CSID 673

WORKSHEET 1
SUMMARY SCORE SHEET

Site Name/Location

Maple Lane School
20311 Old Hwy. 9 SW
Centralia, WA 98531-9620

Thurston County, S14/T15N/R3W
Tax Parcel #13514210000
Ecology Facility ID: 63149499
Date Scored: June 2004

Site Description

Background: In 1980, a 6,000-gallon diesel underground storage tank (UST) was installed as a backup fuel source for on-site heating boilers. The tank was filled in 1980 but never used. In the spring of 1997, the contents of the UST were burned in the boilers and replaced with fresh diesel. Several days later, boiler operators noticed that the tank gauge was less than full. The fuel was removed from the tank and a subsequent tightness test confirmed a leak. It was suspected that approximately 600 gallons of diesel fuel had leaked from the tank. The Washington Department of Ecology (Ecology) was notified and Olympus Environmental was contracted to provide tank removal and site assessment services. While excavating the tank, a gash was discovered in the sidewall, which may have occurred during the original installation. Thus, an additional 600 gallons of product may have leaked after the tank was initially filled in 1980.

Previous Site Investigations:

In July 1997, Olympus Environmental was contracted to conduct soil boring and sample collection activities. A single soil boring was completed in the UST area until reaching groundwater at 31.1 feet below ground surface (bgs). Fresh diesel was observed down to approximately 16 feet bgs, while weathered diesel was observed down to the water table (31.1 ft. bgs). Sample results revealed diesel concentrations in excess of the Model Toxics Control Act (MTCA) Method A cleanup levels from the bottom of the tank down to groundwater. Groundwater samples revealed diesel concentrations at 740 parts per million (ppm), exceeding MTCA Method A cleanup levels of 500 parts per billion (ppb). Additionally, the tank excavation area also exceed MTCA Method A cleanup levels in soil.

In February 1998, Nowicki & Associates installed four monitoring wells around the former UST area. Soil samples collected from the well locations contained diesel concentrations above MTCA Method A cleanup levels. Two rounds of groundwater sampling were conducted in March and August of 1998. Groundwater sample results revealed diesel concentrations in excess of MTCA Method A levels as well.

In November 1999, Nowicki & Associates completed six soil borings to define the area affected by diesel contamination. One boring, placed in the former UST location, was completed as a monitoring well. The highest concentration of diesel fuel was discovered in this well. Although separate phase hydrocarbons (SPH) could not be measured in the well, a heavy sheen and the presence of oil droplets clinging to the sampling equipment was observed.

In November 2000, Hart Crowser, Inc. collected surface water and sediment samples from a slough located approximately 150 feet downgradient from the former UST area. These samples were collected to determine if the diesel spill had migrated to this wetland area. All samples were non-detect for diesel-range hydrocarbons. In order to establish consistent and representative sampling of groundwater moving towards the slough from the spill area, five wellpoints were installed along the slough. Quarterly sampling results from 2001-2003 did not detect diesel contamination above MTCA Method A cleanup levels.

In March 2004, Hart Crowser completed their latest quarterly groundwater sampling event. Since quarterly sampling began in 2001, levels of contamination have decreased over time. No MTCA cleanup level exceedances were reported in the March 2004 sampling event.

Since May 2003, Hart-Crowser has conducted two hydrogen peroxide injections into the monitoring well located in the former UST area. These projects were completed in accordance with Ecology's Underground Injection Control Program requirements. The intent of the injection was to reduce the residual contaminant mass in the UST excavation area. Further monitoring will be required to determine if the injections are effectively oxidizing the diesel contamination.

Since this area of Thurston County contains high nitrates and high porosity, subsurface conditions are conducive to natural attenuation. Additionally, since the diesel contamination has not appeared to migrate into the nearby slough, Hart-Crowser believes that the remaining contamination may be trapped within capillaries in the soil matrix and adsorbed to porous media, thus likely exhibiting limited mobility. Additionally, since there are no drinking water wells located downgradient from the spill area, Hart-Crowser believes that the potential threat to human health is low. Hart-Crowser will continue to monitor the effectiveness of the peroxide injections as well as the natural attenuation occurring at the site.

Special Considerations

Due to the contamination documented on-site being primarily subsurface, the surface water and air routes are not applicable to WARM scoring for this site, thus only the groundwater route will be scored.

ROUTE SCORES:

Surface Water/Human Health: NS	Surface Water/Environment: NS
Air/Human Health: NS	Air/Environmental: NS
Ground Water/Human Health: **36.7**	**OVERALL RANK: 3**

WORKSHEET 2
ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE

List those substances to be considered for scoring. Source: NS

Explain basis for choice of substance(s) to be used in scoring.

List those management units to be considered for scoring. Source: NS

Explain basis for choice of unit to be used in scoring.

2. AIR ROUTE

List those substances to be considered for scoring. Source: NS

Explain basis for choice of substance(s) to be used in scoring.

List those management units to be considered for scoring. Source: NS

Explain basis for choice of unit to be used in scoring.

3. GROUND WATER ROUTE

List those substances to be considered for scoring. Source: 1, 2
TPH-Diesel

Explain basis for choice of substance(s) to be used in scoring.
The above substance is a confirmed contaminant in soil and groundwater, which may be in excess of MTCA cleanup levels.

List those management units to be considered for scoring. Source: 1
Groundwater

Explain basis for choice of unit to be used in scoring.
Analytical Results

WORKSHEET 6

GROUND WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	(ug/m^3)	Val	(mg/kg/bw)	Val	(mg/kg/day)	Val	WOE	PF	Val
1. TPH-Diesel	160	4	490 rat	5	0.004	5	-	-	-
2.									
3.									
4.									
5.									

Source: **Value:** 5 (Max. =10)
+2 Bonus Points?
Final Toxicity Value: 5

1.2 Mobility
(Use numbers to refer to above listed substances)
Cations/Anions Source: __ **Value:** __ (Max. =12)
1.
2.
3.
4.
5.

OR Solubility Source: 1 **Value:** 1 (Max. =3)
1. TPH-Diesel, 3.0E+01
2.
3.
4.
5.

1.3 Substance Quantity Source: 3 **Value:** 4 (Max. =10)
An estimated 1,200 gallons of diesel leaked from the UST

2.0 MIGRATION POTENTIAL

2.1 Containment Source: 3 **Value:** 10 (Max. =10)
Spill to soil

2.2 Net Precipitation: Nov-Apr(inches): Source: 4, 10 **Value:** 3 (Max. =5)
38.98" total precipitation, 11.74" evapotranspiration rate
38.98-11.74 = 27.24 net precip.

2.3 Subsurface Hydraulic Conductivity: Source: 3 **Value:** 4 (Max. =4)
poorly sorted sand, gravel, $>10^{-3}$

2.4 Vertical Depth to Ground Water: Source: 3 **Value:** 8 (Max. =8)
30 feet to ground water, bottom of tank approx. 6 feet, 24 feet from spill to ground water. 30-6=24

3.0 Targets

3.1 Ground Water Usage: Source: 5 **Value: 4** (Max. =10)
Public Supply Alt. Source Available

3.2 Distance to Nearest Drinking Well (ft): Source: 5 **Value: 4** (Max. =5)
Approximately 1000 feet

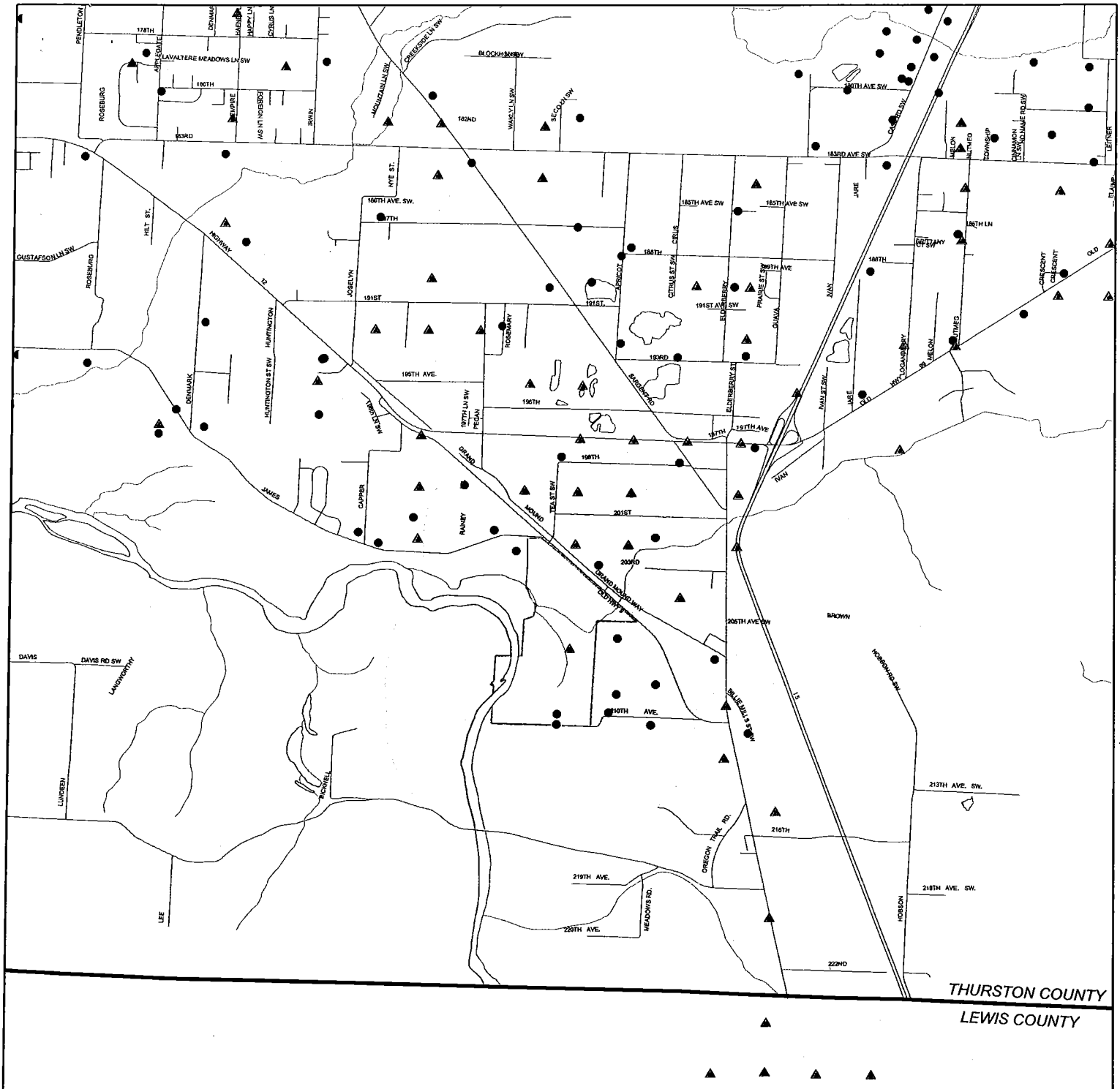
3.3 Population Served within 2 miles: Source: 5 **Value: 65** (Max. =100)
4173 people, √people = 64.6

3.4 Area irrigated by Wells within 2 miles: Source: 6 **Value: 23** (Max. =50)
958.7 total acres
$0.75\sqrt{}$ # of acres = n
$0.75\sqrt{959} = 0.75(31) = 23.25$

4.0 RELEASE Source: 3 **Value: 5** (Max. =5)
Explain basis for scoring a release to ground water:
Confirmed release (analytical results)

SOURCES USED IN SCORING

1. Washington State Dept. of Ecology, Toxicology Database for Use in WARM Scoring, January 1992.
2. Washington State Dept. of Ecology, Washington Ranking Method, Scoring Manual, April 1992.
3. Initial Site Evaluation Report and Third Quarter Monitoring Results, Hart-Crowser Inc., Tyson D. Carlson, L.H.G., William B. Abercrombie, November 2001
4. Washington State Dept. of Ecology website, Precipitation Maps, DAYMET U.S. Data Center, June 2004.
5. Thurston County Roads and Transportation Division, Geodata Center, Amy Calahan, June 2004.
6. Washington State Dept. of Ecology, Water Right Application Tracking System (WRATS), Sheri Carroll, June 2004.
7. UST Removal Report, Olympus Environmental, Inc., Dennis McPherson, August 1997.
8. First Quarter 2004 Monitoring Results, Hart-Crowser, Inc., Tyson D. Carlson, L.H.G., William B. Abercrombie, June 2004.
9. Second Quarter 2003 Monitoring Results, Hart-Crowser, Inc., Tyson D. Carlson, L.H.G., William B. Abercrombie, June 2003.
10. Table 16-Estimated Evapotranspiration, E.M. 2462, p42, for Thurston County Airport.



Maple Lane School:
Parcel #13514210000

Well (Department of Health)

Public Well

Half Mile Buffer

Two Mile Buffer

Stream

POPULATION*:
Within 1/2 Mile Buffer: 1293'
Within 2 Mile Buffer: 4173

*Population based on 2000 US Census data for Thurston County only.

THURSTON COUNTY

Maple Lane School
Wells & Population Analysis

N
W E
S

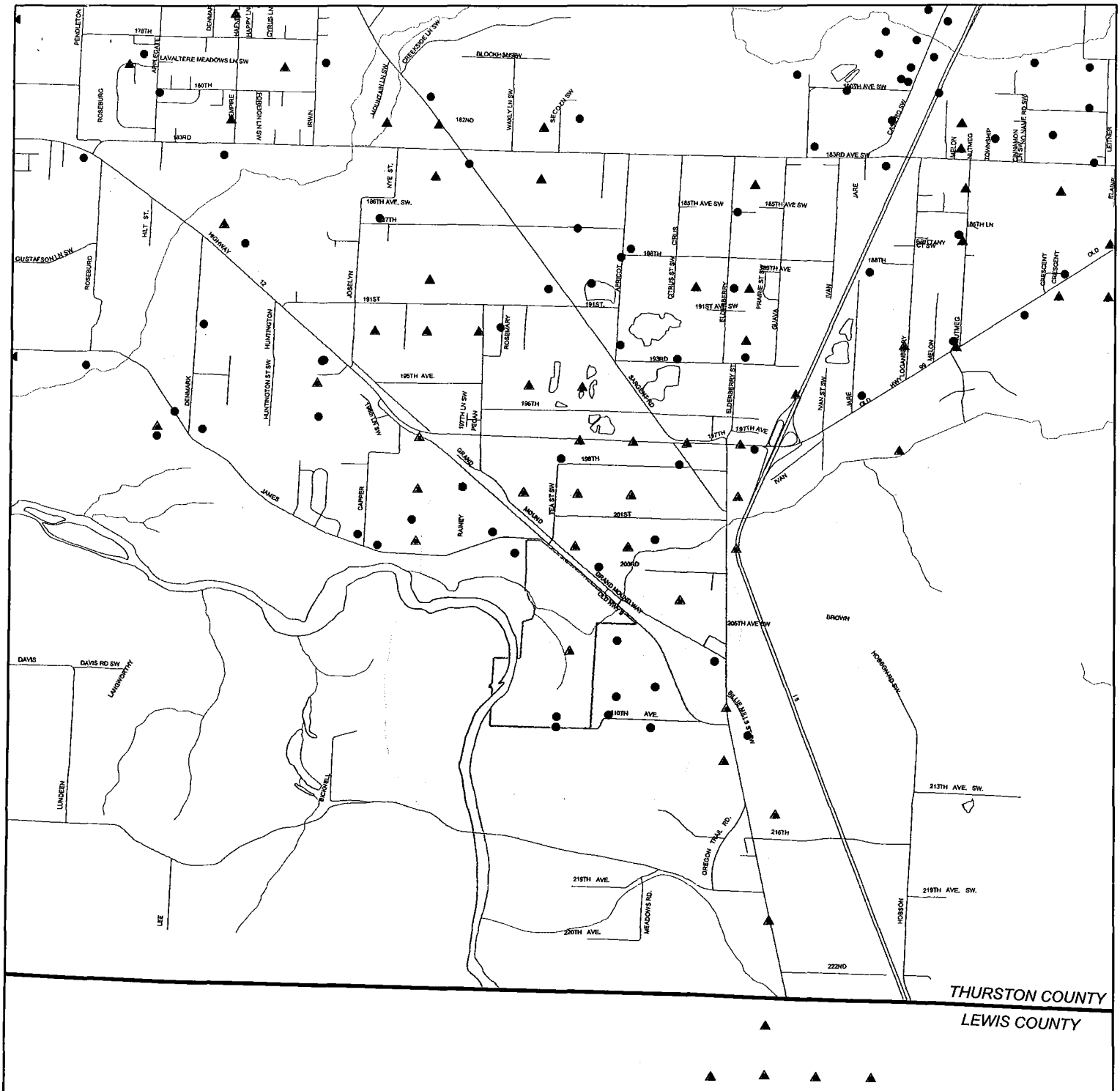
1 inch equals 3,500 feet

0 0.25 0.5 1 Miles

THURSTON COUNTY

Thurston GeoData Center

Map Created on 06.15.04 abc



Maple Lane School:
Parcel #13514210000

▲ Well (Department of Health)

● Public Well

Half Mile Buffer

Two Mile Buffer

Stream

POPULATION*:
Within 1/2 Mile Buffer: 1293'
Within 2 Mile Buffer: 4173

*Population based on 2000 US Census data for Thurston County only.

THURSTON COUNTY

Maple Lane School
Wells & Population Analysis

N
W E
S

1 inch equals 3,500 feet

0 0.25 0.5 1 Miles

THURSTON COUNTY

Thurston GeoData Center

Map Created on 06.15.04 abc

Table 2 - Analytical Results for Groundwater Samples - TPH-Dx and BTEX

Sample ID	Period	Sampling Date	Concentration in mg/L													
			Dissolved Oxygen	TSS	Diesel		Heavy Oil		Benzene		Toluene		Ethlybenzene		Total Xylenes	
MW1	First Quarter	3/17/1998			0.2	U										
	Third Quarter	7/22/1998			0.2	U										
	Fourth Quarter	12/29/1998			**3**		0.4	U								
	Second Quarte	4/29/1999			0.25	U	0.5	U								
	Third Quarter	8/19/1999			**1.6**		0.5	U								
	Fourth Quarter	11/14/2000	(a)	(a)	(a)		(a)		(a)		(a)		(a)		(a)	
	Third Quarter	9/28/2001	(a)	(a)	(a)		(a)		(a)		(a)		(a)		(a)	
	Fourth Quarter	12/19/2001	6.02		0.25	U	0.5	U								
	First Quarter	3/27/2002	4.52		0.25	U	0.4	U	0.001	U	0.001	U	0.001	U	0.001	U
	Second Quarte	6/27/2002	(a)	(a)	(a)		(a)		(a)		(a)		(a)		(a)	
	Third Quarter	9/24/2002	(a)	(a)	(a)		(a)		(a)		(a)		(a)		(a)	
	Fourth Quarter	12/16/2002	(a)	(a)	(a)		(a)		(a)		(a)		(a)		(a)	
	First Quarter	3/26/2003	4.35	450	0.25	U	0.41	U	0.001	U	0.001	U	0.001	U	0.001	U
	Second Quarte	6/11/2003	(d)	670	0.27	U	0.43	U								
	Third Quarter	9/25/2003	(a)	(a)	(a)		(a)		(a)		(a)		(a)		(a)	
	Fourth Quarter	12/17/2003	7.88	912	0.26	U	0.41	U								
	First Quarter	3/25/2004	4.50	2.7 U	0.25	U	0.40	U								
MW2	First Quarter	3/17/1998			0.2	U										
	Third Quarter	7/22/1998			0.2	U										
	Fourth Quarter	12/29/1998			0.2	U	0.4	U								
	Second Quarte	4/29/1999			0.25	U	0.5	U								
	Third Quarter	8/19/1999			0.25	U	0.5	U								
	Fourth Quarter	11/15/2000			0.25	U	0.5	U								
	Third Quarter	9/28/2001	(a)	(a)	(a)		(a)		(a)		(a)		(a)		(a)	
	Fourth Quarter	12/19/2001	6.08		0.25	U	0.5	U								
	First Quarter	3/27/2002	2.53		0.25	U	0.4	U								
	Second Quarte	6/27/2002			0.27	U	0.44	U								
	Third Quarter	9/24/2002	6.19	3200	0.26	U	0.42	U								
	Fourth Quarter	12/16/2002	7.17	1200	0.25	U	0.40	U	0.001	U	0.001	U	0.001	U	0.001	U
	First Quarter	3/26/2003	4.17	460	0.25	U	0.41	U								
	Second Quarte	6/11/2003	(d)	460	0.26	U	0.41	U								
	Third Quarter	9/25/2003	6.92	280	0.27	U	0.42	U								
	Fourth Quarter	12/17/2003	7.72	4.00 U	0.26	U	0.41	U								
	First Quarter	3/25/2004	4.60	9.3	0.26	U	0.41	U	0.001	U	0.001	U	0.001	U	0.001	U
MW3	First Quarter	3/17/1998			**13**											
	Third Quarter	7/22/1998			0.2	U										
	Fourth Quarter	12/29/1998			0.2	U	0.4	U								
	Second Quarte	4/29/1999			0.25	U	0.5	U								
	Third Quarter	8/19/1999			0.25	U	0.5	U								
	Fourth Quarter	11/21/2000			0.25	U	0.5	U								
	Third Quarter	9/28/2001			0.25	U	0.5	U	0.001	U	0.001	U	0.001	U	0.001	U
	Fourth Quarter	12/19/2001	6.80		0.25	U	0.5	U	0.001	U	0.001	U	0.001	U	0.001	U
	First Quarter	3/27/2002	3.84		0.25	U	0.4	U								
	Second Quarte	6/27/2002			0.26	U	0.42	U								
	Third Quarter	9/24/2002	4.69	2000	0.27	U	0.43	U	0.001	U	0.001	U	0.001	U	0.001	U
	Fourth Quarter	12/16/2002	7.64	1600	0.27	U	0.44	U	0.001	U	0.001	U	0.001	U	0.001	U
	First Quarter	3/26/2003	4.95	860	0.26	U	0.41	U								
	Second Quarte	6/11/2003	(d)	270	0.26	U	0.41	U								
	Third Quarter	9/25/2003	6.76	270	0.26	U	0.41	U								
	Fourth Quarter	12/17/2003	7.48	60	0.26	U	0.41	U								
	First Quarter	3/25/2004	5.74	2.7 U	0.26	U	0.41	U								

Table 2 - Analytical Results for Groundwater Samples - TPH-Dx and BTEX

Sample ID	Period	Sampling Date	Concentration in mg/L Dissolved Oxygen	TSS	Diesel	Heavy Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW4	First Quarter	3/17/1998			**33.7**					
	Third Quarter	7/22/1998			0.2 U					
	Replaced by MW 5									
MW5	Fourth Quarter	12/29/1998			**170**	0.4 U				
	Second Quarter	4/29/1999			**3.7**	0.5 U				
	Third Quarter	8/19/1999			0.25 U	0.5 U				
	Fourth Quarter	11/14/2000			0.25 U	0.5 U				
	Third Quarter	9/28/2001			0.25 U	0.5 U	0.001 U	0.001 U	0.001 U	0.001 U
	Fourth Quarter	12/19/2001	4.80		0.25 U	0.5 U	0.001 U	0.001 U	0.001 U	0.0018
	First Quarter	3/27/2002	0.87		0.25 U	0.4 U	0.001 U	0.001 U	0.001 U	0.001 U
	Second Quarter	6/27/2002			0.26 U	0.42 U	0.001 U	0.001 U	0.001 U	0.001 U
	Third Quarter	9/24/2002	7.01	3.00	0.25 U	0.41 U	0.001 U	0.001 U	0.001 U	0.001 U
	Fourth Quarter	12/16/2002	6.49	2	0.25 U	0.40 U	0.001 U	0.001 U	0.001 U	0.001 U
	First Quarter	3/26/2003	2.85	2 U	0.25 U	0.40 U	0.001 U	0.001 U	0.001 U	0.001 U
	Second Quarter	6/11/2003	(d)	320	0.29	0.42 U	0.001 U	0.001 U	0.001 U	0.001 U
	Third Quarter	9/25/2003	5.62	450	0.26 U	0.42 U	0.001 U	0.001 U	0.001 U	0.001 U
	Fourth Quarter	12/17/2003	3.48	78	0.26 U	0.41 U	0.001 U	0.001 U	0.001 U	0.001 U
	First Quarter	3/25/2004	6.13	2.7 U	0.25 U	0.41 U	0.001 U	0.001 U	0.001 U	0.001 U
MW6	Fourth Quarter	11/15/2000			**44**	0.5 U				
	Third Quarter	9/28/2001	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
	Fourth Quarter	12/19/2001	2.08		0.25 U	0.5 U	0.001 U	0.001 U	0.001 U	0.001 U
	First Quarter	3/27/2002	1.10		0.25 U	0.4 U	0.001 U	0.0015	0.001 U	0.001 U
	Second Quarter	6/27/2002		157	**78**	8.5 U	0.001 U	0.0049	0.001 U	0.001 U
	Third Quarter	9/24/2002	0.86	450	**13**	0.4 U	0.001 U	0.001 U	0.001 U	0.0022
	Fourth Quarter	12/16/2002	1.32	14	**1.9**	0.41 U	0.001 U	0.001 U	0.001 U	0.001 U
	First Quarter	3/26/2003	0.82	25	**7.5**	0.40 U	0.004 U	0.004 U	0.004 U	0.004 U
	Second Quarter	6/11/2003	(d)	190	**14**	0.43 U	0.004 U	0.004 U	0.004 U	0.004 U
	Third Quarter	9/25/2003	2.30	600	**17**	0.42 U	0.005 U	0.005 U	0.005 U	0.005 U
	Fourth Quarter	12/17/2003	0.48	267	**5.4**	0.41 U	0.001 U	0.001 U	0.001 U	0.001 U
	First Quarter	3/25/2004	1.07	2.7 U	0.34	0.40 U	0.001 U	0.001 U	0.001 U	0.001 U
WP-1	Third Quarter	9/28/2001			0.25 U	0.5 U	0.001 U	0.001 U	0.001 U	0.001 U
	Wellpoint decommissioned 12/16/02									
WP-2	Third Quarter	9/27/2002			0.25 U	0.5 U	0.001 U	0.001 U	0.001 U	0.001 U
	Fourth Quarter	12/19/2001	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
	First Quarter	3/27/2002	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
	Second Quarter	6/27/2002	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
	Fourth Quarter	12/16/2002	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
	First Quarter	3/26/2003	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
	Second Quarter	6/11/2003	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
	Third Quarter	9/25/2003	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
	Fourth Quarter	12/17/2003	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
	First Quarter	3/25/2004	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)

Table 2 - Analytical Results for Groundwater Samples - TPH-Dx and BTEX

Sample ID	Period	Sampling Date	Concentration in mg/L													
			Dissolved Oxygen	TSS		Diesel		Heavy Oil		Benzene		Toluene		Ethlybenzene		Total Xylenes	
WP-3B	Third Quarter	9/27/2001				0.25	U	0.5	U	0.001	U	0.001	U	0.001	U	0.001	U
	Fourth Quarter	12/19/2002	(b)	(b)		(b)		(b)		(b)		(b)		(b)		(b)	
	First Quarter	3/27/2002	1.58			0.25	U	0.40	U								
	Second Quarte	6/27/2002				0.27	U	0.43	U								
	Third Quarter	9/24/2002	1.48	6		0.25	U	0.40	U								
	Fourth Quarter	12/16/2002	(c)	(c)		(c)		(c)		(c)		(c)		(c)		(c)	
	First Quarter	3/26/2003		6		0.27	U	0.42	U								
	Second Quarte	6/11/2003	(c)	(c)		(c)		(c)		(c)		(c)		(c)		(c)	
	Third Quarter	9/25/2003	(e)	27		0.25	U	0.40	U								
	Fourth Quarter	12/17/2003	(c)	(c)		(c)		(c)		(c)		(c)		(c)		(c)	
	First Quarter	3/25/2004	5.87	2.7	U	0.25	U	0.40	U								
WP-4	Third Quarter	9/27/2001				0.31		0.5	U	0.001	U	0.001	U	0.001	U	0.001	U
	Fourth Quarter	12/19/2001	3.56			0.25	U	0.5	U								
	First Quarter	3/27/2002	1.20			0.25	U	0.40	U								
	Second Quarte	6/27/2002				0.27	U	0.43	U								
	Third Quarter	9/24/2002	4.51	6		0.25	U	0.40	U								
	Fourth Quarter	12/16/2002	(c)	(c)		(c)		(c)		(c)		(c)		(c)		(c)	
	First Quarter	3/26/2003	0.79	2	U	0.25	U	0.41	U								
	Second Quarte	6/11/2003	(c)	(c)		(c)		(c)		(c)		(c)		(c)		(c)	
	Third Quarter	9/25/2003	(e)	110		0.26	U	0.41	U								
	Fourth Quarter	12/17/2003	(c)	(c)		(c)		(c)		(c)		(c)		(c)		(c)	
	First Quarter	3/25/2004	3.00	8.0		0.25	U	0.40	U								
	MTCA Method A Cleanup Levels					**0.5**		**0.5**		**0.005**		**1.0**		**0.7**		**1.0**	

U = Not detected at detection limit indicated.
Bold indicates concentrations exceeds MTCA Method A cleanup level.
Blank indicates sample not analyzed for specific analyte.
Wellpoints sampled during seasonal high and low quarters.
(a) Insufficient water in well to collect groundwater sample.
(b) Monitoring point submerged, not sampled.
(c) Location not sampled.
(d) Dissolved Oxygen meter malfunction.
(e) No data reported.