Explanation of Significant Differences
Northwest Pipe & Casing/Hall Process Company Superfund Site

Site Name:	Northwest Pipe and Casing Superfund Site
CERCLA ID #:	ORD980988307
Site Location:	Clackamas County, Oregon
Support Agency:	Oregon Department of Environmental Quality
Lead Agency:	US EPA, Region 10

Clackamas, Oregon

I. Introduction

The United States Environmental Protection Agency (EPA) is issuing this Explanation of Significant Differences (ESD) in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), 42 U.S.C.§ 9617(c), and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.435(c)(2)(i). Section 117(c) of CERCLA and Section 300.435(c)(2)(i) of the NCP require the publication of an ESD when modifications to the selected remedy are necessary and such modifications significantly change, but do not fundamentally alter, the remedy selected in a Record of Decision (ROD) with respect to scope, performance or cost.

A. Statement of Purpose

This decision document sets forth the basis for issuing an ESD to the September 27, 2001, Operable Unit 2 (OU2) Record of Decision (ROD) for the Northwest Pipe and Casing Superfund Site in Clackamas County, Oregon (Figure 1 – Site Features Map).

This ESD will select in-situ bioremediation and/or chemical reduction instead of air-stripping, which was specified in the ROD for in-situ treatment of groundwater. The primary source removal actions remain unaltered (i.e., contaminated soil excavation and removal to address primary sources), and the cleanup levels specified in the ROD are expected to be met at the points of compliance, facilitated by the alternative technology. In accordance with the ROD for OU2, compliance would then be achieved through monitored natural attenuation (MNA). Treatment of residual sources is necessary to reduce plume migration and support future groundwater restoration at the Site.

The ESD supports deploying in-situ bioremediation and/or chemical reduction within targeted Remediation Zones (RZs). The size and location of RZs are depicted in Figure 3-5 of the Selected Remedy Modification

Report (SRMR) and Figure 2 of this ESD (Remediation Zones and Monitoring Transects) to this ESD. The SRMR is included in the Administrative Record supporting this ESD. This ESD provides an overview of the Site history, previously completed activities, and proposed remedial activities. Additional details on these topics and proposed cleanup approach are provided in the SRMR.

B. Administrative Record

This ESD and supporting documentation will become part of the Administrative Record for the Northwest Pipe and Casing/Hall Process Company Superfund Site (NCP 300.825(a)(2)), which has been developed in accordance with Section 113(k) of CERCLA, 42 U.S.C. § 9613(k).

The Administrative Record is available for review at the Happy Valley Public Library, 13793 SE Sieben Park Way, Happy Valley, OR 97015, Monday - Friday, 9:00 a.m. to 4:00 p.m. The Administrative Record will also be placed on EPA's Northwest Pipe and Casing/Hall Process Company website:.https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000527

II. Site History and Contamination

Site History and Background

The 53-acre Site is located between SE Lawnfield Road and SE Mather Road in Clackamas County, Oregon, about 20 miles southeast of Portland. Interstate 205 (I-205) is about one-half mile west of the Site. The Site consists of two parcels for site management purposes – Parcel A (21 acres) and Parcel B (32 acres) (Figure 1). Northwest Pipe and Casing Company manufactured and stored steel pipe on Parcel A between 1967 and 1985. Hall Process Company operated a pipe-coating facility on Parcel B between 1956 and 1978. After Hall Process Company ended operations in 1978, Parcel B was leased to Northwest Pipe and Casing, with Northwest Pipe and Casing assuming control of Hall's pipe-coating operations until 1986.

Pipe-coating operations used several coating materials including coal tar, coal tar epoxy, asphalt, polyethylene epoxy, and concrete. A volatile organic-based primer was used to bond the coatings to the pipe. Solvents were used to clean pipe-coating equipment. Solidified coal tar was brought to the Site and heated to liquefy it prior to use. Several underground tanks onsite were used to store fuel and possibly waste oil. Used solvents, oil and water mixtures, and metal filings were disposed directly on the ground. Wastes from the pipe-coating operations were also disposed by burial, dumping, burning, and spreading at various Site locations. These waste disposal practices and mishandling of wastes from pipe manufacturing and pipe coating operations contaminated soil and groundwater with hazardous substances. Soil contamination was found primarily on Parcel B while groundwater contamination extended beneath both Parcels A and B.

EPA listed the Site on the Superfund program's National Priorities List (NPL) in October 1992. In 1997 and 1998, Northwest Pipe and Casing Company, Oregon Department of Transportation (ODOT), Wayne Hall, Jr., and Northwest Development Corporation (NWDC) entered consent decrees with EPA and the State of Oregon

("State"). The Consent Decree with Mr. Hall also transferred ownership of Parcel B to Oregon DEQ, as trustee for EPA and Oregon DEQ.

EPA conducted a risk assessment, remedial investigation (RI), and feasibility study (FS) between 1996 and 2000. EPA removed an estimated 230 tons of surface debris, including coal tar, abandoned car tires and batteries from Parcel B in 1997, prior to conducting the RI. Two petroleum associated underground storage tanks (USTs) were also removed from Parcel B in 1998. EPA selected remedies to address soil, debris, and groundwater contamination at the Site in two RODs. EPA issued the ROD for OU1 (soil and debris) in June 2000. EPA issued the ROD for OU2 (groundwater) in September 2001. Given that the successful remediation of contaminated groundwater requires the removal of contaminants associated with site soils and debris, in the greater context of site remedial activities, the soil and debris removal activities associated with the ROD for OU1 and removal actions discussed in following paragraphs are considered the primary treatment technology for the Site and associated groundwater contamination.

In the 2001 OU2 ROD, EPA selected in situ air stripping wells, also called groundwater recirculation wells (GCWs), as a secondary treatment technology to remediate impacted groundwater at OU2. Since groundwater at the Site is considered a potential drinking water source, the selected air stripping remedy was intended to reduce the concentrations of chlorinated volatile organic compounds (CVOCs) to cleanup levels (CULs) at or below federal and state safe drinking water standards. EPA modified Site remedies in two ESDs issued in 2004 and 2008. The ESD issued in 2004 revised the vinyl chloride (VC) CUL, updated ARARs, specified wetland restoration, and documented minor changes to the soil remedy that were made during design and actual construction. The 2008 ESD imposed institutional controls on the eastern lot of Parcel A to restrict groundwater use.

The air stripping remedy for OU2 began operation in 2004. Over the course of operation, the air stripping system became less effective as a result of recontamination from residual soil sources, the GCW's limited vertical and horizontal areas of influence, and as outlined in the following paragraph, the presence of dense non-aqueous phase liquid (DNAPL) in the subsurface. Operation of the air stripping system was discontinued in 2007.

In 2008 an additional site investigation determined that significant soil contamination (manifested as DNAPL) remained on Parcel B. EPA determined that the residual source of DNAPL in subsurface soils was a chronic source of dissolved hazardous substances to groundwater and that groundwater remedial actions would not be effective until the residual sources of DNAPL were removed. In May 2009 EPA conducted a time critical removal action (TCRA) to excavate the source of soil contamination from Parcel B so that a modified groundwater remedy could be implemented (Figure 2). During the TCRA, approximately 24,798 tons of contaminated soil was excavated and disposed of offsite, and approximately 551,000 gallons of contaminated groundwater were treated onsite prior to discharge to the local sewer district. The excavation was backfilled with sand, gravel and soil amendments intended to create conditions encouraging dechlorination. The TCRA efforts significantly reduced COC concentrations in the vicinity of the associated work area, thereby facilitating the potential for reduction of contaminant concentrations in groundwater.

In January 2014 an additional source investigation was conducted. In 2015, a non-time-critical removal action (NTCRA) was initiated to remove an additional mass of contaminated soil in the vicinity of Plant 4, which was also located on Parcel B (Figure 2). Approximately 11,419 tons of contaminated soil (including 10,408 tons of non-hazardous soil and 1,011 tons of hazardous soil) was removed near former Plant 4 and sent for offsite disposal. Approximately 2.35 million gallons of groundwater was pumped, treated onsite, and discharged to the onsite wetland during excavation dewatering activities. Daramend (an anaerobic bioremediation agent) was mixed with the backfill to promote degradation of any residual tetrachloroethylene (PCE) or trichloroethylene (TCE). The excavation was backfilled with a mixture of imported clean sand and gravel.

Site Contamination

The major classes of contaminants at the Site include polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and CVOCs. The commonly detected VOCs in the subsurface are PCE, TCE, and VC (Figure 3). Dense nonaqueous-phase liquid has been observed in the form of coal tar, primarily in the south-central portion of the Site.

The contaminants found in Site groundwater and targeted for remediation in the various decision documents prepared for the Site include PCE, TCE, and VC. Referencing Figure 3-1 of the SRMR, an estimated 54,753,800 cubic feet (ft^3) of groundwater contains PCE at concentrations greater than the maximum contaminant level (MCL) (5 micrograms per liter [µg/L]). An estimated 4,666,600 ft^3 of groundwater contains PCE at concentrations above 100 µg/L, the groundwater treatment threshold proposed under the scope of this ESD. All contaminants identified are hazardous substances as defined in Section 104(14) of CERCLA, 42, U.S.C. § 9601(14), and 40 C.F.R. § 302.4.

III. Selected Remedy

The selected remedy for OU2 consisted of the following:

- Installing and operating 12 in situ air stripping wells (groundwater circulation wells, or GCWs) in Plumes 1 through 4 in the upper aquifer with the highest COCs concentrations. The wells were connected to five equipment sheds that each housed a blower, vapor extraction equipment, and activated carbon canisters for treatment.
- Installing groundwater monitoring wells in the vicinity of the treatment wells to evaluate their effectiveness over time for reducing contaminant concentrations in groundwater.
- Installing and operating four in-situ air stripping wells and an equipment shed in the vicinity of Lawnfield Road to prevent offsite migration of contaminated groundwater. The wells were to remove contaminants from groundwater before it moved offsite.
- Using natural processes outside of the source areas to reduce contaminant concentrations in groundwater.
- Conducting annual sampling of groundwater monitoring wells to evaluate the progress toward attaining the groundwater remedial goals.

- Placing and enforcing institutional controls (ICs) on Parcel A and on Parcel B to ensure access for treatment systems operation and monitoring and to restrict future beneficial use of groundwater until cleanup levels are met.

The 2008 TCRA for OU2 included:

- Excavating 24,798 tons of contaminated soil, disposing this soil offsite and pumping approximately 551,000 gallons of contaminated groundwater for onsite treatment prior to discharge to the local sewer district. The excavation was backfilled with sand, gravel and soil amendment intended to create conditions encouraging dechlorination.

The 2015 NTCRA for OU2 included:

- Excavating and disposing approximately 11,419 tons of contaminated soil (including 10,408 tons of non-hazardous soil and 1,011 tons of hazardous soil) from near former Plant 4. Approximately 2.35 million gallons of groundwater was pumped, treated onsite, and discharged to the onsite wetland during excavation dewatering activities. Daramend (an anaerobic bioremediation agent) was mixed with the backfill to promote degradation of any residual PCE or TCE. The excavation was backfilled with a mixture of imported clean sand and gravel.

IV. Description of Significant Differences and Basis for the ESD

The data gap assessment and optimization efforts concluded that the selected secondary air stripping treatment technology coupled with monitored natural attenuation are not anticipated to achieve CULs in a reasonable time frame without implementing an active treatment for the dissolved-phase plume. The PCE degradation byproduct, cis-1,2-dichloroethene (cis-1,2-DCE) is commonly encountered onsite indicating reductive dechlorination is occuring at the Site. As discussed below, cis-1,2-DCE would be treatable using the methods discussed in this ESD. No changes to CULs are included in the scope of this ESD.

Therefore in-situ bioremediation and/or chemical reduction is selected as a secondary treatment technology to achieve the OU2 ROD cleanup objectivesμμ instead of air-stripping. Bioremediation would include biological treatments that may enhance anaerobic or aerobic degradation processes. For anaerobic biological treatment, fermentable carbon substrates are commercially available in both solid and liquid forms with varying longevity and viscosity. Typical electron donors include lactate, whey, and emulsified vegetable oil; the donors provide electrons to microorganisms that biodegrade VOCs. Carbon substrates are often supplemented with bioaugmentation cultures. For chemical treatment, zero-valent iron (ZVI) is commercially available as nano- or microscale powders or emulsion formulations to enhance the abiotic degradation of chlorinated solvents via chemical reduction. ZVI is commonly employed in combination with carbon amendment. Multiple reagents are commercially available for oxidation treatment, including persulfate, peroxide, and chelated iron (modified Fenton's reagent). Reagents for oxidation are often highly reactive and have shorter longevity than anaerobic bioremediation amendments; however, site-specific conditions may indicate treatment via oxidation as an appropriate strategy.

The above summarized in-situ groundwater treatments and associated remediation efforts would be effectuated by injecting the amendments and recirculating groundwater to enhance the dissolution and distribution of the amendment. To facilitate adaptive management of the remedial action, treatment performance will be assessed by collecting and analyzing groundwater samples from monitoring wells along designated monitoring transect placed just downgradient of the remediation zone. For the purposes of this ESD, groundwater zones with PCE concentrations greater than 100 µg/L will be the target of in-situ remediation. Further, as those CVOCs identified in groundwater are generally comingled, EPA anticipates that remediation activities will decrease the concentrations of both PCE and related breakdown products (i.e., TCE, cis-1,2-DCE, and VC).

The proposed performance metric for this modified remedy would be to realize a 90 percent reduction in PCE and TCE concentrations in the remediation zones. Based on preliminary modeling efforts, meeting this performance metric would reduce concentrations of PCE and TCE across all remediation zone monitoring transects to below 30 µg/L, and in some cases, less than 10 µg/L. An adaptive management approach would be used to decide when bioremediation and/or chemical reduction would be more effective for meeting mass reduction targets, and identify when MNA would then be a viable approach for achieving site CULs.

As outlined in the Engineering Cost Estimate (Class 4, -30/+50 percent) prepared as a component of the SRMR, the total estimated net present value cost for this work is $11.5 million. This estimate assumes five rounds of injections will occur, and that injections will take place every two years accompanied by off-year performance monitoring activities. That costing also includes a best professional judgement derived, budgetary set-aside to cover project operational and oversite support from the United States Army Corps of Engineers.

VI. Support Agency Comments

EPA consulted with the Oregon DEQ and provided the opportunity to comment on the remedy modification outlined in the SRMR provided in the Administrative Record for this ESD, in accordance with NCP § 300.435 (c)(2) and § 300.435 (c)(2)(i) and CERCLA Section 121(f). Oregon DEQ provided concurrence in emails dated August 28, 2023, and October 5, 2023.

VII. Statutory Determinations

EPA has determined that these significant changes comply with the statutory requirements of CERCLA Section 121, 42 U.S.C. § 9621, are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, are cost-effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

EPA will comply with applicable or relevant and appropriate Oregon Underground Injection Control (UIC) regulations. Oregon's UIC regulations at OAR 340-044-018(2)(b)(D) authorize Class V injection systems if the injection is overseen by EPA under CERCLA and meets groundwater quality protection requirements outlined in OAR-340-040. OAR 340-044-0014 prohibits injection activities which allow movement of contaminants into

groundwater if the presence of that contaminant may cause a violation of primary drinking water standards under the Safe Drinking Water Act. Additionally, OAR 340-044-0040 provides decommissioning and conversion requirements for underground injection systems. The substantive requirements found in OAR 340-044-0040(1) and (3)(a-b) are applicable.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, consistent with statutory requirements, reviews will continue to be conducted no less often than each five years after the initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

VIII. Public Participation

The public participation requirements set out in the NCP § 300.435(c)(2) have been met by publishing an online copy of this ESD on the Site's EPA webpage, making it available to the public in the Administrative Record, and publishing a notice summarizing the ESD in the Business Tribune, a local newspaper.

IX. Authorizing Signature

I have determined the remedy for the Site, as modified by this ESD, is protective of human health and the environment, and will remain so provided the actions presented in this report are implemented as described above.

This ESD documents the significant changes related to the remedy at the Site. U.S. EPA selected these changes with the concurrence of Oregon DEQ.

By: SHEILA FLEMING Digitally signed by SHEILA FLEMING Date: 2023.11.07 19:10:20 -08'00'

for Calvin J. Terada
Director, Superfund and Emergency Management Division

Date: November 7, 2023

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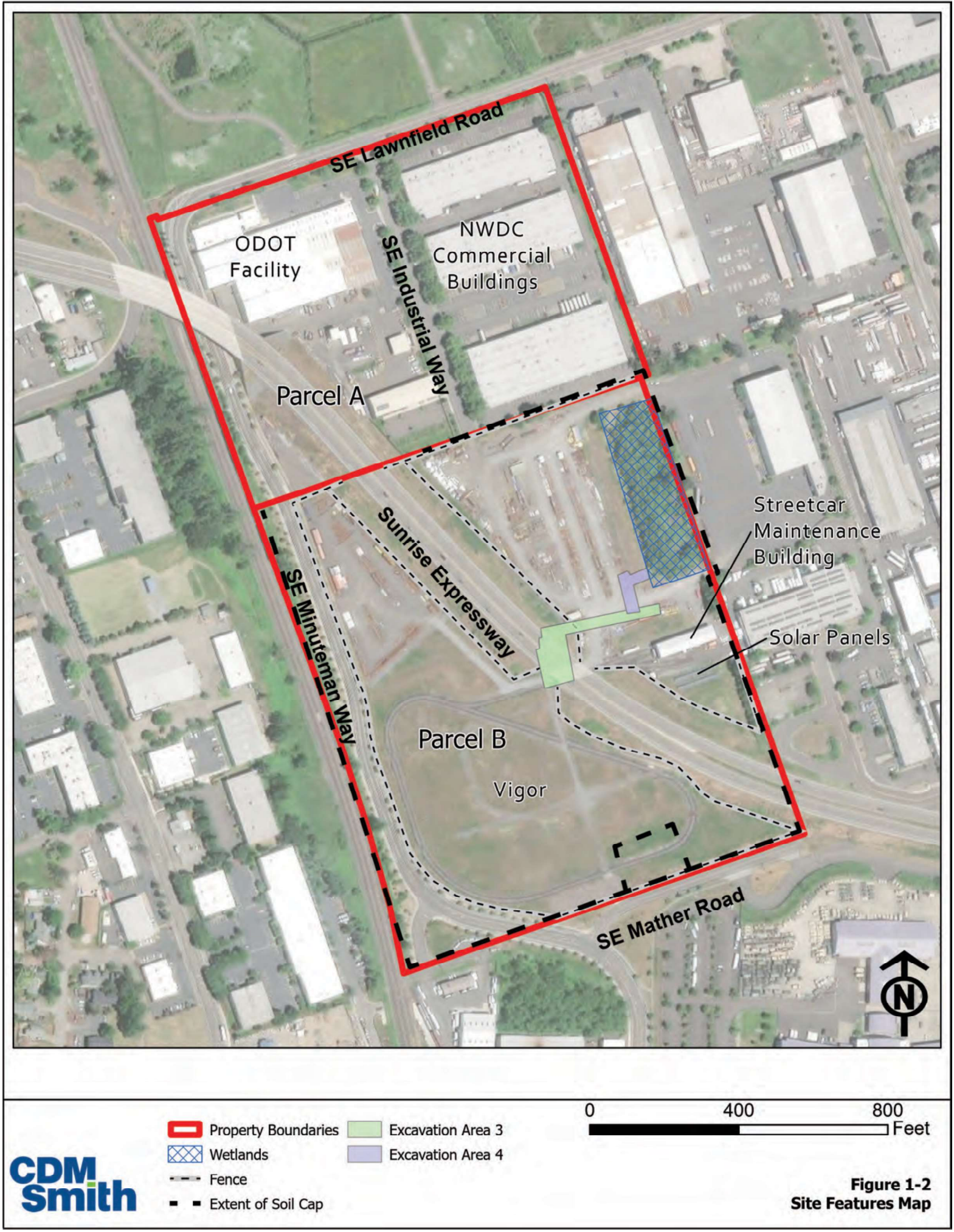

Attachment 1. Site Features Map

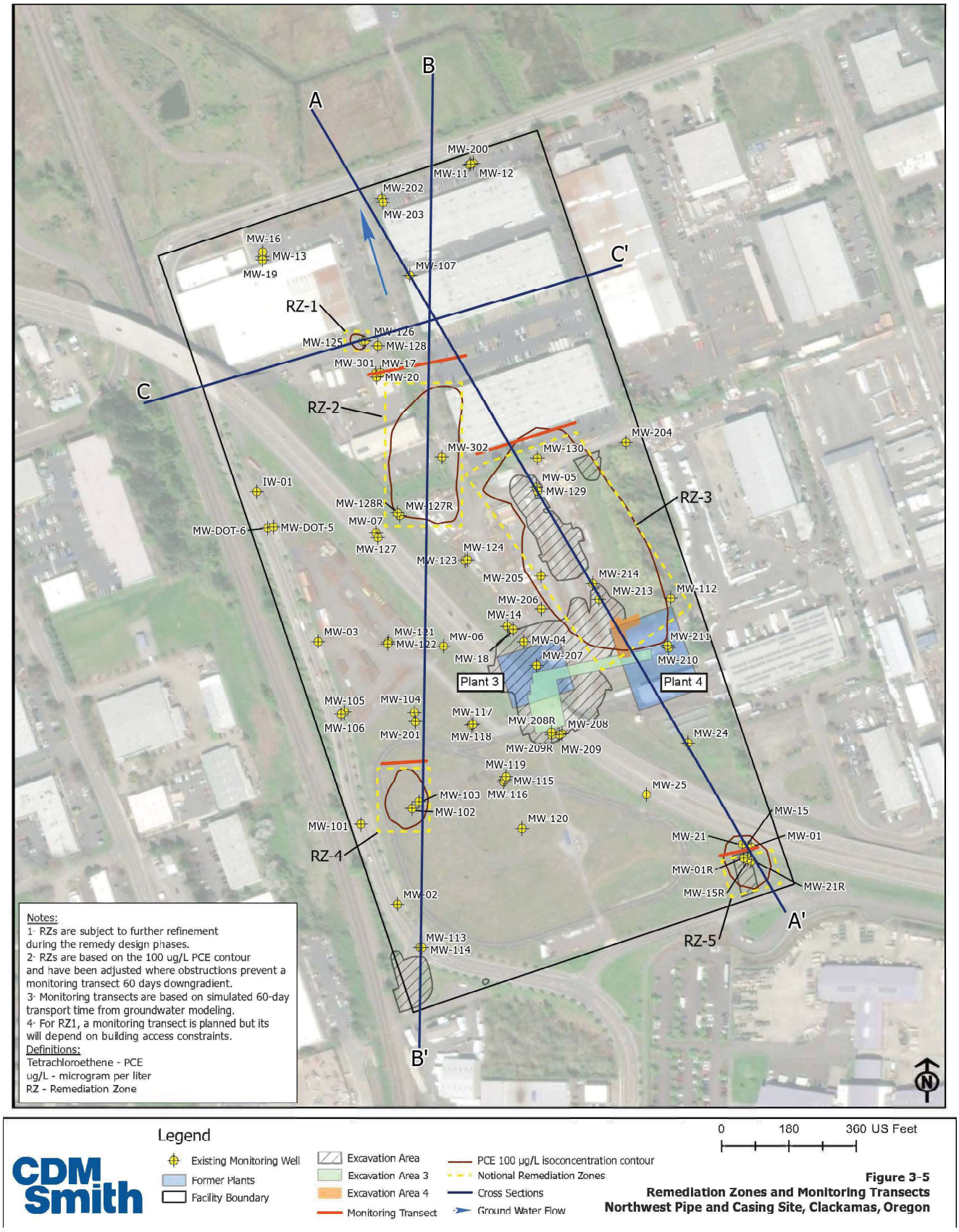

Figure 2. Remediation Zones and Monitoring Transects

2022 Groundwater Plume Extents

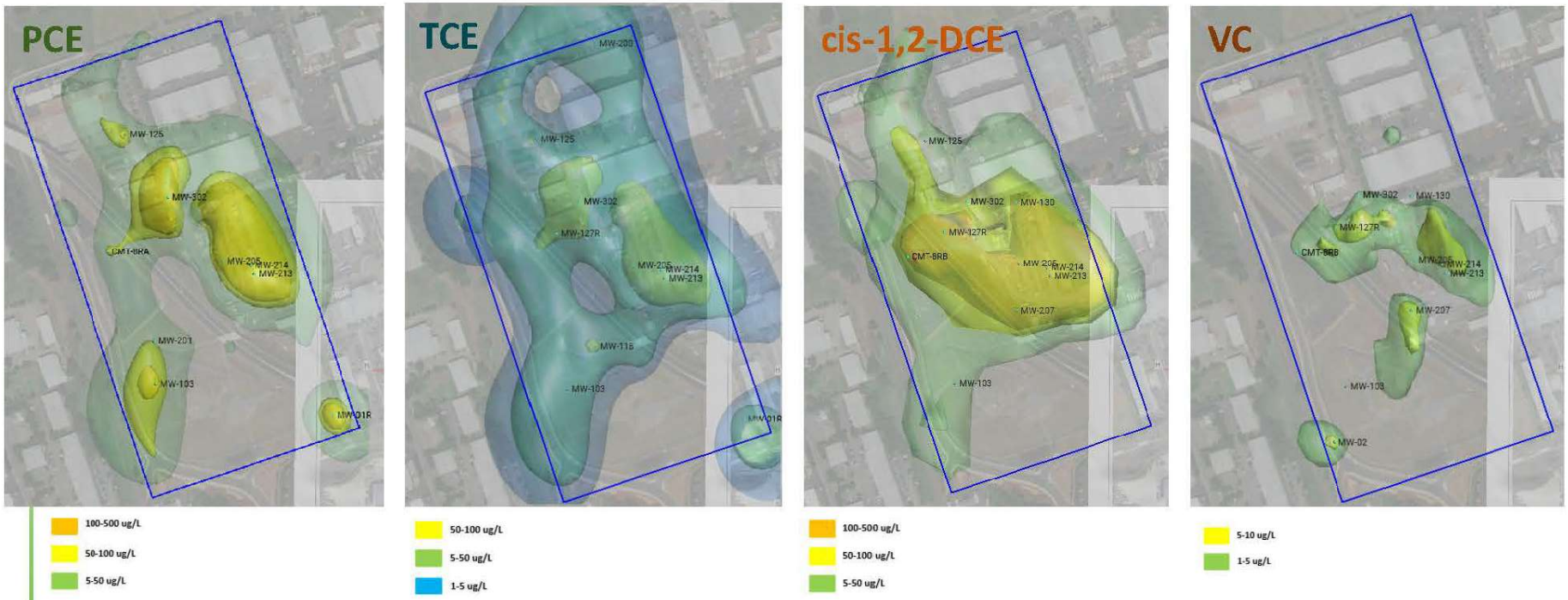

Figure 3. 2022 Groundwater Plume Extents