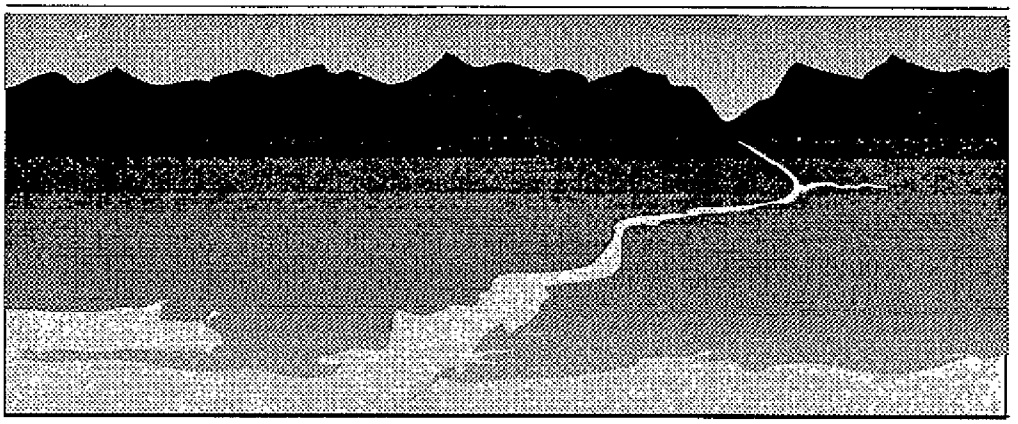
LOWER COLUMBIA RIVER



BI-STATE PROGRAM

RECONNAISSANCE SURVEY OF THE LOWER COLUMBIA RIVER

CRUISE REPORT

NOVEMBER 27, 1991

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Draft Report

LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY: CRUISE REPORT

by

Tetra Tech, Inc.

in association with

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for

The Lower Columbia River Bi-State Program

27 November 1991

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1.0 INTRODUCTION

This report summarizes the results of a reconnaissance survey of the lower Columbia River, conducted from September 23 to November 19, 1991. The study was conducted for the Lower Columbia River Bi-State Water Quality Program (Bi-State Program), which was formed at the direction of the Washington and Oregon State legislatures. The states entered into an Interstate Agreement that directs a four-year water quality program to characterize water quality in the lower Columbia River, identify water quality problems, determine whether beneficial uses are impaired, and develop solutions to problems found in the river below Bonneville Dam. This reconnaissance survey represents the first field investigation under the Bi-State Program.

The lower Columbia River reconnaissance survey had several objectives:

- Provide an initial characterization of levels of contaminants in water, sediment, and tissue.
- Fill data gaps.
- Tentatively identify problem areas.
- Collect data to make recommendations for future studies.

The sampling efforts included in the reconnaissance survey were designed to collect sediment and benthic infaunal samples at 54 stations, water column samples at 45 stations, and fish and crayfish tissue samples at 20 and 18 stations, respectively. The design and rationale for the sampling efforts are described in the sampling plan (Tetra Tech 1991a) and the quality assurance/quality control (QA/QC) plan (Tetra Tech 1991b).

The reconnaissance survey was divided into five distinct field sampling efforts:

- Water, Sediment, and Benthic Infauna Sampling Effort: Briefly, the sediment, benthos, and most water samples were collected from September 23 to October 12, 1991 from the RV BRENDAN D II, a 36 ft. fiberglass hull fishing vessel which had

been converted to a research vessel. All water samples, exclusive of the six water stations analyzed for bacteria, were collected on this cruise segment.

- Bacterial Sampling Effort: Shore-based water sampling of six bacterial stations were collected on five different occasions between October 15 and November 14, 1991.

- Crayfish Sampling Effort: Crayfish were collected from 18 stations within the study area between September 24 and October 1, 1991, from the RV Humpy, an 18 ft. Bayliner.

- Carp, Suckers, and Peamouth Sampling Effort: These three species of fish were collected by electrofishing and gill nets on 15 different days between October 14 and November 19, 1991 from a 17 ft. research vessel.

- White Sturgeon Sampling Effort: Tissue samples from 16 white sturgeon were collected from commercial fishermen between September 30 and October 30, 1991.

This cruise report documents the results of the reconnaissance sample collection efforts. It compares actual procedures to those proposed in the sampling plan and discusses any modifications to the sampling plan that were necessary during the sample collection effort. The sample collection efforts are summarized separately for each of the five cruises. Each summary contains a synopsis of events, including details which were not provided in the sampling plan. For reference purposes, the proposed and actual station locations for the water sampling efforts are provided in Figures 1-4. Proposed and actual station locations for sediment and biota sampling efforts are provided in Figures 5-8.

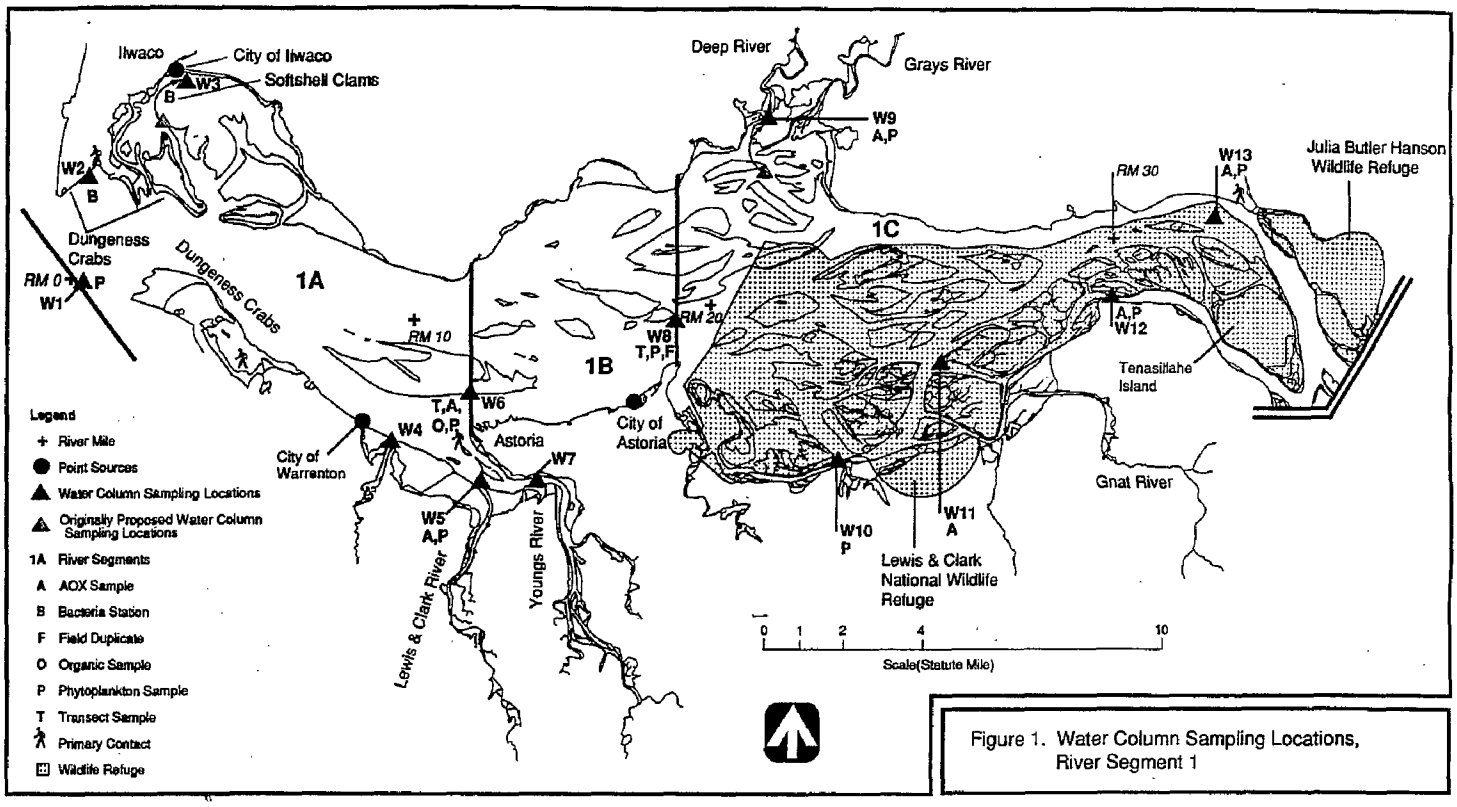

Figure 1. Water Column Sampling Locations, River Segment 1

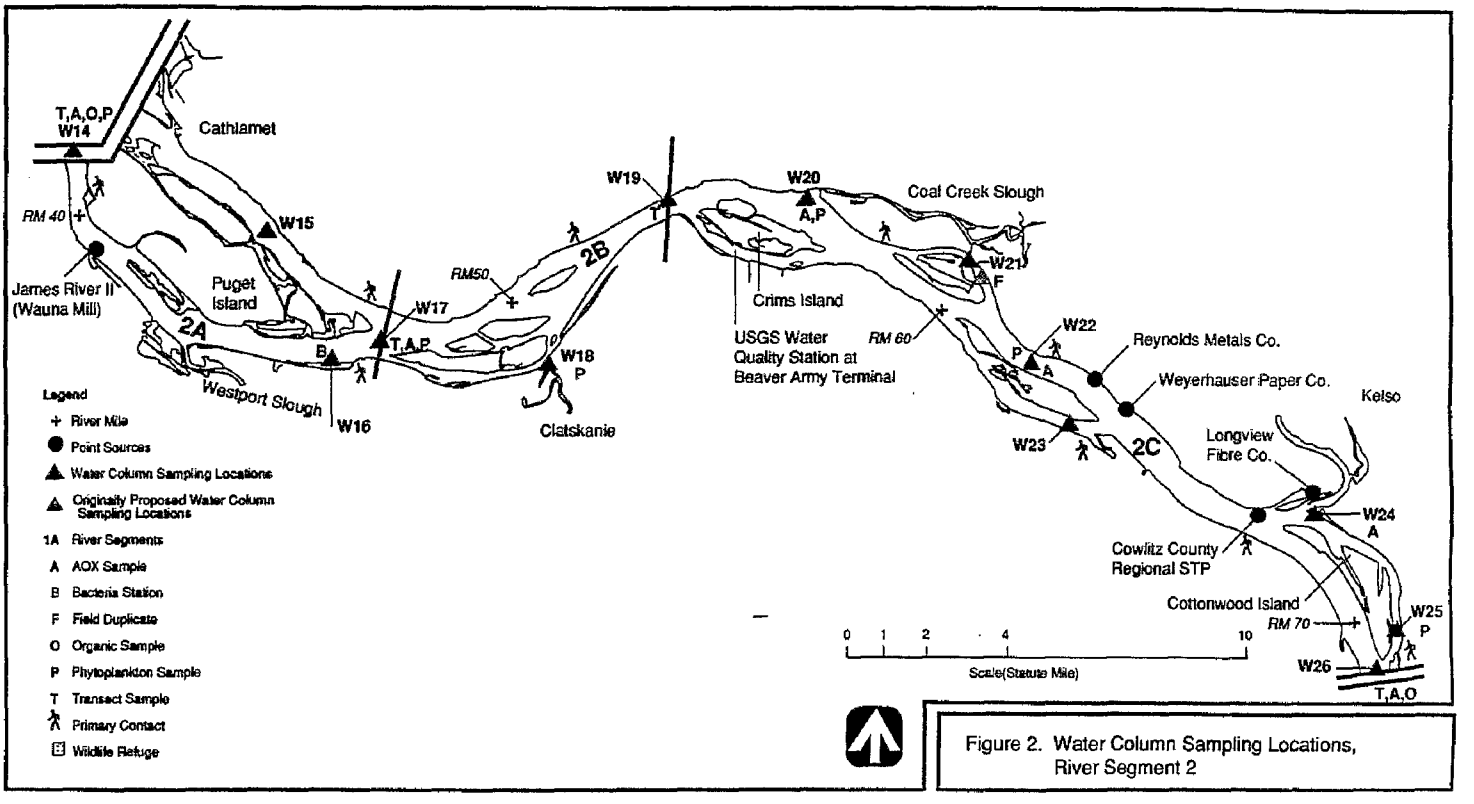

Figure 2. Water Column Sampling Locations, River Segment 2

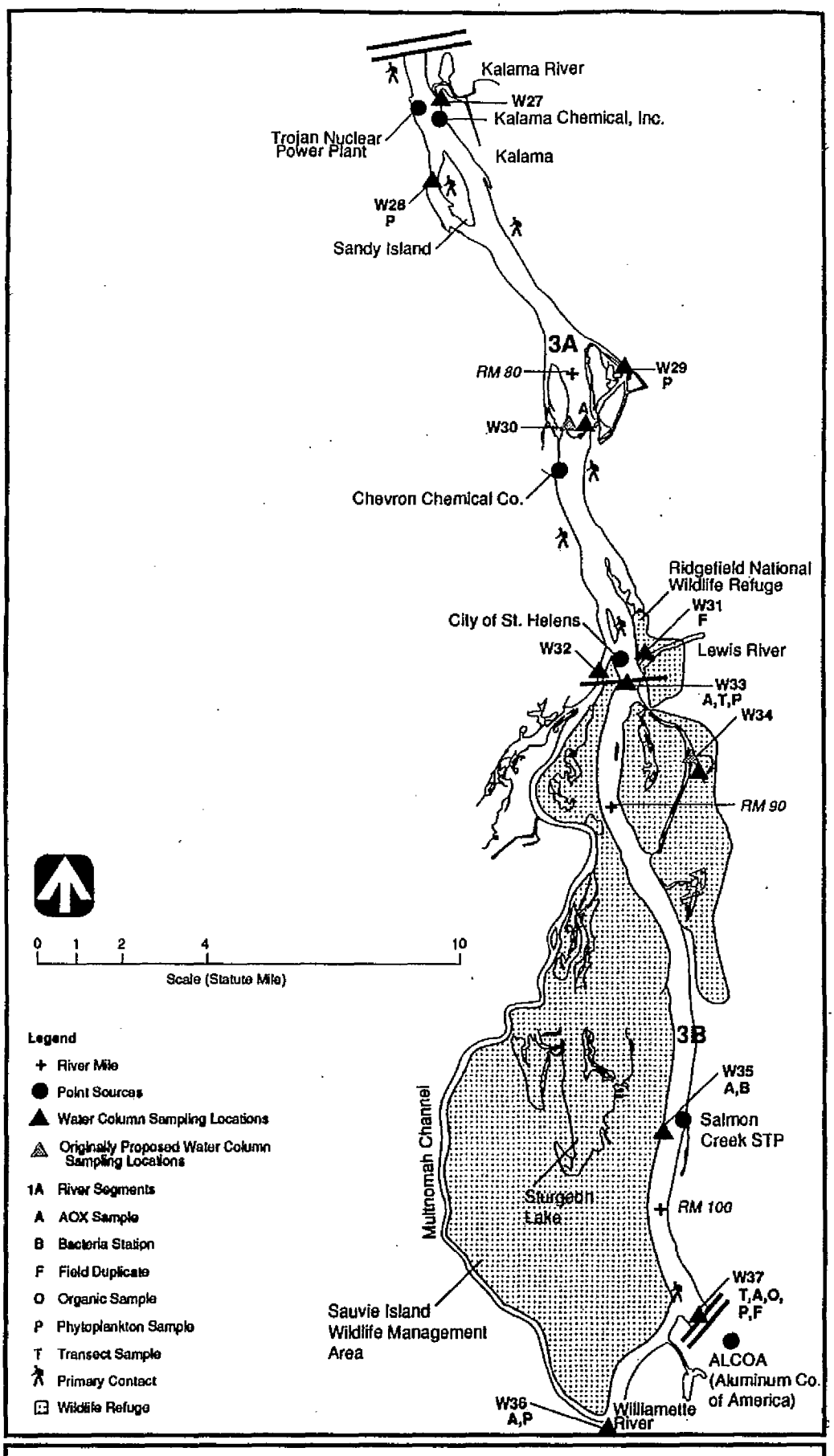

Figure 3. Water Column Sampling Locations, River Segment 3

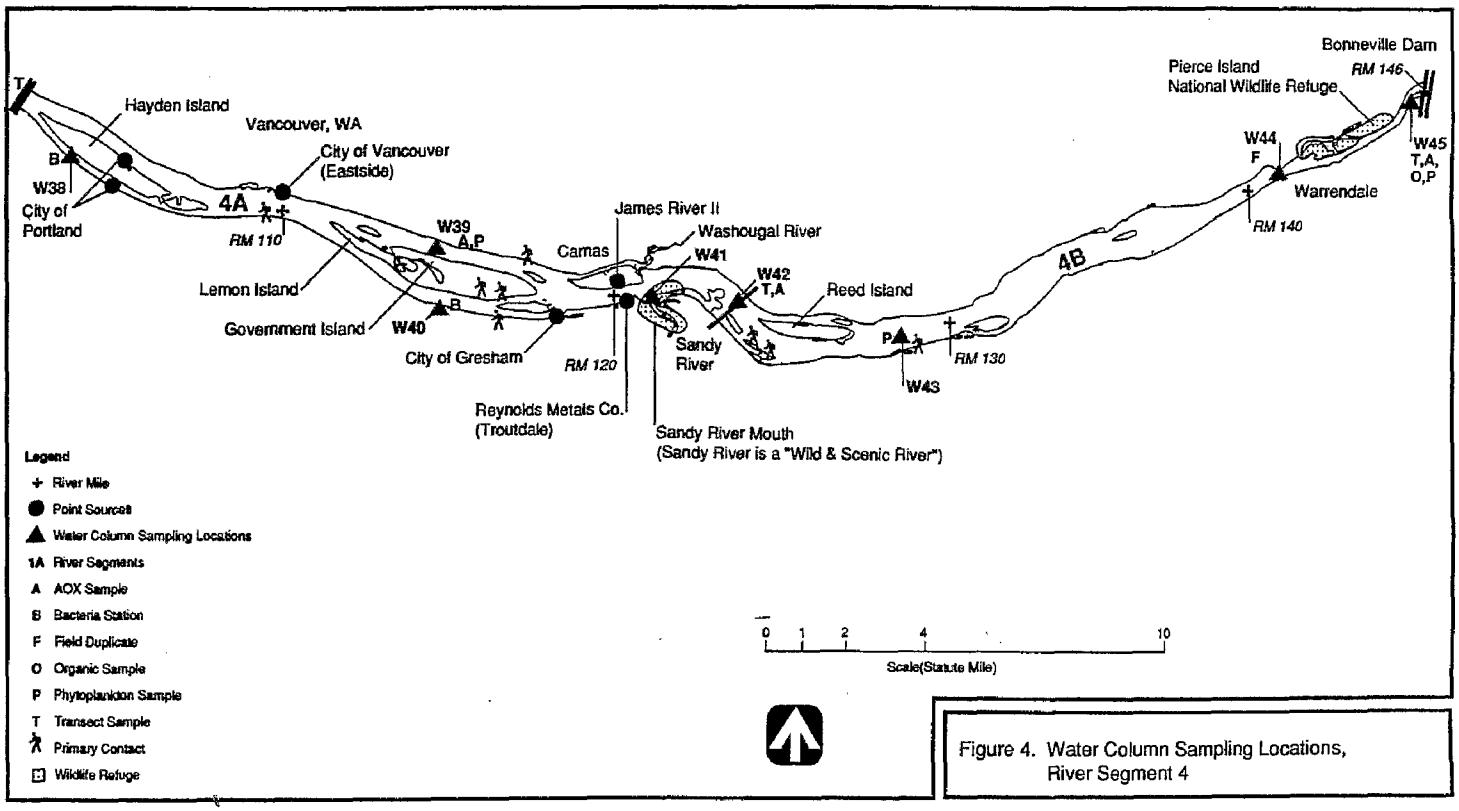

Figure 4. Water Column Sampling Locations, River Segment 4

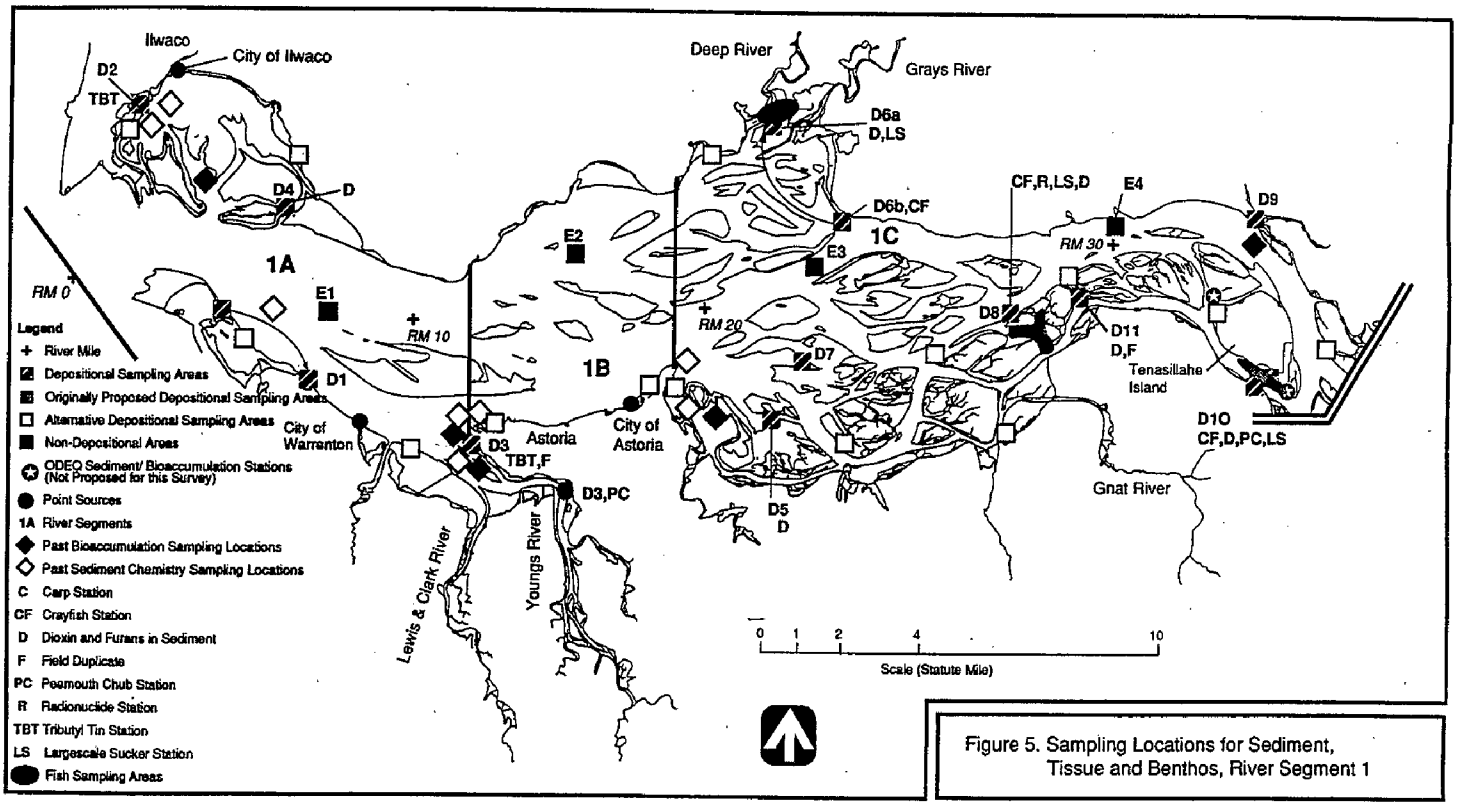

Figure 5. Sampling Locations for Sediment, Tissue and Benthos, River Segment 1

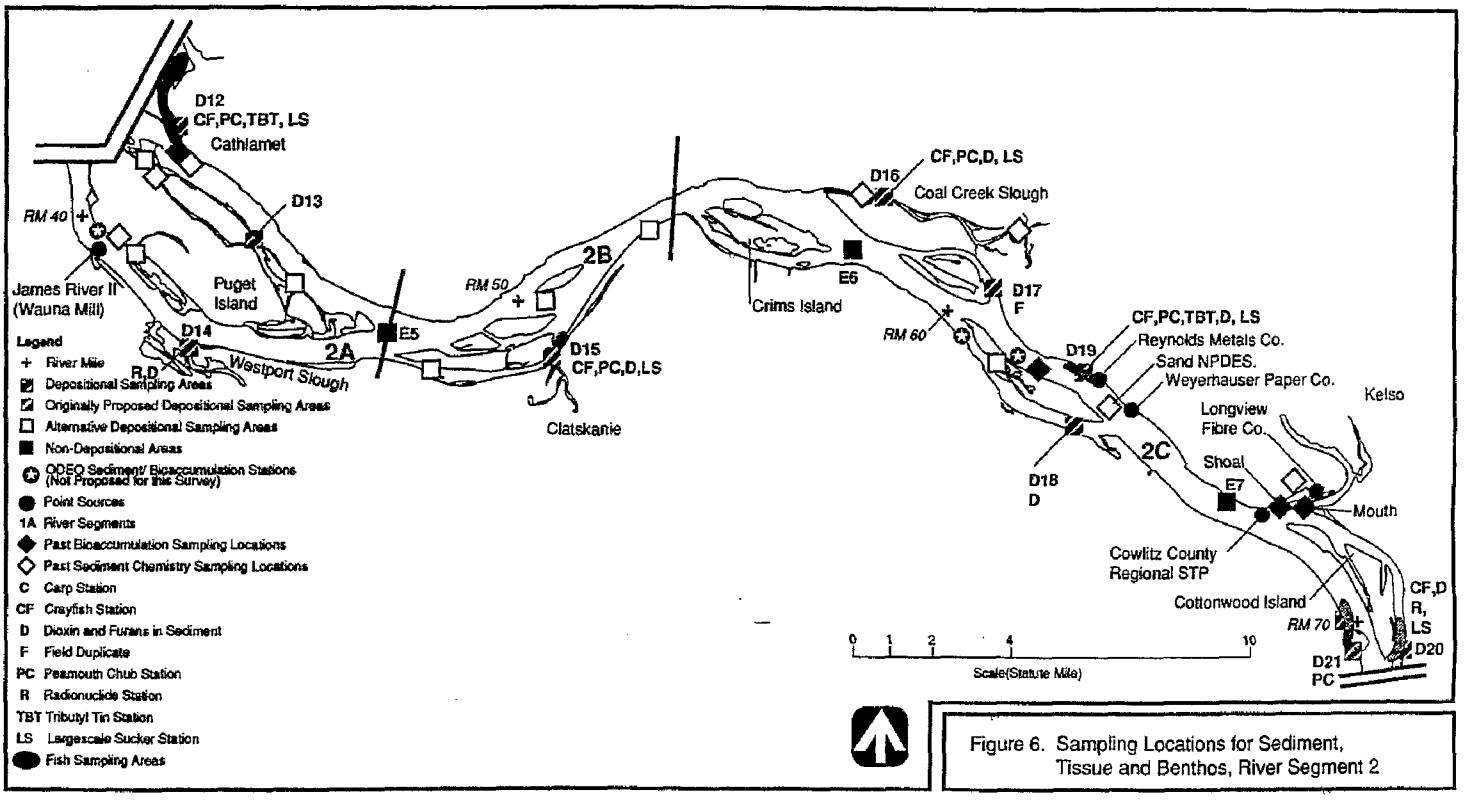

Figure 6. Sampling Locations for Sediment, Tissue and Benthos, River Segment 2

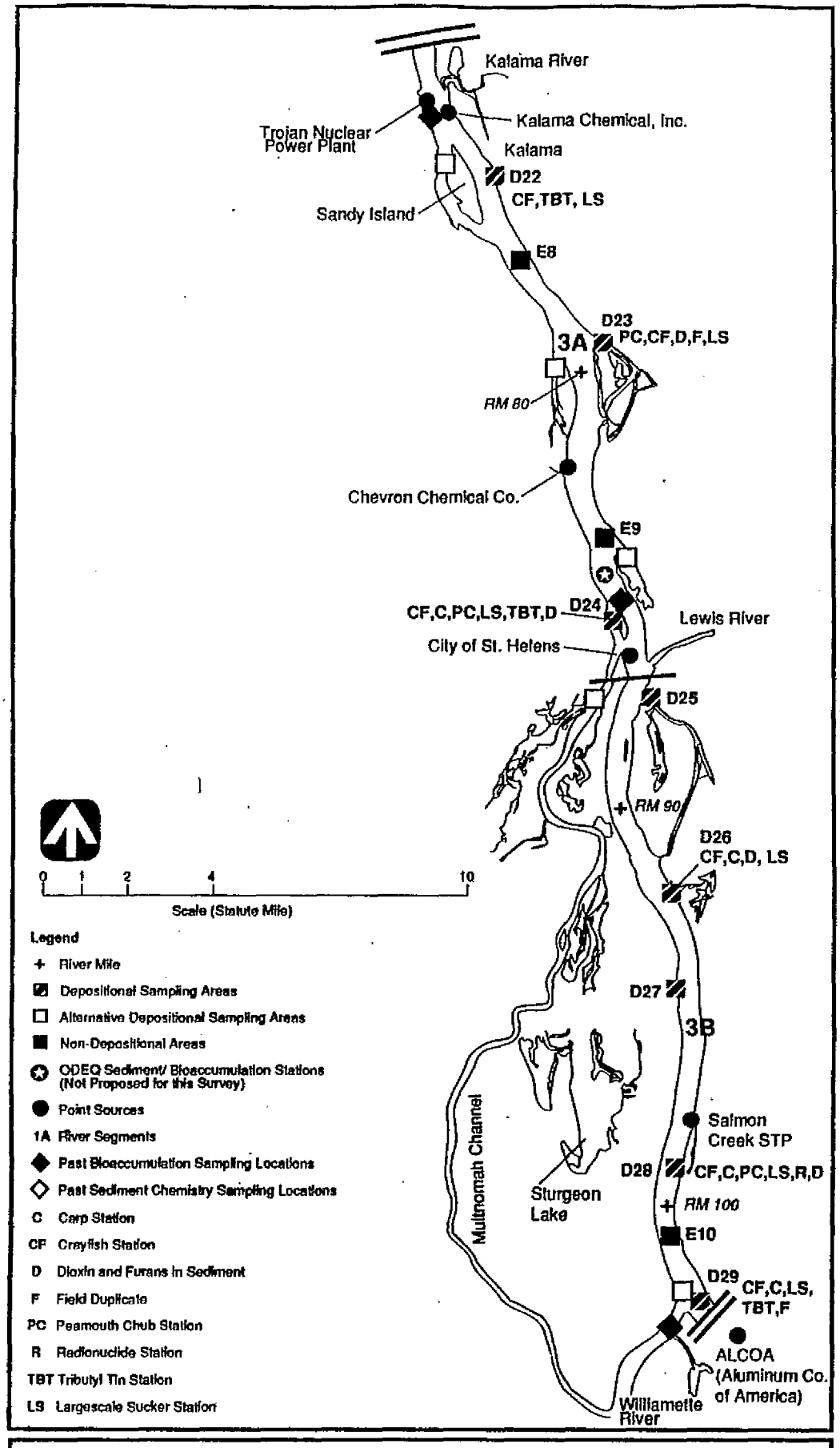

Figure 7. Sampling Locations for Sediment, Tissue and Benthos, River Segment 3

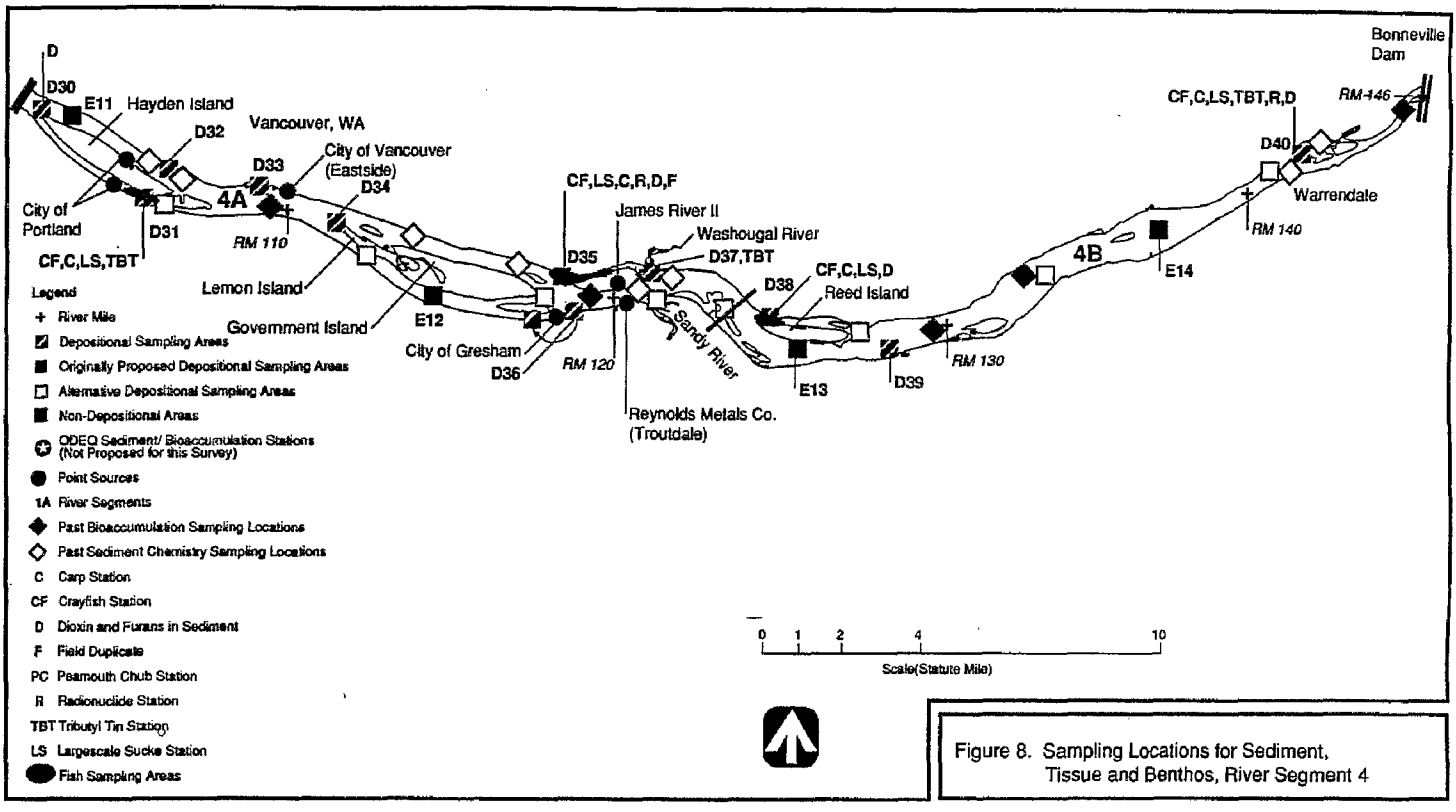

Figure 8. Sampling Locations for Sediment, Tissue and Benthos, River Segment 4

2.0 WATER, SEDIMENT, AND BENTHOS SAMPLING EFFORT

Water, sediment, and benthic infauna sampling objectives, procedures, and locations have been detailed in Sections 4.0 and 5.0 of the final sampling plan (Tetra Tech 1991a). All proposed and actual station locations are illustrated in Figures 1-8.

The navigational system that was used for this study was the Global Positioning System (GPS). GPS is a radio navigation system that calculates and displays position information obtained from orbiting satellites. The GPS system that was used for this survey was the Magnavox MX 200 GPS Navigator System. Position information is displayed as latitude and longitude, in either degrees and decimal minutes, or degrees, minutes, and seconds format. This system has a horizontal root mean square accuracy of 15 m. the accuracy of the GPS signal is sometimes lessened to about 100 m by Selective Availability, a Department of Defense program that denies full GPS accuracy to non-military users by introducing algorithms that alter satellite radio signals. At the present time, however, Selective Availability is not known to be in effect and was not applied during this survey. However, this fact must be confirmed before the navigation system used for this survey can be assumed to have an accuracy of approximately 15 m.

2.1 SYNOPSIS OF EVENTS

The collection of water, sediment, and benthic samples took place aboard the R/V BRENDAN D II. from September 23 to October 12, 1991. All of the 54 sediment and benthic stations and 45 water stations described in the sampling plan (Tetra Tech 1991a) were occupied successfully. Tables 1 and 2 summarize the location, depth, date and time of occupation, and samples collected at each water and sediment/benthic station, respectively.

Further details of the cruise are provided in Appendix A, which includes a synopsis of daily events, the cruise log, station location logs, sample description logs, and summary sampling logs. The cruise log provides a chronology of events during the cruise, as well as navigation notes, weather conditions, and other information not provided in the summary tables. The station location logs provide details of the position of each station,

TABLE 1. SUMMARY OF WATER COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/[a] Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[b]	Notes
W1	0	46-14.86N 124-05.776W	10-8-91 0855-0935	21.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	
W2	2	46-16-50.1N 124-03-36.8W	10-15-91 1300	0.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Bac	Sampled by hand from shoreline
W3	3	46-18-09.9N 124-02-12.4W	10-15-91 1440	0.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Bac	Sampled by hand from shoreline
W4	11	46-10.805N 123-54.543W	10-10-91 0800-0830	6.8	T, Con, pH, Tur, Met, CN, Nut, Flu	Additional DO measurement made on 10-11-91
W5	13	46-09.648N 123-51.333W	10-9-91 0835-0855	4.2	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	pH measured for composite collected on 10-11-91 3 bottles collected due to shallow depth
W6	13	46-11.64N 123-51.16W	10-10-91 0920-0950	16.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX, BNA, Pest, Vol, TOC	Oregon side transect station
		46-14.60N 123-51.94W	10-10-91 1120-1145	20.0		Washington side
		46-13.67N 123-52.06W	10-10-91 1150-1215	3.0		Center towards Washington side 3 bottles collected due to shallow depth
W7	13	46-10.106N 123-50.337W	10-9-91 0920-0940	10.0	T, Con, pH, Tur, Met, CN, Nut, Flu	pH measured for composite sample collected on 10-11-91
W8/W50	19	46-16.30N 123-46.20W	10-10-91 1605-1635	19.6	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	Transect and duplicate station
		46-13.24N 123-45.75W	10-10-91 1745-1815	15.5		
		46-13.94N 123-45.42W	10-10-91 1820-1850	6.5		
W9	22	46-17.935N 123-43.108W	10-10-91 1500-1530	4.8	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	3 bottles collected due to shallow depth

TABLE 1. SUMMARY OF WATER COLLECTION RESULTS
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Station Number	River Mile	Latitude/[a] Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[b]	Notes
W10	23	46-10.824N 123-40.384W	10-11-91 1110-1130	9.2	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	
W11	27	46-13.343N 123-37.256W	10-12-91 1330-1345	7.2	T, Con, pH, Tur, Met, CN, Nut, Flu, AOX	
W12	31	46-14.259N 123-31.296W	10-7-91 1400-1420	6.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	
W13	33	46-15.917N 123-28.511W	10-11-91 1740-1800	9.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	
W14	38	46-12.900N 123-25.117W	10-6-91 1530-1550	6.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX, BNA, Pest, Vol, TOC	Carbuoy blanks for BNA and TOC transect station; Washington side
		46-12.497N 123-25.572W	10-6-91 1600-1620	13.5		Center
		46-12-14N 123-26.03W	10-6-91 1630-1650	7.5		Oregon side
W15	44	46-10.93N 123-21.14W	10-6-91 1025-1045	16.0	T, Con, pH, Tur, Met, CN, Nut, Flu	
W16	45	46-08-21.2N 123-19-07.4W	10-15-91 1755	0.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Bac, AOX	Sampled by hand from shoreline
W17	47	46-09.89N 123-17.64W	10-6-91 1125-1145	6.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	Transect station; Washington side
		46-08.68N 123-17.74W	10-6-91 1155-1215	13.5		Center
		46-08.55N 123-17.75W	10-6-91 1225-1245	10.5		Oregon side
W18	50	46-09.235N 123-13.707W	10-5-91 1805-1825	4.6	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	3 bottles collected due to shallow depth

TABLE 1. SUMMARY OF WATER COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/[a] Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[b]	Notes
W19	54	46-10.922N 123-11.136W	10-5-91 1000-1030	18.0	T, Con, pH, Tur, Met, CN, Nut, Flu	Transect station
		46-10.99N 123-11.18W	10-5-91 1040-1100	18.0		
		46-11.04N 123-11.13W	10-5-91 1110-1130	17.0		
W20	56	46-11.39N 123-06.91W	10-4-91 1620-1640	7.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	
W21/W49	60	46-10.12N 123-03.04W	10-4-91 1125-1155	8.0	T, Con, pH, Tur, Met, CN, Nut, Flu	Duplicate sample collected; station moved down slough adjacent to piers
W22	62	46-08.529N 123-01.953W	10-3-91 1450-1520	15.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	
W23	63	46-07.255N 123-00.287W	10-3-91 1340-1415	4.5	T, Con, pH, Tur, Met, CN, Nut, Flu	3 bottles collected due to shallow depth
W24	68	46-05.67N 122-55.05W	10-3-91 0945-0955	1.5	T, Con, pH, Tur, Met, CN, Nut, Flu, AOX	Sampled Cowlitz River water 3 bottles collected one at a time due to shallow depth
W25	71	46-04.040N 122-52.225W	10-3-91 0900-0930	5.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	3 bottles collected due to shallow depth
W26/W52	72	46-02.823N 122-52.948W	10-2-91 1310-1325	14.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, AOX, BNA, Pest, Vol, TOC	Transect and duplication station; no duplicate for TOC
		46-02.844N 122-52.817W	10-2-91 1330-1350	13.0		
		46-02.844N 122-52.691W	10-2-91 1405-1425	13.0		
W27	73	46-02.185N 122-52.554W	10-2-91 1025-1045	3.5	T, Con, pH, Tur, Met, CN, Nut, Flu	3 bottles collected due to shallow depth

TABLE 1. SUMMARY OF WATER COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/[a] Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[b]	Notes
W28	75	46-00.553N 122-52.320W	10-1-91 1645-1715	22.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	Possible DO meter malfunction
W29	80	45-56.863N 122-47.206W	10-1-91 1205-1235	6.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	
W30/W48	81	45-56.313N 122-48.278W	10-1-91 1050-1130	15.0	T, Con, pH, Tur, Met, CN, Nut, Flu, AOX	Station moved mid-channel; duplicate sample collected
W31	87	45-51.19N 122-46.89W	9-30-91 1520-1545	3.4	T, Con, pH, Tur, Met, CN, Nut, Flu	3 bottles collected due to shallow depth
W32	88	45-50.92N 122-47.86W	9-30-91 1255-1315	17.0	T, Con, pH, Tur, Met, CN, Nut, Flu	N,P,hardness sample may have diluted sulfuric acid preservative
W33	88	45-50.878N 122-47.211W	9-30-91 1135-1140	12.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	Transect station Oregon side; Turbidimeter disabled
		45-50.91N 122-47.90W	9-30-91 1155-1210	15.9		Main channel
		45-50.91N 122-47.01W	9-30-91 1225-1235	16.0		Washington side
W34	91	45-49.25N 122-45.25W	9-30-91 1435-1455	4.5	T, Con, pH, Tur, Met, CN, Nut, Flu	Station moved up Lake River, adjacent to ferry dock 3 bottles collected due to shallow depth
W35	98	45-42-23.6N 122-46-20.0W	10-16-91 1045	0.4	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Bac	
W36	102	45-36.381N 122-47.047W	9-28-91 1600-1620	15.0	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	

TABLE 1. SUMMARY OF WATER COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/[a] Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[b]	Notes
W37/W47	102	45-39.016N 122-45.525W	9-28-91 1250-1315	18.2	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX, BNA, Pest, Vol, TOC	Transect and carbuoy blank Oregon side
		45-39.106N 122-45.416W	9-28-91 1330-1355	18.1		Main channel
		45-39.180N 122-45.295W	9-28-91 1400-1420	11.3		Washington side
W38	104	45-38-02.5N 122-44-25.6W	10-16-91 1315	0.4	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Bac	
W39	114	45-35.09N 122-30.71W	9-27-91 1000-1020	8.5	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX	
W40	115	45-33-50.0N 122-30-41.0W	10-16-91 1425	0.4	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Bac	
W41/W51	121	45-34.011N 122-24.507W	9-23-91 1310-1420	11.0	T, Con, pH, Tur, Met, CN, Nut, Flu	Station moved downstream of Sandy River mouth; Turbidimeter may have been calibrated incorrectly; carbuoy blank taken
W42	125	45-33.831N 122-20.890W	9-25-91 1140-1145	4.1	T, Con, pH, Met, CN, Nut, Flu, AOX	Transect station; turbidimeter disabled
		45-33.868N 122-20.776W	9-25-91 1200-1210	6.7		
		45-33.920N 122-20.662W	9-25-91 1230-1240	11.9		
W43	129	45-32.744N 122-15.574W	9-24-91 1510-1615	8.8	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy	Turbidimeter may have been calibrated incorrectly
W44/W46	141	45-36.844N 122-01.582W	9-26-91 1110-1130	14.0	T, Con, pH, Tur, Met, CN, Nut, Flu	Duplicate sample collected; station moved to mid-channel

TABLE 1. SUMMARY OF WATER COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/[a] Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[b]	Notes
W45	146	45-38.32N 121-57.40W	9-26-91 0805-0810	8.9	T, Con, pH, DO, Tur, Met, CN, Nut, Flu, Phy, AOX, BNA, Pest, Vol, TOC	Transect station; turbidimeter may have been calibrated incorrectly
		45-38.34N 121-57.47W	9-26-91 0835-0840	8.1		
		45-38.39N 121-57.49W	9-26-91 0910-0915	8.2		

[a] Coordinates given are the locations at which water samples were collected. Positions of CTD and DO probe casts were slightly different.

[b] The key to samples collected is as follows:

T = Temperature
Con = Conductivity
pH = pH
Tur = Turbidity
Met = Metals
CN = Cyanide
Nut = Nutrients and hardness
Flu = Fluoride and total suspended solids (TSS)
Phy = Phytoplankton
AOX = Acid absorbable halides
Bac = Bacteria
BNA = Base/neutral/acid-extractable organics
Pest = Pesticides and PCBs
Vol = Volatile organics
TOC = Total organics carbon

TABLE 2. SUMMARY OF SEDIMENT AND BENTHIC INFUANA COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/ Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[a]	Notes
D1	6	46-12.274N 123-56.986W	10-8-91 1400-1530	2.6	Met, BNA, Pest, TOC, GS, AVS, Ben	Station moved inside Hammond Moorage
D2	2	46-18.042N 124-02.494W	10-8-91 1030-1115	5.4	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben	
E1	9	46-13.524N 123-56.303W	10-8-91 1630-1700 (Ben) 10-9-91 1120-1145 (Chem)	5.6	Met, BNA, Pest, TOC, GS, AVS, Ben	Chemistry and benthic samples collected on different days
D3/D46	12	46-10.90N 123-51.72W	10-9-91 1255-1350	2.1	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben	Duplicate sample collected
D4	5	46-15.981N 123-58.261W	10-8-91 1220-1310	2.4	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	
E2	17	46-14.836N 123-48.510W	10-9-91 1555-1635	8.0	Met, BNA, Pest, TOC, GS, AVS, Ben	
D5	20	46-11.638N 123-42.104W	10-11-91 1200-1230	1.5	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	
D6	23	46-17.882N 123-43.113W	10-10-91 1300-1350	1.8	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	
E3	22	46-15.014N 123-41.261W	10-11-91 1530-1615	15.0	Met, BNA, Pest, TOC, GS, AVS, Ben	Oil globules in grab samples
D7	22	46-13.019N 123-41.505W	10-11-91 1340-1410	1.8	Met, BNA, Pest, TOC, GS, AVS, Ben	500 yd north of McGregor Island
D8	27	46-13.695N 123-35.223W	10-12-91 1210-1245	2.1	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox, Rad	Sampling took place on other side of channel from crayfish buoy
E4	30	46-15.976N 123-32.037W	10-12-91 0940-1030	15.0	Met, BNA, Pest, TOC, GS, AVS, Ben	Bald eagle sighted on shore
D9	34	46-16.14N 123-27.34W	10-12-91 0805-0910	1.5	Met, BNA, Pest, TOC, GS, AVS, Ben	

TABLE 2. SUMMARY OF SEDIMENT AND BENTHIC INFUANA COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/ Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[a]	Notes
D10	37	46-12.198N 123-26.639W	10-7-91 1000-1115	1.6	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	Sampling took place on other side of channel from crayfish buoy
D11/D45	28	46-14.49N 123-32.91W	10-7-91 1240-1345	1.8	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	Duplicate sample collected 4 grab samples composited
D12	40	46-12.463N 123-23.375W	10-7-91 0815-0910	3.4	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben	5 grab samples composited
D13	43	46-09.78N 123-20.14W	10-6-91 0840-0950	4.6	Met, BNA, Pest, TOC, GS, AVS, Ben	
D14	37	46-08.914N 123-23.424W	10-6-91 1310-1400	10.0	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox, Rad	
E5	46	46-09.535N 123-19.518W	10-5-91 1455-1550	5.5	Met, BNA, Pest, TOC, GS, AVS, Ben	
D15	50	46-08.347N 123-13.934W	10-5-91 1200-1255	6.6	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	
D16	57	46-11.244N 123-05.429W	10-4-91 1445-1530	9.1	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	4 grab samples composited
E6	58	46-10.149N 123-06.470W	10-4-91 1245-1340	5.5	Met, BNA, Pest, TOC, GS, AVS, Ben	
D17/D44	61	46-09.87N 123-02.76W	10-4-91 0940-1105	5.0 (Ben) 7.0 (Chem)	Met, BNA, Pest, TOC, GS, AVS, Ben	Station moved across slough to Washington coast, duplicate sample collected 4 grab samples composited
D18	62	46-07.429N 123-01.307W	10-3-91 1240-1310	3.0	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	Station moved from south side of Lord Island across channel to Oregon shoreline
D19	63	46-08.32N 123-00.52W	10-3-91 1530-1615	4.0	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben, Diox	
E7	65	46-05.91N 122-56.23W	10-3-91 1020-1055	14.0	Met, BNA, Pest, TOC, GS, AVS, Ben	

TABLE 2. SUMMARY OF SEDIMENT AND BENTHIC INFUANA COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/ Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[a]	Notes
D20	72	46-03.596N 122-52.106W	10-2-91 1615-1655	2.5	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox, Rad	
D21	72	46-04.324N 122-53.934W	10-2-91 1455-1540	3.5	Met, BNA, Pest, TOC, GS, AVS, Ben	Oil sheen on sediment composite; Station moved down river along Oregon coast
D22	74	46-00.584N 122-50.907W (Ben) 46-00.586N 122-50.982W (Chem)	10-2-91 0840-0950	NA	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben	5 grab samples composited
D23/D43	79	45-57.378N 122-48.058W	10-1-91 1255-1325	5.0	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	Crayfish buoy not in depositional area, duplicate sample collected 5 grab samples composited
D24	86	45-52.0N 122-47.8W	9-30-91 1000-1035	2.4	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben, Diox	Oil sheen on sediment composite; station moved northwest to St. Helens marina 5 grab samples composited
D25	87	45-50.408N 122-46.648W	9-29-91 1705-1735	3.4	Met, BNA, Pest, TOC, GS, AVS, Ben	Station moved south to just east of northern tip of Bachelor Island 5 grab samples composited
E8	88	45-59.22N 122-50.23W	10-1-91 1445-1520	9.0	Met, BNA, Pest, TOC, GS, AVS, Ben	Station moved northeast to Washington Coast
E9	83	45-54.32N 122-48.82W	9-30-91 1600-1645	8.0	Met, BNA, Pest, TOC, GS, AVS, Ben	Oil sheen on sediment composite
D26	92	45-46.921N 122-46.156W	9-29-91 1545-1615	13.7	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	Station moved to Washington coast
D27	94	45-45.27N 122-46.669W	9-29-91 1415-1440	1.5	Met, BNA, Pest, TOC, GS, AVS, Ben	
D28/D42	99	45-41.195N 122-46.14W	9-29-91 1145-1255	4.9	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox, Rad	Duplicate sample collected 4 grab samples composited

TABLE 2. SUMMARY OF SEDIMENT AND BENTHIC INFUANA COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/ Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[a]	Notes
E10	100	45-40.518N 122-46.529W	9-29-91 1045-1120	12.8	Met, BNA, Pest, TOC, GS, AVS, Ben	
D29	101	45-40.12N 122-45.86W	9-29-91 1455-1525	2.4	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben	
D30	103	45-38.46N 122-44.68W	9-28-91 1010-1040	5.4	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	
E11	104	45-38.448N 122-43.011W	9-28-91 0855-0925	12.0	Met, BNA, Pest, TOC, GS, AVS, Ben	
D31	106	45-36.41N 122-40.48W	9-27-91 1430-1530	3.0	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben	4 grab samples composited
D32	108	45-37.03N 122-39.54W	9-27-91 1655-1740	5.5	Met, BNA, Pest, TOC, GS, AVS, Ben	
D33	109	45-36.678N 122-37.613W	9-27-91 1255-1320	3.4	Met, BNA, Pest, TOC, GS, AVS, Ben	
D34	111	45-35.604N 122-33.982W	9-27-91 1115-1145	1.7	Met, BNA, Pest, TOC, GS, AVS, Ben	
E12	114	45-34.078N 122-31.191W	9-26-91 1510-1530	3.9	Met, BNA, Pest, TOC, GS, AVS, Ben	
D35/D41	119	45-34.62N 122-26.781W	9-26-91 1705-1750	6.7	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox, Rad	Duplicate sample collected 4 grab samples composited
D36	118	45-33.516N 122-27.441W	9-26-91 1340-1410	4.0	Met, BNA, Pest, TOC, GS, AVS, Ben	Station moved west on Oregon coast to just south of McGuire Island
D37	121	45-34.589N 122-23.73W	9-25-91 0920-1030	3.8	Met, BNA, Pes, TBT, TOC, GS, AVS, Ben	Tied up at Mark dock
D38	124	45-33.464N 122-20.052W	9-25-91 1320-1530	4.0	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox	No anchoring
E13	127	45-32.702N 122-18.935W	9-25-91 1645-1715	6.4	Met, BNA, Pest, TOC, GS, AVS, Ben	

TABLE 2. SUMMARY OF SEDIMENT AND BENTHIC INFUANA COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
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Station Number	River Mile	Latitude/ Longitude	Sampling Date/Time	Water Depth (m)	Samples Collected[a]	Notes
D39	129	45-32.604N 122-15.721W	9-24-91 1640-1830	5.4	Met, BNA, Pest, TOC, GS, AVS, Ben	Very high winds 6 grab samples composited
E14	137	45-35.306N 122-05.979W	9-24-91 1240-1345	5.4	Met, BNA, Pest, TOC, GS, AVS, Ben	Very high winds 4 grab samples composited
D40	141	45-37.327N 122-01.210W	9-24-91 0805-1055	5.4	Met, BNA, Pest, TOC, GS, AVS, Ben, Diox, Rad, TBT	Very high winds 7 grab samples composited

[a] The key to samples collected is as follows:

Met = Trace metals
BNA = Base/neutral/acid-extractable organics
Pest = Pesticides and PCBs
TOC = Total organic carbon
GS = Grain size
AVS = Acid volatile sulfides
Ben = Benthic invertebrates
Diox = Dioxins and furans
TBT = Tributyl tin
Rad = Radionuclides

including water depth, visual fixes, photo notes, and a narrative description of the station location and sampling effort. The sample description logs for sediment and benthos provide information about each van veen grab, including grab number, water depth, time, penetration depth, sediment type, sediment color, and sediment odor. The sample description logs for water include sample depth and time, as well as measurements for conventional variables such as pH, conductivity, DO, temperature, and turbidity. The summary sampling logs give the analysis to be performed for each water and sediment sample.

2.2 MODIFICATIONS TO SAMPLING PLAN

Sampling activities varied from the sampling plan and QA/QC plan (Tetra Tech 1991a and 1991b, respectively) in the following ways:

Water

- For stations located in water depths of less than 5 m, only three or four Niskin bottles were used to collect water samples, instead of five.

- The dissolved oxygen (DO) probe used was not attached to the CTD as described in the Sampling Plan. A separate cast of the DO probe was performed after the CTD cast.

- Because of low battery power and improper calibration of the turbidimeter, accurate turbidity measurements could not be obtained at several stations (Stations W33, W41, W42, W43, and W45).

- Because of a malfunction in the pH probe, pH measurements were taken at Stations W4, W5, and W7 on a different composite sample collected one to two days after the original composite sample.

- Several stations were relocated for various reasons. These stations are noted as follows:

    1) Station W21 - This station was moved slightly downstream of the proposed location to sample near floating boat storage and houseboats (Figure 2).

2) Station W27 - This station was relocated from inside the Kalama River to just downstream of the mouth because the river was too shallow for the boat to navigate.

3) Station W30 - This station was moved to mid-channel to correspond with all other mid-channel stations (Figure 3).

4) Station W34 - This station was moved up Lake River to ensure sample was characteristic of Lake River water (Figure 3).

5) Station W41 - This station was relocated from inside the Sandy River to just downstream of the river mouth because the river was too shallow for the boat to navigate.

Sediment/benthos

- A decontaminated stainless steel spoon was used to subsample each grab instead of a stainless steel spatula at same stations.

- A decontaminated plastic ruler was used to measure grab penetration depth instead of a stainless steel ruler.

- On several occasions, it was necessary to composite more than three grab samples to provide sufficient material for all required analyses.

- Interstitial salinity was only measured occasionally because of the difficulty of obtaining a clear water sample from the sediment.

- Because of extremely fine sediments located at Station D24, the 0.06-m^2 van Veen grab sampler was used for the sediment chemistry samples, instead of the 0.1-m^2 sampler.

- Sediment samples for chemical analyses and samples for benthic analyses were not collected on the same day for Station E1. Because of a strong current, chemistry samples were collected on the day after the benthic samples, during a slack tide.

A number of stations had to be relocated because sediment conditions were unsuitable for van Veen samplers or the original station position was not located in a depositional area. Also, several alternate stations were chosen for other reasons. These stations are noted as follows:

1) Station D1 - No depositional areas could be located at Point Stevens State Park. The station was moved just inside the Hammond moorage, along the northwest edge (Figure 5).

2) Station D6 - Because of the presence of sand bars, the crayfish site could not be sampled for sediment. Samples were taken to the north, near the mouth of the Deep River (Figure 5).

3) Station D8 - Because of the presence of a sand bar, the crayfish site could not be sampled for sediment. Samples were taken across the channel from the crayfish marker buoy (Figure 5).

4) Station D10 - Because the crayfish site lacked depositional sediments, samples were collected across the Clifton Channel behind a dry dock (Figure 5).

5) Station D17 - This station was moved across the slough to the Washington side to avoid the abundant wood debris at the original site (Figure 6). Wood debris often gets stuck in the jaws of the van Veen and prevents complete closure.

6) Station D18 - This station was moved from the south side of Lord Island across the channel to the Oregon side because of a lack of depositional sediments at the original site (Figure 6).

7) Station D21 - This station was moved downriver 3/4 mi. on the Oregon side because of a lack of depositional sediments at the original site (Figure 6).

8) Station E8 - This station was moved northeast to the Washington coastline because of a lack of depositional sediments at the original site (Figure 7).

9) Station D26 - Because the crayfish site lacked depositional sediments, this station was moved along the Washington coast away from the mouth of the slough (Figure 7).

10) Station D36 - This station was moved west on the Oregon coast to just south of McGuire Island because of a lack of depositional sediments at the original site (Figure 8).

3.0 BACTERIAL SAMPLING EFFORT

Water-based bacterial sampling objectives, procedures, and locations have been detailed in Section 4.0 of the final sampling plan (Tetra Tech 1991a). All proposed and actual station locations are illustrated in Figures 1-4.

Station locations were determined using a hand-held Trimble Transpak II GPS receiver. This 3-channel unit has an accuracy comparable to the GPS receiver used during the sediment/water cruise.

3.1 SYNOPSIS OF EVENTS

The bacterial sampling effort took place over five trips, and was completed within thirty days of the first trip. Between October 15 and November 14, 1991, each of the six bacterial stations was sampled five times, with results analyzed in duplicate. Samples were collected from close to shore approximately 16 in below the surface in 1 m deep water. All bacterial water samples were collected in 1 liter sterile glass bottles. Samples were analyzed for both fecal coliforms and enterococci. On the first trip, multiple field samples were collected for analysis of metals, nutrients, and conventionals, as stated in the sampling plan (Tetra Tech 1991a) and QA/QC plan (Tetra Tech 1991b). Concurrently, *in situ* measurements were taken for temperature, conductivity, dissolved oxygen, turbidity, and pH.

A summary of the stations sampled for bacteria, dates of sampling, and latitude/longitude of the stations is presented in Table 3. A synopsis of the bacterial sampling effort, station location, and sample summary logs are presented in Appendix B.

3.2 MODIFICATIONS TO SAMPLING PLAN

No deviations in sampling locations or procedures were made from the sampling plan.

TABLE 3. BACTERIAL SAMPLING STATION SUMMARY
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY

Station	Dates Sampled	Latitude/Longitude	Analysis
W2	10-15-91 10-22-91 11-01-91 11-07-91 11-13-91	46-16-50.1N 124-03-36.8W	Fecal coliforms Enterococci
W3	10-15-91 10-22-91 11-01-91 11-07-91 11-13-91	46-18-8.9N 124-02-12.4W	Fecal coliforms Enterococci
W16	10-15-91 10-22-91 11-01-91 11-07-91 11-13-91	46-08-21.2N 123-19-07.4W	Fecal coliforms Enterococci
W35	10-16-91 10-23-91 11-01-91 11-07-91 11-14-91	45-42-23.6N 122-46-20.0W	Fecal coliforms Enterococci
W38	10-16-91 10-23-91 11-02-91 11-08-91 11-14-91	45-38-02.5N 122-44-25.6W	Fecal coliforms Enterococci
W40	10-16-91 10-23-91 11-02-91 11-08-91 11-14-91	45-33-50.0N 122-30-41.0W	Fecal coliforms Enterococci

4.0 TISSUE SAMPLING EFFORTS

Tissue sampling efforts, consisting of crayfish collection, carp and peamouth chub collection, and white sturgeon collection, have been detailed in Section 6.0 of the final sampling plan (Tetra Tech 1991a). All proposed and actual station locations are illustrated in Figures 5-8.

Ideally, for those depositional sediment stations that were also sampled for fish and crayfish, all samples would be taken from an identical spot. However, due to the nature of the electrofishing method, the availability of suitable habitat, and the mobility of the target species, it was usually necessary to cover a considerable area of the river (up to ½ mile) before the required number of fish could be collected. The area covered for each fishing station is described in detail in the synopsis of events for the fish sampling effort in Section 2.3. In some cases it was not possible to collect sediment and crayfish from the same location. This was usually due to the unavailability of depositional sediments at the crayfish site.

Station locations were determined using a hand-held Trimble Transpak II GPS receiver. This 3-channel unit had an accuracy comparable to the accuracy of the GPS rec
eiver used during the sediment/water cruise.

4.1 CRAYFISH

4.1.1 Synopsis of Events

Crayfish were collected from 18 sampling stations along the Lower Columbia River between September 24 and October 1, 1991. At least ten crayfish were retained from all but one station (Beacon Rock; D40) for compositing and chemical analysis. In all cases, collected sample volume was adequate for all proposed analytical testing. The crayfish collection effort began at the sampling station farthest upriver (Station D40) and the effort moved downriver as target collection goals from the upriver stations were met. A field team arrived on site on September 23, 1991, and sampling commenced the next day. Ten crayfish traps baited with catfood were deployed at each station until 10 to 30 crayfish were collected from the area. Traps were redeployed up to three times over three days to ensure that adequate fishing effort was expended in catching the target number of animals. Traps were redeployed if less than ten crayfish were recovered at a given sampling station. Traps

were redeployed based on previous crayfish sampling locations and visual inspection of the station area for appropriate crayfish habitat.

Between 10 and 30 crayfish were collected from all 18 crayfish sampling stations, except for station D40 (Beacon Rock). At this station, only nine crayfish were recovered after three deployments of ten traps over three days. A number of traps were lost due to cut lines, underwater obstructions, and irreparable damage. Consequently, at some sites, fewer than ten traps were deployed. At least five traps were deployed at all stations.

A total of 773 crayfish were caught during the 8 days of crayfishing effort. Of these, 474 crayfish were retained for chemical analysis. The remainder of the crayfish were returned to the water. A list of station numbers and locations, fishing effort, and catch is provided in Table 4. Copies of the field log sheets are provided in Appendix C. At stations where more than 30 crayfish were caught, only the first 30 retrieved were retained for sample analysis. Once 30 animals had been processed, any crayfish remaining in the traps were released.

At station D22 in the Port of Kalama, due to the configuration of the harbor area, it was difficult to deploy the crayfish traps at a suitable depth within the harbor area without impeding navigation. Consequently, the majority of the crayfish caught at this site were from the entrance to the harbor area. At station D12 in Elochoman Slough near the Cathlamet Marina, 2 traps were lost due to cut lines and 2 traps were pulled by fishing vessels.

- Marker buoys were placed at each crayfish collection station in order to mark the area for sediment and fish collection efforts. A marker buoy was not deployed at station D12 in Elochoman Slough near the Cathlamet Marina since it seemed unlikely to remain intact until the other field teams reached the sample site. The site was relocated easily by detailed description due to its proximity to the marina, the geographical configuration of the sample station area, and GPS coordinates.

4.1.2 Modifications to Sampling Plan

No significant changes were made to the sampling plan. However, exact station locations depended on local conditions in the vicinity of proposed sample stations. Stations were located to maximize the potential for catching crayfish while ensuring that the factors influencing the original sampling rationale were not compromised.

TABLE 4. SUMMARY OF CRAYFISH COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
(Page 1 of 2)

Station	Latitude/ Longitude	Date/Time Deployed	Date/Time Retrieved	Number of Traps	Number Caught	Number Retained
D6	46-16-02.1N 123-40-25.8W	9-30-91 1300	10-1-91 1005	12	186	31
D8	46-13-38.8N 123-34-35.6W	9-29-91 1650	9-30-91 1200	9	34	31
D10	46-12-35.5N 123-26-35.1W	9-29-91 1600	9-30-91 1100	8	37	31
D12	46-12-20.9N 123-23-25.2W	9-29-91 1500	9-30-91 1000	10	10	10
D15	46-09-21.3N 123-13-56.6W	9-28-91 1400	9-28-91 1720	5	9	9
		9-28-91 1720	9-29-91 1320	5	65	23
D16	46-11-15.3N 123-05-28.1W	9-28-91 1330	9-28-91 1700	5	5	5
		9-28-91 1715	9-29-91 1240	5	26	26
D19	46-08-17.3N 123-00-28.5W	9-28-91 1245	9-29-91 1130	9	46	30
D20	46-03-28.4N 122-52-16.1W	9-30-91 1830	10-1-91 1230	10	21	21
D22	46-00-34.8N 122-50-55.6W	9-27-91 1700	9-28-91 1130	10	8	8
		9-28-91 1150	9-29-91 1025	9	10	10
D23	45-57-20.1N 122-48-15.8W	9-27-91 1650	9-28-91 1050	9	12	12

TABLE 4. SUMMARY OF CRAYFISH COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
(Page 2 of 2)

Station	Latitude/ Longitude	Date/Time Deployed	Date/Time Retrieved	Number of Traps	Number Caught	Number Retained
D24	45-52-22.5N 122-47-54.9W	9-27-91 1600	9-28-91 1000	10	0	0
		9-28-91 1030	9-29-91 0730	10	1	1
		9-29-91 0800	9-30-91 1700	10	58	30
D26	45-46-52.5N 122-46-09.3W	9-26-91 1845	9-27-91 1735	10	69	32
D28	46-41-39.4N 122-45-55.2W	9-25-91 1720	9-26-91 1920	10	24	24
D29	45-38-57.9N 122-44-42.1W	9-25-91 1650	9-26-91 2015	9	30	30
D31	45-36-14.2N 122-40-18.3W	9-24-91 1730	9-25-91 1450	9	12	12
D35	45-34-36.7N 122-26-48.2W	9-24-91 1630	9-25-91 1400	10	61	61
D38	45-33-23.7N 122-20-00.4W	9-24-91 1400	9-25-91 1200	10	2	2
		9-25-91 1300	9-26-91 0900	10	38	30
D40	45-37-27.9N 122-01-09.8W	9-24-91 1200	9-25-91 0930	10	5	5
		9-25-91 0845	9-25-91 1830	10	2	2
		9-26-91 0800	9-27-91 1030	10	2	2

Of the 18 stations sampled, two stations were relocated, one due to difficulties navigating in the vicinity of the originally designated station, and one due to the inability to catch crayfish in an area unsuitable as crayfish habitat.

- Station D6 - This station was relocated slightly upriver adjacent to the town of Altona. This decision was made based on water depth and navigability in the vicinity of the original sample station. It was determined that it would be infeasible to navigate this area in a larger boat necessary to retrieve sediment and fish samples. Therefore, to be consistent in all phases of the sampling effort, the station was moved to an area where both small and large boats could navigate. Like the proposed sample station, the relocated sample station was still located near the mouths of the Grays and Deep Rivers and was previously unsampled (Figure 5).

- Station D24 - This station was originally sited adjacent to the St. Helens Marina. This site was moved to the West Bank of the river, an area just downstream of the St. Helens Marina (Figure 7). The decision to move this station was based on unsuccessful fishing efforts with the first 2 deployments. The area adjacent to St. Helens Marina was a sandy island with no rock and mud banks, an unlikely crayfish habitat. The new station location was a more likely crayfish habitat. The new location, like the originally proposed station location, was downriver of Multnomah Channel and Lewis River confluence, comparable with past studies, and near the St. Helens Marina. It was therefore decided that this would be an acceptable revision to the sampling plan.

In general, the sampling effort was successful in obtaining sufficient and representative samples for analysis. The approved sampling plan was modified only slightly and within reason due to local field conditions. Losses of equipment and gear were minimal for this field effort.

4.2 CARP, LARGESCALE SUCKERS, AND PEAMOUTH

4.2.1 Synopsis of Events

Collection efforts for the target species carp (*Cyprinus carpio* Linneaus) and peamouth chub (*Mylocheilus caurinus* Richardson) began October 14, 1991 at station D40 (Beacon Rock) and was completed on November 19, 1991 at Station D20 in the upstream end of Carrols Channel. Fish collection methods included an electrofishing boat and two 6 ft high by 100 ft long sinking gill nets with variable mesh size (2 to 6 in).

Difficulty was encountered in collection of both target species. Where the collection team failed to collect one or both of the target species, an alternate species, the largescale sucker (*Catastomus macrocheilus* Girard) was collected. This species was collected at all sites, with the exception of the two estuarine sites near the mouth of the lower Columbia River in Youngs Bay and Baker Bay.

A total of 51 carp, 64 peamouth chub, and 90 largescale suckers were collected from a total of 20 stations. The fish collection team was not able to collect target species or alternate species at Station D4 near Chinook, WA in Baker Bay.

A list of stations, locations, fish collected, and fishing effort is provided in Table 5. A detailed log of the fish collection effort and a copy of the field notebook are provided in Appendix D.

4.2.2 Modifications to Sampling Plan

There were two significant changes to the sampling plan (Tetra Tech 1991a):

- An electrofishing boat, as opposed to gillnets, was utilized to collect most of the fish.
- An alternate species, the largescale sucker, was collected at stations where target species were not available.

The electrofishing method was selected primarily for two reasons:

- Difficulty was encountered in obtaining gillnetting permits and the gillnetting permits issued were very restrictive in regards to the length of time allowed for gillnet deployment and included the stipulation that gillnetting efforts cease if salmonids were collected in the nets.
- Electrofishing promised to be a more efficient method of collecting the target species, considering the mobility and electroshocking range (up to a 3 m radius) of the anode. However, it was realized that the fishing

TABLE 5. SUMMARY OF FISH COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
(Page 1 of 2)

Station	Station Coordinates	Target Fish	Fish Caught	Electro-shocking Time (sec)	Gillnetting Time	Total Fishing Effort (hours)	Date
D40	45-37-20.5N 122-01-13.7W	5 carp 5 peamouth	5 carp[a] 8 sucker[a]	4061	No gillnets	3.0	14 Oct 91
D38	45-33-32.5N 122-19-03.6W	5 carp 5 peamouth	5 carp[a] 6 sucker[a]	4715	No gillnets	3.0	15 Oct 91
D35	45-34-28.4N 122-26-23.9 W	5 carp 5 peamouth	5 carp[a] 1 peamouth 5 sucker[a]	3926	No gillnets	2.0	15 Oct 91
D31	45-36-33.8N 122-40-33.2W	5 carp 5 peamouth	5 carp[a] 5 sucker[a]	5047	No gillnets	2.5	17 Oct 91
D29	45-40-07.0N 122-44-54.7W	5 carp 5 peamouth	5 carp[a] 2 peamouth 5 sucker[a]	7181	No gillnets	3.0	16 Oct 91-17 Oct 91
D28	45-42-15.7N 122-45-35.3W	5 carp 5 peamouth	5 carp[a] 5 peamouth[a] 6 sucker[a]	2138	No gillnets	0.8	17 Oct 91
D26	45-46-52.5N 122-46-09.3W	5 carp	5 carp[a] 5 sucker[a]	6568	No gillnets	4.5	19 Oct 91 19 Nov 91
D24	45-52-22.5N 122-47-54.9 W	5 carp 5 peamouth	5 carp[a] 5 peamouth[a] 5 sucker[a]	3391	No gillnets	1.8	19 Oct 91
D23	45-57-20.1N 122-48-15.8W	5 carp 5 peamouth	5 carp 5 peamouth[a] 5 sucker[a]	5630	No gillnets	2.5	20 Oct 91
D22	46-00-34.8N 122-50-55.6W	5 carp	3 carp 5 sucker[a]	9146	No gillnets	4.25	21 Oct 91 19 Nov 91
D20/D21	NA	5 carp 5 peamouth	5 peamouth[a] 5 sucker[a]	4620 3445	No gillnets	3.7	21 Oct 91 19 Nov 91
D19	46-08-17.3N 123-00-28.5W	5 carp 5 peamouth	2 carp 7 peamouth[a] 5 sucker[a]	8563	1 gillnet 1.5 hours	6.0	21 Oct 91-23 Oct 91, 27 Oct 91
D16	46-11-15.3N 123-05-28.1W	5 carp 5 peamouth	8 peamouth[a] 5 sucker[a]	4891	No gillnets	2.25	23 Oct 91, 27 Oct 91
D15	46-08-21.3N 123-13-56.6W	5 carp 5 peamouth	7 peamouth[a] 5 sucker[a]	unknown	No gillnets	2.0	23 Oct 91, 27 Oct 91
D12	46-12-20.9N 123-23-25.2W	5 carp 5 peamouth	5 peamouth[a] 1 carp 5 sucker[a]	3990	2 gillnets 1.5 hours/ea	4.0	24 Oct 91-25 Oct 91
D10	46-12-35.5N 123-26-35.1W	5 carp 5 peamouth	5 peamouth[a] 5 sucker[a]	3249	2 gillnets 1.25 hours/ea	1.5	25 Oct 91

TABLE 5. SUMMARY OF FISH COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
(Page 2 of 2)

Station	Station Coordinates	Target Fish	Fish Caught	Electro-shocking Time (sec)	Gillnetting Time	Total Fishing Effort (hours)	Date
D8	46-13-38.8N 123-34-35.6W	5 carp 5 peamouth	5 sucker[a]	5662	2 gillnets 2.5 hours/ea	3.25	27 Oct 91
D6	46-18-02.0N 123-43-16.4W	5 carp 5 peamouth	5 sucker[a]	5679	2 gillnets 2.5 hours/ea	2.75	26 Oct 91
D4	NA	5 peamouth	none	0	2 gillnets 3.0 hours/ea	3.0	26 Oct 91-27 Oct 91
D3	46-09-56.0N 123-48-59.2W	5 peamouth	9 peamouth[a]	1396	2 gillnets 3.0 hours/ea	3.5	26 Oct 91

[a] Five of these fish will be analyzed.

apparatus would prove ineffective in the brackish waters of the estuarine portion of the river and that gillnets could prove useful in these areas.

Collection of largescale suckers as an alternative target species was due to the lack of one or both target species at a number of sites. Carp were generally abundant at stations at and above Kalama, WA (Station D22). Only three carp were collected at Station D22. Only one carp was caught below the Port of Kalama using the electrofishing method. No carp were caught in gillnets deployed by the fish collection team, although commercial gillnetters were observed catching carp and also reported catching carp on occasion.

Peamouth chub were only encountered in small numbers at the stations from near the Bonneville Dam (D40 at Beacon Rock) to just downstream of Vancouver, WA (D29). One peamouth chub was collected in Camas Slough (D35) after two hrs of fishing effort. Two peamouth chub were collected at Station D29 downstream of Vancouver, WA after three hrs of fishing effort. From Station D28 (Caterpillar Island) to Station D10 (Tenasillahe Island), peamouth chub were abundant and no problems were encountered in the collection of both target species.

At Stations D8 (Marsh Island) and D6 (Deep River, Grays Bay) both electrofishing and gillnets were employed. Carp and peamouth chub were not encountered and neither was caught with these techniques. However, five largescale suckers were collected from each station.

At the two stations near the mouth, water salinity made the electrofishing technique ineffective and gillnets were employed. Peamouth chub was the only target species at these stations. Two 100 ft gillnet sets resulted in the collection of nine peamouth from Station D3 (Youngs Bay). No largescale suckers were observed or caught at this site. Two separate gillnet sets were made near Station D4 near the Chinook, WA harbor in Baker Bay. No peamouth were caught, and no other fish, with the exception of a small shad, were caught at this station.

One possible reason for the difficulty in collecting the two target species may be connected with the seasonal habits of these species. Both carp and peamouth spawn in shallow water in spring and summer and both are reported to prefer warm water. Largescale suckers also spawn in spring and summer, but prefer cooler water and may seek the cool waters of tributary mouths in summer. The fish collection effort began during an extended period of warm dry weather that had persisted throughout the summer. Carp are particularly active in warm shallow water in the summer. The end of this favorable weather and the beginning of cold wet weather coincided with the beginning of difficulties in collecting carp. Conversations with gillnetters in the lower river indicated that some carp were taken in the main channel where carp were not encountered by the fish collection team in shallow water. Conversations with local river users also confirmed that carp were abundant at many of

these locations during the summer.

However, peamouth were caught during both warm and cold weather. It was suggested that adult peamouth inhabit deeper water during the day and migrate into shallow water at night. This was not supported by the experience of the fish collection team. Peamouth were easily collected during daylight hours at a number of stations; at stations occupied after dusk, peamouth were not encountered. Therefore, the timing of the fishing effort did not appear to be important, although at one station (D23 in Martin Slough) peamouth were caught after sunset when attempts earlier in the day had failed.

The type of fishing gear employed was also suggested as an explanation for difficulties encountered in the collection of target species. At several stations in the upper reach of the study area where electrofishing methods were not successful in capturing peamouth, gillnets were not employed. However, at stations where both gillnets and electrofishing methods were employed, and peamouth were collected, electrofishing was much more efficient. Gillnetting was effective at only one station, but at this station, water salinity made electrofishing ineffective and therefore comparison with gillnetting cannot be made.

Another explanation for the difficulty in the collection of peamouth could be an uneven distribution of this species along the river. The diurnal and seasonal habits of these fish are not well known and it is possible that other as yet unidentified factors (e.g., tidal cycles) play a role in the distribution of peamouth in the lower Columbia River.

Through consultation with the Bi-State Commission, it was decided that the additional effort to re-attempt to collect the target species at all stations where target species were not collected was not warranted. The fish species to be analyzed at each station are identified in Table 5. Largescale suckers were selected as an alternative target species that could be collected along the length of the study area (with the exception of the two stations at the mouth) and would allow evaluation of contaminant levels in an indicator species throughout the river. Therefore, largescale suckers from 18 stations will be analyzed. Peamouth collected from stations near the mouth of the river, at Station D3 (Youngs Bay) to D28 (Caterpillar Island, downriver of Vancouver, WA) will be analyzed for tissue contaminant levels (a total of 10 stations). However, peamouth were not collected at two sites in the lower river [D6 (Deep River, Grays Bay) and D8 (Marsh Island, Lewis and Clark Wildlife Refuge)]. Carp from stations where five carp were collected (Stations D40 to D24, a total of 8 stations) will be analyzed. Carp at Station D23 were collected but not analyzed.

Due to the nature of the fish collection effort, the sediment sampling location did not always correspond precisely to the location of collected fish samples or the area where fish were collected was much broader than

the area of sediment sampling. Actual fish sampling stations are presented in Figures 5-8. Significant deviations from the sediment sampling location are noted below, but generally the proximity of all fish collection efforts to sediment sampling locations will still allow the comparison of tissue concentrations of contaminants with sediment concentrations among the various stations.

- Station D35 - Sediment sampling was conducted near the mouth of Camas Slough downstream of the City of Camas and the James River II, Inc. pulp and paper mill. Fish collection efforts included the area where sediment was collected, but ranged from the sediment sampling point up to the Highway 14 bridge over Camas Slough.

- Station D31 - Electrofishing efforts included the area where sediment and crayfish were sampled, but most of the carp were collected near the Hayden Island Yacht Club among the boat docks.

- Station D29 - Suitable habitat near this sediment sampling station was difficult to find. A long, narrow artificial channel on the Washington side of the river was selected as the collection site. This feature is a flushing channel for the Lake Vancouver lake water quality improvement project and does not appear on the topographic map.

- Station D28 - Suitable electrofishing habitat was not encountered in this area and a more suitable site in the channel behind Caterpillar Island was selected as an alternative site.

- Station D20 - Initial fishing efforts at this station produced no fish and a decision was made to fish the Oregon side of the river at Station D21 near the Trojan Nuclear Power Plant where habitat was more suitable. The peamouth collected from this area were collected nearer to Station D21. A second sampling effort was conducted on 19 November 1991 to collect largescale suckers at Station D20.

- Station D16 - Fish collection efforts focused on shoreline areas near the mouth of Coal Creek Slough, downstream of the sediment collection site.

- Station D8 - Fishing efforts near the sediment collection site were not successful. The largescale suckers taken at this station were collected in a small channel between Brush Island and Horseshoe Island.

- Station D6 - Fishing efforts were conducted in close proximity to the revised sediment and water sampling location for D6 near Deep River in Grays Bay.

- Station D4 - Due to safety considerations, fishing efforts were concentrated in the area just west of the Chinook, WA harbor near shore. However, fish collection efforts at this station were unsuccessful.

- Station D3 - Due to high winds and seas, it was not possible to perform fish collection efforts near the sediment sampling Station D3 near the City of Astoria. Fish collection efforts were concentrated in an area slightly upstream of Alternate Highway 101 bridge in Youngs Bay/Youngs River. Peamouth were collected in gillnets set just upstream of the boat launch.

4.3 WHITE STURGEON

4.3.1 Synopsis of Events

White sturgeon were collected from fish processors at various locations along the lower Columbia River from September 30 to October 30, 1991. The fish processors receive sturgeon from buyers stationed along the length of the river. Buyers, in turn, receive fish from boats working one to two miles up or downstream from the buyer's location. Thus, the approximate location of the point of capture for each fish can be determined by the location of the buyer.

Buyers receive sturgeon after the fish have been out of the water for 6 to 18 hours. The buyer packs the fish in boxes with crushed ice for delivery to the processor. The processor keeps the fish on ice inside a refrigerated room until it is cut. In most cases, Tetra Tech personnel were present when the fish were cut. Fish were weighed and measured (fork length) prior to cutting and a pectoral fin was collected for aging.

Each sample was assigned a sample number:

ST- (segment code) - (sample no.) - (dioxin code) where:

segment code = 1-4, identifying the river segment in which the fish was caught
sample no. = unique number (1-6), identifying a fish caught in a particular segment
dioxin code = 'D' if the sample was selected for analysis of dioxins and furans, or left blank

A duplicate 2-lb sample was taken from fish ST-1-5 [(labeled ST-1-5(dup)].

The following fish processors supplied sturgeon samples for this project:

Bornstein Seafood of Oregon, Inc. P.O. Box 58 Astoria, OR 97103 Doug Heater, Manager	(503) 325-6164
Fishhawk Fisheries P.O. Box 715 Astoria, OR 97103 Steve Fick, Manager	(503) 325-5252
S & S Seafood Co. 13650 NE Whitaker Way Portland, OR 97230 Jim Harris, Owner	(503) 252-8889
Pacific Coast Seafoods Co. P.O. Box 70 Warrenton, OR 97146 Jerry Boiseert, Manager	(503) 861-2201
Kingfish Trading Co. 3224 W. 2nd St. The Dalles, OR 97058	(503) 296-5780

Table 6 summarizes the samples collected. Four fish samples from each river segment will be analyzed.

4.3.2 Modifications to Sampling Plan

There were two modifications to the sampling plan (Tetra Tech 1991a) that occurred during the collection of the sturgeon samples:

TABLE 6. SUMMARY OF STURGEON COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
(Page 1 of 2)

Sample No.	River Segment	Analyzed	Date Caught	Date Collected	Processor	Location Caught	Sex	Fin Collected	Dioxin	Glass/ Foil
ST-1-1	1A/1B	No	10/15/91	10/16/91	Bornstein, Astoria	Estuary, below Tongue Point	Male	Yes	No	Glass
ST-1-2-D	1B	Yes	10/10/91	10/11/91	Bornstein, Astoria	Tongue Point, Oregon	Male	Yes	Yes	Foil
ST-1-3-D	1C	Yes	10/1/91	10/3/91	Fishhawk Fisheries, Astoria	Caboth Drift (Woody Island Channel)	ND	No	Yes	Glass
ST-1-4	1A/1B	Yes	10/15/91	10/16/91	Bornstein, Astoria	Estuary, below Tongue Point	Female	Yes	No	Glass
ST-1-5	1B	Yes	10/16/91	10/18/91	Pac. Coast Seafood, Astoria	Frankfort, WA (mouth of Deep River)	ND	Yes	No	Glass
ST-1-5(dup)	1B	Yes	10/16/91	10/18/91	Pac. Coast Seafood, Astoria	Frankfort, WA (mouth of Deep River)	ND	Yes	No	Glass
ST-1-6	1B	No	10/20/91	10/21/91	Pac. Coast Seafood, Astoria	Deep River, WA	ND	Yes	No	Glass
ST-2-1-D	2B	Yes	10/10/91	10/11/91	Bornstein, Astoria	Wallace Island, OR	Male	Yes	Yes	Foil
ST-2-2-D	2C	Yes	10/20/91	10/21/91	Fishhawk Fisheries, Astoria	Rainier, OR	Male	Yes	Yes	Glass
ST-2-3	2B	Yes	10/21/91	10/22/91	Bornstein, Astoria	Wallace Island, OR	ND	Yes	No	Foil
ST-2-4	2B	Yes	10/21/91	10/22/91	Bornstein, Astoria	Wallace Island, OR	ND	No	No	Foil
ST-3-1-D	3A	Yes	10/23/91	10/23/91	King Fish Trading Co., The Dalles	Kalama Drift, WA	ND	Yes	Yes	Foil
ST-3-2	3A	No	10/23/91	10/23/91	King Fish Trading Co., The Dalles	Kalama Drift, WA	ND	Yes	No	Foil
ST-3-3-D	3A	Yes	10/23/91	10/23/91	King Fish Trading Co., The Dalles	Kalama Drift, WA	ND	Yes	Yes	Foil
ST-3-4	3A	Yes	10/25/91	10/26/91	King Fish Trading Co., The Dalles	Kalama Drift, WA	ND	Yes	No	Foil
ST-3-5	3A	No	10/25/91	10/26/91	King Fish Trading Co., The Dalles	Kalama Drift, WA	ND	Yes	No	Foil

TABLE 6. SUMMARY OF STURGEON COLLECTION RESULTS
LOWER COLUMBIA RIVER RECONNAISSANCE SURVEY
(Page 2 of 2)

Sample No.	River Segment	Analyzed	Date Caught	Date Collected	Processor	Location Caught	Sex	Fin Collected	Dioxin	Glass/ Foil
ST-3-6	3A	Yes	10/29/91	10/30/91	S&S Seafood, Portland	Martin Bluff (River Mile 80), WA	ND	No	No	Foil
ST-4-1-D	4B	Yes	10/2/91	10/4/91	S&S Seafood, Portland	Warrendale, OR (downstream from Rooster Rock)	ND	No	Yes	Glass
ST-4-2	4B	Yes	10/10/91	10/11/91	Fishhawk Fisheries, Astoria	Multnomah Falls, OR	ND	No	No	Foil
ST-4-3-D	4A	Yes	9/29/91	9/30/91	S&S Seafood, Portland	East of I-205 Bridge (north side of Government Island)	ND	No	Yes	Glass
ST-4-4	4A	Yes	9/29/91	9/30/91	S&S Seafood, Portland	Alcoa Al (downstream from Hayden Island)	ND	No	No	Glass

- The samples were placed inside large glass jars provided by the laboratory. Use of the glass jars presented a logistical problem. The mouth of the jar was relatively narrow. Thus, the samples had to be cut several times before the full two pounds cold be put in the jar. Because the lab had to trim all the exposed surfaces from each piece prior to homogenization, the more a sample was cut, the more material was lost to trimming. Also, once the sample was frozen, it could not be retrieved from the narrow mouth of the jar without breaking it. For these reasons, aluminum foil was subsequently used for storage of samples during transport to the lab. This represents a deviation from the procedure described in the sampling plan. The samples were wrapped in two layers of foil and double-bagged in plastic freezer bags. The samples were frozen within four hours of cutting, except in the few cases where the processor could not wait for Tetra Tech personnel to arrive before cutting. In these cases, the processor stored the sample in a plastic bag.

- Lengths and weight of the sturgeon from which samples were cut could not be obtained in several instances (six of the sixteen fish analyzed), because Tetra Tech personnel were not present when the fish were cut.

5.0 REFERENCES

Tetra Tech. 1991a. Reconnaissance survey of water quality on the lower Columbia River: sampling plan. Final Report. Tetra Tech, Inc., Bellevue, WA. 70 pp.

Tetra Tech. 1991b. Reconnaissance survey of the lower Columbia River: QA/QC Plan. Final Report. Tetra Tech, Inc., Bellevue, WA. 121 pp.

APPENDIX A

WATER, SEDIMENT, AND BENTHIC INFAUNA SAMPLING EFFORT

Synopsis of Daily Events

Daily logs

Water Station Location, Sample Description, and Summary Sample Logs

Sediment/Benthic Infauna Station Location, Sample Description, and Summary Sample Logs

SYNOPSIS OF DAILY EVENTS FOR SEDIMENT/WATER/BENTHOS CRUISE

23 September 1991, Monday

Crew: Gary B., Lynne K., and Tad D.

0500 Field team met at Tetra Tech, Bellevue for final loading and mobilization.

0545 Left Tetra Tech for Port of Camas to meet boat.

0930 Ted and Gary arrive at boat; unload van and begin loading boat. Performing final mobilization: acid-wash carbuoy, mark wire, buy final supplies.

1245 Leave Camas marina for Station W41. On board: Ted Turk, Steve Ellis, Tad Deshler, Margie Mulholland, Lynne Krasnow, Gary Braun, Glen St. Amant.

1310 On station W41; begin sampling.

1435 Completed all samples, headed for Camas Marina to offload personnel (Ted, Steve, Glen, and Margie).

1525 Left Camas Marina for Beacon Rock.

1830 Arrived Beacon Rock Boat Ramp (Station D40). Five test grabs taken to locate depositional area.

24 September 1991, Tuesday

Crew: Gary B., Lynne K., and Tad D.

0730 Decided to take sed/benthos samples at Beacon Rock first.

0800 Moved boat to 3rd piling; first grab was full of cobbles. Decided to move back to dock. Tied boat up at north end of pier between dock and pilings.

0810 Begin sampling at dock.

1056 Last sediment grab.

1130 Depart Beacon Rock for Stations closer to Rooster Rock and Reed Island.

1200 Anchored at Station E14 near Buoy 83A.

1405 Finished sampling and pulled anchor; departed for Station W43 (off Rooster Rock).

1509 Set anchor at Station W43.

1615 Finished water sampling; pulled anchor.

1640 Tried to assist sailboarder with broken mast. Tried to tow him to Rooster Rock but he was too close to shore for us to risk a tow. Another smaller boat helped him.

1645 Set anchor off entrance to Rooster Rock at Station D39. Finished processing water samples.

1730 Begin sed/benthos sampling.

1830 Completed sampling; left for Camas after trying to enter Rooster Rock channel (too shallow).

1925 Arrive and dock at Camas.

25 September 1991, Wednesday

Crew: Gary B., Lynne K., and Tad D.

0700 In need of ice; Tad went to buy a few bags.

0730 Plotting three points for W42 transect station.

0840 Left Camas for Station D37.

0900 Tried one grab; site did not appear depositional. Moved upriver behind a tugboat dock.

0935 Tied up next to tug.

1035 Left Station D37 for Station W42. Continued benthic sieving and processing.

1110 Arrived and anchored at Station W42, position #3.

1150 Moved to position #2.

1156 Arrived position #2, dropped anchor.

1220 Left for position #1.

1300 Pulled anchor and left for Station D38.

1320 Motored to western tip of Reed Island. Could not anchor. Ended up making grab casts as we repeatedly drifted past the grassy tip of the island.

1540 Finished sampling. Transit to Station E13.

1615 Decided on location directly north (approx. 300 m) of marker light #60.

1630 Made call to Tetra Tech, Bellevue.

1640 Started sampling.

1715 Finished sampling, but remained anchored to finish sieving benthic samples and to install AC converter so we can recharge the turbidimeter.

1740 Left station for Beacon Rock.

1750 Stopped at Corbett Station and got some ice for samples.

1800 Left Corbett Station for Beacon Rock. Still sieving benthic samples.

1945 Finished sieving benthic samples. Still cruising to Beacon Rock.

2030 Arrived Beacon Rock Boat Ramp.

2140 Called Ted to discuss Cordy's visit.

2215 Called Steve and Glen in Portland.

26 September 1991, Thursday

Crew: Gary B., Lynne K., and Tad D.

0630 Continued charging the turbidimeter. Began plotting of points for W45 transect.

0640 Left Beacon Rock for Station W45.

0738 At Bonneville Dam.

0800 Could not anchor in boulders near dam. Decided to hold position above station, then drift over station and take samples.

0806 Begin at position #1. Lost one messenger overboard while retrieving water bottles.

0830 Begin at position #2.

0911 Begin at position #3.

0940 Transit to spillway side of dam.

1010 Arrive Beacon Rock Boat Ramp.

1040 Leave dock for Warrendale Station W44.

1055 On Station W44.

1120 Transit to Camas (Station D36); processing sample.

1340 Arrived Station D36, began sampling.

1420 Finished sampling, left for Station E12.

1450 Began sampling at Station E12.

1530 Finished sampling. Transit to Gentry's Landing; abandoned. Called Ted Turk.

1630 Transit to Station D35.

1700 Arrived at Station D35, located yellow buoy left by crayfish crew.

1800 Finished sampling, transited to Donaldson Marina.

1900 No berths available at marina. Moved to public dock just upstream. Continued sieving D35 benthic samples.

2000 Finished sieving benthic samples. Continued preparing chain-of-custody forms.

2030 Met Tarang at boat.

2130 Tad left with all samples.

2200 Called Hank Chambers (NEA) to tell him that Tad will deliver dioxin samples in the morning.

27 September 1991, Friday

Crew: Gary B., Lynne K., and Tarang K.

0645 Called Steve at motel to ask that somebody help us with resupply of food and ice.

0715 Lynne and Jim went to find food and ice.

0900 Transit to Station W39. Talked briefly with the River Patrol.

1000 On site Station W39.

1030 Transit to Station D34.

1100 Made test grabs at Station D34.

1110 Set anchor and started sampling.

1200 Finished sampling; began transit to Station D33.

1234 Took test grabs at Station D33.

1253 Took first acceptable grabs.

1330 Finished sampling; transit to Station D31.

1410 Arrived at Station D31 position, but still sieving benthos from Station D33.

1440 Started sampling.

1530 Finished sampling; transit to marina. Made call to Ted.

1620 Transit to Station D32.

1650 Arrived approximate location of Station D32.

1740 Finished sampling. Transit to 42nd St Public Boat Ramp.

1805 Arrived boat ramp.

2100 Gary and Tarang went to motel (Days Inn). Lynne met her husband and went home for the night.

28 September 1991, Saturday

Crew: Gary B., Lynne K., and Tarang K.

0740 Met back at boat.

0800 Departed dock for Station E11.

0850 On Station E11.

0930 Finished sampling. Transit to Station D30.

0945 Made two test grabs; moved to end of Hayden Island.

0950 Anchored at west end of Hayden Island.

1115 Finished processing samples. Transit to Station D29.

1140 Took test grabs.

1200 Decided to go back to Station W37 and do transect for water samples before moving downriver to Blurock Landing to get depositional sediments.

1215 On Station W37, position #1.

1325 Position #2.

1355 Position #3.

1420 Transit to Blurock Landing (Station D29).

1440 Made several test grabs.

1530 Finished sampling. Transit to Willamette River Station W36.

1615 Discovered that no duplicate samples for sediments were collected at Station D29. Will take duplicates at Station D28. On Station W36; anchored.

1650 Transit to Portland; processing last benthic sample from Station D29 and water samples from Station W36.

1800 Arrived at Portland marina.

29 September 1991, Sunday

Crew: Gary B., Lynne K., and Tarang K.

0745 Left Portland marina for Multnomah Channel marina to get water and fuel.

0830 Testing cellular phone; successfully called Tetra Tech.

0920 Arrived Larsons Marina for fuel.

0950 Left Larsons for Station E10.

1035 On Station E10.

1125 Left Station E10 for Station D28.

1140 Arrived Station D28; took test grabs.

1255 Finished sampling. Transit to Station D27; processing sed/benthos samples.

1345 Arrived Station D27; took test grabs.

1440 Transit to Station D26; processing Station D27 samples.

1500 On Station D26; took test grabs.

1615 Transit to Station D25; processing Station D26 samples.

1700 Arrived mouth of Lake River (Station D25).

1745 Finished sampling. Transit to St. Helens Marina.

1820 Arrived St. Helens Marina. Staying at Village Inn.

1915 Called Cordy and Ted; no answers.

2130 Talked with Ted.

2200 Called Cordy, who will meet us tomorrow at 0900-0930 at marina.

30 September 1991, Monday

Crew: Gary B., Lynne K., and Tarang K.

0800 Left motel; picked up more ice and food supplies.

0830 On boat; packing and labelling sample bottles.

0850 Cordy arrived.

0950 Left dock for Station D24.

0955 On Station; took test grabs.

1040 Finished sampling; processing samples, plotting Station W33 transect positions.

1055 Transit to Station W33 (Warrior Rock).

1140 Transit to position #2.

1200 Transit to position #3.

1240 Transit to Station W32.

1253 On Station W32. Dropped anchor in Multnomah Channel.

1313 Finished taking samples; processing.

1315 Transit to Lake River Station W34.

1400 Arrived Station W34; called Ted.

1430 Started sampling.

1445 Transit to Station W31.

1515 On Station W31, inside Lewis River.

1530 Finished sampling. Transit to Station E9; processing samples.

1600 Arrive at Station E9; took test grabs.

1645 Departed station for St. Helens.

1655 Arrived St. Helens marina. Cordy left.

1730 Moved to public boat ramp to meet Tetra Tech replacement crew.

2000 Called Ted to find out when to expect crew.

2200 New crew arrived (Mahmood Shivji and Gary Rosenthal); stayed in motel.

1 October 1991, Tuesday

Crew: Gary B., Mahmood S., and Gary R.

0730 Met at motel; went shopping, loaded boat with new supplies.

1000 Left St. Helens Landing for transit to Station W30.

1050 On Station W30, dropped anchor.

1130 Transit to Station W29.

1205 Dropped anchor at Station W29.

1235 Transit to Station D23.

1245 Anchored at Station D23; made test grabs.

1400 Left Station D23 for Station E8.

1430 On Station E8; made test grabs.

1445 Began sampling; did not anchor.

1523 Left Station E8 for Station W28.

1550 Called Ted. Anchored at Station W28. Called Cordy, was disconnected.

1635 On Station W28.

1725 Finished Station W28. Transit to Kalama Marina for the night.

1752 Arrived Kalama Marina.

1909 Called Ted.

2 October 1991, Wednesday

Crew: Gary B., Gary R., and Mahmood S.

0730 Met Jerry Heller on dock; discussed possibility of him going out with team tomorrow morning. Agreed to meet at approximately 1130 or 1230 to talk further.

0815 Cordy Shea of OR DEQ and Ken Schnieder, videographer arrive.

0835 Motored to mouth of marina, station D22.

0950 Finished grab sampling. Sediments were very fine and overpenetration of sampler resulted in many rejected grabs. Transit to station W27 in mouth of Kalama River begun.

1020 Arrived at the mouth of Kalama. Too shallow to sample in mouth. Sample taken at downriver location.

1040 Transit back to Kalama Marina.

1054 Message from U.S. Coast Guard about GPS satellite malfunction. Jim Norris says onboard system will compensate. Charts will be checked to verify satellite position periodically.

1100 Cordy and Ken disembark.

1130 Neil Aaland of WA DOE and Gregg Ebersol (Longview Daily News) arrive.

1227 Transit to station W26 (transect station).

1310 On station at position 1 on Oregon side.

1330 On station at position 2 in main channel.

1403 On station at position 3 on Washington side.

1424 Transit to D21 at mouth of Carr Slough on Oregon side.

1500 Arrived at mouth of Carr Slough and took test grabs. Collected mostly gravel and sand. Station eventually moved downriver about 3/4 mi to backeddy above rocky point.

1550 Transit to D20 located in Carrols Channel.

1610 Found crayfish buoy at station and took test grab. Fine sediments encountered and boat anchored.

1705 Pulled anchor and began transit to Kalama Marina.

1745 Neil and Gregg disembark. Jerry Heller still at Marina, but cannot find him in order to make arrangements for tomorrow.

2100 Phoned Ted Turk. Need resupplies. Someone will be sent to Rainier tomorrow.

3 October 1991, Thursday

Crew: Gary B., Gary R., and Mahmood S.

0730 Label sample bottles.

0815 Leave Kalama Marina and begin transit to W24 in Carroll's Channel at mouth of Cowlitz River.

0945 Arrive mouth of Cowlitz. Observed distinct boundary where Cowlitz and Columbia Rivers meet. Used CTD to look for conductivity drop and temperature change. When temperature changed from 17 to 11.5° C, sample was taken. Sample was not taken at low tide, but confident that water sampled was Cowlitz River water.

0955 Transit begun to station E7.

1020 On station at E7. Test grab taken above most of industrialized area, but below confluence with Cowlitz River. Fine sand encountered.

1115 Transit begun for station D18 on the Oregon side of Lord Island.

1200 Near station D18, took time for lunch.

1235 Test grab taken near slough entrance. Coarse sand encountered. Decided to move across channel where fine sand with silt encountered and samples were taken.

1325 Transit to W23 just upriver in same channel as D18.

1416 Completed sampling at W23 and pulled anchor for transit to W22.

1445 Sampled station W22.

1515 Transit to D19.

1530 On station at D19 near crayfish buoy. Test grab taken, but fine sand was encountered and little silt. Moved closer to shore, but sample was still too sandy. Moved downriver of pilings where sediments had more fines and samples were taken.

1630 Transit to Rainier.

1640 Called Ted Turk. Bruce Bennett will meet team in Rainier at 1900.

1720 Arrived Rainier.

1830 Finished chain of custody forms and Bruce arrived to take samples.

4 October 1991, Friday

Crew: Gary B., Gary R., and Mahmood S.

0800 Meet at boat and buy ice and film, repack boat with new sample bottles and coolers.

0850 Left Rainier dock and transit to D17 and begin labelling sample bottles.

0940 First test grab taken at station D17.

1120 Transit to W21.

1125 On station W21. Moved station slightly downstream of map location to sample near floating boat storage and houseboats.

1155 Transit begins to station E6.

1230 In area of station E6, took lunch break.

1300 Test grabs performed. Third area medium to fine sand located.

1345 Transit to D16 in Coal Creek Slough.

1430 Found crayfish buoy. Test grab contained mixture of silt and clay.

1545 Transit to station W20 at mouth of Coal Creek Slough. Tide was ebbing. Sample taken in Slough.

1630 Finished water samples at W20 and began transit back to Rainier dock.

1815 Arrived at Rainier dock. Expecting Steve Ellis.

5 October 1991, Saturday

Crew: S. Ellis, G. Rosenthal, M. Shivji

0815 Left Rainier for station W19.

1000 Arrived at station W19 (transect station) and began sampling.

1130 Left station for Wallace Slough, station W18 and D15.

1200 Arrived at Wallace Slough and located crayfish buoy. Took benthic and sediment samples near mouth of Beaver Slough/Clatskanie River.

1353 Moved upstream to take water samples just prior to high tide. Current is moving upstream so decided to move to next station and return to Clatskanie River at a later time.

1450 Arrived at station E5. Moved upstream of dredge spoil site off Puget Island. Sample taken here consisted of extremely coarse sand and pebbles. Station moved about 100 yards downstream in Cathlamet Channel.

1720 Transit to station W18.

1805 Arrived at station W18 and current was flowing out of river.

1825 Finished water sampling and transit begun to Cathlamet harbor.

6 October 1991, Sunday

Crew: S. Ellis, G. Rosenthal, and M. Shivji

0730 Left Cathlamet harbor for station D13. Foggy with low visibility.

1010 Initial grab consisted of coarse sand. Site moved upstream, near the tip of Puget Island, within Cathlamet Channel. Transit for station W15 begun.

1020 Arrived station W15 on Washington side of Cathlamet Channel.

1050 Sampling completed and transit to W17 begun.

1245 Transect completed and departed for station D14.

1305 Arrived at Westport Slough and collected samples at D14.

1415 Transit to station W14 begun.

1530 Began transect sampling at W14 on Oregon side.

1700 Transect completed.

1715 Returned to Cathlamet.

7 October 1991, Monday

Crew: S. Ellis, M. Shivji, and L. Vogel

0745 Left Cathlamet and performed sediment sampling at station D12 just outside of Cathlamet harbor.

0930 Departed for station D10.

1143 Completed sampling and began transit for station D11. Originally sampled near crayfish buoy, but encountered sandy sediments. Moved station closer to upstream end of Clifton Channel behind dry dock.

1235 Arrived at station D11. Took several grabs in Prairie Channel, but too coarse for depositional area. Moved site between Horseshoe and Woody Island. Some samples contained bits of vegetation (sedges).

1345 Began transit to station W12. Completed sampling at station W12 and departed for Astoria.

8 October 1991, Tuesday

Crew: S. Ellis, M. Shivji, and L. Vogel

0745 Departed Astoria and began transit to station W1 at mouth of Columbia River.

0935 Departed for station D2.

1125 No problems were encountered at station D2 just outside of entrance to Port of Ilwaco. Departed for station D4.

1340 Departed station D4 for station D1. Initial grabs consisted of sand. Moved station to west behind Sand Island. Grabs had a filamentous algal covering.

1545 Departed station D4 for station E1. Could not locate any depositional areas in the vicinity of Point Stevens State Park (D1). All grabs consisted of sand. Tried grabs from Point Adams to river near Hammond. Moved site just inside along northwest side of Hammond moorage. Sediment was black fine silt/clay with sulfide odor.

Collected benthic samples from station E1, but currents too strong to collect sediments for chemical analyses. Plan to return tomorrow at slack tide.

9 October 1991, Wednesday

Crew: S. Ellis, L. Vogel, Tarang K.

0745 Departed Astoria and began transit to station W5.

0830 Arrived at station W5.

0855 Completed sampling and departed for station W7.

0940 Completed sampling of station W7 and departed for Astoria.

Cordy Shea and reporter are picked up in Astoria.

1205 Completed sediment sampling at station E1. Oil observed in sediments. Departed for station D3.

1245 Arrived station D3.

1430 Departed for Astoria to drop of Cordy and Michelle.

1645 Completed sampling at station E2 and departed for Astoria. No problems encountered.

10 October 1991, Thursday

Crew: S. Ellis, T. Khangaonkar, and C. DeGasperi

Received replacement pH meter.

0700 Left Astoria and transit to station W4.

0830 Transit to station W6. The DO profile for W4 is suspect due to problems with temperature readings on the DO meter.

0950 Completed first position of the transect of station W6. pH and DO meter working properly.

1850 Transit to Astoria from station W8. Completed sampling at station D6 and W9 earlier. Station W8 was a transect station from Grays Point to Tongue Point. There was no way to sample middle of channel so sample points taken in navigation channel on Oregon and Washington side.

11 October 1991, Friday

Crew: S. Ellis, T. Khangaonkar, C. DeGasperi

0730 Departed Astoria and began transit to station W4 to redo DO and pH.

0800 Completed DO profile. The values show good agreement with data obtained on 10 October 1991. DO meter apparently works without temperature probe.

0830 Arrived at mouth of Lewis and Clark River, station W5 to retake pH reading.

0845 Arrived at mouth of Youngs River to take pH measurement that was missed on 9 October 1991 due to problems with pH meter. Began transit to station W10.

1110 Arrived at station W10. Took water sample.

1130 Departed for station D5.

1155 Arrived at station D5. Lots of life in benthic sample.

1244 Departed for station D7.

1420 Completed sampling at station D7 and departed for station E3. Conditions rough.

Completed sampling at station E3. Noted what appeared to be oil in sediment grabs.

1800 Completed water sampling at station W13 and departed for Cathlamet harbor.

12 October 1991, Saturday

Crew: S. Ellis, T. Khangaonkar, C. DeGasperi

0720 Departed Cathlamet for station D9 at mouth of Skamakowa Creek, Brooks Slough, and Steamboat Slough.

Sediment at station D9 was layered, with fine sand on top of a black mud. The mud smelled like fecal material.

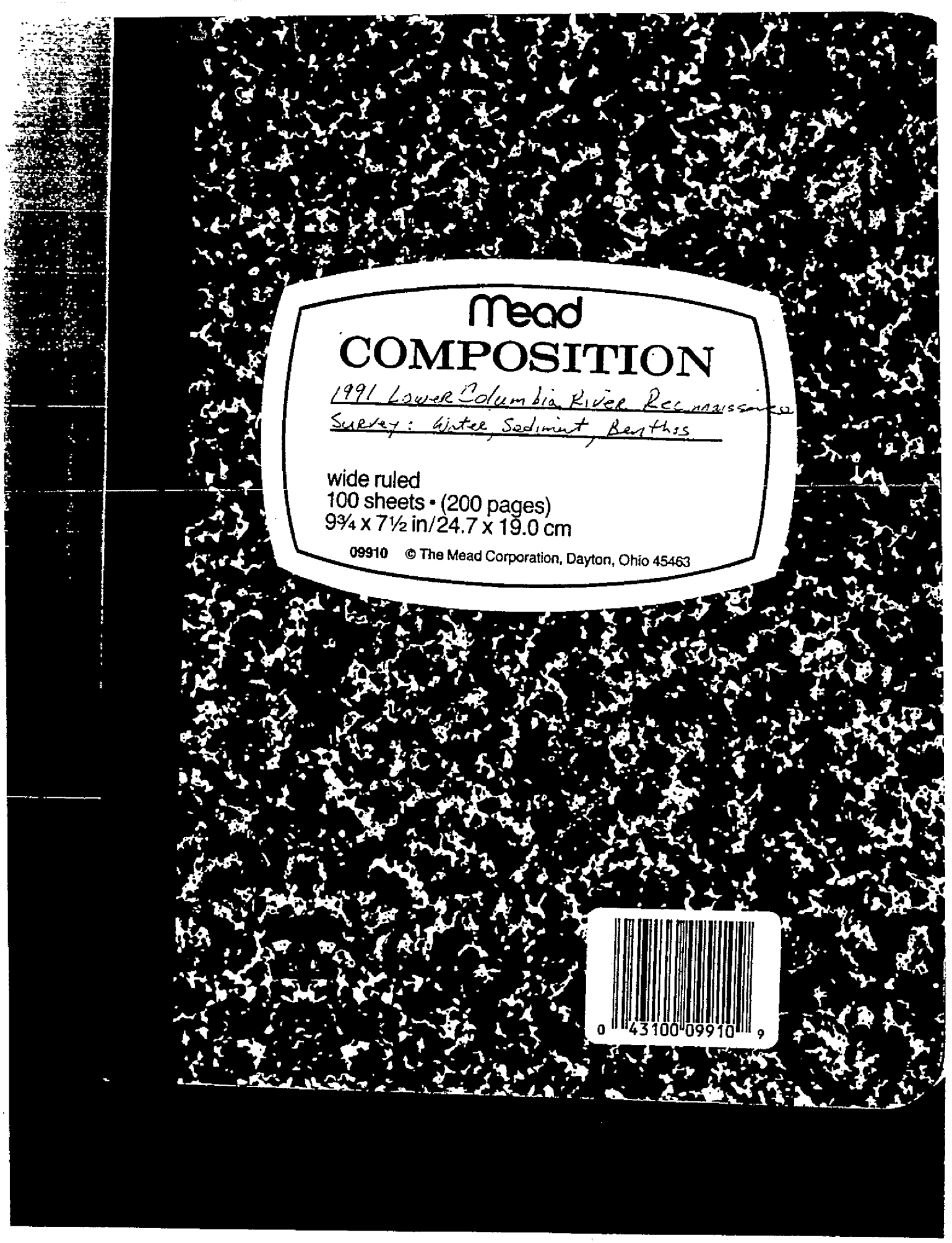
Station E4 was sampled near Jim Crow Point and Three Tree Point. Depositional material encountered within 50 yards of shore so moved to deeper water to collect sample.

At station D8 the crayfish sampling location could not be reached due to the presence of a sand bar. Took sample across the channel from the buoy.

1345 Completed water sampling at station W11 and departed for Cathlamet.

1530 The Brendan D. was unloaded and the team helped Jim Norris pull down the mast and boom to ready the boat for the trailer.

1800 Tetra Tech sampling team loads van and returns to Seattle, WA.


Mead
COMPOSITION
1991 Lower Columbia River Reconnaissance
Survey: Water, Sediment, Benthos
wide ruled
100 sheets • (200 pages)
9¾ x 7½ in/24.7 x 19.0 cm
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Mead

Ted Turk (Home) 206-485-6894
Cordy Shea (503) 229-5664
Niel Haland (206) 459-6868

SQUARE DEAL

CLASS PROGRAM

NAME _____ ADDRESS _____

SCHOOL _____ CLASS _____

		PERIOD 1	PERIOD 2	PERIOD 3	PERIOD 4	PERIOD 5	PERIOD 6	PERIOD 7	PERIOD 8
TIME	FROM TO...								
MONDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
TUESDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
WEDNESDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
THURSDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
FRIDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								
SATURDAY	SUBJECT								
	ROOM								
	INSTRUCTOR								

1991 Lower Columbia River Water Quality Reconnaissance Survey

Research Vessel: RV Brandon D II
Jim Norris - Skipper
Gary Braun - Field Team Leader / Safety officer

9/23/91 0500 Field team met at Tt; Final loading & mobilization. (Team: Gary Braun, Ted Turk, Steve Ellis

0545 Left Tt for Port of Camas to meet boat.

0930 Ted & Gary arrive at boat, unload van. Mud
begin loading boat; performing final Ted Dest
mobilization - acid wash 20L polycarbonate 6 Lum St,
carboys, mark wire (meters), buy final supplies (

1245 leave Camas marina for Station W41;
on board: Ted Turk, Steve Ellis, Tad Deshler, Maggie
Mulholland, Lynne Krasnow, Glen St. Amant, Gary Braun
Run to Station W41 was "shake down"/test of
equipment and familiarize everyone with the
correct sampling protocols.

1310 on Station; begin sampling; 1st bottle cast was
discarded, 2nd retained for compositing - Station depth
approximately 9.5m or 30-31ft

1435 Completed all samples - headed for Camas/Washougal
- Ted left for Seattle, Steve, Maggie & Glen left to do

9/23/91

crayfish sampling.

1525 left Camas marina for Beacon Rock.

1830 Arrived Beacon Rock Boat Ramp

1830-1900 Ran 5 test grab samples to locate depositional area.

9/24/91

0600 Weather - very windy all night and morning
Crew - Tad, Lynne, Gary

0730 decided to take sed/benthos samples at Beacon Rock (D40) first. Then attempt W45 (Bonneville Dam) later if wind slows

0808 moved boat to 2nd piling, 1st grab was full of cobbles and gravel w/ a little fines. decided to move back to dock for station. Tied boat up at North end of pier between dock + pilings.

0810 began sampling for sed/benthos at dock
1050 last sed. grab (#34!)
1130 depart Beacon Rock for Stations closer to Rooster Rock and Reed Island

1200 Anchored at Station E14 (Sed/Ben) Bouy 83A (Green Can) ~ 1/4 mi N in 5.4 m depth
1405 finished sampling and pulled anchor; headed to W43 (off Rooster Rock)

9/24/91 (cont)

1509 Set anchor at Station W43 (off Rooster Rock - main channel)

1615 finished water sampling - pulled anchor

1640 to assist wind surfer w/ broken mast; tried to give tow to Rooster Rock but, too close to shore to be of much help - Some other boat assisted him.

1640 set anchor off entrance to Rooster Rock
station D39
loc 45°32'.603
122° 15'.716
finished processing water samples

1730 Begin Sed/Benthos sampling

1830 Completed sampling; left for Camas after trying to enter Rooster Rock channel - too shallow.

1925 Arrive + dock at Camas
Steve E + Margie M. met up with us after their crayfish run to Portland station ~ 1930

Transect
Vol mid station, surface bottle
or if forget, then do before swirl

9/25/91 Field crew - Same (GB, LK, TD)

0630 Wind is up - even down here, plan to do Stations D37, W42, D38, and E13 then cruise up to Beacon Rock to attempt Stations W44 and W45

0700 In need of ice - Tad went to buy a few bags

0730 Plotting 3 Points for W42 Transect station
River width 0.42 nm ≈ 0.1 nm

Approximate

(1) main channel	45° 33' 51"	(.850)
	122° 20' 54	(.900)
(2)	45° 33' 54"	(.900)
	122 20' 47	(.783)
(3)	45° 33' 57"	(.955)
	122° 20' 40"	(.667)

D37 45° 34' 37"
122° 24.06"

E13 45° 32' 52" (.620)
122° 19.10"

0840 left Camas for Station D37
0900 Tried 1 grab ~ 1/4 mi SE of bridge - gravel (tried to anchor & dock)
& site did not appear depositional - moved upriver behind a tugboat dock
tried to anchor - did not hold (0915)
0935 tied up next to tug

9/25/91

0935 left Station D37 for Station W42 position #3 - continued benthic sieving and sample processing

Water Sample Transect

1110 Arrived and Anchored at position #3
GPS 45 33.920
122 20.662

1150 end move pos2

1156 Arrived position 2, dropped anchor
GPS 45 33.869
122 20.775

1220 left Pos 2 for Pos 1

1228 GPS Pos1 45°33'834
122°20'893

1[illegible] pulled anchor and headed for Station D38

1320 Motored to western tip of Reed Island - could not get into channel North of Island because of sand bars took several (~7) grabs trying to locate depositional sediments - most were med to fine sand - tried anchoring but could not keep position over fine sands - ended up making grab casts as we drifted past the grassy point

9/25/91

location of point ~N43°33.467
W122° 20'.061

1540 Finished Sampling - transit to E13

OBJect of Station is to get sample in non depos area and different sed. types - ∴ this stat we will attempt to sample where there are sand waves and as close to same depth as E14 (5-6m) as possible

1615 decided on station directly North of (~300m) marker light #60 in ≅ 6.4m
dropped anchor at 1617
loc: N45° 32.702'
W122° 18.935'

1630 made call to TT - Try + contact the crayfish crew - got their # at Portland hotel - (503) 252-3200

1640 Started Sampling

1715 Finished sampling but remained anchored to sieve benthic samples and to install AC converter so we can recharge the Hach turbidity meter on way up to Beacon Rock

Left 1740

1750 Stopped at Corbett Station and got some ice for samples - will need more tomorrow!

9/25/91

1500 - Left Cockett St. for Beacon Rock
- still sieving benthic samples - very full grabs and very slow sieving!

1945 Finally finished sieving samples + cleaned up boat; still cruising to Beacon Rock.

2030 Arrived Beacon Rock boat Ramp. Winds virtually calm

2140 Called Ted to discuss Cordy's visit

2215 called Steve/Glenn (503) 252-3200 #209 Days Inn
D35, D31 done

9/26/91 Field crew - same (GB, TD, LK)

0600 weather: [illegible] winds calm; we will go to Station 45 today.

0630 continued charging the turbidity meter began tentative plotting of points for Station W45 transect

POS. 1 = 45°38.317'N x 121°57.417'W
POS. 2 = 45°38.36'N x 121°57.467'W
POS. 3 = 45°38.367'N x 121°57.517'W

} see Station log sheet for loc'n samp

0640 left Beacon Rock Boat dock for Station 45 current in River ≈ 5 knots
- should check w/ Bonneville to determine if there is any pattern to the water release or if this is typical.

0738 at Bonneville Dam - 2 pics (17+18)

0805 could not anchor in boatless at dam; decided to hold position above station then drift over station and take samples - recording GPS fixes at times of samples

0806 - 0820 Position 1 - lost 1 messenger over board while trying to retrieve water bottles
0830 - 0845 Position 2
0911 - 0920 " 3

0940 transit to spillway side of Dam
Picture # 21+22 (unfortunately into the sun!)

9/26/91

1020 Beacon Rock Boat Ramp.

1040 ~~Left~~ dock for Warrendale Station W44

Warrendale Coordinates - USGS,

45°36' 45" (0.75) } see Station log for actual posit.

122° 01' 35" (0.583) }

these coordinates are close to OR shore; moved station to mid channel directly off large pole by shore.

will do this station the same way we did at W45 (drift through station + sample as we drift past.

1055 on station - took water bottles 1st

1102 [illegible] CTD 2nd

1[illegible] [illegible] DO 3rd
(Sta D36)

1100 Transit to Camas; processing sample

1340 Arrived Station D36; looked around for depositional appearing locations - downstream from 2 dry outfalls that were protruding from the OR side bank

loc. 45 33.517

122 27.445

1420 to 1450 Transit to Station E12 45 34.078 122 31.191

[illegible] - midchannel between Govt. Is and OR shore ≈ 4

- coarse grained sand

9/26/91

1530 - transit to Gentrys landing - Abandoned
- Called Ted Turk
- meet Tareng at Donaldson's Marina on OR side
- meet/coordinate Cordy's visit Sat/Sun

1630 - transit to Station D35

1700 Arrived at D35 - yellow bouy left by crayfisher Just west (downstream) of raft.
- Sediments depositional but full of bark debris - moved slightly offshore + were able to get acceptable samples

location - 45° 34.612'
122° 26.781'

1800 finished station; transit to Donaldson Marina.

1900 No berths available - moved to public dock just upstream. Continued sieving D35 benthic samples; checked all samples and repacked samples into appropriate coolers
- tried to find Tareng; Lynne left note at Donaldson's Marina for him; also called Ted and relayed our new location

2000 finished sieving benthic samples; went to find Tareng - met him at 2030

Tad left with all 14 station's samples + 2 duplic

9/26/91

Tad will deliver Dioxin Samples to NEA tomorrow morning then drive back to Tk.

2200 called Hank Chambers (NEA) - left message that Tad will drop off samples in morning - repacked boat + called crayfish crew requesting help in getting food and ice

9/27/91 0645 Called Steve at motel and asked that he or Someone pick us up to resupply food and ice.

0715 Lynne and Jim went to fuel boat + ice

The Field crew ~~is~~ Today is:

Lynne Krasnow

Tareng Khangaonkar

Gary Braun

0900 Transit to Station W39

Talked briefly w/ the River Patrol: asked about depositional areas: really muddy stuff - said they didn't know of any in the area.

Also asked about moorage locations in the Portland area - They could not give us the

manor a location of any that they knew of.
∴ we will probably be back at this moorage site tonight.!

1000 on site W39
1030 transit to D34 (west end of Goat Is and between Lemon Is.)

1100 took test grab at location between Lemon Is and Goat Is (~2m) fine sand; decided to move up into "channel" as far as possible and see if we could get anything finer. 2nd test grab was ≈ the same; decided to make it the station as it appeared to be the most depositional site in area
1110 set anchor + started sampling
1200 Finished sampling; transit to D33; continued processing samples
1234 took test grab at Station D33 - fine sand will move as close to shore as possible (though lots of submerged pilings) and anchor.
1253- 1st grab samples taken
1330 finished sampling - transit to D31

Cordy and Video person

Cordy - home phone
(503) 235-9659

Photographer - Columbia Cable of Wash
Karen Shinseki (206) 254-0398

7:30 pm call Cordy

Station D26 near mouth of slough

Meet at 42nd St Public Boat Ramp
Drop off at Fredd's Marina in Multnomah channel. (503) 286-5537

Remember Life jackets (2)

9/27/91

1410 arrived at station D31 position but still sieving benthos from D33, located yellow D31 bouy. 45°36.416 122°40.473

Drifted near site for 30 min finishing benthos

1430 started sampling at ", see Station log for site description

1530 finished sampling; transit to marina
- made call to Ted - Cordy Shea (ODEQ) and video person want to come out
- called Cordy - not home; call after 7:30,

1620 transit to D32

1650 ARRIVED approximate location of Station D32 Surveyed area; most depositional area appears to be located near an outfall - took test grab - fine to very fine sand. Anchored. Collected ATV antenna and a railroad spike in the grab attempts

1740 Finished sampling; Transit to 42nd St Public Boat Ramp

1805 ARRIVED at boat ramp.

2100 went to motel (Days Inn) GB + TK
Lynne met her husband and went home for the night

9/28/91

0740 met back at boat

0800 departed dock - Corky + photographer cancelled - will try to coordinate again later

0850 on Station E11 - midway between Marker 51 and the Channel marker close to the WA side ~ 35-90 yds offshore in 12m of water

Position 45° 38.446 122° 43.01'

0930 Finished samples, pulled anchor transit to D30

0945 made 2 test grabs at 45°38.47 ≈ 1/4 mile from end of Hayden's / 122°44.32 > both coarse sand

moved to end of Hayden Island to try again

0950 West end of Hayden Island - found muddy sands just inside channel on OR side of Island - anchored

Pos. 45:38.46
122.44.68

1115 Finished processing samples; transit to D29

1140 - test grab at location on maps directly opposite Willamette River mouth - Med sand; moved to another pos. down river - test grab - med. sand

9/28/91

1200 decided to go back to W37 and do transect for water samples then go further down river to Blurock Landing to get depositional sediments. The sed's along river where station was marked were all dredge spoils

Station W37 was supposed to be duplicate station but only had 6 BNA/Rx bottles (needed 8) so decided to do the duplicate at next full Transect Station W26; however, we did collect the carboy B Samples for BNA's + Val.

1215 on Station Position #1 45° 39.016 N
20m depth 122° 45.525 W
located up river of Willamette River mouth on OR side

1325 Position #2 Main channel 45 39.105
(~19m) 122 45.521

1355 Position #3 WA Side 45 39.180
(~12m) 122 45.298

1420 - Transit to Blurock Landing to try and find depositional sediment for Sta. D29

9/28/91

1440 tried several test grabs just down river from row of pilings (marker 39) - mostly fine sands - nothing on the OR or WA sides looked any better so decided to take samples here.

loc: 45 40.12
122 45.86

1530 finished sampling; Transit to Willamette River Station W36 (4 mi up river)

tide should be ebbing between ~ 1100 and 1800
low tide is at 1800 in Portland.

Tides

	Astoria		Portland
high	0515	+5 hrs	1015
low	1030	+7:30 hrs	1800
high	1630	+5	2120
low	2340	+7:30	0710 9/29

Station W36 is a single point station.

1615 - discovered that no duplicate samples for sed's were collected at D29 ∴ we will take duplicates at Station D28.

9/28/91

1615 on Station W36; anchored ~ 4mi up Wd.

Loc 45°36.381

122°47.052

1650 Transit to Portland; processing last benthic sample from D29 and water samples from W36.

- discovered that Carboy samples were not taken w/ Distilled water but w/ same water as sample. We refilled carboy w/ distilled water and retook the samples, because we did not have enough BNA sample bottles. We rinsed the 2 we had mistakenly filled w/ W37 water - 7 times w/ distilled water before taking Carboy blank. Also, collected volatiles into new containers.

1900 Arrived at Portland marina

9/29/91

0745 Left Portland Marina for Multnomah Channel marina - to get water / fuel / and dump head

0930 - Testing cellular phone - successfully called TT Yea!

- Calculated Tides for next seven days for St. Helens, Kalama, + Longview

	Astoria	St Helens	Kalama	Longview
9/29 high	0516	+331	0847	
low	1023	+544	1607	
9/30	0630	1001	+254	0924
	1126	1710	+455	1621
10/1	0749	~~1042~~		1042
	1249			1743
10/2	2009			2303 - 2236
	0855			~~0909~~ 1149 1122
	1419			1914 1833
	0214			0709 < 0628
10/3	~~2128~~			+ 227 ~~0026~~ 2355
	0954			1221
	0322			+ 414 ? < 0730
	1536			1940
10/4	2237			0104
	~~1042~~			1309
	0421			* 0835
	1640			2054

9/29/91

0920 Arrived Larsons Marina for fuel.

0950 Left Larsen for Station E1D

1035 on Station E1D ~ 200m upriver from marker 36 in ~ 40ft (m)
Pos: 45 40.54 N ; 122 46.56 W

1125 left E1D for D28

1140 Arrived D28 – found crayfish marker just downriver from marker 33
took test grabs - pretty muddy looking
Pos. 45°41.188
122 46.154

1255 Transit to D27; processing sed/ben samples

1345 Arrived Station D27 general area. Made several test grabs - both upriver and downriver of Willow Bar channel; tried to go up channel but too shallow
- Took samples at Position 45° 45.271
122° 46.066
~ 100-200m down from channel entrance and w/in ~ 20ft of sunken barge/boat

1440 Transit to D26, processing D27 samples

1500 at D26 - crayfish buoys - not a real

9/29/91

depositional area - 50ft water fairly strong currents (0.7 knots) - will do test grab by buoy - scoured clay - moved up river from mouth of "slough" behind pilings - fine-med sand; took station samples here

P.S. 45 46.921 N
122 46.156 W

1625 Transit to D25; processing Samples

1700 Arrived mouth of Lake River - not very depositional looking right at mouth; i.e. went up into mouth of River ~0.1 mi and took test grabs - very fine sediments - Pos. 45 50.41
122 46.65

1745 Transit to St Helens Marina

1820 St Helens Marina -
Motel tonight - Village Inn

1915 called Cordy - no answer
called Ted - no answer - left message
2130 - Talked w/ Ted
2208 - Called Cordy - she will meet us tomorrow at 9-930 or well at marina; TRY to get media person

9/30/91 Crew: Gary B, Lynne K, Tariq K, Cordy S

0800 left motel; picked up more ice + food supplies

0830 on boat; packing + labelling sample bottles

0850 Cordy arrived - making farther arrangements for photo ops...

0950 Left dock for Station D24 located just downriver from Marina on OR side - sited the crayfish buoys

0955 on station - took grab - really muddy fine seds. - so fine, we used 0.06 grab for chem

Pos: 45°52.160
122° 47.914

1040 Finished sampling; processing samples; plotting W33 transect positions

1055 Transit to W33 (Warrior Rock)

Position #1 45° 50.879 OR side
122 47.211

1140 Transit to Position #2

Note: at Position #1 could see St Helens plume - very brown dark water; ~~Pic~~ we could see plume of boat around Warrior Rock

9/30/91

1150 Position #2 - Main channel - 18m
45° 50.91
122° 47.10

1200 Position #3: WA side (16m)
45° 50.91
122 47.01

1240 Transit to W32 (Multnomah Channel)
(Point sample)

253 on Station W32 - dropped anchor in Multnomah Channel across from Boise Cascade pulp/chip Pile; down River ~ 100m from loading area
Pos 45 50.92 (17m)
122 47.86

1313 finished taking samples - processing - lunch

1315 - Transit to Lake River station W34

1400 Arrived W34 - ~0.5mi upstream of Bachelor Slough - Wood treating Facilities nearby
- had lunch, called Ted.

1430 ~~Pos 45~~ started sampling.

9/30/91

Position: 45° 49.25 N
122° 45.25 W

1445 Transit to W3.1 - Lewis River

1515 inside Lewis River ~ 1/4 mi Station W3
~ 1.5 m Pos 45°51.33N/122°46.67W

1630 finished sampling; transit to ~~E5~~ E9;
processing samples.

1600 test grab at site between large sets of pilings
- too gravelly - moved further down river
beyond last set of pilings, near storage sh
test grab - very fine sand / silt.
took samples here
Position: 45 54.32
122 49.82

1645 Departed station for St Helens
- met Steve + Margie finishing
crayfish samples at St. Helens - said
they would finish ~ Wed.; van broken

1655 St Helens Marina; Candy left

1730 moved to Public Boat ramp to meet
TT guys.

2000 still no sign of TT; called Ted
found that they left ~ 5:30, will call Ted at 9:30
- not here - 2200 they arrived; stayed in motel

10/1/71 St. Helens Landing:

0830 - met at motel, went shopping, loaded boat w/ new supplies.

— Crew: Gary BRAUN, Mahmood Shivji, Gary Rosenthal

1000 left St Helens Landing for Transit to W30 - near Goat Island

1050 on Station W30, dropped anchor just off beacon/channel marker on WA side ~ 15m

45 56.310

122 48.283

1130 Transit to Station W29 (Martins Slough)

1205 dropped anchor W29

45° 56.867

122 47.203

1235 Transit to D23

1245 Anchored at D23 -

Position 45 57.378

122 48.058

test grab - very fine sand/silt

~ 100m upslough from crayfish buoy in ~ 5.0m water; just up river of row of defunct pilings.

Took Duplicate Sed samples here - D43

1)

2) 3 extra

3)

10/1/91

* continued processing samples

1400 left D23 for transit to E8

1430 Station E8 – between 2nd + 3rd pilings from downstream end – (~12 m) test grabs - coarse sand, moved out into river – test grab – coarse sand + gravel – large clam in grab; decided to take samples in this area – just downstream of large grain elevator loading facility

1445 Position 45 59.22 > did not anchor
122 50.22

1523 Left E8, For Transit to W28

1550 Called Ted –; anchored at W28 (~70 ft) called Cordy to make arrangements for Video guy and Cordy, and Nail to report for tomorrow – call got disconnected – will have to call back later.

1635 Position 46 00.553 N
122 52.320 W

1725 Finished station W28; transit to

10/1/91

Kalama Marina for the night.

Station W28 had the deepest water we've sampled ~ 22 m

- The DO meter appears to be malfunctioning below ~ 4 m - it jumps a couple of mg/l then stays relatively stable - checked membrane, look OK -

1752 Kalama Marina.

1909 called Tod

10/2/91 Crew: GaryB, GaryK, Mahmood S.

0730 Met Jerry Hedler on dock; discussed poss. of him going out w/ us tomorrow morn - he will meet us ~11:30/1200 + will discuss some more

0810 Cordy Shea arrived, but video person will be late ~ 8:45

Plan for the day:

Morning - meet Cordy and video person do a water and sediment station (W27, 02) then come back to the dock by 11:30 and meet Neil Aukland and another reporter - take them out for the rest of the day doing both water and sed Stations.

0815 Video person arrived Ken Schneider

0835 moved to mouth of Marina - Station D22 made test grab - Silt mud - 18 additional grabs to collect benthos and sed. chem - Seds. were too fine + got a lot of over full grabs - moved around mouth of marina a fair amount to get

10/2/91

enough sediment for Chems

Benthos position: 46:
122:

Chem Pos. 46:
122:

0950 finished grab sampling; transit to Station W27 - Mouth of Kalama

1020 Arrived mouth of Kalama - too shallow at mouth, moved to down river location and took samples

Pos. 46:02.185
122:52.554

1040 Transit back to Kalama Marina; processing both ~~[illegible]~~ benthos and water samples.

1054 Message from Coastguard about GPS accuracy - apparently some of the satellites are not functioning 100% - Tina says his machine automatically compensates ~~[illegible]~~ and uses the appropriate satellites - We will check positions on charts periodically

10/2/91

1100 Arrived back at Kelowna Marina
Cathy + Ken left boat
Waiting for Neil Ackland and a reporter to arrive

~~1227 left~~

11:30 Neil Ackland + Gregg Ebersol (reporter from Longview Daily News) arrived

12:27 left Kelowna Marina for W26 (Transect station)

Pos1 46° 02:59
122° 52:58

46 03:01

Pos2 122 52:56

Pos3 46

Actual 122 52:40

4602.823 12252.948 1310 on station at Position 1 (W36 OR side)

4602.949 12252.817 1330 on station at Position 2 (main channel)

4602.845 12252.690 1403 on station at Pos #3 (WA side)

1424 pulled anchor; Transit to D21 (at mouth of Carr Slough (OR side)

1500 Arrived at mouth of Carr Slough -

Sample Bottles -
Formalin
TOC?
AOA - how many did we have
coordinates for Fri/Sat meeting us

10/21/91

took cast very muddy + depositional - took test grabs - gravel + sand
moved boat around 5 places; did not find depositional beds. ∴ moved down
~ 3/4 mi to back eddy above rocky point
finally found fine beds & silts
Position: 46.04.324
122.53.934
1550 Transit to D20 located in Carrols channel
1610 found crayfish buoy ~~in~~ at Station
Test grabs ~~fine~~ fine beds.
anchored Pos: 46 03.594
1705 122 52.104
pulled anchor - Transit to Kalama Marina

1745 at Kalama marina; dropped Veil + Gregg off
- Jerry Heller still around but building locked
need to find out if he is going out w/ us tomorrow.
1900 Called Ted - no answer
2100 called Ted - need resupplies of water samples
- Sam ave to meet us in Rainier tomorrow

10/3/91

Crew: Gary B, Gary R, Mahmood S. - no visitors

0730 label sample bottles
0815 Leave Kalama Marina; Transit to W25 in Carroll's Channel
0855 Anchored at Station W25
0910 finished samples - transit to W24 in Carroll's channel at mouth of Cowlitz River

0945 Arrived at the mouth of the Cowlitz River; observed a "line" in water where the 2 rivers meet
- dropped the CTD meter over + explored water until we saw conductivity drop and a big Temperature change ~17 → 11.5 °C
- took samples in this water

Position
46 05.67
122 55.05

- Concerned initially about sampling the Cowlitz River water because we were not at low tide; but we are confident that we sampled the

0955 Transit to E7

10/3/91

1020 testgrab on WA side, above mouth of industrial area, below Cowlitz River Mouth for Station E7 - fine sand

Pos. 46 05.91
122 56.23

1115 Transit to D18; OR side of Lord Is

1200 near Station D18 took time for Lunch

1235 test grab near slough entrance - coarse sand, made several more attempts near mouth - fine sand - no silt; moved across channel - fine sand w/ silt - decided to sample there

Pos: 46 07.429
123 01.307

1325 Transit to W23 just up river in same channel as D18

Position 46 07.255
123 00.287

1416 pulled anchor - Transit to W22 on the main channel side of Lord Is

1420 Called Ted - phone died mid conversation

10/3/91

- but did find out that Bruce is coming down tonight to Rainier

1445 on Station W22
Pos: 46 08.529
123 01.953

1515 Transit To D19 - WA side at crayfish buoy. ~~Test grab~~ -

1530 on Station D19 at Buoy
test grab - fine sand - little silt
moved closer to shore - same stuff
moved downriver of pilings - seds had more fines
D19 Pos: 46 08.32
123 00.52

1630 Transit to Rainier
Note: had to do another Benthic grab because we lost sample while sieving

16.40 Called Ted - Bruce will meet us ~7:00pm in Rainier

1720 Arrived Rainier Dock
- ~~I~~ worked on chain of custody stuff

1830 finished chain of custody; Bruce arrived, loaded samples

10/4/91 Crew: Gary B, Gary K, Mahmood S.

0800 meet at boat, buy ice and film, repack boat w/ new sample bottles and coolers

0850 left Rainier dock; transit to D17; labelling sample bottles

0940 1st boat grab near Station D17

0950 started taking Benthic samples

Pos: 46 09.87 123 02.76

1005 finished benthos, started chemistry

1114 # completed chem samples after moving around area trying to avoid the wood debris

Took Dup #D44 here

Pos. 4609.86 123 02.77

1120 Transit to W21

Took Dup #W49 here

1125 on Station W21 Pos: 46 10.12 N
123 63.04 W

moved station slightly downstream of map location to sample near floating boat storage + houseboats.

1155 Transit to E6

10/4/91

1210 talked w/ some commercial fishermen
(Gold was about Weyerhauser Chlorine
Plant + * Used Mercury in process
1545 & that night would dump the waste
Mercury into sewer that went to the
river. He said that this went on for
~20yrs, but they stopped doing it
~10 yrs ago. ∴ our samples would
probably not detect this — may want
to focus a specific effort near
this area too deeper coring for
Hg. Ex the plant is the one with
the large white mounds

1230 in area of Station E16, took lunch
[illegible]

1300 [illegible] 1st coarse sand
2nd very fine/silt clay
3rd red/fine sand
made station at 3rd [illegible]
sites were fairly variable over a
small range (10-20m)

* this could make a very good depositional area
(just inshore of pilings below Maggie moorage)

1345 Transit to D16 in Coal Creek Slough

10/4/91

1930 found crayfish berry at station D16
- test spot - muddy silt/clay
Pos: 46° 11.245 123° 05.429

1545 Transit to W20 at mouth of Coal Creek Slough - will put CTD in water before crossing bar - if different will take samples inside the slough

1610 CTD reading was 0.09 - 0.10, decided to take sample in Slough; tide was ebbing at the time.
From maps it appears that this slough drains several water bodies around Longview, so thought this was important attribute to characterize

1630 finished water samples at W20
Pos. 46° 11.39 123° 06.91
- Transit back to Rainier Dock
- Called Tod - Steve leaving ~ 5:00

1815 Arrived at Rainier Dock; waited for Steve to arrive

10/5/91

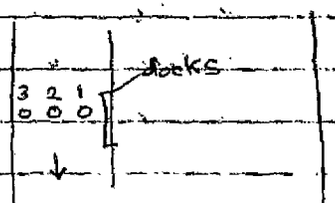
personnel: S. Ellis, D. Rosenthal, M. Shiraki

8:15 left Ranier for station W19

arrived at W19 1000. - 1

Mid channel site: depth 20m 46° 10.910 N 123° 11.184 W

- CTD profile, Water cast (5m increments), DO profile (bottle cast conducted by backing off site - needed because of wire angle)



left site for Wallace slough 1130

Site 1 CTD 46 10.90, 123° 11.18

Bottles 46° 10.92, 123° 11.13

DO start 46° 10.92, 123° 11.13

DO stop 46° 10.90, 123° 11.21

Site 2 CTD 46 10.971, 123° 11.194

Bottles 46° 10.99, 123° 11.18

DO start 46° 10.967, 123° 11.183

DO end 46° 10.961, 123° 11.194

Site 3 CTD 46 11.08, 123° 11.25

Bottles 46° 11.04, 123° 11.13

DO start 46° 11.043, 123° 11.221

DO stop 46° 11.046, 123° 11.221

W18, D15
arrived 12:00, crayfish buoy at site
- pictures 11 + 12
- took benthic + sediment samples near mouth of Beaver slough / Clatskanie river

- moved upstream to take water samples
1:53 pm (just prior to high tide; river current is moving upstream, so decided to move to next site + return later.

- Arrived back on site at 1805 W18
Current flowing out of river
- finished water sampling headed towards Cathlamet 1825

E5 Arrived 1450
- moved upstream of dredge spoil site off Puget Island
- site off upstream tip of Puget Island consisting of silt/very coarse sand + pebbles. The station moved ~ 100 yds downstream in the Cathlamet channel.
Transect back to W18 (Clatskanie river) at 1720.
- TOC + AVS samples were inadvertently left out of cooler. Placed on ice at 8:00.

10/6
crew Steve Ellis, Gary Rosenthal, Melwood Murphy
D13
left dock at 7:30 am. Transit to site
D13. Weather: fog with low ceiling
initial site consisted of coarse sand. Site
was moved upstream closer to the upstream
top of Puget Island; within Cathlamet channel
Completed benthic and sediment sampling.
Departed 1010 to W15.

W15
arrived 1020.
site along Washington side of Cathlamet channel
in the navigation lane.
completed sampling departed 1050 to W17

10/6
W17
transect upstream from Puget Island
Completed transect
departed for D14 : 1245

D14
downstream from Westport Slough
arrived 1305
took benthic grabs + sediment chemistry
departed 1415 for station W14

W14 Transect Station
Transect between Puget Island and Oregon
took water samples at 3 p
along the transect. Started approx 153
Finished @ 17.00 Also did Carbon
blanks at this station. Only took 1 l
(glass bottle) for BNAs because did not
have enough bottles (1 l). For TOC
took a 250ml sample because did
have a 1 l amber bottle.
Returned to Cathlamet @ 1715 to
conduct Chain of Custody procedures.

10/6 pm – Talked to Ted Turk about the lack of acid in TOC bottles. Recharged turbidity meter to a reading of 85 on battery check (was 75).

10/7

Crew: Steve Ellis, Mahmood Sheyja, Lisa Vogel

D12 – left dock at 745.
completed benthic and sediment chemistry sampling.
departed for station D10 at 930
no problems on station
- placed samples in ice.

D10
Sampled next to Crayfish Inlet. Site consisted of sand. so moved across channel. That site consisted of coarse sand. Moved site closer to start (upstream) of Clifton channel behind dry dock.
departed for D11 at 1143
no problems on station
- samples placed in ice.

10/7/91

D11
arrived on site 1235
took several grabs in Prairie channel, all were took coarse for a depositional area. Moved site between ~~Hoodsport~~ Horseshoe Is. & Woody Is.
Took benthic & sediment chemistry grabs. Some of the grabs contained vegetation (eelgrass)
No problems on station. Departed for station W12 at 1345.

W12
Completed sampling and departed for Astoria.
No problems on station; samples placed on ice

10/8/91

crew: Steve Ellis, Mahmood Shirifie, Lisa Vogel

departed Astoria port at 7:45 for D1

completed sampling and departed for station D2 at 935

No problems on site

Calibration of DO meter and saturation setting

D3

sampled just outside entrance to Port of Ilwaco

No problems on site

departed for D4 at 1125

D4

Initial sediment grab consists of sand.

Moved site to the west behind Sand Island

Site sampled had a filamentous algal covering

No problems on site

Departed for D1 at 1340

10/8/91

D1

Could not locate any depositional area in the [illegible] (D1). All grabs consisted of sand.

[illegible] grabs from [illegible] near [illegible]

Moved site just inside along NW side of the [illegible] moorage.

Sediment was black fine silt/clay with sulfide aroma.

Departed site for E1 at 1345

E1

[illegible]

[illegible] for sediment chemistry. Will collect sediment chemistry samples tomorrow am at slack tide.

10/9

crew: Steve Elbe, Lisa Vogel, Tarang Khangaonkar

W5

departed Astoria port at 7:45 am transit to station.

arrived 8:30; completed water profile 0-3m ~~no problems on site~~; departed for W7 at 8:55.

pH electrode defective = no pH measurements.

W7

Station at Oregon Coast Highway bridge.

ebb tide

no pH measurements taken

departed for Port of Astoria 9:40

Picked up Cordy then + reporter

E1

completed E1 sediment chemistry sampling.

Noticed oil in sediments

departed for site D3 at 12:05

D3 + D46 (dupe)

arrived site at 1245

completed benthic + sediment sampling

no problems on station

departed for Astoria at 2:30. Dropped off Cordy + Michelle.

Left for site E2

Plotted channel crossing to be used for Water sampling

E2

Completed benthic + sediment chemistry sampling. No problems on site. Departed for Astoria at 4:45.

10/10/91

crew Steve Ellis, Tarang Khangaonkar, Curtis Dekreps

received replacement pH meter

7:00 on transit to site W4

DO meter not working properly + won't read temperature. The probe for W4 is suspect

Corrected problem while moving to site W6 (wet connections in electrode). Will store meter in cabin from now on.

transit to site W6 at 8:30

W6 - transect from Astoria to

Site # 1 was located in main navigation channel off Astoria below the Astoria Bridge.

pH and DO meter were working properly

completed site 1 at 9:50 began transit to other transect sites on the Washington side of the river.

Site #2 was on WA side halfway between bridge + city of Megler

Site #3 WA side towards mid-channel

DL

Completed Benthic + Sediment sampling

No problems on site

W9

Completed water sampling

transit to W8/W5D transect

W8/W5D

transect from Grays point to Tongue point

No way to sample middle of channel so sample points were taken in navigation chan. on OR + WA side

transit to Astoria at 1850

10/11/91

crew: Steve Ellis, Tarang Khangaonkar, Curtis DeGasperi

departed Astoria at 7:30. Returning to site W4 to redo the DO profile and to sites W4 and W5 to get pH measurements.

8:00 Completed DO profile at site W4. The values show good agreement with data obtained on 10/10/91. ∴ DO meter must work well when temp is not functioning.

830 Arrived at mouth of Lewis + Clark (W5) river to take pH measurement that was missed on 10/9 due to broken meter. completed pH on composite bottle cast.

845 Arrived at mouth of Young river to take pH measurements that was missed on 10/9 due to broken meter. Completed pH on composite bottle cast and departed for site W10 (905)

1040 Arrived at site W10. Took water sample. No problems on site. Departed for site D5 at 1130.

D5 Arrived on site 1155

Completed sediment chemistry and benthic grab

Lots of life in benthic sample

Departed for site D7 at 1244

D7

Completed sediment chemistry and benthic grab. Sediment appeared similar to site D5; lots of worm tubes.

Departed for site E3 at 1420. Rough conditions.

E3

Completed E3 sediment chemistry and benthic grab. Noted what appeared to be oil in sediment grabs.

Departed for site W13.

W13

Completed water sampling and departed for Cathlamet 1300.

10/12

crew: Steve Ellis, Tarang Khangaonkar, Curtis DeGasperi

7:20 Departed Cathlamet for site D9.

D9

Simple site at mouth of Skamokawa creek, Brooks slough and Steamboat slough. Sediment was layered, with fine sand on top of a black mud. The mud smelled like fecal material -

E4

exposed site between Jim Crow point and Three tree point. Depositional material within ~50 yds from shore so moved to deeper water.

D8

Could not reach crayfish site due to presence of a sand bar. Took samples across channel from buoy.

W11

Completed water sampling and departed for Cathlamet 1345.

TETRA TECH, INC.

SUMMARY SAMPLING LOG FOR WATER
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR

SAMPLING DATE	STATION	SAMPLER	SAMPLES COLLECTED									PA
			VOL	PEST/ PCB	BNA	MET	CONV	NUT	TOC	AOX	BAC	
10/3/91	W22	GB, GR, MS				X	X	X		X		
10/4/91	W21	GB, GR, MS				X	X	X				
10/4/91	W49	"				X	X	X				
10/4/91	W20	GB, GR, MS				X	X	X		X		X
10/5/91	W19	SE, GR, MS	+ cyanide + fluoride			X	X	X				
10/5/91	W18	"	+ cyanide + fluoride			X	X	X				X
10/6/91	W15	"	+ cyanide + fluoride			X	X	X				
10/6/91	W17	"	+ cyanide + fluoride			X	X	X		X		X
10/6/91	W14	"	+ cyanide X	+ fluoride X	X	X	X	X	X	X		X
10/6/91	estuary blank W14	"	X		X							
10/7/91	W12	SE, MS, LV	+ cyanide + fluoride			X	X	X		X		X
10/8/91	W1	"	+ cyanide + fluoride			X	X	X				X
10/9/91	W5	SE, LV, TK	+ cyanide + fluoride			X	X	X		X		X
10/9/91	W7	"	+ cyanide + fluoride			X	X	X				
10/10/91	W4	SE, TK, CD	+ cyanide + fluoride			X	X	X				
10/10/91	W6	"	+ cyanide X	+ fluoride X	X	X	X	X	X	X		X
10/10/91	W9	"	+ cyanide + fluoride			X	X	X		X		X
10/10/91	W8	"	+ cyanide			X	X	X				X
10/10/91	W50	"	+ cyanide + fluoride			X	X	X				X
10/11/91	W10	"	+ cyanide + fluoride			X	X	X				X
10/11/91	W13	"	+ cyanide + fluoride			X	X	X		X		X
10/12/91	W11	"	+ cyanide + fluoride			X	X	X		X		

RECORDER: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SUMMARY SAMPLING LOG FOR WATER
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: Lower Columbia River

SAMPLING DATE	STATION	SAMPLER	SAMPLES COLLECTED								
			VOL	PEST/ PCB	BNA	MET	CONV	NUT	TOC	AOX	BAC
9/23/91	W41	GB,LK,TD,TT SE,GS,MM	X	X	X	X	X	X	X	X	
9/24/91	W43	GB,LK,TD				X	X	X			
9/25/91	W42	GB,LK,TD	+cyanide +fluoride			X	X	X		X	
9/26/91	W45	GB,LK,TD	X(2)	X(2)	X(2)	X	X	X	X	X	
9/23/91	W51		X		X						
9/26/91	W44	GB,LK,TD				X	X	X			
9/26/91	W46 DUPE OF 44	GB,LK,TD				X	X	X			
9/27/91	W39	GB,TK,LK				X	X	X		X	
9/28/91	W37	GB,TK,LK	X	X	X	X	+ CARBOY DUPS FOR	X	X	X	+ BNA'S
9/28/91	W36	GB,TK,LK		X	X	X	X	X			
9/28/91	W47	GB,TK,LK	X		X						
9/30/91	W33	GB,TK,LK,CS				X	X	X		X	
9/30/91	W32	GB,TK,LK,CS				X	X	X			
9/30/91	W34	GB,TK,LK,CS				X	X	X			
9/30/91	W31	GB,TK,LK,CS				X	X	X			
10/1/91	W30	GB,GR,MS				X	X	X		X	
10/1/91	W48	GB,GR,MS				X	X	X			
10/1/91	W29	GB,GR,MS				X	X	X			
10/1/91	W28	GR,GB,MS									
10/2/91	W27	GR,GB,MS,CS				X	X	X			
10/2/91	W26	GB,GR,MS,WK	X(2)	X(2)	X(2)	X	X	X	X	X	
10/2/91	W52 DUP OF W25	GB,GR,MS, BA	X(2)	X(2)	X(2)	X	X	X	NO DUP	X	
10/3/91	W25 W26	GR,GB,MS				X	X	X			
10/3/91	W24	GR,GB,MS				X	X	X		X	
10/3/91	W23	GR,GB,MS				X	X	X			

RECORDER: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10/8/91 STATION: W1

STATION LOCATION: River Mile :0, Center Channel

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV, JBN

LOCATION:

Bottom Depth: _____ (ft) 21 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 14.778 LONG 124 05.776

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) noticed the Pacific. ~~Just~~ just past North jetty on Washington side of river

Photos - Roll: _____ Pictures: _____

Comments: CTD 46 14.778 124 05.776
Bottles 46 14.86 124 05.66
DO start 46 14.88 124 05.74
DO stop 46 14.94 124 05.79

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-2-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1A DATE: 10-10-91 STATION: W4

STATION LOCATION: Mouth of Skipanon River

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: _____ (ft) 6.8 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 10.805 LONG 123 54.543

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) approx. 200 yds from river mouth in mid-channel

Photos - Roll: _____ Pictures:

Comments: time 8:00 am at ebb tide

DO meter not working properly. Profile is suspect. Problem was corrected will repeat profile on 10/11

10/11/91 Completed another DO profile (8:00 am) Good agreement with 10/10/91 readings

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-10-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1A DATE: 10-9-91 STATION: L5

STATION LOCATION: Mouth of Lewis + Clark river

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, LV, TK

LOCATION:

Bottom Depth: _____ (ft) 42 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 09.648 LONG 123 51.333

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) next to green buoy (#11) in Youngs Bay off Lewis + Clark river mouth

Photos - Roll: _____ Pictures: _____

Comments: pH electrode is defective. No pH samples at this site

* Completed pH measurements on a composite water sample taken on 10/11/91 with a replacement pH meter

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-9-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1A/1B DATE: 10/10/91 STATION: W6

STATION LOCATION:

STATION DESCRIPTION: transect from Astoria to Chatfield btwn bridge + Megler

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: _____ (ft) 15 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT see below LONG see below

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

Site 1: In main navigation channel just downstream of Astoria bridge
Site 2: Washington side halfway between bridge + Megler ~200 yds from sh
Site 3: Washington side towards mid channel

Photos - Roll: _____ Pictures: _____

Comments: Three sites: #1 (OR side); #2 (WA side); #3 towards center WA

#1 CTD start 46 11.607, 123 51.096
CTD stop 46 11.579, 123 51.413
Bottles 46 11.[illegible] 123 51.16
DO start 46 11.60 123 51.13
DO end 46 11.58 123 51.31

#2 CTD start 46 14.58 123 52.01
CTD stop 46 14.62 123 51.94
Bottles 46 14.60 123 51.97
DO start 46 14.56 123 52.03
DO stop 46 14.58 123 51.98

#3 CTD 46 13.67 123 52.06
Bottles 46 13.67 123 52.06
DO start 46 13.67 123 52.06
DO stop 46 13.66 123 52.06

RECORDER: SE SIGNATURE: Steve Elliott ORG. CODE: _____ DATE: 10/10/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR / 1A DATE: 10-9-91 STATION: W7

STATION LOCATION: Mouth of Youngs River

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, LV, TK

LOCATION:

Bottom Depth: _____ (ft) 10 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 10.106 LONG 123 50.337

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) At Oregon Coast Highway Bridge at mouth of Youngs river

Photos - Roll: _____ Pictures: _____

Comments: Sampling at Ebb tide.
pH meter defective, no pH samples taken

* Completed pH measurements on a composite Waters sample taken on 10/11/91 with replacement meter.

RECORDER: SE SIGNATURE: Steven Ellis ORG. CODE: _____ DATE: 10-9-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR 1B/1C DATE: 10/10/91 STATION: W8/W50

STATION LOCATION: transect Tongue Point to Grays point

STATION DESCRIPTION: Transect

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT see below LONG see below

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Transect from Tongue point to Grays Point

Photos - Roll: _____ Pictures: _____

Comments:

#1 CTD start 46 16.89, 123 46.13 #3 46 13.96 123 45.50
CTD [redacted] 46 16.86, 123 46.23 46 13.91 123 45.51
Bottles: [redacted] 16.90, 123 46.20 46 13.94 123 45.42
DO start [redacted] 16.29, 123 46.11 46 13.95 123 45.43
DO stop 46 16.29 123 46.11 46 13.95 123 45.46

#2 CTD start 46 13.81, 123 45.59
CTD stop 46 13.80, 123 45.88
Bottles: 46 13.24, 123 45.75
DO start 46 13.23, 123 45.65
DO stop 46 13.24, 123 45.65

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10/10/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/C DATE: 10/10/91 STATION: W9

STATION LOCATION: Grays Bay

STATION DESCRIPTION:

SPC ZONE: (N/S) EAST: NORTH:

CREW: SE, TK, CD

LOCATION:

Bottom Depth: (ft) 48 (m) Tide: ± (m) MLLW: (ft) (m)

LORAN C: LOP1 LOP2

LAT 46 17.935 LONG 123 43.108

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) approx. 50 yds west of mouth of Deep river ~ 300 yds off North shore

Photos - Roll: Pictures:

Comments:

RECORDER: SIGNATURE: ORG. CODE: DATE:

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR Lc DATE: 10/11/91 STATION: W10.

STATION LOCATION: North of Settler Point (OR), at intersection of South Prairie channel

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: _____ (ft) 92 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 10.384 LONG 123 40.384

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) northeast of red channel buoy

Photos - Roll: _____ Pictures: _____

Comments: _____

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR /IC DATE: 10/12/91 STATION: W11

STATION LOCATION: _____

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: _____ (ft) 72 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 13.343 LONG 123 37.256

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: _____

Comments: _____

RECORDER: SE SIGNATURE: _____ ORG. CODE: _____ DATE: 10/12/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1C DATE: 10-7-91 STATION: W12

STATION LOCATION: Between Ironson Is. and Boat ramp on OR side

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 14.259 LONG 123 31.296

Variable Radar Range: mid channel off the Boat ramp located in Oregon at Aldrich pond.

Visual Fixes: (Note: Please tape any drawings to back of this sheet) mid channel off Boat ramp.

Photos - Roll: 4 Pictures: 31 looking back at site in Prairie channel

Comments: _____

RECORDER: SE SIGNATURE: Steven Ellis ORG. CODE: _____ DATE: 10-7-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/1C DATE: 10/11/91 STATION: W13

STATION LOCATION:

STATION DESCRIPTION: off Fitzpatrick + Welch Islands - mid-channel.

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: _____ (ft) 9.0 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 15.917 LONG 123 28.511

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) off upstream tip of Fitzpatrick Island in mid-channel. Downstream from red river buoy off town of Skamokawa.

Photos - Roll: _____ Pictures: _____

Comments: _____

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10/11/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A/1C DATE: 10-6-91 STATION: W14

STATION LOCATION: Transect 2A/1C :

STATION DESCRIPTION: transect from below Pier 1s to WA

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 7-14 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 12.894 LONG 123 25.100

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 4 Pictures: 24 looking across transect from WA side
25 looking towards Cathlamet from WA side station

Comments: 3 stations #1 (WA side); #2 center; #3 Or side

#1 CTD 46 12.894, 123 25.100 #3 CTD 46 12.135, 123 26.009
Bottles 46 12.900, 123 25.117 Bottles 46 12.14, 123 26.03
DO start 46 12.902, 123 25.125 DO start 46 12.118, 123 26.02
DO stop 46 12.901, 123 25.117 DO end 46 12.15, 123 26.01

#2 CTD 46 12.497, 123 25.573
Bottles 46 12.497, 123 25.572
DO start 46 12.481, 123 25.572
DO stop 46 12.492, 123 25.543

RECORDER: SE SIGNATURE: Steven Ellis ORG. CODE: _____ DATE: 10-6-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10-6-91 STATION: W15

STATION LOCATION:

STATION DESCRIPTION: Cathlamet Channel across from Bernie slough mouth

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 16 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 10.925 LONG 123 21.137

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Washington side of Cathlamet channel across from mouth of Bernie Slough - (i.e the downstream tip of Jackson Island. Across Puget Island from Wauna mill

Photos - Roll: 4 Pictures: 17 45° angle looking upstream toward WA shore
18 looking across Cathlamet channel towards Wauna mill

Comments:

CTD	46 10.925	123 21.137
Bottles (across 4 m)	46 10.93	123 21.14
DO start	46 10.908	123 21.119
DO stop	46 10.919	123 21.105

RECORDER: SE SIGNATURE: Steve Giles ORG. CODE: _____ DATE: 10-6-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A/2B DATE: 10-6-91 STATION: W17

STATION LOCATION: upstream of tip of Puget Island.

STATION DESCRIPTION: transect upstream of Puget Island.

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 6.5-14 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 08.9 LONG 123 17.7

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 4 Pictures: 30

Comments: transect #1 North (WA), #2 center, #3 south OR.

#1 CTD 46 08.909, 123 17.643
Bottles 46 08.89, 123 17.64
DO start 46 08.914, 123 17.633
DO stop 46 08.913, 123 17.623

#2 CTD 46 08.68, 123 17.750
Bottles 46 08.68, 123 17.74
DO start 46 08.678, 123 17.75
DO stop 46 08.684, 123 17.741

#3 CTD 46 08.561, 123 17.786
Bottles 46 08.55, 123 17.75
DO start 46 08.560, 123 17.792
DO stop 46 08.558, 123 17.78

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-6-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: — DATE: 10-5-91 STATION: W18

STATION LOCATION: LCR

STATION DESCRIPTION: ~ upstream in Beaver Slough / Clatskanie R

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MJ

LOCATION:

Bottom Depth: 15 (ft) 4.6 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 08.235' LONG 123 13.707'

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) approx. 50 yds upstream of the gill fishing dock on west side of Clatskanie R/ Beaver Slough mouth

Photos - Roll: 4 Pictures: 13
14 - facing downstream toward mouth
15 - facing upstream

Comments: _____

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-5-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C/2B DATE: 10/5/91 STATION: W 19

STATION LOCATION: LCR - Intersection of Bradbury Slough & C R.

STATION DESCRIPTION: Transect run right off the light in the middle of the large pier

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT See below LONG See below

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Transect taken from middle of large pier(s) to pilings (on WA side)

Photos - Roll: _____ Pictures: #9 Middle of large pier, directly across from sampling pt.
#10 Upstream end of large pier and downstream point of Crims Island

Comments: _____

POSITION 1 N 46° 10.922
W 123° 11.136

POSITION 2 N 46° 10.99
W 123° 11.18

POSITION 3 N 46° 11.04
W 123° 11.13

RECORDER: MS SIGNATURE: _____ ORG. CODE: It DATE: 10/5/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/4/91 STATION: W20

STATION LOCATION: Mouth of Coal Creek Slough

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, GR, MS

~1615

LOCATION:

Bottom Depth: _____ (ft) 7 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46° 11.39 N LONG 123° 06.91 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Culvert/creek entrance on WA side ~ even w/ end of Willow Grove point

Photos - Roll: 4 Pictures: 7 - downriver toward mouth of Slough
8 - up river/slough from shore

Comments: According to maps, Coal Creek Slough drains several water bodies around Longview & decided to take sample inside mouth of slough

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/4/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

Dupl

SURVEY AREA: 2-C LCR DATE: 10/4/91 STATION: W21 + W49

STATION LOCATION: Mid channel between WA side and Fisher Island

STATION DESCRIPTION: Point

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 8 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 10.12 N LONG 123 03.04 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) LYC Boathouse opposite station

Photos - Roll: 4 Pictures: 3 - looking toward WA shore / boat storage

Comments: took samples in 8m ~ 1/2 way in the middle of yatch club

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/4/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/3/91 STATION: W22

STATION LOCATION: Mid Channel between Lord Is + WA side

STATION DESCRIPTION: Point

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: CB, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 15 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT Bottles CTD DO 46 08.529 N LONG 123 01.953 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) mid channel - even w/ marker 13 (the Barlow Pt light)

Photos - Roll: 3 Pictures: 24 Toward marker 13 (Barlow Pt light)
25 Toward Lord Is - pilings

Comments:
Did not anchor - maintained station

RECORDER: CB SIGNATURE: Gary Braun ORG. CODE: Tt DATE: 10/3/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/3/91 STATION: W23

STATION LOCATION: in channel between Lord Is + OR shore near up RIVER end

STATION DESCRIPTION: Point

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: OB, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 4.5 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 07.255 LONG 123 00.287

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 3 Pictures: 23 looking up River from sample point inside channel between Lord Is + OR side

Comments: _____

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/3/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/3/91 STATION: W24

STATION LOCATION: Carrolls Channel at mouth of Cowlitz River

STATION DESCRIPTION: Point

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, CR, MS

LOCATION: 0945

Bottom Depth: _____ (ft) 1.5 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 05.67 N LONG 122 55.05

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) just off tip of sandspit between Cowlitz and Carrolls Channel

Photos - Roll: 3 Pictures: 16 - in Carrolls Channel - pictures of crane unloading dredge material into spoil area

Comments: 17 - looking up mouth of Cowlitz River ~ 1/4 mi down river from Station

18 - Picture of pulp mill from mouth of Cowlitz

Very definite line in water where Cowlitz and Columbia water meet - Temperature dropped ~5° and conductivity was a 004 in Cowlitz River water - definitely found Cowlitz water to sample

RECORDER: GB SIGNATURE: Gary Bea ORG. CODE: Tt DATE: 10/3/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/3/91 STATION: W25

STATION LOCATION: in Carrolls Channel

STATION DESCRIPTION: Point

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 5.5-6 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 04.040 N LONG 122 52.225

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~ 3/4 mi down channel from mouth

Photos - Roll: 3 Pictures: 15 looking up River from Station

Comments: _____

RECORDER: GB SIGNATURE: Mary M Brandt ORG. CODE: TE DATE: 10/3/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

Duplicate

SURVEY AREA: 3A/2C DATE: 10/2/91 STATION: W26 + W52

STATION LOCATION: Segment boundry above Cottonwood Island

STATION DESCRIPTION: Transect

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gen B. Mahmood S, Gary Rosenthal (EVS), Neil Aalund (DOE) Greg Ebersole (Longview Daily N

LOCATION:

Bottom Depth: _____ (ft) ~14 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT _____ LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

Oregon side: Pilings + houses just ~~upriver~~ downriver from TROJAN NUC. POWER PLANT

WA side: Across from beach upriver from Cottonwood Island

Photos - Roll: 3 Pictures: 10 Toward OR shore - pilings
11 Toward Trojan - up river

Comments:

13F Position 1: 46 02.923
122 52.948

Position 2: 46 02.844
122 52.917

Position 3: 46 02.844
122 52.691

RECORDER: GB SIGNATURE: Mary Brown ORG. CODE: Tt DATE: 10/2/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 10/2/91 STATION: WAJ

STATION LOCATION: below mouth of Kalama River

STATION DESCRIPTION: Point

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, MS, GR, Cordy S., Kim S.

LOCATION:

Bottom Depth: _____ (ft) 4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 02.185 N LONG 122 52.554 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) just up River of Trojan and down river from Kalama River mouth on WA side ~ 0.2 mi down from green marker light

Photos - Roll: 3 Pictures: 8 Toward Trojan
9 Toward Kalama River mouth

Comments: River mouth too shallow to enter i.e. moved station as close to shore as possible down River of mouth

RECORDER: GB SIGNATURE: Gary Brau ORG. CODE: TT DATE: 10/2/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 10/1/91 STATION: W28

STATION LOCATION: Between Sandy Island + OR side

STATION DESCRIPTION: Point

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: _____

LOCATION:

Bottom Depth: _____ (ft) 22 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 00.553 N LONG 122:52.320 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) mid channel ~ 22 m just downRiver from Elder Rocks + abandoned pier

Photos - Roll: 3 Pictures: 4 Gary + Gary on deck at Station
5 up river at Elder Rocks + old loading pier

Comments: _____

RECORDER: MB SIGNATURE: Mary Brown ORG. CODE: TT DATE: 10/1/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 10/1/91 STATION: W29

STATION LOCATION: MARTIN SLOUGH

STATION DESCRIPTION: % FROM MOUTH OF SLOUGH

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GR, GD, MS

LOCATION:

Bottom Depth: _____ (ft) 6.7 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45 56.863 LONG 122 47.206

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) below confluence of water from Both sides of Burke Island; right to log raft on I5 side and Martin Island on the other

Photos - Roll: 2 Pictures: 24 - Toward Burke Island
25 - I 5 opposite direction

Comments: 0.8 mi up slough from mouth by Martin Island

RECORDER: GB SIGNATURE: Gary Brown ORG. CODE: TT DATE: 10/1/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

Dup + W4

SURVEY AREA: 3-A LCR DATE: 10/1/91 STATION: W30

STATION LOCATION: off Goat Island – main channel

STATION DESCRIPTION: Point sample

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, MS, GR

LOCATION:

Bottom Depth: _____ (ft) 15 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT N 45° 56.313 LONG W 122° 48.278

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Between channel markers on WA side – main channel

Photos - Roll: _____ Pictures: _____

Comments: TOOK DUP + W48

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 9/30/91 STATION: W31

STATION LOCATION: Mouth of Lewis River

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gary B, Tarang K, Lynne K, Cody Shea (CREW)

LOCATION:

Bottom Depth: 11 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°51.19'N LONG 122°46.89'W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Undeveloped Shoreline, Refuge. Directly across from "stand" poles for bird boxes (picture #20) Along side NW shore Lewis.

Photos - Roll: 2 Pictures: 20, 21

Comments: shallow water rather than dropping a string of bottles - put 3 down, one at a time

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

32

SURVEY AREA: 3A DATE: 9/30/91 STATION: W 33 TD

STATION LOCATION: gn Multnomah Channel

STATION DESCRIPTION: Near Boisee Cascade Factory

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, LK, TK

LOCATION:

Bottom Depth: _____ (ft) 17 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°50.92'N LONG 122° 47.86'W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 2 Pictures: 16 - West toward chip loader (Boise Cascade)
17 - north toward mouth of Multnomah Ch.

Comments: gn the deepest part of the channel,
100 m. down from loading docks
½ mile up Channel
directly accross a pile (looks like grain or sawdust

N, P, hardness - may have diluted sulfuric acid preservative - put a few ml sample in + then threw it away because I forgot to let spout vent a little

RECORDER: LK SIGNATURE: _____ ORG. CODE: TT DATE: 9/30/91

STATION LOCATION LOG

COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A/B DATE: 9/30/91 STATION: W33

STATION LOCATION: transect across channel at Warrior Rock

STATION DESCRIPTION: water transect

SPC ZONE: ______ (N/S) ______ EAST: ______ NORTH: ______

CREW: GB, TK, LK, CS

LOCATION:

Bottom Depth: ____ (ft) ____ (m) Tide: ± ____ (m) MLLW: ____ (ft) ____ (m)

LORAN C: LOP1 ______ LOP2 ______

LAT ______ LONG ______

Variable Radar Range: ______

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ______

Photos - Roll: 2 Pictures: 14 - Warrior rock (from mid channel)
15 - toward St. Helens (" " ")

Comments:

45°50'.88
122°47'.24

Position #1 oregon side

~~45°50'.91~~
~~122-47'.90~~
#2 main channel

#3 Washington side

45°:50.91
122°:47.01

RECORDER: ______ SIGNATURE: ______ ORG. CODE: ______ DATE: ______

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B DATE: 9/30/91 STATION: W34

STATION LOCATION: Lake River above Bachelor Slough

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gary B, Lynne K, Tatiana K, Cordy Shea (DEQ)

LOCATION:

Bottom Depth: _____ (ft) 4.5 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45 49.25 LONG 122° 45.25

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

Wood treating facility, ~200' below power lines/dock next to tall building in the slough ~0.5nmi above Bachelor Slough

Photos - Roll: 2 Pictures: 18 Toward wood facility
19 Toward tugs - upriver

Comments: River only ~ 50m wide - sampled in middle

RECORDER: CB/LS SIGNATURE: Gary Brown ORG. CODE: TT/DEQ DATE: 9/30/91

STATION LOCATION LOG

COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B DATE: ______ STATION: W36

STATION LOCATION: 4.5mi up the Willamette R.

STATION DESCRIPTION: point - water

SPC ZONE: ______ (N/S) ______ EAST: ______ NORTH: ______

CREW: Gen Braun, Tarang K, Lynne K.

LOCATION:

Bottom Depth: ____ (ft) 15 (m) Tide: ± ______ (m) MLLW: ______ (ft) ______ (m)

LORAN C: LOP1 ______ LOP2 ______

LAT 45°36.381'N LONG 122°47.047'W

Variable Radar Range: ______

Visual Fixes: (Note: Please tape any drawings to back of this sheet) 1.5 mi downriver from the St. John's bridge; 4 miles from mouth

Photos - Roll: 2 Pictures: 5-50. (up Willamette) toward 1st bridge (St. Johns Bridge)

Comments: ______

RECORDER: ______ SIGNATURE: ______ ORG. CODE: ______ DATE: ______

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A/3B Boundary DATE: 9/28/91 STATION: W37

STATION LOCATION: Segment Boundary

STATION DESCRIPTION: Water transect

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: CB, CK, TK

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT see below LONG _____

Variable Radar Range: Turbidity (rep. subsamples) = 4.7, 4.8
pH = 8.18

Visual Fixes: (Note: Please tape any drawings to back of this sheet)
transect is located just upstream of Willamette R. mouth

3 - west toward mouth of Willamette River

Photos - Roll: 2 Pictures: _____

Comments: * Took Corboy duplicates (BNA's + vol) Lee labelled QA W47

1210 Position 1 - ORside 45°39.016 Z=20m DO start 45 39.02
122° 45.525 122 45.52
and 45 39.01
122 45.54

1325 Position 2 - Main channel 45 39.106 DO start 45 39.105
19m Z 122 45.416 122 45.416
and 45 39.106
122 45.422

1410 Position 3 WA side Z=12m DO start 45.39
122 45.
and 45 39.192
122 45.303

RECORDER: CB SIGNATURE: Mary Brandt ORG. CODE: TT DATE: 9/29/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A LCR DATE: 9/27/91 STATION: W39

STATION LOCATION: Main channel; [redacted] between Goat Is. and WA shore

STATION DESCRIPTION: Point sample

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Lynne K, Tareng K, GARY BRAUN

LOCATION:

Bottom Depth: _____ (ft) 8.5 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°35.09 LONG 122°30.71

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Main channel w/ ~8.5m intersection of both sets of range markers (just inside of the ones on Goat Is.

Photos - Roll: _____ Pictures: _____

Comments: Bottles/CTD: 45°35.09' 122°30.71' DO start 45°35.094 122°30.717 End 45 35.103 122 30.749 CORMS: along beach at Government Island

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: Segment 4 DATE: 9/23/91 STATION: W41

STATION LOCATION:

STATION DESCRIPTION: Sandy River mouth

SPC ZONE: ____ (N/S) ____ EAST: ____ NORTH: ____

CREW: Ted T., Steve E., Margie M., Glen S., Ted D., Lynne K., Gary B.

LOCATION: Twice 13:10 and 14:20

Bottom Depth: 30 (ft) 9.5 (m) Tide: ± ____ (m) MLLW: ____ (ft) ____ (m)

LORAN C: LOP1 ____ LOP2 ____

LAT N 45° 34.011 LONG W122° 24.507

Variable Radar Range: ~ DO Drift Start GPS Reading 45°34.020
122°24.495
Start Time 1422

DO Drift End GPS Reading 45°33.998
122°24.570
End Time 1424

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Just upstream of northern most power line. ~100 m. east of metal bulkhead

Photos - Roll: ____ Pictures: ____

Comments: To characterize input of Sandy R. Sandy is not navigable, and we are in ~30 ft. of water just downstream of mouth (multiple channels).

Bottles 1m above bottom, 7m, 5m, 3m, just below surface

RECORDER: ____ SIGNATURE: ____ ORG. CODE: ____ DATE: ____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A-B DATE: 9/25/91 STATION: W42

STATION LOCATION: _____

STATION DESCRIPTION: WATER (TRANSECT)

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, TD, LK

LOCATION:

Bottom Depth: _____ (ft) 5.5 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT see below LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 1 Pictures: 13 – toward WA side

Comments: started at position 3 DO drift

GPS: 45° 33.920'N x 122° 20.1662'W (start 45° 33.9[illegible] N 120° 20.65
end 45° 33.959 N 120° 20.72

Pos 2 45 33.868 (start 45° 33.860 N 120° 20.76
122 20.776 end 45° 33.921 120° 20.82

Pos 1 45° 33.831 start 45° 33.811 120° 20.87
122° 20' .990 end 45° 33.885 120° 21.0

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/24/91 STATION: W43

STATION LOCATION:

STATION DESCRIPTION: Main channel - Rooster Rock

SPC ZONE: (N/S) EAST: NORTH:

CREW: GARY B., Lynne K., Tad D.

LOCATION:

Bottom Depth: (ft) 10.5 (m) Tide: ± (m) MLLW: (ft) (m)

LORAN C: LOP1 LOP2

LAT 45°32.744N LONG 122°15.574W

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Center main channel ~200m from shore (breakwater for Rooster Rock entrance channel)

Photos - Roll: Pictures:

Comments:

DO drift start pos 45°32.744 N
122°15.574 W

end Pos 45°32.702 N
122 15.663 W

45°32.75
15.55

RECORDER: GB SIGNATURE: Gary Br... ORG. CODE: Tt DATE: 9/24/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B LCR DATE: 9/26/91 STATION: W45

STATION LOCATION: Bonneville Dam

STATION DESCRIPTION: Transect station (3 points)

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: LK, GB, TD

LOCATION:

Bottom Depth: _____ (ft) 10.6 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°38.323'N LONG 122°57.427'W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) directly off guard loading dock, west of end of Bradford Island and powerline towers

Photos - Roll: 1 Pictures: 17+18 Bonneville Dam Powerhouse + locks
19 - gravel loading dock off starboard
20 - powerline towers off forward port quarter

Comments: Messenger lost at position 1

position 1
45°38.32 121°57.40
(water bottles)

DO drift position
start 45°38.33 121°57.36
end 45°38.32 121°57.41

position 2
(CTD water Bottles) 45°38.34
121°57.47

DO Drift position
start 45°38.35 121°57.43
end 45°38.34 121°57.48

Position 3 (Bottles) 45°38.39
121°57.49
(CTD) 45°38.44 121°57.44

DO Drift
start 45°38.41 121°57.47
end 45°38.39 121°57.49

RECORDER: GB SIGNATURE: Greg Braun ORG. CODE: Tt DATE: 9/26/91

DUPLICATE STATION

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/26/91 STATION: W441 + W446

STATION LOCATION: Warrendale

STATION DESCRIPTION: water station (point)

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, TD, LK

LOCATION:

Bottom Depth: _____ (ft) 14 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°36.844'N LONG 122°01.582'W 13 - X

Variable Radar Range: _____

10 - X

7 - X

Visual Fixes: (Note: Please tape any drawings to back of this sheet) 1 lone piling on OR side; 2 channel markers downstream 4 - X

Photos - Roll: 1 Pictures: 24 - off starboard beam toward Warrendale Sta ±
25 - off the stern toward the 2 range markers in the bay on the WA side of McGowan Channel

Comments: Warrendale coordinates (USGS) were too close to shore so we moved the station to mid-channel (to be consistent w/ other stations)

water bottle/CTD 45°36'.96
122 01.58

DO Drift
start 45°36.87 122 01.51
end 45°36.85 122°01.59

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T² DATE: 9/26/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10/8/91

STATION: W1 SAMPLER: SE, MS, LV

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH meters	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
			0	8:57 AM	7.98	20.50	7.2	13.54	2.5
			2		8.05	22.72	7.2	13.00	2.8
			4			28.63	7.2	11.86	
			6			30.92	7.6	11.44	
			8			33.69	7.8	10.[illegible]50	
			10			35.13	7.7	10.24	
			12			35.07	7.65	9.71	
			14			35.10		9.46	
			16			35.19		9.46	
			18			35.18		9.46	
			20			35.17		9.47	
	bottom		20.8			35.17		9.47	

RECORDER: SE SIGNATURE: [signature] ORG. CODE: DATE: 10-8-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / [redacted] 1A DATE: 10-10-91

STATION: W4 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCTIVITY	DO (mg/L)	T (°C)	TURB
1			surface	07:58	7.65	855	*6.2	15.46	13.0
			1m		7.74	871	6.0	15.47	13.2
			2m			9.4	6.0	15.47	
			3m			10.34	5.8	15.41	
			4m			21.42	5.6	13.73	
			5m			26.5	5.6	12.71	
			6m			28.42	5.4	12.13	
			surface				6.2		10/11/91
			1				6.0		
			2				5.8		
			3				5.8		
			4				5.6		
			5				5.6		
			6				5.8		
							5.8		

Sur

*DO readings suspect. Temp. not working on meter. Problem corrected (wet connections) will repeat measurements tomorrow 10/11/91)

RECORDER: SE SIGNATURE: Steve Ells ORG. CODE: DATE: 10-10-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10-9-91

STATION: W5 SAMPLER: SE, LV, TK

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH m	TIME (hh:mm)	pH *	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
			0	8:36	7.85	8.71	6.6	14.79	11.8
			1		7.81	9.10	6.5	14.85	12.0
			2			9.2	6.4	14.90	
		bottom	3			9.2	6.4	14.93	
			4						

* pH measurements taken on a separate composite sample collected on 10/11/91 at 8:30 am

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10/9/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1A/1B DATE: 10/10/91

STATION: W16 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
#1			surface	9:20	*7.83	2.1	6.4	16.8	*15.0
			2		*7.88	2.7	6.0	16.8	*22.0
			4			2.98	6.0	16.8	*24.0
			6			3.89	5.8	16.67	
			8			10.7	5.6	15.76	
			10			18.6	5.6	14.84	
			12			19.57	5.6	13.95	
			13 14			20.6	5.6	13.7	
			16			25.0		13.6	
#2			surface	1120		4.27	6.4	16.47	
			2			5.05	6.2	16.28	
			4			10.80	6.0	15.30	
			6			14.5	5.8	14.80	
			8			21.6	5.6	13.42	
			10			29.36	5.6	11.62	
			[illegible]			29.55	5.6	[illegible]	
			[illegible]			29.73	5.0	11.55	
			16			29.79		11.53	
			18			29.86		11.49	
			19.5			29.78		11.50	
			21						

* for composite

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-10-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1A/1B DATE: 10/10/91

STATION: W6 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
#3			surface	11:50		7.6	6.2	16.1	
↓			1m			12.6	6.2	15.4	
↓			2			13.3	6.4	14.94	
↓			2.6			14.12	6.4	14.9	

RECORDER: SE SIGNATURE: Steven Ellis ORG. CODE: DATE: 10/10/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1B/1C DATE: 10-10-91

STATION: W6/W50 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
#3			surface	1820		2.74	7.0	17.08	
			2			2.72	6.8	17.07	
			4			2.23	6.6	17.17	
			6			2.23	6.6	17.17	
		(bottom)	6.4			2.25	6.6	17.17	

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10/10/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10-9-91

STATION: W7 SAMPLER: SE, TK, LV

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH (M)	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
			0	9:19	*7.79	7.77	7.2	14.74	12.0
			2		*7.80	8.60	7.2	15.26	11.9
			4			8.83	7.2	15.37	
			6			8.85	7.0	15.38	
			8			8.87	7.0	15.39	
		bottom	10			8.88	7.0	15.40	

* pH measurements taken on a separate composite sample collected on 10/11/91 at 900 am

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-9-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1B/1C DATE: 10-10-91

STATION: W8/W50 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCTIVITY	DO (mg/L)	T (°C)	TURB
#1			surface	16:05	*7.98	8.9	7.0	16.31	*6.8
			2 m		*7.97	10.91	6.8	15.78	*6.5
			4 m			12.49	6.6	15.38	
			6 m			12.79	6.6	15.21	
			8 m			13.05	6.4	15.26	
			10 m			13.44	6.2	15.15	
			12 m			13.55	6.2	15.11	
			14 m			13.65		15.09	
			16 m			13.81		15.12	
			18 m			14.07		15.09	
			19.1 m			14.09		15.09	
#2			surface	1745		2.72	6.6	17.37	
			2 m			2.94	6.4	17.21	
			4 m			3.58	6.3	17.07	
			6 m			3.52	6.3	17.09	
			8 m			4.35	6.3	16.91	
			10 m			4.55	6.2	16.87	
			12 m			8.94	6.18	16.00	
			14 m			13.80		15.05	
			15 m			14.2		15.02	

* for composite sample

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-10-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR /1c Grays Bay DATE: 10/10/91

STATION: W9 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			surface	1500	8.09	0.37	6.5	17.39	16.0
			1		8.06	0.40	6.4	17.17	
			2			0.38	6.4	17.11	
			3			0.36	6.4	17.0	
			4			0.35	6.4	16.94	
			4.3			0.35	6.4	16.90	

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-10-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10/11/91

STATION: W10 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			surface	1110	7.62	0.08	8.4	16.79	4 NTU
			1		7.82	0.09	8.4	16.76	4 NTU
			2			0.09	8.3	16.76	
			3			0.09	8.4	16.76	
			4			0.09	8.4	16.76	
			5			0.09	8.4	16.77	
			6			0.09	8.4	16.76	
			7			0.09	8.35	16.76	
			8			0.09	8.3	16.76	
↓			9			0.09	8.3	16.76	

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: 10-11-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10/12/91

STATION: W11 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
			surface	13:30	7.73	0.09	9.2	17.29	3.1 NTU
			1		7.75	0.09	9.4	17.22	3.1 NTU
			2			0.09	9.2	17.17	
			3			0.09	9.2	17.13	
			4			0.09	9.2	17.12	
			5			0.09	9.2	17.12	
			6			0.09	9.2	17.11	
		6.6 X				0.09	9.2	17.11	

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10/12/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LRC DATE: 10/7/91

STATION: W12 SAMPLER: SE, MS, LV

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			surface		8.13	0.08	8.[illegible]	17.90	1.0
			1		8.10	0.09	8.4	17.87	1.1
			2		composite	0.09	8.5	17.86	
			3			0.09	8.2	17.86	
			4			0.09	8.3	17.77	
			5			0.09	8.2	17.68	
			6			0.08	8.2	17.66	
			6.5			0.08	8.2	17.63	

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-7-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10/11/91

STATION: W13 SAMPLER: SE, TK, CD

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			surface	1742	7.74	0.08	6.40	17.03	3.5
			1		7.76	0.09	6.45	17.05	3.5
			2			0.09	6.50	17.05	
			3			0.09	6.50	17.06	
			4			0.09	6.45	17.06	
			5			0.09	6.50	17.06	
			6			0.09	6.45	17.06	
			7			0.09	6.45	17.07	
			8			0.09	6.50	17.06	
↓		bottom	8.4			0.09	6.50	17.07	

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10/11/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A/1C DATE: 10-6-91

STATION: W14 SAMPLER:

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	3		Surface			0.08	8.5	18.04	
2			1			0.09	8.4	18.04	
3			2			0.09	8.4	18.04	
4			3			0.09	8.3	18.04	
5			4m			0.09	8.4	18.04	
6			5			0.09	8.3	18.04	
7	↓		6			0.09	8.2	18.04	
8	3		7			0.09	~~8.2~~	18.04	

RECORDER: SIGNATURE: ORG. CODE: DATE:

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A/1C DATE: 10-6-91

STATION: W14 SAMPLER: SE, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		Surface		7.74	0.08	8.1	17.91	4.70
2			1 m		7.69	0.08	8.1	17.92	4.70
3			2			0.08	8.0	17.92	
4			3			0.08	8.0	17.92	
5			4			0.08	8.0	17.92	
6	↓		5			0.08	8.0	17.92	
7	1		6			0.08	8.0	17.92	
1	2		Surface			0.08	8.5	17.93	
2			2 m			0.08	8.5	17.99	
3			4 m			0.08	8.5	17.98	
4			6 m			0.08	8.5	17.97	
5			8 m			0.08	8.6	17.98	
6			10 m			0.08	8.4	17.97	
7	↓		12			0.08	8.6	17.98	
8	2	bottom	13.5			0.08	—	17.93	

RECORDER: SE SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10-6-91

STATION: W15 SAMPLER: SE, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			surface	10:25	7.60	0.09	9.0	17.93	4.5
2			2 m		7.62	0.09	9.1	17.92	4.7
3			4 m			0.09	9.1	17.88	
4			6			0.09	9.1	17.92	
5			8			0.09	9.1	17.91	
6			10			0.09	9.1	17.90	
7			12			0.09	9.1	17.89	
8			14			0.09		17.89	
9			16			0.09		17.89	

RECORDER: SE SIGNATURE: Steve Mio ORG. CODE: DATE: 10-6-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A/2B DATE: 10/6/91

STATION: W17 SAMPLER: SE, OR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	3		Surface		7.41	0.09	8.6	17.98	4.85
2			2m		7.60	0.09	8.4	17.90	4.60
3			4		7.63	0.09	8.4	17.91	
4			6			0.09	8.4	17.90	
5			8			0.09	8.4	17.90	
6	↓		10			0.09	8.3	17.90	
7	3		bottom 10.5m			0.09	—	17.90	

RECORDER: MSK SIGNATURE: M. Rockhold ORG. CODE: _____ DATE: 10/6/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A/2B DATE: 10-6-91

STATION: W17 SAMPLER: SE, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		Surface	11.25		0.09	9.0	18.0	
2	↓		1 m			0.09	8.2	18.01	
3			2 m			0.09	8.2	17.99	
4			3 m			0.09	8.2	17.99	
5			4 m			0.09	8.0	17.98	
6			5 m			0.09	8.0	17.97	
7	↓		6 m			0.09	8.0	17.97	
8	1		6.5 m			0.09	—	17.98	
1	2		Surface			0.09	8.6	17.93	
2	↓		2 m			0.09	8.2	17.91	
3			4 m			0.09	8.2	17.90	
4			6 m			0.09	8.0	17.89	
5			8 m			0.09	8.0	17.90	
6			10 m			0.09	8.0	17.89	
7	↓		12 m			0.09	8.2	17.89	
8	2		12.5 m			0.09	—	17.89	

RECORDER: MSR SIGNATURE: M. Rosenthal ORG. CODE: DATE: 10-6-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10-5-91

STATION: W18 SAMPLER: SE, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH (m)	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
			surface		7.55	.08	8.8	18.29	6.2
			1		7.62	.08	8.8	18.27	6.8
			2			.08	8.8	18.26	
			3			.08	8.8	18.24	
			4			.08	8.7	18.25	

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-5-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C/2B DATE: 9/5/91

STATION: W19 SAMPLER: SE, MS, GR

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	3		Surface		[illegible]	.09	8.1	18.09	
2			2 m			.09	8.1	18.09	
3			4			.09	8.0	18.09	
4			6			.09	8.0	18.09	
5			8			.09	8.0	18.08	
6			10			.09	7.9	18.08	
7			12			.09	8.0	18.08	
8			14			.09	8.0	18.08	
9	↓		16			.09		18.08	
10	3		17			.09		18.08	

RECORDER: MSL SIGNATURE: [signature] ORG. CODE: DATE: 10/5/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C/2B DATE: 10/5/91

STATION: W19 SAMPLER: SE, MS, DR

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCTIVITY	DO (mg/L)	T (°C)	TURB
1	1		Surface	~10:00	7.4	.08	9.0	18.05	6.9
2			2 m		7.48	.09	8.9	18.06	6.2
3			4			.09	8.8	18.06	
4			6			.09	8.8	18.06	
5			8			.09	8.8	18.06	
6			10			.09	10.0	18.06	
7			12			.09	9.8	18.06	
8			14			.09		18.06	
9	↓		16			.09		18.06	
10	1		18			.09		18.06	
1	2		Surface	10:39		.09	9.2	18.05	
2			2 m			.09	9.0	18.06	
3			4			.09	8.9	18.05	
4			6			.09	8.8	18.05	
5			8			.09	8.8	18.05	
6			10			.09	8.8	18.06	
7			12			.09	8.8	18.06	
8			13			.09	8.8	18.06	
9	↓		16			.09		18.05	
10	2		18			.09		18.06	

RECORDER: MSR SIGNATURE: M. Randall ORG. CODE: _____ DATE: 10/5/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/4/91

STATION: W20 SAMPLER: GB, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		Surface	16:17	7.60	0.09	8.8	18.45	5.5
2			1m		7.63	0.09	8.3	18.42	5.6
3			2m			0.09	8.4	18.39	
4			3m			0.09	8.2	18.34	
5			4m			0.09	8.2	18.29	
6			5m			0.09	8.2	18.25	
7			6m			0.09	8.2	18.25	
8			7m			0.09	8.2	18.25	
							8.2		

RECORDER: GB/MS SIGNATURE: Mary Brown ORG. CODE: TT DATE: 10/9/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C 2CR DATE: 10/4/91

STATION: W21 and W49 (DUP) SAMPLER: GB, GR, MG

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			Surface	comp of pairs	7.46	.09 GR	9.2	17.85	3.9
2					7.50	.09	9.4	17.97	3.9
3			2			.09	9.0	17.90	
4			3			.09	9.0	17.89	
5			4			.09	8.8	17.89	
6			5			.09	8.8	17.88	
7			6			.09	8.8	17.87	
8			7			.09	8.8	17.85	
9			7.3			.09	—	17.85	

RECORDER: MD SIGNATURE: [signature] ORG. CODE: TT DATE: 10/3/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/3/91

STATION: W22 SAMPLER: GB, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		Surf	1448	7.39	0.08	9.0	18.82	4.4
2			2m		7.59	6.08	8.9	18.69	4.4
3			4 m		7.47	0.08	9.4	18.60	
4			6			.08	9.0	18.46	
5			8			.08	8.6	18.42	
6			10			.09	8.8	18.35	
7			12			.09	8.8	18.31	
8			14			.09	"	18.32	
9			14.7			.09	"	18.32	

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/3/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/3/91

STATION: W23 SAMPLER: GB, MS, GR

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			Surface		7.44	0.08	9.0	18.70	4.1
2			1m		7.58	0.08	9.0	18.55	3.9
3			2		separate samples	0.08	8.8	18.50	
4			3			0.08	8.8	18.50	
5			4			0.08	9.0	18.50	
			4.5				9.0		

RECORDER: MS SIGNATURE: [signature] ORG. CODE: TE DATE: 10/3/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/3/91

STATION: W24 SAMPLER: BS, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
Surface					7.20	0.04	11.6	11.72	5.5
1m					7.12	0.05	11.2	11.73	5.0
1.5m (B+T+m)						0.05	10.8	11.73	

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/3/91

STATION: W25 SAMPLER: GB, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			Surface	0900	5.27	.08	9.0	18.52	4 ?
2			1m		7.77	.08	8.8	18.54	4.6
3			2		7.68	.08	9.8	18.55	
4			3			.08	9.0	15.54	
5			4			.08	8.7	18.57	
6			5			.08	9.0	18.53	
7			5.5			.05	8.8	18.54	
							8.7 *		

(5) probe cable pulled at * by current.

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

1/2

SURVEY AREA: 3A/2C DATE: 10/2/91

STATION: W26 SAMPLER: GR, GB, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCTIVITY	DO (mg/L)	T (°C)	TURB
1	1	1	SURFACE		8.09	.08	8.2	18.95	4.6
2	1	OR side	2 m		8.13	.08	8.4	15.82	4.7
3	1		4		8.14	.08	8.4	18.76	
4	1		6		meter on	.08	8.2	18.74	
5	1		8		Composite of all	.08	8.2	18.68	
6	1		10		transects	.08	8.0	18.68	
7	1		12			.08	8.0	18.67	
8	1		14	BOTTOM		.08	13m 8.0	18.66	
9	—		16	—					
10	—		18	—					
1	2	2	Surface			.08	9.0	18.74	
2	2	main channel	2 m			.08	8.6	18.75	
3	2		4			.08	8.4	18.73	
4	2		6			.08	8.2	18.73	
5	2		8			.08	8.2	18.66	
6	2		10			.08	8.4	18.65	
7	2		12			.08	8.0	18.66	
8	2		13			.08	8.0	18.66	

RECORDER: MSR SIGNATURE: M. Rosenthal ORG. CODE: DATE: 1/2/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A / 2C DATE: 10/2/91

STATION: W26 SAMPLER: GR, GB, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	3	3	Surface			.08	8.8	18.85	
2	3		2 m			.08	8.6	18.77	
3	3		4			.08	8.4	18.73	
4	3		6			.08	8.4	18.73	
5	3		8			.08	8.2	18.69	
6	3		10			.08	8.2	18.69	
7	3		12			.08	8.2	18.69	
8	3		13			.08	8.0	18.69	

RECORDER: MSR SIGNATURE: M. Rosenthal ORG. CODE: TT DATE: 10/2/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A LCR DATE: 10/2/91

STATION: W27 SAMPLER: CB, CR, MS, CS, KS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			Surf	1025	8.09	0.08	8.2	18.67	4.7
2			1 m		8.08	0.09	8.6	18.64	4.7
3			2 m		8.09	0.09	8.2	18.63	
4			3 m			0.09	8.2	18.63	
5			3.5 bottom			0.09	8.2	18.64	

RECORDER: M.S.S SIGNATURE: [signature] ORG. CODE: Tt DATE: 10/2/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A LCR DATE: 10/1/91

STATION: W28 SAMPLER: GB, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			SURFACE	1605	7.47	.08	8.6	19.01	5 -
2			2m		7.51	.08	8.8	18.97	5.1
3			4m		7.54	.08	10.4*	18.97	5.2
4			6m			.08	10.7*	18.97	
5			8m			.08	10.4*	18.99	
6			10m			.08	10.6*	18.98	
7			12m			.08	10.8*	18.98	
8			14m			.08		18.97	
9			16m			.08		18.97	
10			18m			.08		18.97	
11			20m			.08		18.96	
12			21m			.08		18.96	

* Note! DO meter does not seem to be functioning because at 4m depth it jumps up by a 2-4 mg/L

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/1/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 10-1-91

STATION: W29 SAMPLER: GD, GR, MS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			SURFACE		8.08 don't use	.08	7.8	18.43	6.6
2			1m	sample ①	7.54	.08	8.0	18.46	6.5
3			2m		7.55	.08	7.9	18.44	
4			3 m	sample ②	7.56	.08	7.8	18.41	
5			4 m			.08	9.4	18.42	
6			5 m			.08	10.1	18.40	
7			5.5m			.08	—	18.40	

RECORDER: MSS SIGNATURE: [signature] ORG. CODE: TT DATE: 10/1/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 10-1-91

STATION: W30 SAMPLER: MS GD, GR

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			Surface		8.47	.08	9.0	18.88	4.4
2			2m		8.40	.09	9.0	18.87	4.5
3			4m		8.39	.09	9.2	18.85	
4			6m			.08	9.2	18.76	
5			8m			.08	9.8	18.76	
6			10m			.08	9.0	18.75	
7			12m			.08	10.8⊗	18.76	
8			14m			.08		18.75	

⊗ – Questionable

RECORDER:_____ SIGNATURE:_____ ORG. CODE:_____ DATE:_____

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A LCR DATE: 9/30/91

STATION: W31 SAMPLER: GB, LK, TK, CS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		sfc	1521	7.21	0.02	8.2	15.64	16 NTU
2	1		1.0			0.01	8.6	15.61	
3	1		1.6			0.01	8.6	15.61	

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: TT DATE: 9/30/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A DATE: 9/30/91

STATION: W 32 SAMPLER:

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH (M)	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		sfc	1257	7.17	0.03	9.0	18.21	7.3
2	1		2.1			0.04	8.8	18.19	7.5
3	1		4.0			0.03	8.6	18.13	
4	1		6.1			0.03	8.6	18.13	replicate
5	1		8.0			0.03	8.4	18.11	
6	1		10.1			0.03	8.4	18.13	
7	1		12.0			0.03	8.4	18.10	
8	1		14.1			0.03		18.09	
9	1		15.9			0.03		18.09	

RECORDER: LK SIGNATURE: ORG. CODE: TT DATE: 9/30/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A/B DATE: 9/30/91

STATION: W33 SAMPLER: GB, CS, TK, LK

(3)

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			S+F	11:25		0.08	9.4	14.06	
2			2.1			0.09	9.4	18.96	
3			4.1			0.09	9.4	18.96	
4			6			0.09	9.2	18.96	
5			8.1			0.09	9.2	18.96	
6			10.2			0.09	9.2	18.97	
7			12.1			0.09	9.2	18.96	
8			14.1			0.09		18.97	
			16.0	12:35		0.09		18.97	

RECORDER: TK SIGNATURE: Tony Kayser ORG. CODE: TT DATE: 9/30/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A/B DATE: 9/30/91

STATION: W33 SAMPLER: GD, LK, TK, CS

(1)

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		SRF	11:35	7.90	1.08	9.0	19.12	
2	1		2.0			0.09	9.0	19.02	
3	1		4.0			0.09	9.0	18.96	
4	1		6.0			0.08	9.0	18.88	
5	1		8.0			0.09	9.0	18.86	
6	1		10.0			0.08	9.0	18.84	
7	1		12.0	11:40		0.08	9.0	18.84	
(2)			SRF	11:55		0.08	9.0	19.05	
1			2			0.08	9.0	18.94	
2			4			0.09	9.0	18.91	
3			6			0.09	9.0	18.90	
4			8			0.09	9.0	18.92	
5			10.1			0.09	8.8	18.90	
6			12.1			0.08	8.8	18.90	
7			14.1			0.09		18.90	
8			15.9	12:10		0.09		18.90	
9									

RECORDER: TK SIGNATURE: Tony Taylor ORG. CODE: TK DATE: 9/30/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: S-B DATE: 9/30/91

STATION: W34 SAMPLER: CB, GB, LK, TK

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	Point	mid River	SRF	1435	7.55	0.10	7.6	18.82	35.0
2			1.1	14	7.59	0.10	7.6	18.77	34.0
3			2.1		7.58	0.11	7.6	18.72	"
4			3.1		"	0.11	7.6	18.71	"
5			3.8		"	0.11	7.6	18.69	replicate samples
					triplicate measures of same subsample				

RECORDER: CB SIGNATURE: C. Shea ORG. CODE: TT/DSQ DATE: 9/30/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: SB DATE: 9/28/91

STATION: W36 SAMPLER: GB, TK, LK

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			Surface	1600		0.02	8.8	17.85	
2			2.0			0.02	8.8	17.88	
3			4.0		7.40	0.02	8.8	17.87	
4			6.0			0.02	8.8	17.87	
5			8.0			0.02	8.8	17.87	
6			10.1			0.03	8.8	17.78	
7			12.2			0.03	8.8	17.77	
8			13.5			0.03	8.8	17.77	
9									

RECORDER: _____ SIGNATURE: Tuong Khanjuh ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B/4A DATE: 9/28/91

STATION: W37 SAMPLER: GB, TK, LK

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
(3) 1	3	W45 W22.5	SRF			0,08	9.2	19.11	
2	3		2·1			0·09	9.2	19·12	
3	3		4·1			0·09	9.0	19·12	
4	3		6·0			0·09	9.0	19·12	
5	3		8·1			0·08	8.8	19·12	
6	3		10·2			0·08	8.8	19·12	
7	3		11·3	1421		0·09	8.8	19·12	
~~8~~	~~3~~								
~~9~~	~~3~~								
~~10~~	~~3~~								

RECORDER: LK SIGNATURE: Lynne Kramer ORG. CODE: TT DATE: 9/28/91

Vinay Khayatan

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B/4A DATE: 9/28/91

STATION: W37 SAMPLER: GB, TK, LK

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCTIVITY	DO (mg/L)	T (°C)	TURB
①									
1	1	NW .017 W .524	sfc	1251		0.08	9.4	19.04	
2	1		2.0m			0.08	9.5	19.04	
3	1		4.0			0.09	9.6	19.04	
4	1		6.1			0.09	9.6	19.04	
5	1		8.0			0.09	9.2	19.04	
6	1		10.1			0.08	9.4	19.04	
7	1		12.2			0.08	9.4	19.04	
8	1		14.2			0.08		19.04	
9	1		16.2			0.08		19.04	
10	1		18.2			0.08		19.04	
②		N .106							
1	2	W .421	SFC .05			0.08	9.2	19.10	
2	2		2.0			0.09	9.2	19.11	
3	2		4.0			0.09	9.4	19.11	
4	2		6.1			0.08	9.2	19.11	
5	2		8.1			0.09	9.3	19.11	
6	2		10.1			0.09	9.2	19.08	
7	2		12.1			0.08	9.3	19.08	
8	2		14.1			0.08	9.2	19.08	
9	2		16.0			0.08		19.08	
10	2		18.1			0.08		19.08	

pH (transect 1): composite = 8.18 (2 rep. subsamples)

TURB (transect 1): composite (2 rep. subsamples) = [illegible]

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T2 DATE: 9/28/91

Tahay Khayat

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A LCR DATE: 9/27/91

STATION: W39 SAMPLER:

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		sfc	1000		0.08	9.0	19.15	4.5
2	1		1.1m		7.1	0.08	9.0	19.15	" "
3	1		2.1			0.08	9.0	19.15	NTU
4	1		3.3			0.09	9.0	19.15	
5	1		4.2			0.08	9.0	19.15	
6	1		5.3			0.08	9.2	19.15	
7	1		6.4			0.08	9.2	19.15	
8	1		7.3			0.08	9.2	19.15	

RECORDER: TK SIGNATURE: ORG. CODE: T2 DATE: 9/27/91

LK lynne krasnick

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: Columbia River DATE: 9-23-91

STATION: W-41 SAMPLER:

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCTIVITY	DO (mg/L)	T (°C)	~~TURB~~ TRANS.
			1m			0.08	9	18.79	-.005
			2m			0.08	9	18.78	-.007
			3m			0.08	9	18.81	-.006
			4m			0.08	9	18.79	-.005
			5m		7.93	0.08	8.9	18.76	-.006
			6m			0.08	8.9	18.76	-.006
			7m			0.08	8.8	18.76	-.010
			8m			0.08	8.6	18.76	-.006
			9m			0.08	8.8	18.77	-.007
		9.6 ~~10~~m				0.08		18.79	-.004
			11 m						-.007
			Surface				9		
	FL-TSS								
	Metals								
	Cyanide								
	N, P Hardness								
								Suspect turbidity meter calibrated incorrectly LK 9/26/91	
	Turbidity	- 5.5, 5.7		NTU	(5m.)				
	pH	7.93							
	Distilled water blanks run after this sample.								
	for BNA's (2L) and volatiles (80 ml)								
	Coded Sample W-51								

RECORDER: SIGNATURE: ORG. CODE: DATE: 9-23-91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

7.19

SURVEY AREA: LCR - Seg. 4A/B DATE: 9/25/91

STATION: W42 O SAMPLER: GB, TD, LK

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	3		sfc	1138		0.08	9.0	18.51	
2	3		1.1M			0.08	9.4	18.51	
3	3		2.1			0.08	9.3	18.51	
4	3		3.1			0.08	9.7	18.51	
5	3		4.1	1141		0.08	9.6	18.52	
1	2		sfc	1200		0.08	10.0	18.59	
2	2		1.1M			0.08	9.6	18.59	
3	2		2.1			0.08	9.5	18.60	
4	2		3.1			0.08	9.5	18.59	
5	2		4.1			0.08	9.5	18.59	
6	2		5.1			0.08	9.5	18.59	
7	2		6.1			0.08	9.5	18.59	
8	2		6.7	1207		0.08	9.5	18.59	on bottom
1	1		sfc	1231		0.08	9.6	18.51	
2	1		1.1			0.08	9.5	18.51	
3	1		2.1			0.08	9.5	18.51	
4	1		3.1			0.08	9.5	18.50	
5	1		4.1			0.08	9.4	18.50	
6	1		5.1			0.08	9.4	18.51	
7	1		6.0			0.08	9.5	18.51	
8	1		7.1			0.08	9.4	18.51	
9	1		8.0			0.08	9.4	18.52	
10	1		9.1			0.08	9.5	18.50	
11	1		10.1			0.08	9.5	18.51	
12	1		11.1			0.08	on bottom	18.51	
13	1		11.9/1240h			0.08		18.51	

BATTERIES TOO LOW — COULDN'T TAKE READINGS

RECORDER: LK SIGNATURE: Lynne Knowles ORG. CODE: T2 DATE: 9/25/91

pH 7.19, 7.32 (duplicates)

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LOWER COL. R. DATE: 9/24/91

STATION: W43 SAMPLER:

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCTIVITY (CTD)	DO (mg/L)	T (°C) (CTD)	~~TURB~~ Tr245
			sfc			0.08	10.1	19.01	-.004
			1.2m			0.08	9.9	19.03	-004
			2.2			0.08	9.8	19.02	-.005
			3.2			0.08	9.9	19.02	-.005
			4.2			0.08	10.0	19.02	-.005
			5.2			0.08	10.0	19.02	-.004
			6.2			0.08	10.0	19.02	-.004
			7.2			0.08	10.0	19.02	-.004
			8.2			0.08	10.0	19.02	-.004
			bottom: 8.8			0.08	10.0	19.02	-.004
	Turbidity			1.5,	2.0		suspect turbidity meter calibrated incorrectly LK 9/26/91		
		pH			7.47,	7.62			

RECORDER: LK SIGNATURE: Lynne Kvamme ORG. CODE: T2 DATE: 9/24/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4B (Wanapa(c)) DATE: 9/26/91

STATION: W44 + W46 SAMPLER: LK, TD, GB

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		sfc	1100		0.08	9.4	19.13	
2	1		2.			0.05	9.4	19.13	
3	1		4.2			0.08	9.5	19.13	
4	1		6.3			0.08	9.5	19.13	
5	1		8.3			0.08	9.5	19.12	
6	1		10.4			0.08	9.4	19.13	
7	1		12.0	1110		0.08	9.4	19.13	
PH	1	7.37	} triplicate measurements on same subsample						
	2	7.48							
	3	7.54							
Turbidity	1	7.5			Recalibrated machine according to machine instructions ∴ earlier measurements may not be accurate				
	2	8.4							

RECORDER: LK / GB SIGNATURE: Lynn Kaminski ORG. CODE: TT DATE: 9/26/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/26/91

STATION: W45 SAMPLER: TD/GB/LK

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1	1		sfc	08:06		0.08	9.6	19.04	
2	1		2.1	|		0.0[illegible]	9.7	[illegible]	
3	1		4.2			[illegible]	9.6	[illegible]	
4	1		6.1			0.08	9.1	19.06	
5	1		8.1			0.08	9.1	[illegible]	
6	1		8.9	08 12		0.08	9.2	19.06	
			btm				9.0		
1	2		sfc	08:37		0.08	9.8	19.06	
2	2		1.9	|		0.08	9.8	19.07	
3	2		4.1	|		0.08	9.8	19.07	
4	2		5.8	|		0.08	9.8	19.07	
5	2		8.1	08 41		0.08	9.9	19.07	
1	3		sfc	0911		0.08	9.7	19.08	
2	3		1.9			0.08	9.7	19.09	
3	3		3.9			0.08	9.7	19.09	
4	3		5.9			0.08	9.8	19.09	
5	3		8.1			0.08	9.8	19.10	
6	3		8.2	0915		0.08		19.10	

turbidity 3.3, 3.0 (reps) — suspect turbidity meter calibrated incorrectly LK 9/26/91

pH 7.43, 7.52 (dupe)

RECORDER: TD SIGNATURE: Todd [illegible] ORG. CODE: [illegible] DATE: 9/25/91

LK [illegible]

SEDIMENT SUMMARY SAMPLING LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: D-40 (~~BONNEVILLE POOL STATE PARK~~)

SAMPLING DATE	STATION	SAMPLER	HORIZON	SAMPLE NUMBER	SAMPLES COLLECTED										
					~~BNA~~	MET	PEST/ PCB	TOC	GS	~~AVS~~	~~RADIO~~	SAL	TBT	~~BEN~~	
9/24/91	D-40	0.06VV	0-2cm		X	X	X	X	X	X		X		X	X
9/24/91	E-14	0.06VV	all	B01-B03										X	
9/24/91	E-14	0.1VV	0-2 cm		X	X	X	X	X	X					
9/25/91	D-37	0.06W	all	B01-03										X	
9/25/91	D-37	0.1VV	0-2cm		X	X	X	X	X	X			X		
9/25/91	D-38	0.06VV	all	B01-03										X	
9/25/91	D-38	0.1VV	0-2cm		X	X	X	X	X	X		X	+D	10X+N	X
9/25/91	E-13	0.06VV	all	B01-03										X	
9/25/91	E-13	0.1VV	0-2cm		X	X	X	X	X	X					
9/26/91	D36	0.06VV	all	B01-03										X	
9/26/91	D36	0.1VV	0-2cm		X	X	X	X	X	X					
9/26/91	E-12	0.06VV	all	B01-03											
9/26/91	E-12	0.1VV	0-2cm		X	X	X	X	X	X					
9/27/91	D34	0.06VV	all	B01-03										X	
9/27/91	D34	0.1VV	0-2cm		X	X	X	X	X	X		X			
9/27/91	D33	0.06VV	all	B01-03										X	
9/27/91	D33	0.1VV	0-2cm		X	X	X	X	X	X		X			
9/27/91	D31	0.06VV	all	B01-03										X	
9/27/91	D31	0.1VV	0-2cm		X	X	X	X	X	X			X		
9/27/91	D32	0.06W	all	B01-03										X	
9/27/91	D32	0.1VV	0-2cm		X	X	X	X	X	X					
9/28/91	E11	0.06VV	all	B01-03										X	
9/28/91	E11	0.1VV	0-2cm		X	X	X	X	X	X					
9/26/91	D41	0.1VV	0-2		X	X	X	X	X	X					
9/26/91	D35	0.06VV	all	B01-03										X	
9/26/91	D35	0.1VV	0-2		X	X	X	X	X	X	X				X
9/28/91	D29	0.06VV	all	B01-03	X	X	X	X	X	X			X	X	NO DUP
9/28/91	D29	0.1VV	0-2												

RECORDER: _____ ORG. CODE: T² DATE: _____

SEDIMENT SUMMARY SAMPLING LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR

SAMPLING DATE	STATION	SAMPLER	HORIZON	SAMPLE NUMBER	SAMPLES COLLECTED									
					BUA ~~ORG~~	MET	PEST/ PCB	TOC	GS	AVS ~~SULF~~	Radio ~~VOC~~	SAL	TB ~~ORG~~	BEN ~~SED~~ (4.0)
9/29/91	D30	0.06 m²	all	B01-03										X
9/28/91	D30	0.1 m²	0-2		X	X	X	X	X	X				
~~9/28/91~~	~~D29~~	~~0.06 m²~~	~~all~~	~~B01-03~~										
~~9/28/91~~	~~D29~~	~~0.1 m²~~	~~0-2~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			~~X~~	
~~9/28/91~~	~~D42~~	~~0.1 m²~~	~~0-2~~											
9/29/91	E10	0.06VV	all	B01-03										X
9/29/91	E10	0.1VV	0-2cm	2 bags per sample	X	X	X	X	X	X				
9/29/91	D28	0.06VV	all	B01-03										X
9/29/91	D28	0.1VV	0-2cm		X	X	X	X	X	X	X			
9/29/91	D42	dup. for	D28		X	X	X	X	X	X				
9/29/91	D27	0.06VV	all	B01-03										X
9/29/91	D27	0.1VV	0-2cm		X	X	X	X	X	X				
"	D26	0.06VV	all	B01-03										X
"	D26	0.1VV	0-2cm		X	X	X	X	X	X				
"	D25	0.06VV	all	B01-03										X
"	D25	0.1m VV 0.06 VV	0-2cm		X	X	X	X	X	X				
9/30/91	D24	0.06VV	all	B01-03										X
"	"	0.1VV	0-2cm		X	X	X	X	X	X			X	
9/30/91	E9	0.06VV	all	B01-03										X
	"	0.1W	0-2		✓	✓	✓	X	✓	X				
10/1/91	D23	0.06VV	all	B01-03										X
"	D23	0.1VV	0-2		X	X	X	X	X	X				
"	D43	dup for D23 0.1VV	0-2		X	X	X	X	X	X				
"	E8	0.06VV	all	B01-03										X
"	E8	0.01 VV	0-2cm		X	X	X	X	X	X				
10/2/91	D22	0.06VV	all	B01-03										X
"	D22	0.06VV	0-2cm		X	X	X	X	X	X			X	

RECORDER: _____ ORG. CODE: _____ DATE: _____

SEDIMENT SUMMARY SAMPLING LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR

SAMPLING DATE	STATION	SAMPLER	HORIZON	SAMPLE NUMBER	SAMPLES COLLECTED										Di
					BNA ORG	MET	PEST/ PCB	TOC	GS	AVS SULF	Ratio VOL	SAL	TBT BA	BEN	
10/2/91	D21	GR,GR,MS	all	B01-03										X	
10/2/91	D21	"	0-2cm		X	X	X	X	X	X					
10/2/91	D20	"	all	B01-03										X	
10/2/91	D20	"	0-2		X	X	X	X	X	X	X				X
10/3/91	E7	"	all	B01-03										X	
10/3/91	E7	"	0-2		X	X	X	X	X	X					
10/3/91	D18	"	all	B01-03										X	
10/3/91	D18	"	0-2cm		X	X	X	X	X	X					X
10/3/91	D19	"	all	B01-03										X	
10/3/91	D19	"	0-2cm		X	X	X	X	X	X			X		X
10/4/91	D17	GR GR MS	all	B01-03										X	
10/4/91	D17	"	0-2cm		X	X	X	X	X	X					
10/4/91	D44	"	0-2		X	X	X	X	X	X					
10/4/91	E6	"	all	B01-03										X	
10/4/91	E6	"	0-2		X	X	X	X	X	X					
10/4/91	D16	"	all	B01-03										X	
10/4/91	D16	"	0-2		X	X	X	X	X	X					X
10/5/91	D15	SE,GR,MS	0-2		X	X	X	X	X	X					X
10/6/91	E5	"	0-2		X	X	X	X	X	X					
10/5/91	E5	"	all	B01-03										X	
10/5/91	D15	"	all	B01-03										X	
10/6/91	D13	"	all	B01-03										X	
10/6/91	D13	"	0-2		X	X	X	X	X	X					
10/6/91	D14	"	all	B01-03										X	
10/6/91	D14	"	0-2		X	X	X	X	X	X	X				X
10/7/91	D12	SE,MS,HI	all	B01-B03										X	
10/7/91	D12	"	0-2		X	X	X	X	X	X			X		

RECORDER: _____ ORG. CODE: _____ DATE: _____

SEDIMENT SUMMARY SAMPLING LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR

SAMPLING DATE	STATION	SAMPLER	HORIZON	SAMPLE NUMBER	SAMPLES COLLECTED									
					DNA ORG	MET	PEST/ PCB	TOC	GS	AVS ~~SULF~~	Radio VOL	SAL	TOT ~~BA~~	BEN (1.0)
10/7/91	D10	SE,MS,LV	all	B01-B07										X
10/7/91	D10	"	0-2		X	X	X	X	X	X				
10/7/91	D11	"	all	B01-B03										X
10/7/91	D11	"	0-2		X	X	X	X	X	X				
10/7/91	D45	"	0-2		X	X	X	X	X	X				
10/8/91	D2	"	all	B01-B03										X
10/8/91	D2	"	0-2		X	X	X	X	X	X			X	
10/8/91	D4	"	0-2		X	X	X	X	X	X				
10/8/91	D4	"	all	B01-B03										
10/8/91	D1	"	all	B01-B03										X
10/8/91	D1	"	0-2		X	X	X	X	X	X				
10/8/91	E1	"	all	B01-B03										X
10/9/91	D3	SE,LV,TK	all	B01-B03										X
10/9/91	D3	"	0-2		X	X	X	X	X	X			X	
10/9/91	D46	"	0-2		X	X	X	X	X	X			X	
10/9/91	E2	"	all	B01-B03										X
10/9/91	E2	"	0-2		X	X	X	X	X	X				
10/10/91	D6	SE,TK,CL	all	B01-B03										X
10/10/91	D6	"	0-2		X	X	X	X	X	X				
10/11/91	D5	"	all	B01-B03										X
10/11/91	D5	"	0-2		X	X	X	X	X	X		X		
10/9/91	E1	SE,LV,MS	0-2		X	X	X	X	X	X		X		
10/11/91	D7	SE,TK,CL	all	B01-B03										X
10/11/91	D7	"	0-2		X	X	X	X	X	X				
10/11/91	E3	"	all	B01-B03										X
10/11/91	E3	"	0-2		X	X	X	X	X	X				
10/12/91	D9	"	all	B01-B03										X

RECORDER: _____ ORG. CODE: _____ DATE: _____

SEDIMENT SUMMARY SAMPLING LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR

SAMPLING DATE	STATION	SAMPLER	HORIZON	SAMPLE NUMBER	SAMPLES COLLECTED										
					BNA ORG	MET	PEST/ PCB	TOC	GS	~~AVS SULF~~	~~Radio VOL~~	SAL	~~TBT BA~~	BEN (1.0)	Di
10/12/91	D9	SE, TK, CD	0-2		X	X	X	X	X	X					
10/12/91	E4	"	all											X	
10/12/91	E4	"	0-2		X	X	X	X	X	X					
10/12/91	D8	"	all											X	
10/12/91	D8	"	0-2		X	X	X	X	X	X	X				X

RECORDER: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/1A DATE: 10-8-91 STATION: D1

STATION LOCATION: In Hammond moorage

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: _____ (ft) 2-6 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 12.274 LONG 123 56.986

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

Photos - Roll: 4 Pictures: 36 looking at site on NW side of Hammond moorage

Comments: Original D1 site consisted of sands predominate - Tried sampling from Fort Stevens State Park to the light near the entrance of Hammond moorage. All grabs contained sand. Moved site within Hammond moorage, samples were taken along NW side of moorage

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-8-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR / 1A DATE: 10-8-91 STATION: D2

STATION LOCATION: Port of Ilwaco :

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: _____ (ft) 5.4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 18.042 LONG 124 02.494

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

Just off green marker 3
Off pilings 30-40 yds
West of cable area

33 Looking towards Port entrance

Photos - Roll: 4 Pictures: 34 Looking east from site towards pilings

Comments:

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-8-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR / DATE: 10-9-91 STATION: D3/D46

STATION LOCATION: Youngs Bay next to Hwy 101

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, LV, TK

LOCATION:

Bottom Depth: 6-8 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 16.90 LONG 123 51.72

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) East side of Youngs Bay near Hwy 101, just west of pilings

Photos - Roll: _____ Pictures: _____

Comments: _____

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-9-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR / 1A DATE: 10-8-91 STATION: D4

STATION LOCATION: _____

STATION DESCRIPTION: Near town of Chinook + east of Sand Is.

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 123 58.261 LONG 46 15.981

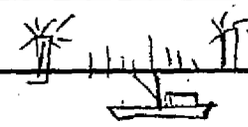
Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

WA side + Sand Island, inbetween the 2 lights, + next to the pilings

Photos - Roll: _____ Pictures: #34 North light and pilings

#35 South light and pilings



Comments: _____

Surface of Sediment chemistry grabs (0.1) had extensive cases of the colony forming diatoms. Also, many worm tubes and some red and green macroalgae.

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10-11-91 STATION: D5

STATION LOCATION: NE of Lois Island in Prairie Channel

STATION DESCRIPTION: In Lewis + Clark Wildlife Refuge

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: 5.0 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 11.638 LONG 123 42.104

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: _____

Comments: _____

interstitial salinity, 0 - 5 ppt - difficult to read refractometer due to presence of particles

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-11-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/IC DATE: 10/10/91 STATION: D6

STATION LOCATION: Grays Bay : LCR/IC

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: 5.8 ft (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT N 46° 17.882 LONG W 123° 43.113

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~ 50 yds west of entrance of Deep river; approx. 300 yds from N shore of Bay

Photos - Roll: _____ Pictures: _____

Comments: _____

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10/10/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / LC DATE: 10/11/91 STATION: D7

STATION LOCATION: North of McGregor Is.

STATION DESCRIPTION: In Lewis + Clark Wildlife Refuge

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: 6 (ft) 2.0 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT _____ LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) approx. 500 yds north of McGregor Island

Photos - Roll: _____ Pictures: _____

Comments: _____

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10/11/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/LC DATE: 10/12/91 STATION: D8

STATION LOCATION: Between Marsh Island and Brush Island

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: 7 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 13.695 LONG 123 35.223

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) across Marsh Island Creek (~ 100 yds) from Crayfish buoy.

Photos - Roll: _____ Pictures: _____

Comments: Channel was too shallow to reach crayfish sampling site, so sampled on other side of channel.

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10/12/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR /1C DATE: 10/12/91 STATION: D9

STATION LOCATION: Mouth of Skamokawa Creek, Brooks slough + Steamboat slough

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, Tk, CD

LOCATION:

Bottom Depth: 5 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 16.14 LONG 123 27.24

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) mouth of Brooks slough across from Grocery store, in front of 2nd house on SE bank

Photos - Roll: _____ Pictures: _____

Comments: Sediments at site were layered with a fine sand overlaying the silty ± 2-3cm and a fine black mud, with a strong odor of fecal matter (?), below the sand.

RECORDER: SI SIGNATURE: Steve Ells ORG. CODE: _____ DATE: 10/12/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/1C DATE: 10-7-91 STATION: D10

STATION LOCATION: South side of Clifton channel

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: _____ (ft) 16 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 12.198 LONG 123 26.639

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

~20 yds downstream from dry dock on south side of Clifton channel

Photos - Roll: 4 Pictures: 28 looking SW toward OR shore
29 looking back towards main channel below Puget Is

Comments: Moved collection site across channel from crayfish burrows. Sediment was too coarse at crayfish collection site.

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-7-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR 1C DATE: 10/7/91 STATION: D11

STATION LOCATION: Between Horseshoe Is + Woody Is.

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: _____ (ft) 18 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 14.49 LONG 123 32.91

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Between Horseshoe Is and Woody Is.

Photos - Roll: 4 Pictures: 29 looking at site towards Horseshoe Is. 30 looking toward docks on Woody Is

Comments: D45 is the duplicate for D11

RECORDER: SE SIGNATURE: Steven S Ellis ORG. CODE: _____ DATE: 10-7-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR - 2A DATE: 10-7-91 STATION: D12

STATION LOCATION:

STATION DESCRIPTION: 50 yds from entrance to Port of Cathlamet

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: 11 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 12.463 LONG 123 23.375

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) South of entrance to the Port of Cathlamet; along western bank of channel

Photos - Roll: 4 Pictures: 25 Looking toward Port entrance
26 Looking toward main channel

Comments:

RECORDER: SE SIGNATURE: [signature] ORG. CODE: _____ DATE: 10-7-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: ~ LCR DATE: 10-6-91 STATION: D13

STATION LOCATION: Cathlamet Channel ; near mouth of Berne slough

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: 15 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 09.73 LONG 123 20.14

Variable Radar Range: ~ 300 yds downstream in Cathlamet channel

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 4 Pictures: 18 looking directly at site + Puget Island
19 looking upstream towards tip of Puget Island.

Comments: _____

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-6-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - 2A DATE: 10-6-91 STATION: D14

STATION LOCATION:

STATION DESCRIPTION: downstream of Westport Slough

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 10 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 08.914 LONG 123 23.424

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~ 150 yds downstream of Westport Slough next to a prominent dead head

Photos - Roll: 4 Pictures: 21 22

Comments:

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-6-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-B DATE: 10-5-91 STATION: D15

STATION LOCATION: LCR, mouth of Klickitat R.

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 5.2-8.1 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46:08.347 LONG 123 13.934

Variable Radar Range: 400 yds from Gill netters boat dock

Visual Fixes: (Note: Please tape any drawings to back of this sheet) downstream side of Klickitat R; 400 yds from Gill netters boat dock; Right at crayfish buoy

Photos - Roll: 4 Pictures: 11 + 12 11 - looking downstream 12 - looking upstream towards main chan.

Comments: _____

RECORDER: SE SIGNATURE: Steven D. Ellis ORG. CODE: It DATE: 10/5/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: -2C DATE: 10/4/91 STATION: D16

STATION LOCATION: COAL CREEK SLOUGH

STATION DESCRIPTION: DEPOSITIONAL

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, GR, MS

LOCATION:

Bottom Depth: 30 (ft) 9.1 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT N 46° 11.244 LONG W 123° 05.429

Variable Radar Range: GPS fix: N 46° 11.244
W 123° 05.429

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Right at crayfish buoy. Across from interesting rock formations in cliff on WA side of slough. Just downriver of rock quarry.

Photos - Roll: _____ Pictures: #5 = downstream photo from sample site
#6 = Crayfish buoy & interesting rock formations in cliff

Comments: very muddy beds w/ high % clay

Interstitial Salinity (refractometer) = 0 ppt

RECORDER: GB/MS SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/4/91

Tt

STATION LOCATION LOG

COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

Duplic

SURVEY AREA: 2-C LCR DATE: 10/4/91 STATION: D17 + D44

STATION LOCATION: Upriver end of Hump Is + in Fisher Is. Slough

STATION DESCRIPTION: Depositional.

SPC ZONE: ______ (N/S) ______ EAST: ______ NORTH: ______

CREW: GB, GR, MS

LOCATION:

Bottom Depth: ____(ft) 5 - Ben / 7 - chan (m) Tide: ± ______ (m) MLLW: ______ (ft) ______ (m)

LORAN C: LOP1 ______ LOP2 ______

Ben LAT 46 09.87 LONG 123 02.76

Variable Radar Range:

Chan 46 09.86 123 02.77

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Wash side of channel near 1st set of pilings that extend into channel ~ 0.4 mi fr upriver mouth marked #4

Photos - Roll: 4 Pictures: 1 - looking downriver toward "marina"
2 - looking upriver at pilings

Comments: Made test grabs on Island side of channel - appeared to be a cut bank area - Mud flat then sharp dropoff - found fine sand well sorted - moved across river to W side near pilings - sed was finer w/ more mud content - collected benthos
- Ran into lots of wood debris - moved boat too slightly deeper water (7m)

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: Tt DATE: 10/4/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/3/91 STATION: D18

STATION LOCATION: Inside Lord Island - OR side

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, MS, GR

LOCATION: 1245

Bottom Depth: _____ (ft) 3 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 07.429 N LONG 123 01.307

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Across channel from mouth of slough just below pilings + stretch log raft to near the 2nd piling

Photos - Roll: 5 Pictures: (20) GB, GR, JN ; (21) pilings log raft (22) pilings

Comments: took several test grabs near mouth of slough - 1st coarse sand 2+3 fine sand - little silt moved across channel to OR side - fine sand w/ silt.

Mouth of slough appeared depositional but could not locate muddy sides as marked.

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/3/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/3/91 STATION: DA

STATION LOCATION: WA side -

STATION DESCRIPTION: at crayfish bay

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: CB, GR, MS

LOCATION:

Bottom Depth: _____ (ft) 4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 08.32N LONG 123 00.52 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) down river of pilings by crayfish bay - down river of most industrial activity

Photos - Roll: _____ Pictures: _____

Comments: Took several test grabs ~~up~~ at bay - moved down river of pilings to get more depositional sediments

RECORDER: CB SIGNATURE: Gary Braun ORG. CODE: Tt DATE: 10/3/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C LCR DATE: 10/2/91 STATION: D20

STATION LOCATION: Carrol's Channel

STATION DESCRIPTION: depositional

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, GR, MS, NA, GE

LOCATION:

Bottom Depth: _____ (ft) 2 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 03.596 N LONG 122 52.106 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) located station near crayfish buoy - on WA side of Carrolls Channel

Photos - Roll: 3 Pictures: 13 looking up river in backwater area
14 looking down Carrolls Channel - log Rafts

Comments: _____

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/2/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C DATE: 10-2-91 STATION: D21

STATION LOCATION: LCR

STATION DESCRIPTION: Depositional

SPC ZONE: (N/S) EAST: NORTH:

CREW: GR, MS, GB

LOCATION:

Bottom Depth: (ft) 3.5 (m) Tide: ± (m) MLLW: (ft) (m)

LORAN C: LOP1 LOP2

LAT 46 04.324 N LONG 122 53.934 W

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) several metal pilings, sand beach, Rocky point

Photos - Roll: 3 Pictures: 12 - looking back toward cove where we collected sample

Comments: on sed. unmonitor was an oil sheen

Tried to locate fine seds off Carr Slough - couldn't find any - moved downriver ≈ 3/4 mi to a back eddy near a rocky point and some metal pilings

RECORDER: GB SIGNATURE: Gary Brown ORG. CODE: Tt DATE: 10/2/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 10/2/91 STATION:

STATION LOCATION: Kalama Marina

STATION DESCRIPTION:

SPC ZONE: (N/S) EAST: NORTH:

CREW: MS, GB, GR, Cordy Shea (DEQ), Ken Schnitzler (Columbia Cable

LOCATION:

Bottom Depth: (ft) (m) Tide: ± (m) MLLW: (ft) (m)

LORAN C: LOP1 LOP2

*Buoy LAT 46° 00.584 N LONG 122° 50.907 W

Variable Radar Range:

*Chan 46° 00.586 N 122° 50.982

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

Inside Kalama Marina breakwater; very near the crayfish buoy

Photos - Roll: 3 Pictures: 6 toward crayfish buoy + log rafts
7 - toward marina

Comments: We encountered very fine sediments here - so fine that the 0.06 μm was consistently overflowing - ∴ we had to move around the mouth of the marina to collect enough grabs for sediments

RECORDER: GB SIGNATURE: Gary Bra ORG. CODE: TT DATE: 10/2/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

D43
D23 Dup.

SURVEY AREA: 3-A LCR DATE: 10/1/91 STATION: D23 Dup

STATION LOCATION: Martin Slough

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: CB, CR, MS

LOCATION:

Bottom Depth: _____ (ft) 5 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45 57.378 LONG 122 48.058

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) just up slough of defunct pilings on sand bar.

Photos - Roll: _____ Pictures: _____

Comments: Crayfish bowl was not in depositional area - moved up slough ~ 100m and behind some pilings in very fine sand / silt

RECORDER: CB SIGNATURE: Gary Braun ORG. CODE: Tt DATE: 10/8/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A DATE: 9/30/91 STATION: D24

STATION LOCATION: OR side - just downstream of St. Helens marina

STATION DESCRIPTION: depositional

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, TK, LK

LOCATION:

Bottom Depth: _____ (ft) 2.4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°52.0'N LONG 122°47.8'W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 2 Pictures: 12 - upriver toward St. Helens Marina
13 - downriver toward dock + pilings

Comments: oil sheen on composite used for chemistry

RECORDER: LK SIGNATURE: Lynne Kronmiller ORG. CODE: T2 DATE: 9/27/91

D25

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B LCR DATE: 9/29/91 STATION: D25

STATION LOCATION: mouth of Lake River

STATION DESCRIPTION: D25

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, LK, TK

LOCATION: 1/10th mile inside the mouth of Lake River

Bottom Depth: 11 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT N 45°50'408 LONG W 122°46'648

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 2 Pictures: 17 looking down Lake River to Columbia Riv

Comments: 50 feet from port shore facing into Columbia River

fast grabs - fine sand at mouth
very silty mud inside Lake River Mouth
- took samples 1 point up Lake River

RECORDER: TK/GB SIGNATURE: Gary Braun ORG. CODE: tt DATE: 9/29/91

STATION LOCATION LOG

COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B DATE: 9/29/91 STATION: D26

STATION LOCATION:

STATION DESCRIPTION: depositional

SPC ZONE: (N/S) EAST: NORTH:

CREW:

LOCATION:

Bottom Depth: 45 (ft) (m) Tide: ± (m) MLLW: (ft) (m)

LORAN C: LOP1 LOP2

LAT 45°46.921'N LONG 122°46.156'W

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~0.1 mi ~~[illegible]~~ from navigational bouy 15, about 20ft downriver from pilings - next set of pilings upriver from crayfish bouy

Photos - Roll: 2 Pictures: #11 looking upriver at pilings

Comments: Tried several test grabs near bouy - bank was muddy looking but bottom was hard clay - not depositional so moved up river behind pilings above mouth of slough

RECORDER: SIGNATURE: ORG. CODE: DATE:

STATION LOCATION LOG

COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B DATE: 9/29/91 STATION: D27

STATION LOCATION: along shoreline of Sauvie Island

STATION DESCRIPTION: depositional

SPC ZONE: ______ (N/S) ______ EAST: ______ NORTH: ______

CREW: GB, TK, LK

LOCATION:

Bottom Depth: ______ (ft) 1.5 (m) Tide: ± ______ (m) MLLW: ______ (ft) ______ (m)

LORAN C: LOP1 ______ LOP2 ______

LAT 45°45.27'N LONG 122°46.069'W

Variable Radar Range: ______

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~100m downstream of Cove Marina on Sauvie Island; w/ 30 ft of sunken boat/barge on OR shore

Photos - Roll: 2 Pictures: 9 ~300m upstream from nude beach on Sauvie Island

Comments: 3-4 test grabs

RECORDER: ______ SIGNATURE: ______ ORG. CODE: ______ DATE: ______

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B DATE: 9/29/91 STATION: D28 + D42 (dup)

STATION LOCATION: Morgan Lower Range - WA side of channel

STATION DESCRIPTION: Repositional (Duplicate)

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Greg B, Tarang K, Lynne K

LOCATION:

Bottom Depth: 16 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°41.195' N LONG 122°46.14' W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~40 m downstream from navigational marker #33 (WA side - north of Hewlitt Pt.)

Photos - Roll: 2 Pictures: 8 - nav. marker 33

Comments: _____

RECORDER: LK SIGNATURE: Lynne Kramer ORG. CODE: T2 DATE: 9/29/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B LCR DATE: 9/28/91 STATION: D29

STATION LOCATION: Approx. to Willamette River Mouth

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: LK, GB, TK

LOCATION:

Bottom Depth: _____ (ft) 2.4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°40.12'N LONG 122°45.86'W

Variable Radar Range: ~~45'~~

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 2 Pictures: 4,5

Comments: 50 m north of marker #39 /

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/28/91 STATION: D30

STATION LOCATION:

STATION DESCRIPTION: depositional

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Liz, Braun, Tracy, Khangaonkar, Lynne Krasnow

LOCATION:

Bottom Depth: _____ (ft) 5.4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 38.46' N LONG 122° 44' 58.15"

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) southern side of western tip of Hayden Is.

Photos - Roll: 2 Pictures: 1 Hyundai dock on OR side
2 dredge pipe at W end of Hayden Is.

Comments:
took 2 test grabs ~1/4 mi upriver from this site - ~10m [redacted] ladder on WA side I
→ rel. sandy
salinity = 0 ‰ (by refractometer)

RECORDER: LK SIGNATURE: Lynne Kra... ORG. CODE: T DATE: 9/27/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A LCR DATE: 9/27/91 STATION: D31

STATION LOCATION: _____

STATION DESCRIPTION: Between Hayden Is. and OR shore

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, LK, TK

LOCATION:

Bottom Depth: 15 (ft) 3 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45 36.41 LONG 122 40.48

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~~from~~ around spit from outfall and upstream of houseboats

Photos - Roll: 1 Pictures: 34+35 looking at houseboats
" " " spit

Comments: Found yellow buoy D31 just off point + below outfall (dry). Took a test grab - coarse sand not deep enough, move to down river side of point and sampled

on station 1430
leave station 1529

RECORDER: GB SIGNATURE: Mary Brown ORG. CODE: Tt DATE: 9/27/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/27/91 STATION: D32

STATION LOCATION: _____

STATION DESCRIPTION: depositional

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gary Braun, Tarang K., Lynne Krasnow

LOCATION:

Bottom Depth: 18 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 37.03' N LONG 122° 39.54' W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

~¼ mi west of I-5 bridge
abm

Photos - Roll: 1 Pictures: 35 - toward outfall along bank on WA side
36 - toward I-5 bridge to the west

Comments: _____

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T2 DATE: 9/27/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/27/91 STATION: D33

STATION LOCATION:

STATION DESCRIPTION: Deposition

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Glen Braun, Tarzan K, Lynne Krasnow

LOCATION:

Bottom Depth: 11 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 36.678 N LONG 122° 37.613 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

on WA side of river - across from Portland International Airport (PDX)

Photos - Roll: 1 Pictures: 32 - pilings on WA side - off the stern
33 - pilings + building on WA side - off back port quarter

Comments:

Salinity = 1 ‰ - wtj refractometer

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T2 DATE: 9/27/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/27/91 STATION: D34

STATION LOCATION: bet. Lemon + Sand Island. D=Tri-Club Is.

STATION DESCRIPTION: depositional station

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gary Braun, Tarang K., Lynne Krasnow

LOCATION:

Bottom Depth: _____ (ft) 1.7 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 35.604 N LONG 122° 33.982 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

~ 1/4 mi. west of I-205 bridge - close / north shore of Lemon Island

just about due south of sand spit at west end of Sand Island

Photos - Roll: 1 Pictures: 31 - east toward the I-205 bridge

Comments: SAL. = 1‰ (w/ refractometer)

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: TI DATE: 9/27/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/26/91 STATION: D35

STATION LOCATION:

STATION DESCRIPTION: at west edge of log raft

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW:

LOCATION:

Bottom Depth: ____ (ft) 6.5-7 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 34.612 LONG 122° 26.781

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) 100m east of barge loaded w. wood chips

Photos - Roll: 1 Pictures: 30 looking east at log raft

Comments: several test grabs, some empty others caught wood debris & some silt

Duplicate taken called D11 for Metals, BNA, Pest/PCB, TOC, AVS, Grainsize

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/26/91 STATION: D36

STATION LOCATION: SE of McGuire Island ~R. Mile 118

STATION DESCRIPTION: depositional sediment station

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, TD, LK

LOCATION:

Bottom Depth: 13 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 33.516'N LONG 122° 24.441'W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 1 Pictures: 26 - GB, TD, LK + lg clam from Van Veen grab
27 - southeast - off starboard bow - toward outfall pipe
28 - West, off stern - toward houseboats

Comments: alone OR shoreline - 2 (dry) outfall pipes
test grab @ 45°33.526'N x 122° 24.443'W (~11 ft Z)
0 - fine sand
sta. is located ~35m off OR shoreline -
< 1/4 mi east of houseboats

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/25/91 STATION: D37

STATION LOCATION: _____

STATION DESCRIPTION: Upcurrent of Lady Island - WA side

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Lynne KRASNOW, Steve BRAUN, Tod Deshler

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°34.589N LONG 122°23.673W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 1 Pictures: 12 - toward Washougal R. bridge

Comments: Test grab #1 - taken at mouth of Washougal R. (300m S of the bridge over the river) - gravel + rock

Test grab #2 - taken 100m south of W end of "MARK" (tug boat) dock - very fine sand + gravel (very poorly sorted)

Test grab #3 - taken ~40m south of "MARK" dock

Test grab #4 - same as preceding

" " #5 - " " "

" " #6 - tied up alongside the Patricia at the "MARK" dock (too hard to hold position, elsewhere in vicinity)

#7-23 - taken at same location as #6

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T2 DATE: 9/24/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/25/91 STATION: D38

STATION LOCATION: west end of Reed Island

STATION DESCRIPTION: depositional

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Tad, Gary, Lynne

LOCATION:

Bottom Depth: 13 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 33.464 LONG 122° 20.052

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: _____

Comments: 1st try - 45°33.469N x 122°20.107W - just so. of downstream end of Reed Is. coarse sand - moved sta. further inshore. Went to get bet. Reed Is. + WA shore - but too shallow - Took a series of test grabs ~300 m downstream from Reed Is. - both N + W of the tip - tried to anchor just off the tip - all we got was med/fine sand

Decision made to repeatedly back on to southern edge of west tip Reed Island no anchoring

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/24/91 STATION: D39

STATION LOCATION:

STATION DESCRIPTION: Near Rooster Rock channel entrance

SPC ZONE: ____ (N/S) ____ EAST: ____ NORTH: ____

CREW: Lynne K, Ted Beckler, Gary Braun

LOCATION:

Bottom Depth: ____ (ft) 5.4 (m) Tide: ± ____ (m) MLLW: ____ (ft) ____ (m)

LORAN C: LOP1 ____ LOP2 ____

LAT 45° 32.604' N LONG 122° 15.721

Variable Radar Range: ____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Directly North (~100m) of set of pilings that are located ≈ 200 m West of channel entrance

Photos - Roll: 1 Pictures: #10 mouth of Rooster Rock channel
#11 toward pilings

Comments:

Water Salinity ≈ 0 ppt

Arrived at station 1640

Left Station for Camas 1830 (tried to stop at Rooster Rock but channel too shallow)

RECORDER: GB SIGNATURE: ____ ORG. CODE: ____ DATE: ____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/24/91 STATION: D40

STATION LOCATION: Beacon Rock State Park, WA

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gary, Tad, Lynne

LOCATION: east wind ~35K

Bottom Depth: _____ (ft) 5.4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

GPS LAT 45°37.327N LONG 122°01.210W

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) alongside dock at Beacon Rock State Park (see reverse)

Photos - Roll: 1 Pictures: 7 = BRENDAN D II ON STATION
8 = TAD - COMPOSITING SED SAMPLES FOR CHEM
9 = GARY - SIEVING SED SAMPLE FOR BENTHOS

Comments: high winds - so we can't move around much in the back water area looking for softer sed's. Found silt at this position along the dock by a previous grab last night. Other previous grabs last night - in the channel directly across in the dock - closer to Pierce Is. - got only gravel. Don't know about other sed's in the channel behind Pierce Is.

Sfc water salinity at this station = 0‰ (w/ hand-held Refractometer)

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T² DATE: 9/24/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/24/91 STATION: D40

STATION LOCATION: BEACON ROCK STATE PARK, WA

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GARY, TOD, LYNNE

LOCATION:

Bottom Depth: 17 (ft) 5.4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

GPS LAT 45°37.342 N LONG 122°01.208 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) bow of boat is tied to the 3rd piling in across from the dock at Beacon Rock St. Park. Stern of boat is hanging back toward corner of dock (see reverse)

Photos - Roll: 1 Pictures: 23 - crayfish trap at Beacon Rock St. Park

Comments: took one grab - just a small amt of gravel moved boat back to dock where we know there is finer material

RECORDER: LK SIGNATURE: Lynne K ORG. CODE: _____ DATE: 9/24/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10-8-91 STATION: E1

STATION LOCATION: In main channel ;

STATION DESCRIPTION: main channel

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, MS, LV

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 13.524 LONG 123 56.303

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

½ mi due east of Deerdemona Sands; due north of Point Adams Coast guard Station

Photos - Roll: _____ Pictures: _____

Comments: Current was too strong to collect sediment chemistry grabs. Will collect sediment chemistry tomorrow am last slack tide

10/9 collected sed chem at 11:30 AM slack-flood tide

Interstitial salinity 17 ‰

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-8-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR /1B DATE: 10-9-91 STATION: E2

STATION LOCATION: NE of Astoria in mid-channel

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, LV, JK

LOCATION:

Bottom Depth: _____ (ft) 30 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 14.836 LONG 123 48.510

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: _____

Comments: _____

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-9-91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR / IC DATE: 10/11/91 STATION: E3

STATION LOCATION: In navigation channel south of Rice Island

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: _____ (ft) 15 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 15.014 LONG 123 41.361

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Off upstream tip of Rice Island in navigational channel

Photos - Roll: _____ Pictures: _____

Comments: Sediment Grabs contained Globules of black material which appeared to be oil.

Captured [redacted] Sole in first benthic grab

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10/11/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR /c DATE: 10/12/91 STATION: E4

STATION LOCATION:

STATION DESCRIPTION:

SPC ZONE: ____ (N/S) ____ EAST: ____ NORTH: ____

CREW: SE, TK, CD

LOCATION:

Bottom Depth: ____ (ft) 15 (m) Tide: ± ____ (m) MLLW: ____ (ft) ____ (m)

LORAN C: LOP1 ____ LOP2 ____

LAT 46 15.976 LONG 123 32.037

Variable Radar Ranges:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) approx halfway between Jim Crow point and Three Tree point

Photos - Roll: ____ Pictures: ____

Comments: Bald eagle sighted on shore

RECORDER: SE SIGNATURE: [signature] ORG. CODE: ____ DATE: 10/12/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - 2B/2A DATE: 10-5-91 STATION: E5

STATION LOCATION: LCR

STATION DESCRIPTION:

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: SE, GR, MS

LOCATION:

Bottom Depth: 12 (ft) 5-6 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46° 09.535 LONG 123° 19.518 W

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) north side of upstream tip of Puget Island; approx 100 yds downstream in middle of Cathlamet Channel.

Photos - Roll: _____ Pictures:

Comments: sediment consisted of coarse sand

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-5-91

STATION LOCATION LOG

COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2 - C DATE: 10 - 4 - 91 STATION: E6

STATION LOCATION: LCR mouth of Bradbury Slough

STATION DESCRIPTION: Non depositional

SPC ZONE: ______ (N/S) ______ EAST: ______ NORTH: ______

CREW: GB, GR, MS

LOCATION:

Bottom Depth: ____ (ft) 5.5 (m) Tide: ± ____ (m) MLLW: ____ (ft) ____ (m)

LORAN C: LOP1 ______ LOP2 ______

LAT 46 10.149 N LONG 123 06.470 W

Variable Radar Range: ______

Visual Fixes: (Note: Please tape any drawings to back of this sheet) just downriver of pilings from Mayger moorage; upriver of 1st set of jetty pilings ≈ 100 yds from shore

Photos - Roll: 4 Pictures: #5 upriver toward Mayger boat moorage

Comments: did 3 boat grabs 1st - coarse sand
2nd - very fine sds w/clay
3rd - med/fine sand w/silt
Station located near 3rd boat grab
This area may be a good depositional area in the future

RECORDER: GB SIGNATURE: Gary Brown ORG. CODE: Tt DATE: 10/4/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C DATE: 10-3-91 STATION: E7

STATION LOCATION: LCR downRiver of Cowlitz mouth + upriver

STATION DESCRIPTION: from industrial section of Longview

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: CB, MS, CR

LOCATION:

Bottom Depth: _____ (ft) 14 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 46 05.91 W LONG 122 56.23 W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Between the eastern most set of Pilings and the 2nd set of pilings (Freighter was tied up at the downriver location)

Photos - Roll: 3 Pictures: 19 - Toward dock w/ Crane DAD upriver pilings

Comments: large crack (0.1 m²) was leaking on one side - modified grout; tested - reduced leaking to minimal amount

RECORDER: CB SIGNATURE: Gary Bree ORG. CODE: TT DATE: 10/31/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 10/1/91 STATION: E8

STATION LOCATION: below grain silos + loading dock

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, GR, AS

LOCATION:

Bottom Depth: _____ (ft) 9 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 59.22 LONG 122° 50.23

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: 3 Pictures: 1 looking toward silos + loading facility
2 looking down river at piling w/ Trojan in background

Comments: _____

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-A LCR DATE: 9/30/91 STATION: E9

STATION LOCATION: Below Columbia City - OR side

STATION DESCRIPTION: "erosional"

SPC ZONE: _____ (NS) _____ EAST: _____ NORTH: _____

CREW: GB, TK, LK, C. Shea

LOCATION:

Bottom Depth: _____ (ft) 8 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°54 32'N LONG 122° 48.82'W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

down river of BST 2 Pilings

Photos - Roll: 2 Pictures: 22, 23

Comments: test grabs - 2 - too coarse - large rocks moved down river - fine sand/silt.

Oil sheen on sediment

RECORDER: LK SIGNATURE: C Glen Lynne Krosnow ORG. CODE: T2 DATE: 9/30/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3-B LCR DATE: 9/29/91 STATION: ~~B3~~ E10

STATION LOCATION: OR side of river; close to shore

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gary B., Tabeng K, Lyane K

LOCATION:

Bottom Depth: 42 (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°40.518'N LONG 122° 46.529'W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) ~100m upstream from navigational marker #36 - along Sauvie Island

Photos - Roll: 2 Pictures: 7

Comments: There are 5 bags w/ benthic samples -
2 for B01, B03
1 for B02

RECORDER: LK SIGNATURE: Lyane Krasnow ORG. CODE: T2 DATE: 9/29/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A LCR DATE: 9/28/91 STATION: E11

STATION LOCATION: Wash Side, lower part of Hayden Is.

STATION DESCRIPTION: moored

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Lynne Krogness, Gary, Brown, Tareng Khangaonkar

LOCATION:

Bottom Depth: _____ (ft) 12 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 38.448' N LONG 122° 43.011' W

~~Variable Factor Range~~ ½ Way between forward range marker (Vancouver range) & marker #51 (WA side)

Visual Fixes: (Note: Please tape any drawings to back of this sheet) !

Photos - Roll: 1 Pictures: 37 - toward marker #51

Comments:

RECORDER: LK SIGNATURE: Lynne Krogness ORG. CODE: T2 DATE: 9/28/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/26/91 STATION: E12

STATION LOCATION: S side of middle Government Island, 1.2 nmi E of 205 br

STATION DESCRIPTION: transitional sed station

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: GB, LK, TD

LOCATION:

Bottom Depth: _____ (ft) 3.9 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 34.078 LONG 122° 31.191

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) mid-channel between OR 29 on shore and government Is.
50m west of bubble house on OR. shoreline

Photos - Roll: 1 Pictures: 29 looking N towards government Is.

Comments: Test grab 45° 34.072 N 122° 31.118 W
4.2 m
coarse sand; good spot!

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/25/91 STATION: E13

STATION LOCATION:

STATION DESCRIPTION: erosional station

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: Gary Braun, Tad, Dashler, Lynne Krasnow

LOCATION:

Bottom Depth: _____ (ft) 64 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45° 32.702 'N LONG 122° 18.935' W

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet) south of Reed Island, west of Rooster Rock - south of main channel

Photos - Roll: 1 Pictures: 15 - south toward light #60

Comments: attempt to sample non-depositional area - picked area w/ sand waves on the bottom (almost 1m amplitude) - tried to get depth similar to that at E14.

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: I² DATE: 9/25/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/24/91 STATION: E14

STATION LOCATION: E14 =

STATION DESCRIPTION: just north of green can 83A (~1/4 mi.)

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: _____

LOCATION:

Bottom Depth: _____ (ft) 5.4 (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT 45°35.306N LONG 122°05.979W

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

~1/3 of the away across the river from the south shore

Photos - Roll: _____ Pictures: _____

Comments: east wind ~ 35K, ~1½ ft. of chop

RECORDER: LK SIGNATURE: Lynne Krabbe ORG. CODE: I DATE: 9/24/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/1A DATE: 10/8/91

STATION: D1 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test		2:13				
Grab rejected - sand - moved							
02	Test		2:20				
Grab rejected - sand - moved							
03	Test	3m	2:30				
Grab rejected - sand - moved							
04	Test	12'	2:36				
Grab rejected - sand - moved - observations and pt							
05	Test	11'	2:43				
Grab rejected - Sand							
07	Test	11'	2:47				
Grab rejected - Sand							
08	Test	2.6m	2:54				
Looks deposition.							
09	Benthos	2.6m					
Rejected - not sufficient material							
10	Benthos						
Rejected - not enough material							
11	Benthos	2.6m	3:02	4.5 inch	silt, clay	Grey/black	
Accepted							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-8-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 2A DATE: 10/8/91

STATION: D4 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
12	benthos	2.6m	3:06	6 inch	silt/clay	BLACK	
Accepted							
13	benthos	2.6m	3:10	6 inches	clay/silt	olive brown to black	
Accepted							
14	Chem	2.6m	3:15		clay/silt	drab olive + black	sulfide
Protocol Grab / methanol rinse / DW rinse / Grab discarded							
15	Chem	2.6	3:18		"	"	"
Composite Grab #1							
16	Chem	2.6	3:24		"	"	"
Composite Grab #2							
17	Chem	2.6	3:30		"	"	"
Composite Grab #3							

RECORDER: SE SIGNATURE: Steven Ellis ORG. CODE: _____ DATE: 10-8-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10-8-91

STATION: D2 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Benthic	5.4 ft	1027	3 1/4"	fine sand silt	drab brown	
Grab accepted B01							
02	test	5.4 ft	1034				
Grab rejected - veg in jobo, diatoms noticed							
03	Benthic	5.4' ft	1035	4 1/2"	fine silt clay	charcoal gray brown black	
Grab accepted - B02							
04	Benthic	5.4 ft	1040	4 3/4"	fine silt clay	charcoal gray brown, black	
Grab accepted - B03							
05	Chem	5.4 ft					
Protocol grab - methanol / DW rinse - grab discarded							
06	Chem	5.4 ft	10:55	6.5 inches	fine silt/clay	charcoal gray brown/black	none
Accepted Composite Grab #1.							
07	chem	5.4 ft	11:09	7.0 in	"	✓	none
Composite Grab #2							
08	chem	5.4 ft	11:15	7.0 in	"	✓	none
Composite Grab #3							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-8-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 03 / 04 dup. DATE: 10/9/91

STATION: LCR SAMPLER: SE, TK, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Benthic	8.0'	1255	<5 cm	fine sand		
	Test rejected - moved slightly - too sandy						
02	Benthic	6.6'	1259	<5 cm	fine sand silt		
	Test rejected but OK will keep next one						
03	Benthic	6.6'	1300	3 cm	fine silt sand		
	~~accepted~~ - rejected - too shallow						
04	Benthic	6.9'	1303	5.5 cm	fine sand	brown gray	none
	accepted -						
05	Benthic	6.8'	1306	<5 cm			
	rejected - insufficient sample						
06	Benthic	6.6'	1309	5.5 cm	fine sand	brown gray	none
	accepted -						
07	Benthic	6.6'	1311	<5 cm			
	rejected						
08	Benthic	6'	1313	1½ cm			
	rejected						
09	Benthic	6.6'	1315	<5 cm			
	rejected						
10	Benthic	7.0'	1316	5¾ cm	fine sand	brown gray	none
	accepted						

RECORDER: LV SIGNATURE: Lisa Vogel ORG. CODE: DATE: 10-9-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: _____ DATE: _____

STATION: D3/D46 SAMPLER: _____

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	Chem	5.5'	1339	7 cm	fine sand	brown/gray, mottled	
accepted							
12	Chem	5.5'	1345	6 cm			
accepted							
13	Chem	5.5'	1349	5.5cm			
accepted							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-9-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10/8/91

STATION: D4 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test	7'	12:22		Mud sand		
Grab rejected — moved site							
02	Test	5'	1225		fine sand		
Grab rejected — moved site							
03	Benthic	7.5'	1233	3 3/4"	sandy silty clay	greenish gray	
Grab accepted - loose diatoms on surface - gelatinous layer 2cm							
04	Benthic	7.8'	1237	3 1/2"	sandy silty clay	greenish gray	
Grab accepted - loose diatoms on surface " "							
05	Benthic	7.8'	1249	3"	sandy silty clay	greenish gray	
Grab accepted - loose diatoms " " " "							
06	Chem	7.8ft					
Protocol Grab methanol / DW rinse + Grab rejected							
07	Chem	7.9ft	1248	5 inches			
Composite #1							
08	Chem	7.9ft	1258	5.5 inches			
Composite #2							
09	chem	7.9ft	1.10	5.5 inches			
Composite # 3							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10/11/91

STATION: D5 SAMPLER:

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	benthic	5 ft	12:00				
Test grab looks good							
02	benthic	5 ft	12:03	8 cm	silty sand	brown	no odor
B#1 B#1							
03	benth	5 ft	1208	8.5 cm	"	"	"
B02							
04	benthic	5 ft	1213	7.5	"	"	"
B03							
05	Chem	5ft					
Protocol Grab / Methanol/DW rinse + Grab disposed							
06	Chem	5 ft	1219	10.0 cm	silty sand	brown	"
Composite Grab #1							
07	Chem	5 ft	1226	11.0	silty sand	brown	none
Composite Grab #2							
08	Chem	5 ft	1232	11.0	silty sand	brown	none
Composite Grab #3							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-11-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / LC DATE: 10/10/91

STATION: DG SAMPLER: SE, TK, CD

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	benthic	5.8	1300		sandy	brown	
reject 2 Good —							
3	benthic	5.8		7cm	~~Silty~~ Sand	brown/grey	none
Good.							
4	benthic	5.8		7.5cm	Silty Sand	brown/grey	none
5	chemistry	5.8	1320				
grab, methanol rinse, Distilled rinse, 1st grab tossed							
6	chem	5.8	1336	10.0	fine sand	brown/grey	none
Composite Grab #1							
7	Chem	5.8	1343	10.0	"	"	"
Composite Grab #2							
08	Chem	5.8	1350	10.0	"	"	"
Composite Grab #3							

RECORDER: SE SIGNATURE: Steve Ells ORG. CODE: DATE: 10/10/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10/11/91

STATION: D7 SAMPLER: SE, TK, CD

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1		5 ft	1340		silty sand	brown	no odor
Test Grab					many worm tubes		
2	benthic	6 ft	1345	7 cm	silty sand	brown	no odor
					many worm tubes		
3	benthic	6 ft	1347	7 cm	silty sand	brown	no odor
4	benthic	6 ft	13:	6.5 cm	silty sand	brown	no odor
5	Chem.	6 ft	1350	"	"	"	"
Protocol Grab methanol/DW rinse + Grab discarded							
6	Chem	6 ft	1354	9.0	silty sand	brown	none
Composite Grab #1							
7	Chem	6 ft	1400	11.0	silty sand	brown	none
Composite Grab #2							
8	Chem	6 ft	1407	12.0	silty sand	brown	none
Composite Grab #3							

RECORDER: JE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10/11/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR /1C DATE: 10/12/91

STATION: D8 SAMPLER: SE, TK, CD

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test		1210				
Sediment looks depositional							
02	Benthic		1212	8 cm	silty sand	brown	none
B01							
03	Benthic		1218	10 cm	silty sand	brown	none
B02							
04	Benthic		1223	8 cm	silty sand	brown	none
B03							
05	Chem						
Protocol Grab methanol/DW rinse + Grab discarded.							
06	Chem		1232	11 cm	silty sand	brown	none
Composite Grab # 1							
07	Chem		1238	10 cm	silty sand	brown	none
Composite Grab # 2							
08	Chem		1243	10cm	silty sand	brown	none
Composite Grab # 3							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10/12/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1C DATE: 10/12/91

STATION: D9 SAMPLER: SE, TK, CD

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	ben	2 ft	8 15				[illegible] odor
	grass						
2	ben	2ft	8 19	2 cm	fine silty sand	light brown	strong odor
	very [illegible] house						
3	ben	2 ft	824	8 cm	fine silty sand	light brown	odor strong
	not so near house						
	B02						
4	ben	6 ft	831		silty sand	light brown	
	too sandy - drifted to center of channel						
5	benthic	4 ft	843	10 cm	silty sand	light brown	odor strong
	B03		small wood debris				
6	chem	5ft	851				
	Probe rinse / methanol, DIW + from alconox						
7	Chem	5 ft	856	10.0	fine silty sand	light brown	[illegible]
8	Chem	5ft	904	10.0	"	"	"
9	Chem	5ft	910	8.0	"	"	

RECORDER: SE SIGNATURE: [signature] ORG. CODE: ______ DATE: [illegible]

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 1C DATE: 10/7/91

STATION: D10 SAMPLER: LV, SS, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test	13'	1000				
Grab rejected - sand							
02	Test	15'	1003				
Grab rejected - stick jam + empty - moved							
03	Test	18'	1014				
Grab rejected - coarse sand + gravel							
04	Test	12'	1016				
Grab rejected - stick jam, sand - moved							
05	Test	5'	1024				
Grab rejected - fine sand, stick jam - moved							
06	Test	6.2'	1029				
Test grab - looks depositional - W end of dry dock - keep next 3 grabs							
07	Test	8.1'	1032				
grab rejected - stick jam - looks depositional							
08	Benthic	7.0'	1033	9 cm	fine sand	drab olive	none
Grab accepted B01							
09	Benthic	4.8'	1037	9.5	fine sand/silt	drab olive	none
Grab accepted - B02							
10	Benthic	4.5'	1043	11cm	fine sand/silt	drab olive	none
Grab accepted - B03							

RECORDER: SS SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-7-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SUBVEY - 1991

SURVEY AREA: LCR 1C DATE: 10-7-91

STATION: D10 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	Chem	4.5 ft	1045				
Protocol Grab Methanol / DW rinse + grab discarded							
12	Chem	4.5 ft	1051	9 cm	fine sand	drab olive	non
Composite Grab #1							
13	Chem	4.5 ft	11:01	15 cm	fine sand	drab olive	none
Composite Grab #2							
14	Chem	4.5 ft	11:07				
Rejected - not enough sediment in grab							
15	Chem	4.5 ft	1113	6½ in	fine sand	drab olive	none
Composite Grab #3							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-7-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10/7/91

STATION: D11 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test	1.8m	1241		Sand, coarse		
Grab rejected - moving							
02	test	6.1m	1246		sand, coarse		
Grab rejected - moving							
03	test	1.4m	1254		fine, very sand		
Grab rejected - next one keeper							
04	test	1.4m	1256				
Grab rejected - excess vegetation in jaws							
05	Benthic	1.5m	1258	2 3/4"	very fine sand, silt	drab olive	sulfide
Grab accepted - some vegetation in grab B01							
06	Benthic	1.6m	1302				
Grab rejected - not enough sample							
07	Benthic	1.6m	1304				
Grab rejected - weeds in jaw + bucket							
08	Benthic		1306				
Grab rejected - full of sedges							
09	Benthic	1.5	1308	2 1/2"	very fine sand, silt	drab olive	none
Grab accepted - B02							
10	Benth	1.6	1311				
Grab rejected - full of sedges							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / LC DATE: 10-7-91

STATION: D11 + D45 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	Benthic	1.8m	1312	3"	very fine sand silt	drab olive	none
Grab accepted -							
12	Chem	1.8m	1317				
Protocol Grab methanol/DW rinse + Grab rejected							
13	Chem	1.8m	1321	5 in	fine sand silt	drab olive	none
Composite Grab #1							
14	Chem	1.8	1328		fine sand silt	drab olive	
Grab rejected							
15	Chem	1.8	1330		fine sand silt	drab olive	
Grab rejected							
16	Chem	1.8	1333	6 in	fine silt sand	drab olive	none
Composite Grab #2							
17	Chem	1.8	1341	5 3/4 in	fine silt sand	drab olive	none
Composite Grab #3							
18	Chem	[redacted]			fine silt sand	drab olive	none
Composite Grab #4							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-7-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR - 2A DATE: 10-7-91

STATION: D1A SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Benthic	11 ft	816	12.0	fine silt	drab olive	none
	B01						
02	Benthic	11 ft	824	12.0	fine silt	drab olive	none
	B02						
03	Benthic	11 ft	823	12.0	fine silt	drab olive	
	B03						
04	Chem	11 ft	837				
	Protocol Grab metanol / DW rinse + Grab discarded						
05	Chem	11 ft	840				
	Grab malfunction						
06	Chem	11 ft	846	16cm	fine silt	drab olive	none
	very little sample taken due to overfill						
07	Chem	11 ft	9:55				
	Rejected						
08	chem	[illegible]	8:59	16 cm	fine silt	"	sulphide small
	Composite Grab #1						
09	chem	11 ft	9:00	16 cm	"	"	sulphide small
	Composite Grab #2						
10	Chem	11 ft	9:03	11 cm	"	"	"
11	Chem	11 ft	9:12	16cm	"	"	"

RECORDER: SE SIGNATURE: Steve Ells ORG. CODE: DATE: 10-7-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10-6-91

STATION: D13 SAMPLER: SE, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Benthic	8.1 ft	840				
Grab rejected coarse sand							
02	Benthic	10 ft	844				
Grab rejected sand							
03	Benthic	30 ft	900				
Grab rejected coarse sand							
04	Benthic	15 ft	910				
Test Grab - looks depositional							
05	Benthic	15 ft	915	9.0 cm	fines	drab olive	none
B01							
06	Benthic	15 ft	918	9.0	silt/clays	drab olive	none
B02							
07	Benthic	15 ft	925	9.0	silt/clay	drab olive	none
B03							
08	Chem	15 ft	930				
Protocol Grab - Methanol + DW rinse followed by Grab which is discarded							
09	Chem	15 ft	935	12 cm	silt/clay	drab olive	none
Composite Grab #1							
10	Chem	15 ft	0944	10 cm	silt clay	drab olive	none
Composite Grab #2							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-6-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10-6-91

STATION: D13 SAMPLER: SE, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	Chem	15 ft	0949				
	Spilled.						
12	Chem	15 ft	0952	11 cm	silt/clay	drab olive	none
	Composite Grab #3						

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-6-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A DATE: 10-6-91

STATION: D14 SAMPLER: SE, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test	9.0	1310				
Grab malfunction							
02	test	6 m	1310				
Grab empty							
03	test	6.1	1311				
Looks good. Depositional							
04	Benthic	10.0	1318	11.0	fine silty sand/clay	drab olive	none
B01							
05	Benthic	10.0	1324		fine silty sand	drab olive	none
Grab rejected wood in jaws							
06	Benthic	10.0	1325	8.5	fine silty sand	drab olive	none
B02							
07	Benthic	10.0	1330	11.0	fine silty sand	drab olive	none
B03							
08	Chem						
methanol/DW rinse/Grab taken + discarded.							
09	chem	10.0	1342				
Grab discarded							
10	Chem	10.0	1344	14.5	fine silty sand	drab olive	none
Composite Grab #1							

RECORDER: SE SIGNATURE: Steven Ellis ORG. CODE: DATE: 10-6-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2A DATE: 10-6-91

STATION: D14 SAMPLER: SE, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	Chem	10.0	1350	12.0 cm	fine silty sand	drab olive	none
Composite Grab #2							
12	Chem	10.0	1400	13.0	fine silty sand	drab olive	none
Composite Grab #3							

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: DATE: 10-6-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-B DATE: 10/5/91

STATION: D15 SAMPLER: SE, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test 1		1200				
Grab malfunction, looks like fine sediments / .06m Van Veen							
02	test 2		1204				
Grab malfunction / .06m Van Veen							
03	benthic	7.2	1205	9.0	fine sand/silt	drab olive	none
1							
04		6.0	1215				
Grab malfunction / .06m Van Veen							
05	benthic	6.0	1216	11.0	fine sand/silt	drab olive	none
.06m Van Veen.							
06	benthic	5.2	1220	11.5	fine sand/silt	drab olive	none
.06m Van Veen							
07	sediment	5.2	1228				
Grab dumped – Protocol Grab / .10m Van Veen							
methanol rinse, DW rinse, river water rinse							
08	sediment	5.2	1234				
Grab dumped – Protocol Grab / .10 m Van Veen							
09	sediment	8.1	1239	13 cm	fine sand/silt	drab olive	none
Kept 2 cm / 0.1 Van Veen / Composite Grab #1							

RECORDER: SE SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR, mouth of Clatskanie 2-B DATE: 10/5/91

STATION: D15 SAMPLER: SE, GR, MS

GRAB NUMBER	BENTHIC OR CHEM	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
10	sediment	7.4	1245	13.0	Fine sand/silt	drab olive	none
Kept upper 2cm / 0.1m Van Veen / composite grab #2							
11	sediment	6.4	1253		Fine sand/silt	drab olive	none
Grab empty							
12	sediment	6.4	1254		Fine sand/silt	drab olive	none
Kept upper 2cm / 0.1m Van Veen composite grab #3							

RECORDER: SE SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2 - C DATE: 10-4-91

STATION: D16 SAMPLER: ER, GB, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	TEST						
02	CHEM		1445	16.5	VF sand/silt CLAY	GREY	—
03	Chem		1450	16.5	"	"	
04	Chem		1454	17	"	"	
05	Rejected						
06	CHEM		15:01	15	"	"	
07			15:09	13			
08	Benth		15:22				
09	Benth	RE		F	(stuff caught in jaws)		
10	Benth		15:27	13			

RECORDER: MS SIGNATURE: ORG. CODE: TT 10/4/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

1 of

SURVEY AREA: 2C LCR DATE: 10/4/91

STATION: D17 and D44 SAMPLER: GB/GR/MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Text	1.5	0940				
Well sorted fine sand – tried other side of channel							
02	test	5m	0945				
~~sticks~~ sticks/roots fine sand – Muddier – some wood debris							
03	~~Bent~~	5	0950				
wood in jaw – reject							
04	Benthic		0952	9.0	fine sand/mud	olive	
B01 wood debris – some oil sheen							
05	ben	5m	0955	5.5	"	"	
B02							
06	Ben	5m	0958				
Bark/wood in jaw – Reject							
07	—	—	1000				
Reject – lots of sticks in jaws							
08	—	—	1001				
wood in jaw – washed – Rejected some oil sheen							
09			1002				
rejected – plastic + wood in jaws plastic w/ agg caught on surface							
10	Ben	5	1004	8.0			
B03 some wood debris –							

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/4/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/4/91

STATION: D17 SAMPLER: QB, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	~~Chem~~ 0.1mm	5m	100				
reject - wood in jaws							
12			1006				
reject - wood in jaw (large stick)							
13			1012				
reject - wood in jaws							
14			1015				
reject - wood in jaws							
15			1017				
reject - wood							
16			1019				
grab malfunction - flipped							
17			1022	7.5			
rejected - washed - moved boat closer to piling							
18	chem 0.1mm B		1025	9.0	fine sand/mud olive		—
Kept							
19	chem 0.1mm 7		1032	8.0	"	"	
Kept							
20			1038				
Washed - rejected							

RECORDER: QB SIGNATURE: Mary Brown ORG. CODE: TT DATE: 10/4/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

3 of 3

SURVEY AREA: 2C / LCR DATE: 10/4/91

STATION: D17 + D44 SAMPLER: CB, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
21	chem	7	1040				
	rejected only 2-3 cm						
22			1042				
	wood in jaw - rejected						
23			1044				
	rejected - wood in jaw						
24			1046				
	reject ok						
25	chem	6					
	reject						
26			1048				
	empty - wood in jaw						
27			1050				
	empty						
28	chem 0.1 m²		1052	9.0			
	keeper						
29	chem 0.1 m²	1.5	1058				
	rejected - hard clay little penetration						
30		2.5	1100				
	rejected - wood in jaw						
keeper 31	chem	6.0m	1106	12.0	fine sand/mud	clams	—

RECORDER: CB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/4/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/3/91

STATION: D18 SAMPLER: GB, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test				coarse sand		
02	TEST				fine sand		
03	TEST				fine sand		
04	TEST				FINE SAND & SILT		
05	0.1 CHEM	2.6m	12:47	11.5	fine sand & silt	olive drab	lovely
06	0.1 CHEM	2.6m	12:53	12.5	fine sand & silt some wood debris	O.D.	EAU DE DIOXIN
07	0.1 CHEM	2.6m	12:59	9.5	fine sand & silt	O.D.	
08	0.06 BENTHOS	2.6m	1307	8.0	fine sand/ silt		
09	0.06 BENTHOS	2.6m	1310	8.5	"		
10	0.06 BENTHOS	2.6m	1312	6.0	"		

RECORDER: MS SIGNATURE: [signature] ORG. CODE: TT DATE: 10/3/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/3/91

STATION: D19 SAMPLER: GB, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test 0.06						
fine sand - little silt - moved shallower							
02	test						
Same stuff - moved to Below pilings							
03	test						
finer sed; w a little more silt, tried to move closer to pilings							
04	test						
back to fine sands - moved back; snail shells.							
05	Ben 0.06 BOT	3.0m	1548	8cm	fine sand		
06							
malfunction grab Rejected							
07	Ben 0.06 B02	4.0	1552	5.5	"		
Some wood debris.							
08	Ben 0.06 B03	4.0	1556	7.5	"		
Snails present.							
09	Chem 0.1 DUP	4.0	1600	10 cm	"		
10	Chem 0.1 DUP		1610	10.5 cm			
11	Chem 0.1		1615	11.0 cm	"		
* 12	Ben 0.1 DUP - B01			6.5 cm	"	Had to redo - lost sample	

RECORDER: GB SIGNATURE: Greg Brown ORG. CODE: TT DATE: 10/3/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/2/91

STATION: D20 SAMPLER: GB, GR, MS, NA, GE

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test		1615				
	fine sand/silt						
02	sed. chem.	2.5	1630	16	fine sand/silt	olive drab	
03	sed. chem.	2.5	1635	13	fs/silt	" "	
04	" "	2.5	1641	16	" "	" "	
05	benthic	2.5	1646	12	" "	" "	
06	benthic	2.5	1652	11.5	" "	" "	
07	benthic	2.5	1656	12	" "	" "	

RECORDER: NA SIGNATURE: Neil Aarland ORG. CODE: WDOE DATE: 10/2/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C DATE: 10-2-91

STATION: D21 SAMPLER: GR, GB, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test						
	Rock in jaw						
2	test						
	Rocks - moved boat						
3	test						
	Washed - sandy - med/coarse						
4	test						
	coarse sand/gravel - moved above a rough mouth						
5	test						
	gravel - grounded boat - moved downriver port mid						
6	test						
	med sand/gravel - Moved again to low angle beach area						
7	test						
	med sand/gravel						
8	test						
	gravel						
9	test						
	fine sand w/ silt - gravel deeper						
10	Benthos		1515	11.5	fS/silt		
	fine sand - silt no gravel oil sheen present						

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/2/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2C LCR DATE: 10/2/91

STATION: D21 SAMPLER: GB, GL, MS, NA, GE

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	bm	3.5	1520	8	Fine Sand/ Silt		—
slightly sandier than #10					branches, twigs		
12	bm	11	1523	11	fs/silt		—
13	oil w/ chem	11	1526	8.5	fs/silt	olive drab	—
twigs at bottom							
14	chem	"	1535	13	fs/silt	olive drab	—
some clay (probably)							
15	oil chem	"	1540	15.5	coarse sand w/ mud (clay?)		~
little bit gravelly (1 cm. or so down); coarse sand							

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/2/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A LCR DATE: 10/2/91

STATION: D22 SAMPLER: MS, GB, GR, CS, KS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
TEST overfull (01)	BENTHOS		0840		SILT	OD	
C							
02	~~Test~~						
over full - reject							
03	~~Test~~						
over full - reject							
04	~~Test~~						
over full - reject						moved to mid channel at mouth	
05	Benthos 0.06		0900	12.5	SILT	Olive Drab. very dark brown/black	
06	Benthos 0.06		0906	12.5	"	"	
07	[illegible]		0913	12.5	Silt w/ some sand	"	
08	Chem						
void malfunction							
09	[illegible]		0920				
Reject - overfull							
10	Chem 0.06		0923	10.0	Silt	"	

RECORDER: CS SIGNATURE: CShea ORG. CODE: TT/IDEQ DATE: 10/2/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A LCR DATE: 10/2/91

STATION: D22 SAMPLER: [illegible], CS, KS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	Chem						
[illegible] empty - reject							
12	[illegible]						
reject [illegible]							
13	Chem 0.06		0931	12	Silt layer top grading down more sand	dark brown olive	
14	Chem 0.06		0935	12.5	Silt	"	
15	Chem 0.06		0940				
Reject overfull							
16	Chem		0943				
Grab Malfunction Moved farther out the mouth of the marina Between [illegible] storage [illegible]							
17	Chem		0945	12.5	Silt	"	
Some oil Sheen							
18	Chem 0.06		0949	12.5	"	"	

RECORDER: CS SIGNATURE: C Shaw ORG. CODE: [illegible] DATE: [illegible]

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A LCR DATE: 10-1-91

STATION: D23 SAMPLER: CB/GR/MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01							
TEST							
(01) 02	Benthos 0.06	5m	12:55	9.5	v. fine sand/silt	olive drab	
(02) 03	Benthos 0.06	5m	1301	11.5	v. fine sand/silt	olive drab	
(03) 04	Benthos 0.06	5m	1304	12cm	v. fine sand/silt	olive drab	
(04) 05	0.1 CHEM	5m	1310	15cm	v. fine sand/silt	olive drab	no odor
(05) 06	CHEM	5m	1314	15.5 cm	v. fine sand/silt	olive drab	no odor
a few twigs							
07	CHEM	5m	1321	16.0 cm	v. fine sand/silt	olive drab	no odor
08	CHEM	[redacted]	1326	15.6 cm	v. fine sand/silt	olive drab	no odor

RECORDER: MSS SIGNATURE: [signature] ORG. CODE: Tt DATE: 10/1/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A DATE: 9/30/91

STATION: D24 SAMPLER:

GRAB NUMBER	BENTHIC OR CHEM	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test		0959		mud		
good stuff!							
2	benth		1005	11.5cm	mud	olive brown	Ø
roots, org. matter							
3	benth		1009	12	"	"	"
roots, org. matter (sieve overflowed briefly)							
4	benth		1012	12	"	"	"
oil sheen, roots, organic matter							
5	chem 106		1015	11	"		
6	Chem		10:20	12	"	"	"
7	Chem		1024	12	"	"	"
8	chem		1029	10	"	"	"
9			1033				
over full, rejected							
10	Chem		10:35	11.5	"	"	"

RECORDER: CMG LK SIGNATURE: C. Shea Lynne Kreshow ORG. CODE: Tt DEQ T2 DATE: 9/30/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B LCR DATE: 9/29/91

STATION: D25 SAMPLER: GB, LK, TK

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	Test	11 Ft	17:03	full	mud		
2	Chem	11 ft		14 1/2 cm	silt sand + mud	Greenish grey	
right up to surface and only taking stuff from the side							
3 empty							
4	Chem	11 Ft	17:11	16	silty mud	Greenish grey	
5	Chem	11 ft	17:18	12.5 cm	silty mud		
changed to smaller grab. 0.06 m²							
6	Chem	11 ft	17:21	12 cm	silty mud		
Benthos							
7	Benthic			12 cm	silty mud		
8	Benthic			12	silty mud		
Coarse sample had roots 3mm diameter							
9	Benthic			12 1/2	same		

ORDER: _____ SIGNATURE: Tracy Hamilton ORG. CODE: TT DATE: 9/29/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B LCR DATE: 9/29/91

STATION: D25 D26 (TD) SAMPLER: GB, LK, TK

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	chem		1543	14.5 cm	fine sand + gravel	Brown-grey	
tubes on surface							
2	chem		1545	10 cm	"	"	
~1 cm of oxidized sand, then a dark layer (~0.5 cm) that looks like weathered petroleum in sand (not much organics but dark & a little sticky), then an orange brown layer that looks like sand with rust, then sand again.							
3			1550	12.5 cm	fine sand + gravel	"	
tubes on surface							
4	Ben		1606	7.5	med-fine sand	Brown	
5	Ben		1610	8.5	med-fine sand	grey brown	
6	Ben		1612	7.5	"	"	
tubes present on surface							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B DATE: 9/29/91

STATION: DZ7 SAMPLER:

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	chem		1413	12.5	fine sand + mud + med. sand	brown	Ø
				top 2-3 mm is fine, below is coarse			
2	chem		1416	14	"	"	"
3	chem		1418	11	"	"	"
4	benth		1433	9	"	"	"
				part of surface covered w a green algal film (microalgae)			
5	benth		1435	11	"	"	"
6	benth		1437	10			

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B DATE: 9/29/91

STATION: D28+42 (dup) SAMPLER:

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	reject		1246				
gravel							
12	reject		1248				
malfunction							
13	benth		1250	11cm	fine sand + mud	olive	Ø
14	benth		1255	10.5cm	"	"	"

RECORDER: T² SIGNATURE: [signature] ORG. CODE: T² DATE: 9/29/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B DATE: 9/29/91

STATION: D28 + D42 (dup) SAMPLER:

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1			1145				
grab flipped							
2	test		1146		mud. sand + mud	olive/brown	
3	chem		1206	12.5cm	fine sand + mud	olive grey brown	
4	reject		1213				
huge stick in address #'s							
5	chem		1214	9	Fine sand/mud	olive brown	
6			1219				
Stone stuck in jaw - Rejected							
7			1220		GRAVEL		
Rejected - boat swung out into channel							
8	chem		1222	14	sand/mud	olive	
9	chem		1233	12	"	"	
fossil !							
10	benth		1242	TD	"	"	

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T2 DATE: 9/29/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B DATE: 9/28/91

STATION: DZ9 SAMPLER: GB, LK, TK

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test				med sand		
2	test				"		
3	benth		1502	9.5cm	med. sand	brown	Ø
4	benth			10cm	"	"	"
5	benth		1510	10cm	"	"	"
6	chems.		1515	13	med sand	"	"
Tubes on the surface							
7	chem		1520	14	"	"	"
8	chem		1524	14	"	"	"

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: TT DATE: 9/28/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A DATE: 9/28/91

STATION: D30 SAMPLER: GB, TK, LK

benthic - w/ 0.06m² VV, chem - w/ 0.1m² VV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test		1010		mud	grey green	Ø
2	chem		1012	15.5cm	mud	"	Ø
3	chem		1017	13.0cm	mud	"	Ø
	oil sheen						
4	chem		1022	15cm	mud	"	Ø
5	benth		1030	11.5cm	mud	"	Ø
6	benth		1035	11cm	mud	"	Ø
	oil sheen						
7	benth		1038	11cm	mud	"	Ø

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: TT DATE: 9/27/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 4A DATE: 9/27/91

STATION: D31 SAMPLER: GB, LK, TK

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	#06		1400		silty/sand		
Test grab							
02	Benth #05	3	1440	13cm	silt	grey	
03	Benth #06	3	1453	10 cm	fine sand	"	
Much sandier than #02							
04	Benth #04	3	1459	10 cm	sandy silt	grey brown	
Sed int in between 02 + 03 texture							
05	Chem 0.1		1507	15	v.f. sand/mud	dark olive	
small tubes on surface; SURFACE uneven - mounded ~3cm RPD							
06	Chem 0.1	3	1512	1			
overfull - rejected							
07	Chem 0.1	3	1516	15+	mud	olive	
tubes on surface (small) / Sand silt mix							
08	Chem 0.1	3	1522	13.5	fine sand	olive	
Slightly sandier than others							

RECORDER GB SIGNATURE: Mary Brown ORG. CODE: TT DATE: 9/27/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A DATE: 9/27/9

STATION: D32 SAMPLER: GB, TK, LK

benthic - w/ 0.06m² VV, chem - w/ 0.1m² VV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test		1655		fine sand + silt	olive brown	
caught a piece of antenna in the jaws of the 0.1 mm grab							
2	chem		1703	11cm	"	"	Ø
lots of wood debris - 1 clam on sfc (~3.5cm)							
3	reject		1708				
stick in jaws - empty							
4	reject		1710				
rail road spike in jaws - empty							
5	chem		1712	12cm	fine sand	grey brown	Ø
6	chem		1716	12cm	same	—	—
clam (~3cm) slightly exposed							
7	reject		1723				
empty							
8	benth		1725	10cm	same	—	—
oil sheen in sfc							
9	reject		1730				
stick in jaws - washed out							
10	benth		1734	7cm	same	—	—

RECORDER: LK SIGNATURE: [signature] ORG. CODE: T2 DATE: 9/27/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A DATE: 9/27/91

STATION: D32 SAMPLER: see preceding

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	benth		1738	8.5cm	same		

RECORDER: LC SIGNATURE: Lynne Kramer ORG. CODE: T² DATE: 9/27/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A DATE: 9/27/91

STATION: D33 SAMPLER: GB, TK, LK

benthos - 0.06-m² VV chem - 0.1 m² VV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	[illegible]		12[illegible]	17[illegible]	fine sand + silt	sandy	Ø
2	chem		1254	14cm	"	"	"
3	chem		1301	15cm	"	"	"
4	benth		1312	11cm	"	"	"
5	benth		1317	11.5cm	"	"	"
6	benth		1321	10.5cm	"	"	"

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T2 DATE: 9/27/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A - LCR DATE: 9/27/91

STATION: D34 SAMPLER: GB, TK, LC

Benthic samples w/ 0.05m² VV, chem w/ 0.1m² VV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test		1115				
fine sand - moved ~ 30m upriver to look for silt							
2	test		1120				
fine sand							
3	benth		1126	8 cm	fine sand	sandy	Ø
4	benth		1133	9 cm	fine sand	sandy	Ø
5	benth		1135	8 cm	fine sand	sandy	Ø
6	chem		1139	11 cm	fine sand	sandy	Ø
7	chem.		1144	9 cm	fine sand	sandy	Ø

RECORDER: LK SIGNATURE: [signature] ORG. CODE: T² DATE: 9/27/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/26/91

STATION: D35 SAMPLER: 0.06 m² van Veen #1-5
0.1 m² van Veen #6

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	B01		17:07	7	silt	brown	none
several twigs caught in jaws							
2	–		17:12				
no closure; caught on weights							
3	B02		17:14	9	silt	brown	none
4	–		17:16				
no closure; caught on weights							
5	B03		17:18	8.5	silt	brown	none
detrital matter on surface; large wood chip slight oil sheen							
6				12			
[illegible] 10% oil sheen.							
7			17:32				
[illegible] no closure							
8			17:[illegible]		silt	brown	
[illegible] small twigs							
9			17:43	13	silt [illegible]		
[illegible] good seal							
10			17:[illegible]	12.5	silt		
wood [illegible] in jaws							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: 9/26/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A DATE: 9/26/91

STATION: D36 benthos 0.06m2 SAMPLER: GB, TD, LK Van Veen, chem - 4 0.1m2 VV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test	11 ft	1340		fine sand		
test grab - looks good!							
2	benth		1345	9 cm	fine sand	brown	∅
some flocculent material on top							
3	benth		1347	8 cm	fine sand	brown	∅
same as 2							
4	benth		1351	9.5 cm	fine sand	brown	∅
same as 2							
5	chem		1354	13.5 cm	"	"	"
same as 2							
6	chem		1402	14.0 cm	"	"	"
same as 2 (+ a few twigs)							
7	chem		1408	11 cm	"	"	"
same as 2							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/25/91

STATION: D37 SAMPLER: LK, GB, TD

0.06-m² Van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1							
test grab → grabed (moved station)							
2							
test grab → fine sedi - although poorly sorted (moved station)							
3			0923				
test grab → 1 big rock							
4			0924				
test grab → 1 big rock							
5			0927				
test grab → fine sand + twigs - but grab leaked (moved station)							
6			0938				
test grab → ~1cm of fine sand, wood chips							
7			0940				
one clump of fine sand + wood chips - grab leaked - reject							
8	benth[redacted]		0941	6.5cm	silty sand	greenish mud	ϕ
oil sheen on surface — convert to m							
9		12.6 ft	0944				
empty - reject							
10	benth[redacted]	12.6 ft	0946	7.0cm	silty sand	greenish mud	ϕ
a few sticks in jaws							

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T² DATE: 9/25/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A DATE: 9/25/91

STATION: D37 0.06-m² Van Veen SAMPLER: LK, GB, TD

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11			0949				
stick in jaws + side - reject							
012			0951				
empty - reject							
13			0952				
empty - reject							
14			0953				
stick in jaws - sed. washing out - reject							
15			0955				
empty - reject							
16			0956				
didn't close							
17			0957				
upside down							
18	bent[redacted]	6ft	0959	7.5cm	silty sand	greenish mud	Ø
19	chem	12.6 ft	1003	9.5cm	silty sand	greenish mud	Ø
mounded on one side							
20			1009				
sticks in jaws - reject							

switch to 0.1 m² Van Veen for chem with grabs

RECORDER: LK SIGNATURE: Lynne Krasnow ORG. CODE: T² DATE: 9/25/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

coll. by GB, TD, LK

SURVEY AREA: 4A DATE: 9/25/91

STATION: D37 SAMPLER: 0.1 m^2 Van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
21	chem.	12.6 ft	1011	8.0 cm	silty sand	greenish mud	∅
Keeper ! lots of woody debris							
22			1017				
stick caught in jaws - reject							
23	chem	12.6 ft	1019	7.0 cm	silty sand	greenish mud	∅
sticks in jaws - but Keep							
24			1023				
BK stick in jaws - reject							
25			1025				
Washed out - reject							
26			1027				
washed out - reject							
27			1030	13.0 cm			
sticks in jaws - but Keep							

RECORDER: LK SIGNATURE: Lynne Krammer ORG. CODE: T2 DATE: 9/25/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4B DATE: 9/25/91

STATION: D38 - no grabs kept SAMPLER: 0.06-m² Van Veen
station location moved.

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1			1322				
coarse sand - reject							
2			1324				
upside down.							
3			1326				
coarse sand - reject							
4			1328				
fine sand - but too close to the sand bar. Moved station.							
5			1341				
med. sand							
6			1420	—			
med. sand - anchored							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4B DATE: 9/25/91

STATION: D38 SAMPLER: 0.06 m² van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	-		14:33				
med/fine sand; small amount of clay; not enough material							
2	B01		14:34	5.5	med/fine snd	brown	
keeper; no clay, 1 large twig							
3			14:37				
no closure; caught on weight							
4			14:39	1			
not enough material							
5			14:41	1			
not enough material; boat probably moving too fast							
6			14:45				
no closure; caught on weight							
7			14:48				
no closure; caught on weight							
8	B02		14:52	5	fine sand		
small blobs of clay; a few wood frags							
9			14:57				
no closure; caught on weight							
10			14:59				
small amount of clay							

RECORDER: TD SIGNATURE: Ted Dutler ORG. CODE: TT DATE: 9/25/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

salinity measured at 15:25 with refractometer. — below zero on scale

SURVEY AREA: 4-B DATE: 9/25/91

STATION: D38 SAMPLER: 0.06 m² van Veen #1
0.1 m² van Veen #2 on

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	B03		15:01	4	fine sand		
mounded on one side, some clay globs							
12	-		15:06				
upside-down, switched to 0.1 m² grab, no closure							
13	-		15:08				
upside-down, no closure							
14	C		15:11	9.5	fine sand	brown	-
some small clay globules, very small mood frags							
15	-		15:17				
water only							
16	C		15:19	9.2	fine sand	brown	
very flat across top; small reddish/brown clay globs redox layer at 1 cm							
17	-		15:27	5			
not enough material							
18	←		15:29				
clay chunks; probably hit side of scour channel not enough material							
19	C		15:31	9	fine sand		
not perfectly flat across; slight wash during siphoning very homogenous							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4B DATE: 9/24/91

STATION: D39 SAMPLER: Tod Deubler, Lynne K, Gary B

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Chem	5.4	1735	9 cm	Fine sand	Sandy brown	—
slight wash on one side, some twigs,							
02	Chem	5.6	1740	7 cm	Fine sand	light brown	—
features flat							
03	~~Chem~~	5.5	1747	—			
grab malfunction - wire wrapped							
04	Chem	5.9	1748	7.5	Fine sand	light brown	—
slight wash one side							
05	chem	5.5	1753	8.0	Fine sand	light brown some black sand	—
06	chem	5.8	1758	6.5	Fine sand	dk brown sandy	—
piece of wood in Jaws							
07	chem	6.6	1804	6.5	Fine sand	same	—
08	Ben	5.9	1808	6	same	same	
09	Ben	5.9	1813	9.0	same	same	
10	Ben	6.0	1816	7.5	same	same	

RECORDER: GB SIGNATURE: Gary Brown ORG. CODE: TT DATE: 9/24/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: BEACON ROCK STATE PARK, WA DATE: 9/24/91

STATION: D40 SAMPLER: _____

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1		5.4	0800				
no keep – small amt. of gravel							

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

East wind ~35k

SURVEY AREA: 4-B DATE: 9/24/91

STATION: D40 SAMPLER: Doc Van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
2			0808				
grab didn't trigger - reject							
3			0810				
water only - reject							
4			0812				
just a little bit of soft sed.							
5	chem	5.4m	0814	4cm	fine sand	sandy brown	Ø
surface debris flats), no "black layer"							
6			0820				
didn't trigger - reject							
7	chem	5.4m	0822	3.5cm	fine sand	sandy brown	Ø
... rich in the middle, no "black layer"							
8			0829				
... skimpy - only ~4cm & s.l. - Reject							
9	chem	5.4m	0832	7.5cm	fine sand	sandy brown	Ø
... divided on one side							
10			0835				
... 1cm - reject							
11			0840				
... debris hanging out bottom of mud - reject							

RECORDER: LK SIGNATURE: Lynne Krone ORG. CODE: TT DATE: 9/24/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

east wind to ~ 35 K (+ gusting!)

SURVEY AREA: HB DATE: 9/24/91

STATION: D40 SAMPLER: 0.06m² Van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
12			0842				
upside down - reject							
13			0843				
old fishing beer can + juv. clam on top! - reject							
14	chem	5.4m	0845	6.5cm	fine sand	sandy brown	Ø
some juv. clam (~2cm)							
15			0855				
caught a big rock! - reject							
16			0857				
not enough material - reject							
17			0859				
wood caught in jaws - reject							
18			0901				
empty - reject							
19			0902				
big stick - reject!							
20			0903				
sticks caught in jaws - reject							
21			0905				
empty							

RECORDER: LK SIGNATURE: Lynne Kramer ORG. CODE: TT DATE: 9/24/?

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4B DATE: 9/24/91

STATION: D40 SAMPLER: .04 m² Van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
22	benth	5.4m	0906	9 cm	fine sand	sandy brown	0
Keep							
23			0913				
not enough material - reject							
24			0915				
leaked a lot of sediment - reject							
25			0917				
empty - reject							
26			0918				
empty - reject							
27	benth	5.4m	0920	4.5cm	fine sand	sandy brown	0
keep							
28	benth	5.4m	0924	4.5cm	"	"	"
Comp							
29			1039				
stick caught in jaws reject							
30			1041				
log stick - reject							
31	chem	5.4m	042	9.5cm	fine sand	sandy brown	0
keeper!							

RECORDER: LK SIGNATURE: Lynne Kroonen ORG. CODE: T² DATE: 9/24/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4/B- DATE: 9/24/91

STATION: D40 SAMPLER: 0.06m² Van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
32	chem	5.4m	1048	7.5cm	fine sand	sandy brown	Ø
Keeper (some leakage when it was pulled up - but lots left.)							
33			1054				
upside down !							
34	chem	5.4m	1056	6 cm	fine sand	sandy brown	Ø
Keeper (small sticks - Grey removed 1)							

RECORDER: LK SIGNATURE: [signature] ORG. CODE: TT DATE: 9/24/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10/8/91

STATION: E1 SAMPLER: SE, MS, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test						
02	Benthic			3.5 inch	coarse sand		
Accepted as erosional							
03	Benthic		4:37				
Grab malfunction							
04	Benthic		4:40	3.5 in	"		
Accepted							
05	Benthic		4:44	4 in	"		
Accepted							
06	CHEM						
Protocol wash with Methanol							
07	CHEM						
DISCARDED GRABS							
08	CHEM						
Discarded - partial grab.							

RECORDER: SE SIGNATURE: Steve Ebbo ORG. CODE: DATE: 10-8-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10/9/91

STATION: E1 continued next day for ... SAMPLER: SE, TK, LV

GRAB NUMBER	BENTHIC OR CHEM	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Pr... Grid	19'	11:20		sand	gray, brown	
Discarded - ... tar globs oil							
02	Chem	19'	1123	10 cm	sand	browngray	none
accepted - oil tar globs							
03	Chem	5.6m	1133	< 5 cm			
Rejected - insufficient sample							
04	Chem	5.6m	1134	< 5 cm			
rejected - insufficient sample							
05	Chem	5.6m	1136	< 5 cm			
rejected - insuff. sample - oil, several tar like globs in all grabs - 4-5 cm diam							
06	Chem	5.8m	1137	8 cm	sand	brown gray	none
accepted - some sand shrimp tar globs, flat 7-8 cm diam							
07	Chem	5.5m	1145	7.5 cm	sand	brown gray	none
accepted - oil globs							

RECORDER: LV SIGNATURE: Lisa Vogel ORG. CODE: ______ DATE: 10/9/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10/9/91

STATION: E2 SAMPLER: SE, TK, LV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test Benthic	29'	3:55			dark brown	
02	Benthic	29'	3:58	6cm	fine sand	dark brown	none
	accepted -						
03	Benthic	8.8m	4:04	5cm	fine sand	dark brown	none
	accepted -						
04	Benthic	8.6m	4:07	6cm	fine sand	dark brown	none
	accepted -						
05	Chem						
	Protocol Grab methanol/DW rinse + Grab discarded						
06	Chem	8.0	4:15	6cm	fine sand	dark brown	none
07	Chem	8.0	4:27	8 cm	fine sand	"	none
08	Chem [redacted]	0	4:34	7cm	fine sand	"	none

RECORDER: SE SIGNATURE: Steve Ellis ORG. CODE: _____ DATE: 10-9-91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10-11/91

STATION: E3 SAMPLER: SE, TK, CO

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	Benthic	51 ft	15:30		Sand	light gray	no odor
	Test Grab 15m				bit of wood		
2	Benthic	51 ft 15m	15:33	7 cm	sand	light gray	no odor
3	Benthic	15m	15:36	8 cm	sand	light gray	no odor
4	Benthic	15m	15:40	7.5 cm	sand	light gray	none
5	Chem						
	Protcol Grab / methanol / DW rinse Grab Discarded						
6	Chem	15m	1550	6.0	coarse sand + pebbles		
	Composite Grab #1						
7	Chem	15m	1608	6.0	coarse sand + pebbles		
	Composite Grab #2						
8	Chem	15m	1615	6.0	coarse sand + pebbles		
	Composite Grab #3						

RECORDER: SE SIGNATURE: Steve Eley ORG. CODE: DATE: 10/11/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / IC DATE: 10/12/91

STATION: E4 SAMPLER: SE, TK, CD

GRAB NUMBER	BENTHIC OR CHEM	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test grab	55 ft	0933		fine silty sand	brown	none
	grab was rejected, moved to non-depositional site						
02	Test grab	22 ft	0950		fine silty sand	brown	
	Bald Eagle present. Grab rejected, looking for non-depositional site						some [illegible] tubes
03	Test Grab	16 m	0958		coarse sand	reddish grey	no odor
04	BENTHIC B01	15 m	1001	7 cm	coarse sand	reddish grey	no odor
05	BENTHIC B02	15 m	1005	8 cm	coarse sand	reddish grey	no odor
06	BENTHIC B03	15 m	1008	8 cm	coarse sand	reddish grey	no odor
	oil sheen noted during sieving						
07	CHEM	15 m	1015		coarse sand	reddish grey	no odor
	test grab, protocol wash						
08	CHEM 01	15 m	1018	11.5 cm	coarse sand	"	"
09	CHEM 02	15 m	1025	12 cm	coarse sand	"	"
10	CHEM 03	15 m	1028	12 cm		"	"
	N46° 5.976 W123° 32.037						

RECORDER: SE SIGNATURE: [signature] ORG. CODE: ______ DATE: 10/12/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2B/2A DATE: 10-5-91

STATION: E5 SAMPLER: SE, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Benthic		02:55				
REJECTED AS TOO COARSE							
02	Benthic		03:00				
Rejected as too coarse							
03	Benthic		3:19				
Rejected as too depositional							
04	Benthic	8m	3:21				
Grab malfunction							
05	Benthic	8m	3:23				
Rejected as too depositional							
06	Benthic	5.4m	3:26	11 cm	coarse sand & gravel	reddish grey and black	none
Good assessment site. Sample taken							
07	Benthic	5.4m	3:33	8.5 cm	coarse sand & gravel	"	none
08	Benthic	5.4m	3:36	10.0 cm	coarse sand & gravel	"	none.
09	Chem	6.1m	1640	13.5 cm	"	"	"
			1540 TD				
10	Chem	6.1m	1645 1545	to 16.0 cm	"	"	"
11	Chem	6.2m	1644 TD	14.0 cm	"	"	"
			1548				

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C DATE: 10-4-91

STATION: E6 SAMPLER: MS, GB, GR

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test						
	coarse sand						
02	test						
	very fine sand/mud w/clay						
03	test						
	med-fine sand — anchor						
04	Ben 0.06	5.5	13	9cm			
	B01						
05	Ben 0.06	5.5	1317	8 cm	med sand		
	B02						
06	Ben 0.06	5.5	1320	8 cm	med-coarse sand	channel	
	B03 clam present						
07	chem 0.1	5.5	1324	11cm	med-coarse sand		
	dark layer ~2-3 cm down ~1/4" thick						
08	chem 0.1 m	[redacted]	1330	13 cm	fine sand/silt		
	finer [redacted] than 07.				has some clay	~Top 5-8cm silty clay bottom sandy	
09	chem 0.1 m	5.5	1337	11 cm	fine sand/med sand	olive	
	top 3mm sandy) below is clay						

RECORDER: GB SIGNATURE: Gary Braun ORG. CODE: TT DATE: 10/4/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 2-C DATE: 10-3-91

STATION: E7 SAMPLER: MS, GB, GR

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	test	14	1020		Med sand	Charcoal gray	
	'06						
02	Ben	14	1023	7.5	"	"	
	some wood debris						
03	Ben	14	[illegible]	8.5	"	"	
04	Ben	14	10[illegible]	11	"	"	
05	Chem		1040	12	"	"	
06	No Good		1045		—	—	
	reject						
07	Chem		1052	10	"	"	
08	Chem		1055	11.5	"	"	

RECORDER: GB/MS SIGNATURE: Gary Bra[illegible] ORG. CODE: Tt DATE: 10/3/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A - LCR DATE: 10/1/91

STATION: E8 SAMPLER: CB, GR, MS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Test				coarse sand		
02	test						
Rock in jaw - empty							
03	test				coarse sand/gravel		
04	~~Ben~~						
Rock - empty							
05	Benth	9m	1454	9.5	coarse sand/gravel	sandy	
06	Ben	"	1457	13	"	"	
07	Ben	"	1502	7.5	"	"	
08	Chem	"	1505	—	—	—	
rejected - washed - clean on surface							
09	Chem	"	1508	12.0	coarse sand/gravel	sandy	
10	chem	"	1513	8.5	"	"	
11	chem	"	1518	11cm	"	"	

RECORDER: CB SIGNATURE: Mary Brew ORG. CODE: tt DATE: 10/1/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 33A LCR DATE: 9/30/91

STATION: E9 SAMPLER: CB, LK, TK, CS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
01	Not						
	Rock						
02	test						
	empty						
03	test						
	malfunction						
04	test		1610	full	v.f.s./silt		
05	benth		1615	12	Top: V.f. Silt Bottom: More Sandy	dark	∅
	.06 grab						
06	"		1620	11	"	"	"
	Oil Sheen						
07	"		1625	11.5	"	"	"
	Oil Sheen						
08	reject		1632				
	Wind shifted, [redacted] into Channel, Collected misc. objects						
09	Chem		1635	15	fine silty/sand	"	"
	.1 grab						
10	Chem		1640	15	"	"	"
	Can of Coors (empty!) caught in grab						

RECORDER: CS SIGNATURE: C Shea ORG. CODE: TT/DEQ DATE: 9/30/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3A LCR DATE: 9/30/91

STATION: E9 SAMPLER: GB, LK, TK, CS

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11	Chem		1645	15	"	"	"

RECORDER: CS SIGNATURE: [signature] ORG. CODE: TT/DEQ DATE: 9/30

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 3B - DATE: 9/29/91

STATION: ~~E11~~ E10 SAMPLER: GB, TK, LK

benth - 0.06m² VV chem 0.1m² VV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test		1043				
only ~ 3cm of material							
2	test		1045				
gravel - moved station further inshore							
3	benth		1053	6 cm	coarse sand + gravel	dark grey	∅
4	benth		1056	6 cm	"	"	"
5	~~benth~~ [illegible]		1058	[illegible] cm			
reject - [illegible] outside [illegible]							
6	[illegible]		1104	[illegible] cm	"	"	"
7	reject		1107		"	"	"
huge stick caught in jaws							
8	chem		1111	12 cm	"	"	"
[illegible] cm at sfc							
9	chem		[illegible]	9	somewhat finer than preceding (drifted closer to beach) (fine sand + mud)	"	
stick present							
10	chem		1120	12	like #9		

RECORDER: LK SIGNATURE: Lynne Kraemer ORG. CODE: T² DATE: 9/29/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4A DATE: 9/28/91

STATION: E11 SAMPLER: GB, LK, TK

centrifuge - w/ 0.06m² VV, chem - w/ 0.1m² VV

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	test		0853				
fine sand + silt							
2	benth		0856	10.5cm	fine sand + silt	brown	Ø
oil sheen							
3	benth		0902	11 cm	"	"	"
4	benth		0906	12cm	"	"	"
5	chem		0911	15.5cm	"	"	"
redox discontinuity at ~ 2-3mm sed. Z					sm. eel-like fish (~10cm) buried in sand		
6	chem		0918	14cm	"	"	"
7	chem		0925	14	"	"	"
little bit of an oil sheen							

RECORDER: LK SIGNATURE: Lynne Kramer ORG. CODE: T[illegible] DATE: [illegible]

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-A DATE: 9/26/91

STATION: E/2 SAMPLER: 0.1 m² Ponar Veen #1-3
0.06 m² Van Veen #4

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	C		15:10	13.5	coarse sand	brown	Ø
some small gravel							
2	C		15:12	13	very coarse sand	dk. brown	Ø
slightly mounded toward center							
3	C		15:18	11.5	coarse sand	dk. brn	Ø
clam on top							
4	B		1524	9	coarse sand	dk brn	Ø
same as 3 (but no clam)							
5	B		1527	11	coarse sand	dk brn	Ø
same as 3	"		"				
6	B		1530	9.5	coarse sand	dk brn	Ø
"	"		"				

RECORDER: _____ SIGNATURE: _____ ORG. CODE: _____ DATE: _____

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 4B DATE: 9/25/91

STATION: E13 SAMPLERS: chem = 0.1 m² Van Veen
coll. by GB, TD, LK benth = 0.06 m² Van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	chem		1643	10.5 cm	coarse sand + gravel	brown	Ø
poorly sorted - coarse sand w/ fine sand - sm. amt of gravel							
2	chem		1651	15 cm	coarse sand + gravel	brown	Ø
poorly sorted - " " " " " " " "							
3	chem		1655	13.5 cm	coarse sand + gravel	brown	Ø
poorly sorted " " " " " " " "							
4	benth		1704	9.5 cm	coarse sand + gravel	brown	Ø
same as preceding							
5			1709	9 cm	coarse sand + gravel	brown	Ø
grab didn't close - wire caught on the weight - reject							
6	benth		1712	9.5 cm	coarse sand + gravel	brown	Ø
same as # 3							

SFC H_2O SALINITY = 17.0 (BY HAND-HELD REFRACTOMETER)

RECORDER: LK SIGNATURE: Lynne Kvitek ORG. CODE: T² DATE: 9/25/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4B DATE: 9/24/91
STATION: E14 SAMPLER: 0.06 m² van Veen

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
1	-		12:40				
reject; few cobbles, no sediment							
2	-		12:41				
grab was upside down; no closure							
3	-		12:42				
reject; cobbles, gravel, clams, clamshells, some sand							
✓ 4	B01		12:43	3.5	sand/gravel		-
keep; some cobbles, clams, shells							
5			12:49	-			
rock in jaws, no closure							
6			12:51	2			
reject; not enough material; same comp. as #4							
7			12:53				
rock in jaws; no closure							
✓ 8	B03		12:54	3.5	sand/gravel		
same as #4							
9			12:57	1			
reject not enough material							
10			12:58				
no closure							

RECORDER: TD SIGNATURE: [signature] ORG. CODE: Tt DATE: 9/24/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/24/91

STATION: E14 SAMPLER: 0.06 m² van Veen
0.1 m² starting with #16

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
11			13:00				
improper closure							
12			13:01				
rocks in jaws; no closure							
13			13:02				
improper closure							
14			13:04				
washed out							
✓ 15	B02		13:05	4	gravel		
slightly washed on one side							
✓ 16	C		13:10	4.5	gravel		
switched to 0.1 m² grab clams, shells, cobbles, pebbles on surface							
17			13:16				
rocks in jaws; no closure							
✓ 18	C		13:18	3.5	sand/gravel		
fewer large cobbles, clams							
19			13:30				
washed out; not enough material							
20			13:32				
1 large rock							

RECORDER: TD SIGNATURE: Ted Dethlefs ORG. CODE: Tt DATE: 9/24/91

TETRA TECH, INC.

SEDIMENT SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: 4-B DATE: 9/24/91

STATION: E14 SAMPLER: 0.1 m² vdh Vedh

GRAB NUMBER	BENTHIC OR CHEM.	WATER DEPTH (m)	TIME (hh:mm)	PENETRATION DEPTH (cm)	SEDIMENT TYPE	SEDIMENT COLOR	SEDIMENT ODOR
21			13:34				
washed out							
22			13:36				
washed out							
✓ 23	C		13:37	5	gravel/sand		
bumped boat, slightly skewed							
24			13:42				
washed out							
✓ 25	C		13:44	4	gravel/sand		
undisturbed, only few clams							

RECORDER: TD SIGNATURE: Jack Vedder ORG. CODE: TT DATE: 9/24/91

APPENDIX B

BACTERIAL SAMPLING EFFORT

Synopsis of Daily Events

Bacteria Station Location and Sample Logs

SYNOPSIS OF BACTERIAL SAMPLING EFFORT

15 October 1991, Tuesday (Trip 1 of 5)

0600 The Tetra Tech Team of Mahmood Shivji and Glen St. Amant depart Seattle, WA, for Ilwaco, WA.

1115 Purchase ice for storing water samples in Ilwaco, WA.

1256 Mahmood S. and Glen S. collect water samples at Station W2 in Ilwaco, WA. Additionally, field measurements of pH, conductivity, dissolved oxygen, temperature, and turbidity were recorded.

1415 Completed analysis of water samples for pH, conductivity, dissolved oxygen, temperature, and turbidity. Mahmood S. and Glen S. packed gear and began driving to next station at the Port of Ilwaco.

1440 Mahmood S. and Glen S. collect water samples at Station W3 in Port of Ilwaco, WA. Additionally, field measurements of pH, conductivity, dissolved oxygen, temperature, and turbidity were recorded.

1545 Completed analysis of water samples for pH, conductivity, dissolved oxygen, temperature, and turbidity. Mahmood S. and Glen S. packed gear and began driving to next station at the Jones Beach in Oregon.

1755 Mahmood S. and Glen S. collect water samples at Station W16 near Jones Beach in Oregon. Additionally, field measurements of pH, conductivity, dissolved oxygen, temperature, and turbidity were recorded.

1900 Completed analysis of water samples for pH, conductivity, dissolved oxygen, temperature, and turbidity. Mahmood S. and Glen S. packed gear and began driving to Days Inn Hotel in Portland.

2030 Mahmood S. and Glen S. check into Hotel.

16 October 1991, Wednesday

0800 Mahmood S. and Glen S. depart hotel to drop off water samples.

0845 Water samples delivered to laboratory.

0900 Mahmood S. and Glen S. depart Portland, OR, to next sampling station on Sauvie Island, OR.

1045 Mahmood S. and Glen S. collect water samples at Station W35 on Sauvie Island, OR. Additionally, field measurements of pH, conductivity, dissolved oxygen, temperature, and turbidity were recorded.

1215 Completed analysis of water samples for pH, conductivity, dissolved oxygen, temperature, and turbidity. Mahmood S. and Glen S. packed gear and began driving to next station near the Port of Portland.

1315 Mahmood S. and Glen S. collect water samples at Station W38 near the Port of Portland. Additionally, field measurements of pH, conductivity, dissolved oxygen, temperature, and turbidity were recorded.

1400 Completed analysis of water samples for pH, conductivity, dissolved oxygen, temperature, and turbidity. Mahmood S. and Glen S. packed gear and began driving to next station along Marine Drive in Northeast Portland.

1425 Mahmood S. and Glen S. collect water samples at Station W40 near 148th and Marine Drive in Northeast Portland. Additionally, field measurements of pH, conductivity, dissolved oxygen, temperature, and turbidity were recorded.

1525 Completed analysis of water samples for pH, conductivity, dissolved oxygen, temperature, and turbidity. Mahmood S. and Glen S. packed gear and began driving to laboratory to deliver final water samples.

1610 Samples delivered to laboratory. Mahmood S. and Glen S. drive back to Tetra Tech in Seattle, WA.

22 October 1991, Tuesday (Trip 2 of 5)

1300 The Tetra Tech Team of Mahmood Shivji departs from Clatskanie, OR for Ilwaco, WA.

1445 Purchase ice for storing water samples in Ilwaco, WA.

1515 Mahmood S. collects water samples at Station W2 in Ilwaco, WA.

1545 Mahmood S. packs gear and begins driving to next station at the Port of Ilwaco.

1600 Mahmood S. collects water samples at Station W3 in Port of Ilwaco, WA.

1630 Mahmood S. packs gear and begins driving to next station at Jones Beach in Oregon.

1740 Mahmood S. collects water samples at Station W16 near Jones Beach in Oregon.

1810 Mahmood S. packs gear and begins driving to Days Inn Hotel in Portland.

2030 Mahmood S. checks into Hotel.

23 October 1991, Wednesday

0900 Mahmood S. departs from hotel to drop off water samples.

1015 Water samples delivered to laboratory.

1030 Mahmood S. departs Portland, OR, to next sampling station on Sauvie Island, OR.

1140 Mahmood S. collects water samples at Station W35 on Sauvie Island, OR.

1210 Mahmood S. packs gear and begins driving to next station near the Port of Portland.

1240 Mahmood S. collects water samples at Station W38 near the Port of Portland.

1310 Mahmood S. packs gear and begins driving to next station along Marine Drive in Northeast Portland.

1325 Mahmood S. collects water samples at Station W40 near 148th and Marine Drive in Northeast Portland.

1330 Mahmood S. packs gear and begins driving to laboratory to deliver final water samples.

1335 Samples delivered to laboratory. Mahmood S. drives back to Tetra Tech in Seattle, WA.

1 November 1991, Friday (Trip 3 of 5)

0830 The Tetra Tech Team of Mahmood Shivji departs from Seattle, WA, for Ilwaco, WA.

1330 Purchase ice for storing water samples in Ilwaco, WA.

1355 Mahmood S. collects water samples at Station W3 in Port of Ilwaco, WA.

1415 Mahmood S. packs gear and begins driving to next station at the Ilwaco Spit.

1430 Mahmood S. collects water samples at Station W2 near the Ilwaco Spit.

1500 Mahmood S. packs gear and begins driving to next station at Jones Beach in Oregon.

1600 Mahmood S. collects water samples at Station W16 near Jones Beach in Oregon.

1630 Mahmood S. packs gear and begins driving to next station on Sauvie Island, Oregon.

1730 Mahmood S. collects water samples at Station W35 on Sauvie Island in Oregon.

1800 Mahmood S. packs gear and begins driving to Days Inn Hotel in Portland.

2000 Mahmood S. checks into Hotel.

2 November 1991, Saturday

0800 Mahmood S. departs from hotel to drop off water samples.

0900 Water samples delivered to laboratory.

0930 Mahmood S. departs Portland, OR, to next sampling station near the Port of Portland.

1110 Mahmood S. collects water samples at Station W38 near the Port of Portland.

1120 Mahmood S. packs gear and begins driving to next station along Marine Drive in Northeast Portland.

1150 Mahmood S. collects water samples at Station W40 near 148th and Marine Drive in Northeast Portland.

1200 Mahmood S. packs gear and begins driving to laboratory to deliver final water samples.

1300 Samples delivered to laboratory. Mahmood S. drives back to Tetra Tech in Seattle, WA.

7 November 1991, Thursday (Trip 4 of 5)

0600 The Tetra Tech Team of Glen St. Amant departs from Seattle, WA, for Ilwaco, WA.

1100 Purchase ice for storing water samples in Ilwaco, WA.

1115 Glen S. collects water samples at Station W2 on Ilwaco Spit.

1130 Glen S. packs gear and begins driving to next station at the Port of Ilwaco.

1145 Glen S. collects water samples at Station W3 at the Port of Ilwaco.

1200 Glen S. packs gear and begins driving to next station at Jones Beach in Oregon.

1315 Glen S. collects water samples at Station W16 near Jones Beach in Oregon.

1345 Glen S. packs gear and begins driving to next station on Sauvie Island, Oregon.

1500 Glen S. collects water samples at Station W35 on Sauvie Island in Oregon.

1530 Glen S. packs gear and begins driving to Days Inn Hotel in Portland.

1700 Glen S. checks into Hotel.

8 November 1991, Friday

0700 Glen S. departs from hotel and drives to next station near the Port of Portland.

0740 Glen S. collects water samples at Station W38 near the Port of Portland.

0800 Glen S. packs gear and begins driving to next station along Marine Drive in Northeast Portland.

0815 Glen S. collects water samples at Station W40 near 148th and Marine Drive in Northeast Portland.

0825 Glen S. packs gear and begins driving to laboratory to deliver final water samples.

0830 Samples delivered to laboratory. Glen S. drives back to Hotel to meet with Lynn Krasnow.

13 November 1991, Wednesday (Trip 5 of 5)

1100 The Tetra Tech Team of Glen St. Amant departs from Seattle, WA, for Ilwaco, WA.

1415 Purchase ice for storing water samples in Ilwaco, WA.

1450 Glen S. collects water samples at Station W2 on Ilwaco Spit. The following GPS coordinates were recorded: 46° 16' 50.1" N 124° 03' 36.8" W.

1500 Glen S. packs gear and begins driving to next station at the Port of Ilwaco.

1515 Glen S. collects water samples at Station W3 at the Port of Ilwaco. The following GPS coordinates were recorded: 46° 18' 8.9" N 124° 02' 12.4" W.

1540 Glen S. packs gear and begins driving to next station at Jones Beach in Oregon.

1640 Glen S. collects water samples at Station W16 near Jones Beach in Oregon. The following GPS coordinates were recorded: 46° 08' 21.2" N 123° 19' 07.4" W.

1715 Glen S. packs gear and begins driving to Days Inn Hotel in Portland.

1900 Glen S. checks into Hotel.

14 November 1991, Thursday

0600 Glen S. departs hotel and begins driving to next station near the Port of Portland.

0720 Glen S. collects water samples at Station W38 near the Port of Portland. The following GPS coordinates were recorded: 45° 38' 02.5" N 122° 44' 25.6" W.

0735 Glen S. packs gear and begins driving to next station on Sauvie Island.

0825 Glen S. collects water samples at Station W35 on Sauvie Island. The following GPS coordinates were recorded: 45° 42' 23.6" N 122° 46' 20.0" W.

0825 Glen S. packs gear and begins driving to next station on Marine Drive near 148th St. in Northeast Portland.

0940 Glen S. collects water samples at Station W40 on Marine Drive near 148th St. in Northeast Portland. The following GPS coordinates were recorded: 45° 33' 50.0" N 122° 30' 41.0" W.

0950 Glen S. packs gear and begins driving to laboratory to deliver final water samples.

1005 Samples delivered to laboratory. Glen S. drives back to Tetra Tech in Seattle.

TETRA TECH, INC.

SUMMARY SAMPLING LOG FOR WATER
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR [redacted]

SAMPLING DATE	STATION	SAMPLER	SAMPLES COLLECTED								
			VOL	PEST/ PCB	BNA	MET	CONV	NUT	TOC	AOX	BAC
10/15/91	W2	MS, GS				X	X	X			X
10/15/91	W3	"				X	X	X			X
10/15/91	W16	"				X	X	X			X
10/16/91	W35	"				X	X	X		X	X
10/16/91	W38	"				X	X	X			X
10/16/91	W40	"				X	X	X			X
10/22/91	W2	MS									X
10/22/91	W3	MS									X
10/22/91	W16	MS									X
10/23/91	W35	MS									X
10/23/91	W38	MS									X
10/23/91	W40	MS									X
11/1/91	W2	MS									X
11/1/91	W3	MS									X
11/1/91	W16	MS									X
11/1/91	W35	MS									X
11/2/91	W38	MS									X
11/2/91	W40	MS									X
11/7/91	W2	GS									X
11/7/91	W3	GS									X
11/7/91	W16	GS									X
11/7/91	W35	GS									X
11/8/91	W38	GS									X
11/8/91	W40	GS									X

RECORDER: GS ORG. CODE: TT DATE: —

TETRA TECH, INC.

SUMMARY SAMPLING LOG FOR WATER
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: _____

SAMPLING DATE	STATION	SAMPLER	SAMPLES COLLECTED								
			VOL	PEST/ PCB	BNA	MET	CONV	NUT	TOC	AOX	BAC
11/13/91	W2	GS									X
11/13/91	W3	GS									X
11/13/91	W16	GS									X
11/14/91	W35	GS									X
11/14/91	W38	GS									X
11/14/91	W40	GS									X

RECORDER: GS ORG. CODE: TT DATE: 11/13-11/14/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR/1A DATE: 10/15/91 STATION: W2

STATION LOCATION: ILWACO NORTH JETTY

STATION DESCRIPTION: Seaward side of North Jetty, Fort Canby campground.

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: M Shivji, Glen St Amant

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT _____ LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) Station located on seaward side of very large breakwater. Follow signs to Fort Canby State Park. Enter campground (turn right and at split stay left) turn into 3rd parking lot on the left of the road. Follow trail to breakwater, climb over breakwall and sample from rocks below.

Photos - Roll: _____ Pictures: _____

Comments: Dangerous area. Potential for large waves. Water sampled ~ 16-20 inches below water surface. Lots of surge.

#2 Glen at sampling station
#3 Glen
#4 View of parking lot from top of breakwater
#5 View of trail from parking lot to breakwater

RECORDER: MS SIGNATURE: M Shivji ORG. CODE: TT DATE: 10/15/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: tCR /1A DATE: 10/15/91 STATION: W3

STATION LOCATION: Ocean side of Ilwaco Marina breakwater (see #'s)

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: M Shiji Crew ST Amant

LOCATION:

Bottom Depth: _____(ft)_____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT _____ LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: #6: STATION W3 behind "witness post"
#7: " " w/breakwater in background
#8: " " in relation to Ilwaco marina

Comments: _____

Station location: Ocean side of Ilwaco marina breakwater. Adjacent to boat winch. Directly below Army CORPS witness post

RECORDER: MS SIGNATURE: M Shiji ORG. CODE: TT DATE: 10/15/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR 1 DATE: 10/15/91 STATION: W16

STATION LOCATION: ~~[illegible]~~ ~100 yds west of Woodson Rd (near Jones creek)

STATION DESCRIPTION: _____

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: MS, GS

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT _____ LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: #9 - path leading to station W16
#10 - view to west from sampling station
#11 - " " east " " "

Comments: Station is located ~ 100 yds west of the intersection of Woodson Rd and Riverfront rd. Private trail leads to beach and sampling area right in front of 12224 Riverfront (Yellow house)

RECORDER: MS SIGNATURE: M Shyr ORG. CODE: TT DATE: 10/15/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: -LCR/ DATE: 10/16/91 STATION: W35

STATION LOCATION: Sauvie Island

STATION DESCRIPTION:

SPC ZONE: (N/S) EAST: NORTH:

CREW: M. Shivji, Glen St. Amant

LOCATION:

Bottom Depth: (ft) (m) Tide: ± (m) MLLW: (ft) (m)

LORAN C: LOP1 LOP2

LAT LONG

Variable Radar Range:

Visual Fixes: (Note: Please tape any drawings to back of this sheet)

Photos - Roll: Pictures: #12: Sampling site in river
#13: relative location of pilings (to the right) when facing sampling site
#14: photo of access pathway to river. #15: photo of private driveway from Re Ro

Comments: Take bridge to Sauvie Island (from Hwy 30 East)
Follow road (NW Reeder Road) for about 4.5 miles
Go past intersection of NW Reeder and Gillihan Loop Road, and take first driveway on the right. There are several mail at the entrance of Private Driveway. Drive on dirt road past farm fields until you reach the end of the road (at the end of the field). There is a wide access to the beach on the right.

W35 station sediments are firm. Use hip waders

RECORDER: MS SIGNATURE: M. Shivji ORG. CODE: TT DATE: 10/16/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR / DATE: 10/16/91 STATION: W 38

STATION LOCATION: Port of Portland; OR side, across from Hayden Island.

STATION DESCRIPTION: Station next to Auto Loading Docks; Large Ship

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: M. Shivji, Glen St. Amant

LOCATION:

Bottom Depth: _____(ft)_____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT _____ LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: #16: Sampling site W38

#17: Docking barge ~~[illegible]~~ marking W38 sampling si

Comments:

- Follow Marine Drive into Rivergate area T-6
- Turn right at Port of Portland Birth 607 sign (just past Montgomery Ward wholesale outlet).
- Follow sign to Birth 607 office
- Stop at Terminal 06 Auto Dock office and clear visit people inside.
- Proceed to auto loading docks. There ~~will be~~ a ga in the wire fence on the right side, allowing access to the river.
- Need to climb down rock bank. Careful! - loose roc
- River is very deep, with quick drop off.

RECORDER: MS SIGNATURE: M. Shivji ORG. CODE: Tt DATE: 10/16/91

STATION LOCATION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: - LCR/ DATE: 10/16/91 STATION: W 40

STATION LOCATION: NE Marine Drive and 148th St, Portland, OR side, opposite Govt. Island

STATION DESCRIPTION: Contact Recreational Area

SPC ZONE: _____ (N/S) _____ EAST: _____ NORTH: _____

CREW: M. Shivji, G. St. Amant

LOCATION:

Bottom Depth: _____ (ft) _____ (m) Tide: ± _____ (m) MLLW: _____ (ft) _____ (m)

LORAN C: LOP1 _____ LOP2 _____

LAT _____ LONG _____

Variable Radar Range: _____

Visual Fixes: (Note: Please tape any drawings to back of this sheet) _____

Photos - Roll: _____ Pictures: #18: photo of sampling site (from road above)
#19: photo towards the east from road above.
#20: " " " west (205 bridge) from road.

Comments:
- Sampling site is on NE Marine Drive, about 0.5 - 0.7 mile east of 205 bridge to Govt. Isl.; ~100 yds west of 148th St.

- Need to climb down to bike/jogging path, and then down to river.

RECORDER: MS SIGNATURE: M. Shivji ORG. CODE: TT DATE: 10/16/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10/15/91

STATION: W2 SAMPLER: MS, BS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			1.5 ft	12:56	7.80	20,000 µMHos	7.2 mg/L	14	62

RECORDER: MS SIGNATURE: M Clary ORG. CODE: TT DATE: 10/15/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / 1A DATE: 10/15/91

STATION: W3 SAMPLER: MS, GS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			1.5 ft	2:40	8.38	12,220 µMHOS	12.2	18.0	8.9*
				* Could not standardize turbidimeter to 10.0 with 10 NTU standard. Meter would read 9.0					
				Salinity = 8°/oo					

RECORDER: MS SIGNATURE: M. Shuy ORG. CODE: TT DATE: 10/15/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10/1/91

STATION: W16 SAMPLER: MS, GS

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			~1.5ft	5:55	8.36	130 µmhos	9.3	12.0	2.45*
				* Turbidimeter would not calibrate to					
				10 NTU standard — reads 8.9 NTUs.					
				Salinity = 0 °/₀₀					

RECORDER: MS SIGNATURE: M. Shuyi ORG. CODE: TT DATE: 10/1/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / DATE: 10/16/91

STATION: W35 SAMPLER: M. Shivji, G. St. Amant

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB	sal
1			~ 16 inches	10:45	8.36	122 µMhos	9.3	16.8	7.9	0

RECORDER: MS SIGNATURE: M. Shivji ORG. CODE: TT DATE: 10/16/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR / DATE: 10/16/91

STATION: W38 SAMPLER: M. Shinn, Glen St. Amant

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB
1			~16 inches	13:15	7.35	140µmhos	9.0	17.0	5.6

RECORDER: MS SIGNATURE: M. Shinn ORG. CODE: TT DATE: 10/16/91

TETRA TECH, INC.

WATER SAMPLE DESCRIPTION LOG
COLUMBIA RIVER RECONNAISSANCE SURVEY - 1991

SURVEY AREA: LCR DATE: 10/16/91

STATION: W40 SAMPLER: M. Shiu, G. St. Amant

SAMPLE NUMBER	TRANSECT POINT	TRANSECT POSITION	SAMPLE DEPTH	TIME (hh:mm)	pH	CONDUCT-IVITY	DO (mg/L)	T (°C)	TURB	Sa
1			~16 inches	14:25	7.33	130 µMHOS	10.2	16.5	6.2	C

RECORDER: MS SIGNATURE: [signature] ORG. CODE: TT DATE: 10/16/91

APPENDIX C

CRAYFISH SAMPLING EFFORT

Synopsis of Daily Events

Crayfish Station Location and Sample Logs

SYNOPSIS OF DAILY EVENTS FOR CRAYFISH SAMPLING EFFORT

23 September 1991, Monday

1700 Tetra Tech team of Steve Ellis, Margie Mulholland, and Glen St. Amant depart Camas, WA, to Stevenson, WA.

1830 Team arrives in Stevenson, WA, and prepares sampling equipment.

1900 Team checks into hotel in Stevenson.

24 September 1991, Tuesday

0800 Team departs from Stevenson to Beacon Rock Boat Ramp.

0900 Team arrives at Beacon Rock Boat Ramp and begins to mobilize sampling gear.

1100 Team launches crayfish boat from Beacon Rock.

1130 Team arrives at Station D40 and begins to deploy traps.

1200 Team successfully deploys ten traps at sampling station. The following GPS coordinates were recorded: 45° 37' 27.9" N, 122° 01' 09.8" W.

1230 Team begins transit from Station D40 to Station D38.

1300 Team arrives at Station D38 and prepares for trap deployment.

1400 Team successfully deploys ten traps at sampling station. The following GPS coordinates were recorded: 45° 33' 23.7"N, 122° 20' 00.4"W.

1500 Team begins transit from Station D38 to Station D35.

1600 Team arrives at Station D35 and prepares for trap deployment.

1630 Team successfully deploys ten traps at sampling station. The following GPS coordinates were recorded: 45° 34' 36.7"N, 122° 26' 48.2"W.

1645 Team begins transit from Station D35 to Station D31.

1700 Team arrives at Station D31 and prepares for trap deployment.

1730 Team successfully deploys ten traps at sampling station. The following GPS coordinates were recorded: 45° 36' 14.2"N, 122° 40' 18.3"W.

1800 Team departs Staion D31 and fuels research vessel.

1900 Team trailers boat at Port of Camas–Washougal and drives to hotel in Stevenson, WA.

1930 Team arrives at hotel in Stevenson, WA.

25 September 1991, Wednesday

0800 Team departs hotel in Stevenson, WA, for Beacon Rock Boat Ramp.

0845 Team arrives at boat ramp.

0915 Team launches boat and motors to Station D40.

0930 Team retrieves traps at Station D40. Five crayfish were caught. Team redeploys ten traps.

1000 Team begins transit to Station D38.

1200 Team retrieves traps from Station D38. Two crayfish were caught. Team decided to redeploy ten traps.

1300 Team redeploys ten traps at Station D38 and begins transit to Station D35.

1400 Team retrieves traps from Station D35. 61 crayfish were caught. Redeployment of traps was unnecessary. Team begins transit to Station D31.

1450 Team retrieves traps from Station D31. Twelve crayfish were caught. Redeployment of traps was unnecessary. Team begins transit to Station D29.

1650 Team deploys nine traps at Station D29. The following GPS coordinates were recorded at the site: 45° 38' 57.9"N, 122° 44' 42.1"W. Team begins transit to Station D28.

1700 Team deploys ten traps at Station D28. The following GPS coordinates were recorded at the site: 46° 41' 39.4"N, 122° 45' 55.2"W. Team begins transit back to Port of Camas–Washougal boat ramp.

1730 Boat trailered and team begins transit to Beacon Rock Boat Ramp.

1815 Team launches boat at Beacon Rock Boat Ramp and motors to Station D40.

1830 Team retrieves traps. Two more crayfish were caught. Too dark to redeploy traps.

1930 Team trailers boat and begins transit to Portland, OR.

1100 Team arrives at hotel in Portland, OR.

26 September 1991, Thursday

0645 Tetra Tech team departs from hotel in Portland to Beacon Rock Boat Ramp.

0745 Team arrives at boat ramp and launches boat. Team motors to Station D40.

0800 Team deploys ten traps at Station D40.

0815 Team trailers boat and begins transit back to Port of Camas–Washougal boat ramp.

0845 Team launches boat and motors to Station D38.

0900 Team retrieves traps and catches 38 crayfish; 30 were randomly retained. No additional traps were deployed.

1000–1600 Team processes crayfish samples, purchases additional dry ice, and delivers samples to Keystone/NEA laboratories in Tigard, OR.

1600 Team drives from lab to Donaldson's Marina in Portland, OR.

1700 Team arrives at marina, prepares gear, and launches boat.

1730 Team motors to Station D26, across from Fishtrap Shoals.

1845 Team arrives at Station D26 and deploys ten traps. The following GPS coordinates were recorded: 45° 46' 52.5"N, 122° 46' 09.3"W.

1900 Team motors to Station D28.

1920 Team retrieves ten traps from Station D28. 24 crayfish were caught and retained. No additional trap deployment at the site was necessary.

1945 Team motors to Station D29.

2015 Team retrieves nine traps from Station D29. 30 crayfish were caught and retained. No additional trap deployment at the site was necessary.

2045 Team motors back to Donaldson's Marina.

2115 Team arrives at marina and trailers boat.

2230 Team arrives at hotel in Portland, OR.

27 September 1991, Friday

0630 Team departs hotel in St. Helens, OR, for Beacon Rock Boat Ramp in Washington.

1000 Team arrives at Beacon Rock Boat Ramp and launches boat.

1030 Team retrieves ten traps from Station D40. Two more crayfish were caught and retained, for a cumulative total of nine. Since three days of fishing effort has elapsed, the team decided not to redeploy any additional traps at Station D40.

1100 Team trailers boat and returns to Portland.

1200–1500 Team processes crayfish, purchases additional dry ice, and delivers samples to Keystone/NEA Laboratories in Tigard, OR.

1500 Team drives to St. Helens, OR.

1550 Team arrives at City of St. Helens Marina and launches boat.

1600 Team arrives at Station D24 (adjacent to Marina) and deploys 10 traps. The following GPS coordinates were recorded: 45° 52' 22.5"N, 122° 47' 54.9"W.

1630 Team motors to Station D23.

1650 Team deploys nine traps at Station D23. The following GPS coordinates were recorded: 45° 57' 20.1"N, 122° 48' 15.8"W. Team begins to motor to Station D22.

1700 Team arrives at Station D22 and deploys 10 traps. The following GPS coordinates were recorded: 46° 00' 34.8"N, 122° 50' 55.6"W. Team motors to Station D26.

1735 Team arrives at Station D26 and retrieves 10 traps. 69 crayfish were caught and 32 were randomly retained. No further deployment of traps was necessary at the site.

1800 Team begins motoring back to City of St. Helens Marina.

1830 Team arrives at St. Helens Marina and moors boat for the night.

1930 Team arrives at hotel in St. Helens, OR.

28 September 1991, Saturday

0900 Team arrives at St. Helens Marina and launches boat.

1000 Team arrives at Station D24 and retrieves ten traps. No crayfish were caught.

1030 Ten traps were redeployed at Station D24. Team motors to Station D23.

1050 Team arrives at Station D23 and retrieves nine traps. Twelve crayfish were caught and retained. No additional traps were deployed at the site.

1100 Team motors to Station D22.

1130 Team arrives at Station D22 and retrieves 10 traps. Eight crayfish were caught and retained. Ten traps were redeployed at the site.

1200 Team motors to Station D19.

1245 Team arrives at Station D19 and deploys nine traps. The following GPS coordinates were recorded: 46° 08' 17.3"N, 123° 00' 28.5"W. Team motors to Station D16.

1330 Team arrives at Station D16 and deploys five traps. The following GPS coordinates were recorded: 46° 11' 15.3"N, 123° 05' 28.1"W. Team motors to Station D15.

1400 Team arrives at Station D15 and deploys five traps. The following GPS coordinates were recorded: 46° 09' 21.3"N, 123° 13' 56.6"W.

1630 Team motors to Station D16.

1700 Team arrives at Station D16 and retrieves five traps. Five crayfish were caught and retained. Five traps were redeployed at the site. Team motors to Station D15.

1720 Team arrives at Station D15 and retrieves five traps. Nine crayfish were caught and retained. Five traps were redeployed at the site. Team motors back to City of St. Helens Marina.

1800 Team trailers boat and returns to hotel in St. Helens, OR.

29 September 1991, Sunday

0700 Team departs hotel in St. Helens, OR, for City of St. Helens Marina

0715 Team launches boat and motors to Station D24.

0730 Team arrives at Station D24 and retrieves ten traps. One crayfish was caught and retained.

0800 Station D24 was moved slightly downstream and across the small channel to more suitable crayfish habitat.

0830 Team trailered boat and motored to Cathlamet, WA.

1000 Team arrives at Elochoman Slough Marina in Cathlamet, WA, and launches boat.

1025 Team arrives at Station D22 and retrieves nine traps. Ten crayfish were caught and retained. No additional trap deployment at the site was necessary. Team motored to Station D19.

1130 Team arrives at Station D19 and retrieves nine traps. Forty-six crayfish were caught and thirty were randomly retained. No additional trap deployment at the site was necessary. Team motors to Station D16.

1240 Team arrives at Station D16 and retrieves five traps. Twenty-six crayfish were caught and retained. No additional trap deployment at the site was necessary. Team motors to Station D15.

1320 Team arrives at Station D15 and retrieves five traps. Sixty-five crayfish were caught and twenty-three were retained from the first traps. Team motors to Station D12.

1500 Team arrives at Station D12 and deploys ten traps. The following GPS coordinates were recorded at the site: 46° 12' 20.9"N, 123° 23' 25.2"W. Team motors to Station D10.

1600 Team arrives at Station D10 and deploys eight traps. The following GPS coordinates were recorded at the site: 46° 12' 35.5"N, 123° 26' 35.1"W. Team motors to Station D8.

1650 Team arrives at Station D8 and deploys nine traps. The following GPS coordinates were recorded at the site: 46° 13' 38.8"N, 123° 34' 35.6"W. Team motors back to Elochoman Slough Marina.

1800 Team arrives at Elochoman Slough Marina and moors boat for the night. Team returns to hotel in Cathlamet, WA.

30 September 1991, Monday

0800-0930 Van brakes down and taken in for repair.

0930 Team departs Elochoman Slough Marina for Station D12.

1000 Team arrives at Station D12 and retrieves ten traps. Ten crayfish were caught and retained. No additional traps were deployed at the site. Team motors to Station D10.

1100 Team arrives at Station D10 and retrieves eight traps. Thirty-seven crayfish were caught and thirty-one were randomly retained. No additional traps were deployed at the site. Team motors to Station D8.

1200 Team arrives at Station D8 and retrieves nine traps. Thirty-four crayfish were caught and thirty-one were randomly retained. No additional traps were deployed at the site. Team motors to Station D6.

1300 Team arrives at Station D6 and deploys twelve traps. The following GPS coordinates were recorded at the site: 46° 16' 02.1"N, 123° 40' 25.8"W. Team motors to Station D24.

1700 Team arrives at Station D24 and retrieves ten traps. Fifty-eight crayfish were caught and thirty were randomly retained. No additional traps were deployed at the site. Team motors to Station D20.

1830 Team arrives at Station D20 and deploys ten traps. The following GPS coordinates were recorded for the site: 46° 03' 28.4"N, 122° 52' 16.1"W. Team motors back to Elochoman Slough Marina.

1900 Team arrives at marina, moors boat, and returns to hotel.

1 October 1991, Tuesday

0900 Team departs marina for Station D6.

1005 Team arrives at Station D6 and retrieves 12 traps. 186 crayfish were caught and 31 were randomly retained. No additional traps were deployed at the site. Team motors to Station D20.

1230 Team arrives at Station D20 and retrieves ten traps. Twenty-one crayfish were caught and retained. Team motors back to Elochoman Slough Marina.

1400 Team trailers boat at Elochoman Slough Marina and returns to Seattle, WA.

Station D40 Sheet.. VC 8706-06 Crayfish Raw Data 9/24/91

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Beacon Rock	10	45°37'27" 52ft altitude	122°01'09.8"		9/24/91	Tuna	9/25/91 0830 Sunny, Warm	1	Sunny, Warm, High winds 12:00 - 12:30
Beacon Rock	9	"	"		9/24/91	Tuna	9/25/91 0830 Sunny, Warm, Windy	1	"
Beacon Rock	8	"	"		9/24/91	Tuna		0	"
Off Beacon Rock Dock	7	"	"		9/24/91	mackerel & Tuna		0	"
"	6	"	"		9/24/91	"	9/25/91 Sunny, Windy, Warm 0830	2	"
"	5	"	"		9/24/91	"		0	"
Near bank of adjacent Island (Pierce Co.)	4	"	"		"	"		0	"
"	3	"	"		"	"		0	"
"	2	"	"		"	"		0	"
"	1	"	"		"	"	9/25/91 0830 Sunny, Warm, Windy	1	"
			Redeployed 6 off boom breakers						
			& 4 off pilings under Beacon Rock						

across by Pierce Co.

Decision To Redeploy 10 @ Site Near Shore

Station D38

Sunny Warm & Windy

Sunny Warm & Windy

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Reed Is.	11	45°33'23.7"	122°20'0.4"		9/24/91		1151-1230 9/25/91	0	1400-1430 deployed
	12							0	
	13							0	
	14							0	
	15							0	
Outside Reed Is.	16					Tuna Mack		0	
Outside Reed Is.	17								
Outside Reed Is.	18					Tuna		0	
Inside Is.	19					Mack		0	
	20							2	
	Redeployed near Rocky area								
*	Redeployed all along (9-25-91)				North side (Wash.)				of inlet (Reed Is.)

Sheet

Station D35

Time 1300

Sunny warm & windy

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Hassalo @ Rock	21	45°34'36.7"	122°26'48.2"		9/24/91	Tuna or Mack	9/25/91 1300	6	1624-1700
22	22							8	
	23							2	
	24							8	
	25							5	
	26							2	
	27							10	Yeah!
	28							3	
	29							10	
	30							7	
~~Escapees on Deck~~								61 CF	
Pulled Traps			LOTS						
by log rafts & visible Plume									

D31

Sheet

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Tomahawk Rs.	31				9/24/91	Tuna on hook	9/25/91	0	1730 - 1800
	32						1450	1	
	33							0	
	34							0	
	35							4 3	3 small
	36							7	
	37							0	
	38							0	
	39							0	
								12	
		None redeployed							
		All caught in rocky area							
		near protruding pipes							

Sheet

D40 - 2nd Deployment

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Beacon Rock	1				9/25/91	mackerel	9/25/91	6	
alma boom break	2							0	
	3							0	
	4							1	
	5							0	
	6							1	
	7							0	
	8							0	
	9							0	
	10							0	

Redeployed 10 Traps.

Guy told us there was a spill that dumped into the creek that drains in here. Said it was polluted.

Sheet

D39

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Outside Reed & Rocks mean Beaver mound	20				9/25/91 1200?	Assorted Catfood Tuna & mackerel	9/26/91	0	Sunny, Warm, Windy Mud bottom
	16							1	Threw it back
	18							0	
Further down	11							8 5	
	12								
	13						9/26/91	7	
	14							2	Threw both back
	15							0	
	17							4	Threw all 4 back
	19							10	Threw 1 back randomly Kept 10
		Lots & Lots					Only took 30		
		from 1st 4 traps opened							

Shee

Station D29 — Sunny, hot,

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
About confluence of Willamette across channel - WA side	31	45°38'59.9"N	122°44'42.1"W		9/25/91	Tuna & Livers & mackerel	9/26/91	2	Deployed 1650-1700
	32						2015	3	
	33							10	
	34							5	
	35							4	
	36							4	
	37							0	
	38							2	
Mud bottom	39							0	

GOOD ONE @ 1

Shee...

D28 – Looks real sandy & unlikely! Really shallow

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Downriver of Wilson	21	45°41'39.4"	122°45'55"		9/25/91 1720- 1730	Tuna's Liver	9/26/91 1920 Dusk	8	Looks unlikely
	22							3	1 dead sculpin
	23							1	
	24							0	
	25							3	
	26							0	
	27							9	
	28							0	
	29							0	
	30							0	

D40 - 3rd deployment

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Beacon Rock	1				9/26/91	Tuna & Liver or mackerel	9/27/91 1930	0	Pulled traps! only 9 total Set marker buoy
outside log boom	2							0	
<@ base of Beacon Rock	3							0	
	4							0	
	5							2	
	6							0	
	7							0	
	8							0	
	9							0	
	10							0	
Chem Spill in Woodward Cr. (Cr. just near Beacon Rock dock) last Winter - Some unknown nasty Substance. Fisherman said it contaminated the area.									

D 26

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Across from Saltrap Shoal's upriver	11	45°46'525"	122°46'09.3"		9/26/91 1845	Tuna fish	1	6 tossed back	Looked real sandy on OR side. Near where we'd deployed for St. Helens & got skunked before. Chose WA side for mudbanks & rocks
	12						9/27/91	11	
	13						1735	5 tossed back	
	14							6 tossed back	
	15							3	
	16							7 tossed back	
	17							7 tossed back	
	18							7	
	19							11	
	20							6 tossed back	
Bald eagle feeding in vicinity of traps.									

Sheet

Station D 24

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
		122° 47' 36.3"	45° 51' 53.7"		9/27/91 1400		9/28/91 1000	0	
								0	
								0	
								0	
								0	
								0	
								0	
								0	
								0	
								0	
								0	

Will redeploy along downriver end of marina adjacent to St. Helens

Station D23

Sheet

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
	31	45°57' 20.1"	122°48' 15.8"		7/		9/28/91	0	Mud Depositional area
	32				165		1050	0	
	33				North Tip of Martin Is. in Martin Slough			7	
	34							0	
	35							0	
	36							0	
	37							5	
	38				~~Abut~~			0	
	39							0	
		The two w/ crayfish were near rocky bank that was real deep. Others were shallow & bad.							

Sheet

Station D22

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Key West	1	34.8'			Inside Marine		9/28/91	0	
	2				along North Key Rk		1130	1	
	3							0	
	4				Bank			0	Bottom blew out of trap
	5				Near Birds			0	
	6							0	
	7				9/24/91			0	
	8				1700			2	
	9							2	
	10							3	
	Better luck outside marina. Channel too								
	narrow so traps were too shallow to keep them								
	out of way of navigation								

Redeployed 9

Shee

D22

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Kalama	1				9/28/91	Cat Food	9/29/91	4	
Harbor	2				1150		1025	2	
	3							1	
	5							0	
	6							0	
	7							0	
	8							1	
	9							0	
	10							1	
								1	

Shee

D19 - Longview downriver from docks

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Longview downriver from Docks - Reynolds, etc.	31	46°08'17.3" N	123°00'28.5" W		9/26/91 1245	Catfood	9/29/91 1130	2	
	32							0	
	33							6	
	34							1	
	35							7	Tossed back
	36							9	Tossed back 7
	37							11	
	38							0	Lost trap
	39							8	
		Downstream of big docks. Upriver power lines							

D 18 → 16

She.

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Coal Creek Slough	16	46°11'15.3"	123°05'28.1"		9/28/91 1330	Cat Food	3		Looks. Fantastic
Below	17						0		
Alder Bluff	18						1		
	19						1		
	20						5		
							9/28/91 1700		
		Looks incredible so we just put out 5.							
		Put traps back							

She.

D15 - Wallace Slough / mouth of Clatskanie

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
mouth	11	46° 08' 21.3" N	123° 13' 56.6"		9/28/91	Catfood		0	
of Clatskanie River	12							0	
Wallace	13						9/28/91	3	Redeployed
Slough	14						9/28/91	6	Redeployed
	15							0	
		Looks like Crayfish habitat on downstream bank of river. Real Deep too.							

Shee

D15

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Clackamas River	11				9/29/91 1720	Catfish	9/29/91 1320	8	
	12							15	
	13							6	Tossed them back
	14							20	Tossed back
	15							16	Tossed back

Shee..

D16

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
~~16~~					9/28/91		9/29/91 1240	7	
17								4	
18								9	
19								2	
20								4	

D12 Elochoman Slough – near marina

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Elochoman Slough	11	46°12'20.9"	123°23'25.2"		9/29/91 1500	Catfood	9/30/91 1000		Lost Trap
	12							1	
	13							0	
	14							0	
	15								Lost Trap
	16							2	
	17								Lost Trap
	18							0	
	19							7	
	20								Lost Trap

People real unfriendly. Esp Port Mgr. / Harbor master

Has 2 traps that were pulled

Didn't drop marker buoy b/c of hostility. Thought it would

Sheet

D10 - Tenasillahee Qs.

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Tenasillahee Qs.	~~37~~	46°12"35.5"	123°26'35.1"		9/29/91 1600	Catford		~~0~~	
	32							0	
	33							6	Tossed 6 Back
	34							9	
	35							0	
	36							14	
	37							0	
	39							5	
	30							3	
		Picked up 1st 4 traps & had enough.							
		Put out marker buoy							

D8 - ~~Mouth~~ Ds.

She

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
~~Ds~~ Mouth Ds. Creek	2	46°13'38.8"	123°34'35.6"		9/29/91 1650	Calfood	9/30/91 1200	1	
	3							7	
	4							0	
	5							4	
	6							8	
	7							0	
	8							0	
	9							9	Threw out 2 of extras
	10							5	
		Set marker buoy			—		Looks good		

Shee...

D6 - Moved to near Altona

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
near Altona	36	46°16'2.1"	123°40'25.8"		9/30/91	Catford	10/1/91	33	Tossed them back Moved site
	33				1300		1005	18	Tossed back
	4							13	
	5							21	tossed then back
	6						1005 10-1-91	~~13~~	10 Tossed back
	~~2~~							9	Tossed back
	8							10	Tossed back
	9							6	Tossed back
	16							~~13~~	13 Tossed back
	32							10	Tossed back
	34						1005 10-1-91	17	& tossed back
	10							26	Tossed all back

Channel to shallow so moved site

loads of small ones

Shee..

D24 - 3rd Deployment

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
St. Helens Downriver	31	~~[illegible]~~	~~[illegible]~~		9/29/91 0800		9/30/91 1700	11	
	21	45°52'22.5"	122°47'54.9"					4	
	23							2	
	24							1	
	25							[illegible]	tossed 9 back
	26								tossed 1 back
	27							7	
	28								tossed 15 back
	29							2	tossed 3 back
	22							7	
		Lots!		All cages deep			& downriver of marina		

Sheet

D20 - Carolls Channel looks OK

SITE LOCATION	BUOY NUMBER	LATITUDE	LONGITUDE	DEPTH	DATE DEPLOYED	BAIT	DATE RETRIEVED	NUMBER CAUGHT	COMMENTS
Carolls Channel 10 traps	~~39~~	46°03'28.4"	122°52'16.1"		9/30/91 1830	Catfood	10/1/91 1230	1	
	~~35~~							1	
	24							1	
	37							4	
	28							1	
	20							1	
	~~25~~							2	
	29							2	
	22							2	
	27							6	

In & around log rafts.

All done!

APPENDIX D

CARP, LARGESCALE SUCKER, AND PEAMOUTH SAMPLING EFFORT

Synopsis of Daily Events

Crayfish Station Location and Sample Logs

SYNOPSIS OF DAILY EVENTS FOR FISH SAMPLING EFFORT

9 September 1991, Monday

Application for Oregon scientific fish collection permit submitted by Steve Ellis of Tetra Tech.

12 September 1991, Thursday

Application for Washington Department of Fisheries permit for carp submitted by Steve Ellis.

9 October 1991, Wednesday

Tetra Tech, Bellevue, WA receives a facsimile of the Oregon Department of Fisheries and Wildlife fish collection permit.

10 October 1991, Thursday

Permit from Washingtion Department of Wildlife issued for collection of peamouth using gillnets.

11 October 1991, Friday

Steve Ellis receives verbal approval for ammendment of Washington Department of Wildlife permit for the use of electroshocking for peamouth and largescale suckers from Bill Taylor of Washington Department of Fisheries in Olympia, WA.

Tetra Tech, Bellevue, WA receives facsimile of ammended Oregon Department of Fisheries and Wildlife permit that allows the use of electroshocking.

14 October 1991, Monday

0900 The Tetra Tech fish collection team of Tad Deshler and Curtis DeGasperi leave Seattle, WA for Portland, OR.

0920 Approximately 100 lbs of dry ice is obtained in Seattle.

1230 Stop at Washington Department of Wildlife to obtain permit for peamouth collection. Permit not available here, but obtained verbal approval from Bill Taylor of Washingtion Department of Wildlife in Olympia, WA. Will expect facsimile of permit at Tetra Tech, Portland office.

1345 Stop at Tetra Tech Portland office to deliver DEQ lifejackets and to make inquiries about Washington peamouth collection permit. A copy of the permit is not yet available.

1445 Check-in at Airport Days Inn.

1500 Return rental van to car rental.

1530 Skipper Mark House of Beak Consultants, Portland, arrives with electrofishing boat. Boat is loaded with gear and team departs for station D40 at Beacon Rock State Park Boat Landing.

1645 Arrive Beacon Rock Boat Landing. Electrofishing boat is prepared.

1700 Boat is launched.

1710 Electrofishing begins. Electrofishing is performed around dock and log booms as well as open water areas near launch. Weedy areas are fished along shore.

1803 Two suckers and two carp have been taken.

2010 Six more suckers and three more carp have been collected. No peamouth were encountered. Largescale suckers are kept for possible alternative target species. Total electrofishing time 4061 sec. Salmon and beaver were encountered.

2030 Boat trailered and team returns to Portland.

2200 Team arrives at the Airport Days Inn.

15 October 1991, Tuesday

1130 Fish collection on previous day weighed, labeled, and packaged for delivery to laboratory.

1230 Mark House arrives, boat is loaded and team departs for Port of Camas-Washougal boat launch and stations D35 (Camas Slough) and D38 (Reed Island).

1345 Electrofishing boat is launched and team motors to Camas Slough.

1420 Electrofishing begins west of Hussalo Rock on Washington shore following log booms. Fished east along shore including log booms and pilings.

1450 One largescale sucker collected and one squawfish returned. Continued fishing up Camas Slough, mostly on north side of Lady Island up to Highway 14 bridge and then headed west on Washington shoreline.

1620 Five largescale suckers, five carp, and one peamouth collected. Total electrofishing time 3926 sec.

1630 Team motors upstream to station D38 (Reed Island).

1700 Began electrofishing along south shore of Reed Island along main channel.

1730 No target species observed. Moved inside of Reed Island and electrofished in shallow weedy areas along north shore of Reed Island and along riprap on Washington shoreline.

1805 Collected two carp and one largescale sucker.

1835 Two carp and another largescale sucker collected.

1845 Two more largescale suckers collected

2000 One more carp and three largescale suckers were collected. No peamouth were observed. Electrofishing time was 4715 sec. Total fishing effort was 2.5 hrs.

2020 Boat trailered and team returned to Portland.

2120 Team arrives at Airport Days Inn, Portland.

16 October 1991, Wednesday

Morning: Coordinate possible meeting with Cordy Shea of DEQ and film crew from Channel 12 news, and Oregonian reporter. Tentatively scheduled for Thursday at Donaldson Marina near Portland International Airport to visit Hayden Island station. Discussion of problems with target species collection and Washington peamouth collection permits with Tetra Tech Bellevue office. Weigh and package fish collected on previous day.

0910 John Rehm of Tetra Tech, Portland, OR arrives at motel to take fish to Keystone/NEA.

1145 John R. delivers fish samples to Keystone/NEA.

1230 Mark H. arrives, boat is loaded and team drives to boat launch at Leeward Isle Marina to visit stations D29 (downstream of Vancouver and Willamette River confluence) and station D28 (near Caterpillar Island).

1330 Boat launched and team motored to station D29.

1410 Suitable electrofishing habitat was not found near the designated station D29 and most of the features of the topographic map were not identified or were dry due to low water levels in river. A long narrow channel in the area of the topographic map identified as Blurock Landing was selected. Later inquiry with the U.S. Army Corps of Engineers identified this feature as part of the Lake Vancouver Restoration Project. This is a channel to gravity feed flushing water from the Columbia River for Lake Vancouver water quality improvement.

1420 A log boom was crossed to access the channel.

1430 Three largescale suckers had been collected.

1500 Two more suckers were collected.

1700 Three carp and two peamouth were collected. When the log boom was crossed to return to the main channel of the Columbia River, the steering cable broke. Electrofishing time 6547 sec. Total fishing effort 3.2 hrs.

1720 Returned to Caterpillar Island without steering.

1740 Boat trailered and team returned to Portland.

1830 Team arrives at the Airport Days Inn, Portland.

17 October 1991, Thursday

Morning: Mark H. repaired steering cable. Meeting with Cordy Shea and press scheduled for 1330 today at Donaldson Marina.

1100 Tetra Tech, Bellevue, WA receives facsimile of ammended Washingtion Department of Fisheries permit for electroshocking.

1230 Mark H. arrives, boat loaded and team drives to Donaldson Marina. Plan is to visit stations D31, D28, and revisit station D29 for carp.

1300 Arrive marina, wait for Cordy Shea and press team scheduled to arrive at 1330.

1330 Cordy Shea and Gene Foster of DEQ arrive as well as camera team and reporter from channel 12, Portland. They have a separate boat and will follow us to Hayden Island station D31.

1400 Boats launched and teams motor to Hayden Island station.

1430 Station coordinates taken: 45° 36' 14.2"W 122° 40' 18.3"N. Located crayfish bouy. Began electrofishing south bank of channel along riprap. Moved to north side of channel near crayfish bouy. Fished along point and around pilings.

1500 Two largescale suckers were collected. Also noted were one lake chub, two squawfish, and one salmon. A short interview was conducted by television news crew and then publicity crew departed.

1610 Two suckers and two carp were collected. Carp taken near Hayden Island Yacht Club. Position coordinates were taken here: 45° 36' 33.8"W 122° 40' 33.2"N.

1700 Had fished south side again along boat docks to Interstate 5 bridge. Crossed to north side and continued west along shore behing house boats. Then headed east under I-5 bridge behind boat docks along shore. Electrofishing time 5047 sec. Total fishing effort 2.5 hrs. No peamouth encountered.

1710 Returned to boat launch.

1730 Boat pulled and team headed for Leeward Isle Marina near Caterpillar Island.

1830 Launched boat. Original site for D28 was dry due to low water levels in the river. Moved station to inside of Caterpiller Island.

1840 Began electrofishing. Station coordinates: 45° 42' 15.7"W 122° 45' 35.3".

1930 Collected five carp, five peamouth, and six largescale suckers. Electrofishing time 2138 sec. Total fishing effort 0.8 hrs.

1940 Motored upstream to station D29 to finish collection of carp.

2000 Began electrofishing outside of booms near small docks just outside of channel where we had been the day before.

2015 Final two carp collected.

2045 Boat trailered.

2100 Alerted by noise, the smell of burning rubber, and smoke. Sheaf springs on boat trailer broken on driver's side and trailer is resting on trailer tire. Pull trailer off road and tire is blown. Valuable equipment is transferred to car, and trailer is left behind.

2215 News coverage of sampling at Hayden Island viewed.

2300 Team returns to Portland Days Inn.

18 October 1991, Friday

Morning: Fish caught previous day are weighed and packaged. All fish collected are prepared for delivery to Keystone/NEA laboratory in Portland. Mark H. works to repair broken sheaf springs on trailer.

0800 Tetra Tech fish sampling team of Mahmood Shivji and Glen St. Amant leave Seattle to replace Curtis D. and Tad D.

1130 Glen St. A. and Mahmood S. arrive at the Airport Days Inn.

1300 Tad D. and Curtis D. leave Days Inn to deliver fish samples collected to Keystone/NEA.

1400 Fish samples delivered to Keystone/NEA.

1530 Curtis D. returns ice chests to Airport Days Inn and departs for Seattle. Tad D. remains in Portland for the weekend.

1930 Curtis D. arrives in Bellevue, WA and returns rental car.

Note: Mark H. does not complete boat repair. Fish sampling postponed until Saturday, 19 October 1991.

19 October 1991, Saturday

1330 Fishing team of Glen, Mahmood, and Mark meet in St. Helens, OR and launched boat at St. Helens Marina boat ramp.

1500 Electrofishing began at station D26 across from Fishtrap Shoal on Washington shoreline. Station coordinates were the same as crayfish: 45° 46' 52.5"N 122° 46' 09.3"W.

1830 Five carp were collected. Electrofishing time 6568 sec. Total fishing time 3.5 hrs.

1945 Begin electrofishing at station D24 near the City of St. Helens. Fished mostly west end of St. Helens marina. Station coordinate same as crayfish: 45° 52' 22.5"N 122° 47' 54.9"W.

2135 Five suckers, five carp, and five peamouth collected. Electrofishing time 3391 sec. Total fishing time 1.8 hrs.

20 October 1991, Sunday

1530 Team meets in Kalama, WA and launches boat from Port of Kalama Marina.

1600 Began electrofishing at station D23 in Martin Slough, near downstream tip of Martin Island.

1700 Five carp and five suckers caught. Electrofishing time 2641 sec. Plan to motor to station D22 (Port of Kalama Marina) and return to station D23 after nightfall for peamouth.

1745 Began electrofishing in Port of Kalama Marina.

2015 No carp caught in Port of Kalama. Motored back to station D23 for peamouth. Five peamouth were caught. Electrofishing time was 2989 sec. Total electrofishing time at station was 5630 sec. Total fishing time was 2.5 hrs.

2300 Motored back to Port of Kalama Marina. Began electrofishing outside of marina breakwater, along pilings.

21 October 1991, Monday

0030 Collected only three carp. Plan to make other attempt after rest.

1545 Team meets at Port of Kalama Marina and boat is launched.

1600 Electrofishing begins. Weather exceptionally cold and windy.

1700 No carp encountered. Electrofishing time 3087 sec. From same marina motored to station D21 near Trojan Nuclear Power Plant.

1720 Began electrofishing at station D21 along south shore of Trojan to Goble Marina. Originally tried Washingtion side of river (station D20) with no success. Decided to try Oregon side.

1900 Five peamouth collected. Electrofishing time 4620 sec. Total fishing time 1.7 hrs.

1915 Boat trailered and team moves to Rainier, WA.

2030 Boat launched at Rainier boat ramp and team motors downstream to station D19, downstream of Longview near high tension power lines. Crayfish bouy sighted and collected. Station coordinates were the same as the crayfish coordinates: 46° 08' 17.3"N 123° 00' 28.5"W.

2330 Four peamouth collected. No carp have been encountered. Heavy rain begins to fall and Mark decides electrofishing cannot be continued. Electrofishing time 2468 sec. Team returns to Rainier.

22 October 1991, Tuesday

0030 Boat trailered and Mark returns to Portland. Mahmood and Glen stay at Northwoods Inn, Clatskanie, OR.

0700 Curtis D. and Bruce Bennet meet at Tetra Tech Bellevue and make final preparations.

0800 Pick up rental car in Bellevue and head for Portland in two cars. One car is for Glen St. A. to return to Bellevue in. The other is for our use while sampling. Heavy rain continues since last evening.

1100 Meet Mahmood S. and Glen St. A. in Clatskanie, OR.

1200 Mahmood S. leaves to perform bacteria sampling. Glen leaves for Portland to deliver fish samples to Keystone/NEA.

1300 Arrange meeting with Oregonian reporter for 1400 at Beaver Boat Ramp in Clatskanie, OR. Mark H. delayed fixing boat trailer lights.

1800 Team meets at Rainier boat ramp.

1820 Boat launched and team motors to revisit station D19 below Longview, WA. Two peamouth and five carp are needed.

1849 Electrofishing begun along north shore of river near high tension power lines downstream of Longview Lewis and Clark Bridge and major industrial area of Longview. Station coordinates: 46° 08' 23.7"W 123° 00' 33.8"N.

1905 Three peamouth collected. These are in addition to four already collected yesterday.

2100– 2215
One gillnet deployed near pilings on north shore near high tension power lines. One peamouth caught in net. Total electrofishing time 2326 sec. gillnetting effort 1.25 hrs.

2152 While gillnet deployed, a gillnetter was questioned about incidental carp catches. One carp was collected from the gillnetter.

2245 Boat trailered and pulled. Mark H. returned to Portland with boat. Bruce B. and Curtis D. returned to Clatskanie.

2315 Bruce B. and Curtis D. arrive in Clatskanie.

23 October 1991, Wednesday

0930 Fish collection team meets at Rainier boat ramp. Boat is launched to revisit station D19 (Longview) to make last attempt to collect carp.

1000 Set gillnet on Oregon side of channel along north shore of Lord Island near power lines.

1015–1100
Electrofish along south shore and around upstream point of Lord Island.

1110 Pull gillnet. Caught one largescale sucker and one salmon. Salmon was released.

1120–1200
Redeploy gillnet inside of upstream point of Lord Island near pilings. Electrofish off point. One gillnet badly snagged and torn when retreived. No fish collected in gillnet.

1220 Stopped to question gillnetter about incidental carp catch. One carp was collected from gillnetter.

1245 Boat trailered. Team headed west by car to Beaver Boat Ramp in Clatskanie, OR.

1400 Met Cordy Shea and Phil from DEQ and Oregonian reporter and photographer. They have separate boat. Boats are launched and we motor down Clatskanie River to mouth and Wallace Island (station D15).

1547 Electrofishing began. Station coordinates for crayfish sampling should adequately locate this site ( ). We electrofished shoreline on upstream and downstream side of Clatskanie River mouth and shore of Wallace Island.

1700 A brief interview was conducted and the publicity team left. Two peamouth had been collected. No carp had been encountered.

1730 Five peamouth were collected. No carp were encountered. Motored out to the main channel to speak with gillnetters. One boat had collected no carp. Electrofishing time 3494 sec. Fishing effort was 1.75 hrs.

1800 Trailered boat and headed for Longview to look for boat ramp near Coal Creek Slough (station D16).

1930 The closest boat ramp was on Weyerhaueser property in Longview, upstream of Coal Creek Slough. Boat was launched and we motored to Coal Creek Slough.

2015 Began electrofishing near mouth of slough and worked up to boat docks.

2230 Collected eight peamouth. Encountered no carp. Did encounter many suckers, squawfish, and salmon. Electrofishing time 4421 sec. Total fishing effort 2.25 hrs.

2300 Boat was trailered and pulled. Mark H. returned to Portland. Curtis and Bruce returned to Clatskanie. Team arranges to meet before 1200 the following day in Cathlamet, WA.

24 October 1991, Thursday

1000 Bruce and Curtis leave Clatskanie for Cathlamet, WA.

1130 Bruce and Curtis arrive at Elochman Slough Marina in Cathlamet, WA.

1330 Mark H. arrives and boat is launched. Station D12 is located outside of harbor in Elochman Slough.

1410–1610
— Two gillnets are deployed. One parallel to shore, the other perpendicular. gillnets are across from a log transfer facility in Elochman Slough. Electrofishing begun along log booms and pilings and in small coves. gillnets are retreived. One squawfish caught in gillnet set parallel and five squawfish were caught in gillnet set perpendicular to shore. No fish have been encountered using the electrofishing apparatus.

1630 Decided problem with electrofishing boat was short in insulated connecter to anode. After attempt at repair boat was pulled and taken to local automotive shop. An attempt was made to solder connector wires.

1800 Boat launched again. Testing indicated that short not repaired.

1830 Boat trailered and Mark returned to Portland to repair boat. Bruce and Curtis remained in Cathlamet.

25 October 1991, Friday

Morning: Mark takes boat to Vancouver for repairs.

1430 Mark arrives in Cathlamet.

1500 Boat launched and electrofishing began immediately.

1610 Electrofished upstream point of Hunting Islands off Elochman Slough Marina and along outside of marina breakwater. Five largescale suckers and five peamouth collected. Electrofishing time 2194 sec. Total fishing effort 1.2 hrs. No carp encountered. Motored to station D10 (downstream of James River II, Wauna mill) at Tenasillahe Island.

1700 Set two gillnets near upstream point of Tenasillahe Island on Clifton Channel side. Electrofishing begun on south shore of Tenasillahe Island from point, then downstream.

1815 Five suckers and five peamouth collected with electrofishing apparatus. Mostly in submerged grass along shore. Pulled gillnets. No fish caught in gillnets. No carp encountered.

1930 Revisited station D12 at Cathlamet, WA to try and locate carp. Electrofished up Elochman Slough from Elochman Slough Marina. Fished booms, pilings, and smaller sloughs.

2030 Caught one carp near piling. Largest carp caught to date (59 cm, 4.2 kg). Electrofishing time 3990 sec. Total fishing time 1.0 hr.

2100 Trailered boat and headed for Deep River to look for boat launch.

2200 No boat launch could be located on Deep River. Drove to Chinook, WA.

2330 Arrive in Chinook and launch boat. Motor to end of jetty.

2400 Two gillnets deployed at end of jetty near day marker. Electrofishing was not possible due to salinity of the water.

26 October 1991, Saturday

0130 gillnets retreived. Caught one small starry flounder and three small crabs.

0145 Trailered boat and headed for Astoria.

0200 Checked in to motel in Astoria.

1030 Arrive at boat ramp on John Day River outside of Astoria. Boat is launched and motors to station D6 (Deep River, Grays Bay).

1230 Two gillnets are set and electrofishing is begun in submerged grassy areas along shore and around snags and pilings.

1339 Five largescale suckers caught electrofishing. No peamouth or carp encountered.

1400 Nets pulled and redeployed. No fish caught. Continued electrofishing. Electrofished most of shoreline in area and up the river a short distance. Station coordinates: 46° 18' 02.0"N 123° 43' 16.4"W

1515 gillnets pulled. No fish caught. No carp or peamouth encountered at this station.

1520 Mark advised us that fuel was not sufficient to make run to Marsh Island station D8. Returned to John Day River and Astoria for fuel.

1540 Made brief attempt to collect peamouth along riprap near Harrington Point. Too rough. Motored for John Day River boat ramp.

1630 Trailered boat and went to Astoria for fuel.

1730 Launched boat into Youngs River from ramp off of highway 202, upstream of 101 alternate bridge.

1750 Seas downstream of 101 alternate bridge very rough. Decided not to attempt crossing to station D3 (101 bridge and Astoria). Began electrofishing along Dagget Point. Station coordinates 46° 09' 56.0"N 123° 48' 59.2". Water brackish. Decided electrofishing was ineffective due to salinity.

1830 Deployed two gillnets upstream of boat launch. Tide was ebbing.

1830 gillnets pulled to deeper water.

2000 Retreived gillnets. Caught two peamouth and five coho salmon juvenilles. Coho were released.

2030 gillnets redeployed.

2130 Retreived gillnets. Caught seven peamouth and two juvenille coho salmon. Released coho salmon. Fishing effort was three hours. Nine peamouth collected. No carp were required at this station. No largescale suckers were encountered.

2145 Trailered boat and found motel in Astoria for the night. Daylight savings time begins tomorrow so we will gain an hour as we set our watched back one hour.

27 October 1991, Sunday

0830 Launch boat from John Day River boat ramp near Astoria and motor to March Island, station D8, in the Lewis and Clark Wildlife Refuge.

0900 Deploy two gillnets near sediment sampling location near mouth of Marsh Island Creek off of Woody Island Channel. Began electrofishing. Tide was ebbing and was near low tide.

1000 Electrofished in small channel between Brush Island and Horseshoe Island where five largescale suckers were collected.

1030 Pulled gillnets. No fish were caught.

1045 Redeployed gillnets. Continued electrofishing following Marsh Island Creek to Prarie Channel. Fished along some pilings and around small houseboats.

1215 Pull gillnets. No fish caught. Electrofishing time 5662 sec. Total fishing effort 3.2 hours.

1245 Trailer boat. Return to Astoria for fuel.

1300 Bruce and Curtis drive to Seaside, OR to buy dry ice.

1345 Bruce and Curtis buy approximately 60 lbs of dry ice.

1415 Bruce and Curtis return to Astoria. Team drives to Chinook, WA to attempt peamouth collection at station D4 (Baker Bay).

1530 Boat launched. Seas too rough to make attempt to deploy nets at Sand Island. Chinook harbor is selected as alternate site. Electrofishing is ineffective due to water salinity.

1600 Two gillnets deployed along grassy bank near seafood processing operation in harbor. Tide ebbing. Appeared to be near high slack.

1730 Nets retreived. Bird that had been caught in net was released unharmed. One small shad was caught. No peamouth or carp, although peamouth was the only target species at this staion.

1800 Trailered boat and headed for several stations to collect largescale suckers.

1900 Launched boat at Beaver Boat Ramp, Clatskanie, OR. Motored to mouth of river.

1930 Began electrofishing.

1935 Collected five largescale suckers. Electrofishing time 262 sec. Peamouth also encountered as before.

1940 Pulled boat and headed for Longview, WA Weyerhaeuser boat ramp.

2115 Launched boat.

2130 Began electrofishing near power lines at station D19.

2145 Collected five largescale suckers. Electrofishing time 353 sec. Motored to Coal Creek Slough.

2210 Began electrofishing in same area as a few days before.

2220 Collected five largescale suckers. Electrofishing time 470 sec.

2250 Trailered boat. Mark returned to Portland. Bruce and Curtis found a motel in Longview.

28 October 1991, Monday

0800 Bruce and Curtis weighed, packaged, and arranged fish for delivery to Keystone/NEA laboratory.

1000 Leave Longview, WA for Portland laboratory.

1030 Samples delivered to Keystone/NEA. Bruce and Curtis return to Seattle, WA.

1600 Bruce and Curtis arrive in Seattle, WA.

19 November 1991, Tuesday

0830 Fish collection team of Gary Braun and Ted Turk meet Mark House at the Kalama Marina.

0900 Boat is launched.

0915 Electrofishing effort begins at station D22 in the area of the Kalama Marina.

0945 Five largescale suckers are collected. Electrofishing time was 775 sec. Total fishing time was 0.75 hrs. Team motors to station D20.

1030 Electrofishing effort begins at station D20 in the upstream end of Carolis Channel.

1230 Five largescale suckers collected. Even largescale suckers were difficult to collect at this station. Electrofishing time was 3445 sec. and total fishing time was 2.0 hrs.

1300 Returned to Kalama marina and trailered boat. Team drove to Ridgefield Marina.

1415 Boat was launched and team motored to station D26, upriver of St. Helens, OR.

1445 Electrofishing effort began.

1545 Five largescale suckers were caught. Electrofishing time 1375 sec. Total fishing time 1.0 hr.

Columbia River
Reconnaissance
Survey
Fish Collection
October 1991

Station 040 14 Oct 91

17:10
45°37' 20.5
122°01 13.7 wt. (cm) length

1	sucker		386 g	33
2	carp		2 kg	42 cm
3	carp		3 kg	49 cm
4	sucker		320 g	32
	18:03			
35	sucker			41
46	sucker		412 g	31
57	sucker		453 g	35
68	sucker			44
89	carp		3 kg	47
910	carp		3.2	52
1011	sucker		592 g	38

finished at 20:10

461 seconds

8	12	sucker	484 g	35/36
5	13	carp	3.1 kg	

(1)

fished entirely within pilings at marina.

Tad D.
Curtis D.

D35 10-15-91 START 14:20
Camas Slough - west end
FINISH 16:20
Fishing Time: 3926 seconds

#	Fish	wt.	lngth (cm)
	N 45° 34' 42.6"		
	W 122° 27' 15.9"		
	14:40		
1	Lg scale sucker	1.2kg	43.5
	~~45°~~ 34' ~~37~~ 37.0		
	~~122°~~ 26' 40.6		
1	carp	3.3 kg	49 cm
	15:20		
2	sucker	1.1 kg	44 cm
	45° 34' 28.4"		
	122° 26' 23.9"		
3	sucker	0.9 kg	39.5
4	sucker	1.0 kg	41 cm
5	carp	2.2 kg	41.5
6	carp	1.9	39
	45° 34' 31.0		122° 25' 45.4

(2)

(3)

D35T 10/15/91

14:20 - 14:50

Fished log booms on north side of river, south of Cannons Slough. Worked east along booms. Only one squawfish & 1 sucker caught so far.

16:20 Fished up to Simms Mill bridge. Caught 5 large suckers & 5 carp. 1 rainbow also.

Tad D.
Curtis D.

4	carp	2.5	45	
5	carp	2.0	42	
	45° 34'	43.4		
	122 22	25.6		
5	sucker	0.9 kg	39.5	
1	Rainbow	0.3 kg	27 cm	(192g)

(4)

(5)

D38 17:00 10:15 - 9/

Reed Island - south shore / north shore

Fishing Time 4715sec Start 17:05 Finish

45 33' 30.0" 122 20 01.9

carp 1 1.7kg 43cm
- from N side of western GP worked down S side w no success

carp 2 1.5 39

sucker 1 (581g) ~~1.0~~ 40
18:05
45° 33' 26.5"
122° 19' 50.9"

carp 3 1.7kg 40cm
~~2kg~~ ~~41~~ cm

sucker 2 (524g) ~~1kg~~ 35cm
carp 4 2kg 41cm
45° 33' 32.5" 18:35
122° 19' 03.6"

(7)

	wt	lngth
Sucker 3	420 g	32 cm
Sucker 4	521 g	36 cm
18:45	~~521 g~~	"
Sucker 5	0.6	38 (524 g)
Sucker 6	0.2	25 (117 g)
Carp 5	2.1	44

Finished at 2000

D38 Reed Island

Worked south side of island - main channel. Erosional area with little habitat. Worked to inside of island on north side. Began to hit a few carp & one sucker

Tad D.
Curtis D.

D~~28~~ 29 10/16/91

Tad & Curtis

put in at Carpenter Island (WA)

steamed upriver to state crossed containment boom into newly dredged channel

45° 39' 57.6" start 14:10
122° 45 29.8" finish 17:00

pictures 7 8 Fish Time: 654/7 sec.

looking S and N, resp. along dredged channel

sucker	1	0.85 kg	44.5 cm
sucker	2	825 g	41 cm
sucker	3	950 g	43 cm
	14:30		

(14)

sucker #4 1,150 g 47 cm

sucker #5 725 g 40 cm

15:00
45° 40' 07.0"
122° 44' 54.7"

carp 1 1.75 Kg 43 cm

chub 1 18 cm
chub 2 17.5 cm

carp. 2 1200 g 41 cm
16:00
carp 3 3125 g 55 cm

Steering malfunction
17:00 may return for
more carp

(12)

D 31 10-17-91
Tied D
Curtis D. Time start: 14:30
Finish:
Fishing time: 5047

Photo 10-11 looking west
toward I-5 Bridge

45° 36' 14.2" 14:30
122° 40' 18.3"
just west of I-5
bridge near small groin on
Hayden Island. Began fishing south
bank of river on mainland side

sucker 1 0.5 Kg 38 cm

sucker 2 680 g 43 cm
15:00
lake chub, 2 squawfish, 1 salmon

sucker 3 740 g 41.5 cm
sucker 4 550 g 37.5 cm

(13)

Sucker	5	1050 g	46 cm
Carp	1	1475 g	42 cm

15:50 ~~10 17 9~~

carp	2	2420 g	52 cm

16:10

45° 36' 31.1"
122° 40' 36.5"

Carps 1 & 2 taken at Hayden Island Yacht Club among docks

45° 36' 33.8
122° 40' 33.2
16:15

carp	3	1460 g	42 cm

channel on WA side, next to houseboats, just W of I-5 bridge.

carp	4	1480 g	41 cm
carp	5	1400 g	40 cm

Caught behind boat docks Hayden Island side east of I-5

45° 36' 33.8"
122° 40' 33.2"
17:00

photo 11 shopping cart habitat where ~~photo~~ carp were taken.

(H)

(15)

D28 10/17/91

start 18:40 2138 sec

finished 19:35 Caterpillar Island

fished channel behind ~~Carpenter~~ Island

carp 1 450g 28cm

carp 2 1430g 40.5cm

carp 3 1230g 39cm

sucker 1 260g 29.5cm

45 42 15.7 N

22 45 35.3 W

sucker 2 600g 37

carp 4 1760g 44

~~carp~~ carp 5 1450g 41.5

sucker 3 146

(16) (17)

sucker	4		800g	41 cm
sucker	5		525g	35.5
sucker	6		525g	35 cm
pla mouth		1	113g	22.5 cm
"		2	125g	21.5 cm
"		3	72g	18.5 cm
"		4	84g	19.5 cm
"		5	67g	18.0 cm

D29 (revisited)

10/17/91

2 20:00

fishing time

Carp 4

634 seconds

Carp 5

about 13 minutes fishing time

Carp	4	39.5	
carp	5	1152g	
carp	4	1150g	39.5 cm
carp	5	1800g	45 cm

Caught outside of boom area near old dock

Station D26

Crayfish GPS Coords:
45° 46' 52.5"
122° 46' 9.3"
(Across from fishtrap shoals)

D24 Crayfish GPS Coords:
45° 52' 22.5"
122° 47' 54.9"

D23 Marina Island Crayfish GPS:
45° 857' 20.1"
122° 48' 15.8"

Station D26 (Across from Fishtrap Shoals) 10/17

	Length (cm)	Wt (g)
Cup 1	51.3 cm	~~2750~~ 2750 g
Cup 2	41.25 cm	1350 g
Cup 3	41.25 cm	1500 g
Cup 4	38.5 cm	1100 g
Cup 5	42.5 cm	1650 g

Effort = 6568 secs

D24

10/14

		length (cm)	weight (g)	comments
Sucker	#1	35.2	450 g.	GOOD CONDITION
	#2	37.4	625 g.	" "
	#3	30.0	300 g.	" "
	#4	40.8	725 g.	" "
	#5	34.2	500 g	" "
Carp	#1	39.4	1050 g.	GOOD CONDITION
	#2	31.0	560 g.	" "
	#3	31.6	550 g	" "
	#4	24.4	250 g.	" "
	#5	30.2	525 g	" "
Pearmouth	#1	25.1	175 g	GOOD CONDITION
	#2	26.0	200 g	CAUDAL SCARS
	#3	16.4	46 g	GOOD CONDITION
	#4	18.9	60 g.	GOOD CONDITION
	#5	17.8	53 g	GOOD CONDITION

(1) ELECTROFISH COUNT 2826 (- 1 CARP, 1 Pearmouth)
(2) E-COUNT. 565 → 1 CARP, 1 Pearmouth

TOTAL 3391

22

SITE D24

10/14

EXAMINED MOST OF THE CARP AND PEARMOUTH AT WESTERN END OF MARINA - SUCKERS TAKEN FROM ROCK BANK FROM CRAWFISH BAY EAST TOWARDS MARINA.

GOOD HABITAT FOR CARP NEAR MARINA - MUDDY SEDIMENTS - Pearmouth ALSO ENCOUNTERED IN MUDDY FLATS. WATER DEPTH FOR PEARMOUTH 1.5-2.0' SUCKERS - 2-3' CARP 1.5-2.0'

ABUNDANT SQUAWFISH & BAITFISH

23

U#3 10-20-91

Began Fishing @ 1600 / Caught Carp & Suckers by 1700. Went on to DJ while still light w/ intent to come back @ dark & try for Chubs.

CARP	1	45.25 cm 2000.0 g
	2	37.8 cm 1050 g
	3	44.0 cm 1575 g
	4	43.8 cm 1400 g
	5	28.7 cm 475 g
Sucker	1	39.4 cm 700 g
	2	44.2 cm 1025 g
	3	43.5 cm 850 g

Sucker	4	40.3 cm 750 g
	5	39.6 cm 700 g
Peamouth	1	19.7 cm 100 g
	2	16.8 cm 80 g
	3	12.9 cm 50 g
	4	13.5 cm 50 g
	5	14.0 cm 50 g

ELECTROFISHING COUNT - 2641
+ 2989
5630 SECONDS

D-22

3162
+ 2997
6059 seconds

CARP	Length (cm)	Weight (g)
#1	49.0 cm	2075 g
#2	42.0 cm	1550 g
#3	44.9 cm	1700 g

Stopped Fishing @ 1243 hrs after no more carp seen encountered for over 2 hours. Decided To try for carp during daylight the following day.

The 3 carp were caught on the sandy shore along the east side of the Marina. Fished in Marina with no success.

10/21/91

D-22 (Revisited)

Returned To site D-22 @ 1600 hrs To fish for final 2 carp. Electrofished for 1-hour outside of marina w/o encountering any fish. Weather was unusually cold because STORM WAS blowing in. Fish Time: 3087

D-~~22~~ 21 (TROJAN)

Electroshocked for ~ 1 hour & 40 minutes along south shore of Trojan To Gable Marina. Found Chubs @ ~ 7:00 pm. No CARP FOUND.

	Wt. (g)	Length (cm)
Chub 1	102.9	20.8
Chub 2	49.1	16.1
Chub 3	71.0	17.6
Chub 4	75.0	18.0
Chub 5	30.6	13.7

Fish Time: 4620 seconds

7/19 Longview

PR is at Rainier boat ramp and electrofished around buoy & pass lines. No CARP encountered during ~1 hr fishing time. Heavy rain started falling - storm front moving in. Caught 4 peamouth. Stopped fishing due to storm.

Kmouth Club

	Length (cm)	wt (g)
#1	17.9	64.4
2	14.3	34.1
3	13.5	27.0
4	13.7	29.1
5		

Fish Time: 2468

28

7/14 Longview

22 Oct '91

Curtis D
Bruce B.

5-18:19
F-10:15

Fish Time: 2326s

			wt
peamouth	5	18.7 cm	74g
peamouth	6	18.7	74.5g
peamouth	7	17.3	55.5

19:05

46° 08' 23.7"
123° 00' 33.8"

Gillnet deployed 21:00 - 22:00

peamouth (in gillnet)	8	23.7	171.5

22:15

Taken from gillnetter upstream of Lewis & Clark Br.

carp	1	50.5	2.4kg

21:50 obtained from fisherman

29

D19 23 - October 1991

10:00 -

10:00 - 11:10
gillnet OK side
near power lines
electrofish also
1 chinook
Fish Times 34/16s 1 sucker

11:20 - 12:00
gillnet & electroshock off
point

Carlander carp from gillnetting
above Lewis & Clark Bridge

Carp 2 41.0 cm
13 kg

D15 10-23-91 Wallace

1547 - 1947 fishing effort

		Length (cm)	Weight (g)
Penmouth	#1	23.4	136
	#2	21.0	99.5
	#3	22.5	137
	#4	22.5	128
	#5	21.0	98
	#6	16.5	65
	#7	16.0	44

D16

Coal Creek Slough

start 20:15

finish 22:30

fish time: 4420's

Many suckers, squawfish & salmon, chubs

no carp

		wt (gm)
chub #1	21.6	115
#2	22.7	143
#3	18.0	69
#4	17.3	52
#5	14.5	29
#6	14.3	31
#7	13.5	23
#8	13.1	21

-Electro

Fished near mouth of slough to docks.

(32)

D12 24 Oct 1991

Cathlamet

Gillnet parallel to shore

14:10 – 15:40

1 squaw fish

Gillnet perpendicular to shore

14:40 – 16:10

5 squawfish

Boat problems

pulled out 19:00

(33)

10-25-91

boat in water 15:00

Wailua station

D10

16:45-

1700 - 2 gill nets in water

pull nets, 1815 - nothing in nets

start electrofishing 1700 end 1815

Shocking time 32 49 s

		length	wt
sucker	1	47.0	1250 g
	2	42.5	950 g
	3	43.5	975 g
	4	44.0	1025 g
	5	35.5	500 g
chub	1	24.0	163 g
	2	24.0	165 g
	3	22.0	131 g
	4	23.0	145 g
	5	16.2	52 g

(34) All fish by shocking

D12 Catchment 10-25-91

15:00 - 16:10 BB, CD

		Fish weight	Fish Time	wt (g)
5 suckers & 5 peamouth chub				
sucker	1	43.5		1000
	2	44.0		1125
	3	40.2		725
	4	38.0		530
	5	37.2		560
peamouth chub	1	22.7		128 g
	2	20.4		97 g
	3	13.0		22 g
	4	17.1		44 g
	5	20.[illegible]		93 g
electrofish 1 carp		19:30 - 20:30 59 cm		420 g

Fish Time 3720 s

(35)

Sand Island - [illegible] - D4

10/23/91 - [illegible] 24:00
10/26/91 -01:30

2 nets deployed

1 starry flounder

3 crabs

one net off [illegible] at end of jetty

Other inside [illegible] inside of jetty.

DO - Deep River 10/26/91

12:30 - 1500 15:15 BD CD

Fish Time: 3315 ~~5438~~ 5679

1230 - deploy 2 gill nets
1400 - pull nets I saw fish
46° 18' 07.0" N
123° 43' 16.4" W

		cm	wt
sucker	1	37.5	745
	2	42.0	960
	3	42.6	900g
	4	45.0	1500g
13:39	5	38.0	775

not many fish

Photo 16 Deep River gill net set

14:15 - pulling [illegible]

D6

14:15 - 1

[illegible] gill [illegible]

redeploy 2 gill nets - 14:15

end 15:15

I moved to mouth of [illegible] River

no fish

D3 - Astoria

10/26/11

17:50 begin electroshock

end electroshock 18:30

no fish

fish time - 1396s

GPS 46° 09' 56.8' N 123° 48' 59.2"

because of rough weather we couldn't be on station shown on map - water here is still salty

deploy 2 gill nets 18:30

pick up nets 20:00

caught 2 chubs

5 silver salmon (coho)

redeployed 2 gill nets

20:20

pulled 21:30

caught 7 chub

2 coho

[redacted]

Chub	length	weight (g)
1	22.0 cm	123
2	26.5 cm	276
3	27.3	269
4	28.0	302
5	25.5	255
6	23.5	158
7	23.9	156
8	22.0	123
9	21.5	125

nets deployed in muddy shelf area during tidal cycle – ebb tide

D8 – Lewis @ Clark 10/27/91
BB
CP

Lat/Long – GPS same as crayfish

9:00 – deploy 2 gill nets
start electroshocking

by 10:00 caught 5 suckers in backwater in center of channel.

electroshock time 586 sec

Flatfish, no chub

sucker	cm	g
1	41.3	1000
2	47.0	1250
3	43.5	1100
4	41.0	745
5	37.5	625

10:30 – pull gillnets – no fish

redeploy 10:45 retrieve 11:15
no fish

continue electroshocking – no fish

D4 - Sand Island - #1 mouth

10/27/91 BS, CR

16:00 deploy 2 gill nets by marker at end of rock wall at Chinook marina ~ 1 mile inshore from Sand Island

habitat looks promising for chub

17:30 - 1 shad caught
bird also entangled in net but rescued

ebb tide at dusk

D5 Wallace Island

1130 - 19:35 262s fishing time

		length	weight	
Sucker	1	45.0	[illegible]	625g
	2	38.5	0750	
	3	40.0	[illegible]	950
	4	32.0	[illegible]	450
	5	35.0	[illegible]	600

lots of chub here also
just like below in the daytime

D17 Gap Video

10-27-91

Fish Time - 353s

~~9:30~~ 21:30

~~9:45~~ 21:45

		(cm)	g	
Sucker	1	34.5	600	~~275~~
	2	28.0		275
	3	29.5		275
	4	~~36.7~~		~~575~~
	5	40.5		725

D16 Coal Creek Slough

10-27-91

22:10 - 22:20

Fish Time - 470s

Sucker	1	37.7	600	
	2	41.0	680	
	3	40.0	700	
	4	32.0	400	
	5	36.2	540	

	Station	Date	Fish caught	Electroshocking Time (s)	Gillnetting Time	
	1	2	3 4	5 6	7	8 9
1	D22	21 Oct 91	3 carp	9146	No	gillnets
2						
3	D21	21 Oct 91	5 peamouth chub	4620	No	gillnets
4						
5	D19	21 Oct 91 -	5 sucker	8563	1 gillnet - 1.5 hours	
6		23 Oct 91,	2 carp[a]			
7		27 Oct 91	7 peamouth chub			
8						
9	D15	23 Oct 91,	5 sucker	unknown	No	gillnets
10		27 Oct 91	7 peamouth chub			
11						
12	D16	23 Oct 91,	5 sucker	4891	No	gillnets
13		27 Oct 91	8 peamouth chub			
14						
15	D12	24 Oct 91 -	5 sucker	3990	2 gillnets - 1.5 hours	each
16		[illegible]	5 peamouth chub			
17		25 Oct 91	1 carp			
18						
19	D10	25 Oct 91	5 sucker	3249	2 gillnets - 1.25 hours	each
20			5 peamouth chub			
21						
22	D4	26 Oct 91 -	none	0[b]	2 gillnets - 3.0 hours	each
23		27 Oct 91				
24						
25	D6	26 Oct 91	5 sucker	5679	2 gillnets - 2.5 hours	each
26						
27	D3	26 Oct 91	9 peamouth chub	1396	2 gillnets - 3.0 hours	each
28						
29	D8	27 Oct 91	5 sucker	5662	2 gillnets - 2.5 hours	each
30						
31						

	Station	Date	Fish caught	Electroshocking Time (s)	Gillnetting Time
1	D40	14 oct 91	8 sucker	4061	No gillnets
2			5 carp		
3					
4	D35	15 oct 91	5 sucker	3926	No gillnets
5			5 carp		
6			1 peamouth chub		
7					
8	D38	15 oct 91	6 sucker	4715	No gillnets
9			5 carp		
10					
11	D29	16 Oct 91 - 17 Oct 91	5 sucker	~~6511~~	No gillnets
12			5 carp	7181	
13			2 peamouth chub		
14					
15	D31	17 Oct 91	5 sucker	5047	No gillnets
16			5 carp		
17					
18	D28	17 Oct 91	6 sucker	2138	No gillnets
19			5 carp		
20			5 peamouth chub		
21					
22	D26	19 Oct 91	5 carp	6568	No gillnets
23					
24					
25	D24	19 Oct 91	5 sucker	3391	No gillnets
26			5 carp		
27			5 peamouth chub		
28					
29	D23	20 Oct 91	5 sucker	5630	No gillnets
30			5 carp		
31			5 peamouth chub		

EFFICIENCY LINE - 22 2016

Sucker Sampling 11-19-9

Kalama Marina D22

Depart 9:15

Caught 5 fish by 9:45

Suckers 1 – 40cm fork

42 total

0.8 kg

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2 45 cm fork

47.5 total

1.35 kg

---

3 39cm fork l.

41 cm total

0.95 kg

#4 44.5 cm fork l.
47 cm total l.
0.85 kg

#5 44 cm. fork l.
46.5 cm total l.
1.0 kg

3446 secs.
of shocking

1922 secs. of shocking

Sucker #1 – 43.5 FORK
47.0 TL
0.9 Kg

Sucker #2 39.5 FK
42.5 TL
0,7 kg

Sucker #3 47.5 FK
50.5 TL
1.2 Kg

Sucker #4 45.5 FL
48.5 TL
1,05 Kg

Sucker #5 48.0 FL
50.5 TL
1.05 Kg

4 42.5 cm fork
45.5 total
1.05 Kg

5 40.5 cm fork l.
43.5 cm total l.
0.8 Kg

779 secs. shocking
at D22

D20 10:30 – 12:30

#1 38.5 cm fork l.
40.5 cm total l.
0.65 Kg

#2 44 cm fork l.
47 cm total l.
0.9 Kg

#3 44 cm fork
47 cm ~~fork~~ total
0.95 Kg

Collection 2:45 - 3:45