

LIST 1855 - UNOCAI # 5028

UST 8472

Blaine

DATE: October 11, 1999

**TOSCO MARKETING COMPANY
GROUNDWATER MONITORING REPORT**

Site No.: 5028 Address: 247 D Street, Blaine, WA
Tosco Project Manager: Timothy D. Johnson
Consultant /Contact Person: Environmental Resolutions, Inc./John Meyer
Primary Agency/Regulatory ID No.: Washington State Department of Ecology

WORK PERFORMED THIS QUARTER(S) [Third - 1999]:

- Monitored 4 groundwater monitoring wells, and sampled 2 wells without purging

WORK PROPOSED FOR NEXT QUARTER [Fourth - 1999]:

- Monitor and sample 4 groundwater monitoring wells without purging

SUMMARY:

Frequency of Sampling Events:	<u>Quarterly</u>	(Quarterly, etc.)
Approximate Depth to Groundwater:	<u>3 to 5 ft</u>	(Measured Feet)
Groundwater Gradient:	<u>Southerly and Westerly</u>	(Direction)
	<u>0.04 ft/ft</u>	(Magnitude)
Maximum TPH-G/Benzene Concentrations:	<u>56,100/10,600</u>	(ppb)
Measurable Free Product Detected:	<u>No</u>	(Yes - ID wells(s)/No)
Free Product Recovered This Quarter:	<u>None</u>	(gallons)
Cumulative Free Product Recovered to Date:	<u>Unknown</u>	(gallons)
Bulk Soil Removed This Quarter:	<u>None</u>	(cubic yards)
Water Wells or Surface Waters w/in a 2000'	<u>Unknown</u>	(Distance and)
Radius and Respective Direction:	<u>Unknown</u>	Direction)
Current Remedial Action:	<u>ORC</u>	(SVE/AS/P&T etc.)
Permits for Discharge:	<u>None</u>	(NPDES, POTW, etc.)

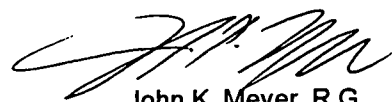
DISCUSSION:

- Both wells sampled contained hydrocarbon concentrations exceeding MTCA Method A Cleanup Levels
- MW-3 contained 19.3 ppb vinyl chloride, exceeding the MTCA Method A Cleanup Level of 0.2 ppb

ATTACHMENTS:

Plate P-1 - Groundwater Sample Analyses Map, 8/12/99
Table 1 - Groundwater Analytical Results
Laboratory Reports and Chain of Custody Records
Field Data Records

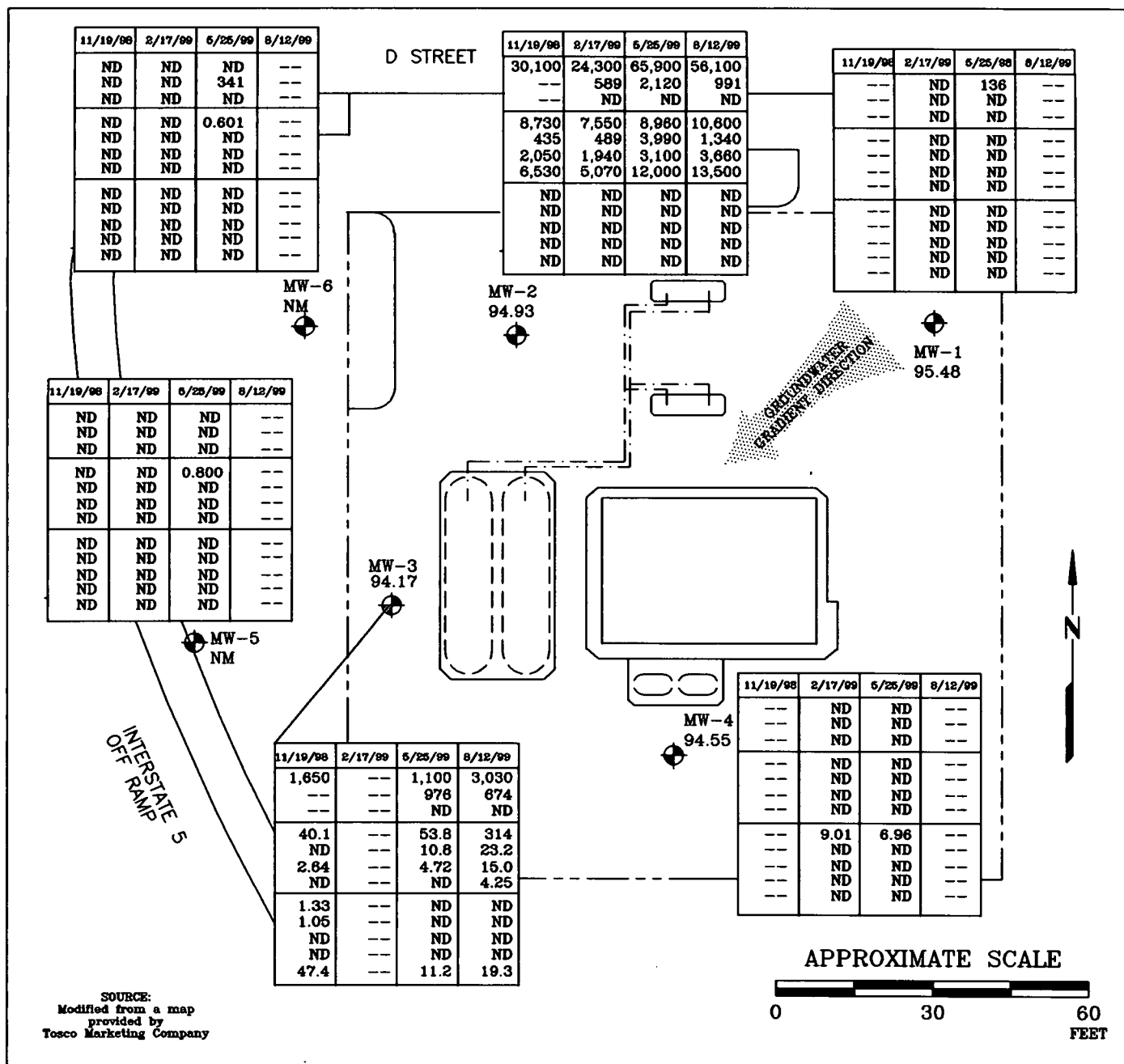
Prepared By:



John K. Meyer, R.G.
Environmental Resolutions, Inc.

cc: Washington State Department of Ecology, NW Region

CRM
ENTERED
11/8/99



FN 5028

EXPLANATION

- MW-3
 93.28 Groundwater Monitoring Well
 Relative Groundwater Elevation
 NM Not Measured

8/17/98	Sample Date
2,990	Total Petroleum Hydrocarbons as Gasoline
ND	Total Petroleum Hydrocarbons as Diesel
ND	Total Petroleum Hydrocarbons as Oil
68.4	Benzene
3.29	Toluene
3.57	Ethylbenzene
ND	Total Xylenes
1.51	1,2-Dichloroethene
ND	Chloroethane
ND	1,1-Dichloroethane
ND	1,2-Dichloroethane
30.6	Vinyl Chloride

Laboratory Results
 in ug/L (ppb)

Numbers in Red Exceed
 MTCA Method A Cleanup Levels
 ND = Not Detected



GROUNDWATER SAMPLE ANALYSES MAP - 8/12/99

Tosco Facility 5028
 247 D Street
 Blaine, Washington

PROJECT NO.

31017

PLATE

P-1

DATE: 10/6/99

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 5028
247 D Street
Blaine, Washington
Page 1 of 3

Well	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X	1,2-DCE	CA	1,1-DCA	1,2-DCA	VC	O ₂ Lab	O ₂ Meter
MW-1 100.42	07/06/93	4.35	96.07	<50	—	—	<0.1	<0.1	<0.1	<1.0	—	—	—	—	—	—	—
	10/11/94	4.60	95.82	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	—	—	—	—	—	—	—
	01/20/95	3.80	96.62	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	—	—	—	—	—	—	—
	04/21/95	3.77	96.65	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	—	—
	07/24/95	5.13	95.29	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	—	—	—	—	—	—	—
	10/25/95	4.28	96.14	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	—	—	—	—	—	—	—
	01/17/96	2.95	97.47	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	—	—	—	—	—	—	—
	04/18/96	3.30	97.12	—	—	—	—	—	—	—	—	—	—	—	—	4	—
	07/25/96	4.13	96.29	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	—	—	—	—	—	1.8	1.6
	10/16/96	4.74	95.68	—	<250	<750	—	—	—	—	—	—	—	—	—	3.0	2.2
	02/27/97	4.47	95.95	<50	<250	<750	<0.500	<0.500	<0.500	<1.00	—	—	—	—	—	—	1.9
	05/13/97	6.19	94.23	—	—	—	—	—	—	—	—	—	—	—	—	—	6.2
	08/21/97	5.65	94.77	142	387	<750	<0.500	<0.500	<0.500	<1.00	—	—	—	—	—	—	8.0
	11/25/97	4.02	96.40	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2/13/98	4.01	96.41	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	—	—
	5/19/98	4.31	96.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	8/17/98	4.94	95.48	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	—	—
	11/19/98	4.28	96.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2/17/99	4.08	96.34	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	—	—
	5/25/99	4.90	95.52	136	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	—	—
	8/12/99	4.94	95.48	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-2 98.49	07/06/93	3.87	94.62	7,800	—	—	890	660	140	840	—	—	—	—	—	—	—
	10/11/94	5.20	93.29	2,600	380	<750	1,600	37	220	300	—	—	—	—	—	—	—
	01/20/95	4.19	94.30	14,000	690	<750	5,400	1,300	680	2,300	<1.0	<1.0	<1.0	<1.0	<1.0	—	—
	04/21/95	4.23	94.26	16,000	680	<750	8,600	950	810	2,800	—	—	—	—	—	—	—
	07/24/95	4.71	93.78	4,500	690	<750	4,300	85	430	800	—	—	—	—	—	—	—
	10/25/95	4.04	94.45	12,000	1000	<750	8,900	390	800	2,000	—	—	—	—	—	—	—
	01/17/96	3.87	94.62	13,000	410	<750	6,300	620	640	2,200	—	—	—	—	—	—	—
	04/18/96	2.67	95.82	31,000	670	<750	5,600	1,900	1,100	4,300	—	—	—	—	—	0.6	—
	07/25/96	4.29	94.20	5,780	689	<750	7,920	189	463	901	—	—	—	—	—	0	1.0
	10/16/96	3.96	94.53	6,880	<250	<750	5,360	252	436	1,120	—	—	—	—	—	0	1.4
	02/27/97	3.67	94.82	16,300	280	<750	6,750	661	832	2,800	—	—	—	—	—	—	0.8
	05/13/97	4.08	94.41	15,800	<250	<750	8,530	1,960	793	3,470	—	—	—	—	—	—	4.6
	08/21/97	4.41	94.08	25,600	<250	<750	8,950	716	852	2,220	—	—	—	—	—	—	4.6
	11/25/97	3.48	95.01	42,400	993	<750	9,070	1,330	1,670	6,620	<20	<20	<20	<20	<20	2.11	—
	2/13/98	3.05	95.44	27,600	455	<750	8,020	664	1,660	6,260	<1.00	<1.00	<1.00	<1.00	<1.00	—	—
	5/19/98	3.71	94.78	54,300	1,300	<750	12,200	2,620	2,340	9,850	<10.0	<10.0	<10.0	<10.0	<10.0	—	—
	8/17/98	4.72	93.77	44,300	750	<750	12,100	644	2,490	9,700	<10.0	<10.0	<10.0	<10.0	<10.0	—	—
	11/19/98	4.18	94.31	30,100	—	—	8,730	435	2,050	6,830	<20.0	<20.0	<20.0	<20.0	<20.0	—	—
	2/17/99	2.66	95.83	24,300	589	<750	7,550	489	1,940	5,070	<20.0	<20.0	<20.0	<20.0	<20.0	—	—
	5/25/99	3.16	95.33	65,900	2,120	<3,750	8,960	3,990	3,100	12,000	<10.0	<10.0	<10.0	<10.0	<10.0	—	—
	8/12/99	3.56	94.93	66,100	891	<750	10,600	1,340	3,680	13,600	<100	<100	<100	<100	<100	—	—
MTCA Method A Cleanup Level				1,000 ^a			5	40	30	20	NA	NA	NA	5	0.2	NA	NA

Continued on Page 2.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 5028
247 D Street
Blaine, Washington
Page 2 of 3

Well	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X	1,2-DCE	CA	1,1-DCA	1,2-DCA	VC	O ₂ Lab	O ₂ Meter
MW-3 98.57	07/06/93	4.39	94.18	1,000	--	--	840	25	77	570	--	--	--	--	--	--	--
	10/11/94	5.54	93.03	21,000	1,200	<750	1,100	21	380	640	--	--	--	--	--	--	--
	01/20/95	5.54	93.03	7,900	2,600	<750	890	13	210	180	4.7	<1.0	<1.0	<2.0	46	--	--
	04/21/95	6.63	91.94	6,300	1,900	<750	100	11	130	91	3.3	1.2	<1.0	1.9	130	--	--
	07/24/95	6.54	92.03	<50	1,700	<750	4.6	<0.5	0.69	<1.0	1.7	<1.0	<1.0	1.2	53	--	--
	10/25/95	5.39	93.18	11,000	2,400	<750	840	5.8	130	34	4.5	<1.0	<1.0	1.5	74	--	--
	01/17/96	6.30	92.27	5,600	930	<750	460	3.8	56	16	2.1	1.7	<1.0	1.3	32	--	--
	04/18/96	3.72	94.85	7,400	1,200	<750	380	5.3	61	22	2.4	1.5	<1.0	1.5	53	0.4	--
	7/25/96	4.74	93.83	4,340	997	<750	372	<1.0	40.2	<10.0	1.21	<1.0	<1.0	1.27	22.3	1.2	1.0
	10/16/96	5.22	93.35	4,040	<250	<750	171	1.85	27.2	5.04	1.04	1.65	<1.00	1.12	32.1	0.4	1.0
	02/27/97	3.79	94.78	2,580	<250	<750	261	<2.50	24.1	6.01	1.47	1.85	<1.00	1.39	13.2	--	0.9
	05/13/97	4.54	94.03	186	<250	<750	119	<1.00	6.85	2.35	<1.00	1.31	<1.00	<1.00	16.8	--	5.0
	08/21/97	4.72	93.85	1,760	<250	<750	136	1.96	18.3	5.45	<1.00	2.24	<1.00	<1.00	21.4	--	5.8
	11/25/97	4.19	94.38	1,640	738	<750	36.3	1.80	5.65	3.21	1.07	<1.00	<1.00	<1.00	18.8	2.49	--
	2/13/98	4.35	94.22	1,850	497	<750	65.6	1.86	4.91	2.99	1.16	1.83	<1.00	<1.00	22.7	--	--
	5/19/98	4.78	93.79	2,850	567	<750	85.8	<5.00	9.07	<5.00	1.03	<1.00	<1.00	<1.00	29.5	--	--
	8/17/98	5.29	93.28	2,990	<250	<750	68.4	3.29	3.57	<5.00	1.51	<1.00	<1.00	<1.00	30.6	--	--
	11/19/98	4.89	93.68	1,650	--	--	40.1	<10.0	2.64	<5.00	1.33	1.05	<1.00	<1.00	47.4	--	--
	2/17/99	Obstructed - Well could not be accessed															
	5/25/99	4.21	94.36	1,100	876	<750	63.8	10.8	4.72	<2.00	<1.00	<1.00	<1.00	<1.00	11.2	--	--
	8/12/99	4.40	94.17	3,030	674	<750	314	23.2	15.0	4.25	<2.00	<2.00	<2.00	<2.00	19.3	--	--
MW-4 99.53	07/06/93	4.78	94.75	<50	320	<1,000	<1.0	<1.0	<1.0	<1.0	9.8	<1.0	<1.0	<1.0	<5.0	--	--
	10/11/94	5.50	94.03	<50	290	<750	<0.5	<0.5	<0.5	<1.0	9.8	<1.0	<1.0	<1.0	<1.0	--	--
	01/20/95	6.53	93.00	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	8.9	<1.0	<1.0	<1.0	<1.0	--	--
	04/21/95	6.62	92.91	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	6.8	<1.0	<1.0	<1.0	<1.0	--	--
	07/24/95	6.83	92.70	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	8.6	<1.0	<1.0	<0.5	<1.0	--	--
	10/25/95	6.41	93.12	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	11	<1.0	<1.0	<0.5	<1.0	--	--
	01/17/96	6.25	93.28	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	7.8	<1.0	<1.0	<0.5	<1.0	--	--
	04/18/96	4.13	95.40	--	--	--	--	--	--	--	--	--	--	--	--	8	--
	7/25/96	4.88	94.65	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	5.15	<1.0	<1.0	<0.5	<1.0	2.0	2.7
	10/16/96	6.55	92.98	--	--	--	--	--	--	--	--	--	--	--	--	4.8	2.4
	02/27/97	6.05	93.48	<50	<250	<750	<0.500	<0.500	<0.500	<1.00	8.33	<1.00	<1.00	<1.00	<1.00	--	2.2
	05/13/97	6.26	93.27	--	--	--	--	--	--	--	--	--	--	--	--	--	7.3
	08/21/97	6.04	93.49	<50	<250	<750	<0.500	<0.500	<0.500	<1.00	10.3	<1.00	<1.00	<1.00	<1.00	--	6.5
	11/25/97	4.88	94.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2/13/98	4.89	94.64	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	7.76	<1.00	<1.00	<1.00	<1.00	--	--
	5/19/98	5.11	94.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/17/98	5.20	94.33	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	5.38	<1.00	<1.00	<1.00	<1.00	--	--
	11/19/98	4.95	94.58	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	2/17/99	4.72	94.81	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	9.01	<1.00	<1.00	<1.00	<1.00	--	--
	5/25/99	4.66	94.87	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	6.96	<1.00	<1.00	<1.00	<1.00	--	--
	8/12/99	4.98	94.55	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MTCA Method A Cleanup Level				1,000 ^a			5	40	30	20	NA	NA	NA	5	0.2	NA	NA

Continued on Page 3.

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GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 5028
247 D Street
Blaine, Washington
Page 3 of 3

Well	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X	1,2-DCE	CA	1,1-DCA	1,2-DCA	VC	O ₂ Lab	O ₂ Meter
MW-5 92.96	10/11/94	5.75	87.21	55	660	<750	2.8	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
	01/20/95	3.04	89.92	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--
	04/21/95	3.57	89.39	<50	<250	<750	<0.70	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
	07/24/95	4.37	88.59	<50	<250	<750	<0.88	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
	10/25/95	3.87	89.09	<50	<250	<750	4.1	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
	01/17/96	2.86	90.10	<50	<250	<750	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
	04/18/96	3.19	89.77	<50	<250	<750	2.9	<0.5	<0.5	<1.0	--	--	--	--	--	4.8	--
	07/25/96	4.06	88.90	<50	<250	<750	1.97	<0.5	<0.5	<1.0	--	--	--	--	--	0.6	1.2
	10/16/96	3.87	89.09	<50	<250	<750	1.02	<0.500	<0.500	<1.00	--	--	--	--	--	2.0	1.6
	02/27/97	3.09	89.87	<50	<250	<750	0.836	<0.500	<0.500	<1.00	--	--	--	--	--	--	2.2
	05/13/97	3.05	89.91	<50	<250	<750	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	5.1
	08/21/97	3.89	89.07	<50	348	<750	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	6.6
	11/25/97	2.53	90.43	<50	266	<750	0.876	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	3.02	--
	2/13/98	3.02	89.94	88.9	<250	<750	<6.00	<0.500	<0.500	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	5/19/98	3.65	89.31	160	<250	<750	<5.00	<1.00	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	8/17/98	4.53	88.43	78.8	<250	<750	<3.00	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	11/19/98	3.33	89.63	<50.0	--	--	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	2/17/99	3.21	89.75	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	5/25/99	3.66	89.30	<50.0	<250	<750	0.800	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	8/12/99	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6 97.84	10/11/94	5.85	91.99	<50	<250	<750	3.2	<0.5	0.53	<1.0	--	--	--	--	--	--	--
	01/20/95	2.36	95.48	<50	260	<750	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--
	04/21/95	3.34	94.50	<50	260	<750	4.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
	07/24/95	5	92.84	150	330	<750	34	<0.5	2.8	<1.0	--	--	--	--	--	--	--
	10/25/95	4.97	92.87	290	440	<750	28	<0.5	2.1	<1.0	--	--	--	--	--	--	--
	01/17/96	2.15	95.69	<50	250	<750	1.6	<0.5	<0.5	<1.0	--	--	--	--	--	--	--
	04/18/96	3.34	94.50	61	250	<750	5.9	<0.5	0.54	<1.0	--	--	--	--	--	8	--
	07/25/96	4.22	93.62	149	321	<750	76.2	<0.5	3.68	1.92	--	--	--	--	--	2.2	2.6
	10/16/96	4.24	93.60	68.3	<250	<750	10.8	<0.500	0.760	<1.00	--	--	--	--	--	1.0	2.5
	02/27/97	4.41	93.43	<50	<250	<750	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	2.6
	05/13/97	4.32	93.52	<50	<250	<750	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	7.9
	08/21/97	5.75	92.09	<50	370	<750	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	6.6
	11/25/97	2.09	95.75	<50	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	4.83	--
	2/13/98	4.23	93.61	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	5/19/98	4.26	93.58	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	8/17/98	6.46	91.38	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	1.04	<1.00	--	--
	11/19/98	3.15	94.69	<50.0	--	--	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	2/17/99	3.54	94.30	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	5/25/99	4.86	92.98	<50.0	341	<750	0.601	<0.500	<0.500	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--
	8/12/99	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MTCA Method A Cleanup Level				1,000 ^a			5	40	30	20	NA	NA	NA	5	0.2	NA	NA

EXPLANATION:

Concentrations in ug/L (ppb) except where noted.

Wellhead elevations taken from prior consultant's reports.

DTW = Depth to water in feet below top of casing.

GW Elev. = Groundwater elevation relative to top of casing elevations.

TPH-G = Total Petroleum Hydrocarbons as Gasoline by Ecology Method WTPH-G.

TPH-D and TPH-O = Total Petroleum Hydrocarbons as Diesel and Oil, respectively, by Ecology Method WTPH-D (extended).

B = Benzene; T = Toluene; E = Ethylbenzene; X = Total Xylenes.

BTEX = Aromatic compounds by EPA Method 8020.

1,2-DCE = Cis 1,2-dichloroethene; CA = chloroethane; 1,1-DCA = 1,1-dichloroethane; 1,2-DCA = 1,2-dichloroethane; VC = vinyl chloride.

1,2-DCE, DCA, 1,1-DCA, 1,2-DCA; and VC by EPA Method 8010B (modified).

< = Less than the stated laboratory reporting limit.

-- = Not analyzed.

Shaded values equal or exceed MTCA Method A Cleanup Levels.

^a Total Petroleum Hydrocarbons

NA = Not applicable.

Data collected before 11/25/97 are taken from prior consultants.

O₂ Lab = Dissolved oxygen by APHA/EPA Methods; results in parts per million (ppm).

O₂ Meter = Dissolved oxygen in parts per million (ppm) measured with field instrumentation.



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ERI	Project: TOSCO Blaine 5028	Sampled: 8/12/99
1921 Edmonds Drive SE	Project Number: 31017	Received: 8/13/99
Renton, WA 98055	Project Manager: John Meyer	Reported: 8/24/99 11:51

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-2	B908302-01	Water	8/12/99
MW-3	B908302-02	Water	8/12/99

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*The results in this report apply to the samples analyzed in accordance with the chain of custody document.
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Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
				B908302-01				
<u>MW-2</u>							<u>Water</u>	
Gasoline Range Hydrocarbons	0890511	8/14/99	8/14/99		25000	56100	ug/l	
Benzene	"	"	"		250	10600	"	
Toluene	"	"	"		250	1340	"	
Ethylbenzene	"	"	"		250	3660	"	
Xylenes (total)	"	"	"		500	13500	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		80.0	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		92.5	"	
				B908302-02				
<u>MW-3</u>							<u>Water</u>	
Gasoline Range Hydrocarbons	0890511	8/14/99	8/14/99		50.0	3030	ug/l	
Benzene	"	"	8/15/99		5.00	314	"	
Toluene	"	"	8/14/99		0.500	23.2	"	
Ethylbenzene	"	"	"		0.500	15.0	"	
Xylenes (total)	"	"	"		1.00	4.25	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		119	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		94.8	"	

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ERI	Project: TOSCO Blaine 5028	Sampled: 8/12/99
1921 Edmonds Drive SE	Project Number: 31017	Received: 8/13/99
Renton, WA 98055	Project Manager: John Meyer	Reported: 8/24/99 11:51

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<u>MW-2</u>				<u>B908302-01</u>		<u>Water</u>		
Diesel Range Hydrocarbons	0890611	8/18/99	8/20/99		0.250	0.991	mg/l	1
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		101	%	
<u>MW-3</u>				<u>B908302-02</u>		<u>Water</u>		
Diesel Range Hydrocarbons	0890611	8/18/99	8/20/99		0.250	0.674	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		90.5	%	

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Page 3 of 11



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ERI	Project: TOSCO Blaine 5028	Sampled: 8/12/99
1921 Edmonds Drive SE	Project Number: 31017	Received: 8/13/99
Renton, WA 98055	Project Manager: John Meyer	Reported: 8/24/99 11:51

Halogenated Volatile Organics by EPA Method 8021B (modified)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-2				B908302-01			Water	2
Bromodichloromethane	0890754	8/20/99	8/21/99		100	ND	ug/l	
Bromoform	"	"	"		100	ND	"	
Bromomethane	"	"	"		100	ND	"	
Carbon tetrachloride	"	"	"		100	ND	"	
Chlorobenzene	"	"	"		100	ND	"	
Chloroethane	"	"	"		100	ND	"	
Chloroform	"	"	"		100	ND	"	
Chloromethane	"	"	"		100	ND	"	
Dibromochloromethane	"	"	"		100	ND	"	
1,2-Dichlorobenzene	"	"	"		100	ND	"	
1,3-Dichlorobenzene	"	"	"		100	ND	"	
1,4-Dichlorobenzene	"	"	"		100	ND	"	
1,1-Dichloroethane	"	"	"		100	ND	"	
1,2-Dichloroethane	"	"	"		100	ND	"	
1,1-Dichloroethene	"	"	"		100	ND	"	
cis-1,2-Dichloroethene	"	"	"		100	ND	"	
trans-1,2-Dichloroethene	"	"	"		100	ND	"	
1,2-Dichloropropane	"	"	"		100	ND	"	
cis-1,3-Dichloropropene	"	"	"		100	ND	"	
trans-1,3-Dichloropropene	"	"	"		100	ND	"	
Methylene chloride	"	"	"		500	ND	"	
1,1,2,2-Tetrachloroethane	"	"	"		100	ND	"	
Tetrachloroethene	"	"	"		100	ND	"	
1,1,1-Trichloroethane	"	"	"		100	ND	"	
1,1,2-Trichloroethane	"	"	"		100	ND	"	
Trichloroethene	"	"	"		100	ND	"	
Trichlorofluoromethane	"	"	"		100	ND	"	
Vinyl chloride	"	"	"		100	ND	"	
Surrogate: 4-BFB (ELCD)	"	"	"	50.0-150		94.6	%	

MW-3				B908302-02			Water	
Bromodichloromethane	0890754	8/20/99	8/21/99		2.00	ND	ug/l	
Bromoform	"	"	"		2.00	ND	"	
Bromomethane	"	"	"		2.00	ND	"	
Carbon tetrachloride	"	"	"		2.00	ND	"	
Chlorobenzene	"	"	"		2.00	ND	"	
Chloroethane	"	"	"		2.00	ND	"	
Chloroform	"	"	"		2.00	ND	"	

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Page 4 of 11



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ERI	Project: TOSCO Blaine 5028	Sampled: 8/12/99
1921 Edmonds Drive SE	Project Number: 31017	Received: 8/13/99
Renton, WA 98055	Project Manager: John Meyer	Reported: 8/24/99 11:51

Halogenated Volatile Organics by EPA Method 8021B (modified)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<u>MW-3 (continued)</u>				<u>B908302-02</u>			<u>Water</u>	
Chloromethane	0890754	8/20/99	8/21/99		2.00	ND	ug/l	
Dibromochloromethane	"	"	"		2.00	ND	"	
1,2-Dichlorobenzene	"	"	"		2.00	ND	"	
1,3-Dichlorobenzene	"	"	"		2.00	ND	"	
1,4-Dichlorobenzene	"	"	"		2.00	ND	"	
1,1-Dichloroethane	"	"	"		2.00	ND	"	
1,2-Dichloroethane	"	"	"		2.00	ND	"	
1,1-Dichloroethene	"	"	"		2.00	ND	"	
cis-1,2-Dichloroethene	"	"	"		2.00	ND	"	
trans-1,2-Dichloroethene	"	"	"		2.00	ND	"	
1,2-Dichloropropane	"	"	"		2.00	ND	"	
cis-1,3-Dichloropropene	"	"	"		2.00	ND	"	
trans-1,3-Dichloropropene	"	"	"		2.00	ND	"	
Methylene chloride	"	"	"		10.0	ND	"	
1,1,2,2-Tetrachloroethane	"	"	"		2.00	ND	"	
Tetrachloroethene	"	"	"		2.00	ND	"	
1,1,1-Trichloroethane	"	"	"		2.00	ND	"	
1,1,2-Trichloroethane	"	"	"		2.00	ND	"	
Trichloroethene	"	"	"		2.00	ND	"	
Trichlorofluoromethane	"	"	"		2.00	ND	"	
Vinyl chloride	"	"	"		2.00	19.3	"	
Surrogate: 4-BFB (ELCD)	"	"	"	50.0-150		86.9	%	

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Page 5 of 11



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ERI	Project: TOSCO Blaine 5028	Sampled: 8/12/99
1921 Edmonds Drive SE	Project Number: 31017	Received: 8/13/99
Renton, WA 98055	Project Manager: John Meyer	Reported: 8/24/99 11:51

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Reporting Limit Units	Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0890511										
Date Prepared: 8/14/99										
Extraction Method: EPA 5030B (P/T)										
Blank	0890511-BLK1									
Gasoline Range Hydrocarbons	8/14/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	1.00				
Surrogate: 4-BFB (FID)	"	48.0		41.6	"	50.0-150	86.7			
Surrogate: 4-BFB (PID)	"	48.0		45.0	"	50.0-150	93.8			
Blank										
0890511-BLK2										
Gasoline Range Hydrocarbons	8/15/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	1.00				
Surrogate: 4-BFB (FID)	"	48.0		40.1	"	50.0-150	83.5			
Surrogate: 4-BFB (PID)	"	48.0		44.3	"	50.0-150	92.3			
Blank										
0890511-BLK3										
Gasoline Range Hydrocarbons	8/19/99			ND	ug/l	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	1.00				
Surrogate: 4-BFB (FID)	"	48.0		39.2	"	50.0-150	81.7			
Surrogate: 4-BFB (PID)	"	48.0		45.5	"	50.0-150	94.8			
LCS										
0890511-BS1										
Gasoline Range Hydrocarbons	8/14/99	500		475	ug/l	70.0-130	95.0			
Surrogate: 4-BFB (FID)	"	48.0		43.3	"	50.0-150	90.2			
Duplicate										
0890511-DUP1 B908300-01										
Gasoline Range Hydrocarbons	8/14/99		951	861	ug/l			25.0	9.93	
Surrogate: 4-BFB (FID)	"	48.0		44.7	"	50.0-150	93.1			
Duplicate										
0890511-DUP2 B908321-02										
Gasoline Range Hydrocarbons	8/15/99		ND	ND	ug/l			25.0		
Surrogate: 4-BFB (FID)	"	48.0		41.5	"	50.0-150	86.5			

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Page 6 of 11



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ERI 1921 Edmonds Drive SE Renton, WA 98055	Project: TOSCO Blaine 5028 Project Number: 31017 Project Manager: John Meyer	Sampled: 8/12/99 Received: 8/13/99 Reported: 8/24/99 11:51
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Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike		0890511-MS1	B908301-01							
Benzene	8/14/99	10.0	ND	10.3	ug/l	70.0-130	103			
Toluene	"	10.0	ND	9.86	"	70.0-130	98.6			
Ethylbenzene	"	10.0	ND	10.2	"	70.0-130	102			
Xylenes (total)	"	30.0	ND	30.8	"	70.0-130	103			
Surrogate: 4-BFB (PID)	"	48.0		45.2	"	50.0-150	94.2			
Matrix Spike Dup		0890511-MSD1	B908301-01							
Benzene	8/14/99	10.0	ND	9.50	ug/l	70.0-130	95.0	15.0	8.08	
Toluene	"	10.0	ND	9.57	"	70.0-130	95.7	15.0	2.99	
Ethylbenzene	"	10.0	ND	9.79	"	70.0-130	97.9	15.0	4.10	
Xylenes (total)	"	30.0	ND	29.0	"	70.0-130	96.7	15.0	6.31	
Surrogate: 4-BFB (PID)	"	48.0		44.9	"	50.0-150	93.5			

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Page 7 of 11



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ERI	Project: TOSCO Blaine 5028	Sampled: 8/12/99
1921 Edmonds Drive SE	Project Number: 31017	Received: 8/13/99
Renton, WA 98055	Project Manager: John Meyer	Reported: 8/24/99 11:51

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended) Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Reporting Limit Units	Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0890611										
Blank										
Diesel Range Hydrocarbons	8/20/99			ND	mg/l	0.250				
Heavy Oil Range Hydrocarbons	"			ND	"	0.750				
Surrogate: 2-FBP	"	0.321		0.314	"	50.0-150	97.8			
LCS										
0890611-BS1										
Diesel Range Hydrocarbons	8/20/99	2.00		1.76	mg/l	60.0-140	88.0			
Surrogate: 2-FBP	"	0.321		0.359	"	50.0-150	112			
Duplicate										
0890611-DUP1 B908270-09										
Diesel Range Hydrocarbons	8/20/99		0.325	0.868	mg/l			44.0	91.0	3
Heavy Oil Range Hydrocarbons	"		ND	0.751	"			44.0		3
Surrogate: 2-FBP	"	0.594		0.575	"	50.0-150	96.8			

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*Refer to end of report for text of notes and definitions.

Steve Davis, Project Manager

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Page 8 of 11



Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

ERI	Project: TOSCO Blaine 5028	Sampled: 8/12/99
1921 Edmonds Drive SE	Project Number: 31017	Received: 8/13/99
Renton, WA 98055	Project Manager: John Meyer	Reported: 8/24/99 11:51

Halogenated Volatile Organics by EPA Method 8021B (modified) Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike	0890754-MS1		B908243-01							
Chlorobenzene	8/20/99	10.0	ND	7.59	ug/l	70.0-130	75.9			
1,1-Dichloroethene	"	10.0	ND	7.57	"	70.0-130	75.7			
Trichloroethene	"	10.0	ND	8.10	"	70.0-130	81.0			
Surrogate: 4-BFB (ELCD)	"	10.0		9.15	"	50.0-150	91.5			
Matrix Spike Dup	0890754-MSD1		B908243-01							
Chlorobenzene	8/20/99	10.0	ND	7.94	ug/l	70.0-130	79.4	20.0	4.51	
1,1-Dichloroethene	"	10.0	ND	8.33	"	70.0-130	83.3	20.0	9.56	
Trichloroethene	"	10.0	ND	8.87	"	70.0-130	88.7	20.0	9.07	
Surrogate: 4-BFB (ELCD)	"	10.0		8.94	"	50.0-150	89.4			

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Page 10 of 11



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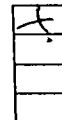
Notes and Definitions

#	Note
1	Results in the diesel organics range are primarily due to overlap from a gasoline range product.
2	Due to difficult matrix the sample was analyzed at a dilution.
3	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

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TOSCO CHAIN OF CUSTODY REPORT

B908302

TOSCO INFORMATION	
Facility Number:	Tosco 5028
Site Address:	247 0 St.
City, State, ZIP:	Blaine, WA
Project/AWO Code	
Tosco Manager:	Tim Tolson
FACILITY TYPE: (check one)	☐ BP/☒ ☐ Terminal/Bulk Plant ☐ Brown Bear ☒ Former 76 Site ☐ Other

CONSULTANT INFORMATION	
Firm:	EKI
Project#	31017
Address:	1921 Edmonds Dr. SE. Renton, WA 98055
Phone:	(425) 227-0280
Fax:	x - 0225
Project Manager:	John Meyer
E-mail:	
Sample Collection by:	Chris Carter

Quality Assurance Data Level:



A: Standard Summary

B: Standard + Chromatograms

Laboratory Turnaround Days:



10 Day - Standard

SAMPLE IDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CONTAINERS
1. MW-2	8/12/99	W	4
2. MW-3	↓	↓	4
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

	OR	WA	AK	NW Series	ID
TPH-HCID					
TPH-Gas					
BTEX					
EPA 8021 Mod.					
TPH-Gas + BTEX					
TPH-Diesel					
TPH-Diesel Extended					
TPH-Diesel-Ext. w/SG Cleanup					
Halogen. Volatiles EPA 8021					
Pesticides/PCBs or PCBs Only					
GC/MS Volatiles EPA 8260					
GC/MS Semi Vols. EPA 8270					
PAH's: 8270 SIM or 8310					
Lead:					
Total or Dissolved TCLP or RCRA Metals (8)					

NCA SAMPLE NUMBER

B908302-01
-02

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time	Comments:
1. [Signature]	EKI	8/12/99	Bill Kume	NCA	8/13/99 18:00	
2. [Signature]	NCA	8/13/99 14:30	S. Widen	NCA	8/13/99 14:30	
3.						

GROUNDWATER SAMPLING - FIELD LOG

Client Name: Tosco 50 28

Location: Blair

Field Crew: ce

ERI Job No. 1017

Field Cleaning Performed:

Analysis:

Date: 8/12/99

Page 1 of 1

* - Case Volume = $(d_{\text{well}} - d_{\text{water}})_{\text{in ft}} \times F$ where $F =$
 0.163 for a 2" inside diameter well casing
 0.652 for a 4" inside diameter well casing
 1.467 for a 6" inside diameter well casing

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ENVIRONMENTAL RESOLUTIONS, INC.

[illegible]