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INTERIM ACTIONS AND REMEDIAL INVESTIGATION/FEASIBILITY STUDY MANHOLE 34 FACILITY SUNNYSIDE, WASHINGTON

SECOR Job No. 00509-001-01

Submitted by
SECOR

For
Manhole 34 Coordinating Group

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Two additional potential source areas within the immediate vicinity of the Facility were identified during the RI/FS scoping phase. Available records indicate that these sites have not been identified by Ecology as potential Facility source areas. As shown on Figure 2, these sites include:

1) The property located on the northwest corner of North Sixth Street and Yakima Valley Highway. Presently, Tom Denchel Ford Country occupies this property. Field observations (building design and tank features) and available records indicate that this site previously operated as a service station.

2) The property located on the southwest corner of North Sixth Street and Yakima Valley Highway. Presently, Pied Piper Mufflers operates a muffler repair shop at this property. Field observations (building design) and available records indicate that this site previously operated as a service station.

As presented in Section 4.1, several field activities were performed at these sites to evaluate the potential presence of petroleum hydrocarbons. For the remainder of this report, potential source areas are referred to by the present businesses operating at the property (e.g., Jackpot Food Mart, Sunnyside Tire Center, R&R Tires, Tom Denchel Ford Country, and Pied Piper Mufflers).

1.3 DEFINITION OF THE STUDY AREA

In order to clearly describe Facility conditions such as surface water, geology, and groundwater relevant to migration of petroleum hydrocarbons, a Study Area was delineated for the Facility RI/FS. The Study Area is illustrated on Figure 3. The Study Area is bounded to the north by North Avenue, to the east by Ninth Street, and to the south by East Custer Avenue. The western Study Area boundary is approximately 600 feet west of Sixth Street.

1.4 SETTING

The City of Sunnyside is located in eastern Yakima County, within the central portion of the State of Washington. This portion of Yakima County can be generally described as broad valleys filled with stream deposited sediments, surrounded by smooth unforested ridges. The climate is semi-arid, with total annual rainfall not exceeding 5 inches per year. Air temperatures vary greatly through the year; commonly dropping below 30 degrees Fahrenheit in winter and rising above 90 degrees Fahrenheit in summer.

Surface water drains to the south towards the Yakima River, located approximately 5 miles south of the City of Sunnyside. Within the Facility vicinity, shallow soils have been described as primarily silts and fine-grained sand, with minor coarse-grained sands or larger material sizes (i.e., gravels or cobbles). Saturated groundwater conditions are relatively shallow, commonly observed at depths of approximately 5 to 9 feet below ground surface. Groundwater generally flows to the south/southwest under a gradient of approximately 0.01 feet per foot.

1.5 REPORT ORGANIZATION

The remainder of this report has been organized into the following 11 sections:

sizes (i.e., clay/silt, sand, gravel) were estimated. Field observations were recorded on a drilling log form. Boring logs are provided in Appendix B.

4.1.2.2 Soil Properties

Two air injection/vapor extraction (AI/VE) (AI/VE-1 and AI/VE-2) wells were installed by Cascade on December 1 and 4, 1993, respectively. AI/VE wells were constructed with two casings nested in one borehole; one screened to an approximate depth of 18 to 20 feet below the water table, and one screened within the unsaturated zone.

Pilot study tests were performed at AI/VE-1 and AI/VE-2 on April 3 and 5, 1994, respectively. In addition, a field percolation test was performed on April 6, 1994 in the northwest corner of the Sunnyside Tire Center property. Percolation testing procedures followed the protocols outlined in the King County, Washington, Surface Water Design Manual. A summary of the layout of the AI/VE and infiltration test procedures are provided in Appendix C.

A total of 15 soils samples were submitted for laboratory physical testing to provide information on soil properties (i.e., bulk density, porosity, permeability, moisture content) for evaluation of cleanup alternatives.

4.1.2.3 Hydrogeology

Well gauging was performed on November 30, 1993 and April 29, 1994 using an oil/water interface probe and electronic sounding tape. This information was used to estimate groundwater flow direction, gradient, and observed seasonal fluctuations.

Two deep monitoring wells (MW-28 and MW-29) were installed on December 2 and 3, 1994 by Cascade near well MW-27 and previously installed well MW-20, respectively. MW-28 and MW-29 were installed to provide information on vertical hydraulic gradients. These wells were completed approximately 20 feet deeper than the Facility water table monitoring wells. At each location, soil samples were collected for field logging and analytical testing using a standard split-spoon soil sampler. Groundwater samples were collected using a disposable bailer following well development and purging activities. Samples were analyzed for TPH within the gasoline and diesel ranges, BTEX, and dissolved lead.

Laboratory hydraulic permeability tests were performed on three samples collected during the installation of RI/FS wells. Aquifer tests were performed at well locations MW-5 and DMW-6 on April 3 and 4, 1994, respectively. Test locations were selected based on those areas where potential groundwater extraction may be performed. Aquifer test procedures are provided in Appendix C. One sample (DMW-6P) was collected from well DMW-6 during the aquifer test to examine the suitability of first encountered groundwater as a potable water supply based on standard drinking water quality parameters (i.e., hardness, general minerals).

4.1.2.4 Additional Potential Source Areas

Monitoring wells MW-21 through MW-26 were installed on December 1 and 2, 1993 by Cascade at the Tom Denchel Ford Country and Pied Piper Muffler Shops locations to evaluate the potential presence of petroleum hydrocarbons. At each location, soil samples were collected for analytical

testing using a standard split-spoon soil sampler. Groundwater samples were collected using a disposable bailer following well development and purging activities. Samples were analyzed for TPH within the gasoline and diesel ranges, BTEX, and dissolved lead.

4.1.2.5 Petroleum Hydrocarbon Impacts

Groundwater samples were collected on November 30, 1993 from 12 monitoring wells installed prior to this RI/FS. Wells sampled did not contain measurable LNAPL (i.e., MW-8, MW-9, MW-12, MW-15 through MW-20, DMW-1, DMW-3, and DMW-6). Samples were collected using a disposable bailer following well purging activities, and were analyzed for TPH within the gasoline and diesel ranges, BTEX, and dissolved lead. In addition, field observations and analytical data collected from other activities (i.e., interim actions, potential source areas) were used to evaluate petroleum hydrocarbon impacts in soil and groundwater.

To evaluate the potential impacts on the storm sewer system, eight storm sewer water samples were collected on November 3, 4, and 5, 1993. Files were reviewed at the City of Sunnyside Public Works Department to determine the sewer layout and the outfall point. For the RI/FS, manholes were categorized into four groups (upflow, midflow, downflow, and adjacent), based on their drainage location relative to the Facility. Manholes categorized as "adjacent" access drain lines that enter into the Facility drain line downflow from the Facility. Samples were collected using a disposable bailer. Samples were analyzed for TPH within the gasoline and diesel ranges, BTEX, and dissolved lead. Water samples were collected from storm sewer manholes located upflow (MH-38), midflow (MH-37), downflow (MH-31, MH-32, MH-33, and MH-42) and adjacent (MH-A and MH-29).

To evaluate the extent of LNAPL within the Facility manholes, thickness measurements were collected on November 30, 1993 and April 29, 1994 using an oil/water interface probe. In addition, the LNAPL recovery rate in MH-34 and MH-35 was evaluated by hand bailing LNAPL to thicknesses of less than 0.05 feet on December 3, 1993 and subsequently monitoring LNAPL recovery over a 24-hour period. Further, an LNAPL sample was collected from MH-34 for fuel characterization. The sample was analyzed using capillary gas chromatography by Worldwide Geosciences, Inc. of Houston, Texas and compared against previous MH-34 LNAPL samples analyzed by Friedman & Bruya (see Section 3.0).

4.2 INTERIM ACTION RESULTS

The following sections provide an overview of the assessment of those conditions deemed to warrant potential interim actions at the Facility.

4.2.1 Condition No. 1 - Explosive Conditions in Storm Sewer System

Storm sewer vapor monitoring data are provided on Table 1. The highest recorded LEL readings appeared to be centered around MH-34 and MH-35. LEL readings above background levels were observed in midflow manhole MH-37 and upflow manhole MH-38. Downflow of MH-34, LEL readings above background were limited to MH-32 and MH-33. No LEL readings above background were observed in the remaining Study Area storm sewer manholes.

per foot south of Yakima Valley Highway (Figure 9). West of North Sixth Street, groundwater generally flows towards the southeast at a gradient of approximately 0.01 feet per foot. Review of the April 26, 1994, water level contours indicates a convergence of groundwater flow along North Sixth Street, further indicating that groundwater is leaking into the storm sewer system (see Section 2.6).

April 26, 1994 water levels from monitoring well clusters MW-20/MW-29 and MW-27/MW-28 indicate an upward hydraulic gradient at these locations (Figure 9). Water levels collected on December 3, 1993, indicate a downward gradient at well cluster MW-27/MW-28. However, the depth to water measurement collected from MW-28 on December 3, 1993 appears to be anomalous (possibly a reading or recording error), based on the observation that it is the only water level measurement from any well that is greater than 10 feet.

Available water level data indicate that the seasonal water table fluctuation at the Facility is less than 1 foot. A plot of groundwater elevations for MW-8, MW-9, and DMW-3 is provided on Figure 10.

Laboratory hydraulic permeability testing was performed on samples collected below the water table. Permeabilities range from 5.5×10^{-6} feet per minute (ft/min) [2.8×10^{-6} centimeter per second (cm/sec)] to 1.9×10^{-5} ft/min (9.6×10^{-6} cm/sec). Test results are provided on Table 6.

The aquifer test conducted at DMW-6 on April 3, 1994 provided calculated hydraulic conductivities of 1.9×10^{-2} ft/min to 1.4×10^{-1} ft/min. This range in hydraulic conductivity is indicative of silty sands to clean sands (Freeze and Cherry, 1979). Review of the boring log for DMW-6 (Appendix B) indicates a sandy layer at a depth of 17 feet to 20 feet (total depth of boring) below ground surface, which is overlain by a sandy silt at depths of 5 feet to 17 feet below ground surface. It is likely that the calculated hydraulic conductivities are significantly influenced by the deeper sand and do not represent the hydraulic properties of the overlying silt. Hydraulic permeabilities calculated from laboratory testing on select soil samples are likely to be more representative for silt layers.

The aquifer test conducted at MW-5 on April 4 and 5, 1994 was less conclusive than the test at DMW-6 due to the presence of LNAPL and only 7.5 feet of available drawdown (total well depth is 15 feet). Based on specific capacity, estimates from drawdown data collected at MW-5, an estimated hydraulic conductivity of 3.3×10^{-3} ft/min was calculated. Review of the boring log for MW-5 (Appendix B) indicates a coarse sand at 12.5 feet below ground surface, which is overlain by a silt occurring from ground surface to a depth of 12.5 feet. This stratigraphic condition is very similar to conditions observed at DMW-6. Aquifer pilot test results are provided in Appendix C.

Water quality (i.e., hardness, general minerals) results for the sample collected from well DMW-6 are summarized on Table 8. Laboratory reports for water quality testing are provided in Appendix D. Table 8 includes water quality data from city wells 3 and 4, as provided by the City of Sunnyside.

4.3.4 Additional Potential Source Areas

Groundwater analytical results for the sample collected at well MW-24 indicate the presence of petroleum hydrocarbon impacts at the Pied Piper Mufflers property. Based on the apparent groundwater flow direction in this area, it is unlikely that these apparent impacts are related to Facility petroleum hydrocarbon impacts. Groundwater analytical results for samples collected at

wells MW-21, MW-22, and MW-23 indicate the absence of petroleum hydrocarbon impacts at the Tom Denchel Ford Country property, with the exception of TPH detected in the diesel range at well MW-21 (see Section 4.3.6 for discussion).

4.3.5 Petroleum Hydrocarbon Impacts in Soil

Soil analytical results derived from the Facility RI/FS are provided in Table 5. TPH was detected in only one (from boring MW-24) out of the 23 soil samples submitted for laboratory analyses. Further testing of this sample indicates the presence of TPH within the gasoline range and BTEX constituents. These results are consistent with field observations that noted petroleum hydrocarbon odors and elevated field screening readings with a photoionization detector, as noted on the field boring log (Appendix B). The only other RI/FS soil boring (excluding AI/VE borings) where field observations indicated the presence of petroleum hydrocarbons was MW-26, where odors and elevated photoionization detector readings were noted.

Soil analytical results and field observations for the samples collected at well borings MW-24 and MW-26 indicate the presence of petroleum hydrocarbon impacts at the Pied Piper Mufflers location. Soil analytical results and field observations for samples collected at wells MW-21, MW-22, and MW-23 indicate the absence of petroleum hydrocarbons impacts at Tom Denchel Ford Country.

4.3.6 Petroleum Hydrocarbon Impacts in Groundwater

Groundwater analytical test results are provided in Tables 9 and 10. Of the 13 Hydropunch® and 21 monitoring well groundwater samples collected, only 3 samples (HP-C, MW-24, and DMW-6) were detected with TPH as gasoline and BTEX constituents. The results of well monitoring and groundwater sampling indicate that dissolved petroleum hydrocarbons in groundwater do not appear to extend significantly beyond areas of observed LNAPL. This may be due, in part, to the effect of the storm sewer system, which is believed to be dewatering (capturing) shallow groundwater. The extent of LNAPL and dissolved phase hydrocarbons are illustrated on Figure 11.

TPH in the diesel range was detected in almost half of the Hydropunch® groundwater samples and 7 of the 21 monitoring well samples located upgradient, downgradient, and crossgradient relative to groundwater movement. As noted on Tables 9 and 10, the nature of these petroleum hydrocarbons, as determined by the laboratory, are more typical of heavier range oil. This condition was also observed for storm sewer water sample results (see Section 4.3.7). The widespread detection of low concentrations of these heavier petroleum hydrocarbons, (for example upgradient of the Facility in an irrigation well located at the Sunnyside Christian School), indicates that the source of these constituents are not likely to originate at the Facility.

Dissolved lead analytical results, particularly for samples DMW-6 and MW-24 where TPH in the diesel and gasoline ranges as well as BTEX were detected, indicate the absence of dissolved lead.

4.3.7 Petroleum Hydrocarbon Impacts in Surface Water

Storm sewer monitoring, observations, and sampling results are presented on Tables 1 and 11, respectively, and are summarized below:

8.5 EXPOSURE

Routes of migration and pathways for human and environmental exposure have been identified. No pathways for soil exposure were identified. The only identified pathway for exposure to impacted groundwater (including LNAPL) is via the storm drain system (i.e., surface water). Exposure via the storm drain system was identified as the major concern to human health and the environment. Direct human contact in the storm drain system, off-site transport of impacted surface water, and LNAPL and atmospheric transport of volatile constituents of concern were identified as the primary exposure routes associated with surface water. These exposure pathways will be addressed when identifying and screening cleanup alternatives. Additionally, infrequent exposure pathways to maintenance and construction workers were identified. Since these are infrequent, and the population exposed is limited in number and frequency, these will be addressed primarily through identification of appropriate institutional controls (Section 10.0).

8.6 CLEANUP LEVELS

Cleanup levels must be proposed for the various media of concern that are protective of human health and the environment, and that address those relevant exposure pathways identified in Section 6.0. Cleanup levels for constituents of concern are discussed and proposed in the following sections.

Cleanup levels have not been proposed for media of concern (i.e., soils) where no clear and present exposure pathway has been demonstrated. However, institutional controls, [i.e. *measures undertaken to limit or prohibit activities that may interfere with the integrity of a cleanup action or result in exposure to hazardous substances at the site* (WAC 173-340-200)], will be used where appropriate to mitigate the potential for future exposure of constituents of concern to human and environmental receptors, where cleanup levels have not been proposed.

8.6.1 Soil

As established in Section 6.0, there is not presently a complete pathway for exposure of soils to human and environmental receptors. Infrequent exposure to utility, maintenance, and construction workers during subsurface excavation or utility maintenance activities can be managed or prevented with institutional controls (WAC 173-340-440). Cleanup of soil has not been proposed. During RI activities impacted soil was only observed at the Pied Piper Muffler shop, and in soil associated with the capillary fringe zone of the LNAPL plumes. As previously stated, (Section 8.4) in-situ remedial measures for soil (i.e., vapor extraction) are not practical in this case due to the low air permeability calculated based on pilot-scale testing. Widespread soil excavation is also not practicable due to, the presence of several subsurface utilities, the location of impacted soil beneath the intersection of Yakima Valley Highway and North Sixth Street, the disruption to traffic required for excavation, and the possibility that soil which is placed in the excavation following remediation (i.e., soil used to backfill the excavation) may become impacted from remaining LNAPL.

8.6.2 Groundwater

8.6.2.1 Dissolved Constituents of Concern

As established in Section 6.0, there is not presently a complete pathway for exposure of dissolved groundwater constituents to human and environmental receptors except through the storm drain system. It has been demonstrated through the RI sampling and chemical analysis (summarized in Sections 4.5 and 8.4) that the extent of groundwater impacts do not indicate significant migration of constituents of concern through the low permeability subsurface soils, and that the observed presence of dissolved constituents of concern are detected within close proximity to the LNAPL plume. In addition, hydrocarbons occur within low permeability silts that are likely not capable of sustaining a yield greater than 0.5 gpm. Therefore, no cleanup levels are proposed at this time for dissolved constituents of concern in groundwater at the Facility.

8.6.2.2 LNAPL on Groundwater

It has been demonstrated that LNAPL is present overlying groundwater at the Facility. In lieu of an analytically or qualitatively based groundwater cleanup level for LNAPL in MTCA, a technology-based cleanup standard has been proposed. A 0.01 foot thick layer of LNAPL floating on the water table in monitoring wells is proposed as the cleanup level for LNAPL on groundwater. This is the minimum thickness that can be removed by current mechanical means.

8.6.3 Surface Water

8.6.3.1 LNAPL on Surface Water

A narrative cleanup standard is proposed to address LNAPL that has been detected overlying surface water in Facility manholes. Although specifying the "no visible sheen" narrative criteria which is typically applied as a surface water quality criteria would be desirable, it is unlikely that this can be achieved due to the uncontrollable pollutant contributions from urban runoff into the Facility storm sewer system. In addition to other unknown sources that appear to be significantly contributing LNAPL to MH-34. A 0.01 foot thick layer of LNAPL floating on surface water is proposed as a cleanup level for LNAPL in the storm drain system. This is reasonable as a minimum thickness that can be mechanically removed and accurately measured in the storm sewer system.

8.6.3.2 Dissolved Constituents of Concern

The state of Washington has not established numeric freshwater chronic water quality standards for TPH or BTEX constituents in WAC 173-201. In lieu of a numeric standard, a narrative cleanup standard of "no statistically significant impacts to surface water" is proposed as the cleanup level for dissolved constituents of concern in surface water at the Facility. In order to establish that no significant impacts to surface water occur across the facility, routine sampling and analysis of surface water from the upflow Manhole MH-38 is recommended to establish Facility baseline water quality conditions. Midflow and downflow manholes will be samples and statistical analysis performed and evaluated to assess if impacted groundwater and/or LNAPL is entering the storm sewer at the Facility. It should be noted that significant variations in surface water quality analytical results typically occur in urban watersheds as a result of seasonal changes, weather patterns, precipitation rates, and human activities conducted within the watershed. During active remediation, historical

TABLE 5
SOIL ANALYTICAL RESULTS
Manhole 34 Facility RI/FS
Intersection of North Sixth Street and Yakima Valley Highway
Sunnyside, Washington

Soil Boring Identification	Date Sampled	Sample Depth (feet)	TPH - Hydrocarbon Identification		
			Gasoline (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)
HP-1	11/04/93	9.5-10.0	--	--	--
HP-2	11/03/93	6.0-6.5	--	--	--
HP-3	11/03/93	9.0-9.5	--	--	--
HP-3	11/03/93	9.5-10.0	--	--	--
HP-4	11/03/93	9.5-10.0	--	--	--
HP-7	11/05/93	6.0-6.5	--	--	--
HP-15	11/04/93	6.0-6.5	--	--	--
HP-16	11/05/93	6.0-6.5	--	--	--
HP-A	11/04/93	6.5-7.0	--	--	--
HP-B	11/04/93	6.0-6.5	--	--	--
HP-C	11/04/93	6.5-7.0	--	--	--
HP-D	11/04/93	7.0-7.5	--	--	--
HP-E	11/04/93	6.0-6.5	--	--	--
HP-E	11/04/93	11.0-11.5	--	--	--
HP-F	11/05/93	6.0-6.5	--	--	--
MW-21	12/01/93	6.0-6.5	--	--	--
MW-22	12/01/93	5.5-6.0	--	--	--
MW-23	12/01/93	5.5-6.0	--	--	--
MW-24	12/02/93	8.0-8.5	(a)	--	--
MW-25	12/02/93	6.0-6.5	--	--	--
MW-26	12/02/93	6.0-6.5	--	--	--
MW-27	12/02/93	8.0-8.5	--	--	--
MW-29	12/03/93	11.0-11.5	--	--	--
Method Reporting Limit			(20)	(50)	(100)

NOTES:
TPH = Total Petroleum Hydrocarbons; mg/kg = milligrams per kilograms.
-- = constituent not detected above the Method Reporting Limit.
(a) Detected above the Method Reporting Limit. Further quantification results: TPH as gasoline = 2,520 mg/kg, benzene = 0.68 mg/kg, toluene = 21.2 mg/kg, ethylbenzene = 21.2 mg/kg, and total xylenes = 60.3 mg/kg.
TPH - Hydrocarbon Identification analyzed by Ecology Method WTPH-HCID.
TPH as gasoline analyzed by Ecology Method WTPH-G.
Benzene, toluene, ethlybenzene, and total xylenes analyzed by EPA Methods 5030/8020.
Laboratory analyses performed by Columbia Analytical Services, Inc., Bothell, Washington.

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BORING LOG

BORING: MW-24
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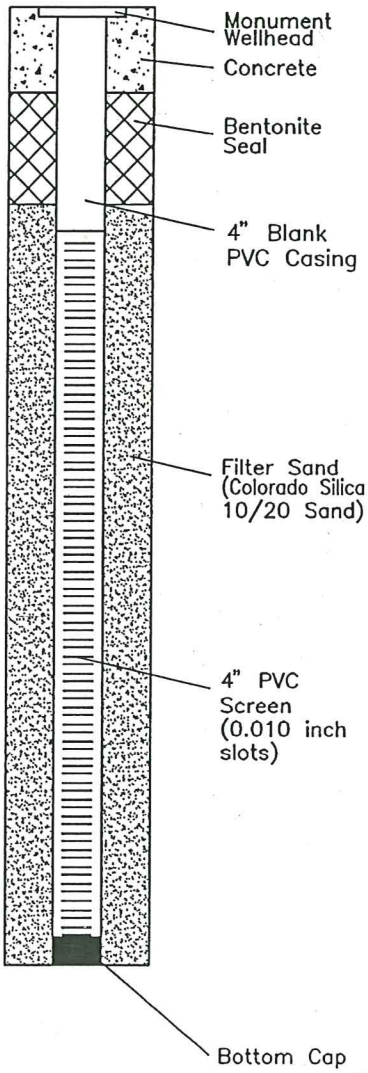
PROJECT MANHOLE 34 FACILITY
LOCATION SUNNYSIDE, WASHINGTON
SURFACE ELEVATION –
CASING TOP ELEVATION 746.17
START 12/2/93 0842
FINISH 12/2/93 0942
SAMPLER D. DELL'AGNESE
MONITORING DEVICE FOXBORO MODEL OVA 128
SUBCONTRACTOR AND EQUIPMENT CASCADE DRILLING, INC.; CME 75
COMMENTS WELL #926

Penetration Results BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
			0	Asphaltic Concrete and Roadbase	
				GRAVELLY SAND, Yellowish Brown (10YR 5/4), Fine to Medium	SW
				SAND, Gray (10YR 6/1) Fine to Medium, with some Silt, Medium Dense, Moist, No Odor, (0,70,30,0)	SM
9/10/11		–	5		
16/22/18		430	▽	Color Becomes Grayish Brown (2.5Y 5/2), Decrease in Silt, Strong Odor, (0,80,20,0) SHEEN TEST POSITIVE	
			10		
19/23/17		>1000		SAND, Brown (10YR 5/3), Fine, with Trace Silt, Medium Dense, Wet, Slight Odor, (0,95,5,0)	SP
				SAND, Brown (10YR 5/3), Fine, with little Silt, Medium Dense, Wet, No Odor, (0,90,10,0)	SP/SM
16/23/19		25	15	Some thin layers of Medium Sand	
				Hand augered to 5 feet.	
				Boring terminated at 17.5 feet.	
				Groundwater encountered at approximately 7.5 feet during drilling.	
			20	Boring converted to a groundwater monitoring well on 12/2/93.	
			25		



Well Construction Details

00111-054-02

DWG: TEX5416L

TABLE 7 (Continued)
LNAPL and Groundwater Level Measurments
Manhole No. 34 Facility
Intersection of North Sixth Street and Yakima Valley Highway
Sunnyside, Washington

Well Identification	Date Measured	Top of Casing Elevation (feet-MSL)	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Calculated Groundwater Elevation (feet-MSL)	Data Reference
MW-12	08/29/91	747.07	--	7.60	0.00	739.47	Shannon & Wilson, 9/91
	01/29/92	747.07	--	7.52	0.00	739.55	Shannon & Wilson, 3/92
	07/24/92	747.07	--	7.29	0.00	739.78	Shannon & Wilson, 9/92
	11/30/93	747.07	--	7.72	0.00	739.35	FACILITY RI/FS
	04/26/94	747.07	--	7.40	0.00	739.67	FACILITY RI/FS
MW-13	08/29/91	746.10	6.75	7.65	0.90	*	Shannon & Wilson, 9/91
	01/29/92	746.10	6.54	8.54	2.00	*	Shannon & Wilson, 3/92
	07/24/92	746.10	6.13	8.73	2.60	*	Shannon & Wilson, 9/92
	11/30/93	746.10	6.39	9.93	3.54	*	FACILITY RI/FS
	04/26/94	746.10	6.20	9.11	2.91	*	FACILITY RI/FS
MW-14	07/24/92	745.85	6.27	6.66	0.39	*	Shannon & Wilson, 9/92
	11/30/93	745.85	7.08	7.97	0.89	*	FACILITY RI/FS
	04/26/94	745.85	6.28	7.32	1.04	*	FACILITY RI/FS
MW-15	07/24/92	746.16	--	6.89	0.00	739.27	Shannon & Wilson, 9/92
	11/30/93	746.16	--	7.29	0.00	738.87	FACILITY RI/FS
	04/26/94	746.16	--	7.05	0.00	739.11	FACILITY RI/FS
MW-16	07/24/92	747.68	--	7.83	0.00	739.85	Shannon & Wilson, 9/92
	11/30/93	747.68	--	8.28	0.00	739.40	FACILITY RI/FS
	04/26/94	747.68	--	7.97	0.00	739.71	FACILITY RI/FS
MW-17	07/24/92	746.73	--	6.00	0.00	740.73	Shannon & Wilson, 9/92
	11/30/93	746.73	--	7.32	0.00	739.41	FACILITY RI/FS
	04/26/94	746.73	--	6.00	0.00	740.73	FACILITY RI/FS
MW-18	07/24/92	745.28	--	5.29	0.00	739.99	Shannon & Wilson, 9/92
	11/30/93	745.28	--	6.00	0.00	739.28	FACILITY RI/FS
	04/26/94	745.28	--	5.92	0.00	739.36	FACILITY RI/FS
MW-19	07/24/92	745.38	--	5.27	0.00	740.11	Shannon & Wilson, 9/92
	11/30/93	745.38	--	5.91	0.00	739.47	FACILITY RI/FS
	04/26/94	745.38	--	5.45	0.00	739.93	FACILITY RI/FS
MW-20	07/24/92	743.77	--	8.90	0.00	734.87	Shannon & Wilson, 9/92
	11/30/93	743.77	--	9.20	0.00	734.57	FACILITY RI/FS
	04/26/94	743.77	--	8.98	0.00	734.79	FACILITY RI/FS
	06/06/94	743.77	--	8.95	0.00	734.82	FACILITY RI/FS
MW-21	12/02/93	745.40	--	6.49	0.00	738.91	FACILITY RI/FS
	04/26/94	745.40	--	6.22	0.00	739.18	FACILITY RI/FS
MW-22	12/02/93	745.90	--	6.56	0.00	739.34	FACILITY RI/FS
	04/26/94	745.90	--	6.21	0.00	739.69	FACILITY RI/FS
MW-23	12/02/93	746.19	--	6.67	0.00	739.52	FACILITY RI/FS
	04/26/94	746.19	--	6.33	0.00	739.86	FACILITY RI/FS
MW-24	12/02/93	746.17	--	7.31	0.00	738.86	FACILITY RI/FS
	04/26/94	746.17	--	6.95	0.00	739.22	FACILITY RI/FS
MW-25	12/02/93	745.07	--	6.27	0.00	738.80	FACILITY RI/FS
	04/26/94	745.07	--	5.94	0.00	739.13	FACILITY RI/FS
MW-26	12/02/93	744.36	--	6.64	0.00	737.72	FACILITY RI/FS
	04/26/94	744.36	--	6.40	0.00	737.96	FACILITY RI/FS
MW-27	12/02/93	744.36	--	9.24	0.00	735.12	FACILITY RI/FS
	04/26/94	744.36	--	9.17	0.00	735.19	FACILITY RI/FS
	06/06/94	744.36	--	9.14	0.00	735.22	FACILITY RI/FS
MW-28	12/03/93	744.42	--	10.80	0.00	733.62	FACILITY RI/FS
	04/26/94	744.42	--	6.27	0.00	738.15	FACILITY RI/FS
	06/06/94	744.42	--	6.19	0.00	738.23	FACILITY RI/FS

* Not calculated due to the presence of LNAPL (Light Non-Aqueous Phase Liquid).

TABLE 10
GROUNDWATER ANALYTICAL RESULTS - MONITORING WELLS (a)
Manhole 34 Facility RI/FS
Intersection of North Sixth Street and Yakima Valley Highway
Sunnyside, Washington

Monitoring Well Identification	Date Sampled	TPH as Diesel (ug/l)	TPH as Gasoline (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-benzene (ug/l)	Total Xylenes (ug/l)	Dissolved Lead (b) (ug/l)
MW-8	11/30/93	--	--	--	--	--	--	--
MW-66 (c)	11/30/93	--	--	--	--	--	--	--
MW-9	11/30/93	--	--	--	--	--	--	--
MW-12	11/30/93	--	--	--	--	--	--	--
MW-15	11/30/93	--	--	--	--	--	--	--
MW-16	11/30/93	--	--	--	--	--	--	--
MW-17	11/30/93	--	--	--	--	--	--	--
MW-18	11/30/93	--	--	--	--	--	--	--
MW-19	11/30/93	--	--	--	--	--	--	--
MW-20	11/30/93	--	--	--	--	--	--	--
MW-21	12/02/93	310 (e)	--	--	--	--	--	--
MW-22	12/02/93	--	--	--	--	--	--	--
MW-23	12/02/93	--	--	--	--	--	--	--
MW-24	12/02/93	650 (f)	630	6.5	27	16	33	--
MW-69 (c)	12/02/93	450 (f) [36%]	580 [8%]	6.7 [3%]	28 [4%]	16 [0%]	35 [6%]	--
MW-25	12/02/93	340 (e)	--	--	--	--	--	--
MW-26	12/02/93	270 (e)	--	--	--	--	--	--
MW-27	12/02/93	320 (d)	--	--	--	--	--	--
MW-28	12/02/93	--	--	--	--	--	--	--
MW-29	12/03/93	380	--	--	--	--	--	--
DMW-1	11/30/93	--	--	--	--	--	--	--
DMW-3	11/30/93	--	--	--	--	--	--	--
DMW-63 (c)	11/30/93	--	--	--	--	--	--	--
DMW-6	11/30/93	450 (d)	3,190	3,040	185	107	214	--
SCS	04/26/94	470 (e)	--	--	--	--	--	--
Trip Blank	11/30/93	(g)	--	--	--	--	--	(g)
Trip Blank	12/03/93	(g)	--	--	--	--	--	(g)
Method Reporting Limit		(250)	(50)	(0.5)	(1)	(1)	(1)	(2)

NOTES:
TPH = Total Petroleum Hydrocarbons; ug/l = micrograms per liter; LNAPL = Light Non-Aqueous Phase Liquid.
-- = constituent not detected above the Method Reporting Limit.
[ ] = Relative Percent Difference, see text for definition.
(a) Wells observed with LNAPL were not sampled, see Table 7 for listing.
(b) Field filtered
(c) Blind duplicate for samples collected from DMW-3, MW-8, and MW-24.
(d) Results due to the overlap of the heavier components of gasoline, which elute in the diesel region.
(e) Quantified as diesel. The sample contained componients that eluted in the oil range, but the chromatogram did not match the typical diesel fingerprint.
(f) Result is due to the light components of oil, which overlap into the diesel region.
(g) Not analyzed, as outlined in the Sampling and Analysis Plan.
TPH as Diesel and TPH as Gasoline analyzed by Ecology Methods WTPH-D and WTPH-G, respectively.
Benzene, toluene, ethlybenzene, and total xylenes analyzed by EPA Methods 5030/8020.
Dissolved lead analyzed by EPA Method 7421.
Laboratory analyses performed by Columbia Analytical Services, Inc., Bothell, Washington.