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CONCEPTUAL SITE MODEL
76 PRODUCTS FACILITY No. 380439

217 E Steuben Street
Bingen, Washington

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Prepared for:

Chevron Environmental Management Company
6001 Bollinger Canyon Road
San Ramon, California 94583

Prepared by:

Leidos, Inc.
18939 120th Avenue NE, Suite 112
Bothell, Washington 98011

Kinga Kozlowska
Environmental Scientist

Ronald Santos, PE
Senior Project Manager

RONALD SANTOS
STATE OF WASHINGTON
53690
REGISTERED
PROFESSIONAL ENGINEER
8/13/18

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1. INTRODUCTION

On behalf of Chevron Environmental Management Company (CEMC), Leidos, Inc. (Leidos) prepared this conceptual site model (CSM) for the property located at 217 East Steuben Street in Bingen, Washington (the site). The site is enrolled in the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP), No. 0480. The site UST ID is 8382 and Facility ID is 61834259.

The CSM identifies the occurrence and distribution of residual soil and groundwater contamination, exposure pathways, and sensitive receptors. The CSM was prepared to summarize environmental investigations, monitoring, and remedial activities that were performed at the site.

2. SITE BACKGROUND AND HISTORY

2.1 SITE DESCRIPTION AND VICINITY

The site is located in the city of Bingen (City), in Klickitat County, Washington at the southeast corner of the intersection of East Steuben Street (Lewis and Clark Hwy) and Maple Street. Currently the site is an active bulk plant facility owned by Garwood RK Co, Inc.

The bulk plant was constructed in 1924; prior use of the property is unknown. By 1953, the facilities at the site consisted of four 20,000-gallon aboveground storage tanks (ASTs), one 550-gallon heating oil underground storage tank (UST), a 6,000-gallon diesel UST, drum fillers, a septic tank, a cesspool, one wooden loading rack, rail car and truck unloaders, a garage building, an office, and a warehouse. In the mid-1970s, a 1,000-gallon UST and associated fuel dispensers were installed east of the warehouse. The UST and dispensers were owned and operated by a third party. The drum fillers were removed in 1981. One 20,000-gallon AST, new truck unloaders and associated concrete slab, and a drain line were installed in approximately early 1980s. The wooden loading rack and original truck unloaders were removed during the same period. The wooden loading rack was replaced with a steel loading rack in the same general vicinity. The heating oil UST and the 6,000-gallon diesel UST were removed in 1989 (GeoEngineers, Inc. [GeoEngineers], 1996).

In addition, a waste-oil AST was formerly located near the southwest corner of the warehouse. The tank was moved to the southwest corner of the garage. Three horizontal ASTs were installed in the tank farm area in the early 1990s. A small concrete containment area was constructed southwest of the horizontal ASTs (GeoEngineers, 1996).

In 1995, some of the site features were removed in preparation for excavation activities (see Section 2.2). Based on aerial photographs, the current property features include an office/warehouse building in the southeast corner of the parcel. The warehouse building is located in the general vicinity of the warehouse present at the site before the 1995 excavation. Five 20,000-gallon ASTs, and a smaller AST (which was apparently added sometime after 1995), three horizontal ASTs, a garage, truck loading rack, and truck unloaders are located in the northwestern-central portion of the property. In the concrete containment located southwest of the horizontal ASTs (indicated in GeoEngineers, 1996) an AST is now present. The former

office building in the central portion of the site, waste-oil AST near the garage, as well as the dispensers located east of the warehouse are not visible on aerial photographs. It is unknown if the third party owned and operated 1,000-gallon UST is still present[1]. The site is paved and the central and northern portion of the property is fenced. The current site features are shown on Figure 1.

Land use in the vicinity of the site is primarily retail, industrial, and residential. The facility is boarded to the south by Amtrak railway, to the east by a City property occupied by a storage garage, to the north by East Steuben Street (Lewis and Clark Hwy), and to the west by Maple Street.

The current zoning of the site is defined in the Klickitat County ordinance as Industrial Park (IP). The industrial park district is a light industrial zoning classification suitable for the manufacturing, distribution, and assembly of finished products. Residential uses are prohibited in the lP zone, with the exception of accessory uses. Land in the general vicinity of the site is developed and includes commercial, industrial, and residential developments.

2.2 SUMMARY OF PREVIOUS SITE INVESTIGATIONS AND REMEDIAL ACTIVITIES

Several environmental investigations and remedial activities were performed at the site and are documented in GeoEngineers 1989, 1990, 1994, and 1996 reports. The selected historical monitoring well and soil boring locations are shown on Figure 1. A summary of soil and groundwater analytical results is presented in Tables 1 and 2 and on Figure 2. The following is a summary of environmental activities compiled from the above referenced reports.

1989

Northwest Field Services (NFS) were contracted by Unocal and completed removal of the 6,000-gallon diesel UST[2] located near the former warehouse. The excavation extended to approximately 10 feet below ground surface (bgs) in the northern portion and to approximately 9 feet bgs in the southern portion. NFS collected one soil sample from the tank excavation (the exact location is unknown) and it was analyzed for total petroleum hydrocarbons (TPH). Concentration of TPH was 1,200 milligrams per kilogram (mg/kg) (GeoEngineers, 1989).

In addition, GeoEngineers were retained by Unocal to document the tank removal and collect soil samples from the above excavation. No water was observed in the excavation. Four soil samples (sample 1, 2, 3, and 5) were collected from the walls at depths between 1 and 3.4 feet bgs and one sample (sample 4) was collected from the bottom of the excavation at a depth of 9 feet bgs. In addition, one soil sample (sample 6) was collected near the oil storage building (warehouse), approximately 6 feet southwest of the excavation at a depth of approximately 1.5 feet bgs[3]. The samples were analyzed for TPHs and benzene, toluene, ethylbenzene, and xylenes (BTEX). TPHs were detected in all of the samples (the maximum concentration was 9,200

[1] Based on Ecology Tank Data Summary report, a 1,000-galon unleaded gasoline UST was removed from the site in February 2008. The tank is listed under Wilson Oil Inc. (Facility ID 24435695), at the site's address. Alternate names for facility 24435695 are listed as Pacific Pride, Pacific Pride Garwood Co, and RK Garwood Co Inc.

[2] In subsequent reports it was indicated that the tank was 5,000-gallon in size.

[3] In subsequent reports it was indicated that in addition to the 5 soil samples collected from the excavation, two other samples were collected. The samples were called B-1 (located within the 1989 tanks excavation) and B-2 (located near the former warehouse). Review of the 1989 GeoEngineers report and the laboratory report indicates however, that only one of these samples was collected. Location of B-2 matches the location of sample that was collected at that time. In this report location B-1 was omitted and location B-2 is called 6 to match the original sample ID.

mg/kg). Based on the soil sampling data, petroleum affected soil were present in the south wall of the excavation and near the oil storage building (GeoEngineers, 1989).

A 550-gallon heating oil UST was also removed in 1989, however, GeoEngineers did not monitor or document this event (GeoEngineers, 1990).

Soil analytical data tables and a figure with sampling locations from the 1989 GeoEngineers report are included in Appendix A.

1990

In April, four soil borings (B-1 through B-4), four groundwater monitoring wells (MW-1 through MW-4), and one hand auger soil boring (RP-1) were completed at the site. The soil borings were completed at depths between 8.5 and 10.5 feet bgs and monitoring wells were installed at depths between 9 and 25 feet bgs. The hand auger boring was completed in the storm water retention pond, east of the warehouse. Soil samples were analyzed for TPHs and BTEX. BTEX compounds were either not detected or detected at concentrations below the Model Toxics Control Act (MTCA) Method A cleanup levels. The maximum concentration of TPHs was 18 mg/kg, below the MTCA Method A cleanup level.

Groundwater samples were collected from all newly installed wells and analyzed for TPHs and BTEX. BTEX compounds were either not detected or detected at concentrations below the MTCA Method A cleanup levels. TPHs were detected in monitoring wells MW-1 and MW-4 at concentrations of 1,600 micrograms per liter (µg/l) and 800 µg/l, respectively (GeoEngineers, 1990). Concentration detected in well MW-1 was above the MTCA Method A cleanup level.

Soil and groundwater analytical data tables and a figure with sampling locations from the 1990 GeoEngineers report are included in Appendix B.

1994

In April, groundwater samples were collected from the existing monitoring wells and analyzed for TPHs and BTEX. TPHs and BTEX compounds were not detected in any of the samples (GeoEngineers, 1994a).

In May, one soil boring (B-5) and one groundwater monitoring well (MW-5) were completed at the site to depths of approximately 9.5 feet bgs and 25 feet bgs, respectively. Concentrations of petroleum hydrocarbons in soil samples collected during this event were below the laboratory reporting limits (GeoEngineers, 1994a). Groundwater was not encountered in monitoring well MW-5 during construction and subsequent event in June. GeoEngineers reviewed historical boring logs and concluded that shallow groundwater in other areas of the site is perched on the basalt surface. In borings MW-1 through MW-4, the basalt layer slopes downward toward MW-4, in the direction of groundwater flow. Basalt was encountered at a depth of approximately 15 feet bgs and groundwater is present at approximately 13.5 feet bgs in well MW-4. Well MW-4 is located in the eastern portion of the site, approximately 45 feet south of well MW-5. Well MW-5 was installed to a depth of approximately 25 feet bgs, however, basalt was encountered at approximately 5 feet bgs. Well MW-5 is dry because the basalt layer is above the level of perched groundwater on this portion of the site (GeoEngineers, 1994a).

Soil and groundwater analytical data tables and a figure with sampling locations from the July 1994 GeoEngineers report are included in Appendix C.

In July, three soil borings (B-6 through B-8) and 16 hand auger borings (HA-1 through HA-16) were completed at the site. The soil borings were advanced to depths of approximately 6.5 and 8 feet bgs and the hand auger borings were advanced to depths of approximately 1.2 to 5.5 feet bgs. In addition, two surface soil samples (S-1 and S-2) were collected from the exterior west end of the warehouse, in the vicinity if the former waste-oil AST. A total of 23 soil samples were collected and analyzed for TPHs and BTEX. Concentrations of TPH as gasoline (TPH-G) and BTEX were below their respective MTCA Method A cleanup levels or the laboratory reporting limits. Concentration of TPH as diesel (TPH-D) in soil sample collected in the vicinity of former pumps (B-8) at a depth of 8 feet bgs exceeded the MTCA Method A cleanup level. Concentrations of TPH-D and TPH as heavy oil (TPH-O) in samples collected in the vicinity of the horizontal ASTs (HA-7 and HA-8) at depths between 0.25 and 0.5 feet bgs as well as in surface samples S-1 and S-2 exceeded their respective MTCA Method A cleanup levels. In addition, concentrations of TPH-O in samples collected in the vicinity of the warehouse (HA-9, HA-10, and HA-11) at depths of approximately 0.25 feet bgs exceeded the MTCA Method A cleanup level (GeoEngineers, 1994b).

GeoEngineers estimated that approximately 465 cubic yards of petroleum affected soil was present at the site (GeoEngineers, 1994b).

Soil analytical data table and a figure with sampling locations from the October 1994 GeoEngineers report are included in Appendix D.

1995

Between September and October 1995, GeoEngineers oversaw excavation of petroleum affected soil at the site and completed shallow hand auger explorations in the previously unexplored areas of the site. Prior to the excavation activities, steel stairway and product piping (located in the vicinity of the loading rack), truck unloaders concrete pad, catch basin, warehouse, and horizontal ASTs were removed from the site. A total of 91 soil samples were submitted to be analyzed for TPH-G, TPH-D, TPH-O, and/or BTEX (GeoEngineers, 1996).

The remedial excavations were completed in the following areas:

1). Western portion of the site, in the vicinity of loading rack, horizontal ASTs, pump #2 and #4, and the former pumps. Approximately 8 cubic yards of soil was excavated in the vicinity of the loading rack to a depth of approximately 3.5 feet bgs. Approximately 40 cubic yards of soil was excavated in the vicinity of the two easternmost ASTs to a maximum depth of approximately 3 feet bgs. Approximately 10 cubic yards of soil was excavated in the vicinity of the pumps to a maximum depth of approximately 2.5 feet bgs in the vicinity of product pump #2 and 4.5 feet bgs in the vicinity of product pump #4. Approximately 322 cubic yards of soil was excavated in the vicinity of the former pumps to a maximum depth of approximately 9 feet bgs where basalt bedrock was encountered.

Based on the analytical results, TPH-D contaminated soil remains in the south wall of the former pumps excavation (sample locations 38, 39, and 40) at a depth of approximately 8 feet bgs. The maximum detected concentration of TPH-D in this area was 6,000 mg/kg. Additional soil could not be removed from this area without encroaching onto the property south of the site, owned by BNSF.

2). Eastern portion of the site, in the vicinity of warehouse, northwest corner of the warehouse, former waste-oil AST, drain line discharge area behind the warehouse, and southwest retention

pond area. Drain line discharge area and retention pond area samples were collected for qualitative analysis purposes. These areas were subsequently over-excavated.

The excavation at this portion of the site merge in one large, shallow excavation. Approximately 320 cubic yards of soil was excavated and the excavation depth was approximately 2 to 3.5 feet bgs.

Based on analytical results, TPH-D and/or TPH-O contaminated soil remains in the south wall of the large east remedial excavation (sample locations 64 and 66) at a depth of approximately 2 feet bgs. The maximum detected concentration of TPH-D was 3,800 mg/kg and of TPH-O was 12,000 mg/kg. Additional soil could not be removed due to proximity of the concrete retaining wall and the property boundary.

3). Driveway in the vicinity of the garage, loading rack and office where surface staining was observed. Each of these areas was excavated to a depth of approximately 1 foot bgs. Approximately 10 cubic yards of contaminated soil was excavated.

Based on analytical data, concentrations of TPH were below their respective MTCA Method A cleanup levels in samples collected in this area.

Approximately 710 cubic yards of contaminated soil from all three areas of the excavation was transported for offsite disposal.

Soil analytical data tables and figures with sampling locations from the 1996 GeoEngineers report are included in Appendix E.

2008

In January, Ecology completed a site hazard assessment and ranked the site 3 using the Washington Ranking Method (WARM; Ecology 2008). Sites are ranked on a scale of one to five, with a score of one representing the highest relative level on concern, and five the lowest.

2017

In July, Ecology issued Notice of Potentially Liability letters to the following parties:

- Wilson Oil, Inc. – current property owner
- Union Oil Company of California – former property operator

2.3 OFF-SITE SOURCES

No potential off-site sources in the immediate vicinity of the site were identified on the Washington Ecology Cleanup Site Database. However, Hunsaker Oil Company (Ecology facility ID 28537434) and Wilson Oil (Ecology facility ID 13233349) are located approximately 0.1 miles northwest and north of the site, respectively.

3. REGIONAL AND SITE GEOLOGY AND HYDROGEOLOGY

There are primarily three soil series within the City of Bingen. These soils include Cauley silt loam, Leidl-Oreoke Complex, and Beezee cobbly loam. The unconsolidated soil thickness is approximately 25 to 30 feet bgs, with basalt bedrock below the soils. The soils may be a result of Pleistocene outburst flood deposits (City, 2015).

The City is located within Water Resource Inventory Area (WRIA) 29. The primary surface water are Columbia River, Dry Creek, Jewett Creek, and Bingen Lake (City, 2015). Columbia

River is located approximately 0.45 miles to the southwest, south, and southeast of the site. Bingen Lake is located approximately 0.3 mile to the south-southeast of the site. Dry Creek and Jewett Creek are located approximately 0.25 miles to the north-northwest and 0.5 mile to the west of the site, respectively.

The National Wetlands Inventory map identifies wetland in the City area that follow the shoreline of the river. The wetlands within the City are classified as Palustrine, Lacustrine, Littoral, Forested, and seasonally or permanently flooded (City, 2015).

Based on the previous soil explorations, the site is underlain by silty fine sand and sandy silt with varying amounts of gravel and gravel with varying amount of silt and cobbles. Fractured basalt was encountered beneath the overlaying sand, silt, and gravel units at depth between 5 and 25 feet bgs in location MW-5 (GeoEngineers, 1994b). Basalt was encountered in a few locations at depths of approximately 9 feet bgs (GeoEngineers, 1994a and 1994b).

Groundwater was encountered at depths between approximately 5 and 14 feet bgs. Based on groundwater elevation data collected to date, groundwater flow trends toward the east with an estimated gradient of approximately 0.04 foot/foot (GeoEngineers, 1994a). Shallow groundwater is perched on the basalt surface. The basalt appears to slope towards east (GeoEngineers, 1994a).

4. CONTAMINATION SOURCE

The site has operated as a bulk fuel facility since the 1924. The site is listed on the Ecology Leaking Underground Storage Tanks List (LUST) since June 1986 with an ID number of 1941. Potential sources of petroleum hydrocarbons detected in soil and groundwater may also be attributed to the general operations of the bulk plant facilities for over 90 years.

5. CONTAMINANTS AND MEDIA OF CONCERN

Historical analytical results were evaluated to identify contaminants of potential concern (COPCs). COPCs include those hazardous substances that are known to be present at a site, or which are suspected to be present based on information regarding the nature of a known release or past operations at a site. The list of COPCs includes all of the analytes that were detected in samples collected during past field activities, as summarized in Tables 1 and 2. The COPCs were compared to MTCA Method A cleanup levels for the applicable medium (soil and groundwater). When a COPC is always detected at a concentration below its cleanup level, it is eliminated from further review as a potential risk.

COPCs with concentrations above their respective MTCA Method A cleanup levels are the contaminants of concern (COCs) and were retained for further evaluation. These COCs for this site include TPH-D and TPH-O. Those media affected by COCs are considered media of concern and are further described below.

5.1 SOILS

5.1.1 Surface Soils (<15 feet)

Five soil sampling events were completed at the site between 1989 and 1995. Soil types encountered during site assessment activities consisted of silty fine sand and sandy silt with varying amounts of gravel and gravel with varying amount of silt and cobbles. Basalt was encountered at depths between 5 and 25 feet bgs. Soil samples collected in 1989 and 1994

indicated residual petroleum hydrocarbons were present in the vicinity of the diesel UST, warehouse, former location of waste-oil AST, former pumps, and horizontal ASTs from ground surface to approximately 5 feet bgs at concentrations above their respective MTCA Method A cleanup levels. Most of these residual hydrocarbon-affected soil locations were subsequently excavated in 1995.

Petroleum contaminated soil remains in the south wall of the diesel UST excavation (sample location 3) at a depth of approximately 1 foot bgs, in the south wall of the former pumps excavation (sample locations 38, 39, and 40) at a depth of approximately 8 feet bgs, and in the south wall of the large east remedial excavation (sample locations 64 and 66) at a depth of approximately 2 feet bgs. Soil analytical results are summarized in Table 1 and on Figure 2.

5.1.2 Subsurface Soils (>15 feet)

Only one soil sample was collected at the site from depths below 15 feet. All COCs detected in this sample were less than their respective MTCA Method A cleanup levels. Basalt bedrock is present at the site at shallow depths, therefore, subsurface soils (>15 feet) are not a media of concern at this site.

5.2 GROUNDWATER

Three monitoring events (May 1990, April and May 1994) which included two sampling events (May 1990 and April 1994) were completed at the site for monitoring wells MW-1 through MW-4. Groundwater samples were analyzed for TPH and BTEX. Concentrations of TPHs during the May 1990 event were detected in monitoring wells MW-1 and MW-4 at concentrations of 1,600 µg/l and 800 µg/l, respectively. BTEX compounds were either not detected or detected below their respective MTCA Method A cleanup levels. Monitoring well MW-5 was monitored twice in May and June 1994 and was dry. Groundwater analytical results are summarized in Table 2.

The status and condition of the monitoring wells after the 1995 excavation is unknown.

5.3 SOIL VAPOR

The potential for vapor intrusion has not been assessed at the site. However, all volatile COPCs were below their respective MTCA Method A cleanup levels in soil. All volatile COPCs were below their respective MTCA Method A cleanup levels in groundwater. In addition, all groundwater volatile COPCs were below their respective Method C groundwater vapor intrusion screening levels as outlined in the draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action (Document 09-09-047) updated February 2016 and April 2018. Method C was applied because the Method B vapor screening levels are overly conservative for non-residential and non-industrial buildings as discussed in Section 6.6.2 of the guidance.

6. POTENTIAL EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

6.1 PRELIMINARY ASSESSMENT

Potential receptors and exposures through direct and indirect pathways were considered for the CSM. The potential receptors and exposure scenarios were determined based on current and reasonably foreseeable future land use in the immediate vicinity of the site.

As the CSM was further refined, receptor scenarios and exposure pathways were reassessed to determine if they are complete or incomplete. When a pathway is determined to be potentially

complete, it is retained for further evaluation. When a pathway is found to be incomplete, the risk of exposure does not exist and that pathway is eliminated from further evaluation.

6.2 POTENTIAL RECEPTORS

The following potential receptors were considered in the evaluation of impacts on human health and the environment:

- Construction workers who contact contaminated soil and/or groundwater in the future during construction, if no worker protection controls are in place;
- Construction workers who contact contaminated soil in the future if pavement is removed;
- Construction workers who inhale contaminated soil particles in the future during remedial action activities, if no protection controls are in place;
- Occupational receptors who inhale indoor air contaminated via vapor intrusion by volatilization of contaminated shallow soil;
- Soil biota and terrestrial organisms which contact contaminated soil or groundwater.

6.3 POTENTIAL EXPOSURE PATHWAYS

An exposure pathway is the path a contaminant of concern could potentially take from a source to a receptor. In identifying the potential exposure pathways at the site, all reasonable means by which receptors might come into contact with contaminants of concern were considered. Impacted media at the site includes soil, groundwater, and potentially vapor.

6.3.1 Direct Contact Exposure Pathway

Surface and Subsurface Soils

Based on historical soil data, the direct contact (dermal absorption and ingestion) exposure pathways to surface soils are considered potentially complete. Concentrations of TPH-D and TPH-O in surface (<15 feet) soil were above their respective MTCA Method A cleanup levels in the vicinity of the diesel UST excavation, former pumps excavation, and the large remedial excavation.

Based on historical soil data, the direct contact (dermal absorption and ingestion) exposure pathways to subsurface (>15 feet) soils are considered incomplete. Only one sample was collected from subsurface soils; however, concentrations of all COPCs were below their respective MTCA Method A cleanup levels and the site is underlain by basalt bedrock at depths ranging between 5 and 25 feet bgs.

Based on historical groundwater data, the soil leaching to groundwater exposure pathway is potentially complete. TPHs in groundwater were detected at concentrations exceeding the MTCA Method A cleanup level.

Groundwater

The direct contact exposure pathways to groundwater to the current receptors were evaluated and eliminated based on the following information: (1) The City of Bingen currently provides domestic water to the site and to all proximal locations around the site, (2) existing water wells in the vicinity of the site are deep, (3) depth to groundwater in wells located at the site ranges from approximately 5 to 14 feet bgs.

The City of Bingen provides treated drinking water. The City has four municipal wells that serve as a water source. In addition, the City purchases drinking water from the City of White Salmon. The municipal wells were installed below 400 feet bgs. Well No. 2 is located in Maple Street, approximately 0.15 miles north of the site; however, the well is no longer in use. The other three wells (Well No. 5 Park Well, Well No. 3 Reservoir Well, and Well No. 6 Dry Creek Well) are located approximately 0.35 miles northwest and west of the site.

Based on the Washington State Water Wells Reports review, there are seven water wells located within approximately 1 mile radius from the site. One of the domestic wells is located approximately 0.25 miles northwest of the site at 416 N Oak Street. The well was constructed in 2005 to 590 feet bgs and had a static water level of 390 feet. Underwood Fruit & Warehouse has one domestic and three industrial wells, constructed to depths of approximately 257 to 425 feet bgs. Underwood Fruit & Warehouse is located approximately 0.9 mile to the west. Dickey Farms Inc. which is located approximately 0.5 miles northwest of the site has a 240 feet deep irrigation well. In addition, a 165 feet deep domestic well, constructed in 1991, is located on Hwy 14 (Lewis and Clark Hwy), however, the exact location of the well is unknown.

A comparison of boring logs and depth-to-water measurements between onsite monitoring wells and nearby water wells identified in the State Water Wells Reports indicate that there may be two separate water-bearing zones beneath the site: a perched upper aquifer and a deeper aquifer which are isolated by a basalt bedrock (GeoEngineers, 1994a).

Based on historical groundwater data, the direct contact exposure pathways for future construction/excavation workers is potentially complete. TPHs in groundwater were detected at concentrations exceeding the MTCA Method A cleanup level.

Surface Water

The nearest surface water body is the Dry Creek located approximately 0.25 miles north-northwest of the site. Based on groundwater elevation data collected in the early 1990s, groundwater flow trends toward the east with an estimated gradient of approximately 0.04 foot/foot (GeoEngineers, 1994a). Based on the groundwater data, the pathway to surface water receptors is eliminated, because surface water is located up-gradient to the site.

6.3.2 Vapor Exposure Pathway

Based on soil and groundwater data, the volatilization to outdoor air and vapor intrusion into building exposure pathways can be eliminated. All groundwater volatile COCs were below their respective Method C groundwater vapor intrusion screening levels. In addition, laboratory results indicate benzene concentrations in soil were below the Method B and Method C soil gas screening levels.

7. CONCLUSIONS

The CSM was prepared to consolidate available site-specific data and regional information to evaluate the nature and extent of hydrocarbon-affected soil and groundwater, exposure pathways, and sensitive receptors.

Numerous remedial excavations were conducted at the site and an approximate total of 1,175 cubic yards of hydrocarbon-affected soil was removed. Available soil data collected after remedial excavations conducted in 1995 indicate residual hydrocarbon-affected soils with concentrations greater than MTCA A were identified in the vicinity of the diesel UST

excavation, former pumps excavation, and the large remedial excavation in the vicinity of the warehouse. These concentrations were detected in excavations that were completed in the southern portion of the Site in close proximity of the southern property line.

Hydrocarbon-affected groundwater with concentrations above MTCA Method A cleanup levels were only detected in well MW-1 which is located near the truck loading rack. The direct contact exposure pathways for the current receptors to groundwater were evaluated and eliminated because the City of Bingen currently provides domestic water to the site and to all proximal locations around the site, and existing water wells in the vicinity of the site are deep and not in the same water bearing zone as the monitoring wells. However, these pathways are potentially complete for future construction/excavation workers. In addition, the soil leaching to groundwater exposure pathway is potentially complete, since TPHs were detected in groundwater at concentrations exceeding the MTCA Method A cleanup level.

Based on soil and groundwater data, the volatilization to outdoor air and vapor intrusion into building exposure pathways can be eliminated. All groundwater volatile COCs were below Method C groundwater vapor intrusion screening levels. In addition, laboratory results indicate benzene concentrations in soil were below the Method B and Method C soil gas screening levels.

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LIMITATIONS

This technical document was prepared on behalf of CEMC and is intended for its sole use and for use by the local, state, or federal regulatory agency that the technical document was sent to by Leidos. Any other person or entity obtaining, using, or relying on this technical document hereby acknowledges that they do so at their own risk, and that Leidos shall have no responsibility or liability for the consequences thereof.

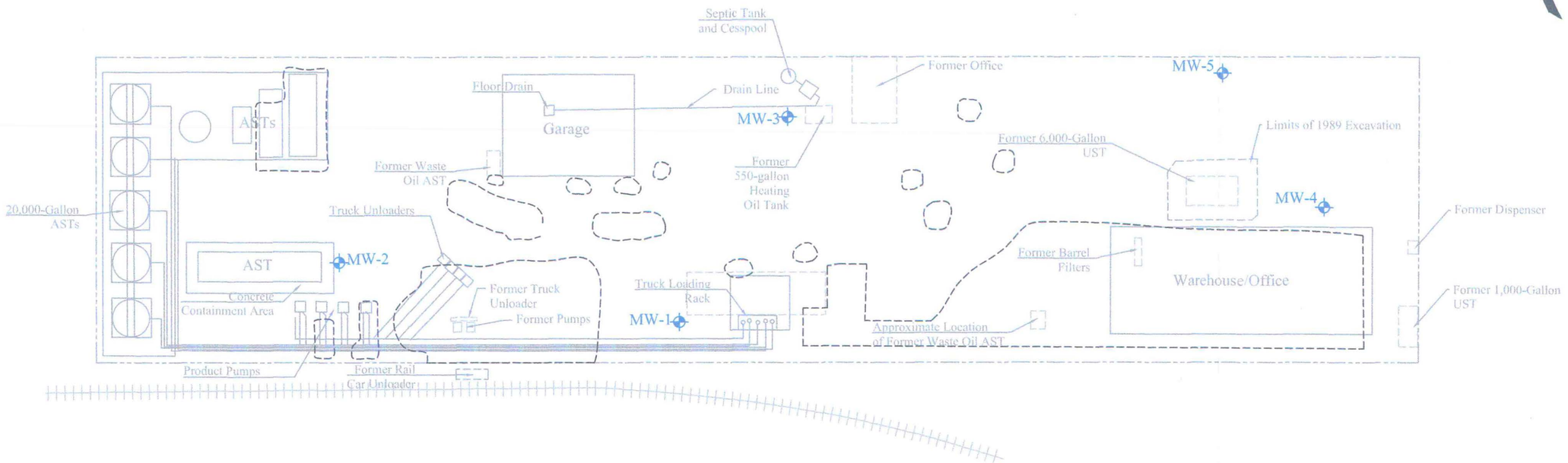
Site history and background information provided in this technical document are based on sources that may include interviews with environmental regulatory agencies and property management personnel and a review of acquired environmental regulatory agency documents and property information obtained from CEMC and others. Leidos has not made, nor has it been asked to make, any independent investigation concerning the accuracy, reliability, or completeness of such information beyond that described in this technical document.

Recognizing reasonable limits of time and cost, this technical document cannot wholly eliminate uncertainty regarding the vertical and lateral extent of impacted environmental media.

Opinions and recommendations presented in this technical document apply only to site conditions and features as they existed at the time of Leidos site visits or site work and cannot be applied to conditions and features of which Leidos is unaware and has not had the opportunity to evaluate.

All sources of information on which Leidos has relied in making its conclusions (including direct field observations) are identified by reference in this technical document or in appendices attached to this technical document. Any information not listed by reference or in appendices has not been evaluated or relied on by Leidos in the context of this technical document. The conclusions, therefore, represent our professional opinion based on the identified sources of information.

Figures



LEGEND

MW-1 ⊕	Monitoring Well Location
— — —	Site Boundary
++++++++	Former Railroad Tracks
- - - - -	Former Site Features
UST	Underground Storage Tank
AST	Aboveground Storage Tank
◯	1995 Excavation Limits

SOURCE: GeoEngineers, Inc., Google Earth

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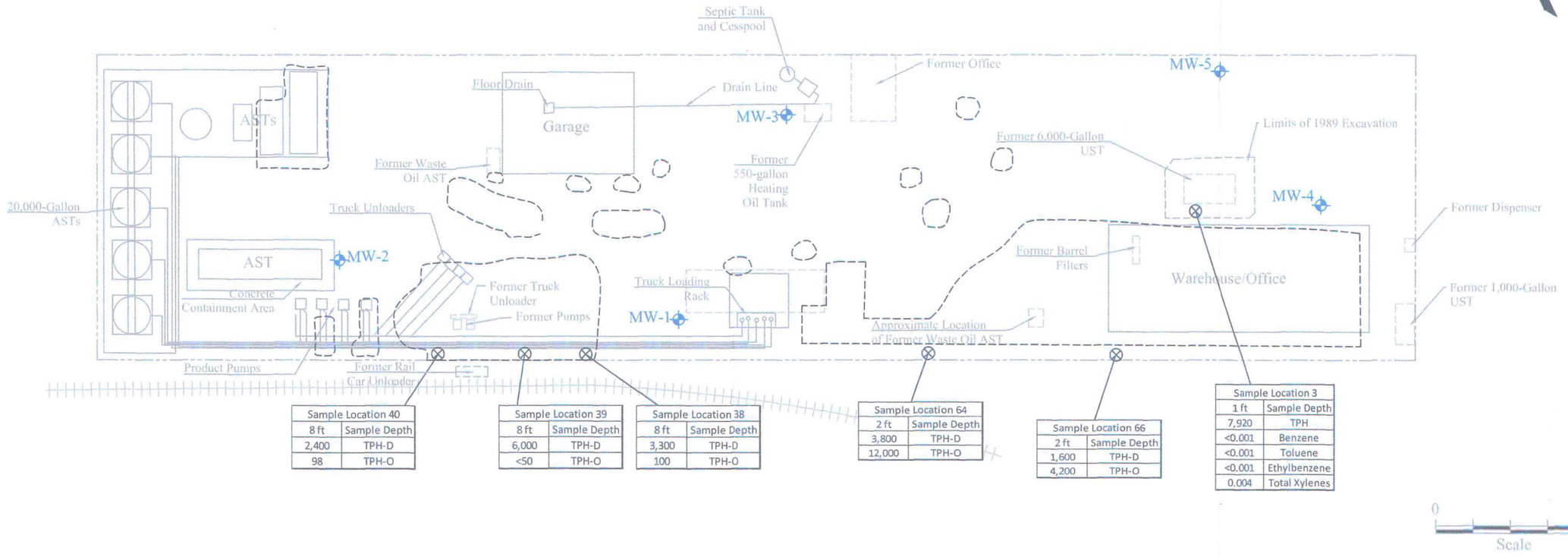
Chevron Site No. 380439
Former Unocal Bulk Plant No. 0046
217 E. Stueben Street
Bingen, Washington

FIGURE 1
Site Plan

DATE: 8/8/2018 | DRAWING: 380439 Site Map.dwg



Sample Location 40	
8 ft	Sample Depth
2,400	TPH-D
98	TPH-O

Sample Location 39	
8 ft	Sample Depth
6,000	TPH-D
<50	TPH-O

Sample Location 38	
8 ft	Sample Depth
3,300	TPH-D
100	TPH-O

Sample Location 64	
2 ft	Sample Depth
3,800	TPH-D
12,000	TPH-O

Sample Location 66	
2 ft	Sample Depth
1,600	TPH-D
4,200	TPH-O

Sample Location 3	
1 ft	Sample Depth
7,920	TPH
<0.001	Benzene
<0.001	Toluene
<0.001	Ethylbenzene
0.004	Total Xylenes

LEGEND

MW-1	Monitoring Well Location
⊗	Soil Sample Location
— — —	Site Boundary
	Former Railroad Tracks
	Former Site Features
UST	Underground Storage Tank
AST	Aboveground Storage Tank
mg/kg	Milligrams per Kilogram
TPH	Total Petroleum Hydrocarbons
TPH-D	Total Petroleum Hydrocarbons as Diesel
TPH-O	Total Petroleum Hydrocarbons as Oil
ft	Feet
	1995 Excavation Limits

Note: All soil concentrations presented in mg/kg.

SOURCE: GeoEngineers, Inc., Google Earth

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Chevron Site No. 380439
Former Unocal Bulk Plant No. 0046
217 E. Stueben Street
Bingen, Washington

FIGURE 2
Summary of Soil Analytical Results Exceeding MTCA Method A

DATE: 8/8/2018 | DRAWING: 380439 Site Map.dwg

TABLE 1
SOIL ANALYTICAL RESULTS
76 PRODUCTS FACILITY NO. 380439
217 E Steuben Street, Bingen, Washington
Concentrations reported in mg/kg

Sample ID	Date Sampled	Sample Depth (ft)	Sample Location	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH	TPH-G by Ecology WTPH-HCID	TPH-D by Ecology WTPH-HCID	TPH-O by Ecology WTPH-HCID	TPH-G by Ecology WTPH-G and -Dx	TPH-D by Ecology WTPH-G and -Dx	TPH-O by Ecology WTPH-G and -Dx
1989 Diesel Storage Tank Excavation														
1	05/19/89	3	North wall	<0.001	<0.001	<0.001	<0.001	11	--	--	--	--	--	--
2	05/19/89	3.4	East wall	<0.001	<0.001	<0.001	<0.001	83	--	--	--	--	--	--
3	05/19/89	1	South wall	<0.001	<0.001	<0.001	0.004	**7,920**	--	--	--	--	--	--
4	05/19/89	9	Base	--	--	--	--	98	--	--	--	--	--	--
5	05/19/89	2.5	West wall	--	--	--	--	13	--	--	--	--	--	--
6 [b]	05/19/89	1.5	Near oil storage building	<0.001	0.002	<0.001	0.003	9,200	--	--	--	--	--	--
1990 Soil Borings														
B-1	05/07/90	3		ND	0.002	ND	0.001	ND	--	--	--	--	--	--
B-2	05/07/90	3		ND	ND	ND	ND	ND	--	--	--	--	--	--
B-3	05/07/90	7.5		ND	0.002	ND	0.003	ND	--	--	--	--	--	--
B-4	05/07/90	3		ND	0.004	0.001	0.006	6	--	--	--	--	--	--
MW-1	05/07/90	5		ND	0.003	ND	0.001	11	--	--	--	--	--	--
MW-2	05/07/90	3		ND	ND	ND	ND	ND	--	--	--	--	--	--
MW-3	05/07/90	3		ND	ND	ND	ND	6	--	--	--	--	--	--
MW-4	05/07/90	5		ND	ND	ND	ND	10	--	--	--	--	--	--
RP-1	05/07/90	0.5	Hand auger excavation	ND	ND	ND	ND	18	--	--	--	--	--	--
	05/07/90	1.5		ND	ND	ND	ND	15	--	--	--	--	--	--
1994 May Soil Borings														
B-5	05/15/94	5.0		--	--	--	--	--	<20	<50	<100	--	--	--
	05/12/94	9		--	--	--	--	--	<20	<50	<100	--	--	--
MW-5	05/12/94	5		--	--	--	--	--	<20	<50	<100	--	--	--
	05/12/94	20		--	--	--	--	--	<20	<50	<100	--	--	--
1994 July Soil Borings														
B-6	07/25/94	2.5	Truck loading rack	--	--	--	--	--	ND	ND	ND	--	--	--
	07/25/94	5.0		--	--	--	--	--	ND	ND	ND	--	--	--
B-7	07/25/94	5.0	Former heating oil tank	--	--	--	--	--	ND	ND	ND	--	--	--
B-8 [b]	07/25/94	2.5	Former pumps	--	--	--	--	--	D	D	ND	--	1,200	170
	07/25/94	5.0		--	--	--	--	--	D	D	ND	--	6,400	<50
HA-1	07/25/94	5.0	Garage floor drain	0.0005	0.0005	0.0005	0.0005	--	ND	ND	ND	--	--	--
HA-2	07/25/94	1.0	Product ASTs	--	--	--	--	--	ND	ND	ND	--	--	--
HA-3	07/25/94	1.5	Product ASTs	--	--	--	--	--	ND	ND	ND	--	--	--
HA-4	07/25/94	1.5	Product ASTs	--	--	--	--	--	ND	D	ND	--	71	<50
HA-5	07/25/94	1.5	Product ASTs	--	--	--	--	--	ND	ND	ND	--	--	--

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TABLE 1
SOIL ANALYTICAL RESULTS
76 PRODUCTS FACILITY NO. 380439
217 E Steuben Street, Bingen, Washington
Concentrations reported in mg/kg

Sample ID	Date Sampled	Sample Depth (ft)	Sample Location	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH	TPH-G by Ecology WTPH-HCID	TPH-D by Ecology WTPH-HCID	TPH-O by Ecology WTPH-HCID	TPH-G by Ecology WTPH-G and -Dx	TPH-D by Ecology WTPH-G and -Dx	TPH-O by Ecology WTPH-G and -Dx
HA-6	07/25/94	1.0	Retention pond	--	--	--	--	--	ND	ND	ND	--	--	--
HA-7 [b]	07/25/94	0.5	Horizontal ASTs	<0.013	<0.013	0.029	0.038	--	D	D	D	<2.0	14,000	32,000
	07/25/94	2.0		--	--	--	--	--	ND	D	D	--	<25	<50
HA-8 [b]	07/25/94	0.25	Horizontal ASTs	<0.013	<0.013	<0.013	0.068	--	D	D	D	2.4	4,100	53,000
	07/25/94	1.5		--	--	--	--	--	ND	D	D	--	31	410
HA-9 [b]	07/25/94	0.25	Warehouse	<0.013	<0.013	<0.013	<0.013	--	D	D	D	<2.0	1,000	2,400
	07/25/94	1.5		--	--	--	--	--	ND	D	D	--	200	520
HA-10 [b]	07/25/94	0.25	Warehouse	--	--	--	--	--	ND	D	D	--	1,100	4,800
	07/25/94	1.5		--	--	--	--	--	ND	ND	D	--	71	320
HA-11 [b]	07/25/94	0.25	Warehouse	<0.013	<0.013	<0.013	<0.013	--	D	D	D	<2.0	580	6,700
	07/25/94	1.5		--	--	--	--	--	ND	ND	D	--	--	--
S-1 [b]	07/25/94	surface	Former waste oil AST	--	--	--	--	--	D	D	D	--	12,000	52,000
S-2 [b]	07/25/94	surface	West end warehouse	<0.013	<0.013	0.049	0.100	--	D	D	D	2.5	19,000	42,000
1995 Excavation - West Portion														
Loading Rack														
4 [a]	09/14/95	0.1	Surface, south side of loading rack	--	--	--	--	--	D	D	D	--	--	--
17	09/14/95	3.0	Base, central portion	--	--	--	--	--	<20	<50	<100	--	44	<50
18	10/09/95	3.0	Base, west end	--	--	--	--	--	<20	<50	<100	--	40	<50
37	10/09/95	3.5	Base, east end	--	--	--	--	--	--	--	--	--	<25	<50
41	10/09/95	2.5	North wall	--	--	--	--	--	--	--	--	--	<25	<50
42	10/09/95	2.0	South wall	--	--	--	--	--	--	--	--	--	<25	<50
43	10/09/95	2.0	South wall, west end	--	--	--	--	--	--	--	--	--	<25	<50
44	10/09/95	2.5	West wall	--	--	--	--	--	--	--	--	--	<25	<50
45	10/09/95	2.5	North wall, west end	--	--	--	--	--	--	--	--	--	--	--
Horizontal AST														
7	09/13/95	2.0	North wall, west end	--	--	--	--	--	--	--	--	--	--	--
8	09/13/95	2.5	Base, west end	--	--	--	--	--	--	--	--	--	--	--
9	09/13/95	2.5	West wall	--	--	--	--	--	--	--	--	--	--	--
10 [a]	09/13/95	2.0	Base, north end	--	--	--	--	--	--	--	--	--	1,500	4,400
11	09/13/95	2.0	Base, east end	--	--	--	--	--	--	--	--	--	--	--
12 [a]	09/13/95	1.0	South wall	--	--	--	--	--	--	--	--	--	390	750
19	09/14/95	3.0	Base, north end	--	--	--	--	--	--	--	--	--	--	--
20	09/14/95	3.0	Base, south end	--	--	--	--	--	--	--	--	--	--	--
29	09/25/95	1.0	East wall	--	--	--	--	--	--	--	--	--	--	--
30	09/25/95	1.0	South wall, east end	--	--	--	--	--	--	--	--	--	--	--
31	10/09/95	1.5	South wall, west end	--	--	--	--	--	--	--	--	--	180	260

TA _ 1
SOIL ANALYTICAL RESULTS
76 PRODUCTS FACILITY NO. 380439
217 E Steuben Street, Bingen, Washington
Concentrations reported in mg/kg

Sample ID	Date Sampled	Sample Depth (ft)	Sample Location	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH	TPH-G by Ecology WTPH-HCID	TPH-D by Ecology WTPH-HCID	TPH-O by Ecology WTPH-HCID	TPH-G by Ecology WTPH-G and -Dx	TPH-D by Ecology WTPH-G and -Dx	TPH-O by Ecology WTPH-G and -Dx
Product Pump														
14	09/14/95	2.5	Below product pump #2	<0.013	<0.013	<0.013	<0.013	--	--	--	--	<2	130	<50
15	09/14/95	2.5	Below product pump #4, south end	<0.013	0.017	<0.013	<0.013	--	--	--	--	<2	<25	<50
16 [a]	09/14/95	2.5	Below, product pump # 4, north end	<0.013	<0.013	<0.013	<0.013	--	--	--	--	<2	620	920
63	10/16/95	4.5	Below product pump #4, north end	--	--	--	--	--	--	--	--	<2	170	<50
Former Pumps														
21	09/14/95	8.0	West wall	--	--	--	--	--	--	--	--	--	<25	--
22	09/19/95	7.0	North wall	--	--	--	--	--	--	--	--	--	<25	--
23	09/19/95	7.0	East wall	--	--	--	--	--	--	--	--	--	<25	--
24	09/19/95	8.5	Southeast corner	--	--	--	--	--	--	--	--	--	<25	--
25	09/19/95	7.0	North wall	--	--	--	--	--	--	--	--	--	<25	--
26 [a]	09/19/95	9.0	Base, southeast corner	--	--	--	--	--	--	--	--	--	3,700	--
38	10/09/95	8.0	South wall, east end	--	--	--	--	--	--	--	--	--	**3,300**	100
39	10/09/95	8.0	South wall, center	--	--	--	--	--	--	--	--	--	**6,000**	<50
40	10/09/95	8.0	South wall, west end	--	--	--	--	--	--	--	--	--	**2,400**	98
1995 - Drain Line Discharge and Retention Pond - Overexcavated														
13 [a]	09/13/95	0.0-0.5	Surface sample, south side of warehouse	--	--	--	--	--	D	D	D	--	11,000	4,800
27 [a]	09/25/95	0.0-0.5	Surface sample, south side of warehouse	--	--	--	--	--	D	D	D	--	3,300	2,400
28 [a]	09/25/95	0.0-0.5	Surface sample, south side of warehouse	--	--	--	--	--	D	D	D	--	12,000	4,000
46 [a]	10/09/95	0.0-0.5	Surface, retention pond	--	--	--	--	--	--	--	--	--	2,800	3,600
47 [a]	10/09/95	0.0-0.5	Surface, retention pond	--	--	--	--	--	--	--	--	--	26,000	16,000
48 [a]	10/09/95	0.0-0.5	Surface, retention pond	--	--	--	--	--	--	--	--	--	2,600	1,800
1995 Excavation - East Portion														
32 [a]	10/09/95	1.0	Wall, former loading rack	--	--	--	--	--	--	--	--	--	590	1,900
33	10/09/95	3.0	Base, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
34	10/09/95	3.0	Base, former waste oil AST	--	--	--	--	--	--	--	--	--	<25	<50
35	10/09/95	1.0	North wall, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
36	10/09/95	1.0	Waste oil AST	--	--	--	--	--	--	--	--	--	86	130
49	10/09/95	3.0	Base, waste oil AST	--	--	--	--	--	--	--	--	--	<25	<50
50	10/09/95	3.0	Base, warehouse	--	--	--	--	--	--	--	--	--	41	82
51	10/09/95	3.0	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
52	10/11/95	3.0	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
53	10/11/95	3.0	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
54	10/11/95	3.5	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
55	10/11/95	3.5	Base, warehouse	--	--	--	--	--	--	--	--	--	31	<50
56 [a]	10/11/95	1.0	Wall, former loading rack	--	--	--	--	--	--	--	--	--	600	2,500
57	10/11/95	3.5	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	<50

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TABLE 1
SOIL ANALYTICAL RESULTS
76 PRODUCTS FACILITY NO. 380439
217 E Steuben Street, Bingen, Washington
Concentrations reported in mg/kg

Sample ID	Date Sampled	Sample Depth (ft)	Sample Location	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH	TPH-G by Ecology WTPH-HCID	TPH-D by Ecology WTPH-HCID	TPH-O by Ecology WTPH-HCID	TPH-G by Ecology WTPH-G and -Dx	TPH-D by Ecology WTPH-G and -Dx	TPH-O by Ecology WTPH-G and -Dx
58	10/11/95	3.0	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
59	10/11/95	1.5	North wall	--	--	--	--	--	--	--	--	--	<25	<50
60	10/11/95	2.0	Base, west of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
61	10/11/95	1.0	West of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
62	10/11/95	2.0	Base, west of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
64	10/16/95	2.0	South wall	--	--	--	--	--	--	--	--	--	**3,800**	**12,000**
65	10/16/95	2.0	South wall	--	--	--	--	--	--	--	--	--	190	750
66	10/16/95	2.0	South wall	--	--	--	--	--	--	--	--	--	1,600	**4,200**
67	10/16/95	2.0	South wall	--	--	--	--	--	--	--	--	--	86	120
68	10/16/95	2.0	South wall	--	--	--	--	--	--	--	--	--	<25	110
69	10/16/95	3.0	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	200
70	10/16/95	3.0	Base, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
71	10/16/95	2.0	North wall	--	--	--	--	--	--	--	--	--	<25	<50
72	10/16/95	1.5	West of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
73	10/16/95	1.5	Wall, west of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
74	10/16/95	2.5	Base, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
75	10/16/95	2.5	Base, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
76	10/16/95	2.5	Base, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
77	10/16/95	2.0	Base, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
78	10/16/95	2.0	Base, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
79	10/17/95	2.0	South wall, retention pond	--	--	--	--	--	--	--	--	--	<25	69
80	10/17/95	2.0	East wall, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
81	10/17/95	2.0	East wall, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
82	10/17/95	2.0	North wall, retention pond	--	--	--	--	--	--	--	--	--	<25	<50
83	10/17/95	2.0	North wall, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
84	10/17/95	2.0	North wall, warehouse	--	--	--	--	--	--	--	--	--	<25	<50
85	10/17/95	2.0	West wall, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
86	10/17/95	2.0	South wall, former loading rack	--	--	--	--	--	--	--	--	--	140	<50
87	10/17/95	3.5	Base, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
88	10/17/95	2.0	West wall, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
89	10/17/95	2.0	North wall, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
90	10/17/95	2.0	East wall, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
91	10/17/95	3.0	Base, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
92	10/17/95	3.5	Base, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50
93	10/17/95	2.0	North wall, former loading rack	--	--	--	--	--	--	--	--	--	<25	<50

TA 2 1

SOIL ANALYTICAL RESULTS
76 PRODUCTS FACILITY NO. 380439
217 E Steuben Street, Bingen, Washington
Concentrations reported in mg/kg

Sample ID	Date Sampled	Sample Depth (ft)	Sample Location	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH	TPH-G	TPH-D	TPH-O	TPH-G	TPH-D	TPH-O
									by Ecology WTPH-HCID			by Ecology WTPH-G and -Dx		
1995 Excavation - Driveway Surface Staining														
108	10/19/95	1.5	Wall, west of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
109	10/19/95	2.0	Base, west of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
110	10/19/95	1.0	Wall, west of warehouse	--	--	--	--	--	--	--	--	--	<25	<50
			MTCA Method A Cleanup Level	**0.03**	**7**	**6**	**9**	**2,000**	**100/30**	**2,000**	**2,000**	**100/30**	**2,000**	**2,000**

Abbreviations

BTEX = Benzene, toluene, ethylbenzene, and total xylenes
D = detected
ft = feet
HVOCs = halogenated volatile organic hydrocarbons
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
ND = not detected
TPH = Total petroleum hydrocarbons
TPH-D = TPH as diesel-range organics
TPH-G = TPH as gasoline-range organics
TPH-O = TPH as heavy oil-range organics
USEPA = United States Environmental Protection Agency
< = Analyte is not detected at or above the laboratory reporting limit. The laboratory reporting limit is listed.
-- = not analyzed

Notes

Analytical results in bold font indicate concentration exceeds MTCA Method A cleanup level.
a Soil represented by this sample was subsequently removed during excavation activities.
b Soil represented by this sample was subsequently removed during the 1995 excavation activities.
BTEX analyzed by USEPA Method 8020.
TPH analyzed by USEPA Method 418.1.
Samples HA-1 at 5 and S-1 were also analyzed for HVOCs by USEPA Method 8010. HVOCs were not detected in sample HA-1. Methylene chloride was detected in S-1 at 1.8 mg/kg.
Samples 4 and 5 were also analyzed for fuel hydrocarbons (gasoline, Diesel 1, and Diesel 2) by USEPA Method 8020. Fuel hydrocarbon were not detected.

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TABLE 2
GROUNDWATER MONITORING DATA AND ANALYTICAL RESULTS
76 PRODUCTS FACILITY No. 380439
217 E Steuben Street, Bingen, Washington
Concentrations reported in µg/L

Well ID	Sample Date	GW Elevation (ft)	TPH	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-1	05/17/90	93.91	**1,600**	<1.0	7	3	6
	04/26/94	92.42	<1,000	<0.50	<0.50	<0.50	<1.0
	05/16/94	92.49	--	--	--	--	--
MW-2	05/17/90	93.51	<500	<1.0	<1.0	<1.0	<1.0
	04/26/94	93.47	<1,000	<0.50	<0.50	<0.50	<1.0
	05/16/94	93.27	--	--	--	--	--
MW-3	05/17/90	88.58	<500	<1.0	<1.0	<1.0	<1.0
	04/26/94	89.20	<1,000	<0.50	<0.50	<0.50	<1.0
	05/16/94	88.90	--	--	--	--	--
MW-4	05/17/90	84.54	800	<1.0	<1.0	<1.0	<1.0
	04/26/94	84.90	<1,000	<0.50	<0.50	<0.50	<1.0
	05/16/94	86.38	--	--	--	--	--
MW-5	05/16/94	DRY	--	--	--	--	--
	06/15/94	DRY	--	--	--	--	--
MTCA Method A Cleanup Levels:			1,000/800[a]	5	1,000	700	1,000

NOTES:
Groundwater elevation relative to a temporary benchmark established on site within an assumed elevation of *100.00* feet.
Analytical results in bold font indicate concentration exceeds MTCA Method A cleanup level.
Groundwater monitoring and laboratory analytical results provided by GeoEngineers Inc.

BTEX = Benzene, toluene, ethylbenzene, and total xylenes
Ecology = Washington State Department of Ecology
ft = feet
TPH = Total Petroleum Hydrocarbons
USEPA = United States Environmental Protection Agency
µg/L = micrograms per liter

ANALYTICAL METHOD:
BTEX analyzed by USEPA Method 8020.
TPH analyzed by USEPA Method 418.1 or Ecology Method NWTPH-418.1 Modified.

a MTCA Method A cleanup levels for TPH-GRO are 1,000 µg/L when no benzene is present and 800 µg/L when benzene is present.

Appendix A:
1989 GeoEngineers report tables and figure

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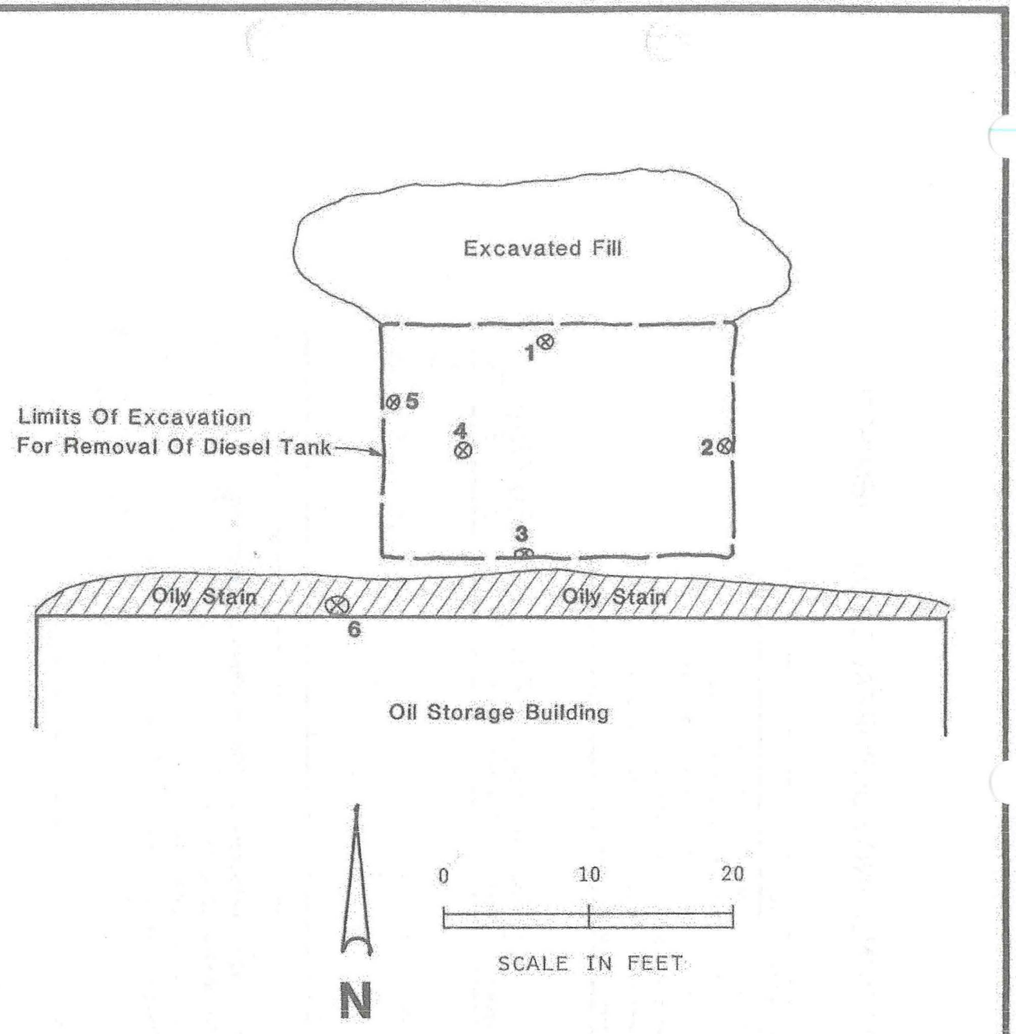
TABLE 1
SUMMARY OF FIELD SCREENING AND SUBSURFACE SOIL CHEMISTRY

Sample Number	Sample Depth	Date Collected	Sample Location
1	3.0	05/19/89	North wall, diesel storage tank excavation
2	3.4	05/19/89	East wall, diesel storage tank excavation
3	1.0	05/19/89	South wall, diesel storage tank excavation
4	9.0	05/19/89	Base of diesel storaqge tank excavation
5	2.5	05/19/89	West wall, diesel storage tank excavtaion
6	1.5	05/19/89	Near oil storage building

	Field Screening									
Sample Number	Headspace Vapors (1)	Sheen Test	TPH (2) (ppm)	Fuel Hydrocarbons (ppm) (3)			BETX (ppb) (4)			
				Gasoline	Diesel 1	Diesel 2	B	E	T	X
1	<100	None	11	--	--	--	<1	<1	<1	<1
2	<100	Slight	83	--	--	--	<1	<1	<1	<1
3	<100	Slight	7920	--	--	--	<1	<1	<1	4
4	<100	Moderate	98	<10	<10	<10	--	--	--	--
5	<100	Slight	13	<10	<10	<10	--	--	--	--
6	<100	Moderate	9200	--	--	--	<1	<1	2	3

Notes:
(1) Headspace vapor field screening was conducted using a Bacharach TLV Sniffer Calibrated to hexane (ppm).
(2) Total Petroleum Hydrocarbons analyzed using EPA Method 418.1
(3) Fuel Hydrocarbons analyzed using EPA Method 8015 (modified)
(4) BETX analyzed by EPA Method 8020. B=Benzene, E=Ethylbenzene, T=Toluene, X=Total Xylenes
ppm = parts per million
ppb = parts per billion
"--" indicates "not tested"



EXPLANATION:

1 SOIL SAMPLE LOCATION AND NUMBER

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SITE PLAN

FIGURE 1

161-181-4 CSL:KKT 6-14-89

Appendix B:
1990 GeoEngineers report tables and figure

TABLE 1
SUMMARY OF SOIL CONTAMINATION DATA

			Field Screening Results			B	E	T	X(c)
Monitor Well Number	Sample I.D.	Depth (feet)	Headspace Vapors (ppm)	Sheen	TPH (b) (ppm)	Benzene (ppb)	Ethylbenzene (ppb)	Toluene (ppb)	Xylenes (ppb)
B-1	MW-1A	3.0	<100	SS	ND	ND	ND	2	1
B-2	MW-2B	3.0	<100	SS	ND	ND	ND	ND	ND
B-3	MW-3	7.5	<100	SS	ND	ND	ND	2	3
B-4	MW-5A	2.5	<100	NS	6	ND	1	4	6
MW-1	MW-4B	5.0	<100	SS	11	ND	ND	3	1
MW-2	MW-7A	3.0	<100	SS	ND	ND	ND	ND	ND
MW-3	MW-8A	3.0	<100	NS	6	ND	ND	ND	ND
MW-4	MW-9A	5.0	<100	NS	10	ND	ND	ND	ND
RP-1(a)	R-2	0.5	--	SS	18	ND	ND	ND	ND
RP-1(a)	R-1	1.5	--	SS	15	ND	ND	ND	ND

Notes:
"--" indicates "not analyzed"
"ND" indicates "not detected"
"NS" indicates "no sheen"
"SS" indicates "slight sheen"
"ppm" indicates "parts per million"
"TPH" indicates "total petroleum hydrocarbons"
(a) Samples obtained from hand excavated hole.
(b) TPH detection limit was 5 ppm. Analytical Method 418.1.
(c) BETX detection limit was 1 ppb. Analytical Method 8020.

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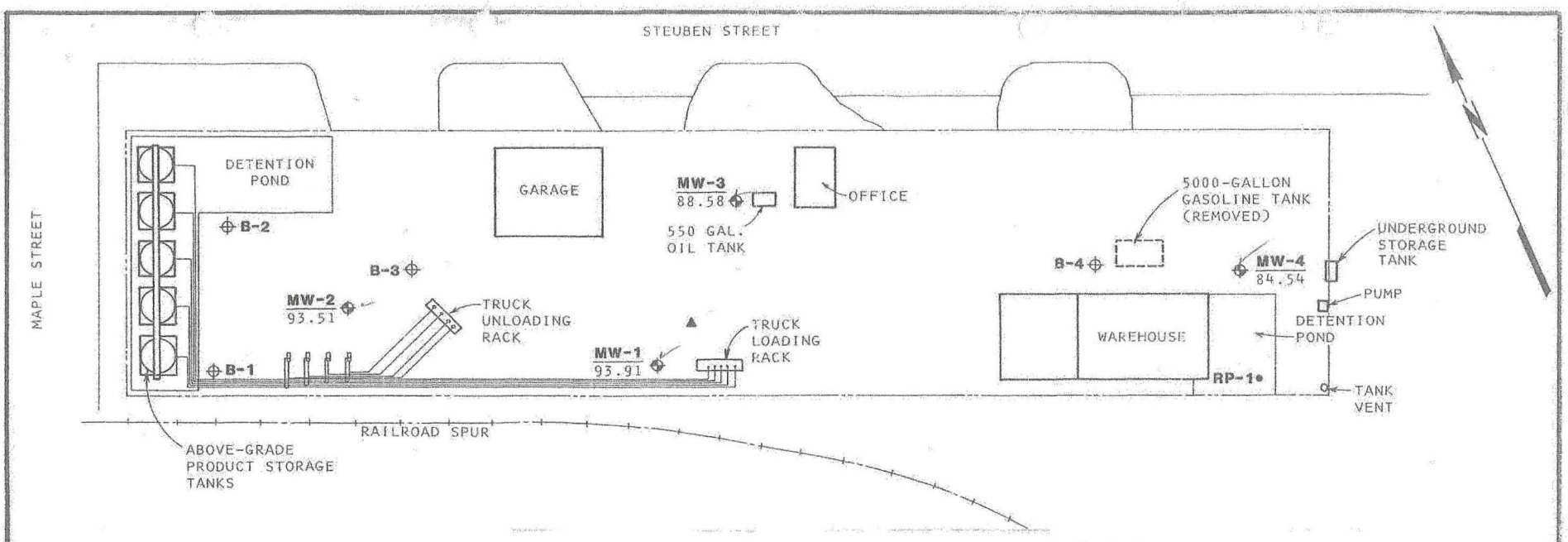
TABLE 2
SUMMARY OF GROUND WATER CHEMISTRY DATA

			B	E	T	X(c)
Monitor Well Number	Hydrocarbon Vapors (ppm)(a)	TPH (ppm)(b)	Benzene (ppb)	Ethylbenzene (ppb)	Toluene (ppb)	Xylenes (ppb)
MW-1	<100	1.6	ND	7	3	6
MW-2	180	ND	ND	ND	ND	ND
MW-3	130	ND	ND	ND	ND	ND
MW-4	<100	0.8	ND	ND	ND	ND

Notes:
"ND" indicates "not detected"
"ppb" indicates "parts per billion"
"ppm" indicates "parts per million"
Analytical methods are described in Appendix A.
Laboratory analysis reports are included as Appendix B.
(a) Measurements were obtained in monitor well within 1 ft. of water surface on May 17, 1990 using a Bacharach TLV Sniffer calibrated to hexane (110 ppm hexane = 1% LEL hexane).
(b) "TPH" indicates "total petroleum hydrocarbons"; laboratory detection limit was 0.5 ppm. Analytical Method 418.1.
(c) BETX detection limit was 1 ppb. Analytical Method 602.



0 30 60
SCALE IN FEET

EXPLANATION:

B-1 ⊕ SOIL BORING LOCATION AND NUMBER

MW-2 / 85.1 ⊕ MONITOR WELL LOCATION AND NUMBER / GROUND WATER ELEVATION ON 5/17/90

RP-1 • RETENTION POND SAMPLE

——·—— PROPERTY BOUNDARY

▲ BENCHMARK ON NORTHWEST CORNER OF CONCRETE PAD OF LOADING RACK.

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SITE PLAN

FIGURE 2

Appendix C:
July 1994 GeoEngineers report tables and figure

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TABLE 1
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA

Boring Number-Sample Depth (feet)	Date Sampled	Depth of Sample (feet)	Field Screening Results[1]		Hydrocarbon Identification (Ecology Method WTPH-HCID) (mg/kg)		
			Headspace Vapor (ppm)	Sheen	Gasoline	Diesel	Oil
B-5-5	05/12/94	5.0	<100	NS	<20	<50	<100
B-5-9	05/12/94	9.0	<100	NS	<20	<50	<100
MW-5-5	05/12/94	5.0	<100	NS	<20	<50	<100
MW-5-20	05/12/94	20.0	<100	SS	<20	<50	<100

Notes:
Chemical analyses were conducted by North Creek Analytical in Portland, Oregon.
[1]Field screening methods are described in Appendix A. NS = no sheen, SS = slight sheen
ppm = parts per million
mg/kg = milligrams per kilogram

TABLE 2
SUMMARY OF GROUND WATER MEASUREMENTS AND CHEMICAL ANALYTICAL DATA

Monitoring Well Number[1]	Date Sampled	Ground Water Elevation[2] (feet)	Combustible Vapor Concentrations[3] (ppm)	TPH[4] (mg/l)	BETX[5] (µg/l)			
					B	E	T	X
MW-1	05/17/90	93.91	<400	1.6	<1.0	7	3	6
	04/26/94	92.42	<400	<1.0	<0.50	<0.50	<0.50	<1.0
	05/16/94	92.49	<400	--	--	--	--	--
MW-2	05/17/90	93.51	<400	<0.5	<1.0	<1.0	<1.0	<1.0
	04/26/94	93.47	<400	<1.0	<0.50	<0.50	<0.50	<1.0
	05/16/94	93.27	<400	--	--	--	--	--
MW-3	05/17/90	88.58	<400	<0.5	<1.0	<1.0	<1.0	<1.0
	04/26/94	89.20	<400	<1.0	<0.50	<0.50	<0.50	<1.0
	05/16/94	88.90	<400	--	--	--	--	--
MW-4	05/17/90	84.54	<400	0.8	<1.0	<1.0	<1.0	<1.0
	04/26/94	84.90	<400	<1.0	<0.50	<0.50	<0.50	<1.0
	05/16/94	86.38	<400	--	--	--	--	--
MW-5	05/16/94	--	<400	--	--	--	--	--
MTCA[6] Method A Cleanup Standards				1	5	30	40	20

Notes:

The samples obtained on May 17, 1990 were analyzed by Pacific Environmental Laboratory in Beaverton, Oregon, and the samples obtained on May 16, 1994 were analyzed by North Creek Analytical in Portland, Oregon.

[1]Approximate monitoring well locations are shown in Figure 2.

[2]Relative to a temporary benchmark established on site with an assumed elevation of 100.00 feet.

[3]Measured with a Bacharach TLV Sniffer calibrated to hexane. The lower threshold of significance in this application is 400 ppm.

[4]TPH = total petroleum hydrocarbons. 1990 analysis conducted using EPA Method 418.1. 1994 analysis conducted using Ecology Method WTPH-418.1 Modified.

[5]B = benzene, E = ethylbenzene, T = toluene, X = xylenes by EPA Method 8020.

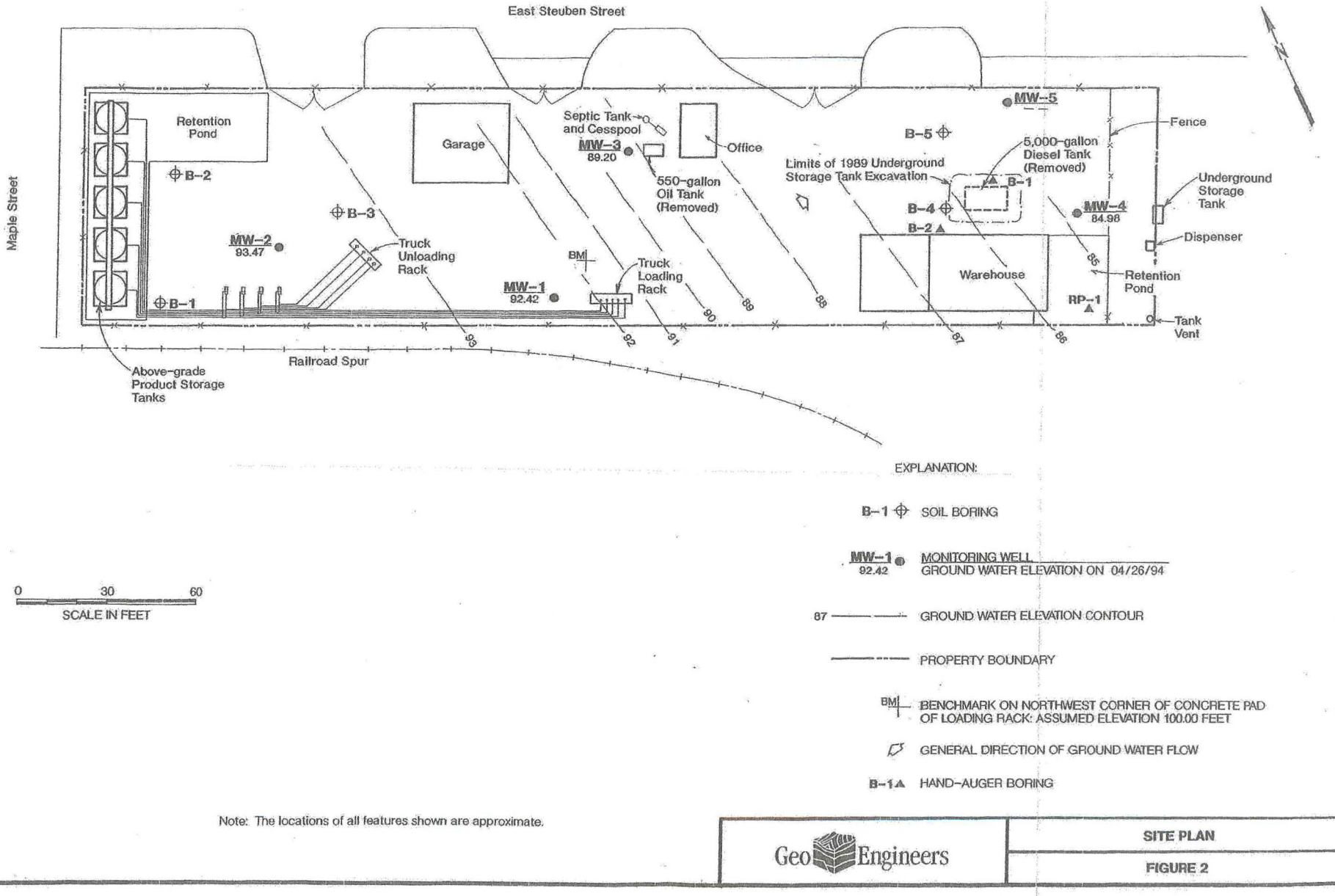
[6]MCTA = Model Toxics Control Act

ppm = parts per million

mg/l = milligrams per liter

µg/l = micrograms per liter

'--' = not analyzed



Note: The locations of all features shown are approximate.

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SITE PLAN

FIGURE 2

0161-1--P18 NCV-CLK 04/28/90 Rev. PJS-MAD 06/17/94

Appendix D:
October 1994 GeoEngineers report table and figure

TABLE 1 (Page 1 of 2)
SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DATA[1]

Soil Sample Number[2]	Date Sampled	General Location of Exploration	Field Screening Results[3]		Hydrocarbon Identification (Ecology Method WTPH-HCID[4])			Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Diesel-range Hydrocarbons (Ecology Method WTPH-D) (mg/kg)	Heavy Oil-range Hydrocarbons (Ecology Method WTPH-D Extended) (mg/kg)	BETX[5] (EPA Method 8020) (mg/kg)			
			Headspace Vapor (ppm)	Sheen	Gasoline	Diesel	Heavy Oil				B	E	T	X
B-6,2.5	07/25/94	Truck loading rack	<100	SS	ND	ND	ND	--	--	--	--	--	--	--
B-6,5.0	07/25/94	Truck loading rack	<100	SS	ND	ND	ND	--	--	--	--	--	--	--
B-7,5.0	07/25/94	Former heating oil tank	<100	SS	ND	ND	ND	--	--	--	--	--	--	--
B-8,2.5	07/25/94	Former pumps	<100	SS	D[6]	D	ND	--	1,200	170	--	--	--	--
B-8.5.0	07/25/94	Former pumps	<100	SS	D[6]	D	ND	--	6,400	<50	--	--	--	--
HA-1,5.0[7]	07/25/94	Garage floor drain	<100	SS	ND	ND	ND	--	--	--	0.0005	0.0005	0.0005	0.0005
HA-2,1.0	07/25/94	Product ASTs	<100	SS	ND	ND	ND	--	--	--	--	--	--	--
HA-3,1.5	07/25/94	Product ASTs	<100	SS	ND	ND	ND	--	--	--	--	--	--	--
HA-4,1.5	07/25/94	Product ASTs	<100	SS	ND	D	ND	--	71	<50	--	--	--	--
HA-5,1.5	07/25/94	Product ASTs	<100	SS	ND	ND	ND	--	--	--	--	--	--	--
HA-6,1.0	07/25/94	Retention pond	<100	SS	ND	ND	ND	--	--	--	--	--	--	--
HA-7,0.5	07/25/94	Horizontal ASTs	<100	MS	D	D[8]	D	<2.0	14,000	32,000	<.013	<.013	.029	.038
HA-7,2.0	07/25/94	Horizontal ASTs	<100	SS	ND	D[8]	D	--	<25	<50	--	--	--	--
HA-8,0.25	07/25/94	Horizontal ASTs	<100	MS	D	D[8]	D	2.4	4,100	53,000	<.013	<.013	<.013	.068
HA-8,1.5	07/25/94	Horizontal ASTs	<100	SS	ND	D[8]	D	--	31	410	--	--	--	--
HA-9,0.25	07/25/94	Warehouse	<100	MS	D	D[8]	D	<2.0	1,000	2,400	<.013	<.013	<.013	<.013
HA-9,1.5	07/25/94	Warehouse	<100	SS	ND	D[8]	D	--	200	520	--	--	--	--
HA-10,0.25	07/25/94	Warehouse	100	MS	ND	D[8]	D	--	1,100	4,800	--	--	--	--
HA-10,1.5	07/25/94	Warehouse	<100	SS	ND	ND	D	--	71	320	--	--	--	--
HA-11,0.25	07/25/94	Warehouse	110	HS	D	D[8]	D	<2.0	580	6,700	<.013	<.013	<.013	<.013
HA-11,1.5	07/25/94	Warehouse	<100	SS	ND	ND	D[9]	--	--	--	--	--	--	--
S-1[7]	07/25/94	Former waste oil AST	--	--	D[8]	D[8]	D	--	12,000	52,000	--	--	--	--
S-2	07/25/94	West end warehouse	--	--	D	D	D	2.5	19,000	42,000	<.013	<.013	.049	.100
MTCA Method A Cleanup Levels								100	200	200	0.5	20	40	20

Notes appear on page 2 of 2.

TABLE 1 (Page 2 of 2)

Notes:

[1]Laboratory analysis performed by North Creek Analytical of Portland, Oregon. See Appendix B for the laboratory report.

[2]The first portion of the soil sample number corresponds to soil boring, hand-auger or surface sample number. The second portion refers to the sample depth. For example, sample B-7,5.0 was obtained from boring B-7 at a depth of 5.0 feet. The two surface samples are identified as S-1 and S-2. See Figure 2 for locations.

[3]Field screening methods are described in Appendix A. SS - slight sheen, MS = moderate sheen, HS = heavy sheen

[4]Detection limit is 20 mg/kg for gasoline, 50 mg/kg for deisel and 100 mg/kg for heavy oil.

[5]B = benzene, E = ethylbenzene, T = toluene, X = xylenes

[6]Detected hydrocarbons in the gasoline range appear to be due to a high concentration of diesel-range hydrocarbons.

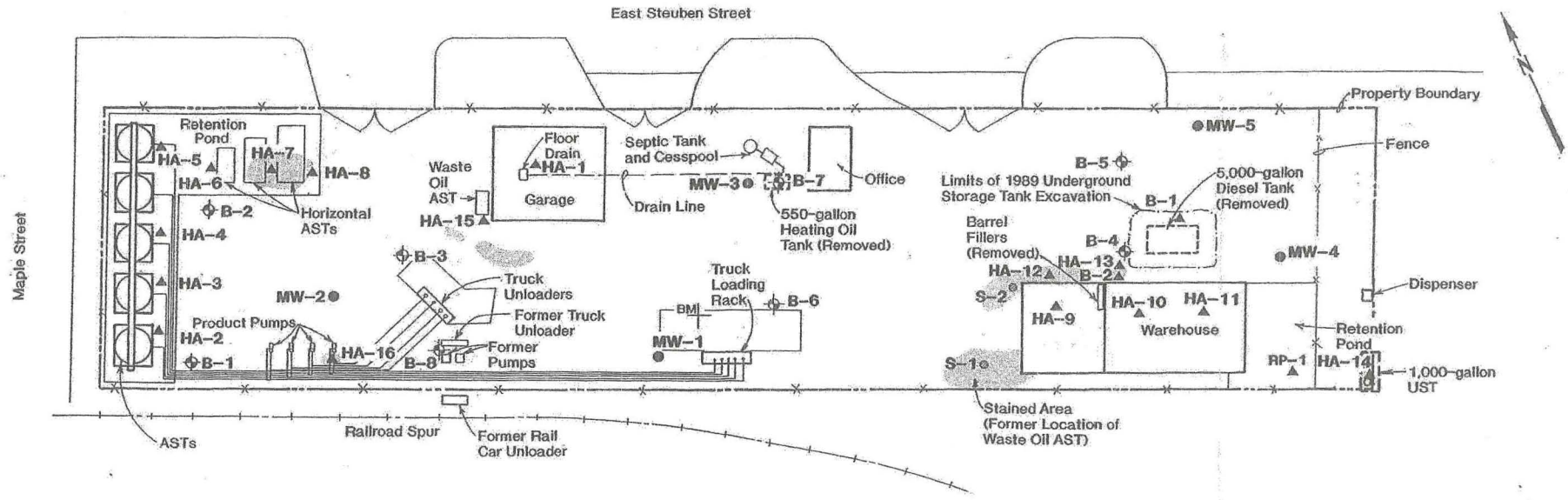
[7]Samples HA-1,5.0 and S-1 also were analyzed for halogenated VOCs by EPA Method 8010. Halogenated VOCs were not detected in sample HA-1,5.0; methylene chloride was detected in S-1 at a concentration of 1.8 mg/kg. Sample S-1 was exposed to laboratory environment prior to analysis. Methylene chloride is a common laboratory contaminant.

[8]Detected hydrocarbons in the gasoline- and/or diesel-range appear to be a result of a high concentration of heavy oil-range hydrocarbons.

[9]Laboratory report states heavy oil-range product was detected below reporting limit of 100 mg/kg.

ppm = parts per million, mg/kg = milligrams per kilogram, µg/kg = micrograms per kilogram, ND = not detected, "--" = not analyzed, ND = not detected, D = detected

Shading indicates concentrations greater than MTCA Method A cleanup levels.



EXPLANATION:

- B–1 ⊕ SOIL BORING
- MW–1 ● MONITORING WELL
- B–1 ▲ HAND–AUGER BORING
- S–1 ◎ SURFACE SAMPLE
- AST ABOVEGROUND STORAGE TANK
- BM BENCHMARK ON NORTHWEST CORNER OF CONCRETE PAD OF LOADING RACK: ASSUMED ELEVATION 100.00 FEET
- UST UNDERGROUND STORAGE TANK
- EXTERIOR SURFACE PETROLEUM HYDROCARBON – LIKE STAINING

Note: The locations of all features shown are approximate.

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SITE PLAN

FIGURE 2

0161-181-P18 NCV:CLK 04/23/90 Rev: PJS:MAD 06/17/94

Appendix E:
1996 GeoEngineers report tables and figures

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TABLE 1 (Page 1 of 2)
SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DATA[1]
BULK PLANT - WEST PORTION

Soil Sample Number[2]	Date Sampled	General Location Sample	Depth of Sample (feet)	Field Screening Results[3]		Hydrocarbon Identification (Ecology Method WTPH-HCID) (mg/kg)			Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Diesel- and Oil-range Hydrocarbons (Ecology Method WTPH-D Extended) (mg/kg)		BETX[4] (EPA Method 8020) (mg/kg)			
				Headspace Vapor (ppm)	Sheen	Gasoline	Diesel	Oil		Diesel	Oil	B	E	T	X
Loading Rack Excavation															
4[5]	09/11/95	Surface, south side of loading rack	0.1	--	HS	Detected[6]	Detected	Detected[6]	--	--	--	--	--	--	--
17	09/14/95	Base, central portion	3.0	<100	SS	<20	<50	<100	--	44	<50	--	--	--	--
18	09/14/95	Base, west end	3.0	<100	NS	<20	<50	<100	--	40	<50	--	--	--	--
37	10/09/95	Base, east end	3.5	<100	SS	--	--	--	--	<25	<50	--	--	--	--
41	10/09/95	North wall	2.5	<100	SS	--	--	--	--	<25	<50	--	--	--	--
42	10/09/95	South wall	2.0	<100	NS	--	--	--	--	<25	<50	--	--	--	--
43	10/09/95	South wall, west end	2.0	<100	SS	--	--	--	--	<25	<50	--	--	--	--
44	10/09/95	West wall	2.5	<100	SS	--	--	--	--	<25	<50	--	--	--	--
45	10/09/95	North wall, west end	2.5	<100	SS	--	--	--	--	<25	<50	--	--	--	--
Horizontal AST Excavation															
7	09/13/95	North wall, west end	2.0	<100	NS	--	--	--	--	<25	<50	--	--	--	--
8	09/13/95	Base, west end	2.5	<100	NS	--	--	--	--	<25	<50	--	--	--	--
9	09/13/95	West wall	2.5	<100	NS	--	--	--	--	<25	<50	--	--	--	--
10[5]	09/13/95	Base, north end	2.0	<100	NS	--	--	--	--	1,500	4,400	--	--	--	--
11	09/13/95	Base, east end	2.0	<100	NS	--	--	--	--	<25	<50	--	--	--	--
12[5]	09/13/95	South wall	1.0	<100	NS	--	--	--	--	390	750	--	--	--	--
19	09/14/95	Base, north end	3.0	<100	NS	--	--	--	--	<25	<50	--	--	--	--
20	09/14/95	Base, south end	3.0	<100	NS	--	--	--	--	<25	<50	--	--	--	--
29	09/25/95	East wall	1.0	<100	NS	--	--	--	--	<25	<50	--	--	--	--
30	09/25/95	South wall, east end	1.0	<100	SS	--	--	--	--	<25	<50	--	--	--	--
31	10/09/95	South wall, west end	1.5	<100	SS	--	--	--	--	180	260	--	--	--	--
MTCA Method A Cleanup Standards									100	200	200	0.5	20	40	20

Notes appear on page 2 of 2.

TABLE 1 (Page 2 of 2)

Soil Sample Number[2]	Date Sampled	General Location Sample	Depth of Sample (feet)	Field Screening Results[3]		Hydrocarbon Identification (Ecology Method WTPH-HCID) (mg/kg)			Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Diesel- and Oil-range Hydrocarbons (Ecology Method WTPH-D Extended) (mg/kg)		BETX[4] (EPA Method 8020) (mg/kg)			
				Headspace Vapor (ppm)	Sheen	Gasoline	Diesel	Oil		Diesel	Oil	B	E	T	X
Product Pump Excavations															
14	09/14/95	Below product pump #2	2.5	<100	NS	--	--	--	<2	130	<50	<0.013	<0.013	<0.013	<0.013
15	09/14/95	Below product pump #4, south end	2.5	<100	SS	--	--	--	<2	<25	<50	<0.013	<0.013	0.017	<0.013
16[5]	09/14/95	Below product pump #4, north end	2.5	<100	NS	--	--	--	<2	620	920	<0.013	<0.013	<0.013	<0.013
63	10/16/95	Below product pump #4, north end	4.5	<100	SS	--	--	--	--	170	<50	--	--	--	--
Former Pumps Excavation															
21	09/14/95	West wall	8.0	<100	NS	--	--	--	--	<25	--	--	--	--	--
22	09/19/95	North wall	7.0	<100	NS	--	--	--	--	<25	--	--	--	--	--
23	09/19/95	East wall	7.0	<100	SS	--	--	--	--	<25	--	--	--	--	--
24	09/19/95	Southeast corner	8.5	<100	SS	--	--	--	--	<25	--	--	--	--	--
25	09/19/95	North wall	7.0	<100	NS	--	--	--	--	<25	--	--	--	--	--
26[5]	09/19/95	Base, southeast corner	9.0	--	HS	--	--	--	--	3,700	--	--	--	--	--
38	10/09/95	South wall, east end	8.0	260	HS	--	--	--	--	3,300	100[6]	--	--	--	--
39	10/09/95	South wall, center	8.0	260	HS	--	--	--	--	5,000	<50	--	--	--	--
40	10/09/95	South wall, west end	8.0	100	HS	--	--	--	--	2,400	98[6]	--	--	--	--
MTCA Method A Cleanup Standards									100	200	200	0.5	20	40	20

Notes:

[1]Laboratory analyses were performed by North Creek Analytical of Portland, Oregon. See Appendix B for the laboratory reports.

[2]Approximate sample locations are shown in Figure 3.

[3]Field screening methods are described in Appendix A. NS = no sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen

[4]B = benzene, E = ethylbenzene, T = toluene, X = xylenes

[5]The soil represented by this sample was subsequently removed during excavation activities.

[6]The laboratory report indicates that the hydrocarbons detected in this range appear to be due to overlap from the diesel range.

ppm = parts per million, mg/kg = milligrams per kilogram, '--' = not analyzed

TABLE 3 (Page 2 of 2)

Soil Sample Number[2]	Date Sampled	General Location of Sample	Depth of Sample (feet)	Field Screening Results[3]		Heavy Oil-range Hydrocarbons (Ecology Method WTPH-D Extended) (mg/kg)	
				Headspace Vapor (ppm)	Sheen	Diesel	Oil
80	10/17/95	East wall, retention pond	2.0	<100	SS	<25	<50
81	10/17/95	East wall, retention pond	2.0	<100	SS	<25	<50
82	10/17/95	North wall, retention pond	2.0	<100	SS	<25	<50
83	10/17/95	North wall, warehouse	2.0	<100	SS	<25	<50
84	10/17/95	North wall, warehouse	2.0	<100	SS	<25	<50
85	10/17/95	West wall, former loading rack	2.0	<100	SS	<25	<50
86	10/17/95	South wall, former loading rack	2.0	<100	SS	140	<50
87	10/17/95	Base, former loading rack	3.5	<100	SS	<25	<50
88	10/17/95	West wall, former loading rack	2.0	<100	SS	<25	<50
89	10/17/95	North wall, former loading rack	2.0	<100	SS	<25	<50
90	10/17/95	East wall, former loading rack	2.0	<100	SS	<25	<50
91	10/17/95	Base, former loading rack	3.0	<100	SS	<25	<50
92	10/17/95	Base, former loading rack	3.5	<100	SS	<25	<50
93	10/17/95	North wall, former loading rack	2.0	<100	SS	<25	<50
108	10/19/95	Wall, west of warehouse	1.5	--	--	<25	<50
109	10/19/95	Base, west of warehouse	2.0	--	--	<25	<50
110	10/19/95	Wall, west of warehouse	1.0	--	--	<25	<50
MTCA Method A Cleanup Standards						200	200

Notes:

[1]Laboratory analyses were performed by North Creek Analytical of Portland, Oregon. See Appendix B for the laboratory reports.

[2]Approximate sample locations are shown in Figure 4.

[3]Field screening methods are described in Appendix A. NS = no sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen

[4]The soil represented by this sample was subsequently removed during excavation activities.

[5]The laboratory report indicates that the hydrocarbons detected in this range appear to be due to overlap from the heavy oil range.

ppm = parts per million

mg/kg = milligrams per kilogram

'--' = not analyzed

TABLE 4
SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DAT
DRIVEWAY SURFACE STAINING EXCAVATIONS

Soil Sample Number[2]	Date Sampled	General Location Sample	Depth of Sample (feet)	Field Screening Results[3]		Diesel- and Oil-range Hydrocarbons (Ecology Method WTPH-D Extended) (mg/kg)	
				Headspace Vapor (ppm)	Sheen	Diesel	Oil
94	10/19/95	South of garage	1.0	<100	SS	<25	<50
95	10/19/95	Southwest of garage	1.0	<100	SS	<25	<50
96	10/19/95	Current waste oil AST	1.0	<100	SS	75	100
97	10/19/95	South of garage	1.0	<100	SS	<25	<50
98	10/19/95	South of garage	1.0	<100	SS	<25	<50
99	10/19/95	East of garage	1.0	<100	SS	<25	<50
100	10/19/95	North of current loading rack	1.0	<100	SS	<25	<50
101	10/19/95	North of current loading rack	1.0	<100	SS	44	69
102	10/19/95	South of garage	1.0	<100	SS	<25	<50
103	10/19/95	Southeast of garage	1.0	<100	SS	<25	<50
104	10/19/95	Southeast of office	1.0	<100	SS	<25	<50
105	10/19/95	Southeast of office	1.0	<100	SS	<25	<5
106	10/19/95	East of office	1.0	<100	SS	<25	<5
107	10/19/95	Northwest of warehouse	1.0	<100	SS	<25	<50
MTCA Method A Cleanup Standards						200	200

Notes:
[1]Laboratory analyses were performed by North Creek Analytical of Portland, Oregon. See Appendix B for the laboratory reports.
[2]Approximate sample locations are shown in Figures 3 and 4.
[3]Field screening methods are described in Appendix A. SS = slight sheen
ppm = parts per million
mg/kg = milligrams per kilogram

TABLE 5 (Page 1 of 2)
SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DATA[1]
STOCKPILES AND RELATED SURFACE SAMPLES

Soil Sample Number	Date Sampled	General Location Sample	Field Screening Results[2]		Hydrocarbon Identification (Ecology Method WTPH-HCID[3]) (mg/kg)			Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Diesel- and Oil-range Hydrocarbons (Ecology Method WTPH-D Extended (mg/kg)		BETX[3] (EPA Method 8020) (mg/kg)				Volatile and Semi-volatile Organic Compounds[4] (EPA Methods 8240 and 8270) (mg/kg)	TCLP Metals[5] (EPA Methods 1311, 6010 and 7470) (mg/l)
			Headspace Vapor (ppm)	Sheen	Gasoline	Diesel	Oil		Diesel	Oil	B	E	T	X		
SP-1[6]	09/18/95	Contaminated soil stockpile	<100	HS	Detected[7]	Detected	<100	--	1,600	--	--	--	--	--	--	--
SP-2[6]	09/18/95	Contaminated soil stockpile	<100	MS	Detected[7]	Detected	<100	--	1,100	--	--	--	--	--	--	--
SP-4[6,8]	09/19/95	Contaminated soil stockpile	<100	MS	--	--	--	10	3,300	7,400	<0.013	<0.013	0.016	0.024	Methylene chloride[9] - 0.077	Barium - 0.68
SP-5[6,8]	09/19/95	Contaminated soil stockpile	<100	MS	--	--	--	7.6	2,600	7,300	<0.013	<0.013	<0.013	<0.013	Methylene chloride[9] - 0.086	Barium - 0.57
SP-6	09/25/95	Noncontaminated soil stockpile	<100	SS	--	--	--	--	130	130	--	--	--	--	--	--
SP-7[6]	09/25/95	Noncontaminated soil stockpile	<100	SS	--	--	--	--	140[11]	300	--	--	--	--	--	--
SP-8[6]	09/25/95	Noncontaminated soil stockpile	<100	SS	--	--	--	--	210	130	--	--	--	--	--	--
111	10/19/95	Gravel beneath contaminated soil stockpile A	<100	SS	--	--	--	--	630	220	--	--	--	--	--	--
P-1[10]	11/14/95	Beneath contaminated soil stockpile B	--	--	<23	<57	<110	--	--	--	--	--	--	--	--	--
P-2[10]	11/14/95	Beneath contaminated soil stockpile B	--	--	<23	<57	<110	--	--	--	--	--	--	--	--	--
MTCA Method A Cleanup Standards								100	200	200	0.5	20	40	20	0.5	NE

Notes appear on page 2 of 2.

TABLE 5 (Page 2 of 2)

Soil Sample Number	Date Sampled	General Location Sample	Field Screening Results[2]		Hydrocarbon Identification (Ecology Method WTPH-HCID[3]) (mg/kg)			Gasoline-range Hydrocarbons (Ecology Method WTPH-G) (mg/kg)	Diesel- and Oil-range Hydrocarbons (Ecology Method WTPH-D Extended (mg/kg)		BETX[3] (EPA Method 8020) (mg/kg)				Volatile and Semi-volatile Organic Compounds[4] (EPA Methods 8240 and 8270) (mg/kg)	TCLP Metals[5] (EPA Methods 1311, 6010 and 7470) (mg/l)
			Headspace Vapor (ppm)	Sheen	Gasoline	Diesel	Oil		Diesel	Oil	B	E	T	X		
P-3[10]	11/14/95	Beneath contaminated soil stockpile A	--	--	<22	<56	<110	--	--	--	--	--	--	--	--	--
P-4[10]	11/14/95	Beneath contaminated soil stockpile A	--	--	<22	<56	<110	--	--	--	--	--	--	--	--	--
MTCA Method A Cleanup Standards								100	200	200	0.5	20	40	20	0.5	NE

Notes:

[1]Laboratory analyses were performed by North Creek Analytical of Portland, Oregon. See Appendix B for the laboratory reports.

[2]Field screening methods are described in Appendix A. SS = slight sheen, MS = moderate sheen, HS = heavy sheen

[3]B = benzene, E = ethylbenzene, T = toluene, X = xylenes

[4]Only detected analytes are shown. A list of analytes and detection limits are presented in the laboratory reports in Appendix B.

[5]TCLP = toxicity characteristic leaching procedure. Analytes include arsenic, barium, cadmium chromium, lead, mercury, selenium and silver. Only those analytes detected are shown. Detection limits are included in the laboratory reports in Appendix B.

[6]The soil represented by this sample was transported off site for disposal.

[7]The laboratory report indicates that the hydrocarbons detected in this range appear to be due to overlap from the diesel range.

[8]This sample was analyzed for PCBs (polychlorinated biphenyls) by EPA Method 8080. PCBs were not detected. Detection limits are presented in the laboratory reports in Appendix B.

[9]The laboratory report indicates that the detection of methylene chloride may be a result of laboratory contamination.

[10]Samples were obtained by PEMCO.

[11]The laboratory report indicates that the hydrocarbons detected in this range appear to be due to overlap from the oil range.

ppm = parts per million

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

"--" = not analyzed

NE = not established

TABLE 2
SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DATA[1]
DRAIN LINE DISCHARGE AREAS AND RETENTION POND

Soil Sample Number[2]	Date Sampled	General Location Sample	Depth of Sample (feet)	Field Screening Results[3]		Hydrocarbon Identification (Ecology Method WTPH-HCID)			Diesel- and Oil-range Hydrocarbons (Ecology Method WTPH-D Extended) (mg/kg)	
				Headspace Vapor (ppm)	Sheen	Gasoline	Diesel	Oil	Diesel	Oil
13[4]	09/13/95	Surface sample, south side of warehouse	0.0 - 0.5	<100	NS	Detected[5]	Detected	Detected	11,000	4,800
27[4]	09/25/95	Surface sample, south side of warehouse	0.0 - 0.5	<100	SS	Detected[5]	Detected	Detected	3,300	2,400
28[4]	09/25/95	Surface sample, south side of warehouse	0.0 - 0.5	<100	SS	Detected[5]	Detected	Detected	12,000	4,000
46[4]	10/09/95	Surface, retention pond	0.0 - 0.5	<100	MS	--	--	--	2,800	3,600
47[4]	10/09/95	Surface, retention pond	0.0 - 0.5	<100	MS	--	--	--	26,000	16,000
48[4]	10/09/95	Surface, retention pond	0.0 - 0.5	<100	NS	--	--	--	2,600	1,800

Notes:

[1]Laboratory analyses were performed by North Creek Analytical of Portland, Oregon. See Appendix B for the laboratory reports.

[2]Approximate sample locations are shown in Figure 4.

[3]Field screening methods are described in Appendix A. NS = no sheen, SS = slight sheen, MS = moderate sheen

[4]The soil represented by this sample was subsequently removed during excavation activities.

[5]The laboratory report indicates that the hydrocarbons detected in this range appear to be due to overlap from the diesel range.

ppm = parts per million, mg/kg = milligrams per kilogram, "--" = not analyzed

TABLE 3 (Page 1 of 2)
SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DATA[1]
BULK PLANT - EAST PORTION

Soil Sample Number[2]	Date Sampled	General Location of Sample	Depth of Sample (feet)	Field Screening Results[3]		Diesel- and Oil-range Hydrocarbons (Ecology Method WTPH-D Extended) (mg/kg)	
				Headspace Vapor (ppm)	Sheen	Diesel	Oil
32[4]	10/09/95	Wall, former loading rack	1.0	<100	SS	590[5]	1,900
33	10/09/95	Base, former loading rack	3.0	<100	SS	<25	<50
34	10/09/95	Base, former waste oil AST	3.0	<100	SS	<25	<50
35	10/09/95	North wall, former loading rack	1.0	<100	NS	<25	<50
36	10/09/95	Waste oil AST	1.0	<100	SS	86	130
49	10/09/95	Base, waste oil AST	3.0	<100	SS	<25	<50
50	10/09/95	Base, warehouse	3.0	<100	SS	41	82
51	10/09/95	Base, warehouse	3.0	<100	SS	<25	<50
52	10/11/95	Base, warehouse	3.0	<100	SS	<25	<50
53	10/11/95	Base, warehouse	3.0	<100	SS	<25	<50
54	10/11/95	Base, warehouse	3.5	<100	SS	<25	<50
55	10/11/95	Base, warehouse	3.5	<100	SS	31[5]	<50
56[4]	10/11/95	Wall, former loading rack	1.0	<100	NS	600	2,500
57	10/11/95	Base, warehouse	3.5	<100	SS	<25	<50
58	10/11/95	Base, warehouse	3.0	<100	SS	<25	<50
59	10/11/95	North wall	1.5	<100	NS	<25	<50
60	10/11/95	Base, west of warehouse	2.0	<100	NS	<25	<50
61	10/11/95	West of warehouse	1.0	<100	SS	<25	<50
62	10/11/95	Base, west of warehouse	2.0	<100	SS	<25	<50
64	10/16/95	South wall	2.0	<100	SS	3,800	12,000
65	10/16/95	South wall	2.0	<100	SS	190	750
66	10/16/95	South wall	2.0	<100	SS	1,600	4,200
67	10/16/95	South wall	2.0	<100	SS	86	120
68	10/16/95	South wall	2.0	<100	SS	<25	110
69	10/16/95	Base, warehouse	3.0	<100	SS	<25	200
70	10/16/95	Base, warehouse	3.0	<100	SS	<25	<50
71	10/16/95	North wall	2.0	<100	SS	<25	<50
72	10/16/95	West of warehouse	1.5	<100	SS	<25	<50
73	10/16/95	Wall, west of warehouse	1.5	<100	SS	<25	<50
74	10/16/95	Base, retention pond	2.5	<100	SS	<25	<50
75	10/16/95	Base, retention pond	2.5	<100	SS	<25	<50
76	10/16/95	Base, retention pond	2.5	<100	SS	<25	<50
77	10/16/95	Base, retention pond	2.0	<100	SS	<25	<50
78	10/16/95	Base, retention pond	2.0	<100	SS	<25	<50
79	10/17/95	South wall, retention pond	2.0	<100	SS	<25	69
MTCA Method A Cleanup Standards						200	200

Notes appear on page 2 of 2.

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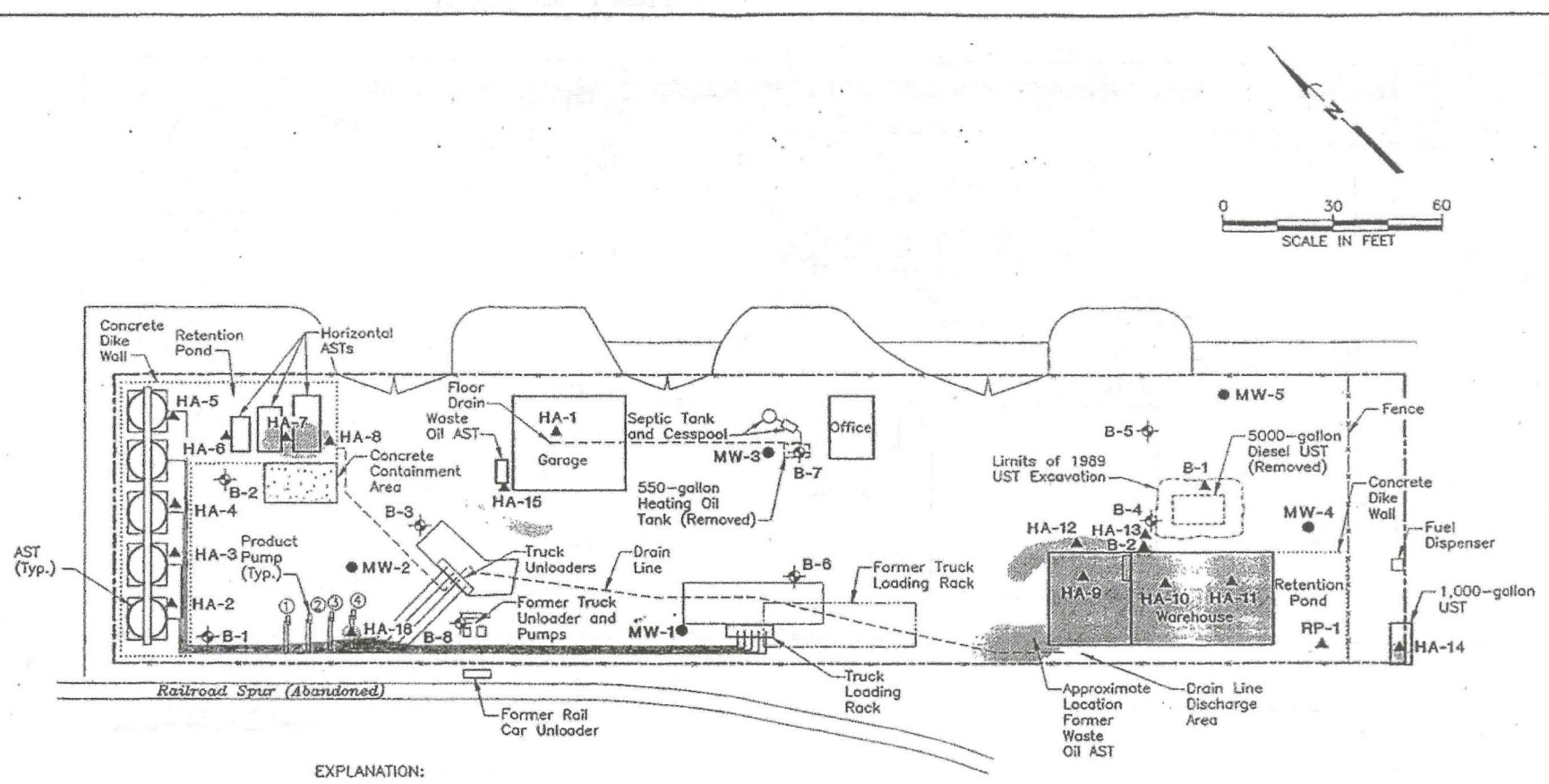

EXPLANATION:

MW-1●	MONITORING WELL
B-1 ⊕	BORING LOCATION
B-1 ▲	HAND-AUGER BORING
UST	UNDERGROUND STORAGE TANK
AST	ABOVEGROUND STORAGE TANK
	AREAS OF PETROLEUM HYDROCARBON-LIKE STAINING

Reference: Undated drawing entitled, "General Arrangement Marketing Station, Bingen, Washington," by Unocal.

Note: The locations of all features shown are approximate.

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SITE PLAN

FIGURE 2

0161-181 PJS:REM 11/13/95

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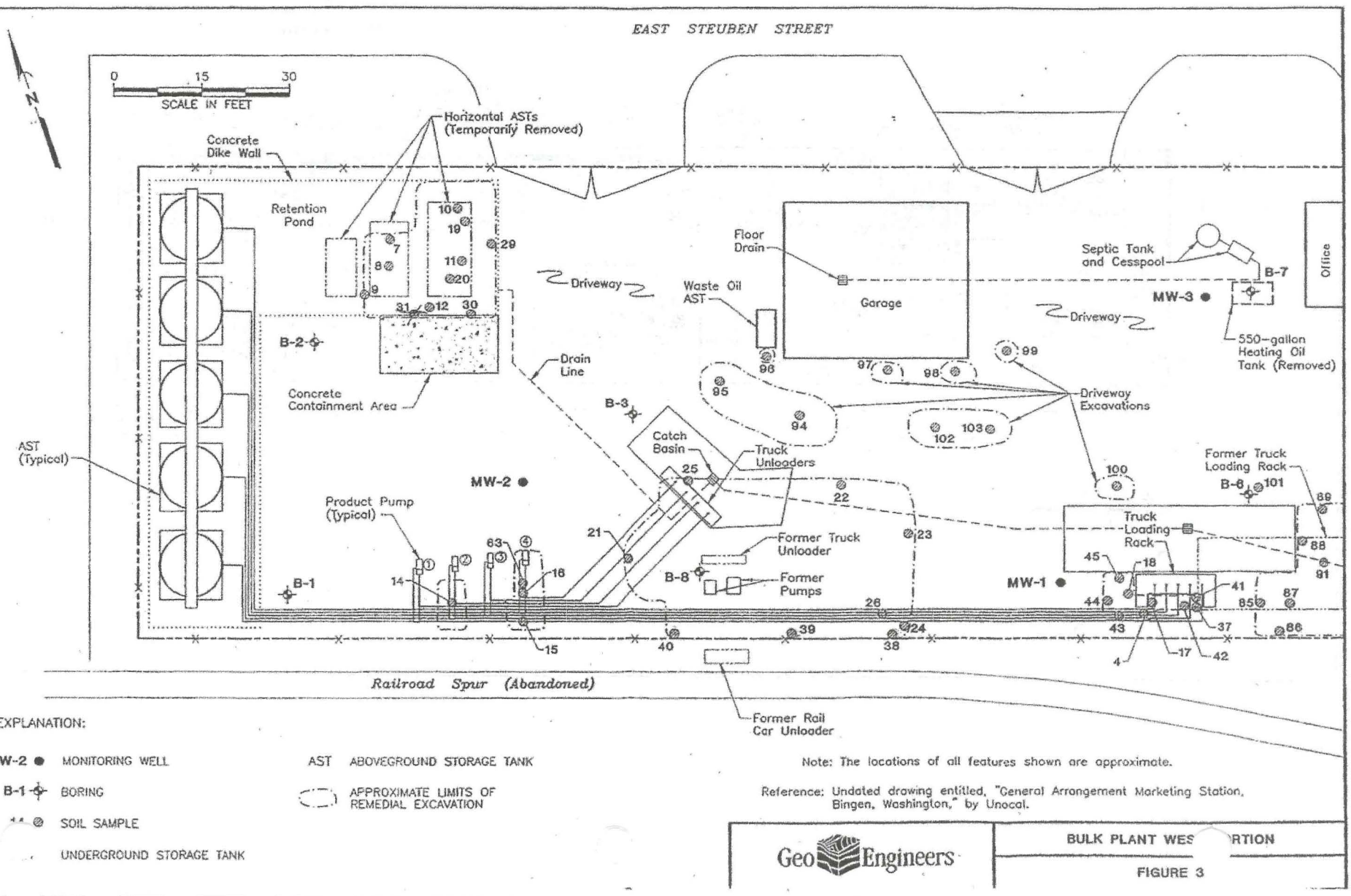

EXPLANATION:

MW-2 ● MONITORING WELL

B-1 ⊕ BORING

SOIL SAMPLE

UNDERGROUND STORAGE TANK

AST ABOVEGROUND STORAGE TANK

APPROXIMATE LIMITS OF REMEDIAL EXCAVATION

Note: The locations of all features shown are approximate.

Reference: Undated drawing entitled, "General Arrangement Marketing Station, Bingen, Washington," by Unocal.

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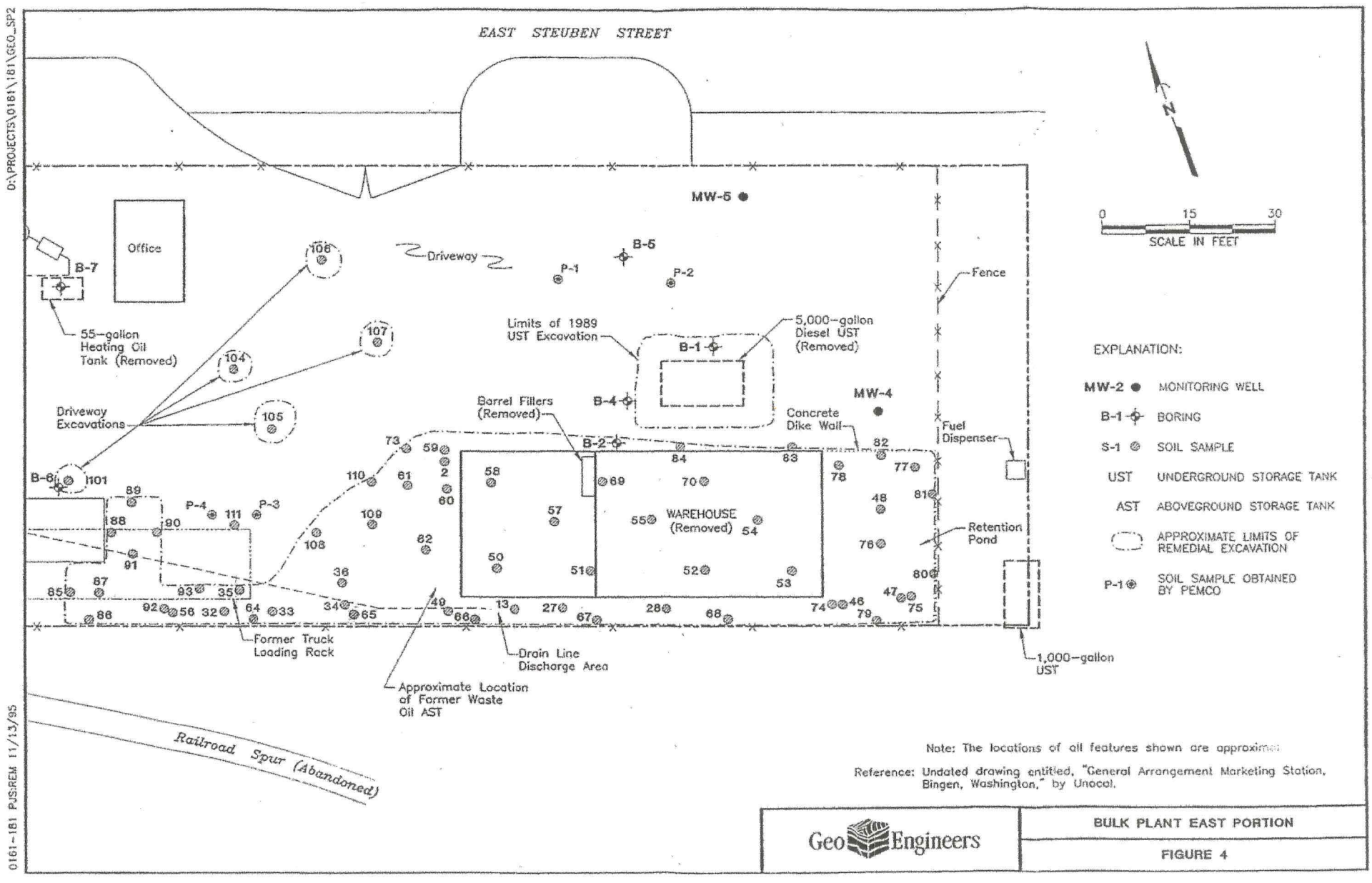
BULK PLANT WES RTION

FIGURE 3

0161-181 PJS:REM 11/13/95



Note: The locations of all features shown are approximate.

Reference: Undated drawing entitled, "General Arrangement Marketing Station, Bingen, Washington," by Unocal.

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BULK PLANT EAST PORTION

FIGURE 4