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June 15, 2005

Mr. Guy Barrett
Site Manager
Washington State Department of Ecology
Southwest Regional Office
Toxics Cleanup Program
P.O. Box 47775
Olympia, Washington 98104-5017

ADMIN

RE: GROUNDWATER COMPLIANCE MONITORING CLOSURE REPORT
NORWEGIAN SALMON INDUSTRIES SITE
GIG HARBOR, WASHINGTON
FARALLON PN: 879-003

Dear Mr. Barrett:

Farallon Consulting, L.L.C. (Farallon) has prepared this Groundwater Compliance Monitoring Closure Report on behalf of Manson Construction Co., Inc. (Manson) for the Norwegian Salmon Industries facility located in Gig Harbor, Washington (herein referred to as the Site) (Figure 1). The Groundwater Compliance Monitoring Closure Report has been prepared to provide sufficient data to confirm that the cleanup action completed at the Site meets the requirements of the Agreed Order No. DE TCPSR-3885, dated April 26, 2002 (Agreed Order) entered into by Manson and the Washington State Department of Ecology (Ecology). As discussed with Ecology on March 22, 2005 and documented in the letter from Ecology dated March 23, 2005 *RE: Ecology Response to Norwegian Salmon Industries Site Closure Report*, Ecology indicated that most of the remedial activities required by the Agreed Order had been completed and that one additional round of groundwater data indicating compliance with Ecology Model Toxics Control Act Cleanup Regulation (MTCA) would provide sufficient data for closure of the Site.

This Groundwater Compliance Monitoring Closure Report summarizes the analytical results of groundwater samples collected from monitoring wells MW-1 once, MW-2 (Figure 2) for five consecutive sampling rounds, and six consecutive sampling rounds collected from MW-3A and MW-5A, including the additional sampling conducted in April 2005 to meet Ecology requirements.

The analytical results of the additional round of groundwater sampling completed in April 2005 required by Ecology confirm that the cleanup action meets the requirements of the Agreed Order. The results of the compliance groundwater sample confirm that no further action at the Site is necessary.

SITE BACKGROUND

The Site is approximately 2 acres of undeveloped waterfront property located adjacent to Colvos Passage, about 4 miles north of the city of Gig Harbor (Figure 2). Manson used the Site from 1960 to 1980 as a storage yard for heavy construction equipment.

Camp Dresser & McKee, Inc. (CDM) completed a Remedial Investigation (RI) at the Site between 1999 and 2000. Results from the RI identified arsenic, cadmium, chromium, lead, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) as contaminants of concern (COCs) in both soil and groundwater. Arsenic and cPAHs were identified as COCs in intertidal sediments. Upland concentrations of COCs in soil exceeded MTCA cleanup levels, while concentrations of COCs in sediments exceeded Ecology's Marine Sediment Quality Standards (WAC 173-340-360). A detailed discussion of the RI is presented in *Remedial Investigation/Feasibility Study Report, Agreed Order No. DE97TC-S438 Norwegian Salmon Industries Site, Gig Harbor, Washington* dated January 8, 2001, prepared by CDM.

CDM completed the Site cleanup action from July through September 2002 and from July through September 2003. The cleanup action consisted of excavation and off-site disposal of approximately 14,600 tons of contaminated soil, sediment, and slag along with wood debris and construction material. A 2-foot-thick soil cap was placed over the remaining contaminated soil and fill to mitigate the potential for off-site transport of soil via erosion and to eliminate the direct contact pathway.

Contaminated fill consisted largely of low solubility PAHs contained or derived from treated wood piling used for bulkhead construction.

Monitoring wells MW-1, MW-2, MW-3A, and MW-5A have been used for compliance monitoring of groundwater (Figure 2). CDM completed the groundwater monitoring events to meet the requirements of the Agreed Order after completion of the soil removal.

RESULTS OF COMPLIANCE MONITORING

Compliance groundwater monitoring has been conducted to confirm that the excavation and removal of contaminated soil and placement of a cap conducted at the Site during the summers of 2002 and 2003 mitigated the effects of upland soil contamination to groundwater. Groundwater sampling was conducted in accordance with the *Corrective Action Plan, Agreed Order No. DE97TC-S438, Norwegian Salmon Industries Site, Gig Harbor, Washington* (Corrective Action Plan) dated March 28, 2002, prepared by CDM for Manson, and as modified in CDM's letter to Ecology dated September 30, 2003. Groundwater samples have been analyzed for arsenic, cadmium, chromium, and lead using U.S. Environmental Protection Agency (EPA) Method 200.8 (ICP/MS). However, as approved by Ecology, groundwater samples collected from monitoring wells MW-3A and MW-5A have been analyzed for arsenic only.

Compliance groundwater monitoring has been conducted since completing the cleanup action in the summer of 2003. The most recent monitoring event was completed in April 2005. A summary of groundwater elevation data, groundwater field parameters, and analytical results for total metals in groundwater is presented in Table 1, Table 2, and Table 3, respectively. Laboratory analytical results for the April 2005 compliance groundwater-monitoring event are presented as Attachment A. Laboratory analytical results from previous confirmation groundwater sampling events are presented in the quarterly groundwater monitoring reports prepared by CDM that have been submitted to Ecology.

Graphical analyses show that concentrations of arsenic in the groundwater at monitoring wells MW-1 and MW-2 were consistently below MTCA Method A cleanup level for five consecutives quarters prior to completing the cleanup action in the summer of 2003. Similarly, graphic analyses of concentrations of arsenic in groundwater in monitoring wells MW-3A and MW-5A show that concentrations of arsenic have been below the MTCA Method A cleanup level for six consecutive quarters from January 2004 through April 2005. Including the results of the groundwater samples collected in April 2005 from monitoring wells MW-3A and MW-5A. The graphical analyses for concentrations of arsenic in groundwater are presented in Attachment B.

EnviroSphere Consulting completed a statistical data analysis of arsenic concentrations in groundwater using the 95 percent upper confidence level (UCL) of the median in accordance with Ecology's statistical guidance document entitled *Statistical Guidance for Ecology Site Managers* dated August 1992. The results of the statistical analysis indicate that 95 percent UCLs for arsenic in groundwater at monitoring wells MW-1 and MW-2 are 2.6 micrograms per liter (µg/l) and 2.7 µg/l, respectively. For monitoring wells MW-3A and MW-5A, the 95 percent UCLs for arsenic in groundwater are 2.8 µg/l and 3.2 µg/l, respectively. The statistical data analysis for arsenic concentrations in groundwater is presented in Attachment B.

An anomalous concentration of arsenic (36 µg/l) was reported in the groundwater sample collected from monitoring well MW-5A in October 2003 (Table 3). The elevated concentration of arsenic was attributed to laboratory interference from a high concentration of bromide in the groundwater as a result of saltwater intrusion. The laboratory failed to correct for bromide interference, as recommend by the EPA when using ICP/MS to test for arsenic, which resulted in concentrations of arsenic biased high. Subsequent arsenic results for groundwater samples collected from monitoring wells MW-3A and MW-5 have been corrected for bromide for samples analyzed by ICP/MS and have been below the MTCA Method A cleanup level. A detailed discussion of the impact of bromide interference on arsenic analyzed by ICP/MS is presented in a report entitled *Fall 2004/Winter 2005 Quarters Groundwater Monitoring, Norwegian Salmon Industries Site, Gig, Harbor, Washington* dated March 11, 2005, prepared by CDM and submitted to Ecology.

CONCLUSIONS

The analytical results of the compliance groundwater monitoring performed since completing the cleanup action at the Site in the summer of 2003 confirm that the cleanup levels for the Site have been attained at the defined points of compliance for groundwater in accordance with the Agreed Order. Additional cleanup and groundwater monitoring is not necessary and no further action is required

Upon Ecology's confirmation that the no further action is necessary, monitoring wells MW-1, MW-2, MW-3A, and MW-4 will be abandoned in accordance with Ecology's requirements for well decommissioning as described in WAC 173-160-460.

CLOSING

The results of the compliance groundwater monitoring confirm that the Site meets the cleanup requirements of the Agreed Order. Farallon requests that Ecology confirm that the compliance-monitoring program be discontinued, the Site can be removed from the Hazardous Site List and from the Confirmed and Suspected Contaminated Sites List, and that no further action is necessary.

Please contact Mr. Thomas Cammarata or Mr. Peter Jewett with any questions or requests for additional information at (425) 427-0061.

Sincerely,

Farallon Consulting, L.L.C.

Thomas Cammarata, L.G., L.H.G.
Senior Environmental Geochemist

Peter Jewett, L.G., L.E.G.
Principal

State of Washington
Engineering Geologist
908
Licensed Geologist
Peter Day Jewett

Attachments: Figure 1, Site *Vicinity Map*
Figure 2, *Site Plan Showing Groundwater Monitoring Well Locations*
Table 1, *Groundwater Elevation Data*
Table 2, *Groundwater Parameters*
Table 3, *Total Metals in Groundwater*
Attachment A, Laboratory Analytical Results
Attachment B, EnviroSphere Consulting, *Groundwater Data Analysis*

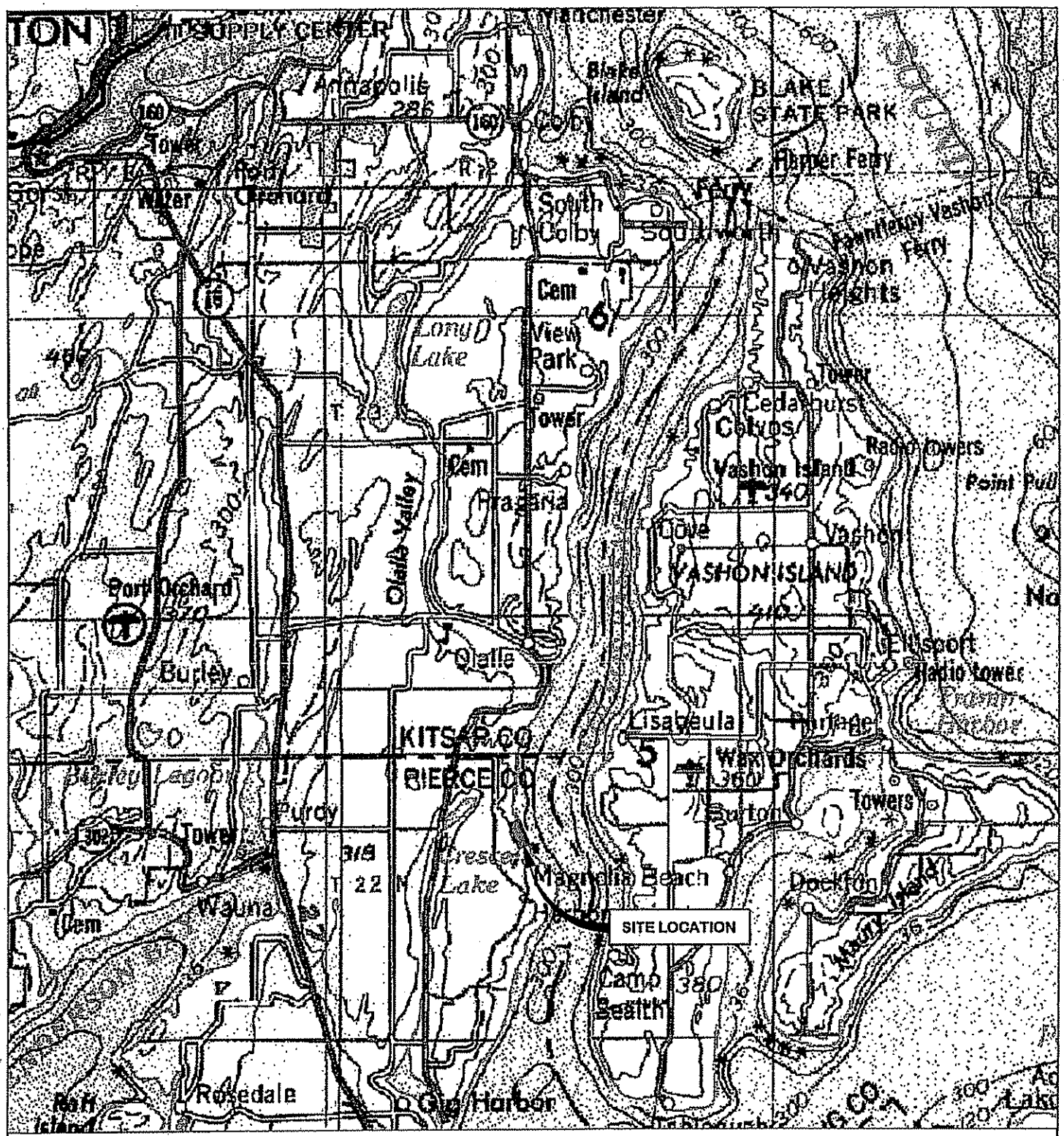
cc: Mr. Mike Radich, Manson Construction Co.
Mr. Richard Dolmseth, Manson Construction Co.
Mr. Donald Verfurth, Caney Badley Spellman
Mr. Ray Sadowski, EnviroSphere Consulting
Ms. Pam Morrell, CDM

TC/PJ:syh

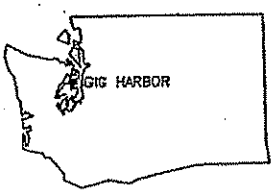
FIGURES

GROUNDWATER COMPLIANCE MONITORING CLOSURE REPORT
Norwegian Salmon Industries Site
Gig Harbor, Washington

Farallon PN: 879-003



REFERENCE: TERRASERVER 2002



WASHINGTON

N

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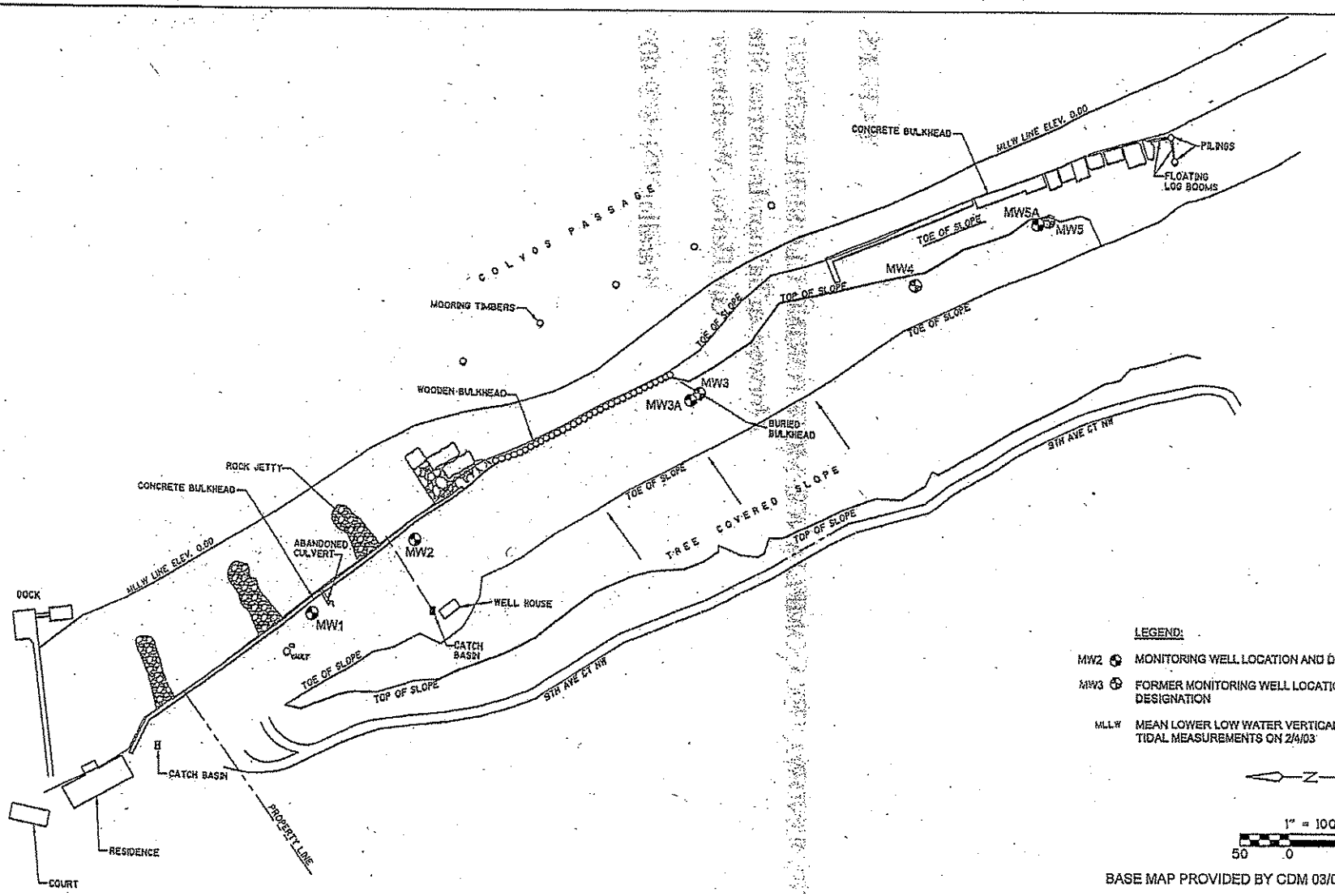
FIGURE 1

SITE VICINITY MAP
MANSON CONSTRUCTION /
NORWEGIAN SALMON INDUSTRIES SITE
GIG HARBOR, WASHINGTON

FARALLON PN: 879-003

Drawn By: DEW	Checked By: TC	Date: 6/1/05	Disk Reference: 879003



LEGEND:

MW2 MONITORING WELL LOCATION AND DESIGNATION

MW3 FORMER MONITORING WELL LOCATION AND DESIGNATION

MLLW MEAN LOWER LOW WATER VERTICAL DATUM BASED ON TIDAL MEASUREMENTS ON 2/4/03

N

1" = 100'

50 0 100

BASE MAP PROVIDED BY CDM 03/04/05

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FIGURE 2

SITE PLAN SHOWING
GROUNDWATER MONITORING WELL LOCATIONS
MANSON CONSTRUCTION
NORWEGIAN SALMON INDUSTRIES SITE
GIG HARBOR, WASHINGTON

FARALLON PN: 879-003

Drawn By:DEW	Checked By:TC	Date:6/1/05	Disk Reference:879-003

TABLES

GROUNDWATER COMPLIANCE MONITORING CLOSURE REPORT
Norwegian Salmon Industries Site
Gig Harbor, Washington

Farallon PN: 879-003

Table 1
Groundwater Elevation Data
Manson Construction Company/NSI
Gig Harbor, Washington

Monitoring Well I.D.	Date Measured	Time (hours)	Top of Casing Elevation a,b (feet)	Depth to Groundwater (ft TOC)	Groundwater Elevation (feet)	Tide MLLW Feet	Tide MLLW Time
MW1	09/04/02	1330	10.04	10.41	-0.37		
	11/04/02	1150		10.40	-0.36		
	02/08/03	1158		8.32	1.72	11.3	0933
	02/08/03	1430		8.95	1.09	2.7	1641
	05/08/03	1447		9.60	0.44	0.2	1557
	07/15/03	1118		10.32	-0.28	-2.7	1306
	10/23/03	1000	10.05	8.55	1.50	2.3	1004
	01/26/04	1413		7.87	2.18	4.3	1509
	04/22/04	1308		9.95	0.10	-0.6	1353
	07/20/04	1300		10.45	-0.40	-0.9	1353
	10/25/04	0850		9.83	0.22	2.5	0953
	01/31/05	1415		8.29	1.76	2.9	1442
MW2	09/04/02	1210	10.12	11.43	-1.31		
	11/04/02	1122		10.97	-0.85		
	02/08/03	1153		9.17	0.95	11.3	0933
	02/08/03	1545		10.21	-0.09	2.7	1641
	05/08/03	1444		10.35	-0.23	0.2	1557
	07/15/03	1117		10.78	-0.66	-2.7	1306
	10/23/03	1002	10.13	9.85	0.28	2.3	1004
	01/26/04	1415		8.73	1.40	4.3	1509
	04/22/04	1310		10.85	-0.72	-0.6	1353
	07/20/04	1302		11.03	-0.90	-0.9	1353
	10/25/04	0849		10.52	-0.39	2.5	0953
	01/31/05	1417		9.08	1.05	2.9	1442
MW3A	09/04/02		14.48	–			
	11/04/02	0925		16.23	-1.75		
	02/08/03	1150		14.49	-0.01	11.3	0933
	02/08/03	1715		16.58	-2.10	2.7	1641
	05/08/03	1442		16.14	-1.66	0.2	1557
	07/15/03	1115		15.64	-1.16	-2.7	1306
	10/23/03	1005	14.48	16.35	-1.87	2.3	1004
	01/26/04	1417		14.41	0.07	4.3	1509
	04/22/04	1312		16.35	-1.87	-0.6	1353
	07/20/04	1304		16.38	-1.90	-0.9	1353
	10/25/04	0847		16.14	-1.66	2.5	0953
	01/31/05	1420		14.58	-0.10	2.9	1442
	04/28/05	1357		15.23	-0.75	-2.3	1456
MW5	09/04/02		8.35	NM			
	11/04/02	0820		10.68	-2.33		
	02/08/03	1145		8.08	0.27	11.3	0933
	02/08/03	1635		12.88	-4.53	2.7	1641
	05/08/03	1440		12.98	-4.63	0.2	1557
	07/15/03	1110		13.55	-5.20	-2.7	1306

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Table 1
Groundwater Elevation Data
Manson Construction Company/NSI
Gig Harbor, Washington

Monitoring Well I.D.	Date Measured	Time (hours)	Top of Casing Elevation[a,b] (feet)	Depth to Groundwater (ft TOC)	Groundwater Elevation (feet)	Tide MLLW Feet	Tide MLLW Time
MW5A	10/23/03	1009	11 04	9 95	1 09	2 3	1004
	01/26/04	1420		9.50	1 54	4 3	1509
	04/22/04	1315		10.48	0.56	-0.6	1353
	07/20/04	1307		10.70	0.34	-0 9	1353
	10/25/04	0843		10 56	0.48	2.5	0953
	01/31/05	1423		9.78	1.26	2.9	1442
	04/28/05	1400		9.98	1.06	-2.3	1456

Notes:
a) Benchmark is a 2 ft by 6 ft board located just southeast of MW3 on the edge of the embankment above the Seawater Benchmark is assumed to be an arbitrary datum of 10.00 feet.
b) Resurvey on 9/23/03 - was resurveyed on 10/25/04 using orig. MW3A elevation as common datum. Previous elevation values adjusted to reflect 10/25/04 survey
MLLW - Mean Lower Low Water.
-- well did not exist.
NM - not measured.
ft TOC - feet above top of casing

A

Table 2
Groundwater Parameters
Manson Construction Company/NSI
Gig Harbor, Washington

Monitoring Well I.D.	Date Sampled	Specific Conductance (µS/cm)	pH (standard units)	Temperature (°C)	Turbidity (NTU)
MW1	09/04/02	195	5.90	15.3	
	11/04/02	203	5.60	12.1	
	02/08/03	203	6.11	9.3	9.8
	05/08/03	MF	6.41	12.4	6
	07/15/03	177	6.30	14.6	6.6
MW2	09/04/02	185	5.40	14.4	
	11/04/02	180	5.40	13.1	
	02/08/03	325	6.12	9.0	70
	05/08/03	MF	6.33	12.1	10
	07/15/03	184	6.18	13.9	9.6
MW3A	09/04/02	--	--	--	
	11/04/02	301	5.80	11.3	
	02/08/03	300	6.43	10.3	25
	05/08/03	MF	6.52	11.8	4
	07/15/03	395	6.21	13.7	8.1
	10/23/03	765	6.10	14.2	4.4
	10/25/04	2,340	6.03	12.6	0.9
	01/31/05	528	6.29	10.4	1.0
	04/28/05	307	6.20	11	2.4
MW5	09/04/02	NS	NS	NS	NS
	11/04/02	5,080	5.40	11.2	NR
	02/08/03	1,221	6.30	8.6	2.5
	05/08/03	MF	6.95	9.7	4
	07/15/03	900	6.21	14.2	3.1
	10/23/03	7,680	5.84	14.2	25
MW5A	01/26/04	440	6.03	8.3	8.5
	04/22/04	195	5.54	9.5	9.2
	07/20/04	414	5.74	14.1	9.5
	10/25/04	3,240	5.65	12.5	2.9
	01/31/05	500	6.05	8.5	9.2
	04/28/05	299	6.09	10.1	6.9

Notes:
µS/cm - microsiemens per centimeter.
°C - degrees Celsius.
-- well did not exist.
NS - not sampled.
NTU - nephalometric turbidity units.
NR - not reported
MF - equipment malfunction, no reading.

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Table 3
Total Metals in Groundwater
Manson Construction Co./NSI
Gig Harbor, Washington

Monitoring Well I.D.	Date Sampled	Arsenic	Cadmium	Chromium	Lead
		mg/L			
MW1	06/25/99	<0.05	<0 002	0.073	<0.02
	09/23/99	0.021	<0 002	0.316	0.052
	12/22/99	0.004	<0 002	0.029	0.006
	03/20/00	0.001 J1	<0 002	<0 005	0.002 J2
	09/04/02	<0 0033	<0 0044	<0 011	<0 0011
	11/04/02	0.0039	<0 0044	<0 011	0.0013
	02/08/03	<0 0033	<0 0044	<0 011	<0 0011
	05/09/03	<0 0033	<0 0044	<0 011	<0 0011
	07/15/03	<0.0033	<0.0044	<0.011	<0.0011
MW2	06/25/99	<0 05	<0 002	0.047	<0 02
	09/23/99	0.005	<0 002	0.026	0.003
	12/22/99	0.010	<0 002	0.026	0.005
	03/20/00	0.011 J1	<0.002	<0 005	0.002 J2
	09/04/02	<0 0033	<0 0044	<0.011	<0 0011
	11/04/02	<0 0033	<0 0044	<0 011	<0 0011
	02/08/03	0.0041	<0 0044	<0.011	0.0025
	05/09/03	<0 0033	<0 0044	<0.011	0.0051
	07/15/03	<0.0033	<0.0044	<0.011	<0.0011
MW3	06/25/99 [a]	<0 05/<0 05	<0.002/<0 0002	<0 005/<0 005	<0 02/0 03
	09/23/99 [a]	<0 001/<0 001	<0 002/<0.002	<0 005/0.006	<0 001/<0 001
	12/22/99	<0 001	<0.002	<0 005	0.002
	03/20/00 [a]	0.001/0.002 J1	<0 002/<0 002	<0 005/<0 005	0.006/0.008
	09/04/02	NS	NS	NS	NS
MW3A	11/04/02	0.0055	<0 0044	<0 011	<0 0011
	02/08/03	<0 0033	<0.0044	<0 011	0.0026
	05/09/03	<0 0033	<0.0044	<0 011	<0 0011
	07/15/03	<0 0033	<0 0044	<0 011	<0 0011
	10/23/03	0.0036	NA	NA	NA
	10/25/04 [b]	0.0008/0.0018	NA	NA	NA
	01/31/05	0.0012	NA	NA	NA
	04/28/05	0.0008	NA	NA	NA
MW5	06/25/99	<0 05	<0 002	0.005	<0 02
	09/23/99	0.005	<0 002	0.012	0.002
	12/22/99	0.008	<0 002	0.016	0.005
	03/20/00	0.003 J1	<0 002	<0 005	0.002 J2
	09/04/02	NS	NS	NS	NS
	11/04/02	0.032	<0.0044	<0 011	<0 0011
	02/08/03	0.0066	<0 0044	<0 011	<0 0011
	05/09/03	0.0043	<0 0044	<0.011	0.0037
	07/15/03	0.0059	<0.0044	<0.011	<0.0011
MW5A	10/23/03	0.036	NA	NA	NA
	01/26/04	<0.0033	NA	NA	NA
	04/22/04	<0 0033	NA	NA	NA
	07/20/04	<0 0033	NA	NA	NA
	10/25/04 [b]	0.0006/0.0013	NA	NA	NA
	01/31/05	0.0005	NA	NA	NA
	04/28/05	0.0006	NA	NA	NA
Cleanup Level [c]		0 005	0 005	0 050	0 015

Notes:

Bold values are detected compounds
Boxed values exceeds the cleanup level
a) Second value is from a field duplicate
b) Second value is a duplicate, different laboratory
c) Model Toxics Control Act (MTCA) Method A cleanup level for groundwater
J1 - estimated value (RPD exceeded QA limits)
J2 - Estimated value due to metal being present in rinsate sample

< - analyte not detected at or greater than the listed concentration
NA - not analyzed
NS - not sampled
mg/L - milligrams per liter