

DATE: December 5, 1999

**TOSCO MARKETING COMPANY
GROUNDWATER MONITORING REPORT**

Site No.: 4165 Address: 202 Avenue D, Snohomish, 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) [Fourth - 1999]:

- Monitored 7, and purged and sampled 6 groundwater monitoring wells

WORK PROPOSED FOR NEXT QUARTER [First - 2000]:

- Monitor, purge, and sample 10 groundwater monitoring wells

RECEIVED

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SUMMARY:

Frequency of Sampling Events:	<u>Quarterly</u>	(Quarterly, etc.)
Approximate Depth to Groundwater:	<u>7 to 11 ft</u>	(Measured Feet)
Groundwater Gradient:	<u>Southerly and Westerly</u>	(Direction)
	<u>0.05 ft/ft</u>	(Magnitude)
Maximum TPH-G/Benzene Concentrations:	<u>12,100/9.22</u>	(ppb)
Measurable Free Product Detected:	<u>Yes; MW-12</u>	(Yes - ID wells(s)/No)
Free Product Recovered This Quarter:	<u>Unknown</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>Snohomish River</u>	
Radius and Respective Direction:	<u>~ 0.25 Miles South</u>	(Direction)
Current Remedial Action:	<u>None</u>	(SVE/AS/P&T etc.)
Permits for Discharge:	<u>None</u>	(NPDES, POTW, etc.)

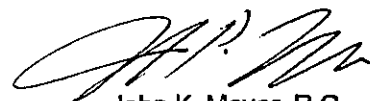
DISCUSSION:

- 3 of 6 wells sampled contained hydrocarbon concentrations exceeding MTCA Method A Cleanup Levels
- 0.29 feet LPH observed in MW-12

ATTACHMENTS:

Plate P-1 - Groundwater Sample Analyses Map, 10/25/99
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: Brian Sato, Ecology NW Region
Mick Monken, City of Snohomish
Lisa Bona, GeoEngineers

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 4165
202 Avenue D
Snohomish, Washington
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Well Name	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X
MW-1 98.11	01/23/95	7.16	90.95	26,000	2,400	<750	32	110	370	2,400
	01/23/95	--	--	27,000	--	--	36	120	390	2,700
	04/20/95	7.56	90.55	40,000	1,600	<750	100	390	750	4,900
	04/20/95	--	--	40,000	--	--	100	420	780	5,200
	07/21/95	10.15	87.96	7,300	1,600	<1,000	6.6	17	80	310
	07/21/95	--	--	8,100	--	--	6.9	19	81	320
	10/18/95	9.17	88.94	30,000	2,600	<750	19	24	260	1,500
	10/18/95	--	--	29,000	--	--	17	17	280	1,600
	01/24/96	5.51	95.47	36,000	2,600	1,700	66	98	640	3,800
	01/24/96	--	--	36,000	--	--	62	84	520	3,700
	04/24/96	7.78	90.73	19,000	1,600	<750	<2.0	<2.0	25	140
	04/24/96	--	--	16,000	--	--	16	4.1	22	130
	07/23/96	9.77	58.89	7,950	648	<750	9.35	61.9	32.1	94.3
	07/23/96	--	--	7,430	--	--	<2.50	<2.50	24.7	72.3
	10/15/96	10.52	58.14	1,750	321	<750	<0.500	1.89	4.91	10.1
	10/15/96	--	--	1,730	--	--	<0.500	1.86	5.01	10.2
	03/17/97 ^{NP}	6.61	62.05	8,600	984	<785	<0.500	3.60	3.25	8.37
	03/17/97	--	--	13,500	2,070	1,030	13.2	8.11	10.3	25.3
	06/04/97	8.40	60.26	16,500	895	<750	18.1	14.7	25.5	108
	09/12/97	10.70	57.96	815	358	<750	12.7	2.76	2.64	9.20
68.26	12/16/97*	--	--	4,640	3,210	3,780	<1.25	<6.25	3.96	10.8
	3/11/98	6.83	61.43	2,090	1,360	<750	0.542	<0.500	5.20	18.3
	6/22/98	8.91	59.35	3,470	726	<750	<2.50	24.9	4.34	6.93
	9/16/98	10.80	57.46	1,530	627	<750	15.2	<6.00	<4.00	<15.0
	1/8/99	7.12	61.14	14,400	1,680	1,430	17.8	<10.0	197	795
	4/28/99	7.89	60.37	6,880	4,580	3,270	25.8	26.1	79.5	350
	7/23/99	8.60	59.66	393	2,430	2,270	<0.980	<1.50	2.89	14.6
	10/25/99	10.40	57.86	910	660	<1670	<0.500	<16.5	<1.15	<2.00
MW-2	01/23/95	4.67	94.72	9,800	810	<750	4.8	5.0	8.8	16
	04/20/95	5.20	94.19	5,700	1,100	<750	46	4.1	4.5	7.0
	07/21/95	8.30	91.09	7,000	1,700	<1,000	2.8	2.4	3.9	7.2
	10/18/95	6.00	93.39	6,400	1,000	760	<2.0	2.7	7.0	11
	01/24/96	3.92	95.75	5,600	580	<750	1.9	<0.5	3.5	6.2
	04/24/96	5.30	94.70	6,300	530	<750	1.6	2.9	4.4	7.1
	07/23/96	8.24	61.97	3,710	458	<750	<2.50	2.61	2.92	<5.00
	10/15/96	8.65	61.56	4,190	427	<750	<1.00	2.57	2.58	4.47
	03/17/97 ^{NP}	4.19	66.02	2,730	359	<750	<2.50	<2.50	<2.50	<5.00
	03/17/97	--	--	3,260	677	<750	<2.50	3.13	2.61	<5.00
	06/04/97	6.20	64.01	2,970	<250	<750	33.7	2.77	2.71	5.07
	09/12/97	8.92	61.29	1,850	338	<750	50.3	4.24	3.37	4.83
	12/16/97	5.52	64.28	1,840	343	<750	29.4	2.59	1.80	3.52
	3/11/98	4.53	65.27	3,030	413	<750	<0.500	<0.500	0.939	<1.00
	6/22/98	7.05	62.75	1,380	312	<750	<2.50	31.6	<2.50	<5.00
	9/16/98	8.98	60.82	1,940	299	<750	42.3	<10.0	<2.50	10.7
	1/8/99	4.90	64.90	1,610	314	<750	20.7	<2.75	<2.50	<5.00
	4/28/99	4.91	64.89	1,180	324	<750	16.1	<1.60	<1.32	<3.30
	7/23/99	6.29	63.51	805	368	<750	12.3	<1.50	<0.500	<4.00
	10/25/99	8.64	61.16	2,100	250	<750	<0.700	<19.6	<0.700	<1.90
69.80	04/24/96	5.30	94.70	6,300	530	<750	1.6	2.9	4.4	7.1
	07/23/96	8.24	61.97	3,710	458	<750	<2.50	2.61	2.92	<5.00
MW-2	10/15/96	8.65	61.56	4,190	427	<750	<1.00	2.57	2.58	4.47
	03/17/97 ^{NP}	4.19	66.02	2,730	359	<750	<2.50	<2.50	<2.50	<5.00
MW-2	03/17/97	--	--	3,260	677	<750	<2.50	3.13	2.61	<5.00
	06/04/97	6.20	64.01	2,970	<250	<750	33.7	2.77	2.71	5.07
MW-2	09/12/97	8.92	61.29	1,850	338	<750	50.3	4.24	3.37	4.83
	12/16/97	5.52	64.28	1,840	343	<750	29.4	2.59	1.80	3.52
MW-2	3/11/98	4.53	65.27	3,030	413	<750	<0.500	<0.500	0.939	<1.00
	6/22/98	7.05	62.75	1,380	312	<750	<2.50	31.6	<2.50	<5.00
MW-2	9/16/98	8.98	60.82	1,940	299	<750	42.3	<10.0	<2.50	10.7
	1/8/99	4.90	64.90	1,610	314	<750	20.7	<2.75	<2.50	<5.00
MW-2	4/28/99	4.91	64.89	1,180	324	<750	16.1	<1.60	<1.32	<3.30
	7/23/99	6.29	63.51	805	368	<750	12.3	<1.50	<0.500	<4.00
MW-2	10/25/99	8.64	61.16	2,100	250	<750	<0.700	<19.6	<0.700	<1.90
MTCA Method A Cleanup Level				1,000 ^d		5	40	30	20	

Continued on Page 2.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 4165
202 Avenue D
Snohomish, Washington
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Well Name	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X
MW-3	01/23/95	4.61	95.26	<50	<250	<750	<0.5	<0.5	<0.5	<0.5
	04/20/95	5.15	94.72	<50	<250	<750	<0.5	<0.5	<0.5	<1.0
	07/21/95	8.72	91.15	<50	<250	<1,000	<0.5	<0.5	<0.5	<1.0
	10/18/95	6.36	93.51	<50	<250	<750	<0.5	<0.5	<0.5	<1.0
	01/24/96	4.12	95.75	<50	<250	<750	<0.5	<0.5	<0.5	<1.0
70.25	04/24/96	5.34	95.04	--	--	--	--	--	--	--
	07/23/96	8.81	61.95	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	10/15/96	9.14	61.62	--	--	--	--	--	--	--
	03/17/97	4.46	66.30	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	06/04/97	--	--	--	--	--	--	--	--	--
	09/12/97	9.41	61.35	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	12/16/97	5.95	64.30	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	3/11/98	4.85	65.40	--	--	--	--	--	--	--
	6/22/98	7.60	62.65	<50.0	<250	<750	<0.500	0.956	<0.500	1.45
	9/16/98	9.29	60.96	--	--	--	--	--	--	--
	1/8/99	4.78	65.47	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	4/28/99	6.04	64.21	--	--	--	--	--	--	--
	7/23/99	7.28	62.97	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	10/25/99	--	--	--	--	--	--	--	--	--
MW-6 67.74	03/17/97 ^{NP}	--	--	4.710	595	<750	941	102	218	142
	03/17/97	6.86	61.30	2.700	551	<750	1,100	37.5	170	105
	06/04/97	6.94	61.22	3.920	<250	<750	201	37.8	141	166
	09/12/97	9.05	59.11	674	<250	<750	7.56	3.98	6.57	12.7
	12/16/97	6.51	61.23	2.260	343	<750	111	32.3	110	137
	3/11/98	6.25	61.49	3.680	523	<750	480	34.0	210	205
	6/22/98 ¹	7.50	60.24	934	<250	<750	2.39	15.6	21.4	22.3
	9/16/98	9.99	57.75	814	<250	<750	7.42	<2.00	10.9	19.3
	1/8/99	5.78	61.96	<50.0	<250	<750	28.1	<0.500	1.25	<1.00
	4/28/99	6.15	61.59	134	<250	<750	11.6	<0.550	2.83	6.12
	7/23/99	6.75	60.99	77.8	<250	<750	<0.700	1.61	<0.750	<2.20
	10/25/99	8.55	59.19	190	<250	<750	<0.500	<1.30	<1.15	<1.90
MW-7 67.86	03/17/97	2.30	65.95	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	06/04/97	5.68	62.57	<50.0	1,420	<750	<0.500	<0.500	<0.500	<1.00
	09/12/97	9.22	59.03	--	--	--	--	--	--	--
	12/16/97	4.79	63.07	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	3/11/98	3.45	64.41	--	--	--	--	--	--	--
	6/22/98	7.32	60.54	<50.0	<250	<750	<0.500	1.24	<0.500	2.07
	9/16/98	10.27	57.59	--	--	--	--	--	--	--
	1/8/99	4.36	63.50	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	4/28/99	5.86	62.00	--	--	--	--	--	--	--
	7/23/99	6.92	60.94	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
MW-8 67.52	03/17/97	6.48	61.45	<50	<250	<750	<0.500	<0.500	<0.500	<1.00
	06/04/97	8.46	59.47	1,050	<250	<750	8.87	4.77	1.79	31.6
	09/12/97	10.74	57.19	1,330	1,360	914	12.2	5.74	2.66	7.89
	12/16/97	7.92	59.60	874	476	<750	8.90	<4.00	<4.00	<8.00
	3/11/98	6.85	60.67	771	308	<750	<0.500	0.774	<0.500	<1.00
	6/22/98	8.99	58.53	829	<250	<750	<0.500	14.1	<1.00	6.98
	9/16/98	10.81	56.71	343	456	<750	2.62	<1.50	<0.500	<4.00
	1/8/99	7.09	60.43	558	311	<750	4.74	<1.50	<0.500	<4.00
	4/28/99	7.91	59.61	349	<250	<750	2.40	<0.800	<0.500	<2.00
	7/23/99	8.68	58.84	388	407	<750	3.44	<1.40	<0.550	<2.90
MW-9 68.66	10/25/99	10.75	56.77	189	<250	<750	<0.500	<3.45	<0.500	<2.40
	03/17/97	6.89	62.21	6,770	4,360	1,140	<2.50	15.7	9.38	12.3
	06/04/97	7.94	61.16	<50	887	<750	<0.500	<0.500	<0.500	<1.00
	09/12/97	9.84	59.26	<50	<250	<750	<0.500	<0.500	<0.500	<1.00
	12/16/97	7.38	61.28	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	3/11/98	6.57	62.09	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	6/22/98	8.27	60.39	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	9/16/98	9.89	58.77	<50.0	--	--	<0.500	<0.500	<0.500	<1.00
	1/8/99	6.50	62.16	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00
	4/28/99	7.28	61.38	<50.0	<250	<750	<0.500	<0.500	<0.500	<1.00

MTCA Method A Cleanup Level

1,000^a

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TABLE 1
GROUNDWATER ANALYTICAL RESULTS
Tosco Facility 4165
202 Avenue D
Snohomish, Washington
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Well Name	Sample Date	DTW	GW Elev.	TPH-G	TPH-D	TPH-O	B	T	E	X
MW-10 67.33	03/17/97	6.47	61.31	4,180	14,300	1,040	10.6	<10.0	124	<20.0
	03/17/97 ^{NP}	--	--	4,650	6,940	<750	9.94	8.36	65.8	9.77
	06/04/97	5.46	62.32	3,620	<250	<750	13.1	7.70	66.4	13.6
	09/12/97	7.49	60.29	4,230	660	<750	21.6	13.4	10.7	41.6
	12/16/97*	4.85	62.48	929	387	<750	<2.00	<2.00	<2.00	<4.00
	3/11/98	4.53	62.80	1,150	343	<750	<0.500	1.07	1.36	<1.00
	6/22/98	5.86	61.47	908	<250	<750	<0.500	<6.00	<3.50	<4.50
	9/16/98	7.97	59.36	1,010	369	<750	<2.10	<2.00	<3.50	<8.00
	1/8/99	4.91	62.42	331	266	<750	2.30	<0.500	<1.50	<2.50
	4/28/99	5.04	62.29	280	<250	<750	2.99	<0.800	<1.10	<3.00
	7/23/99	5.44	61.89	529	<250	<750	2.34	<2.60	2.81	9.37
	10/25/99	7.00	60.33	519	251	<750	<0.800	<5.65	<2.75	<8.65
MW-11 66.37	03/17/97 ^{NP}	--	--	924	<250	<750	246	17.5	37.1	30.1
	03/17/97	9.58	57.33	798	<250	<750	241	16.0	34.4	26.7
	06/04/97	10.05	56.86	1,030	<250	<750	241	11.2	29.6	26.3
	09/12/97	11.01	55.90	1,200	<250	<750	38.4	1.27	2.34	7.12
	12/16/97*	9.59	56.78	512	272	<750	64.2	2.37	4.14	6.31
	3/11/98	9.38	56.99	986	646	<750	168	7.88	17.7	12.0
	6/22/98	9.92	56.45	589	<250	<750	70.8	3.47	4.07	<10.0
	9/16/98	10.93	55.44	306	<250	<750	11.1	<0.500	<0.500	<3.50
	1/8/99	9.32	57.05	371	--	--	141	4.95	10.8	6.66
	4/28/99	9.58	56.79	782	<250	<750	175	<11.0	26.1	29.9
	7/23/99	9.83	56.54	474	<250	<750	43.7	<2.70	3.40	8.32
	10/25/99	10.69	55.68	845	<250	<750	9.22	<2.90	<3.75	<6.20
MW-12 66.40	03/17/97	9.01	58.05	2,080	1,700	<750	9.27	3.53	12.0	13.4
	06/04/97	9.68	57.38	2,840	728	<750	11.4	4.16	32.2	33.5
	09/12/97	10.91	56.15	2,740	762	<750	15.7	2.75	16.7	19.5
	12/16/97	8.09	58.31	0.01 Feet LPH - No sample collected						
	3/11/98 ^{NP}	8.72	57.68	11,200	17,800	5,000	<2.50	4.29	42.9	197
	6/22/98	9.76	56.69	0.06 Feet LPH - No sample collected						
	9/16/98	10.97	55.48	0.07 Feet LPH - No sample collected						
	1/8/99 ^{NP}	8.74	57.66	2,670	--	--	21.1	<5.00	40.1	48.1
	4/28/99	9.22	57.20	0.03 Feet LPH - No sample collected						
	7/23/99	9.51	56.90	0.01 Feet LPH - No sample collected						
	10/25/99	10.81	55.78	0.29 Feet LPH - No sample collected						
MTCA Method A Cleanup Level				1,000 ^a	5	40	30	20		

EXPLANATION:

All concentrations in ug/L (ppb).

Wellhead elevations taken from prior consultant's reports. Elevations recalculated 4/29/96.

DTW = Depth to water in feet below top of casing. Measurements taken from ground surface between 4/24/96 and 9/12/97.

GW Elev. = Groundwater elevation relative to top of casing elevations; corrected for free product where applicable using a specific gravity of 0.75.

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.

LPH = Liquid-phase petroleum hydrocarbons present; no sample collected.

-- = No Data.

< = Less than the stated laboratory reporting limit.

^{NP} = Sample collected without purging.

* Well resampled on 12/23/97 due to laboratory breakage.

¹ Approximate elevation

^a Total Petroleum Hydrocarbons.

Shaded values equal or exceed MTCA Method A Cleanup Levels.

Data collected before 12/16/97 are taken from prior consultants.



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3 November, 1999

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1921 Edmonds Drive SE
Renton, WA 98055

RE: Tosco #4165, Snohomish-1

Enclosed are the results of analyses for samples received by the laboratory on 10/26/99 12:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Steve Davis
Project Manager



Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
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ERI
1921 Edmonds Drive SE
Renton WA, 98055

Project: Tosco #4165, Snohomish-1
Project Number: 31018
Project Manager: John Meyer

Reported:
11/03/99 13:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	B9J0280-01	Water	10/25/99 00:00	10/26/99 12:45
MW-2	B9J0280-02	Water	10/25/99 00:00	10/26/99 12:45
MW-6	B9J0280-03	Water	10/25/99 00:00	10/26/99 12:45
MW-8	B9J0280-04	Water	10/25/99 00:00	10/26/99 12:45
MW-10	B9J0280-05	Water	10/25/99 00:00	10/26/99 12:45
MW-11	B9J0280-06	Water	10/25/99 00:00	10/26/99 12:45

North Creek Analytical - Bothell

Steve Davis, Project Manager

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ERI
1921 Edmonds Drive SE
Renton WA, 98055

Project: Tosco #4165, Snohomish-1
Project Number: 31018
Project Manager: John Meyer

Reported:
11/03/99 13:45

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (B9J0280-01) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45 A-01									
Gasoline Range Hydrocarbons	910	50.0	ug/l	1	9J27020	10/27/99	10/27/99	WTPH-G/8021	G-02
Benzene	ND	0.500	"	"	"	"	"	B	R-03
Toluene	ND	16.5	"	"	"	"	"	"	R-03
Ethylbenzene	ND	1.15	"	"	"	"	"	"	R-03
Xylenes (total)	ND	2.00	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)		88.3 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		63.5 %	50-150		"	"	"	"	
MW-2 (B9J0280-02) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45 A-01									
Gasoline Range Hydrocarbons	2100	50.0	ug/l	1	9J27020	10/27/99	10/28/99	WTPH-G/8021	G-02
Benzene	ND	0.700	"	"	"	"	"	B	R-03
Toluene	ND	19.6	"	"	"	"	"	"	R-03
Ethylbenzene	ND	0.700	"	"	"	"	"	"	R-03
Xylenes (total)	ND	1.90	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)		107 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		66.2 %	50-150		"	"	"	"	
MW-6 (B9J0280-03) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Gasoline Range Hydrocarbons	190	50.0	ug/l	1	9J27020	10/27/99	10/28/99	WTPH-G/8021	G-02
Benzene	ND	0.500	"	"	"	"	"	B	R-03
Toluene	ND	1.30	"	"	"	"	"	"	R-03
Ethylbenzene	ND	1.15	"	"	"	"	"	"	R-03
Xylenes (total)	ND	1.90	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)		90.4 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		85.2 %	50-150		"	"	"	"	

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1921 Edmonds Drive SE
Renton WA, 98055

Project: Tosco #4165, Snohomish-1
Project Number: 31018
Project Manager: John Meyer

Reported:
11/03/99 13:45

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (B9J0280-04) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Gasoline Range Hydrocarbons	189	50.0	ug/l	1	9J27020	10/27/99	10/28/99	WTPH-G/8021	G-02
Benzene	ND	0.500	"	"	"	"	"	B	R-03
Toluene	ND	3.45	"	"	"	"	"	"	R-03
Ethylbenzene	ND	0.500	"	"	"	"	"	"	R-03
Xylenes (total)	ND	2.40	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)		89.6 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		86.5 %	50-150		"	"	"	"	
MW-10 (B9J0280-05) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Gasoline Range Hydrocarbons	519	50.0	ug/l	1	9J27020	10/27/99	10/28/99	WTPH-G/8021	G-02
Benzene	ND	0.800	"	"	"	"	"	B	R-03
Toluene	ND	5.65	"	"	"	"	"	"	R-03
Ethylbenzene	ND	2.75	"	"	"	"	"	"	R-03
Xylenes (total)	ND	8.65	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)		98.8 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		85.6 %	50-150		"	"	"	"	
MW-11 (B9J0280-06) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Gasoline Range Hydrocarbons	845	50.0	ug/l	1	9J27020	10/27/99	10/28/99	WTPH-G/8021	G-02
Benzene	9.22	0.500	"	"	"	"	"	B	R-03
Toluene	ND	2.90	"	"	"	"	"	"	R-03
Ethylbenzene	ND	3.75	"	"	"	"	"	"	R-03
Xylenes (total)	ND	6.20	"	"	"	"	"	"	R-03
Surrogate: 4-BFB (FID)		114 %	50-150		"	"	"	"	
Surrogate: 4-BFB (PID)		83.5 %	50-150		"	"	"	"	

North Creek Analytical - Bothell

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ERI
1921 Edmonds Drive SE
Renton WA, 98055

Project: Tosco #4165, Snohomish-I
Project Number: 31018
Project Manager: John Meyer

Reported:
11/03/99 13:45

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (B9J0280-01) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Diesel Range Hydrocarbons	0.660	0.558	mg/l	1	9J28002	10/28/99	10/29/99	WTPH-D	
Heavy Oil Range Hydrocarbons	ND	1.67	"	"	"	"	"	"	
Surrogate: 2-FBP		83.9 %	50-150		"	"	"	"	
MW-2 (B9J0280-02) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Diesel Range Hydrocarbons	0.250	0.250	mg/l	1	9J28002	10/28/99	10/29/99	WTPH-D	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP		79.5 %	50-150		"	"	"	"	
MW-6 (B9J0280-03) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	9J28002	10/28/99	10/29/99	WTPH-D	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP		86.3 %	50-150		"	"	"	"	
MW-8 (B9J0280-04) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	9J28002	10/28/99	10/29/99	WTPH-D	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP		86.5 %	50-150		"	"	"	"	
MW-10 (B9J0280-05) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Diesel Range Hydrocarbons	0.251	0.250	mg/l	1	9J28002	10/28/99	10/29/99	WTPH-D	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP		89.1 %	50-150		"	"	"	"	
MW-11 (B9J0280-06) Water Sampled: 10/25/99 00:00 Received: 10/26/99 12:45									
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	9J28002	10/28/99	10/29/99	WTPH-D	
Heavy Oil Range Hydrocarbons	ND	0.750	"	"	"	"	"	"	
Surrogate: 2-FBP		84.9 %	50-150		"	"	"	"	

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ERI
1921 Edmonds Drive SE
Renton WA, 98055

Project: Tosco #4165, Snohomish-1
Project Number: 31018
Project Manager: John Meyer

Reported:
11/03/99 13:45

soline Range Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B - Quality Cont
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9J27020: Prepared 10/27/99 Using EPA 5030B (P/T)

Blank (9J27020-BLK1)

Gasoline Range Hydrocarbons	ND	50.0	ug/l
Benzene	ND	0.500	"
Toluene	ND	0.500	"
Ethylbenzene	ND	0.500	"
Xylenes (total)	ND	1.00	"

Surrogate: 4-BFB (FID)	42.9	"	48.0	89.4	50-150
Surrogate: 4-BFB (PID)	43.1	"	48.0	89.8	50-150

LCS (9J27020-BS1)

Gasoline Range Hydrocarbons	480	50.0	ug/l	500	96.0	70-130
Surrogate: 4-BFB (FID)	50.1	"		48.0	104	50-150

Duplicate (9J27020-DUP1)

Source: B9J0278-02

Gasoline Range Hydrocarbons	472	50.0	ug/l	470	0.425	25
Surrogate: 4-BFB (FID)	49.8	"	48.0	104	50-150	

Duplicate (9J27020-DUP2)

Source: B9J0280-02

Gasoline Range Hydrocarbons	2150	50.0	ug/l	2100	2.35	25
Surrogate: 4-BFB (FID)	55.1	"	48.0	115	50-150	

Matrix Spike (9J27020-MS1)

Source: B9J0278-01

Benzene	8.81	0.500	ug/l	10.0	0.102	87.1	70-130
Toluene	8.95	0.500	"	10.0	0.129	88.2	70-130
Ethylbenzene	9.36	0.500	"	10.0	0.0736	92.9	70-130
Xylenes (total)	28.2	1.00	"	30.0	0.462	92.5	70-130
Surrogate: 4-BFB (PID)	44.9		"	48.0		93.5	50-150

Matrix Spike Dup (9J27020-MSD1)

Source: B9J0278-01

Benzene	8.89	0.500	ug/l	10.0	0.102	87.9	70-130	0.904	15
Toluene	8.74	0.500	"	10.0	0.129	86.1	70-130	2.37	15
Ethylbenzene	9.07	0.500	"	10.0	0.0736	90.0	70-130	3.15	15
Xylenes (total)	27.5	1.00	"	30.0	0.462	90.1	70-130	2.51	15
Surrogate: 4-BFB (PID)	43.6		"	48.0		90.8	50-150		

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Renton WA, 98055

Project: Tosco #4165, Snohomish-1
Project Number: 31018
Project Manager: John Meyer

Reported:
11/03/99 13:45

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 9J28002: Prepared 10/28/99 Using EPA 3520C/600 Series									
Blank (9J28002-BLK1)									
Diesel Range Hydrocarbons	ND	0.250	mg/l						
Heavy Oil Range Hydrocarbons	ND	0.750	"						
Surrogate: 2-FBP	0.279		"	0.320		87.2	50-150		
LCS (9J28002-BS1)									
Diesel Range Hydrocarbons	1.73	0.250	mg/l	2.00		86.5	60-140		
Surrogate: 2-FBP	0.300		"	0.320		93.8	50-150		Q-05
Duplicate (9J28002-DUP1)					Source: B9J0280-01				
Diesel Range Hydrocarbons	0.375	0.250	mg/l		0.660		55.1	44	Q-05
Heavy Oil Range Hydrocarbons	ND	0.750	"		ND			44	
Surrogate: 2-FBP	0.255		"	0.320		79.7	50-150		
Duplicate (9J28002-DUP2)					Source: B9J0299-01				
Diesel Range Hydrocarbons	ND	0.250	mg/l		0.259		72.6	44	Q-05
Heavy Oil Range Hydrocarbons	ND	0.750	"		ND			44	
Surrogate: 2-FBP	0.278		"	0.320		86.9	50-150		

North Creek Analytical - Bothell

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Project: Tosco #4165, Snohomish-1
Project Number: 31018
Project Manager: John Meyer

Reported:
11/03/99 13:45

Notes and Definitions

- A-01 Analyte results are estimated due to coelution with the internal standard.
- G-02 The chromatogram for this sample does not resemble a typical gasoline pattern. Please refer to the sample chromatogram.
- Q-05 Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
- R-03 The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
- 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
- RPD Relative Percent Difference

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(503) 906-9200 FAX 906-9210
(541) 383-9310 FAX 382-7588

Work Order #: 39 J0280

CLIENT: EKI		INVOICE TO: Tosco 4165		TURNAROUND REQUEST in Business Days*													
REPORT TO: John Meyer		ATTN: Tin Johnson		Organic & Inorganic Analyses													
ADDRESS: 1921 Edmonds Dr SE		7741652511.280.481.030.01000.		☒ 10 ☐ 7 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ <1													
RENTON, WA 98055		254165		STD. ☒ 4 ☐ 3 ☐ 2 ☐ 1 ☐ <1													
PHONE: (425) 227-0280		FAX: X-0225		P.O. NUMBER:													
PROJECT NAME: Snake Creek		PROJECT NUMBER: 31018		REQUESTED ANALYSES													
SAMPLED BY: Chris Carter		CLIENT SAMPLE IDENTIFICATION		SAMPLING DATE/TIME		TYPH-G/1024		TYPH-D#(Ext)		MATRIX (W, S, O)		# OF CONT.		COMMENTS		NCA WO ID	
1. mw-1		10/25/99		X		X				W		3					
2. mw-2				X		X											
3. mw-6				X		X											
4. mw-8				X		X											
5. mw-10				X		X											
6. mw-11				X		X				W		W					
7.																	
8.																	
9.																	
10.																	
11.																	
12.																	
13.																	
14.																	
15.																	
RELINQUISHED BY: Chris Carter		DATE: 10/25/99		RECEIVED BY: Bill Kunn		DATE: 10/26/99		FIRM: ERT		RECEIVED BY: Cathy Nichols		DATE: 11/24/99		FIRM: NCA		DATE: 11/24/99	
PRINT NAME: Chris Carter		TIME: 12:45		PRINT NAME: BILL KUNN		TIME: 12:45		FIRM: NCA		PRINT NAME: Cathy Nichols		TIME: 12:45		FIRM: NCA		TIME: 12:45	

GROUNDWATER SAMPLING - FIELD LOG

Client Name: Tasco 4/65
Location: Snodgrass
Field Crew: CC

ERI Job No. 03 10 18

Date: 10/25/99

Page / of (

Field Cleaning Performed:
Analysis:

* - 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

[illegible]

Revised 4/20/94