



**STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY**

Southwest Region Office

PO Box 47775 • Olympia, Washington 98504-7775 • 360-407-6300

January 10, 2025

Dr. Peter Y. Chen
Property Owner
4709 Memory Ln W
University Place, WA 98466-1038
yiping10@hotmail.com

Re: Further Action at the following Contaminated Site:

Site name: Pioneer Museum
Site address: 2301 23rd Ave SE, Puyallup, WA 98372
Facility/Site ID: 9490
Cleanup Site ID: 11739
VCP Project No.: SW1846

Dear Dr. Chen:

The Washington State Department of Ecology (Ecology) received your request on October 14, 2024, for an opinion regarding the sufficiency of your independent cleanup of the Pioneer Museum (Site) under the [Voluntary Cleanup Program](#) (VCP).¹ Acceptance of electronic Site data into Ecology's Environmental Information Management (EIM) database is still pending. This letter provides our opinion and analysis. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), chapter [70A.305](#) RCW.²

¹ <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Voluntary-Cleanup-Program>

² <https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305>

Opinion

Ecology has determined that further action is necessary for this cleanup. Please carefully review the recommendations presented in this letter to continue to move this cleanup site towards closure.

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](#) WAC³ (collectively called “MTCA”).

Site Description

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(s):

- Total petroleum hydrocarbons (TPH) as gasoline in the soil.
- TPH as heavy oil in the soil.
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) in soil.
- Pesticides and herbicides into soil.
- Arsenic into soil and stormwater retention pond surface water.
- Barium, cadmium, chromium (trivalent and hexavalent), and lead into soil.

Enclosure A includes a Site description and brief Site history.

A parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

³ <https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340>

Basis for the Opinion

Ecology bases this opinion on the information contained in the following documents:

1. Aerotech Environmental Consulting, Inc. (Aerotech), Limited Phase II Targeted Subsurface Investigation, May 22, 2024.
2. Aerotech, Pioneer Museum, Limited Phase I Environmental Site Assessment, May 6, 2024.
3. Tacoma Pierce County Health Department, Initial Investigation Field Report, May 27, 2011.
4. Environmental Associates, Inc. (EAI), Phase I Environmental Audit, January 14, 2005.

You can request these documents by filing a [records request](#).⁴ 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](#).⁵

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

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. Ecology bases its conclusion on the following analysis:

Characterizing the Site

Ecology has determined your completed Site characterization is not sufficient for setting cleanup standards and selecting a cleanup action.

Interim Actions Are Encouraged

Interim actions, consistent with WAC 173-340-430, help reduce contaminant concentrations in the environment and protect human health. Removing contamination also helps prepare the property for future re-development and productive use. Ecology supports considering interim actions at this Site. An example of an interim action would be to remove contaminated soil by

⁴ <https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests>

⁵ <https://apps.ecology.wa.gov/cleanupsearch/site/11739>

excavation with disposal at a permitted facility (landfill). Excavation with off-Site disposal at a permitted facility is also currently considered a permanent cleanup solution.

An example of where an interim action would be immediately beneficial is excavation at B20, to a depth of at least 5 feet below ground surface (bgs), to remove heavy oil in soil at up to 4 feet bgs. Contaminant concentrations in soil at B20 at 1 and 3 feet bgs currently exceeded the diesel and heavy oil in soil cleanup level protective of ecological receptors (460 mg/kg). The additional benefit of excavation at B20 would likely delineate contamination in soil along the southwest corner of the Property.

Initial Investigation and Phase II ESA results

The Site is **not** located within the Tacoma Smelter Plume footprint.

Two arson related fires were reported and extinguished at the Property on June 27, and June 28, 2010.

On May 11, 2011, Tacoma Pierce County Health Department (TPCHD), on behalf of Ecology, responded after a fire that destroyed the former Site horse barn. Additionally, drums of pesticides were reported as stored in the former horse barn as part of that same initial investigation. Gasoline, ethylbenzene, total xylenes, cPAHs, metals, and pesticides were identified in the limited shallow soil samples collected. Aqueous non-film forming firefighting foam (AFFF) may have been used to extinguish the fire, indicating a potential for per- and poly-fluoroalkyl substance (PFAS) to be present at the Site.

In order to meet City of Puyallup permitting requirements, in January 2024, 36 soil borings and one surface water sample were collected to assess current Property conditions. Additional soil sampling was completed in March 2024 at another 33 sampling locations to further characterize Site soils.

Areas of concern evaluated during the cumulative Phase II ESA included the (buildings all now removed): Pioneer Museum, the original barn, the horse barn, and stormwater retention pond. The retention pond area also included a (now removed) former retaining wall made of battery casings. A previous property owner received reportedly empty battery casings from a neighbor to build the retaining wall, reportedly sometime in the 1960s.

Thank you for responding to Ecology's email on November 4, 2024⁶. Electronic copies of the Phase I ESA and Phase II ESA were submitted to Ecology by email on December 11, 2024. **Please also provide any boring logs for the Phase II ESA borings.**

Recommended Areas of Further Evaluation

Based on available documentation, Ecology recommends additional assessment at the Site in the following areas.

- 1) The footprint of the burned horse-barn.
- 2) The shallow soil associated with the former drum areas.
- 3) The stormwater retention pond.
- 4) Groundwater for the Site.
- 5) The vicinity of boring B20.

Site Hazardous Substances

Generally, soil and groundwater have been evaluated consistent with WAC 173-340-900, Table 830-1. Soils were also tested for pesticides and herbicides at one location.

Based on the available data, Site hazardous substances appear to be gasoline, BTEX, heavy oil, arsenic, barium, cadmium, chromium, and lead.

Additional soil sampling is recommended within the former footprint of the burned horse barn, collecting a few samples for: dioxins and furans, cPAHs, and PFAS.

Recommended Additional Soil Sampling

Based on the figures provided to Ecology, it does not appear that confirmatory soil samples were collected within the former horse barn footprint at TPCHD's 2011 soil sampling locations: S1, S2, and S3. To provide data to determine if any additional cleanup is needed with the footprint of the burned horse barn, Ecology recommends sampling shallow soils for dioxin/furans and PFAS at an interval of one location approximately every 400 square feet. This would be about three shallow soil samples within the former barn footprint. Ecology recommends at least one additional shallow soil sample to screen for residual pesticides at the location of the former drums.

⁶ Tim Mullin of Ecology to Alan Blotch of Aerotech Environmental.

The locations of the former drums were sampled, in 2011 (samples S-1, S-2, S-3), and lindane was identified in shallow soil at the MTCA cleanup level at the time. Other pesticides were detected in soil but did not appear to exceed MTCA direct contact cleanup levels. Gasoline, ethylbenzene, and total xylenes in soil exceeded the MTCA Method A cleanup levels at S2. Heavy oil petroleum hydrocarbons were also detected at S1 and S3 in soil based on the HCID analysis. Ecology recommends confirming current concentrations for pesticides at locations S1, S2, and S3 with both soil with at least one groundwater sample collected to show that groundwater was not impacted. the groundwater sample can be collected by using either a hydropunch/grab method or from a permanent monitoring well).

Groundwater Evaluation

As the Site is within the 10-year wellhead protection zone of the Well #13, AEF202, Ecology recommends collecting at least one hydropunch/grab groundwater sample within each area of concern to determine Site groundwater quality. Based on the surface water elevation in the stormwater pond, groundwater at the Site is expected to be shallow, at approximately 10 feet below ground surface (bgs).

Alternatively, the installation of at least three monitoring wells that are sampled using a low flow groundwater sampling methodology is an option.

Surface Water and Sediment Evaluation

There are no mapped wetlands or priority species habitats at the Site. The Site is located approximately equidistant (0.6 miles to the west and 0.55 miles to the east) between two unnamed perennial streams. Additionally, there is an unnamed pond located 0.1 miles southwest of the Site.

Surface water, in the form of a stormwater holding pond, was evaluated for petroleum, arsenic, cadmium, pesticides, and herbicides. No contaminants were detected, except arsenic at 0.99 µg/L, which was less than the MTCA cleanup level for groundwater (8 µg/L) and for freshwater surface water (10 µg/L). **Surface water, and thus sediment, does not appear to have been impacted by any release of contamination at the Site.**

Air Pathway

Contaminant concentrations to date have not exceeded the MTCA Method A or B cleanup levels. These cleanup levels are generally protective of the soil or groundwater to vapor pathway. There are currently no structures on the Site, and nearby houses are more than 30 feet away from the Site. However, the current property re-development plan, as Ecology understands it, is to develop parcel 0420353027 into residential (houses).

The air/soil vapor pathway at the Site is currently incomplete, unless new soil and/or groundwater data suggest otherwise.

Cultural Resources Evaluation

The Property is in east-central Puyallup in a largely developed urban area. The cleanup does not require additional cultural resources evaluation, based on WAC 173-340-815(3). Ecology can provide additional cultural resources consultation upon request.

Terrestrial Ecological Evaluation (TEE)

The Property was partially developed and is currently generally overgrown. There does not appear to be more than 10 acres of native vegetation within 500 feet of the Site.

Ecology recommends completing a simplified TEE for this Site and use Table 749-2 to screen contaminant concentrations. For most potential contaminants, either MTCA Method A or Method B cleanup levels (protective of the vadose zone) will be the most stringent cleanup values for Site soil. However, screening/cleanup levels protective of ecological receptors for diesel and heavy oil in soil should be screened against 460 mg/kg, and lead in soil against 220 mg/kg.

With your next deliverable, please provide the TEE, [the TEE form⁷](#), and a figure showing the 500-foot radius for the TEE around the Site. Completion of the TEE form alone is not sufficient to document the evaluation.

Environmental Data

In accordance with WAC 173-340-840 and TCP Policy 840,⁸ all Site data collected since August 1, 2005, will need to be confirmed as uploaded, accepted, and approved in Ecology's Environmental Information Management (EIM) database prior to issuing a no further action

⁷ <https://apps.ecology.wa.gov/publications/SummaryPages/ECY090300.html>

⁸ <https://apps.ecology.wa.gov/publications/SummaryPages/1609050>

(NFA) determination. Please continue to work with your EIM data coordinator to finalize your submittal.

Setting Cleanup Standards

Ecology has determined the cleanup levels and points of compliance you set for the Site will likely meet the requirements of MTCA.

Previous soil and pond water concentrations at the Site were screened against the MTCA Method A cleanup levels illustrated in the table below.

Ecology concurs with these points of compliance as they apply to the Site:

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. <i>WAC 173-340-740 (6)(d)</i> Not met – pending additional evaluation or interim actions.
Soil- Protection of Groundwater	Based on the protection of groundwater, the standard point of compliance is throughout the Site. <i>WAC 173-340-740(6)(b)</i> Not met -- pending additional evaluation.
Soil- Protection of Ecological Receptors	Based on the protection of groundwater, the standard point of compliance is throughout the Site. <i>WAC 173-340-740(6)(b)</i> Not met – additional evaluation or interim actions needed.
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. <i>WAC 173-340-720(8)(b)</i> Not met – pending additional evaluation.

The standard points of compliance for soil and groundwater apply at the Site. The air/soil vapor and sediment pathways appear to be incomplete for the Site. Based on sampling data, the surface water pathway at the Site appears to be incomplete.

Unless new data suggest more stringent cleanup levels are needed, Ecology concurs with the following cleanup levels for the Site:

Hazardous Substance ⁹	MTCA Soil Cleanup Level (mg/kg)	MTCA Groundwater Cleanup Level (µg/L)
TPH as gasoline	30	800
TPH as diesel and heavy oil	460	500
Benzene	0.03	5
Ethylbenzene	6	700
Toluene	7	1,000
Total Xylenes	9	1,000
Arsenic	20	8
Cadmium	2	2
Barium	1,600	2,000
Trivalent chromium	2,000	50
Hexavalent chromium	19	50
Lead	220	15
Lindane	0.01	0.08
cPAHs (as benzo[a]pyrene)	0.1	0.1

Other contaminants (dioxin/furans, PFAS) may require Site cleanup levels to be established, depending on sampling results. The arsenic in groundwater cleanup level is protective of groundwater for the Pierce County area, established by Ecology.¹⁰

No adjustments to the cleanup standards were needed based on consideration of applicable state and federal laws.¹¹

Selecting and Implementing the Cleanup Action

Ecology has determined the cleanup completed to date does not meet the substantive requirements of MTCA.

As an interim action consistent with WAC 173-340-430, excavation with off-Site disposal at a permitted facility (landfill) is recommended to remediate contaminated soils at the Site.

⁹ Based on exceedance of screening or cleanup level identified at the Site, per data collected to date.

¹⁰ Ecology publication no. 14-09-044, Natural Background Groundwater Arsenic Concentrations in Washington State, January 2022. <https://apps.ecology.wa.gov/publications/documents/1409044.pdf>

¹¹ Generally, the Toxics Cleanup Program does not regulate asbestos under MTCA. Typically, HWTR or Solid Waste Management Programs do that at Ecology, and the local regional clean air agency. <https://ecology.wa.gov/regulations-permits/guidance-technical-assistance/dangerous-waste-guidance/common-dangerous-waste/asbestos>

Excavation with off-Site disposal at a landfill as an interim or cleanup action, is a permanent cleanup solution to the maximum extent practicable. Likely, excavation with disposal at a landfill would be the most practicable approach. Alternately, you can consider completing a feasibility study with disproportionate cost analysis to evaluate cleanup remedies for the Site.

As the property may be re-developed in the future, Ecology recommends that a contaminated media management plan (CMMP) be developed to manage any potentially contaminated soils encountered during any property re-development. Please note that the re-use of petroleum contaminated soils under section 12 (Tables 12.1 and 12.2) in the *Guidance for Remediation of Petroleum Contaminated Sites*¹², are more stringent than the MTCA Method A cleanup levels.

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).¹³

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](#)¹⁴ and WAC [173-340-545](#).

¹² Ecology publication 10-09-057, revised June 2016.

¹³ <https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.040>

¹⁴ <https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.080>

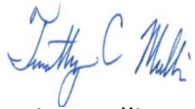
¹⁵State is immune from liability

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).

Questions

If you have any questions about this opinion, please contact me at 360-999-9589 or tim.mullin@ecy.wa.gov.

Sincerely,



Tim Mullin, LHG
Toxics Cleanup Program
Southwest Region Office

TCM: at

Enclosure: A – Site Description and Brief Site History

cc by email: Alan Blotch, Aerotech Environmental Consulting Inc; alan@dirtydirt.us
Dawn Sinagra, CES-NW, Inc.; dsinagra@cesnwinc.com
Chris Beale, AICP, City of Puyallup; CBeale@PuyallupWA.gov
Marian Abbett, PE, Ecology; marian.abbett@ecy.wa.gov
Ecology Site file

¹⁵ <https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340-545>

Enclosure A

Site Description and Brief Site History

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Site Description

The Site is located at 2301 23rd Ave SE, Puyallup, Washington 98372. The Site appears to be contained with Pierce County parcel 0420353027, which is 9.09 acres in size.

Property History and Current Use: The property is currently vacant, and reportedly being prepared for re-development as residences. The Pioneer Museum used to occupy the southern end of the Property before being demolished.

Property Vicinity: The Site is located in east-central Puyallup, an urban area of Pierce County. Surrounding properties are residential.

Soils and Geology: To the maximum depth explored of approximately 22 feet below ground surface (bgs), soils are generally dark gray to brown and comprised of sand with silts and clays.

Groundwater: Site groundwater is estimated at approximately 14-16 feet below ground surface. The facility is located within the 10-year wellhead travel time zone for City of Puyallup supply well #13, AEF202. The supply well is located about 0.9 miles northwest of the Site. The New Haven W System Group A/B wells are closer to the Site, at about 0.5 miles northwest; however, the Site is not located within a wellhead protection zone for this well group.

Surface/Storm Water/Septic Systems/Wetlands: No mapped wetlands are present at the Site, but there is an unpermitted stormwater retention pond. Stormwater at the Site and Property is managed in that unpermitted stormwater retention pond. After development, stormwater management is expected to follow City of Puyallup requirements. The property is expected to be connected to municipal water and sewer upon development.

Environmental Justice/Environmental Health Disparities: Per the revised MTCA rule effective January 1, 2024, WAC 173-340-815, Ecology evaluated the location of the cleanup Site. Based on EPA's EJ Screen Environmental Justice tool, census track 53053073406 has a moderately high environmental justice score. Based on the Washington State Department of Health's Environmental Health Disparities (EHD) map, census track 53053073406 has a score of 8. Vulnerable populations, as defined under the Washington State HEAL Act¹⁶, would benefit from the removal of contaminants from the environment and reduced pollution in their neighborhood.

¹⁶ RCW 70A.02

SHARP: Ecology has completed a site hazard assessment ranking process (SHARP) analysis as a part of this cleanup. The evaluation concluded that the overall rank of the Site is Low signifying the risk to human health and the environment is not imminent or immediate.

Brief Site History: EAI completed a Phase I Environmental Site Assessment (ESA) in 2005. Recognized environmental conditions (RECs) were:

Tacoma Pierce County Health Department, on behalf of Ecology, completed an initial investigation on May 10, 2011, under ERTS 620837. Three soil samples collected around drums identified in a burned down horse barn, identified petroleum, metals, and pesticides in soil.

In January and March 2024, Aerotech completed a Phase II ESA at the property. A total of 33 soil borings were sampled and one surface water sample was collected. Analyses varied depending on the area of concern, though the Table 830-1 sampling requirements were generally met.

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