

## TECHNICAL MEMORANDUM

TO: Joan Davenport, AICP  
Strategic Project Manager  
City of Yakima

FROM: Tim Syverson and Steve Shaw

DATE: December 2, 2013

RE: **BACKGROUND INFORMATION ACQUISITION AND REVIEW  
YAKIMA MILL SITE  
YAKIMA, WASHINGTON**

### INTRODUCTION

This technical memorandum presents the findings of the document review completed by Landau Associates on behalf of the City of Yakima (City), as part of the Yakima (Cascade) Mill Site redevelopment project (Project). The document review was conducted to summarize and evaluate the available information regarding the environmental conditions of the Project site, excluding most of the former City municipal landfill ("Site"; Figure 1, as discussed below), related to releases of potentially hazardous materials to environmental media, including primarily soil and groundwater, that could pose a potential liability to the City as a potential purchaser of the Site. This document focuses on contaminant releases, and the associated previous investigative and remedial activities at the Site, to document environmental conditions based on available information, and to identify data gaps to be addressed during follow-up Phase II investigations, as appropriate. The development and operations history of the Site will be evaluated and presented in the Phase I Environmental Site Assessment (ESA), which is being completed under a separate task, and may identify additional data gaps.

As defined in our scope of services dated March 26, 2013, the Site consists of 20 parcels, totaling approximately 207 acres. Nineteen parcels are currently owned by LeeLynn, Inc. and Wiley Mt., Inc., and one parcel is owned by OfficeMax Corp. The parcel currently owned by OfficeMax Corp (parcel number 191318-41001) is approximately 38 acres in size and contains most of the former City municipal landfill. This parcel is referred to as the "Landfill Parcel." The Landfill Parcel is not included in our current scope of work for the environmental due diligence and investigation activities, with the exception of the triangular portion of the parcel located north of the railroad tracks that run approximately east to west through the central portion of the Site ("Triangular Parcel"). The Site also includes the former Plywood Plant (parcel number 191318-42001), and the parcels located to the west and southwest of the Plywood Plant (parcel numbers 191318-42401, -42404, -43539, and -42003), collectively referred to as the "Plywood Plant parcels" (Figure 1). Documents relating specifically to the Landfill Parcel were not included in the document review with the exception of reports with information related to the Plywood

Plant parcels, as discussed below. Note that the reports documenting the investigative activities for the Landfill Parcel do not include information regarding the Triangular Parcel. Information regarding the Triangular Parcel is included in the reports regarding the Site.

Documents regarding the Site were requested from the City, the Washington State Department of Ecology (Ecology), and the property owners. Investigative and remedial activities conducted at the Site have included primarily general characterization and/or environmental compliance, as well as activities conducted in response to individual releases, or associated with removal of underground storage tanks (USTs). A listing of the documents reviewed is provided in Appendix A. A summary of relevant information regarding the Site from the document review is presented in the sections below. Site features are shown on Figures 2 and 3.

As noted above, the document review is being conducted to support planning for follow-up Phase II investigations, as appropriate. The Phase II investigations will to be conducted in stages, including an initial stage including the Triangular Parcel and the Plywood Plant parcels, and a supplemental stage that will include remaining areas of the Site, as warranted.

## **HISTORICAL RELEASES AND RESPONSE ACTIONS**

The following releases and response actions have been documented for the Site:

- **1980 Sodium Hydroxide Release:** Prior to November 1980, 9,000 lbs of sodium hydroxide (used as a plywood glue catalyst and typically stored as a 50% aqueous solution) was inadvertently heated in its storage container. This caused the aqueous solution to solidify, making it unusable. Site personnel disposed of the solidified material in a shallow excavation [ $< 3$  feet (ft) below ground surface (BGS)] approximately 600 ft east from the southeast corner of the plywood mill (Boise Cascade Corporation 1985).

In June 1981, Boise Cascade Corporation (Boise Cascade) notified the U.S. Environmental Protection Agency (EPA) of the release. A Potential Hazardous Waste Site Preliminary Assessment was completed on November 20, 1984 by Ecology, in coordination with the EPA (Boise Cascade Corporation 1985). Boise Cascade received a Superfund Notification ranking of “medium”, based on potential impacts to groundwater (an associated asbestos release was deemed innocuous). In 1985, Boise Cascade conducted an investigation of the release area consisting of excavation of five test pits, to a maximum depth of 13 ft BGS, and analysis of soil for pH levels. Based on the results (acidic to moderately alkaline), Boise Cascade requested that the ranking be reclassified as “none” (Boise Cascade Corporation 1985). Ecology concurred, but noted that a site investigation would likely need to be performed (Ecology 1985). In August of 1986, Ecology performed a Phase I Site Inspection and concluded that there was no need for “further CERCLA evaluations or actions at this facility” (Ecology 1987).

- **1987 Release of Sodium Hydroxide to the Evaporation Pond:** Prior to 1987, sodium hydroxide was discharged to the evaporation pond located south of the Plywood Plant. The evaporation pond discharges to the Yakima publicly owned treatment works (POTW) (Ecology 1987). This is possibly the release mentioned in Boise Cascade’s Spill Prevention Control and Countermeasures Plan (SPCC) (Olympus Technical Services, Inc. 2000), which

described a discharge of less than 800 gallons of sodium hydroxide to the POTW, approximately 10 years prior, caused by operator error at the Plywood Plant. This caused a disruption at the POTW, but no response actions were warranted or taken.

- **1988 Transformer Leak:** In 1988, a leak occurred from a pole-mounted polychlorinated biphenyl (PCB)-containing capacitor located southwest of the Boiler House. The PCB-contaminated oil was cleaned up and all six pole-mounted capacitors located southwest of the Boiler House were removed. By 1997, all known PCB capacitors (three in Planers #2 and #3 and seven in dry kilns) were removed from the Site. The documents describing the 1988 release were not located during this document review, and this description is based on information from the Phase I investigation completed by URS, which is discussed below (URS 2003). The lack of documentation regarding sampling and analysis associated with the capacitor leak near the Boiler House is considered a data gap.
- **1989 UST Removal:** In December 1989, four USTs were removed from two locations on the Site; a 20,000-gallon diesel tank and a 10,000-gallon gasoline tank were removed from one location, and two 10,000-gallon diesel tanks were removed from a separate location (PLSA 1990). The exact former locations of these USTs are not given, though Fulcrum Environmental Consulting (2012a) notes that the locations were likely north of the auto shop and east of the machine shop, near the fuel dispensing pumps which they supplied. The 20,000-gallon diesel tank, the 10,000-gallon gasoline tank, and one of the 10,000-gallon diesel tanks were reportedly installed in 1964, and the second 10,000-gallon diesel tank was installed in 1981 (URS 2003). Approximately 2,000 cubic yards of petroleum contaminated soil were excavated from the UST cavities during removal of the tanks. Groundwater was encountered at 15 ft BGS during excavation for the two 10,000-gallon diesel tanks. Soil and groundwater (if present) samples collected beneath the tanks were analyzed for total petroleum hydrocarbons (TPH; diesel- and gasoline-range using EPA Method 8015). In addition, samples from beneath the gasoline tank were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). Detected concentrations were less than the laboratory reporting limits (PLSA 1990).
- **1993 Ethylene Glycol Release:** In 1993, 300 to 400 gallons of ethylene glycol were released from a corroded pipe west of the Small Log Sawmill (SLM). The release was discovered during seasonal maintenance. Ethylene glycol was used as the working fluid for a heating system for the SLM, which was housed in a nearby small building. The heat system was installed in 1976, and was last used in 1986 (Boise Cascade Corporation 1993). Cascade Earth Sciences conducted a site investigation in November 1993, including collection of soil and groundwater samples for analysis for ethylene glycol. Ethylene glycol was not detected at concentrations greater than the laboratory reporting limit (25 ppm) in soil and groundwater and no further action was recommended (Cascade Earth Sciences 1994a). During this investigation, a 2,000-gallon lubricating oil UST was discovered and subsequently decommissioned by Cascade Earth Sciences (Cascade Earth Sciences 1993). No contaminated soil was encountered during decommissioning, which was confirmed with analytical testing (Cascade Earth Sciences 1993).

Based on the information available from the document review, the only data gap identified regarding previous releases and associated response actions is related to the capacitor leak at the Boiler House, as discussed above.

## FORMER WOOD WASTE LANDFILL

Boise Cascade operated a 5.7-acre, unpermitted wood waste landfill at the northern portion of the Site. Much of the former wood waste landfill appears to be located beyond the boundaries of the Site; however, the southern extent of the wood waste associated with the landfill has not been clearly delineated. It is uncertain when the operation of the wood waste landfill began, but the operations continued until at least March 1991 (Yakima Health District 1991). In August 1992, Boise Cascade met with Ecology and the Yakima County Health District (YHD) to discuss closure of 2.3 acres of the wood waste landfill by the summer of 1994 (Cascade Earth Sciences 1994b). Four monitoring wells (MW-1 through MW-4) were installed in 1993 in preparation for closure of this portion of the landfill (Cascade Earth Sciences 1995). Groundwater samples collected from these wells were analyzed for conventional parameters (pH, alkalinity, chemical oxygen demand, total organic carbon, etc.) as well as TPH, total phenols, and dissolved metals (iron, manganese, and zinc). Dissolved iron concentrations exceeded the Washington Board of Health Secondary Maximum Contaminant Level (SMCL) screening level [300 micrograms per liter ( $\mu\text{g/L}$ )] in the samples from MW-2, MW-3, and MW-4. Dissolved manganese concentrations exceeded the SMCL (50  $\mu\text{g/L}$ ) in the samples from MW-2, MW-3, and MW-4. No exceedances were reported in the sample from MW-1. No further actions were taken, and as of January 1996, the closure of the landfill had not been completed (Boise Cascade Corporation 1996).

In an attempt to restart the closure process in 2001, Ecology recommended that Boise Cascade resample the groundwater wells to demonstrate that groundwater had not been impacted by the wood waste landfill (Boise Cascade Corporation 2001; Ecology 2001). Groundwater samples were collected from MW-1 and MW-4 and analyzed for TPH, PCBs, volatile organic compounds (VOCs), total phenols, and metals (iron, manganese, and zinc) in addition to conventional parameters. The only constituents detected in the groundwater sample collected at MW-4 were iron and manganese; both of the detected concentrations were above the SMCLs. No exceedances were reported in the sample from MW-1. MW-2 had been damaged previously due to settling of the landfill and was decommissioned by a licensed well driller in August of 1998 (Landau Associates 1998). MW-3 was dry at the time of the 2001 sampling.

In March 2003, Boise Cascade began removing wood waste material from a 2.5-acre portion in the northernmost section (an area they intended to sell) of the wood waste landfill. Wood waste material was placed onto the ground surface on other areas of the site (Ecology 2003). Following removal of the wood waste material from this portion of the landfill, soil samples were collected and analyzed for TPH, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), as well as three phenols commonly used in lumber dipping operations (2,4,5-trichlorophenol; 2,4,6-trichlorophenol; and pentachlorophenol). Gasoline-, diesel-, and heavy oil-range TPH were not detected at concentrations

above the laboratory reporting limits [20 milligrams per kilogram (mg/kg), 50 mg/kg, and 100 mg/kg, respectively]. Phenols (2,4,5-trichlorophenol; 2,4,6-trichlorophenol; and pentachlorophenol) were also not detected above the laboratory reporting limits (0.330 mg/kg, 0.330 mg/kg, and 0.500 mg/kg, respectively). Metals were either not detected above the laboratory reporting limits, or were detected at concentrations less than the Model Toxics Control Act (MTCA) Method A cleanup levels (Boise Cascade Corporation 2003a). Ecology requested further analysis for polycyclic aromatic hydrocarbons (PAHs), which Boise Cascade completed in July 2003. No PAHs were detected above the laboratory reporting limit of 0.0100 mg/kg (Boise Cascade Corporation 2003b).

Boise Cascade contacted the YHD to request an “acceptance of closure” for this portion of the wood waste landfill (Boise Cascade Corporation 2003b), and the closure request was granted (Yakima Health District 2003). In October 2004, the remainder of the wood waste landfill was removed and the underlying soil was tested for TPH (using the hydrocarbon identification method), PAHs, semivolatile organic compounds (SVOCs), and Resource Conservation and Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, mercury, lead, selenium, and silver). Detected contaminant concentrations were less than the MTCA Method A or B screening levels (Office Max 2005). In June 2005, the YHD indicated that it considered the former wood waste landfill closed (Yakima Health District 2005). However, as noted above, there is not clear documentation of the southern extent of the wood waste associated with the landfill in the north portion of the Site.

Based on the information identified during the document review, the lack of documentation of the southern extent of the wood waste associated with the landfill and whether wood waste remains in the northern portion of the Site is considered a data gap.

## **PREVIOUS INVESTIGATIONS**

In addition to the focused investigations associated with individual releases and site activities noted above, four reports have been completed to document the results of environmental investigations conducted at the Site as follows:

- In 1998, Landau Associates conducted a hydrogeologic study on behalf of Boise Cascade, in compliance with Boise Cascade’s State Waste Discharge Permit (Landau Associates 1998).
- In 2003, a Phase I ESA report was completed by URS Corporation on behalf of Boise Cascade (URS 2003).
- In 2008, Parametrix completed a Phase II investigation report on behalf of LeeLynn, Inc. and Wiley Mt., Inc. (Parametrix 2008).
- In 2012, Fulcrum Environmental Consulting completed a Summary of Historic Property Use and Known Environmental Impacts on behalf of LeeLynn, Inc. and Wiley Mt., Inc (Fulcrum Environmental Consulting 2012a).

The following reports, which document investigative activities for the Landfill Parcel, were reviewed for information regarding environmental conditions at the Plywood Plant parcels:

- 2009 SLR International Corp (SLR) Remedial Investigation report for the Closed City of Yakima Landfill Site prepared for the City (SLR International Corp 2009).
- 2010 SLR Additional Investigation report for the Closed City of Yakima Landfill Site prepared for the City (SLR International Corp 2010).

The relevant findings from the documents regarding the Site are discussed below. Information from the documents for the Landfill Parcel is included in the discussions regarding the Plywood Plant, and the soil gas and groundwater investigations.

The 2003 URS Phase I Environmental Site Assessment identified a number of *recognized environmental conditions (RECs*, per the ASTM International definition) for the Site and some environmental concerns that they indicated may or may not qualify as *RECs*. The *RECs* and environmental concerns identified by URS have been consolidated and organized for the discussion below into potential areas of concern (AOC) and grouped by the associated Site building or other distinctive site feature. While most of the buildings on the Site have been demolished, many of the building footprints remain. Investigations that addressed site-wide groundwater quality are discussed at the end of this section.

In 2008, Parametrix conducted Phase II investigation activities in the areas of most of the *RECs* and environmental concerns identified by URS, as well as in a few additional areas. The Parametrix investigation included excavation of 19 test pits, collection of 7 surface soil samples, drilling of 10 soil borings, and installation of 3 gas probes. Parametrix compared detected concentrations of constituents of concern to preliminary cleanup levels (herein referred to as screening levels). For soil, the lower of the MTCA Method A (if available) and MTCA Method B values was selected as the screening level for comparison to the data. Detected concentrations were also compared to established background concentrations for the Yakima Basin area (Ecology 1994). If the screening level was lower than the background concentration, the background concentration was selected as the screening level. For groundwater, the lowest of the MTCA Method A, Method B, and EPA Maximum Contaminant Level (MCL) was selected as the screening level. As part of the 2008 investigation, Parametrix also conducted a geophysical survey to locate utilities and potential USTs. From the information available for review, it is unclear whether the survey was of the entire site, or of selected areas near potential boring locations. No USTs were discovered during the survey. Current and former building locations and previous sample locations are shown on Figures 2 and 3.

The following sections include, for each AOC, the findings of the previous investigations by URS and Parametrix, the conclusions by Parametrix, and Landau Associates evaluation of the available

information and identification of data gaps that warrant further investigation, as appropriate. As noted above, information from the SLR reports is included, as appropriate.

### **Former Log Yard Shop**

Vehicles were previously steam-cleaned on unpaved soil adjacent to the log yard, north bay shop entrance. During the 2003 URS site investigation, oily soil was observed to the southeast of the former log yard shop, adjacent to an area that included three aboveground storage tanks (ASTs). These ASTs ranged in capacity from 200 to 250 gallons and contained lube oil used for vehicle maintenance. The ASTs were located within a concrete secondary containment structure (Olympus Technical Services, Inc. 2000).

In 2008, Parametrix completed one boring (B-9) at the northeastern corner of the former log yard shop, to a depth of 15 ft BGS. Two soil samples were collected from depths of 7 ft and 12 ft BGS and analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and SVOCs. Detected concentrations were less than the screening levels.

The sample location chosen by Parametrix (at the northeast corner of the former log yard shop) did not address the potential release of lube oil from the southeast corner of the shop or potential releases due to steam cleaning of vehicles at the north bay entrance. The lack of analytical data for these areas at the former log shop is considered a data gap.

### **Former Fuel Dispensing Pumps and ASTs**

Three fuel dispensing pumps were formerly located on site and were originally served by USTs that were removed in 1989 (described above). The fuel dispensing pumps were located in two primary areas; north of the auto shop/east of the machine shop, and west of the log yard shop. The area east of the machine shop is within the Triangular Parcel, and the area to the west of the log yard shop is to the north of the Triangular Parcel. Following removal of the USTs, three ASTs were installed southwest of the former log yard shop within the Triangular Parcel. The locations of the fuel dispensing pumps and the former ASTs are shown on Figures 2 and 3. The ASTs included a 10,000-gallon gasoline tank, and two 10,000-gallon diesel tanks (Olympus Technical Services, Inc. 2000). URS noted that the fuel dispensing pumps, and their associated piping, were possible locations of releases due to spills or over-filling during fueling.

The 2008 Parametrix investigation included two borings east of the machine shop (B-6, B-8) and one test pit west of the log yard shop (TP-12) to address the fuel dispensing pump areas. Two additional test pits (TP-21 and TP-22) were completed west of TP-12 to assess the extent of contamination found at TP-12, as discussed below.

Boring B-6 and boring B-8 were completed to a total depth of 15 ft. No visual or olfactory evidence of contamination were identified during field screening. Groundwater was not encountered in either boring. One soil sample was collected from a depth of 14 ft BGS from each boring and analyzed for TPH, BTEX, and lead. Detected concentrations were less than the screening levels.

Test pit TP-12 was completed to a depth of 13 ft BGS. Parametrix noted that “product” was encountered at a depth of 12.5 ft BGS. One soil sample was collected from just below the bottom of the test pit and analyzed for diesel- and gasoline-range TPH, BTEX, lead, and SVOCs. Diesel- and gasoline-range TPH, and the SVOC n-nitrosodiphenylamine were detected at concentrations greater than the screening levels. No deeper sample was collected from this location.

Two additional test pits were completed west (TP-21) and south (TP-22) of TP-12, both to a depth of 13 ft BGS. No product was identified in either of the test pits. Soil samples were collected from just below the bottom of each of the test pits and analyzed for diesel-range TPH, PCBs, and SVOCs at TP-21 and diesel-range TPH at TP-22. Soil samples from the test pits were not analyzed for gasoline-range TPH. The detected concentrations were less than the screening levels. Parametrix concluded that “petroleum contamination is limited in extent (likely less than a 25-foot radius from TP-12).”

Parametrix also investigated the location of the three former gasoline and diesel fuel ASTs. One test pit (TP-11) was completed south of these tanks, to a depth of 14 ft BGS. No visual or olfactory evidence of contamination were identified. Two soil samples were collected (one at 4 ft and one at 14 ft BGS) from this test pit, and analyzed for gasoline- and diesel-range TPH, BTEX, lead, and SVOCs. The detected concentrations were less than the screening levels. No groundwater samples were analyzed.

Petroleum contamination at or around the location of the fuel dispensing pump west of the log yard shop has not been adequately evaluated either vertically or laterally, and potential impacts to groundwater have not been evaluated in either the former dispenser pump areas or at the former location of the gasoline and diesel fuel ASTs. The lack of soil and groundwater data in the former dispenser pump and AST areas is considered a data gap.

### **Former Large Log Sawmill**

The URS Phase I investigation report notes that a dry well was installed in the large log mill (LLM), adjacent to a hydraulic system, and was formerly used to drain steam condensate from nearby equipment. Note that “large” refers to the size of the logs that were processed in this mill. During the URS site inspection, the dry well cover and surrounding area were covered in oily residue indicating the potential for the well to act as a conduit for contamination to the subsurface. In the northeast portion of the LLM, standing oil was observed in the floor expansion joints near the hydraulic reservoirs. URS



noted that an oil house was formerly located southeast of the LLM and may have been the location of historical releases. A septic system was historically located at the eastern end of the LLM.

In 2008, Parametrix completed one test pit (TP-10) east of the dry well to a depth of 13.5 ft BGS. Based on our review of available documents, the location of the dry well is somewhat unclear; it is shown within the LLM in the URS report, and north of the LLM in the Parametrix report. It is possible that the drywell was located in the eastern extension of the LLM that was present in 2003, but not present in 2008. The locations of the test pits also may have been further south than shown on the figure provided by Parametrix. Sample location coordinates are not provided in the Parametrix report. Two soil samples were collected from TP-10 at depths of 8 ft and 13 ft BGS. These samples were analyzed for gasoline- and diesel-range TPH, BTEX, VOCs, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and SVOCs. Diesel- and motor oil-range TPH were detected at concentrations greater than the screening levels in both samples.

Three additional test pits were completed progressively further east of TP-10 to assess the lateral extent of contamination identified in TP-10 (TP-18, TP-19, TP-20). Analytical results for samples from TP-18 and TP-19 were not provided in the Parametrix report, though a review of the boring logs indicates that samples were collected. TP-18 and TP-19 were completed to depths of 20 ft and 7 ft BGS, respectively. A strong diesel odor and significant staining were observed in TP-18 at depths ranging from 4 to 10 ft BGS, and oil was observed floating on the water table at 20 ft. At TP-19, an oily sheen was observed at 7 ft BGS. TP-20 was completed to a depth of 10 ft and a slight hydrocarbon odor was observed. One soil sample, collected from TP-20 at a depth of 10 ft BGS, was analyzed for diesel-range TPH. The detected concentrations were below the screening levels.

Parametrix concluded that “additional test pits (TP-18 to TP-20) excavated in this vicinity suggest that petroleum contamination extends to the water table at a depth of 20 feet and an approximate radius around TP-10 of 60 ft.”

The extent of petroleum contamination in soil in the LLM area has not been adequately defined nor has any investigation of potential impact to groundwater been completed in this area. In addition, investigation of soil and groundwater conditions at the location of the former oil house and at the location of the former septic system has not been completed. The lack of soil and groundwater data in the former LLM, oil house, and septic system locations is considered a data gap.

### **Former Small Log Sawmill**

The URS Phase I investigation report notes that blow down from the air compressors in the small log mill (SLM) was discharged to the exterior asphalt, which drained to a storm drain located north of the compressor room, between the LLM and the SLM. The SLM also contained an oil room on the south

side of the building and oil was observed by URS personnel running across the asphalt surface from the area of the oil room to the log deck to the southeast of the SLM.

These areas were not investigated by Parametrix. The lack of data to document soil and groundwater conditions in the area of the oil room on the south side of the building and the former area of the storm drain north of the compressor room is considered a data gap.

### **Former Machine Shop**

URS observed a 1- to 2-ft-deep pit in the northwest corner of a storeroom in the carpenter's shop located along the north wall of the machine shop. This pit contained oily sawdust, and oil may have been released to the subsurface through the bottom of this pit. Six electrical transformers were stored in the carpenter's shop at the time of the URS site visit. It was unknown if they were included as part of a PCB survey referenced in the URS report. No staining was observed in the area of the transformers.

In 2008, Parametrix completed one test pit (TP-13) north of the machine shop to a depth of 8 ft BGS. One soil sample was collected from a depth of 8 ft BGS and was analyzed for gasoline- and diesel-range TPH, BTEX, VOCs, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), PCBs, and SVOCs. Detected concentrations were less than the screening levels.

The lack of information regarding how the machine shop pit was closed and the current soil and groundwater conditions in this area are considered data gaps.

### **Former Log Ponds/Log Decks**

In 2003, URS noted that the fill materials used to fill in the former log ponds, used as log decks at the time of the URS site visit, were unknown and could potentially impact the subsurface environment.

Parametrix completed four test pits (TP-23, TP-24, TP-25, and TP-26) within the northern and central log decks. TP-23 and TP-24 were excavated to 11 ft BGS, TP-25 was excavated to 12 ft BGS, and TP-26 was excavated to 10 ft BGS. Fill material in these test pits was described as "wood debris". Soil samples were collected beneath the wood debris at 7 ft (TP-23), 4 ft (TP-24), 12 ft (TP-25), and 7 ft (TP-26) and analyzed for diesel-range TPH. Detected concentrations were less than the screening levels.

The lack of information regarding the composition of the fill materials and the limited analytical testing (TPH only) in the former log pond/log deck areas are considered data gaps.

### **Former Kiln Building and Kiln Ponds**

During their site investigation, URS noted that oil dripping from the roof of the former kiln building had stained an area of surface soil next to the building. They also noted that some process water from the kilns and the overflow from the wet scrubber were discharged to the kiln ponds. Boiler blow

down was also discharged to an underground culvert, which discharged to the kiln ponds (see Boiler House section, below). In addition to hog fuel, site-generated waste oil was burned in the boiler (Boise Cascade Corporation 1986).

Two kiln ponds were present on the Site in 2008. Parametrix analyzed surface water samples from both kiln ponds [KILN1-W (northern pond) and KILN2-W (southern pond)] for diesel- and oil-range TPH, BTEX, total and dissolved metals (arsenic, barium, cadmium, calcium, chromium, iron, lead, manganese, mercury, potassium, selenium, silver, and sodium), and SVOCs. Motor oil-range TPH, total iron and manganese, and dissolved manganese were detected at concentrations greater than the screening levels in the sample collected from the northern pond, while total iron and manganese were detected at concentrations greater than the screening levels in the sample collected from the southern pond.

One test pit (TP-9) was completed between the planar shed (located west of the kilns and shown on Figure 2) and the kilns, at the former location of an Oil Car. The report does not specify the depth of this test pit, but indicates that two soil samples were collected, one from 1.5 ft BGS and another from 13 ft BGS. These samples were analyzed for diesel- and gasoline-range TPH, BTEX, VOCs, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), PCBs, and SVOCs. Detected concentrations were less than the screening levels.

No investigation of potential soil contamination was conducted in the stained area next to the kiln building. The quality of sediment and soil associated with the kiln ponds has not been evaluated. In addition, chromium and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were detected in samples collected from the Boiler House at concentrations greater than the screening levels (discussed below). Impacted soil may have been transported to the kiln ponds. The lack of information regarding potential soil and sediment quality in the former locations of the kiln building and kiln ponds are considered data gaps.

### **Boiler House**

As noted above, at the time of the URS investigation, boiler blow down was discharged to an underground culvert, which then discharged to the kiln ponds. URS indicated that boiler treatment chemicals, or past chemicals related to Boiler House operations, could have been released to the kiln ponds via the culvert. In addition to hog fuel, site-generated waste oil was burned in the boiler (Boise Cascade Corporation 1986). A water supply well was present to the south of the Boiler House and was used to provide water to the log decks. The current status of this well is unclear; the well may have been decommissioned. Based on available information, the well may have been installed in 1927 to a depth of 2425 ft (Cascade Lumber Company 1927, provided as part of Ecology 1985).

Parametrix collected two surface soil samples, SS-3 and SS-4, in the vicinity of the Boiler House. SS-3 was collected from a depth of 2 ft BGS, near the drain in the Boiler House. SS-4 was collected from beneath a caustic AST inside the Boiler House. Both samples were analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and SVOCs.

Concentrations of cPAHs [based on the toxic equivalent (TEQ) of all of the cPAHs present] in both samples were greater than current Method A cleanup levels. Individual PAH concentrations were greater than screening levels. Detected concentrations of chromium were greater than the screening levels in both samples. The detected concentrations of chromium (26 and 30 mg/kg) were greater than the screening level [MTCA Method A for chromium VI (19 mg/kg)]. Parametrix did not conduct any speciation of chromium, and it may be that the MTCA Method A screening level for chromium III (2,000 mg/kg) is more appropriate.

One surface soil sample (BOILER DRAIN) was collected from the southern end of the drain from the Boiler House to the kiln ponds. This sample was analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and SVOCs. The detected concentration of chromium (28 mg/kg) was greater than the MTCA Method A cleanup level for chromium VI (19 mg/kg).

The current status of the water supply well to the south of the Boiler House is unknown. The well, if present, may extend into the deep aquifer underlying the region. No sampling has been completed at or around this well. Possible chromium contamination has been identified in soil in the area of the Boiler House. Speciation of chromium has not been conducted to evaluate the potential presence of hexavalent chromium, which has a lower screening level than trivalent chromium. The extent of cPAH contamination in soil has not been evaluated. The lack of information regarding the current status of the water supply well and chromium and cPAH data for the former Boiler House area are considered data gaps.

### **Former Boneyard**

URS noted that an area north and west of the shipping shed was utilized to store unused equipment, and was referred to as the Boneyard. During the URS site investigation, there were approximately 20 pieces of unused equipment (e.g., hydraulic reservoirs/pumps and conveyors). Some of these pieces of equipment appeared to have released oil to the nearby, unpaved ground surface.

In 2008, Parametrix collected one surface soil sample within the Boneyard (SS-2) from a depth of 0.5 ft BGS. This sample was analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic,

barium, cadmium, chromium, lead, mercury, selenium, and silver), PCBs, and SVOCs. The detected concentrations were less than the screening levels.

The lack of area-wide soil and groundwater data for the Boneyard is considered a data gap.

### **Irrigation Ditch/Culvert**

Process water was historically discharged to an irrigation ditch. This ditch ran in an east-west direction across the Site, south of the Boiler House and north of the machine shop, toward the settling pond on the eastern border of the site. Portions of the irrigation ditch were replaced with a culvert at an unknown time. In 2008, Parametrix noted that the depth to this irrigation culvert appeared to range from 5 to 10 ft BGS. The diameter of the culvert is not specified. Parametrix collected one surface water sample (STL-W) from the settling pond. This sample was analyzed for diesel- and gasoline-range TPH, BTEX, and total and dissolved metals (arsenic, barium, cadmium, calcium, chromium, iron, lead, manganese, mercury, potassium, selenium, silver, and sodium). Diesel- and motor oil-range TPH and total iron and manganese were detected at concentrations greater than the screening levels.

The lack of soil and groundwater data along the irrigation culvert and downgradient of the settling pond, and lack of sediment data for the settling pond are considered data gaps.

### **Recycle Pond**

At the time of the URS Phase I investigation, a pond was present in the southeastern corner of the northern log deck and collected surface water runoff and spray water from the log deck. The water from this "Recycle Pond" was re-used to wet the log decks. A water supply well in the vicinity of this pond was noted to be capped and unused. URS noted that the well could provide a conduit for contaminants to groundwater.

Parametrix collected one surface water sample from the Recycle Pond. This sample was analyzed for diesel- and gasoline-range TPH, BTEX, and total and dissolved metals (arsenic, barium, cadmium, calcium, chromium, iron, lead, manganese, mercury, potassium, selenium, silver, and sodium). Diesel- and motor oil-range TPH, and total iron and manganese were detected at concentrations greater than the screening levels.

The lack of information regarding the current condition of the water supply well near the Recycle Pond, and the lack of sediment data for the pond and data for soil and groundwater downgradient of the pond are considered data gaps.

## **Former Plywood Plant**

### ***Former Plywood Mill Oil Room and Maintenance Shop***

The mill oil room was located in the northwestern corner of former Plywood Plant and was the location of a pit previously used for chemical treatment of marine-grade plywood. The pit has been filled, but the condition at the time of filling and what chemicals may have been present in the pit are not known. URS noted that plywood treatment may have also occurred in the adjacent room to the south (the maintenance shop).

In 2008, Parametrix was not able to collect soil samples in, or adjacent to, the oil room due to overhead and subsurface obstructions. Borings B-5 and the boring associated with installation of monitoring well MW-9A were the borings completed closest to the oil room. Boring B-5 was completed to evaluate potential contamination at the former auto shop and was completed to a depth of 15 ft BGS. One soil sample was collected from a depth of 10.5 ft BGS and was analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), VOCs, and SVOCs. Detected concentrations were less than the screening levels. No visual or olfactory indications of contamination were noted at the boring associated with installation of MW-9A and no soil samples were collected. Parametrix collected one sub-slab soil sample (SS-6) at a depth of 1.5 ft BGS in the former maintenance shop. The sample was analyzed for diesel- and gasoline-range TPH, BTEX, PCBs, and SVOCs. Detected concentrations were less than the screening levels.

The lack of information regarding the chemical used in the marine-grade plywood treatment process and the lack of soil and groundwater data at the location of the former oil room, the associated pit, and the maintenance room are considered data gaps.

### ***Former Plywood Mill Lathe Hydraulic Oil Room***

The plywood mill lathe hydraulic oil room was located in the northeastern corner of the former Plywood Plant. During the URS investigation, hydraulic oil was observed within expansion joints in the concrete floor of the lathe hydraulic oil room and also on the asphalt outside of this room to the north and east.

In 2008, Parametrix completed two borings (B-3 and B-4) in the vicinity of this room, to depths of 14 and 15 ft BGS, respectively. Soil samples were collected from 8.5 ft and 14 ft BGS at boring B-3 and at 14 ft BGS at boring B-4. Samples collected from B-3 were analyzed for diesel- and gasoline-range TPH, BTEX, PCBs, VOCs, and SVOCs. Motor oil-range TPH was detected at concentrations greater than the screening level in the sample from 8.5 ft, and at a concentration less than the screening level in the sample from 14 ft. The soil sample collected from B-4 was analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), VOCs,

and SVOCs. Benzene was detected at a concentration greater than the screening levels in the duplicate sample collected from B-4.

The lack of data regarding the lateral and vertical extent of hydrocarbon and benzene contamination in soil beneath the lathe hydraulic oil room, and the lack of groundwater data for this area are considered data gaps.

### ***Former Lathe Pit***

URS noted a 15-ft-deep concrete containment pit beneath the lathe in the former Plywood Plant. The western corner of the pit contained a bucket collecting leaking hydraulic fluid. Parametrix completed one boring (B-2) in the vicinity of the former lathe pit to a depth of 15 ft BGS. One sample was collected from 13 ft BGS, and was analyzed for diesel- and gasoline-range TPH, BTEX, PCBs, and SVOCs. Detected contaminant concentrations were less than the screening levels.

The lack of data for soil beneath the base of the pit is considered a data gap.

### ***General Sub-slab Soil***

Parametrix collected two sub-slab soil samples (SS-5 and SS-7) between 1.5 and 2 ft BGS in the central section of the former Plywood Plant. Sample SS-5 was analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), PCBs, VOCs, and SVOCs. Chromium was detected at SS-5 at a concentration greater than the MTCA Method A cleanup level for chromium VI (19 mg/kg). Parametrix did not conduct any speciation of chromium, and it may be that the MTCA Method A cleanup level for chromium III (2,000 mg/kg) is more appropriate. Sample SS-7 was analyzed for diesel-range TPH. Detected concentrations in this sample were less than the screening levels.

The lack of information regarding the type of chromium present and the subsurface conditions beneath the former Plywood Plant, as discussed above, are considered data gaps.

### ***Former Evaporation Pond***

An unlined evaporation pond was formerly located south of the former Plywood Plant. URS noted that the area around the pond was historically stained and that the water had emulsified oil on it.

In 2008, Parametrix analyzed one surface water sample and a duplicate surface water sample from the evaporation pond. Samples were analyzed for diesel- and gasoline-range TPH, BTEX, total and dissolved metals (arsenic, barium, cadmium, calcium, chromium, iron, lead, manganese, mercury, potassium, selenium, silver, and sodium), VOCs, PCBs, and SVOCs. Detected concentrations of diesel- and motor oil-range TPH and total iron were greater than the screening levels.

The pond appears to have been filled in; however, there is no information regarding how the pond was filled and if any sediment was removed before filling. The lack of information regarding closure/filling of the evaporation pond, including if the bottom sediments were left in place, and the lack of data regarding current soil and groundwater conditions in the pond area are considered data gaps.

### ***Municipal Solid Waste***

In 2009, SLR completed a remedial investigation at the Landfill Parcel. One goal of this investigation was to delineate the vertical and horizontal extent of the municipal solid waste (MSW) landfill and to document the extent of the MSW on the Plywood Plant parcels. The SLR investigation included excavating 56 test pits (TP-8 through TP-63) along the boundary of the landfill, as well as 41 soil borings (SB-1 through SB-41) within the landfill. Eleven of the test pits (TP-35, TP-36, TP-38 through TP-41, TP-45, TP-53, TP-59, TP-62, and TP-63) and two of the soil borings (SB-18 and SB-41) were completed within the Plywood Plant parcels (shown on Figures 2 and 3). The estimated limit of the MSW is also shown on Figures 2 and 3.

MSW extended to 19 ft BGS at SB-18, southeast of the former barker area and to 19.5 ft BGS at SB-41, directly south of the former barker area. Fill overlying the MSW at SB-18 was 6 ft thick and fill overlying the MSW at SB-41 was 7 ft thick. The SLR investigation appears to have documented the horizontal and vertical extents of the MSW; therefore, no data gaps were identified regarding the extent of the MSW on the Plywood Plant parcels.

### **Triangular Parcel**

The Triangular Parcel includes the former steam cleaning pit, the former service pit, the former oil house, the eastern portion of the former auto shop, one of the two fuel dispenser pump areas, and the former ASTs. The ASTs are described above, along with the fuel dispensing pumps. As noted above, the fuel dispenser pump area east of the machine shop is located within the Triangular Parcel and the other fuel dispenser pump area west of the log yard shop is located north of the Triangular Parcel.

### ***Former Oil House and Service Pit***

The former oil house is located to the northwest of the former auto repair shop. A former service pit to the immediate north of the oil house was observed to be filled with sawdust and other wood debris during the URS site investigation. URS was not able to determine if this pit had a drain.

In 2008, Parametrix collected one soil sample (SS-1) within the former service pit at a depth of 2 ft. This sample was analyzed for diesel- and gasoline-range TPH, BTEX, VOCs, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), PCBs, and SVOCs. Diesel- and motor oil-



range TPH and chromium were detected at concentrations greater than the screening levels. No deeper sample was collected. As noted earlier, Parametrix did not conduct any speciation of chromium, and it may be that the MTCA Method A cleanup level for chromium III (2,000 mg/kg) is more appropriate.

Parametrix concluded that “the vertical extent of the petroleum contamination at this location is unknown; however it is likely limited. Diesel and motor oil were not detected in borings B-6 and B-7, southwest of SS-1.” The lateral and vertical extent of the TPH contamination at the service pit has not been evaluated and there has been no investigation of soils beneath the oil house. In addition, groundwater conditions in this area have not been evaluated. The lack of soil data for the service pit and oil house and the lack of groundwater data for the area are considered data gaps.

### ***Former Steam Cleaning Shed***

The former steam cleaning shed is located west of the former oil house and the service pit. In 2003, URS noted that prior to the completion of the steam cleaning shed, vehicles were steam-cleaned in this formerly unpaved area.

In 2008, Parametrix completed one boring (B-7) south of the steam shed to a depth of 15 ft. No visual or olfactory signs of contamination were identified. One soil sample was collected from a depth of 14 ft BGS and analyzed for diesel- and gasoline-range TPH, BTEX, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and SVOCs. Detected concentrations were less than the screening levels.

Data gaps were not identified for this area.

### ***Former Auto Repair Shop***

The eastern portion of the former auto repair shop is located to the northwest of the former Plywood Plant and is within the Triangular Parcel. The former auto repair shop has been present on the site since 1956 and it is unclear when the surrounding area was paved. URS noted that the floor of the auto shop was heavily stained and that potential releases from auto-maintenance activities could have occurred in this area before it was paved.

One boring (B-5) was completed east of the former auto repair shop to a depth of 15 ft BGS. A soil sample was collected at a depth of 10.5 ft BGS and was analyzed for diesel- and gasoline-range TPH, BTEX, VOCs, metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and SVOCs. Detected concentrations were less than the screening levels. No sampling was conducted within the former footprint of the auto repair shop.

The lack of sampling to evaluate subsurface conditions beneath the auto repair shop is considered a data gap.

## Groundwater

The following documents were reviewed for information regarding groundwater conditions at the Site.

- 1998 Landau Associates hydrogeologic study on behalf of Boise Cascade (Landau Associates 1998).
- 2008 Parametrix Phase II investigation report on behalf of LeeLynn, Inc. and Wiley Mt., Inc. (Parametrix 2008).
- 2009 SLR Remedial Investigation report for the Closed City of Yakima Landfill Site on behalf of the City (SLR International Corp 2009).
- 2010 SLR Additional Investigation report for the Closed City of Yakima Landfill Site on behalf of the City (SLR International Corp 2010).
- 2012 Fulcrum Environmental Consulting letter report on behalf of LeeLynn, Inc. and Wiley Mt., Inc. (Fulcrum Environmental Consulting 2012a).

In 1998, Landau Associates conducted a hydrogeologic study as part of the preparation of a groundwater monitoring plan for the Site. This report was prepared to address Permit Section S9C of the State Waste Discharge Permit No. ST-9204. This permit was issued by the Washington State Department of Ecology (Ecology) to Boise Cascade on December 1, 1997. The permit listed four discharge points, two of which were identified as locations where water could potentially infiltrate to groundwater. These points were labeled Discharge #003 (the small evaporation pond south of the Plywood Plant where process water was temporarily stored prior to discharge to the Yakima POTW) and Discharge #004 (the wet log decks and the associated recycle pond and settling pond at the southeastern corner of each of the log decks). Six monitoring wells (MW-5 through MW-10) were installed in July 1998 as part of this study (Landau Associates 1998). As noted earlier, monitoring wells MW-1 through MW-4 were installed by Cascade Earth Sciences in 1993 during the investigation of the wood waste landfill. MW-2 was damaged and was decommissioned. The locations of the wells are shown on Figure 2. The results of this study indicated that groundwater was present at depths ranging from 2.5 to 11 ft BGS and that the direction of groundwater flow was to the southeast.

Water quality data (at MW-1, MW-5, MW-6, MW-7, MW-9, and MW-10) were collected quarterly between January 7, 1999 and May 21, 2002 and were presented in the *Groundwater Monitoring Data Report, Boise Cascade Corporation, Yakima Wood Products Complex* (Landau Associates 2002). General water chemistry data (cation and anion concentrations) were plotted on trilinear plots to evaluate the similarity or difference in water quality between upgradient monitoring wells (MW-1) and downgradient monitoring wells (all other monitoring wells at the Site). This analysis identified no appreciable difference between upgradient and downgradient water quality (Landau Associates 2002). However, detected concentrations of total iron and manganese exceeded the Washington Board of Health

SMCL screening levels for iron (300 µg/L) and manganese (50 µg/L) in the samples from wells MW-5, MW-6, and MW-10 during all quarters. Total iron and manganese exceeded SMCLs in the samples from MW-7 during all but the final quarter it was measured. Total iron exceeded SMCLs during only one quarter in the samples from MW-9; total manganese never exceeded SMCLs. Total iron and manganese concentrations never exceeded SMCLs in the samples from MW-1, the upgradient well.

In 2008, Parametrix collected groundwater samples from monitoring wells MW-1, MW-5 through MW-8, MW-9A (MW-9A was installed in 2008 as a replacement for MW-9, which was consistently dry) and MW-10. Samples were analyzed for diesel- and gasoline-range TPH, BTEX, total and dissolved metals (arsenic, barium, cadmium, calcium, chromium, iron, lead, manganese, mercury, potassium, selenium, silver, and sodium), VOCs, PCBs, and SVOCs, as well as conventional parameters. As noted earlier, screening levels were developed by Parametrix by selecting the lowest value of published Method A, Method B, and/or MCLs for each constituent.

Detected concentrations of total iron and manganese in the samples from all wells exceeded the Washington Board of Health SMCLs for iron and manganese, which were selected as the screening levels by Parametrix. Concentrations of dissolved manganese exceeded the screening level in the samples from all wells except MW-1. Concentrations of dissolved iron exceeded the screening level in the samples from all wells except MW-1 and MW-9A. Vinyl chloride was detected at concentrations above the screening level (MTCA Method B cleanup level, 0.03 µg/L) in the samples from MW-7 and MW-8 during the first sampling event (February 2008), but only in the sample from MW-7 during a subsequent sampling event (August 2008). The following year (fall 2008 to spring 2009) Fulcrum Environmental Consulting completed routine groundwater monitoring at the Site. Groundwater samples collected from MW-7 and MW-8 were analyzed for vinyl chloride. Vinyl chloride was not detected at concentrations greater than the screening level (Fulcrum Environmental Consulting 2012b).

In 2009, as part of a remedial investigation of the Landfill Parcel, SLR installed three additional groundwater monitoring wells (MW-11, MW-12, and MW-13), and conducted groundwater sampling at wells MW-7, MW-8, MW-9A, and the three new wells. Samples were analyzed for VOCs, SVOCs, PCBs, diesel- and gasoline-range TPH, dissolved metals (arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, thallium, and zinc), and conventional parameters.

Screening levels were developed by SLR by selecting the lowest value of the published Method A, Method B, and/or MCLs for each constituent. Dissolved iron and manganese exceeded the screening levels [Washington Board of Health SMCLs for iron and manganese] in the samples from all wells except MW-9A. Dissolved arsenic exceeded the primary maximum contaminant level (PMCL; 0.06 µg/L) in the samples from MW-7 and MW-11. Dissolved sodium exceeded the PCL (20,000 µg/L) in the samples

from MW-8. No other constituents (including vinyl chloride) were detected in the samples from any of the wells at concentrations above the screening levels.

In 2010, SLR completed additional investigations at the Landfill Parcel, in part to identify sources for the contamination identified in 2009. SLR limited their analysis to a number of indicator hazardous substances (IHSs), which included arsenic, sodium, iron, manganese, pH, nitrate, and vinyl chloride. Five new monitoring wells were installed (MW-14 through MW-18). Groundwater samples were collected from MW-7, MW-8, MW-9A, MW-11, MW-12, MW-13, and the five new wells in November 2009 and February 2010. During both events, dissolved arsenic exceeded the screening level in the samples from all monitoring wells. Dissolved manganese exceeded the screening level in the samples from all monitoring wells except MW-9A. Dissolved iron exceeded the screening level in the samples from MW-11, MW-12, MW-13, MW-15, MW-17, and MW-18. Dissolved iron exceeded the PMCL (300 µg/L) in the duplicate sample, MW-37 (851 µg/L), for sample MW-7 (22 µg/L). Dissolved sodium exceeded the screening level at MW-7, MW-8, MW-16, MW-17, and MW-18, but only exceeded the screening level in the sample from MW-14 in November 2009. The laboratory reporting limit for vinyl chloride was higher than the screening level during the first event and no samples had concentrations that exceeded the laboratory reporting limit. Vinyl chloride was not detected above the laboratory reporting limit or the screening level (both 0.03 µg/L) during the second event.

Fulcrum Environmental Consulting has been conducting quarterly monitoring at wells MW-1, MW-5, MW-6, MW-7, and MW-10 since 2004. In the most recent data available, for the final quarterly sampling of 2012 (Landau Associates will request 2013 data from Dunollie Enterprises, LLC), the detected concentrations of dissolved iron and manganese exceeded the screening levels used by Parametrix and SLR for iron and manganese in the samples from all wells except MW-1.

The lack of current groundwater monitoring data from the onsite wells to assess the concentrations of the constituents of concern and groundwater depth and flow is considered a data gap.

### **Soil Gas/Methane**

As part of the 2008 investigation, Parametrix installed three soil gas probes (GP-1, GP-2, and GP-3). Three methane surveys were undertaken, utilizing the three soil gas probes and monitoring wells MW-1, MW-5 through MW-9, MW-9A, and MW-10 (Figure 2). On March 5, 2008, concentrations above the upper explosive limit (UEL; 15% by volume) were detected at GP-1 (23.9%) and at GP-3 (17.2%). Methane was not detected at GP-2. On March 25, 2008, methane concentrations at GP-1 (14.5%) were below the UEL, but still above the lower explosive limit (LEL) of 5% by volume. Methane concentrations at GP-3 (25.6%) remained above the UEL. Methane was not detected at any of the monitoring wells sampled for methane.

As part of the 2009 remedial investigation, SLR installed and sampled 10 soil gas probes (GP-4 through GP-13) to assess combustible gas, which they assumed to consist entirely of methane. An additional five gas probes were installed in April 2009 (GP-14 through GP-18) to assess high methane concentrations to the west and southwest of the landfill. Seven of the gas probes (GP-4, GP-10, GP-11, and GP-15 through GP-18) were installed on the Site. SLR also sampled GP-3 (installed by Parametrix in 2008) as part of this investigation. SLR did not sample GP-1 and GP-2 (also installed by Parametrix), because SLR did not consider them properly sealed.

In February 2009, SLR measured the percentage of oxygen, carbon dioxide, and combustible gas (reported as methane) at each of the gas probes. Methane concentrations on the Site ranged from 0.0 % by volume to 58.5 %. In February 2009, concentrations above the UEL were detected at GP-3 (19.5%), GP-4 (22.4%), GP-10 (22.6%), and GP-11 (58.5%). Concentrations in April 2009 were similar at these four gas probes. Concentrations at the five gas probes installed in April 2009 (GP-15 through GP-18) at the western landfill boundary, ranged from 0.0 to 0.2% methane by volume, and were below the LEL.

In 2010, SLR completed additional investigations at the Landfill Parcel, which included the installation of four additional soil gas probes (GP-19 through GP-22). Methane sampling results during this investigation were similar to those in the previous investigation.

Methane data has not been collected from beneath the slab at the footprint of the former Plywood Plant and this is considered a data gap.

## **DATA GAPS**

As detailed above, the following preliminary data gaps were identified based on the findings of the document review and are summarized below and shown on Figure 4. Additional data gaps may be identified during the Phase I investigation, which is being completed concurrently.

- **Former Wood Waste Landfill:** The landfill has been closed; however, the lack of documentation of the southern extent of the wood waste associated with the landfill and whether wood waste remains in the northern portion of the Site is considered a data gap.
- **Former Log Yard Shop:** The sample location chosen by Parametrix (at the northeast corner of the former log yard shop) did not address the potential release of lube oil from the southeast corner of the shop or potential releases due to steam cleaning of vehicles at the north bay entrance. The lack of analytical data for these areas at the former log yard shop is considered a data gap.
- **Former Fuel Dispensing Pumps and ASTs:** Petroleum contamination at or around the former dispenser pump area west of the log yard shop has not been adequately evaluated either vertically or laterally, and potential impacts to groundwater have not been evaluated in either the former pump/dispenser areas or at the former location of the gasoline- and diesel-fuel ASTs. The lack of soil and groundwater data in the former dispenser pump and AST areas are considered data gaps.

- **Former Large Log Sawmill:** The extent of petroleum contamination in soil in the LLM area has not been adequately defined nor has any investigation of potential impact to groundwater been completed in this area. In addition, investigation of soil and groundwater conditions at the location of the former oil house and at the location of the former septic system has not been completed. The lack of soil and groundwater data in the former LLM, oil house, and septic system locations are considered data gaps.
- **Former Small Log Sawmill:** The URS Phase I investigation report notes that blow down from the air compressors in the small log mill (SLM) was discharged to the exterior asphalt, which drained to a storm drain located north of the compressor room, between the LLM and the SLM. The SLM also contained an oil room on the south side of the building and oil was observed by URS personnel running across the asphalt surface from the area of the oil room to the log deck to the southeast of the SLM. These areas were not investigated by Parametrix. The lack of data to document soil and groundwater conditions in the area of the oil room on the south side of the building and the former area of the storm drain north of the compressor room are considered data gaps.
- **Former Machine Shop:** URS observed a 1- to 2-ft-deep pit in the northwest corner of a storeroom in the carpenter's shop located along the north wall of the machine shop. This pit contained oily sawdust, and oil may have been released to the subsurface through the bottom of this pit. The lack of information regarding how the machine shop pit was closed and the current soil and groundwater conditions in this area are considered data gaps.
- **Former Log Ponds/Log Decks:** In 2003, URS noted that the fill materials used to fill in the former log ponds, used as log decks at the time of the URS site visit, were unknown and could potentially impact the subsurface environment. The lack of information regarding the composition of the fill materials and the limited analytical testing (TPH only) in the former log pond/log deck areas are considered data gaps.
- **Former Kiln Building and Kiln Ponds:** No investigation of potential soil contamination was conducted in the stained area next to the kiln building. The quality of sediment and soil associated with the kiln ponds has not been evaluated. In addition, chromium and cPAHs were detected in samples collected from the Boiler House at concentrations greater than the screening levels (discussed below). Impacted soil may have been transported to the kiln ponds. The lack of information regarding potential soil and sediment quality in the former locations of the kiln building and kiln ponds are considered data gaps.
- **Boiler House:** The current status of the water supply well to the south of the Boiler House is unknown. The well, if present, may extend into the deep aquifer underlying the region. No sampling has been completed at or around this well. Possible chromium contamination has been identified in soil in the area of the Boiler House. Speciation of chromium has not been conducted to evaluate the potential presence of hexavalent chromium. The extent of cPAH contamination in soil has not been evaluated. The lack of information regarding the current status of the water supply well and chromium and cPAH data for the former Boiler House area are considered data gaps.
- **Former Boneyard:** URS noted that an area north and west of the shipping shed was utilized to store unused equipment, and was referred to as the Boneyard. During the URS site investigation, there were approximately 20 pieces of unused equipment (e.g., hydraulic reservoirs/pumps and conveyors). Some of these pieces of equipment appeared to have released oil to the nearby, unpaved ground surface. Only one shallow soil sample was collected in this area. The lack of area-wide soil and groundwater data for the Boneyard is considered a data gap.

- **Irrigation Ditch/Culvert:** Process water was historically discharged to an irrigation ditch. This ditch ran in an east-west direction across the Site, south of the Boiler House and north of the machine shop, toward the settling pond on the eastern border of the site. Portions of the irrigation ditch were replaced with a culvert at an unknown time. The lack of soil and groundwater data along the irrigation culvert and downgradient of the settling pond, and lack of sediment data for the settling pond are considered data gaps.
- **Recycle Pond:** At the time of the URS Phase I investigation, a recycle pond was present in the southeastern corner of the northern log deck and collected surface water runoff from the log deck. A water supply well in the vicinity of this pond was noted to be capped and unused. The lack of information regarding the current condition of the water supply well near the Recycle Pond, and the lack of sediment data for the pond and data for soil and groundwater downgradient of the pond are considered data gaps.
- **Former Plywood Plant**
  - *Former Plywood Mill Oil Room:* The mill oil room was the location of a pit previously used for chemical treatment of marine-grade plywood. The pit has been filled, but the condition at the time of filling and what chemicals may have been present in the pit are not known. The lack of information regarding the chemical used in the marine-grade plywood treatment process and the lack of soil and groundwater data at the location of the former oil room, the associated pit, and the maintenance room are considered data gaps.
  - *Former Plywood Mill Lathe Hydraulic Oil Room:* During the URS investigation, hydraulic oil was observed within expansion joints in the concrete floor of the lathe hydraulic oil room and also on the asphalt outside of this room to the north and east. The lack of data regarding the lateral and vertical extent of hydrocarbon and benzene contamination in soil beneath the lathe hydraulic oil room, and the lack of groundwater data for this area are considered data gaps.
  - *Former Lathe Pit:* URS noted a 15-ft-deep concrete containment pit beneath the lathe in the former plywood plant. The western corner of the pit contained a bucket collecting leaking hydraulic fluid. The lack of data for soil beneath the base of the pit is considered a data gap.
  - *General Sub-slab Soil:* Chromium was detected at concentrations greater than the screening levels for hexavalent chromium; however, chromium speciation has not been conducted to determine if the detected concentrations are representative of hexavalent chromium, trivalent chromium, or both. Subsurface conditions beneath the former Plywood Plant have not been adequately characterized. The lack of information regarding the type of chromium present and the subsurface conditions beneath the former Plywood Plant are considered data gaps.
  - *Former Evaporation Pond:* An unlined evaporation pond was formerly located south of the former Plywood Plant. URS noted that the area around the pond was historically stained and that the water had emulsified oil on it. The pond has been filled in and there is no information regarding how the pond was filled and if any sediment was removed before backfilling. The lack of information regarding closure/filling of the evaporation pond, including if the bottom sediments were left in place, and the lack of data regarding current soil and groundwater condition in the pond area are considered data gaps.

- **Triangular Parcel**
  - *Former Oil House and Service Pit:* The lateral and vertical extent of the TPH contamination at the service pit has not been evaluated and there has been no investigation of soils beneath the oil house. In addition, groundwater conditions in this area have not been evaluated. The lack of soil data for the service pit and oil house and the lack of groundwater data for the area are considered data gaps.
  - *Former Auto Repair Shop:* The former auto repair shop has been present on the site since 1956 and it is unclear when the surrounding area was paved. URS noted that the floor of the auto shop was heavily stained and that potential releases from auto-maintenance activities could have occurred in this area before it was paved. The lack of sampling to evaluate subsurface conditions beneath the former auto repair shop is considered a data gap.
  - *Former Fuel Dispenser Pump Area (east of the machine shop) and Fuel ASTs:* As noted above, the lack of soil and groundwater data in the former dispenser pump and AST areas are considered data gaps.
- **Groundwater:** The lack of current groundwater monitoring data from the onsite wells to assess the concentrations of the constituents of concern and groundwater depth and flow is considered a data gap.
- **Soil Gas/Methane:** Methane investigations have been undertaken throughout the Landfill Parcel and around the boundaries of the former MSW landfill. The lack of methane data beneath the slab at the footprint of the former Plywood Plant is considered a data gap.



## ATTACHMENTS

Figure 1 – Site Plan and Tax Parcels  
Figure 2 – Historical Investigation Areas  
Figure 3 – Phase II Investigation Areas  
Figure 4 – Preliminary Data Gap Locations  
Appendix A – Documents Reviewed

## REFERENCES

- Boise Cascade Corporation. 2003a. Letter *re: Request acceptance of closure of portion of Yakima Complex wood debris landfill*. From Jennifer L. Wasley, Region Environmental Engineer, Boise Building Solutions, Manufacturing, to Art McEwan, Environmental Health Specialist, Yakima County Health. July 25.
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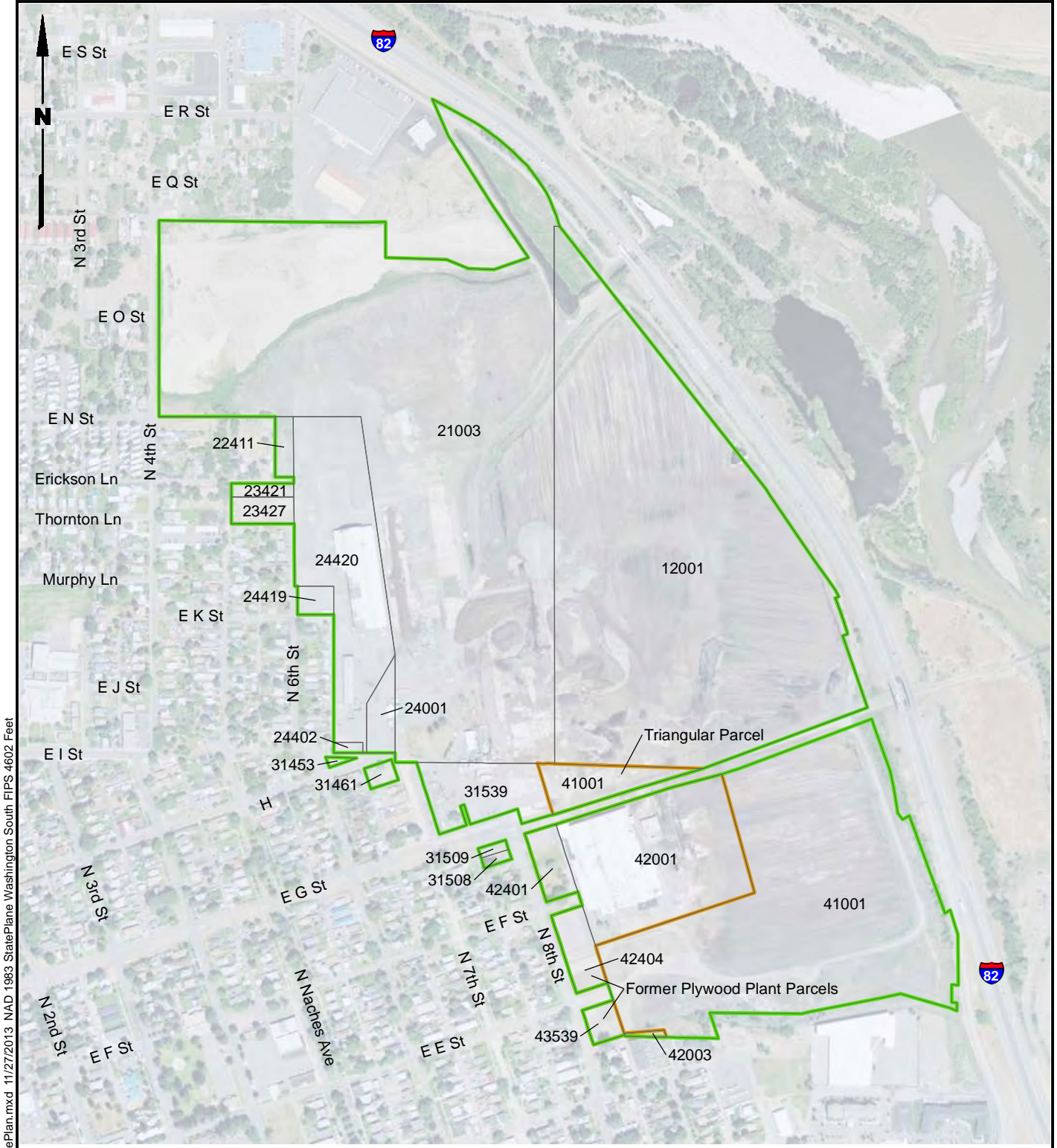
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G:\Projects\1148007\010\010\Figures\SitePlan.mxd 11/27/2013 NAD 1983 StatePlane Washington South FIPS 4602 Feet

**Legend**

- Phase I ESA
- Phase I ESA & Phase II Investigations
- Tax Parcels and Parcel Site Number (191318-XXXXX)

**Note**

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



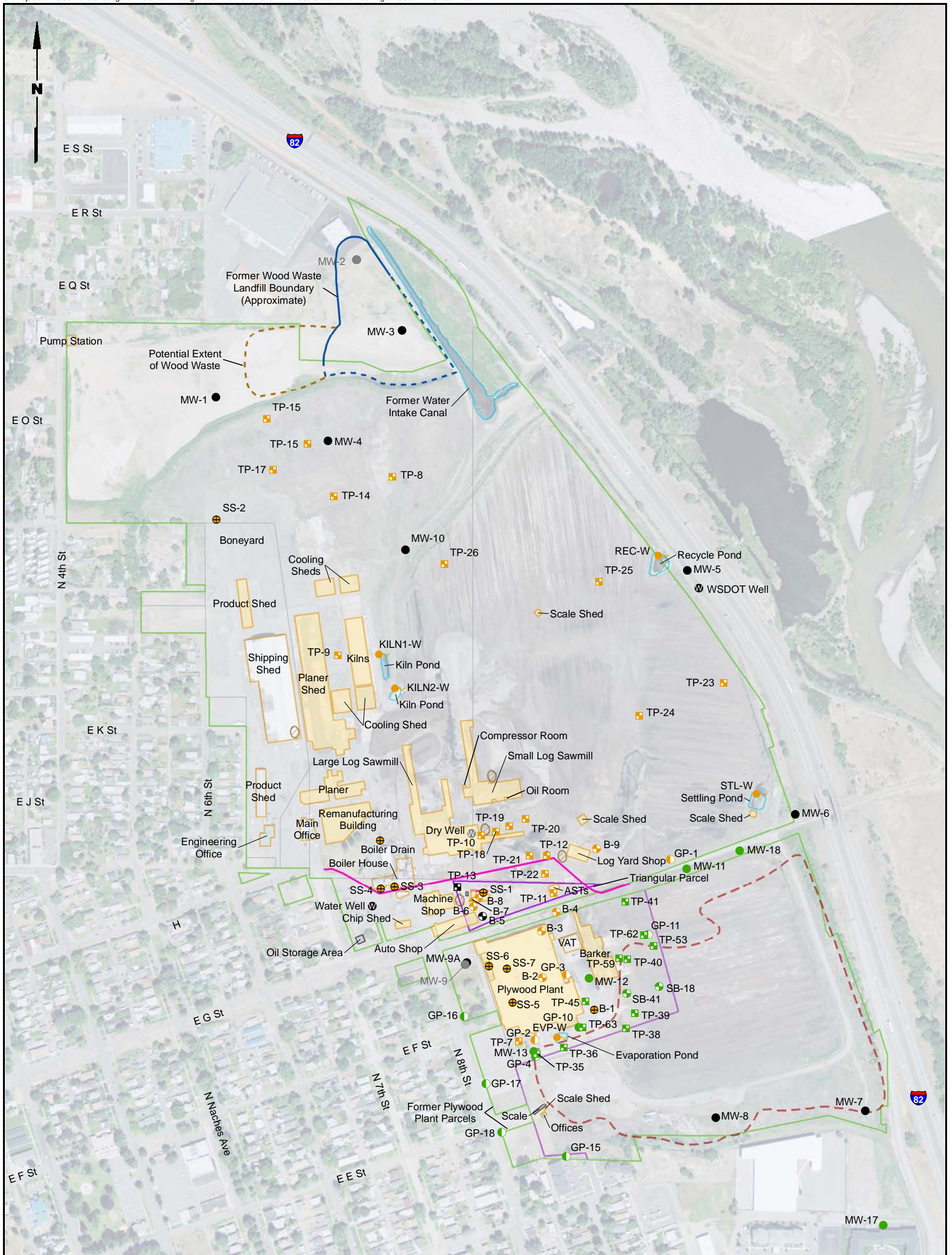
Data Source: Yakima County GIS, ESRI World Imagery



Yakima Facility  
Yakima, Washington

**Site Plan and Tax Parcels**

Figure  
**1**



**Legend**

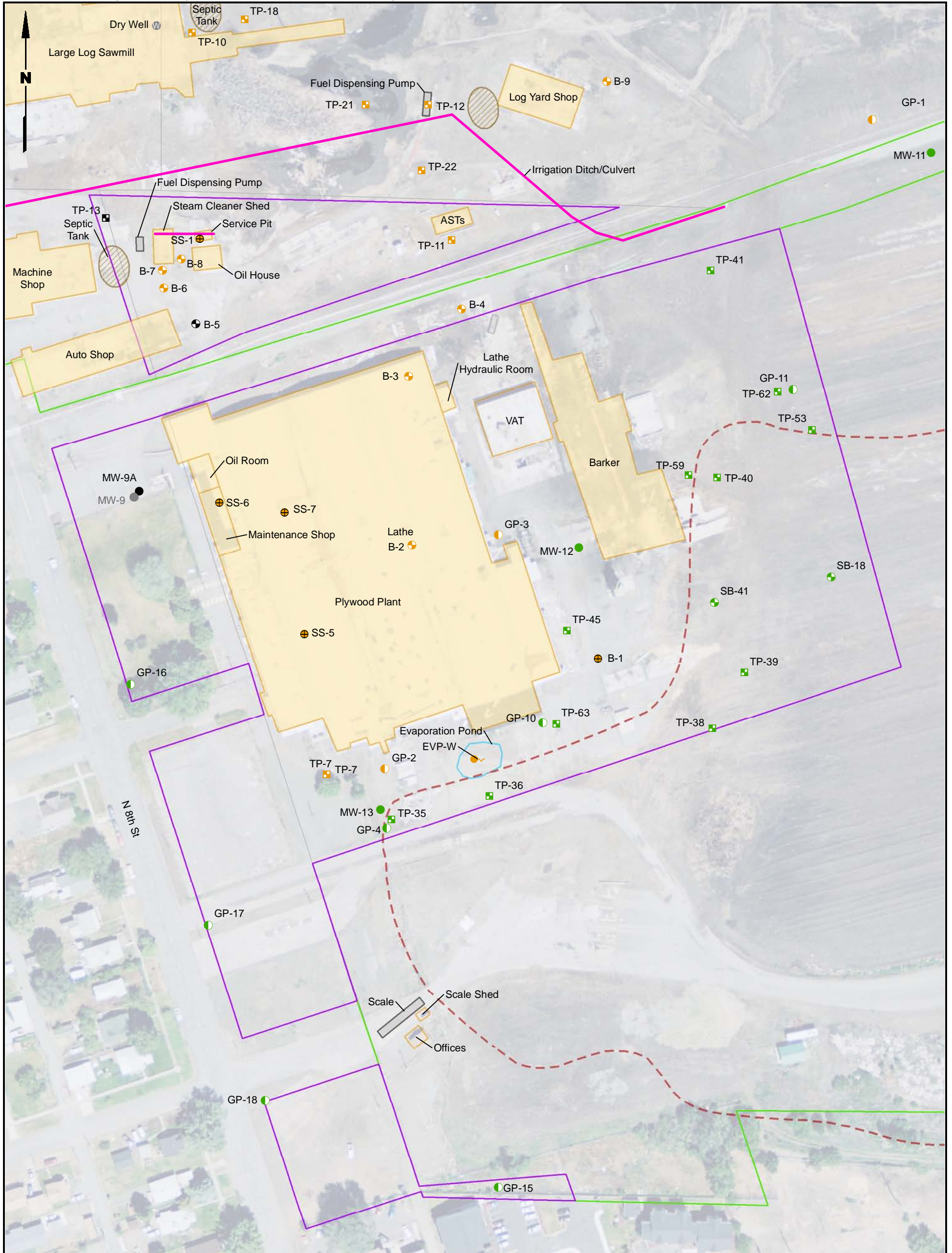
- |                                 |  |                             |   |
|---------------------------------|--|-----------------------------|---|
| ● Gas Probe - Parametrix 2008   | ● Soil Sample - Parametrix 2008          | ▭ Municipal Landfill Extent | ▭ Phase I ESA                           |
| ● Gas Probe - SLR 2009          | ● Surface Water Sample - Parametrix 2008 | ▭ Building                  | ▭ Phase I ESA & Phase II Investigations |
| ● Monitoring Well - SLR 2009    | ● Test Pit - Parametrix 2008             | ▭ Former Building           | ▭ Tax Parcels                           |
| ● Monitoring Well - URS         | ● Test Pit - SLR 2009                    | ▭ Pond                      | ▭ Irrigation Ditch/Culvert              |
| ● Soil Boring - Parametrix 2008 | ● Test Pit - URS                         | ▭ Septic Tank               | ▭ Wood Waste Landfill Boundary          |
| ● Soil Boring - SLR 2009        | ● Water Well - URS                       | ▭ Other Features            | ▭ Potential Extent of Wood Waste        |
| ● Soil Boring - URS             | ● Dry Well - URS                         |                             |   |

**Notes**

- Locations of site features and sample locations are approximate.
- Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Yakima County GIS; ESRI World Imagery; SLR; URS; Parametrix 2008; Boise Cascade 1985.





**Legend**

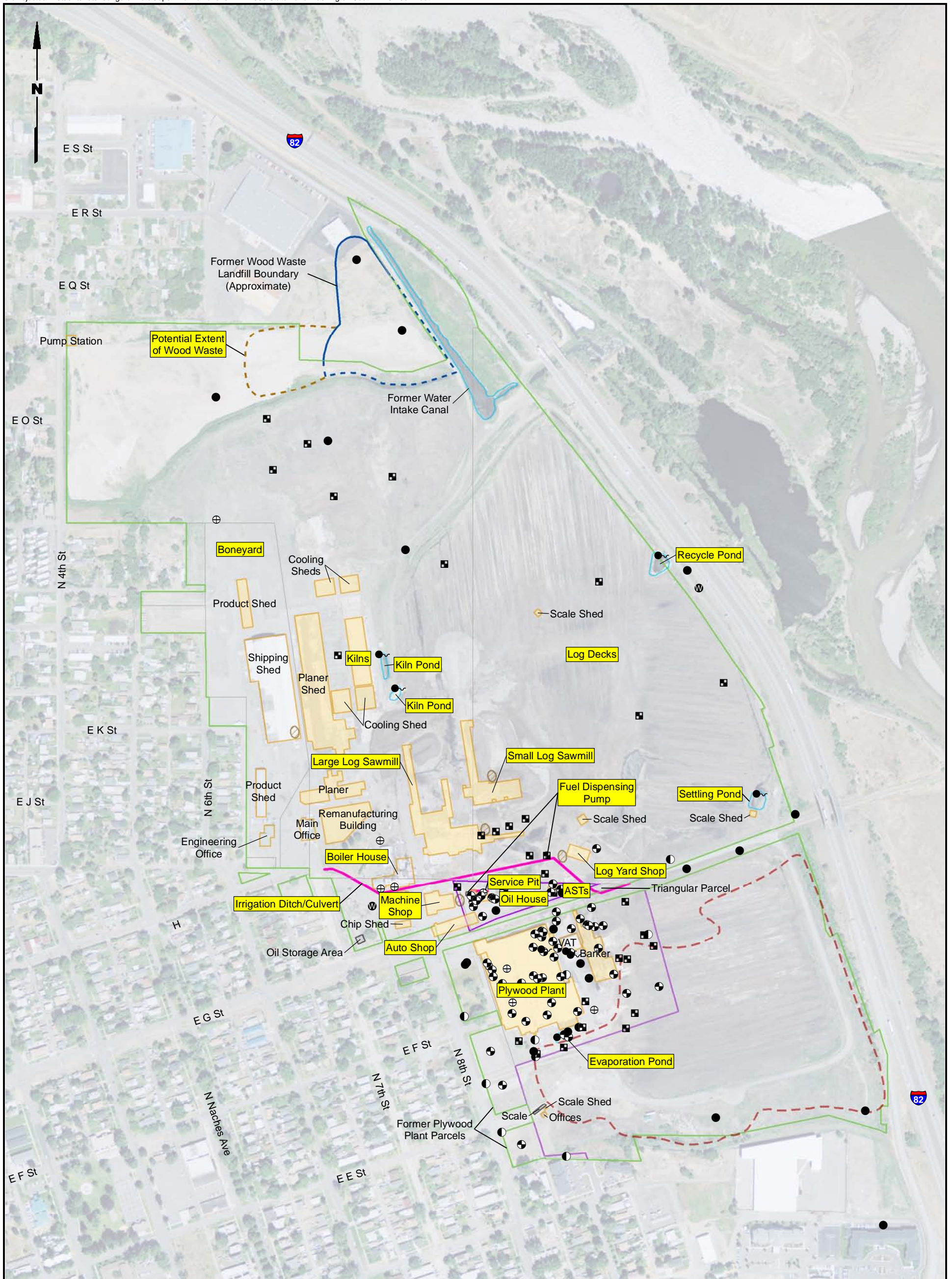
- |                                 |  |                               |   |
|---------------------------------|--|-------------------------------|---|
| ● Gas Probe - Parametrix 2008   | ● Soil Sample - Parametrix 2008          | --- Municipal Landfill Extent | □ Phase I ESA   |
| ● Gas Probe - SLR 2009          | ● Surface Water Sample - Parametrix 2008 | □ Building                    | □ Phase I ESA & Phase II Investigations (i.e., Plywood Plant Parcels) |
| ● Monitoring Well - SLR 2009    | ■ Test Pit - Parametrix 2008             | □ Former Building             | □ Tax Parcels   |
| ● Monitoring Well - URS         | ■ Test Pit - SLR 2009                    | □ Pond                        | — Irrigation Ditch/Culvert  |
| ● Soil Boring - Parametrix 2008 | ■ Test Pit - URS                         | □ Septic Tank                 |   |
| ● Soil Boring - SLR 2009        | ● Water Well - URS                       | □ Other Features              |   |
| ● Soil Boring - URS             | ● Dry Well - URS                         |                               |   |



**Notes**  
 1. Locations of site features and sample locations are approximate.  
 2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Yakima County GIS; ESRI World Imagery; SLR; URS; Parametrix 2008; Boise Cascade 1985.





**Legend**

● Gas Probe	▭ Municipal Landfill Extent	▭ Phase I ESA	▭ Irrigation Ditch/Culvert
● Monitoring Well	▭ Building	▭ Phase I ESA & Phase II Investigations	▭ Potential Extent of Wood Waste
⊕ Soil Boring	▭ Former Building	▭ Tax Parcels	
⊕ Soil Sample	▭ Pond	▭ ASTs Potential Areas of Concern	
● Surface Water Sample	▭ Septic Tank		
▭ Test Pit	▭ Other Features		
⊕ Water Well			

**Notes**

- Locations of site features and sample locations are approximate.
- Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Yakima County GIS; ESRI World Imagery; SLR; URS; Parametrix.

0 400 800  
Scale in Feet

## **Documents Reviewed**



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DOCUMENTS REVIEWED  
YAKIMA FACILITY  
YAKIMA, WASHINGTON**

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