SCREENING SITE INSPECTION REPORT
FOR
BUSE TIMBER & SALES
EVERETT, WASHINGTON

CERCLIS NO. WAD009480542

Prepared for:

Work Assignment No. 54-17-0JZZ
Contract No. 68-W9-0054
United States Environmental Protection Agency
Region 10 ARCS
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ABBREVIATIONS AND ACRONYMS

ARCS	Alternative Remedial Contract Strategy
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRDL	contract-required detection limit (inorganics)
CRQL	contract-required quantitation limit (organics)
EPA	United States Environmental Protection Agency
HRS	Hazard Ranking System
IATA	International Air Transport Association
IDW	investigation-derived waste
NEIC	National Enforcement Investigations Center
NPL	National Priorities List
PA	preliminary assessment
PCB	polychlorinated biphenyl
PCP	pentachlorophenol
QMP	Quality Management Plan
RAS	routine analytical service
RSCC	Regional Sample Coordination Center
SARA	Superfund Amendments and Reauthorization Act of 1986
SAS	special analytical services
SDL	sample detection limit
SI	site inspection
SM	site manager (URS)
SQL	sample quantitation limit
SV	semivolatile
SVOC	semivolatile organic compound
TCP	tetrachlorophenol
TSCA	Toxic Substance Control Act
TSOP	technical standard operating procedures
URS	URS Consultants, Inc.

1.0 INTRODUCTION

Pursuant to United States Environmental Protection Agency (EPA) Contract No. 68-W9-0054 and Work Assignment No. 54-17-0JZZ, URS Consultants, Inc., (URS) conducted a site inspection (SI) of Buse Timber & Sales located at 3812 28th Place N.E. in Everett, Washington. This SI was conducted under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The SI process is intended to document a threat or potential threat to public health or the environment posed by a site, identify whether a potential emergency situation exists that may require an immediate response, document the presence or absence of uncontained or uncontrolled hazardous substances on a site, and confirm site characteristics and area receptor information collected during past studies. The SI is intended to collect sufficient data to enable evaluation of the site's potential for inclusion on the National Priorities List (NPL) and, for those sites determined to be NPL candidates, establish priorities for additional action. The SI process and this SI do not include extensive or complete site characterization, contaminant fate determination, or quantitative risk assessment.

This document presents the Buse Timber & Sales SI in the following manner:

- Section 1.0 Introduction—description of authority and purpose
- Section 2.0 Site Background—site-related information
- Section 3.0 Exposure Pathways and Potential Targets—evaluation of specific pathways and their possible targets
- Section 4.0 Sampling Program—synopsis of sampling conducted
- Section 5.0 Sampling Results—discussion of sampling results and those substances determined to be "significant"
- Section 6.0 Bibliography—list of references

- Appendix A Photodocumentation of May 24 and 25, 1994, URS Sampling Event
- Appendix B Background sample location map
- Appendix C Laboratory Data Reports and Data Validation Reports for Samples Collected for Buse Timber & Sales
- Appendix D Data Quality Objectives

2.0 SITE BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

Site Name:	Buse Timber & Sales
CERCLIS No.:	WAD009480542
Location:	3812 28th Place N.E. Everett, Washington
Latitude:	48°1′17.2″ North
Longitude:	122°10′32.5″ West
Legal Description:	Section 4 and Section 9 Township 29, Range 5 East
Site Owner:	Norman and Delmar Buse 3812 28th Place NE Everett, Washington 98206
Site Operator:	Norman and Delmar Buse
Site Contact:	Steve Fogg (206) 258-2577

Buse Timber & Sales, located at 3812 28th Place N.E., is situated on Smith Island in the Snohomish River floodplain. The mill is 1 mile northeast of the city of Everett, in Snohomish County, Washington. The plant and log yard combined occupy approximately 25 acres of land in the southeast quarter of the southwest quarter of section 4, Township 29 North, Range 5 East, Willamette Meridian, and the northeast quarter of the northwest quarter of section 9, Township 29 North, Range 5 East, Willamette Meridian (USGS 1976). The coordinates of the site are 48°1′17.2″ N. latitude 122°10′32.5″ W. longitude. The site is surrounded by sloughs and agricultural lands. Directly to the east of the mill is Interstate 5. Figure 2-1 shows the general location of the Buse mill.

The mill is adjacent to Union Slough and several backwater arms of the slough. Within ½ mile, the slough discharges into Possession Sound. Because of the proximity to tidally influenced waters, the sloughs surrounding the mill are affected by tidal flooding and ebbing. The water level in an unnamed slough that receives runoff from the northern portion of the mill is controlled by a tidal gate; this slough will be referred to as the tidal gate slough. Because the site is located in the Snohomish River delta, it is underlain by large quantities of alluvial deposits. Tidal influence and Snohomish River water levels have a large influence on groundwater levels in the area. The depth to groundwater is shallow in the area and generally follows the Snohomish River water levels (Ecology 1990).

Twenty-eighth Place N.E., leading from State Route 593, provides access to the site via a land bridge which traverses Union Slough. Although the site is not secured by a fence, the property is physically separated from the surrounding areas by sloughs. The property owned by the Buses includes a large quantity of farmland and pasture on Smith Island. The Buses permit local farmers to produce hay to the south of the mill. The nearest residence, situated 300 feet from the mill offices in the northwest corner of the property, is owned by a member of the Buse family. A pasture to the north and west of the residence serves as a small golf course (URS 1994a).

The 20-acre facility comprises nine main buildings and several smaller ancillary structures (see the site map, Figure 2-2). A 5-acre log storage yard is situated south of the mill complex. Raw logs brought in by trucks and beauty bark from the debarking operation are deposited here.

The 20-acre facility has been in operation on this site since 1946. The Buses purchased the land in 1942 (Buse 1994). Originally, at an unknown point in time prior to the Buse's purchase of the land, the area was used as farmland (Buse 1994).

2.2 SITE OPERATIONS AND WASTE CHARACTERISTICS

Buse Timber & Sales produces approximately 60 million board feet per year of finished lumber products of various dimensions for domestic sale and export to Asia or Canada. Production activities include sizing, debarking, trimming, milling, planing, treating, drying, banding, and shipping. The operations employ 120 persons on two 8-hour shifts at the sawmill and one 8-hour shift at the planer mill. Logs are sorted by size because the mill can handle only logs of a certain dimension. Logs that are too large or too small are

sold to pulp mills (Buse 1994). Appropriately sized logs are sent to the debarking machine. Bark from this machine is then sold as mulch or beauty bark. Debarked logs are transferred to the sawmill where they are trimmed and cut to the required dimensions. Next, the rough-cut wood is sent to the planer for surfacing. Chips and sawdust from sawing and planing are retained and sold to Scott Paper Company in Everett. The lumber is then sorted by hand and sent off to be dipped, dried, or endsealed if necessary. Buse personnel manually spray a product called Light Green Endseal on the ends of the lumber. This water-based paint is a nonhazardous waste defined in RCRA 40 CFR 261. After the endseal has dried, the lumber is banded and wrapped for shipment.

Lumber that is being shipped long distances is sometimes treated in a dip tank with anti-stain chemicals called Britewood S or Britewood Q sapstain control. These are phenolate solutions that contain sodium ortho-phenylphenate. The bundled lumber is dipped into a 28 by 5 by 5-foot-deep steel tank (approximately 5,300 gallons) that contains one of the above products. After the wood is dipped, it rests over a drip pan, which drains back into the tank. The company adds 50 gallons per month to the tank. According to Mr. Buse, because the solution is constantly agitated by compressed air, sludge does not develop at the bottom of the tank. The company has not had to dispose of any sludges since tank installation (Buse 1994). Eighty percent of the tank is underground and is surrounded by a concrete-walled pit, which acts as a secondary containment system. At the bottom of the pit is a sump that pumps the Britewood solution back into the tank. Table 2-1 lists waste-related activities at Buse.

Occasionally, lumber must be kiln dried for special orders. The company has four gas-heated drying kilns for this purpose. Carts of lumber are rolled into the kiln on tracks and heated to 180 degrees under controlled humidity for 3 days (URS 1994a).

Until 1986, the company used pentachlorophenol (PCP) to treat lumber in a dip tank with no cover or secondary containment. On a complaint from EPA and on the advice of the company's chemical supplier, the mill switched to a product called PQ8. At the same time, the dip tank was moved into a shed in an area that is asphalted and bermed. The soils in the former diptank area were simply paved over (Ecology 1990).

In 1986, the EPA sponsored studies to determine whether wood treatment chemicals were entering the soil from lumber mills across the state of Washington. A sediment sample taken from a storm drain near the former dip tank revealed PCP and

Table 2-1
Hazardous-Waste-Related Activities On Site

Activity/Process	Dates	Waste(s) Produced	Storage/Disposal Method(s)	Containment Features	Hazardous Constituents
PCP wood treating	1946-86	PCP sludge	Landfilled	Tank without containment	PCP

Source: URS 1994a, Ecology 1990

trichlorophenol (TCP) at 240 mg/kg, and 47.5 mg/kg respectively. A sediment sample taken from Union Slough revealed 1.97 mg/kg PCP and 0.89 mg/kg TCP.

In 1989, Ecology recommended that Buse Timber & Sales be placed on the EPA CERCLIS list of potential hazardous waste sites. The detection of PCP and TCP in the sediments on and around the site prompted the Washington Department of Ecology to conduct a preliminary assessment (PA), which was completed in November 1990 (Ecology 1990). The Ecology PA recommended that the site be scored using the revised Hazard Ranking System (HRS) before further on-site investigations were conducted.

On June 13, 1990, a Toxic Substance Control Act (TSCA) inspection by Ecology revealed several polychlorinated biphenyl (PCB) violations at the mill. Buse was fined a total of $7,650 (Ecology 1992a).

In June 1992, Ecology again sampled sediments from the same locations as the 1986 EPA sampling effort. Although this round of sampling revealed no evidence of either PCP or TCP in the drain or slough, it revealed petroleum contamination in Union Slough. However, Ecology found no evidence linking the petroleum contamination in the slough with operations at Buse Timber & Sales (Ecology 1992a).

During the URS site visit on March 14, 1994, a rapid immunoassay field screening kit specific for PCP was used to test sediments from the tidal gate slough north of the mill. The results of this screening indicated that PCP was present at concentrations of at least 0.5 ppm in the slough sediments (URS 1994a) (see Table 2-1).

Buse Timber & Sales operates with coverage under the Storm Water Baseline General Permit SO3-000097 (Ecology 1992b).

3.0 EXPOSURE PATHWAYS AND POTENTIAL TARGETS

3.1 GROUNDWATER PATHWAY

3.1.1 Geology and Hydrogeology

Everett is located in the central part of the Puget Sound Lowland, which is a broad, rolling, glacial drift plain of low relief bordered by the Olympic and Cascade Mountains. The geologic features of the Puget Sound Lowland are primarily the result of the Fraser Glaciation, when the Puget glacial lobe made its last advance into the region. The sediments deposited during this time are collectively called "drift" and cover much of the lowland (Haase 1987).

In the Everett area, the glacial history is complicated by repeated advance and retreat episodes of glacial movement. This resulted in the deposition of several drift units, ranging from tills, sands, outwash gravels, silts, and clays to glaciomarine and terrace deposits.

The site is located in the delta region of the Snohomish River. The geology underlying the facility consists mainly of alluvial river deposits derived from glacial sediments and upstream surficial geologic materials. Washington State Department of Transportation boring logs from Interstate 5 bridges across the Snohomish River and the sloughs indicate silts, clays, and sands with small amounts of gravel, shell debris, and decomposing wood debris from the ground surface to more than 130 feet below ground surface (bgs)(DOH 1965).

There are three aquifer systems in the area: recent alluvial deposits associated with the Snohomish River and Union Slough, the Marysville sand member, and the Esperance sand member. The static water level at the site is probably within a range of 10 to 15 feet bgs (Ecology 1990). The depth to the water table varies due to tidal and river flow volume influences. The groundwater in this area is not used for domestic purposes, according to Ecology (Ecology 1990). However, two wells designated as domestic have been identified on Smith Island.

The average annual net precipitation in the Everett area is 18.5 inches (Ecology 1990).

3.1.2 Groundwater Targets

Only about 1 percent of the population within 4 miles of the site uses wells as the primary source of drinking water (Ecology 1990). Everett and the surrounding territory (including Marysville and the Tulalip Indian Reservation) are served by water collected from the 60-square-mile Sultan Basin. The water is stored 30 miles southeast of Everett in the Spada Reservoir, which has a capacity of 50 billion gallons (Wolcott 1994). Approximately 102 domestic and 54 community wells are located within a 4-mile radius of the site. An estimated 1,023 people use these wells for drinking water. However, only two of these wells are on Smith Island. All other wells within 4 miles are separated from the site by either the Snohomish River or the sloughs. Since the river and sloughs are groundwater divides, it is unlikely that contamination from the site could affect groundwater on the other side of these water bodies. A breakdown of groundwater drinking water populations within 4 miles of the site is shown in Table 3-1 (USDC 1990).

Table 3-1
Groundwater Drinking Populations Within 4 Miles of the Buse Timber & Sales Site

Distance from Site (miles)	Number of Domestic Wells	Estimated Domestic Population	Number of Community Wells	Community Well User Population	Total Population
On site	1	2	0	0	2
0 to 0.25	0	0	0	0	0
0.25 to 0.5	0	0	0	0	0
0.5 to 1	1	2	1	10	12
1 to 2	3	7	1	10	17
2 to 3	54	129	18	180	309
3 to 4	102	243	34	340	583
Total	161	383	54	540	923

Note: Domestic well population is based on an estimate of 2.38 people per household to obtain person/household/well except for wells on site. It is known that two persons reside on site (USDC 1990; U.S. EPA 1994a). Community well population assumes 10 persons per well.

3.2 SURFACE WATER PATHWAY

3.2.1 Surface Water Flow

The Buse Timber site is located adjacent to and south of Union Slough on Smith Island north of the Snohomish River. The site is relatively flat, with a general slope less than 5 degrees toward the northeast. The area has a relatively mild and wet climate and a 2-year, 24-hour precipitation of 2.3 inches (Ecology 1990). The site is located within the 100-year flood plain.

The Soil Conservation Service has mapped the soils in the area as Puget-Sultan Pilchuck. These soils are very deep and range from poorly drained to excessively drained, nearly level soils on the floodplain (USDA 1983).

Precipitation accumulating on site would tend to percolate into the ground or flow north; storm sewer drains are located on site to assist in surface water drainage. The on-site surface water flow would eventually reach Union Slough by either the storm sewer or overland flow. The storm sewer has a tidal gate to prevent saltwater from entering the storm sewer system. During the URS 1994 site visit, the stormwater system appeared to be in satisfactory condition.

The flow of Union Slough depends on tidal influences. Union Slough is 120 feet wide adjacent to the site and the Snohomish River is 850 feet wide. Average annual flow of the Union Slough is approximately 5,000 cubic feet per second (cfs). The average discharge in the Snohomish River for the past 29 years is 9,605 cfs (Miles 1992).

3.2.2 Surface Water Quality

As revealed by past sampling events, elevated concentrations of pentachlorophenol (PCP) and trichlorophenol (TCP) have been identified in sediments collected from the tidal gate slough which drains into the Union Slough. These elevated concentrations of contaminants have likely impacted the habitability of the slough for fish and other aqueous species.

3.2.3 Surface Water Targets

There are no surface water intakes for drinking water use within 15 miles downstream of the site. At approximately 1.5 miles downstream from the site, both the Snomomish River and Union Slough empty into Possession Sound.

Two bodies of water in Possession Sound, at Port Gardner and Port Susan, are popular for non-Indian commercial fishing and Indian fishing and shellfish harvesting. The fish species observed in Port Gardner and Port Susan include chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*Oncorhynchus keta*), pink salmon (*Oncorhynchus gorbuscha*), and coho salmon (*Oncorhynchus kisutch*). The Snohomish River is an important migratory route for all of these anadromous fish species and is also home to the bull trout (*Salvelinus confluentis*) and the olympic mudminnow (*Novumbra hubbsi*), both of which are federal candidates for the endangered species list (WDW 1993). Port Gardner and Port Susan have an average annual harvest of 251,095 pounds of fish (WDF 1991) and an average annual harvest of 162,400 pounds of hardshell clams (WDF 1991).

Wetland frontage was calculated for the 1.5 miles downstream of Buse Timber to the point where both the Snohomish River and Union Slough enter the Pacific Ocean in Possession Sound. The frontage of wetlands in that span is 6 miles. National Wetlands Inventory maps classify this area as palustrine, estuarine, riverine, and forested wetlands. However, riverine and estuarine wetlands are also found in the areas downstream of the Buse site.

3.3 SOIL PATHWAY

3.3.1 Soil Description

The surface soils on site are classified as fill and alluvial soils deposited by the Snohomish River and extend 130 feet below the ground surface. These soils have low-to-moderate permeability estimated at 10^{-5} cm/second (Freeze and Cherry 1979) and often become waterlogged in the winter. The underlying sediments consist of alluvial and glacial deposits.

3.3.2 Soil Targets

The Buse Timber site is located within the city limits of Everett, which has a total population of 69,961 (USDC 1990). Residing within a 1-mile radius of the site are 154 people. Both Snohomish River and Union Slough, popular recreational areas, are located within 1 mile of the site. Although the Buse site is not fenced, it is physically separated from surrounding areas by sloughs and blackberries. There are no day cares or schools within 200 feet of the site. The closest resident lives within 200 feet west of the site. Residential populations identified within a 4-mile radius of the site are summarized in Table 3-2.

Table 3-2
Residential Populations Located Within 4 Miles of the Buse Timber & Sales Site

Distance From Site (miles)	Resident Population
0 to 0.25	7
0.25 to 0.5	10
0.5 to 1	137
1 to 2	7,743
2 to 3	22,792
3 to 4	19,801
Total Population	**50,490**

Source: U.S. EPA 1994a

3.3.3 On-Site Workers

Approximately 120 full-time employees work at the Buse facility.

3.4 AIR PATHWAY

3.4.1 Regional Characteristics

The Buse Timber site is located in the tideflats of the Snohomish River in a primarily industrial and agricultural mixed-use area. Possession Sound is located west of the site.

The area has a relatively mild and wet climate, with a normal annual rainfall of 36.51 inches (NOAA 1992).

3.4.2 Air Targets

The residential population within 4 miles of the site is detailed in Table 3-3. The closest residence (owned by Buse) is located within 200 feet of the Buse Timber & Sales office. Although access to the Buse Timber site is limited by the Snohomish River and the Union Slough, there is a road to the site and the east boundary of the site abuts the Interstate 5 right of way.

Table 3-3
Wetlands Within 4 Miles of the Buse Timber & Sales Site

Distance from Site (miles)	Wetland Acreage (estimated)
Onsite	3
0 - ¼	10
¼ - ½	40
½ - 1	150
1 - 2	560
2 - 3	1,000
3 - 4	580

Source: USDI 1987

There is one wetland of approximately 3 acres located on site. Approximately 200 acres of wetlands are located within 1 mile of the site. Table 3-3 gives a breakdown of wetlands within 4 miles of the site (USDI 1987).

3.4.3 Sensitive Areas

Washington State Department of Wildlife Sensitive Area maps were used to determine the presence of sensitive species within 4 miles of the site. The mouth of the Snohomish River, which is 1.5 miles from the site, is an estuary that supports bull trout and the

olympic mudminnow. There are three bald eagle nesting sites between 1 and 2 miles from the site, and one nesting site in both the 2- to 3-mile and 3- to 4-mile ranges.

4.0 SAMPLING PROGRAM

The media-specific sampling procedures were consistent with methodologies described in the field sampling plan (URS 1994b) and technical standard operating procedures (TSOP) (URS 1990b) for ARCS contract activity, as well as those described in EPA's *A Compendium of Superfund Field Operations Methods* (U.S. EPA 1987). All sampling equipment was decontaminated before and after use (TSOP 3.7). Four 8-ounce jars of sediment and soil (one each for SVs and PCBs, and two for inorganics and mercury) were collected from each sample station. All sample containers were clearly labeled with the EPA sample number, URS station number, replicate number (if applicable), date, time, type of sample, and sampling personnel (TSOP 2.4). Additionally, EPA sample tags were taped to the sample bottles, and the bottle lids were custody-label sealed. After sample collection, the containers were placed in a cooled ice chest maintained at approximately 4°C, as appropriate, for transport to an analytical laboratory (TSOP 2.3). The routine analytical service (RAS) samples (PCB and inorganics) were shipped to a different laboratory than the SAS samples (SVs). Additional preservation for water samples was conducted at the time of sampling. A chain-of-custody form was filled out and placed in the chest with the samples. The ice chests were sealed for shipment with duct tape and chain-of-custody seals. An accurate log of the sampling conducted and other information pertinent to the sampling were kept in the field logbook (TSOP 2.6). Photographs were taken during the sampling event and tracked in the field logbook (TSOP 2.5). Refer to Figure 4-1 and Table 4-1 for sample locations, rationale, and identifiers.

4.1 SEDIMENT SAMPLES (TSOP 5.5)

Sediments from the storm drain (sample SDDRN1) were characterized to assess the possible release of wood treating chemicals or their components. The sample locations were selected based on historical sampling results and best professional judgment. All sediment samples were collected as grab samples with a stainless steel spoon. The sediment was collected from the surface of the sediment where no water was present. Since no water was present in the catch basin, the catch basin sediment sample was collected from the bottom of the catch basin. The samples were transferred directly into the sample container. Sticks, rocks, and other large organic matter were removed. The on-site sediment sample was collected as close as possible to the area of sediment accumulation.

Table 4-1
Sample Descriptions

Sample Number	Location	Rationale	Date:Time Collected
SSURO01	Treatment tank area surface soil	Characterize on-site surface soil	05/25/94:0820
SSUBO02	Treatment tank area subsurface soil	Characterize on-site subsurface soil	05/25/94:0844
SDDRN1	Storm drain catch basin	Characterize on-site sediments	05/25/94:0930
SDSD2	Storm drain outfall	Characterize outfall sediments	05/25/94:0957
SDSD3	Storm drain outfall	Characterize outfall sediments, quality control duplicate	05/25/94:1003
SDUS4	Tidal gate outfall to slough	Characterize on-site site slough sediments	05/25/94:1025
SSURBAK3	Off-site surface soil	Characterize background soil	05/25/94:1305
SSUBBAK4	Off-site subsurface soil	Characterize background subsurface soils	05/25/94:1310
ER01	Equipment rinsate	Quality assurance	05/25/94:1052
SBUSBK5	Union slough off-site sediment	Characterize background slough sediment	05/24/94:0940

4.2 SURFACE SOIL SAMPLES (TSOP 5.4)

To determine whether past practices have impacted on-site surface soil quality, one surface soil sample (SSURO01) was collected near the drain at the former dip tank location. Only one soil sample was collected because all other locations near the former dip tank location are paved. The sample was collected at a depth of 0 to 6 inches from the surface level at the location where it is suspected that wastes have been placed. An additional surface soil sample was collected off site to characterize background conditions (SSURBAK3). The background soil sampling location was collected from the residence of a home 2.9 miles southeast of the site. The background soils sampled are the alluvial soils in the valley of the Snohomish River. The map in Appendix B shows the exact location.

The surface soil sample was collected using a decontaminated stainless steel trowel. The sample was placed immediately into the sample containers.

4.3 SUBSURFACE SOIL SAMPLES (TSOP 5.4)

To determine whether past site practices have impacted subsurface soil quality, a subsurface soil sample was collected. One subsurface sample (SSUBO02) was collected from the unpaved area southwest of the former dip tank area. The sample was collected at an approximate depth of 2 feet below surface level. An additional subsurface soil sample was collected off site to characterize background conditions (SSUBBAK4). The location of this sample was 2.9 miles southeast of the site (for location of background surface soil sample, see Appendix B). The background soil sample was not collected in an industrial or agricultural area.

The soil was excavated to the predetermined sampling depth by using a decontaminated hand auger at a right angle to the surface. Once the desired depth was reached, the decontaminated hand auger was used to collect a sufficient soil volume. The soil was placed into a decontaminated stainless steel bowl, homogenized, and placed into the sample containers.

The borehole was refilled with the excavated material using a stainless steel trowel.

4.4 TIDAL GATE SLOUGH, UNION SLOUGH, AND SNOHOMISH RIVER SEDIMENT SAMPLING (TSOP 5.5)

One sediment sample and one field duplicate sample were collected from the outfall basin that drains the area near the former dip tank (SDSD2 and SDSD3) to characterize outfall sediments. The sampling event was conducted during a low tide when sediments are exposed and easily accessible. The sample material was placed into the bowl, debris removed, and homogenized. The sediment was then placed into the sample containers.

The sediment samples from Union Slough (SDUS4 and SDUSBK5) were not collected near piers, pilings, or any other obvious source of wood treatment chemicals. Sample SDUS4 was collected from the tidal gate outfall area to characterize sediments that have entered Union Slough. During the low tide, the sample locations were easily accessible from the boat or shore. The sediment samples were collected following the procedure

described for SDSD2. Because the area is located in the Snohomish River delta, a small boat was required for gathering background samples. Exact background sample locations were determined in the field and based on grain size comparison with site samples. The background Union Slough sample (SDUSBK5) was collected at the point where Union Slough joins the Snohomish River at its most upstream point. See the map in Appendix B for exact locations.

5.0 SAMPLING RESULTS

The conditions used to define an "observed release" of a particular substance to any of the matrices sampled during the data evaluation process are summarized in Table 5-1 (U.S. EPA 1990a, 1990b). Discussions of data results in this report use the term "significant" to classify concentrations of detected chemicals based on the criteria described in Table 5-1. The results discussed in the following sections are limited to those substances determined to be significant (as defined in Table 5-1). Based on EPA Region 10 policy, aluminum, calcium, iron, magnesium, potassium, sodium, and zinc (common earth crust metals) generally are employed only in water mass tracing, which is beyond the scope of this report. These elements will not be discussed further.

Table 5-1
Significance Criteria for Chemical Analysis

Sample Measurement < Sample Quantitation Limit[a]
No observed release is established; the result is not identified as "significant"
Sample Measurement ≥ Sample Quantitation Limit[a]
An observed release or "significant" result is established as follows:
If the background concentration is not detected (or is less than the detection limit), an observed release or significant result is established when the sample measurement equals or exceeds the sample quantitation limit.[a]
If the background concentration equals or exceeds the detection limit, an observed release or significant result is established when the sample measurement is three times or more above the background concentration.

Source: U.S. EPA 1994b

[a]If the SQL cannot be established, determine if there is an observed release as follows: If the sample analysis was performed under the EPA CLP, use the EPA CRQL in place of the SQL. If the sample analysis was not performed under the EPA CLP, use the detection limit in place of the SQL.

The tables provided in the following discussion include all reported concentrations of any metals, polychlorinated biphenyls (PCBs), semivolatiles (SVs), and chlorinated phenols detected in at least one sample collected on May 25, 1993. The laboratory data results and data validation reports are provided in Appendix C. A summary table of the target and actual data quality objectives of the Buse Timber field sampling are also presented in Appendix H. Only four chemicals were detected in significant concentrations and only in sediment samples collected from the storm drain catch basin and the storm drain outfall. It should be noted that detection limits varied considerably between and among samples. There were also a high number of qualified results. Only four organics results, three chlorinated phenols results, and one PCB result were unqualified among all SV, PCB, and chlorinated phenol detections.

5.1 ON-SITE SURFACE SOIL

None of the on-site surface soil results meet the criteria listed in Table 5-1 for significant concentrations. Results are summarized in Table 5-2. All samples collected during this investigation were analyzed for metals, PCBs, SVs, and chlorinated phenols as described in the field sampling plan (URS 1994b). No information was available in the data validation reports to assign a bias (high or low) to the qualified ("J") sample results identified in Table 5-2. Because the appropriate comparable sample for determining elevated concentrations in a surface soil sample is a background surface soil sample, SSURO01 was compared to SSURBAK3 (see Table 5-2).

5.1.1 Metals Analyses

Metals detected in the off-site background surface soil sample (SSURBK3) are summarized in Table 5-2. The metals detected represent concentrations for natural soils in the Snohomish River basin.

Metals detected in the on-site surface soil sample collected at the Buse site are summarized in Table 5-2. For the on-site soil sample location, see Figure 4-1.

5.1.2 PCB Analyses

PCBs were not detected in the off-site background surface soil sample or in the on-site surface soil samples.

Table 5-2
Surface Soil Sampling Results for Buse Timber and Sales, Inc.
May 25, 1994

	Off-site Background Soil	Treatment Tank Area Surface Soil	Treatment Tank Area Surface Soil Laboratory Duplicate
Substance Detected	**SSURBAK3**	**SSURO01**	**SSURO01 DS**
Total Metals (mg/kg)			
Aluminum	20900	18200	19700
Arsenic	22 J	20 J	17 J
Barium	108	50.5 J	52.9
Beryllium	0.49 J	0.34 J	0.37 J
Cadmium	0.35 J	0.24 J	0.2 U
Calcium	3010	2940	3280
Chromium	86.3	54.1	58.1
Cobalt	23.6	9.25	9.63
Copper	45.5	40.1	41.1
Iron	30300	30100	31300
Lead	52.3	12 J	14 J
Magnesium	8720	8840	9250
Manganese	417	298	311
Mercury	0.0575	0.0749	0.076
Nickel	64.1	36.2	39.3
Potassium	905	2410	2500
Selenium	6 U	15 J	15 J
Sodium	299	335	362
Thallium	6 J	5 U	8 J
Vanadium	66	68.6	70.3
Zinc	89.6	57.9	61.2
Semivolatiles (ug/kg)			
Di-n-butylphthalate	32 J	470 U	NAF

Notes:
J =value is an estimate
mg/kg = milligrams per kilograms
NAF = not analyzed for
U =sampe was undetected
ug = Microgram (1E-6 gram)

5.1.3 Semivolatile Organic Analyses

Di-n-butylphthalate was detected in the background sample (SSURBAK3) at an estimated concentration of 32 μg/kg. There were no detections of any SVs in the on-site surface soil sample.

5.1.4 Chlorinated Phenol Analyses

There were no significant detections of any chlorinated phenols in any of the surface soil samples.

5.2 SUBSURFACE SOIL

None of the subsurface soil results meet the criteria listed in Table 5-1 for significant concentrations. Results are summarized in Table 5-3. All samples collected during this investigation were analyzed for metals, PCBs, SVs, and chlorinated phenols as described in the field sampling plan (URS 1994b). No information was available in the data validation reports to assign a bias (high or low) to qualified ("J") sample results identified in Table 5-3. Because the appropriate comparable sample for determining elevated concentrations in a subsurface soil sample is a background subsurface soil sample, SSUBO02 was compared to SSUBBAK4 (see Table 5-3).

5.2.1 Metals Analyses

Metals detected in the off-site background subsurface soil sample (SSUBBK4) are summarized in Table 5-3. The metals detected represent concentrations for natural soils in the Snohomish River basin.

Metals detected in the on-site subsurface soil sample collected at the Buse site are summarized in Table 5-3. For the on-site soil sample location, see Figure 4-1.

5.2.2 PCB Analyses

PCBs were not detected in the off-site background subsurface soil sample or in the on-site subsurface soil samples.

Table 5-3
Subsurface Soil Sampling Results for Buse Timber and Sales, Inc.
May 25, 1994

	Offsite Background Subsurface Soil	Treatment Tank Area Subsurface Soil
Substance Detected	**SSURBAK4**	**SSUBO02**
Inorganics (mg/kg)		
Aluminum	18800	18200
Arsenic	17 J	25 J
Barium	70.9	46.4
Beryllium	0.28 J	0.3 J
Calcium	2530	2630
Chromium	61.5	79.4
Cobalt	13.2	9.92
Copper	34	41.4
Iron	28300	26500
Lead	12 J	9.8 J
Magnesium	7690	8630
Manganese	223	248
Mercury	0.0485	0.0668
Nickel	32.7	44.9
Potassium	985	2230
Selenium	6 J	13 J
Sodium	269	543
Thallium	7 J	6.2 J
Vanadium	63.3	69.6
Zinc	57.4	52.7
Semivolatiles (ug/kg)		
Di-n-butylphthalate	33 J	510 U

Notes:
J = value is an estimate
mg/kg = milligrams per kilogram
U = sample was undetected
ug = Microgram (1E-6 gram)

5.2.3 Semivolatile Organic Analyses

Di-n-butylphthalate was detected in the background sample (SSURBAK4) at an estimated concentration of 33 μg/kg. There were no detections of any SVs in any of the on-site subsurface soil samples.

5.2.4 Chlorinated Phenol Analyses

There were no significant detections of any chlorinated phenols in any of the subsurface soil samples.

5.3 STORM DRAIN SEDIMENT

Data results that satisfy the criteria listed in Table 5-1—described in this section to be significant—are highlighted in Table 5-4. All samples collected during this investigation were analyzed for metals, PCBs, SVs, and chlorinated phenols as described in the field sampling plan (URS 1994b). No information was available in the data validation reports to assign a bias (high or low) to qualified ("J") sample results identified in Table 5-3. Because the appropriate comparable sample for determining elevated concentrations in a sediment sample is a background sediment, sediment samples were compared to SDUSBK5 (see Table 5-4, Sediment Soil Sampling Results for Buse Timber & Sales, Inc., May 25, 1994).

5.3.1 Metals Analyses

Metals detected in the off-site background sediment sample represent concentrations expected for sediments in the Snohomish River estuary conditions. Results for all sediment samples are summarized in Table 5-4. For sample locations, see Figure 4-1.

There were several significant detections of metals in the on-site sediment samples. Lead and mercury were detected in the samples collected from the storm drain catch basin (SDDRN1) and the duplicate samples collected at the outfall for that storm drain (SDSD2 and SDSD3). Lead was detected in sample SDDRN1 at 57 mg/kg and in sample SDSD3 at 56.2 mg/kg, but the concentration of lead in duplicate sample SDSD2 was not significant. Mercury was detected in sample SDDRN1 at 1.84 mg/kg and in sample SDSD2 at 0.282 mg/kg, but the result for duplicate sample SDSD3 was not

Table 5-4
Sediment Sampling Results for Buse Timber and Sales, Inc.
May 25, 1994

	Union Slough Background Sediment	Storm Drain Catch Basin Sediment	Storm Drain Outfall Sediment	Storm Drain Outfall Sediment Duplicate	Union Slough Tidal Gate Sediment
Substance Detected	**SDUSBK5**	**SDDRN1**	**SDSD2**	**SDSD3**	**SDUS4**
Total Metals (mg/kg)					
Aluminum	17600	7410	3790	5030	14400
Antimony	3.2 J	3 UJ	3.4 J	5.6 J	3 UJ
Arsenic	15 J	8 J	6.7 J	7.7 J	10 J
Barium	61.2	51.2	63.9	69.3	45.6
Beryllium	0.41 J	0.15 J	0.13 J	0.15 J	0.33 J
Cadmium	0.29 J	0.56 J	1.9 J	2 J	0.23 J
Calcium	3770	3770	2770	2920	4540
Chromium	72.5	182	96.3	94.6	102
Cobalt	16.5	238	10.6	11.4	29.6
Copper	44.1	108	57.2	69.3	36.2
Iron	25900	13200	16700	18000	26900
Lead	11 J	57	39.9	56.2	13 J
Magnesium	9380	5300	2250	2880	8560
Manganese	385	188	144	153	263
Mercury	0.0694	1.84	0.282	0.159	0.103
Nickel	56.8	56.8	59	60.1	67.9
Potassium	1380	524	380 J	511	1380
Selenium	6.5 J	6 U	6 U	11 J	9.7 J
Sodium	440	378	797	952	3210
Thallium	5 U	5 U	5.2 J	5 U	7.4 J
Vanadium	53	32.3	18.1	22.7	45.4
Zinc	76.8	329	231	262	62.5
PCBs (ug/kg)					
Aroclor 1254	70 U	1000	460J	600 J	75 U

Notes:
Highlighted values indicate sample was detected at significant concentrations based on the criteria in Table 5-1.
J = Value is an estimate
U = Sample was undetected
ug = Microgram (1E-6 gram)
UJ = analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is an estimate

Table 5-4 (Continued)
Sediment Sampling Results for Buse Timber and Sales, Inc.
May 25, 1994

	Union Slough Background Sediment	Storm Drain Catch Basin Sediment	Storm Drain Outfall Sediment	Storm Drain Outfall Sediment Duplicate	Union Slough Tidal Gate Sediment
Substance Detected	**SDUSBK5**	**SDDRN1**	**SDSD2**	**SDSD3**	**SDUS4**
Semivolatile (ug/kg)					
2-Methylnaphthalene	610 U	4600 U	1900 U	3700 J	610 U
2-Methylphenol	610 U	4600 U	30000 U	2900 J	610 U
4-Methylphenol	140 J	4600 U	2100 J	2900 J	610 U
Benzo(g,h,i)perylene	610 U	380 J	30000 U	29000 U	610 U
Butylbenzylphthalate	610 U	650 J	30000 U	29000 U	610 U
Chrysene	610 U	320 J	30000 U	29000 U	610 U
Di-n-butylphthalate	42 J	4600 U	30000 U	1700 J	610 U
Di-n-octylphthalate	610 U	520 J	30000 U	29000 U	610 U
Diethylphthalate	34 J	4600 U	30000 U	29000 U	610 U
Fluoranthene	110 J	400 J	30000 U	29000 U	610 U
Pentachlorophenol	1500 U	460 J	73000 U	70000 U	1500 U
Phenanthrene	74 J	240 J	30000 U	1800 J	610 U
Pyrene	130 J	750 J	2200 J	1800 J	610 U
Chlorinated Phenols (ug/kg)					
2,4,5-Trichlorophenol	18 U	16 J	43 U	56 U	20 U
2,4,6-Trichlorophenol	18 U	16 U	43 U	56 U	10 J
2,4-Dichlorophenol	18 U	16 J	43 U	56 U	20 U
2,6-Dichlorophenol	18 J	16 J	109 J	56 U	40 J
2-Phenylphenol	18 U	32	43 J	56 U	20 J
4-Chloro-3-methylphenol	18 U	8 J	22 J	56 U	20 U
Pentachlorophenol	18 U	71	109	56 U	10 U

Notes:
Highlighted values indicate sample was detected at significant concentrations based on the criteria in Table 5-1.
J = Value is an estimate
U = Sample was undetected
ug = Microgram (1E-6 gram)

significant. There is no known source for mercury on the Buse site. The only known source of lead on the Buse site is leaded gasoline used in vehicles operated on the site.

5.3.2 PCB Analyses

No PCBs were detected in the off-site background sediment sample.

One PCB compound was detected in one on-site sample at a significant concentration. Aroclor 1254 was detected at 1,000 μg/kg in sample SDDRN1, the storm drain catch basin sample. Ecology noted several PCB violations in a 1990 TSCA inspection performed for the EPA (U.S. EPA 1991b). No other significant detections of PCBs were reported.

5.3.3 Semivolatile Analyses

Six SVs were detected at estimated concentrations in the off-site background sediment sample: 4-methylphenol, di-n-butylphthalate, diethylphthalate, fluoranthene, phenanthrene, and pyrene. See Table 5-4 for concentrations. No significant detections of SVs were reported for any of the on-site sediment samples.

5.3.4 Chlorinated Phenol Analyses

One chlorinated phenol (2,6-dichlorophenol) was detected at an estimated concentration of 18 mg/kg in the background sediment sample (SDUSBK5). All sample detections for chlorinated phenol analyses are reported in Table 5-4.

Pentachlorophenol was detected at significant concentrations in both the storm drain outfall sample (SDSD2) and in the storm drain catch basin sample (SDDRN1). Sample SDSD2 was reported to contain 109 μg/kg pentachlorophenol and sample SDDRN1 was reported to contain 71 μg/kg pentachlorophenol. The duplicate storm drain outfall sediment sample did not have any detections of chlorinated phenols. The detection limit for this duplicate sample was reported as 56 μg/kg for pentachlorophenol. The storm drain catch basin sample (SDDRN1) reported a significant concentration of 2-phenylphenol at 32 μg/kg.

5.4 QUALITY CONTROL SAMPLES

Duplicate samples were collected during this field sampling event to evaluate the environmental variability at a location and the consistency of sample collection. The results from the duplicates collected at the Buse site reported detections of similar compounds. However, none of the significant detections in either sample was confirmed by a significant detection in the other sample. Sample detections and detection limits varied widely. For example, sample SDSD3 has a reported concentration of di-n-butylphthalate of 1,700 (estimated) but the duplicate sample's (SDSD2) result is not detected at a detection limit of 30,000. Apparently, despite sample homogenization residual heterogeneity existed between the sample duplicates.

During the field sampling conducted at Buse Timber and Sales, an equipment rinsate sample (ERO01) was collected. The analytes detected in this sample are provided in Table 5-5. The equipment rinsate sample was collected after the stainless steel auger was decontaminated. None of the analytes detected in the rinsate sample were detected at significant concentrations in any of the environmental samples, indicating that cross contamination is not likely to have occurred.

5.5 SUMMARY

Significant quantities of lead, mercury, and pentachlorophenol were detected in the storm drain catch basin and storm drain outfall samples. One PCB (Aroclor 1254) and 2-phenylphenol were detected at significant quantities in the sediment sample collected from the storm drain catch basin. No other significant quantities of any other compound were detected in any sample.

Table 5-5
Rinsate Sample Results for Buse Timber & Sales
May 25, 1994

	Equipment Rinsate
Substance Detected	**ER01**
Inorganics ug/kg	
Aluminum	5.8 UJ
Iron	9.98 J
Magnesium	25 J
Manganese	0.21 UJ
Sodium	5.4 UJ
PCBs ug/kg	
	ND
Semivolatiles ug/kg	
1,4-Dichlorobenzene	1 J
Naphthalene	6 J
Chlorinated Phenols ug/kg	
4-Chloro-3-methylphenol	0.3 J
Phenol	0.3 J

Notes:
J =value is an estimate
mg/kg = milligrams per kilograms
ND = none detected
U =sampe was undetected
ug = Microgram (1E-6 gram)
UJ = analyte was not detected above the reported ample quantitation limit. However, the reported quantitation limit is an estimate.

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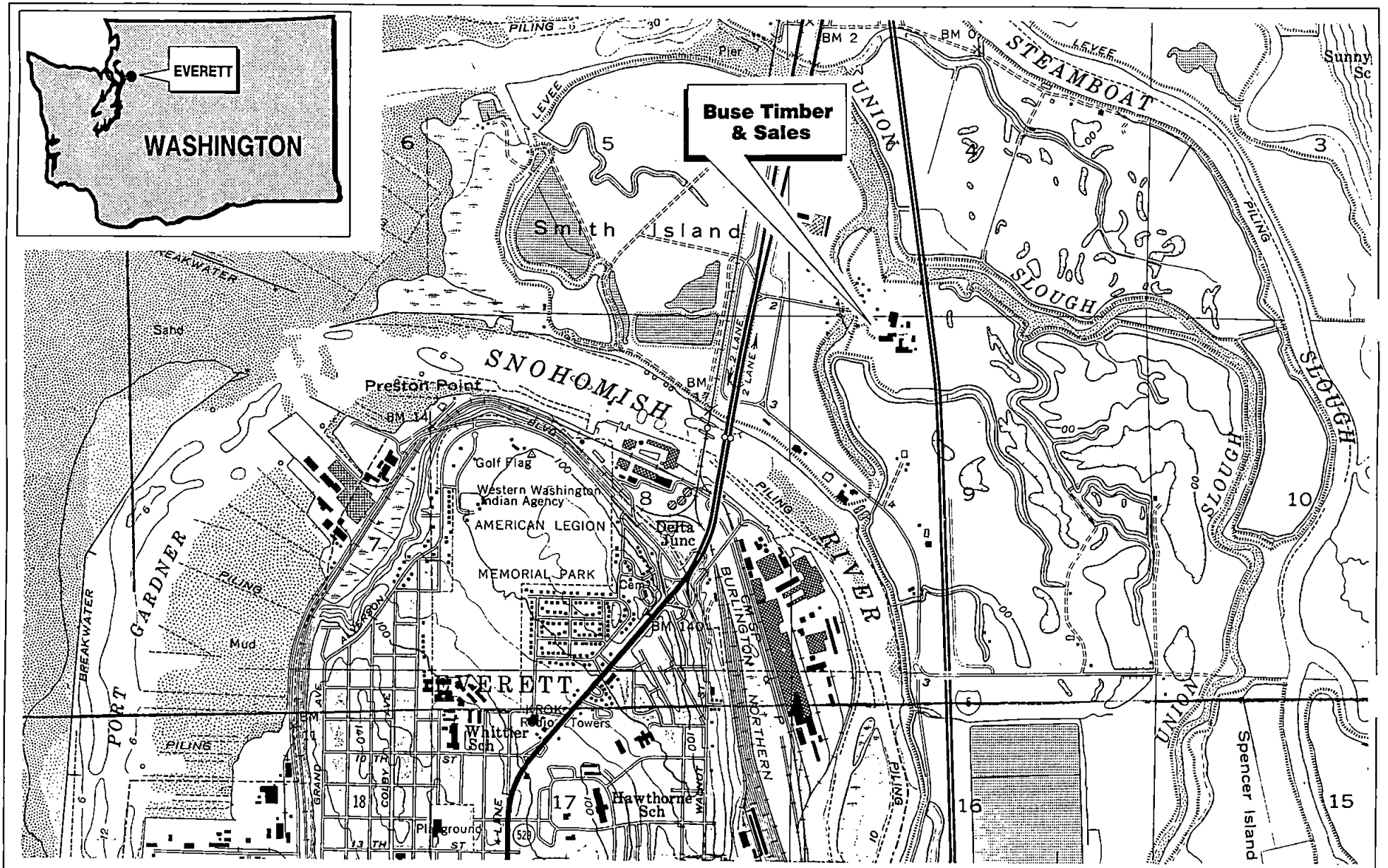


Source: USGS 7.5 Min. Topo Map, MARYSVILLE, WA 1973

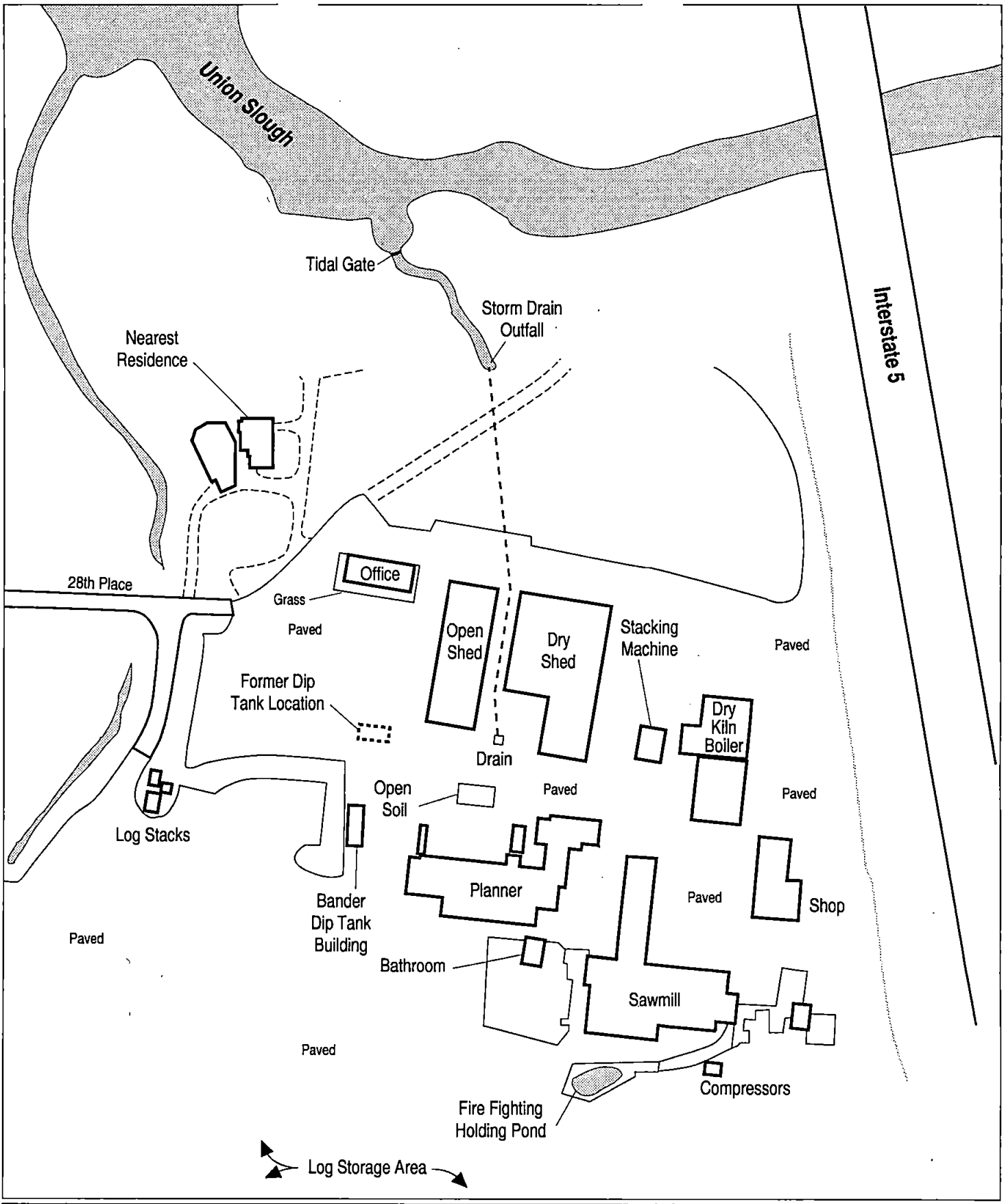
URS
CONSULTANTS

NORTH

0 1/2 1
Scale In Miles

Figure 2-1
Buse Timber & Sales Site Location Map

Buse Timber & Sales
Everett, Washington



URS CONSULTANTS

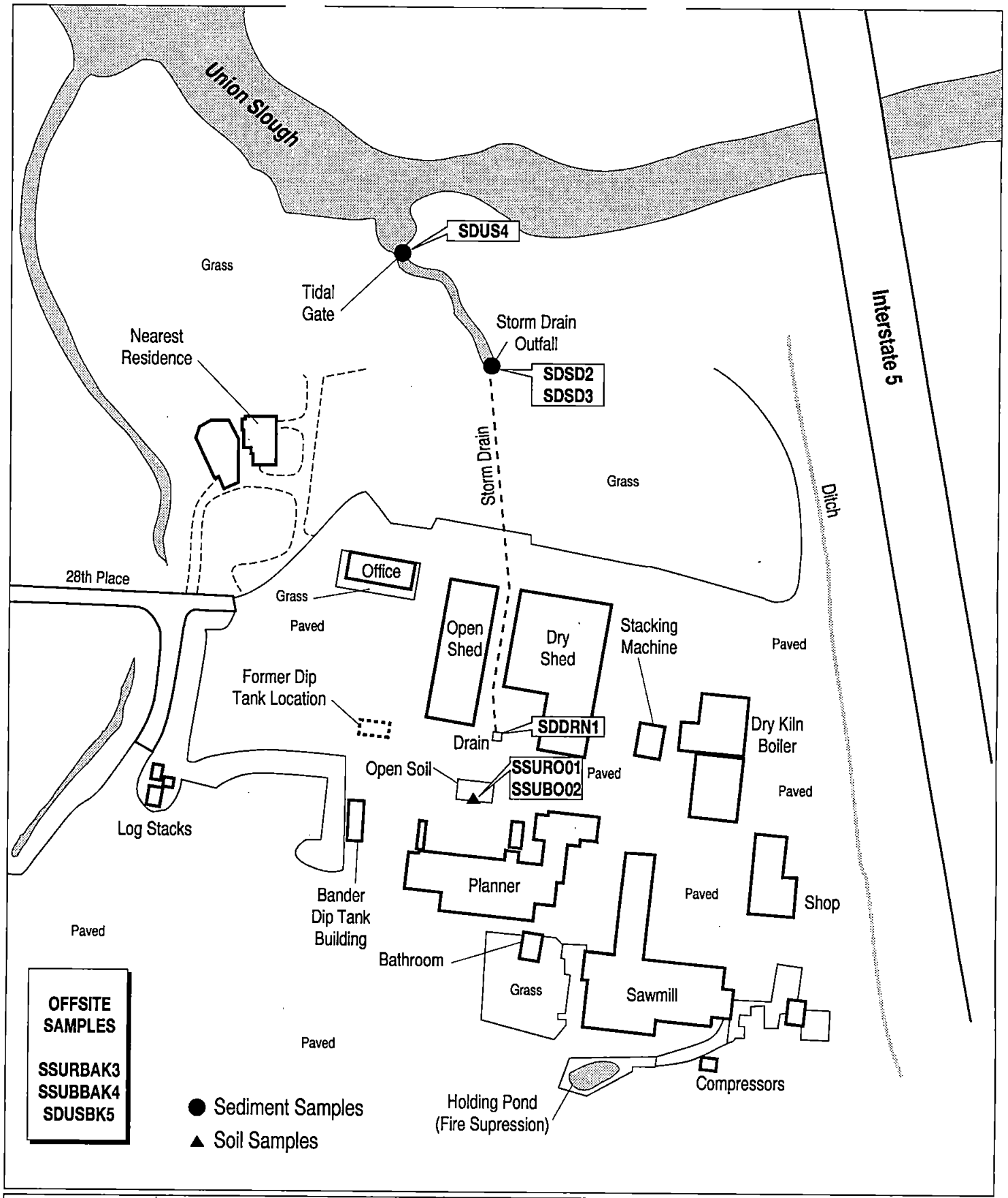
NORTH

0 130 260

Scale In Feet

Figure 2-2
Buse Timber & Sales
Site Map

Buse Timber & Sales
Everett, Washington



URS CONSULTANTS

NORTH

0 130 260

Scale In Feet

Figure 4-1
Buse Timber & Sales
Sample Locations

Buse Timber & Sales
Everett, Washington

APPENDIX A

PHOTODOCUMENTATION OF MAY 24 AND 25, 1994, URS SAMPLING EVENT

URS Consultants	ARCS Photograph Log	DCL # 4162760.17.20.638.27.a	
Project Number 4162760.17	Project/Site Name Buse Marine Construction and Repair, Inc.	Photographer(s) Signatures(s) Thomas Mercer Jeff Kesner	
Camera Type Canon	Film Type/Speed Kodak 200 ASA	Roll Number 1	Date 8/15/94

Frame	Date	Time	Orientation	Subject
1	5-24-94	0940	S	JMK and TAM at Union Slough background
2	5-24-94	0940	N	Sampling the Union Slough background sediment sample
3	5-24-94	0940	N	Sampling the Union Slough background sediment sample
4	5-25-94	0818	N	JMK at SSUR01 sample location
5	5-25-94	0920	SW	BUSE personnel attempting to remove catch basin cover
6	5-25-94	0922	SW	BUSE personnel attempting to remove catch basin cover
7	5-25-94	0926	NW	The catch basin where sample SDRN1 was collected
8	5-25-94	0930	Down	TAM collecting sample SDRN1
9	5-25-94	0946	W	Sample SDSD2 and SDSD3 location
10	5-25-94	0959	NW	JMK sampling SDSD2
11	5-25-94	1024	W	Panorama of tidal gate slough
12	5-25-94	1024	WSW	Panorama of tidal gate slough
13	5-25-94	1024	WSW	Panorama of tidal gate slough
14	5-25-94	1025	SW	Collecting subaqueous tidal gate sediment sample
15	5-25-94	1215	S	SSURBAK3 Abandoned location for background sample
16	5-25-94	1301	SE	JMK preparing to sample background samples SSURBAK3 and SSUBBAK4 at Barbara Lawson's home

Date Delivered to Processor	Date Received from Processor	Comments

1 JMK and TAM at Union Slough background

2 Sampling the Union Slough background sediment sample

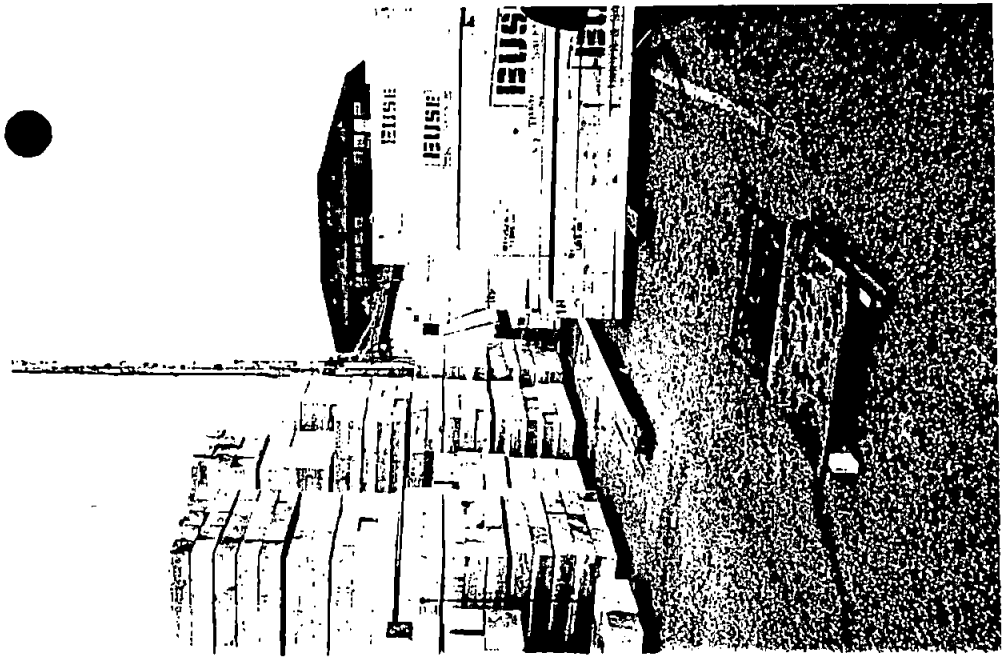
3 Sampling the Union Slough background sediment sample

4 JMK at SSUR01 sample location

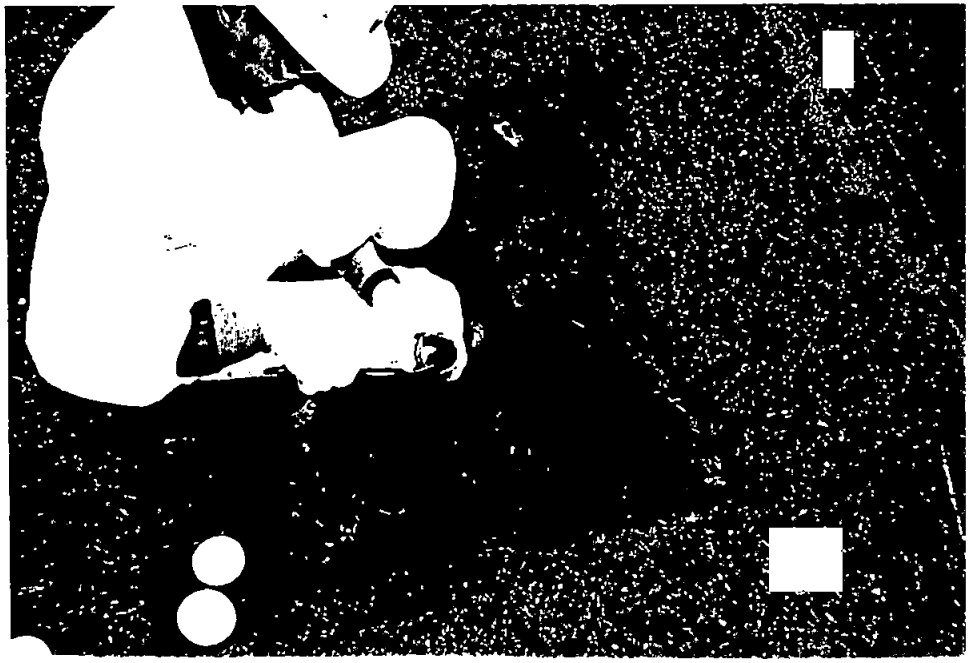
5 BUSE personnel attempting to remove catch basin cover

6 BUSE personnel attempting to remove catch basin cover

7 The catch basin where sample SDRN1 was collected



8 TAM collecting sample SDRN1



9 Sample SDSD2 and SDSD3 location

10 JMK sampling SDSD2

11 Panorama of tidal gate slough

12 Panorama of tidal gate slough

13 Panorama of tidal gate slough

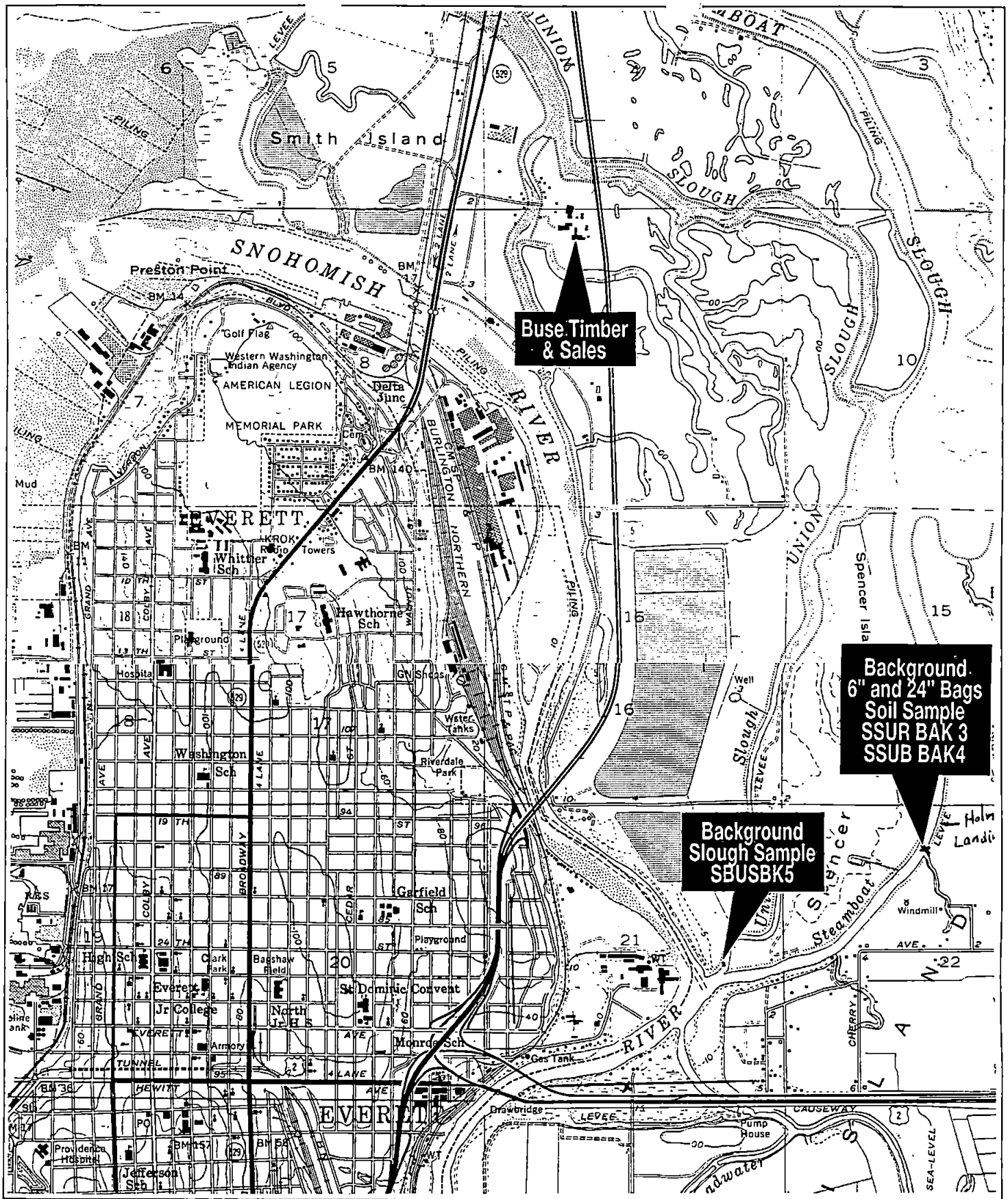
14 Collecting subaqueous tidal gate sediment sample

15 SSURBAK3 Abandoned location for background sample

16 JMK preparing to sample background samples SSURBAK3 and SSUBBAK4 at Barbara Lawson's home

APPENDIX B

BACKGROUND SAMPLE LOCATION MAP



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Background Sample Location Map

Buse Timber & Sales
Everett, Washington

APPENDIX C

LABORATORY DATA REPORTS AND DATA VALIDATION REPORTS FOR SAMPLES COLLECTED FOR BUSE TIMBER & SALES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366
June 28, 1994

MEMORANDUM

SUBJECT: Buse Timber (SSI) Total Metals in Soil Analysis
Samples Nos: 94214115 - 94214124

FROM: Isabel Chamberlain, Task Monitor, USEPA, Region 10

TO: David Bennet, Project Manager, USEPA, Region 10

FULL DATA REVIEW

I have reviewed the attached data package and the corresponding raw data. Based on this review, I find that the Self Evaluation Report prepared by the ESAT contractor was conducted in accordance with the Functional Guidelines, and that the data qualifiers recommended in the ESAT contractor's evaluation are appropriate.

ENVIRONMENTAL SERVICE ASSISTANCE TEAMS - ZONE 2

ESAT Region 10
ICF Technology Inc.
7411 Beach Drive East
Port Orchard, WA 98366
Phone (206) 871-8760

ICF Technology Inc.
ManTech Environmental

MEMORANDUM

DATE: June 17, 1994

TO: Jerry Muth, Regional Project Officer, USEPA, Region 10
Isa Chamberlain, Task Monitor, USEPA, Region 10
David Bennett, Project Manager, USEPA, Region 10

THROUGH: Barry Pepich, Team Manager, ESAT, Region 10

FROM: John Alexander, Senior Chemist, ESAT, Region 10

SUBJECT: Quality Assurance Review of Buse Timber (SSI) Total Metals in Soil Analysis
Sample Nos: 94214115 - 94214124
Project Code: TEC-613A; Account Code: 4TFA10PUZZ

TID#: 10-9404-430
DOC#: ESAT-10A-7075
WUD#: 1420

CC: Bruce Woods, USEPA RQAMO, Region 10
Jeff Kesner, URS Consultants Inc., Seattle, WA

The following is a quality assurance review of the total metals analysis of nine soil samples and one field blank sample from the Buse Timber & Sales investigation, Everett, WA. The analysis was performed following CLP and laboratory guidelines by the ESAT Team at the USEPA Manchester Environmental Laboratory, Port Orchard, WA. This quality assurance review was conducted for the following samples:

94214115	94214116	94214117	94214118	94214119	94214120
94214121	94214122	94214123	94214124		

DATA QUALIFICATIONS

The following comments refer to the ESAT Team's performance in meeting quality control specifications outlined in the *CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILMO3.0*, the *Manchester Environmental Laboratory Quality Assurance Manual, revision 5/88*, and the *Buse Timber & Sales Field Sampling Plan, Rev. 2, 05/04/94*. The recommendations presented herein are based on the information provided for the review.

1.0 TIMELINESS - Acceptable

The suggested holding time from the date of collection for mercury in soil is 28 days and the holding time for remaining metals in soil is 180 days. The samples were collected on 05/24/94 and 05/25/94. Mercury analysis was completed by 06/02/94, nine days from collection. The remaining metals analyses were completed by 06/15/94, twenty-two days from collection. No qualification was recommended based on these holding time criteria.

2.0 SAMPLE PREPARATION - Acceptable

The samples were prepared using hot-plate digestion for total metals on 05/31/94 and for total mercury on 06/01/94. All procedures were in accordance with Manchester Laboratory and CLP protocols. Qualification was not recommended on this basis.

3.0 CALIBRATION - Acceptable

The samples were analyzed by ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) on 06/15/94. The instrument was standardized according to the analytical method using a blank and a series of calibration standards.

The samples were analyzed by CVAAS (Cold Vapor Atomic Absorption Spectroscopy) on 06/02/94 for mercury. Initial calibration included a blank and at least four standards, as required. The curve was linear with a correlation coefficient greater than 0.995.

All calibrations met acceptable criteria therefore no qualification was recommended on this basis.

4.0 REFERENCE CONTROL SAMPLES/CALIBRATION VERIFICATION - Acceptable

Laboratory reference control samples are required before and after sample analysis and after every 10 samples during analysis. All control samples met frequency and recovery criteria of 90 - 110% for ICP-AES and 80 - 120% for CVAAS (mercury) analysis except for aluminum in the final ICP-AES control sample (111%) on 06/15/94. However, a second control standard run for initial and final control verification was within limits and was deemed to be more representative of the aluminum concentrations found in the samples. On this basis, no qualification was recommended.

5.0 BLANKS

Procedural blanks were prepared with the samples to indicate potential contamination from the digestion or analysis procedure. If an analyte was found in the associated blank, the sample results were recommended for qualification if the analyte concentration was less than ten times the analytical value in the blank.

Calcium, iron, magnesium, manganese and sodium were detected in the ICP-AES procedural blank. The concentration of these analytes in the samples exceeded the minimum blank criterion except in the field blank sample 94214123. On this basis, (B) qualification was recommended for these analytes in sample 94214123.

6.0 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 and end of each sample analysis run. The acceptance criterion for the ICS is 80% - 120%. All results met frequency and recovery requirements on the day of analysis.

7.0 DUPLICATE ANALYSIS - Acceptable

Duplicate analysis was performed on samples 94214115 for ICP-AES and CVAAS analyses. All relative percent difference (RPD) were within 20%, as required by the laboratory. No qualification was recommended on this basis.

8.0 FIELD DUPLICATE ANALYSIS - Not Applicable

Field duplicate analysis was not indicated in the field collection documentation.

9.0 MATRIX SPIKE ANALYSIS

Matrix spike sample analyses are performed to provide information about the effect of the sample matrix on digestion and measurement methods. Manchester Laboratory and CLP guidelines specify that the matrix spike recovery must be within the limits of 75 - 125%. Matrix spike/matrix spike duplicate analyses were performed on sample 94214115. All recoveries were within acceptable limits except for antimony (0/0%) in ICP-AES analysis. Low recoveries for antimony are not uncommon in soil matrices, and subsequent post spike analysis demonstrated acceptable recoveries which indicate that matrix interference was not the likely cause of the low matrix spike results. Based on these results, the (N) qualifier was recommended for attachment to all antimony results to denote potential bias due to loss of the analyte during digestion or analysis.

10.0 GRAPHITE FURNACE ATOMIC ABSORPTION SPEC. (GFAAS) QC - Not Applicable

This analytical method was not used for these samples.

11.0 ICP-AES SERIAL DILUTION - Acceptable

Sample 94214115 was analyzed by serial dilution and compared to the original, undiluted analyses in the ICP-AES procedure. All percent differences of analytes above 50 times the detection level were within the required 10% criterion range. No qualification was recommended on this basis.

12.0 DETECTION LIMITS - Acceptable

Sample results which fall below the instrument detection limit (IDL) are assigned the value of the instrument detection limit and the (U) qualifier is recommended for attachment. Any sample result falling between the detection limit and the quantitation limit is recommended for qualification as an estimate (P). This notifies the data user that the

element was detected at the reported value, but below the minimum level of practical quantitation determined to be within precision limits of 10% relative standard deviation.

13.0 OVERALL ASSESSMENT OF THE DATA

The quality assurance review of the data is based on the criteria outlined in the *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (7/88).*

The following is a summary of the recommended qualification for soil samples from the Buse Timber site, EPA sample numbers 94214115, 94214116, 94214117, 94214118, 94214119, 94214120, 94214121, 94214122, 94214123 and 94214124. The (U) qualifier was recommended for attachment to sample results below the minimum level of detection. The (P) qualifier was recommended for attachment to sample results less than the laboratory's quantitation limit.

The (N) qualifier was recommended for attachment to antimony results (4.3% of the reported sample data) due to low matrix spike recovery. The (B) qualifier was recommended for calcium, iron, magnesium, manganese and sodium results (2.2%) in the equipment rinsate blank sample.

Definitions of laboratory data qualifiers are attached.

USEPA Region 10 Laboratory

Below are the definitions for the qualifiers used in the metals area when qualifying data from metals analysis.

DATA QUALIFIERS

U	-	Element was analyzed but not detected. The associated numerical value is the instrument detection limit/method detection limit.
P	-	The analyte was detected above the Instrument Detection Limit, but not quantified within expected limits of precision. The laboratory has established minimum quantitation limits having a relative standard deviation of no more than 10%
H	-	The samples were analyzed after the suggested holding time limit.
E	-	The reported value is an estimate because of the presence of interference. An explanatory note will be included with the report.
B	-	Analyte is found in the analytical blank as well as the sample indicating possible/probable blank contamination. If analytes are found in any of the associated procedural blanks the concentration in the samples must be at least ten times the quantity observed in the blank. If the sample result fails these criteria the sample result is qualified (B).
N	-	Spiked sample recovery not within control limits.
NAR	-	There is no analysis result for this analyte.
NA	-	Not Applicable/Not Required.
S	-	Sample was analyzed by method of standard additions.
+	-	Sample was analyzed by method of standard additions and the correlation coefficient was less than 0.995.
*	-	The analyte was present in the sample.
W	-	Post spike out of specified range, and sample was less than 50% the spike added.

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214115
Type : Reg sample
Station Description: SSURO01

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	0.0749	mg/kg					
ICP-RAS							
Aluminum	18200	mg/kg		Antimony	3.0	mg/kg	UN
Arsenic	20	mg/kg	P	Barium	50.5	mg/kg	
Beryllium	0.34	mg/kg	P	Cadmium	0.24	mg/kg	P
Calcium	2940	mg/kg		Chromium	54.1	mg/kg	
Cobalt	9.25	mg/kg		Copper	40.1	mg/kg	
Iron	30100	mg/kg		Lead	12	mg/kg	P
Magnesium	8840	mg/kg		Manganese	298	mg/kg	
Nickel	36.2	mg/kg		Potassium	2410	mg/kg	
Selenium	15	mg/kg	P	Silver	0.30	mg/kg	U
Sodium	335	mg/kg		Thallium	5.0	mg/kg	U
Vanadium	68.6	mg/kg		Zinc	57.9	mg/kg	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Solid
SampleNumber : 94214115
Type : Duplicate
Station Description:

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	0.0760	mg/kg					
ICP-RAS							
Aluminum	19700	mg/kg		Antimony	3.0	mg/kg	UN
Arsenic	17	mg/kg	P	Barium	52.9	mg/kg	
Beryllium	0.37	mg/kg	P	Cadmium	0.20	mg/kg	U
Calcium	3280	mg/kg		Chromium	58.1	mg/kg	
Cobalt	9.63	mg/kg		Copper	41.1	mg/kg	
Iron	31300	mg/kg		Lead	14	mg/kg	P
Magnesium	9250	mg/kg		Manganese	311	mg/kg	
Nickel	39.3	mg/kg		Potassium	2500	mg/kg	
Selenium	15	mg/kg	P	Silver	0.30	mg/kg	U
Sodium	362	mg/kg		Thallium	8.0	mg/kg	P
Vanadium	70.3	mg/kg		Zinc	61.2	mg/kg	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Solid
SampleNumber : 94214115
Type : Matrix Spike
Station Description:

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	92	%R					
ICP-RAS							
Aluminum	NA			Antimony	0	%R	
Arsenic	91	%R		Barium	100	%R	
Beryllium	96	%R		Cadmium	89	%R	
Calcium	NA	%R		Chromium	97	%R	
Cobalt	94	%R		Copper	97	%R	
Iron	NA			Lead	91	%R	
Magnesium	NA	%R		Manganese	100	%R	
Nickel	95	%R		Potassium	NA	%R	
Selenium	101	%R		Silver	81	%R	
Sodium	NA	%R		Thallium	97	%R	
Vanadium	100	%R		Zinc	92	%R	

Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Solid
SampleNumber : 94214115
Type : Matrix Spike Dupl
Station Description:

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	94	%R					
ICP-RAS							
Aluminum	NA			Antimony	0	%R	
Arsenic	89	%R		Barium	98	%R	
Beryllium	94	%R		Cadmium	90	%R	
Calcium	NA	%R		Chromium	99	%R	
Cobalt	93	%R		Copper	95	%R	
Iron	NA			Lead	90	%R	
Magnesium	NA	%R		Manganese	100	%R	
Nickel	93	%R		Potassium	NA	%R	
Selenium	99	%R		Silver	80	%R	
Sodium	NA	%R		Thallium	94	%R	
Vanadium	98	%R		Zinc	92	%R	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214116
Type : Reg sample
Station Description: SSUBO02

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	0.0668	mg/kg					
ICP-RAS							
Aluminum	18200	mg/kg		Antimony	3.0	mg/kg	UN
Arsenic	25	mg/kg	P	Barium	46.4	mg/kg	
Beryllium	0.30	mg/kg	P	Cadmium	0.20	mg/kg	U
Calcium	2630	mg/kg		Chromium	79.4	mg/kg	
Cobalt	9.92	mg/kg		Copper	41.4	mg/kg	
Iron	26500	mg/kg		Lead	9.8	mg/kg	P
Magnesium	8630	mg/kg		Manganese	248	mg/kg	
Nickel	44.9	mg/kg		Potassium	2230	mg/kg	
Selenium	13	mg/kg	P	Silver	0.30	mg/kg	U
Sodium	543	mg/kg		Thallium	6.2	mg/kg	P
Vanadium	69.6	mg/kg		Zinc	52.7	mg/kg	

Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214117
Type : Reg sample
Station Description: SDDRN1

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	1.84	mg/kg					
ICP-RAS							
Aluminum	7410	mg/kg		Antimony	3.0	mg/kg	UN
Arsenic	8.0	mg/kg	P	Barium	51.2	mg/kg	
Beryllium	0.15	mg/kg	P	Cadmium	0.56	mg/kg	P
Calcium	3770	mg/kg		Chromium	182	mg/kg	
Cobalt	238	mg/kg		Copper	108	mg/kg	
Iron	13200	mg/kg		Lead	57.0	mg/kg	
Magnesium	5300	mg/kg		Manganese	188	mg/kg	
Nickel	56.8	mg/kg		Potassium	524	mg/kg	
Selenium	6.0	mg/kg	U	Silver	0.30	mg/kg	U
Sodium	378	mg/kg		Thallium	5.0	mg/kg	U
Vanadium	32.3	mg/kg		Zinc	329	mg/kg	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214118
Type : Reg sample
Station Description: SDSD3

Analyte	Result	Units	Qlfr
MET			
Hg			
Mercury	0.159	mg/kg	
ICP-RAS			
Aluminum	5030	mg/kg	
Arsenic	7.7	mg/kg	P
Beryllium	0.15	mg/kg	P
Calcium	2920	mg/kg	
Cobalt	11.4	mg/kg	
Iron	18000	mg/kg	
Magnesium	2880	mg/kg	
Nickel	60.1	mg/kg	
Selenium	11	mg/kg	P
Sodium	952	mg/kg	
Vanadium	22.7	mg/kg	
Antimony	5.6	mg/kg	PN
Barium	69.3	mg/kg	
Cadmium	2.0	mg/kg	P
Chromium	94.6	mg/kg	
Copper	69.3	mg/kg	
Lead	56.2	mg/kg	
Manganese	153	mg/kg	
Potassium	511	mg/kg	
Silver	0.30	mg/kg	U
Thallium	5.0	mg/kg	U
Zinc	262	mg/kg	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214119
Type : Reg sample
Station Description: SDSD2

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	0.282	mg/kg					
ICP-RAS							
Aluminum	3790	mg/kg		Antimony	3.4	mg/kg	PN
Arsenic	6.7	mg/kg	P	Barium	63.9	mg/kg	
Beryllium	0.13	mg/kg	P	Cadmium	1.9	mg/kg	P
Calcium	2770	mg/kg		Chromium	96.3	mg/kg	
Cobalt	10.6	mg/kg		Copper	57.2	mg/kg	
Iron	16700	mg/kg		Lead	39.9	mg/kg	
Magnesium	2250	mg/kg		Manganese	144	mg/kg	
Nickel	59.0	mg/kg		Potassium	380	mg/kg	P
Selenium	6.0	mg/kg	U	Silver	0.30	mg/kg	U
Sodium	797	mg/kg		Thallium	5.2	mg/kg	P
Vanadium	18.1	mg/kg		Zinc	231	mg/kg	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214120
Type : Reg sample
Station Description: SDUS4

Analyte	Result	Units	Qlfr
MET			
Hg			
Mercury	0.103	mg/kg	
ICP-RAS			
Aluminum	14400	mg/kg	
Arsenic	10	mg/kg	P
Beryllium	0.33	mg/kg	P
Calcium	4540	mg/kg	
Cobalt	29.6	mg/kg	
Iron	26900	mg/kg	
Magnesium	8560	mg/kg	
Nickel	67.9	mg/kg	
Selenium	9.7	mg/kg	P
Sodium	3210	mg/kg	
Vanadium	45.4	mg/kg	
Antimony	3.0	mg/kg	UN
Barium	45.6	mg/kg	
Cadmium	0.23	mg/kg	P
Chromium	102	mg/kg	
Copper	36.2	mg/kg	
Lead	13	mg/kg	P
Manganese	263	mg/kg	
Potassium	1380	mg/kg	
Silver	0.30	mg/kg	U
Thallium	7.4	mg/kg	P
Zinc	62.5	mg/kg	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214121
Type : Reg sample
Station Description: SSURBAK3

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	0.0575	mg/kg					
ICP-RAS							
Aluminum	20900	mg/kg		Antimony	3.0	mg/kg	UN
Arsenic	22	mg/kg	P	Barium	108	mg/kg	
Beryllium	0.49	mg/kg	P	Cadmium	0.35	mg/kg	P
Calcium	3010	mg/kg		Chromium	86.3	mg/kg	
Cobalt	23.6	mg/kg		Copper	45.5	mg/kg	
Iron	30300	mg/kg		Lead	52.3	mg/kg	
Magnesium	8720	mg/kg		Manganese	417	mg/kg	
Nickel	64.1	mg/kg		Potassium	905	mg/kg	
Selenium	6.0	mg/kg	U	Silver	0.30	mg/kg	U
Sodium	299	mg/kg		Thallium	6.0	mg/kg	P
Vanadium	66.0	mg/kg		Zinc	89.6	mg/kg	

Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214122
Type : Reg sample
Station Description: SSURBAK4

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	0.0485	mg/kg					
ICP-RAS							
Aluminum	18800	mg/kg		Antimony	3.0	mg/kg	UN
Arsenic	17	mg/kg	P	Barium	70.9	mg/kg	
Beryllium	0.28	mg/kg	P	Cadmium	0.20	mg/kg	U
Calcium	2530	mg/kg		Chromium	61.5	mg/kg	
Cobalt	13.2	mg/kg		Copper	34.0	mg/kg	
Iron	28300	mg/kg		Lead	12	mg/kg	P
Magnesium	7690	mg/kg		Manganese	223	mg/kg	
Nickel	32.7	mg/kg		Potassium	985	mg/kg	
Selenium	6.0	mg/kg	U	Silver	0.30	mg/kg	U
Sodium	269	mg/kg		Thallium	7.0	mg/kg	P
Vanadium	63.3	mg/kg		Zinc	57.4	mg/kg	

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid
SampleNumber : 94214123
Type : Reg sample
Station Description: ER01

Analyte	Result	Units	Qlfr
MET			
Hg			
Mercury	0.020	mg/kg	U
ICP-RAS			
Aluminum	5.8	mg/kg	P
Arsenic	4.0	mg/kg	U
Beryllium	0.050	mg/kg	U
Calcium	18.5	mg/kg	B
Cobalt	0.50	mg/kg	U
Iron	9.98	mg/kg	B
Magnesium	25.0	mg/kg	B
Nickel	1.0	mg/kg	U
Selenium	6.0	mg/kg	U
Sodium	5.4	mg/kg	PB
Vanadium	0.30	mg/kg	U
Antimony	3.0	mg/kg	UN
Barium	0.10	mg/kg	U
Cadmium	0.20	mg/kg	U
Chromium	0.50	mg/kg	U
Copper	0.30	mg/kg	U
Lead	2.5	mg/kg	U
Manganese	0.21	mg/kg	PB
Potassium	45	mg/kg	U
Silver	0.30	mg/kg	U
Thallium	5.0	mg/kg	U
Zinc	0.40	mg/kg	U

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/24/94
Matrix : Solid
SampleNumber : 94214124
Type : Reg sample
Station Description: SBUSBK5

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
MET							
Hg							
Mercury	0.0694	mg/kg					
ICP-RAS							
Aluminum	17600	mg/kg		Antimony	3.2	mg/kg	PN
Arsenic	15	mg/kg	P	Barium	61.2	mg/kg	
Beryllium	0.41	mg/kg	P	Cadmium	0.29	mg/kg	P
Calcium	3770	mg/kg		Chromium	72.5	mg/kg	
Cobalt	16.5	mg/kg		Copper	44.1	mg/kg	
Iron	25900	mg/kg		Lead	11	mg/kg	P
Magnesium	9380	mg/kg		Manganese	385	mg/kg	
Nickel	56.8	mg/kg		Potassium	1380	mg/kg	
Selenium	6.5	mg/kg	P	Silver	0.30	mg/kg	U
Sodium	440	mg/kg		Thallium	5.0	mg/kg	U
Vanadium	53.0	mg/kg		Zinc	76.8	mg/kg	

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Solid
SampleNumber : S940531B
Type : Blank
Station Description:

MET

ICP-RAS

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
Aluminum	2.0	mg/kg	U	Antimony	3.0	mg/kg	U
Arsenic	4.0	mg/kg	U	Barium	0.10	mg/kg	U
Beryllium	0.050	mg/kg	U	Cadmium	0.20	mg/kg	U
Calcium	18.7	mg/kg		Chromium	0.50	mg/kg	U
Cobalt	0.50	mg/kg	U	Copper	0.30	mg/kg	U
Iron	2.65	mg/kg		Lead	2.5	mg/kg	U
Magnesium	22.0	mg/kg		Manganese	0.15	mg/kg	P
Nickel	1.0	mg/kg	U	Potassium	45	mg/kg	U
Selenium	6.0	mg/kg	U	Silver	0.30	mg/kg	U
Sodium	2.9	mg/kg	P	Thallium	5.0	mg/kg	U
Vanadium	0.30	mg/kg	U	Zinc	0.40	mg/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Solid
SampleNumber : S940601B
Type : Blank
Station Description:

Analyte	Result	Units	Qlfr
MET			
Hg			
Mercury	0.020	mg/kg	U

02760.7 60.605
27.b1 Kesner

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

July 15, 1994

RECEIVED
JUL 25 1994
URS CONSULTANTS

MEMORANDUM

SUBJECT: QA Review for PCBs from Buse Timber, Everett, WA

FROM: R. H. Rieck, Chemist R. H. Rieck

TO: Dave Bennett, Project Officer

LESS THAN FULL DATA REVIEW

I have reviewed the attached data package and spot-checked approximately 10 percent of the corresponding raw data, as requested by the Superfund Project Manager. Based on this review, I find that it appears that the Self Evaluation Report prepared by the ESAT contractor was conducted in accordance with the Functional Guidelines, and that data qualifiers recommended in the evaluation appear to be appropriate.

ENVIRONMENT . SERVICE ASSISTANCE TEAMS - ZONE 2

ESAT Region 10
ICF Technology Inc.
7411 Beach Drive East
Port Orchard, WA 98366
Phone (206) 871-8760

ICF Technology Inc.
ManTech Environmental

MEMORANDUM

DATE: July 14, 1994

TO: Gerald Muth, RPO, USEPA, Region 10
Robert Rieck, GC Supervisor, USEPA, Region 10 accepted 7-15-94 R.W. Rieck
Dave Bennett, Project Officer, USEPA, Region 10

FROM: Linda Karsonovich, Data Reviewer, ESAT, Region 10

THROUGH: Barry Pepich, ESAT Team Manager, Region 10

SUBJECT: Quality Assurance Review of PCB Samples from the Buse Timber, Everett, WA site

TID#: 10-9404-430
DOC#: ESAT 10A-7156
WUD#: 1423

cc: Bruce Woods, USEPA RQAMO
Jeff Kesner, URS Consultants
Sheila Smith, Organic Technical Lead, ESAT, Region 10
John Finke, Chemist, ESAT, Region 10

The quality assurance (QA) review of one water and nine soil samples from the Buse Timber, Everett, WA site has been completed. These samples were analyzed for polychlorinated biphenyls (PCBs) using SW-846 Method 8080 by the USEPA Region 10 Laboratory ESAT Team located in Manchester, WA. This QA review was conducted for the following samples listed by EPA sample codes:

Water	94214123			
Soil	94214115	94214116	94214117	94214118
	94214119	94214120	94214121	94214122
	94214124			

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the SW-846 Method 8080, the CLP Data Review Guidelines Draft 06/91, and the USEPA Region 10 Manchester Environmental Guidelines. The recommendations presented herein are based on the information provided for the review.

TIMELINESS - Acceptable

The technical holding time for the extraction and analysis of soil samples is 14 days and 40 days respectively. The technical holding time for the extraction and analysis of water samples is seven days and 40 days respectively.

All samples were extracted and analyzed within the technical holding times. No qualifiers were recommended on this basis.

INITIAL CALIBRATION

The relative standard deviation (RSD) of the calibration factors of compounds quantified using a linear equation must be ≤20% for target compounds and ≤30% for surrogates. Compounds which are quantified using a quadratic equation must contain a minimum of five calibration levels and have a correlation coefficient of not less than 0.995.

A Perkin Elmer GC with dual columns (a DB-5 on the M channel and a DB-1701 on the N channel) and dual ECD detectors was used for this analysis. Two initial calibration sequences were included with the data set.

The first initial calibration was analyzed on 06/17/94. The sequence included a five point curve for PCB 1260 and single point standards of PCBs 1016, 1221, 1232, 1242, 1248, and 1254. Only the soil samples were analyzed with this sequence.

The soil and water samples were included in the second sequence analyzed on 06/20/94. This initial calibration contained only standards for PCB 1254. The analyst chose to report the sample results using the chromatograms obtained with this sequence. However, in order to obtain quantitation limits for the remaining PCBs the analyst chose to compare the 06/20 analyses to the standards injected on 06/17. A comparison of the PCB 1254 standard analyzed on 06/17/94 with the PCB standard analyzed on 06/02/94 showed that the retention times had remained stable and that the average percent difference of the calibration factors of PCB 1254 ranged from 12.8-13.7 percent. Therefore, the reviewer felt that it was reasonable to assume that the response of the other PCBs had also remained stable, and no qualifiers were recommended on this basis.

CONTINUING CALIBRATION

The percent difference (%D) between the calculated and the true amount for each compound must not exceed ±15%. The absolute retention time of the compounds must be within the windows determined from the initial calibration.

Retention times were within the windows set by the initial calibration. The %D increased over the length of the run to the positive, indicating an increase in sensitivity. However, there were no positive results reported during the affected part of the analytical sequence. No qualifiers were recommended on this basis.

BLANKS - Acceptable

No contamination should be present in the method blanks. Instrument blanks should not display signs of carryover or cross contamination.

No target compounds were detected in the method blanks at or above the practical quantitation limit (PQL). The instrument blanks showed no signs of carryover or cross contamination at or above one half the PQL. No qualifiers were recommended on this basis.

ANALYTICAL SEQUENCE - Acceptable

Samples must be run following an initial calibration. Continuing calibration checks and instrument blanks must be run at least every 12 hours.

The sequence met the criteria for frequency of initial and continuing calibration. No qualifiers were recommended on this basis.

SURROGATES

The acceptance criteria for surrogate recovery is 60% to 150%. Manchester Laboratory Guidelines allow for 50-150% recovery.

Surrogate recoveries for the water samples ranged from 45-96% for tetrachloro-m-xylene (TCMX) and from 84-140% for decachlorobiphenyl (DCB). No qualifiers were recommended on this basis as the DCB recovery was considered to be more indicative of the behavior of the target compounds.

Surrogate recoveries for the soil samples ranged from 55-120% for TCMX and from 48-120% for DCB. Sample 94214118 was recommended for qualification as J/UJ due to a DCB recovery of 48%. No other qualifiers were recommended on this basis.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE - Acceptable

Matrix spike recoveries for PCBs should be between 50% and 150%. Relative percent differences (RPD) should be within ±30%.

The water MS/MSD had recoveries of 96-100%. The RPD was 4.1%. No qualifiers were recommended on this basis.

The soil MS/MSD had recoveries of 120-130% and the RPD was 8%. No qualifiers were recommended on this basis.

COMPOUND IDENTIFICATION - Acceptable

Compound identification is done by retention time matching of sample chromatograms to the chromatograms of authentic standards on dual dissimilar columns. The retention times of surrogates, matrix spikes, and reported compounds in each sample must be within the retention time window determined from the initial calibration.

The retention times of the surrogates and PCBs appeared to be within the windows set by the initial calibration. No qualifiers were recommended on this basis.

COMPOUND QUANTITATION - Acceptable

Reported results must be calculated using the standard curve or average calibration factor. Compounds reported below the detection level must be within 10% of the lowest calibration standard. Detected results should agree within ±30% RPD.

Results were calculated using the standard curve and reported as an average of both channels. PCB 1254 in sample 94214119 was recommended for qualification as JN as it had an 45% RPD between the two channels. No other qualifiers were recommended on this basis.

OVERALL ASSESSMENT

The data was evaluated using the guidelines set out in the quality control specifications outlined in SW-846 Method 8080, the CLP Data Review Guidelines Draft 06/91, and the USEPA Region 10 Manchester Environmental Guidelines. Overall, two percent of the data was recommended for qualification due to the continuing calibration standard and compound quantitation. While no other qualifiers were recommended, the data would have been better presented if a more sound analytical sequence had been followed.

DATA QUALIFIER DEFINITIONS

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.

REJ - The data are unusable for all purposes.

N - For organic analyses there is evidence that the analyte is present in the sample.

JN - For organic analyses there is evidence that the analyte is present in the sample. The associated numerical result is an estimate.

UJ - The analyte was not detected at or above the reported estimated result.

NAF - Not analyzed for.

* - The analyte was present in the sample.

EXP - The result is equal to the number before the EXP times 10 to the power of the number after the EXP.

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid (Soil)
SampleNumber : 94214115
Type : Reg sample
Station Description: SSURO01
Depth 0-6 inches bgs

GC

PCB

Analyte	Result	Units	Qlfr
Decachlorobiphenyl	97	%R	
PCB-1221	110	ug/kg	U
PCB-1242	110	ug/kg	U
PCB-1254	55	ug/kg	U
Tetrachlorometaxylen	100	%R	
PCB-1016	110	ug/kg	U
PCB-1232	110	ug/kg	U
PCB-1248	110	ug/kg	U
PCB-1260	110	ug/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Solid (Soil)
SampleNumber : 94214115
Type : Matrix Spike
Station Description: SSVR01

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
GC							
PCB							
Decachlorobiphenyl	120	%R		PCB-1260	130	%R	
Tetrachlorometaxylen	120	%R					

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Solid (Soil)
SampleNumber : 94214115
Type : Matrix Spike Dupl
Station Description: SSUR01

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
GC							
PCB							
Decachlorobiphenyl	105	%R		PCB-1260	120	%R	
Tetrachlorometaxylen	104	%R					

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid Soil
SampleNumber : 94214116
Type : Reg sample
Station Description: SSUBO02
Sample depth 18-24" bgs

Analyte	Result	Units	Qlfr
GC			
PCB			
Decachlorobiphenyl	98	%R	
PCB-1221	120	ug/kg	U
PCB-1242	120	ug/kg	U
PCB-1254	62	ug/kg	U
Tetrachlorometaxylen	102	%R	
PCB-1016	120	ug/kg	U
PCB-1232	120	ug/kg	U
PCB-1248	120	ug/kg	U
PCB-1260	120	ug/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid Sediment
SampleNumber : 94214117
Type : Reg sample
Station Description: SDDRN1 Storm Drain

Analyte	Result	Units	Qlfr
GC			
PCB			
Decachlorobiphenyl	110	%R	
PCB-1221	130	ug/kg	U
PCB-1242	130	ug/kg	U
PCB-1254	1000	ug/kg	
Tetrachlorometaxylen	88	%R	
PCB-1016	130	ug/kg	U
PCB-1232	130	ug/kg	U
PCB-1248	130	ug/kg	U
PCB-1260	130	ug/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid Sediment
SampleNumber : 94214118
Type : Reg sample duplicate
Station Description: SDSD3 Storm drain outfall

Analyte	Result	Units	Qlfr
GC			
PCB			
Decachlorobiphenyl	48	%R	
PCB-1221	330	ug/kg	UJ
PCB-1242	330	ug/kg	UJ
PCB-1254	600	ug/kg	J
Tetrachlorometaxylen	55	%R	
PCB-1016	330	ug/kg	UJ
PCB-1232	330	ug/kg	UJ
PCB-1248	330	ug/kg	UJ
PCB-1260	330	ug/kg	UJ

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid Sediment
SampleNumber : 94214119
Type : Reg sample
Station Description: SDSD2 Storm drain out fall

GC

PCB

Analyte	Result	Units	Qlfr
Decachlorobiphenyl	57	%R	
PCB-1221	400	ug/kg	U
PCB-1242	400	ug/kg	U
PCB-1254	460	ug/kg	JN
Tetrachlorometaxylen	65	%R	
PCB-1016	400	ug/kg	U
PCB-1232	400	ug/kg	U
PCB-1248	400	ug/kg	U
PCB-1260	400	ug/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid Sediment
SampleNumber : 94214120
Type : Reg sample
Station Description: SDUS4 Union Slough

GC

PCB

Analyte	Result	Units	Qlfr
Decachlorobiphenyl	81	%R	
PCB-1221	140	ug/kg	U
PCB-1242	140	ug/kg	U
PCB-1254	75	ug/kg	U
Tetrachlorometaxylen	84	%R	
PCB-1016	140	ug/kg	U
PCB-1232	140	ug/kg	U
PCB-1248	140	ug/kg	U
PCB-1260	140	ug/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid Soil
SampleNumber : 94214121
Type : Reg sample Background
Station Description: SSURBAK3 offsite 0-6inch Sys

Analyte	Result	Units	Qlfr
GC			
PCB			
Decachlorobiphenyl	86	%R	
PCB-1221	120	ug/kg	U
PCB-1242	120	ug/kg	U
PCB-1254	62	ug/kg	U
Tetrachlorometaxylen	91	%R	
PCB-1016	120	ug/kg	U
PCB-1232	120	ug/kg	U
PCB-1248	120	ug/kg	U
PCB-1260	120	ug/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Solid Soil
SampleNumber : 94214122
Type : Reg sample background
Station Description: SSURBAK4 offsite 18-24" bgs

GC

PCB

Analyte	Result	Units	Qlfr
Decachlorobiphenyl	95	%R	
PCB-1221	150	ug/kg	U
PCB-1242	150	ug/kg	U
PCB-1254	77	ug/kg	U
Tetrachlorometaxylen	100	%R	
PCB-1016	150	ug/kg	U
PCB-1232	150	ug/kg	U
PCB-1248	150	ug/kg	U
PCB-1260	150	ug/kg	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/25/94
Matrix : Liquid-Total
SampleNumber : 94214123
Type : Reg sample Rinsate
Station Description: ER01

GC

PCB

Analyte	Result	Units	Qlfr
Decachlorobiphenyl	140	%R	
PCB-1221	0.20	ug/L	U
PCB-1242	0.20	ug/L	U
PCB-1254	0.11	ug/L	U
Tetrachlorometaxylen	96	%R	
PCB-1016	0.20	ug/L	U
PCB-1232	0.20	ug/L	U
PCB-1248	0.20	ug/L	U
PCB-1260	0.20	ug/L	U

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Liquid-Total
SampleNumber : 94214123
Type : Matrix Spike
Station Description:

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
GC							
PCB							
Decachlorobiphenyl	110	%R		PCB-1260	100	%R	
Tetrachlorometaxylen	51	%R					

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix : Liquid-Total
SampleNumber : 94214123
Type : Matrix Spike Dupl
Station Description:

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
GC							
PCB							
Decachlorobiphenyl	84	%R		PCB-1260	96	%R	
Tetrachlorometaxylen	45	%R					

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected : 5/24/94
Matrix : Solid Sediment
SampleNumber : 94214124
Type : Reg sample background
Station Description: SBUSBK5 Union Slough

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
GC							
PCB							
Decachlorobiphenyl	92	%R		PCB-1016	140	ug/kg	U
PCB-1221	140	ug/kg	U	PCB-1232	140	ug/kg	U
PCB-1242	140	ug/kg	U	PCB-1248	140	ug/kg	U
PCB-1254	70	ug/kg	U	PCB-1260	140	ug/kg	U
Tetrachlorometaxylen	95	%R					

Manchester Environmental Laboratory
Final Report

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix :
SampleNumber : BW4151
Type : Blank
Station Description:

Analyte	Result	Units	Qlfr
GC			
PCB			
Decachlorobiphenyl	102	%R	
PCB-1221	0.19	ug/L	U
PCB-1242	0.19	ug/L	U
PCB-1254	0.098	ug/L	U
Tetrachlorometaxylen	43	%R	
PCB-1016	0.19	ug/L	U
PCB-1232	0.19	ug/L	U
PCB-1248	0.19	ug/L	U
PCB-1260	0.19	ug/L	U

Project Code : TEC-613A
Project Name : BUSE TIMBER (SSI)
Project Officer : DAVID BENNETT
Account Code : 4TFA10PUZZ

Collected :
Matrix :
SampleNumber : BW4151D
Type : Blank
Station Description:

GC

PCB

Analyte	Result	Units	Qlfr	Analyte	Result	Units	Qlfr
Decachlorobiphenyl	105	%R		PCB-1016	0.20	ug/L	U
PCB-1221	0.20	ug/L	U	PCB-1232	0.20	ug/L	U
PCB-1242	0.20	ug/L	U	PCB-1248	0.20	ug/L	U
PCB-1254	0.11	ug/L	U	PCB-1260	0.20	ug/L	U
Tetrachlorometaxylen	55	%R					

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

RECEIVED
JUL 25 1994
URS CONSULTANTS

REPLY TO
ATTN OF: ES-095

July 21, 19941

MEMORANDUM

SUBJECT: Data Validation for Buse Timber SI, Case No. 22170, SDG No. JL511, Semi-Volatile Organic Analysis

FROM: Donald Matheny, Chemist DM
Quality Assurance Office, ESD

TO: Dave Bennett, Site Manager
Superfund Response & Investigations Branch, HWD

The QA Office has received and is transmitting the above ESAT data validation report.

CC: Porter Lombard, ESAT-RSCC
Jeff Kesner, Site Lead, URS
Bruce Woods, TPO, Region 10
Mike Hiatt, Data Audit Staff, EMSL-LV
QAO, AOB

ESAT Region 10
ICF Technology Inc.
1200 6th Avenue
Seattle, WA 98101
Phone (206) 224-4162

ICF Technology Inc.
ManTech Environmental

MEMORANDUM

DATE: July 19, 1994

TO: Jerry Muth, RPO, USEPA, Region 10

Donald Matheny, Task Monitor, USEPA, Region 10

THROUGH: Barry Pepich, ESAT Team Manager, Region 10

FROM: David J. Lindquist, ESAT Data Reviewer

SUBJECT: Data Validation Report of Semi-Volatile Organic Analyses of Samples from Buse Timber Site Investigation
Case: 22170 SDG: JL511

TID #: 10-9404-430
DOCUMENT #: ESAT-10B-7479
WUD #: 2347

The quality assurance (QA) review of nine (9) low level soil samples and one water sample (rinseate) collected from the above referenced site has been completed. These samples were analyzed for semi-volatile organic compounds in accordance with the USEPA Contract Laboratory Program Statement of Work. The analyses were performed by Southwest Laboratory of Oklahoma located in Broken Arrow, OK. The samples were numbered:

JL511	JL512	JL513	JL514	JL515
JL516	JL517	JL518	JL519	JL520

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the "Contract Laboratory Program Statement of Work for Organics Analysis, 3/90" and the "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, (2/94)".

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

1. Timeliness - Acceptable

The samples were extracted and analyzed within the contract required and technical (40 CFR 136 water criteria) holding times. The Chain of Custody Form indicates that the rinseate was not preserved with HCl.

Listed below are pertinent collection and analysis dates:

Sample Number	Collection Date	Rec'd. Date	Extraction Date	Analysis Date
JL511	052594	052794	052994	060394
JL512	052594	052794	052994	060394
JL513	052594	052794	052994	062094
JL514	052594	052794	052994	062094
JL515	052594	052794	052994	062094
JL516	052594	052794	052994	060394
JL517	052594	052794	052994	060394
JL518	052594	052794	052994	060394
JL519(r)	052594	052794	052894	060194
JL520	052494	052794	052994	060794

(r) = rinseate

2. GC/MS Tuning - Acceptable

Instrument tuning and system performance criteria were met for all dates of analysis.

Two GC/MS systems were used in the analysis of the samples. All samples were analyzed within the acceptable 12 hour window of decafluorotriphenylphosphine (DFTPP) tunings.

The data presented on each GC/MS Tuning and Mass Calibration Form (Form 5B) was compared with each mass listing and the raw data. Calculations and transcriptions were correct.

3. Initial Calibration - Acceptable

The initial calibrations were performed in accordance with the method. The percent relative standard deviation criterion (%RSD $\leq$ 30%) and the minimum average relative response factor requirements were met for all compounds.

The raw data was compared with the reported values. Calculations were correct and no transcription errors were noted.

4. Continuing Calibration

The continuing calibration standards met the criteria for minimum RRFs and percent difference (%D) relative to the initial calibration, for all target compounds with the following exceptions:

Analysis Date: 06/03/94

	%D	Sensitivity
2,2'-oxybis(1-chloropropane)	-31.4	increase@
hexachlorocyclopenatadiene	41.2	decrease
di-n-octylphthalate	-33.5	increase@

Hexachlorocyclopentadiene results are qualified "UJ" (estimated at the detection limit) for the samples listed below:

JL511 JL512 JL516 JL517 JL518

Analysis Date: 06/07/94

	%D	Sensitivity
4,6-dinitro-2-methylphenol	29.9+	decrease
hexachlorocyclopenatadiene	37.0	decrease
2,4-dinitrophenol	32.9+	decrease

Hexachlorocyclopenatadiene results are qualified "UJ" (estimated at the detection limit) for sample JL520.

Analysis Date: 06/13/94

	%D	Sensitivity
2,4-dimethylphenol	27.8+	decrease
4-chloroaniline	35.7	decrease
hexachlorocyclopenatadiene	56.0	decrease
4-nitrophenol	-31.9	increase@
3,3'-dichlorobenzidine	29.4+	decrease
2,4,6-tribromophenol	-27.0	increase@

Hexachlorocyclopenatadiene and 4-chloroaniline results are qualified "UJ" (estimated at the detection limit) for the samples listed below:

JL513 JL514 JL515

@ - Results do not warrant qualification on the basis of increased instrument sensitivity relative to the initial calibration and the associated results were non-detected.

+ - Results do not warrant qualification on the basis that the associated results were non-detected and the %D < 35%.

The raw data was compared with the reported values. Calculations were correct and no transcription errors were noted.

5. Blanks

Background levels for all target compounds in the method blanks were below the contract required quantitation limits.

Bis(2-ethylhexyl)phthalate was detected in VBLK02. All associated bis(2-ethylhexyl)phthalate results less than 10X the concentration reported in the blank are qualified "U", non-detected. Associated results that were detected at levels less than the CRQL, are raised to the CRQL on the Form 1. Bis(2-ethylhexyl)phthalate is qualified, "U" for the samples listed below:

JL511	JL512	JL513	JL514	JL515
JL516	JL517	JL518	JL520	

Tentatively identified compound (TIC) results reported for the method blanks were deleted from the associated sample Form 1s.

6. Surrogate Recovery - Acceptable

Surrogate recovery criteria were met for all samples, blanks and QC samples.

Listed below are the range of surrogate recoveries:

Surrogate	Recovery Range
nitrobenzene-d5	46-72%
2-fluorobiphenyl	55-85%
terphenyl-d14	58-120%
phenol-d5	39-68%
2-fluorophenol	38-65%
2,4,6-tribromophenol	42-96%
2-chlorophenol-d4	39-68%
1,2-dichlorobenzene-d4	40-71%

The raw data was compared with the data presented in the surrogate recovery forms. Calculations were correct and no transcription errors were noted.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD analysis was performed on sample JL511. The MS/MSD compound recoveries and relative percent differences (%RPD) between values were within the required control limits with one exception noted below.

Compound	MS %R	MSD %R	RPD
acenaphthene	58	75	26*

* QC limit = 19

The data was not qualified on the basis of the MS/MSD results.

8. Internal Standards Performance - Acceptable

The data reported on the Internal Standard Area Summary (Form 8B) was verified with the raw data. Chromatograms, quantitation lists, and transcriptions were examined.

All analyses met the technical acceptance criteria for internal standard area counts (+100% to -50% of the associated continuing calibration internal standard area) and retention time shift (± 0.50 minutes of the associated continuing calibration internal standard RT).

9. Compound Identification - Acceptable

The chromatograms and quantitation lists were inspected. Sample and laboratory generated standard spectra were scrutinized. Calculations were checked with the raw data.

Positive sample results were within relative retention time (RRT) windows and provided spectra meeting USEPA spectral matching criteria.

10. Compound Quantitation and Detection Limits - Acceptable

The raw data was examined to verify the calculations of sample results and the reported detection limits. The sample results were quantitated using an updated continuing calibration standard. The method specified detection limits were achieved. The quantitation ions used were in accordance with the method.

11. Tentatively Identified Compounds (TICs)

The raw data and chromatograms were inspected for tentatively identified compounds. Several hydrocarbon TICs were detected in all of the samples.

12. System Performance - Acceptable

All blanks, samples and QC samples were analyzed on a GC/MS system meeting the technical acceptance criteria.

13. Laboratory Contact

The laboratory was not contacted for this review.

14. Overall Assessment

Approximately five percent of the reported sample results were qualified as non-detects or estimates due to blank contamination and/or continuing calibration criteria.

DATA QUALIFIER DEFINITIONS

U- The analyte was analyzed for and is not present above the level of the associated value. The associated numerical value indicates the approximate concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte below the associated numerical level, reanalysis or alternative analytical methods should be considered. The technical staff is available to discuss available options.

J- The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be seriously considered for decision making and are usable for many purposes.

A subscript may be appended to the "J" that indicates which of the following quality control criteria were not met:

1 Blank contamination: indicates possible high bias and/or false positives.

2 Calibration range exceeded: indicates possible low bias.

3 Holding times not met: indicates low bias for most analytes with the exception of common laboratory contaminants and chlorinated ethenes (i.e.: trichloroethene, 1,1-dichloroethene, vinyl chloride).

4 Other QC outside control limits: bias not readily determined.

R- The data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified.

Resampling and reanalysis are necessary to confirm or deny the presence of the analyte.

UJ - A combination of the "U" and "J" qualifier. The analyte was analyzed for and was not present above the level of the associated value. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte close to the associated numerical level, reanalysis or alternative analytical methods should be considered.

N- The analysis indicates that an analyte is present, and there are strong indications that the identity is correct.

Confirmation of the analyte requires further analysis.

NJ- A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

A subscript may be appended to the "NJ" that indicates which of the following situations applies:

1 DDT/Endrin breakdown evident.

2 Interference from other sample components.

3 Non-Target Compound List (TCL) compounds (Confirmation is necessary using specific target compound methodology to accurately determine the concentration and identity of the detected compound).

4 A confirmation analysis was missing or quality control criteria were not met for the confirmation analysis.

NOTE: Data users are encouraged to contact their Regional representative within ESD to clarify or obtain further information on the appropriate use of analytical data.

DPO: [ ] ACTION [X] FYI

Region 10

ORGANIC REGIONAL DATA ASSESSMENT SUMMARY

CASE NO. 22170 LABORATORY Southwest Laboratory

SDG NO. JL511 DATA USER SUPERFUND

SOW 3/90 REVIEW COMPLETION DATE 7-19-94

NO. OF SAMPLES 1 WATER 9 SOIL ____ OTHER ____

REVIEWER [ ] ESD [X] ESAT [ ] OTHER, CONTRACT/CONTRACTOR ____

	~~VOA~~	BNA	PEST	~~OTHER~~
1. HOLDING TIMES		O		
2. GC-MS TUNE/ GC PERFORMANCE		O		
3. INITIAL CALIBRATIONS		O		
4. CONTINUING CALIBRATIONS		X		
5. FIELD BLANKS ("F" = not applicable)		F		
6. LABORATORY BLANKS		X		
7. SURROGATES		O		
8. MATRIX SPIKE/DUPLICATES		O		
9. REGIONAL QC ("F" = not applicable)		F		
10. INTERNAL STANDARDS		O		
11. COMPOUND IDENTIFICATION		O		
12. COMPOUND QUANTITATION		O		
13. SYSTEM PERFORMANCE		O		
14. OVERALL ASSESSMENT		X		

O = No problems or minor problems that do not affect data usability.
X = No more than *about 5%* of the data points are qualified as either estimated or unusable.
M = More than *about 5%* of the data points are qualified as estimated.
Z = More than *about 5%* of the data points are qualified as unusable.

DPO ACTION ITEMS: ____

AREAS OF CONCERN: ____

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
Surface Soil
JL511

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.01

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0211.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 30 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	470	U
111-44-4	bis(2-Chloroethyl)Ether	470	U
95-57-8	2-Chlorophenol	470	U
541-73-1	1,3-Dichlorobenzene	470	U
106-46-7	1,4-Dichlorobenzene	470	U
95-50-1	1,2-Dichlorobenzene	470	U
95-48-7	2-Methylphenol	470	U
108-60-1	2,2'-oxybis(1-Chloropropane)	470	U
106-44-5	4-Methylphenol	470	U
621-64-7	N-Nitroso-di-n-propylamine	470	U
67-72-1	Hexachloroethane	470	U
98-95-3	Nitrobenzene	470	U
78-59-1	Isophorone	470	U
88-75-5	2-Nitrophenol	470	U
105-67-9	2,4-Dimethylphenol	470	U
111-91-1	bis(2-Chloroethoxy)methane	470	U
120-83-2	2,4-Dichlorophenol	470	U
120-82-1	1,2,4-Trichlorobenzene	470	U
91-20-3	Naphthalene	470	U
106-47-8	4-Chloroaniline	470	U
87-68-3	Hexachlorobutadiene	470	U
59-50-7	4-Chloro-3-Methylphenol	470	U
91-57-6	2-Methylnaphthalene	470	U
77-47-4	Hexachlorocyclopentadiene	470	J U
88-06-2	2,4,6-Trichlorophenol	470	U
95-95-4	2,4,5-Trichlorophenol	1100	U
91-58-7	2-Chloronaphthalene	470	U
88-74-4	2-Nitroaniline	1100	U
131-11-3	Dimethylphthalate	470	U
208-96-8	Acenaphthylene	470	U
606-20-2	2,6-Dinitrotoluene	470	U
99-09-2	3-Nitroaniline	1100	U
83-32-9	Acenaphthene	470	U

7-19-94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET SSURO4 EPA SAMPLE NO.

JL511

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.01

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0211.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 30 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1100	U
100-02-7	4-Nitrophenol	1100	U
132-64-9	Dibenzofuran	470	U
121-14-2	2,4-Dinitrotoluene	470	U
84-66-2	Diethylphthalate	470	U
7005-72-3	4-Chlorophenyl-phenylether	470	U
86-73-7	Fluorene	470	U
100-01-6	4-Nitroaniline	1100	U
534-52-1	4,6-Dinitro-2-methylphenol	1100	U
86-30-6	N-Nitrosodiphenylamine (1)	470	U
101-55-3	4-Bromophenyl-phenylether	470	U
118-74-1	Hexachlorobenzene	470	U
87-86-5	Pentachlorophenol	1100	U
85-01-8	Phenanthrene	470	U
120-12-7	Anthracene	470	U
86-74-8	Carbazole	470	U
84-74-2	Di-n-butylphthalate	470	U
206-44-0	Fluoranthene	470	U
129-00-0	Pyrene	470	U
85-68-7	Butylbenzylphthalate	470	U
91-94-1	3,3'-Dichlorobenzidine	470	U
56-55-3	Benzo(a)anthracene	470	U
218-01-9	Chrysene	470	U
117-81-7	bis(2-Ethylhexyl)phthalate	470 98	U JB
117-84-0	Di-n-octylphthalate	470	U
205-99-2	Benzo(b)fluoranthene	470	U
207-08-9	Benzo(k)fluoranthene	470	U
50-32-8	Benzo(a)pyrene	470	U
193-39-5	Indeno(1,2,3-cd)pyrene	470	U
53-70-3	Dibenz(a,h)anthracene	470	U
191-24-2	Benzo(g,h,i)perylene	470	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SYUKUP1
EPA SAMPLE NO.
JL511

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.01

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0211.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 30 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(uL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

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

Number TICs found: 25

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~	~~123-42-2~~	~~2-Pentanone, 4-hydroxy-4-met~~	~~3.463~~	~~17000~~	~~NJAB~~
2.		UNKNOWN HYDROCARBON	12.741	580	NJ
3.		UNKNOWN ORGANIC ACID	13.441	750	NJ
4.		UNKNOWN ORGANIC ACID	13.554	950	NJ
5.		UNKNOWN ALKANE	15.715	370	NJ
~~6.~~		~~UNKNOWN AMIDE~~	~~16.181~~	~~740~~	~~JB~~
7.		UNKNOWN HYDROCARBON	16.863	1100	NJ
8.		UNKNOWN CYCLOALKANE	17.945	2800	NJ
9.		UNKNOWN HYDROCARBON	18.127	1100	NJ
10.		UNKNOWN HYDROCARBON	18.321	390	NJ
~~11.~~		~~UNKNOWN AMIDE~~	~~18.435~~	~~1400~~	~~JB~~
12.		UNKNOWN	18.630	500	NJ
13.		UNKNKOWN ALKANE	18.915	1800	NJ
14.		Phosphonic acid, ester	18.961	1800	NJ
15.		UNKNOWN	19.041	480	NJ
16.		UNKNOWN ALKANE	19.865	1800	NJ
17.		UNKNOWN	20.014	500	NJ
18.		UNKNOWN ALKANE	20.918	450	NJ
19.		UNKNOWN	21.033	510	NJ
20.		UNKNOWN	21.113	460	NJ
21.		UNKNOWN	21.354	590	NJ
22.	83-47-6	.gamma.-Sitosterol	21.595	890	NJ
23.		UNKNOWN	21.698	590	NJ
24.		UNKNOWN	22.409	410	NJ
25.	1058-61-3	Stigmast-4-en-3-one	22.489	440	NJ
26.					
27.					
28.					
29.					
30.					

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SSUB002
Subsurface Soil

EPA SAMPLE NO.

JL512

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0214.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 35 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	510	U
111-44-4	bis(2-Chloroethyl)Ether	510	U
95-57-8	2-Chlorophenol	510	U
541-73-1	1,3-Dichlorobenzene	510	U
106-46-7	1,4-Dichlorobenzene	510	U
95-50-1	1,2-Dichlorobenzene	510	U
95-48-7	2-Methylphenol	510	U
108-60-1	2,2'-oxybis(1-Chloropropane)	510	U
106-44-5	4-Methylphenol	510	U
621-64-7	N-Nitroso-di-n-propylamine	510	U
67-72-1	Hexachloroethane	510	U
98-95-3	Nitrobenzene	510	U
78-59-1	Isophorone	510	U
88-75-5	2-Nitrophenol	510	U
105-67-9	2,4-Dimethylphenol	510	U
111-91-1	bis(2-Chloroethoxy)methane	510	U
120-83-2	2,4-Dichlorophenol	510	U
120-82-1	1,2,4-Trichlorobenzene	510	U
91-20-3	Naphthalene	510	U
106-47-8	4-Chloroaniline	510	U
87-68-3	Hexachlorobutadiene	510	U
59-50-7	4-Chloro-3-Methylphenol	510	U
91-57-6	2-Methylnaphthalene	510	U
77-47-4	Hexachlorocyclopentadiene	510	U
88-06-2	2,4,6-Trichlorophenol	510	U
95-95-4	2,4,5-Trichlorophenol	1200	U
91-58-7	2-Chloronaphthalene	510	U
88-74-4	2-Nitroaniline	1200	U
131-11-3	Dimethylphthalate	510	U
208-96-8	Acenaphthylene	510	U
606-20-2	2,6-Dinitrotoluene	510	U
99-09-2	3-Nitroaniline	1200	U
83-32-9	Acenaphthene	510	U

DL 1-19-94

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JL512

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0214.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 35 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500 (UL) Date Analyzed: 06/03/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1200	U
100-02-7	4-Nitrophenol	1200	U
132-64-9	Dibenzofuran	510	U
121-14-2	2,4-Dinitrotoluene	510	U
84-66-2	Diethylphthalate	510	U
7005-72-3	4-Chlorophenyl-phenylether	510	U
86-73-7	Fluorene	510	U
100-01-6	4-Nitroaniline	1200	U
534-52-1	4,6-Dinitro-2-methylphenol	1200	U
86-30-6	N-Nitrosodiphenylamine (1)	510	U
101-55-3	4-Bromophenyl-phenylether	510	U
118-74-1	Hexachlorobenzene	510	U
87-86-5	Pentachlorophenol	1200	U
85-01-8	Phenanthrene	510	U
120-12-7	Anthracene	510	U
86-74-8	Carbazole	510	U
84-74-2	Di-n-butylphthalate	510	U
206-44-0	Fluoranthene	510	U
129-00-0	Pyrene	510	U
85-68-7	Butylbenzylphthalate	510	U
91-94-1	3,3'-Dichlorobenzidine	510	U
56-55-3	Benzo(a)anthracene	510	U
218-01-9	Chrysene	510	U
117-81-7	bis(2-Ethylhexyl)phthalate	510	U
117-84-0	Di-n-octylphthalate	88	U JB
205-99-2	Benzo(b)fluoranthene	510	U
207-08-9	Benzo(k)fluoranthene	510	U
50-32-8	Benzo(a)pyrene	510	U
193-39-5	Indeno(1,2,3-cd)pyrene	510	U
53-70-3	Dibenz(a,h)anthracene	510	U
191-24-2	Benzo(g,h,i)perylene	510	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO: JL512

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.02

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0214.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 35 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(uL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.8

Number TICs found: 25 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	123-42-2	2-Pentanone, 4-hydroxy-4-met	3.475	13000	NJA
2.		UNKNOWN ALKANE	15.712	450	NJ
3.		UNKNOWN AMIDE	16.189	2800	J
4.		UNKNOWN ALKANE	16.303	370	J
5.		UNKNOWN ALDEHYDE	16.508	510	J
6.		UNKNOWN ALCOHOL	16.872	1200	J
7.		UNKNOWN	16.975	680	J
8.		UNKNOWN ALKANE	17.408	330	J
9.		UNKNOWN ALKANE	17.933	1500	J
10.		UNKNOWN	18.447	860	J
11.		UNKNOWN ALKANE	18.924	1000	J
12.		UNKNOWN	18.970	580	J
13.		UNKNOWN	19.050	340	J
14.		UNKNOWN	19.680	360	J
15.		UNKNOWN ALKANE	19.864	1500	J
16.		UNKNOWN	19.944	720	J
17.		UNKNOWN	20.013	580	J
18.		UNKNOWN	20.150	370	J
19.		UNKNOWN ALKANE	20.242	330	J
20.		UNKNOWN ALKANE	20.918	340	J
21.		UNKNOWN	21.124	370	J
22.		UNKNOWN	21.365	470	J
23.	83-47-6	.gamma.-Sitosterol	21.606	370	NJ
24.		UNKNOWN	21.721	500	J
25.		UNKNOWN	22.409	260	J
26.					
27.					
28.					
29.					
30.					

DL 7-19-94 60

1B

SDDRN1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Strim Brain Sediment

JL513

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0448.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 29 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 5.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	4600	U
111-44-4	bis(2-Chloroethyl)Ether	4600	U
95-57-8	2-Chlorophenol	4600	U
541-73-1	1,3-Dichlorobenzene	4600	U
106-46-7	1,4-Dichlorobenzene	4600	U
95-50-1	1,2-Dichlorobenzene	4600	U
95-48-7	2-Methylphenol	4600	U
108-60-1	2,2'-oxybis(1-Chloropropane)	4600	U
106-44-5	4-Methylphenol	4600	U
621-64-7	N-Nitroso-di-n-propylamine	4600	U
67-72-1	Hexachloroethane	4600	U
98-95-3	Nitrobenzene	4600	U
78-59-1	Isophorone	4600	U
88-75-5	2-Nitrophenol	4600	U
105-67-9	2,4-Dimethylphenol	4600	U
111-91-1	bis(2-Chloroethoxy)methane	4600	U
120-83-2	2,4-Dichlorophenol	4600	U
120-82-1	1,2,4-Trichlorobenzene	4600	U
91-20-3	Naphthalene	4600	U
106-47-8	4-Chloroaniline	4600	J U
87-68-3	Hexachlorobutadiene	4600	U
59-50-7	4-Chloro-3-Methylphenol	4600	U
91-57-6	2-Methylnaphthalene	4600	U
77-47-4	Hexachlorocyclopentadiene	4600	J U
88-06-2	2,4,6-Trichlorophenol	4600	U
95-95-4	2,4,5-Trichlorophenol	11000	U
91-58-7	2-Chloronaphthalene	4600	U
88-74-4	2-Nitroaniline	11000	U
131-11-3	Dimethylphthalate	4600	U
208-96-8	Acenaphthylene	4600	U
606-20-2	2,6-Dinitrotoluene	4600	U
99-09-2	3-Nitroaniline	11000	U
83-32-9	Acenaphthene	4600	U

7-19-94

02

1C

SEMIVOLATIL RGANICS ANALYSIS DATA SH SDDRNI EPA SAMPLE NO.

JL513

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0448.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 29 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 5.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	11000	U
100-02-7	4-Nitrophenol	11000	U
132-64-9	Dibenzofuran	4600	U
121-14-2	2,4-Dinitrotoluene	4600	U
84-66-2	Diethylphthalate	4600	U
7005-72-3	4-Chlorophenyl-phenylether	4600	U
86-73-7	Fluorene	4600	U
100-01-6	4-Nitroaniline	11000	U
534-52-1	4,6-Dinitro-2-methylphenol	11000	U
86-30-6	N-Nitrosodiphenylamine (1)	4600	U
101-55-3	4-Bromophenyl-phenylether	4600	U
118-74-1	Hexachlorobenzene	4600	U
87-86-5	Pentachlorophenol	460	J
85-01-8	Phenanthrene	240	J
120-12-7	Anthracene	4600	U
86-74-8	Carbazole	4600	U
84-74-2	Di-n-butylphthalate	4600	U
206-44-0	Fluoranthene	400	J
129-00-0	Pyrene	750	J
85-68-7	Butylbenzylphthalate	650	J
91-94-1	3,3'-Dichlorobenzidine	4600	U
56-55-3	Benzo(a)anthracene	4600	U
218-01-9	Chrysene	320	J
117-81-7	bis(2-Ethylhexyl)phthalate	4600 ~~2200~~	U ~~JB~~
117-84-0	Di-n-octylphthalate	520	J
205-99-2	Benzo(b)fluoranthene	4600	U
207-08-9	Benzo(k)fluoranthene	4600	U
50-32-8	Benzo(a)pyrene	4600	U
193-39-5	Indeno(1,2,3-cd)pyrene	4600	U
53-70-3	Dibenz(a,h)anthracene	4600	U
191-24-2	Benzo(g,h,i)perylene	380	J

7-19-94

1F

SEMIVOLATII ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

JL513

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0448.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 29 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(uL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 5.3

Number TICs found: 25

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	123-42-2	2-Pentanone, 4-hydroxy-4-met	3.133	28000	NJA
2.		UNKNOWN ALKANE	16.421	12000	NJ
3.		UNKNOWN ALKANE	16.986	5000	J
4.		UNKNOWN ALKANE	17.274	6000	J
5.		UNKNOWN HYDROCARBON	17.494	3800	J
6.		UNKNOWN ALKANE	17.679	5800	J
7.		UNKNOWN HYDROCARBON	18.350	2300	J
8.		UNKNOWN HYDROCARBON	18.558	6400	J
9.		UNKNOWN	18.662	2100	J
10.		UNKNOWN	18.767	1800	J
11.		UNKNOWN ALKANE	18.836	5400	J
12.		UNKNOWN	19.021	2600	J
13.		UNKNOWN	19.091	2400	J
14.		UNKNOWN	19.207	3800	J
15.		UNKNOWN	19.300	5900	J
16.		UNKNOWN	19.392	1300	J
17.		UNKNOWN	19.427	1600	J
18.		UNKNOWN	19.508	3000	J
19.		UNKNOWN	19.636	2600	J
20.		UNKNOWN	19.682	1800	J
21.		UNKNOWN	20.065	2900	J
22.		UNKNOWN ALKANE	20.285	1400	J
23.		UNKNOWN	20.598	1800	J
24.		UNKNOWN ALKANE	20.865	2500	J
25.		UNKNOWN	21.039	2000	J
26.					
27.					
28.					
29.					
30.					

1-19-94

SDSD3

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JL514

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.04

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0449.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 77 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 1000(UL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 6.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	29000	U
111-44-4	bis(2-Chloroethyl)Ether	29000	U
95-57-8	2-Chlorophenol	29000	U
541-73-1	1,3-Dichlorobenzene	29000	U
106-46-7	1,4-Dichlorobenzene	29000	U
95-50-1	1,2-Dichlorobenzene	29000	U
95-48-7	2-Methylphenol	29000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	2900	J
106-44-5	4-Methylphenol	29000	U
621-64-7	N-Nitroso-di-n-propylamine	29000	U
67-72-1	Hexachloroethane	29000	U
98-95-3	Nitrobenzene	29000	U
78-59-1	Isophorone	29000	U
88-75-5	2-Nitrophenol	29000	U
105-67-9	2,4-Dimethylphenol	29000	U
111-91-1	bis(2-Chloroethoxy)methane	29000	U
120-83-2	2,4-Dichlorophenol	29000	U
120-82-1	1,2,4-Trichlorobenzene	29000	U
91-20-3	Naphthalene	29000	U
106-47-8	4-Chloroaniline	29000	U
87-68-3	Hexachlorobutadiene	29000	U
59-50-7	4-Chloro-3-Methylphenol	3700	J
91-57-6	2-Methylnaphthalene	29000	U
77-47-4	Hexachlorocyclopentadiene	29000	U
88-06-2	2,4,6-Trichlorophenol	70000	U
95-95-4	2,4,5-Trichlorophenol	29000	U
91-58-7	2-Chloronaphthalene	70000	U
88-74-4	2-Nitroaniline	29000	U
131-11-3	Dimethylphthalate	29000	U
208-96-8	Acenaphthylene	29000	U
606-20-2	2,6-Dinitrotoluene	70000	U
99-09-2	3-Nitroaniline	29000	U
83-32-9	Acenaphthene		

DV 7-19-94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHE

SDSD3 EPA SAMPLE NO.

JL514

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.04

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0449.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 77 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 1000(UL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 6.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	70000	U
100-02-7	4-Nitrophenol	70000	U
132-64-9	Dibenzofuran	29000	U
121-14-2	2,4-Dinitrotoluene	29000	U
84-66-2	Diethylphthalate	29000	U
7005-72-3	4-Chlorophenyl-phenylether	29000	U
86-73-7	Fluorene	29000	U
100-01-6	4-Nitroaniline	70000	U
534-52-1	4,6-Dinitro-2-methylphenol	70000	U
86-30-6	N-Nitrosodiphenylamine (1)	29000	U
101-55-3	4-Bromophenyl-phenylether	29000	U
118-74-1	Hexachlorobenzene	29000	U
87-86-5	Pentachlorophenol	70000	U
85-01-8	Phenanthrene	1800	J
120-12-7	Anthracene	29000	U
86-74-8	Carbazole	29000	U
84-74-2	Di-n-butylphthalate	1700	J
206-44-0	Fluoranthene	29000	U
129-00-0	Pyrene	1800	J
85-68-7	Butylbenzylphthalate	29000	U
91-94-1	3,3'-Dichlorobenzidine	29000	U
56-55-3	Benzo(a)anthracene	29000	U
218-01-9	Chrysene	29000	U
117-81-7	bis(2-Ethylhexyl)phthalate	29000 ~~17000~~	U ~~JB~~
117-84-0	Di-n-octylphthalate	29000	U
205-99-2	Benzo(b)fluoranthene	29000	U
207-08-9	Benzo(k)fluoranthene	29000	U
50-32-8	Benzo(a)pyrene	29000	U
193-39-5	Indeno(1,2,3-cd)pyrene	29000	U
53-70-3	Dibenz(a,h)anthracene	29000	U
191-24-2	Benzo(g,h,i)perylene	29000	U

DL 7-19-94

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JL514

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.04

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0449.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 77 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 1000(uL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 6.5

Number TICs found: 25

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKANE	8.664	66000	NJ
2.		UNKNOWN ALKANE	9.546	69000	J
3.		UNKNOWN ALKANE	13.371	57000	J
4.		UNKNOWN ALKANE	14.033	54000	J
5.		UNKNOWN	15.637	25000	J
6.		UNKNOWN	15.845	25000	J
7.		UNKNOWN ALCOHOL	16.202	19000	J
8.		UNKNOWN HYDROCARBON	16.363	18000	J
9.		UNKNOWN ALKANE	16.432	42000	J
10.		UNKNOWN	16.767	50000	J
11.		UNKNOWN ALKANE	16.986	27000	J
12.		UNKNOWN	17.148	30000	J
13.		UNKNOWN ALKANE	17.275	56000	J
14.		UNKNOWN	17.507	23000	J
15.		UNKNOWN	17.831	75000	J
16.		UNKNOWN ALKANE	18.352	120000	J
17.		UNKNOWN	18.561	120000	J
18.		UNKNOWN ALKANE	18.839	91000	J
19.		UNKNOWN ALKANE	19.210	81000	J
20.		UNKNOWN	19.303	98000	J
21.		UNKNOWN ALKANE	20.023	73000	J
22.	36728-72-0	28-Nor-17.beta.(H)-hopane	20.069	89000	NJ
23.		UNKNOWN ALKANE	20.290	130000	J
24.		UNKNOWN ALKANE	20.870	120000	J
25.	1058-61-3	Stigmast-4-en-3-one	21.854	75000	NJ
26.					
27.					
28.					
29.					
30.					

DL 7-19-94

SDSD2

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JL515

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.05

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0450.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 78 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 1000(UL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	30000	U
111-44-4	bis(2-Chloroethyl)Ether	30000	U
95-57-8	2-Chlorophenol	30000	U
541-73-1	1,3-Dichlorobenzene	30000	U
106-46-7	1,4-Dichlorobenzene	30000	U
95-50-1	1,2-Dichlorobenzene	30000	U
95-48-7	2-Methylphenol	30000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	30000	U
106-44-5	4-Methylphenol	2100	J
621-64-7	N-Nitroso-di-n-propylamine	30000	U
67-72-1	Hexachloroethane	30000	U
98-95-3	Nitrobenzene	30000	U
78-59-1	Isophorone	30000	U
88-75-5	2-Nitrophenol	30000	U
105-67-9	2,4-Dimethylphenol	30000	U
111-91-1	bis(2-Chloroethoxy)methane	30000	U
120-83-2	2,4-Dichlorophenol	30000	U
120-82-1	1,2,4-Trichlorobenzene	30000	U
91-20-3	Naphthalene	30000	U
106-47-8	4-Chloroaniline	30000	J U
87-68-3	Hexachlorobutadiene	30000	U
59-50-7	4-Chloro-3-Methylphenol	30000	U
91-57-6	2-Methylnaphthalene	1900	J
77-47-4	Hexachlorocyclopentadiene	30000	J U
88-06-2	2,4,6-Trichlorophenol	30000	U
95-95-4	2,4,5-Trichlorophenol	73000	U
91-58-7	2-Chloronaphthalene	30000	U
88-74-4	2-Nitroaniline	73000	U
131-11-3	Dimethylphthalate	30000	U
208-96-8	Acenaphthylene	30000	U
606-20-2	2,6-Dinitrotoluene	30000	U
99-09-2	3-Nitroaniline	73000	U
83-32-9	Acenaphthene	30000	U

JL 1-17-94

1C

SEMIVOLATILE ANICS ANALYSIS DATA SHEE SDS02 EPA SAMPLE NO.

JL515

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.05

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0450.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 78 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 1000(UL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	73000	U
100-02-7	4-Nitrophenol	73000	U
132-64-9	Dibenzofuran	30000	U
121-14-2	2,4-Dinitrotoluene	30000	U
84-66-2	Diethylphthalate	30000	U
7005-72-3	4-Chlorophenyl-phenylether	30000	U
86-73-7	Fluorene	30000	U
100-01-6	4-Nitroaniline	73000	U
534-52-1	4,6-Dinitro-2-methylphenol	73000	U
86-30-6	N-Nitrosodiphenylamine (1)	30000	U
101-55-3	4-Bromophenyl-phenylether	30000	U
118-74-1	Hexachlorobenzene	30000	U
87-86-5	Pentachlorophenol	73000	U
85-01-8	Phenanthrene	30000	U
120-12-7	Anthracene	30000	U
86-74-8	Carbazole	30000	U
84-74-2	Di-n-butylphthalate	30000	U
206-44-0	Fluoranthene	30000	U
129-00-0	Pyrene	2200	J
85-68-7	Butylbenzylphthalate	30000	U
91-94-1	3,3'-Dichlorobenzidine	30000	U
56-55-3	Benzo(a)anthracene	30000	U
218-01-9	Chrysene	30000	U
117-81-7	bis(2-Ethylhexyl)phthalate	30000 ~~15000~~	U JB
117-84-0	Di-n-octylphthalate	30000	U
205-99-2	Benzo(b)fluoranthene	30000	U
207-08-9	Benzo(k)fluoranthene	30000	U
50-32-8	Benzo(a)pyrene	30000	U
193-39-5	Indeno(1,2,3-cd)pyrene	30000	U
53-70-3	Dibenz(a,h)anthracene	30000	U
191-24-2	Benzo(g,h,i)perylene	30000	U

JR 7-19-94

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JL515

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.05

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0450.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 78 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 1000(uL) Date Analyzed: 06/20/94

Injection Volume: 2.0(uL) Dilution Factor: 10.0

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

Number TICs found: 25

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~123-42-2~~	~~2-Pentanone, 4-hydroxy-4-met~~	~~3.124~~	~~110000~~	~~NJA~~
2.		UNKNOWN ALKANE	8.669	60000	NJ
3.		UNKNOWN ALKANE	9.552	53000	J
4.		UNKNOWN ALKANE	13.374	51000	J
5.		UNKNOWN ALKANE	14.037	55000	J
6.		UNKNOWN ALKANE	15.645	26000	J
7.		UNKNOWN	15.853	40000	J
8.		UNKNOWN HYDROCARBON	16.210	30000	J
9.		UNKNOWN	16.383	26000	J
10.		UNKNOWN	16.441	39000	J
11.		UNKNOWN	16.776	63000	J
12.		UNKNOWN ALKANE	17.007	35000	J
13.		UNKNOWN ALKANE	17.157	37000	J
14.		UNKNOWN ALKANE	17.285	59000	J
15.		UNKNOWN	17.516	32000	J
16.		UNKNOWN ALKANE	17.701	62000	J
17.		UNKNOWN ALKANE	18.165	89000	J
18.		UNKNOWN ALKANE	18.362	100000	J
19.		UNKNOWN	18.583	96000	J
20.		UNKNOWN ALKANE	19.221	92000	J
21.		UNKNOWN	19.326	100000	J
22.		UNKNOWN	20.082	82000	J
23.		UNKNOWN ALKANE	20.303	110000	J
24.		UNKNOWN ALKANE	20.885	130000	J
25.	1058-61-3	Stigmast-4-en-3-one	21.873	81000	NJ
26.					
27.					
28.					
29.					
30.					

1B

SDG54

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Division Sleigh

JL516

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.06

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0218.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	610	U
111-44-4	bis(2-Chloroethyl)Ether	610	U
95-57-8	2-Chlorophenol	610	U
541-73-1	1,3-Dichlorobenzene	610	U
106-46-7	1,4-Dichlorobenzene	610	U
95-50-1	1,2-Dichlorobenzene	610	U
95-48-7	2-Methylphenol	610	U
108-60-1	2,2'-oxybis(1-Chloropropane)	610	U
106-44-5	4-Methylphenol	610	U
621-64-7	N-Nitroso-di-n-propylamine	610	U
67-72-1	Hexachloroethane	610	U
98-95-3	Nitrobenzene	610	U
78-59-1	Isophorone	610	U
88-75-5	2-Nitrophenol	610	U
105-67-9	2,4-Dimethylphenol	610	U
111-91-1	bis(2-Chloroethoxy)methane	610	U
120-83-2	2,4-Dichlorophenol	610	U
120-82-1	1,2,4-Trichlorobenzene	610	U
91-20-3	Naphthalene	610	U
106-47-8	4-Chloroaniline	610	U
87-68-3	Hexachlorobutadiene	610	U
59-50-7	4-Chloro-3-Methylphenol	610	U
91-57-6	2-Methylnaphthalene	610	U
77-47-4	Hexachlorocyclopentadiene	610	J U
88-06-2	2,4,6-Trichlorophenol	610	U
95-95-4	2,4,5-Trichlorophenol	1500	U
91-58-7	2-Chloronaphthalene	610	U
88-74-4	2-Nitroaniline	1500	U
131-11-3	Dimethylphthalate	610	U
208-96-8	Acenaphthylene	610	U
606-20-2	2,6-Dinitrotoluene	610	U
99-09-2	3-Nitroaniline	1500	U
83-32-9	Acenaphthene	610	U

DL 7-19-94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET SDG54

EPA SAMPLE NO.: JL516

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.06

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0218.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1500	U
100-02-7	4-Nitrophenol	1500	U
132-64-9	Dibenzofuran	610	U
121-14-2	2,4-Dinitrotoluene	610	U
84-66-2	Diethylphthalate	610	U
7005-72-3	4-Chlorophenyl-phenylether	610	U
86-73-7	Fluorene	610	U
100-01-6	4-Nitroaniline	1500	U
534-52-1	4,6-Dinitro-2-methylphenol	1500	U
86-30-6	N-Nitrosodiphenylamine (1)	610	U
101-55-3	4-Bromophenyl-phenylether	610	U
118-74-1	Hexachlorobenzene	610	U
87-86-5	Pentachlorophenol	1500	U
85-01-8	Phenanthrene	610	U
120-12-7	Anthracene	610	U
86-74-8	Carbazole	610	U
84-74-2	Di-n-butylphthalate	610	U
206-44-0	Fluoranthene	610	U
129-00-0	Pyrene	610	U
85-68-7	Butylbenzylphthalate	610	U
91-94-1	3,3'-Dichlorobenzidine	610	U
56-55-3	Benzo(a)anthracene	610	U
218-01-9	Chrysene	610	U
117-81-7	bis(2-Ethylhexyl)phthalate	610 ~~400~~	U ~~JB~~
117-84-0	Di-n-octylphthalate	610	U
205-99-2	Benzo(b)fluoranthene	610	U
207-08-9	Benzo(k)fluoranthene	610	U
50-32-8	Benzo(a)pyrene	610	U
193-39-5	Indeno(1,2,3-cd)pyrene	610	U
53-70-3	Dibenz(a,h)anthracene	610	U
191-24-2	Benzo(g,h,i)perylene	610	U

1-19-94

211

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JL516

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.06

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0218.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(uL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.0

Number TICs found: 19

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	123-42-2	2-Pentanone, 4-hydroxy-4-met	3.548	97000	NJAB
2.		UNKNOWN ORGANIC ACID	12.256	770	NJ
3.		UNKNOWN ORGANIC ACID	12.728	720	J
4.		UNKNOWN	12.786	1600	J
5.		UNKNOWN HYDROCARBON	13.616	1700	J
6.		UNKNOWN ORGANIC ACID	13.731	2700	J
7.		UNKNOWN	13.917	880	J
8.		UNKNOWN	14.114	800	J
9.		UNKNOWN	14.357	560	J
10.		UNKNOWN	14.613	1300	J
11.		UNKNOWN	14.846	530	J
12.		UNKNOWN AMIDE	15.232	550	J
13.		UNKNOWN ALKANE	15.852	520	J
14.		UNKNOWN	16.062	1500	J
15.		UNKNOWN	16.203	610	J
16.		UNKNOWN AMIDE	16.367	1600	JB
17.		UNKNOWN	16.648	590	J
18.		UNKNOWN	17.035	1300	J
19.		UNKNOWN ALKANE	18.069	500	J
20.					
21.					
22.					
23.					
24.					
25.					
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DL 7-19-94

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SSURBAK 3

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Surface background soil

JL517

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.07

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0219.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 24 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	430	U
111-44-4	bis(2-Chloroethyl)Ether	430	U
95-57-8	2-Chlorophenol	430	U
541-73-1	1,3-Dichlorobenzene	430	U
106-46-7	1,4-Dichlorobenzene	430	U
95-50-1	1,2-Dichlorobenzene	430	U
95-48-7	2-Methylphenol	430	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430	U
106-44-5	4-Methylphenol	430	U
621-64-7	N-Nitroso-di-n-propylamine	430	U
67-72-1	Hexachloroethane	430	U
98-95-3	Nitrobenzene	430	U
78-59-1	Isophorone	430	U
88-75-5	2-Nitrophenol	430	U
105-67-9	2,4-Dimethylphenol	430	U
111-91-1	bis(2-Chloroethoxy)methane	430	U
120-83-2	2,4-Dichlorophenol	430	U
120-82-1	1,2,4-Trichlorobenzene	430	U
91-20-3	Naphthalene	430	U
106-47-8	4-Chloroaniline	430	U
87-68-3	Hexachlorobutadiene	430	U
59-50-7	4-Chloro-3-Methylphenol	430	U
91-57-6	2-Methylnaphthalene	430	U
77-47-4	Hexachlorocyclopentadiene	430	J U
88-06-2	2,4,6-Trichlorophenol	430	U
95-95-4	2,4,5-Trichlorophenol	1000	U
91-58-7	2-Chloronaphthalene	430	U
88-74-4	2-Nitroaniline	1000	U
131-11-3	Dimethylphthalate	430	U
208-96-8	Acenaphthylene	430	U
606-20-2	2,6-Dinitrotoluene	430	U
99-09-2	3-Nitroaniline	1000	U
83-32-9	Acenaphthene	430	U

DL 7-11-94

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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SSUR17AR2 background surface soil

EPA SAMPLE NO.

JL517

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.07

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0219.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 24 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1000	U
100-02-7	4-Nitrophenol	1000	U
132-64-9	Dibenzofuran	430	U
121-14-2	2,4-Dinitrotoluene	430	U
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	430	U
100-01-6	4-Nitroaniline	1000	U
534-52-1	4,6-Dinitro-2-methylphenol	1000	U
86-30-6	N-Nitrosodiphenylamine (1)	430	U
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U
87-86-5	Pentachlorophenol	1000	U
85-01-8	Phenanthrene	430	U
120-12-7	Anthracene	430	U
86-74-8	Carbazole	430	U
84-74-2	Di-n-butylphthalate	32	J
206-44-0	Fluoranthene	430	U
129-00-0	Pyrene	430	U
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	430	U
56-55-3	Benzo(a)anthracene	430	U
218-01-9	Chrysene	430	U
117-81-7	bis(2-Ethylhexyl)phthalate	430~~160~~	U ~~JB~~
117-84-0	Di-n-octylphthalate	430	U
205-99-2	Benzo(b)fluoranthene	430	U
207-08-9	Benzo(k)fluoranthene	430	U
50-32-8	Benzo(a)pyrene	430	U
193-39-5	Indeno(1,2,3-cd)pyrene	430	U
53-70-3	Dibenz(a,h)anthracene	430	U
191-24-2	Benzo(g,h,i)perylene	430	U

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1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JL517

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.07

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0219.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 24 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(uL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.4

Number TICs found: 21

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	2.079	1200	J
2.	123-42-2	2-Pentanone, 4-hydroxy-4-met	3.536	12000	NJAB
3.		UNKNOWN CYCLOALKANE	11.656	980	NJ
4.		UNKNOWN AMIDE	15.198	420	J
5.		UNKNOWN	15.742	1200	J
6.		UNKNONW ALKANE	15.823	670	J
7.		UNKNOWN	16.032	420	J
8.		UNKNOWN	16.333	2000	J
9.		UNKNOWN	16.624	480	J
10.		UNKNOWN	16.822	460	J
11.		UNKNOWN ALKANE	16.974	610	J
12.		UNKNOWN	17.020	920	J
13.		UNKNOWN	17.079	550	J
14.		UNKNOWN ALKANE	18.038	920	J
15.		UNKNOWN	18.460	670	J
16.		UNKNOWN AMIDE	18.601	1900	J
17.		UNKNOWN ALKANE	19.036	2100	J
18.		UNKNOWN	19.177	730	J
19.		UNKNOWN	20.000	4400	J
20.		UNKNOWN	21.294	410	J
21.		UNKNOWN	21.976	1200	J
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SSWOOAK4
Background Sub soil

EPA SAMPLE NO.

JL518

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.08

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0220.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	610	U
111-44-4	bis(2-Chloroethyl)Ether	610	U
95-57-8	2-Chlorophenol	610	U
541-73-1	1,3-Dichlorobenzene	610	U
106-46-7	1,4-Dichlorobenzene	610	U
95-50-1	1,2-Dichlorobenzene	610	U
95-48-7	2-Methylphenol	610	U
108-60-1	2,2'-oxybis(1-Chloropropane)	610	U
106-44-5	4-Methylphenol	610	U
621-64-7	N-Nitroso-di-n-propylamine	610	U
67-72-1	Hexachloroethane	610	U
98-95-3	Nitrobenzene	610	U
78-59-1	Isophorone	610	U
88-75-5	2-Nitrophenol	610	U
105-67-9	2,4-Dimethylphenol	610	U
111-91-1	bis(2-Chloroethoxy)methane	610	U
120-83-2	2,4-Dichlorophenol	610	U
120-82-1	1,2,4-Trichlorobenzene	610	U
91-20-3	Naphthalene	610	U
106-47-8	4-Chloroaniline	610	U
87-68-3	Hexachlorobutadiene	610	U
59-50-7	4-Chloro-3-Methylphenol	610	U
91-57-6	2-Methylnaphthalene	610	U
77-47-4	Hexachlorocyclopentadiene	610	J U
88-06-2	2,4,6-Trichlorophenol	610	U
95-95-4	2,4,5-Trichlorophenol	1500	U
91-58-7	2-Chloronaphthalene	610	U
88-74-4	2-Nitroaniline	1500	U
131-11-3	Dimethylphthalate	610	U
208-96-8	Acenaphthylene	610	U
606-20-2	2,6-Dinitrotoluene	610	U
99-09-2	3-Nitroaniline	1500	U
83-32-9	Acenaphthene	610	U

1-19-94

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BS SUBBAK EPA SAMPLE NO.

background subsurface soil JL518

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.08

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0220.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.5

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1500	U
100-02-7	4-Nitrophenol	1500	U
132-64-9	Dibenzofuran	610	U
121-14-2	2,4-Dinitrotoluene	610	U
84-66-2	Diethylphthalate	610	U
7005-72-3	4-Chlorophenyl-phenylether	610	U
86-73-7	Fluorene	610	U
100-01-6	4-Nitroaniline	1500	U
534-52-1	4,6-Dinitro-2-methylphenol	1500	U
86-30-6	N-Nitrosodiphenylamine (1)	610	U
101-55-3	4-Bromophenyl-phenylether	610	U
118-74-1	Hexachlorobenzene	610	U
87-86-5	Pentachlorophenol	1500	U
85-01-8	Phenanthrene	610	U
120-12-7	Anthracene	610	U
86-74-8	Carbazole	610	U
84-74-2	Di-n-butylphthalate	33	J
206-44-0	Fluoranthene	610	U
129-00-0	Pyrene	610	U
85-68-7	Butylbenzylphthalate	610	U
91-94-1	3,3'-Dichlorobenzidine	610	U
56-55-3	Benzo(a)anthracene	610	U
218-01-9	Chrysene	610	U
117-81-7	bis(2-Ethylhexyl)phthalate	610 ~~140~~	U ~~JB~~
117-84-0	Di-n-octylphthalate	610	U
205-99-2	Benzo(b)fluoranthene	610	U
207-08-9	Benzo(k)fluoranthene	610	U
50-32-8	Benzo(a)pyrene	610	U
193-39-5	Indeno(1,2,3-cd)pyrene	610	U
53-70-3	Dibenz(a,h)anthracene	610	U
191-24-2	Benzo(g,h,i)perylene	610	U

DL 7-17-94

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

JL518

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.08

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0220.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(uL) Date Analyzed: 06/03/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 4.5

Number TICs found: 22

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	123-42-2	2-Pentanone, 4-hydroxy-4-met	3.615	78000	NJA
2.		UNKNOWN	5.252	860	NJ
3.		UNKNOWN	11.640	1200	J
4.		UNKNOWN ALKANE	14.552	450	J
5.		UNKNOWN CYCLOALKANE	14.908	190	J
6.		UNKNOWN ALKANE	15.806	180	J
7.		UNKNOWN HYDROCARBON	16.025	270	J
8.		UNKNOWN	16.152	440	J
9.		UNKNOWN AMIDE	16.314	570	JB
10.		UNKNOWN ALDEHYDE	16.615	230	J
11.		UNKNOWN	16.870	200	J
12.		UNKNOWN ALKANE	18.031	340	J
13.		UNKNOWN ALKANE	19.035	1100	J
14.		UNKNOWN	19.163	430	J
15.		UNKNOWN ALKANE	19.984	380	J
16.		UNKNOWN	20.148	210	J
17.		UNKNOWN	20.324	270	J
18.		UNKNOWN ALKANE	21.087	220	J
19.		UNKNOWN	21.533	190	J
20.		UNKNOWN	21.873	180	J
21.		UNKNOWN	22.236	360	J
22.		UNKNOWN	22.482	400	J
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.: JL519

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) WATER Lab Sample ID: 18854.09

Sample wt/vol: 1000 (g/mL) ML Lab File ID: HH3658.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/28/94

Concentrated Extract Volume: 1000(UL) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
108-95-2	Phenol	10	U	
111-44-4	bis(2-Chloroethyl)Ether	10	U	
95-57-8	2-Chlorophenol	10	U	
541-73-1	1,3-Dichlorobenzene	10	U	
106-46-7	1,4-Dichlorobenzene	1	J	
95-50-1	1,2-Dichlorobenzene	10	U	
95-48-7	2-Methylphenol	10	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	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	
120-82-1	1,2,4-Trichlorobenzene	6	J	
91-20-3	Naphthalene	10	U	
106-47-8	4-Chloroaniline	10	U	
87-68-3	Hexachlorobutadiene	10	U	
59-50-7	4-Chloro-3-Methylphenol	10	U	
91-57-6	2-Methylnaphthalene	10	U	DL
77-47-4	Hexachlorocyclopentadiene	10	U	
88-06-2	2,4,6-Trichlorophenol	25	U	
95-95-4	2,4,5-Trichlorophenol	10	U	
91-58-7	2-Chloronaphthalene	25	U	
88-74-4	2-Nitroaniline	10	U	
131-11-3	Dimethylphthalate	10	U	
208-96-8	Acenaphthylene	10	U	
606-20-2	2,6-Dinitrotoluene	25	U	
99-09-2	3-Nitroaniline	10	U	
83-32-9	Acenaphthene			

DL 7-19-94

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.: JL519

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) WATER Lab Sample ID: 18854.09

Sample wt/vol: 1000 (g/mL) ML Lab File ID: HH3658.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/28/94

Concentrated Extract Volume: 1000(UL) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) 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
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	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
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	Dibenz(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

ER01

EPA SAMPLE NO.

JL519

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) WATER Lab Sample ID: 18854.09

Sample wt/vol: 1000 (g/mL) ML Lab File ID: HH3658.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 05/28/94

Concentrated Extract Volume: 1000(uL) Date Analyzed: 06/01/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.4

Number TICs found: 7

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	2.042	6	JB
2.		UNKNOWN	2.084	4	JB
3.		UNKNOWN	2.198	2	JB
4.		UNKNOWN	2.229	3	JB
5.		UNKNOWN	2.322	3	JB
6.		UNKNOWN	4.116	8	JB
7.		UNKNOWN	10.326	2	NJ
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
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30.					

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7-19-94

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

JL520

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0241.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500 (UL) Date Analyzed: 06/07/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	610	U
111-44-4	bis(2-Chloroethyl)Ether	610	U
95-57-8	2-Chlorophenol	610	U
541-73-1	1,3-Dichlorobenzene	610	U
106-46-7	1,4-Dichlorobenzene	610	U
95-50-1	1,2-Dichlorobenzene	610	U
95-48-7	2-Methylphenol	610	U
108-60-1	2,2'-oxybis(1-Chloropropane)	140	J
106-44-5	4-Methylphenol	610	U
621-64-7	N-Nitroso-di-n-propylamine	610	U
67-72-1	Hexachloroethane	610	U
98-95-3	Nitrobenzene	610	U
78-59-1	Isophorone	610	U
88-75-5	2-Nitrophenol	610	U
105-67-9	2,4-Dimethylphenol	610	U
111-91-1	bis(2-Chloroethoxy)methane	610	U
120-83-2	2,4-Dichlorophenol	610	U
120-82-1	1,2,4-Trichlorobenzene	610	U
91-20-3	Naphthalene	610	U
106-47-8	4-Chloroaniline	610	U
87-68-3	Hexachlorobutadiene	610	U
59-50-7	4-Chloro-3-Methylphenol	610	U
91-57-6	2-Methylnaphthalene	610	U
77-47-4	Hexachlorocyclopentadiene	610	U
88-06-2	2,4,6-Trichlorophenol	1500	U
95-95-4	2,4,5-Trichlorophenol	610	U
91-58-7	2-Chloronaphthalene	1500	U
88-74-4	2-Nitroaniline	610	U
131-11-3	Dimethylphthalate	610	U
208-96-8	Acenaphthylene	610	U
606-20-2	2,6-Dinitrotoluene	1500	U
99-09-2	3-Nitroaniline	610	U
83-32-9	Acenaphthene		

1C

SEMIVOLATILE GANICS ANALYSIS DATA SHE

EPA SAMPLE NO.

SBu03R5

JL520

Lab Name: SWL-TULSA Contract: 68-D2-0013

Clayton Slough background

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0241.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500(UL) Date Analyzed: 06/07/94

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1500	U
100-02-7	4-Nitrophenol	1500	U
132-64-9	Dibenzofuran	610	U
121-14-2	2,4-Dinitrotoluene	610	U
84-66-2	Diethylphthalate	34	J
7005-72-3	4-Chlorophenyl-phenylether	610	U
86-73-7	Fluorene	610	U
100-01-6	4-Nitroaniline	1500	U
534-52-1	4,6-Dinitro-2-methylphenol	1500	U
86-30-6	N-Nitrosodiphenylamine (1)	610	U
101-55-3	4-Bromophenyl-phenylether	610	U
118-74-1	Hexachlorobenzene	610	U
87-86-5	Pentachlorophenol	1500	U
85-01-8	Phenanthrene	74	J
120-12-7	Anthracene	610	U
86-74-8	Carbazole	610	U
84-74-2	Di-n-butylphthalate	42	J
206-44-0	Fluoranthene	110	J
129-00-0	Pyrene	130	J
85-68-7	Butylbenzylphthalate	610	U
91-94-1	3,3'-Dichlorobenzidine	610	U
56-55-3	Benzo(a)anthracene	610	U
218-01-9	Chrysene	610	U
117-81-7	bis(2-Ethylhexyl)phthalate	610 540	U JB
117-84-0	Di-n-octylphthalate	610	U
205-99-2	Benzo(b)fluoranthene	610	U
207-08-9	Benzo(k)fluoranthene	610	U
50-32-8	Benzo(a)pyrene	610	U
193-39-5	Indeno(1,2,3-cd)pyrene	610	U
53-70-3	Dibenz(a,h)anthracene	610	U
191-24-2	Benzo(g,h,i)perylene	610	U

7-19-94

1F

EPA SAMPLE NO.

JL520

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: SWL-TULSA Contract: 68-D2-0013

Lab Code: SWOK Case No.: 22170 SAS No.: SDG No.: JL511

Matrix: (soil/water) SOIL Lab Sample ID: 18854.10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: M0241.D

Level: (low/med) LOW Date Received: 05/27/94

% Moisture: 46 decanted: (Y/N) N Date Extracted: 05/29/94

Concentrated Extract Volume: 500 (uL) Date Analyzed: 06/07/94

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.3

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

Number TICs found: 25

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
~~1.~~	~~123-42-2~~	~~2-Pentanone, 4-hydroxy-4-met~~	~~3.745~~	~~18000~~	~~NJA~~
2.		UNKNOWN	13.084	1100	J
3.		UNKNOWN	13.402	1100	J
4.		UNKNOWN ORGANIC ACID	13.846	1300	J
5.		UNKNOWN ORGANIC ACID	13.960	2000	J
6.		UNKNOWN	15.203	1400	J
7.		2-Phenanthrenol, -octa	16.542	1200	J
8.		UNKNOWN	17.954	3200	J
9.		UNKNOWN ALKANE	18.345	4900	J
10.		UNKNOWN AMIDE	18.874	1000	J
11.		UNKNOWN ALDEHYDE	19.081	1700	J
12.		UNKNOWN ALKANE	19.334	1700	J
13.		UNKNOWN ALCOHOL	19.381	1100	J
14.		UNKNOWN ALDEHYDE	20.072	1000	J
15.		UNKNOWN	20.233	680	J
16.		UNKNOWN	20.325	680	J
17.		UNKNOWN	20.394	1400	J
18.		UNKNOWN	20.728	980	J
19.		UNKNOWN	20.982	1200	J
20.		UNKNOWN	21.074	820	J
21.		UNKNOWN	21.269	910	J
22.		UNKNOWN	21.695	1100	J
23.		UNKNOWN	21.891	1100	J
24.		UNKNOWN	22.294	4600	J
25.		UNKNOWN	22.386	1100	J
26.					
27.					
28.					
29.					
30.					

DR 7-19-94

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27.a

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

RECEIVED
AUG - 5 1994
URS CONSULTANTS

REPLY TO
ATTN OF: ES-095

August 4, 1994

MEMORANDUM

SUBJECT: Data Validation for Buse Timber SI, SAS No. 8404J-01, SDG No. 94214115, Chlorinated Phenols Analysis

FROM: Donald Matheny, Chemist
Quality Assurance Office, ESD

TO: Dave Bennett, Site Manager
Superfund Response & Investigations Branch, HWD

The QA Office has received and is transmitting the above ESAT data validation report.

CC: Porter Lombard, ESAT-RSCC
Jeff Kesner, Site Lead, URS
Bruce Woods, TPO, Region 10

ENVIRONMENTA SERVICE ASSISTANCE EAMS - ZONE 2

ICF Technology Inc.
ManTech Environmental

ESAT Region 10
ICF Technology Inc.
Suite 1510
1200 6th Avenue
Seattle, WA 98101
Phone (206) 224-4161

MEMORANDUM

DATE: July 28, 1994

TO: Jerry Muth, RPO, USEPA, Region 10

Donald Matheny, Task Monitor, USEPA, Region 10

THROUGH: Barry Pepich, ESAT Team Manager, Region 10

FROM: David J. Lindquist, ESAT Data Reviewer

SUBJECT: Data Validation Report of Chlorinated Phenols Analyses of Samples from Buse Timber Site Investigation
SAS: 8404J-01 SDG: 94214115

TID#: 10-9404-430
DOC#: ESAT-10B-7502
WUD#: 2351

The quality assurance (QA) review of nine (9) soil samples and one water sample collected from the above referenced site has been completed. These samples were analyzed for phenol, 2-chlorophenol, 2,6-dichlorophenol, 4-chloro-3-methylphenol, 2,4-dichlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, o-phenylphenol and pentachlorophenol via Method 8040A, "Phenols by Gas Chromatography" by Pacific Analytical, Inc. of Carlsbad, California. The samples were numbered as follows:

94214115	94214116	94214117	94214118	94214119
94214120	94214121	94214122	94214123	94214124

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in Method 8040A, "Phenols by Gas Chromatography" found in "Test Methods for Evaluating Solid Waste (SW-846)", the technical instructions specified in Special Analytical Services (SAS) Request 8404J-01 and the "National Functional Guidelines for Organic Data Review, 2/94".

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

1. Timeliness - Acceptable

All of the samples were extracted and analyzed within the SAS specified holding times. In addition, the water sample met the technical (40 CFR 136 water criteria) holding time criteria.

The Extraction Logs indicate that the samples underwent extraction, acid/base cleanup, pentafluorobenzylbromide derivatization, GPC and silica gel cleanup as specified by the SAS request.

Listed below are pertinent sample collection, extraction and analysis dates.

Sample Number	Collection Date	Rec'd. Date	Extraction Date	Preparation* Date	Sample Analysis
94214115	052594	052794	060694	062794	070794
94214116	052594	052794	060694	062794	070794
94214117	052594	052794	060694	062794	070794
94214118	052594	052794	060694	062794	070794
94214119	052594	052794	060694	062794	070794
94214120	052594	052794	060694	062794	070794
94214121	052594	052794	060694	062794	070794
94214122	052594	052794	060694	062794	070794
94214123	052594	052794	060194	062794	070894
94214124	052594	052794	060694	062794	070794

* Silica gel cleanup. Acid/base partition and derivatization were performed on 062194 and 062394.

2. Initial Calibration

The SAS specified QC criteria were met for the initial calibration.

A five point initial calibration curve was analyzed for all target compounds and surrogates in accordance with the SAS request. The percent relative standard deviations (%RSDs) were within the SAS specified level (<30%) and ranged from 6.7 - 24.8% for all target compounds and surrogates for both of the columns used.

The %RSDs between the retention times of the different standards ranged from 0.05 - 0.12%.

For the surrogate, 2,4,6-tribromophenol, the low standard response factor associated with the DB-608 Megabore column was not used. Therefore, the 2,4,6-tribromophenol quantitation limit warrants elevation for this column.

2,6-Dichlorophenol and 4-chloro-3-methylphenol co-eluted on the DB-608 column (see section 7 for qualifications).

3. Continuing Calibration

The SAS specified the analysis of a continuing calibration verification (CCV) standard every ten samples at a concentration approximately equal to half the instrument calibration range. The relative percent difference (RPD) between the CCV response factors (RFs) and the mean RF associated with the initial calibration was required to be less than 25%.

Two CCVs were performed meeting the above continuing calibration criteria. However, the RPDs were calculated using the mid-range standard (.01 ppm) RF from the initial calibration rather than the mean RF. The data was not qualified on this basis.

2,6-Dichlorophenol and 4-chloro-3-methylphenol co-eluted on the DB-608 column (see section 7 for qualifications) .

The RPDs for all compounds ranged from 3 - 23% on the DB-608 column and 1 - 24% on the DB-5 column.

4. Blanks

The method blank frequency of analysis criterion was met. The target compounds were not detected in the method blanks at levels greater than the detection limits with the following exceptions:

Soil Sample Method Blank	Compound
5394PB	pentachlorophenol

Water Sample Method Blanks	Compound
5370PB	2,6-dichlorophenol
5371PB	

Detected pentachlorophenol and 2,6-dichlorophenol results were qualified as non-detected, "U", if the sample result area integration was below five times that of the associated method blank. The following detected target compound results are qualified as non-detected, "U", based on the associated method blank results:

pentachlorophenol - 94214115 94214116 94214120

2,6-dichlorophenol - 94214123

5. Surrogate Recovery

The raw data was compared with the data presented in the surrogate recovery form. All of the surrogate recoveries were within the control limits (50-150%) with the following exceptions:

Sample	2-fluorophenol %R	2,4,6-tribromophenol %R
94214116	210	160
94214120	240	170
94214123		46

The high surrogate recoveries indicate the possibility of high bias. Therefore, the following compounds detected in samples 94214116 and 94214120 are qualified estimated (J):

Sample		
94214116	-	2,6-dichlorophenol
94214120	-	2,6-dichlorophenol, 2,4,6-trichlorophenol, o-phenylphenol

The reviewer deemed not to qualify compounds associated with the low surrogate recovery of 2,4,6-tribromophenol on the basis that the percent recovery was just slightly lower than the control limit and the 2-fluorophenol percent recovery was within the control limits.

For the remaining samples the 2-fluorophenol recoveries ranged from 70 - 130% and the 2,4,6-tribromophenol recoveries ranged from 60 - 90%.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) - Acceptable

The frequency and percent recovery criteria for MS/MSD analysis were met. The values reported on the matrix spike/matrix spike duplicate recovery form were verified with the raw data. The MS and MSD analyses yielded recovery results that were within the SAS specified control limits for all target compounds. The recoveries ranged from 70% to 130% and the RPDs between matrix spike duplicate results ranged 0% to 55%.

7. Compound Identification

The chromatograms and quantitation lists were inspected.

2,6-Dichlorophenol and 4-chloro-3-methylphenol co-eluted on the DB-608 column. Positive results for these compounds cannot be confirmed due to co-elution on the confirmation column. Therefore, the following sample results are qualified, "JN" (tentatively identified at an estimated concentration):

2,6-dichlorophenol	-	94214115	94214116	94214117	94214119
		94214120	94214121	94214122	94214124
p-chloro-m-cresol	-	94214117	94214119	94214123	

Calculations were checked with the raw data. Calculations were correct. There were no transcription errors observed between the raw data and the reported results.

8. Compound Quantitation and Detection Limits

The response factor from the mid-range initial calibration was used for quantitation. Both columns were used for quantitation and confirmation of the compounds.

A method detection limit (MDL) study prior to sample analysis indicated that the SAS specified detection limits were achievable.

The raw data was examined to verify the calculations of sample results and the reported detection limits. The calculations were correct and conformed with the SAS and method required detection limits.

9. Laboratory Contact

The laboratory was contacted on 07/28/94 requesting that the Form 1s be re-submitted with the sample results reported on a dry weight basis.

The Form 1s were received on 08/02/94 and included with the CSF (purge file).

10. Overall Assessment

Approximately fifteen percent of the total data points were qualified as estimated due to high surrogate recoveries and/or identification problems. All of the standards, samples and QC samples were analyzed in accordance with the SAS specified method with exceptions previously noted.

DATA QUALIFIER DEFINITIONS

U- The analyte was analyzed for and is not present above the level of the associated value. The associated numerical value indicates the approximate concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte below the associated numerical level, reanalysis or alternative analytical methods should be considered. The technical staff is available to discuss available options.

J- The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be seriously considered for decision making and are usable for many purposes.

A subscript may be appended to the "J" that indicates which of the following quality control criteria were not met:

1 Blank contamination: indicates possible high bias and/or false positives.

2 Calibration range exceeded: indicates possible low bias.

3 Holding times not met: indicates low bias for most analytes with the exception of common laboratory contaminants and chlorinated ethenes (i.e.: trichloroethene, 1,1-dichloroethene, vinyl chloride).

4 Other QC outside control limits: bias not readily determined.

R- The data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified.

Resampling and reanalysis are necessary to confirm or deny the presence of the analyte.

UJ - A combination of the "U" and "J" qualifier. The analyte was analyzed for and was not present above the level of the associated value. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte close to the associated numerical level, reanalysis or alternative analytical methods should be considered.

N- The analysis indicates that an analyte is present, and there are strong indications that the identity is correct.

Confirmation of the analyte requires further analysis.

NJ- A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

A subscript may be appended to the "NJ" that indicates which of the following situations applies:

1 DDT/Endrin breakdown evident.

2 Interference from other sample components.

3 Non-Target Compound List (TCL) compounds (Confirmation is necessary using specific target compound methodology to accurately determine the concentration and identity of the detected compound).

4 A confirmation analysis was missing or quality control criteria were not met for the confirmation analysis.

NOTE: Data users are encouraged to contact their Regional representative within ESD to clarify or obtain further information on the appropriate use of analytical data.

FORM 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

94214115

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: SAS No.: 8404J01 SDG No.: 94214115

SSUR001 or the other soil

Matrix Type: SOIL Lab Sample ID: 89401

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 26

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	74	
108-95-2	Phenol	14	U
95-57-8	2-Chlorophenol	14	U
87-65-0	2,6-Dichlorophenol	27	J N
59-50-7	p-Chloro-m-Cresol	14	U
120-83-2	2,4-Dichlorophenol	14	U
88-06-2	2,4,6-Trichlorophenol	14	U
95-95-4	2,4,5-Trichlorophenol	14	U
90-43-7	o-Phenylphenol	14	U
96-11-7	2,4,6-Tribromophenol	61	
87-86-5	Pentachlorophenol	7	J U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

8-2-94

FORM 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

94214116

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89402

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 35

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	162	
108-95-2	Phenol	15	U
95-57-8	2-Chlorophenol	15	U
87-65-0	2,6-Dichlorophenol	8	NJ
59-50-7	p-Chloro-m-Cresol	15	U
120-83-2	2,4-Dichlorophenol	15	U
88-06-2	2,4,6-Trichlorophenol	15	U
95-95-4	2,4,5-Trichlorophenol	15	U
90-43-7	o-Phenylphenol	15	U
96-11-7	2,4,6-Tribromophenol	123	
87-86-5	Pentachlorophenol	8	U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

FORM 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

94214117

SDPRNT

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89403

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 37

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	79	
108-95-2	Phenol	16	U
95-57-8	2-Chlorophenol	16	U
87-65-0	2,6-Dichlorophenol	16	J N
59-50-7	p-Chloro-m-Cresol	8	J N
120-83-2	2,4-Dichlorophenol	16	J
88-06-2	2,4,6-Trichlorophenol	16	U
95-95-4	2,4,5-Trichlorophenol	16	J
90-43-7	o-Phenylphenol	32	
96-11-7	2,4,6-Tribromophenol	63	
87-86-5	Pentachlorophenol	71	

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

8-4-94

FORM 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

94214118

SP503

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89404

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 82

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	194	
108-95-2	Phenol	56	U
95-57-8	2-Chlorophenol	56	U
87-65-0	2,6-Dichlorophenol	56	U
59-50-7	p-Chloro-m-Cresol	56	U
120-83-2	2,4-Dichlorophenol	56	U
88-06-2	2,4,6-Trichlorophenol	56	U
95-95-4	2,4,5-Trichlorophenol	56	U
90-43-7	o-Phenylphenol	56	U
96-11-7	2,4,6-Tribromophenol	167	
87-86-5	Pentachlorophenol	56	U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

FORM 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

94214119

SDSD2

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: ____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89405

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 77

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	217	
108-95-2	Phenol	43	U
95-57-8	2-Chlorophenol	43	U
87-65-0	2,6-Dichlorophenol	109	J N
59-50-7	p-Chloro-m-Cresol	22	J N
120-83-2	2,4-Dichlorophenol	43	U
88-06-2	2,4,6-Trichlorophenol	43	U
95-95-4	2,4,5-Trichlorophenol	43	U
90-43-7	o-Phenylphenol	43	J
96-11-7	2,4,6-Tribromophenol	130	
87-86-5	Pentachlorophenol	109	

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

8-4-94

FO.... 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

4120
9421~~420~~ pr
SDUS4

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89406

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 50

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	240	
108-95-2	Phenol	20	U
95-57-8	2-Chlorophenol	20	U
87-65-0	2,6-Dichlorophenol	40	J N
59-50-7	p-Chloro-m-Cresol	20	U
120-83-2	2,4-Dichlorophenol	20	U
88-06-2	2,4,6-Trichlorophenol	10	J
95-95-4	2,4,5-Trichlorophenol	20	U
90-43-7	o-Phenylphenol	20	J
96-11-7	2,4,6-Tribromophenol	170	
87-86-5	Pentachlorophenol	10	J U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

pr 8-4-94

000040

FO 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

4121
9421~~421~~ DL

SURBAK3

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89407

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 25

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	73	
108-95-2	Phenol	13	U
95-57-8	2-Chlorophenol	13	U
87-65-0	2,6-Dichlorophenol	27	J N
59-50-7	p-Chloro-m-Cresol	13	U
120-83-2	2,4-Dichlorophenol	13	U
88-06-2	2,4,6-Trichlorophenol	13	U
95-95-4	2,4,5-Trichlorophenol	13	U
90-43-7	o-Phenylphenol	13	U
96-11-7	2,4,6-Tribromophenol	60	
87-86-5	Pentachlorophenol	13	U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

DL 8-4-94

000047

FC... 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

9421~~422~~ 4122

SuBBAK4

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89408

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 65

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	129	
108-95-2	Phenol	29	U
95-57-8	2-Chlorophenol	29	U
87-65-0	2,6-Dichlorophenol	14	J N
59-50-7	p-Chloro-m-Cresol	29	U
120-83-2	2,4-Dichlorophenol	29	U
88-06-2	2,4,6-Trichlorophenol	29	U
95-95-4	2,4,5-Trichlorophenol	29	U
90-43-7	o-Phenylphenol	29	U
96-11-7	2,4,6-Tribromophenol	100	
87-86-5	Pentachlorophenol	29	U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

FORM
METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

4123
9421~~423~~ R
ER01

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: WATER Lab Sample ID: 89409

Sample weight: ~~1000~~.0 (G/mL) mL Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/01/94

Injection Volume: 2 (uL) Date Analyzed: 07/0~~6~~/94 CSP

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/L	Q
367-12-4	2-Fluorophenol	~~4.0~~	
108-95-2	Phenol	~~0.3~~	J
95-57-8	2-Chlorophenol	0.5	U
87-65-0	2,6-Dichlorophenol	0.3 ug/L	~~J~~ U
59-50-7	p-Chloro-m-Cresol	0.3	J N
120-83-2	2,4-Dichlorophenol	0.5	U
88-06-2	2,4,6-Trichlorophenol	0.5	U
95-95-4	2,4,5-Trichlorophenol	0.5	U
90-43-7	o-Phenylphenol	0.5	U
76-11-7	2,4,6-Tribromophenol	~~2.3~~	
87-86-5	Pentachlorophenol	0.5	U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

8-4-94

000058

FORM 1

METHOD 8040A - PFBBr DERIVATIVES OF PHENOLS

EPA SAMPLE NO.

94214124

5 BUS BKS

Lab Name: Pacific Analytical, Inc.

Lab Code: PACIF Case No.: _____ SAS No.: 8404J01 SDG No.: 94214115

Matrix Type: SOIL Lab Sample ID: 89410

Sample weight: 50.0 (G/mL) Grams Date Received: 05/27/94

Final Extract Volume: 250 (mL) Date Extracted: 06/06/94

Injection Volume: 2 (uL) Date Analyzed: 07/07/94

% Moisture: 44

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kG) uG/kG	Q
367-12-4	2-Fluorophenol	89	
108-95-2	Phenol	18	U
95-57-8	2-Chlorophenol	18	U
87-65-0	2,6-Dichlorophenol	18	J N
59-50-7	p-Chloro-m-Cresol	18	U
120-83-2	2,4-Dichlorophenol	18	U
88-06-2	2,4,6-Trichlorophenol	18	U
95-95-4	2,4,5-Trichlorophenol	18	U
90-43-7	o-Phenylphenol	18	U
96-11-7	2,4,6-Tribromophenol	45	
87-86-5	Pentachlorophenol	18	U

Flags: U - Undetected at or above the listed value.
P - Value differs by more than 25% for confirmation analysis.

APPENDIX D

DATA QUALITY OBJECTIVES

Appendix D
Table D-1
Data Quality Objectives for RAS Soil Samples

Analysis	Method[a]	Targeted Detection Limit[b]	Actual Detection Limits	Units[c]	Target Accuracy[d]	Actual Accuracy	Target Precision[e]	Actual Precision	Target Completeness[f]	Actual Completeness
SVs	CLP-RAS	330-800	430-73,000	µg/kg	11-142%	38-120%	50%	26%[i]	90%	90%
PCBs	CLP-RAS	1.7-170	55-150	µg/kg	23-139%	48-170%	50%	8%	90%	90%
Inorganics	CLP-RAS	0.6-100	0.05-6	mg/kg	75-125%	75-125%	20%	20%	90%	90%
Mercury[g]	CLP-RAS	0.10	0.02	mg/kg	75-125%	75-125%	20%	20%	90%	90%

[a]Methods for analyses as defined in U.S. EPA 1990a, 1990b.
[b]Calculated from laboratory reporting limits.
[c]Units reported in mass/mass unless otherwise indicated.
[d]Calculated from laboratory attainable control limits through analytical surrogate or matrix spike recovery and laboratory QC.
[e]Calculated from laboratory relative percent difference between results of field replicate samples or through matrix duplicates.
[f]Calculated from comparing planned and actual analytical results, including analyte rejections and work plan deviations.
[g]Mercury listed separately due to specific target detection limit.
[h]Antimony recovery was 0 percent in both quality assurance samples. Data were qualified appropriately.
[i]Data were not qualified on this basis.

RAS soil sample data quality objectives were met or exceeded for all inorganics and mercury analyses. RAS soil sample data quality objectives for SVs and PCBs were met for completeness and exceeded for precision. Target detection limits were not met by the laboratory for either SVs or PCBs. The detection limits also had high variability within and among samples. Higher than expected detection limits make comparison of relatively low detections with sample results for which analytes were not detected at higher detection limits difficult. PCB accuracy targets were not met for RAS soil samples. Surrogate recoveries were high for some of the samples; however, data quality is not believed to have been affected.

Appendix D
Table D-2
Data Quality Objectives for RAS Water Samples

Analysis	Method[a]	Targeted Detection Limit[b]	Actual Detection Limit	Units[c]	Target Accuracy[d]	Actual Accuracy	Target Precision[e]	Actual Precision	Target Completeness[f]	Actual Completeness
SVs	CLP-RAS	10-25	10-25	µg/L	9-145%	No data quality information provided by laboratory	50%	No data quality information provided by laboratory	90%	No data quality information provided by laboratory
PCBs	CLP-RAS	0.05-1.0	0.11-0.20	µg/L	38-127%	96-100%	30%	4.1%	90%	100%
Inorganics	CLP-RAS	0.003-5.0	0.05-6.0	mg/L	75-125%	75-125%[h]	20%	20%	90%	100%
Mercury[g]	CLP-RAS	0.0002	0.02	mg/L	75-125%	75-125%	20%	20%	90%	100%

[a]Methods for analyses as defined in U.S. EPA 1990a, 1990b.
[b]Calculated from laboratory reporting limits.
[c]Units reported in mass/mass unless otherwise indicated.
[d]Calculated from laboratory attainable control limits through analytical surrogate or matrix spike recovery and laboratory quality control (QC).
[e]Calculated from laboratory relative percent difference between results of field replicate samples or through matrix duplicates.
[f]Calculated from comparing planned and actual analytical results, including analyte rejections and work plan deviations.
[g]Mercury listed separately due to specific target detection limit.
[h]Antimony recovery was 0 percent in both quality assurance samples. Data were qualified appropriately.
Data quality objectives were met for RAS water samples with the exception of the inorganics and mercury detection limits. The laboratory reported all inorganics detection limits within targets except for selenium. The mercury detection limit was reported by the laboratory at 0.020 mg/L, 100 times the target detection limit. Data quality was not apparently affected.

Appendix D
Table D-3
Data Quality Objectives for SAS Soil and Water Samples

Matrix	Analysis	Method	Target Detection Limit[a]	Actual Detection Limit	Target Precision[b]	Actual Precision	Target Accuracy[c]	Actual Accuracy	Target Completion[d]	Actual Completeness
Soil	SV	CLP-SAS	4.0-600 µg/kg	13-56 µg/kg	60%	0-55%	20-140%	46-240%[e]	90%	90%
Water	SV	CLP-SAS	0.6-10 µg/L	0.5 µg/L	60%	No data quality information provided by laboratory	20-140%	No data quality information provided by laboratory	90%	100%

[a]Calculated from laboratory reporting limits.
[b]Calculated from laboratory relative percent difference between results of field duplicate samples or through matrix duplicates.
[c]Calculated from laboratory attainable control limits through analytical surrogate or MS recovery and laboratory QC.
[d]Calculated from comparing planned and actual analytical results, including analyte rejections and work plan deviations.
[e]Data outside laboratory control limits were qualified appropriately.
Data quality objectives were met or exceeded for all soil targets. Water sample data quality objectives were met for detection limit, but information concerning the other aspects of data quality was not provided by the laboratory. Target completeness is exceeded.