

Outfall, Shoreline, and Nearshore Sediments Sampling Report
Boeing Renton Plant

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Outfall, Shoreline, and Nearshore Sediments Sampling Report

Boeing Renton Plant
Renton, Washington

Submitted To:
The Boeing Company
Boeing Shared Services Group
Energy and Environmental Affairs

November 1999

**Outfall, Shoreline and Nearshore Sediments
Investigation Report. Renton. Weston.
November 29, 1999**

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Loc: RSC

Description

Sediments Investigation Report Outfalls, -003, 004, 010, 011, 012, 013, 014, 015, 016. Boeing Renton Plant

Contents

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**OUTFALL, SHORELINE, AND NEARSHORE
SEDIMENTS INVESTIGATION REPORT
OUTFALLS OF-003, -004, -010, -011,
-012, -013, -014, -015 AND -016
BOEING RENTON PLANT**

Submitted to

**The Boeing Company
Boeing Shared Services Group
Energy and Environmental Affairs**

29 November 1999

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Section 1

SECTION 1

INTRODUCTION

This report was prepared in compliance with the requirements of the Agreed Order (Order No. DE 97HZ-N233), issued by Washington Department of Ecology (Ecology) to The Boeing Company (Boeing). The Order (effective 10 October 1997) identifies activities necessary to investigate and evaluate actual or potential threats to human health and the environment resulting from the release or potential release of hazardous constituents from or at the Boeing Commercial Airplane Group (BCAG)—Renton Plant (Facility).

Roy F. Weston, Inc. (WESTON®) implemented an investigation on behalf of Boeing to characterize outfall, shoreline, and nearshore sediment quality on the south shore of Lake Washington along the northern boundary of the Facility. The sediment investigation in this area was performed in accordance with Appendix I of the Remedial Investigation (RI) Work Plan (WESTON 1999). The objective of the investigation was to evaluate the presence and concentration of specific chemicals of concern (COCs) in nearshore sediments along the shoreline adjacent to and near nine stormwater outfalls at the Boeing property and two non-Boeing discharge points to Lake Washington. The target COCs included: low-molecular-weight polycyclic aromatic hydrocarbons (LPAHs), high-molecular-weight polycyclic aromatic hydrocarbons (HPAHs), and other base/neutral/acid organic compounds (BNAs), metals, and polychlorinated biphenyls (PCBs). WESTON collected sediment samples at 37 stations on 11, 12, and 13 August 1999.

1.1 LOCATION

The investigation area is located on the south shore of Lake Washington (Figure 1-1) along the northern boundary of the Facility and property owned by the Department of Natural Resources (DNR) (Figure 1-2). Within the area of investigation, Boeing owns approximately 1,000 feet of shoreline, and approximately 1,000 feet of shoreline is owned by DNR. The investigation area extends westward from the current Shuffleton Power Plant cooling water flume (current flume) to within about 800 feet of the mouth of the Cedar River and from the shoreline north about 200 feet.

The study area for this investigation is located adjacent to and near nine selected outfalls (OF-003, -004, and OF-010 through OF-016) that currently drain stormwater from the Facility's pavement, roofs, and parking areas into Lake Washington. Outfall diameters range from about 6 inches to about 24 inches. Figure 1-2 shows the nine selected outfall locations.

The study area also includes locations adjacent to and near two non-Boeing discharge points. Both points are cooling water flumes from the Shuffleton Power Plant. The former flume is located near Boeing Outfall OF-004 and the current flume lies near the eastern boundary of the study area near Boeing Outfall OF-003 (Figure 1-2).

1.2 BACKGROUND

The Boeing Facility is located at the south end of Lake Washington within the Renton City limits (Figure 1-1). Operations include parts preparation, mechanical assembly, coating operations, testing, and support operations associated with the final assembly of commercial airplanes. A detailed description of the Facility's operations, surface features, and hydrogeologic conditions is provided in the RI Work Plan.

From 1929 to about 1966, the Shuffleton Power Plant, operated by Puget Sound Power & Light Company (currently doing business as Puget Sound Energy [PSE]), discharged cooling water from the former flume into the investigation area. The shoreline was altered between 1966 and 1967, when approximately 150,000 cubic yards of dredged sediment from Lake Washington was used by PSE to fill a portion of the nearshore area owned by DNR (WESTON 1997b). Concurrent with this action, a new flume was constructed about 400 feet east of the former flume. The current flume replaced the former flume and discharged cooling water into Lake Washington until power-generating activities ceased in 1989; periodic discharges occurred for plant maintenance activities until 1996. The location of the DNR property and the current and former flumes are shown on Figure 1-2.

Previous investigations conducted within or adjacent to the outfall, shoreline and nearshore sampling area are documented in the following reports:

- *DNR Property Pre-Lease Assessment Investigation Report* (WESTON 1997a). In order to support a proposed property lease by Boeing, this investigation was conducted to characterize the soil quality on the DNR property contiguous with the Boeing Facility in an area that had been previously filled by PSE with dredged Lake Washington sediment. Soil samples were collected on 29 January through 1 February 1997 from 23 borings at depths ranging from 0 to 19 feet below ground surface (bgs). Concentrations of LPAHs, HPAHs, PCBs, metals and petroleum hydrocarbons (gasoline-, diesel- and oil-range) were detected.
- *DNR Parcel Offshore Sediment Investigation Report* (WESTON 1997b). In order to support a proposed lease by Boeing, this investigation was conducted to evaluate sediment conditions with respect to former water discharge operations from the current and former flume, as well as historical dredging and fill activities. Surface sediment samples were collected from ten stations in the vicinity of the current and former flumes. Concentrations of LPAHs, HPAHs, PCBs, and metals were detected.
- *Cedar River Delta Sediment Assessment Report* (SEACOR 1993). A total of 84 sediment samples from the Cedar River Delta were analyzed for the 21 compounds listed in "Table 2 Method A Cleanup Level – Soil" of the Model Toxics Control Act (MTCA), Chapter 173-3340 WAC. The analytical results were used by Boeing to evaluate whether the sediment would be suitable as fill material. Concentrations of total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), PAHs and metals were detected.

Section 2

SECTION 2

SURFACE SEDIMENT SAMPLING AND ANALYSIS ACTIVITIES

2.1 SAMPLING APPROACH

The sampling approach was designed to assess the presence and concentration of COCs in sediment adjacent to outfalls along the shoreline, and in nearshore locations within the investigation area. In accordance with the Appendix I of the RI Work Plan (WESTON 1999), sediment samples from 37 stations were collected (Figure 1-2) at the following locations:

- Seventeen stations were sampled adjacent to Boeing outfalls OF-003, -004, and OF-010 through OF-016;
- Two stations were sampled near two non-Boeing outfalls, PSE's former and current flumes;
- Five stations were sampled to assess the quality of shoreline sediment that is not adjacent to an outfall; and
- Thirteen nearshore stations were collected along two transects parallel to shore (generally 100 feet and 200 feet from the shoreline) to assess the approximate horizontal extent of COCs.

Outfall and flume samples were collected and analyzed for target COCs. All shoreline and nearshore samples were initially archived then later analyzed for the same target COCs. The target COCs included: LPAHs, HPAHs, and other BNAs, metals, and PCBs. The sediment samples collected were also analyzed for grain size and total organic carbon (TOC).

2.2 SAMPLING LOCATIONS

Sediment sampling was conducted on 11, 12, and 13 August 1999. Samples were collected from the upper 10-cm of sediment, defined as the biologically active zone. Station locations are depicted on Figure 1-2.

2.2.1 Outfall and Shoreline Sample Locations

Outfall sampling stations were located in groups on a 10-foot radius from the stormwater outfall outlets. At outfalls OF-003, OF-004, and OF-010, three discrete samples were collected within 10 feet of the pipe outlet at approximately 60°, 90°, and 120° from the shore (measured from the outfall centerline). The close proximity of outfalls OF-011, -012 and -013, and OF-014, -015, and -016, warranted treatment of both outfall clusters as single point sources. Because of the potentially complex nature of these outfalls, four discrete samples were collected as described above for each outfall group.

In summary, four samples were collected at outfall cluster OF-011, -012, and -013, four samples were collected at outfall cluster OF-014, -015, and -016, and three samples per outfall were collected at OF-003, OF-004, and OF-010 (Figure 1-2).

Shoreline samples were collected to characterize sediment quality potentially affected by flume discharges, surface water runoff, bank erosion, upland seepage, and longshore sediment transport sources that may have mixed with stormwater outfall discharges.

Five shoreline surface sediment samples were collected throughout the study area within 38 feet of the shoreline and approximately 100 to 200 feet along the shoreline between the outfalls and flumes. Two additional samples were collected immediately offshore of the current (LWCF) and former (LWFF) flumes (Figure 1-2).

Field modifications to the RI Work Plan for station positioning were required due to substrate conditions. At the cluster of stations for outfall OF-010 (LWOF010, LWOF010E, and LWOF010W), rocks and vegetation prevented the grab sampler from penetrating into the sediment. The stations were systematically moved offshore in 3-foot (1-meter) increments until an acceptable sample was obtained. As a result, the outfall cluster of stations was moved approximately 13 feet northwest from its original location. At three shoreline stations (LWOS003, LWOS005, and LWOS006) substrate conditions (e.g., dense vegetation and/or rocks) prevented the grab sampler from penetrating into sediment or closing tightly. In these areas, stations were moved offshore in 3-foot (1-meter) increments until an acceptable sample could be collected. Stations LWOS003, LWOS005, and LWOS006 were relocated from their original locations approximately 28, 38, and 17 feet northwest, respectively.

2.2.2 Nearshore Sample Locations

A series of nearshore surface sediment samples were collected approximately 100 feet and 200 feet from the shoreline at 200- to 300-foot intervals parallel to the shoreline (Figure 1-2). Samples were collected to characterize the horizontal extent of COCs that may have accumulated from a variety of potential sources including stormwater outfalls, flume discharges, stormwater runoff, bank erosion, upland seepage, and longshore sediment movement.

2.3 SAMPLING METHODOLOGIES

2.3.1 Station Positioning Procedures

A differential global positioning system (DGPS) was used to determine subtidal station locations within ± 3 meters. Station coordinates were recorded in latitude and longitude to the nearest decimal minute. Water depth was determined at each station using a stadia rod or the fathometer. Distances to outfalls and flumes were determined by a measuring tape. Station coordinates and depths are provided in Appendix A.

2.3.2 Sample Collection

Surface sediment samples were collected at each station using a van Veen clamshell grab (sample area either 0.1 meter² [m²] or 0.05 m²). For outfall and shoreline samples located in areas too shallow for boat access, the smaller grab sampler was deployed by hand from a shallow-draft boat. At these shallow locations, multiple grabs were collected to obtain sufficient sample volumes, following guidelines specified in the RI Work Plan. All samples were collected in accordance with Puget Sound Estuary Program (PSEP) protocols (Ecology 1986, with updates) for sediment chemistry, with modifications as necessary for freshwater sampling. For each sediment sample, the following observations were recorded on the field sample logs (Appendix B):

- Grab sampler penetration depth (to the nearest 0.5 cm);
- Water column depth (to the nearest cm);
- Physical sediment characteristics, including color, texture, sheen, odor, and debris; and
- Presence and type of biological structures and organisms.

Sediment for chemical analysis was removed from the grab sampler using decontaminated stainless steel spoons and placed in stainless steel bowls for compositing and homogenization. Sediment samples were placed into precleaned analytical containers for laboratory analysis. Large debris (e.g., rocks, vegetation, plastic, etc.) was not included in samples for laboratory analysis.

2.3.3 Sample Handling, Packaging, and Shipping

Samples were handled and packaged in accordance with the procedures specified in the RI Work Plan. Archived samples were frozen according to PS&P protocols in order to extend the holding time to a six month period.

2.3.4 Documentation

All field documentation, sample designation and labeling, and chain-of-custody procedures were followed in accordance with the methods specified in the RI Work Plan. Field Sample Logs are provided in Appendix B. Chain-of-custody forms are included in Appendix C.

Section 3

SECTION 3

ANALYTICAL RESULTS

Surface sediment collected at outfall, shoreline, and nearshore areas were analyzed for grain size, TOC, metals, PAHs, BNAs, and PCBs. A complete list of analytical results is presented in Tables 3-1 and 3-2. The laboratory analytical data reports, data validation, and quality assurance and quality control (QA/QC) review are provided in Appendix C. The laboratory data results and statistical summary are included in Appendix D.

For some chemical groups, (e.g., LPAHs, HPAHs, benzofluoranthenes, and PCBs) chemical concentrations were added to yield a group total. Total concentrations (indicated by a "T" data qualifier) were based on detected values only. Summaries of categorical total organic chemical concentrations are depicted in Figure 3-1 for the outfall and shoreline stations, and on Figure 3-7 for the nearshore stations. Analytical results discussed in this report are reported on a dry-weight basis.

3.1 OUTFALL AND SHORELINE SAMPLE LOCATIONS

3.1.1 Conventional Parameters

TOC

TOC ranged from 0.09 to 4.9 percent. The highest TOC concentration occurred at station LWOS003. Low TOC values were indicative of the coarse substrate at several shoreline and outfall stations where gravel and cobbles predominated.

Grain Size

Grain size analysis indicated heterogeneous sediment characteristics ranging from clayey silt to gravel. Generally, sediment associated with the outfalls tended to be coarse-grained (i.e., sands and gravel), except Outfall 10 and current flume which tended to be more composed of fine-grained material. Shoreline samples collected from stations LWOS005 and LWOS006 were also predominantly composed of fine-grained material. Total fines (silt and clay fractions) ranged from 0 to 82.3 percent with the highest percentage of fines observed at station LWOF010W. Total sand and gravel fractions ranged from 17.7 to 100 percent, with the highest percentage of sand and gravel identified at station LWOF003.

3.1.2 Metals

Figure 3-2 presents the analytical results for the metal compounds. All metal compounds, except silver, were detected at one or more outfall and shoreline sediment sampling locations. The metals concentrations detected at the outfall and shoreline stations are similar to the values observed in Lake Washington at the Cedar River delta. Sediment samples collected in 1993 from the Cedar River Delta were analyzed for arsenic, cadmium, chromium, lead and mercury

(SEACOR 1993). Only one outfall station (LWOF016) contained higher concentrations of cadmium, chromium and/or lead, as compared to the highest concentrations detected in the delta sediment samples. However, these values carried a “J” qualifier due to low matrix recoveries. This condition was likely the result of matrix effect from a heterogeneous sample, and was inconsistent with the sample results from adjacent stations.

3.1.3 LPAHs

Total LPAHs are computed by summing the detected concentrations of acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene. Figure 3-3 depicts the results of the individual constituents and the total LPAH concentrations. Total LPAHs were detected at 18 of the 24 stations sampled, with concentrations ranging from 21 to 12,448 $\mu\text{g}/\text{kg}$, and a geometric mean of 749 $\mu\text{g}/\text{kg}$. The highest concentration was detected at station LWOF012.

3.1.4 HPAHs

Total HPAHs are computed by summing the detected concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, total benzofluoranthenes (sum of the “b”, “j”, and “k” isomers), chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene. Figure 3-4 depicts the results of the individual constituents and the total HPAH concentrations. Total HPAHs were detected at 19 of the 24 stations sampled, with concentrations ranging from 64 to 30,640 $\mu\text{g}/\text{kg}$, and a geometric mean of 2,794 $\mu\text{g}/\text{kg}$. The highest concentration was detected at station LWOF012. Total HPAHs were detected at the same stations where total LPAHs were detected with the exception of station LWOF012W.

3.1.5 Total Benzofluoranthene

Total benzofluoranthenes equal the sum of detected benzo(b)fluoranthene and benzo(k)fluoranthene concentrations. Figure 3-4 depicts the results of the individual constituents and the total benzofluoranthene concentrations. Total benzofluoranthenes were detected at 17 of the 24 stations sampled with concentrations ranging from 39 to 3,410 $\mu\text{g}/\text{kg}$, and a geometric mean of 426 $\mu\text{g}/\text{kg}$. The highest concentration was detected at station LWOF012.

3.1.6 Other BNA Compounds

Figure 3-5 depicts other BNA results (non-PAHs) at the corresponding sample locations. Bis(2-ethylhexyl)phthalate was the most prevalent BNA constituent present, detected at 22 of the 24 stations sampled. Detected concentrations of bis(2-ethylhexyl)phthalate ranged from 22 to 4,200 $\mu\text{g}/\text{kg}$, with a geometric mean of 607 $\mu\text{g}/\text{kg}$. The highest concentration identified was at station LWOF004E.

Carbazole was detected at 6 of the 24 stations sampled with concentrations ranging from 18 to 1,000 $\mu\text{g}/\text{kg}$, and a geometric mean of 66 $\mu\text{g}/\text{kg}$. The highest carbazole concentration was detected at station LWOF012.

Di-n-butylphthalate was detected at 8 of the 24 stations sampled with concentrations ranging from 46 to 280 0181 µg/kg, and a geometric mean of 43 µg/kg. The highest concentration of di-n-butylphthalate was detected at station LWOS003.

Dibenzofuran was detected at 3 of the 24 stations sampled with concentrations ranging from 47 to 610 µg/kg, and a geometric mean of 40 µg/kg. The sediment sample from station LWOF012 had the highest dibenzofuran concentration.

Phenol was detected at 3 of the 24 stations sampled with concentrations ranging from 33 to 150 µg/kg, and a geometric mean of 25 µg/kg. The highest phenol concentration was detected at station LWOF016.

3.1.7 PCBs

Total PCBs are represented by the sum of all detected PCB Aroclors. As shown on Figure 3-6, PCBs were detected at 19 of the 24 stations sampled. Total PCB concentrations detected ranged from 7.1 to 760 µg/kg, with a geometric mean of 117 µg/kg. Aroclors 1242, 1254, 1260, and 1268 were detected at the outfall and shoreline stations, and Aroclor 1260 had the greatest percent frequency of detection of any Aroclor (17 of 24 stations). The highest total PCB concentration was identified at station LWOS003 (760 µg/kg). This station is located directly offshore of the highest PCB concentration detected (2,900 µg/kg) in the upland portion of the DNR property (WESTON 1997a).

3.2 NEARSHORE SAMPLE LOCATIONS

3.2.1 Conventional Parameters

TOC

TOC ranged from 0.23 to 3.3 percent. The highest TOC concentration occurred at station LWOS006-100.

Grain Size

Grain size analysis indicated heterogeneous sediment characteristics ranging from clayey silt to gravel. Generally, sediment associated with the nearshore sample stations tended to be fine-grained (i.e., silts and clay), except for stations LWOS015016W-200 and LWOS011012-200 which tended to be more composed of coarse-grained material. Total fines (silt and clay fractions) ranged from 5.2 to 89.6 percent with the highest percentage of fines observed at station LWCFNE-200. Total sand and gravel fractions ranged from 10.4 to 94.8 percent with the highest percentage of sand and gravel identified at station LWOS011012-200.

3.2.2 Metals

Figure 3-8 presents the analytical results for the metal compounds detected at the nearshore sampling stations. Aluminum, beryllium, cadmium, chromium, copper, iron, lead, mercury, nickel, and zinc were detected at every nearshore location. Antimony, selenium, and arsenic were infrequently detected, and silver and thallium were not detected in any of the nearshore samples.

3.2.3 LPAHs

Figure 3-9 depicts the results of the individual constituents and the total LPAH concentrations. Total LPAHs were detected at 12 of the 13 stations sampled, with concentrations ranging from 24 to 88 $\mu\text{g}/\text{kg}$, and a geometric mean of 39 $\mu\text{g}/\text{kg}$. The highest concentration was detected at station LWOS015016W-200. LPAHs were not detected at station LWOS011012-200.

3.2.4 HPAHs

Figure 3-10 depicts the results of the individual constituents and the total HPAH concentrations. Total HPAHs were detected at 12 of the 13 stations sampled, with concentrations ranging from 329 to 1,213 $\mu\text{g}/\text{kg}$, and a geometric mean of 589 $\mu\text{g}/\text{kg}$. The highest concentration was detected at station LWOS015016W-200. Total HPAHs were detected at each of the same stations that total LPAHs were detected. PAHs were not detected at station LWOS011012-200.

3.2.5 Total Benzofluoranthene

Total benzofluoranthenes were detected at 12 of the 13 stations sampled with concentrations ranging from 77 to 290 $\mu\text{g}/\text{kg}$, and a geometric mean of 137 $\mu\text{g}/\text{kg}$. Figure 3-10 depicts the results of the individual constituents and the total benzofluoranthene concentrations detected. The highest total concentrations were detected at station LWOS015016W-200. Total benzofluoranthenes were not detected at station LWOS011012-200.

3.2.6 Other BNA Compounds

Figure 3-11 depicts other BNA (non-PAHs) results at the corresponding nearshore sampling stations. Bis(2-ethylhexyl)phthalate was detected at 12 of the 13 stations and was the most prevalent BNA constituent present. Detected concentrations of bis(2-ethylhexyl)phthalate ranged from 91 to 330 $\mu\text{g}/\text{kg}$, with a geometric mean of 176 $\mu\text{g}/\text{kg}$. The highest concentration was identified at station LWOS006-100. Bis(2-ethylhexyl)phthalate was not detected at station LWOS011012-200.

Station LWCFE-200 was the only nearshore sampling station where di-n-butylphthalate was detected. Di-n-butylphthalate concentration at this location was 34 $\mu\text{g}/\text{kg}$. The geometric mean for this constituent is 12 $\mu\text{g}/\text{kg}$.

Carbazole and dibenzofuran were not detected at any of the nearshore sampling stations.

Phenol was detected at 9 of the 13 nearshore sampling stations with concentrations ranging from 20 to 54 $\mu\text{g}/\text{kg}$, and a geometric mean of 26 $\mu\text{g}/\text{kg}$. The highest concentration was identified at station LWOS010-200.

3.2.7 PCBs

As depicted on Figure 3-12, PCBs were detected at each of the nearshore sampling stations with the exception of LWOS011012-200. The geometric mean for total PCBs is 36 $\mu\text{g}/\text{kg}$ for the nearshore samples, and Aroclors 1254 and 1260 were the only PCB Aroclors detected at the nearshore stations. Total PCB concentrations detected ranged from 20 to 70 $\mu\text{g}/\text{kg}$, with the highest concentration occurring at station LWOS011012-100. It is worth noting that total PCB concentrations at this station were higher than the concentrations detected at the nearest outfalls (i.e., OF-011, OF-012 and OF-013), where PCBs were only detected in two of the four sediment samples at concentrations of 7.1 $\mu\text{g}/\text{kg}$ (estimated) and 39 $\mu\text{g}/\text{kg}$.

Section 4

SECTION 4

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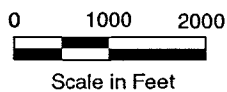
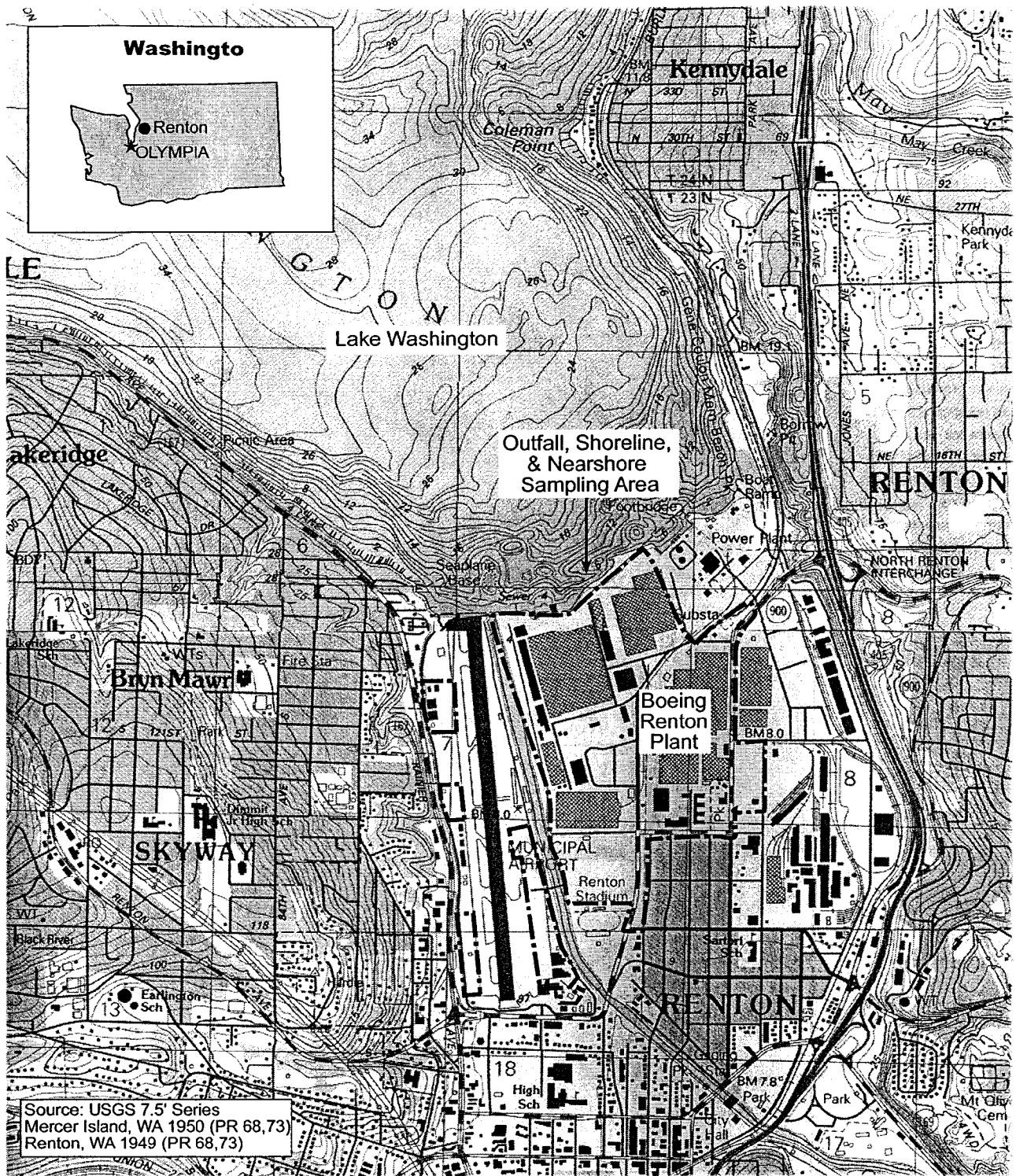
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Figures



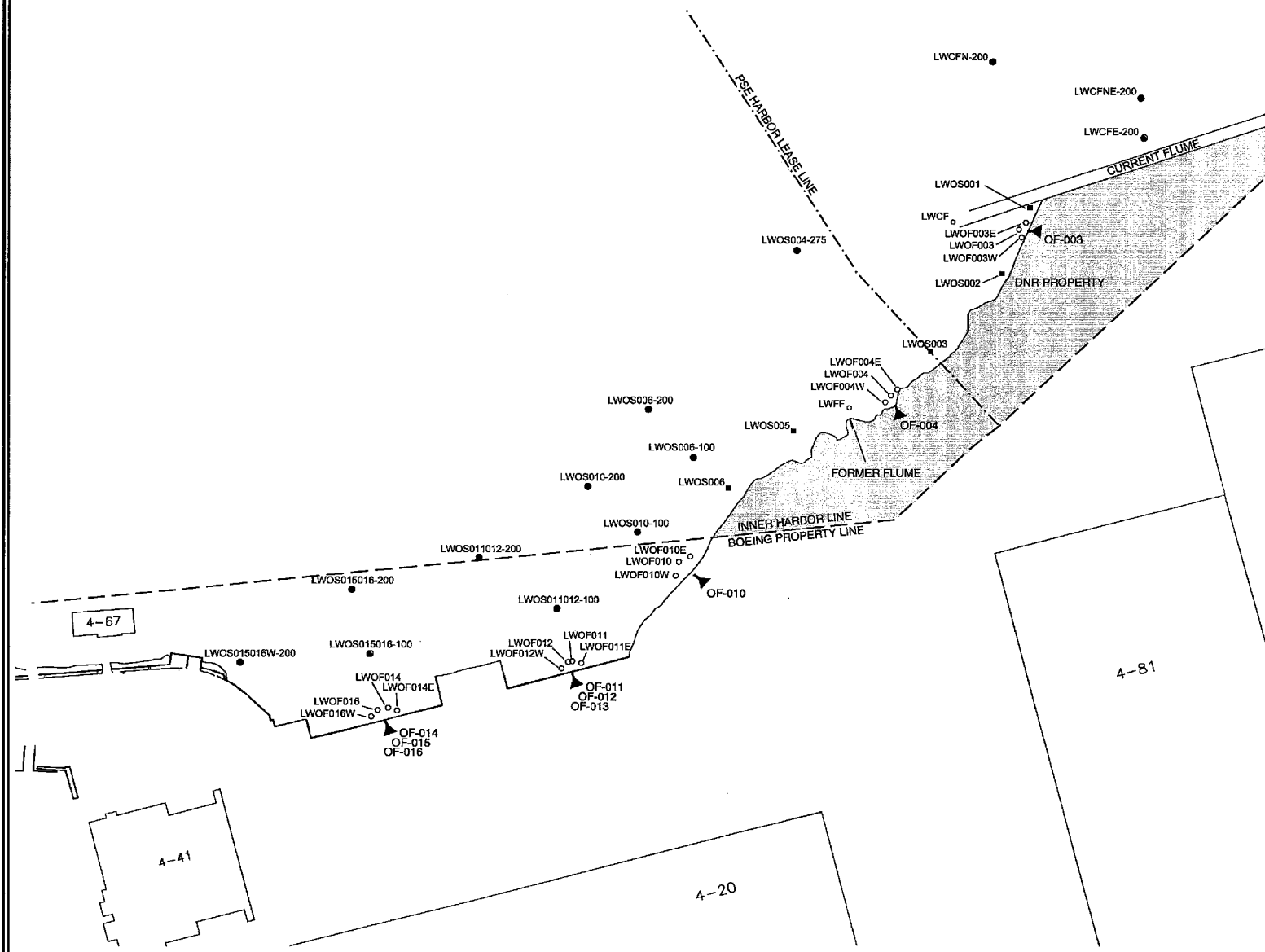
Boeing Renton Plant Site Location Map



Figure



1-1

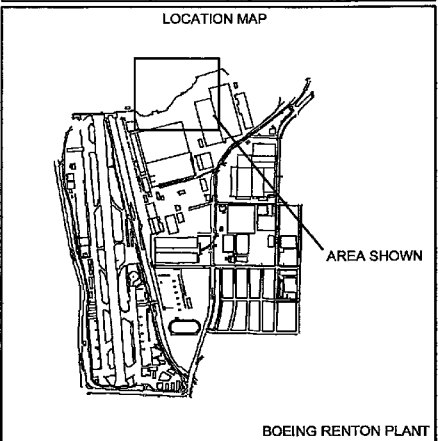
LAKE WASHINGTON



EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

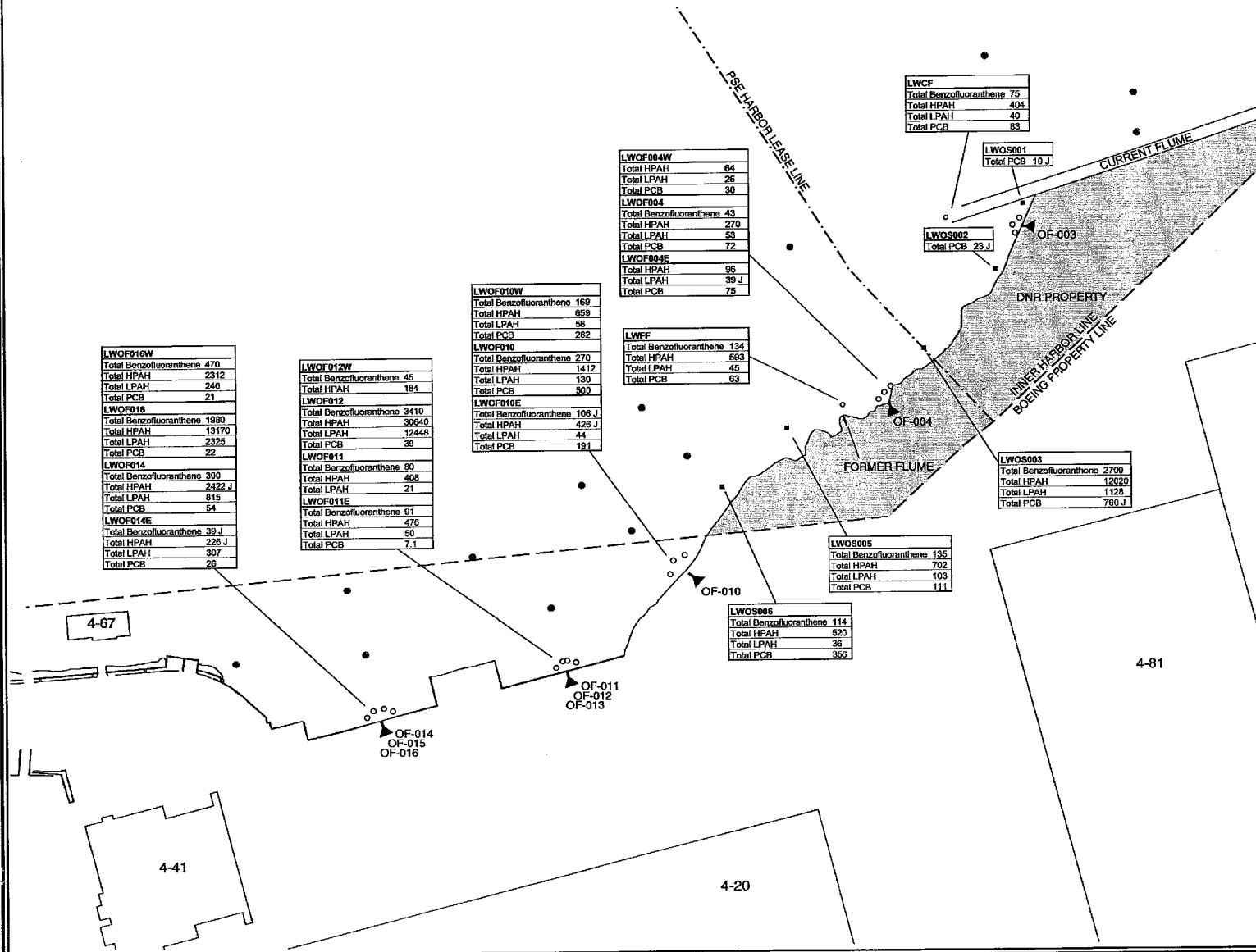





Outfall & Shoreline Sediment Sampling Locations

figure
1-2

LAKE WASHINGTON



EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeig Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- DNR Property

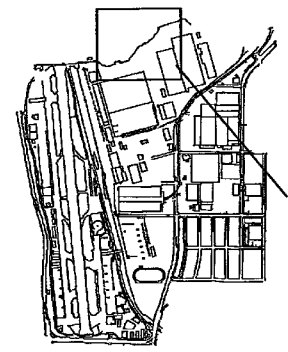
Notes:

- 1) Units=µg/kg (dry weight)
- 2) Only detected constituents are shown.



0 150
Scale in Feet

LOCATION MAP

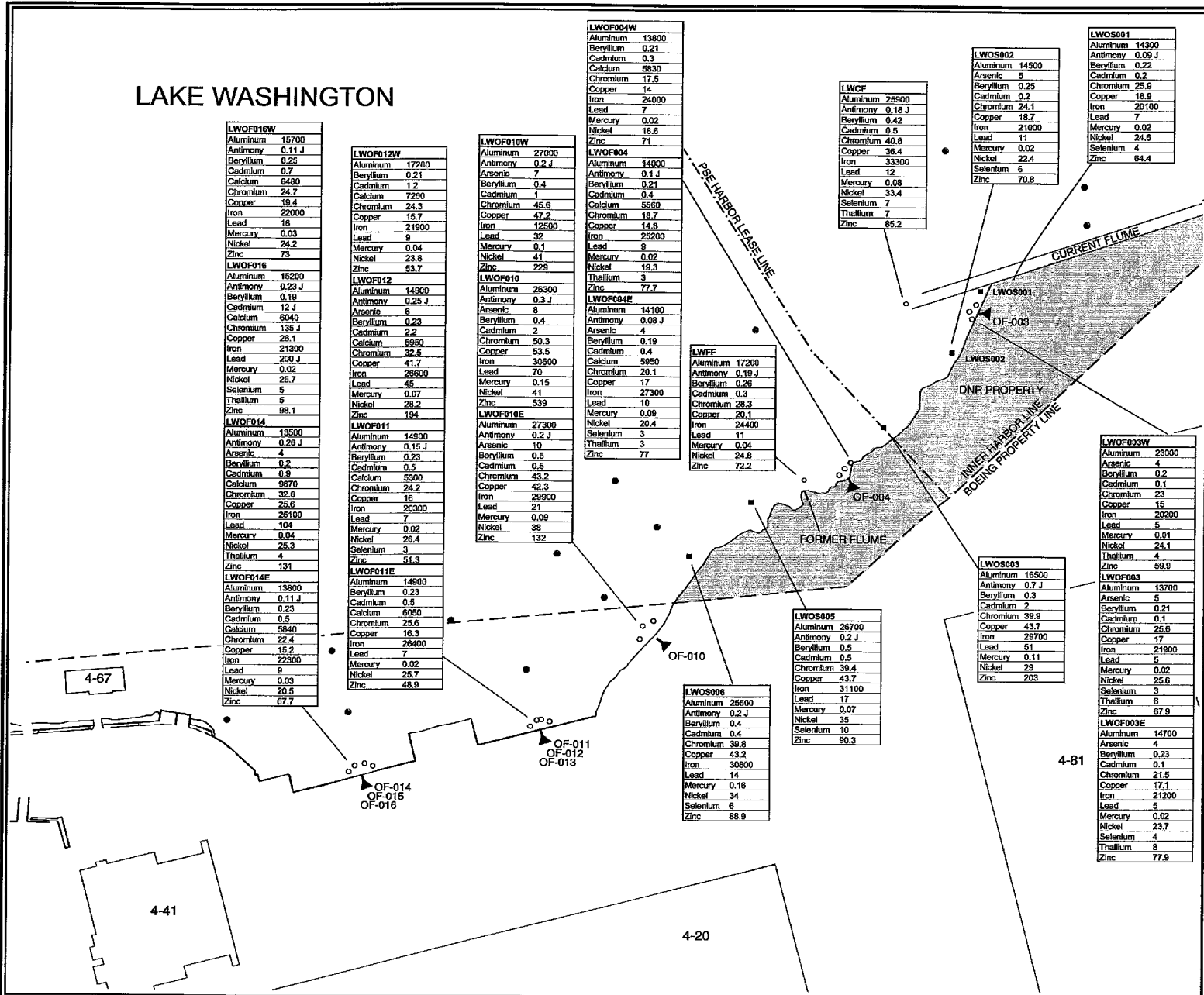


BOEING RENTON PLANT

Outfall & Shoreline Sediment Sample Results Total Organics

figure
3-1

LAKE WASHINGTON



LWOF016W	
Aluminum	15700
Antimony	0.11 J
Beryllium	0.25
Cadmium	0.7
Calcium	6480
Chromium	24.7
Copper	19.4
Iron	22000
Lead	18
Mercury	0.03
Nickel	24.2
Zinc	73
LWOF016	
Aluminum	15200
Antimony	0.23 J
Beryllium	0.19
Cadmium	12.1
Calcium	6040
Chromium	135 J
Copper	28.1
Iron	21300
Lead	200 J
Mercury	0.02
Nickel	25.7
Selenium	5
Thallium	5
Zinc	88.1
LWOF014	
Aluminum	13500
Antimony	0.28 J
Arsenic	4
Beryllium	0.2
Cadmium	0.9
Calcium	9070
Chromium	32.8
Copper	25.6
Iron	25100
Lead	104
Mercury	0.04
Nickel	25.3
Thallium	4
Zinc	131
LWOF014E	
Aluminum	13800
Antimony	0.11 J
Beryllium	0.23
Cadmium	0.5
Calcium	6840
Chromium	22.4
Copper	15.2
Iron	22300
Lead	9
Mercury	0.03
Nickel	20.5
Zinc	67.7

LWOF012W	
Aluminum	17200
Beryllium	0.21
Cadmium	1.2
Calcium	7280
Chromium	24.3
Copper	15.7
Iron	21900
Lead	9
Mercury	0.04
Nickel	23.8
Zinc	53.7
LWOF012	
Aluminum	14900
Antimony	0.25 J
Arsenic	6
Beryllium	0.23
Cadmium	2.2
Calcium	5950
Chromium	32.5
Copper	41.7
Iron	26500
Lead	45
Mercury	0.07
Nickel	28.2
Zinc	194
LWOF011	
Aluminum	14900
Antimony	0.15 J
Beryllium	0.23
Cadmium	0.5
Calcium	5300
Chromium	24.2
Copper	16
Iron	20300
Lead	7
Mercury	0.02
Nickel	26.4
Selenium	3
Zinc	51.3
LWOF011E	
Aluminum	14900
Antimony	0.23
Cadmium	0.5
Calcium	6050
Chromium	25.6
Copper	16.3
Iron	28400
Lead	7
Mercury	0.02
Nickel	25.7
Zinc	48.9

LWOF010W	
Aluminum	27000
Antimony	0.2 J
Arsenic	7
Beryllium	0.4
Cadmium	1
Chromium	45.6
Copper	47.2
Iron	12500
Lead	32
Mercury	0.1
Nickel	41
Zinc	229
LWOF010	
Aluminum	26300
Antimony	0.3 J
Arsenic	8
Beryllium	0.4
Cadmium	2
Calcium	50.3
Copper	53.5
Lead	30600
Mercury	70
Nickel	0.15
Zinc	539
LWOF010E	
Aluminum	27300
Antimony	0.2 J
Arsenic	10
Beryllium	0.5
Cadmium	0.5
Calcium	43.2
Copper	42.3
Iron	29900
Lead	21
Mercury	0.09
Nickel	38
Zinc	132

LWOF004W	
Aluminum	13800
Beryllium	0.21
Cadmium	0.3
Calcium	5830
Chromium	17.5
Copper	14
Iron	24000
Lead	7
Mercury	0.02
Nickel	18.6
Zinc	71
LWOF004	
Aluminum	14000
Antimony	0.1 J
Beryllium	0.21
Cadmium	0.4
Calcium	5560
Chromium	18.7
Copper	14.8
Iron	25200
Lead	9
Mercury	0.02
Nickel	19.3
Thallium	3
Zinc	77.7
LWOF004E	
Aluminum	14100
Antimony	0.09 J
Arsenic	4
Beryllium	0.19
Cadmium	0.4
Calcium	5980
Chromium	20.1
Copper	17
Iron	27300
Lead	10
Mercury	0.09
Nickel	20.4
Selenium	3
Thallium	3
Zinc	72.2

LWFF	
Aluminum	17200
Antimony	0.19 J
Beryllium	0.26
Cadmium	0.3
Chromium	28.3
Copper	20.1
Iron	24400
Lead	11.4
Mercury	0.04
Nickel	24.8
Zinc	72.2

LWOS005	
Aluminum	26700
Antimony	0.2 J
Beryllium	0.5
Cadmium	0.5
Chromium	39.4
Copper	43.7
Iron	31100
Lead	17
Mercury	0.07
Nickel	35
Selenium	10
Zinc	90.3

LWOS002	
Aluminum	14500
Arsenic	5
Beryllium	0.25
Cadmium	0.2
Chromium	24.1
Copper	18.7
Iron	21000
Lead	11
Mercury	0.02
Nickel	22.4
Selenium	6
Zinc	70.8

LWOS001	
Aluminum	14300
Antimony	0.09 J
Beryllium	0.22
Cadmium	0.2
Chromium	25.0
Copper	18.5
Iron	20100
Lead	7
Mercury	0.02
Nickel	24.5
Selenium	4
Zinc	64.4



LWOF003W	
Aluminum	23000
Arsenic	4
Beryllium	0.2
Cadmium	0.1
Chromium	23
Copper	15
Iron	20200
Lead	5
Mercury	0.01
Nickel	24.1
Thallium	4
Zinc	69.9
LWOF003	
Aluminum	13700
Antimony	0.7 J
Beryllium	0.3
Cadmium	2
Chromium	39.9
Copper	43.7
Iron	29700
Lead	51
Mercury	0.11
Nickel	29
Zinc	203
LWOF003E	
Aluminum	14700
Arsenic	4
Beryllium	0.23
Cadmium	0.1
Chromium	21.5
Copper	17.1
Iron	21200
Lead	5
Mercury	0.02
Nickel	23.7
Selenium	4
Thallium	8
Zinc	77.9

EXPLANATION

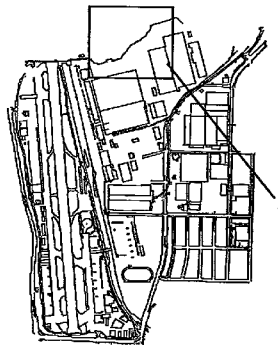
- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=mg/kg (dry weight)
- 2) Only detected constituents are shown.

LOCATION MAP



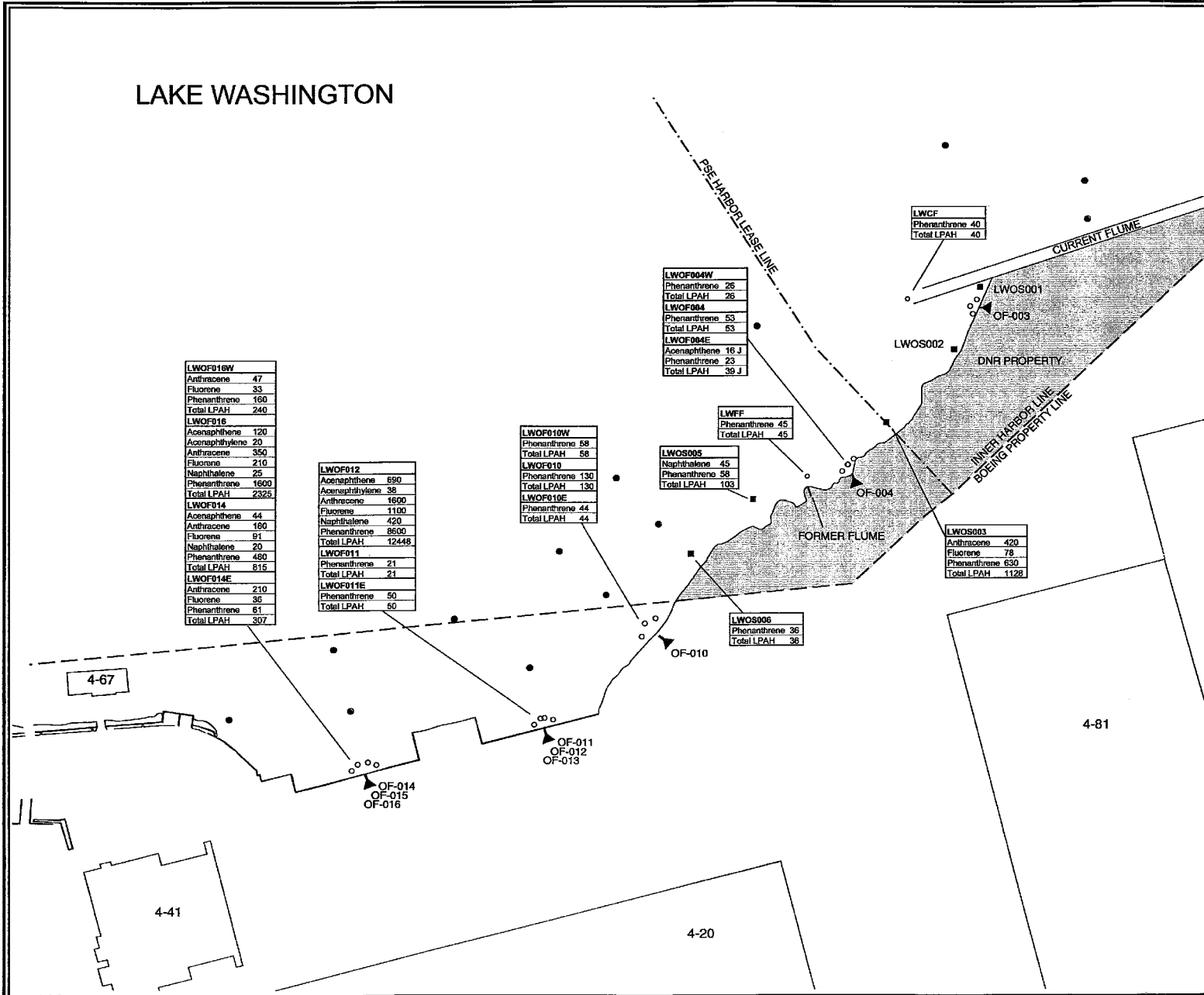
AREA SHOWN

BOEING RENTON PLANT

Outfall & Shoreline Sediment Sample Results Metals

Figure 3-2

LAKE WASHINGTON





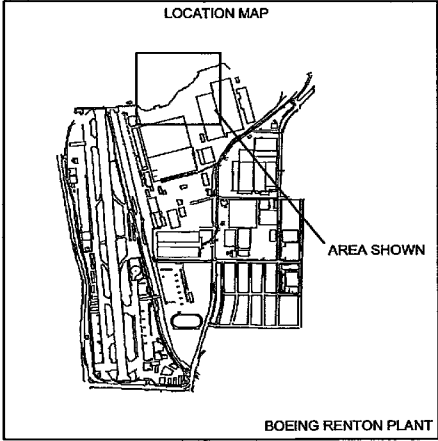
EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=μg/kg (dry weight)
- 2) Only detected constituents are shown.



Outfall & Shoreline Sediment Sample Results

LPAHs

figure **3-3**

LAKE WASHINGTON

LWOF016W	
Benzo(a)anthracene	170
Benzo(a)pyrene	300
Benzo(b)fluoranthene	260
Benzo(g,h,i)perylene	200
Benzo(k)fluoranthene	210
Chrysene	210
Dibenz(a,h)anthracene	32
Fluoranthene	400
Indeno(1,2,3-cd)pyrene	210
Pyrene	320
Total Benzo(a)fluoranthene	470
Total HPAH	2312

LWOF012W	
Benzo(a)anthracene	21
Benzo(a)pyrene	21
Benzo(b)fluoranthene	25
Benzo(k)fluoranthene	20
Chrysene	23
Fluoranthene	36
Pyrene	36
Total Benzo(a)fluoranthene	45
Total HPAH	184

LWOF010W	
Benzo(a)anthracene	42
Benzo(a)pyrene	47
Benzo(b)fluoranthene	47
Benzo(g,h,i)perylene	44
Benzo(k)fluoranthene	74
Chrysene	88
Fluoranthene	190
Indeno(1,2,3-cd)pyrene	37
Total Benzo(a)fluoranthene	169
Total HPAH	659

LWOF004W	
Fluoranthene	33
Pyrene	31
Total HPAH	64

LWOF004	
Benzo(a)anthracene	26
Benzo(e)pyrene	22
Benzo(b)fluoranthene	22
Benzo(k)fluoranthene	20
Chrysene	34
Fluoranthene	75
Pyrene	70
Total Benzo(a)fluoranthene	43
Total HPAH	270

LWFF	
Benzo(a)anthracene	45
Benzo(a)pyrene	45
Benzo(b)fluoranthene	90
Benzo(g,h,i)perylene	34
Benzo(k)fluoranthene	44
Chrysene	84
Fluoranthene	130
Indeno(1,2,3-cd)pyrene	28
Pyrene	92
Total Benzo(a)fluoranthene	134
Total HPAH	593

LWCF	
Benzo(a)anthracene	34
Benzo(a)pyrene	33
Benzo(b)fluoranthene	36
Benzo(g,h,i)perylene	27
Benzo(k)fluoranthene	36
Chrysene	59
Fluoranthene	87
Indeno(1,2,3-cd)pyrene	28
Pyrene	61
Total Benzo(a)fluoranthene	75
Total HPAH	404

LWOS003	
Benzo(a)anthracene	1100
Benzo(a)pyrene	1200
Benzo(b)fluoranthene	1500
Benzo(g,h,i)perylene	580
Benzo(k)fluoranthene	1200
Chrysene	1900
Dibenz(a,h)anthracene	320
Fluoranthene	1600
Indeno(1,2,3-cd)pyrene	620
Pyrene	2000
Total Benzo(a)fluoranthene	2700
Total HPAH	12020

LWOS005	
Benzo(a)anthracene	58
Benzo(a)pyrene	59
Benzo(b)fluoranthene	76
Benzo(g,h,i)perylene	50
Benzo(k)fluoranthene	56
Chrysene	89
Fluoranthene	120
Indeno(1,2,3-cd)pyrene	41
Pyrene	150
Total Benzo(a)fluoranthene	135
Total HPAH	702

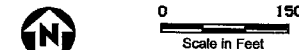
LWOS006	
Benzo(a)anthracene	34
Benzo(a)pyrene	49
Benzo(b)fluoranthene	60
Benzo(g,h,i)perylene	47
Benzo(k)fluoranthene	54
Chrysene	59
Dibenz(a,h)anthracene	20
Fluoranthene	73
Indeno(1,2,3-cd)pyrene	42
Pyrene	82
Total Benzo(a)fluoranthene	114
Total HPAH	520

EXPLANATION

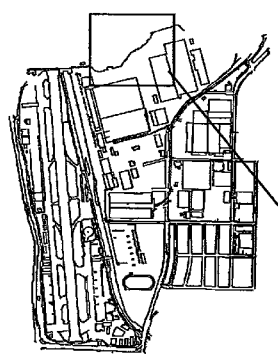
- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=μg/kg (dry weight)
- 2) Only detected constituents are shown.



LOCATION MAP

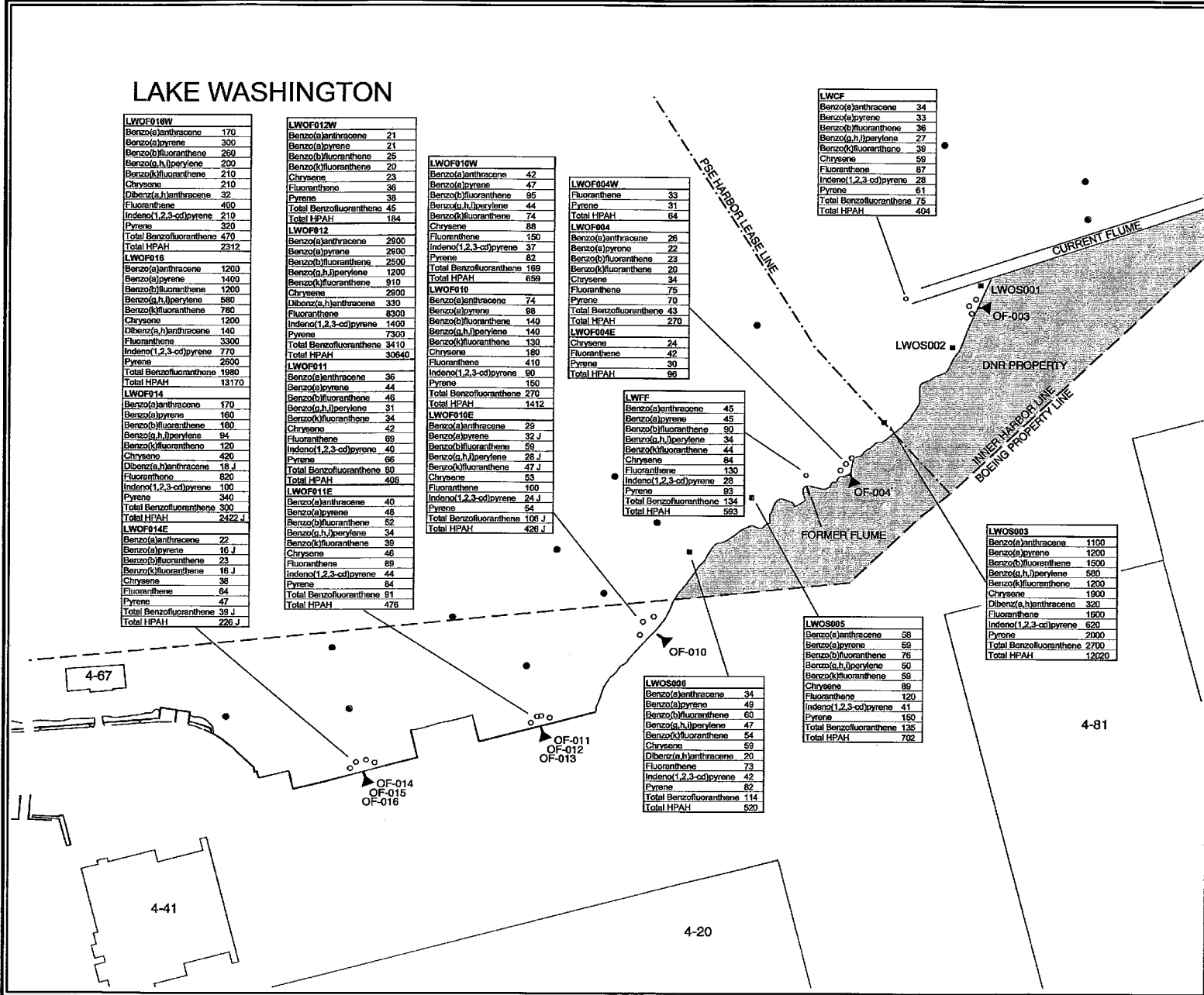


AREA SHOWN

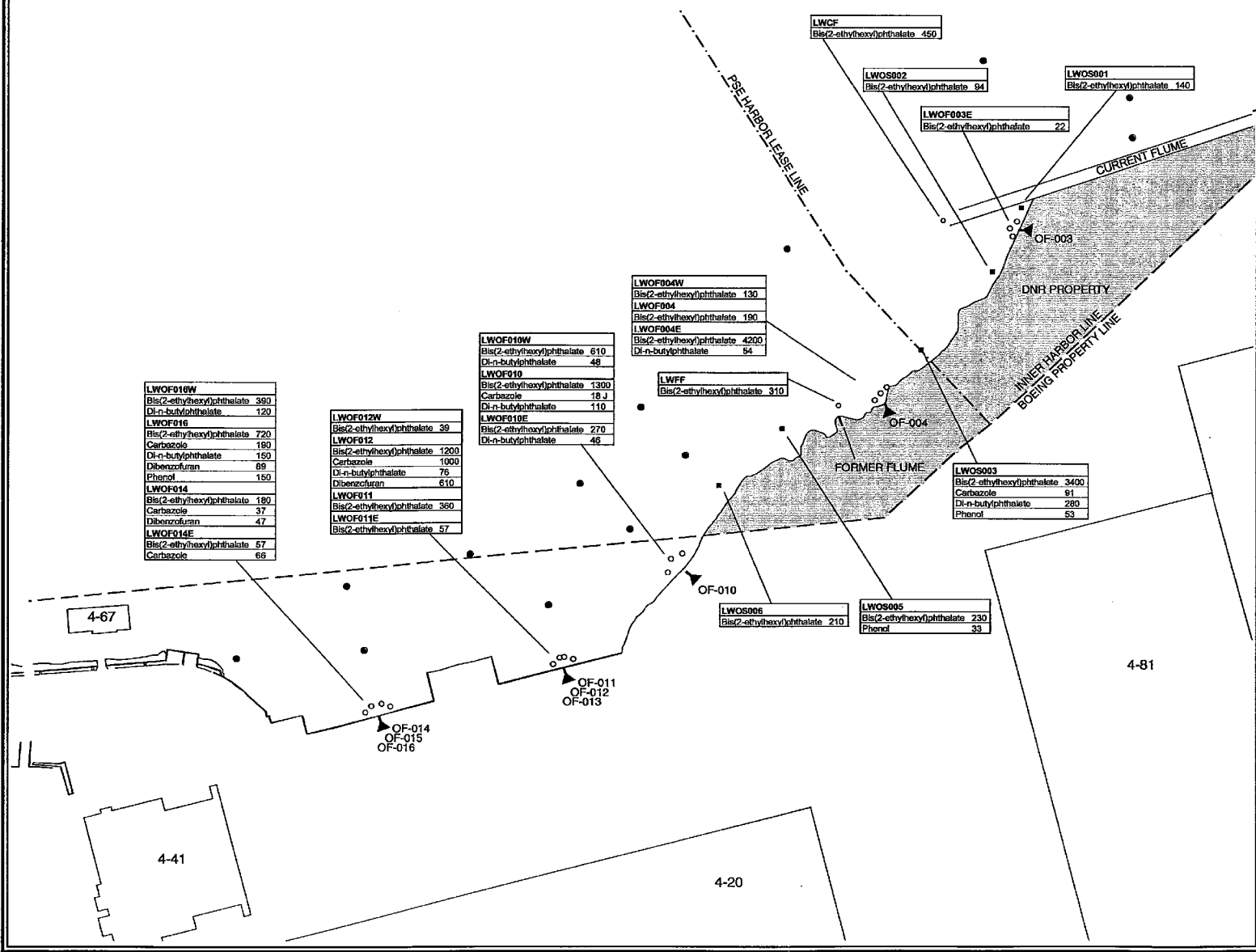
BOEING RENTON PLANT

Outfall & Shoreline Sediment Sample Results HPAHs

figure 3-4



LAKE WASHINGTON



LWOF016W	
Bis(2-ethylhexyl)phthalate	390
Di-n-butylphthalate	120
LWOF016	
Bis(2-ethylhexyl)phthalate	720
Carbazole	180
Di-n-butylphthalate	150
Dibenzofuran	89
Phenol	150
LWOF014	
Bis(2-ethylhexyl)phthalate	180
Carbazole	37
Dibenzofuran	47
LWOF014E	
Bis(2-ethylhexyl)phthalate	57
Carbazole	66

LWOF012W	
Bis(2-ethylhexyl)phthalate	39
LWOF012	
Bis(2-ethylhexyl)phthalate	1200
Carbazole	1000
Di-n-butylphthalate	76
Dibenzofuran	610
LWOF011	
Bis(2-ethylhexyl)phthalate	360
LWOF011E	
Bis(2-ethylhexyl)phthalate	57

LWOF010W	
Bis(2-ethylhexyl)phthalate	610
Di-n-butylphthalate	48
LWOF010	
Bis(2-ethylhexyl)phthalate	1300
Carbazole	18 J
Di-n-butylphthalate	110
LWOF010E	
Bis(2-ethylhexyl)phthalate	270
Di-n-butylphthalate	46

LWOF004W	
Bis(2-ethylhexyl)phthalate	130
LWOF004	
Bis(2-ethylhexyl)phthalate	180
LWOF004E	
Bis(2-ethylhexyl)phthalate	4200
Di-n-butylphthalate	54

LWFF	
Bis(2-ethylhexyl)phthalate	310

LWCF	
Bis(2-ethylhexyl)phthalate	450

LWOS002	
Bis(2-ethylhexyl)phthalate	94

LWOS001	
Bis(2-ethylhexyl)phthalate	140

LWOF003E	
Bis(2-ethylhexyl)phthalate	22

LWOS003	
Bis(2-ethylhexyl)phthalate	3400
Carbazole	91
Di-n-butylphthalate	280
Phenol	53

LWOS006	
Bis(2-ethylhexyl)phthalate	210

LWOS005	
Bis(2-ethylhexyl)phthalate	230
Phenol	33

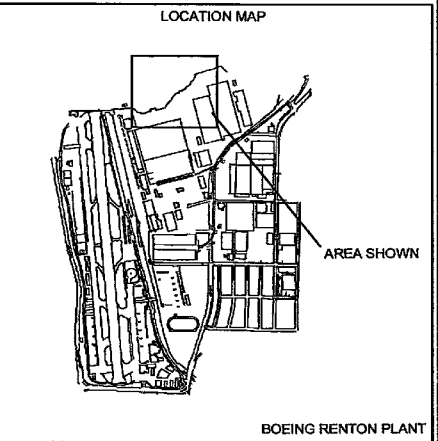
EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

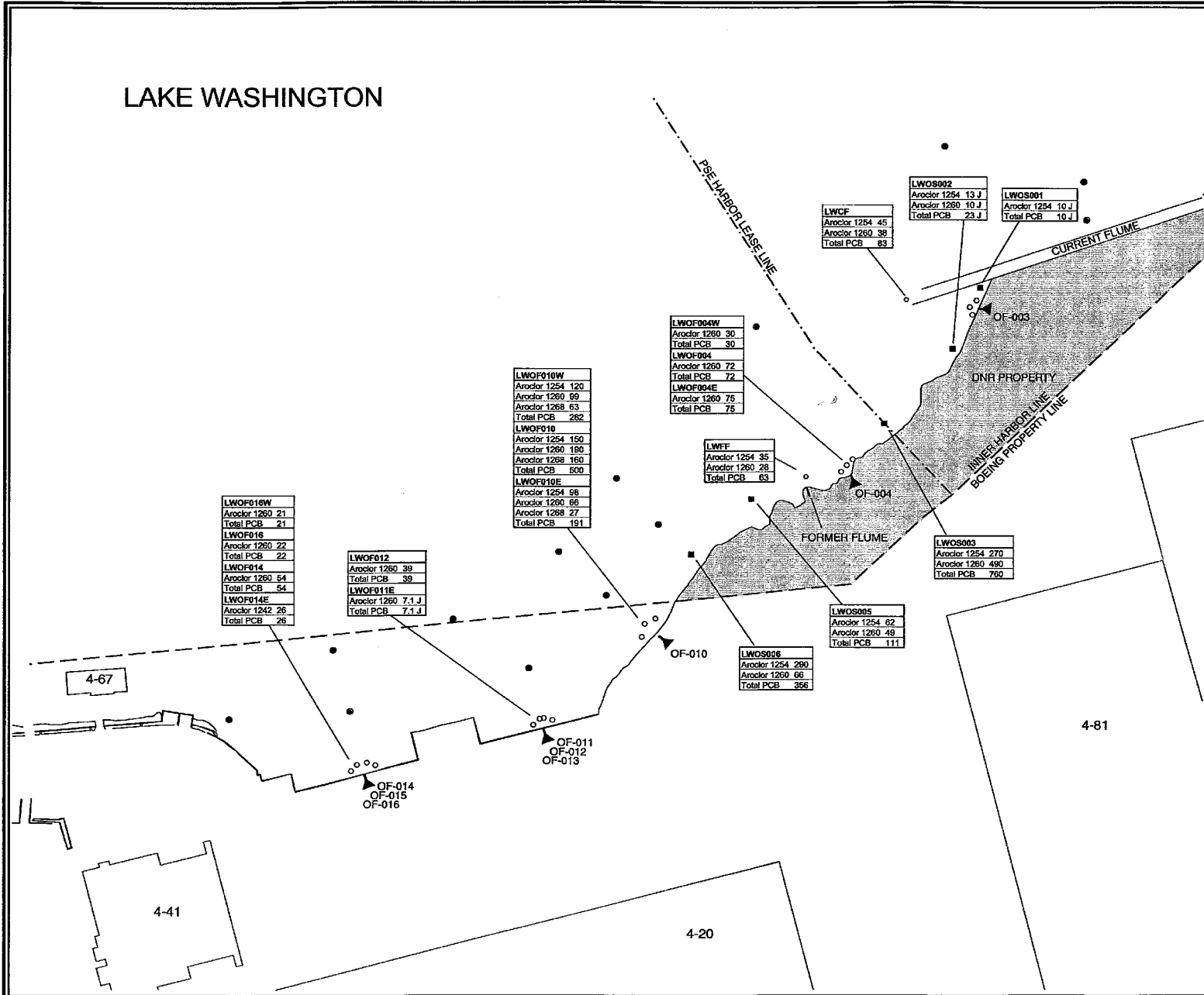
- Units= $\mu\text{g}/\text{kg}$ (dry weight)
- Only detected constituents are shown.

0 150
Scale in Feet



Outfall & Shoreline Sediment Sample Results
Miscellaneous Organics
figure
3-5

LAKE WASHINGTON



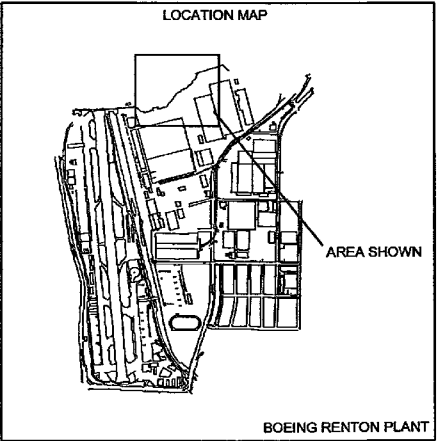
EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=µg/kg (dry weight)
- 2) Only detected constituents are shown.

0 150
Scale in Feet

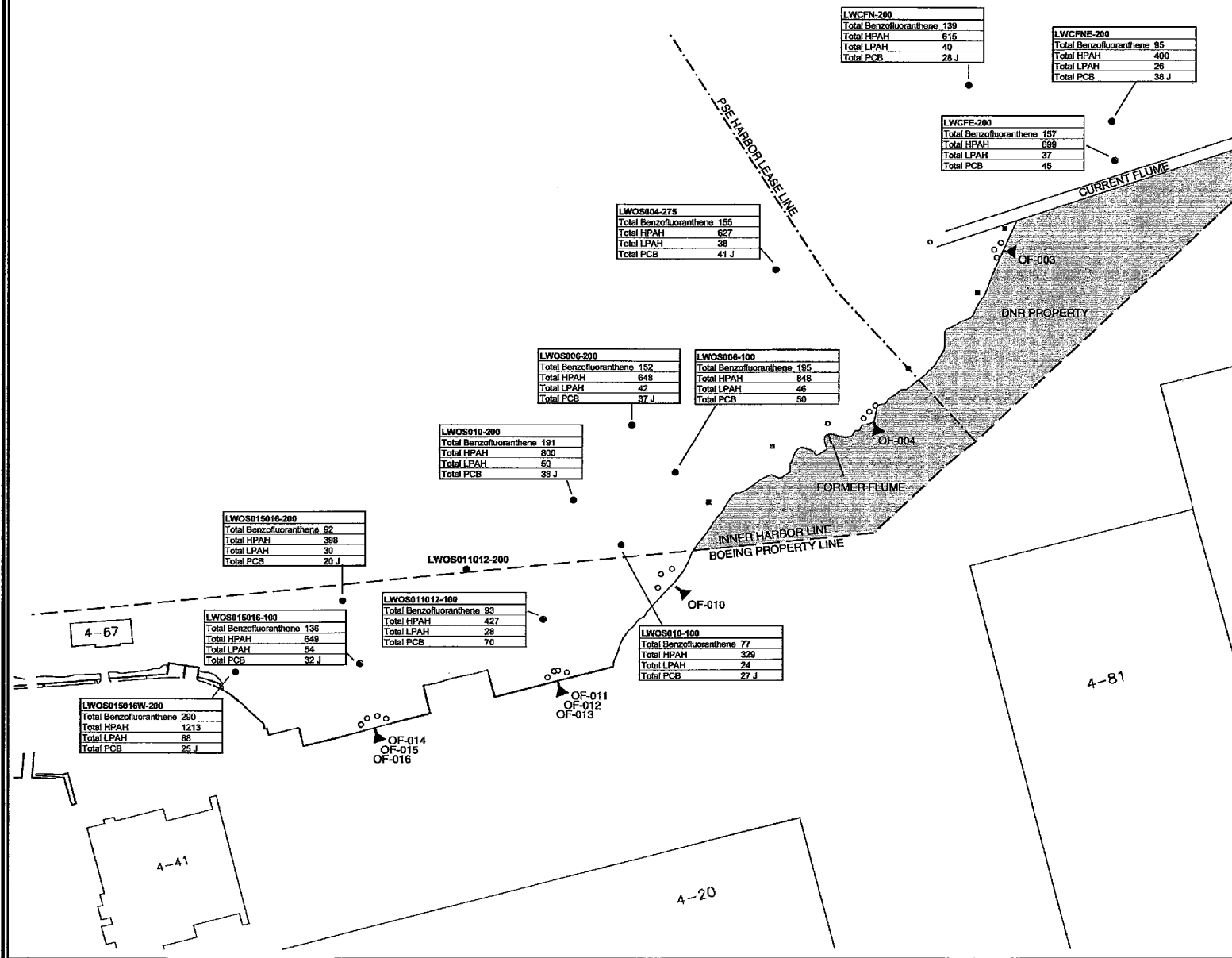


Outfall & Shoreline Sediment Sample Results

PCBs

figure
3-6

LAKE WASHINGTON



EXPLANATION

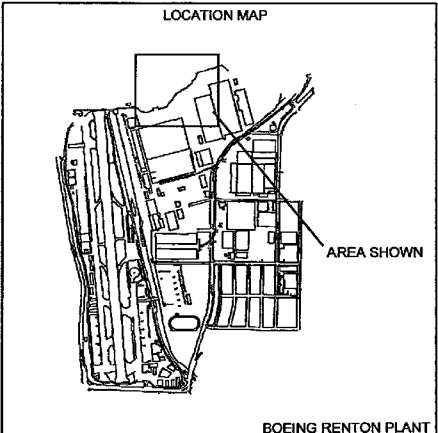
- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeig Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- Units=µg/kg (dry weight)
- Only detected constituents are shown.

Scale: 0 to 150 Feet

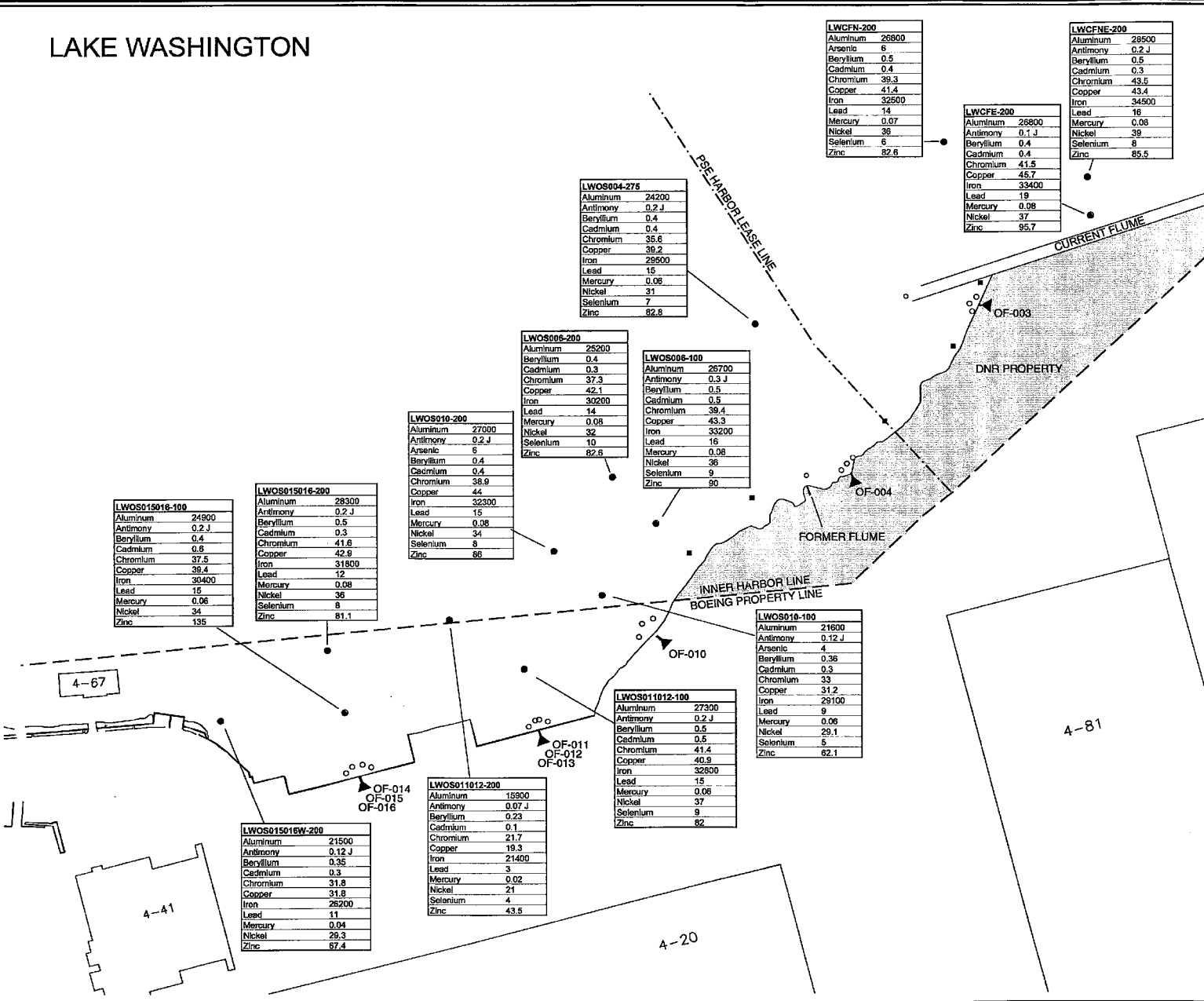
North Arrow: N



Nearshore Sediment Sample Results Total Organics

figure **3-7**

LAKE WASHINGTON



LWCFN-200

Aluminum	26800
Arsenic	6
Beryllium	0.5
Cadmium	0.4
Chromium	39.3
Copper	41.4
Iron	32500
Lead	14
Mercury	0.07
Nickel	36
Selenium	6
Zinc	82.6

LWCFNE-200

Aluminum	26500
Antimony	0.2 J
Beryllium	0.5
Cadmium	0.3
Chromium	43.6
Copper	43.4
Iron	34500
Lead	16
Mercury	0.08
Nickel	39
Selenium	8
Zinc	85.5

LWCFE-200

Aluminum	26800
Antimony	0.1 J
Beryllium	0.4
Cadmium	0.4
Chromium	41.5
Copper	45.7
Iron	33400
Lead	19
Mercury	0.08
Nickel	37
Zinc	95.7

LWOS004-275

Aluminum	24200
Antimony	0.2 J
Beryllium	0.4
Cadmium	0.4
Chromium	35.6
Copper	39.2
Iron	29500
Lead	15
Mercury	0.08
Nickel	31
Selenium	7
Zinc	82.8

LWOS005-200

Aluminum	25200
Beryllium	0.4
Cadmium	0.3
Chromium	37.3
Copper	42.1
Iron	32200
Lead	14
Mercury	0.08
Nickel	32
Selenium	10
Zinc	82.6

LWOS006-100

Aluminum	26700
Antimony	0.3 J
Beryllium	0.5
Cadmium	0.5
Chromium	39.4
Copper	43.3
Iron	33200
Lead	16
Mercury	0.08
Nickel	36
Selenium	9
Zinc	90

LWOS010-200

Aluminum	27000
Antimony	0.2 J
Arsenic	5
Beryllium	0.4
Cadmium	0.4
Chromium	38.9
Copper	44
Iron	32300
Lead	15
Mercury	0.08
Nickel	34
Selenium	8
Zinc	86

LWOS015016-100

Aluminum	24900
Antimony	0.2 J
Beryllium	0.4
Cadmium	0.6
Chromium	37.5
Copper	39.4
Iron	30400
Lead	16
Mercury	0.06
Nickel	34
Zinc	135

LWOS015016-200

Aluminum	28300
Antimony	0.2 J
Beryllium	0.5
Cadmium	0.3
Chromium	41.6
Copper	42.9
Iron	31800
Lead	12
Mercury	0.08
Nickel	36
Selenium	8
Zinc	81.1

LWOS018-100

Aluminum	21600
Antimony	0.12 J
Arsenic	4
Beryllium	0.36
Cadmium	0.3
Chromium	33
Copper	31.2
Iron	29100
Lead	9
Mercury	0.06
Nickel	29.1
Selenium	5
Zinc	82.1

LWOS011012-100

Aluminum	27300
Antimony	0.2 J
Beryllium	0.5
Cadmium	0.5
Chromium	41.4
Copper	40.9
Iron	32800
Lead	15
Mercury	0.06
Nickel	37
Selenium	9
Zinc	82

LWOS011012-200

Aluminum	15900
Antimony	0.07 J
Beryllium	0.23
Cadmium	0.1
Chromium	21.7
Copper	19.3
Iron	21400
Lead	3
Mercury	0.02
Nickel	21
Selenium	4
Zinc	43.5

LWOS015016W-200



Aluminum	21500
Antimony	0.12 J
Beryllium	0.35
Cadmium	0.3
Chromium	31.8
Copper	31.8
Iron	25200
Lead	11
Mercury	0.04
Nickel	26.3
Zinc	67.4

EXPLANATION

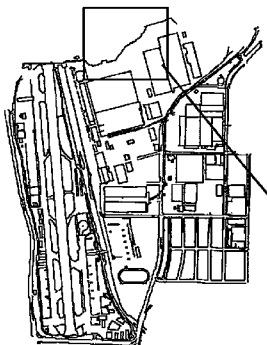
- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=mg/kg (dry weight)
- 2) Only detected constituents are shown.

LOCATION MAP



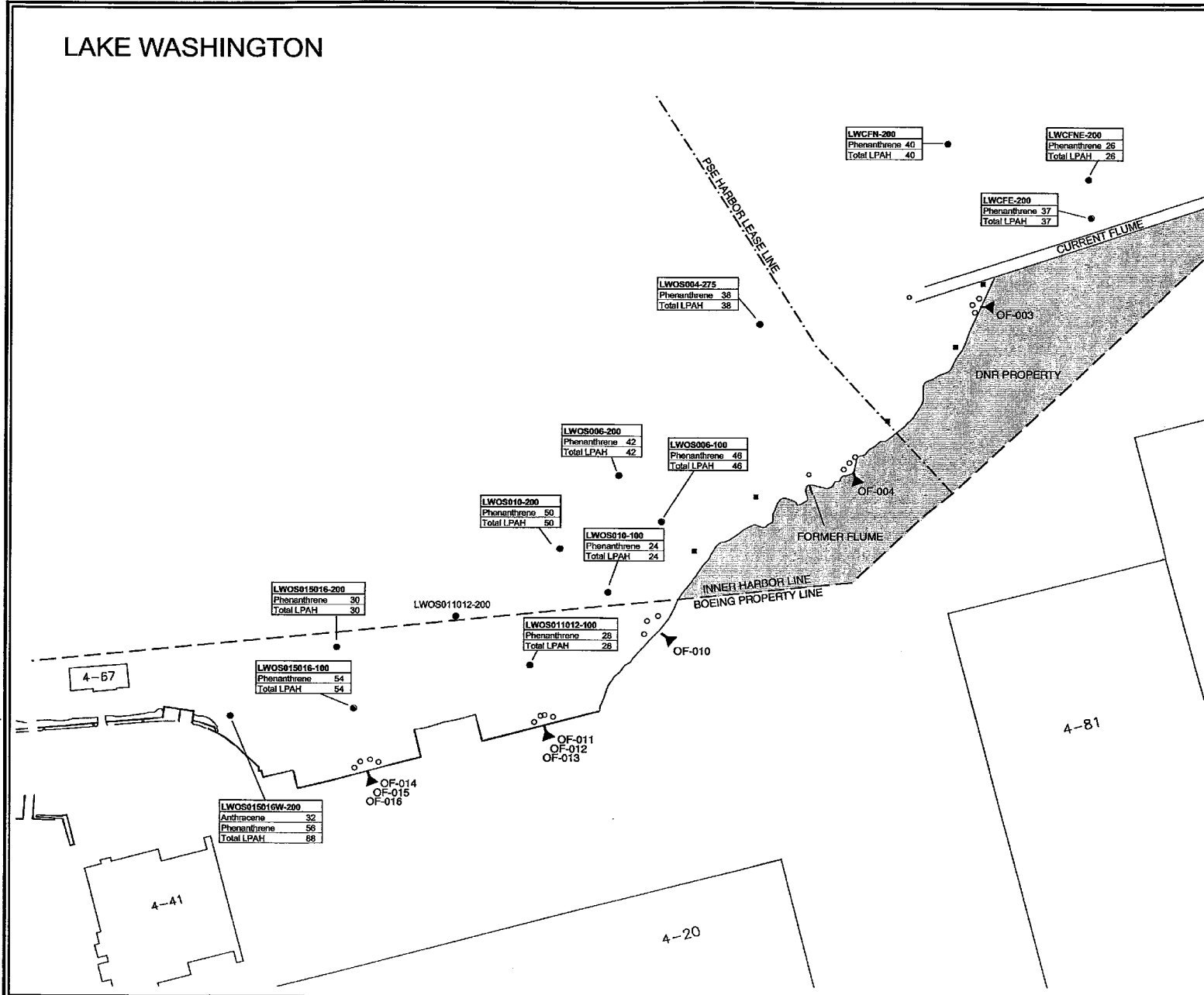
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BOEING RENTON PLANT

Nearshore Sediment Sample Results Metals

figure **3-8**

LAKE WASHINGTON



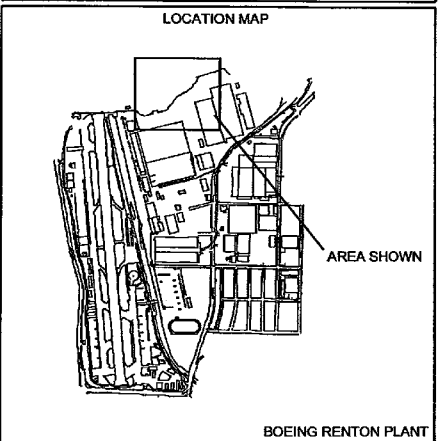
EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

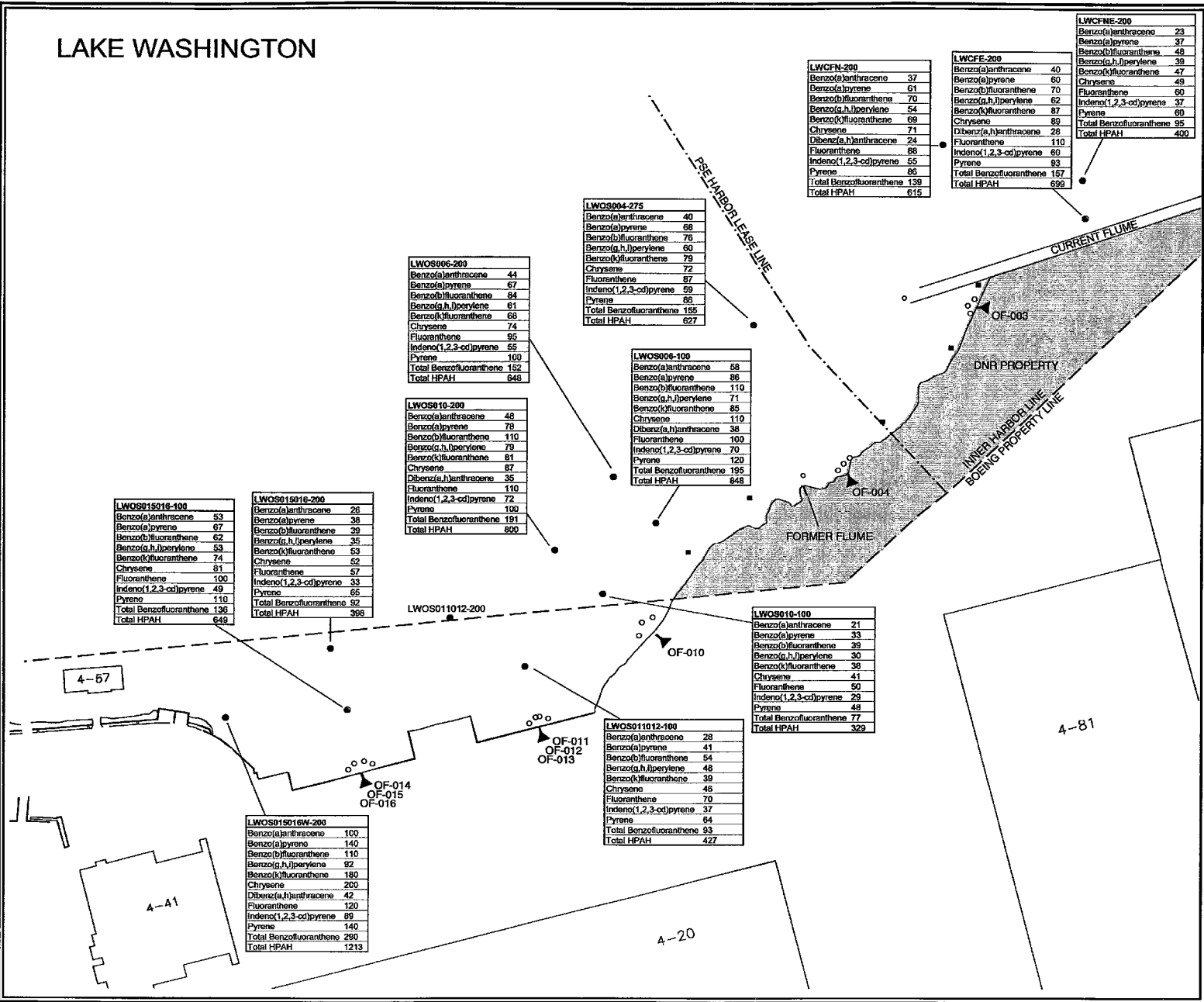
- 1) Units=μg/kg (dry weight)
- 2) Only detected constituents are shown.

0 150
Scale in Feet



**Nearshore Sediment
Sample Results
LPAHs**
figure
3-9

LAKE WASHINGTON



LWOS015016-100	
Benzo(a)anthracene	53
Benzo(a)pyrene	67
Benzo(b)fluoranthene	62
Benzo(g,h,i)perylene	53
Benzo(k)fluoranthene	74
Chrysene	81
Fluoranthene	100
Indeno(1,2,3-cd)pyrene	49
Pyrene	110
Total Benzo(a)fluoranthene	138
Total HPAH	649

LWOS015016-200	
Benzo(a)anthracene	26
Benzo(a)pyrene	38
Benzo(b)fluoranthene	39
Benzo(g,h,i)perylene	35
Benzo(k)fluoranthene	53
Chrysene	52
Fluoranthene	57
Indeno(1,2,3-cd)pyrene	33
Pyrene	66
Total Benzo(a)fluoranthene	92
Total HPAH	388

LWOS010-200	
Benzo(a)anthracene	48
Benzo(a)pyrene	78
Benzo(b)fluoranthene	110
Benzo(g,h,i)perylene	79
Benzo(k)fluoranthene	81
Chrysene	87
Dibenz(a,h)anthracene	35
Fluoranthene	110
Indeno(1,2,3-cd)pyrene	72
Pyrene	100
Total Benzo(a)fluoranthene	191
Total HPAH	800

LWOS006-200	
Benzo(a)anthracene	44
Benzo(a)pyrene	67
Benzo(b)fluoranthene	84
Benzo(g,h,i)perylene	61
Benzo(k)fluoranthene	68
Chrysene	74
Fluoranthene	95
Indeno(1,2,3-cd)pyrene	55
Pyrene	100
Total Benzo(a)fluoranthene	162
Total HPAH	648

LWOS004-275	
Benzo(a)anthracene	40
Benzo(a)pyrene	68
Benzo(b)fluoranthene	76
Benzo(g,h,i)perylene	60
Benzo(k)fluoranthene	79
Chrysene	72
Fluoranthene	87
Indeno(1,2,3-cd)pyrene	59
Pyrene	86
Total Benzo(a)fluoranthene	155
Total HPAH	627

LWOS006-100	
Benzo(a)anthracene	58
Benzo(a)pyrene	86
Benzo(b)fluoranthene	110
Benzo(g,h,i)perylene	71
Benzo(k)fluoranthene	83
Chrysene	110
Dibenz(a,h)anthracene	38
Fluoranthene	100
Indeno(1,2,3-cd)pyrene	70
Pyrene	120
Total Benzo(a)fluoranthene	170
Total HPAH	648

LWOS010-100	
Benzo(a)anthracene	21
Benzo(a)pyrene	33
Benzo(b)fluoranthene	39
Benzo(g,h,i)perylene	30
Benzo(k)fluoranthene	38
Chrysene	41
Fluoranthene	50
Indeno(1,2,3-cd)pyrene	29
Pyrene	48
Total Benzo(a)fluoranthene	77
Total HPAH	329

LWOS011012-100	
Benzo(a)anthracene	28
Benzo(a)pyrene	41
Benzo(b)fluoranthene	54
Benzo(g,h,i)perylene	48
Benzo(k)fluoranthene	39
Chrysene	46
Fluoranthene	70
Indeno(1,2,3-cd)pyrene	37
Pyrene	84
Total Benzo(a)fluoranthene	93
Total HPAH	427

LWCFN-200	
Benzo(a)anthracene	37
Benzo(a)pyrene	61
Benzo(b)fluoranthene	70
Benzo(g,h,i)perylene	54
Benzo(k)fluoranthene	69
Chrysene	71
Dibenz(a,h)anthracene	24
Fluoranthene	88
Indeno(1,2,3-cd)pyrene	55
Pyrene	86
Total Benzo(a)fluoranthene	138
Total HPAH	615

LWCFE-200	
Benzo(a)anthracene	40
Benzo(a)pyrene	60
Benzo(b)fluoranthene	70
Benzo(g,h,i)perylene	62
Benzo(k)fluoranthene	87
Chrysene	89
Dibenz(a,h)anthracene	26
Fluoranthene	110
Indeno(1,2,3-cd)pyrene	60
Pyrene	83
Total Benzo(a)fluoranthene	157
Total HPAH	699

LWCFNE-200	
Benzo(a)anthracene	23
Benzo(a)pyrene	37
Benzo(b)fluoranthene	48
Benzo(g,h,i)perylene	39
Benzo(k)fluoranthene	47
Chrysene	48
Fluoranthene	60
Indeno(1,2,3-cd)pyrene	37
Pyrene	60
Total Benzo(a)fluoranthene	95
Total HPAH	400

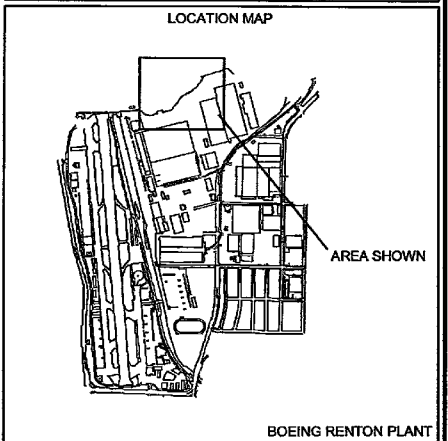
EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=μg/kg (dry weight)
- 2) Only detected constituents are shown.

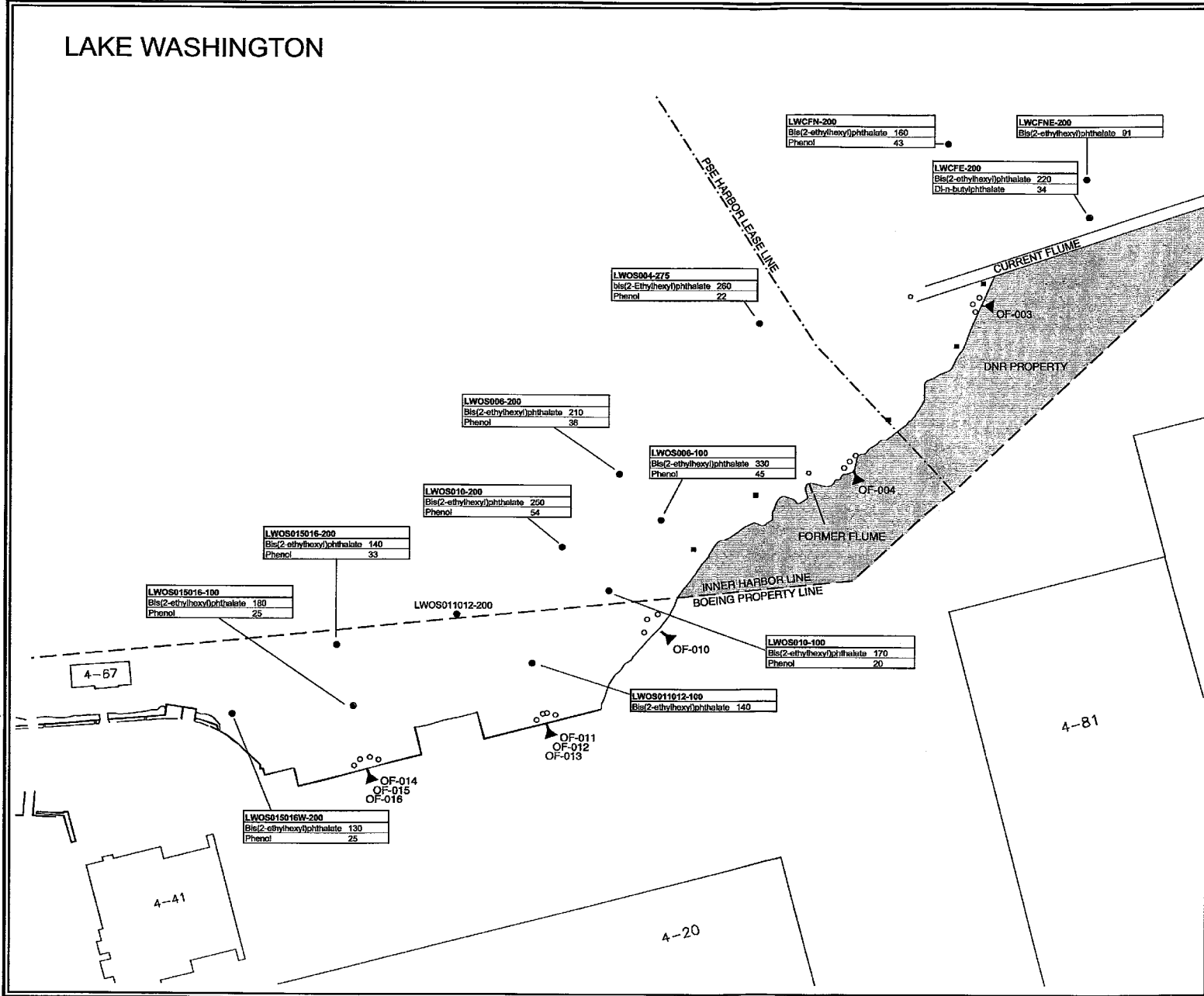
Scale In Feet
0 150



Nearshore Sediment Sample Results HPAHs

Figure 3-10

LAKE WASHINGTON



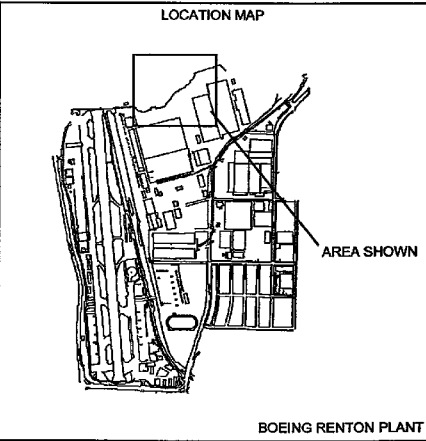
EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=µg/kg (dry weight)
- 2) Only detected constituents are shown.

Scale In Feet: 0 to 150

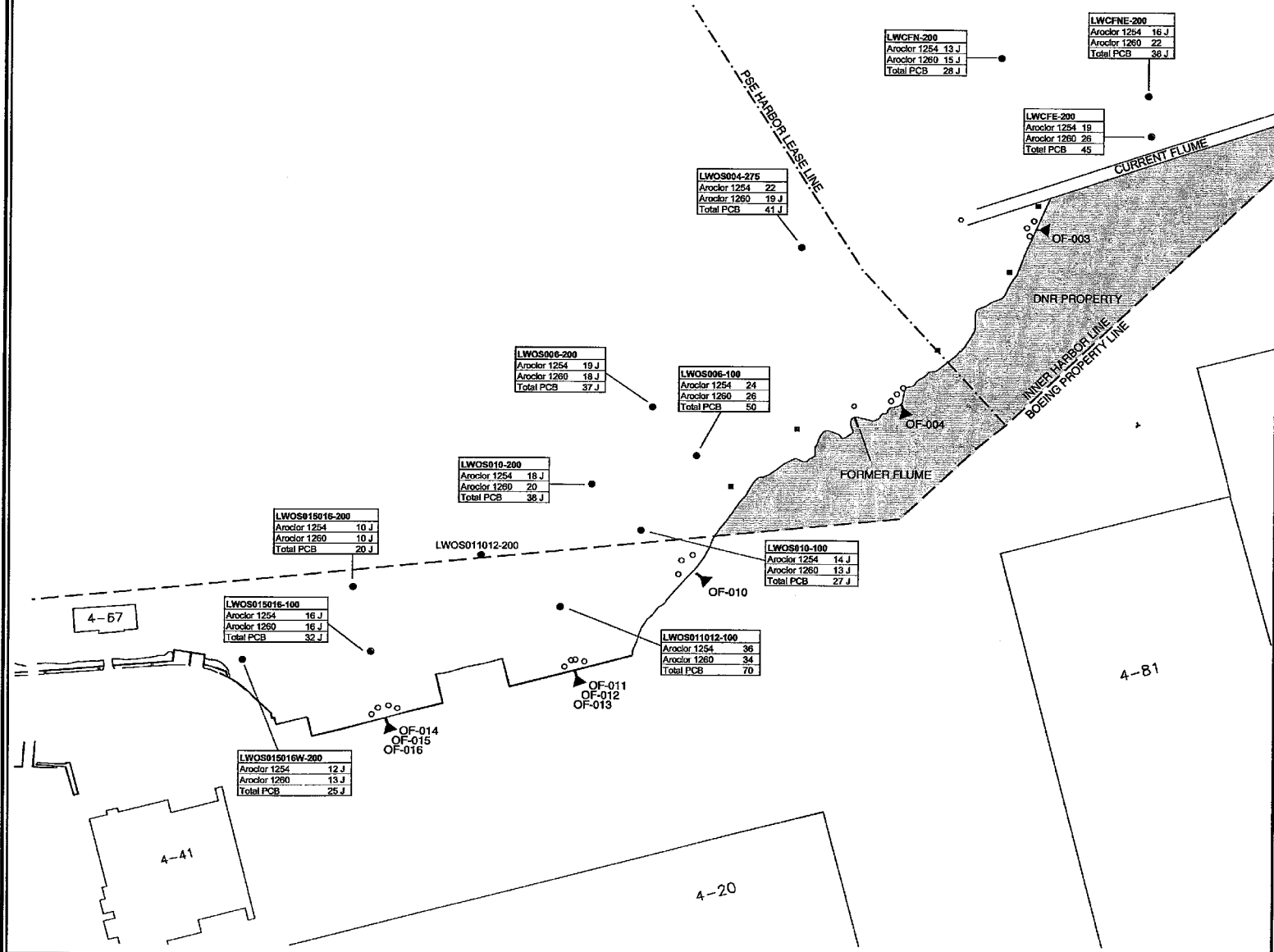


Nearshore Sediment Sample Results

Miscellaneous Organics

figure **3-11**

LAKE WASHINGTON



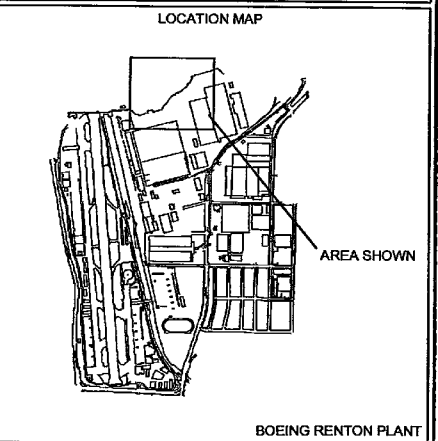
EXPLANATION

- ▲ Storm Water Outfall
- Outfall or Flume Sediment Sample Location
- Nearshore Sediment Sample Location
- Shoreline Sediment Sample Location
- Boeing Property Line and Inner Harbor Line
- - - PSE Harbor Lease Line
- ▨ DNR Property

Notes:

- 1) Units=ug/kg (dry weight)
- 2) Only detected constituents are shown.

0 150
Scale in Feet



Nearshore Sediment Sample Results

Total PCBs

Figure **3-12**

Tables

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Outfall 3 *	Outfall 3 *	Outfall 3 *	Outfall 4 *	Outfall 4	TOCN	Outfall 4	TOCN
	LWOF003	LWOF003E	LWOF003W	LWOF004	LWOF004E	LWOF004E	LWOF004W	LWOF004W
Conventional Parameters (%)								
Total Solids	82.0	79.7	84.0	81.4	81.4		79.9	
Total Organic Carbon	0.26	0.18	0.091	0.36	0.60		0.60	
Grain Size (%)								
Gravel (<3 to <1 Phi)	5.44	0.40	6.89	13.34	26.23		14.46	
Sand (<1 to 4 Phi)	94.68	89.62	90.76	84.76	73.72		83.26	
Total Sand and Gravel	100.00	89.82	97.75	98.11	89.85		97.72	
SR (4 to 8 Phi)	0.00	0.08	2.18	0.00	0.05		2.12	
Clay (8 to <10 Phi)	0.00	0.00	0.15	0.00	0.00		0.16	
Total Fines (Silt and Clay)	0.00	0.08	2.33	0.00	0.05		2.28	
Total Metals (mg/kg dry weight)								
Aluminum	13,700	14,700	13,000	14,000	14,100		13,800	
Antimony	0.06 UJ	0.06 UJ	0.06 UJ	0.10 J	0.08 J		0.06 UJ	
Arsenic	5	4	4	3 U	4		3 U	
Beryllium	0.21	0.23	0.20	0.21	0.19		0.21	
Cadmium	0.1	0.1	0.1	0.4	0.4		0.3	
Chromium	25.6	21.5	23.0	18.7	20.1		17.5	
Copper	17.0	17.1	15.0	14.8	17.0		14.0	
Iron	21,800	21,200	20,200	25,200	27,300		24,000	
Lead	5	5	5	8	10		7	
Mercury	0.02	0.02	0.01	0.02	0.09		0.02	
Nickel	25.6	23.7	24.1	19.3	20.4		18.6	
Selenium	3	4	3 U	3 U	3		3 U	
Silver	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U		0.2 U	
Thallium	6	6	4	3	3		3 U	
Zinc	67.8	77.9	69.9	77.7	77.0		71.0	
LPAH (µg/kg dry weight)								
Acenaphthene	19 U	19 U	19 U	19 U	16 J	2687 J	19 U	3800 U
Acenaphthylene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Anthracene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Fluorene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
2-Methylnaphthalene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Naphthalene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Phenanthrene	19 U	19 U	19 U	53	23	3833	26	5200
Total LPAH	ND	ND	ND	53 T	39 T	6500 T	26 T	5200 T
HPAH (µg/kg dry weight)								
Benzo(a)anthracene	19 U	19 U	19 U	26	20 U	3333 U	19 U	3800 U
Benzo(a)pyrene	19 U	19 U	19 U	22	20 U	3333 U	19 U	3800 U
Benzo(g,h,i)perylene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Benzo(b)fluoranthene	19 U	19 U	19 U	23	20 U	3333 U	19 U	3800 U
Benzo(k)fluoranthene	19 U	19 U	19 U	20	20 U	3333 U	19 U	3800 U
Total Benzofluoranthene	ND	ND	ND	43 T	ND	ND	ND	ND
Chrysene	19 U	19 U	19 U	34	24	4000	19 U	3800 U
Dibenzo(a,h)anthracene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Fluoranthene	19 U	19 U	19 U	75	42	7000	33	6600
Indeno(1,2,3-cd)pyrene	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Pyrene	19 U	19 U	19 U	70	30	5000	31	6200
Total HPAH	ND	ND	ND	270 T	96 T	16000 T	64 T	12800 T
Misc. BNAAs (µg/kg dry weight)								
Bis(2-ethylhexyl)phthalate	19 U	22	19 U	190	4,200	700000	130	26000
Carbazole	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Di-n-butylphthalate	19 U	19 U	19 U	19 U	54	9000	19 U	3800 U
Dibenzofuran	19 U	19 U	19 U	19 U	20 U	3333 U	19 U	3800 U
Phenol	37 U	39 U	38 U	39 U	39 U		39 U	
PCBs (µg/kg dry weight)								
Aroclor 1016	17 U	18 U	18 U	18 U	18 U	3000 U	18 U	3800 U
Aroclor 1221	35 U	36 U	35 U	36 U	36 U	6000 U	36 U	7200 U
Aroclor 1232	17 U	18 U	18 U	18 U	18 U	3000 U	18 U	3800 U
Aroclor 1242	17 U	18 U	18 U	18 U	18 U	3000 U	18 U	3800 U
Aroclor 1248	17 U	18 U	18 U	18 U	18 U	3000 U	18 U	3800 U
Aroclor 1254	17 U	18 U	18 U	50 U	18 U	3000 U	18 U	3800 U
Aroclor 1260	17 U	18 U	18 U	72	75	12500	30	6000
Aroclor 1268	17 U		18 U					
Total PCB	ND	ND	ND	72 T	75 T	12500 T	30 T	6000 T

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analyte was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UU: The analyte was not detected; the quantitation limit is an estimated value.

* TOC normalization of analytical data is not recommended because the total organic content of the sample falls outside the range of 0.5% to 4.0%.

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Outfall 10 LWOF010	TOCN LWOF010	Outfall 10 LWOF010E	TOCN LWOF010E	Outfall 10 LWOF010W	TOCN LWOF010W	Outfall 11-12-13 LWOF011	TOCN LWOF011	Outfall 11-12-13* LWOF011E
Conventional Parameters (%)									
Total Solids	41.6		40.0		40.9		64.4		63.5
Total Organic Carbon	2.1		2.1		1.7		0.64		0.39
Grain Size (%)									
Gravel (-3 to -1 Phi)	0.00		1.82		0.02		54.14		45.86
Sand (-1 to 4 Phi)	28.13		30.62		17.72		45.00		50.69
Total Sand and Gravel	28.13		32.45		17.74		99.13		96.65
Silt (4 to 8 Phi)	66.50		62.07		75.41		0.00		2.89
Clay (9 to <10 Phi)	5.36		5.48		6.85		0.00		0.47
Total Fines (Silt and Clay)	71.87		67.55		82.26		0.00		3.35
Total Metals (mg/kg dry weight)									
Aluminum	28,300		27,300		27,000		14,800		14,800
Antimony	0.3 J		0.2 J		0.2 J		0.15 J		0.06 UJ
Arsenic	8		10		7		3 U		3 U
Beryllium	0.4		0.5		0.4		0.23		0.23
Cadmium	2.0		0.6		1.0		0.5		0.5
Chromium	50.3		43.2		45.6		24.2		25.6
Copper	53.5		42.3		47.2		16.0		16.3
Iron	30,600		29,900		32,500		20,300		26,400
Lead	70		21		32		7		7
Mercury	0.15		0.09		0.10		0.02		0.02
Nickel	41		38		41		28.4		25.7
Selenium	8 U		7 U		6 U		3		3 U
Silver	0.4 U		0.4 U		0.4 U		0.2 U		0.2 U
Thallium	8 U		7 U		6 U		3 U		3 U
Zinc	539		132		229		51.3		48.9
LPAH (µg/kg dry weight)									
Acenaphthene	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Acenaphthylene	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Anthracene	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Fluorene	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
2-Methylnaphthalene	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Naphthalene	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Phenanthrene	130	6190	44	2095	58	3412	21	3281	50
Total LPAH	130 T	6190 T	44 T	2095 T	58 T	3412 T	21 T	3281 T	50 T
HPAH (µg/kg dry weight)									
Benzo(a)anthracene	74	3524	29	1381	42	2471	36	5625	40
Benzo(a)pyrene	88	4667	32 J	1524 J	47	2785	44	6875	48
Benzo(b)fluoranthene	140	6667	28 J	1333 J	44	2588	31	4844	34
Benzo(k)fluoranthene	140	6667	59	2810	85	5588	46	7188	52
Benzo(e)fluoranthene	130	6190	47 J	2238 J	74	4353	34	5313	39
Total Benzo(a)fluoranthene	270 T	12857 T	106 T	5048 T	169 T	8941 T	80 T	12500 T	81 T
Chrysene	180	8571	63	2524	88	5176	42	6563	46
Dibenz(a,h)anthracene	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Fluoranthene	410	18524	100	4762	150	8824	69	10781	89
Indeno(1,2,3-cd)pyrene	90	4266	24 J	1143 J	37	2176	40	6250	44
Pyrene	150	7143	54	2571	82	4824	66	10313	84
Total HPAH	1,412 T	67238 T	426 JT	20288 JT	659 T	38785 T	408 T	63750 T	478 T
Misc. BNAe (µg/kg dry weight)									
Bis(2-ethylhexyl)phthalate	1,300	61905	270	12857	610	35882	360	56250	57
Carbazole	18 J	857 J	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Di-n-butylphthalate	110	5238	46	2190	48	2824	19 U	2969 U	18 U
Dibenzofuran	19 U	905 U	19 U	905 U	20 U	1176 U	19 U	2969 U	18 U
Phenol	39 U		39 U		39 U		37 U		37 U
PCBs (µg/kg dry weight)									
Aroclor 1016	19 U	905 U	19 U	905 U	19 U	1118 U	19 U	2969 U	17 U
Aroclor 1221	37 U	1762 U	37 U	1762 U	38 U	2235 U	37 U	5781 U	34 U
Aroclor 1232	19 U	905 U	19 U	905 U	19 U	1118 U	19 U	2969 U	17 U
Aroclor 1242	19 U	905 U	19 U	905 U	19 U	1118 U	19 U	2969 U	17 U
Aroclor 1248	19 U	905 U	19 U	905 U	19 U	1118 U	19 U	2969 U	17 U
Aroclor 1254	150	7143	88	4667	120	7059	18 U	2969 U	17 U
Aroclor 1260	190	9048	66	3143	89	5824	19 U	2969 U	7.1 J
Aroclor 1268	160	7819	27	1288	63	3706			
Total PCB	500 T	23810 T	191 T	9095 T	282 T	16588 T	ND		7.1 JT

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analysis was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UJ: The analyte was not detected; the quantitation limit is an estimated value.

* TOC normalization of analytical data is not recommended because the total organic content of the sample falls outside the range of 0.5% to 4.0%.

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Outfall 11-12-13	TOCN	Outfall 11-12-13	TOCN	Outfall 14-15-16	TOCN	Outfall 14-15-16	TOCN
	LWOF012	LWOF012	LWOF012W	LWOF012W	LWOF014	LWOF014	LWOF014E	LWOF014E
Conventional Parameters (%)								
Total Solids	80.6		81.3		81.9		78.5	
Total Organic Carbon	0.84		0.77		0.66		0.66	
Grain Size (%)								
Gravel (<3 to >1 Phi)	58.22		67.75		33.12		48.67	
Sand (>1 to <4 Phi)	37.47		32.25		64.31		51.47	
Total Sand and Gravel	95.69		100.00		97.42		98.14	
Silt (>4 to <8 Phi)	4.11		0.73		2.35		1.64	
Clay (>8 to <10 Phi)	0.38		0.00		0.28		0.37	
Total Fines (Silt and Clay)	4.49		0.73		2.61		1.90	
Total Metals (mg/kg dry weight)								
Aluminum	14,900		17,200		13,500		13,800	
Antimony	0.25 J		0.06 UJ		0.29 J		0.11 J	
Arsenic	6		3 U		4		3 U	
Beryllium	0.23		0.21		0.20		0.23	
Cadmium	2.2		1.2		0.9		0.5	
Chromium	32.5		24.3		32.8		22.4	
Copper	41.7		15.7		25.6		15.2	
Iron	28,600		21,600		25,100		22,300	
Lead	45		9		104		9	
Mercury	0.07		0.04		0.04		0.03	
Nickel	28.2		23.8		25.3		20.5	
Selenium	3 U		3 U		3 U		3 U	
Silver	0.2 U		0.2 U		0.2 U		0.2 U	
Thallium	3 U		3 U		4		3 U	
Zinc	194		53.7		131		67.7	
LPAAH (µg/kg dry weight)								
Acenaphthene	690	82143	19 U	2468 U	44	7857	20 U	3571 U
Acenaphthylene	38	4524	19 U	2468 U	19 U	3393 U	20 U	3571 U
Anthracene	1,600	190476	19 U	2468 U	180	32143	210	37500
Fluorene	1,100	130852	19 U	2468 U	81	16250	38	6429
2-Methylnaphthalene	140	16687	19 U	2468 U	31	5536	20 U	3571 U
Naphthalene	420	50000	19 U	2468 U	20	3571	20 U	3571 U
Phenanthrene	8,600	1023810	19 U	2468 U	480	85714	61	10893
Total LPAAH	12,448 T	1481905 T	ND		815 T	145536 T	307 T	54821 T
HPAAH (µg/kg dry weight)								
Benzo(a)anthracene	2,900	345238	21	2727	170	30357	22	3929
Benzo(a)pyrene	2,900	345238	21	2727	160	28571	16 J	2857 J
Benzo(g,h,i)perylene	1200	142857	19 U	2468 U	94	16788	20 U	3571 U
Benzo(b)fluoranthene	2,500	297619	25	3247	180	32143	23	4107
Benzo(k)fluoranthene	910	108333	20	2587	120	21429	16 J	2857 J
Total Benzofluoranthene	3410 T	405952 T	45 T	5844 T	300 T	53571 T	39 T	6964 T
Chrysene	2,900	345238	23	2697	420	75000	38	6788
Dibenzo(a,h)anthracene	330	39286	19 U	2468 U	18 J	3214 J	20 U	3571 U
Fluoranthene	8,300	688095	36	4675	820	146429	64	11429
Indeno(1,2,3-cd)pyrene	1,400	166687	19 U	2468 U	100	17857	20 U	3571 U
Pyrene	7,300	889048	38	4935	340	60714	47	8393
Total HPAH	30,640 T	3847619 T	184 T	23896 T	2,422 JT	432500 JT	226 JT	40357 JT
Misc. BNAAs (µg/kg dry weight)								
Bis(2-ethylhexyl)phthalate	1,200	142857	39	5065	180	32143	57	10179
Carbazole	1,000	119048	19 U	2468 U	37	6607	66	11786
Di-n-butylphthalate	76	9048	19 U	2468 U	19 U	3393 U	20 U	3571 U
Dibenzofuran	610	72619	19 U	2468 U	47	8393	20 U	3571 U
Phenol	38 U		38 U		38 U		39 U	
PCBs (µg/kg dry weight)								
Aroclor 1016	19 U	2282 U	19 U	2468 U	17 U	3036 U	19 U	3393 U
Aroclor 1221	38 U	4524 U	38 U	4935 U	34 U	6071 U	39 U	6964 U
Aroclor 1232	19 U	2282 U	19 U	2468 U	17 U	3036 U	19 U	3393 U
Aroclor 1242	19 U	2282 U	19 U	2468 U	17 U	3036 U	26	4643
Aroclor 1248	19 U	2282 U	19 U	2468 U	17 U	3036 U	19 U	3393 U
Aroclor 1254	19 U	2282 U	19 U	2468 U	17 U	3036 U	19 U	3393 U
Aroclor 1260	39	4643	19 U	2468 U	54	9643	19 U	3393 U
Aroclor 1268								
Total PCB	39 T	4643 T	ND		54 T	9643 T	26 T	4643 T

Notes:
µg/kg: Microgram per kilogram
mg/kg: Milligram per kilogram detected above the quantitation limit.
Blank cell: Analysis was not reported by the analytical laboratory.
J: The analyte was identified and detected; the concentration is an estimated value.
ND: None of the summed constituents were detected above the quantitation limit.
T: Value was total of constituents.
U: The analyte was not detected at the given quantitation limit.
UJ: The analyte was not detected; the quantitation limit is an estimated value.
* TOC normalization of analytical data is not recommended because the total organic content of the sample falls outside the range of 0.5% to 4.0%.

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Outfall 14-15-16 LWOF016	TOCN LWOF016	Outfall 14-15-16 LWOF016W	TOCN LWOF016W	Current Flume LWCF	TOCN LWCF	Current Flume LWCF (dup.)	TOCN LWCF (dup.)
Conventional Parameters (%)								
Total Solids	74.2		73.5		58.1		52.7	
Total Organic Carbon	0.88		0.74		1.4		1.8	
Grain Size (%)								
Gravel (<3 to >1 Phi)	17.22		7.92		0.22		0.41	
Sand (>1 to <4 Phi)	75.50		83.17		43.98		28.39	
Total Sand and Gravel	92.72		91.08		44.20		28.80	
Silt (>4 to <8 Phi)	6.83		8.33		51.44		65.69	
Clay (>8 to <10 Phi)	0.75		0.59		4.36		5.21	
Total Fines (Silt and Clay)	7.58		8.92		55.80		71.20	
Total Metals (mg/kg dry weight)								
Aluminum	15,200		15,700		23,000		25,900	
Antimony	0.23 J		0.11 J		0.12 J		0.18 J	
Arsenic	3 U		4 U		4 U		6 U	
Beryllium	0.19		0.25		0.36		0.42	
Cadmium	12.0 J		0.7		0.4		0.5	
Chromium	135 J		24.7		37.2		40.6	
Copper	28.1		19.4		31.2		36.4	
Iron	21,300		22,000		30,100		33,300.0	
Lead	200 J		18		12		12	
Mercury	0.02		0.03		0.07		0.08	
Nickel	25.7		24.2		31.6		33.4	
Selenium	5		4 U		6		7	
Silver	0.2 U		0.2 U		0.2 U		0.3 U	
Thallium	5		4 U		4 U		7	
Zinc	98.1		73.0		81.7		85.2	
LP AH (µg/kg dry weight)								
Acenaphthene	120	13636	19 U	2568 U	19 U	1357 U	19 U	1056 U
Acenaphthylene	20	2273	19 U	2568 U	19 U	1357 U	19 U	1056 U
Anthracene	350	39773	47	8351	19 U	1357 U	19 U	1056 U
Fluorene	210	23864	33	4459	19 U	1357 U	19 U	1056 U
2-Methylnaphthalene	19 U	2159 U	19 U	2568 U	19 U	1357 U	19 U	1056 U
Naphthalene	25	2841	19 U	2568 U	19 U	1357 U	19 U	1056 U
Phenanthrene	1,600	181818	160	21622	23	1643	40	2222
Total LP AH	2,325 T	264205 T	240 T	32432 T	23 T	1643 T	40 T	2222 T
HP AH (µg/kg dry weight)								
Benzo(a)anthracene	1,200	136364	170	22973	20	1429	34	1889
Benzo(a)pyrene	1,400	159091	300	40541	22	1571	33	1833
Benzo(g,h,i)perylene	580	65909	200	27027	26	1857	27	1500
Benzo(b)fluoranthene	1,200	136364	280	35135	32	2286	36	2000
Benzo(k)fluoranthene	780	88836	210	28378	22	1571	39	2167
Total Benzofluoranthene	1880 T	225000 T	470 T	63514 T	54 T	3857 T	75 T	4187 T
Chrysene	1,200	136364	210	28378	37	2643	59	3278
Dibenzo(a,h)anthracene	140	15909	32	4324	19 U	1357 U	19 U	1056 U
Fluoranthene	3,300	375000	400	54054	58	4143	87	4833
Indeno(1,2,3-cd)pyrene	770	87500	210	28378	20	1429	28	1556
Pyrene	2,600	295455	320	43243	42	3000	61	3389
Total HPAH	13,170 T	1496591 T	2,312 T	312432 T	278 T	19929 T	404 T	22444 T
Misc. BNAs (µg/kg dry weight)								
Bis(2-ethylhexyl)phthalate	720	81818	390	52703	270	19298	450	25000
Carbazole	190	21591	19 U	2568 U	19 U	1357 U	19 U	1056 U
Di-n-butylphthalate	150	17045	120	16216	19 U	1357 U	19 U	1056 U
Dibenzofuran	89	10114	19 U	2568 U	19 U	1357 U	19 U	1056 U
Phenol	150		37 U		39 U		38 U	
PCBs (µg/kg dry weight)								
Aroclor 1016	18 U	2045 U	19 U	2568 U	20 U	1429 U	19 U	1056 U
Aroclor 1221	35 U	3977 U	37 U	5000 U	39 U	2786 U	38 U	2111 U
Aroclor 1232	18 U	2045 U	19 U	2568 U	20 U	1429 U	19 U	1056 U
Aroclor 1242	18 U	2045 U	19 U	2568 U	20 U	1429 U	19 U	1056 U
Aroclor 1248	18 U	2045 U	19 U	2568 U	20 U	1429 U	19 U	1056 U
Aroclor 1254	18 U	2045 U	27 U	3648 U	33	2357	45	2500
Aroclor 1260	22	2500	21	2838	27	1929	38	2111
Aroclor 1268								
Total PCB	22 T	2500 T	21 T	2838 T	60 T	4286 T	83 T	4611 T

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analysis was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UU: The analyte was not detected; the quantitation limit is an estimated value.

* TOC normalization of analytical data is not recommended because the total organic content of the sample falls outside the range of 0.5% to 4.0%.

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Former Flume LWFF	TOCN LWFF	Shoreline 1* LWOS001	Shoreline 2* LWOS002	Shoreline 3 LWOS003	TOCN LWOS003	Shoreline 5 LWOS005	TOCN LWOS005	Shoreline 6 LWOS006	TOCN LWOS006
Conventional Parameters (%)										
Total Solids	55.4		59.8	81.0	37.5		52.5		38.4	
Total Organic Carbon	2.1		0.26	0.26	4.9		2.6		2.6	
Grain Size (%)										
Gravel (-3 to -1 Phi)	0.94		0.63	4.94	2.33		0.04		0.07	
Sand (-1 to 4 Phi)	75.76		98.83	92.61	52.85		24.19		28.11	
Total Sand and Gravel	76.70		99.46	97.55	55.18		24.24		28.18	
SR (4 to 8 Phi)	20.89		0.49	2.27	42.68		68.10		68.16	
Clay (8 to <10 Phi)	2.41		0.05	0.18	2.16		7.66		5.66	
Total Fines (Silt and Clay)	23.30		0.54	2.45	44.82		75.76		73.82	
Total Metals (mg/kg dry weight)										
Aluminum	17,200		14300	14500	18500		26700		25500	
Antimony	0.19 J		0.09 J	0.06 UJ	0.7 J		0.2 J		0.2 J	
Arsenic	5 U		3 U	5	8 U		6 U		6 U	
Beryllium	0.26		0.22	0.25	0.3		0.5		0.4	
Cadmium	0.3		0.2	0.2	2		0.5		0.4	
Chromium	28.3		25.9	24.1	39.9		39.4		39.8	
Copper	20.1		18.9	18.7	43.7		43.7		43.2	
Iron	24,400		20100	21000	28700		31100		30800	
Lead	11		7	11	51		17		14	
Mercury	0.04		0.02	0.02	0.11		0.07		0.16	
Nickel	24.8		24.6	22.4	29		35		34	
Selenium	5 U		4	6	8 U		10		6	
Silver	0.3 U		0.2 U	0.2 U	0.5 U		0.3 U		0.4 U	
Thallium	5 U		3 U	3 U	8 U		6 U		6 U	
Zinc	72.2		64.4	70.8	203		90.3		88.9	
LPAH (µg/kg dry weight)										
Acenaphthene	19 U	905 U	19 U	19 U	39 U	796 U	20 U	769 U	19 U	731 U
Acenaphthylene	19 U	905 U	19 U	19 U	39 U	796 U	20 U	769 U	19 U	731 U
Anthracene	19 U	905 U	19 U	19 U	420	8571	20 U	789 U	19 U	731 U
Fluorene	19 U	905 U	19 U	19 U	78	1592	20 U	769 U	19 U	731 U
2-Methylnaphthalene	19 U	905 U	19 U	19 U	39 U	796 U	20 U	769 U	19 U	731 U
Naphthalene	19 U	905 U	19 U	19 U	39 U	796 U	45	1731	19 U	731 U
Phenanthrene	45	2143	19 U	19 U	630	12857	58	2231	36	1385
Total LPAH	45 T	2143 T	ND	ND	1128 T	23020 T	103 T	3962 T	36 T	1385 T
HPAH (µg/kg dry weight)										
Benzo(a)anthracene	45	2143	19 U	19 U	1100	22449	58	2231	34	1308
Benzo(a)pyrene	45	2143	19 U	19 U	1200	24490	59	2269	49	1885
Benzo(g,h,i)perylene	34	1619	19 U	19 U	580	11837	50	1923	47	1808
Benzo(b)fluoranthene	90	4288	19 U	19 U	1500	30612	78	2923	60	2308
Benzo(k)fluoranthene	44	2095	19 U	19 U	1200	24490	59	2269	54	2077
Total Benzofluoranthene	134 T	6381 T	ND	ND	2700 T	55102 T	135 T	5189 T	114 T	4385 T
Chrysene	84	4000	19 U	19 U	1900	38776	89	3423	59	2269
Dibenzo(a,h)anthracene	19 U	905 U	19 U	19 U	320	6531	20 U	769 U	20	769
Fluoranthene	130	6190	19 U	19 U	1600	32853	120	4615	73	2808
Indeno(1,2,3-cd)pyrene	28	1333	19 U	19 U	620	12853	41	1577	42	1615
Pyrene	93	4429	19 U	19 U	2000	40816	150	5789	82	3154
Total HPAH	593 T	28238 T	ND	ND	12020 T	245306 T	702 T	27000 T	520 T	20000 T
Misc. BNAs (µg/kg dry weight)										
Bis(2-ethylhexyl)phthalate	310	14782	140	94	3400	69388	230	8846	210	8077
Carbazole	19 U	905 U	19 U	19 U	61	1857	20 U	769 U	19 U	731 U
Di-n-butylphthalate	25 U	1190 U	19 U	19 U	280	5714	20 U	769 U	19 U	731 U
Dibenzofuran	19 U	905 U	19 U	19 U	39 U	796 U	20 U	769 U	19 U	731 U
Phenol	39 U		19 U	19 U	53		33		19 U	
PCBs (µg/kg dry weight)										
Aroclor 1016	18 U	857 U	18 U	18 U	19 U	388 U	20 U	769 U	19 U	731 U
Aroclor 1221	36 U	1714 U	36 U	35 U	37 U	755 U	40 U	1538 U	38 U	1462 U
Aroclor 1232	18 U	857 U	18 U	18 U	19 U	388 U	20 U	769 U	19 U	731 U
Aroclor 1242	18 U	857 U	18 U	18 U	19 U	388 U	20 U	769 U	19 U	731 U
Aroclor 1248	18 U	857 U	18 U	18 U	19 U	388 U	20 U	769 U	19 U	731 U
Aroclor 1254	35	1667	10 J	13 J	270	5510	62	2385	290	11154
Aroclor 1260	28	1333	18 U	10 J	490	10000	49	1885	66	2538
Aroclor 1268										
Total PCB	63 T	3000 T	10 JT	23 JT	760 T	15510 T	111 T	4268 T	356 T	13892 T

Notes:
 µg/kg: Microgram per kilogram
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 ND: None of the summed constituents were detected above the quantitation limit.
 T: Value was total of constituents.
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 * TOC normalization of analytical data is not recommended because the total organic content of the sample falls outside the range of 0.5% to 4.0%.

Table 3-2—Boeing Renton Nearshore Sediment Sampling Results, August 1999

	Current Flume LWCFE-200	TOCN LWCFE-200	Current Flume LWCFN-200	TOCN LWCFN-200	Current Flume LWCFNE-200	TOCN LWCFNE-200
Conventional Parameters (%)						
Total Solids	37.3		49.8		41.2	
Total Organic Carbon	2.3		2.6		2	
Grain Size (%)						
Gravel (-3 to -1 Phi)	0.00		0.04		0.01	
Sand (-1 to 4 Phi)	18.44		18.53		10.35	
Total Sand and Gravel	18.44		18.57		10.36	
Silt (4 to 8 Phi)	76.10		73.92		82.86	
Clay (8 to <10 Phi)	5.46		7.51		6.78	
Total Fines (Silt and Clay)	81.56		81.43		89.64	
Total Metals (mg/kg dry weight)						
Aluminum	26800		26800		28500	
Antimony	0.1 J		0.1 UJ		0.2 J	
Arsenic	6 U		6		6 U	
Beryllium	0.4		0.5		0.5	
Cadmium	0.4		0.4		0.3	
Chromium	41.5		39.3		43.5	
Copper	45.7		41.4		43.4	
Iron	33400		32500		34500	
Lead	19		14		16	
Mercury	0.08		0.07		0.08	
Nickel	37		36		39	
Selenium	6 U		6		8	
Silver	0.4 U		0.4 U		0.3 U	
Thallium	6 U		6 U		6 U	
Zinc	95.7		82.6		85.5	
LPAH (µg/kg dry weight)						
Acenaphthene	20 U	870 U	19 U	731 U	19 U	950 U
Acenaphthylene	20 U	870 U	19 U	731 U	19 U	950 U
Anthracene	20 U	870 U	19 U	731 U	19 U	950 U
Fluorene	20 U	870 U	19 U	731 U	19 U	950 U
2-Methylnaphthalene	20 U	870 U	19 U	731 U	19 U	950 U
Naphthalene	20 U	870 U	19 U	731 U	19 U	950 U
Phenanthrene	37	1609	40	1538	26	1300
Total LPAH	37 T	1609 T	40 T	1538 T	26 T	1300 T
HPAH (µg/kg dry weight)						
Benzo(a)anthracene	40	1739	37	1423	23	1150
Benzo(a)pyrene	60	2609	61	2346	37	1850
Benzo(b)fluoranthene	70	3043	70	2692	48	2400
Benzo(g,h,i)perylene	62	2686	54	2077	39	1950
Benzo(k)fluoranthene	87	3783	69	2654	47	2350
Total Benzofluoranthene	157 T	6826 T	139 T	5346 T	95 T	4750 T
Chrysene	89	3870	71	2731	49	2450
Dibenz(a,h)anthracene	28	1217	24	923	19 U	950 U
Fluoranthene	110	4783	88	3385	60	3000
Indeno(1,2,3-cd)pyrene	60	2609	55	2115	37	1850
Pyrene	93	4043	86	3308	60	3000
Total HPAH	699 T	30391 T	615 T	23654 T	400 T	20000 T
Misc. BNAs (µg/kg dry weight)						
bis(2-Ethylhexyl)phthalate	220	9565	160	6154	91	4550
Carbazole	20 U	870 U	19 U	731 U	19 U	950 U
Di-n-butylphthalate	34	1478	19 U	731 U	19 U	950 U
Dibenzofuran	20 U	870 U	19 U	731 U	19 U	950 U
Phenol	20 U		43		19 U	
PCBs (µg/kg dry weight)						
Aroclor 1016	19 U	826 U	19 U	731 U	19 U	950 U
Aroclor 1221	38 U	1652 U	37 U	1423 U	37 U	1850 U
Aroclor 1232	19 U	826 U	19 U	731 U	19 U	950 U
Aroclor 1242	19 U	826 U	19 U	731 U	19 U	950 U
Aroclor 1248	19 U	826 U	19 U	731 U	19 U	950 U
Aroclor 1254	19	826	13 J	500 J	16 J	800 J
Aroclor 1260	26	1130	15 J	577 J	22	1100
Total PCB	45 T	1957 T	28 JT	1077 JT	38 JT	1900 JT

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

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J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

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Table 3-2—Boeing Renton Nearshore Sediment Sampling Results, August 1999

	Nearshore 4 LWOS004-275	TOCN LWOS004-275	Nearshore 6 LWOS006-100	TOCN LWOS006-100	Nearshore 6 LWOS006-200	TOCN LWOS006-200
Conventional Parameters (%)						
Total Solids	51.0		53.7		53.2	
Total Organic Carbon	2.6		3.3		2.8	
Grain Size (%)						
Gravel (-3 to -1 Phi)	0.27		3.98		0.13	
Sand (-1 to 4 Phi)	27.10		16.14		18.50	
Total Sand and Gravel	27.36		20.11		18.63	
Silt (4 to 6 Phi)	67.75		73.50		74.58	
Clay (6 to <10 Phi)	4.88		6.38		6.80	
Total Fines (Silt and Clay)	72.64		79.89		81.37	
Total Metals (mg/kg dry weight)						
Aluminum	24200		26700		25200	
Antimony	0.2 J		0.3 J		0.1 UJ	
Arsenic	6 U		5 U		7 U	
Beryllium	0.4		0.5		0.4	
Cadmium	0.4		0.5		0.3	
Chromium	35.6		39.4		37.3	
Copper	39.2		43.3		42.1	
Iron	29500		33200		30200	
Lead	15		16		14	
Mercury	0.06		0.08		0.08	
Nickel	31		36		32	
Selenium	7		9		10	
Silver	0.4 U		0.3 U		0.4 U	
Thallium	6 U		5 U		7 U	
Zinc	82.8		90		82.6	
LPAH (µg/kg dry weight)						
Acenaphthene	20 U	769 U	19 U	576 U	20 U	714 U
Acenaphthylene	20 U	769 U	19 U	576 U	20 U	714 U
Anthracene	20 U	769 U	19 U	576 U	20 U	714 U
Fluorene	20 U	769 U	19 U	576 U	20 U	714 U
2-Methylnaphthalene	20 U	769 U	19 U	576 U	20 U	714 U
Naphthalene	20 U	769 U	19 U	576 U	20 U	714 U
Phenanthrene	38	1462	46	1394	42	1500
Total LPAH	38 T	1462 T	46 T	1394 T	42 T	1500 T
HPAH (µg/kg dry weight)						
Benzo(a)anthracene	40	1538	58	1758	44	1571
Benzo(a)pyrene	68	2615	86	2606	67	2393
Benzo(b)fluoranthene	76	2923	110	3333	84	3000
Benzo(g,h,i)perylene	60	2308	71	2152	61	2179
Benzo(k)fluoranthene	79	3038	85	2576	68	2429
Total Benzo(a)fluoranthene	155 T	5962 T	195 T	5909 T	152 T	5429 T
Chrysene	72	2769	110	3333	74	2643
Dibenz(a,h)anthracene	20 U	769 U	38	1152	20 U	714 U
Fluoranthene	87	3346	100	3030	95	3393
Indeno(1,2,3-cd)pyrene	59	2269	70	2121	55	1964
Pyrene	86	3308	120	3636	100	3571
Total HPAH	627 T	24115 T	848 T	25697 T	648 T	23143 T
Misc. BNAs (µg/kg dry weight)						
bis(2-Ethylhexyl)phthalate	260	10000	330	10000	210	7500
Carbazole	20 U	769 U	19 U	576 U	20 U	714 U
Di-n-butylphthalate	20 U	769 U	19 U	576 U	20 U	714 U
Dibenzofuran	20 U	769 U	19 U	576 U	20 U	714 U
Phenol	22		45		36	
PCBs (µg/kg dry weight)						
Aroclor 1016	20 U	769 U	18 U	545 U	20 U	714 U
Aroclor 1221	40 U	1538 U	37 U	1121 U	40 U	1429 U
Aroclor 1232	20 U	769 U	18 U	545 U	20 U	714 U
Aroclor 1242	20 U	769 U	18 U	545 U	20 U	714 U
Aroclor 1248	20 U	769 U	18 U	545 U	20 U	714 U
Aroclor 1254	22	846	24	727	19 J	679 J
Aroclor 1260	19 J	731 J	26	788	18 J	643 J
Total PCB	41 JT	1577 JT	50 T	1515 T	37 JT	1321 JT

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

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* TOC normalization of analytical data is not recommended because the total organic content of the sample falls outside the range of 0.5% to 4.0%.

Table 3-2—Boeing Renton Nearshore Sediment Sampling Results, August 1999

	Nearshore 10 LWOS010-100	TOCN LWOS010-100	Nearshore 10 LWOS010-200	TOCN LWOS010-200	Nearshore 011012 LWOS011012-100	TOCN LWOS011012-100	Nearshore 011012* LWOS011012-200
Conventional Parameters (%)							
Total Solids	59.9		48.6		53.2		79.7
Total Organic Carbon	1.6		2.8		1.9		0.23
Grain Size (%)							
Gravel (-3 to -1 Phi)	0.01		0.06		0.07		3.50
Sand (-1 to 4 Phi)	35.18		15.69		18.62		91.30
Total Sand and Gravel	35.19		15.74		18.68		94.80
Silt (4 to 8 Phi)	60.24		78.28		74.61		4.86
Clay (9 to <10 Phi)	4.56		5.98		6.71		0.34
Total Fines (Silt and Clay)	64.81		84.26		81.32		5.20
Total Metals (mg/kg dry weight)							
Aluminum	21600		27000		27300		15900
Antimony	0.12 J		0.2 J		0.2 J		0.07 J
Arsenic	4		6		6 U		3 U
Beryllium	0.36		0.4		0.5		0.23
Cadmium	0.3		0.4		0.5		0.1
Chromium	33		38.9		41.4		21.7
Copper	31.2		44		40.9		19.3
Iron	29100		32300		32800		21400
Lead	9		15		15		3
Mercury	0.06		0.08		0.06		0.02
Nickel	29.1		34		37		21
Selenium	5		8		9		4
Silver	0.2 U		0.3 U		0.4 U		0.2 U
Thallium	4 U		5 U		6 U		3 U
Zinc	62.1		86		82		43.5
LPAH (µg/kg dry weight)							
Acenaphthene	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
Acenaphthylene	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
Anthracene	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
Fluorene	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
2-Methylnaphthalene	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
Naphthalene	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
phenanthrene	24	1500	50	1786	28	1474	19 U
Total LPAH	24 T	1500 T	50 T	1786 T	28 T	1474 T	ND
PAH (µg/kg dry weight)							
benzo(a)anthracene	21	1313	48	1714	28	1474	19 U
benzo(a)pyrene	33	2063	78	2786	41	2158	19 U
Benzo(b)fluoranthene	39	2438	110	3929	54	2842	19 U
Benzo(g,h,i)perylene	30	1875	79	2821	48	2526	19 U
Benzo(k)fluoranthene	38	2375	81	2893	39	2053	19 U
Total Benzo(a)fluoranthene	77 T	4813 T	191 T	6821 T	93 T	4895 T	ND
Chrysene	41	2563	87	3107	46	2421	19 U
Dibenz(a,h)anthracene	20 U	1250 U	35	1250	20 U	1053 U	19 U
Fluoranthene	50	3125	110	3929	70	3684	19 U
Indeno(1,2,3-cd)pyrene	29	1813	72	2571	37	1947	19 U
Pyrene	48	3000	100	3571	64	3368	19 U
Total HPAH	329 T	20563 T	800 T	28571 T	427 T	22474 T	ND
Misc. BNAs (µg/kg dry weight)							
bis(2-Ethylhexyl)phthalate	170	10625	250	8929	140	7368	19 U
Carbazole	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
Di-n-butylphthalate	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
Dibenzofuran	20 U	1250 U	19 U	679 U	20 U	1053 U	19 U
Phenol	20		54		20 U		19 U
PCBs (µg/kg dry weight)							
Aroclor 1016	20 U	1250 U	19 U	679 U	20 U	1053 U	18 U
Aroclor 1221	40 U	2500 U	39 U	1393 U	40 U	2105 U	35 U
Aroclor 1232	20 U	1250 U	19 U	679 U	20 U	1053 U	18 U
Aroclor 1242	20 U	1250 U	19 U	679 U	20 U	1053 U	18 U
Aroclor 1248	20 U	1250 U	19 U	679 U	20 U	1053 U	18 U
Aroclor 1254	14 J	875 J	18 J	643 J	36	1895	18 U
Aroclor 1260	13 J	813 J	20	714	34	1789	18 U
Total PCB	27 JT	1688 JT	38 JT	1357 JT	70 T	3684 T	ND

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analysis was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UJ: The analyte was not detected; the quantitation limit is an estimated value.

* TOC normalization of analytical data is not recommended because the total organic content of the sample falls outside the range of 0.5% to 4.0%.

Table 3-2—Boeing Renton Nearshore Sediment Sampling Results, August 1999

	Nearshore 015016 LWOS015016-100	TOCN LWOS015016-100	Nearshore 015016 LWOS015016-200	TOCN LWOS015016-200	Nearshore 015016 LWOS015016W-200	TOCN LWOS015016W-200
Conventional Parameters (%)						
Total Solids	56.4		52.4		53.0	
Total Organic Carbon	2		2.2		1.7	
Grain Size (%)						
Gravel (-3 to -1 Phi)	0.00		0.01		0.37	
Sand (-1 to 4 Phi)	32.08		17.91		68.31	
Total Sand and Gravel	32.08		17.92		68.69	
Silt (4 to 8 Phi)	63.66		69.48		29.54	
Clay (9 to <10 Phi)	4.26		12.59		1.78	
Total Fines (Silt and Clay)	67.92		82.08		31.31	
Total Metals (mg/kg dry weight)						
Aluminum	24900		28300		21500	
Antimony	0.2 J		0.2 J		0.12 J	
Arsenic	6 U		6 U		5 U	
Beryllium	0.4		0.5		0.35	
Cadmium	0.6		0.3		0.3	
Chromium	37.5		41.6		31.8	
Copper	39.4		42.9		31.8	
Iron	30400		31800		26200	
Lead	15		12		11	
Mercury	0.06		0.08		0.04	
Nickel	34		36		29.3	
Selenium	6 U		8		5 U	
Silver	0.3 U		0.3 U		0.3 U	
Thallium	6 U		6 U		5 U	
Zinc	135		81.1		67.4	
LPAH (µg/kg dry weight)						
Acenaphthene	20 U	1000 U	20 U	909 U	19 U	1118 U
Acenaphthylene	20 U	1000 U	20 U	909 U	19 U	1118 U
Anthracene	20 U	1000 U	20 U	909 U	32	1882
Fluorene	20 U	1000 U	20 U	909 U	19 U	1118 U
2-Methylnaphthalene	20 U	1000 U	20 U	909 U	19 U	1118 U
Naphthalene	20 U	1000 U	20 U	909 U	19 U	1118 U
Phenanthrene	54	2700	30	1364	56	3294
Total LPAH	54 T	2700 T	30 T	1364 T	88 T	5176 T
HPAH (µg/kg dry weight)						
Benzo(a)anthracene	53	2650	26	1182	100	5882
Benzo(a)pyrene	67	3350	38	1727	140	8235
Benzo(b)fluoranthene	62	3100	39	1773	110	6471
Benzo(g,h,i)perylene	53	2650	35	1591	92	5412
Benzo(k)fluoranthene	74	3700	53	2409	180	10588
Total Benzofluoranthene	136 T	6800 T	92 T	4182 T	290 T	17059 T
Chrysene	81	4050	52	2364	200	11765
Dibenz(a,h)anthracene	20 U	1000 U	20 U	909 U	42	2471
Fluoranthene	100	5000	57	2591	120	7059
Indeno(1,2,3-cd)pyrene	49	2450	33	1500	89	5235
Pyrene	110	5500	65	2955	140	8235
Total HPAH	649 T	32450 T	398 T	18091 T	1213 T	71353 T
Misc. BNAs (µg/kg dry weight)						
bis(2-Ethylhexyl)phthalate	180	9000	140	6364	130	7647
Carbazole	20 U	1000 U	20 U	909 U	19 U	1118 U
Di-n-butylphthalate	20 U	1000 U	20 U	909 U	19 U	1118 U
Dibenzofuran	20 U	1000 U	20 U	909 U	19 U	1118 U
Phenol	25		33		25	
PCBs (µg/kg dry weight)						
Aroclor 1016	20 U	1000 U	19 U	864 U	19 U	1118 U
Aroclor 1221	40 U	2000 U	37 U	1682 U	38 U	2235 U
Aroclor 1232	20 U	1000 U	19 U	864 U	19 U	1118 U
Aroclor 1242	20 U	1000 U	19 U	864 U	19 U	1118 U
Aroclor 1248	20 U	1000 U	19 U	864 U	19 U	1118 U
Aroclor 1254	16 J	800 J	10 J	455 J	12 J	706 J
Aroclor 1260	16 J	800 J	10 J	455 J	13 J	765 J
Total PCB	32 JT	1600 JT	20 JT	909 JT	25 JT	1471 JT

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analysis was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

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Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Outfall 3 LWOF003	Outfall 3 LWOF003E	Outfall 3 LWOF003W	Outfall 4 LWOF004	Outfall 4 LWOF004E	Outfall 4 LWOF004W	Outfall 10 LWOF010
Conventional Parameters (%)							
Total Solids	82.0	79.7	84.0	81.4	81.4	79.9	41.6
Total Organic Carbon	0.26	0.18	0.091	0.36	0.60	0.50	2.1
Grain Size (%)							
Gravel (-3 to -1 Phi)	5.44	0.40	6.99	13.34	26.23	14.46	0.00
Sand (-1 to 4 Phi)	94.56	99.52	90.76	84.76	73.72	83.26	28.13
Total Sand and Gravel	100.00	99.92	97.75	98.11	99.95	97.72	28.13
Silt (4 to 8 Phi)	0.00	0.08	2.18	0.00	0.05	2.12	66.50
Clay (9 to <10 Phi)	0.00	0.00	0.15	0.00	0.00	0.16	5.36
Total Fines (Silt and Clay)	0.00	0.08	2.33	0.00	0.05	2.28	71.87
Total Metals (mg/kg dry weight)							
Aluminum	13,700	14,700	13,000	14,000	14,100	13,800	26,300
Antimony	0.06 UJ	0.06 UJ	0.06 UJ	0.10 J	0.08 J	0.06 UJ	0.3 J
Arsenic	5	4	4	3 U	4	3 U	8
Beryllium	0.21	0.23	0.20	0.21	0.19	0.21	0.4
Cadmium	0.1	0.1	0.1	0.4	0.4	0.3	2.0
Chromium	25.6	21.5	23.0	18.7	20.1	17.5	50.3
Copper	17.0	17.1	15.0	14.8	17.0	14.0	53.5
Iron	21,900	21,200	20,200	25,200	27,300	24,000	30,600
Lead	5	5	5	9	10	7	70
Mercury	0.02	0.02	0.01	0.02	0.09	0.02	0.15
Nickel	25.6	23.7	24.1	19.3	20.4	18.6	41
Selenium	3	4	3 U	3 U	3	3 U	6 U
Silver	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.4 U
Thallium	6	8	4	3	3	3 U	6 U
Zinc	67.9	77.9	59.9	77.7	77.0	71.0	539
LPAH (µg/kg dry weight)							
Acenaphthene	19 U	19 U	19 U	19 U	16 J	19 U	19 U
Acenaphthylene	19 U	19 U	19 U	19 U	20 U	19 U	19 U
Anthracene	19 U	19 U	19 U	19 U	20 U	19 U	19 U
Fluorene	19 U	19 U	19 U	19 U	20 U	19 U	19 U
2-Methylnaphthalene	19 U	19 U	19 U	19 U	20 U	19 U	19 U
Naphthalene	19 U	19 U	19 U	19 U	20 U	19 U	19 U
Phenanthrene	19 U	19 U	19 U	53	23	26	130
Total LPAH	ND	ND	ND	53 T	39 T	26 T	130 T
HPAH (µg/kg dry weight)							
Benzo(a)anthracene	19 U	19 U	19 U	26	20 U	19 U	74
Benzo(a)pyrene	19 U	19 U	19 U	22	20 U	19 U	98
Benzo(g,h,i)perylene	19 U	19 U	19 U	19 U	20 U	19 U	140
Benzo(b)fluoranthene	19 U	19 U	19 U	23	20 U	19 U	140
Benzo(k)fluoranthene	19 U	19 U	19 U	20	20 U	19 U	130
Total Benzofluoranthene	ND	ND	ND	43 T	ND	ND	270 T
Chrysene	19 U	19 U	19 U	34	24	19 U	180
Dibenzo(a,h)anthracene	19 U	19 U	19 U	19 U	20 U	19 U	19 U
Fluoranthene	19 U	19 U	19 U	75	42	33	410
Indeno(1,2,3-cd)pyrene	19 U	19 U	19 U	19 U	20 U	19 U	90
Pyrene	19 U	19 U	19 U	70	30	31	150
Total HPAH	ND	ND	ND	270 T	96 T	64 T	1,412 T
Misc. BNAs (µg/kg dry weight)							
Bis(2-ethylhexyl)phthalate	19 U	22	19 U	190	4,200	130	1,300
Carbazole	19 U	19 U	19 U	19 U	20 U	19 U	18 J
Di-n-butylphthalate	19 U	19 U	19 U	19 U	54	19 U	110
Dibenzofuran	19 U	19 U	19 U	19 U	20 U	19 U	19 U
Phenol	37 U	39 U	38 U	39 U	39 U	39 U	39 U
PCBs (µg/kg dry weight)							
Aroclor 1016	17 U	18 U	18 U	18 U	18 U	18 U	19 U
Aroclor 1221	35 U	36 U	35 U	36 U	36 U	36 U	37 U
Aroclor 1232	17 U	18 U	18 U	18 U	18 U	18 U	19 U
Aroclor 1242	17 U	18 U	18 U	18 U	18 U	18 U	19 U
Aroclor 1248	17 U	18 U	18 U	18 U	18 U	18 U	19 U
Aroclor 1254	17 U	18 U	18 U	50 U	18 U	18 U	150
Aroclor 1260	17 U	18 U	18 U	72	75	30	190
Aroclor 1268	17 U		18 U				160
Total PCB	ND	ND	ND	72 T	75 T	30 T	500 T

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

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ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UJ: The analyte was not detected; the quantitation limit is an estimated value.

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Outfall 10 LWOF010E	Outfall 10 LWOF010W	Outfall 11-12-13 LWOF011	Outfall 11-12-13 LWOF011E	Outfall 11-12-13 LWOF012	Outfall 11-12-13 LWOF012W	Outfall 14-15-16 LWOF014
Conventional Parameters (%)							
Total Solids	40.0	40.9	84.4	83.5	80.6	81.3	81.9
Total Organic Carbon	2.1	1.7	0.64	0.39	0.84	0.77	0.56
Grain Size (%)							
Gravel (-3 to -1 Phi)	1.82	0.02	54.14	45.96	58.22	67.75	33.12
Sand (-1 to 4 Phi)	30.62	17.72	45.00	50.69	37.47	32.25	64.31
Total Sand and Gravel	32.45	17.74	99.13	96.65	95.69	100.00	97.42
Silt (4 to 8 Phi)	62.07	75.41	0.00	2.89	4.11	0.73	2.35
Clay (9 to <10 Phi)	5.48	6.85	0.00	0.47	0.38	0.00	0.26
Total Fines (Silt and Clay)	67.55	82.26	0.00	3.35	4.49	0.73	2.61
Total Metals (mg/kg dry weight)							
Aluminum	27,300	27,000	14,900	14,900	14,900	17,200	13,500
Antimony	0.2 J	0.2 J	0.15 J	0.06 UJ	0.25 J	0.06 UJ	0.26 J
Arsenic	10	7	3 U	3 U	6	3 U	4
Beryllium	0.5	0.4	0.23	0.23	0.23	0.21	0.20
Cadmium	0.5	1.0	0.5	0.5	2.2	1.2	0.9
Chromium	43.2	45.6	24.2	25.6	32.5	24.3	32.8
Copper	42.3	47.2	16.0	16.3	41.7	15.7	25.6
Iron	29,900	32,500	20,300	26,400	26,600	21,900	25,100
Lead	21	32	7	7	45	9	104
Mercury	0.09	0.10	0.02	0.02	0.07	0.04	0.04
Nickel	38	41	26.4	25.7	28.2	23.8	25.3
Selenium	7 U	6 U	3	3 U	3 U	3 U	3 U
Silver	0.4 U	0.4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Thallium	7 U	6 U	3 U	3 U	3 U	3 U	4
Zinc	132	229	51.3	48.9	194	53.7	131
LPAH (µg/kg dry weight)							
Acenaphthene	19 U	20 U	19 U	18 U	690	19 U	44
Acenaphthylene	19 U	20 U	19 U	18 U	38	19 U	19 U
Anthracene	19 U	20 U	19 U	18 U	1,600	19 U	180
Fluorene	19 U	20 U	19 U	18 U	1,100	19 U	91
2-Methylnaphthalene	19 U	20 U	19 U	18 U	140	19 U	31
Naphthalene	19 U	20 U	19 U	18 U	420	19 U	20
Phenanthrene	44	58	21	50	8,600	19 U	480
Total LPAH	44 T	58 T	21 T	50 T	12,448 T	ND	815 T
HPAH (µg/kg dry weight)							
Benzo(a)anthracene	29	42	36	40	2,900	21	170
Benzo(a)pyrene	32 J	47	44	48	2,900	21	160
Benzo(g,h,i)perylene	28 J	44	31	34	1200	19 U	94
Benzo(b)fluoranthene	59	95	46	52	2,500	25	180
Benzo(k)fluoranthene	47 J	74	34	39	910	20	120
Total Benzofluoranthene	106 T	169 T	80 T	91 T	3410 T	45 T	300 T
Chrysene	53	88	42	46	2,900	23	420
Dibenzo(a,h)anthracene	19 U	20 U	19 U	18 U	330	19 U	18 J
Fluoranthene	100	150	69	89	8,300	36	820
Indeno(1,2,3-cd)pyrene	24 J	37	40	44	1,400	19 U	100
Pyrene	54	82	66	84	7,300	38	340
Total HPAH	426 JT	659 T	408 T	476 T	30,640 T	184 T	2,422 JT
Misc. BNAs (µg/kg dry weight)							
Bis(2-ethylhexyl)phthalate	270	610	360	57	1,200	39	180
Carbazole	19 U	20 U	19 U	18 U	1,000	19 U	37
Di-n-butylphthalate	46	48	19 U	18 U	76	19 U	19 U
Dibenzofuran	19 U	20 U	19 U	18 U	610	19 U	47
Phenol	39 U	39 U	37 U	37 U	38 U	38 U	38 U
PCBs (µg/kg dry weight)							
Aroclor 1016	19 U	19 U	19 U	17 U	19 U	19 U	17 U
Aroclor 1221	37 U	38 U	37 U	34 U	38 U	38 U	34 U
Aroclor 1232	19 U	19 U	19 U	17 U	19 U	19 U	17 U
Aroclor 1242	19 U	19 U	19 U	17 U	19 U	19 U	17 U
Aroclor 1248	19 U	19 U	19 U	17 U	19 U	19 U	17 U
Aroclor 1254	98	120	19 U	17 U	19 U	19 U	17 U
Aroclor 1260	66	99	19 U	7.1 J	39	19 U	54
Aroclor 1268	27	63					
Total PCB	191 T	282 T	ND	7.1 JT	39 T	ND	54 T

Notes:

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mg/kg: Milligram per kilogram detected above the quantitation limit.

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ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UJ: The analyte was not detected; the quantitation limit is an estimated value.

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Outfall 14-15-16 LWOF014E	Outfall 14-15-16 LWOF016	Outfall 14-15-16 LWOF016W	Current Flume LWCF	Current Flume LWCF (dup.)	Former Flume LWFF	Shoreline 1 LWOS001
Conventional Parameters (%)							
Total Solids	78.5	74.2	73.5	58.1	52.7	55.4	99.8
Total Organic Carbon	0.56	0.88	0.74	1.4	1.8	2.1	0.26
Grain Size (%)							
Gravel (-3 to -1 Phi)	46.67	17.22	7.92	0.22	0.41	0.94	0.63
Sand (-1 to 4 Phi)	51.47	75.50	83.17	43.98	28.39	75.76	98.83
Total Sand and Gravel	98.14	92.72	91.08	44.20	28.80	76.70	99.46
Silt (4 to 8 Phi)	1.54	6.83	8.33	51.44	65.99	20.89	0.49
Clay (9 to <10 Phi)	0.37	0.75	0.59	4.36	5.21	2.41	0.05
Total Fines (Silt and Clay)	1.90	7.58	8.92	55.80	71.20	23.30	0.54
Total Metals (mg/kg dry weight)							
Aluminum	13,800	15,200	15,700	23,000	25,900	17,200	14,300
Antimony	0.11 J	0.23 J	0.11 J	0.12 J	0.18 J	0.19 J	0.09 J
Arsenic	3 U	3 U	4 U	4 U	5 U	5 U	3 U
Beryllium	0.23	0.19	0.25	0.36	0.42	0.26	0.22
Cadmium	0.5	12.0 J	0.7	0.4	0.5	0.3	0.2
Chromium	22.4	135 J	24.7	37.2	40.8	28.3	25.9
Copper	15.2	26.1	19.4	31.2	36.4	20.1	18.9
Iron	22,300	21,300	22,000	30,100	33,300.0	24,400	20,100
Lead	9	200 J	18	12	12	11	7
Mercury	0.03	0.02	0.03	0.07	0.08	0.04	0.02
Nickel	20.5	25.7	24.2	31.6	33.4	24.8	24.6
Selenium	3 U	5	4 U	6	7	5 U	4
Silver	0.2 U	0.2 U	0.2 U	0.2 U	0.3 U	0.3 U	0.2 U
Thallium	3 U	5	4 U	4 U	7	5 U	3 U
Zinc	67.7	98.1	73.0	81.7	85.2	72.2	64.4
LPAH (µg/kg dry weight)							
Acenaphthene	20 U	120	19 U	19 U	19 U	19 U	19 U
Acenaphthylene	20 U	20	19 U	19 U	19 U	19 U	19 U
Anthracene	210	350	47	19 U	19 U	19 U	19 U
Fluorene	36	210	33	19 U	19 U	19 U	19 U
2-Methylnaphthalene	20 U	19 U	19 U	19 U	19 U	19 U	19 U
Naphthalene	20 U	25	19 U	19 U	19 U	19 U	19 U
Phenanthrene	61	1,600	160	23	40	45	19 U
Total LPAH	307 T	2,325 T	240 T	23 T	40 T	45 T	ND
HPAH (µg/kg dry weight)							
Benzo(a)anthracene	22	1,200	170	20	34	45	19 U
Benzo(a)pyrene	16 J	1,400	300	22	33	45	19 U
Benzo(g,h,i)perylene	20 U	580	200	26	27	34	19 U
Benzo(b)fluoranthene	23	1,200	260	32	36	90	19 U
Benzo(k)fluoranthene	16 J	780	210	22	39	44	19 U
Total Benzofluoranthene	39 T	1980 T	470 T	54 T	75 T	134 T	ND
Chrysene	38	1,200	210	37	59	84	19 U
Dibenzo(a,h)anthracene	20 U	140	32	19 U	19 U	19 U	19 U
Fluoranthene	64	3,300	400	58	87	130	19 U
Indeno(1,2,3-cd)pyrene	20 U	770	210	20	28	28	19 U
Pyrene	47	2,600	320	42	61	93	19 U
Total HPAH	228 JT	13,170 T	2,312 T	279 T	404 T	593 T	ND
Misc. BNAs (µg/kg dry weight)							
Bis(2-ethylhexyl)phthalate	57	720	390	270	450	310	140
Carbazole	66	190	19 U	19 U	19 U	19 U	19 U
Di-n-butylphthalate	20 U	150	120	19 U	19 U	25 U	19 U
Dibenzofuran	20 U	89	19 U	19 U	19 U	19 U	19 U
Phenol	39 U	150	37 U	39 U	38 U	39 U	19 U
PCBs (µg/kg dry weight)							
Aroclor 1016	19 U	18 U	19 U	20 U	19 U	18 U	18 U
Aroclor 1221	39 U	35 U	37 U	39 U	38 U	36 U	36 U
Aroclor 1232	19 U	18 U	19 U	20 U	19 U	18 U	18 U
Aroclor 1242	26	18 U	19 U	20 U	19 U	18 U	18 U
Aroclor 1248	19 U	18 U	19 U	20 U	19 U	18 U	18 U
Aroclor 1254	19 U	18 U	27 U	33	45	35	10 J
Aroclor 1260	19 U	22	21	27	38	28	18 U
Aroclor 1268							
Total PCB	26 T	22 T	21 T	60 T	83 T	63 T	10 JT

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analysis was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UJ: The analyte was not detected; the quantitation limit is an estimated value.

Table 3-1—Boeing Renton Outfall and Shoreline Sediment Sampling Results, August 1999

	Shoreline 2 LWOS002	Shoreline 3 LWOS003	Shoreline 5 LWOS005	Shoreline 6 LWOS006
Conventional Parameters (%)				
Total Solids	81.0	37.5	52.5	38.4
Total Organic Carbon	0.26	4.9	2.6	2.6
Grain Size (%)				
Gravel (-3 to -1 Phi)	4.94	2.33	0.04	0.07
Sand (-1 to 4 Phi)	92.61	52.85	24.19	26.11
Total Sand and Gravel	97.55	55.18	24.24	26.18
Silt (4 to 8 Phi)	2.27	42.66	68.10	68.16
Clay (9 to <10 Phi)	0.18	2.16	7.66	5.66
Total Fines (Silt and Clay)	2.45	44.82	75.76	73.82
Total Metals (mg/kg dry weight)				
Aluminum	14500	16500	26700	25500
Antimony	0.06 UJ	0.7 J	0.2 J	0.2 J
Arsenic	5	8 U	6 U	6 U
Beryllium	0.25	0.3	0.5	0.4
Cadmium	0.2	2	0.5	0.4
Chromium	24.1	39.9	39.4	39.8
Copper	18.7	43.7	43.7	43.2
Iron	21000	29700	31100	30800
Lead	11	51	17	14
Mercury	0.02	0.11	0.07	0.16
Nickel	22.4	29	35	34
Selenium	6	8 U	10	6
Silver	0.2 U	0.5 U	0.3 U	0.4 U
Thallium	3 U	8 U	6 U	6 U
Zinc	70.8	203	90.3	88.9
LPAH (µg/kg dry weight)				
Acenaphthene	19 U	39 U	20 U	19 U
Acenaphthylene	19 U	39 U	20 U	19 U
Anthracene	19 U	420	20 U	19 U
Fluorene	19 U	78	20 U	19 U
2-Methylnaphthalene	19 U	39 U	20 U	19 U
Naphthalene	19 U	39 U	45	19 U
Phenanthrene	19 U	630	58	36
Total LPAH	ND	1128 T	103 T	36 T
HPAH (µg/kg dry weight)				
Benzo(a)anthracene	19 U	1100	58	34
Benzo(a)pyrene	19 U	1200	59	49
Benzo(g,h,i)perylene	19 U	580	50	47
Benzo(b)fluoranthene	19 U	1500	76	60
Benzo(k)fluoranthene	19 U	1200	59	54
Total Benzofluoranthene	ND	2700 T	135 T	114 T
Chrysene	19 U	1900	89	59
Dibenzo(a,h)anthracene	19 U	320	20 U	20
Fluoranthene	19 U	1600	120	73
Indeno(1,2,3-cd)pyrene	19 U	620	41	42
Pyrene	19 U	2000	150	82
Total HPAH	ND	12020 T	702 T	520 T
Misc. BNAs (µg/kg dry weight)				
Bis(2-ethylhexyl)phthalate	94	3400	230	210
Carbazole	19 U	91	20 U	19 U
Di-n-butylphthalate	19 U	280	20 U	19 U
Dibenzofuran	19 U	39 U	20 U	19 U
Phenol	19 U	53	33	19 U
PCBs (µg/kg dry weight)				
Aroclor 1016	18 U	19 U	20 U	19 U
Aroclor 1221	35 U	37 U	40 U	38 U
Aroclor 1232	18 U	19 U	20 U	19 U
Aroclor 1242	18 U	19 U	20 U	19 U
Aroclor 1248	18 U	19 U	20 U	19 U
Aroclor 1254	13 J	270	62	290
Aroclor 1260	10 J	490	49	66
Aroclor 1268				
Total PCB	23 JT	760 T	111 T	356 T

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analysis was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UJ: The analyte was not detected; the quantitation limit is an estimated value.

Table 3-2—Boeing Renton Nearshore Sediment Sampling Results, August 1999

	Current Flume LWCFE-200	Current Flume LWCFN-200	Current Flume LWCFNE-200	Nearshore 4 LWOS004-275	Nearshore 6 LWOS006-100	Nearshore 6 LWOS006-200	Nearshore 10 LWOS010-100
Conventional Parameters (%)							
Total Solids	37.3	49.8	41.2	51.0	53.7	53.2	59.9
Total Organic Carbon	2.3	2.6	2	2.6	3.3	2.8	1.6
Grain Size (%)							
Gravel (-3 to -1 Phi)	0.00	0.04	0.01	0.27	3.98	0.13	0.01
Sand (-1 to 4 Phi)	18.44	18.53	10.35	27.10	16.14	18.50	35.18
Total Sand and Gravel	18.44	18.57	10.36	27.36	20.11	18.63	35.19
Silt (4 to 8 Phi)	76.10	73.92	82.86	67.75	73.50	74.58	60.24
Clay (9 to <10 Phi)	5.46	7.51	6.78	4.88	6.38	6.80	4.56
Total Fines (Silt and Clay)	81.56	81.43	89.64	72.64	79.89	81.37	64.81
Total Metals (mg/kg dry weight)							
Aluminum	26800	26800	28500	24200	26700	25200	21600
Antimony	0.1 J	0.1 UJ	0.2 J	0.2 J	0.3 J	0.1 UJ	0.12 J
Arsenic	6 U	6	6 U	6 U	5 U	7 U	4
Beryllium	0.4	0.5	0.5	0.4	0.5	0.4	0.36
Cadmium	0.4	0.4	0.3	0.4	0.5	0.3	0.3
Chromium	41.5	39.3	43.5	35.6	39.4	37.3	33
Copper	45.7	41.4	43.4	39.2	43.3	42.1	31.2
Iron	33400	32500	34500	29500	33200	30200	29100
Lead	19	14	16	15	16	14	9
Mercury	0.08	0.07	0.08	0.08	0.08	0.08	0.06
Nickel	37	38	39	31	36	32	29.1
Selenium	6 U	6	8	7	9	10	5
Silver	0.4 U	0.4 U	0.3 U	0.4 U	0.3 U	0.4 U	0.2 U
Thallium	6 U	6 U	6 U	6 U	5 U	7 U	4 U
Zinc	95.7	82.8	85.5	82.8	90	82.6	62.1
LPAH (µg/kg dry weight)							
Acenaphthene	20 U	19 U	19 U	20 U	19 U	20 U	20 U
Acenaphthylene	20 U	19 U	19 U	20 U	19 U	20 U	20 U
Anthracene	20 U	19 U	19 U	20 U	19 U	20 U	20 U
Fluorene	20 U	19 U	19 U	20 U	19 U	20 U	20 U
2-Methylnaphthalene	20 U	19 U	19 U	20 U	19 U	20 U	20 U
Naphthalene	20 U	19 U	19 U	20 U	19 U	20 U	20 U
Phenanthrene	37	40	26	38	46	42	24
Total LPAH	37 T	40 T	26 T	38 T	46 T	42 T	24 T
HPAH (µg/kg dry weight)							
Benzo(a)anthracene	40	37	23	40	58	44	21
Benzo(a)pyrene	60	61	37	68	86	67	33
Benzo(b)fluoranthene	70	70	48	76	110	84	39
Benzo(g,h,i)perylene	62	54	39	60	71	61	30
Benzo(k)fluoranthene	87	69	47	79	85	68	38
Total Benzofluoranthene	157 T	139 T	95 T	155 T	195 T	152 T	77 T
Chrysene	89	71	49	72	110	74	41
Dibenz(a,h)anthracene	28	24	19 U	20 U	38	20 U	20 U
Fluoranthene	110	88	60	87	100	95	50
Indeno(1,2,3-cd)pyrene	60	55	37	59	70	55	29
Pyrene	93	86	60	86	120	100	48
Total HPAH	699 T	615 T	400 T	627 T	848 T	648 T	329 T
Misc. BNAs (µg/kg dry weight)							
bis(2-Ethylhexyl)phthalate	220	160	91	260	330	210	170
Carbazole	20 U	19 U	19 U	20 U	19 U	20 U	20 U
Di-n-butylphthalate	34	19 U	19 U	20 U	19 U	20 U	20 U
Dibenzofuran	20 U	19 U	19 U	20 U	19 U	20 U	20 U
Phenol	20 U	43	19 U	22	45	36	20
PCBs (µg/kg dry weight)							
Aroclor 1016	19 U	19 U	19 U	20 U	18 U	20 U	20 U
Aroclor 1221	38 U	37 U	37 U	40 U	37 U	40 U	40 U
Aroclor 1232	19 U	19 U	19 U	20 U	18 U	20 U	20 U
Aroclor 1242	19 U	19 U	19 U	20 U	18 U	20 U	20 U
Aroclor 1248	19 U	19 U	19 U	20 U	18 U	20 U	20 U
Aroclor 1254	19	13 J	16 J	22	24	19 J	14 J
Aroclor 1260	26	15 J	22	19 J	26	18 J	13 J
Total PCB	45 T	28 JT	38 JT	41 JT	50 T	37 JT	27 JT

Notes:

µg/kg: Microgram per kilogram

mg/kg: Milligram per kilogram detected above the quantitation limit.

Blank cell: Analysis was not reported by the analytical laboratory.

J: The analyte was identified and detected; the concentration is an estimated value.

ND: None of the summed constituents were detected above the quantitation limit.

T: Value was total of constituents.

U: The analyte was not detected at the given quantitation limit.

UJ: The analyte was not detected; the quantitation limit is an estimated value.

Table 3-2—Boeing Renton Nearshore Sediment Sampling Results, August 1999

	Nearshore 10 LWOS010-200	Nearshore 011012 LWOS011012-100	Nearshore 011012 LWOS011012-200	Nearshore 015016 LWOS015016-100	Nearshore 015016 LWOS015016-200	Nearshore 015016 LWOS015016W-200
Conventional Parameters (%)						
Total Solids	48.6	53.2	79.7	56.4	52.4	53.0
Total Organic Carbon	2.8	1.9	0.23	2	2.2	1.7
Grain Size (%)						
Gravel (-3 to -1 Phi)	0.06	0.07	3.50	0.00	0.01	0.37
Sand (-1 to 4 Phi)	15.69	18.62	91.30	32.08	17.91	68.31
Total Sand and Gravel	15.74	18.68	94.80	32.08	17.92	68.69
Silt (4 to 8 Phi)	78.28	74.61	4.86	63.66	69.48	29.54
Clay (9 to <10 Phi)	5.98	6.71	0.34	4.28	12.59	1.78
Total Fines (Silt and Clay)	84.26	81.32	5.20	67.92	82.08	31.31
Total Metals (mg/kg dry weight)						
Aluminum	27000	27300	15900	24900	28300	21500
Antimony	0.2 J	0.2 J	0.07 J	0.2 J	0.2 J	0.12 J
Arsenic	6	6 U	3 U	6 U	6 U	5 U
Beryllium	0.4	0.5	0.23	0.4	0.5	0.35
Cadmium	0.4	0.5	0.1	0.6	0.3	0.3
Chromium	38.9	41.4	21.7	37.5	41.6	31.8
Copper	44	40.9	19.3	39.4	42.9	31.8
Iron	32300	32800	21400	30400	31800	26200
Lead	15	15	3	15	12	11
Mercury	0.08	0.06	0.02	0.06	0.08	0.04
Nickel	34	37	21	34	36	29.3
Selenium	8	9	4	6 U	8	5 U
Silver	0.3 U	0.4 U	0.2 U	0.3 U	0.3 U	0.3 U
Thallium	5 U	6 U	3 U	6 U	6 U	5 U
Zinc	86	82	43.5	135	81.1	67.4
LPAH (µg/kg dry weight)						
Acenaphthene	19 U	20 U	19 U	20 U	20 U	19 U
Acenaphthylene	19 U	20 U	19 U	20 U	20 U	19 U
Anthracene	19 U	20 U	19 U	20 U	20 U	32
Fluorene	19 U	20 U	19 U	20 U	20 U	19 U
2-Methylnaphthalene	19 U	20 U	19 U	20 U	20 U	19 U
Naphthalene	19 U	20 U	19 U	20 U	20 U	19 U
Phenanthrene	50	28	19 U	54	30	56
Total LPAH	50 T	28 T	ND	54 T	30 T	88 T
HPAH (µg/kg dry weight)						
Benzo(a)anthracene	48	28	19 U	53	26	100
Benzo(a)pyrene	78	41	19 U	67	38	140
Benzo(b)fluoranthene	110	54	19 U	62	39	110
Benzo(g,h,i)perylene	79	48	19 U	53	35	92
Benzo(k)fluoranthene	81	39	19 U	74	53	180
Total Benzofluoranthene	191 T	93 T	ND	136 T	92 T	290 T
Chrysene	87	46	19 U	81	52	200
Dibenz(a,h)anthracene	35	20 U	19 U	20 U	20 U	42
Fluoranthene	110	70	19 U	100	57	120
Indeno(1,2,3-cd)pyrene	72	37	19 U	49	33	89
Pyrene	100	64	19 U	110	65	140
Total HPAH	800 T	427 T	ND	649 T	398 T	1213 T
Misc. BNAs (µg/kg dry weight)						
bis(2-Ethylhexyl)phthalate	250	140	19 U	180	140	130
Carbazole	19 U	20 U	19 U	20 U	20 U	19 U
Di-n-butylphthalate	19 U	20 U	19 U	20 U	20 U	19 U
Dibenzofuran	19 U	20 U	19 U	20 U	20 U	19 U
Phenol	54	20 U	19 U	25	33	25
PCBs (µg/kg dry weight)						
Aroclor 1016	19 U	20 U	18 U	20 U	19 U	19 U
Aroclor 1221	39 U	40 U	35 U	40 U	37 U	38 U
Aroclor 1232	19 U	20 U	18 U	20 U	19 U	19 U
Aroclor 1242	19 U	20 U	18 U	20 U	19 U	19 U
Aroclor 1248	19 U	20 U	18 U	20 U	19 U	19 U
Aroclor 1254	18 J	36	18 U	16 J	10 J	12 J
Aroclor 1260	20	34	18 U	16 J	10 J	13 J
Total PCB	38 JT	70 T	ND	32 JT	20 JT	25 JT

Notes:
µg/kg: Microgram per kilogram
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Blank cell: Analysis was not reported by the analytical laboratory.
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Appendix A

APPENDIX A
STATION COORDINATES

Station ID	Longitude	Latitude	Water Depth to Sediment (ft)
Boeing dock	122 12 48.102037	47 30 3.756393	N/A
OF-004	122 12 35.169336	47 30 6.599249	N/A
OF-016	122 12 46.198458	47 30 1.728339	N/A
OF-015	122 12 46.097076	47 30 1.750300	N/A
OF-014	122 12 45.995615	47 30 1.769300	N/A
OF-013	122 12 42.125897	47 30 2.505285	N/A
OF-012	122 12 42.096852	47 30 2.508599	N/A
OF-011	122 12 42.009796	47 30 2.521501	N/A
OF-010-OS	122 12 39.308064	47 30 3.911543	N/A
OF-010	122 12 39.455845	47 30 3.991679	N/A
OF-003-OS	122 12 32.252248	47 30 9.216838	N/A
OF-003	122 12 32.368849	47 30 9.219374	N/A
LWOS015016W-200	122 12 49.206606	47 30 2.562401	3.2
LWOS015016-200	122 12 46.861815	47 30 3.677690	4.1
LWOS015016-100	122 12 46.457706	47 30 2.718208	3.9
LWOS011012-200	122 12 44.136513	47 30 4.175716	7.8
LWOS011012-100	122 12 42.412917	47 30 3.444477	4.8
LWOS010-200	122 12 41.805635	47 30 5.268104	12.1
LWOS010-100	122 12 40.680972	47 30 4.601645	8.2
LWOS006-200	122 12 40.525713	47 30 6.443474	11.6
LWOS006-100	122 12 39.545623	47 30 5.735773	9.7
LWOS006	122 12 38.791005	47 30 5.291851	3.8
LWOS005	122 12 37.415615	47 30 6.162370	4.3
LWOS004-275	122 12 37.384954	47 30 8.862447	N/A
LWOS003	122 12 34.536501	47 30 7.457795	2.4
LWOS002	122 12 32.890619	47 30 8.567493	2.2
LWOS001	122 12 32.333910	47 30 9.551461	1
LWOF016W	122 12 46.403807	47 30 1.782109	1.1
LWOF016	122 12 46.260698	47 30 1.878609	1.3
LWOF014E	122 12 45.838049	47 30 1.869924	1.2
LWOF014	122 12 46.028497	47 30 1.911043	1.1
LWOF012W	122 12 42.287118	47 30 2.542812	1.2
LWOF012	122 12 42.144032	47 30 2.640297	1.2
LWOF011E	122 12 41.867049	47 30 2.631814	1.3
LWOF011	122 12 42.056976	47 30 2.653199	1.3
LWOF010W	122 12 39.789356	47 30 3.934329	2
LWOF010E	122 12 39.490965	47 30 4.218284	2.9
LWOF010	122 12 39.721918	47 30 4.138489	2.6
LWOF004W	122 12 35.373385	47 30 6.603686	0.8
LWOF004E	122 12 35.116167	47 30 6.792377	0.8
LWOF004	122 12 35.259729	47 30 6.712657	0.8
LWOF003W	122 12 32.482508	47 30 9.110403	0.2
LWOF003E	122 12 32.400863	47 30 9.328553	0.3
LWOF003	122 12 32.558520	47 30 9.230895	0.1
LWFF	122 12 36.160040	47 30 6.605994	3.1
LWCF-200NE	122 12 30.017936	47 30 11.214139	8.6
LWCF-200N	122 12 33.192579	47 30 11.730433	15.6
LWCF-200E	122 12 29.929590	47 30 10.625914	N/A
LWCF	122 12 34.281120	47 30 9.371906	4.3

Appendix B

SURFACE SEDIMENT FIELD SAMPLE RECORD

Project Name: <u>Boeing Outfall</u>	Sampling Personnel: <u>Reak, Fernandez, Shaw</u>
Project Location: <u>Renton L. WA</u>	Sampling Vessel: <u>R/V Kittiwake</u>
Project No.: <u>3709.066.020.2100</u>	Subcontractor(s): <u>C. Eaton, D. Dickinson</u>
Date: <u>8/11/99</u>	Weather: <u>overcast, breezy</u>
WESTON Sample No.: <u>N/A</u>	Sampling Method: <u>0.1 m² van Veen</u>
EPA Sample No.: <u>N/A</u>	Proposed Location: <u>Shoreline along SW Lake WA.</u>
Analyses: <u>Grain size, metals, BNAs, TOC, PCBs</u>	

Grab #	Time	Depth to Sed. (m)	Coordinates		Grab Accept. ?	Penet. Depth (cm)	Color	Texture	Odor	Debris	Other	ARCHIVE
			X	Y								
1	09:20		Sta. 11	0F015016-200-0000	no	>max					milfoil, over pen	
2	09:30	4.1	Sta. 11	↓	y	21.5	BR	wet SC	no	tax paper visqueen	weeds (milfoil)	X
3	10:04		Sta. 1	0F015016-200-0000W	no						log	
4	10:06	1.8	Sta. 1	↓	no						empty	
5	10:08	3.7	Sta. 1	↓	y	18	BR/BL	SC, SD	no	none	milfoil	X
6	10:25		Sta. 10	0F015016-100-0000	no	>max					over penetration	
7	10:31	4.0	Sta. 10	↓	no	>max					over pen.	
8	10:36	3.9	Sta. 10	↓	y	17.9	BR/BL	SC, SD	no	none	small dots of oily sheen	X
9	10:58	7.8	Sta. 20	0S011012-200-0000	y	15.5	BR	SD, wet	no	none	—	X
10	11:05	5.3	Sta. 19	0S011012-100-0000	no	>max					over pen	
11	11:11	5.2	Sta. 19	↓	no	>max					"	
12	11:16	5.0	Sta. 19	↓	no	>max					"	
13	11:20		Sta. 19	↓	no	>max						
14	11:28		Sta. 19	↓	no	>max						
15	11:31		Sta. 19	↓	no	—					didn't trip shut	
16	11:32	4.8	Sta. 19	↓	yes	17	GY	wet SC	no	none	oily sheen in dots larvae	X

Color Codes

BR = Brown
BK = Black
GY = Gray
GR = Green
ST = Rust

Texture Codes

SC = Silt/Clay
SD = Sand
GR = Granule
PB = Pebble
GV = Gravel

F = Fine
M = Medium
C = Coarse

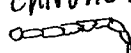
Odor Codes

H2S = Sulfide
TPH = Petroleum

SL = Slight
M = Moderate
ST = Strong

Other:

Include presence of biota, debris, or redox layer

chironomid?
 1/2 - 3/4"
- reddish brown
- curls in "C"
- fast-moving whip-like burrowing motion
- shiny exoskel.

Sampler Signature: Alison Reak

8/11/99 Boring Outfall sediment

met WESTON staff in N. Parking lot at 7:30 am
obtained badges at 7:45

met guard at boat house 8:00

loaded gear onto Kittiwake + mobilized 8:20

departed dock 9:00

reconnaissance of area until 1st grab at 9:20



SURFACE SEDIMENT FIELD SAMPLE RECORD

Project Name: <u>Boeing Outfall</u>	Sampling Personnel: <u>Reak, Fernandez, Shaw</u>
Project Location: _____	Sampling Vessel: _____
Project No.: <u>3709.066.020.2100</u>	Subcontractor(s): _____
Date: <u>8/11/99</u>	Weather: _____
WESTON Sample No.: _____	Sampling Method: _____
EPA Sample No.: _____	Proposed Location: _____
Analyses: <u>BNA's, TOC, metals, G.S, PCBs</u>	

Grab #	Time	Depth to Spd (ft/m)	Coordinates		Grab Accpt. ?	Penet. Depth (cm)	Color	Texture	Odor	Debris	Other	Archive
			X	Y								
17	11:45		Sta. 28	05010-200-0000	no	>max						
18	11:50	12.0	↓	↓	no	7mox						
19	11:55	12.1	↓	↓	partial	21+	G4	wet SE	no	no	chironomid, oily sheen	X
20	12:45	11.6	Sta. 32	05006-200-0000	no	>max						
21	12:50	11.4	↓	↓	no	>max						
22	12:55	11.6	↓	↓	yes	21+	G4, BR specks	wet SE	no	no	only sheen leeches	X
23	13:10		Sta. 42	05004-275-0000	partial	17	G4	wet SE	no	no	only sheen, chironomids	X
24	13:15		Sta. 55	CF-200-0000N	no							
25	13:21	15.6	Sta. 55	↓	partial	17.5	G4	wet SE	no	no	oily sheen, chironomids	X
26	13:35	8.6	Sta. 54	CF-200-0000NE	partial	18+	G4	wet SE	no	no	drop of oily sheen	X
27	13:53		Sta. 53	CF-200-0000E	no						rock in jaws	
28	13:55		↓	↓	no						nothing	
29	14:05		↓	↓	yes	16.5	G4	wet SE	no	no	1 oligochaet(?)	X
30	14:17	4.3	Sta. 52	CF-10-0000	yes	13.5	G4	(BR) wet SE	no	no	2 clam spp. know worms 10cm	
31	14:32	5.2	Sta. 52	CF-10-1000	yes	16.5	G4	(then SD)	no	no	DUP on Sta. 52	
											many worms, many 1cm clams	

Color Codes

BR = Brown
 BK = Black
 GY = Gray
 GR = Green
 RST = Rust

Texture Codes

SC = Silt/Clay
 SD = Sand
 GR = Granule
 PB = Pebble
 GV = Gravel

F = Fine
 M = Medium
 C = Coarse

Odor Codes

H2S = Sulfide
 TPH = Petroleum

SL = Slight
 M = Moderate
 ST = Strong

Other:

Include presence of biota, m. nasuta, debris, or redox layer

(like cockle), many 4 cm clams (like chironomids)

Sampler Signature: Allison Reak

Sta 52 BR silt 2cm and Dup: G4 SC to 6cm SD to 10cm + below



SURFACE SEDIMENT FIELD SAMPLE RECORD

Project Name: <u>Boeing outfall</u>	Sampling Personnel: _____
Project Location: _____	Sampling Vessel: _____
Project No.: <u>3709-066-020-2100</u>	Subcontractor(s): _____
Date: <u>8/11/99</u>	Weather: _____
WESTON Sample No.: _____	Sampling Method: _____
EPA Sample No.: _____	Proposed Location: _____
Analyses: _____	

Grab #	Time	Depth to Sed. (ft/m)	Coordinates		Grab Acpt. ?	Penet. Depth (cm)	Color	Texture	Odor	Debris	Other
			X	Y							
32	1445	9.4	Sta. 31	05-006-100-0000	NO	> MAY					
33	1450	9.5	↓	↓	NO	> MAY					
34	1455	9.7	↓	↓	Y	16.5	GY	wet SC	NO	NO	oily sheen dots brown-rust streaks
35	1505	8.2	Sta. 27	05-10-100-0000	Y	17	GY	wet SC, SD	NO	NO	chironomids, oily sheen, worms
36	1517	1.5	Sta. 30	05-006-10-0000	NO						rock in jaw
37	1520	2.9	↓	↓	NO						rock
38	1525	2.7	↓	↓	NO						rock
39	1548	3.8	↓	↓	Y	17.5	GY	wet SC	NO	NO	some oily sheen, isopods, worms
40	1616	1.8	Sta. 35	FF-10-0000	NO						rock
41	1621	3.1	↓	↓	YES	11.0	GY	wet SD	NO	NO	milfoil thick
42	1627		Sta. 43	05-003-10-0000	NO						weeds + water
43	1642	2.4	↓	↓	YES	13.0	BL	wet SD	NO	NO	very oily, numerous oil spots at surface
finished for 8/11/99											

Archive

X

X

- | | | | | |
|---|---|---|---|---|
| Color Codes
BR = Brown
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GY = Gray
GR = Green
RST = Rust | Texture Codes
SC = Silt/Clay
SD = Sand
GR = Granule
PB = Pebble
GV = Gravel | Odor Codes
F = Fine
M = Medium
C = Coarse | Other:
H2S = Sulfide
TPH = Petroleum
SL = Slight
M = Moderate
ST = Strong | Other:
Include presence of biota,
debris, or redox layer |
|---|---|---|---|---|

Sampler Signature: Allison Reak

SURFACE SEDIMENT FIELD SAMPLE RECORD

Project Name: <u>Boeing Outfalls Sed Sample</u>	Sampling Personnel: <u>A. Reak, M. Shaw, S. Fitzgerald</u>
Project Location: <u>Renton - Lake Wash</u>	Sampling Vessel: <u>R/V Kittiwake</u>
Project No.: <u>3709-066-020-2100</u>	Subcontractor(s): <u>C. Eaton, D. Dickinson</u>
Date: <u>8/12/99</u>	Weather: <u>overcast, calm, mist, clearing by 12:00</u>
WESTON Sample No.: <u> </u>	Sampling Method: <u>0.1 m² van Veen grabs 1-7</u>
EPA Sample No.: <u> </u>	Proposed Location: <u>0.05 m² van Veen grabs 8-15</u>
Analyses: <u>metals, BNAs, TDC, grain size, PCBs</u>	

Grab #	Time	Depth to Sed. (ft/m)	Coordinates		Grab Accpt. ?	Penet. Depth (cm)	Color	Texture	Odor	Debris	Other
			X	Y							
1	0857	2.4	Sta. 29	05-005-10 -0000	no						thick weeds ~2m off submerged 10" dia pipe
2	0904		↓	↓	no						weeds
3	0908		↓	↓	no						(moved off shore in 1-m increments)
4	0911	1.7	↓	↓	no						
5	0917		↓	↓	no						oily sheen
6	0921	4.3	↓	↓	y	14.5	6Y	wet SL	SL H ₂ S	no	leaf litter, milfoil, chironomid
7	1002	1.2	Sta. 39	05-004-10 -0000							too shallow
8	1140	1.3	Sta. 5	0F016-10 0000	y	8	6Y	wet SD, PB	ST H ₂ S	2 stones dumped	hand deployed small van Veen
9	1144		↓	↓	partial	6				(walnut, golf ball)	oily sheen on water after dredge is raised
10	1146		↓	↓	no						sample has very oily sheen
11	1150		↓	↓	no						roots, gravel
12	1155		↓	↓	no						
13	1158		↓	↓	no						
14	1202		↓	↓	yes	8					
15	1251	1.1	Sta. 6	0F016-10- 0000W	partial	6.5	6Y	C-SD	no	no	1 large (4cm) clam
16	1330		↓	↓	yes	8.5					

Color Codes

BR = Brown
BK = Black
GY = Gray
GR = Green
PST = Rust

Texture Codes

SC = Silt/Clay
SD = Sand
GR = Granule
PB = Pebble
GV = Gravel

F = Fine
M = Medium
C = Coarse

Odor Codes

H₂S = Sulfide
TPH = Petroleum

SL = Slight
M = Moderate
ST = Strong

Other:

Include presence of biota, debris, or redox layer

Sampler Signature: *Alison Reak*

① Labeled as R-SDI-LWOF016-10-0006

Note: "OF 016015" was collected 10 ft from pt. 2 ft E of OF016
(OF016 probably discharges, OF015 probably doesn't)

OF016 is 8 ft W of OF015

② R-SDI-LWOF016-10-0000W is 6 ft west of OF016
and 8 ft N (45° , not 30°)

SURFACE SEDIMENT FIELD SAMPLE RECORD

Project Name: <u>Boeing Outfalls</u>	Sampling Personnel: _____
Project Location: _____	Sampling Vessel: _____
Project No.: <u>3709-066-020-2100</u>	Subcontractor(s): _____
Date: <u>8/12/99</u>	Weather: <u>sunny, hot, breezy</u>
WESTON Sample No.: _____	Sampling Method: <u>0.1 m² Van Veen</u>
EPA Sample No.: _____	Proposed Location: _____
Analyses: _____	

Grab #	Time	Depth to Sed. (ft/m)	Coordinates		Grab Acpt. ?	Penet. Depth (cm)	Color	Texture	Odor	Debris	Other switched back to 0.1 m ² VVeen
			X	Y							
17	1340	1.1	Sta. 8	OF014-10 0000	y	8.5	G4	CSD, GV	no	vinyl tape	
18	1400	1.2	Sta. 9	OF014-10 0000E	y	7.0	G4	CSD, GV	no	no	double jars, very coarse
19	1450	1.2	Sta. 17	OF012-10 0000	partial	6.5	G4	CSD, GV	no	washer, trash, bone	11
20	1530	1.3	Sta. 13	OF011-10 0000	partial	7.5	G4	CSD, GV	no	1/2" bolt, glass	1 extra jar 12-oz for volume
21	1545	^{3.0'} 1.3	Sta. 14	OF011-10 0000E	y	9.5	G4	CSD, GV	strong sewage	smell	45°E, 1 extra 12-oz jar
22	1605	^{3.0'} 1.2	Sta. 18	OF012-10 0000W	partial	6.5	G4	GV, CSD	no	metal, glass	45°W, 2 extra 12-oz jars
23	1615	1.2	↓	↓	y	7.5	G4	GV, CSD	no		
24	1655	0.8	Sta. 39	OF004-10 0000	y	7.5	BK	M SD	no	no	small VVeen
25	1700	0.8	↓	↓	y	7.0	BK	M SD	no	no	
26	1712	0.8	Sta. 41	OF004-10 0000W	y	8.0	BK	M-SD	no	no	small VVeen
27	1720	↓	↓	↓	y	6.5	↓	↓	↓	↓	
28	1734	0.8	Sta. 40	OF004-10 0000E	y	8.5	BK	M-SD	no	no	small VVeen
29	1738	0.8	↓	↓	y	6.6	↓	↓	↓	↓	

Color Codes

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Texture Codes

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GR = Granule
PB = Pebble
GV = Gravel

F = Fine
M = Medium
C = Coarse

Odor Codes

H2S = Sulfide
TPH = Petroleum

SL = Slight
M = Moderate
ST = Strong

Other:

Include presence of biota, debris, or redox layer

Sampler Signature: Allison Reak

OF-015 notes on back

1655
1700 2.6 7cm 7 1/2

0F015-10-0000 is 2 ft W of 0F-014
0F015-10-0000 E is 6 ft E of 0F-015 and 8 ft N.
collected as volume for metals, ABAs, TCE
etc of high grade cement

SURFACE SEDIMENT FIELD SAMPLE RECORD

Project Name: <u>Boeing Outfall</u>	Sampling Personnel: <u>K. Reak, S. Fitzgerald, M. Shaw</u>
Project Location: <u>Remton Lake WA</u>	Sampling Vessel: <u>R/V Kittiwake</u>
Project No.: <u>3709-066-020-2100</u>	Subcontractor(s): <u>C. Eaton, D. Dickinson</u>
Date: <u>8/13/99</u>	Weather: <u>overcast, breeze</u>
WESTON Sample No.: _____	Sampling Method: <u>0.05 van Veen</u>
EPA Sample No.: _____	Proposed Location: _____
Analyses: <u>metals, TDC, BNAs, grain size, PCBs</u>	

Grab #	Time	Depth to Sed (ft/m)	Coordinates		Grab Accept. ?	Penet. Depth (cm)	Color	Texture	Odor	Debris	Other
			X	Y							
1	0957	0.1	Sta. 48	OF-003-10 0000	no	> max	BR/GY	M SD			
2	1000	0.1	↓	↓	no	> max	↓	↓			
3	1005	0.1	↓	↓	yes	13	↓	↓	no	no	
4	1007	0.1	↓	↓	yes	11	↓	↓	no	no	
5	1013	0.2	Sta. 49	OF-003-10 0000E	yes	8	BR/GY	M SD	no	no	
6	1016	0.3	↓	↓	yes	10	↓	↓	no	no	
7	1020	0.2	Sta. 50	OF-003-10 0000W	yes	8.5	BR/GY	M SD	no	no	
8	1041	1.2	Sta. 51	OS-001-10	partial	7.0	BR/GY	M SD	no	no	
9	1055	1.3	↓	↓	no	6.5		M SD	no	no	
10	1100	1.0	↓	↓	yes	9.5	GY	M SD	no	no	
11	1330	1.6	Sta. 24	OF-010-10 0000	no						SLIGHT SHEEN rock + asphalt in jaws
12	1401	2.6	↓	↓	yes	11.5	GY/BL	SC	M-H2S	no	also sulfur smell, weeds, worm, faint oil sheen
13	1415	2.0	Sta. 26	OF-010-10 0000W.	yes	8.5	GY/BL	SC	no	no	SAME, faint oil sheen
14	1427	2.9	Sta. 25	OF-010-10 0000E.	yes	11.5	GY/BL	SC	no	no	same, faint oil sheen
15	1459	2.2 ft	Sta. 44	OS-002-10 0000	yes	7.5	BR/GY	SD	no	brick chips	
DONE SAMPLING											

- | | | | | |
|---|---|---|---|---|
| Color Codes
BR = Brown
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GY = Gray
GR = Green
RST = Rust | Texture Codes
SC = Silt/Clay
SD = Sand
GR = Granule
PB = Pebble
GV = Gravel | Odor Codes
F = Fine
M = Medium
C = Coarse | Other:
H2S = Sulfide
TPH = Petroleum
SL = Slight
M = Moderate
ST = Strong | Include presence of biota, debris, or redox layer |
|---|---|---|---|---|

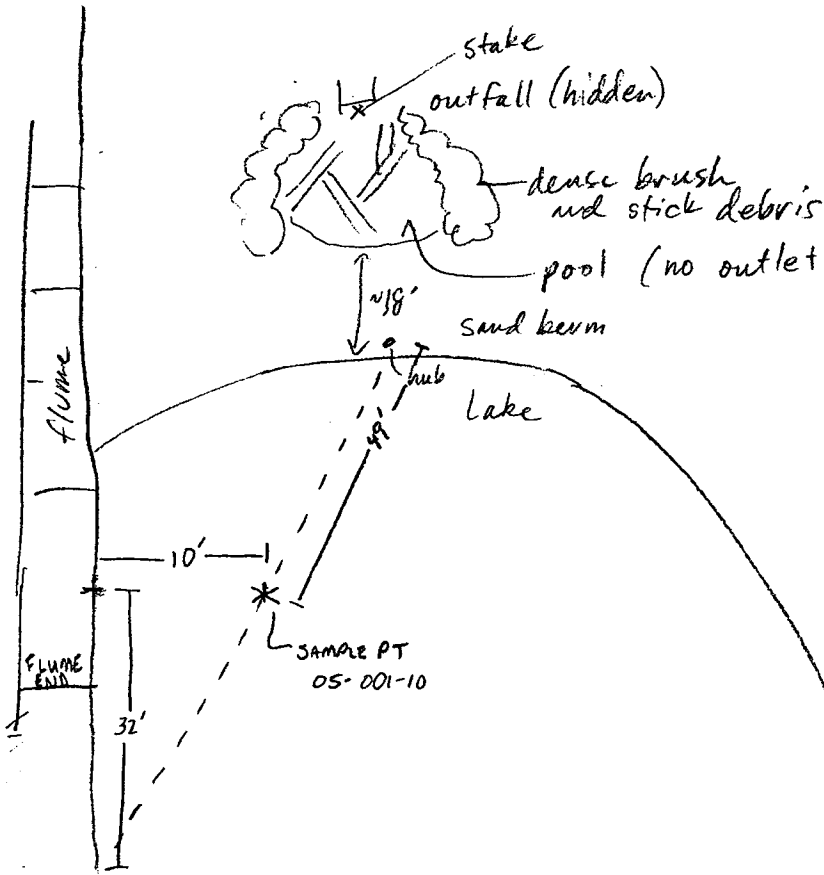
Sampler Signature: William Reak

STA 05-001-10:
 32' FROM FLUME END, 10' SOUTH; 49' FROM HUB, IN LINE W/ END OF FLUME (SEE DIAGRAM)
 Sta. OF 010-10-0000 is 37 ft off Pt #111 hub "14 ft to outfall;" at nearest distance where soft sed was found. Shoreline riprapped to that point.

fairs
 6
 6
 6
 6
 5
 5
 5

OF 003-10

sampled 10' from W. hub



OS-002-

51 ft toward shore from
buoy (get lat/lon + < from
Charlie)

Appendix C

APPENDIX C.1
OUTFALL AND FLUME SAMPLES

APPENDIX C.1

OUTFALL AND FLUME SAMPLES DATA VALIDATION QA/QC REVIEW

C.1 INTRODUCTION

Twenty-four sediment samples collected from adjacent to Lake Washington outfalls at Boeing's Renton Complex 11-13 August 1999 were analyzed for selected base/neutral/acid organic compounds (BNAs), polychlorinated biphenyls (PCBs), selected metals, total organic carbon (TOC), and grain size distribution. Results were reported by the laboratory as batches AP90, AQ07, AQ20, and AT96. Grain size analysis was subcontracted to Rosa Environmental Geosciences (REG) laboratory and was reported as batch 10000-179-01.

Samples were analyzed by Analytical Resources Incorporated of Seattle, Washington in accordance with procedures described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA SW-846, 3rd edition).

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. A data review was performed on laboratory QC results summary sheets to ensure they met data quality objectives for the project. Data review followed the format outlined in the *National Functional Guidelines for Organic Data Review* (EPA 1994) and the *National Functional Guidelines for Inorganic Data Review* (EPA 1994) modified to include specific criteria of the individual analytical methods. Raw laboratory data including calibrations, sample login forms, sample preparation logs and bench sheets, quantitation reports, mass spectra, and chromatograms are kept on file at the laboratory.

Results of the data reviews, organized by analysis class, follow.

C.2 BASE/NEUTRAL/ACID ORGANIC COMPOUNDS

C.2.1 Analytical Methods

Samples for BNA analysis were prepared using EPA Method 3550, ultrasonic extraction for soils. Samples were analyzed by gas chromatography/mass spectrometry utilizing EPA Method 8270.

C.2.2 Sample Holding Times

All samples were prepared and analyzed within holding time limits of 14 days for soil samples.

C.2.3 Laboratory Detection Limits

Detection limits were elevated the following samples because dilution was required to remove analytical interferences or because concentrations of one or more analytes were greater than the highest calibration standard:

Laboratory Batch	Sample	Dilution Factor
AQ07	R-SD1-LWOF16-10-0000	1:5
	R-SD1-LWOF12-10-0000	1:10
	R-SD1-LWOF004-10-0000E	1:20
AQ20	R-SD1-LWOF10-10-0000	1:3
	R-SD1-LWOF10-10-0000E	1:3
	R-SD1-LWOF10-10-0000W	1:3

Results from both analyses were reported by the laboratory. Results from the diluted sample were used for analytes with analytical interferences or where concentrations were greater than the highest calibration standard. Original, undiluted results were used for all other analytes. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.2.4 Blank Contamination

No target analytes were detected in laboratory or field blanks.

C.2.5 Surrogate Recovery

All surrogate compound recoveries were within QC limits except for the following samples:

Lab Batch	Sample Number	Surrogate	Recovery	QC Limit
AQ07	R-SD1-LWOF16-10-0000 DL	2,4,6-Tribromophenol	46.9%	54 -126%
AQ20	R-SD1-LWOF10-10-0000 DL	2,4,6-Tribromophenol	50.1%	54 -126%

No action was required since only one acid fraction surrogate did not meet recovery criteria. Phenol was the only acid fraction compound analyzed in samples and the d₅-phenol surrogate recoveries were acceptable.

C.2.6 Matrix Spike Compound Recovery

MS and MS duplicate recoveries were within QC limits for all spiked compounds. The relative percent difference (RPD) between duplicate analyses was within QC limits of less than 35% RPD.

C.2.7 Laboratory Control Sample (LCS) Recovery

LCS (blank spike) recoveries were within QC limits for all analytes.

C.2.8 Field Duplicate Sample Analysis

Samples R-SD1-LWCF-10-0000 and R-SD1-LWCF-10-1000 were submitted to the laboratory as blind field duplicates. The RPD between measurements was within QC criteria of less than 50% RPD.

C.2.9 Internal Standards

The following samples were reanalyzed (at higher dilution in some cases) due to d₁₂-perylene internal standard areas that were outside criteria:

Lab Batch	Sample
AP90	R-SD1-LWFF-10-0000
AQ07	R-SD1-LWOF016-10-0000
	R-SD1-LWOF10-10-0000
	R-SD1-LWOF10-10-0000E
	R-SD1-LWOF10-10-0000W

Results from both analyses were reported by the laboratory. Results from the re-analysis were used for data evaluation unless the sample was diluted. In cases of sample dilution, re-analysis results were used for analytes associated with the d₁₂-perylene internal standard and original results were used for all other analytes.

C.3 POLYCHLORINATED BIPHENYLS

C.3.1 Analytical Methods

Samples for PCB analysis were prepared using EPA Method 3550, ultrasonic extraction for soils, and were analyzed by gas chromatography/electron capture detection utilizing EPA Method 8081. The laboratory indicated that two samples, R-SD1-LWOF014-10-0000 and R-SD1-LWOF012-10-0000, possibly contained Aroclor 1262 in addition to Aroclor 1260. Samples were quantitated as Aroclor 1260. In addition, three samples (R-SD1-LWOF010-10-0000, R-SD1-LWOF010-10-0000E, and R-SD1-LWOF010W-10-0000) contained Aroclor 1268.

C.3.2 Sample Holding Times

All samples were prepared and analyzed within holding time limits of 14 days except samples R-SD1-LWCF-10-0000, R-SD1-LWCF-10-1000, and R-SD1-LWFF-10-0000 which were inadvertently not analyzed initially and were extracted 42 days after collection. Since samples

were archived by freezing, holding times may be extended to six months and no data qualification was required.

C.3.3 Laboratory Detection Limits

The laboratory achieved specified detection limits except for Aroclor 1254 in samples R-SD1-LWOF016-10-0000W and R-SD1-LWOF004-10-0000 which had slightly elevated detection limits due to analytical interferences in the samples. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.3.4 Blank Contamination

No target analytes were detected in laboratory or field blanks.

C.3.5 Surrogate Recovery

All surrogate compound recoveries were within advisory QC limits.

C.3.6 Matrix Spike Compound Recovery

MS and MS duplicate recoveries were within QC limits for all spiked compounds. The RPD between duplicate analyses was within QC limits of less than 35% RPD.

C.3.7 Laboratory Control Sample Recovery

LCS (blank spike) recoveries were within QC limits.

C.3.8 Field Duplicate Sample Analysis

Samples R-SD1-LWCF-0000 and R-SD1-LWCF-1000 were submitted to the laboratory as blind duplicates. The relative percent difference between results was acceptable.

C.4 METALS

C.4.1 Analytical Methods

Samples for mercury analysis were prepared using the EPA CLP SOW 4.0 method. Samples for other metals analysis were prepared using EPA Method 3050, acid digestion. Mercury was analyzed by EPA Method 7471, cold vapor AA. Antimony was analyzed by graphite furnace AA, EPA Method 7041. All other metals were determined by ICP spectroscopy, EPA Method 6010.

C.4.2 Sample Holding Times

All samples were prepared and analyzed within holding time limits of six months (28 days for mercury).

C.4.3 Laboratory Detection Limits

The laboratory achieved specified detection limits. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.4.4 Blank Contamination

No target analytes were detected in laboratory blanks except for the following:

Laboratory Batch	Analyte	Concentration (mg/kg)
AP90	Aluminum	3
AQ07	Aluminum	4
	Calcium	3
AQ20	Zinc	0.2

No action was required since sample concentrations were greater than five times the concentration detected in associated blanks.

C.4.5 Matrix Spike Analysis

MS recoveries met QC limits of 75-125% for all analytes except the following:

Laboratory Batch	Analyte	% Recovery
AP90	Antimony	17.6%
AQ07	Aluminum	72.5%
	Antimony	21.0%
	Chromium	- 94.2%
	Lead	- 39.1%
AQ20	Antimony	13.3%

Antimony results and reporting limits have been qualified as estimated (J/UJ) for all samples and may exhibit a low bias. Data were not qualified for aluminum, chromium, and lead in samples from batch AQ07 because laboratory duplicate results on the same sample indicate it is highly heterogeneous.

C.4.6 Laboratory Control Sample Recovery

LCS (blank spike) recoveries were within QC limits of 80-120%.

C.4.7 Laboratory Duplicate Sample Analysis

The RPD between replicate measurements met laboratory QC limits of less than 35% (where concentrations were greater than five times the detection limit) for all analytes except the following:

Laboratory Batch	Analyte	% RPD
AQ07	Cadmium	138%
	Chromium	131%
	Lead	156%

Data were qualified only for the sample used for laboratory duplicate analysis, R-SD1-LWOF016-10-0000, because based on MS results for this sample, it appeared to be very heterogeneous.

C.4.8 Field Duplicate Sample Analysis

Samples R-SD1-LWCF-10-0000 and R-SD1-LWCF-10-1000 were submitted to the laboratory as blind field duplicates. The RPD between measurements was within QC criteria of less than 50% RPD.

C.5 TOTAL ORGANIC CARBON

C.5.1 Analytical Methods

Samples for TOC were analyzed using EPA Method 9060.

C.5.2 Sample Holding Times

All samples were prepared and analyzed within holding time limits of 14 days for soil samples.

C.5.3 Laboratory Detection Limits

The laboratory achieved specified detection limits. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.5.4 Blank Contamination

No target analytes were detected in laboratory or field blanks.

C.5.5 Laboratory Control Sample Recovery

LCS (blank spike) recoveries were within QC limits of 80-120%.

C.5.6 Laboratory Duplicate Sample Analysis

The RPD between replicate measurements met laboratory QC limits of less than 35%.

C.5.7 Field Duplicate Sample Analysis

Samples R-SD1-LWCF-10-0000 and R-SD1-LWCF-10-1000 were submitted to the laboratory as blind field duplicates. The RPD between measurements was within QC criteria of less than 50% RPD.

C.6 PARTICLE SIZE DISTRIBUTION

C.6.1 Analytical Methods

Samples were analyzed using the PSEP modification to ASTM Method 422 (sieve plus pipette).

C.6.2 Sample Holding Times

All samples were cooled with ice or refrigerated from the time of collection until analysis. Analyses were performed within 14 days of sample collection.

C.6.3 Laboratory Triplicate Analysis

Laboratory triplicate analysis was performed on sample R-SD1-LWOF010-10-0000. The laboratory triplicate percent relative standard deviation was within QC limits of less than 25% for all fractions.

C.6.4 Field Duplicate Analysis

Samples R-SD1-LWOF010-10-0000 and R-SD1-LWOF010-10-1000 were submitted to the laboratory as blind field duplicates. The RPDs between duplicate measurements was within QC limits of 35 percent for all fractions.

C.6.5 Total Sample Recovery

Total combined sample percent recovery (sieve and pipette) was within QC limits of 95-105%.

C.7 DATA QUALIFIERS

The following qualifiers were used to modify the data quality and usefulness of individual analytical results.


U - The analyte was not detected at the given quantitation limit.

- J - The analyte was positively identified and detected; however, the concentration is an estimated value because the result is less than the quantitation limit or QC criteria were not met.
- UJ - The analyte was not detected; the associated quantitation limit is an estimated value.
- R - Data are rejected due to significant exceedance of QC criteria. The analyte may or may not be present. Additional sampling and analysis are required to determine.

C.8 DATA ASSESSMENT

Data review was performed by an experienced QA chemist independent of the analytical laboratory and not directly involved in the project.

This is to certify that I have examined the analytical data and based on the information provided to me by the laboratory, in my professional judgement the data are acceptable for use except where qualified with qualifiers which modify the usefulness of those individual values.

 _____ Roger McGinnis, PhD Senior Chemist	<u>11/27/99</u> Date
---	-------------------------



Analytical Resources, Incorporated
Analytical Chemists and Consultants

August 31, 1999

Roger McGinnis
Roy F. Weston, Inc.
Suite 5700
700 Fifth Ave
Seattle, WA 98103

RE: Project: Boeing Renton Sediment
ARI Job: AP90

Dear Roger:

Please find enclosed an original chain of custody (COC) record and a set of analytical results for the above referenced project. Analytical Resources, Inc. received eighteen sediment samples in good condition on August 12, 1999. Three samples were analyzed and the rest were archived as per the COC.

The samples were analyzed for total metals (PSDDA), semivolatiles (PSDDA), total organic carbon (PSDDA), and grain size (PSEP). The samples for grain size were subcontracted to Rosa Environmental and Geotechnical Laboratory (ROSA). Grain size for ARI jobs AQ07 and AQ20 have also been included. Aluminum was detected in the method blank.

No other analytical complications were noted for this delivery group. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Jennifer M. Baier
Project Manager
jennifer@arilabs.com

JMB/sl
Enclosure

Chain of Custody Record & Laboratory Analysis Request

AP90

117930 11810

Date: 8/11/99

Page 1 of 3

Number of coolers: 2

Cooler Temp: 6.0, 9.0



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: WESTON Phone#: (206) 521-7600

Client Contact: Roger McGinnis / Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, M. Shaw, S. Fernandez

							Analysis Required				Notes/Comments		
Sample ID	Date	Time	Matx	No Cont	Lab ID	metals, TOC, grain size, BMAs	ARCHIVE					Archived Samples: refrigerate Grain Size, freeze metals, BMAs, TOC	
1 R-SDI-LWOK015016-100	8/11/99	see field				4	X						
2 R-SDI-LWOK015016-200		logs				4	X						
3 R-SDI-LWOK015016-200W		at				4	X						
4 R-SDI-LWOS011012-200		Weston				4	X						
5 R-SDI-LWOS011012-100						4	X						
6 R-SDI-LWOS010-200						4	X						
7 R-SDI-LWOS006-200	8/11/99					4	X						

ARI Project No:	Relinquished by: (Signature) Allison Reak	Relinquished by: (Signature) [Signature]	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: ALLISON REAK	Printed Name: [Signature]	Printed Name:
Comments/Special Instructions:	Company: Roy F Weston	Company: ARI	Company:
	Date: 8/11/99 Time: 1832	Date: 8/12/99 Time: 7:15	Date: Time:
	Received by: (Signature) ARI locker	Received by: (Signature)	Received by: (Signature)
	Printed Name: Night drop off	Printed Name:	Printed Name:
	Company: ARI	Company:	Company:
	Date: 8/11/99 Time: 1832	Date: Time:	Date: Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Chain of Custody Record & Laboratory Analysis Request

Date: 8/11/99
 Page 2 of 3
 Number of coolers: 2
 Cooler Temp: _____



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: WESTON Phone#: 521-7600 ²⁰⁶

Client Contact: Roger McInnis / Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, M. Shaw, S. Fernandez

Analysis Required										Notes/Comments
metals, TOC	BNA's, grain size	ARCHIVE								
4	X									Archived Samples: refrigerate grain size, freeze metals, TOC, BNAs
4	X									
4	X									
4	X									
4										Analyze, do not archive
4										Analyze, do not archive
4	X									

K
L
M
N
A
B
O

Sample ID	Date	Time	Matx	No Cont	Lab ID
1 R-SDI-LW05004-275	8/11/99	see			
2 R-SDI-LWCF-200-0000N	↓	field logs			
3 R-SDI-LWCF-200-0000NE		at			
4 R-SDI-LWCF-200-0000E		weston			
5 R-SDI-LWCF-10-0000	↓				
6 R-SDI-LWCF-10-1000					
7 R-SDI-LW05-10-100	8/11/99				

ARI Project No:	Relinquished by: (Signature) <u>Allison Reak</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>ALLISON REAK</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>Roy F Weston</u>	Company:	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date:	Time:
	Received by: (Signature)	Received by: (Signature)	Received by: (Signature)
	Printed Name: <u>ARI Locker DROP</u>	Printed Name: <u>ZACH SANDLER</u>	Printed Name:
	Company: <u>ARI</u>	Company: <u>ARI</u>	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date: <u>8/12/99</u> Time: <u>7:15</u>	Date: Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

Date: 8/11/99
 Page 3 of 3
 Number of coolers: 2
 Cooler Temp: _____

ARI Client: WESTON ⁽²⁰⁶⁾ Phone#: 521-7600

Client Contact: Roger McGinnis / Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, M. Shaw, S. Fernandez

P
C
Q
R

Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required					Notes/Comments			
						Grain Size, TOC, metals, BMTs	ARCHIVE							
1 R-SDI-LWOS-006-10	8/11/99	see				4	X							
2 R-SDI-LWFF-10-0000	↓	weston field				4								Analyze, do not archive
3 R-SDI-LWOS-003-10	8/11/99	logs				4	X							
4 R-SDI-LWOS-006-100	8/11/99					4	X							
5														
6														
7														

ARI Project No:	Relinquished by: (Signature) <u>Allison Reak</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>ALLISON REAK</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>Ron F. Weston</u>	Company:	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date: _____ Time: _____	Date: _____ Time: _____
	Received by: (Signature)	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature)
	Printed Name: <u>ARI LOCKER DROP</u>	Printed Name: <u>ARI LOCKER DROP</u>	Printed Name:
	Company: <u>ARI</u>	Company: <u>ARI</u>	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date: <u>8/12/99</u> Time: <u>7:15</u>	Date: _____ Time: _____

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.



SOIL SEMIVOLATILE SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: AP90-Roy F. Weston

Project: BOEING

3709-066-020-2100

Client ID	NBZ	FBP	TPH	PHL	2FP	TBP	2CP	DCB	TOT OUT
Method Blank	70.6%	72.1%	101%	69.2%	84.8%	63.1%	69.7%	73.1%	0
Lab Control	84.1%	80.0%	94.0%	80.9%	101%	72.8%	83.7%	85.4%	0
R-SD1-LWCF-10-0000	74.2%	83.2%	89.4%	83.1%	94.0%	89.0%	79.1%	67.1%	0
R-SD1-LWCF-10-00-MS	65.0%	76.6%	80.6%	72.5%	84.0%	104%	73.2%	44.2%	0
R-SD1-LWCF-10-00-SD	66.3%	81.9%	72.2%	69.2%	81.6%	78.3%	68.6%	58.5%	0
R-SD1-LWCF-10-1000	70.7%	80.0%	84.1%	73.9%	86.9%	93.6%	73.5%	62.2%	0
R-SD1-LWFF-10-0000	74.1%	89.9%	90.2%	78.1%	95.3%	107%	78.3%	59.0%	0
R-SD1-LWFF-10-0000-R74.5%	74.5%	82.3%	87.4%	75.6%	83.3%	105%	73.5%	55.8%	0

LCS/MB LIMITS QC LIMITS

(NBZ) = Nitrobenzene-d5	(20-120)	(35-120)
(FBP) = 2-Fluorobiphenyl	(29-120)	(49-120)
(TPH) = p-Terphenyl-d14	(45-123)	(44-131)
(PHL) = Phenol-d5	(17-120)	(37-120)
(2FP) = 2-Fluorophenol	(23-120)	(39-120)
(TBP) = 2,4,6-Tribromophenol	(17-134)	(54-126)
(2CP) = 2-Chlorophenol-d4	(21-120)	(36-120)
(DCB) = 1,2-Dichlorobenzene-d4	(30-120)	(29-120)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS



Sample No: R-SD1-LWCF-10-0000

ANALYTICAL
RESOURCES
INCORPORATED

Page 1 of 1

Lab Sample ID: AP90A

QC Report No: AP90-Roy F. Weston

LIMS ID: 99-11793

Project: BOEING

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *AWB*

Date Sampled: 08/11/99

Reported: 08/24/99

Date Received: 08/12/99

Date extracted: 08/16/99

Sample Amount: 51.9 g-dry-wt

Date analyzed: 08/18/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 38.9%

pH: 7.3

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	23
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	58
129-00-0	Pyrene	42
56-55-3	Benzo (a) anthracene	20
117-81-7	bis (2-Ethylhexyl) phthalate	270
218-01-9	Chrysene	37
205-99-2	Benzo (b) fluoranthene	32
207-08-9	Benzo (k) fluoranthene	22
50-32-8	Benzo (a) pyrene	22
193-39-5	Indeno (1,2,3-cd) pyrene	20
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	26

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.2%	d5-Phenol	83.1%
2-Fluorobiphenyl	83.2%	2-Fluorophenol	94.0%
d14-p-Terphenyl	89.4%	2,4,6-Tribromophenol	89.0%
d4-1,2-Dichlorobenzene	67.1%	d4-2-Chlorophenol	79.1%

rum
8/31/99

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AP90C

LIMS ID: 99-11795

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 08/24/99



Sample No: R-SD1-LWFF-10-0000

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AP90-

Project: BOEING

3709-066-020-2100

Date Sampled: 08/11/99

Date Received: 08/12/99

Date extracted: 08/16/99

Date analyzed: 08/18/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 51.7 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 39.2%

pH: 7.2

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	53
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	160
129-00-0	Pyrene	88
56-55-3	Benzo (a) anthracene	47
117-81-7	bis (2-Ethylhexyl) phthalate	300
218-01-9	Chrysene	90
205-99-2	Benzo (b) fluoranthene	69
207-08-9	Benzo (k) fluoranthene	55
50-32-8	Benzo (a) pyrene	43
193-39-5	Indeno (1,2,3-cd) pyrene	24
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	27

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.1%	d5-Phenol	78.1%
2-Fluorobiphenyl	89.9%	2-Fluorophenol	95.3%
d14-p-Terphenyl	90.2%	2,4,6-Tribromophenol	107%
d4-1,2-Dichlorobenzene	59.0%	d4-2-Chlorophenol	78.3%

*use reanalysis
internal std recovery
outside limits*

*run
8/31/99*

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



Sample No: R-SD1-LWFF-10-0000
 REANALYSIS

ANALYTICAL
 RESOURCES
 INCORPORATED

Page 1 of 1

Lab Sample ID: AP90C

QC Report No: AP90-

LIMS ID: 99-11795

Project: BOEING

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *MB*

Date Sampled: 08/11/99

Reported: 08/24/99

Date Received: 08/12/99

Date extracted: 08/16/99

Sample Amount: 51.7 g-dry-wt

Date analyzed: 08/20/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 39.2%

pH: 7.2

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	45
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	25 <i>u</i>
206-44-0	Fluoranthene	130
129-00-0	Pyrene	93
56-55-3	Benzo(a)anthracene	45
117-81-7	bis(2-Ethylhexyl)phthalate	310
218-01-9	Chrysene	84
205-99-2	Benzo(b)fluoranthene	90
207-08-9	Benzo(k)fluoranthene	44
50-32-8	Benzo(a)pyrene	45
193-39-5	Indeno(1,2,3-cd)pyrene	28
53-70-3	Dibenz(a,h)anthracene	19 U
191-24-2	Benzo(g,h,i)perylene	34

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.5%	d5-Phenol	75.6%
2-Fluorobiphenyl	82.3%	2-Fluorophenol	83.3%
d14-p-Terphenyl	87.4%	2,4,6-Tribromophenol	105%
d4-1,2-Dichlorobenzene	55.8%	d4-2-Chlorophenol	73.5%

Rnm
8/31/99

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AP90B

LIMS ID: 99-11794

Matrix: Sediment

Data Release Authorized: *MS*

Reported: 08/24/99



Sample No: R-SD1-LWCF-10-1000

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AP90-Roy F. Weston

Project: BOEING

3709-066-020-2100

Date Sampled: 08/11/99

Date Received: 08/12/99

Date extracted: 08/16/99

Date analyzed: 08/18/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 52.7 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 44.5%

pH: 7.2

CAS Number	Analyte	ug/kg
108-95-2	Phenol	38 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	40
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	87
129-00-0	Pyrene	61
56-55-3	Benzo(a)anthracene	34
117-81-7	bis(2-Ethylhexyl)phthalate	450
218-01-9	Chrysene	59
205-99-2	Benzo(b)fluoranthene	36
207-08-9	Benzo(k)fluoranthene	39
50-32-8	Benzo(a)pyrene	33
193-39-5	Indeno(1,2,3-cd)pyrene	28
53-70-3	Dibenz(a,h)anthracene	19 U
191-24-2	Benzo(g,h,i)perylene	27

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	70.7%	d5-Phenol	73.9%
2-Fluorobiphenyl	80.0%	2-Fluorophenol	86.9%
d14-p-Terphenyl	84.1%	2,4,6-Tribromophenol	93.6%
d4-1,2-Dichlorobenzene	62.2%	d4-2-Chlorophenol	73.5%

Rnm
8/31/99

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS
Page 1 of 1



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AP90A
LIMS ID: 99-11793
Matrix: Sediment
Data Release Authorized: *MB*
Reported: 08/24/99

Sample No: R-SD1-LWCF-10-0000
QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100
Date Received: 08/12/99

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 08/16/99
Date analyzed: 08/18/99

CONSTITUENT		SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE						
Phenol	<	38.5	516	722	71.5%	
Acenaphthene	<	19.3	429	481	89.2%	
Pyrene		42.5	462	481	87.2%	
Benzo(g,h,i)perylene		26.2	576	481	114%	

MATRIX SPIKE DUPLICATE

Phenol	<	38.5	487	722	67.5%	5.7%
Acenaphthene	<	19.3	407	481	84.6%	5.3%
Pyrene		42.5	400	481	74.3%	16%
Benzo(g,h,i)perylene		26.2	526	481	104%	9.5%

Values reported in ug/kg-dry-weight

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AP90A-MS

LIMS ID: 99-11793

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 08/24/99



Sample No: R-SD1-LWCF-10-0000
MATRIX SPIKE

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AP90-Roy F. Weston

Project: BOEING

3709-066-020-2100

Date Sampled: 08/11/99

Date Received: 08/12/99

Date extracted: 08/16/99

Date analyzed: 08/18/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 52.0 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 38.9%

pH: 7.3

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	28
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	21
206-44-0	Fluoranthene	68
129-00-0	Pyrene	---
56-55-3	Benzo (a) anthracene	22
117-81-7	bis (2-Ethylhexyl) phthalate	240
218-01-9	Chrysene	44
205-99-2	Benzo (b) fluoranthene	31
207-08-9	Benzo (k) fluoranthene	26
50-32-8	Benzo (a) pyrene	24
193-39-5	Indeno (1,2,3-cd) pyrene	22
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	65.0%	d5-Phenol	72.5%
2-Fluorobiphenyl	76.6%	2-Fluorophenol	84.0%
d14-p-Terphenyl	80.6%	2,4,6-Tribromophenol	104%
d4-1,2-Dichlorobenzene	44.2%	d4-2-Chlorophenol	73.2%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS



Sample No: R-SD1-IWCF-10-0000
SPIKE DUPLICATE

ANALYTICAL
RESOURCES
INCORPORATED

Page 1 of 1

Lab Sample ID: AP90A-MSD

QC Report No: AP90-Roy F. Weston

LIMS ID: 99-11793

Project: BOEING

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *AP*

Date Sampled: 08/11/99

Reported: 08/24/99

Date Received: 08/12/99

Date extracted: 08/16/99

Sample Amount: 52.0 g-dry-wt

Date analyzed: 08/18/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 38.9%

pH: 7.3

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	32
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	62
129-00-0	Pyrene	---
56-55-3	Benzo (a) anthracene	23
117-81-7	bis (2-Ethylhexyl) phthalate	300
218-01-9	Chrysene	43
205-99-2	Benzo (b) fluoranthene	28
207-08-9	Benzo (k) fluoranthene	29
50-32-8	Benzo (a) pyrene	22
193-39-5	Indeno (1,2,3-cd) pyrene	21
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	66.3%	d5-Phenol	69.2%
2-Fluorobiphenyl	81.9%	2-Fluorophenol	81.6%
d14-p-Terphenyl	72.2%	2,4,6-Tribromophenol	78.3%
d4-1,2-Dichlorobenzene	58.5%	d4-2-Chlorophenol	68.6%

ORGANICS ANALYSIS DATA SHEET



**ANALYTICAL
RESOURCES
INCORPORATED**

Semivolatiles by GC/MS

Sample No: Method Blank

Page 1 of 1

Lab Sample ID: AP90MB

QC Report No: AP90-Roy F. Weston

LIMS ID: 99-11793

Project: BOEING

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *MS*

Date Sampled: NA

Reported: 08/24/99

Date Received: NA

Date extracted: 08/16/99

Sample Amount: 50.0 g-dry-wt Equiv

Date analyzed: 08/18/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: NA

pH: NA

CAS Number	Analyte	ug/kg
108-95-2	Phenol	40 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	20 U
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	20 U
129-00-0	Pyrene	20 U
56-55-3	Benzo (a) anthracene	20 U
117-81-7	bis (2-Ethylhexyl) phthalate	20 U
218-01-9	Chrysene	20 U
205-99-2	Benzo (b) fluoranthene	20 U
207-08-9	Benzo (k) fluoranthene	20 U
50-32-8	Benzo (a) pyrene	20 U
193-39-5	Indeno (1,2,3-cd) pyrene	20 U
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	20 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	70.6%	d5-Phenol	69.2%
2-Fluorobiphenyl	72.1%	2-Fluorophenol	84.8%
d14-p-Terphenyl	101%	2,4,6-Tribromophenol	63.1%
d4-1,2-Dichlorobenzene	73.1%	d4-2-Chlorophenol	69.7%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS
Page 1 of 1



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AP90SB
LIMS ID: 99-11793
Matrix: Sediment

QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100

Data Release Authorized: *AS*
Reported: 08/24/99

LABORATORY CONTROL SAMPLE

Date extracted: 08/16/99
Date analyzed: 08/18/99

CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY
Phenol	610	750	81.3%
Acenaphthene	424	500	84.8%
Pyrene	474	500	94.8%
Benzo(g,h,i)perylene	593	500	119%

Lab Control Surrogate Recovery

d5-Nitrobenzene	84.1%	d5-Phenol	80.9%
2-Fluorobiphenyl	80.0%	2-Fluorophenol	101%
d14-p-Terphenyl	94.0%	2,4,6-Tribromophenol	72.8%
d4-1,2-Dichlorobenzene	85.4%	d4-2-Chlorophenol	83.7%

Values reported in ug/kg-dry-weight



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWCF-10-0000

Lab Sample ID: AP90A
LIMS ID: 99-11793
Matrix: Sediment

QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *LR*
Reported: 08/25/99

Percent Total Solids: 60.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/16/99	6010	08/20/99	7429-90-5	Aluminum	2	23,000
3050	08/16/99	7041	08/20/99	7440-36-0	Antimony	0.08	0.12 <i>J</i>
3050	08/16/99	6010	08/20/99	7440-38-2	Arsenic	4	4 U
3050	08/16/99	6010	08/20/99	7440-41-7	Beryllium	0.08	0.36
3050	08/16/99	6010	08/20/99	7440-43-9	Cadmium	0.2	0.4
3050	08/16/99	6010	08/20/99	7440-47-3	Chromium	0.4	37.2
3050	08/16/99	6010	08/20/99	7440-50-8	Copper	0.2	31.2
3050	08/16/99	6010	08/20/99	7439-89-6	Iron	2	30,100
3050	08/16/99	6010	08/20/99	7439-92-1	Lead	2	12
CLP	08/16/99	7471	08/18/99	7439-97-6	Mercury	0.02	0.07
3050	08/16/99	6010	08/20/99	7440-02-0	Nickel	0.8	31.6
3050	08/16/99	6010	08/20/99	7782-49-2	Selenium	4	6
3050	08/16/99	6010	08/20/99	7440-22-4	Silver	0.2	0.2 U
3050	08/16/99	6010	08/20/99	7440-28-0	Thallium	4	4 U
3050	08/16/99	6010	08/20/99	7440-66-6	Zinc	0.3	81.7

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

RHM
8/31/99



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWCF-10-1000

Lab Sample ID: AP90B
LIMS ID: 99-11794
Matrix: Sediment

QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *LR*
Reported: 08/25/99

Percent Total Solids: 51.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/16/99	6010	08/20/99	7429-90-5	Aluminum	2	25,900
3050	08/16/99	7041	08/20/99	7440-36-0	Antimony	0.10	0.18 J
3050	08/16/99	6010	08/20/99	7440-38-2	Arsenic	5	5 U
3050	08/16/99	6010	08/20/99	7440-41-7	Beryllium	0.10	0.42
3050	08/16/99	6010	08/20/99	7440-43-9	Cadmium	0.2	0.5
3050	08/16/99	6010	08/20/99	7440-47-3	Chromium	0.5	40.8
3050	08/16/99	6010	08/20/99	7440-50-8	Copper	0.2	36.4
3050	08/16/99	6010	08/20/99	7439-89-6	Iron	2	33,300
3050	08/16/99	6010	08/20/99	7439-92-1	Lead	2	12
CLP	08/16/99	7471	08/18/99	7439-97-6	Mercury	0.02	0.08
3050	08/16/99	6010	08/20/99	7440-02-0	Nickel	1.0	33.4
3050	08/16/99	6010	08/20/99	7782-49-2	Selenium	5	7
3050	08/16/99	6010	08/20/99	7440-22-4	Silver	0.3	0.3 U
3050	08/16/99	6010	08/20/99	7440-28-0	Thallium	5	7
3050	08/16/99	6010	08/20/99	7440-66-6	Zinc	0.4	85.2

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

RMM
8/31/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWFF-10-0000

Lab Sample ID: AP90C
LIMS ID: 99-11795
Matrix: Sediment

QC Report No: AP90-
Project: BOEING
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *SM*
Reported: 08/25/99

Percent Total Solids: 54.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/16/99	6010	08/23/99	7429-90-5	Aluminum	2	17,200
3050	08/16/99	7041	08/20/99	7440-36-0	Antimony	0.09	0.19 J
3050	08/16/99	6010	08/23/99	7440-38-2	Arsenic	5	5 U
3050	08/16/99	6010	08/23/99	7440-41-7	Beryllium	0.09	0.26
3050	08/16/99	6010	08/23/99	7440-43-9	Cadmium	0.2	0.3
3050	08/16/99	6010	08/23/99	7440-47-3	Chromium	0.5	28.3
3050	08/16/99	6010	08/23/99	7440-50-8	Copper	0.2	20.1
3050	08/16/99	6010	08/23/99	7439-89-6	Iron	2	24,400
3050	08/16/99	6010	08/23/99	7439-92-1	Lead	2	11
CLP	08/16/99	7471	08/18/99	7439-97-6	Mercury	0.02	0.04
3050	08/16/99	6010	08/23/99	7440-02-0	Nickel	0.9	24.8
3050	08/16/99	6010	08/23/99	7782-49-2	Selenium	5	5 U
3050	08/16/99	6010	08/23/99	7440-22-4	Silver	0.3	0.3 U
3050	08/16/99	6010	08/23/99	7440-28-0	Thallium	5	5 U
3050	08/16/99	6010	08/23/99	7440-66-6	Zinc	0.4	72.2

U Analyte undetected at given RL

RL Reporting Limit

run
8/31/99


INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AP90A
LIMS ID: 99-11793
Matrix: Sediment

Sample No: R-SD1-LWCF-10-0000
QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100
Date Received: 08/12/99

Data Release Authorized: 
Reported: 08/25/99

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	23000	24800	206	874%	H
Antimony	7041	0.12	1.57	8.26	17.6%	N
Arsenic	6010	4 U	189	206	91.7%	
Beryllium	6010	0.36	4.16	4.13	92.0%	
Cadmium	6010	0.4	8.7	8.3	100%	
Chromium	6010	37.2	58.3	20.6	102%	
Copper	6010	31.2	39.5	8.3	100%	
Iron	6010	30100	31200	206	534%	H
Lead	6010	12	88	83	91.6%	
Mercury	7471	0.07	0.22	0.16	93.8%	
Nickel	6010	31.6	68.6	41.3	89.6%	
Selenium	6010	6	202	206	95.1%	
Silver	6010	0.2 U	18.7	20.6	90.8%	
Thallium	6010	4 U	193	206	93.7%	
Zinc	6010	81.7	121	41.3	95.2%	

'Q' codes: N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AP90A
LIMS ID: 99-11793
Matrix: Sediment

Sample No: R-SD1-LWCF-10-0000
QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100

Date Received: 08/12/99

Data Release Authorized: *LR*
Reported: 08/25/99

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Aluminum	6010	23000	21900	4.9%	+/- 20 %	
Antimony	7041	0.12	0.13	8.0%	+/- 0.08	L
Arsenic	6010	4 U	4 U	0.0%	+/- 4	L
Beryllium	6010	0.36	0.36	0.0%	+/- 0.08	L
Cadmium	6010	0.4	0.4	0.0%	+/- 0.2	L
Chromium	6010	37.2	34.2	8.4%	+/- 20 %	
Copper	6010	31.2	31.8	1.9%	+/- 20 %	
Iron	6010	30100	29800	1.0%	+/- 20 %	
Lead	6010	12	12	0.0%	+/- 20 %	
Mercury	7471	0.07	0.08	13.3%	+/- 0.02	L
Nickel	6010	31.6	29.6	6.5%	+/- 20 %	
Selenium	6010	6	7	15.4%	+/- 4	L
Silver	6010	0.2 U	0.2 U	0.0%	+/- 0.2	L
Thallium	6010	4 U	6	40.0%	+/- 4	L
Zinc	6010	81.7	79.5	2.7%	+/- 20 %	

'Q' codes:

* = control limit not met

L = RPD not valid, alternate limit = detection limit




INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: AP90MB
LIMS ID: 99-11793
Matrix: Sediment

QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100
Date Sampled: NA
Date Received: NA

Data Release Authorized: 
Reported: 08/25/99

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/16/99	6010	08/23/99	7429-90-5	Aluminum	1	3
3050	08/16/99	7041	08/20/99	7440-36-0	Antimony	0.05	0.05 U
3050	08/16/99	6010	08/23/99	7440-38-2	Arsenic	2	2 U
3050	08/16/99	6010	08/23/99	7440-41-7	Beryllium	0.05	0.05 U
3050	08/16/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.1 U
3050	08/16/99	6010	08/23/99	7440-47-3	Chromium	0.2	0.2 U
3050	08/16/99	6010	08/23/99	7440-50-8	Copper	0.1	0.1 U
3050	08/16/99	6010	08/23/99	7439-89-6	Iron	1	1 U
3050	08/16/99	6010	08/23/99	7439-92-1	Lead	1	1 U
CLP	08/16/99	7471	08/18/99	7439-97-6	Mercury	0.01	0.01 U
3050	08/16/99	6010	08/23/99	7440-02-0	Nickel	0.5	0.5 U
3050	08/16/99	6010	08/23/99	7782-49-2	Selenium	2	2 U
3050	08/16/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/16/99	6010	08/23/99	7440-28-0	Thallium	2	2 U
3050	08/16/99	6010	08/23/99	7440-66-6	Zinc	0.2	0.2 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AP90LCS
LIMS ID: 99-11793
Matrix: Sediment

QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100

Data Release Authorized: *WJ*
Reported: 08/25/99

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	129	125	103%	
Antimony	7041	4.2	5.0	84.0%	
Arsenic	6010	124	125	99.2%	
Beryllium	6010	2.36	2.50	94.4%	
Cadmium	6010	4.9	5.0	98.0%	
Chromium	6010	11.8	12.5	94.4%	
Copper	6010	4.7	5.0	94.0%	
Iron	6010	122	125	97.6%	
Lead	6010	49	50	98.0%	
Mercury	7471	0.19	0.20	95.0%	
Nickel	6010	25.2	25.0	101%	
Selenium	6010	128	125	102%	
Silver	6010	12.4	12.5	99.2%	
Thallium	6010	121	125	96.8%	
Zinc	6010	25.2	25.0	101%	

'Q' codes: N = control limit not met

Control Limits: 80-120%



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWCF-10-0000

Lab Sample ID: AP90A

QC Report No: AP90-Roy F. Weston

LIMS ID: 99-11793

Project: BOEING

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *MP*

Date Sampled: 08/11/99

Reported: 08/30/99 Dr. M.A. Perkins

Date Received: 08/12/99

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/17/99 081799#1	EPA 160.3 SM 2540 B		0.01	Percent	58.1
Total Organic Carbon	08/23/99 082399#1	Plumb, 1981		0.0050	Percent	1.4

RM
8/31/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AP90 received 08/12/99



**ANALYTICAL
RESOURCES
INCORPORATED**

**Final Report
Laboratory Analysis of Conventional Parameters**

Sample No: R-SD1-LWCF-10-1000

Lab Sample ID: AP90B QC Report No: AP90-Roy F. Weston
LIMS ID: 99-11794 Project: BOEING
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/11/99
Data Release Authorized: *MP* Date Received: 08/12/99
Reported: 08/30/99 Dr. M.A. Perkins

<u>Analyte</u>	<u>Analysis</u>		<u>Dilution</u>		<u>Units</u>	<u>Result</u>
	<u>Date/Batch</u>	<u>Method</u>	<u>Factor</u>	<u>RL</u>		
Total Solids	08/17/99 081799#1	EPA 160.3 SM 2540 B	0.01		Percent	52.7
Total Organic Carbon	08/23/99 082399#1	Plumb, 1981	0.0050		Percent	1.8

*RHM
8/31/99*

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AP90 received 08/12/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWFF-10-0000

Lab Sample ID: AP90C
LIMS ID: 99-11795
Matrix: Sediment

QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100

Data Release Authorized: *MB* Date Sampled: 08/11/99
Reported: 08/30/99 Dr. M.A. Perkins Date Received: 08/12/99

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/17/99	EPA 160.3		0.01	Percent	55.4
	081799#1	SM 2540 B				
Total Organic Carbon	08/23/99	Plumb, 1981		0.0050	Percent	2.1
	082399#1					

Rnm
8/31/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AP90 received 08/12/99



QA Report - Method Blank Analysis

Matrix: Sediment

QC Report No: AP90-Roy F. Weston

Project: BOEING

3709-066-020-2100

Date Received: NA

Data Release Authorized: *MP*
Reported: 08/30/99 Dr. M.A. Perkins

**METHOD BLANK RESULTS
CONVENTIONALS**

Analysis			
Date & Batch	Constituent	Units	Result
Method Blank			
08/17/99 081799#1	Total Solids	mg residue	< 1.00 U
Method Blank			
08/23/99 082399#1	Total Organic Carbon	Percent	<0.0050 U



ANALYTICAL
RESOURCES
INCORPORATED

QA Report - Standard Reference Material Analysis

QC Report No: AP90-Roy F. Weston

Project: BOEING

3709-066-020-2100

Date Received: NA

Data Release Authorized: *MB*

Reported: 08/30/99 Dr. M.A. Perkins

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Value</u>	<u>True Value</u>	<u>Recovery</u>
NBS #2704				
Total Organic Carbon	Percent	3.12	3.35	93.1%

Date analyzed: 08/23/99 Batch ID: 082399#1



QA Report - Replicate Analysis

Matrix: Sediment
QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100
Date Received: 08/12/99
Data Release Authorized *MB*
Reported: 08/30/99 Dr. M.A. Perkins

**REPLICATE ANALYSIS RESULTS
CONVENTIONALS**

<u>Constituent</u>	<u>Units</u>	<u>Sample Value</u>	<u>Replicate Value (s)</u>	<u>RPD/RSD</u>
ARI ID: 99-11793, AP90 A		Client Sample ID: R-SD1-LWCF-10-0000		
Total Solids	Percent	58.1	58.4 58.9	RSD: 0.7%
Total Organic Carbon	Percent	1.4	1.5 1.5	RSD: 3.9%



ANALYTICAL
RESOURCES
INCORPORATED

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

Matrix: Sediment
QC Report No: AP90-Roy F. Weston
Project: BOEING
3709-066-020-2100
Date Received: 08/12/99
Data Release Authorized: *MB*
Reported: 08/30/99 Dr. M.A. Perkins

MATRIX SPIKE/MATRIX SPIKE DUP. QA/QC REPORT
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Sample Value</u>	<u>Spike Value</u>	<u>Spike Added</u>	<u>Recovery</u>
ARI ID: 99-11793, AP90 A Client Sample ID: R-SD1-LWCF-10-0000					
Total Organic Carbon MS	Percent	1.44	4.75	2.78	119%
Total Organic Carbon MSD	Percent	1.44	4.31	2.78	103%

MS/MSD Recovery Limits: 75 - 125 %

REG Lab WMBE
Rosa Environmental & Geotechnical Laboratory, LLC

815 Harrison Street, #100
Seattle, WA 98109-5187
(206) 287-9122

August 26, 1999

Ms. Jennifer Baier
Analytical Resources, Inc.
400 Ninth Avenue North
Seattle, WA 98109

Regarding: ARI Project No. AP90, AQ07, AQ20; REGL Project No. 1000-179

Dear Ms. Baier,

Samples from the referenced project were received for grain size analysis on August 12, 13, and 16, 1999, in good condition. The analysis was complete on August 25, 1999. The report consists of the attached tables, plots, and QA summary. A copy of the chain of custody is attached for your information. Please call me if you have any questions or comments on the data or its presentation.

Best Regards,
Rosa Environmental & Geotechnical Laboratory, LLC


Harold Benny
QA Manager

Client: Roy F. Weston Company	REGL Project No.: 1000-179
Client Project No.: 3709-066-020-2100	Sample Batch No.: 1000-179-01

Case Narrative

1. Samples were received on August 12, 13 and 16, 1999, and were in good condition. The samples consisted of 8 and 4 oz jars.
2. The samples were tested for grain size distribution according to PSEP methods. A triplicate was run on one sample in the batch, and is reported in the attached QA summary.
3. PSEP protocol requires that the amount of material in the pipette portion of the analysis be between 5 and 25 grams. The following samples did not meet this requirement. Listed is the amount in the pipette portion, if run.
 - R-SD1-LWOF14-10-0000, 3.8 grams, reported but flagged.
 - R-SD1-LWOF12-10-0000W, fines not reported.
 - R-SD1-LWOF004-10-0000, fines not reported.
 - R-SD1-LWOF004-10-0000W, 2.7 grams, reported but flagged.
 - R-SD1-LWOF11-10-0000, fines not reported.
 - R-SD1-LWOF11-10-0000E, 4.3 grams, reported but flagged.
 - R-SD1-LWOF004-10-0000E, fines not reported.
 - R-SD1-LWOF003-10-0000, fines not reported.
 - R-SD1-LWOF003-10-0000E, fines not reported.
 - R-SD1-LWOF003-10-0000W, 2.8 grams, reported but flagged.
4. Samples R-SD1-LWOF16-10-0000 and R-SD1-LWOF14-10-0000E had a "sour" odor.
5. There were no other anomalies to the samples or testing.

Approved by:
Title:



Laboratory Manager

Date: 9/26/99

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand		Coarse Sand		Medium Sand		Fine Sand		Very Fine Sand		Coarse Silt	Medium Silt	Fine Silt	Very Fine Clay		< 10		
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10			< 10			
Sieve Size (microns)	> #10	(2000)	10 to 18	(2000-1000)	18-35	(1000-500)	35-60	(500-250)	60-120	(250-125)	120-230	(125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0
R-SD1-LWOF010-10-0000 A	0.00		0.27		2.06		4.12		6.80		14.88		28.91	20.46	11.62	5.51	2.15	0.94	2.27
R-SD1-LWOF010-10-0000 B	0.00		0.39		2.55		4.43		7.53		16.11		26.03	20.21	11.72	5.38	2.37	0.96	2.31
R-SD1-LWOF010-10-0000 C	0.38		0.33		2.47		5.38		8.13		16.03		25.15	19.60	11.58	5.43	2.32	0.76	2.48
R-SD1-LWCF-10-0000	0.22		1.45		6.05		15.11		11.08		10.30		18.99	17.83	10.64	3.98	1.77	0.79	1.80
R-SD1-LWCF-10-1000	0.41		0.64		2.94		5.58		5.70		13.52		26.71	23.63	11.12	4.52	1.79	0.90	2.52
R-SD1-LWFF-10-0000	0.94		1.20		5.52		23.74		30.72		14.58		9.89	5.85	3.28	1.87	0.77	0.20	1.44
R-SD1-LWOF16-10-0000	17.22		7.83		16.38		30.15		14.88		4.26		4.90	1.06	0.56	0.31	0.13	0.32	0.30
R-SD1-LWOF16-10-0000W	7.92		5.88		15.70		32.39		20.40		9.00		5.36	1.67	0.81	0.48	0.24	0.03	0.32
R-SD1-LWOF14-10-0000	33.12		11.47		18.28		22.89		9.49		2.17		1.22	0.63	0.31	0.18	0.06	0.00	0.20
R-SD1-LWOF14-10-0000E	46.67		11.67		13.01		15.61		6.75		4.43		0.00	0.85	0.40	0.29	0.13	0.00	0.24
R-SD1-LWOF12-10-0000	58.22		8.67		10.40		12.13		5.46		0.80		3.64	0.18	0.17	0.13	0.00	0.16	0.22
R-SD1-LWOF12-10-0000W	67.75		10.32		8.01		8.72		3.97		1.23		0.73	0.00	0.00	0.00	0.00	0.00	0.00
R-SD1-LWOF004-10-0000	13.34		11.41		31.18		34.37		6.39		1.41		0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-SD1-LWOF004-10-0000W	14.46		11.69		22.38		35.35		11.29		2.54		1.52	0.46	0.11	0.04	0.02	0.01	0.13
R-SD1-LWOF11-10-0000	54.14		12.72		13.43		12.14		5.58		1.12		0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-SD1-LWOF11-10-0000E	45.96		10.61		13.89		16.42		7.87		1.90		1.64	0.56	0.38	0.30	0.17	0.00	0.30
R-SD1-LWOF004-10-0000E	26.23		9.62		27.33		28.43		6.24		2.11		0.05	0.00	0.00	0.00	0.00	0.00	0.00
R-SD1-LWOF010-10-0000E	1.82		1.59		4.42		6.89		6.94		10.79		24.09	20.35	12.23	5.40	2.35	1.01	2.12
R-SD1-LWOF010-10-0000W	0.02		0.09		1.48		1.82		3.70		10.63		27.50	25.37	15.50	7.04	2.71	1.55	2.58
R-SD1-LWOF003-10-0000	5.44		7.34		24.41		47.45		14.92		0.44		0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-SD1-LWOF003-10-0000E	0.40		2.50		20.78		62.45		13.43		0.37		0.08	0.00	0.00	0.00	0.00	0.00	0.00
R-SD1-LWOF003-10-0000W	6.99		5.64		17.73		42.58		23.89		0.91		2.12	0.00	0.00	0.05	0.00	0.00	0.15

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
	Phi Size	-3	-2						-1	0	1	2	3	4
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
R-SD1-LWOF010-10-0000 A	100.0	100.0	100.0	99.7	97.7	93.5	86.7	71.9	43.0	22.5	10.9	5.4	3.2	2.3
R-SD1-LWOF010-10-0000 B	100.0	100.0	100.0	99.6	97.1	92.6	85.1	69.0	42.9	22.7	11.0	5.6	3.3	2.3
R-SD1-LWOF010-10-0000 C	100.0	100.0	99.6	99.3	96.8	91.4	83.3	67.3	42.1	22.5	11.0	5.5	3.2	2.5
R-SD1-LWCF-10-0000	100.0	100.0	99.8	98.3	92.3	77.2	66.1	55.8	36.8	19.0	8.3	4.4	2.6	1.8
R-SD1-LWCF-10-1000	100.0	100.0	99.6	98.9	96.0	90.4	84.7	71.2	44.5	20.9	9.7	5.2	3.4	2.5
R-SD1-LWFF-10-0000	100.0	100.0	99.1	97.9	92.3	68.6	37.9	23.3	13.4	7.6	4.3	2.4	1.6	1.4
R-SD1-LWOF16-10-0000	100.0	91.5	82.8	75.0	56.6	26.4	11.5	7.3	2.4	1.3	0.8	0.5	0.3	0.3
R-SD1-LWOF16-10-0000W	100.0	96.0	92.1	86.4	70.7	38.3	17.9	8.9	3.6	1.9	1.1	0.6	0.4	0.3
<i>R-SD1-LWOF14-10-0000</i>	<i>100.0</i>	<i>83.9</i>	<i>66.9</i>	<i>55.4</i>	<i>37.1</i>	<i>14.2</i>	<i>4.7</i>	<i>2.6</i>	<i>1.4</i>	<i>0.7</i>	<i>0.4</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>
R-SD1-LWOF14-10-0000E	100.0	74.1	53.3	41.7	28.7	13.0	6.3	3.6	1.9	1.0	0.6	0.3	0.2	0.2
R-SD1-LWOF12-10-0000	100.0	58.8	41.8	33.1	22.7	10.6	5.1	4.3	0.7	0.5	0.3	0.2	0.2	0.2
R-SD1-LWOF12-10-0000W	100.0	56.6	32.3	21.9	13.9	5.2	1.2	0.7	NA	NA	NA	NA	NA	NA
R-SD1-LWOF004-10-0000	100.0	93.9	86.7	75.2	44.1	9.7	3.3	1.9	NA	NA	NA	NA	NA	NA
<i>R-SD1-LWOF004-10-0000W</i>	<i>100.0</i>	<i>94.4</i>	<i>85.5</i>	<i>73.8</i>	<i>51.5</i>	<i>16.1</i>	<i>4.8</i>	<i>2.3</i>	<i>0.8</i>	<i>0.3</i>	<i>0.2</i>	<i>0.2</i>	<i>0.1</i>	<i>0.1</i>
R-SD1-LWOF11-10-0000	100.0	66.7	45.9	33.1	19.7	7.6	2.0	0.9	NA	NA	NA	NA	NA	NA
<i>R-SD1-LWOF11-10-0000E</i>	<i>100.0</i>	<i>69.3</i>	<i>54.0</i>	<i>43.4</i>	<i>29.5</i>	<i>13.1</i>	<i>5.3</i>	<i>3.3</i>	<i>1.7</i>	<i>1.1</i>	<i>0.8</i>	<i>0.5</i>	<i>0.3</i>	<i>0.3</i>
R-SD1-LWOF004-10-0000E	100.0	80.8	73.8	64.2	36.8	8.4	2.2	0.1	NA	NA	NA	NA	NA	NA
R-SD1-LWOF010-10-0000E	100.0	100.0	98.2	96.6	92.2	85.3	78.3	67.6	43.5	23.1	10.9	5.5	3.1	2.1
R-SD1-LWOF010-10-0000W	100.0	100.0	100.0	99.9	98.4	96.6	92.9	82.3	54.8	29.4	13.9	6.8	4.1	2.6
R-SD1-LWOF003-10-0000	100.0	98.4	94.6	87.2	62.8	15.4	0.4	0.0	NA	NA	NA	NA	NA	NA
R-SD1-LWOF003-10-0000E	100.0	100.0	99.6	97.1	76.3	13.9	0.4	0.1	NA	NA	NA	NA	NA	NA
<i>R-SD1-LWOF003-10-0000W</i>	<i>100.0</i>	<i>98.4</i>	<i>93.0</i>	<i>87.4</i>	<i>69.6</i>	<i>27.1</i>	<i>3.2</i>	<i>2.2</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>

Notes to the Testing:

1. Apparent grain size distributions according to PSEP protocols.
2. Data in italics does not meet procedural requirements. Please review narrative for further information.

RHW
8/31/99

QA SUMMARY

PROJECT:	Roy F. Weston Company	Project No.:	3709-066-020-2100
REGL Triplicate Sample ID:	99-0834	Batch No.:	1000-179-01
Client Triplicate Sample ID:	R-SD1-LWOF010-10-0000	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
R-SD1-LWOF010-10-0000 A	100.0	100.0	100.0	99.7	97.7	93.5	86.7	71.9	43.0	22.5	10.9	5.4	3.2	2.3
R-SD1-LWOF010-10-0000 B	100.0	100.0	100.0	99.6	97.1	92.6	85.1	69.0	42.9	22.7	11.0	5.6	3.3	2.3
R-SD1-LWOF010-10-0000 C	100.0	100.0	99.6	99.3	96.8	91.4	83.3	67.3	42.1	22.5	11.0	5.5	3.2	2.5
AVE	NA	100.00	99.87	99.54	97.18	92.54	85.05	69.38	42.68	22.59	10.96	5.52	3.24	2.35
STDEV	NA	0.00	0.22	0.22	0.43	1.05	1.71	2.31	0.47	0.13	0.08	0.14	0.04	0.10
%RSD	NA	0.00	0.22	0.22	0.45	1.13	2.01	3.34	1.09	0.59	0.69	2.62	1.09	4.35

The Triplicate Applies To The Following Samples

REGL ID	Client ID	Date Sampled	Date Extracted	Date Complete	QA*
990834	R-SD1-LWOF010-10-0000 A	8/13/99	8/18/99	8/25/99	99.8
990834	R-SD1-LWOF010-10-0000 B	8/13/99	8/18/99	8/25/99	99.4
990834	R-SD1-LWOF010-10-0000 C	8/13/99	8/18/99	8/25/99	99.9
990783	R-SD1-LWCF-10-0000	8/11/99	8/18/99	8/25/99	98.7
990784	R-SD1-LWCF-10-1000	8/11/99	8/18/99	8/25/99	98.3
990785	R-SD1-LWFF-10-0000	8/11/99	8/18/99	8/25/99	101.6
990723	R-SD1-LWOF16-10-0000	8/12/99	8/18/99	8/25/99	102.4
990724	R-SD1-LWOF16-10-0000W	8/12/99	8/18/99	8/25/99	100.8
990725	R-SD1-LWOF14-10-0000	8/12/99	8/18/99	8/25/99	100.0
990726	R-SD1-LWOF14-10-0000E	8/12/99	8/18/99	8/25/99	105.0
990727	R-SD1-LWOF12-10-0000	8/12/99	8/18/99	8/25/99	103.6
990728	R-SD1-LWOF12-10-0000W	8/12/99	8/18/99	8/25/99	98.5
990729	R-SD1-LWOF004-10-0000	8/12/99	8/18/99	8/25/99	101.0
990730	R-SD1-LWOF004-10-0000W	8/12/99	8/18/99	8/25/99	100.3
990731	R-SD1-LWOF11-10-0000	8/12/99	8/18/99	8/25/99	99.8
990732	R-SD1-LWOF11-10-0000E	8/12/99	8/18/99	8/25/99	101.0
990733	R-SD1-LWOF004-10-0000E	8/12/99	8/18/99	8/25/99	99.0
990735	R-SD1-LWOF010-10-0000E	8/13/99	8/18/99	8/25/99	101.6
990736	R-SD1-LWOF010-10-0000W	8/13/99	8/18/99	8/25/99	99.9
990737	R-SD1-LWOF003-10-0000	8/13/99	8/18/99	8/25/99	99.8
990738	R-SD1-LWOF003-10-0000E	8/13/99	8/18/99	8/25/99	99.8
990739	R-SD1-LWOF003-10-0000W	8/13/99	8/18/99	8/25/99	102.1

* REGL Internal QA limits = 95-105%

Notes to the Testing:

1. See narrative for discussion of testing.

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
	Phi Size	-3	-2						-1	0	1	2	3	4
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
R-SD1-LWOF010-10-0000 A	100.0	100.0	100.0	99.7	97.7	93.5	86.7	71.9	43.0	22.5	10.9	5.4	3.2	2.3
R-SD1-LWOF010-10-0000 B	100.0	100.0	100.0	99.6	97.1	92.6	85.1	69.0	42.9	22.7	11.0	5.6	3.3	2.3
R-SD1-LWOF010-10-0000 C	100.0	100.0	99.6	99.3	96.8	91.4	83.3	67.3	42.1	22.5	11.0	5.5	3.2	2.5
R-SD1-LWCF-10-0000	100.0	100.0	99.8	98.3	92.3	77.2	66.1	55.8	36.8	19.0	8.3	4.4	2.6	1.8
R-SD1-LWCF-10-1000	100.0	100.0	99.6	98.9	96.0	90.4	84.7	71.2	44.5	20.9	9.7	5.2	3.4	2.5
R-SD1-LWFF-10-0000	100.0	100.0	99.1	97.9	92.3	68.6	37.9	23.3	13.4	7.6	4.3	2.4	1.6	1.4
R-SD1-LWOF16-10-0000	100.0	91.5	82.8	75.0	56.6	26.4	11.5	7.3	2.4	1.3	0.8	0.5	0.3	0.3
R-SD1-LWOF16-10-0000W	100.0	96.0	92.1	86.4	70.7	38.3	17.9	8.9	3.6	1.9	1.1	0.6	0.4	0.3
<i>R-SD1-LWOF14-10-0000</i>	<i>100.0</i>	<i>83.9</i>	<i>66.9</i>	<i>55.4</i>	<i>37.1</i>	<i>14.2</i>	<i>4.7</i>	<i>2.6</i>	<i>1.4</i>	<i>0.7</i>	<i>0.4</i>	<i>0.2</i>	<i>0.2</i>	<i>0.2</i>
R-SD1-LWOF14-10-0000E	100.0	74.1	53.3	41.7	28.7	13.0	6.3	3.6	1.9	1.0	0.6	0.3	0.2	0.2
R-SD1-LWOF12-10-0000	100.0	58.8	41.8	33.1	22.7	10.6	5.1	4.3	0.7	0.5	0.3	0.2	0.2	0.2
R-SD1-LWOF12-10-0000W	100.0	56.6	32.3	21.9	13.9	5.2	1.2	0.7	NA	NA	NA	NA	NA	NA
R-SD1-LW0F004-10-0000	100.0	93.9	86.7	75.2	44.1	9.7	3.3	1.9	NA	NA	NA	NA	NA	NA
<i>R-SD1-LW0F004-10-0000W</i>	<i>100.0</i>	<i>94.4</i>	<i>85.5</i>	<i>73.8</i>	<i>51.5</i>	<i>16.1</i>	<i>4.8</i>	<i>2.3</i>	<i>0.8</i>	<i>0.3</i>	<i>0.2</i>	<i>0.2</i>	<i>0.1</i>	<i>0.1</i>
R-SD1-LWOF11-10-0000	100.0	66.7	45.9	33.1	19.7	7.6	2.0	0.9	NA	NA	NA	NA	NA	NA
<i>R-SD1-LW0F11-10-0000E</i>	<i>100.0</i>	<i>69.3</i>	<i>54.0</i>	<i>43.4</i>	<i>29.5</i>	<i>13.1</i>	<i>5.3</i>	<i>3.3</i>	<i>1.7</i>	<i>1.1</i>	<i>0.8</i>	<i>0.5</i>	<i>0.3</i>	<i>0.3</i>
R-SD1-LW0F004-10-0000E	100.0	80.8	73.8	64.2	36.8	8.4	2.2	0.1	NA	NA	NA	NA	NA	NA
R-SD1-LW0F010-10-0000E	100.0	100.0	98.2	96.6	92.2	85.3	78.3	67.6	43.5	23.1	10.9	5.5	3.1	2.1
R-SD1-LW0F010-10-0000W	100.0	100.0	100.0	99.9	98.4	96.6	92.9	82.3	54.8	29.4	13.9	6.8	4.1	2.6
R-SD1-LW0F003-10-0000	100.0	98.4	94.6	87.2	62.8	15.4	0.4	0.0	NA	NA	NA	NA	NA	NA
R-SD1-LW0F003-10-0000E	100.0	100.0	99.6	97.1	76.3	13.9	0.4	0.1	NA	NA	NA	NA	NA	NA
<i>R-SD1-LW0F003-10-0000W</i>	<i>100.0</i>	<i>98.4</i>	<i>93.0</i>	<i>87.4</i>	<i>69.6</i>	<i>27.1</i>	<i>3.2</i>	<i>2.2</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>

Notes to the Testing:

1. Apparent grain size distributions according to PSEP protocols.
2. Data in italics does not meet procedural requirements. Please review narrative for further information.

Rum
8/31/99

Rosa Environmental Geotechnical Laboratory, LLC

Roy F. Weston Company
 Project No.: 3709-066-020-2100

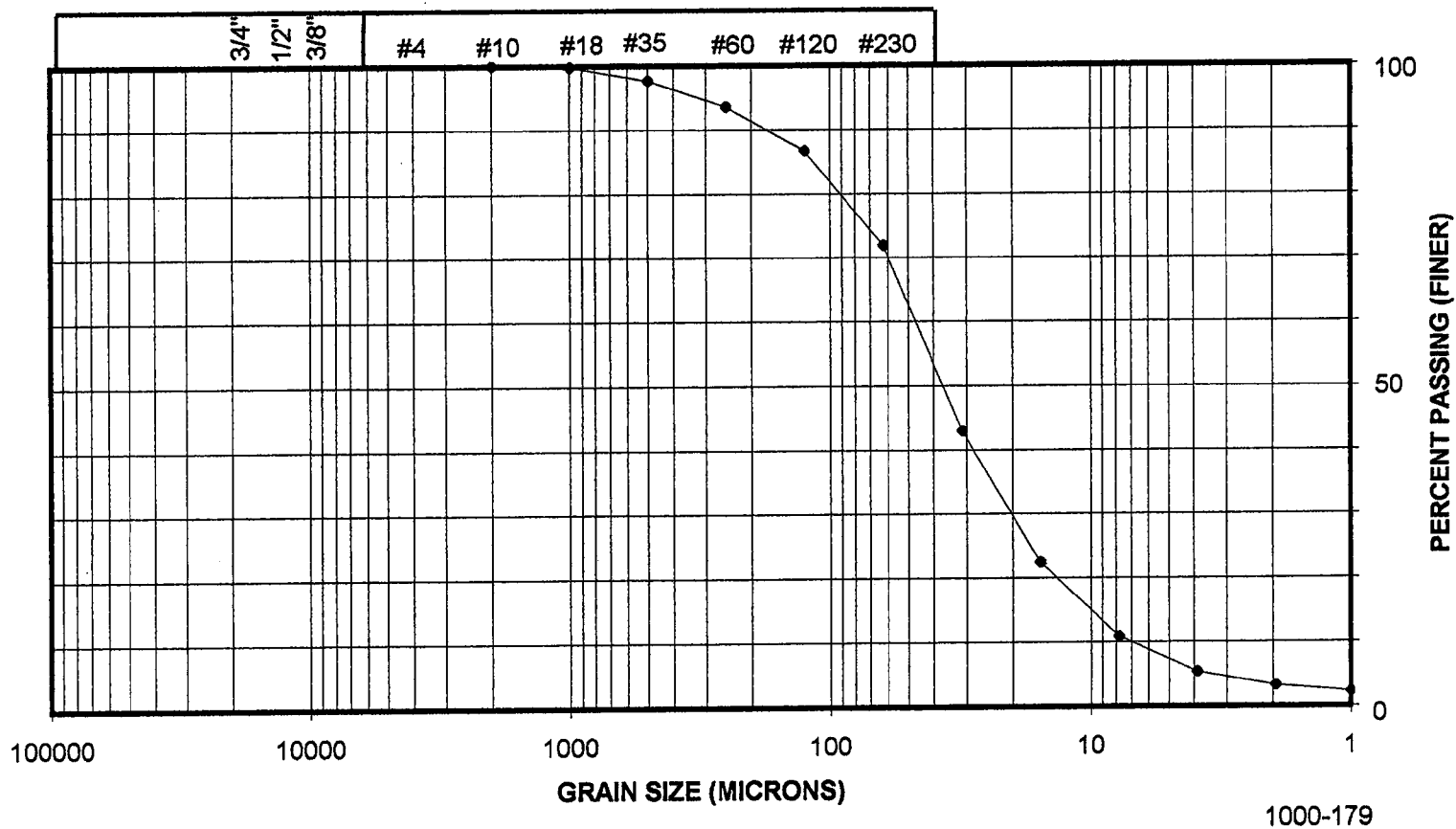
PSEP Total Solids Analysis
 Percent of Wet Weight

Sample No.	Total Solids (%)
R-SD1-LWOF010-10-0000 A	39.2
R-SD1-LWOF010-10-0000 B	39.2
R-SD1-LWOF010-10-0000 C	39.2
R-SD1-LWCF-10-0000	58.1
R-SD1-LWCF-10-1000	51.4
R-SD1-LWFF-10-0000	57.4
R-SD1-LWOF16-10-0000	79.3
R-SD1-LWOF16-10-0000W	73.9
R-SD1-LWOF14-10-0000	82.4
R-SD1-LWOF14-10-0000E	87.2
R-SD1-LWOF12-10-0000	89.2
R-SD1-LWOF12-10-0000W	88.6
R-SD1-LWOF004-10-0000	81.9
R-SD1-LWOF004-10-0000W	81.6
R-SD1-LWOF11-10-0000	89.4
R-SD1-LWOF11-10-0000E	87.4
R-SD1-LWOF004-10-0000E	81.9
R-SD1-LWOF010-10-0000E	40.3
R-SD1-LWOF010-10-0000W	41.3
R-SD1-LWOF003-10-0000	81.5
R-SD1-LWOF003-10-0000E	79.7
R-SD1-LWOF003-10-0000W	81.7
Triplicate Average	39.2
Standard Deviation	0.00
%RSD	0.00

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

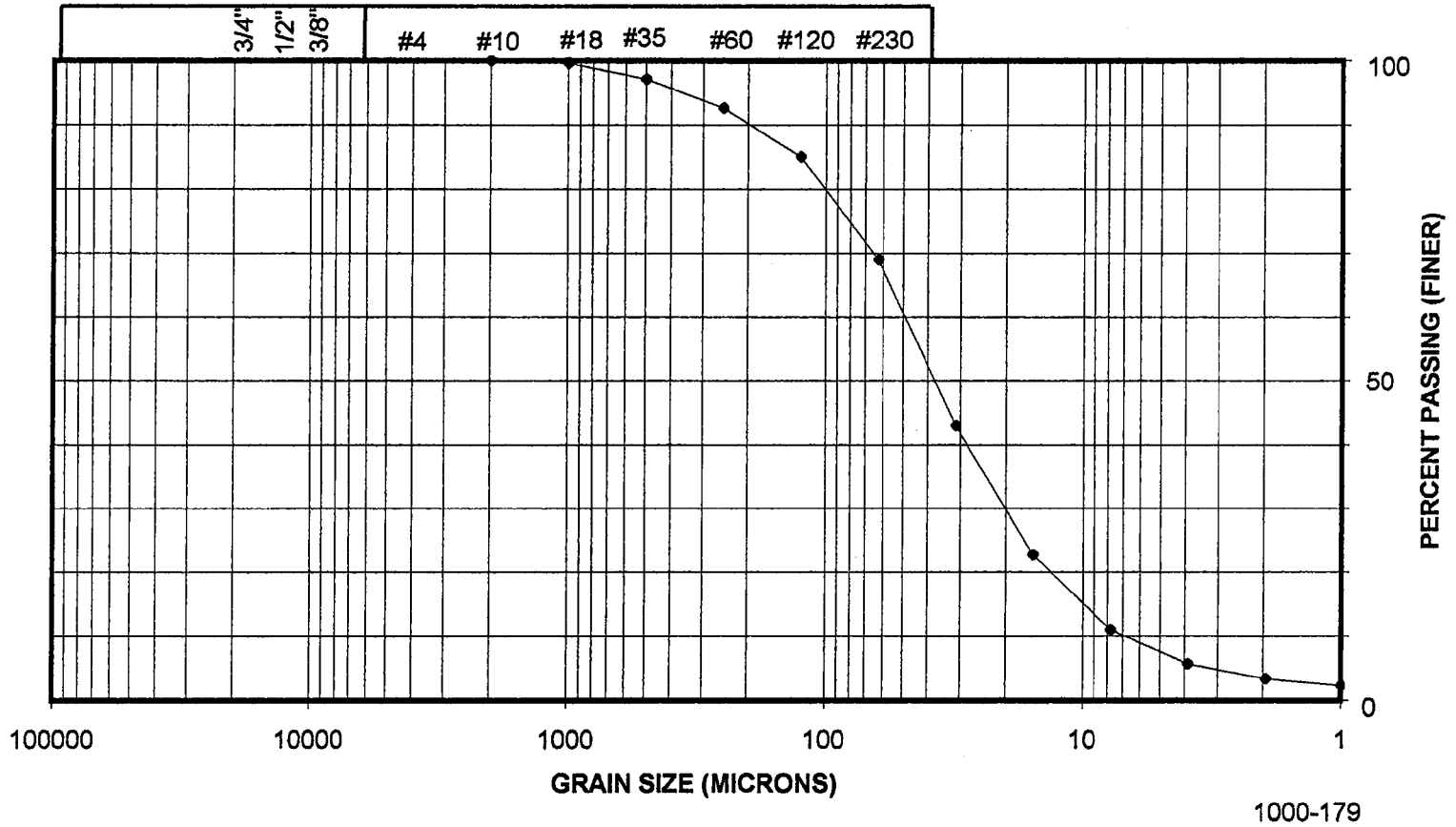
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF010-10-0000 A



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

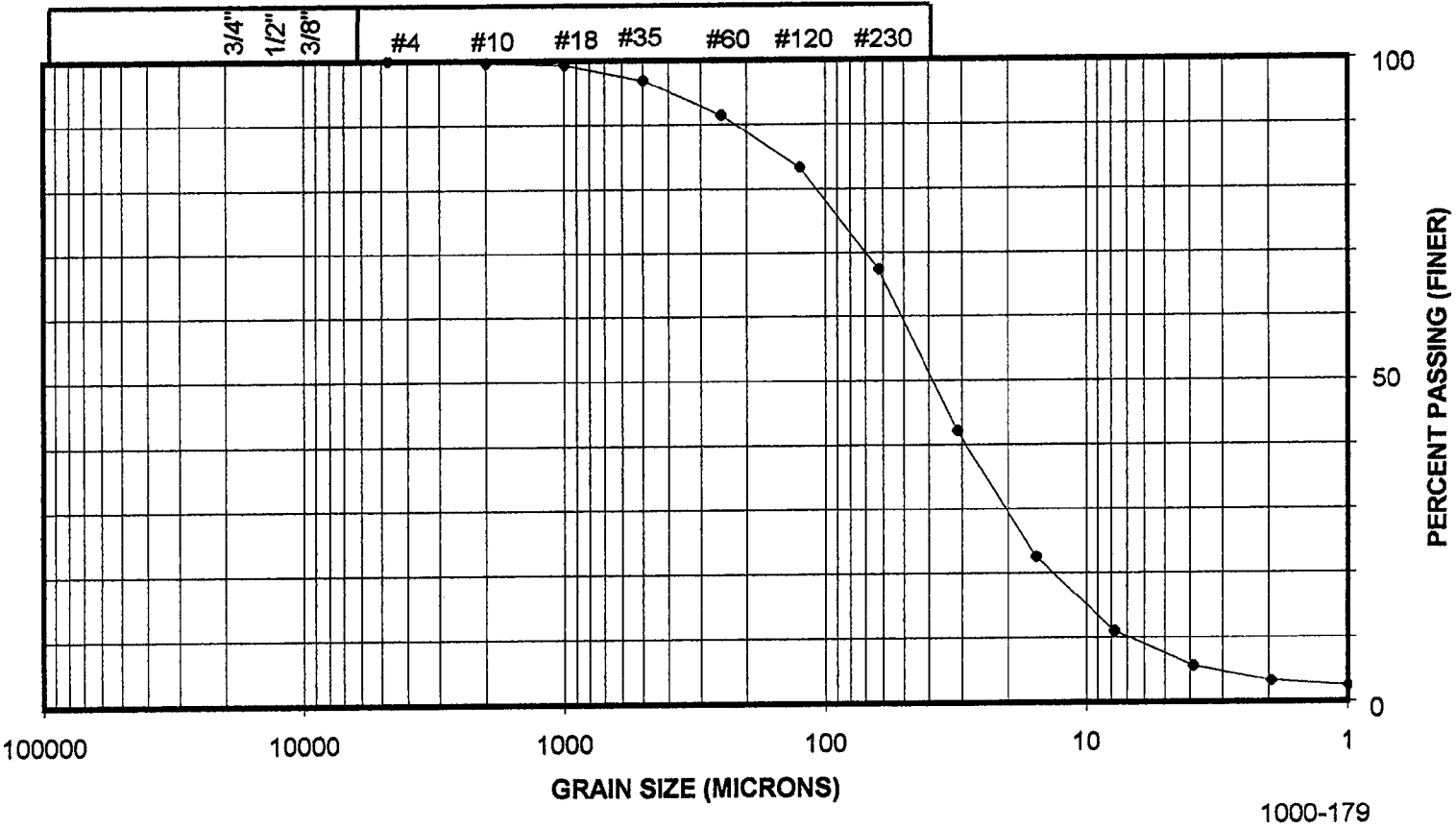
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF010-10-0000 B



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

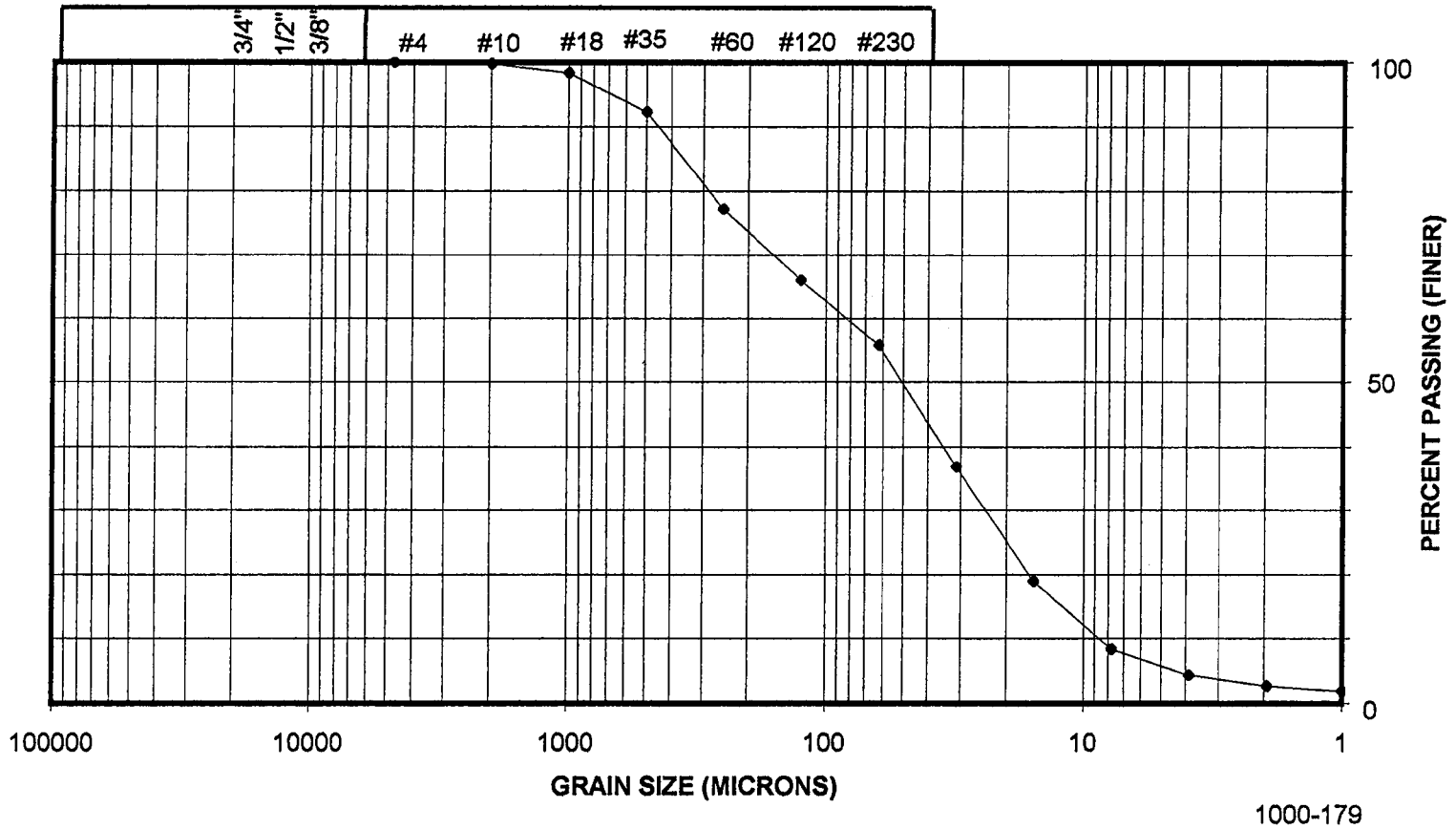
Project: Roy F. Weston Company
 Sample No. R-SD1-LWOF010-10-0000 C



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

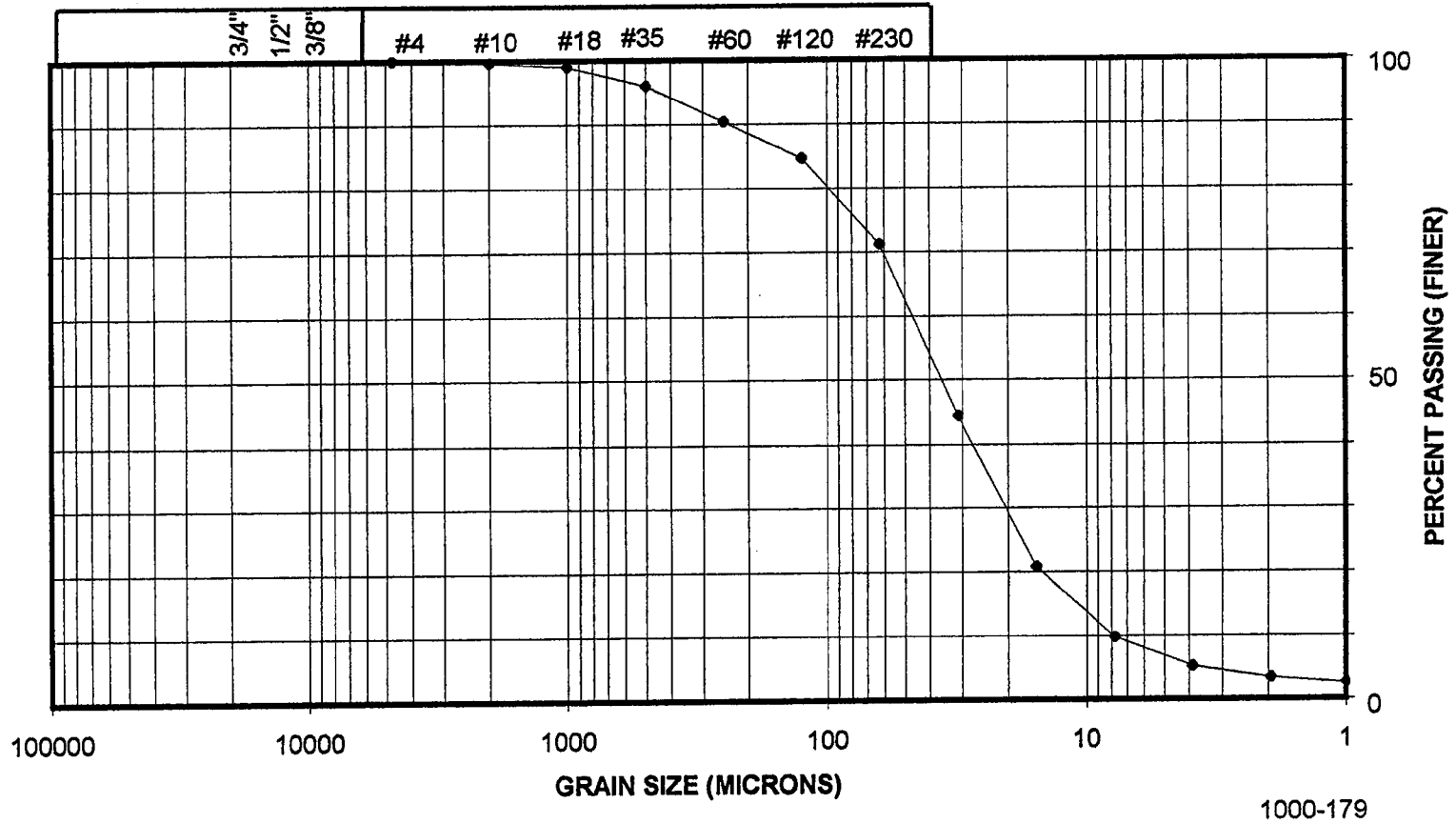
Project: Roy F. Weston Company
Sample No. R-SD1-LWCF-10-0000



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

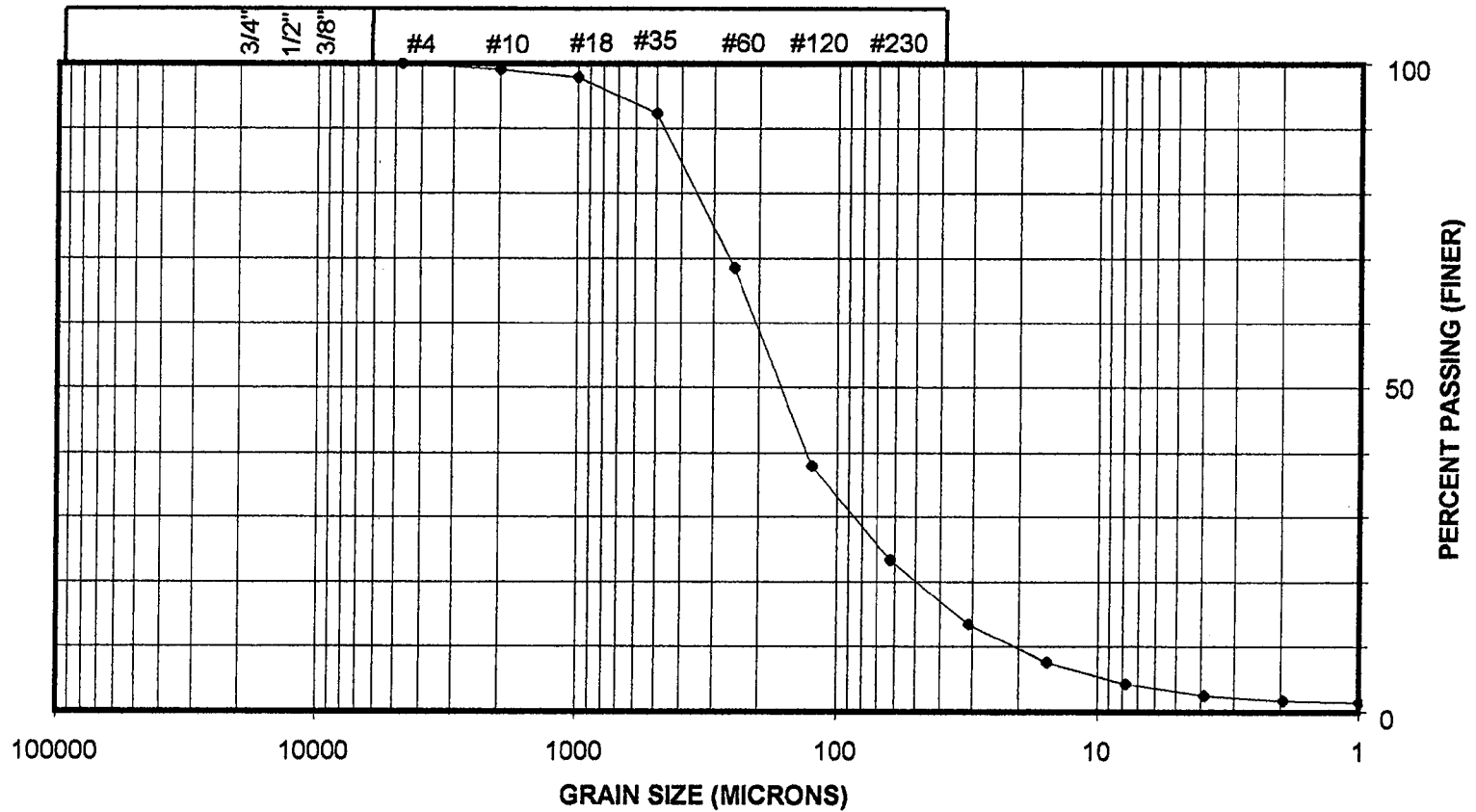
Project: Roy F. Weston Company
Sample No. R-SD1-LWCF-10-1000



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston Company
Sample No. R-SD1-LWFF-10-0000

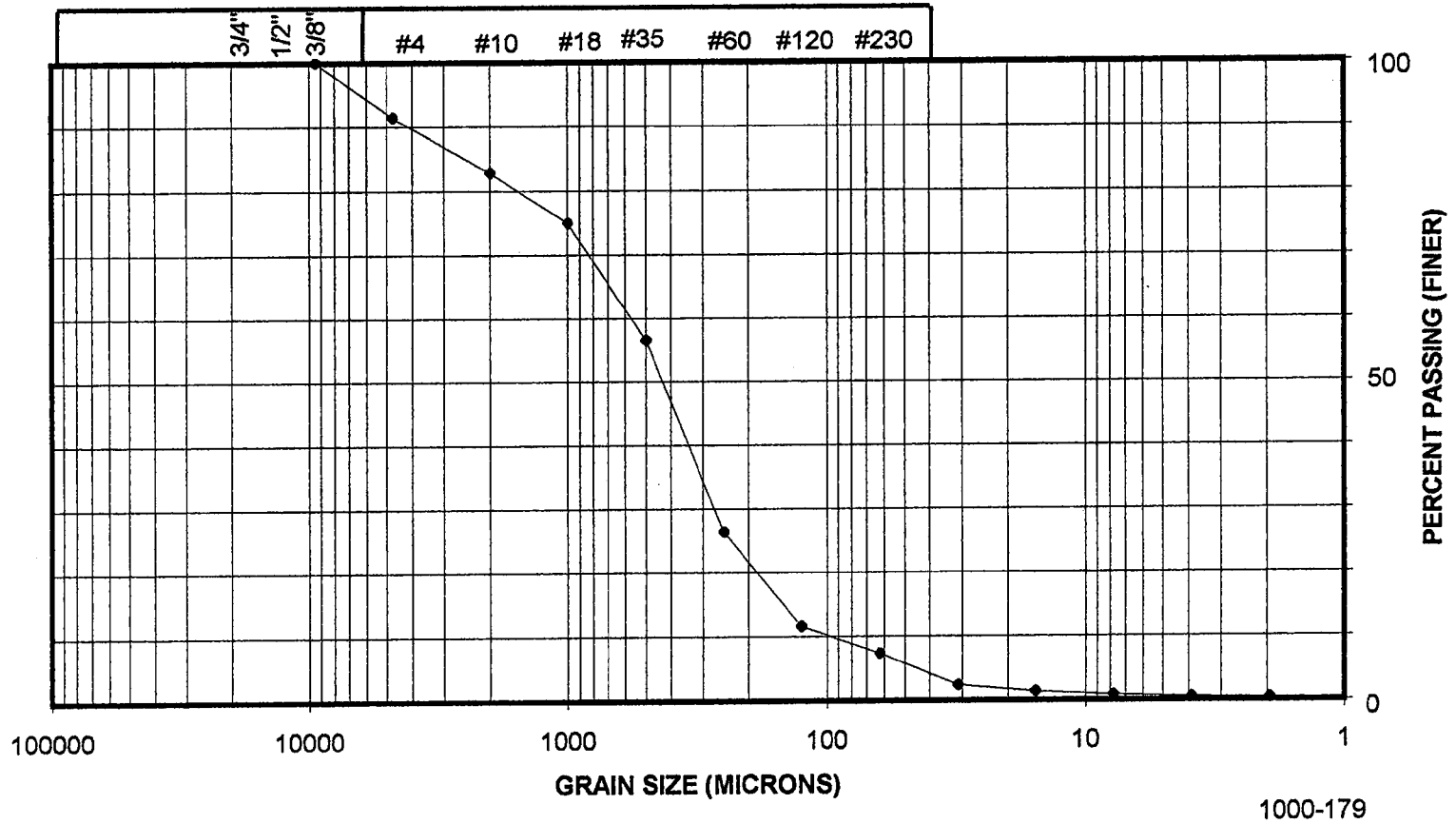


1000-179

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

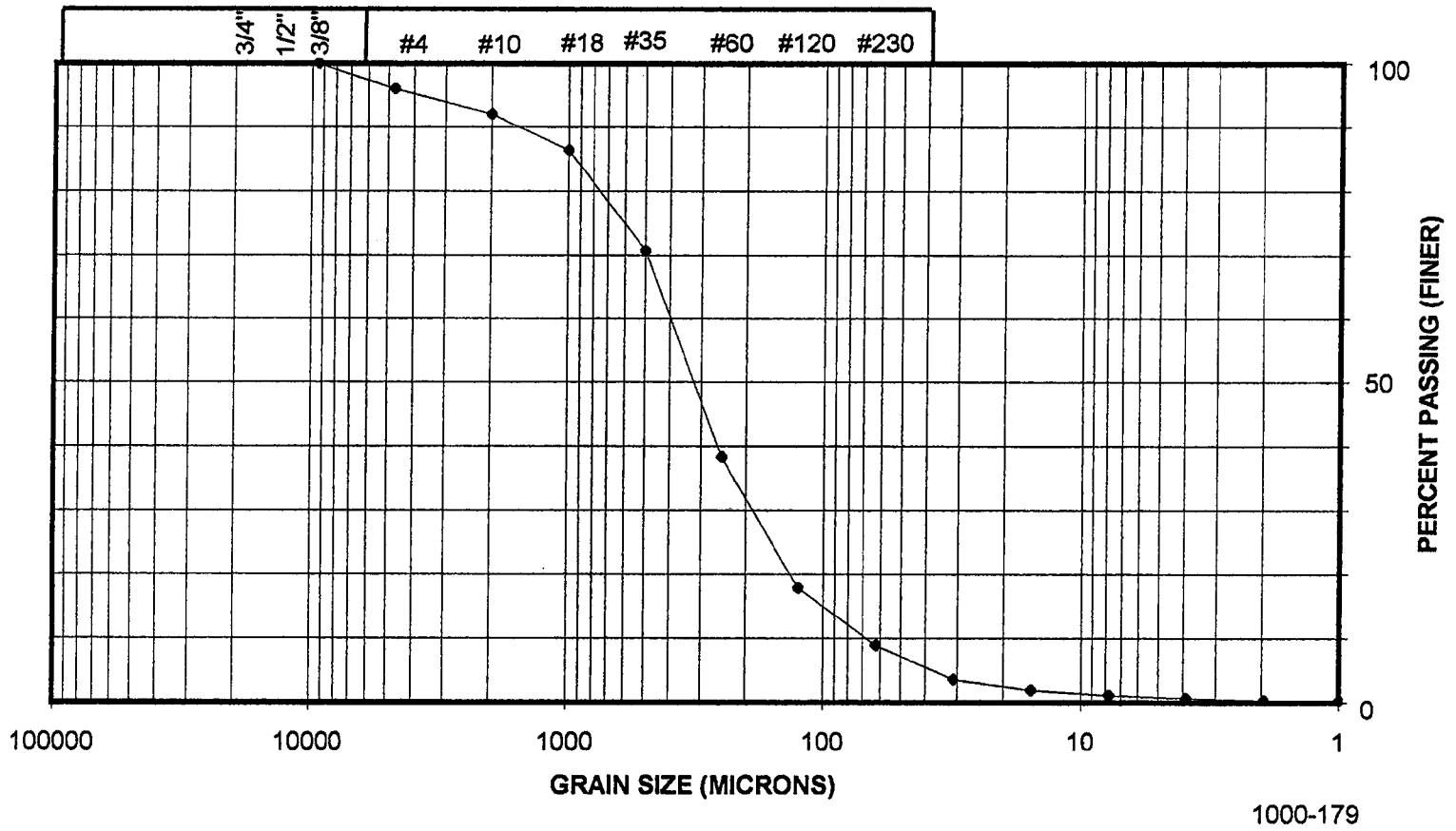
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF16-10-0000



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

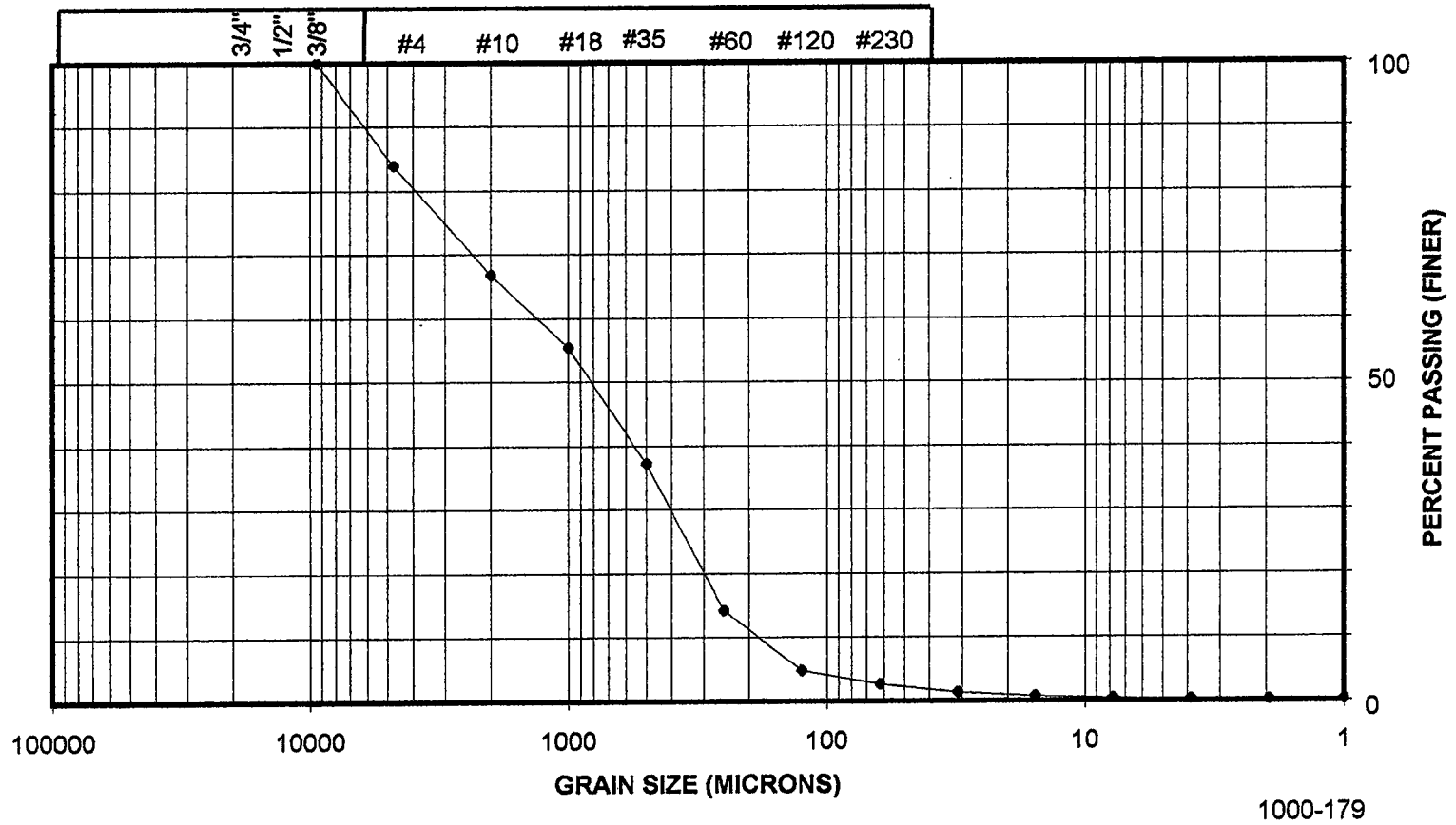
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF16-10-0000W



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

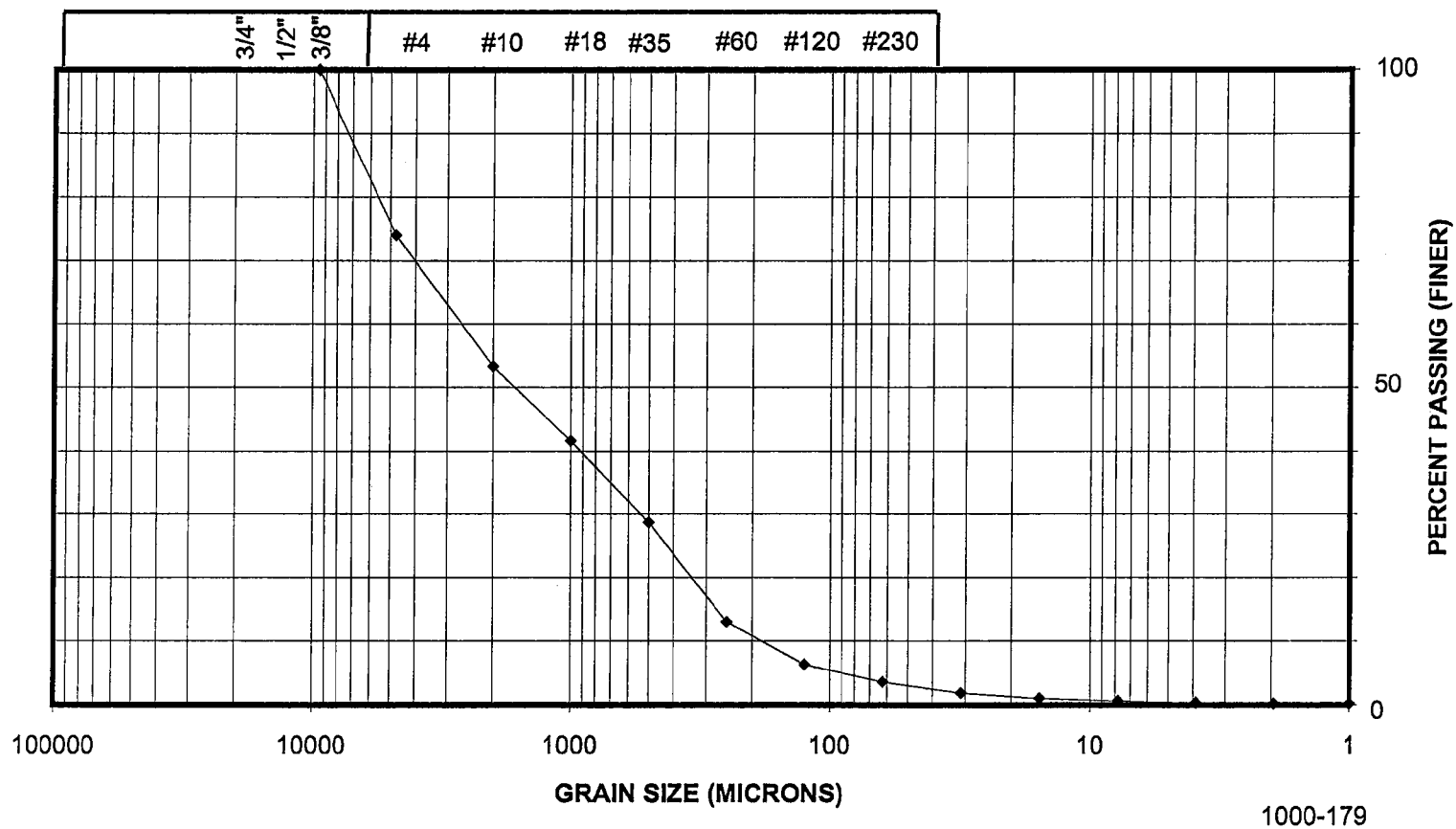
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF14-10-0000



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston Company
Sample No. R-SD1-LWOF14-10-0000E

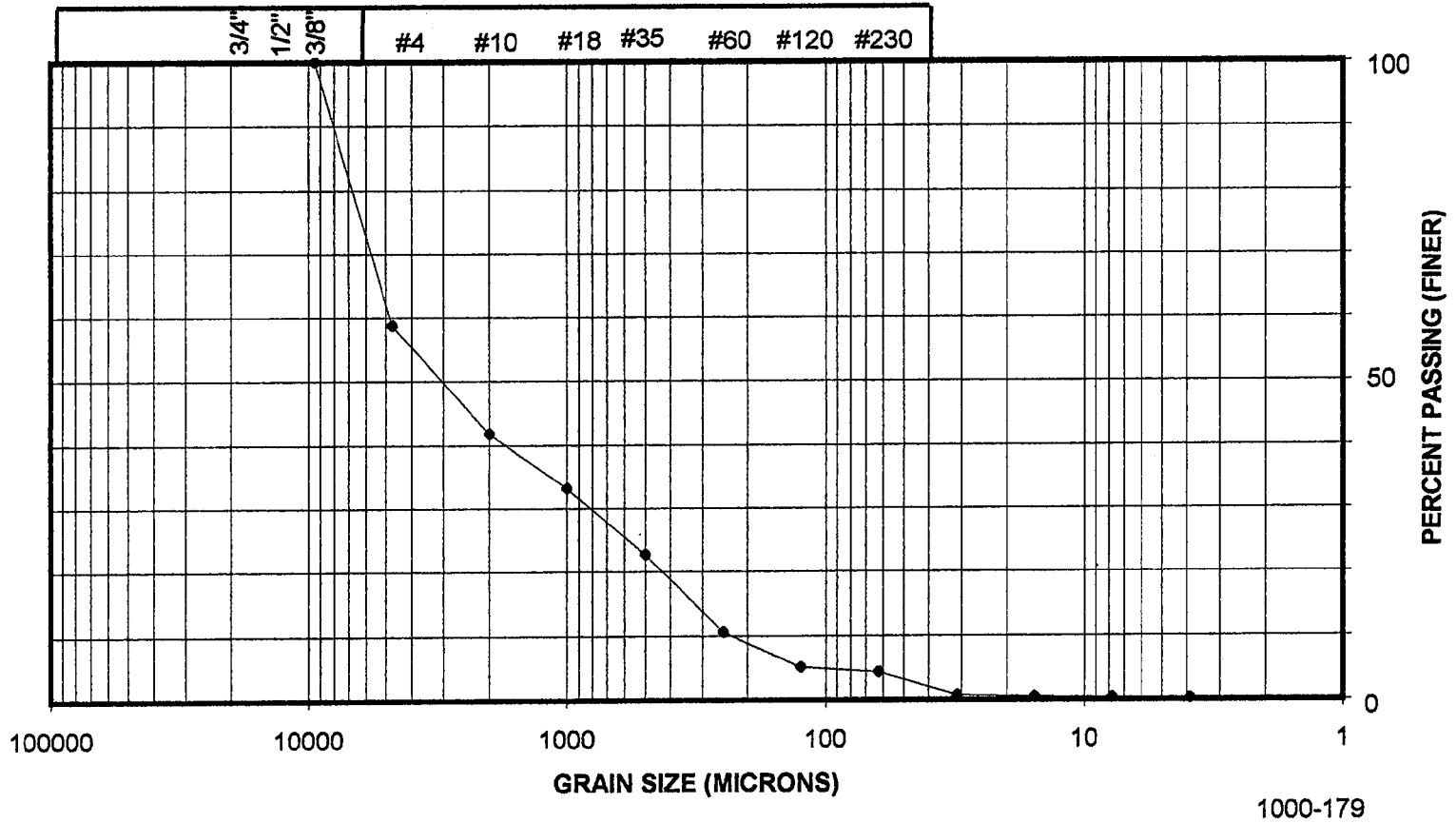


1000-179

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

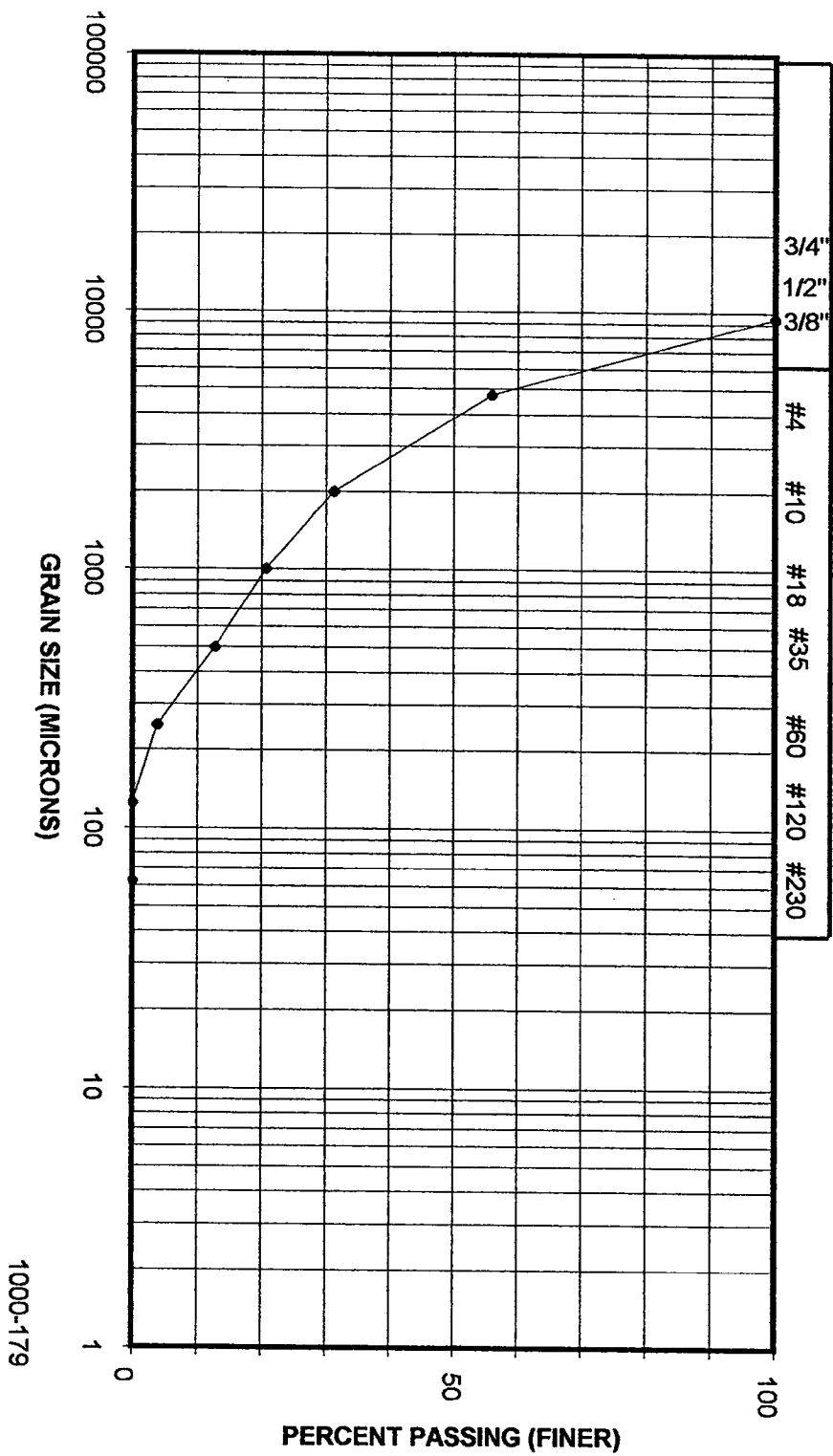
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF12-10-0000



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

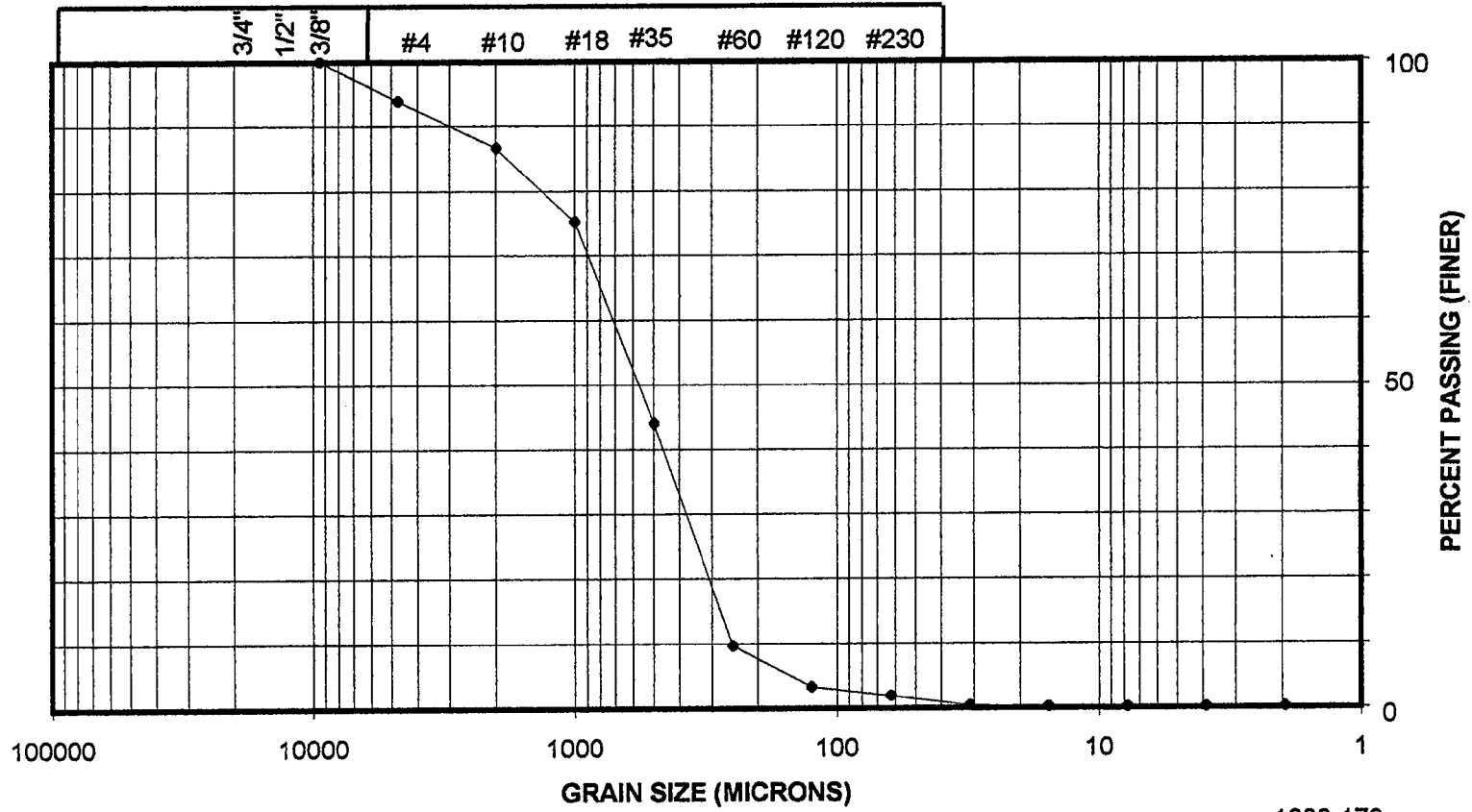
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF12-10-0000W



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston Company
Sample No. R-SD1-LWOF004-10-0000

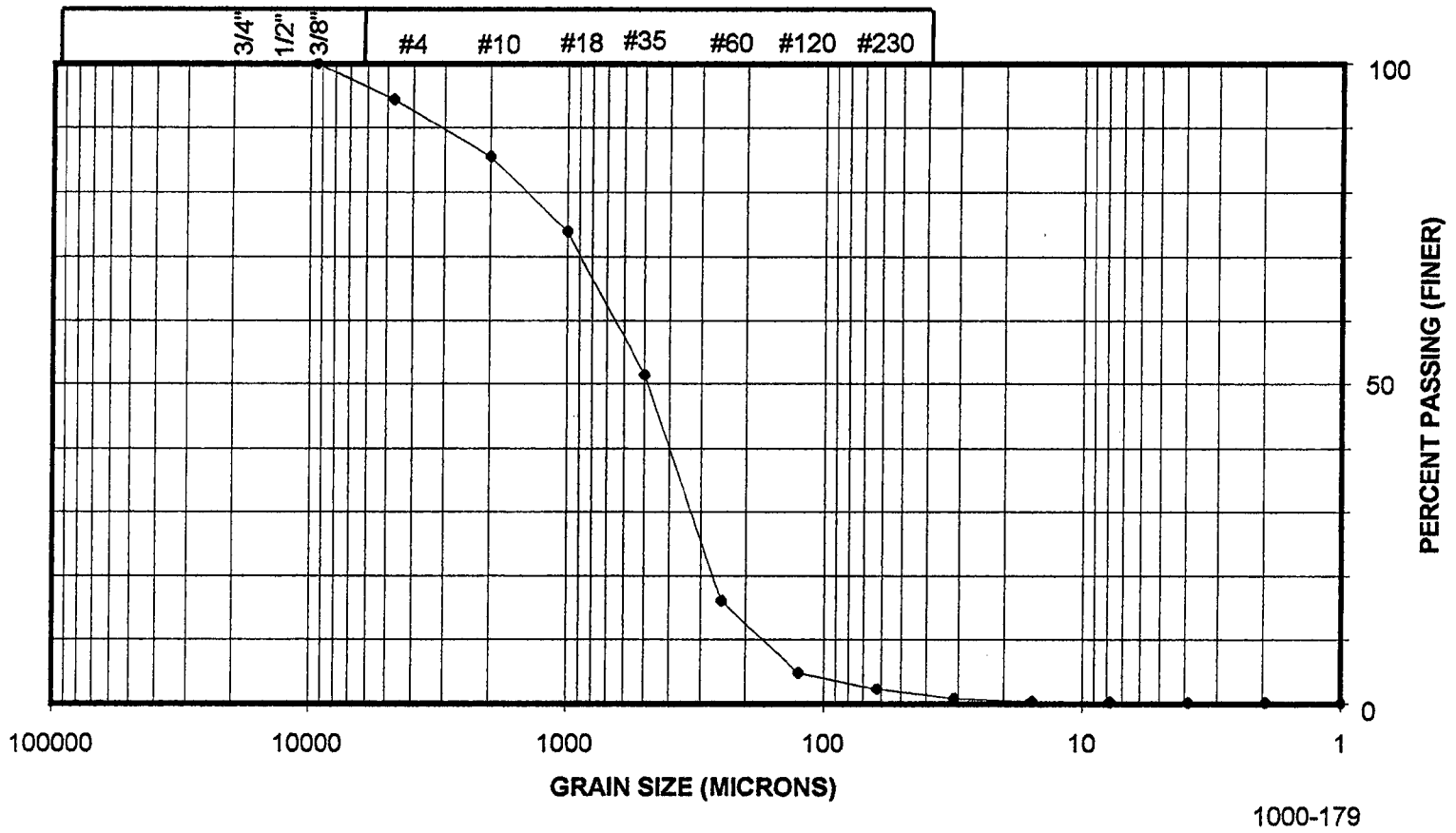


1000-179

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

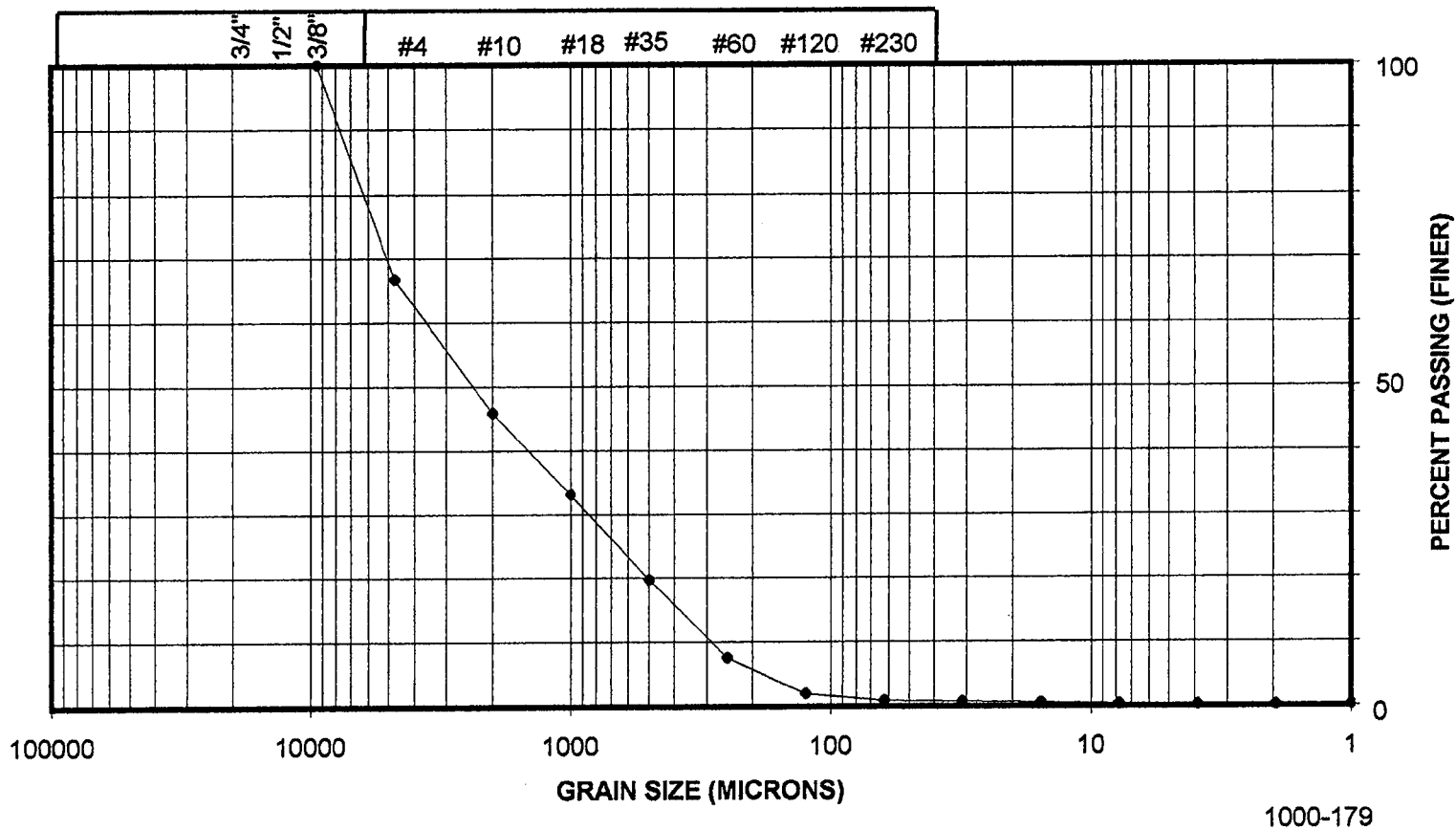
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF004-10-0000W



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

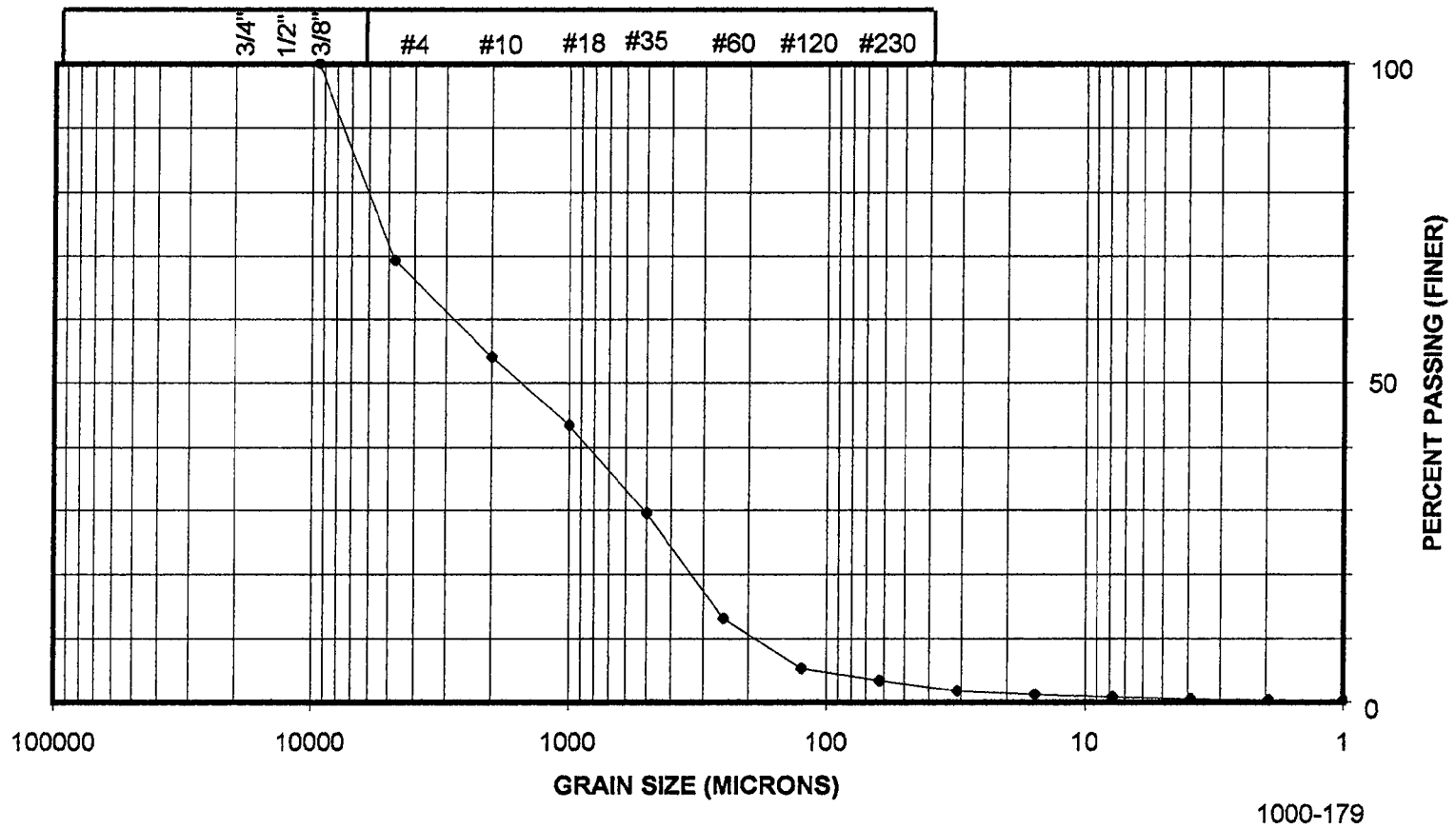
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF11-10-0000



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

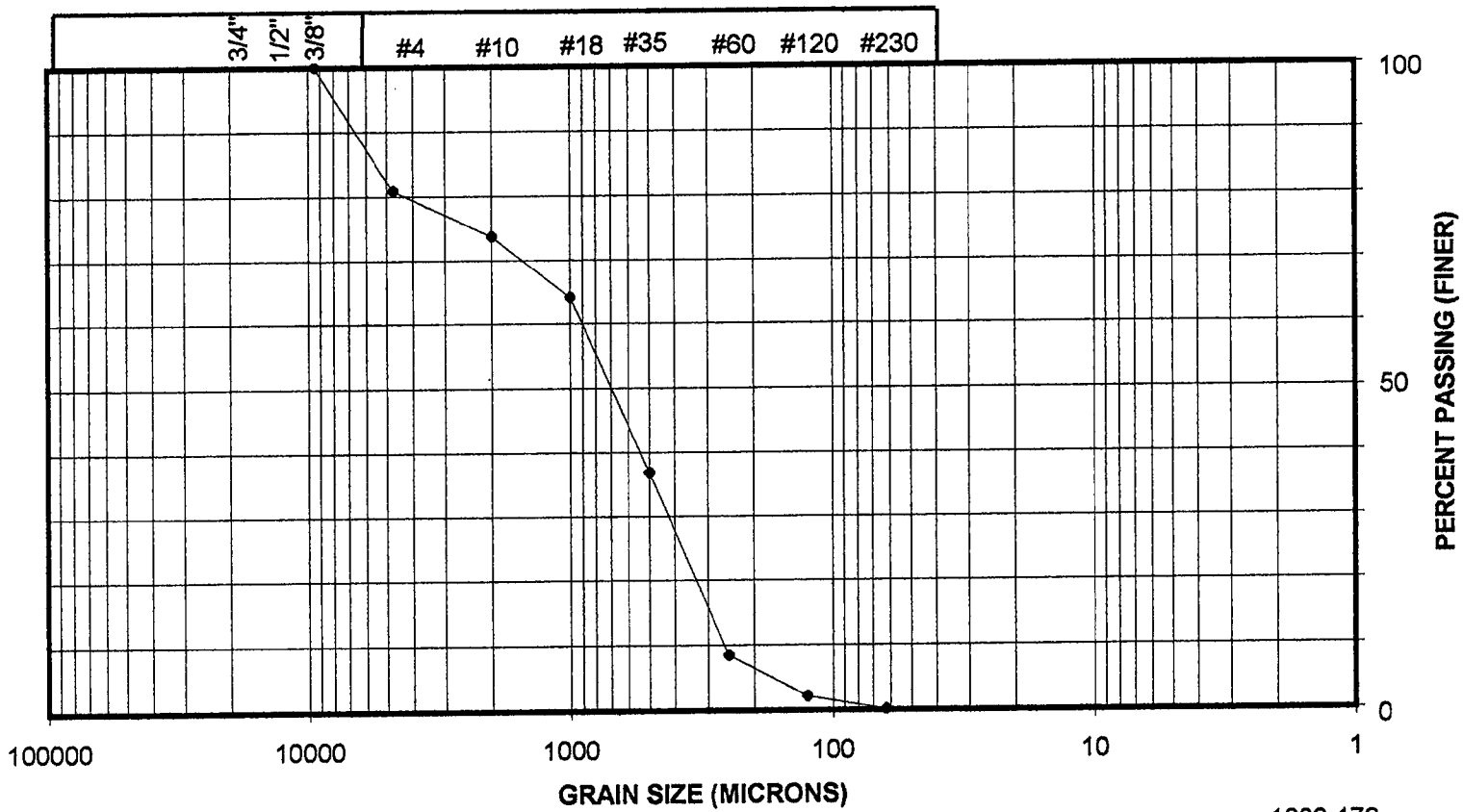
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF11-10-0000E



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston Company
Sample No. R-SD1-LWOF004-10-0000E

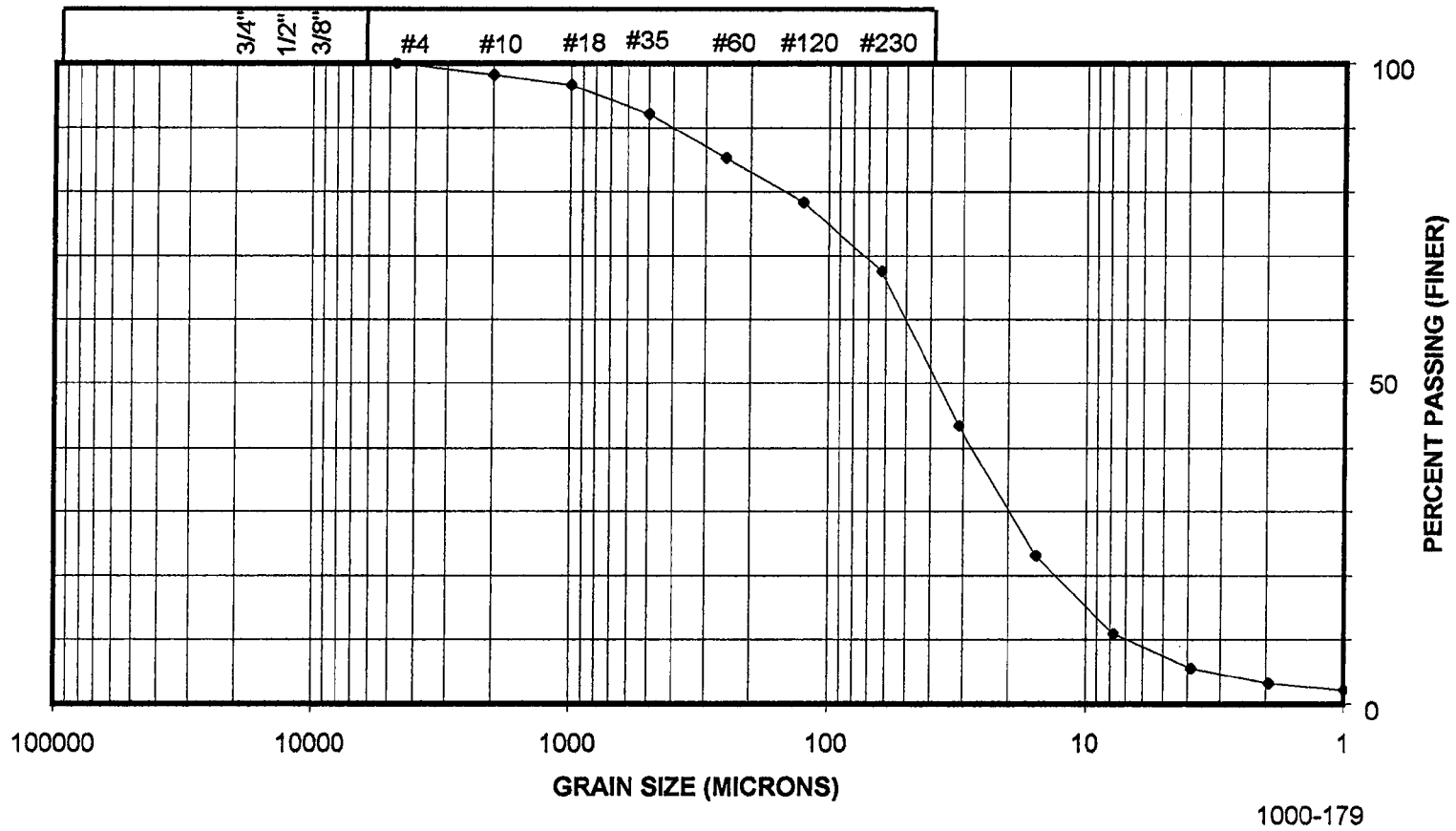


1000-179

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston Company
Sample No. R-SD1-LWOF010-10-1000E





Analytical Resources, Incorporated
Analytical Chemists and Consultants

September 1, 1999

Roger McGinnis
Roy F. Weston, Inc.
Suite 5700
700 Fifth Ave
Seattle, WA 98103

RE: Project: Boeing Renton Sediment / 3709-066-020-2100
ARI Job: AQ07

Dear Roger:

Please find enclosed an original chain of custody (COC) record and a set of analytical results for the above referenced project. Analytical Resources, Inc. received thirteen sediment samples in good condition on August 13, 1999.

The samples were analyzed for total metals (PSDDA), semivolatiles (PSDDA), total organic carbon (PSDDA), PCBs (PSDDA) and grain size (PSEP). The samples for grain size were subcontracted to Rosa Environmental and Geotechnical Laboratory (ROSA). Grain size data was mailed with ARI job AP90.

Aluminum and calcium were detected in the metals method blank. Samples **R-SD1-LWOF016-10-0000**, **R-SD1-LWOF012-10-0000**, and **R-SD1-LWOF004-10-0000E** required additional dilutions and were reanalyzed to quantitate the semivolatile compound within the instrument's linear range. The compounds that exceeded the linear range have been qualified with an "E" on the original report. Sample **R-SD1-LWOF016-10-0000** had internal standard d12-perylene outside the acceptable range for semivolatiles. The sample was reanalyzed at a dilution. Sample **R-SD1-LWOF014-10-0000** could possibly contain aroclor 1262 – some peaks look more like 1260, some look more like 1262. All peaks co-elute so it is not possible to quantitate both separately. The samples were quantified as 1260. Sample **R-SD1-LWOF012-10-0000** had high five finger pattern. Possible 1262 quanted as 1260.

No other analytical complications were noted for this delivery group. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Jennifer M. Baier
Project Manager
jennifer@arilabs.com

JMB/sl
Enclosure

Chain of Custody Record & Laboratory Analysis Request

5.5

Date: 8/12/99

Page 1 of 2

Number of coolers: 1

Cooler Temp: _____



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: Roy F Weston Phone#: ⁽²⁰⁶⁾ 521-7600

Client Contact: Roger McGinnis/Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, M. Shaw, S. Fitzgerald

Sample ID	Date	Time	Matx	No Cont	Lab ID	Metals, ABNS, PCB, grain size	Analysis Required										Notes/Comments		
1 R-SDI-LWOF016-10-0000	8/12/99	time				4													
2 R-SDI-LWOF016-10-0000W	↓	or Weston				4													
3 R-SDI-4 LWOF016-10-0000		field				4													
4 R-SDI-4 LWOF016-10-0000E		logs				8												double volume	
5 R-SDI-4 LWOF016-10-0000																			
6 R-SDI-LWOF012-10-0000							8												double volume
7 R-SDI-LWOF012-10-0000W	8/12/99					6												2 extra 12-oz jars for volume	

ARI Project No:	Relinquished by: (Signature) <u>Allison Reak</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>ALLISON REAK</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>Roy F Weston</u>	Company:	Company:
	Date: <u>8/12/99</u> Time: <u>2030</u>	Date:	Time:
	Received by: (Signature) <u>locker</u>	Received by: (Signature)	Received by: (Signature)
	Printed Name: <u>ARI</u>	Printed Name: <u>FACH STANLEY</u>	Printed Name:
	Company:	Company: <u>ARI</u>	Company:
	Date: <u>8/12/99</u> Time: <u>2030</u>	Date: <u>8/13/99</u> Time: <u>830</u>	Date: Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Chain of Custody Record & Laboratory Analysis Request

Date: 8/12/99
 Page 2 of 2
 Number of coolers: 1
 Cooler Temp: _____



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: Roy F. Weston Phone#: ⁽²⁰⁶⁾ 521-7600

Client Contact: Roger McGinnis/Allison Reak

Client Project ID: 3709-066-020-2100

Samplers: A. Reak, S. Fitzgerald, M. Shaw

Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required						Notes/Comments		
1 R-SDI-LWOF004-10-0000	8/12/99	time on				metals, ABNS, grain size, TOC								
2 R-SDI-LWOS005-10-0000		Weston												ARCHIVE
3 R-SDI-LWOF004-10-0000W		field logs												
4 R-SDI-LWOF011-10-0000														12-oz jar for extra volume
5 R-SDI-LWOF011-10-0000E														12-oz jar for extra volume
6 R-SDI-LWOF004-10-0000E	8/12/99													
7														

ARI Project No:	Relinquished by: (Signature) <u>Allison Reak</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>ALLISON REAK</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>Roy F Weston</u>	Company:	Company:
	Date: <u>8/12/99</u> Time: <u>2030</u>	Date:	Time:
	Received by: (Signature) <u>locker</u>	Received by: (Signature)	Received by: (Signature)
	Printed Name:	Printed Name: <u>Locke</u>	Printed Name:
	Company: <u>ARI</u>	Company: <u>ARI</u>	Company:
	Date: <u>8/12/99</u> Time: <u>2030</u>	Date: <u>8/13/99</u> Time: <u>030</u>	Date:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.



SOIL SEMIVOLATILE SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Client ID	NBZ	FBP	TPH	PHL	2FP	TBP	2CP	DCB	TOT OUT
Method Blank	63.9%	69.7%	114%	59.7%	72.8%	64.6%	60.3%	63.6%	0
Lab Control	61.0%	58.6%	91.6%	55.3%	67.2%	68.8%	57.4%	59.3%	0
R-SD1-LWOF016-10-0	76.6%	82.5%	80.2%	75.4%	93.9%	104%	77.5%	66.8%	0
R-SD1-LWOF016-1-DL	81.6%	85.0%	88.6%	83.3%	96.5%	66.9%	82.1%	62.4%	0
R-SD1-LWOF016-10-0	64.8%	76.4%	87.6%	70.0%	77.2%	106%	68.8%	58.4%	0
R-SD1-LWOF014-10-0	70.2%	77.8%	69.3%	75.0%	81.5%	110%	73.1%	64.3%	0
R-SD1-LWOF014-10-0	61.4%	72.5%	92.4%	66.9%	73.3%	102%	64.8%	55.0%	0
R-SD1-LWOF012-10-0	74.7%	79.4%	73.4%	74.1%	84.2%	94.5%	75.6%	66.8%	0
R-SD1-LWOF012-1-DL	72.8%	70.8%	77.2%	69.6%	77.9%	46.9% *	70.7%	58.0%	1
R-SD1-LWOF012-10-MS	71.5%	77.6%	90.0%	73.8%	82.6%	93.9%	75.8%	65.1%	0
R-SD1-LWOF012-10-SD	76.0%	81.8%	71.5%	79.0%	91.8%	106%	79.7%	71.8%	0
R-SD1-LWOF012-10-0	58.7%	68.0%	105%	64.9%	71.2%	96.7%	61.0%	51.5%	0
R-SD1-LWOF004-10-0	59.6%	74.7%	86.4%	69.1%	73.9%	90.7%	65.3%	52.6%	0
R-SD1-LWOF004-10-0	66.6%	81.6%	89.5%	70.9%	83.8%	109%	71.0%	60.8%	0
R-SD1-LWOF011-10-0	89.7%	78.3%	94.4%	77.6%	115%	76.4%	79.4%	70.2%	0
R-SD1-LWOF011-10-0	72.5%	73.1%	91.7%	67.3%	95.5%	81.2%	70.5%	56.8%	0
R-SD1-LWOF004-10-0	77.7%	84.9%	87.8%	75.2%	116%	74.6%	80.7%	65.2%	0
R-SD1-LWOF004-1-DL	D	D	D	D	D	D	D	D	0

LCS/MB LIMITS QC LIMITS

(NBZ) = Nitrobenzene-d5	(20-120)	(35-120)
(FBP) = 2-Fluorobiphenyl	(29-120)	(49-120)
(TPH) = p-Terphenyl-d14	(45-123)	(44-131)
(PHL) = Phenol-d5	(17-120)	(37-120)
(2FP) = 2-Fluorophenol	(23-120)	(39-120)
(TBP) = 2,4,6-Tribromophenol	(17-134)	(54-126)
(2CP) = 2-Chlorophenol-d4	(21-120)	(36-120)
(DCB) = 1,2-Dichlorobenzene-d4	(30-120)	(29-120)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ07A

LIMS ID: 99-11911

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 08/25/99



Sample No: R-SD1-LWOF016-10-0006

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/20/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 52.4 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 19.5%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	150
91-20-3	Naphthalene	25
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	20
83-32-9	Acenaphthene	120
132-64-9	Dibenzofuran	89
86-73-7	Fluorene	210
85-01-8	Phenanthrene	1,500 1600
86-74-8	Carbazole	190
120-12-7	Anthracene	350
84-74-2	Di-n-Butylphthalate	150
206-44-0	Fluoranthene	3,300 X
129-00-0	Pyrene	1,700 2600
56-55-3	Benzo (a) anthracene	1,200
117-81-7	bis (2-Ethylhexyl) phthalate	720
218-01-9	Chrysene	1,200
205-99-2	Benzo (b) fluoranthene	1,800 1200
207-08-9	Benzo (k) fluoranthene	780
50-32-8	Benzo (a) pyrene	1,400
193-39-5	Indeno (1,2,3-cd) pyrene	770
53-70-3	Dibenz (a,h) anthracene	140
191-24-2	Benzo (g,h,i) perylene	580

*Transcribed
from
dilution
analysis
RLW*

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	76.6%	d5-Phenol	75.4%
2-Fluorobiphenyl	82.5%	2-Fluorophenol	93.9%
d14-p-Terphenyl	80.2%	2,4,6-Tribromophenol	104%
d4-1,2-Dichlorobenzene	66.8%	d4-2-Chlorophenol	77.5%

*RLW
9/10/99*



**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Page 1 of 1

Lab Sample ID: AQ07A

LIMS ID: 99-11911

Matrix: Sediment

Data Release Authorized: *MB*

Reported: 08/25/99

Sample No: R-SD1-LWOF016-10-008
DILUTION

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/23/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 52.4 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:5

Percent Moisture: 19.5%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	190 U
91-20-3	Naphthalene	95 U
91-57-6	2-Methylnaphthalene	95 U
208-96-8	Acenaphthylene	95 U
83-32-9	Acenaphthene	110
132-64-9	Dibenzofuran	95 U
86-73-7	Fluorene	200
85-01-8	Phenanthrene	1,600 *
86-74-8	Carbazole	160
120-12-7	Anthracene	370
84-74-2	Di-n-Butylphthalate	120
206-44-0	Fluoranthene	3,300
129-00-0	Pyrene	2,600 *
56-55-3	Benzo (a) anthracene	1,200
117-81-7	bis (2-Ethylhexyl) phthalate	850
218-01-9	Chrysene	1,200
205-99-2	Benzo (b) fluoranthene	1,200 *
207-08-9	Benzo (k) fluoranthene	1,100
50-32-8	Benzo (a) pyrene	1,500
193-39-5	Indeno (1,2,3-cd) pyrene	1,000
53-70-3	Dibenz (a,h) anthracene	200
191-24-2	Benzo (g,h,i) perylene	820

*only use
analyzed
marked **

run

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	81.6%	d5-Phenol	83.3%
2-Fluorobiphenyl	85.0%	2-Fluorophenol	96.5%
d14-p-Terphenyl	88.6%	2,4,6-Tribromophenol	66.9%
d4-1,2-Dichlorobenzene	62.4%	d4-2-Chlorophenol	82.1%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF016-10-0000W

Page 1 of 1

Lab Sample ID: AQ07B

QC Report No: AQ07-Roy F. Weston

LIMS ID: 99-11912

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *W/S*

Date Sampled: 08/12/99

Reported: 08/25/99

Date Received: 08/13/99

Date extracted: 08/17/99

Sample Amount: 53.7 g-dry-wt

Date analyzed: 08/20/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 23.8%

pH: 6.9

CAS Number	Analyte	ug/kg
108-95-2	Phenol	37 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	33
85-01-8	Phenanthrene	160
86-74-8	Carbazole	19 U
120-12-7	Anthracene	47
84-74-2	Di-n-Butylphthalate	120
206-44-0	Fluoranthene	400
129-00-0	Pyrene	320
56-55-3	Benzo(a)anthracene	170
117-81-7	bis(2-Ethylhexyl)phthalate	390
218-01-9	Chrysene	210
205-99-2	Benzo(b)fluoranthene	260
207-08-9	Benzo(k)fluoranthene	210
50-32-8	Benzo(a)pyrene	300
193-39-5	Indeno(1,2,3-cd)pyrene	210
53-70-3	Dibenz(a,h)anthracene	32
191-24-2	Benzo(g,h,i)perylene	200

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	64.8%	d5-Phenol	70.0%
2-Fluorobiphenyl	76.4%	2-Fluorophenol	77.2%
d14-p-Terphenyl	87.6%	2,4,6-Tribromophenol	106%
d4-1,2-Dichlorobenzene	58.4%	d4-2-Chlorophenol	68.8%

Rnm
9/10/99

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF014-10-0000

Page 1 of 1

Lab Sample ID: AQ07C

QC Report No: AQ07-Roy F. Weston

LIMS ID: 99-11913

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *MS*

Date Sampled: 08/12/99

Reported: 08/25/99

Date Received: 08/13/99

Date extracted: 08/17/99

Sample Amount: 53.3 g-dry-wt

Date analyzed: 08/20/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 18.4%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	38 U
91-20-3	Naphthalene	20
91-57-6	2-Methylnaphthalene	31
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	44
132-64-9	Dibenzofuran	47
86-73-7	Fluorene	91
85-01-8	Phenanthrene	480
86-74-8	Carbazole	37
120-12-7	Anthracene	180
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	820
129-00-0	Pyrene	340
56-55-3	Benzo (a) anthracene	170
117-81-7	bis (2-Ethylhexyl) phthalate	180
218-01-9	Chrysene	420
205-99-2	Benzo (b) fluoranthene	180
207-08-9	Benzo (k) fluoranthene	120
50-32-8	Benzo (a) pyrene	160
193-39-5	Indeno (1,2,3-cd) pyrene	100
53-70-3	Dibenz (a,h) anthracene	18 J
191-24-2	Benzo (g,h,i) perylene	94

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	70.2%	d5-Phenol	75.0%
2-Fluorobiphenyl	77.8%	2-Fluorophenol	81.5%
d14-p-Terphenyl	69.3%	2,4,6-Tribromophenol	110%
d4-1,2-Dichlorobenzene	64.3%	d4-2-Chlorophenol	73.1%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ07D

LIMS ID: 99-11914

Matrix: Sediment

Data Release Authorized: *MB*

Reported: 08/25/99



Sample No: R-SD1-LWOF014-10-00002

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/20/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 51.1 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 15.4%

pH: 7.1

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	36
85-01-8	Phenanthrene	61
86-74-8	Carbazole	66
120-12-7	Anthracene	210
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	64
129-00-0	Pyrene	47
56-55-3	Benzo (a) anthracene	22
117-81-7	bis (2-Ethylhexyl) phthalate	57
218-01-9	Chrysene	38
205-99-2	Benzo (b) fluoranthene	23
207-08-9	Benzo (k) fluoranthene	16 J
50-32-8	Benzo (a) pyrene	16 J
193-39-5	Indeno (1,2,3-cd) pyrene	20 U
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	20 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	61.4%	d5-Phenol	66.9%
2-Fluorobiphenyl	72.5%	2-Fluorophenol	73.3%
d14-p-Terphenyl	92.4%	2,4,6-Tribromophenol	102%
d4-1,2-Dichlorobenzene	55.0%	d4-2-Chlorophenol	64.8%

Rmm
9/10/99

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ07E

LIMS ID: 99-11915

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 08/25/99



Sample No: R-SD1-LWOF012-10-0006 INCORPORATED

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/20/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 52.6 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 12.9%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	38 U
91-20-3	Naphthalene	420
91-57-6	2-Methylnaphthalene	140
208-96-8	Acenaphthylene	38
83-32-9	Acenaphthene	690
132-64-9	Dibenzofuran	610
86-73-7	Fluorene	1,100
85-01-8	Phenanthrene	5,300 E 8600
86-74-8	Carbazole	1,000
120-12-7	Anthracene	1,800 E 1600
84-74-2	Di-n-Butylphthalate	76
206-44-0	Fluoranthene	6,800 E 8300
129-00-0	Pyrene	3,800 E 7300
56-55-3	Benzo (a) anthracene	2,500 E 2900
117-81-7	bis (2-Ethylhexyl) phthalate	1,200
218-01-9	Chrysene	2,300 E 2900
205-99-2	Benzo (b) fluoranthene	3,800 E 2500
207-08-9	Benzo (k) fluoranthene	910
50-32-8	Benzo (a) pyrene	2,600 E 2900
193-39-5	Indeno (1,2,3-cd) pyrene	1,400
53-70-3	Dibenz (a,h) anthracene	330
191-24-2	Benzo (g,h,i) perylene	1,200

*Transcribe
from dilution
analysis
Kus*

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.7%	d5-Phenol	74.1%
2-Fluorobiphenyl	79.4%	2-Fluorophenol	84.2%
d14-p-Terphenyl	73.4%	2,4,6-Tribromophenol	94.5%
d4-1,2-Dichlorobenzene	66.8%	d4-2-Chlorophenol	75.6%

*Run
9/30/99*

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



Sample No: R-SD1-LWOF012-10-00
 DILUTION

ANALYTICAL
 RESOURCES
 INCORPORATED

Page 1 of 1

Lab Sample ID: AQ07E

QC Report No: AQ07-Roy F. Weston

LIMS ID: 99-11915

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *AMS*

Date Sampled: 08/12/99

Reported: 08/25/99

Date Received: 08/13/99

Date extracted: 08/17/99

Sample Amount: 52.6 g-dry-wt

Date analyzed: 08/23/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:10

GPC Cleanup: YES

Percent Moisture: 12.9%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	380 U
91-20-3	Naphthalene	390
91-57-6	2-Methylnaphthalene	190 U
208-96-8	Acenaphthylene	190 U
83-32-9	Acenaphthene	640
132-64-9	Dibenzofuran	470
86-73-7	Fluorene	850
85-01-8	Phenanthrene	8,600 *
86-74-8	Carbazole	870
120-12-7	Anthracene	1,600 *
84-74-2	Di-n-Butylphthalate	190 U
206-44-0	Fluoranthene	8,300 *
129-00-0	Pyrene	7,300 *
56-55-3	Benzo(a)anthracene	2,900 *
117-81-7	bis(2-Ethylhexyl)phthalate	1,400
218-01-9	Chrysene	2,900 *
205-99-2	Benzo(b)fluoranthene	2,500 *
207-08-9	Benzo(k)fluoranthene	2,100
50-32-8	Benzo(a)pyrene	2,900 *
193-39-5	Indeno(1,2,3-cd)pyrene	1,800
53-70-3	Dibenz(a,h)anthracene	380
191-24-2	Benzo(g,h,i)perylene	1,700

*only use
 results
 marked
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Semivolatiles Surrogate Recovery

d5-Nitrobenzene	72.8%	d5-Phenol	69.6%
2-Fluorobiphenyl	70.8%	2-Fluorophenol	77.9%
d14-p-Terphenyl	77.2%	2,4,6-Tribromophenol	46.9%
d4-1,2-Dichlorobenzene	58.0%	d4-2-Chlorophenol	70.7%



ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Sample No: R-SD1-LWOF012-10-0000W

Page 1 of 1

Lab Sample ID: AQ07F

QC Report No: AQ07-Roy F. Weston

LIMS ID: 99-11916

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *MB*

Date Sampled: 08/12/99

Reported: 08/25/99

Date Received: 08/13/99

Date extracted: 08/17/99

Sample Amount: 52.2 g-dry-wt

Date analyzed: 08/21/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 13.3%

pH: 6.9

CAS Number	Analyte	ug/kg
108-95-2	Phenol	38 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	36
129-00-0	Pyrene	38
56-55-3	Benzo (a) anthracene	21
117-81-7	bis (2-Ethylhexyl) phthalate	39
218-01-9	Chrysene	23
205-99-2	Benzo (b) fluoranthene	25
207-08-9	Benzo (k) fluoranthene	20
50-32-8	Benzo (a) pyrene	21
193-39-5	Indeno (1,2,3-cd) pyrene	19 U
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	58.7%	d5-Phenol	64.9%
2-Fluorobiphenyl	68.0%	2-Fluorophenol	71.2%
d14-p-Terphenyl	105%	2,4,6-Tribromophenol	96.7%
d4-1,2-Dichlorobenzene	51.5%	d4-2-Chlorophenol	61.0%

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9/10/99

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF004-10-0000

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Lab Sample ID: AQ07G

QC Report No: AQ07-Roy F. Weston

LIMS ID: 99-11917

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *[Signature]*

Date Sampled: 08/12/99

Reported: 08/25/99

Date Received: 08/13/99

Date extracted: 08/17/99

Sample Amount: 51.7 g-dry-wt

Date analyzed: 08/21/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 20.9%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	53
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	75
129-00-0	Pyrene	70
56-55-3	Benzo(a)anthracene	26
117-81-7	bis(2-Ethylhexyl)phthalate	190
218-01-9	Chrysene	34
205-99-2	Benzo(b)fluoranthene	23
207-08-9	Benzo(k)fluoranthene	20
50-32-8	Benzo(a)pyrene	22
193-39-5	Indeno(1,2,3-cd)pyrene	19 U
53-70-3	Dibenz(a,h)anthracene	19 U
191-24-2	Benzo(g,h,i)perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	59.6%	d5-Phenol	69.1%
2-Fluorobiphenyl	74.7%	2-Fluorophenol	73.9%
d14-p-Terphenyl	86.4%	2,4,6-Tribromophenol	90.7%
d4-1,2-Dichlorobenzene	52.6%	d4-2-Chlorophenol	65.3%

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9/10/99



ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

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Lab Sample ID: AQ07H

LIMS ID: 99-11918

Matrix: Sediment

Data Release Authorized: *APB*

Reported: 08/25/99

Sample No: R-SD1-LWOF004-10-0000W

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/21/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 51.5 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 21.1%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	26
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	33
129-00-0	Pyrene	31
56-55-3	Benzo(a)anthracene	19 U
117-81-7	bis(2-Ethylhexyl)phthalate	130
218-01-9	Chrysene	19 U
205-99-2	Benzo(b)fluoranthene	19 U
207-08-9	Benzo(k)fluoranthene	19 U
50-32-8	Benzo(a)pyrene	19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19 U
53-70-3	Dibenz(a,h)anthracene	19 U
191-24-2	Benzo(g,h,i)perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	66.6%	d5-Phenol	70.9%
2-Fluorobiphenyl	81.6%	2-Fluorophenol	83.8%
d14-p-Terphenyl	89.5%	2,4,6-Tribromophenol	109%
d4-1,2-Dichlorobenzene	60.8%	d4-2-Chlorophenol	71.0%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

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Lab Sample ID: AQ07I

LIMS ID: 99-11919

Matrix: Sediment

Data Release Authorized: *AB*

Reported: 08/25/99



Sample No: R-SD1-LWOF011-10-0000

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/23/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 53.6 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 10.8%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	37 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	21
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	69
129-00-0	Pyrene	66
56-55-3	Benzo (a) anthracene	36
117-81-7	bis (2-Ethylhexyl) phthalate	360
218-01-9	Chrysene	42
205-99-2	Benzo (b) fluoranthene	46
207-08-9	Benzo (k) fluoranthene	34
50-32-8	Benzo (a) pyrene	44
193-39-5	Indeno (1,2,3-cd) pyrene	40
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	31

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	89.7%	d5-Phenol	77.6%
2-Fluorobiphenyl	78.3%	2-Fluorophenol	115%
d14-p-Terphenyl	94.4%	2,4,6-Tribromophenol	76.4%
d4-1,2-Dichlorobenzene	70.2%	d4-2-Chlorophenol	79.4%

ORGANICS ANALYSIS DATA SHEET



ANALYTICAL
RESOURCES
INCORPORATED

Semivolatiles by GC/MS

Sample No: R-SD1-LWOF011-10-00002

Page 1 of 1

Lab Sample ID: AQ07J

QC Report No: AQ07-Roy F. Weston

LIMS ID: 99-11920

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *MS*

Date Sampled: 08/12/99

Reported: 08/25/99

Date Received: 08/13/99

Date extracted: 08/17/99

Sample Amount: 54.2 g-dry-wt

Date analyzed: 08/23/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 17.0%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	37 U
91-20-3	Naphthalene	18 U
91-57-6	2-Methylnaphthalene	18 U
208-96-8	Acenaphthylene	18 U
83-32-9	Acenaphthene	18 U
132-64-9	Dibenzofuran	18 U
86-73-7	Fluorene	18 U
85-01-8	Phenanthrene	50
86-74-8	Carbazole	18 U
120-12-7	Anthracene	18 U
84-74-2	Di-n-Butylphthalate	18 U
206-44-0	Fluoranthene	89
129-00-0	Pyrene	84
56-55-3	Benzo (a) anthracene	40
117-81-7	bis (2-Ethylhexyl) phthalate	57
218-01-9	Chrysene	46
205-99-2	Benzo (b) fluoranthene	52
207-08-9	Benzo (k) fluoranthene	39
50-32-8	Benzo (a) pyrene	48
193-39-5	Indeno (1,2,3-cd) pyrene	44
53-70-3	Dibenz (a,h) anthracene	18 U
191-24-2	Benzo (g,h,i) perylene	34

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	72.5%	d5-Phenol	67.3%
2-Fluorobiphenyl	73.1%	2-Fluorophenol	95.5%
d14-p-Terphenyl	91.7%	2,4,6-Tribromophenol	81.2%
d4-1,2-Dichlorobenzene	56.8%	d4-2-Chlorophenol	70.5%

run
9/10/99

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ07K

LIMS ID: 99-11921

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 08/25/99



Sample No: R-SD1-LWOF004-10-0000E

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/23/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 51.0 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 21.6%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	16 J
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	23
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	54
206-44-0	Fluoranthene	42
129-00-0	Pyrene	30
56-55-3	Benzo (a) anthracene	20 U
117-81-7	bis (2-Ethylhexyl) phthalate	4,300 4200
218-01-9	Chrysene	24
205-99-2	Benzo (b) fluoranthene	20 U
207-08-9	Benzo (k) fluoranthene	20 U
50-32-8	Benzo (a) pyrene	20 U
193-39-5	Indeno (1,2,3-cd) pyrene	20 U
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	20 U

*Transcribed
from dilution
analysis
run*

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	77.7%	d5-Phenol	75.2%
2-Fluorobiphenyl	84.9%	2-Fluorophenol	116%
d14-p-Terphenyl	87.8%	2,4,6-Tribromophenol	74.6%
d4-1,2-Dichlorobenzene	65.2%	d4-2-Chlorophenol	80.7%

*run
9/10/99*

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



Sample No: R-SD1-LWOF004-10-000005
 DILUTION

ANALYTICAL
 RESOURCES
 INCORPORATED

Page 1 of 1
 Lab Sample ID: AQ07K
 LIMS ID: 99-11921
 Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
 Project: Boeing
 3709-066-020-2100

Data Release Authorized: *AS*
 Reported: 08/25/99

Date Sampled: 08/12/99
 Date Received: 08/13/99

Date extracted: 08/17/99
 Date analyzed: 08/24/99
 Instrument: finn8
 GPC Cleanup: YES

Sample Amount: 51.0 g-dry-wt
 Final Extract Volume: 1.0 mL
 Dilution Factor: 1:20
 Percent Moisture: 21.6%
 pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	780 U
91-20-3	Naphthalene	390 U
91-57-6	2-Methylnaphthalene	390 U
208-96-8	Acenaphthylene	390 U
83-32-9	Acenaphthene	390 U
132-64-9	Dibenzofuran	390 U
86-73-7	Fluorene	390 U
85-01-8	Phenanthrene	390 U
86-74-8	Carbazole	390 U
120-12-7	Anthracene	390 U
84-74-2	Di-n-Butylphthalate	390 U
206-44-0	Fluoranthene	390 U
129-00-0	Pyrene	390 U
56-55-3	Benzo(a)anthracene	390 U
117-81-7	bis(2-Ethylhexyl)phthalate	4,200 *
218-01-9	Chrysene	390 U
205-99-2	Benzo(b)fluoranthene	390 U
207-08-9	Benzo(k)fluoranthene	390 U
50-32-8	Benzo(a)pyrene	390 U
193-39-5	Indeno(1,2,3-cd)pyrene	390 U
53-70-3	Dibenz(a,h)anthracene	390 U
191-24-2	Benzo(g,h,i)perylene	390 U

*only use
 result marked
 **
run

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	D	d5-Phenol	D
2-Fluorobiphenyl	D	2-Fluorophenol	D
d14-p-Terphenyl	D	2,4,6-Tribromophenol	D
d4-1,2-Dichlorobenzene	D	d4-2-Chlorophenol	D

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS
Page 1 of 1



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AQ07E
LIMS ID: 99-11915
Matrix: Sediment

Sample No: R-SD1-LWOF012-10-0000
QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Received: 08/13/99

Data Release Authorized: *MS*
Reported: 08/25/99

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 08/17/99
Date analyzed: 08/21/99

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Phenol	< 38.1	552	712	77.5%	
Acenaphthene	693	426	475	NA	
Pyrene	3800	1400	475	NA	
Benzo(g,h,i)perylene	1160	652	475	NA	

MATRIX SPIKE DUPLICATE

Phenol	< 38.1	604	713	84.7%	8.8%
Acenaphthene	693	598	475	NA	NA
Pyrene	3800	1910	475	NA	NA
Benzo(g,h,i)perylene	1160	707	475	NA	NA

NA No recovery due to high concentration of analyte in original sample.

Values reported in ug/kg-dry-weight

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ07E-MS

LIMS ID: 99-11915

Matrix: Sediment

Data Release Authorized: *01/3*

Reported: 08/25/99



Sample No: R-SD1-LWOF012-10-00

MATRIX SPIKE

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Date extracted: 08/17/99

Date analyzed: 08/21/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 52.7 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 12.9%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	18 J
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	26
86-73-7	Fluorene	56
85-01-8	Phenanthrene	570
86-74-8	Carbazole	110
120-12-7	Anthracene	110
84-74-2	Di-n-Butylphthalate	240
206-44-0	Fluoranthene	1,300
129-00-0	Pyrene	---
56-55-3	Benzo (a) anthracene	520
117-81-7	bis (2-Ethylhexyl) phthalate	15,000 E
218-01-9	Chrysene	580
205-99-2	Benzo (b) fluoranthene	620
207-08-9	Benzo (k) fluoranthene	440
50-32-8	Benzo (a) pyrene	590
193-39-5	Indeno (1,2,3-cd) pyrene	320
53-70-3	Dibenz (a,h) anthracene	61
191-24-2	Benzo (g,h,i) perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	71.5%	d5-Phenol	73.8%
2-Fluorobiphenyl	77.6%	2-Fluorophenol	82.6%
d14-p-Terphenyl	90.0%	2,4,6-Tribromophenol	93.9%
d4-1,2-Dichlorobenzene	65.1%	d4-2-Chlorophenol	75.8%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS



Sample No: R-SD1-LWOF012-10-000
SPIKE DUPLICATE

ANALYTICAL
RESOURCES
INCORPORATED

Page 1 of 1

Lab Sample ID: AQ07E-MSD

QC Report No: AQ07-Roy F. Weston

LIMS ID: 99-11915

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Data Release Authorized: *AWB*

Date Sampled: 08/12/99

Reported: 08/25/99

Date Received: 08/13/99

Date extracted: 08/17/99

Sample Amount: 52.6 g-dry-wt

Date analyzed: 08/21/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 12.9%

pH: 7.0

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	100
91-57-6	2-Methylnaphthalene	29
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	120
86-73-7	Fluorene	240
85-01-8	Phenanthrene	1,700 E
86-74-8	Carbazole	220
120-12-7	Anthracene	380
84-74-2	Di-n-Butylphthalate	130
206-44-0	Fluoranthene	2,400 E
129-00-0	Pyrene	---
56-55-3	Benzo (a) anthracene	850
117-81-7	bis (2-Ethylhexyl) phthalate	1,400
218-01-9	Chrysene	890
205-99-2	Benzo (b) fluoranthene	880
207-08-9	Benzo (k) fluoranthene	600
50-32-8	Benzo (a) pyrene	840
193-39-5	Indeno (1,2,3-cd) pyrene	400
53-70-3	Dibenz (a,h) anthracene	94
191-24-2	Benzo (g,h,i) perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	76.0%	d5-Phenol	79.0%
2-Fluorobiphenyl	81.8%	2-Fluorophenol	91.8%
d14-p-Terphenyl	71.5%	2,4,6-Tribromophenol	106%
d4-1,2-Dichlorobenzene	71.8%	d4-2-Chlorophenol	79.7%



ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ07MB

LIMS ID: 99-11911

Matrix: Sediment

Data Release Authorized: *MB*

Reported: 08/25/99

Sample No: Method Blank

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Sampled: NA

Date Received: NA

Date extracted: 08/17/99

Date analyzed: 08/20/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 50.0 g-dry-wt Equiv

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: NA

pH: NA

CAS Number	Analyte	ug/kg
108-95-2	Phenol	40 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	20 U
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	20 U
129-00-0	Pyrene	20 U
56-55-3	Benzo(a)anthracene	20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20 U
218-01-9	Chrysene	20 U
205-99-2	Benzo(b)fluoranthene	20 U
207-08-9	Benzo(k)fluoranthene	20 U
50-32-8	Benzo(a)pyrene	20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20 U
53-70-3	Dibenz(a,h)anthracene	20 U
191-24-2	Benzo(g,h,i)perylene	20 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	63.9%	d5-Phenol	59.7%
2-Fluorobiphenyl	69.7%	2-Fluorophenol	72.8%
d14-p-Terphenyl	114%	2,4,6-Tribromophenol	64.6%
d4-1,2-Dichlorobenzene	63.6%	d4-2-Chlorophenol	60.3%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS
Page 1 of 1



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AQ07SB
LIMS ID: 99-11911
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Data Release Authorized: *AB*
Reported: 08/25/99

LABORATORY CONTROL SAMPLE
Date extracted: 08/17/99
Date analyzed: 08/20/99

CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY
Phenol	439	750	58.5%
Acenaphthene	320	500	64.0%
Pyrene	488	500	97.6%
Benzo(g,h,i)perylene	569	500	114%

Lab Control Surrogate Recovery

d5-Nitrobenzene	61.0%	d5-Phenol	55.3%
2-Fluorobiphenyl	58.6%	2-Fluorophenol	67.2%
d14-p-Terphenyl	91.6%	2,4,6-Tribromophenol	68.8%
d4-1,2-Dichlorobenzene	59.3%	d4-2-Chlorophenol	57.4%

Values reported in ug/kg-dry-weight



WATER AROCLOR SURROGATE SUMMARY

Matrix: Sediment

QC Report No: AQ07

Project: Boeing

3709-066-020-2100

LIMS ID	Lab ID	Client ID	TCMX #	DCBP #	TOT OUT
99-11911MB	081799MB	Method Blank	74.5%	88.5%	0
99-11911SB	081799SB	Lab Control	78.5%	89.0%	0
99-11911	AQ07A	R-SD1-LWOF016-10-0000	78.0%	88.5%	0
99-11912	AQ07B	R-SD1-LWOF016-10-0000W	72.7%	88.6%	0
99-11913	AQ07C	R-SD1-LWOF014-10-0000	79.4%	95.8%	0
99-11914	AQ07D	R-SD1-LWOF014-10-0000E	76.5%	90.0%	0
99-11914MS	AQ07D	R-SD1-LWOF014-10-0000E	72.2%	86.4%	0
99-11914MD	AQ07D	R-SD1-LWOF014-10-0000E	80.5%	89.8%	0
99-11915	AQ07E	R-SD1-LWOF012-10-0000	66.4%	95.3%	0
99-11916	AQ07F	R-SD1-LWOF012-10-0000W	79.0%	83.7%	0
99-11917	AQ07G	R-SD1-LWOF004-10-0000	73.2%	84.1%	0
99-11918	AQ07H	R-SD1-LWOF004-10-0000W	74.3%	86.3%	0
99-11919	AQ07I	R-SD1-LWOF011-10-0000	77.5%	101%	0
99-11920	AQ07J	R-SD1-LWOF011-10-0000E	79.4%	88.9%	0
99-11921	AQ07K	R-SD1-LWOF004-10-0000E	75.2%	95.7%	0

QC LIMITS

(TCMX) = Tetrachloro-m-xylene

(30-103)

(DCBP) = Decachlorobiphenyl

(30-128)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF016-10-0000W

Lab Sample ID: AQ07B
LIMS ID: 99-11912
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Cathy M. Kusner

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 26.9 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	27 ✓ 4
11096-82-5	Aroclor 1260	21
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 88.6%
Tetrachlorometaxylene 72.7%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

RMS
9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF014-10-0000

Lab Sample ID: AQ07C
LIMS ID: 99-11913
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisol Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 29.0 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	17 U
53469-21-9	Aroclor 1242	17 U
12672-29-6	Aroclor 1248	17 U
11097-69-1	Aroclor 1254	17 U
11096-82-5	Aroclor 1260	54
11104-28-2	Aroclor 1221	34 U
11141-16-5	Aroclor 1232	17 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 95.8%
Tetrachlorometaxylene 79.4%

Data Qualifiers

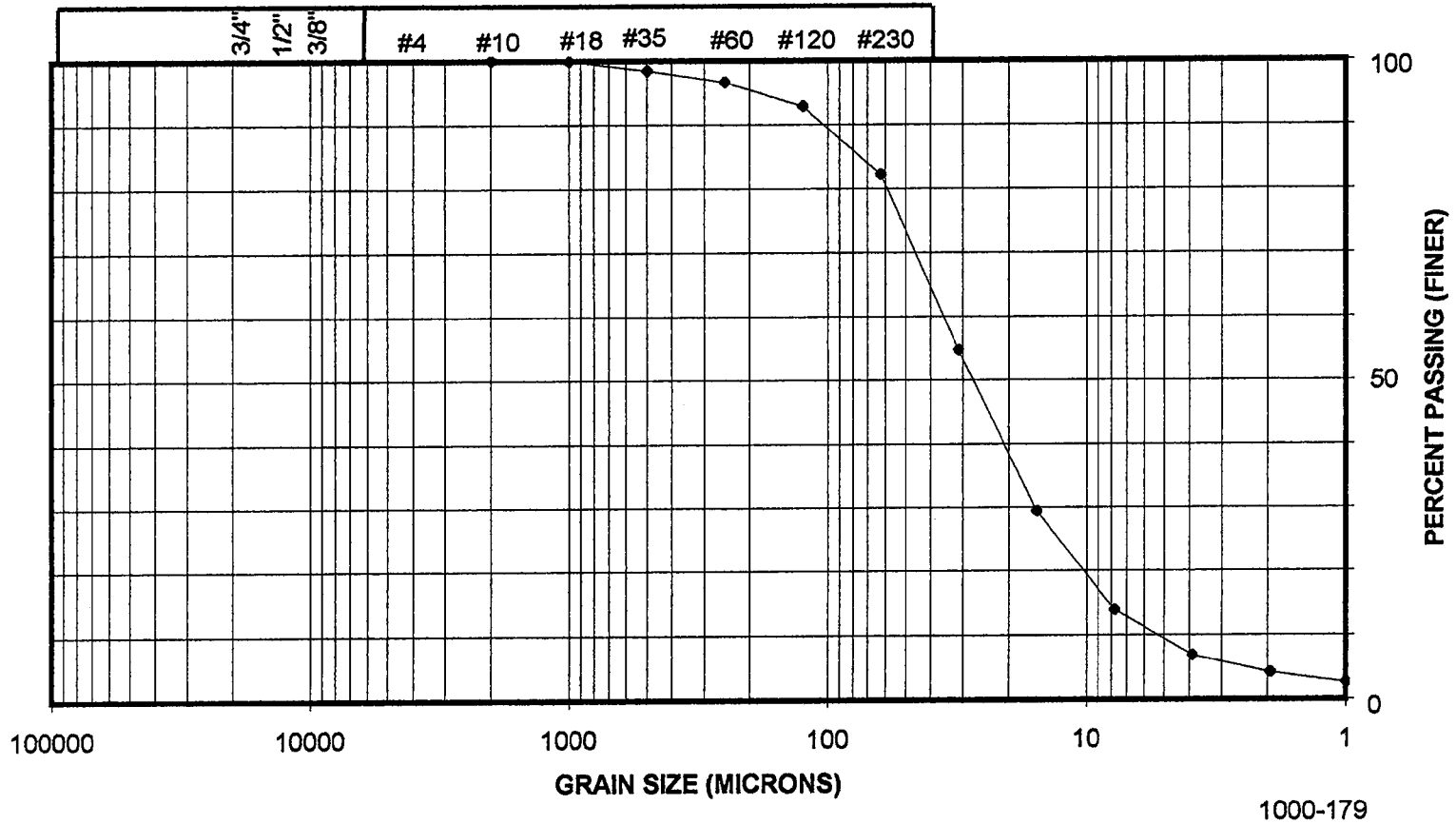
- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

run
7/10/99

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

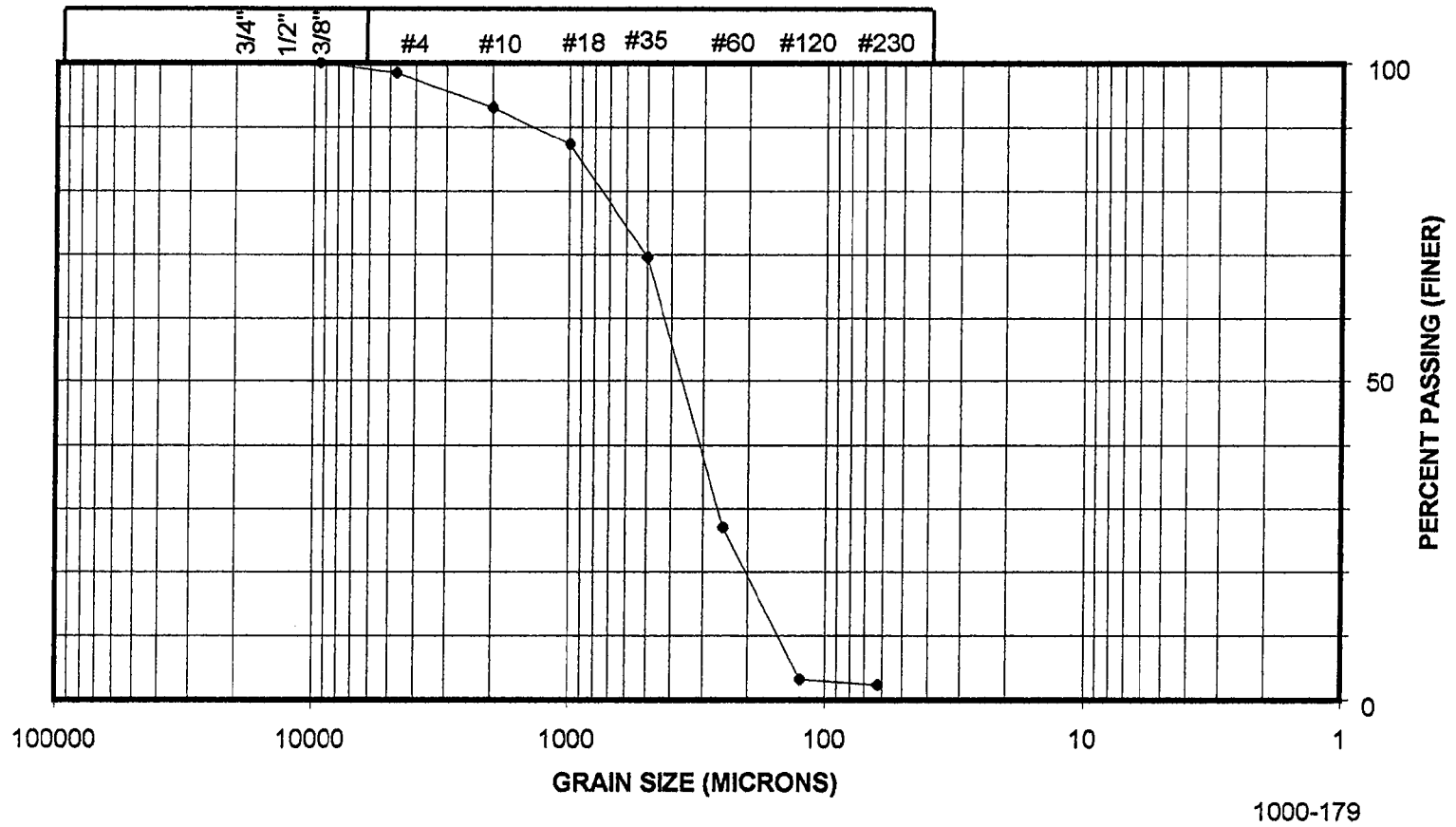
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF010-10-0000W



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston Company
Sample No. R-SD1-LWOF003-10-0000

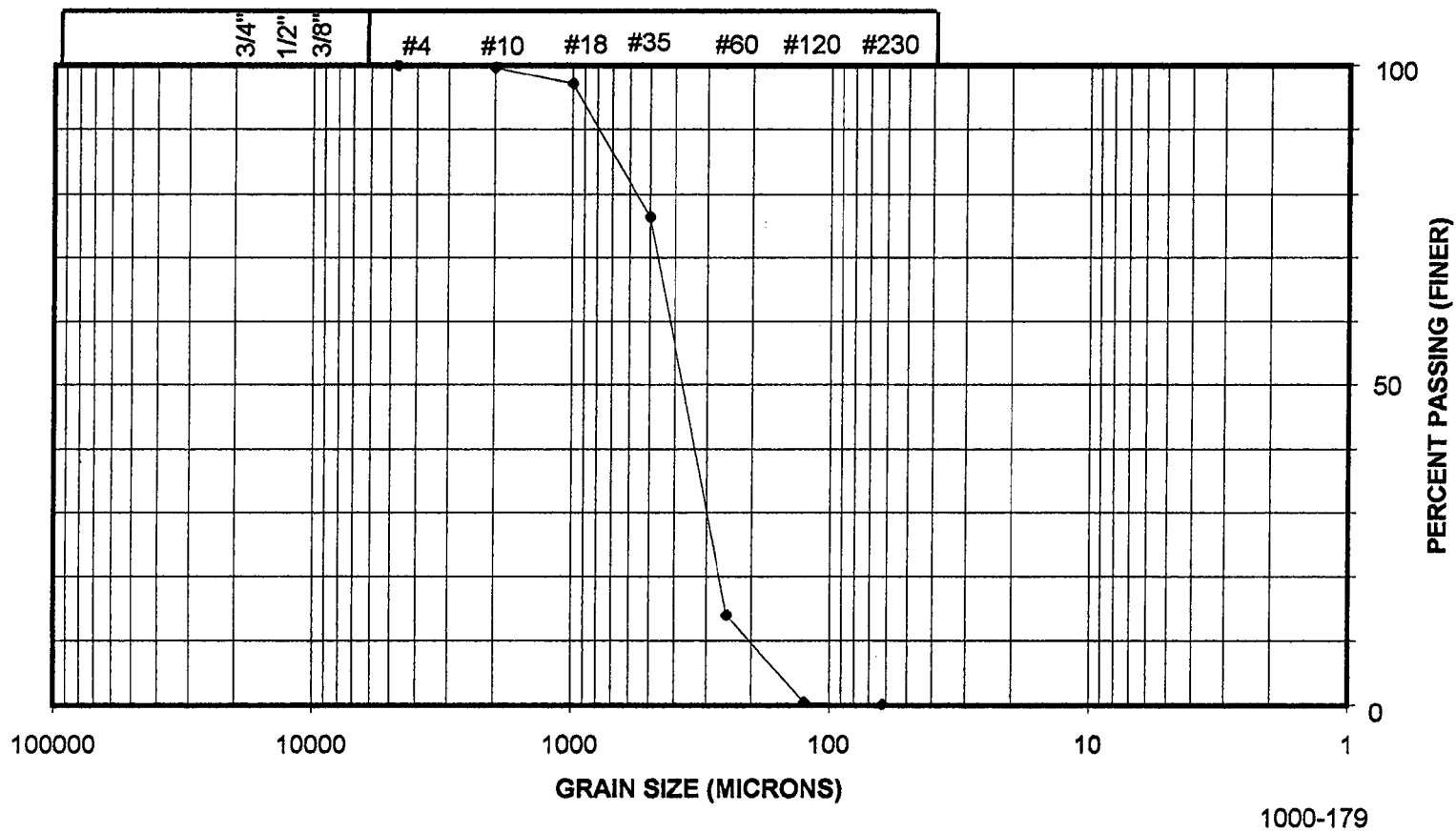


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ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

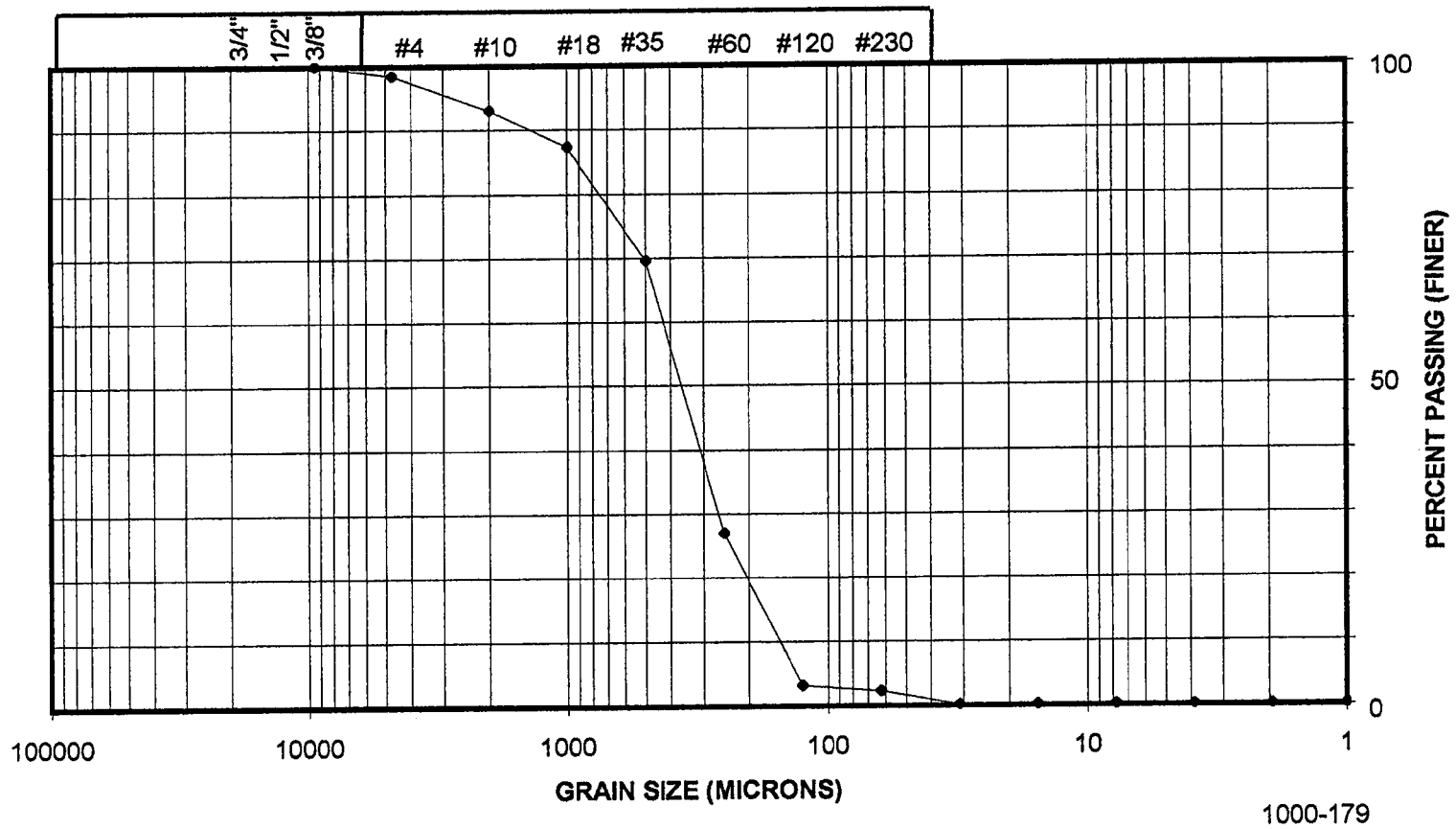
Project: Roy F. Weston Company
Sample No. R-SD1-LWOF003-10-0000E



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston Company
Sample No. R-SD1-LWOF003-10-0000W



1000 - 179

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\12\99**

ARI Project: AP90

Laboratory: REG Lab
Lab Contact: Harold Benny
Lab Address: 400 Ninth Ave N, Ste B
Seattle, WA 98109-5187
Phone: 206-389-6156
Fax:

ARI Client: Roy F. Weston Company
Project ID: 3709-066-020-2100
ARI PMgr: Kate Stegemoeller
Phone: (206) 340-2866 Ext 117
Fax: (206) 621-7523

Analytical Protocol: PSDDA

Requested Turn Around: 2 wks
Fax Results (Y/N):

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11793-AP90A	R-SD1-LWCF-10-0000 703	8/11/99	Sediment	1	Grain Size (Subc)
99-11794-AP90B	R-SD1-LWCF-10-1000 704	8/11/99	Sediment	1	Grain Size (Subc)
99-11795-AP90C	R-SD1-LWFF-10-0000 705	8/11/99	Sediment	1	Grain Size (Subc)

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by <i>[Signature]</i>	Company ARI	Date 8/12/99	Time 1135
Received by <i>[Signature]</i>	Company ARI	Date 8/12/99	Time 1135

Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

1000-174 Part II

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\13\99**

ARI Project: AQ07

Laboratory: REG Lab
Lab Contact: Harold Benny
Lab Address: 400 Ninth Ave N, Ste B
Seattle, WA 98109-5187
Phone: 206-389-6156
Fax:

ARI Client: Roy F. Weston
Project ID: 3709-066-020-2100
ARI PMgr: Jennifer Baier
Phone: (206) 340-2866 Ext 106
Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: 08/27/99

Fax Results (Y/N): Yes

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11911-AQ07A	R-SD1-LWOF16-10-0000	8/12/99	Sediment		Grain Size (Subc)
Limited Volume! <i>B23</i>					
99-11912-AQ07B	R-SD1-LWOF16-10-0000W	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume! <i>B24</i>					
99-11913-AQ07C	R-SD1-LWOF14-10-0000	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume! <i>B25</i>					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by <i>[Signature]</i>	Company <i>ARI</i>	Date <i>8/13/99</i>	Time <i>1600</i>
Received by <i>[Signature]</i>	Company <i>NEOL</i>	Date <i>8/13/99</i>	Time <i>1600</i>
Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\13\99**

ARI Project: AQ07

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: 08/27/99

Fax Results (Y/N): Yes

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11914-AQ07D	R-SD1-LWOF14-10-0000E	8/12/99	Sediment	2	Grain Size (Subc)
Limited Volume! <i>624</i>					
99-11915-AQ07E	R-SD1-LWOF12-10-0000	8/12/99	Sediment	2	Grain Size (Subc)
Limited Volume! <i>627</i>					
99-11916-AQ07F	R-SD1-LWOF12-10-0000W	8/12/99	Sediment	2	Grain Size (Subc)
Limited Volume! <i>628</i>					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill		Date
Relinquished by <i>[Signature]</i>	Company <i>ARI</i>	Date <i>8/13/99</i>	Time <i>1600</i>
Received by <i>[Signature]</i>	Company <i>ARL</i>	Date <i>8/13/99</i>	Time <i>1600</i>
Carrier	Airbill		Date
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\13\99**

ARI Project: AQ07

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: 08/27/99
 Fax Results (Y/N): Yes

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11917-AQ07G	R-SD1-LWOF004-10-0000	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume! <i>829</i>					
99-11918-AQ07H	R-SD1-LWOF004-10-0000W	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume! <i>630</i>					
99-11919-AQ07I	R-SD1-LWOF11-10-0000	8/12/99	Sediment	<i>2</i>	Grain Size (Subc)
Limited Volume! <i>831</i>					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill		Date
Relinquished by <i>[Signature]</i>	Company <i>ARI</i>	Date <i>8/13/99</i>	Time <i>1600</i>
Received by <i>[Signature]</i>	Company <i>WOL</i>	Date <i>8/13/99</i>	Time <i>1600</i>
Carrier	Airbill		Date
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\13\99**

ARI Project: AQ07

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

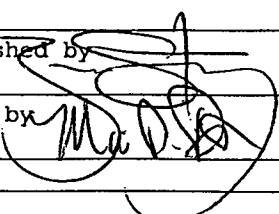
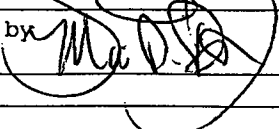
Analytical Protocol: In-house

Requested Turn Around: 08/27/99

Fax Results (Y/N): Yes

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11920-AQ07J	R-SD1-LWOF11-10-0000E	8/12/99	Sediment	2	Grain Size (Subc)
Limited Volume! 032					
99-11921-AQ07K	R-SD1-LWOF004-10-0000E	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume! 033					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by 	Company ARI	Date 8/13/99	Time 1600
Received by 	Company REG	Date 9/13/99	Time 1600
Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

1000-174 PART 3

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\16\99**

ARI Project: AQ20

Laboratory: REG Lab
Lab Contact: Harold Benny
Lab Address: 400 Ninth Ave N, Ste B
Seattle, WA 98109-5187
Phone: 206-389-6156
Fax:

ARI Client: Roy F. Weston Company
Project ID: 3709-066-020-2100
ARI PMgr: Kate Stegemoeller
Phone: (206) 340-2866 Ext 117
Fax: (206) 621-7523

Analytical Protocol: PSDDA

Requested Turn Around: 08/29/99
Fax Results (Y/N):

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11996-AQ20A	R-SD1-LWOF010-10-0000	8/13/99	Sediment	1	Grain Size (Subc)
B34					
99-11997-AQ20B	R-SD1-LWOF010-10-0000E	8/13/99	Sediment	1	Grain Size (Subc)
B35					
99-11998-AQ20C	R-SD1-LWOF010-10-0000W	8/13/99	Sediment	1	Grain Size (Subc)
B36					
99-11999-AQ20D	R-SD1-LWOF003-10-0000	8/13/99	Sediment	2	Grain Size (Subc)
B37					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by	Company ARI	Date 8/16/99	Time 1115
Received by	Company REGC	Date 8/16/99	Time 1115

Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\16\99**

ARI Project: AQ20

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

ARI Client: Roy F. Weston Company
 Project ID: 3709-066-020-2100
 ARI PMgr: Kate Stegemoeller
 Phone: (206) 340-2866 Ext 117
 Fax: (206) 621-7523

Analytical Protocol: PSDDA

Requested Turn Around: 08/29/99
 Fax Results (Y/N):

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-12000-AQ20E	R-SD1-LWOF003-10-0000E	8/13/99	Sediment	2	Grain Size (Subc)
	B38				
99-12001-AQ20F	R-SD1-LWOF003-10-0000W	8/13/99	Sediment	2	Grain Size (Subc)
	B39				
99-12002-AQ20G	R-SD1-LWOS001-10-0000	8/13/99	Sediment	2	Grain Size (Subc)
	B40				
99-12003-AQ20H	R-SD1-LWOS002-10-0000	8/13/99	Sediment	1	Grain Size (Subc)
	B41				

RETURNED TO ARI

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
<i>[Signature]</i>	ARI	8.16.99	1115
Received by	Company	Date	Time
<i>[Signature]</i>	ARI	8/16/99	1115

Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF014-10-0000E

Lab Sample ID: AQ07D
LIMS ID: 99-11914
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: Yes

Sample Amount: 25.7 g-dry-wt
Final Ext Vol: 5.0 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	26
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	19 U
11096-82-5	Aroclor 1260	19 U
11104-28-2	Aroclor 1221	39 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 90.0%
Tetrachlorometaxylene 76.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF012-10-0000

Lab Sample ID: AQ07E
LIMS ID: 99-11915
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisisl Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 26.5 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	19 U
11096-82-5	Aroclor 1260	39
11104-28-2	Aroclor 1221	38 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 95.3%
Tetrachlorometaxylene 66.4%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF012-10-0000W

Lab Sample ID: AQ07F
LIMS ID: 99-11916
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Cathy M. Weston

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 26.2 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	19 U
11096-82-5	Aroclor 1260	19 U
11104-28-2	Aroclor 1221	38 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 83.7%
Tetrachlorometaxylene 79.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

R 11/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF004-10-0000

Lab Sample ID: AQ07G
LIMS ID: 99-11917
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 27.9 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	50 Y U
11096-82-5	Aroclor 1260	72
11104-28-2	Aroclor 1221	36 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 84.1%
Tetrachlorometaxylene 73.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF004-10-0000W

Lab Sample ID: AQ07H
LIMS ID: 99-11918
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 28.0 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	18 U
11096-82-5	Aroclor 1260	30
11104-28-2	Aroclor 1221	36 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 86.3%
Tetrachlorometaxylene 74.3%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF011-10-0000

Lab Sample ID: AQ07I
LIMS ID: 99-11919
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Catherine Lawson

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 27.0 g-dry-wt
Final Ext Vol: 5.0 mL

Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	19 U
11096-82-5	Aroclor 1260	19 U
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 101%
Tetrachlorometaxylene 77.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF011-10-0000E

Lab Sample ID: AQ07J
LIMS ID: 99-11920
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Catherine Weston

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 29.1 g-dry-wt

Sulfur Cleanup: Yes

Final Ext Vol: 5.0 mL

Conc/Dilution Factor: 1:1

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	17 U
53469-21-9	Aroclor 1242	17 U
12672-29-6	Aroclor 1248	17 U
11097-69-1	Aroclor 1254	17 U
11096-82-5	Aroclor 1260	7.1 J
11104-28-2	Aroclor 1221	34 U
11141-16-5	Aroclor 1232	17 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 88.9%
Tetrachlorometaxylene 79.4%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF004-10-0000E

Lab Sample ID: AQ07K
LIMS ID: 99-11921
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes

Sample Amount: 27.4 g-dry-wt
Final Ext Vol: 5.0 mL

Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	18 U
11096-82-5	Aroclor 1260	75
11104-28-2	Aroclor 1221	36 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 95.7%
Tetrachlorometaxylene 75.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

*Run
9/10/99*



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: AQ07D
LIMS ID: 99-11914
Matrix: Sediment

Sample No: R-SD1-LWOF014-10-0000E
QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Cathy M. Newman

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY
Date extracted: 08/17/99

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	26.0	156.	196	66.2%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	26.0	162.	196	69.4%	4.8%

Values reported in ug/L

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF014-10-0000E
MATRIX SPIKE

Lab Sample ID: AQ07DMS
LIMS ID: 99-11914
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99

Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Ext Vol: 5.0 mL

Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Reported in Total ug/L

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	19 U
11096-82-5	Aroclor 1260	13 J
11104-28-2	Aroclor 1221	39 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 86.4%
Tetrachlorometaxylene 72.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF014-10-0000E
SPIKE DUPLICATE

Lab Sample ID: AQ07DMSD
LIMS ID: 99-11914
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 25.7 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	19 U
11096-82-5	Aroclor 1260	16 J
11104-28-2	Aroclor 1221	39 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 89.8%
Tetrachlorometaxylene 80.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
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Sample No: Method Blank

Lab Sample ID: AQ07MB
LIMS ID: 99-11911
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: NA

Date Received: NA

Data Release Authorized:
Reported: 08/25/99

Date extracted: 08/17/99
Date analyzed: 08/20/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1

Sample Amount: 25.0 g-dry-wt
Final Ext Vol: 5.0 mL

Reported in Total ug/L

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	20 U
11096-82-5	Aroclor 1260	20 U
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 88.5%
Tetrachlorometaxylene 74.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by METHOD 8080

Lab Sample ID: AQ07SB
LIMS ID: 99-11911
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Data Release Authorized:
Reported: 08/25/99

Cathy M. Hewson

LABORATORY CONTROL SAMPLE RECOVERY

Date extracted: 08/17/99

CONSTITUENT	SPIKE VALUE	SPIKE AMT	% RECOVERY
LABORATORY CONTROL SAMPLE			
Aroclor 1242	177.	202	87.8%

Aroclor Surrogate Recoveries

Decachlorobiphenyl 89.0%
Tetrachlorometaxylene 78.5%

Values reported in ug/L



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF016-10-0000

Lab Sample ID: AQ07A
LIMS ID: 99-11911
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/30/99

Percent Total Solids: 72.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/25/99	6010	08/26/99	7429-90-5	Aluminum	1	15,200
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.07	0.23 J
3050	08/25/99	6010	08/26/99	7440-38-2	Arsenic	3	3 U
3050	08/25/99	6010	08/26/99	7440-41-7	Beryllium	0.07	0.19
3050	08/25/99	6010	08/26/99	7440-43-9	Cadmium	0.1	12.0 J
3050	08/25/99	6010	08/26/99	7440-70-2	Calcium	1	6,040
3050	08/25/99	6010	08/26/99	7440-47-3	Chromium	0.3	135 J
3050	08/25/99	6010	08/26/99	7440-50-8	Copper	0.1	26.1
3050	08/25/99	6010	08/26/99	7439-89-6	Iron	1	21,300
3050	08/25/99	6010	08/26/99	7439-92-1	Lead	1	200 J
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.01	0.02
3050	08/25/99	6010	08/26/99	7440-02-0	Nickel	0.7	25.7
3050	08/25/99	6010	08/26/99	7782-49-2	Selenium	3	5
3050	08/25/99	6010	08/26/99	7440-22-4	Silver	0.2	0.2 U
3050	08/25/99	6010	08/26/99	7440-28-0	Thallium	3	5
3050	08/25/99	6010	08/26/99	7440-66-6	Zinc	0.3	98.1

U Analyte undetected at given RL

RL Reporting Limit

run
7/10/99




ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF016-10-0000W

Lab Sample ID: AQ07B
LIMS ID: 99-11912
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized: 
Reported: 08/30/99

Percent Total Solids: 68.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	15,700
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.07	0.11 J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	4	4 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.07	0.25
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.7
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	6,480
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.4	24.7
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	19.4
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	22,000
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	18
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.03
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.7	24.2
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	4	4 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	4	4 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.3	73.0

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

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9/10/99



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RESOURCES
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF014-10-0000

Lab Sample ID: AQ07C
LIMS ID: 99-11913
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized
Reported: 08/30/99

Percent Total Solids: 80.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	13,500
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.26 J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	4
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.20
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.9
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	9,670
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	32.8
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	25.6
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	25,100
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	104
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.04
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	25.3
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	4
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	131

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Rym
9/10/99



**ANALYTICAL
RESOURCES
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**INORGANICS ANALYSIS DATA SHEET
TOTAL METALS**

Sample No: R-SD1-LWOF014-10-0000E

Lab Sample ID: AQ07D
LIMS ID: 99-11914
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized
Reported: 08/30/99

Percent Total Solids: 82.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	13,800
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.11 J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	3 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.23
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.5
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	5,840
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	22.4
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	15.2
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	22,300
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	9
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.03
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	20.5
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	67.7

U Analyte undetected at given RL
RL Reporting Limit

run
7/10/99



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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF012-10-0000

Lab Sample ID: AQ07E
LIMS ID: 99-11915
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized
Reported: 08/30/99

Percent Total Solids: 82.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	14,900
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.25 J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	6
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.23
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	2.2
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	5,950
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	32.5
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	41.7
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	26,600
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	45
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.07
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	28.2
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	194

U Analyte undetected at given RL

RL Reporting Limit

rum
9/10/99



**ANALYTICAL
RESOURCES
INCORPORATED**

**INORGANICS ANALYSIS DATA SHEET
TOTAL METALS**

Sample No: R-SD1-LWOF012-10-0000W

Lab Sample ID: AQ07F
LIMS ID: 99-11916
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/30/99

Percent Total Solids: 79.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	17,200
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.06 U J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	3 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.21
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	1.2
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	7,260
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	24.3
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	15.7
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	21,900
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	9
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.04
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	23.8
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	53.7

U Analyte undetected at given RL

RL Reporting Limit

Rum

9/10/99




ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF004-10-0000

Lab Sample ID: AQ07G
LIMS ID: 99-11917
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized: 
Reported: 08/30/99

Percent Total Solids: 83.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	14,000
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.10 J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	3 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.21
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.4
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	5,560
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	18.7
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	14.8
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	25,200
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	9
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.02
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	19.3
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	77.7

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Rum
9/10/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF004-10-0000W

Lab Sample ID: AQ07H
LIMS ID: 99-11918
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/30/99

Percent Total Solids: 78.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	13,800
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.06 U J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	3 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.21
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.3
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	5,830
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	17.5
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	14.0
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	24,000
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	7
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.02
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	18.6
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	71.0

U Analyte undetected at given RL

RL Reporting Limit

Handwritten: 7/10/99



ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF011-10-0000

Lab Sample ID: AQ07I
LIMS ID: 99-11919
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized:
Reported: 08/30/99

Percent Total Solids: 84.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	14,900
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.15 J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	3 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.23
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.5
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	5,300
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	24.2
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	16.0
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	20,300
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	7
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.02
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	26.4
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	51.3

U Analyte undetected at given RL

RL Reporting Limit

rum
9/10/99



**INORGANICS ANALYSIS DATA SHEET
TOTAL METALS**

Sample No: R-SD1-LWOF011-10-0000E

Lab Sample ID: AQ07J
LIMS ID: 99-11920
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized
Reported: 08/30/99

Percent Total Solids: 81.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	14,900
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.06 U J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	3 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.23
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.5
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	6,050
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	25.6
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	16.3
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	26,400
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	7
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.02
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	25.7
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	48.9

U Analyte undetected at given RL

RL Reporting Limit

rum
9/10/99



ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF004-10-0000E

Lab Sample ID: AQ07K
LIMS ID: 99-11921
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized
Reported: 08/30/99

Percent Total Solids: 82.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	1	14,100
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.06	0.08 J
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	3	4
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.06	0.19
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.1	0.4
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	1	5,950
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.3	20.1
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.1	17.0
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	1	27,300
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	1	10
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.09
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	0.6	20.4
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	3	3
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	3	3
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.2	77.0

U Analyte undetected at given RL

RL Reporting Limit

Rum
9/10/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: AQ07MB
LIMS ID: 99-11911
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 08/30/99

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/18/99	6010	08/23/99	7429-90-5	Aluminum	2	4
3050	08/18/99	7041	08/20/99	7440-36-0	Antimony	0.1	0.1 U
3050	08/18/99	6010	08/23/99	7440-38-2	Arsenic	5	5 U
3050	08/18/99	6010	08/23/99	7440-41-7	Beryllium	0.1	0.1 U
3050	08/18/99	6010	08/23/99	7440-43-9	Cadmium	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7440-70-2	Calcium	2	3
3050	08/18/99	6010	08/23/99	7440-47-3	Chromium	0.5	0.5 U
3050	08/18/99	6010	08/23/99	7440-50-8	Copper	0.2	0.2 U
3050	08/18/99	6010	08/23/99	7439-89-6	Iron	2	2 U
3050	08/18/99	6010	08/23/99	7439-92-1	Lead	2	2 U
CLP	08/18/99	7471	08/20/99	7439-97-6	Mercury	0.01	0.01 U
3050	08/18/99	6010	08/23/99	7440-02-0	Nickel	1	1 U
3050	08/18/99	6010	08/23/99	7782-49-2	Selenium	5	5 U
3050	08/18/99	6010	08/23/99	7440-22-4	Silver	0.3	0.3 U
3050	08/18/99	6010	08/23/99	7440-28-0	Thallium	5	5 U
3050	08/18/99	6010	08/23/99	7440-66-6	Zinc	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit



ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: AQ07MB
LIMS ID: 99-11912
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: NA
Date Received: NA

Data Release Authorized
Reported: 08/30/99

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/25/99	6010	08/26/99	7429-90-5	Aluminum	1	1 U
3050	08/25/99	6010	08/26/99	7440-38-2	Arsenic	2	2 U
3050	08/25/99	6010	08/26/99	7440-41-7	Beryllium	0.05	0.05 U
3050	08/25/99	6010	08/26/99	7440-43-9	Cadmium	0.1	0.1 U
3050	08/25/99	6010	08/26/99	7440-70-2	Calcium	1	1 U
3050	08/25/99	6010	08/26/99	7440-47-3	Chromium	0.2	0.2 U
3050	08/25/99	6010	08/26/99	7440-50-8	Copper	0.1	0.1 U
3050	08/25/99	6010	08/26/99	7439-89-6	Iron	1	1 U
3050	08/25/99	6010	08/26/99	7439-92-1	Lead	1	1 U
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.01	0.01 U
3050	08/25/99	6010	08/26/99	7440-02-0	Nickel	0.5	0.5 U
3050	08/25/99	6010	08/26/99	7782-49-2	Selenium	2	2 U
3050	08/25/99	6010	08/26/99	7440-22-4	Silver	0.2	0.2 U
3050	08/25/99	6010	08/26/99	7440-28-0	Thallium	2	2 U
3050	08/25/99	6010	08/26/99	7440-66-6	Zinc	0.2	0.2 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
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Lab Sample ID: AQ07A
LIMS ID: 99-11911
Matrix: Sediment

Sample No: R-SD1-LWOF016-10-0000
QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Received: 08/13/99

Data Release Authorized: *[Signature]*
Reported: 08/30/99

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Aluminum	6010	15200	16100	5.8%	+/- 20 %	
Antimony	7041	0.23	0.24	4.3%	+/- 0.07	L
Arsenic	6010	3 U	3 U	0.0%	+/- 3	L
Beryllium	6010	0.19	0.18	5.4%	+/- 0.07	L
Cadmium	6010	12.0	2.2	138%	+/- 20 %	*
Calcium	6010	6040	6100	1.0%	+/- 20 %	
Chromium	6010	135	28.2	131%	+/- 20 %	*
Copper	6010	26.1	23.7	9.6%	+/- 20 %	
Iron	6010	21300	21700	1.9%	+/- 20 %	
Lead	6010	200	25	156%	+/- 20 %	*
Mercury	7471	0.02	0.03	40.0%	+/- 0.01	L
Nickel	6010	25.7	21.5	17.8%	+/- 20 %	
Selenium	6010	5	4	22.2%	+/- 3	L
Silver	6010	0.2 U	0.2 U	0.0%	+/- 0.2	L
Thallium	6010	5	3 U	50.0%	+/- 3	L
Zinc	6010	98.1	103	4.9%	+/- 20 %	

'Q' codes:

* = control limit not met
L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS




ANALYTICAL
RESOURCES
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Lab Sample ID: AQ07A
LIMS ID: 99-11911
Matrix: Sediment

Sample No: R-SD1-LWOF016-10-0000
QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Received: 08/13/99

Data Release Authorized: 
Reported: 08/30/99

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	15200	16200	1380	72.5%	H
Antimony	7041	0.23	1.64	6.71	21.0%	N
Arsenic	6010	3 U	310	345	89.9%	
Beryllium	6010	0.19	6.53	6.89	92.0%	
Cadmium	6010	12.0	15.2	3.4	94.1%	
Calcium	6010	6040	7080	1380	75.4%	H
Chromium	6010	135	70.1	68.9	-94.2%	N
Copper	6010	26.1	34.5	6.9	122%	
Iron	6010	21300	22500	1380	87.0%	H
Lead	6010	200	173	69	-39.1%	N
Mercury	7471	0.02	0.15	0.14	92.9%	
Nickel	6010	25.7	86.9	68.9	88.8%	
Selenium	6010	5	321	345	91.6%	
Silver	6010	0.2 U	31.7	34.5	91.9%	
Thallium	6010	5	307	345	87.5%	
Zinc	6010	98.1	158	68.9	86.9%	

'Q' codes:
 N = control limit not met
 H = %R not applicable, sample concentration too high
 * = RPD control limit not met
 NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
 RPD: +/-20%

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
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INCORPORATED

Lab Sample ID: AQ07LCS
LIMS ID: 99-11911
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Data Release Authorized:
Reported: 08/30/99

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	257	250	103%	
Antimony	7041	8.6	10.0	86.0%	
Arsenic	6010	249	250	99.6%	
Beryllium	6010	4.8	5.0	96.0%	
Cadmium	6010	10.1	10.0	101%	
Calcium	6010	1020	1000	102%	
Chromium	6010	23.7	25.0	94.8%	
Copper	6010	9.6	10.0	96.0%	
Iron	6010	245	250	98.0%	
Lead	6010	100	100	100%	
Mercury	7471	0.16	0.20	80.0%	
Nickel	6010	51	50	102%	
Selenium	6010	261	250	104%	
Silver	6010	25.0	25.0	100%	
Thallium	6010	239	250	95.6%	
Zinc	6010	51.4	50.0	103%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AQ07LCS
LIMS ID: 99-11912
Matrix: Sediment

QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100

Data Release Authorized
Reported: 08/30/99

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	249	250	99.6%	
Arsenic	6010	238	250	95.2%	
Beryllium	6010	4.74	5.00	94.8%	
Cadmium	6010	9.9	10.0	99.0%	
Calcium	6010	962	1000	96.2%	
Chromium	6010	24.3	25.0	97.2%	
Copper	6010	9.9	10.0	99.0%	
Iron	6010	241	250	96.4%	
Lead	6010	96	100	96.0%	
Mercury	7471	0.19	0.20	95.0%	
Nickel	6010	46.7	50.0	93.4%	
Selenium	6010	244	250	97.6%	
Silver	6010	24.5	25.0	98.0%	
Thallium	6010	243	250	97.2%	
Zinc	6010	47.5	50.0	95.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%



**Final Report
Laboratory Analysis of Conventional Parameters**

Sample No: R-SD1-LWOF016-10-0000

Lab Sample ID: AQ07A	QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11911	Project: Boeing
Matrix: Sediment	3709-066-020-2100
	Date Sampled: 08/12/99
Data Release Authorized: <i>mf</i>	Date Received: 08/13/99
Reported: 08/31/99	Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99	EPA 160.3		0.01	Percent	74.2
	082099#1	SM 2540 B				
Total Organic Carbon	08/27/99	Plumb, 1981		0.0050	Percent	0.88
	082799#1					

RL Analytical reporting limit
 U Undetected at reported detection limit
 B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

mf
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF016-10-0000W

Lab Sample ID: AQ07B QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11912 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *mg* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	73.5
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.74

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

mg
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF014-10-0000

Lab Sample ID: AQ07C QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11913 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized *ms* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	81.9
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.56

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

ms
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF014-10-0000E

Lab Sample ID: AQ07D QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11914 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *mmf* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	78.5
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.56

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

mmf
9/10/99



Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF012-10-0000

Lab Sample ID: AQ07E QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11915 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *mf* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99	EPA 160.3		0.01	Percent	80.6
	082099#1	SM 2540 B				
Total Organic Carbon	08/27/99	Plumb, 1981		0.0050	Percent	0.84
	082799#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

mf
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF012-10-0000W

Lab Sample ID: AQ07F QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11916 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *MS* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99	EPA 160.3		0.01	Percent	81.3
	082099#1	SM 2540 B				
Total Organic Carbon	08/27/99	Plumb, 1981		0.0050	Percent	0.77
	082799#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

MS
9/10/99



Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF004-10-0000

Lab Sample ID: AQ07G QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11917 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *MS* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	81.4
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.36

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

rum
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF004-10-0000W

Lab Sample ID: AQ07H QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11918 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *mf* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution			Result
	Date/Batch	Method	Factor	RL	Units	
Total Solids	08/20/99	EPA 160.3		0.01	Percent	79.9
	082099#1	SM 2540 B				
Total Organic Carbon	08/27/99	Plumb, 1981		0.0050	Percent	0.50
	082799#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

mf
9/10/99



**Final Report
Laboratory Analysis of Conventional Parameters**

Sample No: R-SD1-LWOF011-10-0000

Lab Sample ID: AQ07I QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11919 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *MB* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

<u>Analyte</u>	<u>Analysis</u>		<u>Dilution</u>		<u>Units</u>	<u>Result</u>
	<u>Date/Batch</u>	<u>Method</u>	<u>Factor</u>	<u>RL</u>		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	84.4
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.64

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

Rum
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF011-10-0000E

Lab Sample ID: AQ07J QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11920 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *mp* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	83.5
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.39

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

R 11 m
9/11/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF004-10-0000E

Lab Sample ID: AQ07K QC Report No: AQ07-Roy F. Weston
LIMS ID: 99-11921 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/12/99
Data Release Authorized: *MS* Date Received: 08/13/99
Reported: 08/31/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99	EPA 160.3		0.01	Percent	81.4
	082099#1	SM 2540 B				
Total Organic Carbon	08/27/99	Plumb, 1981		0.0050	Percent	0.60
	082799#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ07 received 08/13/99

rum
9/10/99



QA Report - Method Blank Analysis

Matrix: Sediment
QC Report No: AQ07-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Received: NA
Data Release Authorized: *MS*
Reported: 08/31/99 Dr. M.A. Perkins

METHOD BLANK RESULTS
CONVENTIONALS

Analysis			
<u>Date & Batch</u>	<u>Constituent</u>	<u>Units</u>	<u>Result</u>
Method Blank			
08/20/99 082099#1	Total Solids	mg residue	< 1.00 U
Method Blank			
08/27/99 082799#1	Total Organic Carbon	Percent	<0.0050 U



ANALYTICAL
RESOURCES
INCORPORATED

QA Report - Standard Reference Material Analysis

QC Report No: AQ07-Roy F. Weston

Project: Boeing

3709-066-020-2100

Date Received: NA

Data Release Authorized: *mf*
Reported: 08/31/99 Dr. M.A. Perkins

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Value</u>	<u>True Value</u>	<u>Recovery</u>
NBS #2704				
Total Organic Carbon	Percent	3.16	3.35	94.3%

Date analyzed: 08/27/99 Batch ID: 082799#1

SUBCONTRACTOR ANALYSIS REQUEST
 CUSTODY TRANSFER 08\13\99

ARI Project: AQ07

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

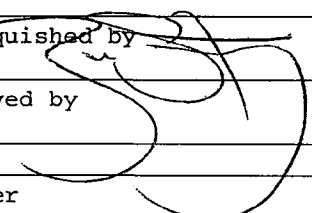
ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: 08/27/99
 Fax Results (Y/N): Yes

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11911-AQ07A	R-SD1-LWOF16-10-0000	8/12/99	Sediment		Grain Size (Subc)
Limited Volume!					
99-11912-AQ07B	R-SD1-LWOF16-10-0000W	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume!					
99-11913-AQ07C	R-SD1-LWOF14-10-0000	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume!					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by 	Company ARI	Date 8/13/99	Time 1610
Received by	Company	Date	Time
Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\13\99**

ARI Project: AQ07

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

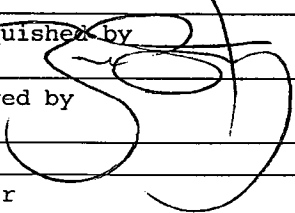
ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: 08/27/99
 Fax Results (Y/N): Yes

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11914-AQ07D	R-SD1-LWOF14-10-0000E	8/12/99	Sediment		Grain Size (Subc) Limited Volume!
99-11915-AQ07E	R-SD1-LWOF12-10-0000	8/12/99	Sediment	2	Grain Size (Subc) Limited Volume!
99-11916-AQ07F	R-SD1-LWOF12-10-0000W	8/12/99	Sediment	2	Grain Size (Subc) Limited Volume!

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by 	Company ARI	Date 8/13/99	Time 1600
Received by	Company	Date	Time
Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 08\13\99**

ARI Project: AQ07

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

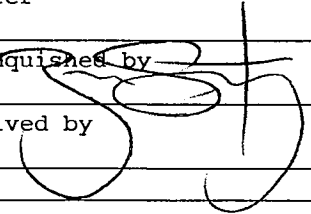
ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: **08/27/99**
 Fax Results (Y/N): **Yes**

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11917-AQ07G	R-SD1-LWOF004-10-0000	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume!					
99-11918-AQ07H	R-SD1-LWOF004-10-0000W	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume!					
99-11919-AQ07I	R-SD1-LWOF11-10-0000	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume!					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date
Relinquished by 	Company ARI	Date 8/13/99 Time 1600
Received by	Company	Date Time
Carrier	Airbill	Date
Relinquished by	Company	Date Time
Received by	Company	Date Time

SUBCONTRACTOR ANALYSIS REQUEST
 CUSTODY TRANSFER 08\13\99

ARI Project: AQ07

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

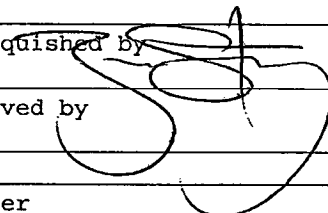
ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: In-house

Requested Turn Around: 08/27/99
 Fax Results (Y/N): Yes

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-11920-AQ07J	R-SD1-LWOF11-10-0000E	8/12/99	Sediment	2	Grain Size (Subc)
Limited Volume!					
99-11921-AQ07K	R-SD1-LWOF004-10-0000E	8/12/99	Sediment	1	Grain Size (Subc)
Limited Volume!					

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date
Relinquished by 	Company ARI	Date 8/13/99 Time 1600
Received by	Company	Date

Carrier	Airbill	Date
Relinquished by	Company	Date
Received by	Company	Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

September 1, 1999

Roger McGinnis
Roy F. Weston, Inc.
Suite 5700
700 Fifth Ave
Seattle, WA 98103

RE: Project: Boeing Renton Sediment
ARI Job: AQ20

Dear Roger:

Please find enclosed an original chain of custody (COC) record and a set of analytical results for the above referenced project. Analytical Resources, Inc. received eight sediment samples in good condition on August 14, 1999.

The samples were analyzed for total metals (PSDDA), semivolatiles (PSDDA), total organic carbon (PSDDA), and grain size (PSEP). The samples for grain size were subcontracted to Rosa Environmental and Geotechnical Laboratory (ROSA). Grain size results were included in ARI job AP90. Zinc was detected in the method blank.

No other analytical complications were noted for this delivery group. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Jennifer M. Baier
Project Manager
jennifer@arilabs.com

JMB/sl
Enclosure

Chain of Custody Record & Laboratory Analysis Request

AG20 119910-12003
Date: 8/13/99



Analytical Resources, Incorporated
Analytical Chemist and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
(206) 621-6490
(206) 621-7523 (Fax)

ARI Client: Roy F. Weston Phone#: (206) 521-7600

Number of coolers: 1
Cooler Temp: 5.5

Client Contact: Roger McGinnis / Allison Reak

Client Project ID: 3709-066-020-2100

Samplers: A. Reak, S. Fitzgerald, M. Shaw

						Analysis Required	Notes/Comments
1	R-SDI-LWDF010-10-0000	8/13/99	see			5	Metals, TOC, grain size, BVALS/PCBS 8/13/99
2	R-SDI-LWDF010-10-0000E		weston			5	
3	R-SDI-LWDF010-10-0000W		logs			5	
4	R-SDI-LWDF003-10-0000					6	
5	R-SDI-LWDF003-10-0000E					6	
6	R-SDI-LWDF003-10-0000W					6	
7	R-SDI-LWDF001-10-0000	8/13/99				6	

ARI Project No:	Relinquished by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: Susan M. Fitzgerald	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: R. F. WESTON INC	Company:	Company:
	Date: 8-13-99 Time: 6:30 PM	Date: Time:	Date: Time:
	Received by: (Signature) LOCKER	Received by: (Signature) <i>[Signature]</i>	Received by: (Signature)
	Printed Name:	Printed Name: EACH STANLEY	Printed Name:
	Company:	Company: ARI	Company:
	Date: 8-13-99 Time: 6:30 PM	Date: 8/14/99 Time: 1500	Date: Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Chain of Custody Record & Laboratory Analysis Request

Date: 8/13/99
 Page 2 of 2
 Number of coolers: 1
 Cooler Temp: _____



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: Roy F. Weston Phone#: (206) 521-7600

Client Contact: Roger McGinnis/Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, S. Fitzgerald, M. Shaw

Sample ID	Date	Time	Matx	No Cont	Lab ID
1 <u>R-SDIS LW07002-10-0000</u>	<u>8/13/99</u>	<u>see Weston field logs</u>			
2					
3					
4					
5					
6					
7					

Analysis Required							Notes/Comments
<u>metals, TOC, ABNst, PCB, grainsize</u>							<u>Note: some labels are missing the "1" following "R-SD" All samples should start "R-SD1-LW..."</u>
<u>4</u>							<u>ARCHIVE</u>

ARI Project No:	Relinquished by: (Signature) <u>[Signature]</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>Susan M. Fitzgerald</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>R. F. WESTON INC</u>	Company:	Company:
	Date: <u>8-13-99</u> Time: <u>6:30 PM</u>	Date:	Time:
	Received by: (Signature)	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature)
	Printed Name:	Printed Name: <u>LAURA STRANDBERG</u>	Printed Name:
	Company:	Company: <u>ARI</u>	Company:
	Date:	Date: <u>8/14/99</u> Time: <u>1500</u>	Date:
	Time:	Time:	Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Chain of Custody Record & Laboratory Analysis Request

Date: 8.17.99
 Page 1 of 1
 Number of coolers: 0
 Cooler Temp: NA



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: ROSA ENL Phone#:

Client Contact: HAROLD

Client Project ID: 3709-060-020-2100

Samplers:

	Sample ID	Date	Time	Matx	No Cont	Lab ID
1	<u>R-SD1-LW05001-10-0000</u>	<u>8/13/99</u>	<u>---</u>	<u>S</u>	<u>1</u>	
2	<u>R-SD1-LW05002-10-0000</u>	<u>8/13/99</u>	<u>---</u>	<u>S</u>	<u>1</u>	
3						
4						
5						
6						
7						

Analysis Required						Notes/Comments
<u>Grain Sample</u>						
<u>#</u>						
<u>1</u>						

ARI Project No:	Relinquished by: (Signature)	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name:	Printed Name:	Printed Name:
Comments/Special Instructions:	Company:	Company:	Company:
	Date: Time:	Date: Time:	Date: Time:
<u>Samples delivered to RFO by mistake for pick-up & refilling is on hold.</u>	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature)
	Printed Name: <u>JERRY GUSCHNER</u>	Printed Name: <u>H. Benz</u>	Printed Name:
	Company: <u>ARI</u>	Company: <u>Regl</u>	Company:
	Date: <u>8.17.99</u> Time: <u>1145</u>	Date: <u>8/17/99</u> Time: <u>1145</u>	Date: Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following Standard Operating Procedures and our Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.



SOIL SEMIVOLATILE SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Client ID	NBZ	FBP	TPH	PHL	2FP	TBP	2CP	DCB	TOT OUT
Method Blank	81.3%	74.4%	94.8%	78.6%	103%	56.7%	81.3%	77.5%	0
Lab Control	81.2%	76.5%	103%	80.5%	101%	60.7%	79.8%	75.6%	0
R-SD1-LWOF010-10-0	63.4%	59.3%	64.8%	71.2%	91.5%	93.7%	60.8%	39.3%	0
R-SD1-LWOF010-1-DL	50.0%	50.0%	58.4%	56.4%	53.4%	50.1% *	49.0%	33.2%	1
R-SD1-LWOF010-10-0	71.5%	73.8%	78.8%	75.4%	87.8%	74.6%	69.5%	43.5%	0
R-SD1-LWOF010-1-DL	56.2%	76.3%	85.8%	63.1%	62.5%	89.5%	62.9%	51.8%	0
R-SD1-LWOF010-10-0	66.8%	63.1%	73.7%	74.8%	93.0%	77.2%	69.2%	44.2%	0
R-SD1-LWOF010-1-DL	50.2%	66.8%	76.2%	59.2%	59.1%	88.6%	59.2%	43.6%	0
R-SD1-LWOF003-10-0	79.6%	72.8%	114%	78.9%	110%	75.8%	81.3%	74.2%	0
R-SD1-LWOF003-10-MS	59.6%	55.1%	81.0%	56.6%	70.3%	69.0%	56.8%	51.9%	0
R-SD1-LWOF003-10-SD	63.7%	64.0%	93.0%	68.2%	84.8%	81.1%	67.9%	62.2%	0
R-SD1-LWOF003-10-0	58.3%	61.1%	119%	62.6%	78.3%	91.8%	60.7%	54.7%	0
R-SD1-LWOF003-10-0	60.9%	60.5%	99.3%	64.9%	90.2%	88.3%	66.0%	61.8%	0

LCS/MB LIMITS QC LIMITS

(NBZ) = Nitrobenzene-d5	(20-120)	(35-120)
(FBP) = 2-Fluorobiphenyl	(29-120)	(49-120)
(TPH) = p-Terphenyl-d14	(45-123)	(44-131)
(PHL) = Phenol-d5	(17-120)	(37-120)
(2FP) = 2-Fluorophenol	(23-120)	(39-120)
(TBP) = 2,4,6-Tribromophenol	(17-134)	(54-126)
(2CP) = 2-Chlorophenol-d4	(21-120)	(36-120)
(DCB) = 1,2-Dichlorobenzene-d4	(30-120)	(29-120)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ20A

LIMS ID: 99-11996

Matrix: Sediment

Data Release Authorized: *MS*

Reported: 08/30/99



Sample No: R-SD1-LWOF010-10-0000

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Date extracted: 08/20/99

Date analyzed: 08/26/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 51.8 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 58.6%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	130
86-74-8	Carbazole	18 J
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	110
206-44-0	Fluoranthene	410
129-00-0	Pyrene	150
56-55-3	Benzo (a) anthracene	74
117-81-7	bis (2-Ethylhexyl) phthalate	1,300
218-01-9	Chrysene	180
205-99-2	Benzo (b) fluoranthene	170 140
207-08-9	Benzo (k) fluoranthene	200 130
50-32-8	Benzo (a) pyrene	95 98
193-39-5	Indeno (1,2,3-cd) pyrene	53 90
53-70-3	Dibenz (a, h) anthracene	19 U
191-24-2	Benzo (g, h, i) perylene	66 140

*Transcribed
from re-analysis*

RM

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	63.4%	d5-Phenol	71.2%
2-Fluorobiphenyl	59.3%	2-Fluorophenol	91.5%
d14-p-Terphenyl	64.8%	2,4,6-Tribromophenol	93.7%
d4-1,2-Dichlorobenzene	39.3%	d4-2-Chlorophenol	60.8%

*RM
9/2/99*

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



ANALYTICAL
 RESOURCES
 INCORPORATED

Sample No: R-SD1-LWOF010-10-000
 DILUTION

Page 1 of 1

Lab Sample ID: AQ20A

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11996

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *MS*

Date Sampled: 08/13/99

Reported: 08/30/99

Date Received: 08/16/99

Date extracted: 08/20/99

Sample Amount: 51.8 g-dry-wt

Date analyzed: 08/26/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:3

GPC Cleanup: YES

Percent Moisture: 58.6%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	120 U
91-20-3	Naphthalene	58 U
91-57-6	2-Methylnaphthalene	58 U
208-96-8	Acenaphthylene	58 U
83-32-9	Acenaphthene	58 U
132-64-9	Dibenzofuran	58 U
86-73-7	Fluorene	58 U
85-01-8	Phenanthrene	100
86-74-8	Carbazole	58 U
120-12-7	Anthracene	58 U
84-74-2	Di-n-Butylphthalate	58 U
206-44-0	Fluoranthene	230
129-00-0	Pyrene	150
56-55-3	Benzo (a) anthracene	67
117-81-7	bis (2-Ethylhexyl) phtalate	1,500
218-01-9	Chrysene	160
205-99-2	Benzo (b) fluoranthene	140 *
207-08-9	Benzo (k) fluoranthene	130 *
50-32-8	Benzo (a) pyrene	98 *
193-39-5	Indeno (1,2,3-cd) pyrene	90 *
53-70-3	Dibenz (a, h) anthracene	58 U
191-24-2	Benzo (g, h, i) perylene	140 *

*only use
 results marked **
run

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	50.0%	d5-Phenol	56.4%
2-Fluorobiphenyl	50.0%	2-Fluorophenol	53.4%
d14-p-Terphenyl	58.4%	2,4,6-Tribromophenol	50.1%
d4-1,2-Dichlorobenzene	33.2%	d4-2-Chlorophenol	49.0%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF010-10-0000E

Page 1 of 1

Lab Sample ID: AQ20B

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11997

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *DA*

Date Sampled: 08/13/99

Reported: 08/30/99

Date Received: 08/16/99

Date extracted: 08/20/99

Sample Amount: 51.6 g-dry-wt

Date analyzed: 08/26/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 55.1%

pH: 6.4

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	44
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	46
206-44-0	Fluoranthene	100
129-00-0	Pyrene	54
56-55-3	Benzo (a) anthracene	29
117-81-7	bis (2-Ethylhexyl) phthalate	270
218-01-9	Chrysene	53
205-99-2	Benzo (b) fluoranthene	52 59
207-08-9	Benzo (k) fluoranthene	40 47 J
50-32-8	Benzo (a) pyrene	32 J
193-39-5	Indeno (1,2,3-cd) pyrene	24 J
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	28 J

*Transcribed
from dilution
analysis
run*

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	71.5%	d5-Phenol	75.4%
2-Fluorobiphenyl	73.8%	2-Fluorophenol	87.8%
d14-p-Terphenyl	78.8%	2,4,6-Tribromophenol	74.6%
d4-1,2-Dichlorobenzene	43.5%	d4-2-Chlorophenol	69.5%

*R run
9/10/99*

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



Sample No: R-SD1-LWOF010-10-00005
 DILUTION

ANALYTICAL
 RESOURCES
 INCORPORATED

Page 1 of 1

Lab Sample ID: AQ20B

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11997

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *ASB*

Date Sampled: 08/13/99

Reported: 08/30/99

Date Received: 08/16/99

Date extracted: 08/20/99

Sample Amount: 51.6 g-dry-wt

Date analyzed: 08/27/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:3

GPC Cleanup: YES

Percent Moisture: 55.1%

pH: 6.4

CAS Number	Analyte	ug/kg
108-95-2	Phenol	120 U
91-20-3	Naphthalene	58 U
91-57-6	2-Methylnaphthalene	58 U
208-96-8	Acenaphthylene	58 U
83-32-9	Acenaphthene	58 U
132-64-9	Dibenzofuran	58 U
86-73-7	Fluorene	58 U
85-01-8	Phenanthrene	47 J
86-74-8	Carbazole	58 U
120-12-7	Anthracene	58 U
84-74-2	Di-n-Butylphthalate	58 U
206-44-0	Fluoranthene	88
129-00-0	Pyrene	70
56-55-3	Benzo (a) anthracene	55 J
117-81-7	bis (2-Ethylhexyl) phthalate	240
218-01-9	Chrysene	52 J
205-99-2	Benzo (b) fluoranthene	59 *
207-08-9	Benzo (k) fluoranthene	47 J*
50-32-8	Benzo (a) pyrene	58 U
193-39-5	Indeno (1, 2, 3-cd) pyrene	58 U
53-70-3	Dibenz (a, h) anthracene	58 U
191-24-2	Benzo (g, h, i) perylene	58 U

*only use results
marked **

RW

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	56.2%	d5-Phenol	63.1%
2-Fluorobiphenyl	76.3%	2-Fluorophenol	62.5%
d14-p-Terphenyl	85.8%	2,4,6-Tribromophenol	89.5%
d4-1,2-Dichlorobenzene	51.8%	d4-2-Chlorophenol	62.9%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ20C

LIMS ID: 99-11998

Matrix: Sediment

Data Release Authorized: *AS*

Reported: 08/30/99



Sample No: R-SD1-LWOF010-10-0000W

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Date extracted: 08/20/99

Date analyzed: 08/26/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 50.7 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 55.9%

pH: 6.6

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	58
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	48
206-44-0	Fluoranthene	150
129-00-0	Pyrene	82
56-55-3	Benzo (a) anthracene	42
117-81-7	bis (2-Ethylhexyl)phthalate	610
218-01-9	Chrysene	88
205-99-2	Benzo (b) fluoranthene	90 95
207-08-9	Benzo (k) fluoranthene	64 74
50-32-8	Benzo (a) pyrene	47
193-39-5	Indeno (1,2,3-cd) pyrene	37
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	44

*Transcribed from
dilution analysis
Run*

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	66.8%	d5-Phenol	74.8%
2-Fluorobiphenyl	63.1%	2-Fluorophenol	93.0%
d14-p-Terphenyl	73.7%	2,4,6-Tribromophenol	77.2%
d4-1,2-Dichlorobenzene	44.2%	d4-2-Chlorophenol	69.2%

*Run
9/10/99*



ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS

Sample No: R-SD1-LWOF010-10-0000
DILUTION

Page 1 of 1

Lab Sample ID: AQ20C

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11998

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *AMS*

Date Sampled: 08/13/99

Reported: 08/30/99

Date Received: 08/16/99

Date extracted: 08/20/99

Sample Amount: 50.7 g-dry-wt

Date analyzed: 08/27/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:3

GPC Cleanup: YES

Percent Moisture: 55.9%

pH: 6.6

CAS Number	Analyte	ug/kg
108-95-2	Phenol	120 U
91-20-3	Naphthalene	59 U
91-57-6	2-Methylnaphthalene	59 U
208-96-8	Acenaphthylene	59 U
83-32-9	Acenaphthene	59 U
132-64-9	Dibenzofuran	59 U
86-73-7	Fluorene	59 U
85-01-8	Phenanthrene	61
86-74-8	Carbazole	59 U
120-12-7	Anthracene	59 U
84-74-2	Di-n-Butylphthalate	59 U
206-44-0	Fluoranthene	120
129-00-0	Pyrene	92
56-55-3	Benzo (a) anthracene	45 J
117-81-7	bis (2-Ethylhexyl) phthalate	490
218-01-9	Chrysene	81
205-99-2	Benzo (b) fluoranthene	95 *
207-08-9	Benzo (k) fluoranthene	74 *
50-32-8	Benzo (a) pyrene	47 J
193-39-5	Indeno (1,2,3-cd) pyrene	59 U
53-70-3	Dibenz (a, h) anthracene	59 U
191-24-2	Benzo (g, h, i) perylene	59 U

*only use
results marked
**

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	50.2%	d5-Phenol	59.2%
2-Fluorobiphenyl	66.8%	2-Fluorophenol	59.1%
d14-p-Terphenyl	76.2%	2,4,6-Tribromophenol	88.6%
d4-1,2-Dichlorobenzene	43.6%	d4-2-Chlorophenol	59.2%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF003-10-0000

Page 1 of 1

Lab Sample ID: AQ20D

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11999

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *RLB*

Date Sampled: 08/13/99

Reported: 08/30/99

Date Received: 08/16/99

Date extracted: 08/20/99

Sample Amount: 53.4 g-dry-wt

Date analyzed: 08/26/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 17.9%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	37 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	19 U
56-55-3	Benzo (a) anthracene	19 U
117-81-7	bis (2-Ethylhexyl) phthalate	19 U
218-01-9	Chrysene	19 U
205-99-2	Benzo (b) fluoranthene	19 U
207-08-9	Benzo (k) fluoranthene	19 U
50-32-8	Benzo (a) pyrene	19 U
193-39-5	Indeno (1, 2, 3-cd) pyrene	19 U
53-70-3	Dibenz (a, h) anthracene	19 U
191-24-2	Benzo (g, h, i) perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	79.6%	d5-Phenol	78.9%
2-Fluorobiphenyl	72.8%	2-Fluorophenol	110%
d14-p-Terphenyl	114%	2, 4, 6-Tribromophenol	75.8%
d4-1, 2-Dichlorobenzene	74.2%	d4-2-Chlorophenol	81.3%

RLB
7/10/99

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ20E

LIMS ID: 99-12000

Matrix: Sediment

Data Release Authorized: *AMS*

Reported: 08/30/99



Sample No: R-SD1-LWOF003-10-0000E

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Date extracted: 08/20/99

Date analyzed: 08/26/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 51.5 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 20.8%

pH: 6.6

CAS Number	Analyte	ug/kg
108-95-2	Phenol	39 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	19 U
56-55-3	Benzo (a) anthracene	19 U
117-81-7	bis (2-Ethylhexyl) phthalate	22
218-01-9	Chrysene	19 U
205-99-2	Benzo (b) fluoranthene	19 U
207-08-9	Benzo (k) fluoranthene	19 U
50-32-8	Benzo (a) pyrene	19 U
193-39-5	Indeno (1, 2, 3-cd) pyrene	19 U
53-70-3	Dibenz (a, h) anthracene	19 U
191-24-2	Benzo (g, h, i) perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	58.3%	d5-Phenol	62.6%
2-Fluorobiphenyl	61.1%	2-Fluorophenol	78.3%
d14-p-Terphenyl	119%	2,4,6-Tribromophenol	91.8%
d4-1,2-Dichlorobenzene	54.7%	d4-2-Chlorophenol	60.7%

*run
9/10/99*

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ20F

LIMS ID: 99-12001

Matrix: Sediment

Data Release Authorized: *ASB*

Reported: 08/30/99



Sample No: R-SD1-LWOF003-10-0000W

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Date extracted: 08/20/99

Date analyzed: 08/26/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 52.9 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 18.7%

pH: 6.8

CAS Number	Analyte	ug/kg
108-95-2	Phenol	38 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	19 U
56-55-3	Benzo (a) anthracene	19 U
117-81-7	bis (2-Ethylhexyl)phthalate	19 U
218-01-9	Chrysene	19 U
205-99-2	Benzo (b) fluoranthene	19 U
207-08-9	Benzo (k) fluoranthene	19 U
50-32-8	Benzo (a) pyrene	19 U
193-39-5	Indeno (1,2,3-cd) pyrene	19 U
53-70-3	Dibenz (a, h) anthracene	19 U
191-24-2	Benzo (g, h, i) perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	60.9%	d5-Phenol	64.9%
2-Fluorobiphenyl	60.5%	2-Fluorophenol	90.2%
d14-p-Terphenyl	99.3%	2,4,6-Tribromophenol	88.3%
d4-1,2-Dichlorobenzene	61.8%	d4-2-Chlorophenol	66.0%

7/10/99

ORGANICS ANALYSIS DATA SHEET
 Semivolatiles by GC/MS
 Page 1 of 1



ANALYTICAL
 RESOURCES
 INCORPORATED

Lab Sample ID: AQ20D
 LIMS ID: 99-11999
 Matrix: Sediment

Sample No: R-SD1-LWOF003-10-0000
 QC Report No: AQ20-Roy F. Weston
 Project: 3709-066-020-2100

Date Received: 08/16/99

Data Release Authorized: *AP*
 Reported: 08/30/99

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 08/20/99
 Date analyzed: 08/26/99

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Phenol	< 37.5	376	703	53.5%	
Acenaphthene	< 18.7	268	469	57.1%	
Pyrene	< 18.7	359	469	76.5%	
Benzo(g,h,i)perylene	< 18.7	368	469	78.5%	

MATRIX SPIKE DUPLICATE

Phenol	< 37.5	471	703	67.0%	22%
Acenaphthene	< 18.7	316	468	67.5%	17%
Pyrene	< 18.7	451	468	96.4%	23%
Benzo(g,h,i)perylene	< 18.7	427	468	91.2%	15%

Values reported in ug/kg-dry-weight

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ20D-MS

LIMS ID: 99-11999

Matrix: Sediment

Data Release Authorized: *AS*

Reported: 08/30/99



Sample No: R-SD1-LWOF003-10-000

MATRIX SPIKE

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Date extracted: 08/20/99

Date analyzed: 08/26/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 53.4 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 17.9%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	---
56-55-3	Benzo (a) anthracene	19 U
117-81-7	bis (2-Ethylhexyl) phthalate	19 U
218-01-9	Chrysene	19 U
205-99-2	Benzo (b) fluoranthene	19 U
207-08-9	Benzo (k) fluoranthene	19 U
50-32-8	Benzo (a) pyrene	19 U
193-39-5	Indeno (1,2,3-cd) pyrene	19 U
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	59.6%	d5-Phenol	56.6%
2-Fluorobiphenyl	55.1%	2-Fluorophenol	70.3%
d14-p-Terphenyl	81.0%	2,4,6-Tribromophenol	69.0%
d4-1,2-Dichlorobenzene	51.9%	d4-2-Chlorophenol	56.8%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AQ20D-MSD

LIMS ID: 99-11999

Matrix: Sediment

Data Release Authorized: *MS*

Reported: 08/30/99



Sample No: R-SD1-LWOF003-10-0008

SPIKE DUPLICATE

ANALYTICAL
RESOURCES
INCORPORATED

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Date extracted: 08/20/99

Date analyzed: 08/26/99

Instrument: finn8

GPC Cleanup: YES

Sample Amount: 53.4 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 17.9%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	---
56-55-3	Benzo (a) anthracene	19 U
117-81-7	bis (2-Ethylhexyl) phthalate	19 U
218-01-9	Chrysene	19 U
205-99-2	Benzo (b) fluoranthene	19 U
207-08-9	Benzo (k) fluoranthene	19 U
50-32-8	Benzo (a) pyrene	19 U
193-39-5	Indeno (1,2,3-cd) pyrene	19 U
53-70-3	Dibenz (a, h) anthracene	19 U
191-24-2	Benzo (g, h, i) perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	63.7%	d5-Phenol	68.2%
2-Fluorobiphenyl	64.0%	2-Fluorophenol	84.8%
d14-p-Terphenyl	93.0%	2,4,6-Tribromophenol	81.1%
d4-1,2-Dichlorobenzene	62.2%	d4-2-Chlorophenol	67.9%

ORGANICS ANALYSIS DATA SHEET



ANALYTICAL
RESOURCES
INCORPORATED

Semivolatiles by GC/MS

Sample No: Method Blank

Page 1 of 1

Lab Sample ID: AQ20MB

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11996

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *MB*

Date Sampled: NA

Reported: 08/30/99

Date Received: NA

Date extracted: 08/20/99

Sample Amount: 50.0 g-dry-wt Equiv

Date analyzed: 08/26/99

Final Extract Volume: 1.0 mL

Instrument: finn8

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: NA

pH: NA

CAS Number	Analyte	ug/kg
108-95-2	Phenol	40 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	20 U
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	20 U
129-00-0	Pyrene	20 U
56-55-3	Benzo (a) anthracene	20 U
117-81-7	bis (2-Ethylhexyl) phthalate	20 U
218-01-9	Chrysene	20 U
205-99-2	Benzo (b) fluoranthene	20 U
207-08-9	Benzo (k) fluoranthene	20 U
50-32-8	Benzo (a) pyrene	20 U
193-39-5	Indeno (1,2,3-cd) pyrene	20 U
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	20 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	81.3%	d5-Phenol	78.6%
2-Fluorobiphenyl	74.4%	2-Fluorophenol	103%
d14-p-Terphenyl	94.8%	2,4,6-Tribromophenol	56.7%
d4-1,2-Dichlorobenzene	77.5%	d4-2-Chlorophenol	81.3%



Lab Sample ID: AQ20SB
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized: *AMB*
Reported: 08/30/99

LABORATORY CONTROL SAMPLE
Date extracted: 08/20/99
Date analyzed: 08/26/99

CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY
Phenol	588	750	78.4%
Acenaphthene	378	500	75.6%
Pyrene	483	500	96.6%
Benzo(g,h,i)perylene	399	500	79.8%

Lab Control Surrogate Recovery

d5-Nitrobenzene	81.2%	d5-Phenol	80.5%
2-Fluorobiphenyl	76.5%	2-Fluorophenol	101%
d14-p-Terphenyl	103%	2,4,6-Tribromophenol	60.7%
d4-1,2-Dichlorobenzene	75.6%	d4-2-Chlorophenol	79.8%

Values reported in ug/kg-dry-weight



SOIL AROCLOR SURROGATE SUMMARY

Matrix: Sediment

QC Report No: AQ20

Project:

3709-066-020-2100

<u>LIMS ID</u>	<u>Lab ID</u>	<u>Client ID</u>	<u>DCBP #</u>	<u>TCMX #</u>	<u>TOT OUT</u>
99-11996MB	082099MB	Method Blank	83.0%	77.0%	0
99-11996SB	082099SB	Lab Control	82.0%	67.0%	0
99-11996	AQ20A	R-SD1-LWOF010-10-0000	102%	64.0%	0
99-11997	AQ20B	R-SD1-LWOF010-10-0000E	76.0%	65.0%	0
99-11998	AQ20C	R-SD1-LWOF010-10-0000W	81.0%	66.0%	0
99-11999	AQ20D	R-SD1-LWOF003-10-0000	82.0%	74.0%	0
99-12000	AQ20E	R-SD1-LWOF003-10-0000E	76.0%	68.5%	0
99-12001	AQ20F	R-SD1-LWOF003-10-0000W	83.0%	73.0%	0
99-12001MS	AQ20F	R-SD1-LWOF003-10-0000W	85.5%	77.0%	0
99-12001MD	AQ20F	R-SD1-LWOF003-10-0000W	81.0%	71.0%	0

QC LIMITS

(TCMX) = Tetrachloro-m-xylene (33-134)

(DCBP) = Decachlorobiphenyl (43-155)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF010-10-0000

Lab Sample ID: AQ20A
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Cathy M. Newson

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 58.6%

Sample Amount: 26.9 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	150
11096-82-5	Aroclor 1260	190
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U
11100-14-4	Aroclor 1268	160

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 102%
Tetrachlorometaxylene 64.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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9/10/99*

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF010-10-0000E

Lab Sample ID: AQ20B
LIMS ID: 99-11997
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:
3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 55.1%

Sample Amount: 26.9 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.4

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	98
11096-82-5	Aroclor 1260	66
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U
11100-14-4	Aroclor 1268	27

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 76.0%
Tetrachlorometaxylene 65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

Rum
9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF010-10-0000W

Lab Sample ID: AQ20C
LIMS ID: 99-11998
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:
3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Catt M. Hawner

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 55.9%

Sample Amount: 26.4 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.6

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	120
11096-82-5	Aroclor 1260	99
11104-28-2	Aroclor 1221	38 U
11141-16-5	Aroclor 1232	19 U
11100-14-4	Aroclor 1268	63

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 81.0%
Tetrachlorometaxylene 66.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration,
but in the opinion of the analyst, confirmation was inadequate.

RAM
9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF003-10-0000

Lab Sample ID: AQ20D
LIMS ID: 99-11999
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:
3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 17.9%

Sample Amount: 28.7 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.7

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	17 U
53469-21-9	Aroclor 1242	17 U
12672-29-6	Aroclor 1248	17 U
11097-69-1	Aroclor 1254	17 U
11096-82-5	Aroclor 1260	17 U
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	17 U
11100-14-4	Aroclor 1268	17 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 82.0%
Tetrachlorometaxylene 74.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

Handwritten: 9/10/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF003-10-0000E

Lab Sample ID: AQ20E
LIMS ID: 99-12000
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:

3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: Yes

Sample Amount: 27.7 g-dry-wt

Final Ext Vol: 5.0 mL

Conc/Dilution Factor: 1:1

pH: 6.6

Percent Moisture: 20.8%

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	18 U
11096-82-5	Aroclor 1260	18 U
11104-28-2	Aroclor 1221	36 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	68.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

*R. M.
9/10/99*

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF003-10-0000W

Lab Sample ID: AQ20F
LIMS ID: 99-12001
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:
3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes
Florisol Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 18.7%

Sample Amount: 28.4 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.8

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	18 U
11096-82-5	Aroclor 1260	18 U
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	18 U
11100-14-4	Aroclor 1268	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 83.0%
Tetrachlorometaxylene 73.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



**ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD**

Lab Sample ID: AQ20F
LIMS ID: 99-12001
Matrix: Sediment

Sample No: R-SD1-LWOF003-10-0000W
QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized:
Reported: 08/30/99

Date Received: 08/16/99
C. Weston

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 08/20/99

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 18.	154.	177	87.0%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 18.	148.	177	83.6%	4.0%

Values Reported in Total ug/kg Dry Weight

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF003-10-0000W

MATRIX SPIKE

Lab Sample ID: AQ20FMS
LIMS ID: 99-12001
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:
3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Date extracted: 08/20/99

Date analyzed: 08/25/99

GPC Cleanup: Yes

Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: Yes

Sample Amount: 28.4 g-dry-wt

Final Ext Vol: 5.0 mL

Conc/Dilution Factor: 1:1

pH: 6.8

Percent Moisture: 18.7%

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	18 U
11096-82-5	Aroclor 1260	18 U
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	18 U
11100-14-4	Aroclor 1268	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 85.5%

Tetrachlorometaxylene 77.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: R-SD1-LWOF003-10-0000W
SPIKE DUPLICATE

Lab Sample ID: AQ20FMSD
LIMS ID: 99-12001
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:

3709-066-020-2100

Date Sampled: 08/13/99

Date Received: 08/16/99

Data Release Authorized:
Reported: 08/30/99

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes
Florisil Cleanup: No

Acid Cleanup: Yes

Sulfur Cleanup: Yes

Sample Amount: 28.4 g-dry-wt

Final Ext Vol: 5.0 mL

Conc/Dilution Factor: 1:1

pH: 6.8

Percent Moisture: 18.7%

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	18 U
11096-82-5	Aroclor 1260	18 U
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	18 U
11100-14-4	Aroclor 1268	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 81.0%
Tetrachlorometaxylene 71.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



ANALYTICAL
RESOURCES
INCORPORATED

Sample No: Method Blank

Lab Sample ID: AQ20MB
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:
3709-066-020-2100

Date Sampled: NA
Date Received: NA

Data Release Authorized:
Reported: 08/30/99

Date extracted: 08/20/99
Date analyzed: 08/25/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: NA

Sample Amount: 25.0 g-dry-wt
Final Ext Vol: 5.0 mL
pH: NA

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	20 U
11096-82-5	Aroclor 1260	20 U
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U
11100-14-4	Aroclor 1268	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 83.0%
Tetrachlorometaxylene 77.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: AQ20
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project:
3709-066-020-2100

Data Release Authorized:
Reported: 08/30/99

LABORATORY CONTROL SAMPLE SPIKE RECOVERY

Date extracted: 08/20/99

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
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LABORATORY CONTROL SAMPLE

Aroclor 1242	167	202	82.8%
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Aroclor Surrogate Recoveries

Decachlorobiphenyl	82.0%
Tetrachlorometaxylene	67.0%

Values Reported in Total ug/kg Dry Weight



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF010-10-0000

Lab Sample ID: AQ20A
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized
Reported: 08/27/99

Percent Total Solids: 39.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/23/99	6010	08/25/99	7429-90-5	Aluminum	3	26,300
3050	08/23/99	7041	08/26/99	7440-36-0	Antimony	0.1	0.3 J
3050	08/23/99	6010	08/25/99	7440-38-2	Arsenic	6	8
3050	08/23/99	6010	08/25/99	7440-41-7	Beryllium	0.1	0.4
3050	08/23/99	6010	08/25/99	7440-43-9	Cadmium	0.3	2.0
3050	08/23/99	6010	08/25/99	7440-47-3	Chromium	0.6	50.3
3050	08/23/99	6010	08/25/99	7440-50-8	Copper	0.3	53.5
3050	08/23/99	6010	08/25/99	7439-89-6	Iron	3	30,600
3050	08/23/99	6010	08/25/99	7439-92-1	Lead	3	70
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.03	0.15
3050	08/23/99	6010	08/25/99	7440-02-0	Nickel	1	41
3050	08/23/99	6010	08/25/99	7782-49-2	Selenium	6	6 U
3050	08/23/99	6010	08/25/99	7440-22-4	Silver	0.4	0.4 U
3050	08/23/99	6010	08/25/99	7440-28-0	Thallium	6	6 U
3050	08/23/99	6010	08/25/99	7440-66-6	Zinc	0.5	539

U Analyte undetected at given RL

RL Reporting Limit

run
9/10/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF010-10-0000E

Lab Sample ID: AQ20B
LIMS ID: 99-11997
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized:
Reported: 08/27/99

Percent Total Solids: 37.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/23/99	6010	08/25/99	7429-90-5	Aluminum	3	27,300
3050	08/23/99	7041	08/26/99	7440-36-0	Antimony	0.1	0.2 J
3050	08/23/99	6010	08/25/99	7440-38-2	Arsenic	7	10
3050	08/23/99	6010	08/25/99	7440-41-7	Beryllium	0.1	0.5
3050	08/23/99	6010	08/25/99	7440-43-9	Cadmium	0.3	0.5
3050	08/23/99	6010	08/25/99	7440-47-3	Chromium	0.7	43.2
3050	08/23/99	6010	08/25/99	7440-50-8	Copper	0.3	42.3
3050	08/23/99	6010	08/25/99	7439-89-6	Iron	3	29,900
3050	08/23/99	6010	08/25/99	7439-92-1	Lead	3	21
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.03	0.09
3050	08/23/99	6010	08/25/99	7440-02-0	Nickel	1	38
3050	08/23/99	6010	08/25/99	7782-49-2	Selenium	7	7 U
3050	08/23/99	6010	08/25/99	7440-22-4	Silver	0.4	0.4 U
3050	08/23/99	6010	08/25/99	7440-28-0	Thallium	7	7 U
3050	08/23/99	6010	08/25/99	7440-66-6	Zinc	0.5	132

U Analyte undetected at given RL

RL Reporting Limit

*run
9/10/99*




INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF010-10-0000W

Lab Sample ID: AQ20C
LIMS ID: 99-11998
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized: 
Reported: 08/27/99

Percent Total Solids: 38.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/23/99	6010	08/25/99	7429-90-5	Aluminum	3	27,000
3050	08/23/99	7041	08/26/99	7440-36-0	Antimony	0.1	0.2 J
3050	08/23/99	6010	08/25/99	7440-38-2	Arsenic	6	7
3050	08/23/99	6010	08/25/99	7440-41-7	Beryllium	0.1	0.4
3050	08/23/99	6010	08/25/99	7440-43-9	Cadmium	0.3	1.0
3050	08/23/99	6010	08/25/99	7440-47-3	Chromium	0.6	45.6
3050	08/23/99	6010	08/25/99	7440-50-8	Copper	0.3	47.2
3050	08/23/99	6010	08/25/99	7439-89-6	Iron	3	32,500
3050	08/23/99	6010	08/25/99	7439-92-1	Lead	3	32
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.02	0.10
3050	08/23/99	6010	08/25/99	7440-02-0	Nickel	1	41
3050	08/23/99	6010	08/25/99	7782-49-2	Selenium	6	6 U
3050	08/23/99	6010	08/25/99	7440-22-4	Silver	0.4	0.4 U
3050	08/23/99	6010	08/25/99	7440-28-0	Thallium	6	6 U
3050	08/23/99	6010	08/25/99	7440-66-6	Zinc	0.5	229

U Analyte undetected at given RL

RL Reporting Limit

run
7/10/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF003-10-0000

Lab Sample ID: AQ20D
LIMS ID: 99-11999
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized:
Reported: 08/27/99

Percent Total Solids: 78.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/23/99	6010	08/25/99	7429-90-5	Aluminum	1	13,700
3050	08/23/99	7041	08/26/99	7440-36-0	Antimony	0.06	0.06 U J
3050	08/23/99	6010	08/25/99	7440-38-2	Arsenic	3	5
3050	08/23/99	6010	08/25/99	7440-41-7	Beryllium	0.06	0.21
3050	08/23/99	6010	08/25/99	7440-43-9	Cadmium	0.1	0.1
3050	08/23/99	6010	08/25/99	7440-47-3	Chromium	0.3	25.6
3050	08/23/99	6010	08/25/99	7440-50-8	Copper	0.1	17.0
3050	08/23/99	6010	08/25/99	7439-89-6	Iron	1	21,900
3050	08/23/99	6010	08/25/99	7439-92-1	Lead	1	5
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.01	0.02
3050	08/23/99	6010	08/25/99	7440-02-0	Nickel	0.6	25.6
3050	08/23/99	6010	08/25/99	7782-49-2	Selenium	3	3
3050	08/23/99	6010	08/25/99	7440-22-4	Silver	0.2	0.2 U
3050	08/23/99	6010	08/25/99	7440-28-0	Thallium	3	6
3050	08/23/99	6010	08/25/99	7440-66-6	Zinc	0.3	67.9

U Analyte undetected at given RL
RL Reporting Limit

rum
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED


INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF003-10-0000E

Lab Sample ID: AQ20E
LIMS ID: 99-12000
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized: 
Reported: 08/27/99

Percent Total Solids: 77.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/23/99	6010	08/25/99	7429-90-5	Aluminum	1	14,700
3050	08/23/99	7041	08/26/99	7440-36-0	Antimony	0.06	0.06 U J
3050	08/23/99	6010	08/25/99	7440-38-2	Arsenic	3	4
3050	08/23/99	6010	08/25/99	7440-41-7	Beryllium	0.06	0.23
3050	08/23/99	6010	08/25/99	7440-43-9	Cadmium	0.1	0.1
3050	08/23/99	6010	08/25/99	7440-47-3	Chromium	0.3	21.5
3050	08/23/99	6010	08/25/99	7440-50-8	Copper	0.1	17.1
3050	08/23/99	6010	08/25/99	7439-89-6	Iron	1	21,200
3050	08/23/99	6010	08/25/99	7439-92-1	Lead	1	5
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.01	0.02
3050	08/23/99	6010	08/25/99	7440-02-0	Nickel	0.6	23.7
3050	08/23/99	6010	08/25/99	7782-49-2	Selenium	3	4
3050	08/23/99	6010	08/25/99	7440-22-4	Silver	0.2	0.2 U
3050	08/23/99	6010	08/25/99	7440-28-0	Thallium	3	8
3050	08/23/99	6010	08/25/99	7440-66-6	Zinc	0.2	77.9

U Analyte undetected at given RL

RL Reporting Limit

rum
9/10/99




INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOF003-10-0000W

Lab Sample ID: AQ20F
LIMS ID: 99-12001
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/16/99

Data Release Authorized: 
Reported: 08/27/99

Percent Total Solids: 81.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/23/99	6010	08/25/99	7429-90-5	Aluminum	1	13,000
3050	08/23/99	7041	08/26/99	7440-36-0	Antimony	0.06	0.06 U J
3050	08/23/99	6010	08/25/99	7440-38-2	Arsenic	3	4
3050	08/23/99	6010	08/25/99	7440-41-7	Beryllium	0.06	0.20
3050	08/23/99	6010	08/25/99	7440-43-9	Cadmium	0.1	0.1
3050	08/23/99	6010	08/25/99	7440-47-3	Chromium	0.3	23.0
3050	08/23/99	6010	08/25/99	7440-50-8	Copper	0.1	15.0
3050	08/23/99	6010	08/25/99	7439-89-6	Iron	1	20,200
3050	08/23/99	6010	08/25/99	7439-92-1	Lead	1	5
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.01	0.01
3050	08/23/99	6010	08/25/99	7440-02-0	Nickel	0.6	24.1
3050	08/23/99	6010	08/25/99	7782-49-2	Selenium	3	3 U
3050	08/23/99	6010	08/25/99	7440-22-4	Silver	0.2	0.2 U
3050	08/23/99	6010	08/25/99	7440-28-0	Thallium	3	4
3050	08/23/99	6010	08/25/99	7440-66-6	Zinc	0.2	59.9

U Analyte undetected at given RL

RL Reporting Limit

*Rev
9/10/99*



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank


Lab Sample ID: AQ20MB
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: NA

Date Received: NA

Data Release Authorized: 

Reported: 08/27/99

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	08/23/99	6010	08/25/99	7429-90-5	Aluminum	1	1 U
3050	08/23/99	7041	08/26/99	7440-36-0	Antimony	0.05	0.05 U
3050	08/23/99	6010	08/25/99	7440-38-2	Arsenic	2	2 U
3050	08/23/99	6010	08/25/99	7440-41-7	Beryllium	0.05	0.05 U
3050	08/23/99	6010	08/25/99	7440-43-9	Cadmium	0.1	0.1 U
3050	08/23/99	6010	08/25/99	7440-47-3	Chromium	0.2	0.2 U
3050	08/23/99	6010	08/25/99	7440-50-8	Copper	0.1	0.1 U
3050	08/23/99	6010	08/25/99	7439-89-6	Iron	1	1 U
3050	08/23/99	6010	08/25/99	7439-92-1	Lead	1	1 U
CLP	08/24/99	7471	08/25/99	7439-97-6	Mercury	0.01	0.01 U
3050	08/23/99	6010	08/25/99	7440-02-0	Nickel	0.5	0.5 U
3050	08/23/99	6010	08/25/99	7782-49-2	Selenium	2	2 U
3050	08/23/99	6010	08/25/99	7440-22-4	Silver	0.2	0.2 U
3050	08/23/99	6010	08/25/99	7440-28-0	Thallium	2	2 U
3050	08/23/99	6010	08/25/99	7440-66-6	Zinc	0.2	0.2

U Analyte undetected at given RL

RL Reporting Limit

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AQ20A
LIMS ID: 99-11996
Matrix: Sediment

Sample No: R-SD1-LWOF010-10-0000
QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Received: 08/16/99

Data Release Authorized
Reported: 08/27/99

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Aluminum	6010	26300	24500	7.1%	+/- 20 %	
Antimony	7041	0.3	0.3	0.0%	+/- 0.1	L
Arsenic	6010	8	8	0.0%	+/- 6	L
Beryllium	6010	0.4	0.4	0.0%	+/- 0.1	L
Cadmium	6010	2.0	1.9	5.1%	+/- 20 %	
Chromium	6010	50.3	49.4	1.8%	+/- 20 %	
Copper	6010	53.5	55.1	2.9%	+/- 20 %	
Iron	6010	30600	29800	2.6%	+/- 20 %	
Lead	6010	70	71	1.4%	+/- 20 %	
Mercury	7471	0.15	0.16	6.5%	+/- 20 %	
Nickel	6010	41	42	2.4%	+/- 20 %	
Selenium	6010	6 U	6 U	0.0%	+/- 6	L
Silver	6010	0.4 U	0.4 U	0.0%	+/- 0.4	L
Thallium	6010	6 U	6 U	0.0%	+/- 6	L
Zinc	6010	539	521	3.4%	+/- 20 %	

'Q' codes:

* = control limit not met
L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS




ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AQ20A
LIMS ID: 99-11996
Matrix: Sediment

Sample No: R-SD1-LWOF010-10-0000
QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Received: 08/16/99

Data Release Authorized: 
Reported: 08/27/99

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	26300	26100	319	-62.7%	H
Antimony	7041	0.3	2.0	12.8	13.3%	N
Arsenic	6010	8	331	319	101%	
Beryllium	6010	0.4	6.9	6.4	102%	
Cadmium	6010	2.0	15.1	12.8	102%	
Chromium	6010	50.3	84.2	31.9	106%	
Copper	6010	53.5	65.5	12.8	93.8%	H
Iron	6010	30600	30200	319	-125%	H
Lead	6010	70	197	128	99.2%	
Mercury	7471	0.15	0.45	0.25	120%	
Nickel	6010	41	108	64	105%	
Selenium	6010	6 U	337	319	106%	
Silver	6010	0.4 U	30.8	31.9	96.6%	
Thallium	6010	6 U	316	319	99.1%	
Zinc	6010	539	588	63.8	76.8%	H

'Q' codes: N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%


INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AQ20LCS
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized: 
Reported: 08/27/99

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	130	125	104%	
Antimony	7041	5.1	5.0	102%	
Arsenic	6010	131	125	105%	
Beryllium	6010	2.55	2.50	102%	
Cadmium	6010	5.0	5.0	100%	
Chromium	6010	12.6	12.5	101%	
Copper	6010	5.2	5.0	104%	
Iron	6010	129	125	103%	
Lead	6010	52	50	104%	
Mercury	7471	0.19	0.20	95.0%	
Nickel	6010	26.4	25.0	106%	
Selenium	6010	134	125	107%	
Silver	6010	12.9	12.5	103%	
Thallium	6010	122	125	97.6%	
Zinc	6010	25.9	25.0	104%	

'Q' codes: N = control limit not met

Control Limits: 80-120%



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF010-10-0000

Lab Sample ID: AQ20A
LIMS ID: 99-11996
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/13/99

Data Release Authorized: *mp* Date Received: 08/16/99

Reported: 09/01/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	41.6
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	2.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ20 received 08/16/99

Rym
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF010-10-0000E

Lab Sample ID: AQ20B

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11997

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/13/99

Data Release Authorized: *MP*

Date Received: 08/16/99

Reported: 09/01/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	40.0
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	2.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ20 received 08/16/99

MP
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF010-10-0000W

Lab Sample ID: AQ20C

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11998

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/13/99

Data Release Authorized: *MS* Date Received: 08/16/99

Reported: 09/01/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	40.9
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ20 received 08/16/99

MS
7/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF003-10-0000

Lab Sample ID: AQ20D

QC Report No: AQ20-Roy F. Weston

LIMS ID: 99-11999

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/13/99

Data Release Authorized: *MS*

Date Received: 08/16/99

Reported: 09/01/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99	EPA 160.3		0.01	Percent	82.0
	082099#1	SM 2540 B				
Total Organic Carbon	08/27/99	Plumb, 1981		0.0050	Percent	0.26
	082799#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ20 received 08/16/99

MS
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF003-10-0000E

Lab Sample ID: AQ20E
LIMS ID: 99-12000
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/13/99
Data Release Authorized: *mb* Date Received: 08/16/99
Reported: 09/01/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	79.7
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.18

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ20 received 08/16/99

rum
9/10/99



ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOF003-10-0000W

Lab Sample ID: AQ20F
LIMS ID: 99-12001
Matrix: Sediment

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized: *MB* Date Sampled: 08/13/99
Date Received: 08/16/99
Reported: 09/01/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/20/99 082099#1	EPA 160.3 SM 2540 B		0.01	Percent	84.0
Total Organic Carbon	08/27/99 082799#1	Plumb, 1981		0.0050	Percent	0.091

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AQ20 received 08/16/99

RL
9/10/99



QA Report - Method Blank Analysis

Matrix: Sediment
Data Release Authorized: *me*
Reported: 09/01/99 Dr. M.A. Perkins

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100
Date Received: NA

METHOD BLANK RESULTS
CONVENTIONALS

Analysis			
<u>Date & Batch</u>	<u>Constituent</u>	<u>Units</u>	<u>Result</u>
Method Blank			
08/20/99 082099#1	Total Solids	mg residue	< 1.00 U
Method Blank			
08/27/99 082799#1	Total Organic Carbon	Percent	<0.0050 U



ANALYTICAL
RESOURCES
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QA Report - Standard Reference Material Analysis

QC Report No: AQ20-Roy F. Weston

Project: 3709-066-020-2100

Date Received: NA

Data Release Authorized: *MB*

Reported: 09/01/99 Dr. M.A. Perkins

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Value</u>	<u>True Value</u>	<u>Recovery</u>
NBS #2704				
Total Organic Carbon	Percent	3.16	3.35	94.3%
Date analyzed: 08/27/99 Batch ID: 082799#1				



ANALYTICAL
RESOURCES
INCORPORATED

QA Report - Replicate Analysis

Matrix: Sediment
Data Release Authorized: *MB*
Reported: 09/01/99 Dr. M.A. Perkins

QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100
Date Received: 08/16/99

REPLICATE ANALYSIS RESULTS
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Sample Value</u>	<u>Replicate Value(s)</u>	<u>RPD/RSD</u>
ARI ID: 99-11998, AQ20 C Client Sample ID: R-SD1-LWOF010-10-0000W				
Total Solids	Percent	40.9	41.0 41.1	RSD: 0.2%
Total Organic Carbon	Percent	1.7	2.0 1.8	RSD: 8.3%



ANALYTICAL
RESOURCES
INCORPORATED

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

Matrix: Sediment
QC Report No: AQ20-Roy F. Weston
Project: 3709-066-020-2100
Date Received: 08/16/99
Data Release Authorized: *MB*
Reported: 09/01/99 Dr. M.A. Perkins

MATRIX SPIKE/MATRIX SPIKE DUP. QA/QC REPORT
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Sample Value</u>	<u>Spike Value</u>	<u>Spike Added</u>	<u>Recovery</u>
ARI ID: 99-11998, AQ20 C Client Sample ID: R-SD1-LWOF010-10-0000W					
Total Organic Carbon MS	Percent	1.67	2.66	0.920	108%
Total Organic Carbon MSD	Percent	1.67	2.76	1.09	99.6%

MS/MSD Recovery Limits: 75 - 125 %



Analytical Resources, Incorporated
Analytical Chemists and Consultants

September 24, 1999

Roger McGinnis
Roy F. Weston, Inc.
Suite 5700
700 Fifth Ave
Seattle, WA 98103

RE: Project: Boeing Renton Sediment
ARI Job: AT96

Dear Roger:

Please find enclosed a set of analytical results for the above referenced project. Three samples were taken out of archive and analyzed for PCBs (PSDDA).

No analytical complications were noted. Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

A handwritten signature in black ink, appearing to read "Jennifer M. Baier".

Jennifer M. Baier
Project Manager
jennifer@arilabs.com

JMB/sl
Enclosure

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Sediment

QC Report No: AT96

Project: Boeing

3709-066-020-2100

LIMS ID	Lab ID	Client ID	DCBP #	TCMX #	TOT OUT
99-14289MB	092299MB	Method Blank	80.8%	77.0%	0
99-14289SB	092299SB	Lab Control	79.8%	75.0%	0
99-14289	AT96A	R-SD1-LWCF-10-0000	75.5%	70.2%	0
99-14290	AT96B	R-SD1-LWCF-10-1000	72.8%	69.0%	0
99-14291	AT96C	R-SD1-LWFF-10-0000	68.8%	67.0%	0

QC LIMITS

(TCMX) = Tetrachloro-m-xylene (33-134)
(DCBP) = Decachlorobiphenyl (43-155)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWCF-10-0000

Lab Sample ID: AT96A
LIMS ID: 99-14289
Matrix: Sediment

QC Report No: AT96-Roy F. Weston
Project: Boeing
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 09/24/99

Cathryn Newson

Date extracted: 09/22/99
Date analyzed: 09/23/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 35.9%

Sample Amount: 25.6 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.6

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	33
11096-82-5	Aroclor 1260	27
11104-28-2	Aroclor 1221	39 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 75.5%
Tetrachlorometaxylene 70.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

RM
9/28/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWCF-10-1000

Lab Sample ID: AT96B
LIMS ID: 99-14290
Matrix: Sediment

QC Report No: AT96-Roy F. Weston
Project: Boeing
3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 09/24/99

Date extracted: 09/22/99
Date analyzed: 09/23/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes

Sample Amount: 25.9 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 7.0

Conc/Dilution Factor: 1:1
Percent Moisture: 42.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	45
11096-82-5	Aroclor 1260	38
11104-28-2	Aroclor 1221	38 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	72.8%
Tetrachlorometaxylene	69.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

R 4 m
9/28/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWFF-10-0000

Lab Sample ID: AT96C QC Report No: AT96-Roy F. Weston
LIMS ID: 99-14291 Project: Boeing
Matrix: Sediment 3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99
Data Release Authorized: *Cathy M. Weston*
Reported: 09/24/99

Date extracted: 09/22/99 GPC Cleanup: Yes
Date analyzed: 09/23/99 Florisil Cleanup: No
Sample Amount: 27.8 g-dry-wt Acid Cleanup: Yes
Final Ext Vol: 5.0 mL Sulfur Cleanup: Yes
pH: 7.0 Conc/Dilution Factor: 1:1
Percent Moisture: 38.2%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	35
11096-82-5	Aroclor 1260	28
11104-28-2	Aroclor 1221	36 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	68.8%
Tetrachlorometaxylene	67.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

*Run
9/28/99*

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD

Sample No: Method Blank

Lab Sample ID: AT96MB

QC Report No: AT96-Roy F. Weston

LIMS ID: 99-14289

Project: Boeing

Matrix: Sediment

3709-066-020-2100

Date Sampled: NA

Date Received: NA

Data Release Authorized:

Reported: 09/24/99

Cathy F. Newman

Date extracted: 09/22/99

GPC Cleanup: Yes

Date analyzed: 09/23/99

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 25.0 g-dry-wt

Sulfur Cleanup: Yes

Final Ext Vol: 5.0 mL

Conc/Dilution Factor: 1:1

pH: NA

Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	20 U
11096-82-5	Aroclor 1260	20 U
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	80.8%
Tetrachlorometaxylene	77.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: AT96
LIMS ID: 99-14289
Matrix: Sediment

QC Report No: AT96-Roy F. Weston
Project: Boeing
3709-066-020-2100

Data Release Authorized:
Reported: 09/24/99



LABORATORY CONTROL SAMPLE SPIKE RECOVERY

Date extracted: 09/22/99

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
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LABORATORY CONTROL SAMPLE

Aroclor 1242	171	202	84.8%
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Aroclor Surrogate Recoveries

Decachlorobiphenyl	79.8%
Tetrachlorometaxylene	75.0%

Values Reported in Total ug/kg Dry Weight

APPENDIX C.2
SHORELINE AND NEARSHORE SAMPLES

APPENDIX C.2

SHORELINE AND NEARSHORE SAMPLES DATA VALIDATION QA/QC REVIEW

C.1 INTRODUCTION

Eighteen archived sediment samples collected from adjacent to Lake Washington outfalls at Boeing's Renton Complex 11-13 August 1999 were analyzed for selected base/neutral/acid organic compounds (BNAs), polychlorinated biphenyls (PCBs), selected metals, total organic carbon (TOC), and grain size distribution. Results were reported by the laboratory as batch AU63. Grain size analysis was subcontracted to Rosa Environmental Geosciences (REG) laboratory and was reported as batch 10000-196-01.

Samples were analyzed by Analytical Resources Incorporated of Seattle, Washington in accordance with procedures described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (USEPA SW-846, 3rd edition).

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. A data review was performed on laboratory QC results summary sheets to ensure they met data quality objectives for the project. Data review followed the format outlined in the *National Functional Guidelines for Organic Data Review* (EPA 1994) and the *National Functional Guidelines for Inorganic Data Review* (EPA 1994) modified to include specific criteria of the individual analytical methods. Raw laboratory data including calibrations, sample login forms, sample preparation logs and bench sheets, quantitation reports, mass spectra, and chromatograms are kept on file at the laboratory.

Results of the data reviews, organized by analysis class, follow.

C.2 BASE/NEUTRAL/ACID ORGANIC COMPOUNDS

C.2.1 Analytical Methods

Samples for BNA analysis were prepared using EPA Method 3550, ultrasonic extraction for soils. Samples were analyzed by gas chromatography/mass spectrometry utilizing EPA Method 8270.

C.2.2 Sample Holding Times

All samples were extracted 51 days after collection. Since samples were archived by freezing holding times may be extended to six months and no data qualification was required.

C.2.3 Laboratory Detection Limits

Detection limits were elevated the following samples because dilution was required to remove analytical interferences or because concentrations of one or more analytes were greater than the highest calibration standard:

Laboratory Batch	Sample	Dilution Factor
AU63	R-SD1-LWOS-003-10	1:3

Results from both analyses were reported by the laboratory. Results from the diluted sample were used for analytes with analytical interferences or where concentrations were greater than the highest calibration standard; original, undiluted results were used for all other analytes. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.2.4 Blank Contamination

No target analytes were detected in laboratory or field blanks.

C.2.5 Surrogate Recovery

All surrogate compound recoveries were within QC limits.

C.2.6 Matrix Spike (MS) Compound Recovery

MS and MS duplicate recoveries were within QC limits for all spiked compounds. The relative percent difference (RPD) between duplicate analyses was within QC limits of less than 35% RPD.

C.2.7 Laboratory Control Sample (LCS) Recovery

LCS (blank spike) recoveries were within laboratory QC limits for all analytes.

C.2.8 Field Duplicate Sample Analysis

No field duplicate samples were submitted to the laboratory with this analytical batch.

C.3 POLYCHLORINATED BIPHENYLS

C.3.1 Analytical Methods

Samples for PCB analysis were prepared using EPA Method 3550, ultrasonic extraction for soils, and were analyzed by gas chromatography/electron capture detection utilizing EPA Method 8081.

C.3.2 Sample Holding Times

All samples were extracted 51 days after collection. Since samples were archived by freezing holding times may be extended to six months and no data qualification was required.

C.3.3 Laboratory Detection Limits

The laboratory achieved specified detection limits. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.3.4 Blank Contamination

No target analytes were detected in laboratory or field blanks.

C.3.5 Surrogate Recovery

All surrogate compound recoveries were within advisory QC limits.

C.3.6 Matrix Spike Compound Recovery

MS and MS duplicate recoveries were within QC limits for all spiked compounds. The RPD between duplicate analyses was within QC limits of less than 35% RPD.

C.3.7 Laboratory Control Sample Recovery

LCS (blank spike) recoveries were within QC limits.

C.3.8 Field Duplicate Sample Analysis

No field duplicate samples were submitted to the laboratory with this analytical batch.

C.4 METALS

C.4.1 Analytical Methods

Samples for mercury analysis were prepared using the EPA CLP SOW 4.0 method. Samples for other metals analysis were prepared using EPA Method 3050, acid digestion. Mercury was analyzed by EPA Method 7471, cold vapor AA. Antimony was analyzed by graphite furnace AA, EPA Method 7041. All other metals were determined by ICP spectroscopy, EPA Method 6010.

C.4.2 Sample Holding Times

All samples were extracted 51 days after collection. All samples were prepared and analyzed within holding time limits of six months except for mercury which has a holding time of 28 days. Since samples were archived by freezing, mercury holding times may be extended to six months and no data qualification was required.

C.4.3 Laboratory Detection Limits

The laboratory achieved specified detection limits. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.4.4 Blank Contamination

No target analytes were detected in laboratory blanks except for the following:

Laboratory Batch	Analyte	Concentration (mg/kg)
AU63	Aluminum	4
	Copper	0.3

No action was required since sample concentrations were greater than five times the concentration detected in associated blanks.

C.4.5 Matrix Spike Analysis

MS recoveries met QC limits of 75-125% for all analytes except the following:

Laboratory Batch	Analyte	% Recovery
AU63	Antimony	16.2%

Antimony results and reporting limits have been qualified as estimated (J/UJ) for all samples and may exhibit a low bias.

C.4.6 Laboratory Control Sample Recovery

LCS (blank spike) recoveries were within QC limits of 80-120% for all analytes except the following:

Laboratory Batch	Analyte	% Recovery
AU63	Antimony	78.0%

Antimony results and reporting limits have been qualified as estimated (J/UJ) for all samples and may exhibit a low bias.

C.4.7 Laboratory Duplicate Sample Analysis

No laboratory duplicate results were reported with this analytical batch.

C.4.8 Field Duplicate Sample Analysis

No field duplicate samples were submitted to the laboratory with this analytical batch.

C.5 TOTAL ORGANIC CARBON

C.5.1 Analytical Methods

Samples for TOC were analyzed using EPA Method 9060.

C.5.2 Sample Holding Times

All samples were prepared and analyzed 51 days after collection. Since samples were archived by freezing holding times may be extended to six months and no data qualification was required.

C.5.3 Laboratory Detection Limits

The laboratory achieved specified detection limits. Reported detection limits and analytical results were adjusted for soil moisture content and any required dilution factors.

C.5.4 Blank Contamination

No target analytes were detected in laboratory or field blanks.

C.5.5 Laboratory Control Sample Recovery

LCS (standard reference material) recoveries were within QC limits of 80-120%.

C.5.6 Matrix Spike Analysis

MS and MS duplicate recoveries were within QC limits. The RPD between duplicate analyses was within QC limits of less than 35% RPD.

C.5.7 Laboratory Duplicate Sample Analysis

The RPD between replicate measurements met laboratory QC limits of less than 35%.

C.5.8 Field Duplicate Sample Analysis

No field duplicate samples were submitted to the laboratory with this analytical batch.

C.6 PARTICLE SIZE DISTRIBUTION

C.6.1 Analytical Methods

Samples were analyzed using the PSEP modification to ASTM Method 422 (sieve plus pipette).

C.6.2 Sample Holding Times

All samples were cooled with ice or refrigerated from the time of collection until analysis. Analyses were performed within 14 days of sample collection.

C.6.3 Laboratory Triplicate Analysis

Laboratory triplicate analysis was performed on sample R-SD1-LWOF010-10-0000. The laboratory triplicate percent relative standard deviation was within QC limits of less than 25% for all fractions.

C.6.4 Field Duplicate Analysis

Samples R-SD1-LWOF010-10-0000 and R-SD1-LWOF010-10-1000 were submitted to the laboratory as blind field duplicates. The RPDs between duplicate measurements was within QC limits of 35% for all fractions.

C.6.5 Total Sample Recovery

Total combined sample percent recovery (sieve and pipette) was within QC limits of 95-105%.

C.7 DATA QUALIFIERS

The following qualifiers were used to modify the data quality and usefulness of individual analytical results.

- U - The analyte was not detected at the given quantitation limit.
- J - The analyte was positively identified and detected; however, the concentration is an estimated value because the result is less than the quantitation limit or QC criteria were not met.
- UJ - The analyte was not detected; the associated quantitation limit is an estimated value.
- R - Data are rejected due to significant exceedance of QC criteria. The analyte may or may not be present. Additional sampling and analysis are required to determine.

C.8 DATA ASSESSMENT

Data review was performed by an experienced QA chemist independent of the analytical laboratory and not directly involved in the project.

This is to certify that I have examined the analytical data and based on the information provided to me by the laboratory, in my professional judgement the data are acceptable for use except where qualified with qualifiers which modify the usefulness of those individual values.

Roger McGinnis
Roger McGinnis, PhD
Senior Chemist

11/29/99
Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

October 15, 1999

Roger McGinnis
Roy F. Weston, Inc.
Suite 5700
700 Fifth Ave
Seattle, WA 98103

RE: Project: Boeing Renton Sediment
ARI Job: AU63

Dear Roger:

Please find enclosed a set of analytical results for the above referenced project. Eighteen sediment samples were taken out of archive and analyzed for PSDDA SVOAs, PSDDA PCBs, PSDDA metals, PSDDA grain size (subcontracted to Rosa Environmental and Geotechnical Laboratory), and total organic carbon (TOC).

The PCB sample extracts were cleaned with mercury to remove sulfur interferences prior to analysis. The matrix spike percent recovery for antimony was below QC limits. Aluminum and copper were detected in the metals method blank. Sample R-SD1-LWOS-003-10 contained large twigs which were excluded from the sample taken for TOC analysis. No other analytical complications were noted. Quality control analysis results are included for your review.

Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Jennifer M. Baier
Project Manager
jennifer@arilabs.com

JMB/jb
Enclosure

Chain of Custody Record & Laboratory Analysis Request

AP90

117930 11810



Analytical Resources, Inc.
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

Date: 8/11/99
 Page 1 of 3
 Number of coolers: 2
 Cooler Temp: 60, 910

ARI Client: WESTON
 Phone#: (206) 521-7600

Client Contact: Roger McGinnis / Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, M. Shaw, S. Fernandez

		Analysis Required						Notes/Comments
Sample ID	Date	Time	Matx	No Cont	Lab ID			
1 R-SDI-LWOF015016-100	8/11/99	see field				4 X	99-11796 AP90D +3	
2 R-SDI-LWOF015016-200						4 X	99-11797 AP90E +3	
3 R-SDI-LWOF015016-200W						4 X	99-11798 AP90F +3 +1 G.S.	
4 R-SDI-LWOS011012-200		Weston				4 X	99-11799 AP90G +3	
5 R-SDI-LWOS011012-100						4 X	99-11800 AP90H +3	
6 R-SDI-LWOS010-200						4 X	99-11801 AP90I +3	
7 R-SDI-LWOS006-200	8/11/99					4 X	99-11802 AP90J +3 +1 G.S.	

metals, TOC, grain size, BNAS

ARCHIVE

Archived Samples: refrigerate Grain Size, freeze metals, BNAS, TOC

ARI Project No:	Relinquished by: (Signature) Allison Reak	Relinquished by: (Signature) [Signature]	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: ALLISON REAK	Printed Name: CARL SANDSON	Printed Name:
Comments/Special Instructions:	Company: Roy F Weston	Company: ARI	Company:
	Date: 8/11/99 Time: 1832	Date: 8/12/99 Time: 715	Date: Time:
	Received by: (Signature) ARI locker	Received by: (Signature)	Received by: (Signature)
	Printed Name: Night drop off	Printed Name:	Printed Name:
	Company: ARI	Company:	Company:
	Date: 8/11/99 Time: 1832	Date: Time:	Date: Time:

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Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

Date: 8/11/99
 Page 2 of 3
 Number of coolers: 2
 Cooler Temp: _____

1467

ARI Client: WESTON Phone#: 206 521-7600
 Client Contact: Roger McEbinis / Allison Reak
 Client Project ID: 3709-066-020-2100 (Boeing)
 Samplers: A. Reak, M. Shaw, S. Fernandez

	Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required				Notes/Comments
							metals, TOC	BNA's, grain size	ARCHIVE		
K	1 R-SDI-LWSD004-275	8/11/99	see				4	X	99-11803	AP90K	+3
L	2 R-SDI-LWCF-200-0000N		field				4	X	99-11804	AP90L	+3
M	3 R-SDI-LWCF-200-0000E		logs				4	X	99-11805	AP90M	+3 + 1 G S
N	4 R-SDI-LWCF-200-0000E		weston				4	X	99-11806	AP90N	+3 + 1 G S
A.O.	5 R-SDI-LWCF-10-0000						4				Analyze, do not archive
B.S.	6 R-SDI-LWCF-10-1000						4				Analyze, do not archive
O	7 R-SDI-LWSD-10-100	8/11/99					4	X	99-11807	AP90O	+3

ARI Project No:	Relinquished by: (Signature) <u>Allison Reak</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>ALLISON REAK</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>Roy F Weston</u>	Company:	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date:	Time:
	Received by: (Signature)	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature)
	Printed Name: <u>ARI Locker DROP</u>	Printed Name: <u>[Signature]</u>	Printed Name:
	Company: <u>ARI</u>	Company: <u>ARI</u>	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date: <u>8/12/99</u> Time: <u>7:15</u>	Date: Time:

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Chain of Custody Record & Laboratory Analysis Request

Date: 8/11/99
 Page 3 of 3
 Number of coolers: 2
 Cooler Temp: _____



Analytical Resources, Inc. Registered
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: WESTON Phone#: 521-7600 (206)

Client Contact: Roger McGinnis / Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, M. Shaw, S. Fernandez

Grain Size, Top, Metals, BNAs	Analysis Required						Notes/Comments
	ARCHIVE						
4	X	99-11808	AP90P	AP90Q			Archived samples: refrigerate grain size, freeze metals, TOC, BNAs
4							Analyze, do not archive
4	X	99-11809	AP90Q				+3
4	X	99-11810	AP90R				+3 + 1 G.S.

P
C
Q
R

ARI Project No:	Relinquished by: (Signature) <u>Allison Reak</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>ALLISON REAK</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>ROY F. WESTON</u>	Company:	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date: _____ Time: _____	Date: _____ Time: _____
	Received by: (Signature)	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature)
	Printed Name: <u>ARI LOCKER DROP</u>	Printed Name: <u>ZACK BRANSON</u>	Printed Name:
	Company: <u>ARI</u>	Company: <u>ARI</u>	Company:
	Date: <u>8/11/99</u> Time: <u>1832</u>	Date: <u>8/12/99</u> Time: <u>7:15</u>	Date: _____ Time: _____

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Chain of Custody Record & Laboratory Analysis Request

AG20

14711K-10443

Date: 8/13/99

Page 1 of 2

Number of coolers: 1

Cooler Temp: 5.5



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: Roy F. Weston (206) Phone#: 521-7600

Client Contact: Roger McGinnis / Allison Reak

Client Project ID: 3709-066-020-2100

Samplers: A. Reak, S. Fitzgerald, M. Shaw

Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required				Notes/Comments
						Metals, TOC, grain size, BNAs/PCBs				
1 R-SDI-LWDF010-10-0000	8/13/99	see				5				
2 R-SDI-LWDF010-10-0000E		Weston field				5				
3 R-SDI-LWDF010-10-0000W		logs				5				
4 R-SDI-LWDF003-10-0000						6				
5 R-SDI-LWDF003-10-0000E						6				
6 R-SDI-LWDF003-10-0000W						6				
7 R-SDI-R-SD-LWDF001-10-0000	8/13/99	one bottle				6	99-12002	AG20 G		ARCHIVE #4402

ARI Project No:	Relinquished by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <i>Susan M. Fitzgerald</i>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <i>R.F. WESTON INC</i>	Company:	Company:
	Date: <i>8-13-99</i> Time: <i>6:30 PM</i>	Date:	Time:
	Received by: (Signature) <i>LOCKER</i>	Received by: (Signature) <i>[Signature]</i>	Received by: (Signature)
	Printed Name:	Printed Name: <i>CACH STANLEY</i>	Printed Name:
	Company:	Company: <i>ARI</i>	Company:
	Date: <i>8-13-99</i> Time: <i>6:30 PM</i>	Date: <i>8/14/99</i> Time: <i>1500</i>	Date: Time:

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Chain of Custody Record & Laboratory Analysis Request

Date: 8/13/99
 Page 2 of 2
 Number of coolers: 1
 Cooler Temp: _____



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: Roy F. Weston Phone#: 521-7600 (206)

Client Contact: Roger McGinnis/Allison Reak

Client Project ID: 3709-066-020-2100 (Boeing)

Samplers: A. Reak, S. Fitzgerald, M. Shaw

	Sample ID	Date	Time	Matx	No Cont	Lab ID
1	R-SDIS R-SD-0205006 <u>LW02-10-0000</u>	<u>8/13/99</u>	<u>see</u>	<u>on bottle</u>		
2			<u>Weston</u>			
3			<u>field</u>			
4			<u>logs</u>			
5						
6						
7						

Analysis Required										Notes/Comments	
metals, TOC, ABNst, PCB, gran size											Note: some labels are missing the "1" following "R-SD" All samples should start "R-SDI-LW..." ARCHIVE 450Bldg.
4	99-12003	AQ20	H							+3	

ARI Project No:	Relinquished by: (Signature) <u>[Signature]</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>Susan M. Fitzgerald</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>R. F. WESTON INC</u>	Company:	Company:
	Date: <u>8-13-99</u> Time: <u>6:30 PM</u>	Date:	Time:
	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Received by: (Signature)
	Printed Name:	Printed Name: <u>SAVANNA</u>	Printed Name:
	Company:	Company: <u>ARI</u>	Company:
	Date:	Date: <u>8/14/99</u> Time: <u>1500</u>	Date:

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Chain of Custody Record & Laboratory Analysis Request

Date: 8/12/99
 Page 2 of 2
 Number of coolers: 1
 Cooler Temp: _____



Analytical Resources, Incorporated
 Analytical Chemist and Consultants
 400 Ninth Avenue North
 Seattle, WA 98109-4708
 (206) 621-6490
 (206) 621-7523 (Fax)

ARI Client: Roy F. Weston Phone#: (206) 521-7600

Client Contact: Roger McGinnis / Allison Reak

Client Project ID: 3709-066-020-2100

Samplers: A. Reak, S. Fitzgerald, M. Shaw

Sample ID	Date	Time	Matx	No. Cont	Lab ID	Metals, ABMS, Metals, ABMS, DB	Analysis Required				Notes/Comments	
1 R-SDI-LWOF004-10-0000	8/12/99	Time on				4						
2 R-SDI-LWOS005-10-0000		weston				4	99-11922	A207L	13	ARCHIVE		
3 R-SDI-LWOF004-10-0000W		field logs				4						
4 R-SDI-LWOF011-10-0000						5						12-oz jar for extra volume
5 R-SDI-LWOF011-10-0000E						5						12-oz jar for extra volume
6 R-SDI-LWOF004-10-0000E	8/12/99					4						
7												

ARI Project No:	Relinquished by: (Signature) <u>Allison Reak</u>	Relinquished by: (Signature)	Relinquished by: (Signature)
T.A.T. Requested:	Printed Name: <u>ALLISON REAK</u>	Printed Name:	Printed Name:
Comments/Special Instructions:	Company: <u>Roy F Weston</u>	Company:	Company:
	Date: <u>8/12/99</u> Time: <u>2030</u>	Date:	Time:
	Received by: (Signature) <u>locker</u>	Received by: (Signature)	Received by: (Signature)
	Printed Name:	Printed Name: <u>Locke</u>	Printed Name:
	Company: <u>ARI</u>	Company: <u>ARI</u>	Company:
	Date: <u>8/12/99</u> Time: <u>2030</u>	Date: <u>8/3/99</u> Time: <u>930</u>	Date:

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SOIL SEMIVOLATILE SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: AU63-Roy F. Weston

Project: 3907-066-020-2100

Client ID	NBZ	FBP	TPH	PHL	2FP	TBP	2CP	DCB	TOT OUT
R-SD1-LWOS005-10-0	59.2%	61.6%	81.4%	60.0%	53.9%	67.8%	57.8%	47.6%	0

LCS/MB LIMITS QC LIMITS

(NBZ) = Nitrobenzene-d5	(20-120)	(35-120)
(FBP) = 2-Fluorobiphenyl	(29-120)	(49-120)
(TPH) = p-Terphenyl-d14	(45-123)	(44-131)
(PHL) = Phenol-d5	(17-120)	(37-120)
(2FP) = 2-Fluorophenol	(23-120)	(39-120)
(TBP) = 2,4,6-Tribromophenol	(17-134)	(54-126)
(2CP) = 2-Chlorophenol-d4	(21-120)	(36-120)
(DCB) = 1,2-Dichlorobenzene-d4	(30-120)	(29-120)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS

Sample No: R-SD1-LWOS015016-100

Page 1 of 1

Lab Sample ID: AU63A

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14636

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *yms*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 50.4 g-dry-wt

Date analyzed: 10/04/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 44.0%

pH: 6.2

CAS Number	Analyte	ug/kg
108-95-2	Phenol	25
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	54
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	100
129-00-0	Pyrene	110
56-55-3	Benzo (a) anthracene	53
117-81-7	bis (2-Ethylhexyl) phthalate	180
218-01-9	Chrysene	81
205-99-2	Benzo (b) fluoranthene	62
207-08-9	Benzo (k) fluoranthene	74
50-32-8	Benzo (a) pyrene	67
193-39-5	Indeno (1,2,3-cd) pyrene	49
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	53

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	60.0%	d5-Phenol	59.1%
2-Fluorobiphenyl	75.0%	2-Fluorophenol	58.9%
d14-p-Terphenyl	78.6%	2,4,6-Tribromophenol	78.6%
d4-1,2-Dichlorobenzene	52.4%	d4-2-Chlorophenol	61.5%

RHM
10/11/99

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



ANALYTICAL
 RESOURCES
 INCORPORATED

Sample No: R-SD1-LWOS015016-200

Page 1 of 1

Lab Sample ID: AU63B

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14637

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *JMB*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 51.1 g-dry-wt

Date analyzed: 10/04/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 46.2%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	33
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	30
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	57
129-00-0	Pyrene	65
56-55-3	Benzo (a) anthracene	26
117-81-7	bis (2-Ethylhexyl) phthalate	140
218-01-9	Chrysene	52
205-99-2	Benzo (b) fluoranthene	39
207-08-9	Benzo (k) fluoranthene	53
50-32-8	Benzo (a) pyrene	38
193-39-5	Indeno (1,2,3-cd) pyrene	33
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	35

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	60.1%	d5-Phenol	58.8%
2-Fluorobiphenyl	73.8%	2-Fluorophenol	56.2%
d14-p-Terphenyl	80.8%	2,4,6-Tribromophenol	79.0%
d4-1,2-Dichlorobenzene	47.8%	d4-2-Chlorophenol	57.9%

RHW
 10/11/99

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



ANALYTICAL
 RESOURCES
 INCORPORATED

Sample No: R-SD1-LWOS015016-200W

Page 1 of 1

Lab Sample ID: AU63C

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14638

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *JMB*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 52.7 g-dry-wt

Date analyzed: 10/04/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 41.5%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	25
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	56
86-74-8	Carbazole	19 U
120-12-7	Anthracene	32
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	120
129-00-0	Pyrene	140
56-55-3	Benzo (a) anthracene	100
117-81-7	bis (2-Ethylhexyl) phthalate	130
218-01-9	Chrysene	200
205-99-2	Benzo (b) fluoranthene	110
207-08-9	Benzo (k) fluoranthene	180
50-32-8	Benzo (a) pyrene	140
193-39-5	Indeno (1,2,3-cd) pyrene	89
53-70-3	Dibenz (a, h) anthracene	42
191-24-2	Benzo (g, h, i) perylene	92

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	62.9%	d5-Phenol	62.2%
2-Fluorobiphenyl	78.8%	2-Fluorophenol	59.1%
d14-p-Terphenyl	85.3%	2,4,6-Tribromophenol	82.6%
d4-1,2-Dichlorobenzene	50.5%	d4-2-Chlorophenol	63.1%

Rum
 10/17/99

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS

Sample No: R-SD1-LWOS011012-200

Page 1 of 1

Lab Sample ID: AU63D

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14639

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *JMB*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 52.3 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 19.5%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	19 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	19 U
56-55-3	Benzo (a) anthracene	19 U
117-81-7	bis (2-Ethylhexyl) phthalate	19 U
218-01-9	Chrysene	19 U
205-99-2	Benzo (b) fluoranthene	19 U
207-08-9	Benzo (k) fluoranthene	19 U
50-32-8	Benzo (a) pyrene	19 U
193-39-5	Indeno (1,2,3-cd) pyrene	19 U
53-70-3	Dibenz (a, h) anthracene	19 U
191-24-2	Benzo (g, h, i) perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	61.3%	d5-Phenol	48.9%
2-Fluorobiphenyl	55.5%	2-Fluorophenol	51.5%
d14-p-Terphenyl	72.7%	2,4,6-Tribromophenol	73.1%
d4-1,2-Dichlorobenzene	48.2%	d4-2-Chlorophenol	47.7%

RW
10/12/99



ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AU63E

LIMS ID: 99-14640

Matrix: Sediment

Data Release Authorized: *JMB*

Reported: 10/11/99

Sample No: R-SD1-LWOS011012-100

QC Report No: AU63-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Date analyzed: 10/05/99

Instrument: nt1

GPC Cleanup: YES

Sample Amount: 50.1 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 49.9%

pH: 6.9

CAS Number	Analyte	ug/kg
108-95-2	Phenol	20 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	28
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	70
129-00-0	Pyrene	64
56-55-3	Benzo (a) anthracene	28
117-81-7	bis (2-Ethylhexyl) phthalate	140
218-01-9	Chrysene	46
205-99-2	Benzo (b) fluoranthene	54
207-08-9	Benzo (k) fluoranthene	39
50-32-8	Benzo (a) pyrene	41
193-39-5	Indeno (1,2,3-cd) pyrene	37
53-70-3	Dibenz (a, h) anthracene	20 U
191-24-2	Benzo (g, h, i) perylene	48

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	68.3%	d5-Phenol	67.9%
2-Fluorobiphenyl	65.1%	2-Fluorophenol	68.4%
d14-p-Terphenyl	79.2%	2,4,6-Tribromophenol	71.8%
d4-1,2-Dichlorobenzene	59.9%	d4-2-Chlorophenol	64.8%

JMB
10/17/99

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



ANALYTICAL
 RESOURCES
 INCORPORATED

Sample No: R-SD1-LWOS010-200

Page 1 of 1

Lab Sample ID: AU63F

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14641

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *JMB*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 51.6 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 57.0%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	54
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	50
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	110
129-00-0	Pyrene	100
56-55-3	Benzo (a) anthracene	48
117-81-7	bis (2-Ethylhexyl) phthalate	250
218-01-9	Chrysene	87
205-99-2	Benzo (b) fluoranthene	110
207-08-9	Benzo (k) fluoranthene	81
50-32-8	Benzo (a) pyrene	78
193-39-5	Indeno (1,2,3-cd) pyrene	72
53-70-3	Dibenz (a,h) anthracene	35
191-24-2	Benzo (g,h,i) perylene	79

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	58.6%	d5-Phenol	62.7%
2-Fluorobiphenyl	57.9%	2-Fluorophenol	61.2%
d14-p-Terphenyl	70.3%	2,4,6-Tribromophenol	60.5%
d4-1,2-Dichlorobenzene	50.7%	d4-2-Chlorophenol	59.7%

Ruv
 10/17/99



**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Sample No: R-SD1-LWOS006-200

Page 1 of 1

Lab Sample ID: AU63G

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14642

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *JMB*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 50.2 g-dry-wt

Date analyzed: 10/06/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 54.4%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	36
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	42
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	95
129-00-0	Pyrene	100
56-55-3	Benzo (a) anthracene	44
117-81-7	bis (2-Ethylhexyl) phthalate	210
218-01-9	Chrysene	74
205-99-2	Benzo (b) fluoranthene	84
207-08-9	Benzo (k) fluoranthene	68
50-32-8	Benzo (a) pyrene	67
193-39-5	Indeno (1,2,3-cd) pyrene	55
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	61

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	55.2%	d5-Phenol	59.9%
2-Fluorobiphenyl	57.4%	2-Fluorophenol	57.4%
d14-p-Terphenyl	73.7%	2,4,6-Tribromophenol	64.2%
d4-1,2-Dichlorobenzene	43.4%	d4-2-Chlorophenol	54.8%

*RMB
10/11/99*



ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AU63H

LIMS ID: 99-14643

Matrix: Sediment

Data Release Authorized: *gms*

Reported: 10/11/99

Sample No: R-SD1-LWOS004-275

QC Report No: AU63-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Date analyzed: 10/05/99

Instrument: ntl

GPC Cleanup: YES

Sample Amount: 50.6 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 49.4%

pH: 6.4

CAS Number	Analyte	ug/kg
108-95-2	Phenol	22
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	38
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	87
129-00-0	Pyrene	86
56-55-3	Benzo(a)anthracene	40
117-81-7	bis(2-Ethylhexyl)phthalate	260
218-01-9	Chrysene	72
205-99-2	Benzo(b)fluoranthene	76
207-08-9	Benzo(k)fluoranthene	79
50-32-8	Benzo(a)pyrene	68
193-39-5	Indeno(1,2,3-cd)pyrene	59
53-70-3	Dibenz(a,h)anthracene	20 U
191-24-2	Benzo(g,h,i)perylene	60

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	63.5%	d5-Phenol	62.6%
2-Fluorobiphenyl	64.2%	2-Fluorophenol	60.3%
d14-p-Terphenyl	79.2%	2,4,6-Tribromophenol	70.6%
d4-1,2-Dichlorobenzene	52.5%	d4-2-Chlorophenol	61.0%

RW
10/17/99



ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AU63I

LIMS ID: 99-14644

Matrix: Sediment

Data Release Authorized: *JMB*

Reported: 10/11/99

Sample No: R-SD1-LWCF-200-0000N

QC Report No: AU63-Roy F. Weston

Project: 3709-066-020-2100

Date Sampled: 08/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Date analyzed: 10/05/99

Instrument: ntl

GPC Cleanup: YES

Sample Amount: 51.3 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 51.1%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	43
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	40
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	88
129-00-0	Pyrene	86
56-55-3	Benzo(a)anthracene	37
117-81-7	bis(2-Ethylhexyl)phthalate	160
218-01-9	Chrysene	71
205-99-2	Benzo(b)fluoranthene	70
207-08-9	Benzo(k)fluoranthene	69
50-32-8	Benzo(a)pyrene	61
193-39-5	Indeno(1,2,3-cd)pyrene	55
53-70-3	Dibenz(a,h)anthracene	24
191-24-2	Benzo(g,h,i)perylene	54

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	64.9%	d5-Phenol	70.9%
2-Fluorobiphenyl	64.9%	2-Fluorophenol	68.7%
d14-p-Terphenyl	87.0%	2,4,6-Tribromophenol	78.1%
d4-1,2-Dichlorobenzene	61.4%	d4-2-Chlorophenol	69.3%

*RNM
10/17/99*



**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Sample No: R-SD1-LWCF-200-0000NE

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Lab Sample ID: AU63J

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14645

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *gms*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 51.4 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 51.1%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	19 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	26
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	60
129-00-0	Pyrene	60
56-55-3	Benzo (a) anthracene	23
117-81-7	bis (2-Ethylhexyl) phthalate	91
218-01-9	Chrysene	49
205-99-2	Benzo (b) fluoranthene	48
207-08-9	Benzo (k) fluoranthene	47
50-32-8	Benzo (a) pyrene	37
193-39-5	Indeno (1,2,3-cd) pyrene	37
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	39

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	50.0%	d5-Phenol	53.0%
2-Fluorobiphenyl	56.8%	2-Fluorophenol	49.4%
d14-p-Terphenyl	74.9%	2,4,6-Tribromophenol	63.9%
d4-1,2-Dichlorobenzene	44.1%	d4-2-Chlorophenol	48.9%

RAM
10/17/99



ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by GC/MS

Sample No: R-SD1-LWCF-200-0000E

Page 1 of 1

Lab Sample ID: AU63K

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14646

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *gmb*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 50.4 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 59.7%

pH: 6.8

CAS Number	Analyte	ug/kg
108-95-2	Phenol	20 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	37
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	34
206-44-0	Fluoranthene	110
129-00-0	Pyrene	93
56-55-3	Benzo(a)anthracene	40
117-81-7	bis(2-Ethylhexyl)phthalate	220
218-01-9	Chrysene	89
205-99-2	Benzo(b)fluoranthene	70
207-08-9	Benzo(k)fluoranthene	87
50-32-8	Benzo(a)pyrene	60
193-39-5	Indeno(1,2,3-cd)pyrene	60
53-70-3	Dibenz(a,h)anthracene	28
191-24-2	Benzo(g,h,i)perylene	62

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	69.3%	d5-Phenol	58.5%
2-Fluorobiphenyl	60.0%	2-Fluorophenol	55.4%
d14-p-Terphenyl	73.5%	2,4,6-Tribromophenol	68.1%
d4-1,2-Dichlorobenzene	54.2%	d4-2-Chlorophenol	54.1%

RW
10/17/99



**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Sample No: R-SD1-LWOS-10-100

Page 1 of 1

Lab Sample ID: AU63L

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14647

Project: 3907-066-020-2100

Matrix: Sediment

Data Release Authorized: *gmb*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 50.3 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 44.1%

pH: 6.4

CAS Number	Analyte	ug/kg
108-95-2	Phenol	20
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	24
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	50
129-00-0	Pyrene	48
56-55-3	Benzo (a) anthracene	21
117-81-7	bis (2-Ethylhexyl) phthalate	170
218-01-9	Chrysene	41
205-99-2	Benzo (b) fluoranthene	39
207-08-9	Benzo (k) fluoranthene	38
50-32-8	Benzo (a) pyrene	33
193-39-5	Indeno (1,2,3-cd) pyrene	29
53-70-3	Dibenz (a,h) anthracene	20 U
191-24-2	Benzo (g,h,i) perylene	30

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	61.6%	d5-Phenol	56.9%
2-Fluorobiphenyl	58.7%	2-Fluorophenol	55.8%
d14-p-Terphenyl	77.9%	2,4,6-Tribromophenol	72.3%
d4-1,2-Dichlorobenzene	46.0%	d4-2-Chlorophenol	55.0%

Rhm
10/17/99



ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS
Page 1 of 1

Sample No: R-SD1-LWOS-006-10

Lab Sample ID: AU63M
LIMS ID: 99-14648
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Data Release Authorized: *gmb*
Reported: 10/11/99

Date Sampled: 08/11/99
Date Received: 08/12/99

Date extracted: 10/01/99
Date analyzed: 10/05/99
Instrument: nt1
GPC Cleanup: YES

Sample Amount: 52.0 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1:1
Percent Moisture: 52.7%
pH: 6.6

CAS Number	Analyte	ug/kg
108-95-2	Phenol	19 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	36
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	73
129-00-0	Pyrene	82
56-55-3	Benzo (a) anthracene	34
117-81-7	bis (2-Ethylhexyl) phthalate	210
218-01-9	Chrysene	59
205-99-2	Benzo (b) fluoranthene	60
207-08-9	Benzo (k) fluoranthene	54
50-32-8	Benzo (a) pyrene	49
193-39-5	Indeno (1,2,3-cd) pyrene	42
53-70-3	Dibenz (a,h) anthracene	20
191-24-2	Benzo (g,h,i) perylene	47

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	68.4%	d5-Phenol	63.7%
2-Fluorobiphenyl	67.8%	2-Fluorophenol	65.8%
d14-p-Terphenyl	86.6%	2,4,6-Tribromophenol	79.2%
d4-1,2-Dichlorobenzene	55.0%	d4-2-Chlorophenol	63.8%

gmb
10/17/99



ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS

Sample No: R-SD1-LWOS-003-10

Page 1 of 1

Lab Sample ID: AU63N

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14649

Project: 3907-066-020-2100

Matrix: Sediment

Data Release Authorized: *MMB*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 51.8 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 2.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 61.6%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	53
91-20-3	Naphthalene	39 U
91-57-6	2-Methylnaphthalene	39 U
208-96-8	Acenaphthylene	39 U
83-32-9	Acenaphthene	39 U
132-64-9	Dibenzofuran	39 U
86-73-7	Fluorene	78
85-01-8	Phenanthrene	630
86-74-8	Carbazole	91
120-12-7	Anthracene	420
84-74-2	Di-n-Butylphthalate	280
206-44-0	Fluoranthene	1,600
129-00-0	Pyrene	2,000
56-55-3	Benzo (a) anthracene	1,100
117-81-7	bis (2-Ethylhexyl)phthalate	3,300 3,400
218-01-9	Chrysene	1,900
205-99-2	Benzo (b) fluoranthene	1,500
207-08-9	Benzo (k) fluoranthene	1,200
50-32-8	Benzo (a) pyrene	1,200
193-39-5	Indeno (1,2,3-cd) pyrene	620
53-70-3	Dibenz (a,h) anthracene	320
191-24-2	Benzo (g,h,i) perylene	580

*Transcribed from
analysis of
diluted extract
RM*

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	74.7%	d5-Phenol	60.6%
2-Fluorobiphenyl	72.4%	2-Fluorophenol	63.4%
d14-p-Terphenyl	89.6%	2,4,6-Tribromophenol	78.7%
d4-1,2-Dichlorobenzene	53.8%	d4-2-Chlorophenol	64.7%

*RM
10/17/99*



**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Sample No: R-SD1-LWOS-003-10
DILUTION

Page 1 of 1

Lab Sample ID: AU63N

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14649

Project: 3907-066-020-2100

Matrix: Sediment

Data Release Authorized: *gmb*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 51.8 g-dry-wt

Date analyzed: 10/06/99

Final Extract Volume: 2.0 mL

Instrument: ntl

Dilution Factor: 1:3

GPC Cleanup: YES

Percent Moisture: 61.6%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	120 U
91-20-3	Naphthalene	120 U
91-57-6	2-Methylnaphthalene	120 U
208-96-8	Acenaphthylene	120 U
83-32-9	Acenaphthene	120 U
132-64-9	Dibenzofuran	120 U
86-73-7	Fluorene	120 U
85-01-8	Phenanthrene	560
86-74-8	Carbazole	120 U
120-12-7	Anthracene	400
84-74-2	Di-n-Butylphthalate	270
206-44-0	Fluoranthene	1,800
129-00-0	Pyrene	1,800
56-55-3	Benzo(a)anthracene	1,100
117-81-7	bis(2-Ethylhexyl)phthalate	3,400
218-01-9	Chrysene	1,800
205-99-2	Benzo(b)fluoranthene	1,300
207-08-9	Benzo(k)fluoranthene	1,500
50-32-8	Benzo(a)pyrene	1,200
193-39-5	Indeno(1,2,3-cd)pyrene	680
53-70-3	Dibenz(a,h)anthracene	350
191-24-2	Benzo(g,h,i)perylene	680

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	72.5%	d5-Phenol	65.0%
2-Fluorobiphenyl	68.4%	2-Fluorophenol	62.6%
d14-p-Terphenyl	78.2%	2,4,6-Tribromophenol	77.8%
d4-1,2-Dichlorobenzene	53.8%	d4-2-Chlorophenol	62.7%

*use undiluted sample results
except for bis(2-ethylhexyl phthalate)*

R24

10/11/99

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



ANALYTICAL
 RESOURCES
 INCORPORATED

Sample No: R-SD1-LWOS-006-100

Page 1 of 1

Lab Sample ID: AU630

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14650

Project: 3907-066-020-2100

Matrix: Sediment

Data Release Authorized: *gmb*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 52.2 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 54.6%

pH: 6.5

CAS Number	Analyte	ug/kg
108-95-2	Phenol	45
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	46
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	100
129-00-0	Pyrene	120
56-55-3	Benzo (a) anthracene	58
117-81-7	bis (2-Ethylhexyl) phthalate	330
218-01-9	Chrysene	110
205-99-2	Benzo (b) fluoranthene	110
207-08-9	Benzo (k) fluoranthene	85
50-32-8	Benzo (a) pyrene	86
193-39-5	Indeno (1,2,3-cd) pyrene	70
53-70-3	Dibenz (a, h) anthracene	38
191-24-2	Benzo (g, h, i) perylene	71

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	59.2%	d5-Phenol	57.5%
2-Fluorobiphenyl	58.8%	2-Fluorophenol	55.0%
d14-p-Terphenyl	79.6%	2,4,6-Tribromophenol	68.8%
d4-1,2-Dichlorobenzene	45.7%	d4-2-Chlorophenol	56.1%

Rum
 10/17/99



**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Sample No: R-SD1-LWOS001-10-0000

Page 1 of 1

Lab Sample ID: AU63P

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14651

Project: 3907-066-020-2100

Matrix: Sediment

Data Release Authorized: *gmb*

Date Sampled: 08/13/99

Reported: 10/11/99

Date Received: 08/14/99

Date extracted: 10/01/99

Sample Amount: 51.6 g-dry-wt

Date analyzed: 10/06/99

Final Extract Volume: 1.0 mL

Instrument: ntl

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 20.7%

pH: 6.8

CAS Number	Analyte	ug/kg
108-95-2	Phenol	19 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	19 U
56-55-3	Benzo(a)anthracene	19 U
117-81-7	bis(2-Ethylhexyl)phthalate	140
218-01-9	Chrysene	19 U
205-99-2	Benzo(b)fluoranthene	19 U
207-08-9	Benzo(k)fluoranthene	19 U
50-32-8	Benzo(a)pyrene	19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19 U
53-70-3	Dibenz(a,h)anthracene	19 U
191-24-2	Benzo(g,h,i)perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	58.4%	d5-Phenol	60.1%
2-Fluorobiphenyl	57.7%	2-Fluorophenol	53.5%
d14-p-Terphenyl	74.5%	2,4,6-Tribromophenol	69.5%
d4-1,2-Dichlorobenzene	50.2%	d4-2-Chlorophenol	55.3%

RM
10/17/99

ORGANICS ANALYSIS DATA SHEET
 PSDDA Semivolatiles by GC/MS



ANALYTICAL
 RESOURCES
 INCORPORATED

Sample No: R-SD1-LWOS002-10-0000

Page 1 of 1

Lab Sample ID: AU63Q

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14652

Project: 3907-066-020-2100

Matrix: Sediment

Data Release Authorized: *JMB*

Date Sampled: 08/13/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 52.5 g-dry-wt

Date analyzed: 10/06/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 19.3%

pH: 6.4

CAS Number	Analyte	ug/kg
108-95-2	Phenol	19 U
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	19 U
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	19 U
56-55-3	Benzo (a) anthracene	19 U
117-81-7	bis (2-Ethylhexyl) phthalate	94
218-01-9	Chrysene	19 U
205-99-2	Benzo (b) fluoranthene	19 U
207-08-9	Benzo (k) fluoranthene	19 U
50-32-8	Benzo (a) pyrene	19 U
193-39-5	Indeno (1,2,3-cd) pyrene	19 U
53-70-3	Dibenz (a,h) anthracene	19 U
191-24-2	Benzo (g,h,i) perylene	19 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	56.2%	d5-Phenol	56.6%
2-Fluorobiphenyl	60.0%	2-Fluorophenol	50.2%
d14-p-Terphenyl	77.3%	2,4,6-Tribromophenol	63.6%
d4-1,2-Dichlorobenzene	49.5%	d4-2-Chlorophenol	51.3%

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 10/17/99



ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AU63R

LIMS ID: 99-14653

Matrix: Sediment

Data Release Authorized: *ymb*

Reported: 10/11/99

Date Sampled: 08/12/99

Date Received: 08/13/99

Sample No: R-SD1-LWOS005-10-0000

QC Report No: AU63-Roy F. Weston

Project: 3907-066-020-2100

Date extracted: 10/01/99

Date analyzed: 10/06/99

Instrument: ntl

GPC Cleanup: YES

Sample Amount: 50.1 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1:1

Percent Moisture: 49.9%

pH: 6.6

CAS Number	Analyte	ug/kg
108-95-2	Phenol	33
91-20-3	Naphthalene	45
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	58
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	120
129-00-0	Pyrene	150
56-55-3	Benzo (a) anthracene	58
117-81-7	bis (2-Ethylhexyl) phthalate	230
218-01-9	Chrysene	89
205-99-2	Benzo (b) fluoranthene	76
207-08-9	Benzo (k) fluoranthene	59
50-32-8	Benzo (a) pyrene	59
193-39-5	Indeno (1,2,3-cd) pyrene	41
53-70-3	Dibenz (a, h) anthracene	20 U
191-24-2	Benzo (g, h, i) perylene	50

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	59.2%	d5-Phenol	60.0%
2-Fluorobiphenyl	61.6%	2-Fluorophenol	53.9%
d14-p-Terphenyl	81.4%	2,4,6-Tribromophenol	67.8%
d4-1,2-Dichlorobenzene	47.6%	d4-2-Chlorophenol	57.8%

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10/17/99

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Lab Sample ID: AU63D

LIMS ID: 99-14639

Matrix: Sediment

Sample No: R-SD1-LWOS011012-200

QC Report No: AU63-Roy F. Weston

Project: 3709-066-020-2100

Date Received: 08/12/99

Data Release Authorized: *W*

Reported: 10/07/99

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/01/99

Date analyzed: 10/05/99

CONSTITUENT	SAMPLE VALUE	SPIKE VALUE	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Phenol	< 19.1	311	716	43.4%	
1,4-Dichlorobenzene	< 19.1	236	478	49.4%	
1,2,4-Trichlorobenzene	< 19.1	224	478	46.9%	
Acenaphthene	< 19.1	291	478	60.9%	
Pentachlorophenol	< 95.5	374	716	52.2%	
Pyrene	< 19.1	317	478	66.3%	
Di-n-Octyl phthalate	< 19.1	354	478	74.1%	
Benzo(g,h,i)perylene	< 19.1	421	478	88.1%	

MATRIX SPIKE DUPLICATE

Phenol	< 19.1	350	717	48.8%	12%
1,4-Dichlorobenzene	< 19.1	264	478	55.2%	11%
1,2,4-Trichlorobenzene	< 19.1	247	478	51.7%	9.8%
Acenaphthene	< 19.1	300	478	62.8%	3.1%
Pentachlorophenol	< 95.5	447	717	62.3%	18%
Pyrene	< 19.1	337	478	70.5%	6.1%
Di-n-Octyl phthalate	< 19.1	373	478	78.0%	5.2%
Benzo(g,h,i)perylene	< 19.1	416	478	87.0%	1.2%

Values reported in ug/kg-dry-weight



ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS

Sample No: R-SD1-LWOS011012-200
MATRIX SPIKE

Page 1 of 1

Lab Sample ID: AU63D-MS

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14639

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *JMB*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 52.3 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 19.5%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	---
56-55-3	Benzo(a)anthracene	19 U
117-81-7	bis(2-Ethylhexyl)phthalate	19 U
218-01-9	Chrysene	19 U
205-99-2	Benzo(b)fluoranthene	19 U
207-08-9	Benzo(k)fluoranthene	19 U
50-32-8	Benzo(a)pyrene	19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19 U
53-70-3	Dibenz(a,h)anthracene	19 U
191-24-2	Benzo(g,h,i)perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	51.0%	d5-Phenol	44.7%
2-Fluorobiphenyl	52.9%	2-Fluorophenol	47.6%
d14-p-Terphenyl	68.7%	2,4,6-Tribromophenol	73.9%
d4-1,2-Dichlorobenzene	46.0%	d4-2-Chlorophenol	44.8%



**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Sample No: R-SD1-LWOS011012-200
SPIKE DUPLICATE

Page 1 of 1

Lab Sample ID: AU63D-MSD

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14639

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *gmb*

Date Sampled: 08/11/99

Reported: 10/11/99

Date Received: 08/12/99

Date extracted: 10/01/99

Sample Amount: 52.3 g-dry-wt

Date analyzed: 10/05/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: 19.5%

pH: 6.7

CAS Number	Analyte	ug/kg
108-95-2	Phenol	---
91-20-3	Naphthalene	19 U
91-57-6	2-Methylnaphthalene	19 U
208-96-8	Acenaphthylene	19 U
83-32-9	Acenaphthene	---
132-64-9	Dibenzofuran	19 U
86-73-7	Fluorene	19 U
85-01-8	Phenanthrene	19 U
86-74-8	Carbazole	19 U
120-12-7	Anthracene	19 U
84-74-2	Di-n-Butylphthalate	19 U
206-44-0	Fluoranthene	19 U
129-00-0	Pyrene	---
56-55-3	Benzo(a)anthracene	19 U
117-81-7	bis(2-Ethylhexyl)phthalate	19 U
218-01-9	Chrysene	19 U
205-99-2	Benzo(b)fluoranthene	19 U
207-08-9	Benzo(k)fluoranthene	19 U
50-32-8	Benzo(a)pyrene	19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19 U
53-70-3	Dibenz(a,h)anthracene	19 U
191-24-2	Benzo(g,h,i)perylene	---

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	54.6%	d5-Phenol	49.8%
2-Fluorobiphenyl	55.1%	2-Fluorophenol	52.9%
d14-p-Terphenyl	72.0%	2,4,6-Tribromophenol	79.1%
d4-1,2-Dichlorobenzene	50.8%	d4-2-Chlorophenol	50.4%

**ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by GC/MS**

Sample No: Method Blank

Page 1 of 1

Lab Sample ID: AU63MB

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14636

Project: 3709-066-020-2100

Matrix: Sediment

Data Release Authorized: *gmb*

Date Sampled: NA

Reported: 10/11/99

Date Received: NA

Date extracted: 10/01/99

Sample Amount: 50.0 g-dry-wt Equiv

Date analyzed: 10/04/99

Final Extract Volume: 1.0 mL

Instrument: nt1

Dilution Factor: 1:1

GPC Cleanup: YES

Percent Moisture: NA

pH: NA

CAS Number	Analyte	ug/kg
108-95-2	Phenol	20 U
91-20-3	Naphthalene	20 U
91-57-6	2-Methylnaphthalene	20 U
208-96-8	Acenaphthylene	20 U
83-32-9	Acenaphthene	20 U
132-64-9	Dibenzofuran	20 U
86-73-7	Fluorene	20 U
85-01-8	Phenanthrene	20 U
86-74-8	Carbazole	20 U
120-12-7	Anthracene	20 U
84-74-2	Di-n-Butylphthalate	20 U
206-44-0	Fluoranthene	20 U
129-00-0	Pyrene	20 U
56-55-3	Benzo(a)anthracene	20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20 U
218-01-9	Chrysene	20 U
205-99-2	Benzo(b)fluoranthene	20 U
207-08-9	Benzo(k)fluoranthene	20 U
50-32-8	Benzo(a)pyrene	20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20 U
53-70-3	Dibenz(a,h)anthracene	20 U
191-24-2	Benzo(g,h,i)perylene	20 U

Semivolatiles Surrogate Recovery

d5-Nitrobenzene	65.4%	d5-Phenol	41.8%
2-Fluorobiphenyl	53.2%	2-Fluorophenol	44.5%
d14-p-Terphenyl	67.9%	2,4,6-Tribromophenol	44.9%
d4-1,2-Dichlorobenzene	52.3%	d4-2-Chlorophenol	41.8%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS
Page 1 of 1

Lab Sample ID: AU63SB
LIMS ID: 99-14636
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized: *mw*
Reported: 10/07/99

LABORATORY CONTROL SAMPLE

Date extracted: 10/01/99
Date analyzed: 10/04/99

CONSTITUENT	SPIKE VALUE	SPIKE ADDED	% RECOVERY
Phenol	306	750	40.8%
1,4-Dichlorobenzene	269	500	53.8%
1,2,4-Trichlorobenzene	322	500	64.4%
Acenaphthene	260	500	52.0%
Pentachlorophenol	180	750	24.0%
Pyrene	342	500	68.4%
Di-n-Octyl phthalate	333	500	66.6%
Benzo(g,h,i)perylene	372	500	74.4%

Lab Control Surrogate Recovery

d5-Nitrobenzene	69.3%	d5-Phenol	44.3%
2-Fluorobiphenyl	56.7%	2-Fluorophenol	48.3%
d14-p-Terphenyl	76.1%	2,4,6-Tribromophenol	50.3%
d4-1,2-Dichlorobenzene	54.2%	d4-2-Chlorophenol	47.0%

Values reported in ug/kg-dry-weight

SOIL AROCLOR SURROGATE SUMMARY

Matrix: Sediment

QC Report No: AU63

Project:

3709-066-020-2100

LIMS ID	Lab ID	Client ID	DCBP #	TCMX #	TOT OUT
99-14636MB	100199MB	Method Blank	88.0%	83.5%	0
99-14636SB	100199SB	Lab Control	96.5%	92.5%	0
99-14636	AU63A	R-SD1-LWOS015016-100	83.2%	78.0%	0
99-14637	AU63B	R-SD1-LWOS015016-200	79.5%	74.0%	0
99-14638	AU63C	R-SD1-LWOS015016-200W	83.0%	78.0%	0
99-14639	AU63D	R-SD1-LWOS011012-200	88.5%	83.5%	0
99-14640	AU63E	R-SD1-LWOS011012-100	82.5%	78.2%	0
99-14641	AU63F	R-SD1-LWOS010-200	82.5%	77.2%	0
99-14642	AU63G	R-SD1-LWOS006-200	92.5%	90.0%	0
99-14643	AU63H	R-SD1-LWOS004-275	81.5%	80.2%	0
99-14644	AU63I	R-SD1-LWCF-200-0000N	70.5%	65.0%	0
99-14645	AU63J	R-SD1-LWCF-200-0000NE	79.0%	76.5%	0
99-14646	AU63K	R-SD1-LWCF-200-0000E	77.2%	77.2%	0
99-14647	AU63L	R-SD1-LWOS-10-100	80.5%	76.8%	0
99-14648	AU63M	R-SD1-LWOS-006-10	78.0%	72.2%	0
99-14649	AU63N	R-SD1-LWOS-003-10	76.8%	64.0%	0
99-14650	AU63O	R-SD1-LWOS-006-100	73.5%	63.2%	0
99-14651	AU63P	R-SD1-LWOS001-10-0000	80.0%	80.8%	0
99-14652	AU63Q	R-SD1-LWOS002-10-0000	82.8%	83.0%	0
99-14652MS	AU63Q	R-SD1-LWOS002-10-0000	78.2%	78.8%	0
99-14652MD	AU63Q	R-SD1-LWOS002-10-0000	79.0%	77.8%	0
99-14653	AU63R	R-SD1-LWOS005-10-0000	77.2%	73.0%	0

QC LIMITS

(TCMX) = Tetrachloro-m-xylene (33-134)
(DCBP) = Decachlorobiphenyl (43-155)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWOS015016-100

Lab Sample ID: AU63A
LIMS ID: 99-14636
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 44.0%

Sample Amount: 25.2 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.2

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	16 J
11096-82-5	Aroclor 1260	16 J
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 83.2%
Tetrachlorometaxylene 78.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

RHM
10/17/97

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWOS015016-200

Lab Sample ID: AU63B
LIMS ID: 99-14637
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: CH
Reported: 10/06/99 10/6/99

Date extracted: 10/01/99
Date analyzed: 10/05/99
Sample Amount: 26.9 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 46.2%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	10 J
11096-82-5	Aroclor 1260	10 J
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	79.5%
Tetrachlorometaxylene	74.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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10/17/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: R-SD1-LWOS015016-200W

Lab Sample ID: AU63C
LIMS ID: 99-14638
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *C/1*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 41.5%

Sample Amount: 26.3 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	12 J
11096-82-5	Aroclor 1260	13 J
11104-28-2	Aroclor 1221	38 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	83.0%
Tetrachlorometaxylene	78.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWOS011012-200

Lab Sample ID: AU63D
LIMS ID: 99-14639
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *w/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99
Sample Amount: 28.2 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.7

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 19.5%

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	18 U
11096-82-5	Aroclor 1260	18 U
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 88.5%
Tetrachlorometaxylene 83.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

rum
10/17/99

SOIL SEMIVOLATILE SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: AU63-Roy F. Weston

Project: 3709-066-020-2100

Client ID	NBZ	FBP	TPH	PHL	2FP	TBP	2CP	DCB	TOT OUT
Method Blank	65.4%	53.2%	67.9%	41.8%	44.5%	44.9%	41.8%	52.3%	0
Lab Control	69.3%	56.7%	76.1%	44.3%	48.3%	50.3%	47.0%	54.2%	0
R-SD1-LWOS015016-10060.0%		75.0%	78.6%	59.1%	58.9%	78.6%	61.5%	52.4%	0
R-SD1-LWOS015016-20060.1%		73.8%	80.8%	58.8%	56.2%	79.0%	57.9%	47.8%	0
R-SD1-LWOS015016-2 62.9%		78.8%	85.3%	62.2%	59.1%	82.6%	63.1%	50.5%	0
R-SD1-LWOS011012-20061.3%		55.5%	72.7%	48.9%	51.5%	73.1%	47.7%	48.2%	0
R-SD1-LWOS011012-MS 51.0%		52.9%	68.7%	44.7%	47.6%	73.9%	44.8%	46.0%	0
R-SD1-LWOS011012-SD 54.6%		55.1%	72.0%	49.8%	52.9%	79.1%	50.4%	50.8%	0
R-SD1-LWOS011012-10068.3%		65.1%	79.2%	67.9%	68.4%	71.8%	64.8%	59.9%	0
R-SD1-LWOS010-200 58.6%		57.9%	70.3%	62.7%	61.2%	60.5%	59.7%	50.7%	0
R-SD1-LWOS006-200 55.2%		57.4%	73.7%	59.9%	57.4%	64.2%	54.8%	43.4%	0
R-SD1-LWOS004-275 63.5%		64.2%	79.2%	62.6%	60.3%	70.6%	61.0%	52.5%	0
R-SD1-LWCF-200-0000N64.9%		64.9%	87.0%	70.9%	68.7%	78.1%	69.3%	61.4%	0
R-SD1-LWCF-200-000 50.0%		56.8%	74.9%	53.0%	49.4%	63.9%	48.9%	44.1%	0
R-SD1-LWCF-200-0000E69.3%		60.0%	73.5%	58.5%	55.4%	68.1%	54.1%	54.2%	0
R-SD1-LWOS-10-100 61.6%		58.7%	77.9%	56.9%	55.8%	72.3%	55.0%	46.0%	0
R-SD1-LWOS-006-10 68.4%		67.8%	86.6%	63.7%	65.8%	79.2%	63.8%	55.0%	0
R-SD1-LWOS-003-10 74.7%		72.4%	89.6%	60.6%	63.4%	78.7%	64.7%	53.8%	0
R-SD1-LWOS-003-10-DL72.5%		68.4%	78.2%	65.0%	62.6%	77.8%	62.7%	53.8%	0
R-SD1-LWOS-006-100 59.2%		58.8%	79.6%	57.5%	55.0%	68.8%	56.1%	45.7%	0
R-SD1-LWOS001-10-0 58.4%		57.7%	74.5%	60.1%	53.5%	69.5%	55.3%	50.2%	0
R-SD1-LWOS002-10-0 56.2%		60.0%	77.3%	56.6%	50.2%	63.6%	51.3%	49.5%	0

LCS/MB LIMITS QC LIMITS

(NBZ) = Nitrobenzene-d5	(20-120)	(35-120)
(FBP) = 2-Fluorobiphenyl	(29-120)	(49-120)
(TPH) = p-Terphenyl-d14	(45-123)	(44-131)
(PHL) = Phenol-d5	(17-120)	(37-120)
(2FP) = 2-Fluorophenol	(23-120)	(39-120)
(TBP) = 2,4,6-Tribromophenol	(17-134)	(54-126)
(2CP) = 2-Chlorophenol-d4	(21-120)	(36-120)
(DCB) = 1,2-Dichlorobenzene-d4	(30-120)	(29-120)

Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWOS011012-100

Lab Sample ID: AU63E
LIMS ID: 99-14640
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 49.9%

Sample Amount: 25.0 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.9

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	36
11096-82-5	Aroclor 1260	34
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 82.5%
Tetrachlorometaxylene 78.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

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10/17/99

**ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD**

Sample No: R-SD1-LWOS010-200

Lab Sample ID: AU63F
LIMS ID: 99-14641
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 57.0%

Sample Amount: 25.8 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	18 J
11096-82-5	Aroclor 1260	20
11104-28-2	Aroclor 1221	39 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	82.5%
Tetrachlorometaxylene	77.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: R-SD1-LWOS006-200

Lab Sample ID: AU63G
LIMS ID: 99-14642
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *c/f*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisol Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 54.4%

Sample Amount: 25.0 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	19 J
11096-82-5	Aroclor 1260	18 J
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	92.5%
Tetrachlorometaxylene	90.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: R-SD1-LWOS004-275

Lab Sample ID: AU63H
LIMS ID: 99-14643
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 49.4%

Sample Amount: 25.3 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.4

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	22
11096-82-5	Aroclor 1260	19 J
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 81.5%
Tetrachlorometaxylene 80.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWCF-200-0000N

Lab Sample ID: AU63I
LIMS ID: 99-14644
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CL*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 51.1%

Sample Amount: 26.9 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	13 J
11096-82-5	Aroclor 1260	15 J
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	70.5%
Tetrachlorometaxylene	65.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

rum
10/17/99

**ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD**

Sample No: R-SD1-LWCF-200-0000NE

Lab Sample ID: AU63J
LIMS ID: 99-14645
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 51.1%

Sample Amount: 26.9 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.7

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	16 J
11096-82-5	Aroclor 1260	22
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 79.0%
Tetrachlorometaxylene 76.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWCF-200-0000E

Lab Sample ID: AU63K
LIMS ID: 99-14646
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/05/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 59.7%

Sample Amount: 26.2 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.8

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	19
11096-82-5	Aroclor 1260	26
11104-28-2	Aroclor 1221	38 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 77.2%
Tetrachlorometaxylene 77.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

RMM
10/17/99

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD

Sample No: R-SD1-LWOS-10-100

Lab Sample ID: AU63L

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14647

Project:

Matrix: Sediment

3907-066-020-2100

Date Sampled: 08/11/99

Date Received: 08/12/99

Data Release Authorized: *CH*

Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99

GPC Cleanup: Yes

Date analyzed: 10/05/99

Florisil Cleanup: No

Acid Cleanup: Yes

Sample Amount: 25.1 g-dry-wt

Sulfur Cleanup: Yes

Final Ext Vol: 5.0 mL

Conc/Dilution Factor: 1:1

pH: 6.4

Percent Moisture: 44.1%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	14 J
11096-82-5	Aroclor 1260	13 J
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	80.5%
Tetrachlorometaxylene	76.8%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWOS-006-10

Lab Sample ID: AU63M
LIMS ID: 99-14648
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3907-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/06/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 52.7%

Sample Amount: 26.0 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.6

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	290
11096-82-5	Aroclor 1260	66
11104-28-2	Aroclor 1221	38 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 78.0%
Tetrachlorometaxylene 72.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

RW
10/17/99

**ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD**

Sample No: R-SD1-LWOS-003-10

Lab Sample ID: AU63N
LIMS ID: 99-14649
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3907-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CF*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/06/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 61.6%

Sample Amount: 26.9 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	19 U
53469-21-9	Aroclor 1242	19 U
12672-29-6	Aroclor 1248	19 U
11097-69-1	Aroclor 1254	270
11096-82-5	Aroclor 1260	490
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	19 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 76.8%
Tetrachlorometaxylene 64.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWOS-006-100

Lab Sample ID: AU630
LIMS ID: 99-14650
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100
Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/4/99*

Date extracted: 10/01/99
Date analyzed: 10/06/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 54.6%

Sample Amount: 27.2 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.5

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	24
11096-82-5	Aroclor 1260	26
11104-28-2	Aroclor 1221	37 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl 73.5%
Tetrachlorometaxylene 63.2%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

Anna
10/17/99

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: R-SD1-LWOS001-10-0000

Lab Sample ID: AU63P
LIMS ID: 99-14651
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3907-066-020-2100
Date Sampled: 08/13/99
Date Received: 08/14/99

Data Release Authorized: CH
Reported: 10/06/99 10/6/99

Date extracted: 10/01/99
Date analyzed: 10/06/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 20.7%

Sample Amount: 27.7 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.8

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	10 J
11096-82-5	Aroclor 1260	18 U
11104-28-2	Aroclor 1221	36 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	80.0%
Tetrachlorometaxylene	80.8%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD



Sample No: R-SD1-LWOS002-10-0000

Lab Sample ID: AU63Q
LIMS ID: 99-14652
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3907-066-020-2100
Date Sampled: 08/13/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/06/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 19.3%

Sample Amount: 28.2 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.4

Reported in Total ug/kg Dry Weight

<u>CAS Number</u>	<u>Analyte</u>	<u>Value</u>
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	18 U
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	13 J
11096-82-5	Aroclor 1260	10 J
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	82.8%
Tetrachlorometaxylene	83.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

CH
10/17/99

**ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD**

Sample No: R-SD1-LWOS005-10-0000

Lab Sample ID: AU63R
LIMS ID: 99-14653
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3907-066-020-2100
Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/06/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 49.9%

Sample Amount: 25.0 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.6

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	62
11096-82-5	Aroclor 1260	49
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	77.2%
Tetrachlorometaxylene	73.0%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

**ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD**

Sample No: Method Blank

Lab Sample ID: AU63MB QC Report No: AU63-Roy F. Weston
LIMS ID: 99-14636 Project:
Matrix: Sediment 3709-066-020-2100
Date Sampled: NA
Date Received: NA

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99 GPC Cleanup: Yes
Date analyzed: 10/05/99 Florisil Cleanup: No
Sample Amount: 25.0 g-dry-wt Acid Cleanup: Yes
Final Ext Vol: 5.0 mL Sulfur Cleanup: Yes
pH: NA Conc/Dilution Factor: 1:1
Percent Moisture: NA

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	20 U
53469-21-9	Aroclor 1242	20 U
12672-29-6	Aroclor 1248	20 U
11097-69-1	Aroclor 1254	20 U
11096-82-5	Aroclor 1260	20 U
11104-28-2	Aroclor 1221	40 U
11141-16-5	Aroclor 1232	20 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	88.0%
Tetrachlorometaxylene	83.5%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: AU63
LIMS ID: 99-14636
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

LABORATORY CONTROL SAMPLE SPIKE RECOVERY

Date extracted: 10/01/99

CONSTITUENT	SPIKE FOUND	SPIKE ADDED	% RECOVERY
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LABORATORY CONTROL SAMPLE

Aroclor 1242	191	202	94.7%
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Aroclor Surrogate Recoveries

Decachlorobiphenyl	96.5%
Tetrachlorometaxylene	92.5%

Values Reported in Total ug/kg Dry Weight

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Lab Sample ID: AU63Q
LIMS ID: 99-14652
Matrix: Sediment

Sample No: R-SD1-LWOS002-10-0000
QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Received: 08/12/99

Data Release Authorized: C/H
Reported: 10/06/99 *10/6/99*

MATRIX SPIKE/SPIKE DUPLICATE RECOVERY

Date extracted: 10/01/99

CONSTITUENT	SAMPLE VALUE	SPIKE FOUND	SPIKE ADDED	% RECOVERY	RPD
MATRIX SPIKE					
Aroclor 1242	< 18.	151.	178	84.7%	
MATRIX SPIKE DUPLICATE					
Aroclor 1242	< 18.	149.	178	83.5%	1.4%

Values Reported in Total ug/kg Dry Weight

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD

Sample No: R-SD1-LWOS002-10-0000
MATRIX SPIKE

Lab Sample ID: AU63QMS
LIMS ID: 99-14652
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project:
3907-066-020-2100
Date Sampled: 08/13/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *10/6/99*

Date extracted: 10/01/99
Date analyzed: 10/06/99

GPC Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: Yes
Sulfur Cleanup: Yes
Conc/Dilution Factor: 1:1
Percent Moisture: 19.3%

Sample Amount: 28.2 g-dry-wt
Final Ext Vol: 5.0 mL
pH: 6.4

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	34
11096-82-5	Aroclor 1260	21
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	78.2%
Tetrachlorometaxylene	78.8%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.

**ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD**

Sample No: R-SD1-LWOS002-10-0000
SPIKE DUPLICATE

Lab Sample ID: AU63QMSD QC Report No: AU63-Roy F. Weston
LIMS ID: 99-14652 Project:
Matrix: Sediment 3907-066-020-2100
Date Sampled: 08/13/99
Date Received: 08/12/99

Data Release Authorized: *CH*
Reported: 10/06/99 *6/4/99*

Date extracted: 10/01/99 GPC Cleanup: Yes
Date analyzed: 10/06/99 Florisil Cleanup: No
Acid Cleanup: Yes
Sample Amount: 28.2 g-dry-wt Sulfur Cleanup: Yes
Final Ext Vol: 5.0 mL Conc/Dilution Factor: 1:1
pH: 6.4 Percent Moisture: 19.3%

Reported in Total ug/kg Dry Weight

CAS Number	Analyte	Value
12674-11-2	Aroclor 1016	18 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	18 U
11097-69-1	Aroclor 1254	38
11096-82-5	Aroclor 1260	15 J
11104-28-2	Aroclor 1221	35 U
11141-16-5	Aroclor 1232	18 U

PCB-Aroclor Surrogate Recovery

Decachlorobiphenyl	79.0%
Tetrachlorometaxylene	77.8%

Data Qualifiers

- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector.
Dilution Required
- S Indicates no value reported due to saturation of the detector.
- D Indicates the surrogate was diluted out.
- U Indicates compound was analyzed for, but not detected at the given detection limit.
- B Found in associated method blank
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.
- NV Indicates no value reportable - see additional analyses.
- Y Indicates a raised reporting limit due to matrix interferences.
The analyte may be present at or below the listed concentration, but in the opinion of the analyst, confirmation was inadequate.



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS015016-100

Lab Sample ID: AU63A
LIMS ID: 99-14636
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 10/07/99

Percent Total Solids: 44.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	24,900
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.4
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.6
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	37.5
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	39.4
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	30,400
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	15
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.06
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	34
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	6 U
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.4	135

U Analyte undetected at given RL

RL Reporting Limit

rum
10/17/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS015016-200

Lab Sample ID: AU63B
LIMS ID: 99-14637
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 10/07/99

Percent Total Solids: 42.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	28,300
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.5
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.3
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	41.6
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	42.9
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	31,800
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	12
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.08
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	36
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	8
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	81.1

U Analyte undetected at given RL

RL Reporting Limit

Rum
10/17/99



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS015016-200W

Lab Sample ID: AU63C
LIMS ID: 99-14638
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 53.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	21,500
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.09	0.12 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	5	5 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.09	0.35
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.3
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.5	31.8
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	31.8
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	26,200
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	11
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.04
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	0.9	29.3
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	5	5 U
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	5	5 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.4	67.4

U Analyte undetected at given RL
RL Reporting Limit

rum
10/17/99



**INORGANICS ANALYSIS DATA SHEET
TOTAL METALS**

Sample No: R-SD1-LWOS011012-200

Lab Sample ID: AU63D
LIMS ID: 99-14639
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 10/07/99

Percent Total Solids: 77.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	1	15,900
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.06	0.07 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	3	3 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.06	0.23
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.1	0.1
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.3	21.7
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.1	19.3
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	1	21,400
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	1	3
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.01	0.02
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	0.6	21.0
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	3	4
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.2	0.2 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	3	3 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.3	43.5

U Analyte undetected at given RL

RL Reporting Limit

Rum
10/17/99



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS011012-100

Lab Sample ID: AU63E
LIMS ID: 99-14640
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 42.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	27,300
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.5
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.5
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	41.4
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	40.9
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	32,800
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	15
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.06
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	37
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	9
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.4	0.4 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	82.0

rum
10/17/99

U Analyte undetected at given RL
RL Reporting Limit



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS010-200

Lab Sample ID: AU63F
LIMS ID: 99-14641
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 10/07/99

Percent Total Solids: 49.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	27,000
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	5	6
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.4
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.4
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.5	38.9
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	44.0
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	32,300
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	15
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.08
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	34
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	5	8
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	5	5 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.4	86.0

U Analyte undetected at given RL

RL Reporting Limit

Rym
10/17/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS006-200

Lab Sample ID: AU63G
LIMS ID: 99-14642
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 36.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	3	25,200
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.1 U J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	7	7 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.4
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.3	0.3
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.7	37.3
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.3	42.1
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	3	30,200
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	3	14
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.03	0.08
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	32
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	7	10
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.4	0.4 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	7	7 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	82.6

U Analyte undetected at given RL

RL Reporting Limit

RL
10/17/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS004-275

Lab Sample ID: AU63H
LIMS ID: 99-14643
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 10/07/99

Percent Total Solids: 41.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	24,200
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.4
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.4
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	35.6
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	39.2
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	29,500
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	15
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.06
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	31
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	7
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.4	0.4 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	82.8

U Analyte undetected at given RL

RL Reporting Limit

Run
10/17/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWCF-200-0000N

Lab Sample ID: AU63I
LIMS ID: 99-14644
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 40.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	26,800
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.1 U J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.5
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.4
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	39.3
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	41.4
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	32,500
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	14
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.07
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	36
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	6
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.4	0.4 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	82.6

U Analyte undetected at given RL

RL Reporting Limit

R444
10/17/99



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWCF-200-0000NE

Lab Sample ID: AU63J
LIMS ID: 99-14645
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 43.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	28,500
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.5
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.3
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	43.5
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	43.4
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	34,500
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	16
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.08
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	39
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	8
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	85.5

U Analyte undetected at given RL

RL Reporting Limit

Russ
10/17/99




**INORGANICS ANALYSIS DATA SHEET
TOTAL METALS**

Sample No: R-SD1-LWCF-200-0000E

Lab Sample ID: AU63K
LIMS ID: 99-14646
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized: 
Reported: 10/07/99

Percent Total Solids: 39.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	3	26,800
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.1 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.4
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.3	0.4
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	41.5
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.3	45.7
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	3	33,400
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	3	19
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.03	0.08
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	37
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	6 U
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.4	0.4 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	95.7

U Analyte undetected at given RL
RL Reporting Limit

RM
10/17/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS-10-100

Lab Sample ID: AU63L
LIMS ID: 99-14647
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 60.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	21,600
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.08	0.12 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	4	4
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.08	0.36
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.3
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.4	33.0
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	31.2
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	29,100
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	9
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.06
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	0.8	29.1
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	4	5
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.2	0.2 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	4	4 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.3	62.1

U Analyte undetected at given RL

RL Reporting Limit

Rum

10/17/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS-006-10

Lab Sample ID: AU63M
LIMS ID: 99-14648
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 40.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	25,500
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.4
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.4
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	39.8
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	43.2
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	30,800
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	14
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.16
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	34
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	6
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.4	0.4 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	88.9

U Analyte undetected at given RL

RL Reporting Limit

rum
10/17/99



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS-003-10

Lab Sample ID: AU63N
LIMS ID: 99-14649
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized:
Reported: 10/07/99

Percent Total Solids: 32.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	3	16,500
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.2	0.7 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	8	8 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.2	0.3
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.3	2.0
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.8	39.9
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.3	43.7
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	3	29,700
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	3	51
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.03	0.11
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	2	29
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	8	8 U
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.5	0.5 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	8	8 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.6	203

*Run
10/17/99*

U Analyte undetected at given RL

RL Reporting Limit



INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS-006-100

Lab Sample ID: AU630
LIMS ID: 99-14650
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Sampled: 08/11/99
Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 47.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	26,700
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.3 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	5	5 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.5
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.5
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.5	39.4
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	43.3
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	33,200
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	16
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.08
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	36
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	5	9
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	5	5 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.4	90.0

U Analyte undetected at given RL

RL Reporting Limit

Rnm
10/17/99



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS001-10-0000

Lab Sample ID: AU63P
LIMS ID: 99-14651
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Sampled: 08/13/99
Date Received: 08/14/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 77.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	1	14,300
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.06	0.09 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	3	3 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.06	0.22
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.1	0.2
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.3	25.9
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.1	18.9
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	1	20,100
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	1	7
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.01	0.02
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	0.6	24.6
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	3	4
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.2	0.2 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	3	3 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.3	64.4

Rum
10/17/99

U Analyte undetected at given RL
RL Reporting Limit



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET

Sample No: R-SD1-LWOS002-10-0000

TOTAL METALS

Lab Sample ID: AU63Q

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14652

Project: 3907-066-020-2100

Matrix: Sediment

Date Sampled: 08/13/99

Date Received: 08/12/99

Data Release Authorized

Reported: 10/07/99

Percent Total Solids: 76.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	1	14,500
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.06	0.06 U J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	3	5
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.06	0.25
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.1	0.2
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.3	24.1
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.1	18.7
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	1	21,000
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	1	11
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.01	0.02
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	0.6	22.4
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	3	6
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.2	0.2 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	3	3 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.3	70.8

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

Rum
10/17/99



ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: R-SD1-LWOS005-10-0000

Lab Sample ID: AU63R
LIMS ID: 99-14653
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Sampled: 08/12/99
Date Received: 08/13/99

Data Release Authorized
Reported: 10/07/99

Percent Total Solids: 42.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	26,700
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.2 J
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	6	6 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.5
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.5
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.6	39.4
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	43.7
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	31,100
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	17
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.02	0.07
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	35
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	6	10
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	6	6 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.5	90.3

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

RMH
10/17/99




INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: AU63MB
LIMS ID: 99-14636
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: NA
Date Received: NA

Data Release Authorized: 
Reported: 10/07/99

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050	09/29/99	6010	10/04/99	7429-90-5	Aluminum	2	4
3050	09/29/99	7041	10/01/99	7440-36-0	Antimony	0.1	0.1 U
3050	09/29/99	6010	10/04/99	7440-38-2	Arsenic	5	5 U
3050	09/29/99	6010	10/04/99	7440-41-7	Beryllium	0.1	0.1 U
3050	09/29/99	6010	10/04/99	7440-43-9	Cadmium	0.2	0.2 U
3050	09/29/99	6010	10/04/99	7440-47-3	Chromium	0.5	0.5 U
3050	09/29/99	6010	10/04/99	7440-50-8	Copper	0.2	0.3
3050	09/29/99	6010	10/04/99	7439-89-6	Iron	2	2 U
3050	09/29/99	6010	10/04/99	7439-92-1	Lead	2	2 U
CLP	09/29/99	7471	10/04/99	7439-97-6	Mercury	0.05	0.05 U
3050	09/29/99	6010	10/04/99	7440-02-0	Nickel	1	1 U
3050	09/29/99	6010	10/04/99	7782-49-2	Selenium	5	5 U
3050	09/29/99	6010	10/04/99	7440-22-4	Silver	0.3	0.3 U
3050	09/29/99	6010	10/04/99	7440-28-0	Thallium	5	5 U
3050	09/29/99	6010	10/04/99	7440-66-6	Zinc	0.4	0.4 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AU63A
LIMS ID: 99-14636
Matrix: Sediment

Sample No: R-SD1-LWOS015016-100
QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Received: 08/12/99

Data Release Authorized
Reported: 10/07/99

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Aluminum	6010	24900	23700	4.9%	+/- 20 %	
Antimony	7041	0.2	0.1	66.7%	+/- 0.1	L
Arsenic	6010	6 U	6 U	0.0%	+/- 6	L
Beryllium	6010	0.4	0.4	0.0%	+/- 0.1	L
Cadmium	6010	0.6	0.5	18.2%	+/- 0.2	L
Chromium	6010	37.5	36.5	2.7%	+/- 20 %	
Copper	6010	39.4	38.4	2.6%	+/- 20 %	
Iron	6010	30400	28900	5.1%	+/- 20 %	
Lead	6010	15	14	6.9%	+/- 20 %	
Mercury	7471	0.06	0.07	15.4%	+/- 0.02	L
Nickel	6010	34	31	9.2%	+/- 20 %	
Selenium	6010	6 U	6	0.0%	+/- 6	L
Silver	6010	0.3 U	0.3 U	0.0%	+/- 0.3	L
Thallium	6010	6 U	6 U	0.0%	+/- 6	L
Zinc	6010	135	126	6.9%	+/- 20 %	

'Q' codes:

* = control limit not met
L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS




ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AU63A
LIMS ID: 99-14636
Matrix: Sediment

Sample No: R-SD1-LWOS015016-100
QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Received: 08/12/99

Data Release Authorized: 
Reported: 10/07/99

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	24900	25100	278	71.9%	H
Antimony	7041	0.2	2.0	11.1	16.2%	N
Arsenic	6010	6 U	259	278	93.2%	
Beryllium	6010	0.4	5.7	5.6	94.6%	
Cadmium	6010	0.6	11.4	11.1	97.3%	
Chromium	6010	37.5	64.3	27.8	96.4%	
Copper	6010	39.4	52.2	11.1	115%	
Iron	6010	30400	31300	278	324%	H
Lead	6010	15	119	111	93.7%	
Mercury	7471	0.06	0.25	0.22	86.4%	
Nickel	6010	34	87	56	94.6%	
Selenium	6010	6 U	271	278	97.5%	
Silver	6010	0.3 U	25.6	27.8	92.1%	
Thallium	6010	6 U	251	278	90.3%	
Zinc	6010	135	190	55.6	98.9%	

'Q' codes: N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%


INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: AU63LCS
LIMS ID: 99-14636
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized: 
Reported: 10/07/99

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Aluminum	6010	254	250	102%	
Antimony	7041	7.8	10.0	78.0%	N
Arsenic	6010	239	250	95.6%	
Beryllium	6010	4.7	5.0	94.0%	
Cadmium	6010	10.0	10.0	100%	
Chromium	6010	23.5	25.0	94.0%	
Copper	6010	10.4	10.0	104%	
Iron	6010	246	250	98.4%	
Lead	6010	95	100	95.0%	
Mercury	7471	0.84	1.00	84.0%	
Nickel	6010	49	50	98.0%	
Selenium	6010	242	250	96.8%	
Silver	6010	24.4	25.0	97.6%	
Thallium	6010	233	250	93.2%	
Zinc	6010	48.8	50.0	97.6%	

'Q' codes: N = control limit not met

Control Limits: 80-120%

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS015016-100

Lab Sample ID: AU63A
LIMS ID: 99-14636
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Release Authorized: *MS* Date Received: 08/12/99
Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	45.4
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	2.0
	100499#1					

RJM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS015016-200

Lab Sample ID: AU63B

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14637

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *mf* Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	46.3
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	2.2
	100499#1					

Rum
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS015016-200W

Lab Sample ID: AU63C
LIMS ID: 99-14638
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Date Release Authorized: *MF* Date Received: 08/12/99
Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99 100199#1	EPA 160.3 SM 2540 B		0.01	Percent	53.4
Total Organic Carbon	10/04/99 100499#1	Plumb, 1981		0.0050	Percent	1.7

RMS
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS011012-200

Lab Sample ID: AU63D

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14639

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized *mf*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	74.1
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	0.23
	100499#1					

Rum
10/12/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS011012-100

Lab Sample ID: AU63E
LIMS ID: 99-14640
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Data Release Authorized: *MS* Date Sampled: 08/11/99
Date Received: 08/12/99
Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	44.4
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	1.9
	100499#1					

RHM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS010-200

Lab Sample ID: AU63F

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14641

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *MS*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	51.1
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	2.8
	100499#1					

RHM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

**Final Report
Laboratory Analysis of Conventional Parameters**

Sample No: R-SD1-LWOS006-200

Lab Sample ID: AU63G
LIMS ID: 99-14642
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100

Date Sampled: 08/11/99
Data Release Authorized: *mf* Date Received: 08/12/99
Reported: 10/06/99 Dr. M.A. Perkins

<u>Analyte</u>	<u>Analysis</u>		<u>Dilution</u>		<u>Units</u>	<u>Result</u>
	<u>Date/Batch</u>	<u>Method</u>	<u>Factor</u>	<u>RL</u>		
Total Solids	10/01/99 100199#1	EPA 160.3 SM 2540 B		0.01	Percent	50.8
Total Organic Carbon	10/04/99 100499#1	Plumb, 1981		0.0050	Percent	2.8

RUM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS004-275

Lab Sample ID: AU63H

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14643

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *MB*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	37.0
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	2.6
	100499#1					

RMH
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWCF-200-0000N

Lab Sample ID: AU63I

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14644

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *MS*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99 100199#1	EPA 160.3 SM 2540 B		0.01	Percent	36.0
Total Organic Carbon	10/04/99 100499#1	Plumb, 1981		0.0050	Percent	2.6

RUM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWCF-200-0000NE

Lab Sample ID: AU63J

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14645

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *mf*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	42.8
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	2.0
	100499#1					

RUM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWCF-200-0000E

Lab Sample ID: AU63K

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14646

Project: 3709-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *MP*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	37.2
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	2.3
	100499#1					

run
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS-10-100

Lab Sample ID: AU63L

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14647

Project: 3907-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *MB*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	52.7
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	1.6
	100499#1					

Rum
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS-006-10

Lab Sample ID: AU63M
LIMS ID: 99-14648
Matrix: Sediment

QC Report No: AU63-Roy F. Weston
Project: 3907-066-020-2100

Date Sampled: 08/11/99
Date Release Authorized: *MS* Date Received: 08/12/99
Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99 100199#1	EPA 160.3 SM 2540 B		0.01	Percent	39.4
Total Organic Carbon	10/04/99 100499#1	Plumb, 1981		0.0050	Percent	2.6

RHM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS-003-10

Lab Sample ID: AU63N

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14649

Project: 3907-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *omb*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	28.0
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	4.9
	100499#1					

RHM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

**Final Report
Laboratory Analysis of Conventional Parameters**

Sample No: R-SD1-LWOS-006-100

Lab Sample ID: AU630

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14650

Project: 3907-066-020-2100

Matrix: Sediment

Date Sampled: 08/11/99

Data Release Authorized: *MB*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

<u>Analyte</u>	<u>Analysis</u>		<u>Dilution</u>		<u>Units</u>	<u>Result</u>
	<u>Date/Batch</u>	<u>Method</u>	<u>Factor</u>	<u>RL</u>		
Total Solids	10/01/99 100199#1	EPA 160.3 SM 2540 B		0.01	Percent	29.6
Total Organic Carbon	10/04/99 100499#1	Plumb, 1981		0.0050	Percent	3.3

*RUM
10/17/99*

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS001-10-0000

Lab Sample ID: AU63P

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14651

Project: 3907-066-020-2100

Matrix: Sediment

Date Sampled: 08/13/99

Data Release Authorized: *MP*

Date Received: 08/14/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	77.8
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	0.26
	100499#1					

Kum
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/14/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS002-10-0000

Lab Sample ID: AU63Q

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14652

Project: 3907-066-020-2100

Matrix: Sediment

Date Sampled: 08/13/99

Data Release Authorized: *MS*

Date Received: 08/12/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	78.9
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	0.26
	100499#1					

RMH
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/12/99

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: R-SD1-LWOS005-10-0000

Lab Sample ID: AU63R

QC Report No: AU63-Roy F. Weston

LIMS ID: 99-14653

Project: 3907-066-020-2100

Matrix: Sediment

Date Sampled: 08/12/99

Data Release Authorized: *MS*

Date Received: 08/13/99

Reported: 10/06/99 Dr. M.A. Perkins

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/01/99	EPA 160.3		0.01	Percent	41.6
	100199#1	SM 2540 B				
Total Organic Carbon	10/04/99	Plumb, 1981		0.0050	Percent	2.6
	100499#1					

RAM
10/17/99

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for AU63 received 08/13/99

QA Report - Method Blank Analysis

Matrix: Sediment
Data Release Authorized: *MS*
Reported: 10/06/99 Dr. M.A. Perkins

QC Report No: AU63-Roy F. Weston
Project: 3709-066-020-2100
Date Received: NA

METHOD BLANK RESULTS
CONVENTIONALS

Analysis

<u>Date & Batch</u>	<u>Constituent</u>	<u>Units</u>	<u>Result</u>
Method Blank			
10/01/99 100199#1	Total Solids	mg residue	< 1.00 U
Method Blank			
10/04/99 100499#1	Total Organic Carbon	Percent	<0.0050 U

QA Report - Standard Reference Material Analysis

QC Report No: AU63-Roy F. Weston

Project: 3709-066-020-2100

Date Received: NA

Data Release Authorized: *MP*

Reported: 10/06/99 Dr. M.A. Perkins

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONALS

Constituent	Units	Value	True Value	Recovery
NBS #2704				
Total Organic Carbon	Percent	3.16	3.35	94.3%
Date analyzed: 10/04/99 Batch ID: 100499#1				

QA Report - Replicate Analysis

Matrix: Sediment
 QC Report No: AU63-Roy F. Weston
 Project: 3709-066-020-2100
 Date Received: 08/12/99
 Data Release Authorized: *MP*
 Reported: 10/06/99 Dr. M.A. Perkins

REPLICATE ANALYSIS RESULTS
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Sample Value</u>	<u>Replicate Value (s)</u>	<u>RPD/RSD</u>
ARI ID: 99-14636, AU63 A Client Sample ID: R-SD1-LWOS015016-100				
Total Solids	Percent	45.4	44.0 44.2	RSD: 1.7%
Total Organic Carbon	Percent	2.0	2.1 2.2	RSD: 4.8%

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

Matrix: Sediment
 QC Report No: AU63-Roy F. Weston
 Project: 3709-066-020-2100
 Date Received: 08/12/99
 Data Release Authorized *MP*
 Reported: 10/06/99 Dr. M.A. Perkins

MATRIX SPIKE/MATRIX SPIKE DUP. QA/QC REPORT
CONVENTIONALS

<u>Constituent</u>	<u>Units</u>	<u>Sample Value</u>	<u>Spike Value</u>	<u>Spike Added</u>	<u>Recovery</u>
ARI ID: 99-14636, AU63 A Client Sample ID: R-SD1-LWOS015016-100					
Total Organic Carbon MS	Percent	2.02	4.17	2.59	82.9%
Total Organic Carbon MSD	Percent	2.02	4.48	2.43	101%

MS/MSD Recovery Limits: 75 - 125 %



Analytical Resources, Incorporated
Analytical Chemists and Consultants

October 18, 1999

Roger McGinnis
Roy F. Weston, Inc.
Suite 5700
700 Fifth Ave
Seattle, WA 98103

RE: Project: Boeing Renton Sediment
ARI Job: AU63

Dear Roger:

Please find enclosed a set of analytical results for the above referenced project. Eighteen sediment samples were taken out of archive and analyzed for PSDDA SVOAs, PSDDA PCBs, PSDDA metals, PSDDA grain size (subcontracted to Rosa Environmental and Geotechnical Laboratory), and total organic carbon (TOC).

The grain size data was submitted to ARI after the chemical data was sent. This data deliverable contains the grain size data.

Copies of the reports and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Jennifer M. Baier
Project Manager
jennifer@arilabs.com

JMB/jb
Enclosure

October 18, 1999

Ms. Jennifer Baier
Analytical Resources, Inc.
400 Ninth Avenue North
Seattle, WA 98109


Subject: Roy F. Weston, Project: 3709-066-020-2100; REGL Project No.: 1000-196

Dear Ms. Baier;

The samples from the referenced project were received for grain size analysis. The analysis was performed according to the PSEP method. The results of the grain size analysis are discussed on the attached tables, plots, and narrative.

Please call me to discuss any questions, or comments you may have on the data or its presentation.

Best Regards,
Rosa Environmental & Geotechnical Laboratory, LLC.


Harold Benny
Quality Assurance Manager

Client: Roy F. Weston	REGL Project No.: 1000-196
Client Project: 3709-066-020-2100	Sample Batch No.: 1000-196-01

Case Narrative

1. Four samples were received on September 27, 1999 for grain size analysis. Twelve samples were received October 6, 1999. The remaining two samples were received on October 8, 1999.
2. All samples were previously frozen except for R-SD1-LWOS015016-200W, LWCF-200-0000NE, LWCF-200-0000E, and LWOS-006-10. All previously frozen samples had broken glass throughout the samples, which was removed prior to analysis.
3. All previously frozen samples were limited with sample amount. Many were difficult to homogenize.
4. Care should be taken when interpreting data. Samples that show low fines and unusually high total solids may have been compromised by the freezing step. Due to the presence of broken glass, it may be possible that the sample jars burst during thaw and that moisture and fines were lost in archive.
5. All samples were set up for grain size analysis according to the PSEP methodology.
6. A triplicate analysis was performed on LWOS015016-200W, not a frozen sample, and the results are reported on the respective QA summary.
7. There were no other anomalies in the samples or methods on this project.

Approved by: 
Title: Laboratory Manager

Date: 10/14/99

Roy F. Weston
 Project No.: 3709-066-020-2100

Apparent Grain Size Distribution Summary
 Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay		
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0
R-SD1-LWOS015016-200W-A	0.2	0.9	1.4	3.4	28.9	34.0	14.6	8.2	4.4	2.1	0.9	0.4	0.5
R-SD1-LWOS015016-200W-B	0.2	1.0	1.2	3.5	28.0	33.2	15.5	8.2	4.2	2.7	0.7	0.8	0.8
R-SD1-LWOS015016-200W-C	0.4	1.0	1.4	3.3	28.5	34.0	15.1	7.4	4.5	2.6	0.7	0.4	0.6
R-SD1-LWOS015016-100	0.0	0.2	0.6	0.8	7.1	23.4	26.5 J	19.0 J	12.6 J	5.5 J	2.7 J	0.4 J	1.2 J
R-SD1-LWOS015016-200	0.0	0.5	0.8	1.0	3.5	12.1	32.9	18.5	16.3	1.8	9.2	1.5	1.9
R-SD1-LWOS011012-200	3.5	0.9	11.5	52.1	22.8	4.0	2.0	1.4	0.8	0.7	0.1	0.1	0.1
R-SD1-LWOS011012-100	0.1	0.3	0.5	0.7	2.8	14.3	23.9	27.1	16.2	7.4	3.2	1.8	1.7
R-SD1-LWOS010-200	0.1	0.6	0.7	1.6	2.6	10.3	18.6	30.8	19.3	9.7	0.4	5.6	0.0
R-SD1-LWOS006-200	0.1	0.6	0.7	0.9	3.2	13.1	24.9	25.9	16.3	7.4	3.1	1.7	2.0
R-SD1-LWOS004-275	0.3	0.7	0.8	1.4	4.9	19.3	26.4 v	22.2 v	13.4 v	5.8 v	2.5 v	1.4 v	1.0 v
R-SD1-LWCF-200-0000N	0.0	0.5	0.7	0.8	3.0	13.4	21.9 J	26.2 J	17.9 J	7.9 J	3.8 J	2.4 J	1.3 J
R-SD1-LWCF-200-0000NE	0.0	0.1	0.7	0.9	1.8	6.8	17.9	29.0	25.9	10.0	4.2	0.8	1.7
R-SD1-LWCF-200-0000E	0.0	0.1	1.4	2.6	4.9	9.5	15.9	31.2	22.7	6.3	2.6	1.1	1.8
R-SD1-LWOS-10-100	0.0	0.2	0.3	0.6	4.5	29.5	35.8 J	13.9 J	7.5 J	3.1 J	2.6 J	0.5 J	1.5 J
R-SD1-LWOS-006-10	0.1	1.6	2.0	2.1	4.9	15.5	24.5	24.0	14.3	5.3	2.9	0.5	2.3
R-SD1-LWOS-003-10	2.3	2.7	4.3	10.5	18.6	16.8	16.7 J	14.5 J	7.4 J	4.0 J	0.6 J	0.5 J	1.0 J
R-SD1-LWOS-006-100	4.0	0.6	0.8	0.8	2.5	11.5	24.8	23.3	17.7	7.7	3.0	1.9	1.6
R-SD1-LWOS001-10-0000	0.6	1.3	10.6	48.6	32.6	5.7	0.3	0.1	0.0	0.0	0.0	0.1	0.0
R-SD1-LWOS002-10-0000	4.9	5.8	13.1	43.3	26.4	4.0	2.0	0.2	0.0	0.1	0.0	0.1	0.0
R-SD1-LWOS005-10-0000	0.0	0.9	0.9	2.0	4.4	16.0	23.1 v	23.9 v	13.9 v	7.1 v	4.0 v	1.3 v	2.4 v

Notes to the Testing:
 1. Apparent grain size distributions according to PSEP protocols.

Rosen
 11/18/99

Rosa Environmental Geotechnical Laboratory, LLC

Roy F. Weston
 Project No.: 3709-066-020-2100

Apparent Grain Size Distribution Summary
 Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
	Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9
Sieve Size (microns)	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (62)	31.00	15.60	7.80	3.90	2.00	1.00
R-SD1-LWOS015016-200W-A	100.0	100.0	99.8	98.9	97.5	94.1	65.2	31.2	16.6	8.4	4.0	1.8	0.9	0.5
R-SD1-LWOS015016-200W-B	100.0	100.0	99.8	98.8	97.5	94.1	66.1	32.9	17.3	9.1	4.9	2.2	1.5	0.8
R-SD1-LWOS015016-200W-C	100.0	100.0	99.6	98.6	97.1	93.8	65.3	31.3	16.2	8.8	4.4	1.8	1.1	0.6
R-SD1-LWOS015016-100	100.0	100.0	100.0	99.8	99.2	98.4	91.3	67.9	41.4	22.4	9.8	4.3	1.6	1.2
R-SD1-LWOS015016-200	100.0	100.0	100.0	99.5	98.7	97.7	94.2	82.1	49.2	30.7	14.4	12.6	3.4	1.9
R-SD1-LWOS011012-200	100.0	97.3	96.5	95.6	84.1	32.1	9.2	5.2	3.2	1.8	1.0	0.3	0.2	0.1
R-SD1-LWOS011012-100	100.0	100.0	99.9	99.7	99.1	98.4	95.6	81.3	57.4	30.3	14.1	6.7	3.5	1.7
R-SD1-LWOS010-200	100.0	100.0	99.9	99.3	98.7	97.1	94.5	84.3	65.7	34.9	15.6	6.0	5.6	0.0
R-SD1-LWOS006-200	100.0	100.0	99.9	99.3	98.6	97.7	94.4	81.4	56.5	30.6	14.2	6.8	3.7	2.0
R-SD1-LWOS004-275	100.0	99.9	99.7	99.1	98.3	96.8	91.9	72.6	46.2	24.0	10.6	4.9	2.4	1.0
R-SD1-LWCF-200-0000N	100.0	100.0	100.0	99.4	98.7	97.8	94.8	81.4	59.5	33.3	15.5	7.5	3.7	1.3
R-SD1-LWCF-200-0000NE	100.0	100.0	100.0	99.9	99.2	98.3	96.5	89.6	71.7	42.7	16.8	6.8	2.5	1.7
R-SD1-LWCF-200-0000E	100.0	100.0	100.0	99.9	98.5	95.9	91.1	81.6	65.7	34.5	11.8	5.5	2.9	1.8
R-SD1-LWOS-10-100	100.0	100.0	100.0	99.8	99.4	98.8	94.4	64.8	29.1	15.1	7.7	4.6	2.0	1.5
R-SD1-LWOS-006-10	100.0	100.0	99.9	98.4	96.3	94.2	89.3	73.8	49.3	25.2	11.0	5.7	2.8	2.3
R-SD1-LWOS-003-10	100.0	100.0	97.7	95.0	90.7	80.2	61.6	44.8	28.1	13.6	6.2	2.2	1.6	1.0
R-SD1-LWOS-006-100	100.0	99.8	96.0	95.5	94.6	93.9	91.4	79.9	55.1	31.8	14.1	6.4	3.4	1.6
R-SD1-LWOS001-10-0000	100.0	99.6	99.4	98.0	87.4	38.8	6.2	0.5	0.2	0.1	0.1	0.1	0.1	0.0
R-SD1-LWOS002-10-0000	100.0	99.2	95.1	89.3	76.2	32.9	6.5	2.5	0.4	0.3	0.2	0.2	0.1	0.0
R-SD1-LWOS005-10-0000	100.0	100.0	100.0	99.1	98.2	96.2	91.8	75.8	52.7	28.7	14.8	7.7	3.7	2.4

Notes to the Testing:

1. Apparent grain size distributions according to PSEP protocols.

Rosa Environmental Geotechnical Laboratory, LLC

Roy F. Weston
 Project No.: 3709-066-020-2100

PSEP Total Solids Analysis
 Percent of Wet Weight

Sample No.	Total Solids (%)
R-SD1-LWOS015016-200W-A	52.1
R-SD1-LWOS015016-200W-B	52.3
R-SD1-LWOS015016-200W-C	53.0
R-SD1-LWOS015016-100	56.4
R-SD1-LWOS015016-200	52.4
R-SD1-LWOS011012-200	79.7
R-SD1-LWOS011012-100	53.2
R-SD1-LWOS010-200	48.6
R-SD1-LWOS006-200	53.2
R-SD1-LWOS004-275	51.0
R-SD1-LWCF-200-0000N	49.8
R-SD1-LWCF-200-0000NE	41.2
R-SD1-LWCF-200-0000E	37.3
R-SD1-LWOS-10-100	59.9
R-SD1-LWOS-006-10	38.4
R-SD1-LWOS-003-10	37.5
R-SD1-LWOS-006-100	53.7
R-SD1-LWOS001-10-0000	99.8
R-SD1-LWOS002-10-0000	81.0
R-SD1-LWOS005-10-0000	52.5

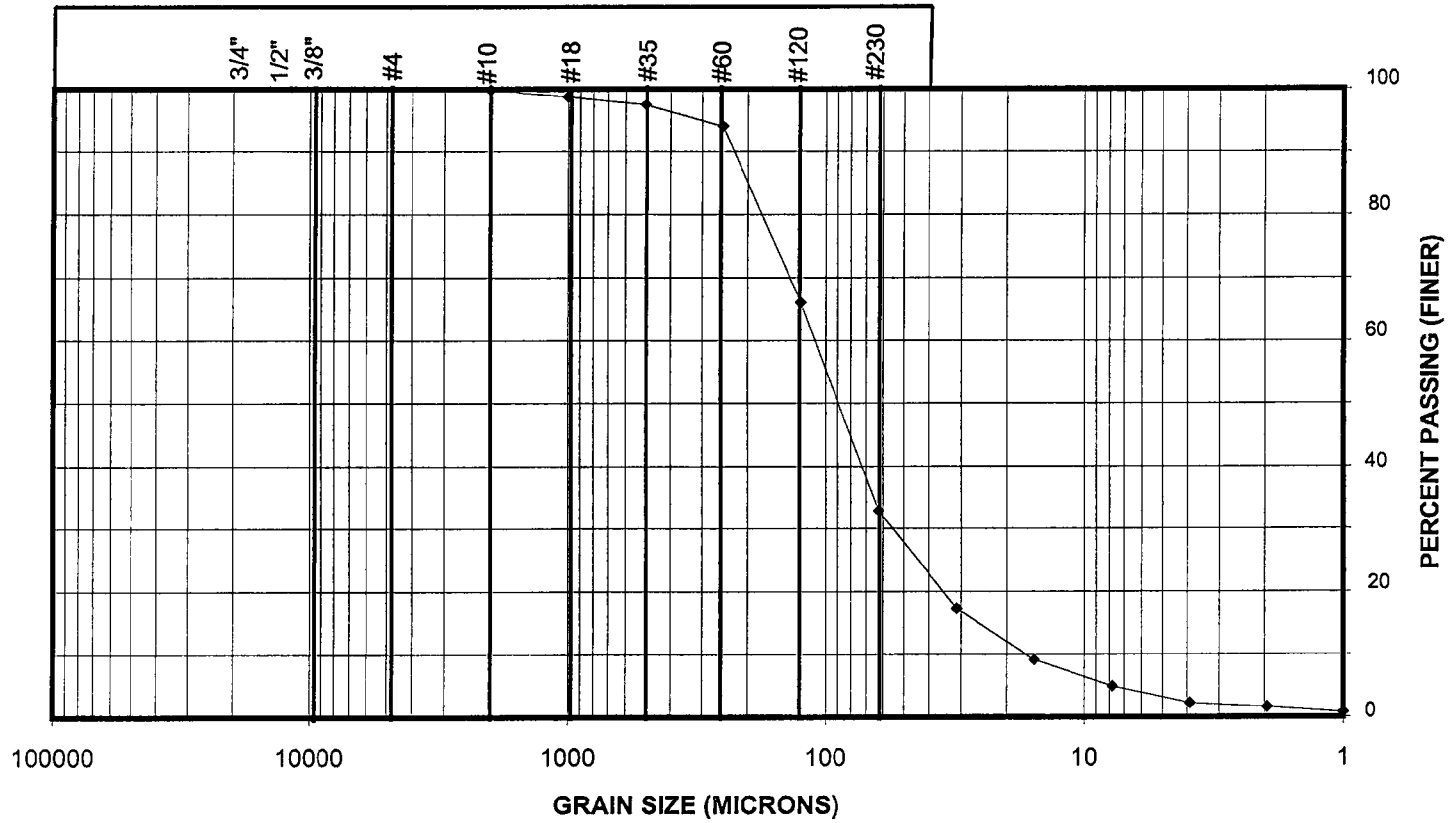
Triplicate Average	52.5
Standard Deviation	0.47
%RSD	0.89

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston

Sample No. R-SD1-LWOS015016-200W-B



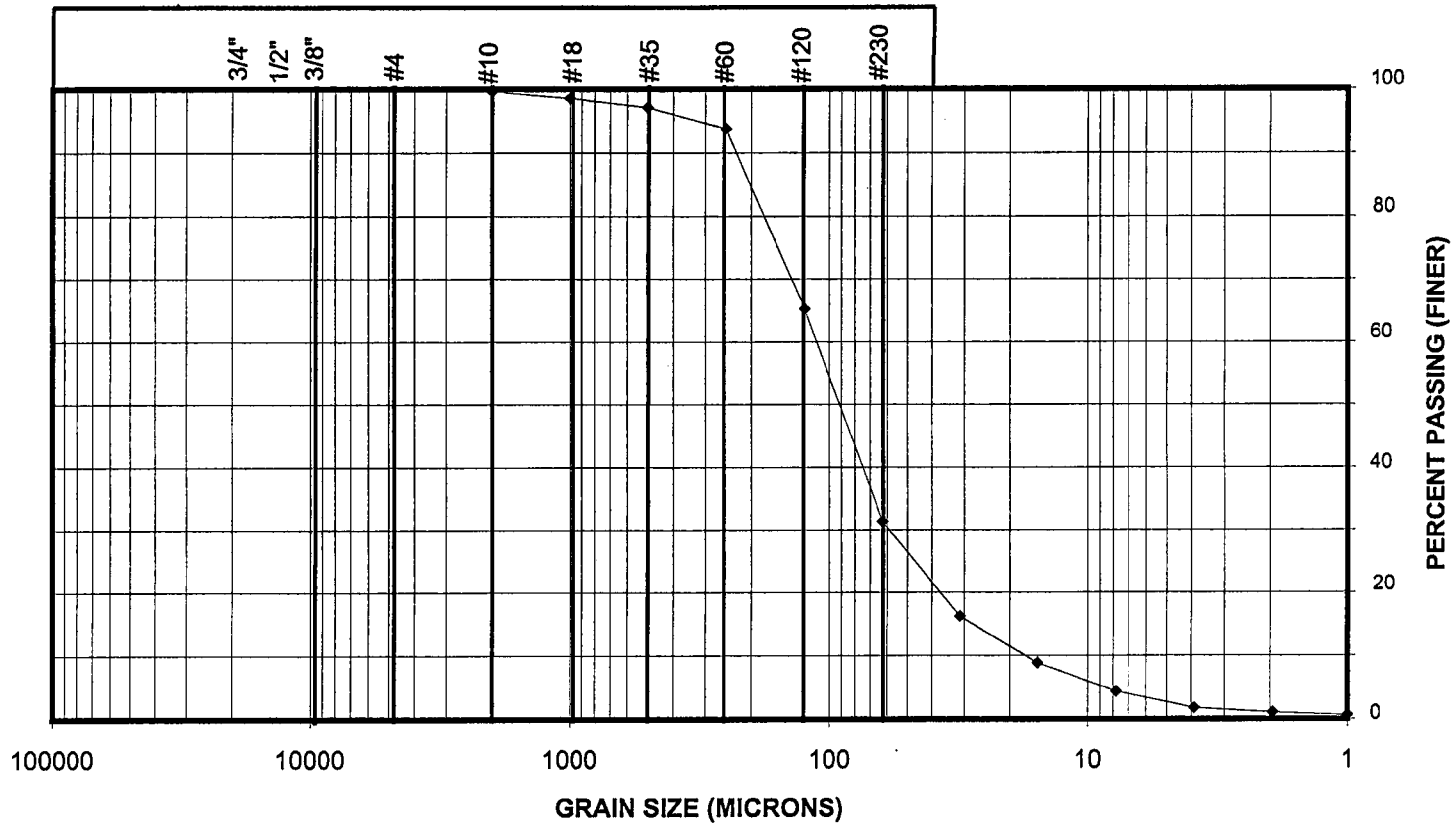
1000-196

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston

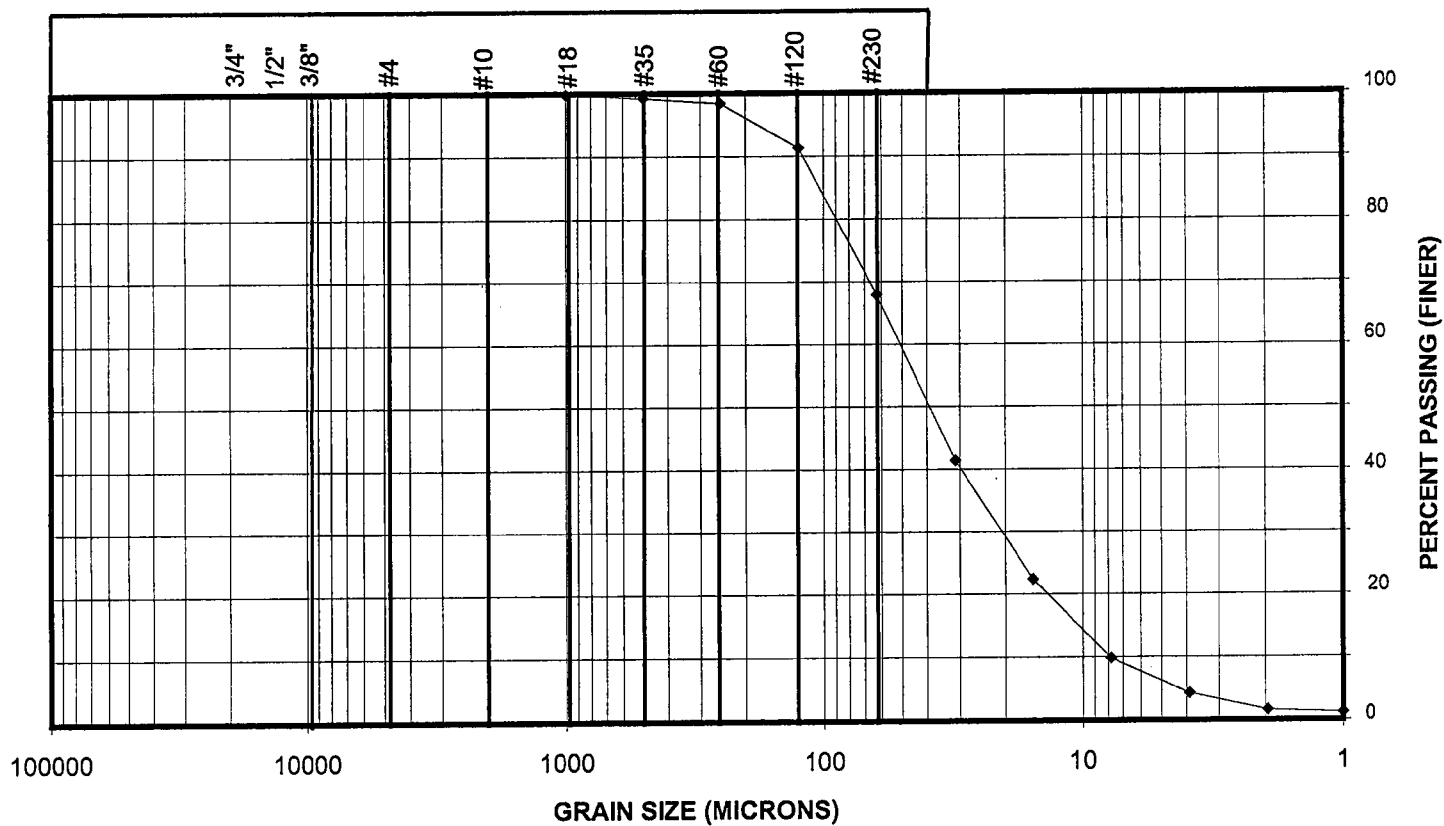
Sample No. R-SD1-LWOS015016-200W-C



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

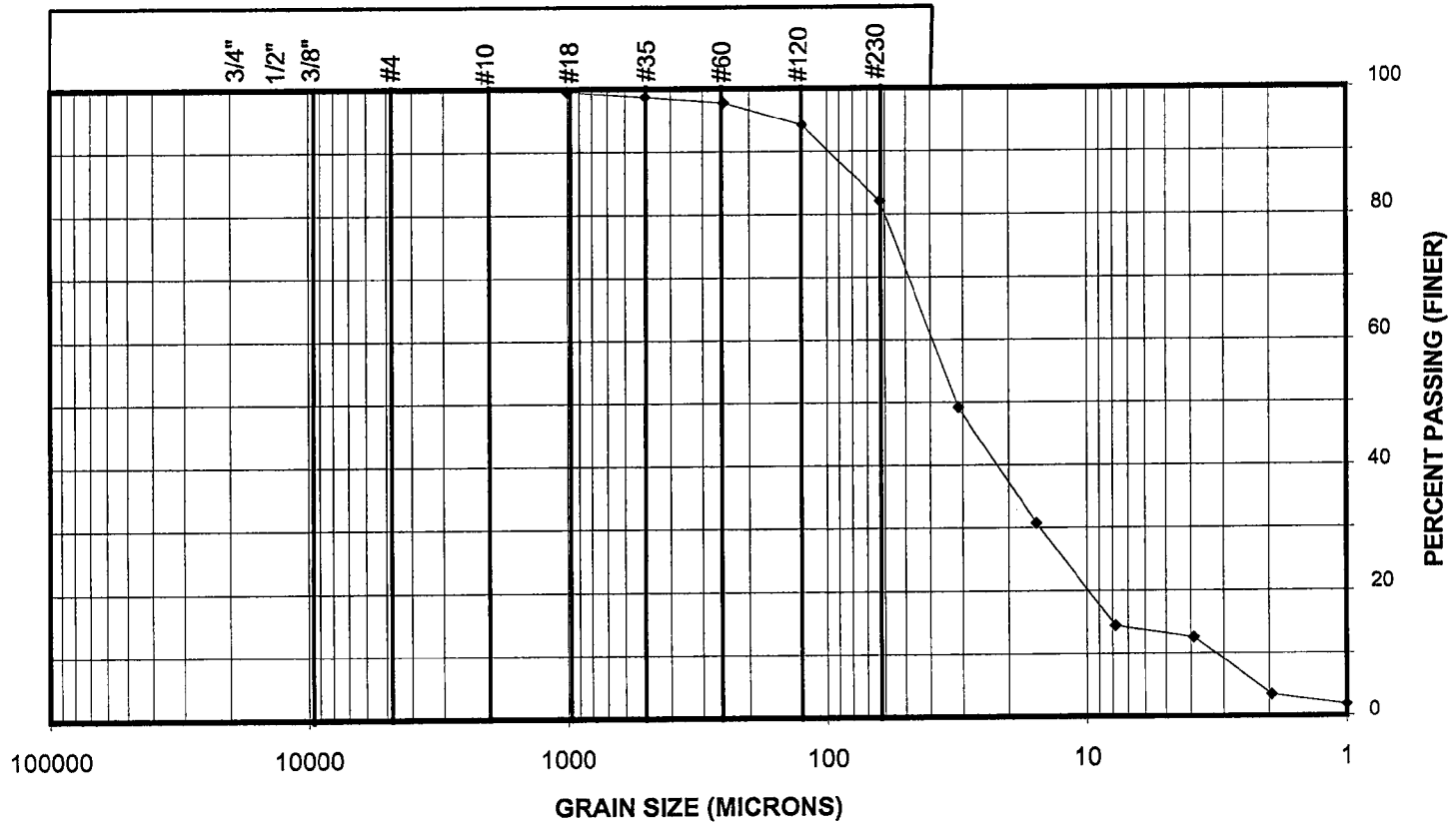
Project: Roy F. Weston
Sample No. R-SD1-LWOS015016-100



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWOS015016-200



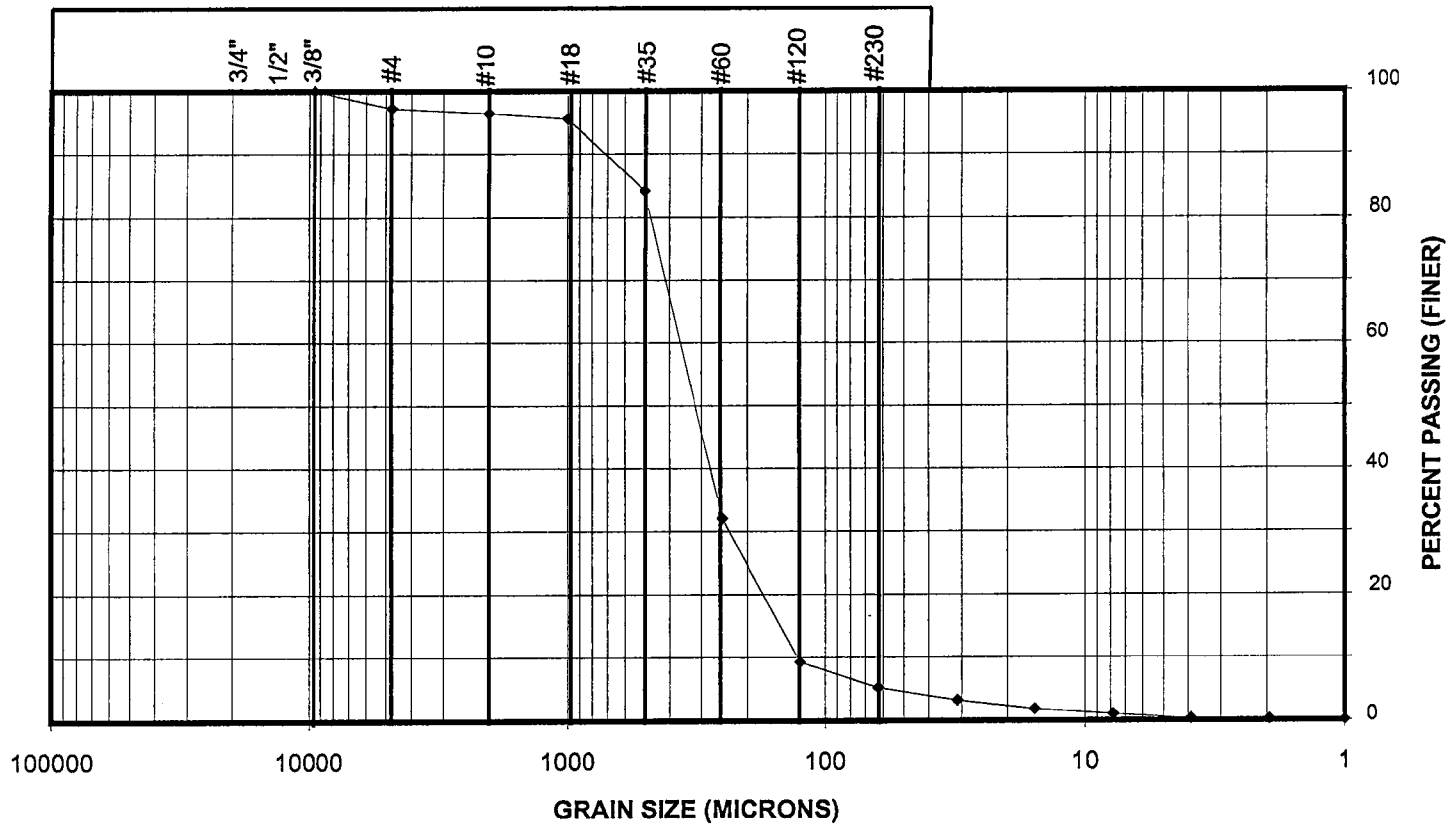
1000-196

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston

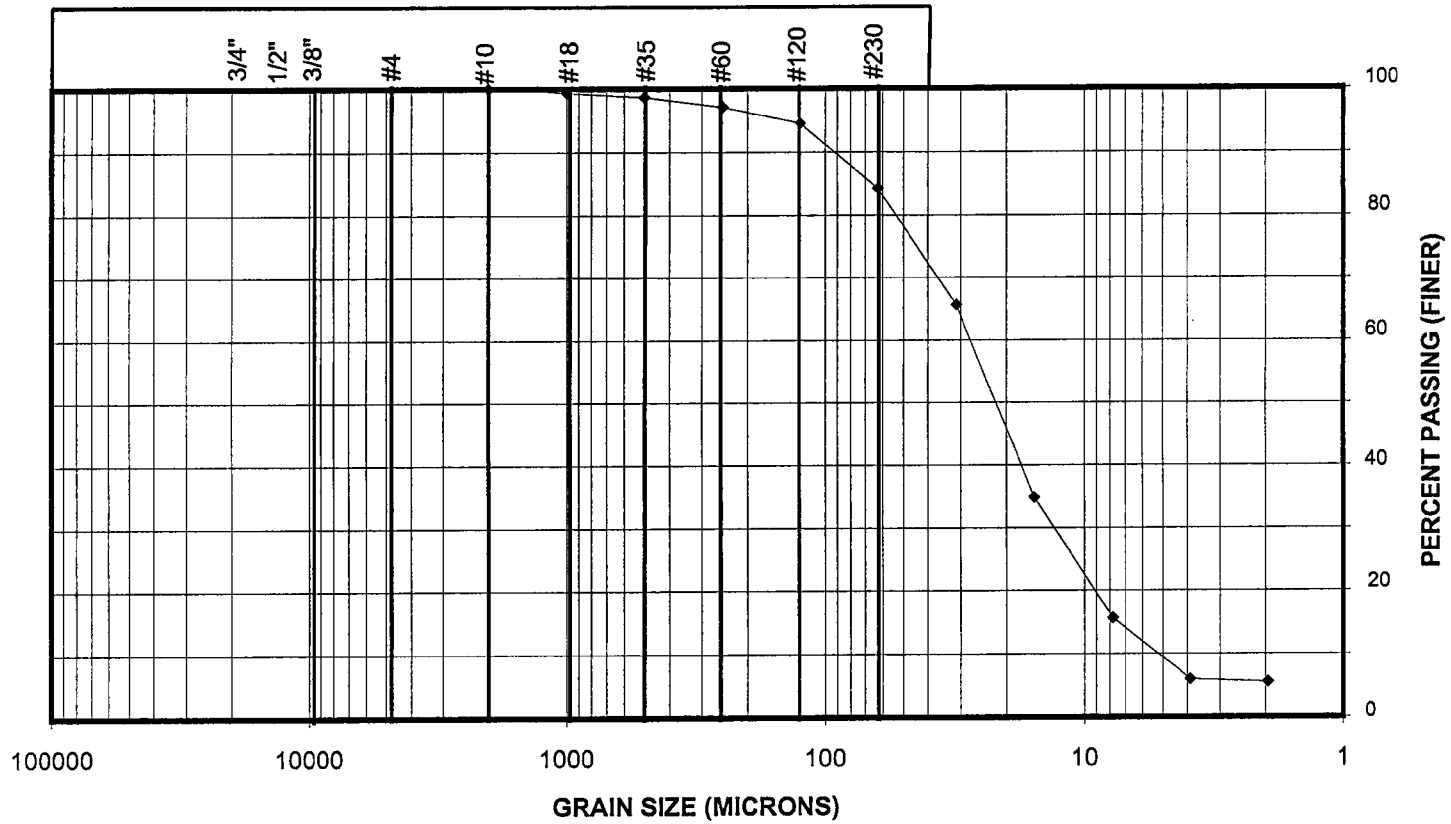
Sample No. R-SD1-LWOS011012-200



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWOS010-200

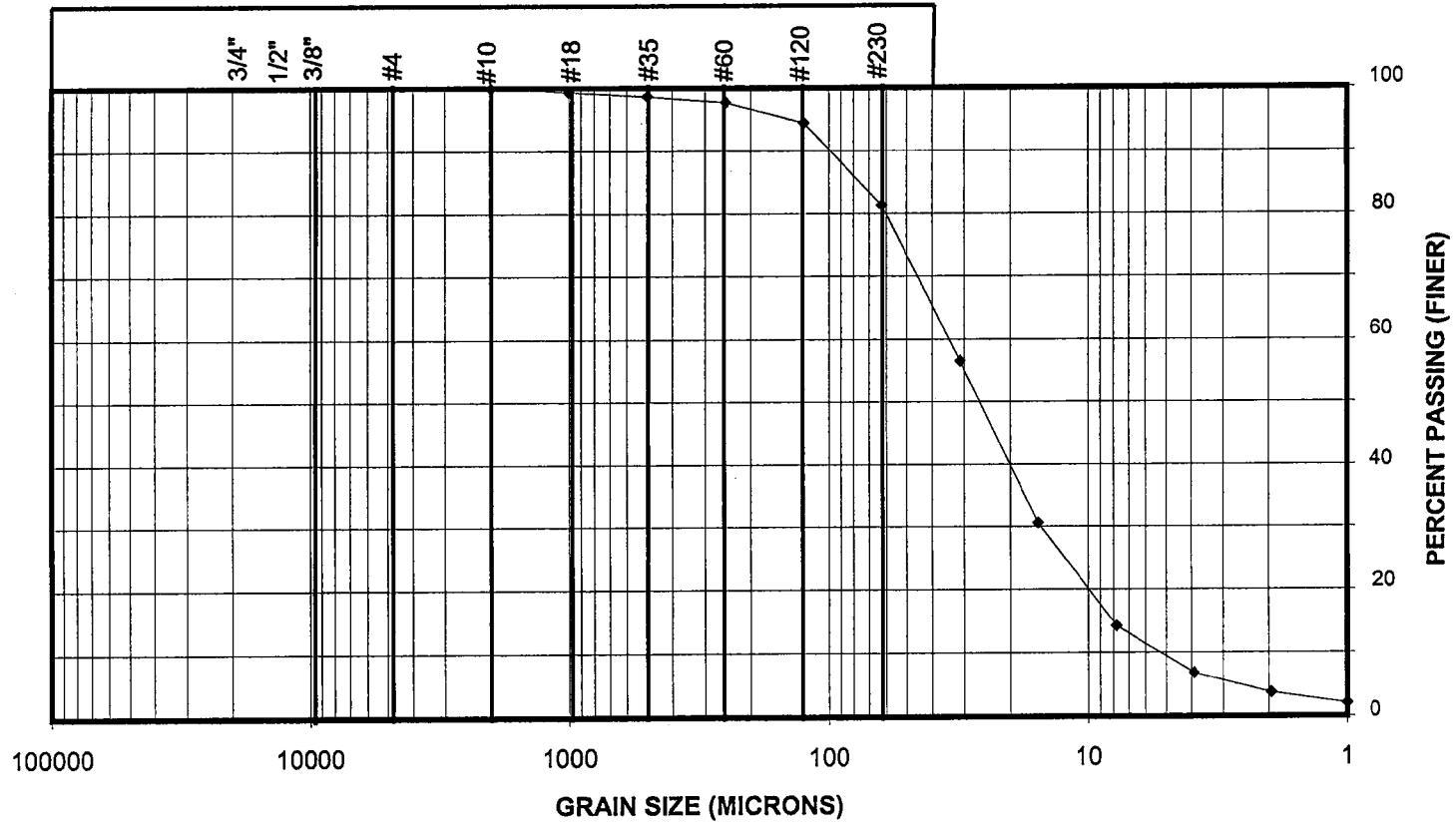


1000-196

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

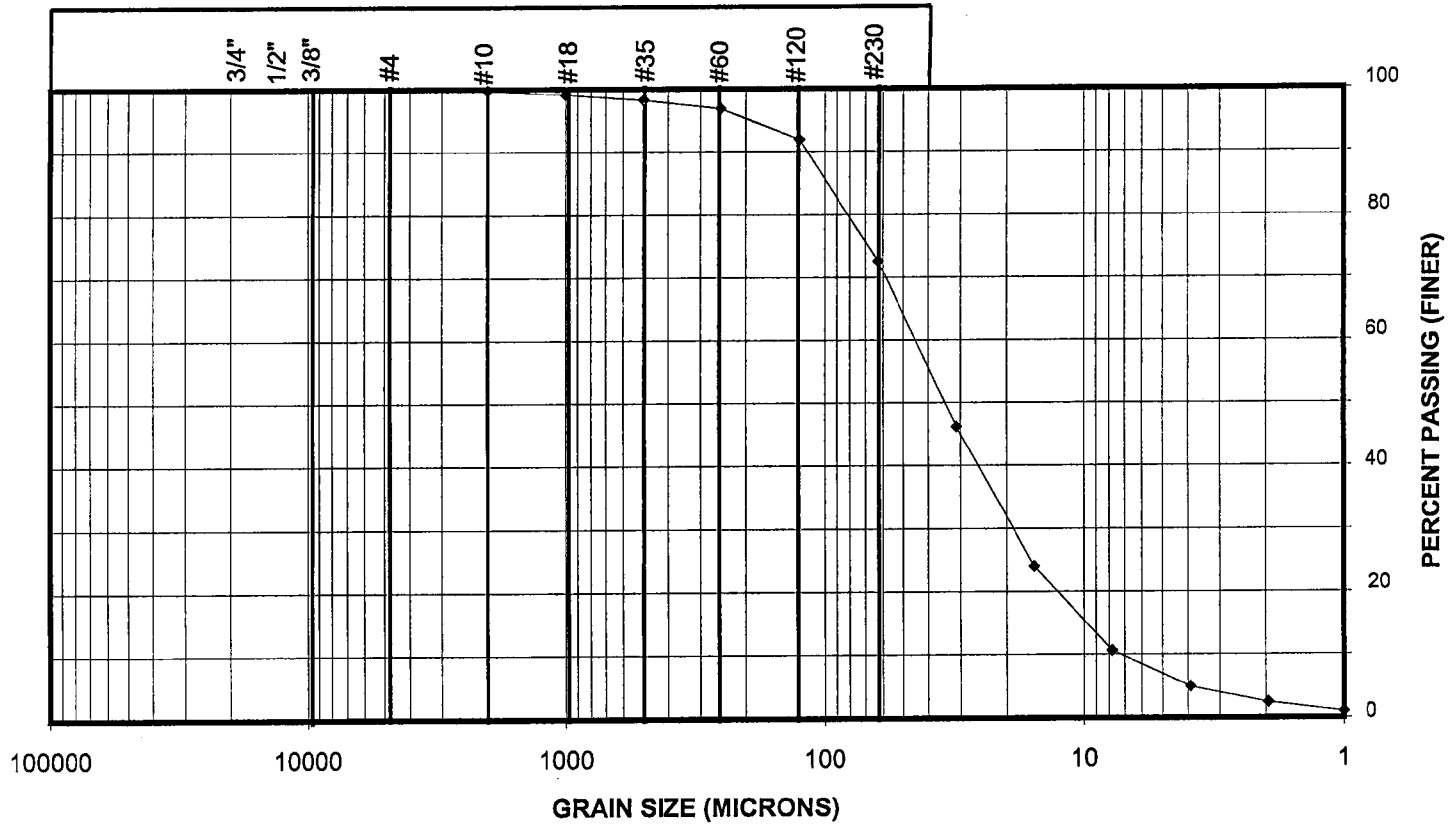
Project: Roy F. Weston
Sample No. R-SD1-LWOS006-200



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWOS004-275

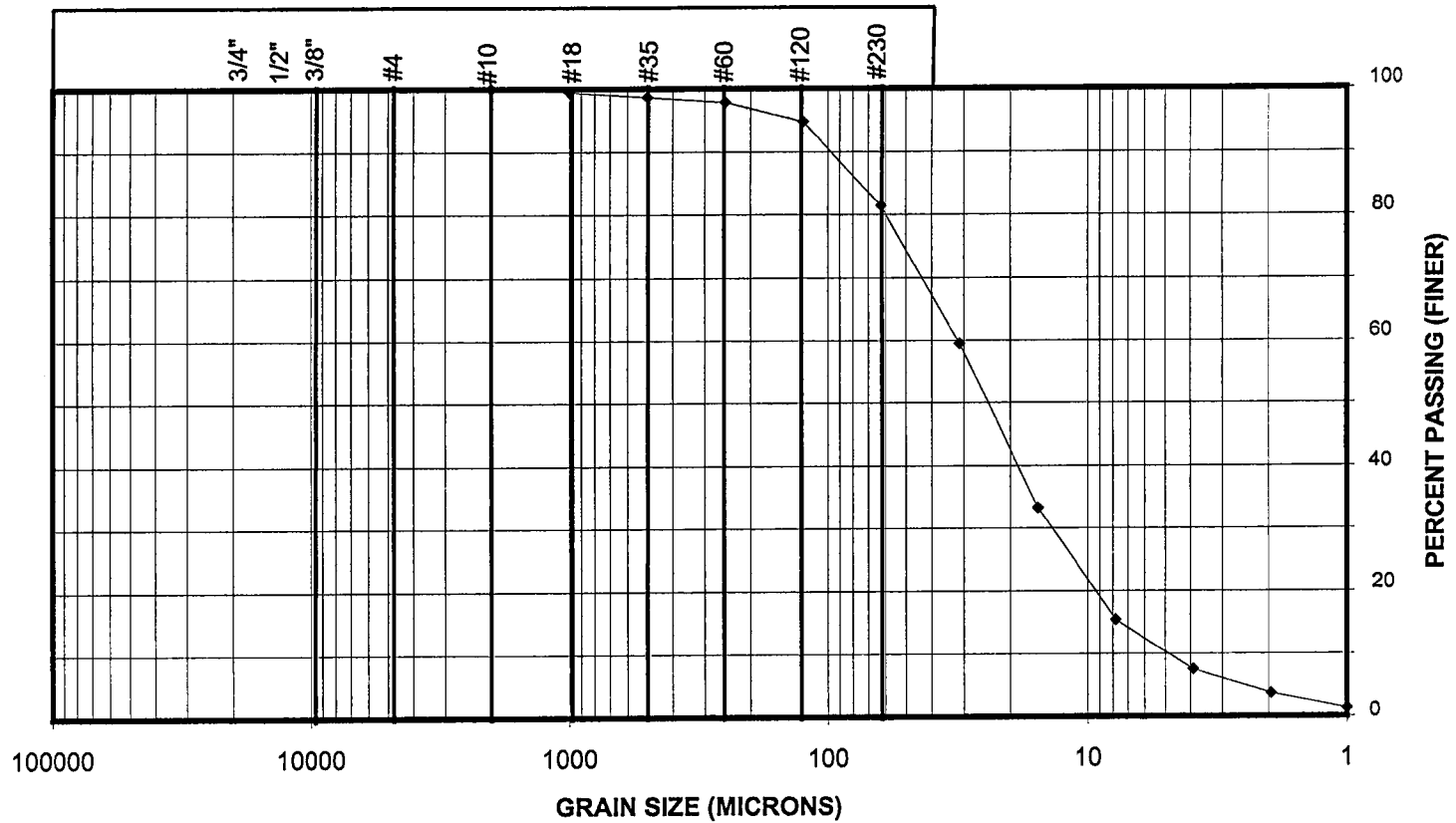


1000-196

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWCF-200-0000N

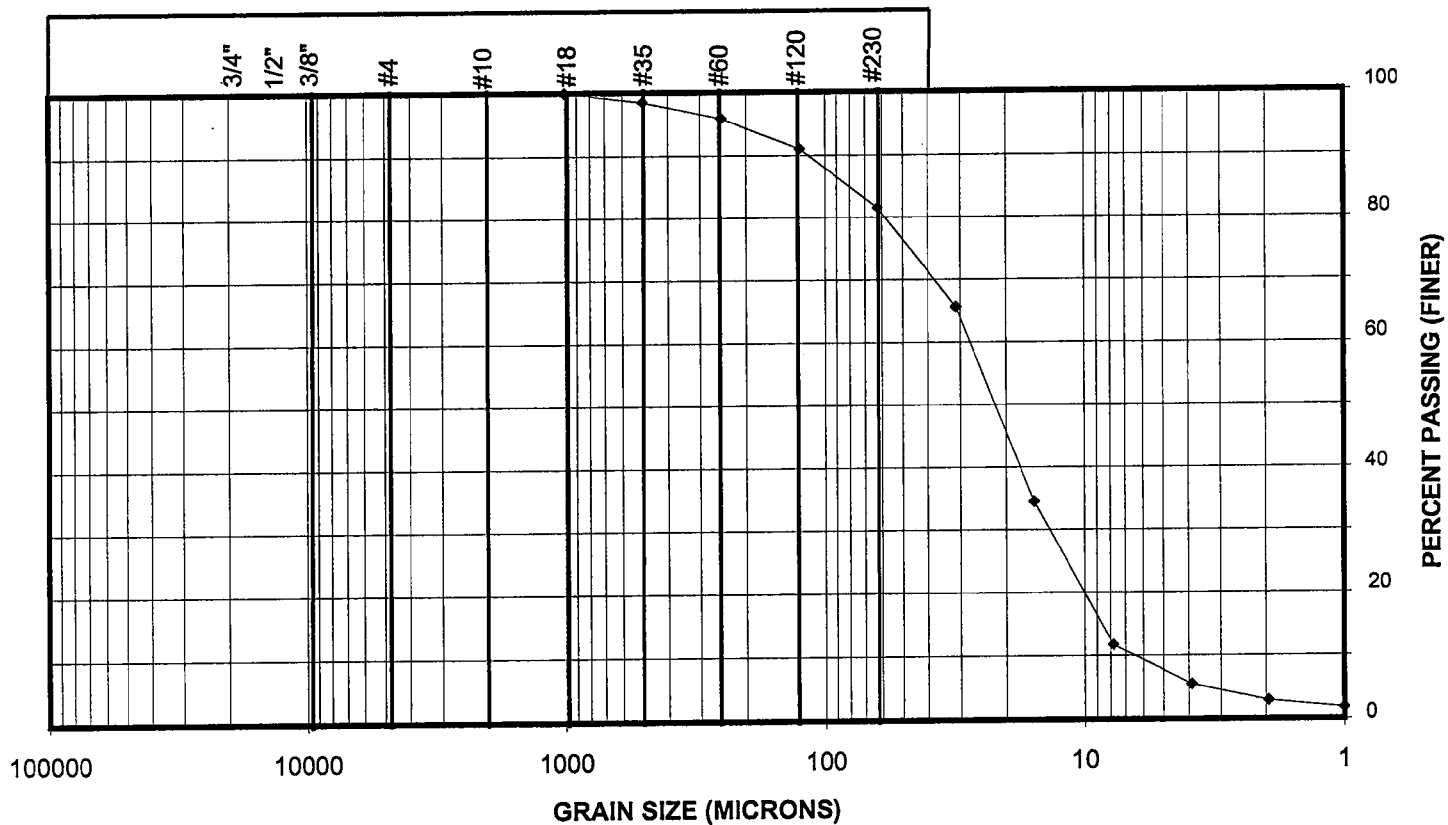


ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston

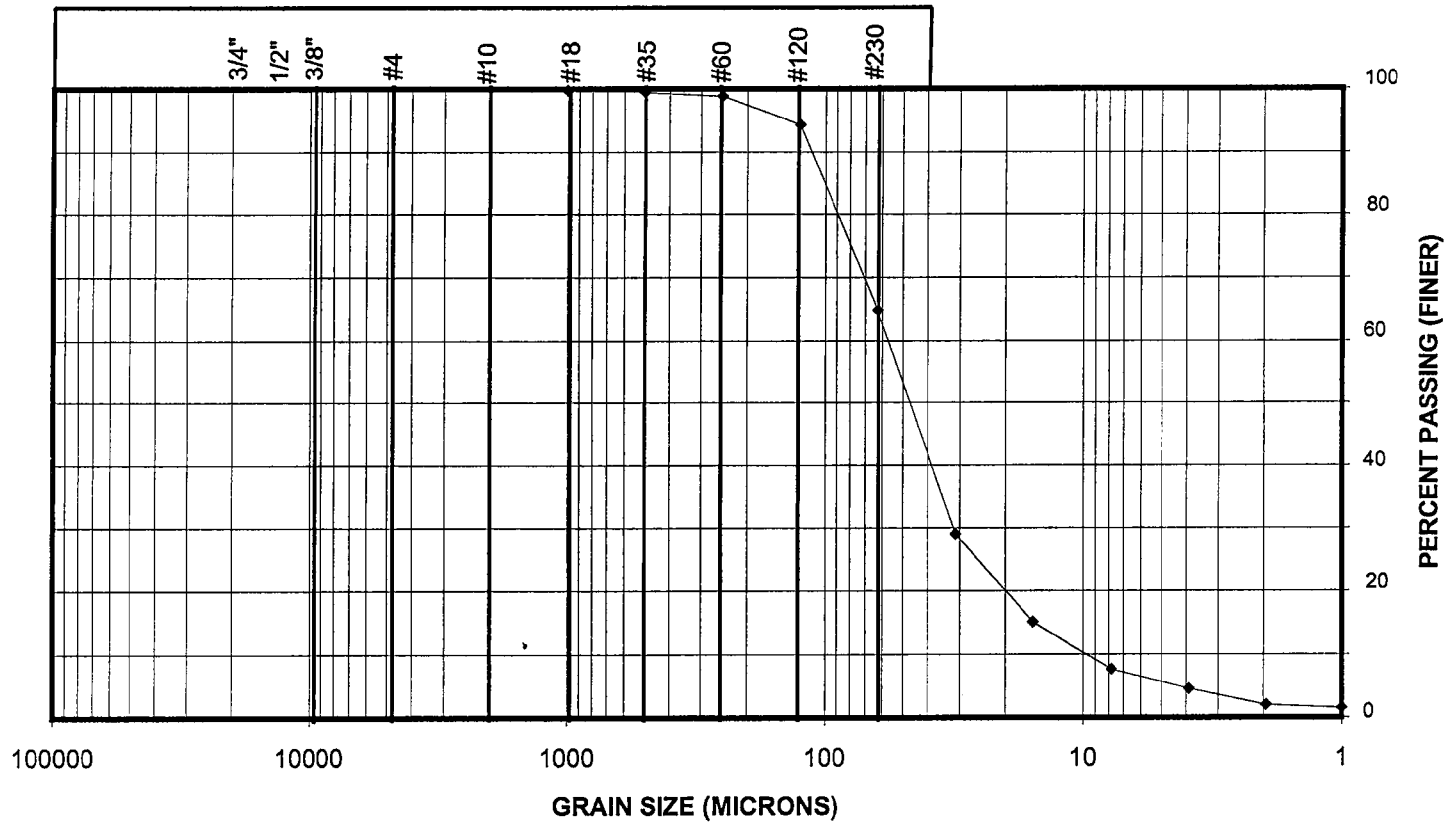
Sample No. R-SD1-LWCF-200-0000E



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWOS-10-100

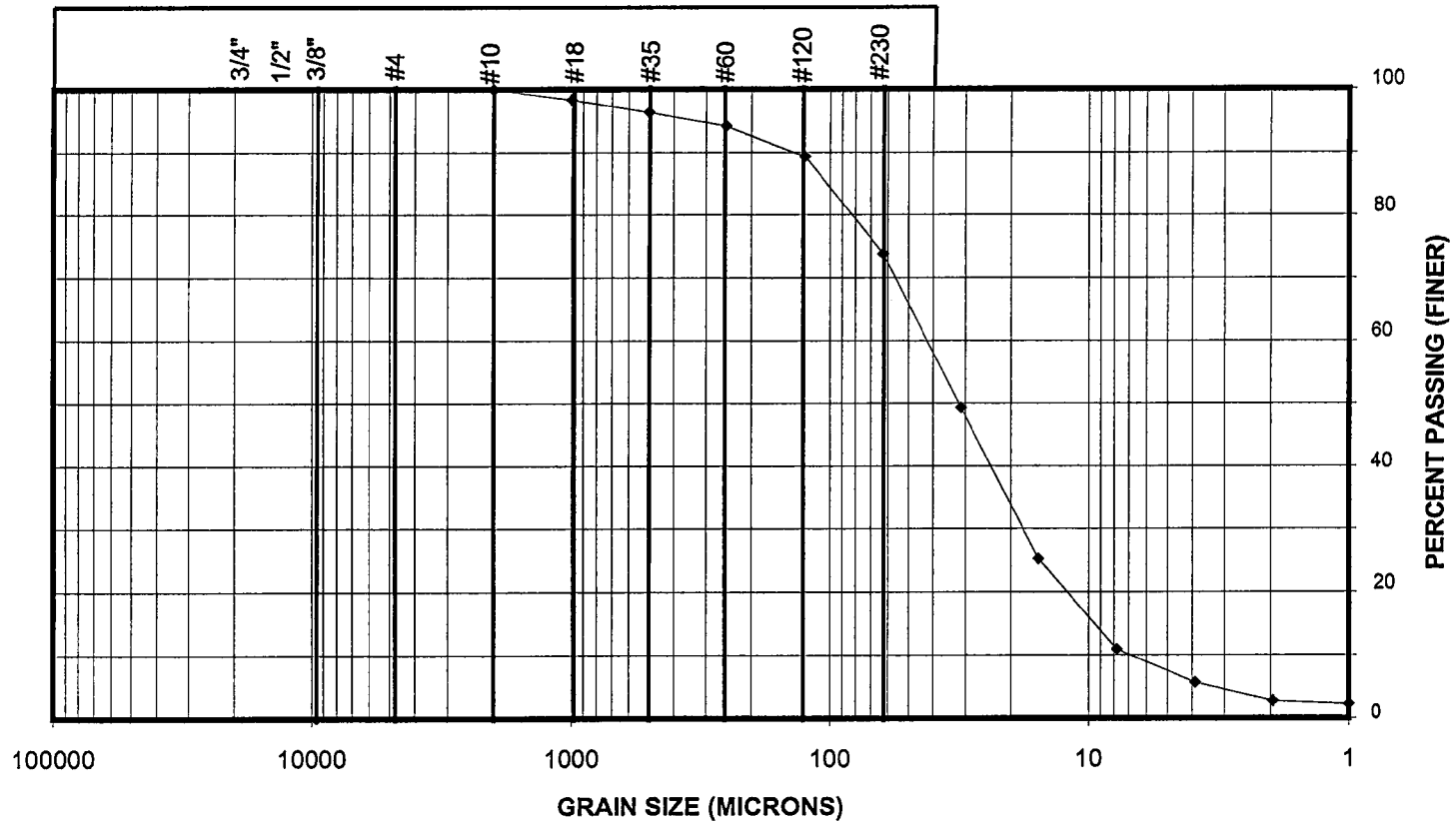


1000-196

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

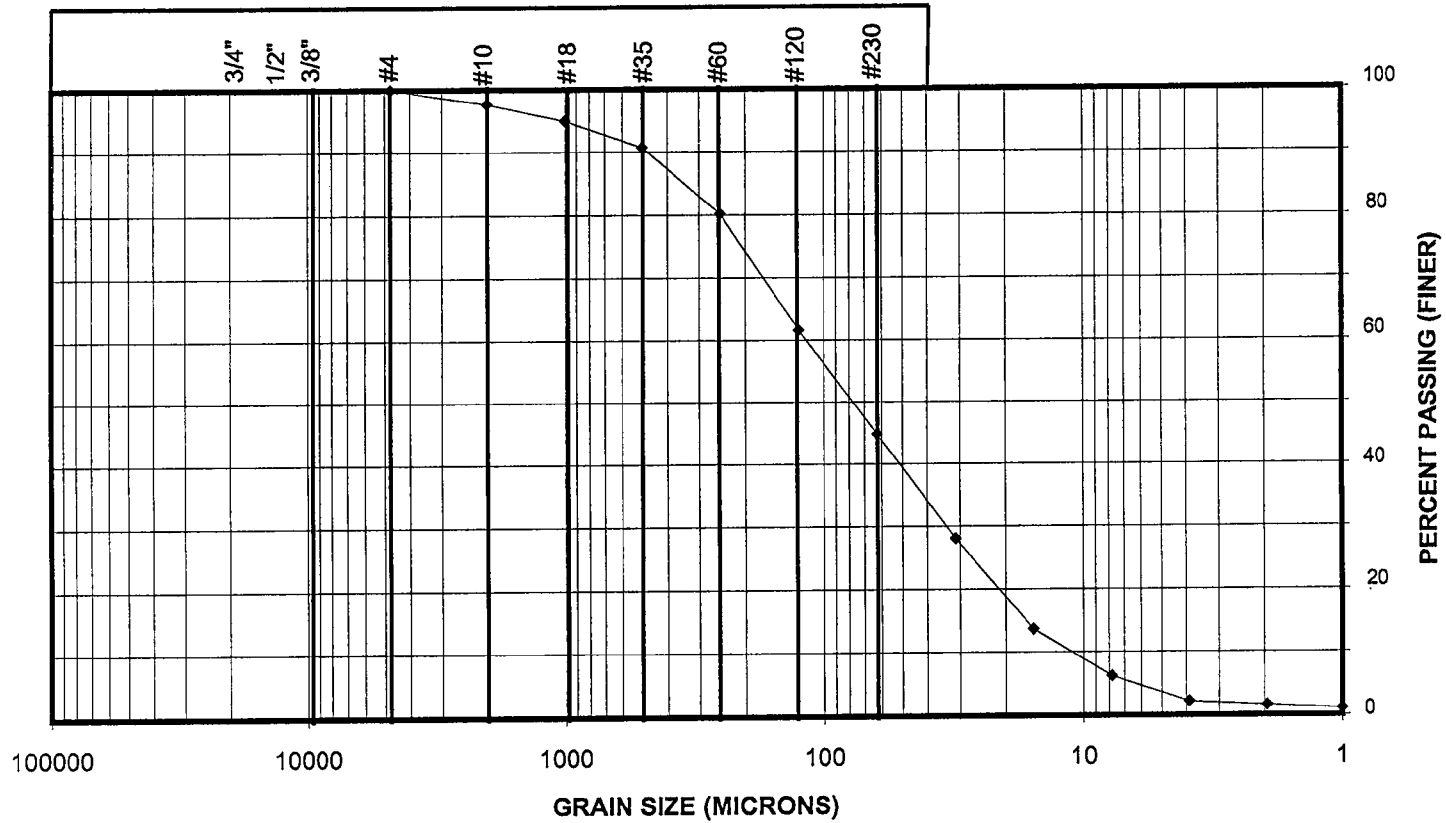
Project: Roy F. Weston
Sample No. R-SD1-LWOS-006-10



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

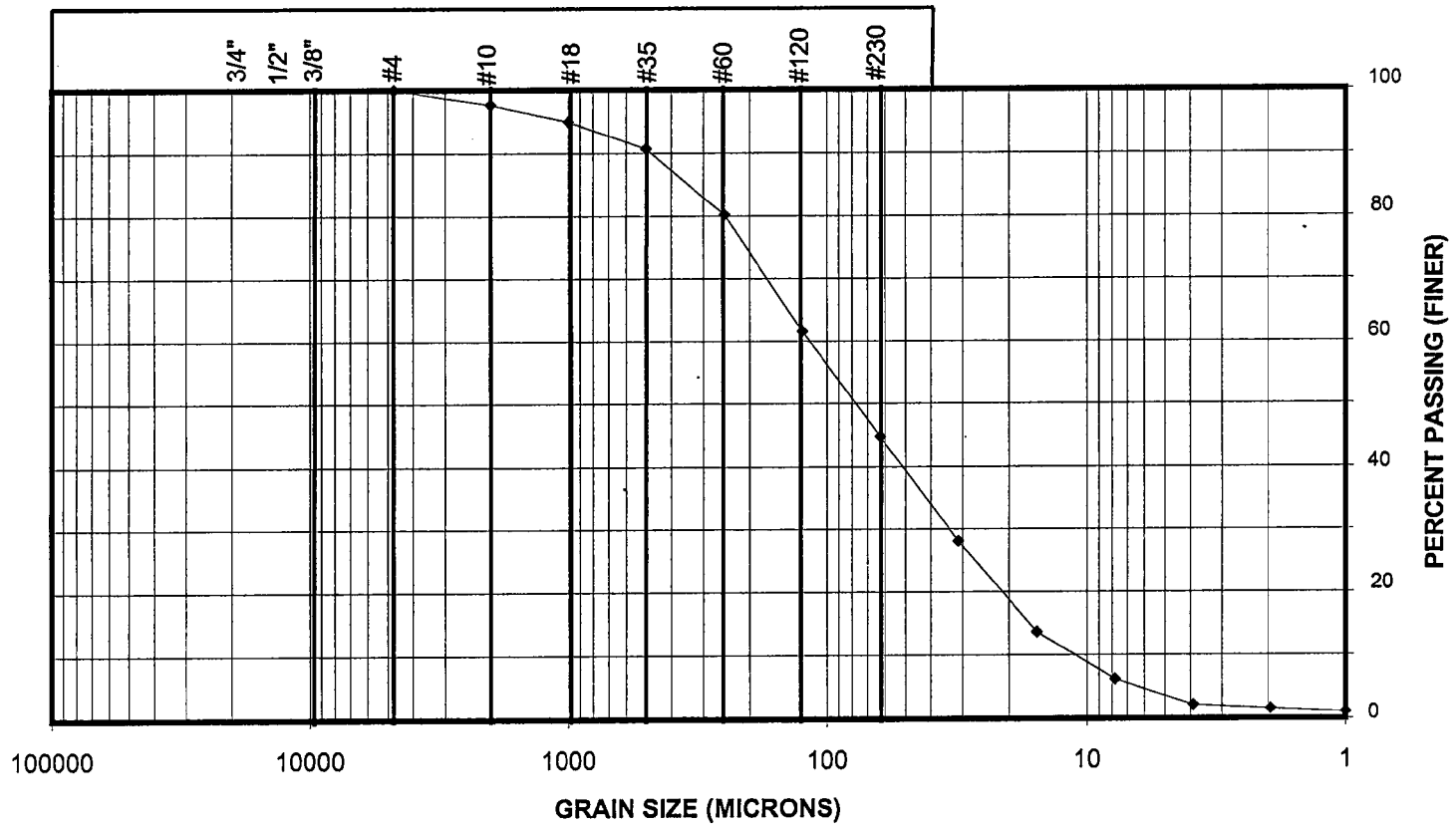
Project: Roy F. Weston
Sample No. R-SD1-LWOS-003-10



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

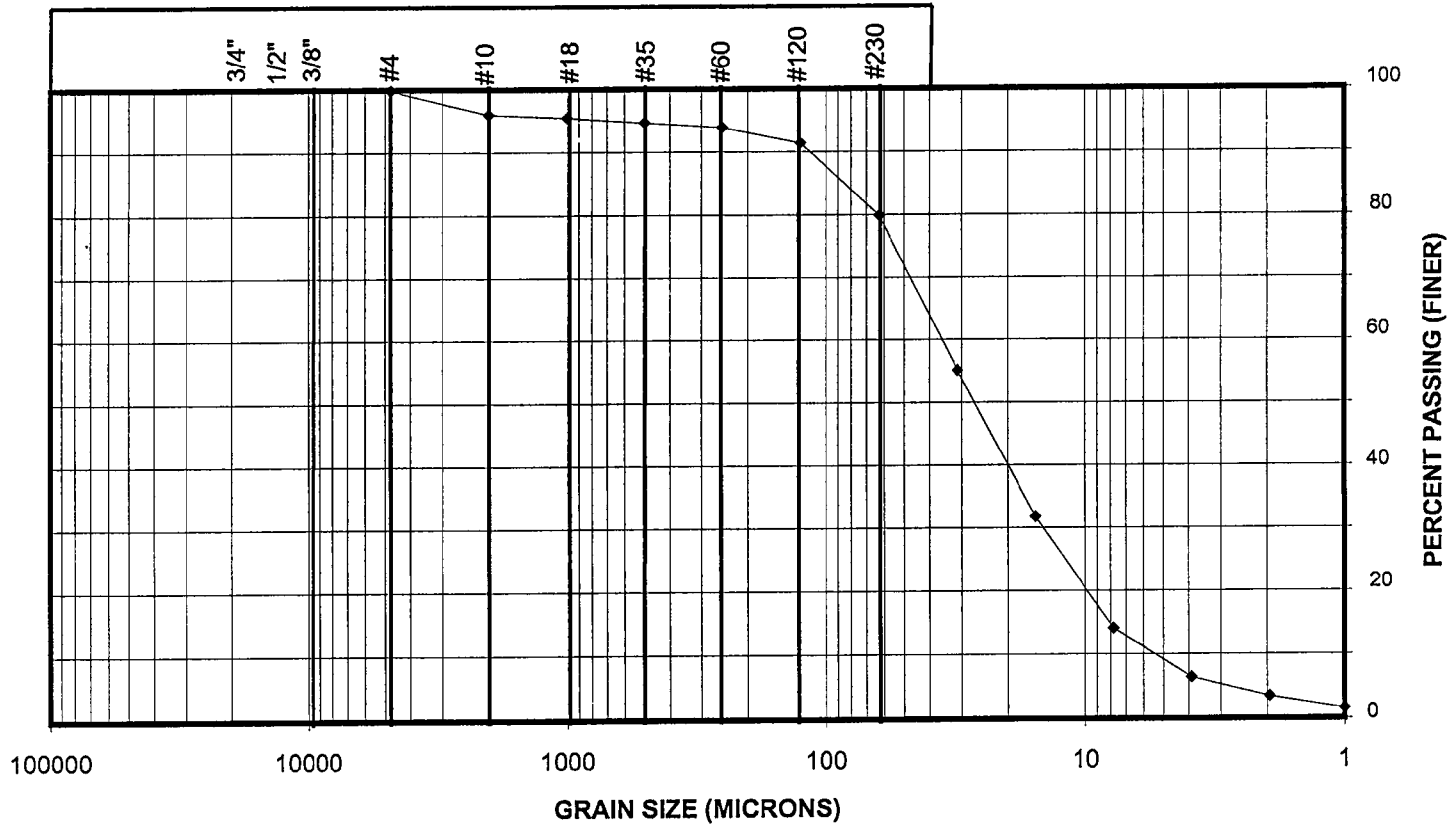
Project: Roy F. Weston
Sample No. R-SD1-LWOS-003-10



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWOS-006-100

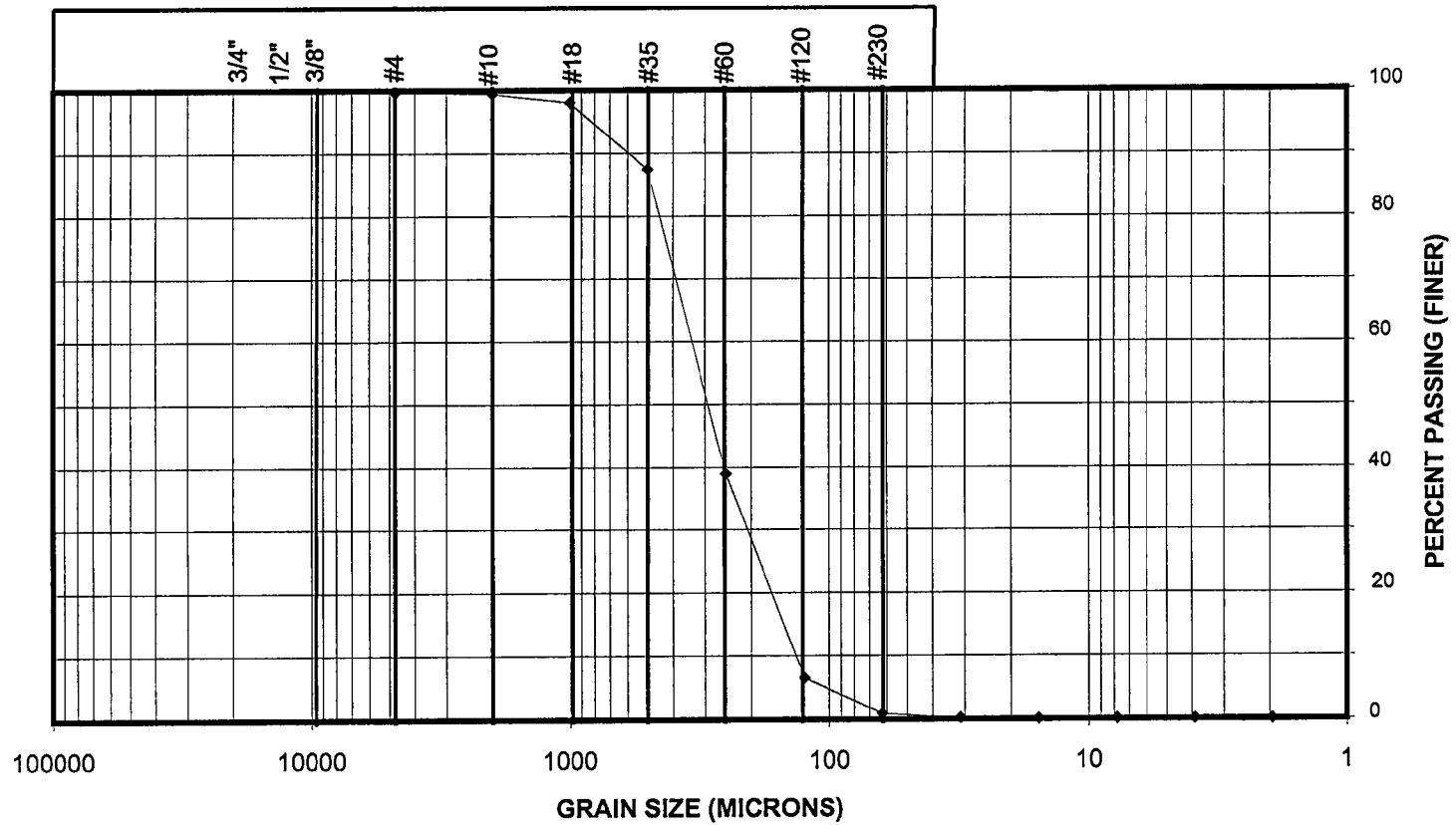


1000-196

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

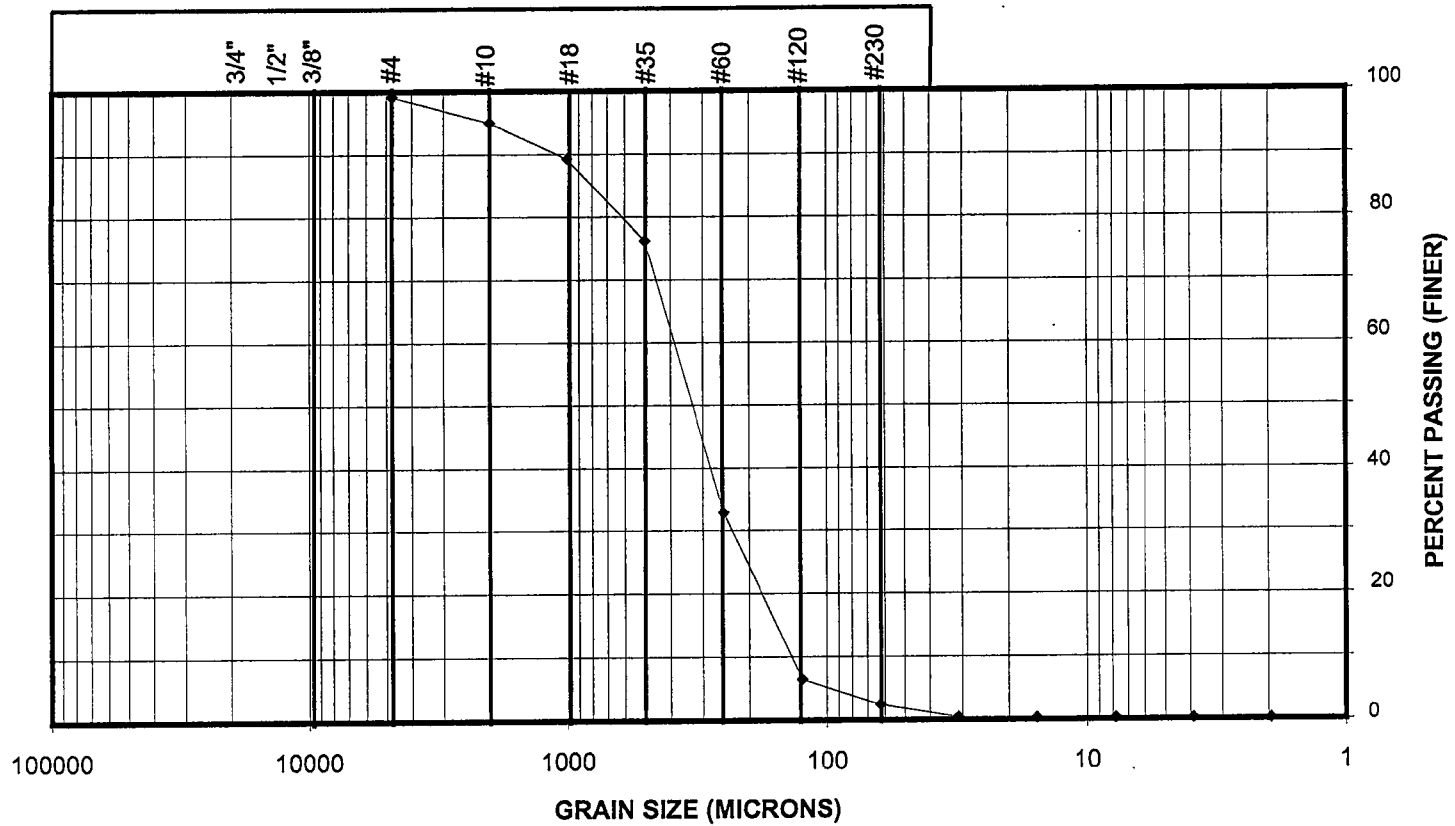
Project: Roy F. Weston
Sample No. R-SD1-LWOS001-10-0000



ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWOS002-10-0000

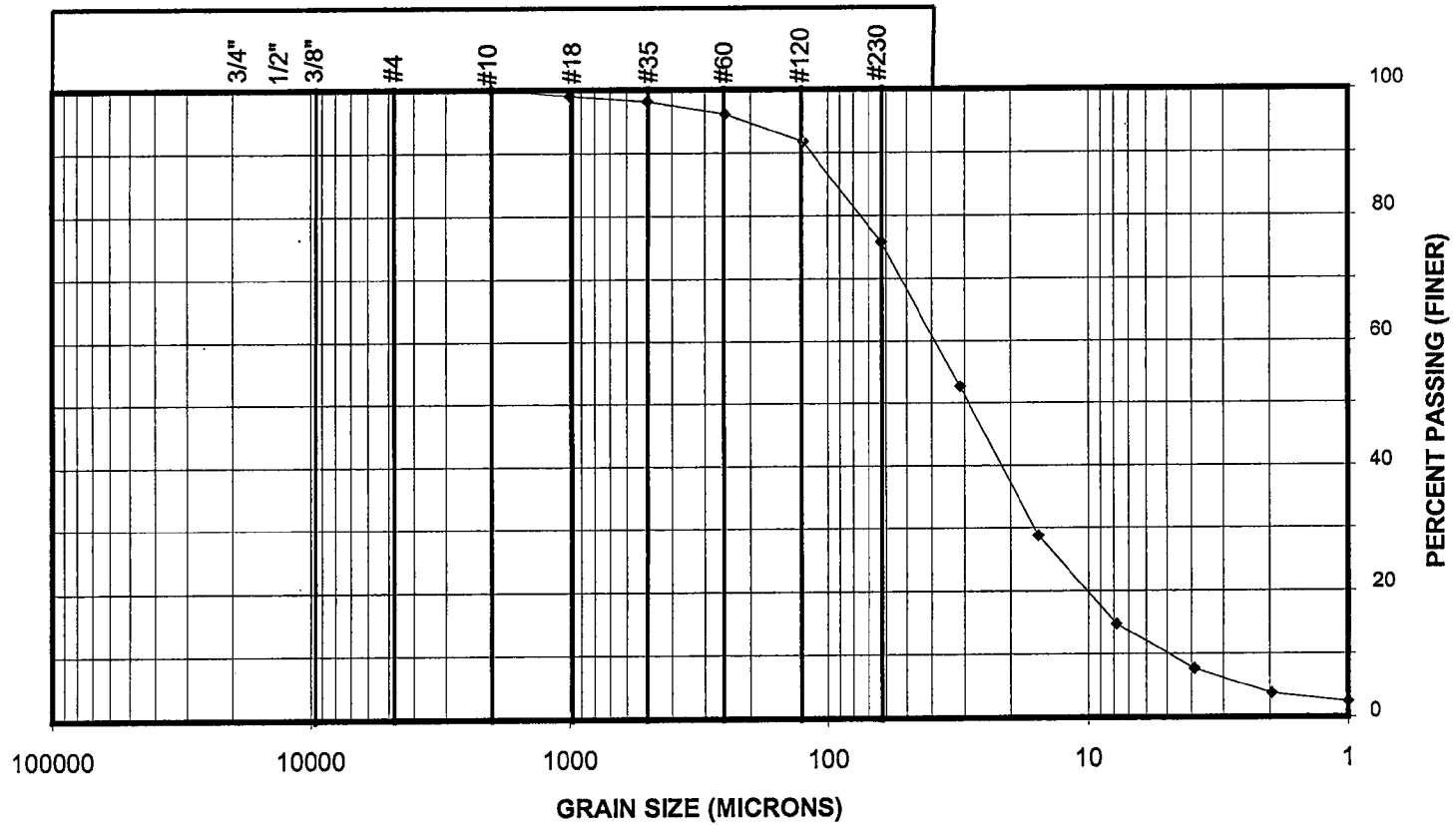


1000-196

ROSA ENVIRONMENTAL & GEOTECHNICAL LABORATORY

PSEP APPARENT GRAIN SIZE DISTRIBUTION

Project: Roy F. Weston
Sample No. R-SD1-LWOS005-10-0000



Frozen } West Werg OWA 10/6/99
 G.S. O 10/8/99

**SUBCONTRACTOR ANALYSIS REQUEST
 CUSTODY TRANSFER 09\27\99**

ARI Project: AU63 / 000-196

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: PSDDA

Requested Turn Around:
 Fax Results (Y/N):

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-14636-AU63A	✓ R-SD1-LWOS015016-100 1229	8/11/99	Sediment	0	Grain Size (Subc)
99-14637-AU63B	✓ R-SD1-LWOS015016-200 1229	8/11/99	Sediment	0	Grain Size (Subc)
99-14638-AU63C	✓ R-SD1-LWOS015016-200W 1230	8/11/99	Sediment	1	Grain Size (Subc)
99-14639-AU63D	✓ R-SD1-LWOS011012-200 1231	8/11/99	Sediment	0	Grain Size (Subc)
99-14640-AU63E	✓ R-SD1-LWOS011012-100 1232	8/11/99	Sediment	0	Grain Size (Subc)

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time
Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

PAR STAMPS
 C, K, J, M

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 09\27\99**

ARI Project: AU63

Laboratory: REG Lab
Lab Contact: Harold Benny
Lab Address: 400 Ninth Ave N, Ste B
Seattle, WA 98109-5187
Phone: 206-389-6156
Fax:

ARI Client: Roy F. Weston
Project ID: 3709-066-020-2100
ARI PMgr: Jennifer Baier
Phone: (206) 340-2866 Ext 106
Fax: (206) 621-7523

Analytical Protocol: PSDDA

Requested Turn Around:
Fax Results (Y/N):

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-14641-AU63F	R-SD1-LWOS010-200 ✓ 1233	8/11/99	Sediment	2	Grain Size (Subc)
99-14642-AU63G	R-SD1-LWOS006-200 1234	8/11/99	Sediment	2	Grain Size (Subc)
99-14643-AU63H	R-SD1-LWOS004-275 ✓ 1235	8/11/99	Sediment	1	Grain Size (Subc)
99-14644-AU63I	R-SD1-LWCF-200-0000N ✓ 1236	8/11/99	Sediment	1	Grain Size (Subc)
99-14645-AU63J	R-SD1-LWCF-200-0000NE ✓ 1237	8/11/99	Sediment	1	Grain Size (Subc)

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time
Carrier	Airbill	Date	
Relinquished by	Company	Date	Time
Received by	Company	Date	Time

**SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 09\27\99**

ARI Project: AU63

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

ARI Client: Roy F. Weston
 Project ID: 3709-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: PSDDA

Requested Turn Around:
 Fax Results (Y/N):

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-14646-AU63K	R-SD1-LWCF-200-0000E ✓ 1238	8/11/99	Sediment	1	Grain Size (Subc)
99-14647-AU63L	R-SD1-LWOS-10-100 ✓ 1239	8/11/99	Sediment	1	Grain Size (Subc)
99-14648-AU63M	R-SD1-LWOS-006-10 ✓ 1240	8/11/99	Sediment	1	Grain Size (Subc)
99-14649-AU63N	R-SD1-LWOS-003-10 ✓ 1241	8/11/99	Sediment	2	Grain Size (Subc)
99-14650-AU63O	R-SD1-LWOS-006-100 1242	8/11/99	Sediment	1	Grain Size (Subc)

W3A.B.C

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date
Relinquished by	Company	Date
Received by	Company	Date

Carrier	Airbill	Date
Relinquished by	Company	Date
Received by	Company	Date

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 09\27\99

ARI Project: AU63

Laboratory: REG Lab
 Lab Contact: Harold Benny
 Lab Address: 400 Ninth Ave N, Ste B
 Seattle, WA 98109-5187
 Phone: 206-389-6156
 Fax:

ARI Client: Roy F. Weston
 Project ID: 3907-066-020-2100
 ARI PMgr: Jennifer Baier
 Phone: (206) 340-2866 Ext 106
 Fax: (206) 621-7523

Analytical Protocol: PSDDA

Requested Turn Around:
 Fax Results (Y/N):

ARI Sample ID	Client Sample ID	Sampled	Matrix	Bottles	Analyses
99-14651-AU63P	R-SD1-LWOS001-10-0000	8/13/99	Sediment	1	Grain Size (Subc)
99-14652-AU63Q	R-SD1-LWOS002-10-0000	8/13/99	Sediment	1	Grain Size (Subc)
99-14653-AU63R	R-SD1-LWOS005-10-0000	8/12/99	Sediment	2	Grain Size (Subc)

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

Carrier	Airbill	Date
Relinquished by	Company	Date
Received by	Company	Date

Carrier	Airbill	Date
Relinquished by	Company	Date
Received by	Company	Date

Appendix D

LABORATORY RESULTS AND STATISTICAL SUMMARY

The following qualifiers and notes may apply to the laboratory data and statistical information included in this appendix.

LABORATORY DATA QUALIFIERS

The following qualifiers were used to modify the data quality and usefulness of individual analytical results.

- U - The analyte was not detected at the given quantitation limit.
- J - The analyte was positively identified and detected; however, the concentration is an estimated value because the result is less than the quantitation limit or quality control criteria were not met.
- UJ - The analyte was not detected; the associated quantitation limit is an estimated value.
- R - Data are rejected due to significant exceedance of quality control criteria. The analyte may or may not be present. Additional sampling and analysis are required to determine. For statistical reasons, rejected values are not included in the database.
- UB - The analyte concentration was qualified as undetected due to blank contamination.
- N - Tentative identification. The analyte exhibits low spectral match parameters but, based on the analyst's or reviewer's judgement, is present. The chromatogram of the sample did not match that of the requested product.
- H - Holding times have been exceeded. Results and quantitation limits may be biased low.
- E - Concentration exceeded the instrument calibration range. Results may be biased low. Sample dilution and reanalysis are required to verify concentration.
- D - Value was obtained from reanalysis of a diluted sample.
- I - Results or quantitation limit are elevated due to analytical interference

DATA MANAGEMENT QUALIFIERS

The following notes may apply to the data provided in this appendix.

- CC - When present as a sample ID suffix, -CC indicates the most conservative results of multiple samples (i.e., original and duplicate sample) were used.
- NA - Not available or not applicable.
- T - When present in data qualifier, indicates value was summed from other constituents by software. Result was not present in original laboratory reports.

A blank cell indicates analysis was not performed or the result was rejected during validation.

For statistical calculations, half the detection limit is used for samples when the constituent was not detected.

OUTFALL AND SHORELINE SEDIMENT SAMPLE RESULTS

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Constituent	Number of Samples Analyzed	Number of Detections	Detection Frequency (%)	Minimum Detection Limit	Maximum Detection Limit	Minimum Detected Value	Maximum Detected Value	Sample Number of Maximum Detected Value	Geometric Mean	Median Value	Upper 95% Confidence Limit
Semi-Volatile Organic Compounds (ug/kg)											
2-Methylnaphthalene	24	2	8.3	18	39	31	140	R-SD1-LWOF012-10-0000	16.313	9.5	25.678
bis(2-Ethylhexyl)phthalate	24	22	91.7	19	19	22	4200	R-SD1-LWOF004E-10-0000	607.417	220	973.914
Carbazole	24	6	25.0	18	20	18	1000	R-SD1-LWOF012-10-0000	65.583	9.5	136.646
Di-n-butylphthalate	24	8	33.3	18	25	46	280	R-SD1-LWOS003-10-0000	43.313	9.5	66.035
Dibenzofuran	24	3	12.5	18	39	47	610	R-SD1-LWOF012-10-0000	39.875	9.5	82.805
Phenol	24	3	12.5	19	39	33	150	R-SD1-LWOF016-10-0000	25.375	19.25	35.111
Naphthalene	24	4	16.7	18	39	20	420	R-SD1-LWOF012-10-0000	29.625	9.5	58.852
Acenaphthylene	24	2	8.3	18	39	20	38	R-SD1-LWOF012-10-0000	11.604	9.5	13.814
Acenaphthene	24	4	16.7	18	39	16	690	R-SD1-LWOF012-10-0000	44.625	9.5	93.4
Fluorene	24	6	25.0	18	20	33	1100	R-SD1-LWOF012-10-0000	71.667	9.5	149.873
Phenanthrene	24	18	75.0	19	19	21	8600	R-SD1-LWOF012-10-0000	507.167	44.5	1122.056
Anthracene	24	6	25.0	18	20	47	1600	R-SD1-LWOF012-10-0000	124.125	9.5	241.065
Total LPAH	24	18	75.0	19	19	21	12448	R-SD1-LWOF012-10-0000	748.542	44.5	1639.178
Fluoranthene	24	19	79.2	19	19	33	8300	R-SD1-LWOF012-10-0000	664.396	81	1287.063
Pyrene	24	19	79.2	19	19	30	7300	R-SD1-LWOF012-10-0000	568.563	68	1117.435
Benzo(a)anthracene	24	17	70.8	19	20	21	2900	R-SD1-LWOF012-10-0000	252.833	34	478.922
Chrysene	24	18	75.0	19	19	23	2900	R-SD1-LWOF012-10-0000	312.75	49.5	559.132
Benzo(b)fluoranthene	24	17	70.8	19	20	23	2500	R-SD1-LWOF012-10-0000	268	49	479.113
Benzo(k)fluoranthene	24	17	70.8	19	20	16	1200	R-SD1-LWOS003-10-0000	160.958	39	272.841
Total Benzofluoranthene	24	17	70.8	19	20	39	3410	R-SD1-LWOF012-10-0000	426.167	85.5	743.982
Benzo(a)pyrene	24	17	70.8	19	20	16	2900	R-SD1-LWOF012-10-0000	272.542	38.5	505.2
Indeno(1,2,3-cd)pyrene	24	14	58.3	19	20	24	1400	R-SD1-LWOF012-10-0000	148.75	28	263.633
Dibenz(a,h)anthracene	24	6	25.0	18	20	18	330	R-SD1-LWOF012-10-0000	43.021	9.5	74.81
Benzo(g,h,i)perylene	24	14	58.3	19	20	27	1200	R-SD1-LWOF012-10-0000	132.708	29.5	229.791
Total HPAH	24	19	79.2	19	19	64	30640	R-SD1-LWOF012-10-0000	2793.813	417	5196.907
PCBs (ug/kg)											
Aroclor 1016	24	0	0.0	17	20	n/a	n/a		9.22	9.25	9.375
Aroclor 1221	24	0	0.0	34	40	n/a	n/a		18.276	18.25	18.559
Aroclor 1232	24	0	0.0	17	20	n/a	n/a		9.2	9.25	9.344
Aroclor 1242	24	1	4.2	17	20	26	26	R-SD1-LWOF014E-10-0000	9.917	9.25	11.124
Aroclor 1248	24	0	0.0	17	20	n/a	n/a		9.2	9.25	9.344
Aroclor 1254	24	10	41.7	17	50	10	290	R-SD1-LWOS006-10-0000	51.667	9.75	79.788
Aroclor 1260	24	17	70.8	17	19	7.1	490	R-SD1-LWOS003-10-0000	59.171	29	94.394
Aroclor 1268	5	3	60.0	17	18	27	160	R-SD1-LWOF010-10-0000	53.5	27	114.065

n/a - Criteria not available
Half undetect weighting used for statistical calculations.

11/18/99

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Page 1 of 2

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Constituent	Number of Samples Analyzed	Number of Detections	Detection Frequency (%)	Minimum Detection Limit	Maximum Detection Limit	Minimum Detected Value	Maximum Detected Value	Sample Number of Maximum Detected Value	Geometric Mean	Median Value	Upper 95% Confidence Limit
PCBs (ug/kg)											
Total PCB	24	19	79.2	35	38	7.1	760	R-SD1-LWOS003-10-0000	117.317	34.5	181.882
Inorganics (Total) (mg/kg)											
Aluminum	24	24	100.0	n/a	n/a	13500	27300	R-SD1-LWOF010E-10-0000	18108.333	15050	19958.225
Antimony	24	17	70.8	0.06	0.06	0.08	0.7	R-SD1-LWOS003-10-0000	0.157	0.13	0.207
Arsenic	24	10	41.7	3	8	4	10	R-SD1-LWOF010E-10-0000	3.563	3	4.377
Beryllium	24	24	100.0	n/a	n/a	0.19	0.5	R-SD1-LWOF010E-10-0000	0.278	0.23	0.313
Cadmium	24	24	100.0	n/a	n/a	0.1	12	R-SD1-LWOF016-10-0000	1.146	0.5	1.982
Calcium	11	11	100.0	n/a	n/a	5300	9670	R-SD1-LWOF014-10-0000	6357.273	5950	7018.094
Chromium	24	24	100.0	n/a	n/a	17.5	135	R-SD1-LWOF016-10-0000	34.383	25.75	42.558
Copper	24	24	100.0	n/a	n/a	14	53.5	R-SD1-LWOF010-10-0000	26.608	19.15	31.205
Iron	24	24	100.0	n/a	n/a	12500	33300	R-SD1-LWCF-10-0000-CC	24545.833	24200	26222.951
Lead	24	24	100.0	n/a	n/a	5	200	R-SD1-LWOF016-10-0000	28.583	11	43.887
Mercury	24	24	100.0	n/a	n/a	0.01	0.16	R-SD1-LWOS006-10-0000	0.054	0.035	0.069
Nickel	24	24	100.0	n/a	n/a	18.6	41	R-SD1-LWOF010W-10-0000	27.279	25.45	29.544
Selenium	24	10	41.7	3	8	3	10	R-SD1-LWOS005-10-0000	3.375	3	4.127
Silver	24	0	0.0	0.2	0.5	n/a	n/a		0.123	0.1	0.145
Thallium	24	8	33.3	3	8	3	8	R-SD1-LWOF003E-10-0000	3.167	3	3.802
Zinc	24	24	100.0	n/a	n/a	48.9	539	R-SD1-LWOF010-10-0000	113.496	77.35	149.506
Conventional Parameters											
Total Organic Carbon (%)	24	24	100.0	n/a	n/a	0.091	4.9	R-SD1-LWOS003-10-0000	1.158	0.69	1.554

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWCF	LWFF	LWOF003	LWOF003E	LWOF003W	LWOF004
Sample ID:	R-SD1-LWCF-10-0000-CC	R-SD1-LWFF-10-0000	R-SD1-LWOF003-10-0000	R-SD1-LWOF003E-10-0000	R-SD1-LWOF003W-10-0000	R-SD1-LWOF004-10-0000
Sample Date:	08/11/99	08/11/99	08/13/99	08/13/99	08/13/99	08/12/99
Semi-Volatile Organic Compounds (ug/kg)						
2-Methylnaphthalene	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
bis(2-Ethylhexyl)phthalate	450.0000	310.0000	19.0000 U	22.0000	19.0000 U	190.0000
Carbazole	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Di-n-butylphthalate	19.0000 U	25.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Dibenzofuran	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Phenol	38.0000 U	39.0000 U	37.0000 U	39.0000 U	38.0000 U	39.0000 U
Naphthalene	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Acenaphthylene	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Acenaphthene	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Fluorene	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Phenanthrene	40.0000	45.0000	19.0000 U	19.0000 U	19.0000 U	53.0000
Anthracene	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Total LPAH	40.0000 T	45.0000 T	19.0000 UT	19.0000 UT	19.0000 UT	53.0000 T
Fluoranthene	87.0000	130.0000	19.0000 U	19.0000 U	19.0000 U	75.0000
Pyrene	61.0000	93.0000	19.0000 U	19.0000 U	19.0000 U	70.0000
Benzo(a)anthracene	34.0000	45.0000	19.0000 U	19.0000 U	19.0000 U	26.0000
Chrysene	59.0000	84.0000	19.0000 U	19.0000 U	19.0000 U	34.0000
Benzo(b)fluoranthene	36.0000	90.0000	19.0000 U	19.0000 U	19.0000 U	23.0000
Benzo(k)fluoranthene	39.0000	44.0000	19.0000 U	19.0000 U	19.0000 U	20.0000
Total Benzofluoranthene	75.0000 T	134.0000 T	19.0000 UT	19.0000 UT	19.0000 UT	43.0000 T
Benzo(a)pyrene	33.0000	45.0000	19.0000 U	19.0000 U	19.0000 U	22.0000
Indeno(1,2,3-cd)pyrene	28.0000	28.0000	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Dibenz(a,h)anthracene	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Benzo(g,h,i)perylene	27.0000	34.0000	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Total HPAH	404.0000 T	593.0000 T	19.0000 UT	19.0000 UT	19.0000 UT	270.0000 T
PCBs (ug/kg)						
Aroclor 1016	20.0000 U	18.0000 U	17.0000 U	18.0000 U	18.0000 U	18.0000 U
Aroclor 1221	38.0000 U	36.0000 U	35.0000 U	36.0000 U	35.0000 U	36.0000 U
Aroclor 1232	19.0000 U	18.0000 U	17.0000 U	18.0000 U	18.0000 U	18.0000 U

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWCF	LWFF	LWOF003	LWOF003E	LWOF003W	LWOF004
Sample ID:	R-SD1-LWCF-10-0000-CC	R-SD1-LWFF-10-0000	R-SD1-LWOF003-10-0000	R-SD1-LWOF003E-10-0000	R-SD1-LWOF003W-10-0000	R-SD1-LWOF004-10-0000
Sample Date:	08/11/99	08/11/99	08/13/99	08/13/99	08/13/99	08/12/99
Constituent						
Aroclor 1242	20.0000 U	18.0000 U	17.0000 U	18.0000 U	18.0000 U	18.0000 U
Aroclor 1248	19.0000 U	18.0000 U	17.0000 U	18.0000 U	18.0000 U	18.0000 U
Aroclor 1254	45.0000	35.0000	17.0000 U	18.0000 U	18.0000 U	50.0000 U
Aroclor 1260	38.0000	28.0000	17.0000 U	18.0000 U	18.0000 U	72.0000
Aroclor 1268	0.0000	0.0000	17.0000 U	0.0000	18.0000 U	0.0000
Total PCB	83.0000 T	63.0000 T	35.0000 UT	36.0000 UT	35.0000 UT	72.0000 T
Grain Size (%)						
<1.0 microns-Fractional % retained	2.5200	1.4400	0.0000	0.0000	0.1500	0.0000
2.0-1.0 microns-Fractional % retained	0.9000	0.2000	0.0000	0.0000	0.0000	0.0000
3.9-2.0 microns-Fractional % retained	1.7900	0.7700	0.0000	0.0000	0.0000	0.0000
7.8-3.9 microns-Fractional % retained	4.5200	1.8700	0.0000	0.0000	0.0500	0.0000
15.6-7.8 microns-Fractional % retained	11.1200	3.2800	0.0000	0.0000	0.0000	0.0000
31.0-15.6 microns-Fractional % retained	23.6300	5.8600	0.0000	0.0000	0.0000	0.0000
62.5-31.0 microns-Fractional % retained	26.7100	9.8900	0.0000	0.0800	2.1200	0.0000
Total Grain Size (Fine)	71.1900 T	23.3100 T	0.0000 T	0.0800 T	2.3200 T	0.0000 T
125-62.5 microns-Fractional % retained	13.5200	14.5800	0.4400	0.3700	0.9100	1.4100
250-125 microns-Fractional % retained	11.0800	30.7200	14.9200	13.4300	23.8900	6.3900
500-250 microns-Fractional % retained	15.1100	23.7400	47.4500	62.4500	42.5800	34.3700
1000-500 microns-Fractional % retained	6.0500	5.5200	24.4100	20.7800	17.7300	31.1800
2000-1000 microns-Fractional % retained	1.4500	1.2000	7.3400	2.5000	5.8400	11.4100
>2000 microns-Fractional % retained	0.4100	0.9400	5.4400	0.4000	6.3900	13.3400
Total Grain Size (Sand)	47.6200 T	76.7000 T	100.0000 T	99.9300 T	97.3400 T	98.1000 T
Inorganics (Total) (mg/kg)						
Aluminum	25900.0000	17200.0000	13700.0000	14700.0000	23000.0000	14000.0000
Antimony	0.1800 J	0.1900 J	0.0600 UJ	0.0600 UJ	0.0600 UJ	0.1000 J
Arsenic	4.0000 U	5.0000 U	5.0000	4.0000	4.0000	3.0000 U
Beryllium	0.4200	0.2600	0.2100	0.2300	0.2000	0.2100
Cadmium	0.5000	0.3000	0.1000	0.1000	0.1000	0.4000
Calcium	0.0000	0.0000	0.0000	0.0000	0.0000	5560.0000
Chromium	40.8000	28.3000	25.6000	21.5000	23.0000	18.7000

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWCF	LWFF	LWOF003	LWOF003E	LWOF003W	LWOF004
Sample ID:	R-SD1-LWCF-10-0000-CC	R-SD1-LWFF-10-0000	R-SD1-LWOF003-10-0000	R-SD1-LWOF003E-10-0000	R-SD1-LWOF003W-10-0000	R-SD1-LWOF004-10-0000
Sample Date:	08/11/99	08/11/99	08/13/99	08/13/99	08/13/99	08/12/99
Constituent						
Copper	36.4000	20.1000	17.0000	17.1000	15.0000	14.8000
Iron	33300.0000	24400.0000	21900.0000	21200.0000	20200.0000	25200.0000
Lead	12.0000	11.0000	5.0000	5.0000	5.0000	9.0000
Mercury	0.0800	0.0400	0.0200	0.0200	0.0100	0.0200
Nickel	33.4000	24.8000	25.6000	23.7000	24.1000	19.3000
Selenium	7.0000	5.0000 U	3.0000	4.0000	3.0000 U	3.0000 U
Silver	0.3000 U	0.3000 U	0.2000 U	0.2000 U	0.2000 U	0.2000 U
Thallium	7.0000	5.0000 U	6.0000	8.0000	4.0000	3.0000
Zinc	85.2000	72.2000	67.9000	77.9000	59.9000	77.7000
Conventional Parameters						
Total Organic Carbon (%)	1.8000	2.1000	0.2600	0.1800	0.0910	0.3600

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF004E	LWOF004W	LWOF010	LWOF010E	LWOF010W	LWOF011
Sample ID:	R-SD1-LWOF004E-10-0000	R-SD1-LWOF004W-10-0000	R-SD1-LWOF010-10-0000	R-SD1-LWOF010E-10-0000	R-SD1-LWOF010W-10-0000	R-SD1-LWOF011-10-0000
Sample Date:	08/12/99	08/12/99	08/13/99	08/13/99	08/13/99	08/12/99
Constituent						
Semi-Volatile Organic Compounds (ug/kg)						
2-Methylnaphthalene	20.0000 U	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
bis(2-Ethylhexyl)phthalate	4200.0000	130.0000	1300.0000	270.0000	610.0000	360.0000
Carbazole	20.0000 U	19.0000 U	18.0000 J	19.0000 U	20.0000 U	19.0000 U
Di-n-butylphthalate	54.0000	19.0000 U	110.0000	46.0000	48.0000	19.0000 U
Dibenzofuran	20.0000 U	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
Phenol	39.0000 U	39.0000 U	39.0000 U	39.0000 U	39.0000 U	37.0000 U
Naphthalene	20.0000 U	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
Acenaphthylene	20.0000 U	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
Acenaphthene	16.0000 J	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
Fluorene	20.0000 U	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
Phenanthrene	23.0000	26.0000	130.0000	44.0000	58.0000	21.0000
Anthracene	20.0000 U	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
Total LPAH	39.0000 JT	26.0000 T	130.0000 T	44.0000 T	58.0000 T	21.0000 T
Fluoranthene	42.0000	33.0000	410.0000	100.0000	150.0000	69.0000
Pyrene	30.0000	31.0000	150.0000	54.0000	82.0000	66.0000
Benzo(a)anthracene	20.0000 U	19.0000 U	74.0000	29.0000	42.0000	36.0000
Chrysene	24.0000	19.0000 U	180.0000	53.0000	88.0000	42.0000
Benzo(b)fluoranthene	20.0000 U	19.0000 U	140.0000	59.0000	95.0000	46.0000
Benzo(k)fluoranthene	20.0000 U	19.0000 U	130.0000	47.0000 J	74.0000	34.0000
Total Benzofluoranthene	20.0000 UT	19.0000 UT	270.0000 T	106.0000 JT	169.0000 T	80.0000 T
Benzo(a)pyrene	20.0000 U	19.0000 U	98.0000	32.0000 J	47.0000	44.0000
Indeno(1,2,3-cd)pyrene	20.0000 U	19.0000 U	90.0000	24.0000 J	37.0000	40.0000
Dibenz(a,h)anthracene	20.0000 U	19.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U
Benzo(g,h,i)perylene	20.0000 U	19.0000 U	140.0000	28.0000 J	44.0000	31.0000
Total HPAH	96.0000 T	64.0000 T	1412.0000 T	426.0000 JT	659.0000 T	408.0000 T
PCBs (ug/kg)						
Aroclor 1016	18.0000 U	18.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Aroclor 1221	36.0000 U	36.0000 U	37.0000 U	37.0000 U	38.0000 U	37.0000 U
Aroclor 1232	18.0000 U	18.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF004E	LWOF004W	LWOF010	LWOF010E	LWOF010W	LWOF011
Sample ID:	R-SD1-LWOF004E-10-0000	R-SD1-LWOF004W-10-0000	R-SD1-LWOF010-10-0000	R-SD1-LWOF010E-10-0000	R-SD1-LWOF010W-10-0000	R-SD1-LWOF011-10-0000
Sample Date:	08/12/99	08/12/99	08/13/99	08/13/99	08/13/99	08/12/99
Constituent						
Aroclor 1242	18.0000 U	18.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Aroclor 1248	18.0000 U	18.0000 U	19.0000 U	19.0000 U	19.0000 U	19.0000 U
Aroclor 1254	18.0000 U	18.0000 U	150.0000	98.0000	120.0000	19.0000 U
Aroclor 1260	75.0000	30.0000	190.0000	66.0000	99.0000	19.0000 U
Aroclor 1268	0.0000	0.0000	160.0000	27.0000	63.0000	0.0000
Total PCB	75.0000 T	30.0000 T	500.0000 T	191.0000 T	282.0000 T	37.0000 UT
Grain Size (%)						
<1.0 microns-Fractional % retained	0.0000	0.1300	2.2700	2.1200	2.5800	0.0000
2.0-1.0 microns-Fractional % retained	0.0000	0.0100	0.9400	1.0100	1.5500	0.0000
3.9-2.0 microns-Fractional % retained	0.0000	0.0200	2.1600	2.3500	2.7100	0.0000
7.8-3.9 microns-Fractional % retained	0.0000	0.0400	6.5100	5.4000	7.0400	0.0000
15.6-7.8 microns-Fractional % retained	0.0000	0.1100	11.8200	12.2300	15.5000	0.0000
31.0-15.6 microns-Fractional % retained	0.0000	0.4600	20.4600	20.3500	25.3700	0.0000
62.5-31.0 microns-Fractional % retained	0.0500	1.5200	28.8100	24.0800	27.5000	0.0000
Total Grain Size (Fine)	0.0500 T	2.2900 T	72.9700 T	67.5400 T	82.2500 T	0.0000 T
125-62.5 microns-Fractional % retained	2.1100	2.5400	14.8800	10.7900	10.6300	1.1200
250-125 microns-Fractional % retained	6.2400	11.2900	6.8000	6.9400	3.7000	5.5800
500-250 microns-Fractional % retained	28.4300	35.3500	4.1200	6.8900	1.8200	12.1400
1000-500 microns-Fractional % retained	27.3300	22.3800	2.0600	4.4200	1.4800	13.4300
2000-1000 microns-Fractional % retained	9.6200	11.6900	0.2700	1.5900	0.0900	12.7200
>2000 microns-Fractional % retained	26.2300	14.4800	0.0000	1.8200	0.0200	54.1400
Total Grain Size (Sand)	99.9600 T	97.7300 T	28.1300 T	32.4500 T	17.7400 T	99.1300 T
Inorganics (Total) (mg/kg)						
Aluminum	14100.0000	13800.0000	26300.0000	27300.0000	27000.0000	14900.0000
Antimony	0.0800 J	0.0600 UJ	0.3000 J	0.2000 J	0.2000 J	0.1500 J
Arsenic	4.0000	3.0000 U	8.0000	10.0000	7.0000	3.0000 U
Beryllium	0.1900	0.2100	0.4000	0.5000	0.4000	0.2300
Cadmium	0.4000	0.3000	2.0000	0.5000	1.0000	0.5000
Calcium	5950.0000	5830.0000	0.0000	0.0000	0.0000	5300.0000
Chromium	20.1000	17.5000	50.3000	43.2000	45.6000	24.2000

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF004E	LWOF004W	LWOF010	LWOF010E	LWOF010W	LWOF011
Sample ID:	R-SD1-LWOF004E-10-0000	R-SD1-LWOF004W-10-0000	R-SD1-LWOF010-10-0000	R-SD1-LWOF010E-10-0000	R-SD1-LWOF010W-10-0000	R-SD1-LWOF011-10-0000
Sample Date:	08/12/99	08/12/99	08/13/99	08/13/99	08/13/99	08/12/99
Constituent						
Copper	17.0000	14.0000	53.5000	42.3000	47.2000	16.0000
Iron	27300.0000	24000.0000	30600.0000	29900.0000	12500.0000	20300.0000
Lead	10.0000	7.0000	70.0000	21.0000	32.0000	7.0000
Mercury	0.0900	0.0200	0.1500	0.0900	0.1000	0.0200
Nickel	20.4000	18.6000	41.0000	38.0000	41.0000	26.4000
Selenium	3.0000	3.0000 U	6.0000 U	7.0000 U	6.0000 U	3.0000
Silver	0.2000 U	0.2000 U	0.4000 U	0.4000 U	0.4000 U	0.2000 U
Thallium	3.0000	3.0000 U	6.0000 U	7.0000 U	6.0000 U	3.0000 U
Zinc	77.0000	71.0000	539.0000	132.0000	229.0000	51.3000
Conventional Parameters						
Total Organic Carbon (%)	0.6000	0.5000	2.1000	2.1000	1.7000	0.6400

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF011E	LWOF012	LWOF012W	LWOF014	LWOF014E	LWOF016
Sample ID:	R-SD1-LWOF011E-10-0000	R-SD1-LWOF012-10-0000	R-SD1-LWOF012W-10-0000	R-SD1-LWOF014-10-0000	R-SD1-LWOF014E-10-0000	R-SD1-LWOF016-10-0000
Sample Date:	08/12/99	08/12/99	08/12/99	08/12/99	08/12/99	08/12/99
Semi-Volatile Organic Compounds (ug/kg)						
2-Methylnaphthalene	18.0000 U	140.0000	19.0000 U	31.0000	20.0000 U	19.0000 U
bis(2-Ethylhexyl)phthalate	57.0000	1200.0000	39.0000	180.0000	57.0000	720.0000
Carbazole	18.0000 U	1000.0000	19.0000 U	37.0000	66.0000	190.0000
Di-n-butylphthalate	18.0000 U	76.0000	19.0000 U	19.0000 U	20.0000 U	150.0000
Dibenzofuran	18.0000 U	610.0000	19.0000 U	47.0000	20.0000 U	89.0000
Phenol	37.0000 U	38.0000 U	38.0000 U	38.0000 U	39.0000 U	150.0000
Naphthalene	18.0000 U	420.0000	19.0000 U	20.0000	20.0000 U	25.0000
Acenaphthylene	18.0000 U	38.0000	19.0000 U	19.0000 U	20.0000 U	20.0000
Acenaphthene	18.0000 U	690.0000	19.0000 U	44.0000	20.0000 U	120.0000
Fluorene	18.0000 U	1100.0000	19.0000 U	91.0000	36.0000	210.0000
Phenanthrene	50.0000	8600.0000	19.0000 U	480.0000	61.0000	1600.0000
Anthracene	18.0000 U	1600.0000	19.0000 U	180.0000	210.0000	350.0000
Total LPAH	50.0000 T	12448.0000 T	19.0000 UT	815.0000 T	307.0000 T	2325.0000 T
Fluoranthene	89.0000	8300.0000	36.0000	820.0000	64.0000	3300.0000
Pyrene	84.0000	7300.0000	38.0000	340.0000	47.0000	2600.0000
Benzo(a)anthracene	40.0000	2900.0000	21.0000	170.0000	22.0000	1200.0000
Chrysene	46.0000	2900.0000	23.0000	420.0000	38.0000	1200.0000
Benzo(b)fluoranthene	52.0000	2500.0000	25.0000	180.0000	23.0000	1200.0000
Benzo(k)fluoranthene	39.0000	910.0000	20.0000	120.0000	16.0000 J	780.0000
Total Benzofluoranthene	91.0000 T	3410.0000 T	45.0000 T	300.0000 T	39.0000 JT	1980.0000 T
Benzo(a)pyrene	48.0000	2900.0000	21.0000	160.0000	16.0000 J	1400.0000
Indeno(1,2,3-cd)pyrene	44.0000	1400.0000	19.0000 U	100.0000	20.0000 U	770.0000
Dibenz(a,h)anthracene	18.0000 U	330.0000	19.0000 U	18.0000 J	20.0000 U	140.0000
Benzo(g,h,i)perylene	34.0000	1200.0000	19.0000 U	94.0000	20.0000 U	580.0000
Total HPAH	476.0000 T	30640.0000 T	184.0000 T	2422.0000 JT	226.0000 JT	13170.0000 T
PCBs (ug/kg)						
Aroclor 1016	17.0000 U	19.0000 U	19.0000 U	17.0000 U	19.0000 U	18.0000 U
Aroclor 1221	34.0000 U	38.0000 U	38.0000 U	34.0000 U	39.0000 U	35.0000 U
Aroclor 1232	17.0000 U	19.0000 U	19.0000 U	17.0000 U	19.0000 U	18.0000 U

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Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF011E	LWOF012	LWOF012W	LWOF014	LWOF014E	LWOF016
Sample ID:	R-SD1-LWOF011E-10-0000	R-SD1-LWOF012-10-0000	R-SD1-LWOF012W-10-0000	R-SD1-LWOF014-10-0000	R-SD1-LWOF014E-10-0000	R-SD1-LWOF016-10-0000
Sample Date:	08/12/99	08/12/99	08/12/99	08/12/99	08/12/99	08/12/99
Constituent						
Aroclor 1242	17.0000 U	19.0000 U	19.0000 U	17.0000 U	26.0000	18.0000 U
Aroclor 1248	17.0000 U	19.0000 U	19.0000 U	17.0000 U	19.0000 U	18.0000 U
Aroclor 1254	17.0000 U	19.0000 U	19.0000 U	17.0000 U	19.0000 U	18.0000 U
Aroclor 1260	7.1000 J	39.0000	19.0000 U	54.0000	19.0000 U	22.0000
Aroclor 1268	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PCB	7.1000 JT	39.0000 T	38.0000 UT	54.0000 T	26.0000 T	22.0000 T
Grain Size (%)						
<1.0 microns-Fractional % retained	0.3000	0.2200	0.0000	0.2000	0.2400	0.3000
2.0-1.0 microns-Fractional % retained	0.0000	0.1600	0.0000	0.0000	0.0000	0.3200
3.9-2.0 microns-Fractional % retained	0.1700	0.0000	0.0000	0.0600	0.1300	0.1300
7.8-3.9 microns-Fractional % retained	0.3000	0.1300	0.0000	0.1600	0.2900	0.3100
15.6-7.8 microns-Fractional % retained	0.3800	0.1700	0.0000	0.3100	0.4000	0.5600
31.0-15.6 microns-Fractional % retained	0.5600	0.1800	0.0000	0.6300	0.8500	1.0600
62.5-31.0 microns-Fractional % retained	1.8400	3.6400	0.7300	1.2200	0.0000	4.9000
Total Grain Size (Fine)	3.5500 T	4.5000 T	0.7300 T	2.5800 T	1.9100 T	7.5800 T
125-62.5 microns-Fractional % retained	1.9000	0.8000	1.2300	2.1700	4.4300	4.2800
250-125 microns-Fractional % retained	7.8700	5.4600	3.9700	9.4900	6.7500	14.8800
500-250 microns-Fractional % retained	16.4200	12.1300	8.7200	22.8900	15.6100	30.1600
1000-500 microns-Fractional % retained	13.8900	10.4000	8.0100	18.2600	13.0100	18.3800
2000-1000 microns-Fractional % retained	10.6100	8.8700	10.3200	11.4700	11.6700	7.8300
>2000 microns-Fractional % retained	45.9600	58.2200	67.7500	33.1200	46.6700	17.2200
Total Grain Size (Sand)	96.6500 T	95.8800 T	100.0000 T	97.4000 T	98.1400 T	92.7500 T
Inorganics (Total) (mg/kg)						
Aluminum	14900.0000	14900.0000	17200.0000	13500.0000	13800.0000	15200.0000
Antimony	0.0600 UJ	0.2500 J	0.0600 UJ	0.2600 J	0.1100 J	0.2300 J
Arsenic	3.0000 U	6.0000	3.0000 U	4.0000	3.0000 U	3.0000 U
Beryllium	0.2300	0.2300	0.2100	0.2000	0.2300	0.1900
Cadmium	0.5000	2.2000	1.2000	0.9000	0.5000	12.0000 J
Calcium	6050.0000	5950.0000	7260.0000	9670.0000	5840.0000	6040.0000
Chromium	25.6000	32.5000	24.3000	32.8000	22.4000	135.0000 J

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF011E	LWOF012	LWOF012W	LWOF014	LWOF014E	LWOF016
Sample ID:	R-SD1-LWOF011E-10-0000	R-SD1-LWOF012-10-0000	R-SD1-LWOF012W-10-0000	R-SD1-LWOF014-10-0000	R-SD1-LWOF014E-10-0000	R-SD1-LWOF016-10-0000
Sample Date:	08/12/99	08/12/99	08/12/99	08/12/99	08/12/99	08/12/99
Constituent						
Copper	16.3000	41.7000	15.7000	25.6000	15.2000	26.1000
Iron	26400.0000	26600.0000	21900.0000	25100.0000	22300.0000	21300.0000
Lead	7.0000	45.0000	9.0000	104.0000	9.0000	200.0000 J
Mercury	0.0200	0.0700	0.0400	0.0400	0.0300	0.0200
Nickel	25.7000	28.2000	23.8000	25.3000	20.5000	25.7000
Selenium	3.0000 U	3.0000 U	3.0000 U	3.0000 U	3.0000 U	5.0000
Silver	0.2000 U	0.2000 U	0.2000 U	0.2000 U	0.2000 U	0.2000 U
Thallium	3.0000 U	3.0000 U	3.0000 U	4.0000	3.0000 U	5.0000
Zinc	48.9000	194.0000	53.7000	131.0000	67.7000	98.1000
Conventional Parameters						
Total Organic Carbon (%)	0.3900	0.8400	0.7700	0.5600	0.5600	0.8800

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF016W	LWOS001	LWOS002	LWOS003	LWOS005	LWOS006
Sample ID:	R-SD1-LWOF016W-10-0000	R-SD1-LWOS001-10-0000	R-SD1-LWOS002-10-0000	R-SD1-LWOS003-10-0000	R-SD1-LWOS005-10-0000	R-SD1-LWOS006-10-0000
Sample Date:	08/12/99	08/13/99	08/13/99	08/11/99	08/12/99	08/11/99
Constituent						
Semi-Volatile Organic Compounds (ug/kg)						
2-Methylnaphthalene	19.0000 U	19.0000 U	19.0000 U	39.0000 U	20.0000 U	19.0000 U
bis(2-Ethylhexyl)phthalate	390.0000	140.0000	94.0000	3400.0000	230.0000	210.0000
Carbazole	19.0000 U	19.0000 U	19.0000 U	91.0000	20.0000 U	19.0000 U
Di-n-butylphthalate	120.0000	19.0000 U	19.0000 U	280.0000	20.0000 U	19.0000 U
Dibenzofuran	19.0000 U	19.0000 U	19.0000 U	39.0000 U	20.0000 U	19.0000 U
Phenol	37.0000 U	19.0000 U	19.0000 U	53.0000	33.0000	19.0000 U
Naphthalene	19.0000 U	19.0000 U	19.0000 U	39.0000 U	45.0000	19.0000 U
Acenaphthylene	19.0000 U	19.0000 U	19.0000 U	39.0000 U	20.0000 U	19.0000 U
Acenaphthene	19.0000 U	19.0000 U	19.0000 U	39.0000 U	20.0000 U	19.0000 U
Fluorene	33.0000	19.0000 U	19.0000 U	78.0000	20.0000 U	19.0000 U
Phenanthrene	160.0000	19.0000 U	19.0000 U	630.0000	58.0000	36.0000
Anthracene	47.0000	19.0000 U	19.0000 U	420.0000	20.0000 U	19.0000 U
Total LPAH	240.0000 T	19.0000 UT	19.0000 UT	1128.0000 T	103.0000 T	36.0000 T
Fluoranthene	400.0000	19.0000 U	19.0000 U	1600.0000	120.0000	73.0000
Pyrene	320.0000	19.0000 U	19.0000 U	2000.0000	150.0000	82.0000
Benzo(a)anthracene	170.0000	19.0000 U	19.0000 U	1100.0000	58.0000	34.0000
Chrysene	210.0000	19.0000 U	19.0000 U	1900.0000	89.0000	59.0000
Benzo(b)fluoranthene	260.0000	19.0000 U	19.0000 U	1500.0000	76.0000	60.0000
Benzo(k)fluoranthene	210.0000	19.0000 U	19.0000 U	1200.0000	59.0000	54.0000
Total Benzofluoranthene	470.0000 T	19.0000 UT	19.0000 UT	2700.0000 T	135.0000 T	114.0000 T
Benzo(a)pyrene	300.0000	19.0000 U	19.0000 U	1200.0000	59.0000	49.0000
Indeno(1,2,3-cd)pyrene	210.0000	19.0000 U	19.0000 U	620.0000	41.0000	42.0000
Dibenz(a,h)anthracene	32.0000	19.0000 U	19.0000 U	320.0000	20.0000 U	20.0000
Benzo(g,h,i)perylene	200.0000	19.0000 U	19.0000 U	580.0000	50.0000	47.0000
Total HPAH	2312.0000 T	19.0000 UT	19.0000 UT	12020.0000 T	702.0000 T	520.0000 T
PCBs (ug/kg)						
Aroclor 1016	19.0000 U	18.0000 U	18.0000 U	19.0000 U	20.0000 U	19.0000 U
Aroclor 1221	37.0000 U	36.0000 U	35.0000 U	37.0000 U	40.0000 U	38.0000 U
Aroclor 1232	19.0000 U	18.0000 U	18.0000 U	19.0000 U	20.0000 U	19.0000 U

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

Station ID:	LWOF016W	LWOS001	LWOS002	LWOS003	LWOS005	LWOS006
Sample ID:	R-SD1-LWOF016W-10-0000	R-SD1-LWOS001-10-0000	R-SD1-LWOS002-10-0000	R-SD1-LWOS003-10-0000	R-SD1-LWOS005-10-0000	R-SD1-LWOS006-10-0000
Sample Date:	08/12/99	08/13/99	08/13/99	08/11/99	08/12/99	08/11/99
Constituent						
Aroclor 1242	19.0000 U	18.0000 U	18.0000 U	19.0000 U	20.0000 U	19.0000 U
Aroclor 1248	19.0000 U	18.0000 U	18.0000 U	19.0000 U	20.0000 U	19.0000 U
Aroclor 1254	27.0000 U	10.0000 J	13.0000 J	270.0000	62.0000	290.0000
Aroclor 1260	21.0000	18.0000 U	10.0000 J	490.0000	49.0000	66.0000
Aroclor 1268	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total PCB	21.0000 T	10.0000 JT	23.0000 JT	760.0000 T	111.0000 T	356.0000 T
Grain Size (%)						
<1.0 microns-Fractional % retained	0.3200	0.0000 J	0.0000 J	1.0000 J	2.4000 J	2.3000
2.0-1.0 microns-Fractional % retained	0.0300	0.1000 J	0.1000 J	0.5000 J	1.3000 J	0.5000
3.9-2.0 microns-Fractional % retained	0.2400	0.0000 J	0.0000 J	0.6000 J	4.0000 J	2.9000
7.8-3.9 microns-Fractional % retained	0.4800	0.0000 J	0.1000 J	4.0000 J	7.1000 J	5.3000
15.6-7.8 microns-Fractional % retained	0.3100	0.0000 J	0.0000 J	7.4000 J	13.9000 J	14.3000
31.0-15.6 microns-Fractional % retained	1.8700	0.1000 J	0.2000 J	14.5000 J	23.9000 J	24.0000
62.5-31.0 microns-Fractional % retained	5.3600	0.3000 J	2.0000 J	16.7000 J	23.1000 J	24.5000
Total Grain Size (Fine)	8.6100 T	0.5000 JT	2.4000 JT	44.7000 JT	75.7000 JT	73.8000 T
125-62.5 microns-Fractional % retained	9.0000	5.7000	4.0000	16.8000	16.0000	15.5000
250-125 microns-Fractional % retained	20.4000	32.6000	26.4000	18.6000	4.4000	4.9000
500-250 microns-Fractional % retained	32.3900	48.6000	43.3000	10.5000	2.0000	2.1000
1000-500 microns-Fractional % retained	16.7000	10.6000	13.1000	4.3000	0.9000	2.0000
2000-1000 microns-Fractional % retained	5.6800	1.3000	5.8000	2.7000	0.9000	1.6000
>2000 microns-Fractional % retained	7.9200	0.6000	4.9000	2.3000	0.0000	0.1000
Total Grain Size (Sand)	92.0900 T	99.4000 T	97.5000 T	55.2000 T	24.2000 T	26.2000 T
Inorganics (Total) (mg/kg)						
Aluminum	15700.0000	14300.0000	14500.0000	16500.0000	26700.0000	25500.0000
Antimony	0.1100 J	0.0900 J	0.0600 UJ	0.7000 J	0.2000 J	0.2000 J
Arsenic	4.0000 U	3.0000 U	5.0000	8.0000 U	6.0000 U	6.0000 U
Beryllium	0.2500	0.2200	0.2500	0.3000	0.5000	0.4000
Cadmium	0.7000	0.2000	0.2000	2.0000	0.5000	0.4000
Calcium	6480.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Chromium	24.7000	25.9000	24.1000	39.9000	39.4000	39.8000

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Outfall and Shoreline Sediment Sample Results from August 1999

	Station ID:	LWOF016W	LWOS001	LWOS002	LWOS003	LWOS005	LWOS006
	Sample ID:	R-SD1-LWOF016W-10-0000	R-SD1-LWOS001-10-0000	R-SD1-LWOS002-10-0000	R-SD1-LWOS003-10-0000	R-SD1-LWOS005-10-0000	R-SD1-LWOS006-10-0000
Constituent	Sample Date:	08/12/99	08/13/99	08/13/99	08/11/99	08/12/99	08/11/99
Copper		19.4000	18.9000	18.7000	43.7000	43.7000	43.2000
Iron		22000.0000	20100.0000	21000.0000	29700.0000	31100.0000	30800.0000
Lead		18.0000	7.0000	11.0000	51.0000	17.0000	14.0000
Mercury		0.0300	0.0200	0.0200	0.1100	0.0700	0.1600
Nickel		24.2000	24.6000	22.4000	29.0000	35.0000	34.0000
Selenium		4.0000 U	4.0000	6.0000	8.0000 U	10.0000	6.0000
Silver		0.2000 U	0.2000 U	0.2000 U	0.5000 U	0.3000 U	0.4000 U
Thallium		4.0000 U	3.0000 U	3.0000 U	8.0000 U	6.0000 U	6.0000 U
Zinc		73.0000	64.4000	70.8000	203.0000	90.3000	88.9000
Conventional Parameters							
Total Organic Carbon (%)		0.7400	0.2600	0.2600	4.9000	2.6000	2.6000

A blank cell indicates analysis was not performed or the result was rejected during validation.

NEARSHORE SEDIMENT SAMPLE RESULTS

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

Constituent	Number of Samples Analyzed	Number of Detections	Detection Frequency (%)	Minimum Detection Limit	Maximum Detection Limit	Minimum Detected Value	Maximum Detected Value	Sample Number of Maximum Detected Value	Geometric Mean	Median Value	Upper 95% Confidence Limit
Semi-Volatile Organic Compounds (ug/kg)											
2-Methylnaphthalene	13	0	0.0	19	20	n/a	n/a		9.766	10	9.897
bis(2-Ethylhexyl)phthalate	13	12	92.3	19	19	91	330	R-SD1-LWOS006-100-0000	176.192	170	216.37
Carbazole	13	0	0.0	19	20	n/a	n/a		9.766	10	9.897
Di-n-butylphthalate	13	1	7.7	19	20	34	34	R-SD1-LWCFE-200-0000	11.815	10	14.942
Dibenzofuran	13	0	0.0	19	20	n/a	n/a		9.766	10	9.897
Phenol	13	9	69.2	19	20	20	54	R-SD1-LWOS010-200-0000	26.308	25	33.711
Naphthalene	13	0	0.0	19	20	n/a	n/a		9.766	10	9.897
Acenaphthylene	13	0	0.0	19	20	n/a	n/a		9.766	10	9.897
Acenaphthene	13	0	0.0	19	20	n/a	n/a		9.766	10	9.897
Fluorene	13	0	0.0	19	20	n/a	n/a		9.766	10	9.897
Phenanthrene	13	12	92.3	19	19	24	56	R-SD1-LWOS015016W-200-0000	36.962	38	43.517
Anthracene	13	1	7.7	19	20	32	32	R-SD1-LWOS015016W-200-0000	11.5	10	14.547
Total LPAH	13	12	92.3	19	19	24	88	R-SD1-LWOS015016W-200-0000	39.423	38	48.752
Fluoranthene	13	12	92.3	19	19	50	120	R-SD1-LWOS015016W-200-0000	81.269	88	96.514
Pyrene	13	12	92.3	19	19	48	140	R-SD1-LWOS015016W-200-0000	83.192	86	100.004
Benzo(a)anthracene	13	12	92.3	19	19	21	100	R-SD1-LWOS015016W-200-0000	40.577	40	51.718
Chrysene	13	12	92.3	19	19	41	200	R-SD1-LWOS015016W-200-0000	75.5	72	97.942
Benzo(b)fluoranthene	13	12	92.3	19	19	39	110	R-SD1-LWOS015016W-200-0000	67.808	70	83.012
Benzo(k)fluoranthene	13	12	92.3	19	19	38	180	R-SD1-LWOS015016W-200-0000	69.962	69	89.783
Total Benzofluoranthene	13	12	92.3	19	19	77	290	R-SD1-LWOS015016W-200-0000	137.038	139	170.869
Benzo(a)pyrene	13	12	92.3	19	19	33	140	R-SD1-LWOS015016W-200-0000	60.423	61	76.191
Indeno(1,2,3-cd)pyrene	13	12	92.3	19	19	29	89	R-SD1-LWOS015016W-200-0000	50.346	55	60.776
Dibenz(a,h)anthracene	13	5	38.5	19	20	24	42	R-SD1-LWOS015016W-200-0000	18.923	10	25.172
Benzo(g,h,i)perylene	13	12	92.3	19	19	30	92	R-SD1-LWOS015016W-200-0000	53.346	54	64.1
Total HPAH	13	12	92.3	19	19	329	1213	R-SD1-LWOS015016W-200-0000	589.423	627	733.809
PCBs (ug/kg)											
Aroclor 1016	13	0	0.0	18	20	n/a	n/a		9.609	9.5	9.795
Aroclor 1221	13	0	0.0	35	40	n/a	n/a		19.137	19	19.562
Aroclor 1232	13	0	0.0	18	20	n/a	n/a		9.609	9.5	9.795
Aroclor 1242	13	0	0.0	18	20	n/a	n/a		9.609	9.5	9.795
Aroclor 1248	13	0	0.0	18	20	n/a	n/a		9.609	9.5	9.795
Aroclor 1254	13	12	92.3	18	18	10	36	R-SD1-LWOS011012-100-0000	17.538	16	21.048
Aroclor 1260	13	12	92.3	18	18	10	34	R-SD1-LWOS011012-100-0000	18.538	18	22.06
Total PCB	13	12	92.3	35	35	20	70	R-SD1-LWOS011012-100-0000	38.038	37	42.951

n/a - Criteria not available
Half undetect weighting used for statistical calculations.

11/18/99

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Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

Constituent	Number of Samples Analyzed	Number of Detections	Detection Frequency (%)	Minimum Detection Limit	Maximum Detection Limit	Minimum Detected Value	Maximum Detected Value	Sample Number of Maximum Detected Value	Geometric Mean	Median Value	Upper 95% Confidence Limit
Inorganics (Total) (mg/kg)											
Aluminum	13	13	100.0	n/a	n/a	15900	28500	R-SD1-LWCFNE-200-0000	24976.923	26700	26719.086
Antimony	13	11	84.6	0.1	0.1	0.07	0.3	R-SD1-LWOS006-100-0000	0.155	0.2	0.192
Arsenic	13	3	23.1	3	7	4	6	R-SD1-LWOS010-200-0000	3.385	3	4.024
Beryllium	13	13	100.0	n/a	n/a	0.23	0.5	R-SD1-LWOS011012-100-0000	0.418	0.4	0.458
Cadmium	13	13	100.0	n/a	n/a	0.1	0.6	R-SD1-LWOS015016-100-0000	0.369	0.4	0.431
Chromium	13	13	100.0	n/a	n/a	21.7	43.5	R-SD1-LWCFNE-200-0000	37.115	38.9	39.958
Copper	13	13	100.0	n/a	n/a	19.3	45.7	R-SD1-LWCFE-200-0000	38.815	41.4	42.432
Iron	13	13	100.0	n/a	n/a	21400	34500	R-SD1-LWCFNE-200-0000	30561.538	31800	32310.277
Lead	13	13	100.0	n/a	n/a	3	19	R-SD1-LWCFE-200-0000	13.385	15	15.357
Mercury	13	13	100.0	n/a	n/a	0.02	0.08	R-SD1-LWOS010-200-0000	0.065	0.07	0.075
Nickel	13	13	100.0	n/a	n/a	21	39	R-SD1-LWCFNE-200-0000	33.185	34	35.548
Selenium	13	10	76.9	5	6	4	10	R-SD1-LWOS006-200-0000	6.346	7	7.628
Silver	13	0	0.0	0.2	0.4	n/a	n/a		0.157	0.15	0.179
Thallium	13	0	0.0	3	7	n/a	n/a		2.675	3	2.99
Zinc	13	13	100.0	n/a	n/a	43.5	135	R-SD1-LWOS015016-100-0000	82.792	82.6	93.055
Conventional Parameters											
Total Organic Carbon (%)	13	13	100.0	n/a	n/a	0.23	3.3	R-SD1-LWOS006-100-0000	2.156	2.2	2.531

n/a - Criteria not available
 Half undetect weighting used for statistical calculations.

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

Station ID:	LWCFE-200	LWCFN-200	LWCFNE-200	LWOS004-275	LWOS006-100	LWOS006-200
Sample ID:	R-SD1-LWCFE-200-0000	R-SD1-LWCFN-200-0000	R-SD1-LWCFNE-200-0000	R-SD1-LWOS004-275-0000	R-SD1-LWOS006-100-0000	R-SD1-LWOS006-200-0000
Sample Date:	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99
Constituent						
Semi-Volatile Organic Compounds (ug/kg)						
2-Methylnaphthalene	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
bis(2-Ethylhexyl)phthalate	220.0000	160.0000	91.0000	260.0000	330.0000	210.0000
Carbazole	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Di-n-butylphthalate	34.0000	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Dibenzofuran	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Phenol	20.0000 U	43.0000	19.0000 U	22.0000	45.0000	36.0000
Naphthalene	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Acenaphthylene	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Acenaphthene	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Fluorene	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Phenanthrene	37.0000	40.0000	26.0000	38.0000	46.0000	42.0000
Anthracene	20.0000 U	19.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U
Total LPAH	37.0000 T	40.0000 T	26.0000 T	38.0000 T	46.0000 T	42.0000 T
Fluoranthene	110.0000	88.0000	60.0000	87.0000	100.0000	95.0000
Pyrene	93.0000	86.0000	60.0000	86.0000	120.0000	100.0000
Benzo(a)anthracene	40.0000	37.0000	23.0000	40.0000	58.0000	44.0000
Chrysene	89.0000	71.0000	49.0000	72.0000	110.0000	74.0000
Benzo(b)fluoranthene	70.0000	70.0000	48.0000	76.0000	110.0000	84.0000
Benzo(k)fluoranthene	87.0000	69.0000	47.0000	79.0000	85.0000	68.0000
Total Benzofluoranthene	157.0000 T	139.0000 T	95.0000 T	155.0000 T	195.0000 T	152.0000 T
Benzo(a)pyrene	60.0000	61.0000	37.0000	68.0000	86.0000	67.0000
Indeno(1,2,3-cd)pyrene	60.0000	55.0000	37.0000	59.0000	70.0000	55.0000
Dibenz(a,h)anthracene	28.0000	24.0000	19.0000 U	20.0000 U	38.0000	20.0000 U
Benzo(g,h,i)perylene	62.0000	54.0000	39.0000	60.0000	71.0000	61.0000
Total HPAH	699.0000 T	615.0000 T	400.0000 T	627.0000 T	848.0000 T	648.0000 T
PCBs (ug/kg)						
Aroclor 1016	19.0000 U	19.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U
Aroclor 1221	38.0000 U	37.0000 U	37.0000 U	40.0000 U	37.0000 U	40.0000 U
Aroclor 1232	19.0000 U	19.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

Station ID:	LWCFE-200	LWCFN-200	LWCFNE-200	LWOS004-275	LWOS006-100	LWOS006-200
Sample ID:	R-SD1-LWCFE-200-0000	R-SD1-LWCFN-200-0000	R-SD1-LWCFNE-200-0000	R-SD1-LWOS004-275-0000	R-SD1-LWOS006-100-0000	R-SD1-LWOS006-200-0000
Sample Date:	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99
Constituent						
Aroclor 1242	19.0000 U	19.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U
Aroclor 1248	19.0000 U	19.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U
Aroclor 1254	19.0000	13.0000 J	16.0000 J	22.0000	24.0000	19.0000 J
Aroclor 1260	26.0000	15.0000 J	22.0000	19.0000 J	26.0000	18.0000 J
Total PCB	45.0000 T	28.0000 JT	38.0000 JT	41.0000 JT	50.0000 T	37.0000 JT
Grain Size (%)						
<1.0 microns-Fractional % retained	1.8000	1.3000 J	1.7000	1.0000 J	1.6000 J	2.0000 J
2.0-1.0 microns-Fractional % retained	1.1000	2.4000 J	0.8000	1.4000 J	1.9000 J	1.7000 J
3.9-2.0 microns-Fractional % retained	2.6000	3.8000 J	4.2000	2.5000 J	3.0000 J	3.1000 J
7.8-3.9 microns-Fractional % retained	6.3000	7.9000 J	10.0000	5.8000 J	7.7000 J	7.4000 J
15.6-7.8 microns-Fractional % retained	22.7000	17.9000 J	25.9000	13.4000 J	17.7000 J	16.3000 J
31.0-15.6 microns-Fractional % retained	31.2000	26.2000 J	29.0000	22.2000 J	23.3000 J	25.9000 J
62.5-31.0 microns-Fractional % retained	15.9000	21.9000 J	17.9000	26.4000 J	24.8000 J	24.9000 J
Total Grain Size (Fine)	81.6000 T	81.4000 JT	89.5000 T	72.7000 JT	80.0000 JT	81.3000 JT
125-62.5 microns-Fractional % retained	9.5000	13.4000	6.8000	19.3000	11.5000	13.1000
250-125 microns-Fractional % retained	4.9000	3.0000	1.8000	4.9000	2.5000	3.2000
500-250 microns-Fractional % retained	2.6000	0.8000	0.9000	1.4000	0.8000	0.9000
1000-500 microns-Fractional % retained	1.4000	0.7000	0.7000	0.8000	0.8000	0.7000
2000-1000 microns-Fractional % retained	0.1000	0.5000	0.1000	0.7000	0.6000	0.6000
>2000 microns-Fractional % retained	0.0000	0.0000	0.0000	0.3000	4.0000	0.1000
Total Grain Size (Sand)	18.5000 T	18.4000 T	10.3000 T	27.4000 T	20.2000 T	18.6000 T
Inorganics (Total) (mg/kg)						
Aluminum	26800.0000	26800.0000	28500.0000	24200.0000	26700.0000	25200.0000
Antimony	0.1000 J	0.1000 UJ	0.2000 J	0.2000 J	0.3000 J	0.1000 UJ
Arsenic	6.0000 U	6.0000	6.0000 U	6.0000 U	5.0000 U	7.0000 U
Beryllium	0.4000	0.5000	0.5000	0.4000	0.5000	0.4000
Cadmium	0.4000	0.4000	0.3000	0.4000	0.5000	0.3000
Chromium	41.5000	39.3000	43.5000	35.6000	39.4000	37.3000
Copper	45.7000	41.4000	43.4000	39.2000	43.3000	42.1000
Iron	33400.0000	32500.0000	34500.0000	29500.0000	33200.0000	30200.0000

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

	Station ID:	LWCFE-200	LWCFN-200	LWCFNE-200	LWOS004-275	LWOS006-100	LWOS006-200
	Sample ID:	R-SD1-LWCFE-200-0000	R-SD1-LWCFN-200-0000	R-SD1-LWCFNE-200-0000	R-SD1-LWOS004-275-0000	R-SD1-LWOS006-100-0000	R-SD1-LWOS006-200-0000
Constituent	Sample Date:	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99
Lead		19.0000	14.0000	16.0000	15.0000	16.0000	14.0000
Mercury		0.0800	0.0700	0.0800	0.0600	0.0800	0.0800
Nickel		37.0000	36.0000	39.0000	31.0000	36.0000	32.0000
Selenium		6.0000 U	6.0000	8.0000	7.0000	9.0000	10.0000
Silver		0.4000 U	0.4000 U	0.3000 U	0.4000 U	0.3000 U	0.4000 U
Thallium		6.0000 U	6.0000 U	6.0000 U	6.0000 U	5.0000 U	7.0000 U
Zinc		95.7000	82.6000	85.5000	82.8000	90.0000	82.6000
Conventional Parameters							
Total Organic Carbon (%)		2.3000	2.6000	2.0000	2.6000	3.3000	2.8000

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

Station ID:	LWOS010-100	LWOS010-200	LWOS011012-100	LWOS011012-200	LWOS015016-100	LWOS015016-200
Sample ID:	R-SD1-LWOS010-100-0000	R-SD1-LWOS010-200-0000	R-SD1-LWOS011012-100-00	R-SD1-LWOS011012-200-00	R-SD1-LWOS015016-100-00	R-SD1-LWOS015016-200-00
Sample Date:	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99
Constituent						
Semi-Volatile Organic Compounds (ug/kg)						
2-Methylnaphthalene	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
bis(2-Ethylhexyl)phthalate	170.0000	250.0000	140.0000	19.0000 U	180.0000	140.0000
Carbazole	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Di-n-butylphthalate	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Dibenzofuran	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Phenol	20.0000	54.0000	20.0000 U	19.0000 U	25.0000	33.0000
Naphthalene	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Acenaphthylene	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Acenaphthene	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Fluorene	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Phenanthrene	24.0000	50.0000	28.0000	19.0000 U	54.0000	30.0000
Anthracene	20.0000 U	19.0000 U	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Total LPAH	24.0000 T	50.0000 T	28.0000 T	19.0000 UT	54.0000 T	30.0000 T
Fluoranthene	50.0000	110.0000	70.0000	19.0000 U	100.0000	57.0000
Pyrene	48.0000	100.0000	64.0000	19.0000 U	110.0000	65.0000
Benzo(a)anthracene	21.0000	48.0000	28.0000	19.0000 U	53.0000	26.0000
Chrysene	41.0000	87.0000	46.0000	19.0000 U	81.0000	52.0000
Benzo(b)fluoranthene	39.0000	110.0000	54.0000	19.0000 U	62.0000	39.0000
Benzo(k)fluoranthene	38.0000	81.0000	39.0000	19.0000 U	74.0000	53.0000
Total Benzofluoranthene	77.0000 T	191.0000 T	93.0000 T	19.0000 UT	136.0000 T	92.0000 T
Benzo(a)pyrene	33.0000	78.0000	41.0000	19.0000 U	67.0000	38.0000
Indeno(1,2,3-cd)pyrene	29.0000	72.0000	37.0000	19.0000 U	49.0000	33.0000
Dibenz(a,h)anthracene	20.0000 U	35.0000	20.0000 U	19.0000 U	20.0000 U	20.0000 U
Benzo(g,h,i)perylene	30.0000	79.0000	48.0000	19.0000 U	53.0000	35.0000
Total HPAH	329.0000 T	800.0000 T	427.0000 T	19.0000 UT	649.0000 T	398.0000 T
PCBs (ug/kg)						
Aroclor 1016	20.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U	19.0000 U
Aroclor 1221	40.0000 U	39.0000 U	40.0000 U	35.0000 U	40.0000 U	37.0000 U
Aroclor 1232	20.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U	19.0000 U

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Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

	Station ID:	LWOS010-100	LWOS010-200	LWOS011012-100	LWOS011012-200	LWOS015016-100	LWOS015016-200
	Sample ID:	R-SD1-LWOS010-100-0000	R-SD1-LWOS010-200-0000	R-SD1-LWOS011012-100-00	R-SD1-LWOS011012-200-00	R-SD1-LWOS015016-100-00	R-SD1-LWOS015016-200-00
Constituent	Sample Date:	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99
Aroclor 1242		20.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U	19.0000 U
Aroclor 1248		20.0000 U	19.0000 U	20.0000 U	18.0000 U	20.0000 U	19.0000 U
Aroclor 1254		14.0000 J	18.0000 J	36.0000	18.0000 U	16.0000 J	10.0000 J
Aroclor 1260		13.0000 J	20.0000	34.0000	18.0000 U	16.0000 J	10.0000 J
Total PCB		27.0000 JT	38.0000 JT	70.0000 T	35.0000 JT	32.0000 JT	20.0000 JT
Grain Size (%)							
<1.0 microns-Fractional % retained		1.5000 J	0.0000 J	1.7000 J	0.1000 J	1.2000 J	1.9000 J
2.0-1.0 microns-Fractional % retained		0.5000 J	5.6000 J	1.8000 J	0.1000 J	0.4000 J	1.5000 J
3.9-2.0 microns-Fractional % retained		2.6000 J	0.4000 J	3.2000 J	0.1000 J	2.7000 J	9.2000 J
7.8-3.9 microns-Fractional % retained		3.1000 J	9.7000 J	7.4000 J	0.7000 J	5.5000 J	1.8000 J
15.6-7.8 microns-Fractional % retained		7.5000 J	19.3000 J	16.2000 J	0.8000 J	12.6000 J	16.3000 J
31.0-15.6 microns-Fractional % retained		13.9000 J	30.8000 J	27.1000 J	1.4000 J	19.0000 J	18.5000 J
62.5-31.0 microns-Fractional % retained		35.8000 J	18.6000 J	23.9000 J	2.0000 J	26.5000 J	32.9000 J
Total Grain Size (Fine)		64.9000 JT	84.4000 JT	81.3000 JT	5.2000 JT	67.9000 JT	82.1000 JT
125-62.5 microns-Fractional % retained		29.5000	10.3000	14.3000	4.0000	23.4000	12.1000
250-125 microns-Fractional % retained		4.5000	2.6000	2.8000	22.8000	7.1000	3.5000
500-250 microns-Fractional % retained		0.6000	1.6000	0.7000	52.1000	0.8000	1.0000
1000-500 microns-Fractional % retained		0.3000	0.7000	0.5000	11.5000	0.6000	0.8000
2000-1000 microns-Fractional % retained		0.2000	0.6000	0.3000	0.9000	0.2000	0.5000
>2000 microns-Fractional % retained		0.0000	0.1000	0.1000	3.5000	0.0000	0.0000
Total Grain Size (Sand)		35.1000 T	15.9000 T	18.7000 T	94.8000 T	32.1000 T	17.9000 T
Inorganics (Total) (mg/kg)							
Aluminum		21600.0000	27000.0000	27300.0000	15900.0000	24900.0000	28300.0000
Antimony		0.1200 J	0.2000 J	0.2000 J	0.0700 J	0.2000 J	0.2000 J
Arsenic		4.0000	6.0000	6.0000 U	3.0000 U	6.0000 U	6.0000 U
Beryllium		0.3600	0.4000	0.5000	0.2300	0.4000	0.5000
Cadmium		0.3000	0.4000	0.5000	0.1000	0.6000	0.3000
Chromium		33.0000	38.9000	41.4000	21.7000	37.5000	41.6000
Copper		31.2000	44.0000	40.9000	19.3000	39.4000	42.9000
Iron		29100.0000	32300.0000	32800.0000	21400.0000	30400.0000	31800.0000

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Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

Station ID:	LWOS010-100	LWOS010-200	LWOS011012-100	LWOS011012-200	LWOS015016-100	LWOS015016-200
Sample ID:	R-SD1-LWOS010-100-0000	R-SD1-LWOS010-200-0000	R-SD1-LWOS011012-100-00	R-SD1-LWOS011012-200-00	R-SD1-LWOS015016-100-00	R-SD1-LWOS015016-200-00
Sample Date:	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99	08/11/99
Constituent						
Lead	9.0000	15.0000	15.0000	3.0000	15.0000	12.0000
Mercury	0.0600	0.0800	0.0600	0.0200	0.0600	0.0800
Nickel	29.1000	34.0000	37.0000	21.0000	34.0000	36.0000
Selenium	5.0000	8.0000	9.0000	4.0000	6.0000 U	8.0000
Silver	0.2000 U	0.3000 U	0.4000 U	0.2000 U	0.3000 U	0.3000 U
Thallium	4.0000 U	5.0000 U	6.0000 U	3.0000 U	6.0000 U	6.0000 U
Zinc	62.1000	86.0000	82.0000	43.5000	135.0000	81.1000
Conventional Parameters						
Total Organic Carbon (%)	1.6000	2.8000	1.9000	0.2300	2.0000	2.2000

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

	Station ID:	LWOS015016W-200
	Sample ID:	R-SD1-LWOS015016W-200-0
	Sample Date:	08/11/99
Constituent		
Semi-Volatile Organic Compounds (ug/kg)		
2-Methylnaphthalene		19.0000 U
bis(2-Ethylhexyl)phthalate		130.0000
Carbazole		19.0000 U
Di-n-butylphthalate		19.0000 U
Dibenzofuran		19.0000 U
Phenol		25.0000
Naphthalene		19.0000 U
Acenaphthylene		19.0000 U
Acenaphthene		19.0000 U
Fluorene		19.0000 U
Phenanthrene		56.0000
Anthracene		32.0000
Total LPAH		88.0000 T
Fluoranthene		120.0000
Pyrene		140.0000
Benzo(a)anthracene		100.0000
Chrysene		200.0000
Benzo(b)fluoranthene		110.0000
Benzo(k)fluoranthene		180.0000
Total Benzofluoranthene		290.0000 T
Benzo(a)pyrene		140.0000
Indeno(1,2,3-cd)pyrene		89.0000
Dibenz(a,h)anthracene		42.0000
Benzo(g,h,i)perylene		92.0000
Total HPAH		1213.0000 T
PCBs (ug/kg)		
Aroclor 1016		19.0000 U
Aroclor 1221		38.0000 U
Aroclor 1232		19.0000 U

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

Constituent	Station ID:	LWOS015016W-200
	Sample ID:	R-SD1-LWOS015016W-200-0
	Sample Date:	08/11/99
Aroclor 1242		19.0000 U
Aroclor 1248		19.0000 U
Aroclor 1254		12.0000 J
Aroclor 1260		13.0000 J
Total PCB		25.0000 JT
Grain Size (%)		
<1.0 microns-Fractional % retained		0.5000
2.0-1.0 microns-Fractional % retained		0.4000
3.9-2.0 microns-Fractional % retained		0.9000
7.8-3.9 microns-Fractional % retained		2.1000
15.6-7.8 microns-Fractional % retained		4.4000
31.0-15.6 microns-Fractional % retained		8.2000
62.5-31.0 microns-Fractional % retained		14.6000
Total Grain Size (Fine)		31.1000 T
125-62.5 microns-Fractional % retained		34.0000
250-125 microns-Fractional % retained		28.9000
500-250 microns-Fractional % retained		3.4000
1000-500 microns-Fractional % retained		1.4000
2000-1000 microns-Fractional % retained		0.9000
>2000 microns-Fractional % retained		0.2000
Total Grain Size (Sand)		68.8000 T
Inorganics (Total) (mg/kg)		
Aluminum		21500.0000
Antimony		0.1200 J
Arsenic		5.0000 U
Beryllium		0.3500
Cadmium		0.3000
Chromium		31.8000
Copper		31.8000
Iron		26200.0000

A blank cell indicates analysis was not performed or the result was rejected during validation.

Boeing Renton RI - Nearshore Sediment Sample Results from August 1999

	Station ID:	LWOS015016W-200
	Sample ID:	R-SD1-LWOS015016W-200-0
	Sample Date:	08/11/99
Constituent		
Lead		11.0000
Mercury		0.0400
Nickel		29.3000
Selenium		5.0000 U
Silver		0.3000 U
Thallium		5.0000 U
Zinc		67.4000
Conventional Parameters		
Total Organic Carbon (%)		1.7000

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