STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, Washington 98504-7600 • 360-407-6300

December 18, 2023

Terry Wise
7622 Waller Rd. E
Tacoma, WA 98443
Terry@TerryWiseRE.com

Re: Opinion on Proposed Cleanup of the following Site:

Site Name:	Elk Plain County Shop
Site Address:	23101 Mountain Highway E, Spanaway, Pierce County, WA 98387
Cleanup Site ID:	5764
Facility/Site ID:	25185281
VCP Project ID:	XS0007

Dear Terry Wise:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your proposed independent cleanup of the Elk Plain County Shop site (Site). This letter provides our opinion regarding the sufficiency of your independent cleanup. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA),[1] chapter 70A.305 Revised Code of Washington (RCW).[2]

Issue Presented and Opinion

The former Elk Plain County Shop facility has 25 Areas of Concern (AOCs) that were investigated. As of March 22, 2023, Ecology has closed 23 of the 25 AOCs, with statements such as "Ecology recommends no further evaluation or cleanup for this AOC." Ecology notes that any "closed" AOC has potential to be reopened should new information become available that indicates a contamination concern may remain.

Following Ecology's March 22, 2023, letter, additional activities have been conducted for the remaining two AOCs:

- AOC 14 – SE and NW Berms
- AOC 22 – Vapor/Air Pathway

[1] https://apps.ecology.wa.gov/publications/SummaryPages/9406.html
[2] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305

Additional investigation activities took place for AOC 22, as discussed in an email from Ecology dated July 10, 2023, and further discussed below. Ecology has concluded that no further evaluation or cleanup appears to be warranted for AOC 22; therefore, this AOC can be considered closed.

Ecology has received a Feasibility Study[3] for AOC 14, SE and NW Berms. This opinion letter is primarily focused on AOC 14 and the proposed cleanup plans for AOC 14 presented within the Feasibility Study report.

Opinion

Ecology has determined that upon completion of your proposed cleanup of AOC 14 (capping and implementation of institutional controls memorialized by an environmental covenant), no further remedial action will likely be necessary to clean up contamination at the Site.

This no further action likely determination is dependent on yet-to-be determined factors such as:

- Ecology concurrence on the design of the capped area following submittal of a cap design document.
- Ecology concurrence on the appropriateness of the clean fill material that will be used to construct the cap.
- Ecology concurrence on the appropriate construction of the cap following submittal of a remedial action completion (cap installation) report.
- Ecology concurrence of a cap inspection plan.
- Recording of an environmental convent signed by Ecology.

Ecology bases this opinion on an analysis of whether the remedial action meets the substantive requirements of MTCA and its implementing regulations, which are specified in chapter 70A.305 RCW and chapter 173-340 WAC[4] (collectively called "MTCA").

Site Description

This opinion applies to the Site described as follows. The Site is defined by the nature and extent of contamination associated with the following releases:

- Petroleum (diesel and heavy oil) into the soil.
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) into the soil.

[3] Herrera. *Feasibility Study Report, Former Elk Plain Roads Maintenance Facility, Area of Concern 14 - SE and NW Berm Area*. December 8, 2023.
[4] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340

Ecology notes that some contaminants that were previously identified as contaminants of potential concern at the Site have been removed from further consideration during previous correspondences, including within letters from Ecology dated February 18, 2021, May 27, 2022, and March 22, 2023. These included arsenic in soil at AOC 19 – Beneath the Former Maintenance Shop, and chromium in soil at AOC 20 – Former Septic System and Drainfield. Polychlorinated biphenyls (PCBs); gasoline-range petroleum hydrocarbons (GRPH); and benzene, toluene, ethylbenzene, and xylenes (BTEX) were previous identified as Site contaminants of potential concern; however, no cleanup level exceedances for these contaminants have been identified to date. Therefore, these contaminants have been removed from the above list of Site contaminants.

Enclosure B includes a detailed description and diagrams of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, Ecology has no information that other sites affect the parcel associated with this Site.

Basis for the Opinion

Ecology bases this opinion on information in the documents listed in **Enclosure A**.

You can request these documents by filing a records request.[5] For help making a request, contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or call 360-407-6040. Before making a request, check whether the documents are available on Ecology's Cleanup Site Search web page.[6]

This opinion is void if any of the information contained in those documents is materially false or misleading.

AOC 22 – Vapor/Air Pathways

AOC 22 was discussed within opinion letters from Ecology dated February 18, 2021, and May 27, 2022. Ecology received a technical memorandum dated July 5, 2023, titled "Subject: Elk Plain County Shop XS0007–Soil Vapor Monitoring Results for AOC#22 (Vapor/Air Pathway)." Ecology responded in an email dated July 10, 2023, that stated:

> *The investigation appears to sufficiently demonstrate that methane is not a contaminant of concern in this area, and that a sufficient case has been made for closing Area of Concern (AOC) #22, Vapor/Air Pathway, at the Site. Based on Ecology's opinion letter dated March 22, 2023, the sole remaining Area of Concern at the Site is AOC #14, SE and NW Berms (petroleum and CPAHs in soil).*

[5] https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests
[6] https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=5764

In summary, a concern of potential methane generation in the SE/NW Berms areas had been identified since this area had a significant quantity of fill soils and may have contained organic materials that could produce methane. The soil in this area was found to not have a significant organic material content, and methane monitoring conducted in April 2021 and March 2022 verified the lack of a methane concern in this area.

In addition to potential methane concerns, AOC 22 also included a concern regarding potential volatile contaminants throughout the Site. No cleanup level exceedances were found for volatile contaminants in soil at the Site and the site contaminants have a relatively low vapor pressure. In addition, no structures are present within the area of contamination or are planned for this area. No vapor pathway of concern has been identified; therefore, Ecology recommends no further evaluation or cleanup for this AOC.

Analysis of the Proposed Cleanup – AOC 14 – SE and NW Berms

Ecology has concluded that, upon completion of your proposed cleanup, **no further remedial action** will likely be necessary to clean up contamination at AOC 14, and therefore at the Site as a whole. That conclusion is based on the following analysis:

Characterizing the Site

Ecology has determined your characterization of AOCs 14 is sufficient to establish cleanup standards and select a cleanup action. Other AOCs were addressed as discussed in previous correspondence from Ecology, including our opinion letters dated March 22, 2022, and May 27, 2022.

The Site is described above and in **Enclosure B.** AOC 14 – SE and NW Berms area is an area of hilly topography in the southwest part of the Property (see Figure 3 in **Enclosure B**). The elevated topographic relief in this area is believed to be attributable to Pierce County historically piling fill soils in this area, as well as due to quarrying of soil to the east of the AOC 14.

The native topography in the vicinity of AOC 14 appears to be in the range of 420 to 425 feet above mean sea level (ft amsl). The SE and NW Berms area is highest in the northwest part of AOC 14, reaching an elevation of approximately 432 ft amsl. Highway 7, located just west of the Site, is at an elevation of approximately 421 ft amsl adjacent to AOC 14. Hence, the SE and NW Berms Area has a relief of approximately 11 feet above native grade. However, just east of AOC 14 is lower topography (approximately 411 ft amsl) due to the historical soil quarrying. Fill materials placed in AOC 14, subsequent to such quarrying, may be locally over 20 feet thick.

Site contaminants and soil and groundwater cleanup level exceedances are discussed as follows:

Site Contaminants

Petroleum (diesel and heavy oil) and cPAHs were found in soil at AOC 14 at concentrations exceeding the MTCA cleanup levels. The soil contamination appears to originate from Pierce County importing and piling fill soils from road projects in this area. Data from soil borings indicates that these soils included asphalt grindings.

Soil Characterization

The extent of soil contamination in AOC 14 – SE and NW Berms area has been defined through investigations that took place in 2019 and 2020. A total of 98 soil samples were collected at depths ranging from 2.5 to 20 feet below ground surface (ft bgs). Method A cleanup level exceedances are summarized in Table 1:

Table 1. Summary of Cleanup Level Exceedances in Soil Samples in AOC 14

Contaminant	Method A Cleanup Level (mg/kg)	TEE-based Concentration[a] (mg/kg)	Maximum Concentration (mg/kg)	Number of Method A Cleanup Level Exceedances/ Samples	Number of TEE Concentration Exceedances/ Samples
DRPH	2,000	460	1,400	0/98	4/98
HRPH	2,000	460	9,100	21/98	57/98
DRPH + HRPH	2,000	460	9,100	21/98	57/98
Total cPAHs	0.1	30	0.41	4/13	0/13

DRPH = Diesel Range Petroleum Hydrocarbons
HRPH = Heavy Oil Range Petroleum Hydrocarbons
TEE = Terrestrial Environmental Evaluation
[a] Simplified TEE concentration from MTCA Table 749-2.

Method A Cleanup level exceedances were found at depths between 2.5 and 15 ft bgs. Maps showing the locations of cleanup level exceedances are provided in Enclosure B.

Overall, the contaminant concentrations are relatively low, with a maximum exceedance factor of the Method A cleanup level of 4.6 times. However, the heavy oil TEE-based concentration exceedances are very prevalent, with 58% of the soil samples in this area exceeding the TEE-based concentration.

Groundwater Characterization

A total of eight monitoring wells were installed at the Site, including four monitoring wells in the vicinity of the SE and NW Berms area. The depth to groundwater during seven monitoring rounds in 2020 to 2021 ranged from 18.4 ft bgs in MW-4 in January 2021 to 34.5 ft bgs in MW-7 in October 2020. Groundwater flows to the west-northwest, based on a potentiometric surface map prepared for the Site.

The monitoring wells in the vicinity of the SE and NW Berms area were sampled during five monitoring rounds in 2020 to 2021. In addition, one former water supply well on the Site was sampled in April 2016. Monitoring well samples were analyzed for metals, petroleum, and volatile organic compounds (VOCs). No petroleum was detected in any of the samples, and no metals concentrations exceeded cleanup levels. One VOC detection in groundwater in April 2020 (carbon disulfide in MW-7 at 0.9 micrograms per Liter [µg/L]) was not repeated and appears to likely be a laboratory contaminant.

Ecology has concluded that the soil-to-groundwater pathway at the Site (and in the SE and NW Berms area) is incomplete. No further action appears to be warranted with respect to groundwater at the Site.

Setting Cleanup Standards

Ecology has determined the cleanup levels and points of compliance presented below meet the substantive requirements of MTCA. The following Method A cleanup levels have been applied at the Site.

Table 2. Method A Cleanup Levels and TEE-based Concentrations

Contaminant	Method A Cleanup Level for Soil (mg/kg)	TEE-based Concentration for Soil[a] (mg/kg)	Method A Cleanup Level for Groundwater (µg/L)
DRPH	2,000	460	500
HRPH	2,000	460	500
DRPH + HRPH	2,000	460	500
cPAHs	0.1	30	0.1

TEE = terrestrial ecological evaluation.

[a] Simplified TEE concentration from MTCA Table 749-2.

Points of Compliance

The points of compliance are throughout the Site. Soil cleanup levels based on the soil-to-groundwater pathway apply without respect to depth. Cleanup levels based on the direct contact pathway apply to soils to a depth of 15 ft bgs. The deepest soil contamination at AOC 14 was found at a depth of 15 ft bgs. TEE-based concentrations apply to a depth of six ft bgs, which is the biologically active zone.[7]

Terrestrial Ecological Evaluation (TEE)

WAC 173-340-7491 and 7492 provides for criteria regarding the application of Terrestrial Ecological Evaluation (TEE) based soil concentrations. Criteria for selecting a Simplified or Site-Specific TEE at a Site are provided in WAC 173-340-7491(2). Ecology accepted application of the Simplified TEE-based concentrations from MTCA Table 749-2 at the Site within our opinion letter dated February 18, 2021.

[7] WAC 173-340-7490(4)(a)

Ecology notes that no TEE-based concentration is available in Table 749-2 or Implementation Memo 19[8] for heavy oil-range petroleum hydrocarbons. However, the toxicological study that provided the screening levels listed in Implementation Memo 19 provides for inclusion of heavy oil within the screening level for diesel. Hence, Ecology considers the use of the screening level of 460 mg/kg for diesel plus heavy oil to be appropriate at the Site to a depth of six ft bgs. Below a depth of six ft bgs, the Method A cleanup level of 2,000 mg/kg would apply.

Selecting and implementing the cleanup action

Ecology has determined the cleanup you proposed for the Site is anticipated to meet substantive requirements of MTCA. The proposed cleanup action was presented in the Feasibility Study (FS) report dated September 29, 2023.

Selecting the Cleanup Action

The following four cleanup alternatives were evaluated within the FS report to address the soil contamination in the AOC 14 – SE and NW Berms area:

Table 3. Feasibility Study Alternatives

Alternative Number	Alternative Description	Benefit Score	Estimated Cost (Million Dollars)
1	Excavation and Offsite Disposal	9.4	$5.16
2	Ex-Situ Bioremediation	7.5	$3.47
3	Ex-Situ Thermal Desorption	8.1	$5.49
4	Consolidation, Capping, and Institutional Controls	7.6	$0.73

Ecology notes that Alternative 3, Ex-Situ Bioremediation, includes uncertainties with respect to the ability to achieve cleanup levels within a reasonable restoration timeframe since the biodegradation of cPAHs is less certain.

Ecology also notes that Alternative 1, Excavation and Offsite Disposal, would be expected to have a significantly lower green remediation score[9] than other alternatives, since numerous dump trucks hauling soils to distant landfill facilities would be required for this alternative.

Alternative 4, Consolidation, Capping, and Institutional Controls, was selected as the preferred remedial alternative within the FS Report. **Ecology concurs with the selection of this alternative and that the costs for more permanent alternatives are disproportionate when compared with their incremental relative benefits**.

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[8] *Gasoline and Diesel Soil Concentrations Predicted to be Protective of Upland Ecological Receptors*, Implementation Memorandum No. 19, August 11, 2017.

[9] See Appendix D of Department of Ecology's, *Sustainable Remediation: Climate Change Resiliency and Green Remediation*, dated January 2023.

Ecology understands that the capped SE and NW Berm Area is intended to serve as a public park and will be covered with turf grass and landscaping. Ecology notes that Alternative 4 includes a few additional positive benefits due to the planned land use as public park, including public use benefits and negative greenhouse gas emissions.

Cleanup at the Site will consist of the following elements:

- Capping of the SE and NW Berms Area with a minimum of six feet of clean fill to constitute a barrier for both human and ecological receptors.
- Implementation of institutional controls within a recorded environmental covenant signed by Ecology.

The clean soil cap is anticipated to provide long-term protection to both human and ecological receptors. Rigorous cap inspections and reporting will be needed to assure the long-term performance of this cap, as further discussed below.

Soil Capping Implementation

Prior to Ecology's issuance of a No Further Action (NFA) determination, a demonstration should be made that the contaminated soil has been sufficiently capped and covered to prevent exposure of contaminated soil to human and ecological receptors.

The design of the cap should be submitted to Ecology prior to construction for Ecology's review and comment. It will be important that the capped area be designed such that erosion is not a long-term concern. This design should include maximum slopes, materials, and vegetative cover, as well as any park improvement features. Ecology anticipates that the design will include a marker material between the contaminated soil and overlying clean fill to demarcate the vertical boundary between contaminated soil and the overlying clean fill over the long-term.

The cap design document should include a construction schedule that includes stormwater and erosion prevention components. Ecology anticipates the construction should be done in an appropriate time of year such that vegetive cover can be rapidly established to prevent erosion and potential runoff containing contaminated soils. Ecology notes the source of the clean fill (including documentation to support that it is indeed clean fill) should also be provided.

Documentation of the installed cap should be provided to Ecology following construction. This should include as-built drawing(s), section(s), and photographs. Pre- and post-capping surface elevation mapping should be done to document the installed cap thickness.

Environmental Covenant

Following the cap installation, an Ecology-signed environmental covenant (EC) should be recorded at Pierce County for the parcel(s) that contain AOC 14. The EC should include a plan map showing the remaining areas of soil contamination and the cap area.

The EC will include, but not be limited to, the following restrictions on the area of contamination:

- Public Park land use of the capped area in perpetuity.
- Protection of the cap preventing exposure to the soil contamination (Ecology must be notified prior to any intrusive activities that could affect the integrity of the cap, and immediately following the identification of any damage to the cap).
- A prohibition on drinking water supply wells in the area of soil contamination.

Cap Inspection Plan

Prior to Ecology's issue of an NFA determination, Ecology will need to review and approve a long-term cap inspection plan. This plan should include a field form to document inspections, an inspection schedule, reporting requirements, and a reporting schedule. The plan should also include contingency measures and the schedule for corrective measures, should any concerns be identified during inspections.

A cap inspection report will be required to be submitted to Ecology for our 5-year periodic reviews. The inspection report is anticipated to include the inspection forms, and photographs documenting the condition of the cap.

Ecology's NFA letter will stipulate that Ecology must be notified immediately if any cap concerns are unidentified, and if the inspection report is not submitted to Ecology, then the NFA could be rescinded. Ecology anticipates that the frequency of cap inspections should initially be more frequent, with a gradual reduction in frequency based on positive inspection results. Ecology's periodic reviewer will identify the frequency of cap inspections following the first periodic review.

Next Steps

Ecology anticipates the following next steps at the Site, likely in this sequence:

1. Submittal of a cap design document for Ecology review and comment. A cap design document was submitted to Ecology with the December 8, 2023, Feasibility Study Report (received by Ecology on December 11, 2023). Ecology will be providing feedback on that document under separate cover.
2. Submittal of a Contaminated Soils Management Plan (CSMP) for Ecology review and comment. The CSMP will detail handling procedures for potentially contaminated soils identified during site development activities and provide for contingency measures in case of encountering unexpected conditions.
3. Submittal of documentation of the provenance and/or soil sampling data for clean fill that will comprise the cap.
4. Following construction of the cap, submittal of documentation of the Remedial Action Completion (cap installation) Report.
5. Submittal of a cap inspection plan for Ecology review and comment.
6. Preparation and recording at Pierce County of an Ecology-signed environmental covenant.
7. Ecology issue of an NFA letter.
8. Submittal of a cap inspection report for Ecology's 5-year periodic review.

Limitations of the Opinion

Opinion does not settle liability with the state

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion does not:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70A.305.040(4).[10]

Opinion does not constitute a determination of substantial equivalence

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. See RCW 70A.305.080[11] and WAC 173-340-545.[12]

Opinion is limited to proposed cleanup.

This letter does not provide an opinion on whether further remedial action will actually be necessary at the Site upon completion of your proposed cleanup. To obtain such an opinion, you must submit a report to Ecology upon completion of your cleanup and request an opinion under the Voluntary Cleanup Program (VCP).

State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. See RCW 70A.305.170(6).[13]

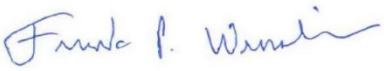
[10] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.040
[11] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.080
[12] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340-545
[13] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.170

Questions

Thank you for choosing to clean up the Site under the VCP. As you conduct your cleanup, please do not hesitate to request additional services. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our webpage.[14] If you have any questions about this opinion, please contact me at frank.winslow@ecy.wa.gov or 509-454-7835.

Sincerely,



Frank P. Winslow, LHG
Toxics Cleanup Program
Headquarters Section

FPW/tam

Enclosures (2): A – Document List
B – Site Description and Diagrams

cc by email: George Iftner, Herrera, giftner@herrerainc.com
Treasure Mitchell, Ecology, treasure.mitchell@ecy.wa.gov
Ecology Site File

[14] https://www.ecy.wa.gov/vcp

Enclosure A

Documents List

Documents List

1. Herrera, *Elk Plain Roads Maintenance Facility, Phase II Environmental Site Assessment*, March 8, 2017.
2. Department of Ecology, *Letter re Further Action at the following Site: Elk Plain County Shop*, August 15, 2017.
3. Earth Solutions NW, *Limited Phase II Environmental Site Assessment, Mountain Highway Mixed Use Property*, April 1, 2019.
4. Herrera, *Interim Site Characterization Report, Former Elk Plain Road Maintenance Facility*, June 30, 2020.
5. Herrera, *April 2021 Interim Action and Groundwater Monitoring Report*, June 15, 2021.
6. Department of Ecology (Ecology), *Technical Assistance at the following Site: Elk Plain County Shop*, June 9, 2021.
7. Ecology, *Letter re Further Action at the following Site: Elk Plain County Shop*, February 18, 2021.
8. Herrera*, Elk Plain County Shop XS0007 – Revised Information Package for AOC #13 (Former Road Tar/Paving Truck Calibration Area) and AOC #17 (Former Materials Storage Shed)*, April 14, 2022.
9. Herrera, *Elk Plain County Shop XS0007 – Information for AOC#20 (Former Septic System and Drain Field) and AOC#21 (Perimeter Soil Berm)*, May 5, 2022.
10. Ecology, *Letter re Further Action at the following Site: Elk Plain County Shop*, May 27, 2022.
11. Herrera, *Elk Plain County Shop XS0007 – Information for AOC#20 (Former Septic System and Drain Field) and AOC#21 (Perimeter Soil Berm)*, March 20, 2023.
12. Herrera, *Elk Plain County Shop XS0007 – Subject: Elk Plain County Shop XS0007 – Soil Vapor Monitoring Results for AOC#22 (Vapor/Air Pathway)*, July 5, 2023.
13. Ecology, *Letter re Further Action at the following Site: Elk Plain County Shop*, March 22, 2023.
14. Herrera, *Feasibility Study, Former Elk Plain Roads Maintenance Facility, Area of Concern 14 – SE and NW Berm Area*, December 8, 2023.

Enclosure B

Site Description and Diagrams

Site Description

Site

The Site is defined by diesel- and heavy oil-range petroleum and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in soils associated with historical County roads maintenance facility-related activities. The Site is located at 23101 Mountain Highway East, in unincorporated Pierce County, near Spanaway, Washington. The Site is situated immediately east of Joint Base Lewis McChord (JBLM), at the southeast corner of State Route (SR) 7 and 224th Street East.

The Site is located fully within Pierce County Parcel # 0318142001 (the Property), a 63.1-acre roughly triangular shaped parcel. This parcel was purchased from Pierce County in 2021 by 224th Street E LLC. Plans for redevelopment of the Property include primarily residential development with lesser commercial areas.

In previous Ecology correspondence, the Site was stated to include Parcels 0318141058, and 0318141007 which are 9.44 acres and 4.63 acres, respectively. Those parcels are still owned by Pierce County Public Works and no contamination has been identified on those parcels. Hence Parcels 0318141058, and 0318141007 are not currently considered to be part of the Site by Ecology.

Property History and Current Use

The Property was owned by Pierce County and reportedly operated from 1958 until 2009 by Pierce County Public Works as a road maintenance facility. Pierce County used the Property for vehicle fueling, maintenance, vehicle and materials storage, gravel mining, asphalt truck testing, street spoils storage, and administrative activities. Pierce County discontinued use of the Property in May 2008, and the Property has been vacant since 2009.

The Property was improved with a maximum of seven structures that supported vehicle maintenance, fueling, materials storage, a truck wash facility, and business operations. A historical fueling facility was located on the Property, and reportedly contained three underground storage tanks (USTs) and associated ancillary equipment and fueling dispensers. Three above ground storage tanks (ASTs), one gasoline, one diesel, and one containing asphaltic tar, and associated ancillary equipment and dispensers were also located at the facility. All buildings were removed by 2009, except for the materials storage shed, which housed vehicles and bagged asphalt.

The Property is divided into three general areas. The central portion of the Property has an active mining permit for a former gravel pit, the southern portion of the Property is paved and included the main shop area and materials storage. The northern portion of the Property has been cleared and grubbed, and reportedly was not used for maintenance purposes. Site cover ranges from mainly asphalt and concrete in the southern portion of the Property, to gravel, dirt, and vegetative cover over the remainder of the parcels.

In October 1998, AGRA Earth & Environmental (AGRA) decommissioned the three USTs formerly containing diesel and gasoline fuel. AGRA removed a total of 210 cubic yards of petroleum contaminated soil (PCS) from the UST basin. In 2016, Herrera oversaw removal of a 9,000-gallon steel AST formerly containing road oil/asphaltic tar that had reportedly been removed in 2012. Two fuel ASTs (one gasoline and one diesel) had been installed in 1998 to replace the USTs at the Property. The fuel ASTs were decommissioned and removed from the Property, along with dispensers and associated piping in March 2016.

Property Vicinity

The Site is surrounded primarily by low density residential properties to the north and east and forested lands of JBLM across Mountain Highway East to the west and south. A grocery store-anchored shopping center is located north and adjacent to the northwest corner of the Property. As previously discussed, two parcels east and adjacent to the southern part of the Property are currently owned and operated by Pierce County public works for road maintenance-related activities.

Physiographic and Topographic Setting

The Site is located south of Spanaway, Washington, approximately 13 miles southeast of Puget Sound. The Site is in an area of undulating glacial terrain within the Puget Lowland Physiographic Province.

Surface elevations on the Property range from approximately 434 feet above mean sea level (ft amsl) on a small knob located near the eastern property boundary to 406 feet amsl at the bottom of the former gravel pit located in the central part of the Property. A perimeter berm, roughly seven (7) feet high, parallels the west, north, and east boundaries of the Property.

Just west of and parallel to the Mountain Highway East on the JBLM property, is an approximately 100-feet high ridge, which appears to likely be anthropogenic in origin.

Surface/Storm Water/Septic Systems

The former gravel pit forms a topographic depression which would be expected to accumulate and infiltrate stormwater at the Site. The perimeter berm prevents runoff onto and off the majority of the Property. Mountain Highway East slopes gently to the southeast, from an elevation of about 428 ft amsl to the northwest to about 422 ft amsl to the southeast.

The Site contained four former catch basins located in the southern part of the Property. The former on-Site catch basins discharged to a stormwater detention pond, formerly located in the southern portion of the Site. A septic tank and drainfield are present to the west of the former stormwater detention pond in the southern portion of the Site.

No surface water bodies are located on the Property other than the stormwater detention pond which appears to likely be dry most of the time. The nearest natural surface water features to the Site appear to be ponds located approximately 3,400 feet southeast of the Site and a retention pond located approximately 1,600 feet north of the Site. The nearest mapped wetland is located approximately 2,500 feet southeast of the Site.

Ecological Setting

There are roughly 24 acres of forested areas on Parcel # 0318142001. These forested areas are typically about 150 feet wide around the perimeter of the 63-acre Property. In addition, there is an open field at the northern portion of the Property that is about 13 acres in area. There are approximately 37 acres of forest land within 500 feet of the Site on the JBLM property to the west across Mountain Highway East.

Based on the requirements in WAC 173-340-7492, Ecology identified the Simplified terrestrial ecological evaluation (TEE) concentrations in MTCA Table 749-2 are appropriate for use at the Site.

Potential for ecological receptors to encounter contamination would appear to be greatest in AOC-14 (SE and NW berms). Heavy oil would appear to be the Site contaminant which would be expected to drive cleanup needs for AOC-14.

Geology

The Site is underlain primarily by fill and unconsolidated sands and gravels (glacial outwash) to approximately 17 feet below ground surface (ft bgs). Glacial till is thought to underlie the sands and gravels to the maximum depth explored at the Site of 40 feet bgs.

Groundwater and Water Supply

Based on sampling of the on-Property domestic supply water well in 2016, depth to groundwater was approximately 26 feet below top of casing. Based on the well log, the domestic supply water well is screened from 76-81 feet bgs and is sealed from ground surface to 76 feet bgs. This domestic supply well is reportedly out of service at this time.

Groundwater flows to the west-northwest based on a potentiometric surface map prepared for the Site (Herrera 2021). Water supply for the planned development will be through Washington Water service and sewer service through Pierce County Utilities.

The outer edge of a mapped wellhead protection zone extends to the northernmost part of the Property. This wellhead protection zone appears to be from well(s) located at Loveland Mobile estates, located approximately one (1) mile northwest of the Site. Several Group A/B wells are located in the vicinity of the Site to the north, south, and east. Risk to water supply wells from the Site contamination appears to be low based on the lack of groundwater contamination at the Site as well as the relatively low mobility of Site contaminants.

Site Diagrams