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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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September 14, 2021

Keum Woo
6730 Troon Ln SE
Olympia, WA 98501
keumwoo@hotmail.com

**Re: Opinion on Proposed Cleanup of the following Site:**

- **Site Name:** Lacey Urban Center
- **Site Address:** 7131 - 7239 Martin Way E, Olympia, Thurston County, WA 98516
- **Facility/Site ID:** 67913
- **Cleanup Site ID:** 15414
- **VCP Project ID:** SW1745

Dear Keum Woo:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Lacey Urban Center facility (Site). This letter provides our opinion. 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

Ecology has determined that upon completion of your proposed cleanup (installation of a vapor mitigation system and institutional controls memorialized by an environmental covenant), no further remedial action will likely be necessary to clean up contamination at the Site. This determination is dependent on yet-to be determined factors such as:

- Demonstrated success of the proposed vapor mitigation system.
- Implementation of an environmental convent with long term monitoring requirements.

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

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, chapter 70.105D RCW, and its implementing regulations, Washington Administrative Code (WAC) chapter 173-340 (collectively "substantive requirements of MTCA"). The analysis is provided below.

## Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following release:

- Tetrachloroethylene (PCE) into the soil and air.

The parcel(s) of real property associated with this Site are also located within the projected boundaries of the Asarco Tacoma Smelter Site (FSID: 89267963). At this time, we have no information that those parcel(s) are actually affected. This opinion does not apply to any contamination associated with the Asarco Tacoma Smelter Site facility.

## Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Envitechnology (Envitech), *Additional Phase II Subsurface Investigation, Lacey Urban Center, 7131-7269 Martin Way East, Olympia, Washington*, November 30, 2018.
2. Associated Environmental Group, LLC (AEG), *Remedial Investigation / Feasibility Study Report*, September 15, 2020.
3. AEG, *April 2021 Groundwater Sampling Results Report*, letter, addressed to Ms. Keum Woo, May 18, 2021.

These documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. Information on obtaining those records can be found on Ecology's public records requests web page.[3] Some site documents may be available on Ecology's Cleanup Site Search web page.[4]

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

[3] https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests
[4] https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=15414

## Analysis of the Cleanup

The Site is located within Thurston County tax parcel 78801200000, a 4.66-acre lot improved with the Lacey Urban Shopping Center. A former dry cleaner operated from 1965 to 1997, in a slab-on-grade, single-story masonry building located in the western portion of the shopping center (AEG Figure 2). The former dry cleaner space is now operated as Lacey Laundry, a coin-operated laundromat. Occupancy of the current multi-tenant shopping center has primarily been for retail, office, and service tenants, and have included a bank, barber shop, post office, donut shop, drapery shop, hair salon, drug store, restaurants, shoe repair, floral and gift shops, nail shops, bakery, dentist, and chiropractic center.

In July 2018, Envitech advanced 18 soil borings (B-1 through B-18) and collected 11 soil gas borings (SG1 through SG11) to determine whether a release had occurred from the former dry-cleaning operation. Soil samples were collected from each boring, soil gas samples were collected from ten borings (B-1 through B-8, B-10, and B-11), and groundwater was sampled from one boring (B-14) at about 26 feet below ground surface (bgs). Analytical results indicated the presence of PCE in soil and soil gas samples above MTCA Method A/B cleanup screening levels (AEG Table 4, Figure 4).

In July 2020, AEG advanced additional borings to complete the remedial investigation. Two borings (B-19 and B-20) were advanced inside the laundromat adjacent to borings B-3 and B-1, respectively, to define the vertical extent of PCE in soil. Borings B-21, B-22, and B-23, and monitoring well MW-1 were advanced on the south and southwest sides of the building to laterally define the extent of PCE in soil. Three soil gas borings (SG-1, SG-2, and SG-3) were advanced west of the former leach field to laterally define soil gas impacts in this area, and soil gas samples SG-4, SG-5, and SG-6 were collected from borings B-23, B-22, and B-21, respectively, on the south side of the building to laterally define soil gas impacts in this area.

Three monitoring wells (MW-1, MW-2, and MW-3) were installed to determine potential impacts to shallow groundwater. Groundwater was encountered at about 31 feet bgs, and the monitoring wells were screened from 25 to 35 feet bgs. All samples were submitted for analysis for PCE and daughter products. Laboratory results for all constituents analyzed in soil, groundwater, and soil gas samples were either non-detect or were detected below their respective MTCA Method A/B cleanup screening levels (AEG Table 1, Figure 3).

In October 2020, AEG installed two deep monitoring wells (MW-4 and MW-5) to evaluate the potential presence of dense non-aqueous phase liquid (DNAPL) that may not have been detected in shallow groundwater. Groundwater flow in the shallow groundwater unit was determined to be to the southwest, so the monitoring wells were installed on the south (MW-4) and west (MW-5) sides of the building. The well borings were advanced until a confining layer was encountered. A confining layer was encountered at about 75 to 80 feet bgs, and the monitoring wells were installed with 5 feet of screen. Soil samples collected and analyzed for PCE and daughter products were non-detect for all constituents (AEG Table 2).

In October 2020, AEG also completed a Tier II Vapor Assessment, which included sampling indoor air from two locations (Indoor-1 and Indoor-2), ambient air from one location outside and upwind (ambient), and sub-slab vapor from two locations (SS-1 and SS-2). The assessment was completed to determine if the PCE detected in the soil beneath the building is present and/or has to potential to migrate into the indoor air inside the Lacey Urban Center facility. Analytical results indicated PCE and daughter products were non-detect in the indoor and ambient air samples; however, PCE was detected above the MTCA Method B sub-slab screening level at both sampling locations (SS-1 and SS-2). All other daughter products were below the laboratory detection limits for each compound. (AEG Table 5).

Ecology has determined your characterization of the Site is sufficient to establish cleanup standards for the Site, and to select a cleanup action.

**1. Characterization of the Site.**

Ecology has determined your characterization of the Site is sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.** Figures and Tables referenced below are included in **Enclosure A**.

***Ecology Comments:***

Prior to installing a vapor mitigation system at the Site, an inspection of the building foundation (slab on grade) should be performed evaluating preferential pathways (i.e. cracks, utilities, bathrooms, etc.).

If a passive sub-slab depressurization system is to be installed, a network of sub-slab monitoring points should be installed so that differential pressure and sub-slab soil gas concentrations can be measured over time to evaluate the effectiveness of the passive system and whether or not an active system will be needed. If an active system is needed, then these monitoring points can be also used to monitor its effectiveness. Indoor air concentrations will need to be measured concurrently with sub-slab soil gas concentrations.

Ecology recommends providing a description of the design and installation of sub-slab monitoring points. Include a description of how the monitoring points will be sealed to the vapor barrier. Also, provide the cross-slab pressure differential criteria for determining whether an active system is needed.

Differential pressures should be measured using a micro-manometer that is auto-zeroing and has a pressure differential sensitivity to 0.001 inches of water (such as a CLK-Zephyr II+ data logging micro-manometer). Differential pressures should be recorded using a data logger for at least 48 hours (preferably one week) prior to sampling to assess fluctuations (if any) of cross-slab differential pressure.

Following successful confirmation of installation and operation of the sub slab depressurization system please review Ecology's *Procedure 440A: Establishing Environmental Covenants under the Model Toxics Control Act*, Revised December 22, 2016,[5] and the requirements outlined in Enclosure B prior to submitting your draft environmental covenant.

**2. Establishment of Cleanup Standards.**

Ecology has determined the cleanup levels and points of compliance you established for the Site meet the substantive requirements of MTCA.

**Cleanup Standards:** Under MTCA, cleanup standards consist of three primary components; (a) points of compliance, (b) cleanup levels, and (c) applicable state and federal laws.

**(a) Points of Compliance**. Standard points of compliance listed below are being applied to the Site. Points of compliance are the specific locations at the Site where cleanup levels have been attained.

[5] https://fortress.wa.gov/ecy/publications/documents/1509054.pdf

| Media | Points of Compliance |
|---|---|
| Soil-Direct Contact | Based on human exposure via direct contact, the standard point of compliance is throughout the Site from ground surface to fifteen feet below the ground surface.[6]<br><br>*Standard not met - proposed to be maintained protective through institutional controls* |
| Soil- Protection of Groundwater | Based on the protection of groundwater, the standard point of compliance is throughout the Site.[7]<br><br>*Standard not met - proposed to be maintained protective through institutional controls* |
| Soil-Protection of Plants, Animals, and Soil Biota | Based on ecological protection, the standard point of compliance is throughout the Site from ground surface to fifteen feet below the ground surface.[8]<br><br>*Standard met by exemption by simplified TEE process.* |
| Groundwater | Based on the protection of groundwater quality, the standard point of compliance is throughout the site from the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially be affected by the site.[9]<br><br>*Standard being met with ongoing long term monitoring.* |
| Air Quality | Based on the protection of air quality, the point of compliance is indoor and ambient air throughout the Site.[10]<br><br>*Standard not met - proposed to be maintained protective through vapor mitigation and institutional controls.* |

**(b)** **<u>Cleanup Levels</u>**. Cleanup levels are the concentrations of a hazardous substance in soil, water, air, or sediment that are determined to be protective of human health and the environment. At this Site, hazardous substance MTCA cleanup screening levels were used to evaluate PCE (and associated daughter products) contamination detected at the Site in soil, groundwater, and air.

[6] WAC 173-340-740(6)(d)
[7] WAC 173-340-747
[8] WAC 173-340-7490(4)(b)
[9] WAC 173-340-720(8)(b)
[10] WAC 173-340-750(6)

***Method A Soil & Groundwater Cleanup Screening Levels, Method B Soil-Vapor Screening Levels, and Method B Indoor Air Cleanup Screening Levels***

| Hazardous Substance | CAS # | Method A Soil (mg/kg) | Method A Groundwater (µg/l) | Method B Sub Slab Soil Gas (µg/m$^3$) | Method B Indoor Air (µg/m$^3$) |
|---|---|---|---|---|---|
| Tetrachloroethylene (PCE) | 127-18-4 | 0.05 | 5 | 320 | 9.6 |
| Trichloroethylene (TCE) | 79-01-6 | 0.03 | 5 | 11 | 0.33 |
| Cis-1,2-dichloroethene (cDCE) | 156-59-2 | 160 | 16 | NONE | NONE |
| Trans-1,2-dichloroethene (tDCE) | 156-60-5 | 1,600 | 160 | 610 | 18 |
| Vinyl chloride (VC) | 75-01-4 | 0.67 | 0.02 | 9.5 | 0.28 |

**(c) Applicable Laws and Regulations.** Applicable local, state, and federal laws were evaluated within the *Remedial Investigation / Feasibility Study Report*. Ecology concurs that these requirements have been correctly identified and are legally applicable or relevant and appropriate.[11,12]

## 3. Selection of Cleanup Action.

*Proposed Cleanup Alternatives Review*

AEG proposed the following cleanup alternatives in their 2021 RI/FS:[13]

- Alternative 1: No Action
- Alternative 2: In-Situ Soil Treatment via Vapor Extraction.
- Alternative 3: Closure with Vapor Mitigation Installation and Environmental Covenant.

[11] WAC 173-340-710(2)
[12] Note – MTCA Method A includes ARARs and concentration-based tables (WAC 173-340-700(5)(a)) If MTCA Method A remains in use as proposed Site cleanup levels, identify non-concentration based technical and procedural requirements. If Method B or C cleanup levels are proposed, also include concentration-based requirements.
[13] AEG, *Remedial Investigation/Feasibility Study Report*, April 1, 2021.

Based on the results of the Disproportionate Cost Analysis (DCA), Alternative 3 - Closure with Vapor Mitigation Installation and Environmental Covenant was proposed as the least costly and equally beneficial to Alternative 2. Sufficient information has been presented to Ecology for us to concur that the preferred remedial alternative is sufficient to meet the requirements of MTCA and are protective of human health and the environment. To assist with completion of the draft environmental covenant for Ecology review, Details on what is expected for a draft environmental covenant is included in **Enclosure B**.

Should future land use change, or if contaminated media are exposed for any reason, the FS/DCA may need to be revised and a more permanent cleanup action may need to be evaluated. Depending on the nature of the future change, additional cleanup action may be required.

## Limitations of the Opinion

**1. 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).

**2. 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 and WAC 173-340-545.

**3. 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.305D.180.

## Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our Voluntary Cleanup Program web site.[14] If you have any questions about this opinion, please contact me at (360) 407-6347 or nicholas.acklam@ecy.wa.gov.

Sincerely,

Nicholas M. Acklam, Unit Supervisor
Toxics Cleanup Program
Southwest Regional Office

NMA:sl

Enclosures (8): A – Site Diagrams and Tables
B – Environmental Covenant Reference Information

cc: Scott Rose, AEG srose@aegwa.com
Ecology Site File

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

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## Enclosure A

Diagrams and Tables of the Site

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## Site Diagrams

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| FILENAME | DRAWN BY | CHECKED BY | APPROVED BY | PROJECT NUMBER |
|---|---|---|---|---|
| 18-236_2101_1.DWG | ICD 3/23/2021 | CS 3/23/2021 | CS 3/23/2021 | 18-236 |


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W E
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## LEGEND

| | |
|---|---|
| MW-1 | SHALLOW MONITORING WELL LOCATION |
| MW-4 | DEEP MONITORING WELL LOCATION |
| SG-1 | SOIL GAS SAMPLE LOCATION |
| B-1 | SOIL BORING LOCATION |
| SS-1 | SUB-SLAB VAPOR SAMPLE LOCATION |
| AMBIENT | AIR SAMPLE LOCATION |
| —x—x— | FENCE |

## NOTES

1. THE LOCATIONS OF ALL FEATURES SHOWN ARE APPROXIMATE
2. THIS DRAWING IS FOR INFORMATION PURPOSES. IT IS INTENDED TO ASSIST IN SHOWING FEATURES DISCUSSED IN AN ATTACHED DOCUMENT.

## REFERENCE

DRAWING CREATED FROM AERIAL PHOTOGRAPH AND NOTES PROVIDED BY AEG, LLC.

0 10 20
SCALE IN FEET

Associated Environmental Group, LLC

**FIGURE 2**

**SITE MAP**

LACEY URBAN CENTER
7131-7269 MARTIN WAY EAST
OLYMPIA, WASHINGTON

| | |
|---|---|
| PROJECT NUMBER | 18-236 |
| APPROVED BY | BD 3/23/2021 |
| CHECKED BY | BD 3/23/2021 |
| DRAWN BY | ICD 3/23/2021 |
| FILENAME | 18-236_2101_1.DWG |


N
W E
S

## LEGEND

| | |
|---|---|
| MW-1 | SHALLOW MONITORING WELL LOCATION |
| MW-4 | DEEP MONITORING WELL LOCATION |
| SG-1 | SOIL GAS SAMPLE LOCATION |
| B-1 | SOIL BORING LOCATION |
| SS-1 | SUB-SLAB VAPOR SAMPLE LOCATION |
| AMBIENT | AIR SAMPLE LOCATION |
| —x—x— | FENCE |
| -------- | 0.05 mg/kg ISOCONCENTRATION LINE |
| -------- | 0.20 mg/kg ISOCONCENTRATION LINE |
| 0.07 | PCE CONCENTRATION IN SOIL (mg/kg) |
| PCE | TETRACHLOROETHYLENE |
| mg/kg | MILLIGRAMS PER KILOGRAM |

## NOTES

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2. THIS DRAWING IS FOR INFORMATION PURPOSES. IT IS INTENDED TO ASSIST IN SHOWING FEATURES DISCUSSED IN AN ATTACHED DOCUMENT.

## REFERENCE

DRAWING CREATED FROM AERIAL PHOTOGRAPH AND NOTES PROVIDED BY AEG, LLC.

0 10 20
SCALE IN FEET

AEG Associated Environmental Group, LLC

**FIGURE 3**

**PCE IN SOIL PLUME MAP**

LACEY URBAN CENTER
7131-7269 MARTIN WAY EAST
OLYMPIA, WASHINGTON

| FILENAME | DRAWN BY | CHECKED BY | APPROVED BY | PROJECT NUMBER |
|---|---|---|---|---|
| 18-236_2101_1.DWG | ICD 3/23/2021 | BD 3/23/2021 | BD 3/23/2021 | 18-236 |


N

W E

S

## LEGEND

| | |
|---|---|
| MW-1 | SHALLOW MONITORING WELL LOCATION |
| MW-4 | DEEP MONITORING WELL LOCATION |
| SG-1 | SOIL GAS SAMPLE LOCATION |
| B-1 | SOIL BORING LOCATION |
| SS-1 | SUB-SLAB VAPOR SAMPLE LOCATION |
| AMBIENT | AIR SAMPLE LOCATION |
| —x—x— | FENCE |
| ------- | 400 $\mu g/m^3$ ISOCONCENTRATION LINE |
| ------- | 1,000 $\mu g/m^3$ ISOCONCENTRATION LINE |
| 450 | PCE CONCENTRATION IN SOIL VAPOR ($\mu g/m^3$) |
| $\mu g/m^3$ | MICROGRAMS PER CUBIC METER |
| PCE | TETRACHLOROETHYLENE |
| < | NOT DETECTED ABOVE LIMIT NOTED |

**RED BOLD INDICATES THE DETECTED CONCENTRATION EXCEEDS ECOLOGY MTCA METHOD B SCREENING LEVELS**

**BOLD INDICATES THE DETECTED CONCENTRATION IS BELOW ECOLOGY MTCA METHOD B SCREENING LEVELS**

## NOTES

1. THE LOCATIONS OF ALL FEATURES SHOWN ARE APPROXIMATE
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## REFERENCE

DRAWING CREATED FROM AERIAL PHOTOGRAPH AND NOTES PROVIDED BY AEG, LLC.

0 10 20

SCALE IN FEET

AEG Associated Environmental Group, LLC

# FIGURE 4

## PCE IN SOIL VAPOR PLUME MAP

LACEY URBAN CENTER
7131-7269 MARTIN WAY EAST
OLYMPIA, WASHINGTON

## Site Tables

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**Table 1 - Summary of Soil Analytical Results**
Lacey Urban Center (18-236)
Olympia, Washington

| Sample Number | Depth (feet) | Date Collected | Chlorinated Volatile Organic Compounds | | | | |
|---|---|---|---|---|---|---|---|
| | | | PCE | TCE | cis-1,2 DCE | trans-1,2-DCE | Vinyl Chloride |
| **Envitechnology, 2018** | | | | | | | |
| B1-2 | 2 | 7/20/2018 | **0.04** | <0.03 | <0.15 | <0.15 | <0.15 |
| B1-5 | 5 | 7/20/2018 | **0.06** | <0.03 | <0.15 | <0.15 | <0.15 |
| B2-2 | 2 | 7/20/2018 | **0.02** | <0.03 | <0.15 | <0.15 | <0.15 |
| B2-5 | 5 | 7/20/2018 | **0.02** | <0.03 | <0.15 | <0.15 | <0.15 |
| B3-2 | 2 | 7/20/2018 | **0.19** | <0.03 | <0.15 | <0.15 | <0.15 |
| B3-5 | 5 | 7/20/2018 | **0.24** | <0.03 | <0.15 | <0.15 | <0.15 |
| B4-5 | 5 | 7/20/2018 | **0.04** | <0.03 | <0.15 | <0.15 | <0.15 |
| B4-20 | 20 | 7/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B5-5 | 5 | 7/20/2018 | **0.25** | <0.03 | <0.15 | <0.15 | <0.15 |
| B5-20 | 20 | 7/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B6-20 | 20 | 7/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B7-5 | 5 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B8-5 | 5 | 8/20/2018 | **0.03** | <0.03 | <0.15 | <0.15 | <0.15 |
| B9-5 | 5 | 8/20/2018 | **0.07** | <0.03 | <0.15 | <0.15 | <0.15 |
| B9-10 | 10 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B9-15 | 15 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B10-2 | 2 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B10-5 | 5 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B11-2 | 2 | 8/20/2018 | **0.05** | <0.03 | <0.15 | <0.15 | <0.15 |
| B11-5 | 5 | 8/20/2018 | **0.04** | <0.03 | <0.15 | <0.15 | <0.15 |
| B12-5 | 5 | 8/20/2018 | **0.19** | <0.03 | <0.15 | <0.15 | <0.15 |
| B12-15 | 15 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B13-5 | 5 | 8/20/2018 | **0.02** | <0.03 | <0.15 | <0.15 | <0.15 |
| B13-15 | 15 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B14-10 | 10 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B14-15 | 15 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B14-25 | 25 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B15-5 | 5 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B15-15 | 15 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B16-10 | 10 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B16-29 | 29 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B17-5 | 5 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B17-15 | 15 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B18-5 | 5 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B18-15 | 15 | 8/20/2018 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| **AEG, 2020** | | | | | | | |
| B19-9 | 9 | 7/22/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B20-9 | 9 | 7/22/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B21-6 | 6 | 7/28/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B21-11 | 11 | 7/28/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |

**Table 1 - Summary of Soil Analytical Results**
Lacey Urban Center (18-236)
Olympia, Washington

| Sample Number | Depth (feet) | Date Collected | Chlorinated Volatile Organic Compounds | | | | |
|---|---|---|---|---|---|---|---|
| | | | PCE | TCE | cis-1,2 DCE | trans-1,2-DCE | Vinyl Chloride |
| B22-6 | 6 | 7/28/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B22-11 | 11 | 7/28/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B23-6 | 6 | 7/29/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B23-11 | 11 | 7/29/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| MW1-6 | 6 | 7/29/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| MW1-11 | 11 | 7/29/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| MW2-6 | 6 | 7/29/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| MW2-11 | 11 | 7/29/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| MW3-6 | 6 | 7/30/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| MW3-11 | 11 | 7/30/2020 | <0.05 | <0.03 | <0.15 | <0.15 | <0.15 |
| B24-5/MW4-5 | 5 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-10/MW4-10 | 10 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-16/MW4-16 | 16 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-21/MW4-21 | 21 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-26/MW4-26 | 26 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-31/MW4-31 | 31 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-36/MW4-36 | 36 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-41/MW4-41 | 41 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-45/MW4-45 | 45 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-56/MW4-56 | 56 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-60/MW4-60 | 60 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-74/MW4-74 | 74 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-78/MW4-78 | 78 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| B24-81/MW4-81 | 81 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| MW5-40 | 40 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| MW5-60 | 60 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| MW5-75 | 75 | 10/30/2020 | <0.03 | <0.02 | <0.03 | <0.03 | <0.02 |
| Laboratory PQL | | | 0.03/0.05 | 0.02/0.03 | 0.03/0.15 | 0.03/0.15 | 0.02/0.15 |
| MTCA Method A Cleanup Levels | | | 0.05 | 0.03 | *160 | *1,600 | *0.67 |

Notes:
All values are presented in milligrams per kilogram (mg/kg)
< = Not detected at the listed laboratory detection limits
PQL = Practical Quantification Limit (laboratory detection limit)
**Red Bold** indicates the detected concentration exceeds MTCA cleanup level
**Bold** indicates the detected concentration is below MTCA cleanup level
PCE = Tetrachloroethylene
TCE = Trichloroethylene
DCE = Dichloroethylene
* MTCA Method B cleanup level; Method A cleanup level not established

**Table 2 - Summary of Groundwater Analytical Results**

Lacey Urban Center (18-236)

Olympia, Washington

| Sample/Well Number | Date Collected | Halogenated Volatile Organic Compounds | | | | |
|---|---|---|---|---|---|---|
| | | PCE | TCE | cis-1,2-DCE | trans-1,2-DCE | Vinyl Chloride |
| **Boring Groundwater Results (Envitechnology)** | | | | | | |
| W14 | 8/20/2018 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| **Boring Groundwater Results (AEG)** | | | | | | |
| B21-W | 7/28/2020 | **0.6** | <0.4 | <1.0 | <1.0 | <0.2 |
| B22-W | 7/29/2020 | **1.6** | <0.4 | <1.0 | <1.0 | <0.2 |
| B23-W | 7/30/2020 | **1.3** | <0.4 | <1.0 | <1.0 | <0.2 |
| **Monitoring Well Results (AEG)** | | | | | | |
| MW-1 | 7/30/2020 | **0.82** | <0.4 | <1.0 | <1.0 | <0.2 |
| | 10/16/2020 | **0.7 J** | <0.4 | <1.0 | <1.0 | <0.2 |
| | 1/7/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| | 4/6/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| MW-2 | 7/30/2020 | **0.66** | <0.4 | <1.0 | <1.0 | <0.2 |
| | 10/16/2020 | **0.6J** | <0.4 | <1.0 | <1.0 | <0.2 |
| | 1/7/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| | 4/6/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| MW-3 | 7/30/2020 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| | 10/16/2020 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| | 1/7/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| | 4/6/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| MW-4 | 1/7/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| | 4/6/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| MW-5 | 1/7/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| | 4/6/2021 | <1.0 | <0.4 | <1.0 | <1.0 | <0.2 |
| PQL | | 1.0 | 0.4/1.0 | 1.0 | 1.0 | 0.2 |
| MTCA Method A Cleanup Levels | | 5 | 5 | 16* | 160* | 0.2 |

Notes:

All values reported in micrograms per liter (µg/L)

-- = Not analyzed for constituent

< = Not detected at the listed laboratory detection limits

PQL = Practical Quantification Limit (laboratory detection limit)

**Red Bold** indicates the detected concentration exceeds MTCA cleanup levels

**Bold** indicates the detected concentration is below MTCA cleanup levels

* MTCA Method B cleanup level; Method A cleanup level not established

PCE = Tetrachloroethylene

TCE = Trichloroethylene

DCE = Dichloroethylene

**Table 4 - Summary of Soil Gas Analytical Results**
Lacey Urban Center (18-236)
Olympia, Washington

| Sample Number | Date Collected | Chlorinated Volatile Organic Compounds | | | | |
|---|---|---|---|---|---|---|
| | | PCE | TCE | cis-1,2-DCE | trans-1,2-DCE | Vinyl Chloride |
| **Envitechnology, 2018** | | | | | | |
| SG1-5 (B-1) | 7/20/2018 | **180** | **6.6** | <4.0 | <4.0 | <2.6 |
| SG2-5 (B-2) | 7/20/2018 | **140** | **3.8** | <4.0 | <4.0 | <2.6 |
| SG3-5 (B-3) | 7/20/2018 | **1,800** | <2.7 | <4.0 | <4.0 | <2.6 |
| SG4-5 (B-4') | 7/20/2018 | **430** | <2.7 | <4.0 | <4.0 | <2.6 |
| SG5-5 (B-5') | 7/20/2018 | **610** | <2.7 | <4.0 | <4.0 | <2.6 |
| SG6-5 (B-6') | 7/20/2018 | **350** | <2.7 | <4.0 | <4.0 | <2.6 |
| SG7-5 (B-7) | 8/21/2018 | **450** | **1.7** | <4.0 | <4.0 | <2.6 |
| SG8-5 (B-8) | 8/21/2018 | **450** | **3.3** | <4.0 | <4.0 | <2.6 |
| SG10-5 (B-10) | 8/21/2018 | **120** | **7.3** | <4.0 | <4.0 | <2.6 |
| SG11-5 (B-11) | 8/21/2018 | **780** | **3.5** | <4.0 | <4.0 | **6.2** |
| **AEG, 2020** | | | | | | |
| SG-1 | 7/29/2020 | **60** | <1.8 | <2.7 | <2.7 | <1.7 |
| SG-2 | 7/29/2020 | **180** | <1.8 | <2.7 | <2.7 | <1.7 |
| SG-3 | 7/29/2020 | **90** | <1.8 | <2.7 | <2.7 | <1.7 |
| SG-4 | 7/29/2020 | **72** | **2.4** | <2.7 | <2.7 | <1.7 |
| SG-5 | 7/29/2020 | **270** | <3.5 | <5.2 | <5.2 | <3.3 |
| SG-6 | 7/29/2020 | **76** | <1.9 | <2.8 | <2.8 | <1.8 |
| MTCA Method B Sub-Slab Screening Levels | | 321* | 12.3* | NL | NL | 9.33* |

Notes:

All values presented in micrograms per cubic meter ($\mu g/m^3$)

< = Not detected above the laboratory practical quantitation limit (PQL)

* Cancer cleanup/screening level (all other constituents listed have non-cancer values)

**Red Bold** indicates the detected concentration exceeds MTCA Method B screening levels

**Bold** indicates the detected concentration is below MTCA Method B screening levels

NL = Not Listed; no screening level has been promulgated for these constituents

PCE = Tetrachloroethylene

TCE = Trichloroethylene

DCE = Dichloroethene

**Table 5 - Summary of Sub-Slab Vapor and Indoor Air Analytical Results**

Lacey Urban Center (18-236)

Olympia, Washington

| Sample ID | | Indoor-1 | Indoor-2 | Ambient | Method B Indoor Air Cleanup Level | SS-1 | SS-2 | Method B Sub-Slab Screening Level |
|---|---|---|---|---|---|---|---|---|
| Date Collected | | 10/29/2020 | 10/29/2020 | 10/29/2020 | | 10/29/2020 | 10/29/2020 | |
| TO-15 - Volatile Organic Compounds | Vinyl Chloride | <0.26 | <0.26 | <0.26 | 0.28* | <8.9 | <1.8 | 9.33* |
| | trans-1,2-DCE | <0.4 | <0.4 | <0.4 | NL | <14 | <2.8 | NL |
| | cis-1,2-DCE | <0.4 | <0.4 | <0.4 | NL | <14 | <2.8 | NL |
| | TCE | <0.11 | <0.11 | <0.11 | 0.37* | <3.8 | <0.75 | 12.3* |
| | PCE | <6.8 | <6.8 | <6.8 | 9.62* | **1,600** | **410** | 321* |

Notes:

All values presented in micrograms per cubic meter ($\mu g/m^3$)

-- = Not analyzed for constituent

< = Not detected above laboratory limits

* Cancer cleanup/screening level (all other constituents listed have non-cancer values)

**Red Bold** indicates the detected concentration exceeds MTCA Method B cleanup or screening levels

**Bold** indicates the detected concentration is below MTCA Method B cleanup or screening levels

NL = Not Listed; no cleanup/screening levels have been promulgated for these constituents

PCE = Tetrachloroethylene

TCE = Trichloroethylene

DCE = Dichloroethylene

## Enclosure B

Environmental Covenant Reference Information

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# Enclosure B. Environmental Covenant Reference Information.

**Draft Covenant:** Ecology will need a draft covenant memorializing proposed institutional and engineered controls for all impacted properties. Also provide the environmental covenant in electronic word-processing-compatible format.[1] Include the following information with the draft covenant:

a. **Plan View Maps and Geologic Cross Sections:** Include delineated concentration (1) isopleth plan view maps and (2) geologic cross sections showing the extents of remaining contamination at the Site. Include the boundaries of the MTCA facility, the affected Properties, and the location of any rights of way or easements. Indicate where insufficient data are available to delineate to natural background concentrations. These maps will be used to indicate where contamination remains at the Site after closure. For consistency with other sites in our program, Ecology prefers that data for these maps are provided in units of milligrams per kilogram (mg/kg) for soil, micrograms per liter (µg/L) for groundwater, and microgram per meter cubed (µg/$m^3$) for air and soil vapor.

b. **Title Search:** Provide a complete title search as part of Exhibit A, legal description.

c. **Land Survey:** Provide a land survey of impacted properties and rights-of-way, including platting and dedications.

d. **Review the title search and land survey to determine if existing easements include any area of proposed engineered or institutional controls:**

   i. Develop a plan view map or sketch of the locations of existing easements sufficient for Ecology to concur with your evaluation of whether any easements include the areas of proposed engineered or institutional controls.

   ii. For each easement that intersects proposed controls at the Site, either provide

      1) A signed subordination agreement or;

      2) Sufficient evaluation of specific easement terms for Ecology to concur that the easement will not impact the integrity of the cleanup.

   Ecology recommends contacting easement owners prior to completing a draft environmental covenant. When reviewing easements, Ecology assumes that Property boundaries extend to the centerline of the adjacent rights of way.

e. **Financial Assurance Requirements:** Ecology recommends that you review the financial assurance requirements of WAC 173-340-440(11) and contact our Financial Assurance Officer Joanna Richards at joar461@ECY.WA.GOV or (360)407-6754 for direction on evaluating financial assurance requirements.[2] Include any needed

[1] See the word processing formatted document at: https://fortress.wa.gov/ecy/publications/SummaryPages/1509054.html

[2] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Dangerous-waste-guidance/Dispose-recycle-or-treat/Financial-assurance

financial assurance mechanisms and implementation of financial assurances based on the requirements. If financial assurances are determined to be unnecessary, include sufficient explanation for Ecology to concur.

f. **Local Government Notification Requirements:** Please document how the local government notification requirements of WAC 173-340-440(10) are completed. Ecology suggests providing the draft covenant and enclosure package to the local land use planning authority for review and comment. If comments are provided, update the draft covenant based on comments, and provide Ecology the correspondence, local government comments, and how those comments were addressed. If no response is received, include sufficient information for Ecology to concur that the correct local government agency was notified, the date they were notified, and that comments were sought. At this Site, Ecology believes that the appropriate local land use planning authority is likely the Thurston County Community Planning & Economic Development (CPED).[3]

g. **Long-Term Air, Groundwater, and Cap Monitoring Plan:** Ecology will need long-term monitoring of the sub slab vapor, soil gas, and indoor air and the existing groundwater monitoring well network to ensure the remedy is effective. A long-term sub slab and indoor air, groundwater, and cap monitoring and reporting plan will be needed. That plan needs to also include contingency planning, in the event that the remedy is not effective or contaminated soil becomes exposed.

**Soil Vapor/Soil Gas/ Indoor Air:**

Ecology suggests an annual confirmation soil vapor, soil gas, and indoor air frequency for the first five years of post-closure monitoring. Inspection of the system should be completed on an on-going basis; Ecology recommends completing these inspections monthly. In addition, an annual independent third party inspection should also occur concurrently with indoor air sampling.

The annual sampling event should include pressure field extension monitoring to measure cross-slab gradient pressures while the system is operating and sub-slab, indoor air, and outdoor (ambient) air sampling. Sampling should occur during the winter months (December to February). Sub-slab and indoor air sample locations should be the same as those used in October 2020.

Ambient air samples should be collected upwind and near the building, but not so close as to be influenced by volatile emissions emanating from the building or any other point sources of emissions. Copies of the annual sampling event shall be provided to Ecology.

- **Operation and Maintenance Requirements for the vapor mitigation system:** As recommended by New York State Guidance and Environmental Protection Agency , the building's owner (and tenants, as applicable) should be provided with information

[3] https://www.thurstoncountywa.gov/cped/Pages/default.aspx

regarding system operation, maintenance, and monitoring.[4,5] The long term monitoring plan should include the following:

- A description of the system that was installed including its basic operating principles.
- How the owner, tenant or responsible person can check that the system is operating properly.
- Who will be responsible for performing the monthly inspections.
- How the system will be maintained and by whom. System components that may require maintenance include the exhaust fans, manometers, and piping. Exhaust fans should be replaced in the event of excessive noise/vibration or significantly reduced cross-slab pressure readings. An operational failure of the fan and/or lack of proper moisture drainage should be indicated by manometer readings and noted during inspections. Replacement of cracked or damaged piping should be performed if identified during inspections or by the building manager and/or tenants. Proposed modifications to the SSDS, if necessary, should be discussed with Ecology.
- A list of appropriate actions for the owner, tenant, or responsible person to take if there is an indication of system degradation or failure.
- Contact information, including names and contact information (phone number and email) if the owner or tenant has questions, comments, or concerns.
- Requirement that the building owner or responsible person receive copies of all applicable contracts, warranties, and manufacturer's operation and maintenance instructions.
- It is recommended that wherever possible, illustrations should be provided such as pictures of a manometer under normal operating conditions, as well as drawings, pictures, or schematics showing the system at work (for examples, see Figures 5.1 and 5.2 in NYSDOE, 2006).

**Groundwater:**

Ecology suggests an annual or fifteen-month confirmation groundwater monitoring frequency for the first five years of post-closure monitoring, so that four quarters of seasonal groundwater results are obtained over the five years prior to Ecology's first required regular review.

**Cap:**

[4] NYSDOH, *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, October 2006

[5] EPA, *Indoor Air Vapor Intrusion Mitigation Approaches.* EPA/600/R-08/115, October 2008.

Reporting on the cap condition may be conducted at the same time as long term monitoring, and should be detailed in the monitoring plan. An initial inspection with photographs and description of the cap to be monitored should be included with the plan.

The plan should also include provisions to ensure that all environmental data is provided in accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements).[6]

i. **Contingency Plan:** A long-term groundwater and vapor intrusion contingency plan is required. The plan should describe those actions that will be conducted if long-term monitoring results exceed predetermined levels, or if cap maintenance or other maintenance is needed, such as repairing groundwater monitoring wells, or what to do if the cap is damaged.

   The contingency plan may be triggered during regular inspection of the cap and monitoring well integrity, or by exceedances of cleanup levels at a point of compliance during long term monitoring. An adequate contingency plan would include and detail, as applicable, that when specific levels are detected during long-term monitoring, additional confirmation sampling would be performed within 30 days of the initial receipt of results. If the cap were damaged, indoor air sampling and analysis would be conducted and the cap repaired.

   Additional follow-up groundwater sampling would include all required testing for detected hazardous substances and related compounds. The contingency plan should include proposed analytes for contingency sampling in an analytical schedule. Results of performance and confirmation sampling for a contingency plan would be provided to Ecology within 90 days of the laboratory result date if no exceedances of criteria are detected, or within 30 days of the laboratory report result date if exceedances are detected, or for follow-up confirmation sampling.

   If confirmation sampling reveals the continued presence of contaminants above predetermined levels, the contingency plan should include that a work plan to further evaluate conditions beneath the Site would be submitted to Ecology within 60 days of receipt of results of confirmation sampling.

j. **Rights-of-Way:** If contamination is proposed to be left in rights-of-way exceeding cleanup standards, or exceeding soil vapor cleanup screening levels where an engineered control such as a sidewalk is needed to reduce human exposure to contaminated soil vapor, a subordination agreement with the right-of-way holder would be required for implementing an environmental covenant. Grantor and/or subordinate agreements may be required with adjacent Property owners or right-of-way holders, determined by the extents of the Site. Alternately, consider a property-specific no further action approach excluding rights of way. Ecology recommends contacting rights-of-way holders (and adjacent property owners) prior to completing a draft environmental covenant.

[6] https://fortress.wa.gov/ecy/publications/SummaryPages/1609050.html