Environmental Quality
2020 SW 4th Suite 400
Portland, OR 97201
Telephone: (503) 229-5982

Issued in Accordance with the Provisions of ORS 468A.710

ISSUED TO:

CASCADE INSULATION INC
22356 NELSON RD
BEND OR 97701

LICENSE NUMBER:

FSC506

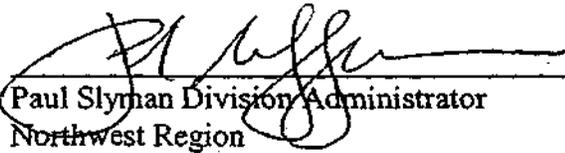
EXPIRATION DATE:

MARCH 1, 2005

INFORMATION RELIED UPON:

Asbestos Abatement Contractor License Application submitted February 23, 2004

ISSUED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY



Paul Slyman Division Administrator
Northwest Region

2/25/04

Date

The contractor named above is herewith authorized to conduct asbestos abatement in the State of Oregon subject to the terms and conditions of Oregon Administrative Rules (OAR) Chapter 340 Division 248, including the conditions listed below.

1. The contractor must ensure that each worker performs asbestos abatement work in compliance with OAR 340-248-0005 through 340-248-0290 and other applicable state and federal asbestos abatement regulations.

STATE OF OREGON CONSTRUCTION CONTRACTORS BOARD
LICENSE CERTIFICATE

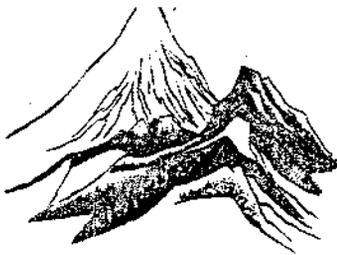
his certifies that the person named hereon
licensed as provided by law as a
Specialty Contractor/All
NON-EXEMPT
Corporation

CASCADE INSULATION INC
22356 NELSON RD
BEND OR 97701

License
Number: **63085**
License
Expires: **01/12/2006**



SIGNATURE OF LICENSEE



Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

➤ Fed Tax ID 93-0655282

- **Central Oregon District Hospital**
Eric Knettel
Redmond OR
541-548-9357
- **Eastern Oregon University**
Mike Rhodes
La Grande OR
541-962-3302
- **Oregon State University**
Andrew Gray
Corvallis OR
541-737-7651
- **Oregon Institute of Technology**
Jim Lake
Klamath Falls OR
541-885-1679
- **Roseburg School District**
Bruce Lathers
Roseburg OR
541-440-4053
- **Glide School District**
Doug McKillop
Glide OR
541-496-3373
- **Central Oregon Irrigation District**
Ron Nelson
Redmond OR
541-548-6047

OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125

E-mail: areed@cascadeinsulation.com

22356 NELSON ROAD, BEND OR 97701



Cascade Insulation, Inc

Mechanical
Insulation

CCB# 63085

Asbestos
Abatement

Cascade Insulation, Inc. was incorporated on January 1, 1976 specializing in mechanical insulation (installing insulation for boilers, piping duct work, etc.). We have been actively engaged in the asbestos abatement industry since the fall of 1982. Our philosophy and excellent work force have helped us develop into one of the premier asbestos abatement companies in the Pacific Northwest. We have invented and manufactured state-of-the art machinery for the industry. We have performed abatement projects in Alaska, Idaho, Oregon and Washington.

In 1991 we added the equipment and training for our crew to reinsulate with spray-on fireproofing after an abatement project.

We are locally and privately owned. Our management and owners are actively involved in the business, the design of projects and the direction of our work forces.

Cascade Insulation, Inc. Has held Asbestos Abatement Master Agreements from the Oregon State System of Higher Education since 1986.

Please feel free to contact us if you require any additional information, or if we can answer any questions

Sincerely,
Alan R. Reed CEO
Cascade Insulation, Inc

OFFICE: 541-388-2600 • FAX: (541) 388-2635 • CELL: (541) 480-0125

E-mail: areed@cascadeinsulation.com

22356 NELSON ROAD, BEND OR 97701

APPENDIX C
CORRECTED AND UNCORRECTED GPS COORDINATES

**Appendix C—Corrected and Uncorrected GPS Coordinates Nonpareil Mine Retort Area PA/SI Sampling Locations
Douglas County, Oregon**

Station ID	Location Description	GPS File Name	Uncorrected GPS Coordinates		Corrected GPS Coordinates		Notes
			Latitude	Longitude	Latitude	Longitude	
SS-LF001 and SS-LF002	Discrete Surface and Subsurface Soil Sample at Landfill	P051416A	43.88609444	121.4478222	43.88601542	-121.4478407	
SW-LF001 and SD-LF001	Discrete Surface Water and Sediment Sample at Landfill	P051416B	43.884475	121.4480722	43.88556608	-121.4480385	
SS-MR001	Discrete Soil Sample at Machine Gun Range	P051419A	43.87843333	121.4579944	43.87847139	-121.4579516	
SS-MR002	Discrete Soil Sample at Machine Gun Range	P051420A	43.87745556	121.4580972	43.8774514	-121.4580414	
SS-MR003	Discrete Soil Sample at Machine Gun Range	P051420B	43.87729722	121.4570528	43.87731636	-121.4570339	
GW-MW001	Groundwater Sample at Sunriver Municipal Well #2	P051420C	43.88049167	121.4419083	43.88050848	-121.4418828	
SS-RR001	Discrete Surface Soil Sample at Northern Rifle Range	P051500A	43.87234444	121.4556139	43.87232945	-121.4555815	
SS-RR002	Discrete Surface Soil Sample at Northern Rifle Range	P051500B	43.87253333	121.4559361	43.87250941	-121.4559122	
SS-RR003	Discrete Surface Soil Sample at Northern Rifle Range	P051500C	43.87341667	121.4559306	43.87339466	-121.4559029	
SS-DP001	Discrete Surface Soil Sample at Demolition Pits	NA	NA	NA	NA	NA	Could not acquire GPS because of thick tree cover.
SS-DP002	Discrete Surface Soil Sample at Demolition Pits	NA	NA	NA	NA	NA	Could not acquire GPS because of thick tree cover.
SS-DP003	Discrete Surface Soil Sample at Demolition Pits	P051600A	43.91131944	121.46275	43.91132308	-121.4627478	

**Appendix C—Corrected and Uncorrected GPS Coordinates Nonpareil Mine Retort Area PA/SI Sampling Locations
Douglas County, Oregon**

Station ID	Location Description	GPS File Name	Uncorrected GPS Coordinates		Corrected GPS Coordinates		Notes
			Latitude	Longitude	Latitude	Longitude	
SS-RR006	Discrete Surface Soil Sample at Southern Rifle Range	P051617A	43.86998333	121.4578444	43.86996186	-121.4578087	
SS-RR005	Discrete Surface Soil Sample at Southern Rifle Range	P051617B	43.86913056	121.4569972	43.8691173	-121.4569779	
SS-RR004	Discrete Surface Soil Sample at Southern Rifle Range	P051617C	43.86981944	121.4568583	43.86981212	-121.4568412	

APPENDIX D
DATA VALIDATION MEMORANDA AND LABORATORY SHEETS

ORGANIC CLP DATA

RECEIVED

JUL 12 2004

Per... *[Signature]* .

Data Validation Report
Camp Abbot FUDS Site Investigation
Case 32858 SDG: J2C82
Page 1 of 5



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

July 12, 2004

MEMORANDUM

SUBJECT: Data validation report for the semi-volatile organic compounds (SVOCs), pesticides (pests) and polychlorinated biphenyls (PCB) analysis of samples from the Camp Abbot FUDS Site Investigation Case: 32858 SDG: J2C82

FROM: *[Signature]* Gina Grepo-Grove, QA Chemist, OEA

TO: *[Signature]* Ken Marcy, Site Assessment Manager, ECL

CC: Adrienne Barnes, Weston
Greg Stuesse, Weston

The quality assurance (QA) review of 2 water and 5 soil samples collected from the above referenced site has been completed. The samples were analyzed for SVOCs, pests and PCBs following the CLP Statement of Work for Organic Analysis OLMO4.3 by Ceimic Corp of Narragansett, RI. The samples validated in this report are:

SDG: J2C82

J2C82	J2C83	J2C84	J2C85
J2CA6	J2CA7	J2CA8	

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control (QC) Specifications outlined in the Statement of Work for Organic Analysis (OLMO4.3) and the USEPA CLP National Functional Guidelines for Organic Data Review (10/99).

The conclusions presented herein are based on the information provided for the review.

Blanks

Due to cross contamination with Region 3 samples, all of the method blanks extracted on 5/20/04 had detections of 4,4'-DDT. The 4,4'-DDT detected in the samples were qualified unusable, 'R'. The rest of the target compounds were not detected in all of the original method and/or instrument blanks analyzed for SVOC and Pest/PCB. All of the re-extracted method blanks for 4,4'-DDT were clean.

Analytical Sequence - Acceptable

All of the standards, blanks, samples, and QC samples were analyzed in accordance with the SOW specified analytical sequence.

Surrogate Recoveries

The SVOC and Pest/PCB surrogate spike recoveries met the applicable technical acceptance criteria. Some of the SVOC surrogate recoveries were slightly outside the control limits indicating high bias in the associated results. Since these associated results were not detected in the sample(s), none of the data were qualified on this basis.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Samples J2C84 and J2C85 were the designated QC samples for the SVOCs and pests/PCBs. Sample J2C83 was also analyzed as MS/MSD for pests/PCBs. The criteria for frequency of analysis, spike recoveries and relative percent differences (RPDs) were met by the SVOC MS/MSD analyses. However, almost all of the pesticide recoveries for all of QC samples were outside the control limits, indicating low bias in the associated results. Since all of the results associated with these out of control pesticides MS/MSD were already flagged due to holding time, no further qualification is necessary.

Internal Standards - Acceptable

The acceptance criteria for internal standards (IS) are ± 30 seconds for retention time (RT) shifts and -50% to +100% of the IS area as compared to the IS RT and area of the daily continuing calibration standard. All of the GC/MS analyses met the IS area and RT shift criteria. None of the data were qualified on this basis.

Compound Identification

The target compounds reported by the laboratory were detected within the established retention time windows, met the USEPA spectral matching criteria and were judged to be acceptable. Some detected compounds with results below the CRQL and had weak spectra were qualified as non-detects, "U", and were reported at the CRQL by this reviewer.

All 4,4'-DDT detections in the samples were qualified as unusable due to sample cross-contamination. The rest of the SVOC and pests/PCB data were not qualified on this basis. The original pest/PCB analyses can be used for all target compounds except for 4,4'-DDT. The dilution runs should not be used at all. 4,4'-DDT values should be taken off the pesticide re-analyses.

Data Qualifiers		
	U	The analyte was not detected at or above the reported result.
	J	The analyte was positively identified. The associated numerical result is an estimate.
	UJ	The analyte was not detected at or above the reported estimated result. The associated numerical value is an estimate of the quantitation limit of the analyte in this sample.
	R	The data are unusable for all purposes.
	N	There is evidence the analyte is present in this sample.
	JN	There is evidence that the analyte is present. The associated numerical result is an estimate.
Bias Qualifiers	L	Low bias.
	H	High bias.
	Q	The result is estimated because the concentration is below the Contract Required Quantitation Limits (CRQLs).
	K	Unknown Bias.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C82

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-01

Sample wt/vol: 30.5 (g/mL) G

Lab File ID: DH347

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 40 Decanted: (Y/N)N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.9

Extraction: (Type) SONC

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	UG/KG	Q
100-52-7	Benzaldehyde	540	U
108-95-2	Phenol	540	U
111-44-4	bis(2-Chloroethyl) Ether	540	U
95-57-8	2-Chlorophenol	540	U
95-48-7	2-Methylphenol	540	U
108-60-1	2,2'-oxybis(1-Chloropropane)	540	U
98-86-2	Acetophenone	540	U
106-44-5	4-Methylphenol	540	U
621-64-7	N-Nitroso-di-n-propylamine	540	U
67-72-1	Hexachloroethane	540	U
98-95-3	Nitrobenzene	540	U
78-59-1	Isophorone	540	U
88-75-5	2-Nitrophenol	540	U
105-67-9	2,4-Dimethylphenol	540	U
111-91-1	bis(2-Chloroethoxy)methane	540	U
120-83-2	2,4-Dichlorophenol	540	U
91-20-3	Naphthalene	540	U
106-47-8	4-Chloroaniline	540	U
87-68-3	Hexachlorobutadiene	540	U
105-60-2	Caprolactam	540	U
59-50-7	4-Chloro-3-Methylphenol	540	U
91-57-6	2-Methylnaphthalene	540	U
77-47-4	Hexachlorocyclopentadiene	540	U
88-06-2	2,4,6-Trichlorophenol	540	U
95-95-4	2,4,5-Trichlorophenol	1400	U
92-52-4	1,1'-Biphenyl	540	U
91-58-7	2-Chloronaphthalene	540	U
88-74-4	2-Nitroaniline	1400	U
131-11-3	Dimethylphthalate	540	U
606-20-2	2,6-Dinitrotoluene	540	U
208-96-8	Acenaphthylene	540	U
99-09-2	3-Nitroaniline	1400	U
83-32-9	Acenaphthene	540	U

B
SEP 07 2004

FORM I SV-1

[Signature]
01 25
FORM 04.3

1D
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C82

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-01

Sample wt/vol: 30.5(g/mL) G

Lab File ID: DH347

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 40 Decanted: (Y/N)N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

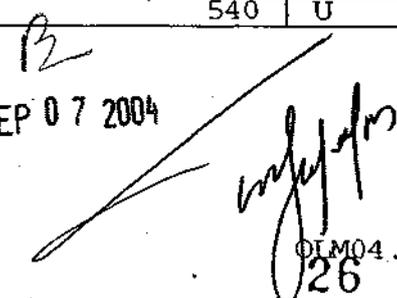
pH: 5.9

Extraction: (Type) SONC

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	UG/KG	Q
51-28-5	2,4-Dinitrophenol	1400	U
100-02-7	4-Nitrophenol	1400	U
132-64-9	Dibenzofuran	540	U
121-14-2	2,4-Dinitrotoluene	540	U
84-66-2	Diethylphthalate	540	U
86-73-7	Fluorene	540	U
7005-72-3	4-Chlorophenyl-phenylether	540	U
100-01-6	4-Nitroaniline	1400	U
534-52-1	4,6-Dinitro-2-methylphenol	1400	U
86-30-6	N-nitrosodiphenylamine (1)	540	U
101-55-3	4-Bromophenyl-phenylether	540	U
118-74-1	Hexachlorobenzene	540	U
1912-24-9	Atrazine	540	U
87-86-5	Pentachlorophenol	1400	U
85-01-8	Phenanthrene	540	U
120-12-7	Anthracene	540	U
86-74-8	Carbazole	540	U
84-74-2	Di-n-butylphthalate	540	U
206-44-0	Fluoranthene	540	U
129-00-0	Pyrene	540	U
85-68-7	Butylbenzylphthalate	540	U
91-94-1	3,3'-Dichlorobenzidine	540	U
56-55-3	Benzo(a)anthracene	540	U
218-01-9	Chrysene	540	U
117-81-7	bis(2-Ethylhexyl)phthalate	540	U
117-84-0	Di-n-octylphthalate	540	U
205-99-2	Benzo(b)fluoranthene	540	U
207-08-9	Benzo(k)fluoranthene	540	U
50-32-8	Benzo(a)pyrene	540	U
193-39-5	Indeno(1,2,3-cd)pyrene	540	U
53-70-3	Dibenzo(a,h)anthracene	540	U
191-24-2	Benzo(g,h,i)perylene	540	U

(1) - Cannot be separated from Diphenylamine


 SEP 07 2004
 OLM04.3
 26

1G
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J2C82

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-01

Sample wt/vol: 30.5 (g/mL) G

Lab File ID: DH347

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 40 Decanted: (Y/N) N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.9

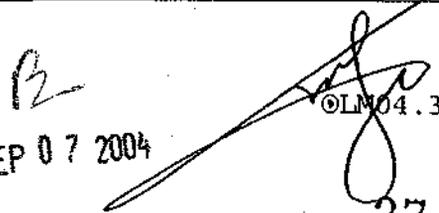
Extraction: (Type) SONC

Number TICs found: 15

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.21	180	JN
2. 57-10-3	HEXADECANOIC ACID	12.17	250	NJ
3. 0-00-0	2-HEXYL-1-DECANOL	13.39	190	NJ
4.	UNKNOWN	13.74	140	JN
5. 2136-70-1	ETHANOL, 2-(TETRADECYLOXY)-	14.11	390	NJ
6.	UNKNOWN ALCOHOL/ALKENE	14.95	180	JN
7.	UNKNOWN AMIDE	15.44	230	JJ
8.	UNKNOWN	15.56	320	JJ
9. 629-80-1	HEXADECANAL	15.67	300	NJ
10. 629-96-9	1-EICOSANOL	16.03	1000	NJ
11.	UNKNOWN ALCOHOL/ALKENE	17.49	260	JN
12.	UNKNOWN KETONE	17.61	200	J
13.	UNKNOWN KETONE	19.67	310	J
14.	UNKNOWN	20.42	560	J
15.	UNKNOWN	20.82	210	J
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

FORM I SV-TIC.


 SEP 07 2004
 © L M 04.3
 27

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C84

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-03

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: DH357

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: _____ Decanted: (Y/N) _____

Date Extracted: 05/20/04

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: _____

Extraction: (Type) CONT

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) Ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy) methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

B

SEP 07 2004

FORM I SV-1

[Signature]
OLM04.3
59

1D
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C84

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-03

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: DH357

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: _____ Decanted: (Y/N) _____

Date Extracted: 05/20/04

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: _____

Extraction: (Type) CONT

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

B
SEP 07 2004

FORM I SV-2

CLM04.3
60

1G
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J2C84

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-03

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: DH357

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: _____ Decanted: (Y/N) _____

Date Extracted: 05/20/04

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Extraction: (Type) CONT

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

[Signature]
04.3
61

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C85

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-04

Sample wt/vol: 30.0(g/mL) G

Lab File ID: DH351

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 16 Decanted: (Y/N)N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.6

Extraction: (Type) SONC

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q
100-52-7	Benzaldehyde	390 U
108-95-2	Phenol	390 U
111-44-4	bis(2-Chloroethyl) Ether	390 U
95-57-8	2-Chlorophenol	390 U
95-48-7	2-Methylphenol	390 U
108-60-1	2,2'-oxybis(1-Chloropropane)	390 U
98-86-2	Acetophenone	390 U
106-44-5	4-Methylphenol	390 U
621-64-7	N-Nitroso-di-n-propylamine	390 U
67-72-1	Hexachloroethane	390 U
98-95-3	Nitrobenzene	390 U
78-59-1	Isophorone	390 U
88-75-5	2-Nitrophenol	390 U
105-67-9	2,4-Dimethylphenol	390 U
111-91-1	bis(2-Chloroethoxy) methane	390 U
120-83-2	2,4-Dichlorophenol	390 U
91-20-3	Naphthalene	390 U
106-47-8	4-Chloroaniline	390 U
87-68-3	Hexachlorobutadiene	390 U
105-60-2	Caprolactam	390 U
59-50-7	4-Chloro-3-Methylphenol	390 U
91-57-6	2-Methylnaphthalene	390 U
77-47-4	Hexachlorocyclopentadiene	390 U
88-06-2	2,4,6-Trichlorophenol	390 U
95-95-4	2,4,5-Trichlorophenol	990 U
92-52-4	1,1'-Biphenyl	390 U
91-58-7	2-Chloronaphthalene	390 U
88-74-4	2-Nitroaniline	990 U
131-11-3	Dimethylphthalate	390 U
606-20-2	2,6-Dinitrotoluene	390 U
208-96-8	Acenaphthylene	390 U
99-09-2	3-Nitroaniline	990 U
83-32-9	Acenaphthene	390 U


 QLM04.3
 65

1D
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C85

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-04

Sample wt/vol: 30.0(g/mL) G

Lab File ID: DH351

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 16 Decanted: (Y/N)N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.6

Extraction: (Type) SONC

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q
51-28-5	2,4-Dinitrophenol	990 U
100-02-7	4-Nitrophenol	990 U
132-64-9	Dibenzofuran	390 U
121-14-2	2,4-Dinitrotoluene	390 U
84-66-2	Diethylphthalate	390 U
86-73-7	Fluorene	390 U
7005-72-3	4-Chlorophenyl-phenylether	390 U
100-01-6	4-Nitroaniline	990 U
534-52-1	4,6-Dinitro-2-methylphenol	990 U
86-30-6	N-nitrosodiphenylamine (1)	390 U
101-55-3	4-Bromophenyl-phenylether	390 U
118-74-1	Hexachlorobenzene	390 U
1912-24-9	Atrazine	390 U
87-86-5	Pentachlorophenol	990 U
85-01-8	Phenanthrene	390 U
120-12-7	Anthracene	390 U
86-74-8	Carbazole	390 U
84-74-2	Di-n-butylphthalate	390 U
206-44-0	Fluoranthene	390 U
129-00-0	Pyrene	390 U
85-68-7	Butylbenzylphthalate	390 U
91-94-1	3,3'-Dichlorobenzidine	390 U
56-55-3	Benzo(a)anthracene	390 U
218-01-9	Chrysene	390 U
117-81-7	bis(2-Ethylhexyl)phthalate	390 U
117-84-0	Di-n-octylphthalate	390 U
205-99-2	Benzo(b)fluoranthene	390 U
207-08-9	Benzo(k)fluoranthene	390 U
50-32-8	Benzo(a)pyrene	390 U
193-39-5	Indeno(1,2,3-cd)pyrene	390 U
53-70-3	Dibenzo(a,h)anthracene	390 U
191-24-2	Benzo(g,h,i)perylene	390 U

(1) - Cannot be separated from Diphenylamine

B
SEP 07 2004

FORM I SV-2

OLM04.3
66

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA6

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-05

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: DH356

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: _____ Decanted: (Y/N) _____

Date Extracted: 05/21/04

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Extraction: (Type) CONT

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) Ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	25	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

1D
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA6

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-05

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: DH356

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: _____ Decanted: (Y/N) _____

Date Extracted: 05/21/04

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: _____

Extraction: (Type) CONT

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	UG/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	.10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo (a) anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo (b) fluoranthene	10	U
207-08-9	Benzo (k) fluoranthene	10	U
50-32-8	Benzo (a) pyrene	10	U
193-39-5	Indeno (1,2,3-cd) pyrene	10	U
53-70-3	Dibenzo (a,h) anthracene	10	U
191-24-2	Benzo (g,h,i) perylene	10	U

(1) - Cannot be separated from Diphenylamine

B
SEP 07 2004
[Signature]
OLM04.3
73

1G
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J2CA6

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-05

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: DH356

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: _____ Decanted: (Y/N) _____

Date Extracted: 05/21/04

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Extraction: (Type) CONT

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.98	9	JB
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

474

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA7

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-06

Sample wt/vol: 30.1(g/mL) G

Lab File ID: DH354

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 26

Decanted: (Y/N)N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 6.1

Extraction: (Type) SONC

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q
100-52-7	Benzaldehyde	440 U
108-95-2	Phenol	440 U
111-44-4	bis(2-Chloroethyl) Ether	440 U
95-57-8	2-Chlorophenol	440 U
95-48-7	2-Methylphenol	440 U
108-60-1	2,2'-oxybis(1-Chloropropane)	440 U
98-86-2	Acetophenone	440 U
106-44-5	4-Methylphenol	440 U
621-64-7	N-Nitroso-di-n-propylamine	440 U
67-72-1	Hexachloroethane	440 U
98-95-3	Nitrobenzene	440 U
78-59-1	Isophorone	440 U
88-75-5	2-Nitrophenol	440 U
105-67-9	2,4-Dimethylphenol	440 U
111-91-1	bis(2-Chloroethoxy) methane	440 U
120-83-2	2,4-Dichlorophenol	440 U
91-20-3	Naphthalene	440 U
106-47-8	4-Chloroaniline	440 U
87-68-3	Hexachlorobutadiene	440 U
105-60-2	Caprolactam	440 U
59-50-7	4-Chloro-3-Methylphenol	440 U
91-57-6	2-Methylnaphthalene	440 U
77-47-4	Hexachlorocyclopentadiene	440 U
88-06-2	2,4,6-Trichlorophenol	440 U
95-95-4	2,4,5-Trichlorophenol	1100 U
92-52-4	1,1'-Biphenyl	440 U
91-58-7	2-Chloronaphthalene	440 U
88-74-4	2-Nitroaniline	1100 U
131-11-3	Dimethylphthalate	440 U
606-20-2	2,6-Dinitrotoluene	440 U
208-96-8	Acenaphthylene	440 U
99-09-2	3-Nitroaniline	1100 U
83-32-9	Acenaphthene	440 U

1D
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA7

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-06

Sample wt/vol: 30.1(g/mL) G

Lab File ID: DH354

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 26 Decanted: (Y/N)N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 6.1

Extraction: (Type) SONC

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q
51-28-5	2,4-Dinitrophenol	1100 U
100-02-7	4-Nitrophenol	1100 U
132-64-9	Dibenzofuran	440 U
121-14-2	2,4-Dinitrotoluene	440 U
84-66-2	Diethylphthalate	440 U
86-73-7	Fluorene	440 U
7005-72-3	4-Chlorophenyl-phenylether	440 U
100-01-6	4-Nitroaniline	1100 U
534-52-1	4,6-Dinitro-2-methylphenol	1100 U
86-30-6	N-nitrosodiphenylamine (1)	440 U
101-55-3	4-Bromophenyl-phenylether	440 U
118-74-1	Hexachlorobenzene	440 U
1912-24-9	Atrazine	440 U
87-86-5	Pentachlorophenol	1100 U
85-01-8	Phenanthrene	440 U
120-12-7	Anthracene	440 U
86-74-8	Carbazole	440 U
84-74-2	Di-n-butylphthalate	440 U
206-44-0	Fluoranthene	440 U
129-00-0	Pyrene	440 U
85-68-7	Butylbenzylphthalate	440 U
91-94-1	3,3'-Dichlorobenzidine	440 U
56-55-3	Benzo(a)anthracene	440 U
218-01-9	Chrysene	440 U
117-81-7	bis(2-Ethylhexyl)phthalate	440 U
117-84-0	Di-n-octylphthalate	440 U
205-99-2	Benzo(b)fluoranthene	440 U
207-08-9	Benzo(k)fluoranthene	440 U
50-32-8	Benzo(a)pyrene	440 U
193-39-5	Indeno(1,2,3-cd)pyrene	440 U
53-70-3	Dibenzo(a,h)anthracene	440 U
191-24-2	Benzo(g,h,i)perylene	440 U

(1) - Cannot be separated from Diphenylamine

B
SEP 07 2004

[Handwritten Signature]
CLM043
80

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA8

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-07

Sample wt/vol: 30.5(g/mL) G

Lab File ID: DH355

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 16 Decanted: (Y/N)N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.4

Extraction: (Type) SONC

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	bis(2-Chloroethyl) Ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-n-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	bis(2-Chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-Methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	970	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	970	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	970	U
83-32-9	Acenaphthene	390	U

FORM I SV-1

SEP 07 2004

QLM04.3

85

1G
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

J2CA8

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-07

Sample wt/vol: 30.5 (g/mL) G

Lab File ID: DH355

Level: (low/med) LOW

Date Received: 05/18/04

% Moisture: 16 Decanted: (Y/N) N

Date Extracted: 05/20/04

Concentrated Extract Volume: 500 (uL)

Date Analyzed: 05/25/04

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.4

Extraction: (Type) SONC

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALCOHOL/ALKENE	12.78	660	JV
2.	UNKNOWN	13.63	140	JV
3.	UNKNOWN	13.90	95	JV
4. 629-96-9	1-EICOSANOL	14.13	170	NJ
5.	UNKNOWN	20.41	490	JV
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

FORM I SV-TIC

B
SEP 07 2004

07/04.3
[Signature]
87

ALKANE NARRATIVE REPORT
Report date : 05/31/2004
SDG: J2C82

Client Sample ID: J2C82	Lab Sample ID: 040414-01	File ID: DH347	
Compound	RT	Est. Conc.	Q
Unknown Straight Chain Alkane	14.92	170	JN
Unknown Straight Chain Alkane	15.97	770	JN
Unknown Straight Chain Alkane	17.38	1800	JN
Unknown Straight Chain Alkane	19.31	480	JN

Client Sample ID: J2CA7	Lab Sample ID: 040414-06	File ID: DH354	
Compound	RT	Est. Conc.	Q
Unknown Straight Chain Alkane	14.05	170	JN

Client Sample ID: J2CA8	Lab Sample ID: 040414-07	File ID: DH355	
Compound	RT	Est. Conc.	Q
Unknown Branched Alkane	15.97	160	JN
Unknown Straight Chain Alkane	17.37	340	JN

B
SEP 07 2004

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C82

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-01

Sample wt/vol: 30.1(g/mL) G

Lab File ID: _____

% Moisture: 40 Decanted: (Y/N) N

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 05/20/04

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 5.9

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q
319-84-6	alpha-BHC	2.8 U
319-85-7	beta-BHC	2.8 U
319-86-8	delta-BHC	2.8 U
58-89-9	gamma-BHC (Lindane)	2.8 U
76-44-8	Heptachlor	2.8 U
309-00-2	Aldrin	2.8 U
1024-57-3	Heptachlor epoxide	2.8 U
959-98-8	Endosulfan I	2.8 U
60-57-1	Dieldrin	5.5 U
72-55-9	4,4'-DDE	5.5 U
72-20-8	Endrin	5.5 U
33213-65-9	Endosulfan II	5.5 U
72-54-8	4,4'-DDD	5.5 U
1031-07-8	Endosulfan sulfate	5.5 U
50-29-3	4,4'-DDT	26 R ✓
72-43-5	Methoxychlor	28 U
53494-70-5	Endrin ketone	5.5 U
7421-93-4	Endrin aldehyde	5.5 U
5103-71-9	alpha-Chlordane	2.8 U
5103-74-2	gamma-Chlordane	2.8 U
8001-35-2	Toxaphene	280 U
12674-11-2	Aroclor-1016	55 U
11104-28-2	Aroclor-1221	110 U
11141-16-5	Aroclor-1232	55 U
53469-21-9	Aroclor-1242	55 U
12672-29-6	Aroclor-1248	55 U
11097-69-1	Aroclor-1254	55 U
11096-82-5	Aroclor-1260	55 U

B
SEP 07 2004

[Signature]
CLM04.3
233

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C83

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-02

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: _____

% Moisture: 55 Decanted: (Y/N) N

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 05/20/04

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 6.1

Sulfur Cleanup: (Y/N) N

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

319-84-6	alpha-BHC	3.8	U
319-85-7	beta-BHC	3.8	U
319-86-8	delta-BHC	3.8	U
58-89-9	gamma-BHC (Lindane)	3.8	U
76-44-8	Heptachlor	3.8	U
309-00-2	Aldrin	3.8	U
1024-57-3	Heptachlor epoxide	3.8	U
959-98-8	Endosulfan I	3.8	U
60-57-1	Dieldrin	7.3	U
72-55-9	4,4'-DDE	7.3	U
72-20-8	Endrin	7.3	U
33213-65-9	Endosulfan II	7.3	U
72-54-8	4,4'-DDD	7.3	U
1031-07-8	Endosulfan sulfate	7.3	U
50-29-3	4,4'-DDT	150	U R
72-43-5	Methoxychlor	38	U
53494-70-5	Endrin ketone	7.3	U
7421-93-4	Endrin aldehyde	7.3	U
5103-71-9	alpha-Chlordane	3.8	U
5103-74-2	gamma-Chlordane	3.8	U
8001-35-2	Toxaphene	380	U
12674-11-2	Aroclor-1016	73	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	73	U
53469-21-9	Aroclor-1242	73	U
12672-29-6	Aroclor-1248	73	U
11097-69-1	Aroclor-1254	73	U
11096-82-5	Aroclor-1260	73	U

Use the re-analysis of 4,4' DDT.

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C83RE

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC Case No.: 32858

SAS No.: SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-02RE

Sample wt/vol: 30.5(g/mL) G

Lab File ID: _____

% Moisture: 55 Decanted: (Y/N) N

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 06/07/04

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 06/11/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.1

Sulfur Cleanup: (Y/N) N

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)	UG/KG	Q
319-84-6	alpha-BHC	3.7	UJK	
319-85-7	beta-BHC	3.7	U	
319-86-8	delta-BHC	3.7	U	
58-89-9	gamma-BHC (Lindane)	3.7	U	
76-44-8	Heptachlor	3.7	U	
309-00-2	Aldrin	3.7	U	
1024-57-3	Heptachlor epoxide	3.7	U	
959-98-8	Endosulfan I	3.7	U	
60-57-1	Dieldrin	7.2	U	
72-55-9	4,4'-DDE	7.2	U	
72-20-8	Endrin	7.2	U	
33213-65-9	Endosulfan II	7.2	U	
72-54-8	4,4'-DDD	7.2	U	
1031-07-8	Endosulfan sulfate	7.2	U	
50-29-3	4,4'-DDT	7.2	U	
72-43-5	Methoxychlor	37	U	
53494-70-5	Endrin ketone	7.2	U	
7421-93-4	Endrin aldehyde	7.2	U	
5103-71-9	alpha-Chlordane	3.7	U	
5103-74-2	gamma-Chlordane	3.7	U	
8001-35-2	Toxaphene	370	U	
12674-11-2	Aroclor-1016	72	U	
11104-28-2	Aroclor-1221	150	U	
11141-16-5	Aroclor-1232	72	U	
53469-21-9	Aroclor-1242	72	U	
12672-29-6	Aroclor-1248	72	U	
11097-69-1	Aroclor-1254	72	U	
11096-82-5	Aroclor-1260	72	U	✓

B
SEP 07 2004

FORM I PEST

m/aldon
OLM04.3
250

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C84

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-03

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: _____

% Moisture: _____ Decanted: (Y/N) _____

Date Received: 05/18/04

Extraction: (Type) SEPF

Date Extracted: 05/20/04

Concentrated Extract Volume: 10000 (uL)

Date Analyzed: 05/24/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Sulfur Cleanup: (Y/N) N

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	3.7	U R ²
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

Use the re-analysis of 4,4'-DDT.

B
SEP 07 2004

FORM I PEST

OLM04.3

255

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C84RE

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-03RE

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: _____

% Moisture: _____ Decanted: (Y/N) _____

Date Received: 05/18/04

Extraction: (Type) SEPF

Date Extracted: 05/26/04

Concentrated Extract Volume: 10000 (uL)

Date Analyzed: 05/27/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Sulfur Cleanup: (Y/N) N

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

B
SEP 07 2004

FORM I PEST

OLM04.3

266

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C85

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-04

Sample wt/vol: 30.5(g/mL) G

Lab File ID: _____

% Moisture: 16 Decanted: (Y/N) Y

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 05/20/04

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 6.6

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q
319-84-6	alpha-BHC	2.0 U
319-85-7	beta-BHC	2.9 U
319-86-8	delta-BHC	2.0 U
58-89-9	gamma-BHC (Lindane)	2.0 U
76-44-8	Heptachlor	2.0 U
309-00-2	Aldrin	2.0 U
1024-57-3	Heptachlor epoxide	2.0 U
959-98-8	Endosulfan I	2.0 U
60-57-1	Dieldrin	3.9 U
72-55-9	4,4'-DDE	3.9 U
72-20-8	Endrin	3.9 U
33213-65-9	Endosulfan II	3.9 U
72-54-8	4,4'-DDD	3.9 U
1031-07-8	Endosulfan sulfate	3.9 U
50-29-3	4,4'-DDT	140 EPB R
72-43-5	Methoxychlor	20 U
53494-70-5	Endrin ketone	3.9 U
7421-93-4	Endrin aldehyde	3.9 U
5103-71-9	alpha-Chlordane	2.0 U
5103-74-2	gamma-Chlordane	2.0 U
8001-35-2	Toxaphene	200 U
12674-11-2	Aroclor-1016	39 U
11104-28-2	Aroclor-1221	78 U
11141-16-5	Aroclor-1232	39 U
53469-21-9	Aroclor-1242	39 U
12672-29-6	Aroclor-1248	39 U
11097-69-1	Aroclor-1254	39 U
11096-82-5	Aroclor-1260	39 U

Use re-analysis value for 4,4'-DDT.

B
SEP 07 2004

FORM I PEST

OLM04.3

272

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2C85RE

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-04RE

Sample wt/vol: 30.1(g/mL) G

Lab File ID: _____

% Moisture: 16 Decanted: (Y/N) Y

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 06/07/04

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 06/11/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 6.6

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q	
319-84-6	alpha-BHC	2.0	U <i>K</i>
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
76-44-8	Heptachlor	2.0	U
309-00-2	Aldrin	2.0	U
1024-57-3	Heptachlor epoxide	2.0	U
959-98-8	Endosulfan I	2.0	U
60-57-1	Dieldrin	3.9	U
72-55-9	4,4'-DDE	3.9	U
72-20-8	Endrin	3.9	U
33213-65-9	Endosulfan II	3.9	U
72-54-8	4,4'-DDD	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U <i>✓</i>
50-29-3	4,4'-DDT	3.9	U <i>K</i>
72-43-5	Methoxychlor	20	U
53494-70-5	Endrin ketone	3.9	U
7421-93-4	Endrin aldehyde	3.9	U
5103-71-9	alpha-Chlordane	2.0	U
5103-74-2	gamma-Chlordane	2.0	U
8001-35-2	Toxaphene	200	U
12674-11-2	Aroclor-1016	39	U
11104-28-2	Aroclor-1221	79	U
11141-16-5	Aroclor-1232	39	U
53469-21-9	Aroclor-1242	39	U
12672-29-6	Aroclor-1248	39	U
11097-69-1	Aroclor-1254	39	U
11096-82-5	Aroclor-1260	39	U <i>✓</i>

B
SEP 07 2004

FORM I PEST

[Signature]
OLM04.3
283

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA6

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) WATER

Lab Sample ID: 040414-05

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: _____

% Moisture: _____ Decanted: (Y/N) _____

Date Received: 05/18/04

Extraction: (Type) SEPF

Date Extracted: 05/20/04

Concentrated Extract Volume: 10000 (uL)

Date Analyzed: 05/24/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: _____

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

CAS NO.	COMPOUND	UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

B

SEP 07 2004

FORM I PEST

[Signature]
OLM04.3
288

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA7

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC

Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-06

Sample wt/vol: 30.5(g/mL) G

Lab File ID: _____

% Moisture: 26 Decanted: (Y/N) Y

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 05/20/04

Concentrated Extract Volume: 5000(uL)

Date Analyzed: 05/25/04

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y

pH: 6.1

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	UG/KG	Q
319-84-6	alpha-BHC	2.3	U
319-85-7	beta-BHC	2.3	U
319-86-8	delta-BHC	2.3	U
58-89-9	gamma-BHC (Lindane)	2.3	U
76-44-8	Heptachlor	2.3	U
309-00-2	Aldrin	2.3	U
1024-57-3	Heptachlor epoxide	2.3	U
959-98-8	Endosulfan I	2.3	U
60-57-1	Dieldrin	4.4	U
72-55-9	4,4'-DDE	4.4	U
72-20-8	Endrin	4.4	U
33213-65-9	Endosulfan II	4.4	U
72-54-8	4,4'-DDD	4.4	U
1031-07-8	Endosulfan sulfate	4.4	U
50-29-3	4,4'-DDT	98	U
72-43-5	Methoxychlor	23	U
53494-70-5	Endrin ketone	4.4	U
7421-93-4	Endrin aldehyde	4.4	U
5103-71-9	alpha-Chlordane	2.3	U
5103-74-2	gamma-Chlordane	2.3	U
8001-35-2	Toxaphene	230	U
12674-11-2	Aroclor-1016	44	U
11104-28-2	Aroclor-1221	89	U
11141-16-5	Aroclor-1232	44	U
53469-21-9	Aroclor-1242	44	U
12672-29-6	Aroclor-1248	44	U
11097-69-1	Aroclor-1254	44	U
11096-82-5	Aroclor-1260	44	U

Use this num for sample J2CA7.

SEP 07 2004

FORM I PEST

OLM04.3

293

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA7RE

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC Case No.: 32858

SAS No.: SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-06RE

Sample wt/vol: 30.3(g/mL) G

Lab File ID: _____

% Moisture: 26 Decanted: (Y/N) Y

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 06/07/04

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 06/11/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.1

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q	
319-84-6	alpha-BHC	2.3	UJK
319-85-7	beta-BHC	2.3	U
319-86-8	delta-BHC	2.3	U
58-89-9	gamma-BHC (Lindane)	2.3	U
76-44-8	Heptachlor	2.3	U
309-00-2	Aldrin	2.3	U
1024-57-3	Heptachlor epoxide	2.3	U
959-98-8	Endosulfan I	2.3	U
60-57-1	Dieldrin	4.4	U
72-55-9	4,4'-DDE	4.4	U
72-20-8	Endrin	4.4	U
33213-65-9	Endosulfan II	4.4	U
72-54-8	4,4'-DDD	4.4	U
1031-07-8	Endosulfan sulfate	4.4	U
50-29-3	4,4'-DDT	5.3	U
72-43-5	Methoxychlor	23	UJK
53494-70-5	Endrin ketone	4.4	U
7421-93-4	Endrin aldehyde	4.4	U
5103-71-9	alpha-Chlordane	2.3	U
5103-74-2	gamma-Chlordane	2.3	U
8001-35-2	Toxaphene	230	U
12674-11-2	Aroclor-1016	44	U
11104-28-2	Aroclor-1221	90	U
11141-16-5	Aroclor-1232	44	U
53469-21-9	Aroclor-1242	44	U
12672-29-6	Aroclor-1248	44	U
11097-69-1	Aroclor-1254	44	U
11096-82-5	Aroclor-1260	44	U

B
SEP 07 2004

FORM I PEST

OLM04.3

304

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA8

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC Case No.: 32858

SAS No.: SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-07

Sample wt/vol: 30.3(g/mL) G

Lab File ID: _____

% Moisture: 16 Decanted: (Y/N) N

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 05/20/04

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 05/25/04

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.4

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q
319-84-6	alpha-BHC	2.0 U
319-85-7	beta-BHC	2.0 U
319-86-8	delta-BHC	2.0 U
58-89-9	gamma-BHC (Lindane)	2.0 U
76-44-8	Heptachlor	2.0 U
309-00-2	Aldrin	2.0 U
1024-57-3	Heptachlor epoxide	2.0 U
959-98-8	Endosulfan I	2.0 U
60-57-1	Dieldrin	3.9 U
72-55-9	4,4'-DDE	3.9 U
72-20-8	Endrin	3.9 U
33213-65-9	Endosulfan II	3.9 U
72-54-8	4,4'-DDD	3.9 U
1031-07-8	Endosulfan sulfate	3.9 U
50-29-3	4,4'-DDT	33 U
72-43-5	Methoxychlor	20 U
53494-70-5	Endrin ketone	3.9 U
7421-93-4	Endrin aldehyde	3.9 U
5103-71-9	alpha-Chlordane	2.0 U
5103-74-2	gamma-Chlordane	2.0 U
8001-35-2	Toxaphene	200 U
12674-11-2	Aroclor-1016	39 U
11104-28-2	Aroclor-1221	79 U
11141-16-5	Aroclor-1232	39 U
53469-21-9	Aroclor-1242	39 U
12672-29-6	Aroclor-1248	39 U
11097-69-1	Aroclor-1254	39 U
11096-82-5	Aroclor-1260	39 U

Use the re-analysis for 4,4'-DDT.

B
SEP 07 2004

FORM I PEST

CLM04.3

309

1E
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

J2CA8RE

Lab Name: CEIMIC CORP

Contract: 68-W-03-018

Lab Code: CEIMIC Case No.: 32858

SAS No.:

SDG No.: J2C82

Matrix: (soil/water) SOIL

Lab Sample ID: 040414-07RE

Sample wt/vol: 30.2(g/mL) G

Lab File ID: _____

% Moisture: 16 Decanted: (Y/N) N

Date Received: 05/18/04

Extraction: (Type) SONC

Date Extracted: 06/07/04

Concentrated Extract Volume: 5000(uL)

Date Analyzed: 06/11/04

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.4

Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u> Q	
319-84-6	alpha-BHC	2.0	UJK
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
76-44-8	Heptachlor	2.0	U
309-00-2	Aldrin	2.0	U
1024-57-3	Heptachlor epoxide	2.0	U
959-98-8	Endosulfan I	2.0	U
60-57-1	Dieldrin	3.9	U
72-55-9	4,4'-DDE	3.9	U
72-20-8	Endrin	3.9	U
33213-65-9	Endosulfan II	3.9	U
72-54-8	4,4'-DDD	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
50-29-3	4,4'-DDT	3.9	U
72-43-5	Methoxychlor	20	U
53494-70-5	Endrin ketone	3.9	U
7421-93-4	Endrin aldehyde	3.9	U
5103-71-9	alpha-Chlordane	2.0	U
5103-74-2	gamma-Chlordane	2.0	U
8001-35-2	Toxaphene	200	U
12674-11-2	Aroclor-1016	39	U
11104-28-2	Aroclor-1221	79	U
11141-16-5	Aroclor-1232	39	U
53469-21-9	Aroclor-1242	39	U
12672-29-6	Aroclor-1248	39	U
11097-69-1	Aroclor-1254	39	U
11096-82-5	Aroclor-1260	39	U

FORM I PEST

B
SEP 07 2004

[Signature]
01M04.2
316

INORGANIC CLP DATA



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

July 6, 2004

RECEIVED
JUL 08 2004
Per...*B*.....

Reply To
Attn Of: OEA-095

MEMORANDUM

SUBJECT: Camp Abbot FUDS Site, CLP Metals Analysis, Data Validation
Case: 32858
SDG: MJ2CA4

FROM: 
Laura Castrilli, Chemist
Technical Support Unit, OEA

TO: Ken Marcy, Site Assessment Manager
Office of Environmental Cleanup

CC: Bruce Woods, Region 10 CLP TPO
Adrienne Barnes, Weston Solutions Inc.
Greg Stuesse, Weston Solutions Inc.

The following is a validation of ICP-AES and mercury analyses of five soil/sediment samples from the Camp Abbot FUDS site. The analyses were performed following the USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis Multi-media, Multi-Concentration, ILM05.3. Analyses were conducted by Chemtech Consulting Group, Mountainside, New Jersey. This validation was conducted for the following samples:

MJ2C85 MJ2CA4 MJ2CA5 MJ2CA7 MJ2CA8

Data Qualifications

The following comments refer to Chemtech's performance in meeting quality control specifications outlined in the *CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.3 and the Functional Guidelines for Inorganic Data Review (July 2002): utilizing professional judgement of the reviewer*. The comments presented herein are based on the information provided for the review.

negative results with absolute values greater than the MDLs. Based on blank contamination, the following qualifications were made:

- ◆ Arsenic in all samples was qualified 'U', undetected.
- ◆ Cadmium in sample MJ2CA8 was qualified 'UJ', estimated detection limit.
- ◆ Lead in samples MJ2CA4, MJ2CA5, and MJ2CA7 was qualified 'U', undetected.
- ◆ Mercury in all samples was qualified 'UJ', estimated detection limit.

Remaining analytes were greater than five times the associated blank levels (or were already undetected) and were not qualified based on blank contamination.

5.0 ICP-AES Interference Check Sample -

The interference check sample (ICS) is analyzed by ICP-AES to verify interelement and background correction factors. Analysis is required at the beginning of each sample analysis run and recoveries must be between 80% and 120% or within ± 2 times the CRQL, whichever is greater. All ICS-A and ICS-AB recoveries for reported analytes were within the recovery criteria.

Note that the samples had interfering levels of aluminum and/or iron. These samples were assessed for possible bias in low or undetected sample results where no analyte is in the ICS-A, but there are positive or negative results above the absolute value of the MDL. Analytes considered for qualification were only those historically affected by high iron or aluminum and analytes that have interelement corrections for aluminum or iron.

Based on suspected interference the following qualifications were made:

- ◆ Arsenic in samples MJ2CA4, MJ2CA5, and MJ2CA8 was qualified 'J', estimated.
- ◆ Cadmium in all samples was qualified 'UJ', estimated detection limit (possible false negatives).
- ◆ Thallium in samples MJ2CA4, MJ2CA5, and MJ2CA8 was qualified 'UJ', estimated (possible false negatives).

The computer assisted data review expert (CADRE) qualified lead and barium sample results as rejected in those samples with interference. Barium is not historically interfered with by iron and/or aluminum nor is there an interelement correction for iron or aluminum on barium. Electronic data users will need to remove the 'R' qualifiers from the barium results.

Aluminum is a potential interferent for lead. CADRE also qualified the lead results as rejected. The ICS-A standard has a true value of 5 ug/L (which is below the 10 ug/L CRQL) and lead was not recovered in most of the ICS-As. Two samples, MJ2CA4 and MJ2CA5, had results less than 2 times the CRQL and were qualified as 'J', estimated (possible suppression due to high

CRQL results were within the general 70-130% (50-150% for ICP-AES antimony, lead, and thallium) recovery criteria; therefore no qualification was made on this basis.

11.0 Overall Assessment of the Data

For ILM05.3, the laboratory is required to flag all detected results below the CRQL with a 'J' concentration qualifier (result below the CRQL but above the MDL).

There were 115 data points reported: 14 results were qualified due to blank contamination, 13 results were qualified due to suspected interference, 5 results were qualified due to matrix spike recovery, and 10 results were qualified due to poor serial dilution results. Overall, 32 percent of the data was qualified (counting one qualification per analyte).

Below are the definitions for the National Functional Guidelines for Inorganic Data Review (07/02) qualifiers used when validating/qualifying data from Inorganic analysis.

DATA QUALIFIERS

- U - The material was analyzed for, but was not detected above the level of the reported sample quantitation limit.
- J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ - The result is an estimated quantity, but the result may be biased high*.
- J- - The result is an estimated quantity, but the result may be biased low*.
- R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
- UJ - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

* As this is a site investigation, the '+' and '-' bias modifiers to the J qualifier were not used. Instead, the 'H' and 'L' bias modifiers were used.

At the request of the site assessment manager, bias for the data was qualitatively assessed and if applicable, the following additional qualifiers were applied:

- L - Low bias.
- H - High bias.
- K - Unknown Bias.

Also, at the request of the site assessment manager, all results that have a laboratory 'J'

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ2C85

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 32858 SAS No. SDG No.: MJ2CA4

Matrix: (soil/water) SOIL Lab Sample ID: S2597-01

Level: (low/med) LOW Date Received: 05/18/2004

% Solids: 72.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10900			P
7440-36-0	Antimony	8.3	U		P
7440-38-2	Arsenic	0.53	J	U	P
7440-39-3	Barium	92.4			P
7440-41-7	Beryllium	0.24	J	BJK	P
7440-43-9	Cadmium	0.69	U	JK	P
7440-70-2	Calcium	4460			P
7440-47-3	Chromium	14.4			P
7440-48-4	Cobalt	13.7			P
7440-50-8	Copper	15.5		EJK	P
7439-89-6	Iron	18800			P
7439-92-1	Lead	1.4	U		P
7439-95-4	Magnesium	7260			P
7439-96-5	Manganese	178			P
7439-97-6	Mercury	0.14	U		CV
7440-02-0	Nickel	48.5			P
7440-09-7	Potassium	581	J	B-E JK	P
7782-49-2	Selenium	4.8	U		P
7440-22-4	Silver	1.4	U	N JK K	P
7440-23-5	Sodium	898			P
7440-28-0	Thallium	3.5	U		P
7440-62-2	Vanadium	54.5			P
7440-66-6	Zinc	28.4			P
57-12-5	Cyanide				NR

See 06/24/04

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM IA-IN

ILM05.3

B
SEP 07 2004

0009

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ2CA5

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM

Case No.: 32858

SAS No.

SDG No.: MJ2CA4

Matrix: (soil/water) SOIL

Lab Sample ID: S2597-05

Level: (low/med) LOW

Date Received: 05/18/2004

% Solids: 89.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14700			P
7440-36-0	Antimony	6.7	U		P
7440-38-2	Arsenic	0.89	U	UJK	P
7440-39-3	Barium	119			P
7440-41-7	Beryllium	0.35	U	BJK	P
7440-43-9	Cadmium	0.56	U	JK	P
7440-70-2	Calcium	3170			P
7440-47-3	Chromium	12.5			P
7440-48-4	Cobalt	12.9			P
7440-50-8	Copper	16.0		EJK	P
7439-89-6	Iron	18500			P
7439-92-1	Lead	2.0		UJK	P
7439-95-4	Magnesium	5810			P
7439-96-5	Manganese	392			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	32.7			P
7440-09-7	Potassium	586		EJK	P
7782-49-2	Selenium	3.9	U		P
7440-22-4	Silver	1.1	U	EJKK	P
7440-23-5	Sodium	351	U	BJK	P
7440-28-0	Thallium	2.8	U	JK	P
7440-62-2	Vanadium	49.2			P
7440-66-6	Zinc	31.3			P
57-12-5	Cyanide				NR

ML 06/24/04

Color Before: BROWN

Clarity Before:

Texture: MEDIUM

Color After: YELLOW

Clarity After:

Artifacts:

Comments:

B
SEP 07 2004

USEPA - CLP

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ2CA8

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 32858 SAS No. SDG No.: MJ2CA4

Matrix: (soil/water) SOIL Lab Sample ID: S2597-07

Level: (low/med) LOW Date Received: 05/18/2004

% Solids: 82.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	20100			P
7440-36-0	Antimony	7.2	U		P
7440-38-2	Arsenic	0.91	J	UJK	P
7440-39-3	Barium	130			P
7440-41-7	Beryllium	0.51	J	BJK	P
7440-43-9	Cadmium	0.60	U	JK	P
7440-70-2	Calcium	2030			P
7440-47-3	Chromium	11.0			P
7440-48-4	Cobalt	11.8			P
7440-50-8	Copper	14.3		BJK	P
7439-89-6	Iron	19000			P
7439-92-1	Lead	2.9			P
7439-95-4	Magnesium	3630			P
7439-96-5	Manganese	574			P
7439-97-6	Mercury	0.03	J	BJK	CV
7440-02-0	Nickel	25.5			P
7440-09-7	Potassium	547	J	BJK	P
7782-49-2	Selenium	4.2	U		P
7440-22-4	Silver	1.2	U	#JKK	P
7440-23-5	Sodium	198	J	BJK	P
7440-28-0	Thallium	3.0	U	JK	P
7440-62-2	Vanadium	45.5			P
7440-66-6	Zinc	40.2			P
57-12-5	Cyanide				NR

Handwritten signature

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

Handwritten mark

SEP 07 2004

USEPA - CLP

9-IN
METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068
 Lab Code: CHEM Case No.: 32858 SAS No. SDG No.: MJ2CA4
 Instrument Type: CV Instrument ID: CV Date: 02/21/2004
 Preparation Method: CS1
 Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Wavelength /Mass	CRQL	MDL
Aluminum		20	
Antimony		6	
Arsenic		1	
Barium		20	
Beryllium		0.5	
Cadmium		0.5	
Calcium		500	
Chromium		1	
Cobalt		5	
Copper		2.5	
Iron		10	
Lead		1	
Magnesium		500	
Manganese		1.5	
Mercury	253.70	0.1	0.030
Nickel		4	
Potassium		500	
Selenium		3.5	
Silver		1	
Sodium		500	
Thallium		2.5	
Vanadium		5	
Zinc		6	
Cyanide		2.5	

Comments:
 CV: LEE MAN PS200 HG ANALYZER
 LEE MAN HG ANALYZER



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10
1200 Sixth Avenue
Seattle, WA 98101

July 6, 2004

Reply To
Attn Of: OEA-095

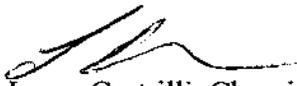
RECEIVED

JUL 08 2004

Per.....*B*.....

MEMORANDUM

SUBJECT: Camp Abbot FUDS Site, CLP Metals Analysis, Data Validation
Case: 32858
SDG: MJ2CA6

FROM: 
Laura Castrilli, Chemist
Technical Support Unit, OEA

TO: Ken Marcy, Site Assessment Manager
Office of Environmental Cleanup

CC: Bruce Woods, Region 10 CLP TPO
Adrienne Barnes, Weston Solutions Inc.
Greg Stuesse, Weston Solutions Inc.

The following is a validation of ICP-AES and mercury analyses of two water samples from the Camp Abbot FUDS site. The analyses were performed following the USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis Multi-media, Multi-Concentration, ILM05.3. Analyses were conducted by Chemtech Consulting Group, Mountainside, New Jersey. This validation was conducted for the samples MJ2C84 and MJ2CA6.

Data Qualifications

The following comments refer to Chemtech's performance in meeting quality control specifications outlined in the *CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.3 and the Functional Guidelines for Inorganic Data Review (July 2002)*; utilizing professional judgement of the reviewer. The comments presented herein are based on the information provided for the review.

following qualifications were made:

- ◆ Aluminum in all samples was qualified 'U', undetected.
- ◆ Barium in sample MJ2C84 was qualified 'U', undetected.
- ◆ Copper in all samples was qualified 'UJ', estimated detection limit.
- ◆ Mercury in all samples was qualified 'UJ', estimated detection limit.
- ◆ Zinc in all samples was qualified 'J', estimated.

Remaining analytes were greater than five times the associated blank levels (or were already undetected) and were not qualified based on blank contamination.

5.0 ICP-AES Interference Check Sample - Acceptable

The interference check sample (ICS) is analyzed by ICP-AES to verify interelement and background correction factors. Analysis is required at the beginning of each sample analysis run and recoveries must be between 80% and 120% or within ± 2 times the CRQL, whichever is greater. All ICS-A and ICS-AB recoveries for reported analytes were within the recovery criteria.

None of the samples had interfering levels of analytes, therefore no qualification was made based on suspected interference..

6.0 Laboratory Control Samples - Acceptable

Laboratory Control samples (LCS) are digested and analyzed along with the samples to verify the efficiency of laboratory procedures. All recoveries associated with reported sample results met the acceptance criteria for control samples; therefore no qualification was made on this basis.

7.0 Duplicate Analysis - Acceptable

Duplicate analysis was done on sample MJ2C84. Water duplicate results were within the $\pm 20\%$ Relative Percent Difference (RPD) or \pm CRQL criteria for results < 5 times the CRQL criteria; therefore no qualification was made on this basis.

8.0 Matrix Spike Analysis -

Matrix spike sample analyses are done to provide information about the effect of the sample matrix on digestion and measurement methods. Matrix spike recovery must be within the limits of 75 - 125%.

Matrix spike analysis was done on sample MJ2C84. All matrix spike recoveries were within the required QC limits; with the exception of silver (54%). Silver results were qualified 'J', estimated (low bias is suspected).

July 6, 2004

UJ - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

* As this is a site investigation, the '+' and '-' bias modifiers to the J qualifier were not used. Instead, the 'H' and 'L' bias modifiers were used.

At the request of the site assessment manager, bias for the data was qualitatively assessed and if applicable, the following additional qualifiers were applied:

L - Low bias.

H - High bias.

K - Unknown Bias.

Also, at the request of the site assessment manager, all results that have a laboratory 'J' concentration qualifier (result below the CRQL but above the MDL) were assigned a 'J' qualifier in the Q column of the Form 1 (no bias assessment for results only qualified based on concentration) to aid in the data entry process.

1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ2CA6

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068

Lab Code: CHEM Case No.: 32858 SAS No. SDG No.: MJ2CA6

Matrix: (soil/water) WATER Lab Sample ID: S2598-01

Level: (low/med) LOW Date Received: 05/18/2004

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	118	#	U	P
7440-36-0	Antimony	60.0	U		P
7440-38-2	Arsenic	10.0	U		P
7440-39-3	Barium	200	U		P
7440-41-7	Beryllium	5.0	U		P
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium	5640			P
7440-47-3	Chromium	1.2	#	BJK	P
7440-48-4	Cobalt	50.0	U		P
7440-50-8	Copper	25.0	U	JK	P
7439-89-6	Iron	216			P
7439-92-1	Lead	10.0	U		P
7439-95-4	Magnesium	2310	#	BJK	P
7439-96-5	Manganese	15.5			P
7439-97-6	Mercury	0.20	U	JK	CV
7440-02-0	Nickel	40.0	U		P
7440-09-7	Potassium	993	#	B=JK	P
7782-49-2	Selenium	35.0	U		P
7440-22-4	Silver	10.0	U	#JKK	P
7440-23-5	Sodium	3410	#	BJK	P
7440-28-0	Thallium	25.0	U		P
7440-62-2	Vanadium	6.8	#	BJK	P
7440-66-6	Zinc	9.7	#	BJK	P
57-12-5	Cyanide				NR

See 3/3/04

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

USEPA - CLP

9-IN

METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: CHEMTECH CONSULTING GROUP Contract: 68-W0-2068
 Lab Code: CHEM Case No.: 32858 SAS No. SDG No.: MJ2CA6
 Instrument Type: P Instrument ID: P2 Date: 07/02/2003
 Preparation Method: HW1
 Concentration Units (ug/L or mg/kg): UG/L

Analyte	Wavelength /Mass	CRQL	MDL
Aluminum	308.20	200	14.0
Antimony	206.80	60	7.0
Arsenic	189.00	10	3.5
Barium	493.40	200	7.4
Beryllium	313.00	5	0.49
Cadmium	226.50	5	0.57
Calcium	317.90	5000	6.1
Chromium	267.70	10	1.1
Cobalt	228.60	50	2.1
Copper	324.70	25	2.5
Iron	271.40	100	15.4
Lead	220.40	10	3.7
Magnesium	279.00	5000	13.9
Manganese	257.60	15	0.46
Mercury		0.2	
Nickel	231.60	40	2.8
Potassium	766.50	5000	52.2
Selenium	196.00	35	4.2
Silver	328.00	10	1.4
Sodium	588.90	5000	706
Thallium	190.90	25	7.0
Vanadium	292.40	50	0.85
Zinc	206.20	60	0.59
Cyanide		10	

Comments:

P2: ICP 61E TRACE ANALYZER

FORM IX-IN

ILM05.3

0032

MEL DATA



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

RECEIVED

OCT 05 2004

Per... (3)

MEMORANDUM

SUBJECT: Data Release for Classical Chemistry Results from the Region 10
Manchester Environmental Laboratory.

PROJECT NAME: Camp Abbott

PROJECT CODE: TEC-831A

FROM: Linda Anderson-Carnahan
Director

TO: Ken Marcy
Project Officer

I have authorized release of this data package. Attached you will find the perchlorate results for the Camp Abbott project for one sample collected on 5/14/2004. This is the last of the data associated with this project. For further information regarding the attached data, contact Kathy Parker at 360-871-8716.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

IMPORTANT INFORMATION REGARDING ATTACHED FILE

This file contains data that is readable into Lotus, Excel, WordPerfect, or most databases.

You will need access to PKUNZIP or WINZIP to decompress the file. Once "unzipped" there will be one large file (more appropriate for importing into a database) with the project code as the file name. The fields will be in the following order:

Project ID	Analyte	Matrix
Sample ID	Result	Sample Type Description
Sample Type	Units Code	Sample Description
Parameter Code	Qualifier	Version (Date this file was created)
Analyte Code	Date Collection End	

There will also be multiple smaller files with names such as "METQ1-1.txt," "GENSA-1.txt," "BNASA-1.txt," etc. These files are meant to be imported into Lotus or Excel. To open select File/Open and select file type TEXT or .TXT.

The naming convention is as follows: SSSSTT-#.TXT

Where:

- SSSS: Metals (MET), General (GEN), GCMS(BNA, VOA, BNAT, VOAT), GC(GC)
- TT: Sample Data (SA, Blanks (Q1), Matrix spikes/controls (Q2), Duplicates (Q3)
- #: If the table size exceeds 256 columns then the files will be split into multiple smaller files with sequential numbering. Lotus and Excel can only handle 256 columns.

Sample information appears in the following order:

Sample ID
Sample Description
Sample Type
Matrix
Units

(It will be indicated if a cell contains data of units other than the default.)

Analyte information appears in the following order:

Parameter ID
Method Code
Analyte Code
Analyte Name

For General (also called Classical) and FASP data, sample information appears down the side. All other data has the sample information appearing across the top.

Any questions/suggestions should be e-mailed to Tony Morris at morris.tony@epa.gov.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

MEMORANDUM

DATE: June 7, 2004
TO: Ken Marcy, Project Manager
FROM: M.K.Parker, Manchester Laboratory Chemist
SUBJECT: Perchlorate Analyses for Camp Abbott Project (TEC-831A)
for Water Sample 04204007

The following is a quality assurance data review of classical chemistry analyses performed at the Manchester Laboratory. The analyses were performed following USEPA and laboratory guidelines at the USEPA Manchester Environmental Laboratory (MEL), Port Orchard, WA.

All Manchester Environmental Laboratory quality assurance criteria for the analyses were met (holding time, calibration correlation coefficient, method blank, initial and continuing calibration verification, independent calibration verification, sample duplication and matrix spike duplication) without exception.

Instrument results below the method detection limit for each analysis are qualified (U) to indicate to the data user that if the analyte is present in the samples, the concentration is below the minimum level at which the laboratory has established the practical quantitation limit.

Questions concerning the data may be directed to Kathy Parker at the Manchester Environmental Laboratory by either email (parker.katherine@epa.gov) or telephone (360.871.8716).

USEPA Manchester Environmental Laboratory Classical Chemistry QC Criteria

Analyte in water sample	Instrument Precision Check	Laboratory Control Sample	Laboratory Fortified Blank	Matrix Spike / Duplicate Spike	Duplicate Precision (or if <5xRL, Diff<RL)	Holding Time
Alkalinity, Nitrate in Drinking water, Nitrite in Drinking water, Orthophosphate in Drinking Water, TKN in Drinking water	90-110%	90-110%	90-110%	90-110%	RPD<20%	14 days 48 hours 48 hours 48 hours 28 days
Ammonia, Cyanide, TOC	90-110%	85-115%	90-110%	75-125%	RPD<20%	28 days 14 days 28 days
Anions, Hardness, Hexachrome, Mercury by 245.1, NO ₂ +NO ₃ , Perchlorate, Silica, Total Phosphorus, TKN,	90-110%	90-110%	90-110%	75-125%	RPD<20%	28 days 28 days 28 days 28 days 24 hours 6 months 6 months 28 days
BOD	90-110%	80-120%	NA	NA	RPD<20%	48 hours
Conductivity	90-110%	90-110%	NA	NA	RPD<20%	Immediate
Cyanide in Drinking Water	90-110%	85-115%	90-110%	90-110%	RPD<20%	14 days
Chlorate, Chlorite, Bromate	>10xMRL: 85-115% <10xMRL: 75-125%	85-115%	90-110%	75-125%	RPD<20% Surrogate: 90-110%, PGF:0.8-1.15	28 days 28 days 28 days
Flashpoint	NA	25 to 31C	NA	NA	NA	none
Mercury by 1631E	79-121%			71-125%	RPD<24%	90 days
Nitrate, Nitrite, Orthophosphate	90-110%	80-120%	90-110%	75-125%	RPD<20%	48 hours 48 hours 48 hours
O&G	NA	78-114%	NA	78-114%	RPD<18%	28 days
pH	+/-0.05	+/-0.1	NA	NA	DUP: +/-0.1	Immediate
Solids, Turbidity, Water by KF	NA	90-110%	NA	NA	RPD<20%	7 days immediate none
Sulfide	NA	80-120%	NA	75-125%	RPD<20%	7 days

LABORATORY QUALIFIER/REMARK CODE DEFINITIONS

Qualifier/ Remark Code	Definition (Codes Assigned To Values)
<	Flash Point – The expected flash point temperature is less than the reported value.
>	Flash Point – If the sample has a flashpoint, it is greater than the reported value.
J	The identification of the analyte is acceptable; the reported value is an estimate.
JK	The identification of the analyte is acceptable; the reported value is an estimate and may be <u>biased high</u> . The actual value is expected to be less than the reported value.
JL	The identification of the analyte is acceptable; the reported value is an estimate and may be <u>biased low</u> . The actual value is expected to be greater than the reported value.
K	The identification of the analyte is acceptable; the reported value may be <u>biased high</u> . The actual value is expected to be less than the reported value.
L	The identification of the analyte is acceptable; the reported value may be <u>biased low</u> . The actual value is expected to be greater than the reported value.
NJ	There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.
U	The analyte was not detected at or above the reported value.
UJ	The analyte was not detected at or above the reported value. The reported value is an estimate.
A	Absent – The target parameter was analyzed for but was not present or was undetected. <u>No value is reported with this qualification.</u>
NA	Not Applicable, the parameter was not analyzed for, or there is no analytical result for this parameter. <u>No value is reported with this qualification.</u>
R	The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable. <u>No value is reported with this qualification.</u>

NOTE: For any qualifier code see the QA memo or case narrative for a more detailed description of its use.

Manchester Environmental Laboratory
Report by Parameter for Project TEC-831A

Project Code: TEC-831A
Project Name: CAMP ABBOTT
Project Officer: KEN MARCY
Account Code: 04T10P302DD2C10ZZLA00
Station Description: CAFD-GW-MW001-0000

Collected: 5/14/04
Matrix: Liquid
Sample Number: 04204007
Type: Reg sample

			Result	Units	Olfr
GEN					
Parameter	:	Perchlorate			
Method	:	314.0	Perchlorate		
Prep Method	:	314.0			
Analyte(s)	:	*90180	Perchlorate	2.0	ug/L U

B
OCT 06 2004

Manchester Environmental Laboratory
Report by Parameter for Project TEC-831A

Project Code: TEC-831A
Project Name: CAMP ABBOTT
Project Officer: KEN MARCY
Account Code: 04T10P302DD2C10ZZLA00
Station Description:

Collected:
Matrix: Liquid
Sample Number: 04204007
Type: Duplicate

			<u>Result</u>	<u>Units</u>	<u>Qlfr</u>
GEN					
Parameter	: Perchlorate				
Method	: 314.0	Perchlorate			
Prep Method	: 314.0				
Analyte(s)	: *90180	Perchlorate	2.0	ug/L	U

B
OCT 06 2004

Manchester Environmental Laboratory

Report by Parameter for Project TEC-831A

Project Code: TEC-831A
Project Name: CAMP ABBOTT
Project Officer: KEN MARCY
Account Code: 04T10P302DD2C10ZZLA00
Station Description:

Collected:
Matrix: Liquid
Sample Number: 04204007
Type: Matrix Spike

		Result	Units	Olfr
GEN				
Parameter	: Perchlorate			
Method	: 314.0	Perchlorate		
Prep Method	: 314.0			
Surrogate(s)	: *90180	Perchlorate	100	%Rec

B
OCT 06 2004

Manchester Environmental Laboratory
Report by Parameter for Project TEC-831A

Project Code: TEC-831A
Project Name: CAMP ABBOTT
Project Officer: KEN MARCY
Account Code: 04T10P302DD2C10ZZLA00
Station Description:

Collected:
Matrix: Liquid
Sample Number: 04204007
Type: Matrix Spike Dupl

			Result	Units	Qlfr
GEN					
Parameter	: Perchlorate				
Method	: 314.0	Perchlorate			
Prep Method	: 314.0				
Surrogate(s)	: *90180	Perchlorate	103	%Rec	

B
OCT 06 2004

Manchester Environmental Laboratory

Report by Parameter for Project TEC-831A

Project Code: TEC-831A
Project Name: CAMP ABBOTT
Project Officer: KEN MARCY
Account Code: 04T10P302DD2C10ZZLA00
Station Description:

Collected:
Matrix: Liquid
Sample Number: CW040601A
Type: Blank

			Result	Units	Qlfr
GEN					
Parameter	:	Perchlorate			
Method	:	314.0	Perchlorate		
Prep Method	:	314.0			
Analyte(s)	:	*90180	2.0	ug/L	U

B2
OCT 06 2004

Manchester Environmental Laboratory
Report by Parameter for Project TEC-831A

Project Code: TEC-831A
Project Name: CAMP ABBOTT
Project Officer: KEN MARCY
Account Code: 04T10P302DD2C10ZZLA00
Station Description:

Collected:
Matrix: Liquid
Sample Number: CW040601A
Type: Control

			Result	Units	Qlfr
GEN					
Parameter	:	Perchlorate			
Method	:	314.0	Perchlorate		
Prep Method	:	314.0			
Surrogate(s)	:	*90180	Perchlorate	107	%Rec

B
OCT 06 2004

LAUCKS DATA

Sample Results

CAFB1

Ordinance by Method 8330

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

GW-MW001-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) WATER

Lab Sample ID: 0405253-01

Sample wt/vol: 1020 (g/ml) ml

Lab File ID: O5260435.D

% Moisture: N/A

Date Collected: 05/14/04

Extraction: SOLIDPHASE

Date Received: 05/18/04

Concentrated Extract Volume: 5000 (uL)

Date Prepared: 05/21/04

Dilution Factor: 2.0

Date Analyzed: 05/27/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	ug/L	Q	RL
2691-41-0	HMX	0.49	U	0.49
121-82-4	RDX	0.49	U	0.49
99-35-4	1,3,5-Trinitrobenzene	0.49	U	0.49
99-65-0	1,3-Dinitrobenzene	0.49	U	0.49
479-45-8	Tetryl	0.49	U	0.49
98-95-3	Nitrobenzene	0.49	U	0.49
118-96-7	2,4,6-Trinitrotoluene	0.49	U	0.49
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.49	U	0.49
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.49	U	0.49
606-20-2	2,6-Dinitrotoluene	0.49	U	0.49
121-14-2	2,4-Dinitrotoluene	0.49	U	0.49
88-72-2	2-Nitrotoluene	0.49	U	0.49
99-99-0	4-Nitrotoluene	0.49	U	0.49
99-08-1	3-Nitrotoluene	0.49	U	0.49

B
SEP 03 2004

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 13

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SD-BK001-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-02

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260405.D

% Moisture: 0

Date Collected: 05/16/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 16

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SD-DP001-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-03

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260406.D

% Moisture: 0

Date Collected: 05/16/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 21

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SD-GC001-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-04

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260407.D

% Moisture: 0

Date Collected: 05/16/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS.NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SS-BK001-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-05

Sample wt/vol: 5 (g/ml) g

Lab File ID: 05260408.D

% Moisture: 0

Date Collected: 05/16/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 31

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SS-DP001-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-06

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260409.D

% Moisture: 0

Date Collected: 05/15/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 34

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SS-DP002-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-07

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260413.D

% Moisture: 0

Date Collected: 05/15/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 39

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SS-DP003-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-08

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260414.D

% Moisture: 0

Date Collected: 05/15/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 42

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SS-GC001-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-09

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260415.D

% Moisture: 0

Date Collected: 05/16/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 47

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SS-GC002-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-10

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260416.D

% Moisture: 0

Date Collected: 05/16/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE ID

SS-GC003-0000

Lab Name: LAUCKS TESTING LABS

SDG No.: CAFB1

Matrix: (soil/water) SOIL

Lab Sample ID: 0405253-11

Sample wt/vol: 5 (g/ml) g

Lab File ID: O5260417.D

% Moisture: 0

Date Collected: 05/16/04

Extraction: SONC

Date Received: 05/18/04

Concentrated Extract Volume: 20000 (uL)

Date Prepared: 05/20/04

Dilution Factor: 1.0

Date Analyzed: 05/26/04

CONCENTRATION UNITS:

CAS NO.	COMPOUND	mg/Kg	Q	RL
2691-41-0	HMX	0.20	U	0.20
121-82-4	RDX	0.20	U	0.20
99-35-4	1,3,5-Trinitrobenzene	0.20	U	0.20
99-65-0	1,3-Dinitrobenzene	0.20	U	0.20
479-45-8	Tetryl	0.20	U	0.20
98-95-3	Nitrobenzene	0.20	U	0.20
118-96-7	2,4,6-Trinitrotoluene	0.20	U	0.20
1946-51-0	4-Amino-2,6-Dinitrotoluene	0.20	U	0.20
35572-78-2	2-Amino-4,6-Dinitrotoluene	0.20	U	0.20
606-20-2	2,6-Dinitrotoluene	0.20	U	0.20
121-14-2	2,4-Dinitrotoluene	0.20	U	0.20
88-72-2	2-Nitrotoluene	0.20	U	0.20
99-99-0	4-Nitrotoluene	0.20	U	0.20
99-08-1	3-Nitrotoluene	0.20	U	0.20

RL = Reporting Limit

RESULT FORM

FormVer 1.0 11/23/96

ORD - 55

APPENDIX E

SUNRIVER WATER LLC MUNICIPAL WELL #2 HISTORICAL ANALYTICAL DATA



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
 425.420.9200 fax 425.420.9210
 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
 509.924.9200 fax 509.924.9290
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503.906.9200 fax 503.906.9210
 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588
 Anchorage 3209 Denali Street, Anchorage, AK 99503
 907.334.9200 fax 907.334.9210

Drinking Water Analysis Results

SYSTEM IDENTIFICATION	
System:	Sunriver Environmental L.L.C.
Address:	PO Box 3699
City, State, Zip:	Sunriver OR, 97707

SAMPLE IDENTIFICATION			
Pws Id #:	00846	Source ID:	B
		Source Name:	Well #2
Sampled At:	Well #2	Sampled By:	<i>Jeff Grafton</i>
Date Collected:	10/21/2003	Time Collected:	1:30 pm
		Date Received:	10/21/2003
Sample Composition:	Raw	Source	Single
Lab Sample ID:	C310087-02	Receiving Laboratory:	North Creek Analytical - Bend
		ORLAP#:	100020

SAMPLE RESULTS (mg/L)								
Inorganic Compounds - IOCs								
Contaminant	Code	MCL (mg/L)	Result (mg/L)	Method	Analyzed	Analyst	Lab	OR Cert#
Arsenic	1005	0.05	0.00431	EPA 200.8	11/05/2003	mp	NCAP	100021

Teresa Mireles

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Teresa Mireles, Client Services

North Creek Analytical, Inc.
Environmental Laboratory Network



STL

STL Richland
 2800 George Washington Way
 Richland, WA 99352
 (509) 375-3131
 ORELAP ID No. WA100002

System ID#: 4100846	Source ID: B	Source Name(s): Well #2
Water System: Sun River Water LLC		
Address: PO Box 3699		
City: Sun River	State: OR	Zip: 97707
Sample Identification		
Single Sample <input checked="" type="checkbox"/>	Four Year Resample <input type="checkbox"/>	Composite of Quarterly Samples <input type="checkbox"/>
Sampled at: Well #2	Sampled by: Jeff Grafton	
Date(s) Collected: 9/16/03	Time Collected: 0935	
Date Received: 9/18/03	Date Analyzed: 10/13/03	
Sample Characteristic: Treated Water <input type="checkbox"/>	Raw or From Source or Distribution <input type="checkbox"/>	Single or Combined Source <input type="checkbox"/>
Lab Sample ID #: C309087-2, J3I180292, F0MQ5, 23958		

Contaminant	Code	MCL pCi/l	Analysis pCi/l	Method	Analyst
Gross Alpha	4000	15		EPA 900.0	
Combined Radium 226/228	4010	5	ND @ 0.174	EPA 903.0	GEK
Combined Uranium	4006	30	0.12 (MDA=0.009) ug/L	ASTM D5174	GEK
Gross Beta	4100	50		EPA 900.0	

ND=MDA Indicates the analyte was measured and was not detected at a level greater than or equal to the Minimum Detectable Amount (MDA).

--All quality controls are within contractual requirements.

UMPQUA Research Company

P.O. Box 609 - 626 Division Street

Myrtle Creek, OR 97457

(541) 863-5201 Fax: (541) 863-6199

ANALYSIS REPORT

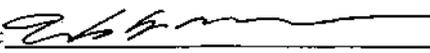
ORELAP ID# OR100031	Date Reported: 10/31/03
PWS#: 4100846	Date Collected: 10/21/03
Source Name: Well #2	Time Collected: 1:30 PM
Source ID: B	Sampled By: Jeff Grafton

North Creek Analytical - Bend 20332 Empire Avenue Suite F-1 Bend, OR 97701	Invoice# 14764
---	--------------------------

Synthetic Organic Chemicals (SOC's) Matrix: **Drinking Water**

URC Sample #:		31022-35							
Sample ID:		C310087-02				Date		Date	
Regulated Analyte	Code/Method	Results	[Q]	Units	MCL	Extracted	Analyzed	Analyst	
2,4-D(†)	2105 / 515.2	ND@0.0002		mg/L	0.07	10/29/03	10/29/03	JCN	
2,4,5-TP (Silvex)(†)	2110 / 515.2	ND@0.0004		mg/L	0.05	10/29/03	10/29/03	JCN	
Bis(2-ethylhexyl)adipate(†)	2035 / 525.2	ND@0.001		mg/L	0.4	10/28/03	10/29/03	JCN	
Alachlor (Lasso)(†)	2051 / 525.2	ND@0.0004		mg/L	0.002	10/28/03	10/29/03	JCN	
Atrazine(†)	2050 / 525.2	ND@0.0002		mg/L	0.003	10/28/03	10/29/03	JCN	
Benzo(a)pyrene(†)	2306 / 525.2	ND@0.00004		mg/L	0.0002	10/28/03	10/29/03	JCN	
BHC-gamma (Lindane)(†)	2010 / 525.2	ND@0.00002		mg/L	0.0002	10/28/03	10/29/03	JCN	
Chlordane(†)	2959 / 508.1	ND@0.0004		mg/L	0.002	10/28/03	10/28/03	JCN	
Dinoseb(†)	2041 / 515.2	ND@0.0004		mg/L	0.007	10/29/03	10/29/03	JCN	
Endothall(†)	2033 / 548.1	ND@0.01		mg/L	0.1	10/24/03	10/30/03	BEM	
Endrin(†)	2005 / 525.2	ND@0.00002		mg/L	0.002	10/28/03	10/29/03	JCN	
Heptachlor epoxide(†)	2067 / 525.2	ND@0.00002		mg/L	0.0002	10/28/03	10/29/03	JCN	
Heptachlor(†)	2065 / 525.2	ND@0.00004		mg/L	0.0004	10/28/03	10/29/03	JCN	
Hexachlorobenzene(†)	2274 / 525.2	ND@0.0001		mg/L	0.001	10/28/03	10/29/03	JCN	
Hexachlorocyclopentadiene(†)	2042 / 525.2	ND@0.0002		mg/L	0.05	10/28/03	10/29/03	JCN	
Methoxychlor(†)	2015 / 525.2	ND@0.0002		mg/L	0.04	10/28/03	10/29/03	JCN	
Pentachlorophenol(†)	2326 / 515.2	ND@0.00008		mg/L	0.001	10/29/03	10/29/03	JCN	
Bis(2-ethylhexyl)phthalate(†)	2039 / 525.2	ND@0.0013		mg/L	0.006	10/28/03	10/29/03	JCN	
Picloram(†)	2040 / 515.2	ND@0.0002		mg/L	0.5	10/29/03	10/29/03	JCN	
Polychlorinatedbiphenyls-PCBs(†)	2383 / 508.1	ND@0.0002		mg/L	0.0005	10/28/03	10/28/03	JCN	
Simazine(†)	2037 / 525.2	ND@0.0001		mg/L	0.004	10/28/03	10/29/03	JCN	
Toxaphene(†)	2020 / 508.1	ND@0.001		mg/L	0.003	10/28/03	10/28/03	JCN	
Unregulated Analytes									
Aldrin(†)	2356 / 525.2	ND@0.0001		mg/L		10/28/03	10/29/03	JCN	
Butachlor(†)	2076 / 525.2	ND@0.001		mg/L		10/28/03	10/29/03	JCN	
Dicamba(†)	2440 / 515.2	ND@0.0005		mg/L		10/29/03	10/29/03	JCN	
Dieldrin(†)	2070 / 525.2	ND@0.0001		mg/L		10/28/03	10/29/03	JCN	
Metolachlor(†)	2045 / 525.2	ND@0.002		mg/L		10/28/03	10/29/03	JCN	
Metribuzin(†)	2595 / 525.2	ND@0.001		mg/L		10/28/03	10/29/03	JCN	
Propachlor(†)	2077 / 525.2	ND@0.001		mg/L		10/28/03	10/29/03	JCN	

(†) Accredited in accordance with NELAP MCL - Maximum Contaminant Level ND - None Detected
 [Q] Qualifier: B= Analyte Detected in LMB; E= Estimate, Outside Calibration Range; M= Possible Matrix Effect; X= See Case Narrative

Approved By:  Laboratory Manager



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
 425.420.9200 fax 425.420.9210
 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
 509.924.9200 fax 509.924.9290
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503.906.9200 fax 503.906.9210
 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588
 Anchorage 3209 Denali Street, Anchorage, AK 99503
 907.334.9200 fax 907.334.9210

Drinking Water Analysis Results

SYSTEM IDENTIFICATION	
System:	Sunriver Environmental L.L.C.
Address:	PO Box 3699
City, State, Zip:	Sunriver OR, 97707

SAMPLE IDENTIFICATION			
Pws Id #:	00846	Source ID:	B
		Source Name:	Well #2
Sampled At:	Well #2	Sampled By:	<i>Jeff Grafton</i>
Date Collected:	10/21/2003	Time Collected:	1:30 pm
		Date Received:	10/21/2003
Sample Composition:	Raw	Source	Single
Lab Sample ID:	C310087-02	Receiving Laboratory:	North Creek Analytical - Bend
		ORLAP#:	100020

SAMPLE RESULTS (mg/L)								
Volatile Organic Compounds - Regulated VOCs								
Contaminant	Code	MCL (mg/L)	Result (mg/L)	Method	Analyzed	Analyst	Lab	OR Cert#
1,1-Dichloroethylene	2977	0.007	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,1,1-Trichloroethane	2981	0.2	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,1,2-Trichloroethane	2985	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,2-Dichloroethane	2980	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,2-Dichloropropane	2983	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,2,4-Trichlorobenzene	2378	0.07	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Benzene	2990	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Carbon tetrachloride	2982	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
cis-1,2-Dichloroethylene	2380	0.07	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Dichloromethane	2964	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Ethylbenzene	2992	0.7	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Monochlorobenzene	2989	0.1	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
o-Dichlorobenzene	2968	0.6	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
p-Dichlorobenzene	2969	0.075	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Styrene	2996	0.1	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Tetrachloroethylene	2987	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Toluene	2991	1.0	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
trans-1,2-Dichloroethylene	2979	0.1	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Teresa Mireles

Teresa Mireles, Client Services

North Creek Analytical, Inc.
Environmental Laboratory Network



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
 425.420.9200 fax 425.420.9210
 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
 509.924.9200 fax 509.924.9290
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503.906.9200 fax 503.906.9210
 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588
 Anchorage 3209 Denali Street, Anchorage, AK 99503
 907.334.9200 fax 907.334.9210

Drinking Water Analysis Results

SYSTEM IDENTIFICATION	
System:	Sunriver Environmental L.L.C.
Address:	PO Box 3699
City, State, Zip:	Sunriver OR, 97707

SAMPLE IDENTIFICATION			
Pws Id #:	00846	Source ID:	B
		Source Name:	Well #2
Sampled At:	Well #2	Sampled By:	<i>Jeff Grafton</i>
Date Collected:	10/21/2003	Time Collected:	1:30 pm
		Date Received:	10/21/2003
Sample Composition:	Raw	Source	Single
Lab Sample ID:	C310087-02	Receiving Laboratory:	North Creek Analytical - Bend
		ORLAP#:	100020

SAMPLE RESULTS (mg/L)								
Volatile Organic Compounds - Regulated VOCs								
Contaminant	Code	MCL (mg/L)	Result (mg/L)	Method	Analyzed	Analyst	Lab	OR Cert#
Trichloroethylene	2984	0.005	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Total Xylenes	2955	10.0	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Vinyl chloride	2976	0.002	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021

Teresa Mireles

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Teresa Mireles, Client Services

North Creek Analytical, Inc.
Environmental Laboratory Network



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
 425.420.9200 fax 425.420.9210
 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
 509.924.9200 fax 509.924.9290
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503.906.9200 fax 503.906.9210
 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588
 Anchorage 3209 Denali Street, Anchorage, AK 99503
 907.334.9200 fax 907.334.9210

Drinking Water Analysis Results

SYSTEM IDENTIFICATION	
System:	Sunriver Environmental L.L.C.
Address:	PO Box 3699
City, State, Zip:	Sunriver OR, 97707

SAMPLE IDENTIFICATION			
Pws Id #:	00846	Source ID:	B
		Source Name:	Well #2
Sampled At:	Well #2	Sampled By:	<i>Jeff Grafton</i>
Date Collected:	10/21/2003	Time Collected:	1:30 pm
		Date Received:	10/21/2003
Sample Composition:	Raw	Source	Single
Lab Sample ID:	C310087-02	Receiving Laboratory:	North Creek Analytical - Bend
		ORLAP#:	100020

SAMPLE RESULTS (mg/L)								
Volatile Organic Compounds - Unregulated VOCs								
Contaminant	Code	MCL (mg/L)	Result (mg/L)	Method	Analyzed	Analyst	Lab	OR Cert#
1,1-Dichloroethane	2978	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,1-Dichloropropene	2410	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,1,1,2-Tetrachloroethane	2986	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,1,2,2-Tetrachloroethane	2988	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
1,3-Dichloropropane	2412	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
2,2-Dichloropropane	2416	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Bromobenzene	2993	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Bromodichloromethane	2943	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Bromoform	2942	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Bromomethane	2214	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Chloroethane	2216	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Chloroform	2941	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Chloromethane	2210	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
o-Chlorotoluene	2965	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
p-Chlorotoluene	2966	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Dibromochloromethane	2944	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
Dibromomethane	2408	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
m-Dichlorobenzene	2967	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021

Teresa Mireles

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Teresa Mireles, Client Services

North Creek Analytical, Inc.
Environmental Laboratory Network



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
 425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
 509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588
Anchorage 3209 Denali Street, Anchorage, AK 99503
 907.334.9200 fax 907.334.9210

Drinking Water Analysis Results

SYSTEM IDENTIFICATION	
System:	Sunriver Environmental L.L.C.
Address:	PO Box 3699
City, State, Zip:	Sunriver OR, 97707

SAMPLE IDENTIFICATION			
Pws Id #:	00846	Source ID:	B
		Source Name:	Well #2
Sampled At:	Well #2	Sampled By:	Jeff Gradden
Date Collected:	10/21/2003	Time Collected:	1:30 pm
		Date Received:	10/21/2003
Sample Composition:	Raw	Source	Single
Lab Sample ID:	C310087-02	Receiving Laboratory:	North Creek Analytical - Bend
		ORLAP#:	100020

SAMPLE RESULTS (mg/L)								
Volatile Organic Compounds - Unregulated VOCs								
Contaminant	Code	MCL (mg/L)	Result (mg/L)	Method	Analyzed	Analyst	Lab	OR Cert#
cis-1,3-Dichloropropene	2413	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021
trans-1,3-Dichloropropene	2224	NA	ND@0.000500	EPA 524.2	10/28/2003	dwm	NCAP	100021

Teresa Mireles

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Teresa Mireles, Client Services

North Creek Analytical, Inc.
Environmental Laboratory Network



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
 425.420.9200 fax 425.420.9210
 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
 509.924.9200 fax 509.924.9290
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503.906.9200 fax 503.906.9210
 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588
 Anchorage 3209 Denali Street, Anchorage, AK 99503
 907.334.9200 fax 907.334.9210

Drinking Water Analysis Results

SYSTEM IDENTIFICATION	
System:	Sunriver Environmental L.L.C.
Address:	PO Box 3699
City, State, Zip:	Sunriver OR, 97707

SAMPLE IDENTIFICATION			
Pws Id #:	00846	Source ID:	B
		Source Name:	Well #2
Sampled At:	Well #2	Sampled By:	<i>Jeff Grafton</i>
Date Collected:	10/21/2003	Time Collected:	1:30 pm
		Date Received:	10/21/2003
Sample Composition:	Raw	Source	Single
Lab Sample ID:	C310087-02	Receiving Laboratory:	North Creek Analytical - Bend
		ORLAP#:	100020

SAMPLE RESULTS (mg/L)								
Synthetic Organic Compounds - Regulated SOCs								
Contaminant	Code	MCL (mg/L)	Result (mg/L)	Method	Analyzed	Analyst	Lab	OR Cert#
Carbofuran	2046	0.04	ND@0.000900	EPA 531.2	10/30/2003	BRB	NCAP	100021
Dalapon	2031	0.2	ND@0.00100	EPA 552.2	10/29/2003	BRB	NCAP	100021
Dibromochloropropane	2931	0.0002	ND@0.0000200	EPA 504.1	10/25/2003	BRB	NCAP	100021
Diquat	2032	0.02	ND@0.000400	EPA 549.2	10/24/2003	BRB	NCAP	100021
Ethylene Dibromide (EDB)	2946	0.00005	ND@0.0000100	EPA 504.1	10/25/2003	BRB	NCAP	100021
Glyphosate	2034	0.7	ND@0.00500	EPA 547	10/27/2003	BRB	NCAP	100021
Vydate	2036	0.2	ND@0.00190	EPA 531.2	10/30/2003	BRB	NCAP	100021

Teresa Mireles

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Teresa Mireles, Client Services

North Creek Analytical, Inc.
Environmental Laboratory Network



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
 425.420.9200 fax 425.420.9210
 Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
 509.924.9200 fax 509.924.9290
 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
 503.906.9200 fax 503.906.9210
 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588
 Anchorage 3209 Denali Street, Anchorage, AK 99503
 907.334.9200 fax 907.334.9210

Drinking Water Analysis Results

SYSTEM IDENTIFICATION	
System:	Sunriver Environmental L.L.C.
Address:	PO Box 3699
City, State, Zip:	Sunriver OR, 97707

SAMPLE IDENTIFICATION			
Pws Id #:	00846	Source ID:	B
		Source Name:	Well #2
Sampled At:	Well #2	Sampled By:	<i>Jeff Grafton</i>
Date Collected:	10/21/2003	Time Collected:	1:30 pm
		Date Received:	10/21/2003
Sample Composition:	Raw	Source	Single
Lab Sample ID:	C310087-02	Receiving Laboratory:	North Creek Analytical - Bend
		ORLAP#:	100020

SAMPLE RESULTS (mg/L)								
Synthetic Organic Compounds - Unregulated SOCs								
Contaminant	Code	MCL (mg/L)	Result (mg/L)	Method	Analyzed	Analyst	Lab	OR Cert#
3-Hydroxycarbofuran	2066	NA	ND@0.000990	EPA 531.2	10/30/2003	BRB	NCAP	100021
Aldicarb	2047	NA	ND@0.00123	EPA 531.2	10/30/2003	BRB	NCAP	100021
Aldicarb sulfone	2044	NA	ND@0.00134	EPA 531.2	10/30/2003	BRB	NCAP	100021
Aldicarb sulfoxide	2043	NA	ND@0.00202	EPA 531.2	10/30/2003	BRB	NCAP	100021
Carbaryl	2021	NA	ND@0.00111	EPA 531.2	10/30/2003	BRB	NCAP	100021
Methomyl	2022	NA	ND@0.000970	EPA 531.2	10/30/2003	BRB	NCAP	100021
1,2,3-Trichloropropane	2414	NA	ND@0.0000200	EPA 504.1	10/25/2003	BRB	NCAP	100021

Teresa Mireles

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Teresa Mireles, Client Services

North Creek Analytical, Inc.
Environmental Laboratory Network

UMPQUA Research Company

P.O. Box 609 - 626 Division Street

Myrtle Creek, OR 97457

(541) 863-5201 Fax: (541) 863-6199

REPORT

OREGON STATE CERTIFIED LAB #015 PWS#: 4100846 Source Name: Sampled At:	Date Reported: 10/30/00 Date Collected: 10/24/00 Time Collected: 11:10 AM Sampled By: Jeff Grafton
--	---

North Creek Analytical - Bend 20332 Empire Avenue Suite F-1 Bend, OR 97701	C010194-01 Well #2 Souce B PWS#4100846,	Invoice# 4447
---	--	------------------

Volatile Organic Chemicals (VOC's)	Method: EPA 524.2	Matrix: Water
URC Sample #: 201025-22 Sample ID: C010194-01	Date Analyzed: 10/26/00 Analyst: BKO	

REGULATED ANALYTES	Code	Results mg/L	MCL mg/L
1,1-Dichloroethylene	2977	ND@0.0005	0.007
1,1,1-Trichloroethane	2981	ND@0.0005	0.2
1,1,2-Trichloroethane	2985	ND@0.0005	0.005
1,2-Dichloroethane	2980	ND@0.0005	0.005
1,2-Dichloropropane	2983	ND@0.0005	0.005
1,2,4-Trichlorobenzene	2378	ND@0.0005	0.07
1,2-Dichlorobenzene	2968	ND@0.0005	0.6
1,4-Dichlorobenzene	2969	ND@0.0005	0.075
Benzene	2990	ND@0.0005	0.005
Carbon tetrachloride	2982	ND@0.0005	0.005
Chlorobenzene	2989	ND@0.0005	0.1
cis-1,2-Dichloroethylene	2380	ND@0.0005	0.07
Ethylbenzene	2992	ND@0.0005	0.7
Methylene chloride	2964	ND@0.0005	0.005
Styrene	2996	ND@0.0005	0.1
Tetrachloroethylene	2987	ND@0.0005	0.005
Toluene	2991	ND@0.0005	1.0
Total Xylenes	2955	ND@0.0005	10.0
trans-1,2-Dichloroethylene	2979	ND@0.0005	0.005
Trichloroethylene	2984	ND@0.0005	0.005
Vinyl chloride	2976	ND@0.0005	0.002

MCL = Maximum Contaminant Level
 ND = None Detected at level indicated.

Page 1 of 2 Approved By: *JSC*

201025-22voc

VOLATILE ORGANIC CHEMICALS (VOC'S) - Unregulated

Method: EPA 524.2

Matrix: Water

URC Sample #: 201025-22

Sample ID: C010194-01

UNREGULATED ANALYTES

Code	Results mg/L
2941	ND@0.0005
2943	ND@0.0005
2944	ND@0.0005
2942	ND@0.0005
2210	ND@0.0005
2214	ND@0.0005
2216	ND@0.0005
2416	ND@0.0005
2410	ND@0.0005
2978	ND@0.0005
2408	ND@0.0005
2413	ND@0.0005
2224	ND@0.0005
2412	ND@0.0005
2986	ND@0.0005
2988	ND@0.0005
2414	ND@0.0005
2993	ND@0.0005
2965	ND@0.0005
2966	ND@0.0005
2967	ND@0.0005

MCL = Maximum Contaminant Level

ND = None Detected

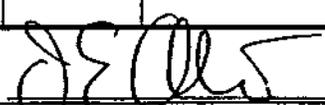
UMPQUA Research Company

P.O. Box 609 - 626 Division Street

Myrtle Creek, OR 97457

(541) 863-5201 Fax: (541) 863-6199

REPORT

OREGON STATE CERTIFIED LAB #015 PWS#: 4100846 Source Name: Sampled At:		Date Reported: 11/17/00 Date Collected: 10/24/00 Time Collected: 11:10 AM Sampled By: Jeff Grafton				
North Creek Analytical - Bend 20332 Empire Ave Suite F-1 Bend, OR 97701		C010194-01 Well #2 Source B			Invoice# 4447	
Inorganic Chemicals (IOC's)		Matrix: Water				
URC Sample #: 201025-22 Sample ID: C010194-01						
Analyte	Code/Method (EPA unless marked)	Results	Units	MCL	Date Analyzed	Analyst
pH	SM 4500-H+	7.2	pH Units	6.5-8.5	10/25/00	MLH
Specific Conductance	SM 2510A	97	µmho/cm	<500	10/25/00	MLH
Antimony	1074 / 200.9	ND@0.003	mg/L	0.006	10/31/00	JMR
Arsenic	1005 / 200.9	ND@0.01	mg/L	0.05	11/01/00	JMR
Barium	1010 / SM3113B	ND@0.1	mg/L	2.0	11/02/00	JMR
Beryllium	1075 / 200.9	ND@0.0002	mg/L	0.004	11/01/00	JMR
Cadmium	1015 / 200.9	ND@0.001	mg/L	0.005	11/02/00	JMR
Chromium	1020 / 200.9	ND@0.02	mg/L	0.1	11/02/00	
Lead	1030 / 200.9	ND@0.002	mg/L	0.015	10/30/00	JMR
Mercury	1035 / 245.1	ND@0.001	mg/L	0.002	11/17/00	JMR
Nickel	1036 / 200.9	ND@0.02	mg/L	0.1	10/30/00	JMR
Selenium	1045 / 200.9	ND@0.003	mg/L	0.05	10/31/00	JMR
Sodium	1052 / SM3111B	9.65	mg/L	*<20	10/27/00	JMR
Thallium	1085 / 200.9	ND@0.001	mg/L	0.002	11/03/00	JMR
Fluoride	1025 / 300.0	0.10	mg/L	4.0	10/26/00	NJS
Nitrate as N	1040 / 300.0	0.11	mg/L	10.0	10/26/00	NJS
Nitrite as N	1041 / 300.0	ND@0.01	mg/L	1.0	10/26/00	NJS
Nitrate+Nitrite	1038 / 300.0	0.11	mg/L	10.0	10/26/00	NJS
Sulfate	1055 / 300.0	1.09	mg/L		10/26/00	NJS
Cyanide	1024/SM4500CN	ND@0.02	mg/L	0.2	11/07/00	KSO
MCL = Maximum Contaminant Level ND = None Detected						
						Approved By: 

201025-22ioc

UMPQUA Research Company

P.O. Box 609 - 626 Division Street

Myrtle Creek, OR 97457

(541) 863-5201 Fax: (541) 863-6199

REPORT

OREGON STATE CERTIFIED LAB #015 PWS#: 4100846 Source Name: Sunriver Water LLC Sampled At: Well #2	Date Reported: 11/30/00 Date Collected: 10/24/00 Time Collected: 11:10 AM Sampled By: Jeff Grafton
---	---

North Creek Analytical - Bend 20332 Empire Avenue Suite F-1 Bend, OR 97701	Invoice# 4447
---	------------------

Synthetic Organic Chemicals (SOC's)	Matrix: Water
-------------------------------------	---------------

URC Sample #: 201025-22						
Sample ID: C010194-01						
Analyte	Code/Method	Results	Units	MCL	Date Analyzed	Analyst
2,4-D	2105 / 515.1	ND@0.0002	mg/L	0.07	10/30/00	BKO
2,4,5-TP (Silvex)	2110 / 515.1	ND@0.0004	mg/L	0.05	10/30/00	BKO
Adipates	2035 / 525.2	ND@0.001	mg/L	0.4	11/15/00	BKO
Alachlor (Lasso)	2051 / 525.2	ND@0.0004	mg/L	0.002	11/15/00	BKO
Atrazine	2050 / 525.2	ND@0.0002	mg/L	0.003	11/15/00	BKO
Benzo(a)pyrene	2306 / 525.2	ND@0.00004	mg/L	0.0002	11/15/00	BKO
BHC-gamma (Lindane)	2010 / 525.2	ND@0.00002	mg/L	0.0002	11/15/00	BKO
Carbofuran	2046 / 531.1	ND@0.001	mg/L	0.04	10/26/00	BKO
Chlordane	2959 / 508.1	ND@0.0004	mg/L	0.002	11/16/00	BKO
Dalapon	2031 / 515.1	ND@0.002	mg/L	0.2	10/30/00	BKO
Dibromochloropropane(DBCP)	2931 / 504.1	ND@0.00002	mg/L	0.0002	11/01/00	BKO
Dinoseb	2041 / 515.1	ND@0.0004	mg/L	0.007	10/30/00	BKO
Diquat	2032 / 549.2	ND@0.0004	mg/L	0.02	11/06/00	BKO
Endothall	2033 / 548.1	ND@0.01	mg/L	0.1	11/08/00	BEM
Endrin	2005 / 525.2	ND@0.00002	mg/L	0.0002	11/15/00	BKO
Ethylene dibromide (EDB)	2946 / 504.1	ND@0.00001	mg/L	0.00005	11/01/00	BKO
Glyphosate	2034 / 547	ND@0.01	mg/L	0.7	11/18/00	BKO
Heptachlor epoxide	2067 / 525.2	ND@0.00002	mg/L	0.0002	11/15/00	BKO
Heptachlor	2065 / 525.2	ND@0.00004	mg/L	0.0004	11/15/00	BKO
Hexachlorobenzene	2274 / 525.2	ND@0.0001	mg/L	0.001	11/15/00	BKO
Hexachlorocyclopentadiene	2042 / 525.2	ND@0.0002	mg/L	0.05	11/15/00	BKO
Methoxychlor	2015 / 525.2	ND@0.0002	mg/L	0.04	11/15/00	BKO
Pentachlorophenol	2326 / 515.1	ND@0.00008	mg/L	0.001	10/30/00	BKO
Phthalates	2039 / 525.2	ND@0.001	mg/L	0.006	11/15/00	BKO
Picloram	2040 / 515.1	ND@0.0002	mg/L	0.5	10/30/00	BKO
Polychlorinatedbiphenyls-PCBs	2383 / 508.1	ND@0.0002	mg/L	0.0005	11/16/00	BKO
Simazine	2037 / 525.2	ND@0.0001	mg/L	0.004	11/15/00	BKO
Toxaphene	2020 / 508.1	ND@0.001	mg/L	0.003	11/16/00	BKO
Vydate (Oxamyl)	2036 / 531.1	ND@0.002	mg/L	0.2	10/26/00	BKO

MCL = Maximum Contaminant Level
 ND = None Detected
 Page 1 of 2 Approved By: 

201025-22soc

