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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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July 11, 2023

Allison Block
MultiCare Health System a WA Nonprofit Corp
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Re: Technical Assistance at the following contaminated Site:

- **Site Name:** Proposed South Hill Emergency Center
- **Site Address:** 13108 Meridian Ave E, Puyallup, Pierce County, WA 98373
- **Facility/Site ID:** 41261
- **Cleanup Site ID:** 15242
- **VCP Project ID:** SW1717

Dear Allison Block:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Proposed South Hill Emergency 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 further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, chapter 70A.305 RCW, and its implementing regulations, Washington Administrative Code (WAC) chapter 173-340[3] (collectively "substantive requirements of MTCA"). The analysis is provided below.

[1] https://apps.ecology.wa.gov/publications/SummaryPages/9406.html
[2] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305
[3] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340

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 releases:

- Metals (arsenic, barium, chromium, lead, mercury) into soil and groundwater.
- Polycyclic aromatic hydrocarbon (PAH) into soil.
- Diesel-range and oil-range total petroleum hydrocarbons (TPH-D and TPH-O, collectively TPH-D/O) into soil and groundwater.
- Gasoline-range total petroleum hydrocarbons (TPH-G) into groundwater.
- Acetone, methyl ethyl ketone (MEK), and toluene into groundwater.
- Multiple volatile organic compounds (VOCs) into air.[4]

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.

[4] Site has specific Method B screening level exceedances for benzene, and trichloroethylene (TCE) in soil vapor and benzene in indoor air.

Basis for the Opinion

This opinion is based on the information contained in the documents listed in **Enclosure B**.

You can request these documents by filing a records request.[5] For help making a request, contact the Public Records Officer[6] or call 360-407-6040. Before making a request, check whether the documents are available on Ecology's Cleanup Site Search webpage.[7]

This opinion is void if any of the information contained in those 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. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action.

Ecology appreciates your response to the previous opinion letters. The responses below are grouped by subject with reference to specific parts of the Response to Ecology Comments letter (Report, the Report) as needed for clarity. The goal of this technical assistance opinion letter is to acknowledge where we concur with TRG's responses and to focus on next steps to finish the remedial investigation and select a cleanup.

Administrative

a. In general, Ecology appreciates your clarification on the State Environmental Policy Act (SEPA) submittal and compliance and clarification of what property is being associated with the Site. Ecology has no further comments on these SEPA aspects of the Site.

b. Ecology acknowledges that all missing reports have been submitted and are in the Site record.

[5] https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests
[6] publicrecordsofficer@ecy.wa.gov
[7] https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=15242

c. Ecology concurs that the entire facilities stormwater system does not need to be sampled because it was installed as part of the current facility construction, and after the release(s) of hazardous substances associated with the Site.

d. TGE has requested that Ecology provide a statement of "'no interest' in further corrective action concerning this Site." That is something that cannot be provided by the Voluntary Cleanup Program (VCP). Under the VCP (WAC 173-340-130(3)[8]), opinions are considered informal advice and assistance to persons conducting remedial actions. Any comments by the department or its agents are advisory and not commitments or approvals binding on the department. No further action determinations (NFAs) can be rescinded if Ecology receives additional information about that specific release, and new sites can be created on this same property if a new release occurs, or a new discovery of a preexisting release is made.

Site Definition

e. Ecology acknowledges that some hazardous substances may be present in the environment that did not result from activities associated with a facility or property. MTCA has process for establishing background concentrations (WAC 173-340-709[9]) or in some groundwater cases, an area-wide point of compliance (WAC 173-340-720(8)(d)(iii)[10]) or the "plume clause".[11] These would need to be demonstrated or established on a per-Site basis. Currently, it has not been demonstrated that any contamination is from an off-Site source. That generally requires that hazardous substances be sufficiently defined under MTCA as addressed in past opinion letters. Additionally, under MTCA, property owners are responsible for cleaning up the hazardous substances on their property.[12] Although the "plume clause" can provide relief from this regulation, in addition to showing that contamination is migrating by groundwater onto your property from an off property source, you would need to demonstrate subsections (A) through (E) of RCW 70A.305.020(22)(b)(iv) in order to meet that exemption. If you believe your property has been contaminated by an off Site source, you may pursue a legal claim known as a private right of action with that person or facility under WAC 173-340-545.[13]

[8] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-130
[9] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-709
[10] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720
[11] RCW 70A.305.020(22)(b)(iv)
[12] RCW 70A.305.040
[13] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-545

f. Although no records of historical property use were identified,[14] it is clear from the historical areal imagery included in the EDR report that some type of facility was present on or directly adjacent to the Site's property. A large facility can be seen in the 1957 areal image, and a smaller facility can be seen in the 1972 image.[15] The presence of a septic tank on the property also indicates past use of the property.[16] Under WAC 173-340-545, you may also pursue a private right of action against a past property owner or operator if you believe that they contributed to the contamination at the Site.

g. Ecology's understanding of Technical Response to Agency Comment No. 2[17] and Technical Responses to Agency Comment No. 2b[18] is that TGE is still attempting to define the Site by only those hazardous substances that exceed a TGE screening level, and that total risk assessments (total cancer and hazard quotient [HQ]) were only done for those hazardous substances that exceeded this initial screening assessment of the hazardous substances present at the Site. This method of defining the Site does not comply with the substantive requirement of MTCA as has been addressed in previous opinion letters. The total risk assessment for the Site is discussed in Section 2 of this opinion letter.

h. At this time, Ecology considers the sediment, surface water, and terrestrial ecological evaluation (TEE) pathways incomplete (either the media is not present, or there is not a complete pathway to receptors of concern) for this Site. Groundwater, soil, and air/vapor still need additional investigation.

Groundwater

i. TGE cites WAC 173-201A[19] to show that groundwater at the Site is not potable.[20] WAC 173-201A covers surface waters of the State of Washington, not groundwater and is therefore not applicable.

TGE also appears to be attempting to establish that groundwater at the Site is non-potable based only on WAC 173-340-720(2)(a).[21]

[14] Report, page 3.
[15] TGE, Phase I Environmental Site Assessment, January 30, 2018, Appendix D, The EDR Aerial Photo Decade Package, December 08, 2017.
[16] Report, Figure 1.
[17] Report, page 19.
[18] Report, page 20.
[19] Water Quality Standards for Surface Waters of the State of Washington https://app.leg.wa.gov/WAC/default.aspx?cite=173-201A
[20] Report, page 2.
[21] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720

Under WAC 173-340-720(2),[22] "groundwater shall be classified as potable to protect drinking water beneficial uses unless" you can demonstrate that the groundwater meets the criteria spelled out in items (a) through (c) of that subsection. It should be noted that the demonstrations of non-potability are very specific and should not be loosely interpreted or conducted without strict adherence to the methods as written in MTCA.

j. Ecology understands that the conceptual site model (CSM) for this Site includes hazardous substances in groundwater migrating from the adjacent gas station (Safeway Fuel Center 2640, FSID 9435265, USTID 618918) and the exemption of this Site from the need to cleanup up groundwater under the "plume clause".

i. This CSM relies on a release to have occurred at the gas station, the gas station to be located upgradient from the Site, and sufficient time to have passed since the release for the hazardous substances to have migrated to the Site.

ii. Ecology has two issues with this claim.

1) First, A release from the Safeway Fuel Center is not indicated in the underground storage tank (UST) records. USTID 618918 passed release detection and prevention as recently as December 13, 2022. Additionally, you would still have to delineate your Site with respect to any other plume to meet the requirements of WAC 173-340-350(7).

2) Second, although the Safeway Fuel Center is claimed to be upgradient from the Site, Ecology can find no evidence that a groundwater gradient has been determined for either this Site or the Safeway Fuel Center. As part of any demonstration, a sufficient number of monitoring wells and groundwater sampling events would be necessary to confirm groundwater flow direction and show a plume encroaching on the Property and Site.

A release from the Safeway Fuel Center and the local groundwater gradient will need to be demonstrated in order to determine that hazardous substances are migrating onto the MultiCare property. However, even in this scenario, your option is to pursue recuperation of cleanup costs incurred related to any off-Site plume, under a private right of action, WAC 173-340-545. Alternately, you could contact Safeway directly and discuss your findings with them. Another option is to continue sampling monitoring well MW-1 and obtain at least four consecutive quarters of compliant results for applicable Site hazardous substances.

[22] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340-720

Soil

k. Ecology concurs that the pre-construction stormwater pond samples identified as "Pond A Composite", "Pond B Composite", and "Pond C Composite" are soil samples and not sediment samples and do not fall under WAC 173-204.[23]

l. Additional explanation is required for the Analyte/Media-Specific Supplemental Remedial Investigation (SRI) Screening Values Matrix. Ecology has the following questions:

i. How is it that most hazardous substances have a Site-specific concentration range, but are considered to have no impacts present?

ii. What is meant by a "reasonable approach to 'background' concentrations"?

m. The Site currently has two exceedances of natural background concentration for total chromium (42 [milligrams per kilogram; mg/kg] Statewide and 48 mg/kg Puget Sound).[24]

Sample TMW1 (45.5 mg/kg) is from a depth of 36 to 36.5 feet and is therefore outside the point of compliance. Additionally, total chromium has only been present at the Site in groundwater at a concentration greater than the laboratory PQL in the sample collected from a temporary monitoring well sample TMW1 which does appear to have the typical issues associated with metals that are frequently observed in temporary wells and groundwater grab samples. Ecology assumes the results from MW1 to be more representative of the actual metals concentration in groundwater and a confirmatory evaluation of the results seen in sample TMW1. At this time, Ecology does not think this exceedance in soil is affecting groundwater negatively. **No further action is required for chromium in soil at TMW1.**

Sample TVMP3 (59.7 mg/kg) is from a depth of 8 to 8.5 feet and is within the point of compliance. Ecology request evaluating compliance with either the Statewide or Puget Sound natural background values using the 95 UCL statistical method.[25] Ecology understands that many of the sample locations have been removed. Because of that, Ecology recommends evaluating the Site using all total chromium results collected in the 0 to 15 feet below ground surface (bgs) interval before any excavations were conducted to determine if the Site was in compliance with natural background concentration before any cleanup was performed and therefore total chromium would have been removed from consideration as a hazardous substance that would need to be remediated.

[23] https://app.leg.wa.gov/WAC/default.aspx?cite=173-204
[24] Report, Table # 4A.
[25] WAC 173-340-740(7)

Terrestrial ecological evaluation (TEE)

n. Ecology concurs with your application of Table 749-2[26] values in order to meet the TEE regulations. Be aware, that as with most NWTPH-Dx analysis, the total NWTPH-Dx (sum of TPH-D and TPH-O) needs to be compared to the 460 mg/kg soil concentration.[27] Make sure that the Site is being evaluated by comparing the total NWTPH-Dx analytical result to the 460 mg/kg cleanup level (CUL).

Soil Vapor and Vapor Intrusion (VI)

o. With concentrations of benzene, 1,3-butadiene, 1,1,2,2-tetrachloroethane, and trichloroethylene (TCE), present in soil gas within the proposed construction footprint of the building, and at concentrations multiple times greater than the Method B screening level, Ecology does not concur that it has been demonstrated that "existing pathways for receptor exposure are not present at the Property."

The lateral inclusion zones established in Ecology's Guidance for Evaluating Vapor Intrusion in Washington State[28] are intended for the distance of the VOCs from the building, not the distance of the sampling point from the building. Sampling soil vapor only at a distance beyond the lateral inclusion zone and not fully defining the extents of hazardous substances indicates to Ecology that additional sampling is required.

p. Construction standards are not cleanup standards and do not apply as demonstration of meeting environmental remediation standards.[29] At this time, Ecology considers the vapor intrusion mitigation system (VIMS) to be an interim action. As far as the impossibility of demonstrating compliance of indoor air and an incomplete VI pathway in an urban environment,[30] it is typically standard procedure to collect sub-slab soil gas, indoor air, and outdoor air samples simultaneously. The purpose of the outdoor air samples is to establish the background contributions of the outdoor air emissions and subtract that contribution from the indoor air sample analytical results in order to mitigate that effect of being in an "urban setting" or near other sources of VOCs.

[26] WAC 173-340-900.
[27] Table 6.13 of the Washington State Department of Ecology Toxics Cleanup Program, Guidance for Remediation of Petroleum Contaminated Sites, Publication No. 10-09-057, June 2016. https://apps.ecology.wa.gov/publications/SummaryPages/1009057.html
[28] Washington State Department of Ecology, Guidance for Evaluating Vapor Intrusion in Washington State, Publication No. 09-09-047, March 2022. https://apps.ecology.wa.gov/publications/SummaryPages/0909047.html
[29] Report, page 13.
[30] Report, page 14.

q. Ecology does not concur with the assumption that a Site cannot be defined in accordance with MTCA based on being in an urban location. If bromodichloromethane and chloroform are problematic compounds in the area of this Site, there should be an identifiable background concentration or a nearby point source from a municipal drinking water line or similar utility.

The industry report that TGE is citing,[31] specifically states that when "[vapor intrusion (VI)] evaluations show that 1,4-dichlorobenzene, chloroform, and/or naphthalene are the **only** compounds showing exceedances, engineering controls are unlikely to be an appropriate follow-up action." And only then should "non-VI sources […] be assumed to be potentially significant."[32] This would seem to indicate that VI is not the source of these compounds in indoor air.

Although bromodichloromethane is mentioned in Problematic Compounds in Vapor Intrusion Investigations, it appears to only be there to clarify what a trihalomethane is because chloroform also falls under that classification. Bromodichloromethane itself is never called out as being one of the "problematic compounds".

Soil Reuse

r. Please provide a table comparing the results of the POND A, POND B, and POND C samples (also referenced as Pond A Composite, Pond B Composite and Pond C Composite) to applicable reuse criteria. For those hazardous substances included in Table 12.1 of the Guidance for Remediation of Petroleum Contaminated Sites,[33] we recommend using the table values for the soil category with which you are proposing to comply. For substances not included in Table 12.1, please propose Site-specific reuse criteria. Please note that in accordance with WAC 173-340-100,[34] MTCA CULs are only intended to determine the areas of a Site that will need to be remediated and may not be appropriate for purposes other than that.[35]

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[31] Report, page 16.
[32] Bart Eklund, January 2020 Vapor Intrusion News; Problematic Compounds in Vapor Intrusion Investigations, website, January 2020. https://www.vaporpin.com/august-radon-news/problematiccompounds/#:~:text=Among%20the%20compounds%20often%20detected,2%2Dbutanone%20(MEK).
[33] Washington State Department of Ecology Toxics Cleanup Program, Guidance for Remediation of Petroleum Contaminated Sites, Publication No. 10-09-057, June 2016. https://apps.ecology.wa.gov/publications/SummaryPages/1009057.html
[34] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-100
[35] Washington State Department of Ecology Toxics Cleanup Program, Concise Explanatory Statement, Publication No. 01-09-043, February 12, 2001. https://apps.ecology.wa.gov/publications/summarypages/0109043.html

For metals present in Site soils, but not listed in Table 12.1, Ecology recommends using the background values established in the Natural Background Soil Metals Concentrations in Washington State[36] and then the values from Table 749-2[37] for those metals that do not have a natural background concentration established.

Make sure you are following the notes to Table 12.1, specifically numbers (1) and (2). As is typical for most evaluations at a MTCA cleanup Site, the TPH-D, and TPH-O analytical results should not be compared separately to a regulatory level but should be compared as a total NWTPH-Dx analytical result to the reuse criteria. Additionally, unless a specific product can be identified, the total TPH mixture (sum of NWTPH-Gx and NWTPH-Dx analytical results) should be compared to the gasoline range organics reuse criteria.

Ecology requests that you provide a Site map showing the area or areas where the excavated soils were placed on the property.

[36] Washington State Department of Ecology Toxics Cleanup Program, Natural Background Soil Metals Concentrations in Washington State, Publication No. 94-115, October 1994. https://apps.ecology.wa.gov/publications/SummaryPages/94115.html
[37] WAC 173-340-900.

2. Establishment of Cleanup Standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA.

Cleanup Standards: Under MTCA, cleanup standards consist of three primary components; points of compliance,[38] cleanup levels,[39] and applicable state and federal laws.[40]

Points of Compliance. Points of compliance are the specific locations at the Site where cleanup levels must be attained. For clarity, Ecology provides the following table of standard points of compliance:

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. *WAC 173-340-740 (6)(d)*
Soil- Protection of Groundwater	Based on the protection of groundwater, the standard point of compliance is throughout the Site. *WAC 173-340-740(6)(b)*
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. *WAC 173-340-7490(4)(b)*
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. *WAC 173-340-720(8)(b)*
Groundwater-Surface Water Protection	Based on the protection of surface water, the standard point of compliance is all locations where hazardous substances are released to surface water. *WAC 173-340-730(6)*
Air Quality	Based on the protection of air quality, the point of compliance is indoor and ambient air throughout the Site. *WAC 173-340-750(6)*

Ecology concurs with the use of standard points of compliance for soil direct contact, soil protection of soil vapors, and soil protection of plants, animal, and soil biota as well as for groundwater.

[38]WAC 173-340-200 "Point of Compliance."
[39]WAC 173-340-200 "Cleanup level."
[40]WAC 173-340-200 "Applicable state and federal laws," WAC 173-340-700(3)(c).

Ecology does not concur with the proposed conditional point of compliance for soil protective of groundwater. The limit that TGE is placing on the point of compliance of "the first groundwater bearing unit" and "approximately 65 [feet below ground surface]"[41] is fundamentally different than the standard point of compliance defined in WAC 173-340-740(6)(b).

a. Cleanup Levels. 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, a mixture of MTCA Method A unrestricted cleanup levels and MTCA Method B cleanup levels were used as "screening levels" to evaluate contamination detected at the Site. Table 1 shows Ecology's evaluation of TGEs screening level sources.

i. MTCA does not allow for the use of MTCA Method B CULs for hazardous substances that do not have a MTCA Method A CUL. Method B CULs cannot be used for a Method A cleanup of a specific media. When using a Method A cleanup for sites that have substances that are not included on the Method A tables provided in WAC 173-340-900[42] (Tables 720-1, 740-1, and 745-1), and do not have an applicable state or federal law, you will need to use either the laboratory practical quantitation limit (PQL) or natural background level, whichever is higher.[43] The mixing of MTCA Method A and Method B CULs as "screening levels" that TGE is using is not permitted by MTCA. For more information on mixing methods, refer to the Concise Explanatory Statement (CES)[44], and Ecology's December 2022 opinion letter.

It appears to Ecology that MTCA Method B for soil and groundwater most closely aligns with what TGE is proposing. Ecology recommends using Method B for both soil and groundwater at this Site. For Method B soil you may reduce your CULs to the Table 749-2 values in order to meet the requirements of the TEE, including those for petroleum hydrocarbons. And you may use Method A CULs for soil or groundwater as Method B CULs for any hazardous substances except petroleum hydrocarbons.

[41] Report page 19.
[42] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-900
[43] WAC 173-340-720(3)(b)(iii) for groundwater, and WAC 173-340-740(2)(b)(iv) for soil.
[44] Washington State Department of Ecology Toxics Cleanup Program, Concise Explanatory Statement, Publication No. 01-09-043, February 12, 2001. https://apps.ecology.wa.gov/publications/summarypages/0109043.html

ii. Ecology accepts the 5.2 mg/kg CUL for selenium in soil previously agreed upon by Nick Acklam of TCP.[45] Using 5.2 mg/kg as the selenium in soil CUL will not have any negative effects on the hazard quotient (HQ) or total cancer risk for the Site (no single substance exceedances of the HQ or cancer risk), and given the low levels of selenium remaining (all results are below the sample detection limit), any effects on terrestrial ecological receptors should be well mitigated despite the sample detection limits across the various selenium samples still present on the Site being greater than the MTCA Table 749-2 concentration of 0.8 mg/kg. The largest sample detection limit for a sample still remining on the Site is 0.888 mg/kg. However, please be aware that CULs do not have to be lower than the quantitation limit. Practical quantitation limits (PQLs) listed in your Environmental Information Management (EIM) system data for all selenium results ranges from 2.08 mg/kg to 3.06 mg/kg. Therefore, 2.08 mg/kg could also be used as the Site CUL for selenium in soil, per WAC 173-340-700(6).

iii. Ecology concurs that it takes more than 10 hazardous substances with a cancer risk to exceed the total cancer risk of $1x10^{-5}$. As Ecology currently understands the Site, there are ten hazardous substances present at the Site that can cause cancer:

1,3-Dichlorobenzene	Methyl tert-butyl ether (MTBE)
Arsenic	Methylene Chloride
Benzene	Tetrachloroethylene (PCE)
Benzo(a)pyrene	Trichloroethylene (TCE)
Chloroform	Vinyl Chloride

iv. Ecology requires further explanation as to why the total health index assessment was limited to only the 17 substances presented in Table 10. Some of which do not appear to have been present at the Site, according to your EIM data. Refer to Table 2 for a complete list of substances known by Ecology to be present in soil at the Site based on EIM data. These are the substances that Ecology expects to be evaluated for total cancer and total hazard quotient (HQ) for the Site using the following process:

[45] Nick Acklam was the Southwest Regional Office (SWRO) Voluntary Cleanup Program (VCP) Unit supervisor at the time this CULs was agreed upon.

1) Begin with the lowest of either the Method B non-cancer or Method B cancer CULs published in the Cleanup Levels and Risk Calculation (CLARC) Tables.

2) Make any applicable substitutions. This would typically be reductions necessary to comply with the TEE pathway, or for protection of groundwater, increases to allow for natural background or PQL limits, or use of Method A CULs or Table 749-2 values for substances that do not have a Method B CUL. You would also include the 5.2 mg/kg selenium CUL as one of the substitutions.

3) Perform your total risk assessments using all detected Site hazardous substances that are included in CLARC using the CUL derived in the previous steps. Any CUL substitutions made for the TEE pathway, protection of groundwater, or use of Method A CULs or Table 749-2 values are subject to further reduction if necessary to comply with total risk. CUL substitutions based on natural background or PQL do not need to be reduced further, even if exceedances of the total cancer risk or HQ result from them.

4) A similar assessment would need to be done for groundwater.

v. For most hazardous substances, it is acceptable to use Method A CUL Table values as a Method B CUL. However, the one exception to this is for total petroleum hydrocarbons (TPH). "For noncarcinogenic effects of petroleum mixtures, a total petroleum hydrocarbon cleanup level shall be calculated taking into account the additive effects of the petroleum fractions and VOC substances present in the petroleum mixture."[46]

When using Method A CULs, there is rarely a situation where you would compare the TPH-D and TPH-O fractions to separate cleanup levels. Generally speaking, the total NWTPH-Dx (sum of TPH-D and TPH-O) analytical result should always be compared to the relevant CUL or screening level. This is presented in Ecology's Implementation Memorandum #4.[47] This would make both the February 23, 2022, and the September 14, 2022, sampling events exceed the 500 micrograms per Liter (µg/L) CUL for groundwater.

[46] WAC 173-340-720(4)(b)(iii)(C) and WAC 173-340-740(3)(b)(iii)(B)(III)

[47] Washington State Department of Ecology, Implementation Memorandum #4; Determining Compliance with Method A Cleanup Levels for Diesel and Heavy Oil, Publication No. 04-09-086, June 17, 2004. https://apps.ecology.wa.gov/publications/SummaryPages/0409086.html

Because there is benzene present in groundwater at the Site, regardless of its location and seasonal variability, the lower TPH-G soil CUL with benzene present (30 mg/kg) should be used at this Site. As CULs are set on a sitewide basis, you would not switch to the higher TPH-G without benzene present for specific locations that don't show benzene, or for seasonal and sampling variations where benzene drops below the laboratory method detection limit (MDL), unless proposing a remediation level for a cleanup. Remediation levels require the use of institutional and engineered controls memorialized by an environmental covenant.

For petroleum mixtures, the lowest applicable TPH CUL should be applied.[48] This would require comparing the total TPH to the 500 µg/L TPH-D or TPH-O CUL.

Ecology recommends determining a Method B TPH groundwater CUL using the Workbook for calculating cleanup levels for petroleum contaminated sites (MTCATPH11.1 Excel workbook). Resources for determining a Method B TPH CUL can be found at Ecology's website; Tools for cleaning up petroleum contaminated sites.[49]

b. Applicable Laws and Regulations. In addition to establishing minimum requirements for cleanup standards, applicable local, state, and federal laws may also impose certain technical and procedural requirements for performing cleanup actions. These requirements are described in WAC 173-340-710.

Ecology accepts the following TGE identified applicable state and federal laws:

- RCRA regulations (40 CFR Part 261) and the corresponding Washington Dangerous Waste Regulations (WAC 173-303) involving hazardous waste management may pertain to (1) waste identification; (2) waste generation and transportation; (3) land disposal restrictions; and (4) treatment, storage, and disposal facilities.

- Clean Water Act (40 CFR Part 320) and the corresponding Washington regulations (WAC 173-220) for permitting off-property wastewater discharges to surface water or publicly owned treatment works (POTW) may pertain to the discharge or wastewater such as water generated by stormwater collection to a POTW.
    - Discharge from the Property is regulated by Pierce County, which operates the local POTW.

[48] WAC 173-340-900, MTCA Table 720-1 footnote x and Table 740-1 footnote s.
[49] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Clean-up-petroleum-contamination

- Clean Air Act (U.S.C. 7401 et seq) and the corresponding Washington regulations (WAC 173-400, 173-460, and 173-490) involving fugitive dust emissions generated at the Property during cleanup.

    - To meet this regulation during redevelopment, controls were in place (e.g., wetting and covering exposed soils and stockpiles) to meet Puget Sound Clean Air Agency substantive restrictions on off-Property transport of airborne particulates.

- Monitoring Well Construction, Maintenance, and Decommissioning Rules and the corresponding Washington regulations (WAC 173-160) involving installation, maintenance, and/or decommissioning of permanent groundwater and/or vapor monitor wells were met via the use of a Washington-licensed water well driller and a Washington-licensed P.G. for the installation of Property temporary screened boreholes and monitor wells.

    - A Site Development Permit (for grading, stormwater, and excavation permits) was obtained by the development company before Property work per Pierce County regulations.

- Cleanup activities were performed per the requirements of the Washington Industrial Safety and Health Act Regulations (RCW 49.17) and the federal Occupational Safety and Health Act (29 CFR 1910 and 1926) to ensure workers were protected from physical hazards and exposure to hazardous substances or other deleterious materials.

It does not appear that any of these state and federal laws would require any adjustments to the established CULs.

3. Selection of Cleanup Action.

Ecology has determined that additional remedial investigation is necessary at the Site before selecting a cleanup action.

Additional Site definition to complete the remedial investigation is required before selecting a final cleanup action or determining that the cleanup actions preformed meet the substantive requirements of MTCA. Upon completion of the remedial investigation, Ecology requests an updated or supplemental remedial investigation report.

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(8) 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.305.170(6).

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 webpage.[50] If you have any questions about this opinion, please contact me at 360-584-6212 or aaren.fiedler@ecy.wa.gov.

Sincerely,

Aaren Fiedler

Aaren Fiedler, LG
Toxics Cleanup Program
Southwest Region Office

AF/jc

Enclosures (2): A – Ecology Assessments Tables
B – Basis for the Opinion: List of Documents

cc by mail: MultiCare Health System a WA nonprofit corp

cc by email: Timothy E Crump PG, TGE Resources, Inc. tecrump@tgeresources.com
Jerome Lambiotte, Ecology, jerome.lambiotte@ecy.wa.gov
Ecology Site File

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

Site Tables

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Enclosure A

Ecology Assessments Tables

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Table 1
Ecology Cleanup Level Source Assessments

Hazardous Substances	CAS#	TGE Proposed Soil CUL (mg/kg)	TGE Reported Proposed Soil CUL Source	MTCA Method A Soil CUL[#] (mg/kg)	MTCA Method B Soil CUL Noncancer[#] (mg/kg)	MTCA Method B Soil CUL Cancer[#] (mg/kg)	Washington State Background Soil Concentrations[# +] [State Wide / Pudget Sound] (mg/kg)	TGE Proposed Groundwater CUL (µg/L)	TGE Reported Proposed Groundwater CUL Source	MTCA Method A Groundwater CUL[#] (µg/L)	MTCA Method B Groundwater CUL Noncancer[#] (µg/L)	MTCA Method B Groundwater CUL Cancer[#] (µg/L)	TGE Proposed Soil Gas Screening Value (µg/m^3)	TGE Reported Proposed Soil Gas Screening Value Source	MTCA Method B Soil Gas Screening Value Noncancer[#] (µg/m^3)	MTCA Method B Soil Gas Screening Value Cancer[#] (µg/m^3)	TGE Proposed Air Screening Value (µg/m^3)	TGE Reported Proposed Air Screening Value Source	MTCA Method B Indoor Air CUL Noncancer[#] (µg/m^3)	MTCA Method B Indoor Air CUL Cancer[#] (µg/m^3)
Metals																				
Arsenic	7440-38-2	20	Table 749-2	20	24	0.67	7 / 7	5	Method A	5	4.8	0.058	NA	None			NA	None		
Barium	7440-39-3	1,250	Table 749-2		16,000			3,200	Method B		3,200		NA	None			NA	None		
Cadmium	7440-43-9	25	Table 749-2	2	80		1 / 1	NONE		5	8		NA	None			NA	None		
Chromium (Total)	7440-47-3	48	Ecology[*]				42 / 48	50	Method A	50			NA	None			NA	None		
Chromium III	16065-83-1	18	CLARC[^]	2,000	120,000			24,000	Method B		24,000		NA	None			NA	None		
Chromium VI	18540-29-9	480,000	CLARC[^]	19	240	0.38		48	Method B		48	0.046	NA	None			NA	None		
Lead	7439-92-1	220	Table 749-2	250			17 / 24	15	Method A	15			NA	None			NA	None		
Mercury	7439-97-6	9	Table 749-2	2			0.07 / 0.07	2.2	Method A	2			None	None	4.6		None	None	0.137	
Selenium	7782-49-2	1.2	USGS[*]		400			80	Method B		80		NA	None			NA	None		
Silver	7440-22-4	0.61	USGS[*?]		400			80	Method B		80		NA	None			NA	None		
Total Petroleum Hydrocarbons (TPH)																				
Gasoline range total petroleum hydrocarbons (benzene present)	None	200	Table 749-2	30	Method B TPH CUL is calculated on a Site specific basis			800	Ecology believes these values to be sourced from MTCA Method A [?]	800	Method B TPH CUL is calculated on a Site specific basis		None	None	1,500		None	None	46	
Diesel range and oil range total petroleum hydrocarbon	None	460 / 2,000	Table 749-2 / Method A	2,000				500		500										
Volatile Organic Compounds (VOCs)																				
Acetone	67-64-1	72,000	Method B		72,000			7,200	Method B		7,200		470,000	Method B			14,000	Method B		
Benzene	71-43-2	0.03	Method A	0.03	320	18		5	Method A	5	32	0.8	11	Method B	460	11	0.32	Method B	13.7	0.321
Butadiene;1,3-	106-99-0	None	None			1.7		None	None			0.073	2.8	Method B	30	2.8	0.083	Method B	0.914	0.0833
Carbon disulfide	75-15-0	None	None		8,000			None	None		800		11,000	Method B	11,000		320	Method B	320	
Chloroform	67-66-3	32	Method B		800	32		80	Method B		80	1.4	None	None	1,500	3.6	None	None	44.8	0.109
Chloromethane	74-87-3	None	None					None	None				150,000	Method B	1,400		41	Method B	41.1	
Cumene	98-82-8	None	None		8,000			None	None		800		6,100	Method B	6,100		180	Method B	183	
Cyclohexane	110-82-7	None	None					None	None				91,000	Method B	91,000		2,700	Method B	2,743	
Cymene (4-Isopropyltoluene)	99-87-6	None	None					None	None				None	None			None	None		
Dichlorobenzene;1,3-	541-73-1	None	None					None	None				None	None			None	None		
Dichlorobenzene;1,4-	106-46-7	190	Method B		5,600	190		560	Method B		560	8.1	None	None	12,000	7.6	None	None	366	0.227
Dichloroethylene;1,1-	75-35-4	4,000	Method B		4,000			40	Method B		400		None	None	3,000		None	None	91.4	
Dichloroethylene;1,2-,cis (a.k.a. cis 1,2-Dichloroethene)	156-59-2	160	Method B		160			16	Method B		16		610	Method B	610		None	None	18.3	
Dichloroethylene;1,2-,trans	156-60-5	1,600	Method B		1,600			160	Method B		160		None	None	610		None	None	18.3	
Ethanol	64-17-5	None	None					None	None				78.6	Calculated[@ ?]			None	None		
Ethyl-4-methylbenzene;1-	622-96-8	None	None					None	None				32.7	Calculated[@ ?]			None	None		
Ethylbenzene	100-41-4	6	Method A	6	8,000			700	Method A	700	800		15,000	Method B	15,000		460	Method B	457	
Ethyl chloride	75-00-3	None	None					None	None				150,000	Method B	150,000		4,600	Method B	4,571	
Heptane	142-82-5	None	None		24			None	None		2.4		6,100	Method B	6,100		180	Method B	183	
Hexane;n-	110-54-3	None	None		4,800			None	None		480		11,000	Method B	11,000		320	Method B	320	
Isopropanol	67-63-0	None	None	0	160,000			None	None	0	16,000		3,033	Calculated[@]			91	Method B	91.0	
Methyl ethyl ketone	78-93-3	48,000	Method B		48,000			4,800	Method B		4,800		76,000	Method B	76,000		2,300	Method B	2,286	
Methyl methacrylate	80-62-6	None	None		110,000			None	None		11,000		11,000	Method B	11,000		320	Method B	320	
Methylene chloride	75-09-2	0.02	Method A	0.02	480	94		5	Method A	5	48	5.8	None	None	9,100	2,200	None	None	274	65.8
methyl tert-butyl ether (MTBE)	1634-04-4	0.1	Method A	0.1		560		20	Method A	20		24	None	None	46,000	320	None	None	1,371	9.62
Naphthalene	91-20-3	5	Method A	5	1,600			160	Method A	160	160		None	None	46	2.5	None	None	1.37	0.0735
Propene	115-07-1	None	None					None	None				71.6	Calculated[@ ?]			None	None		
Propylbenzene;n-	103-65-1	8,000	Method B		8,000			800	Method B		800		None	None	15,000		None	None	457	
Styrene	100-42-5	None	None		16,000			None	None		1,600		15,000	Method B	15,000		460	Method B	457	
Tetrachloroethylene (PCE)	127-18-4	0.05	Method A	0.05	480	480		5	Method A	5	48	21	None	None	610	320	None	None	18.3	9.62
Tetrachloroethane;1,1,2,2-	79-34-5	None	None		1,600	5		None	None		160	0.22	1.4	Method B		1.4	0.043	Method B		0.0431
Toluene	108-88-3	7	Method A	7	6,400			1,000	Method A	1,000	640		76,000	Method B	76,000		2,300	Method B	2,286	
Trichloroethane;1,1,1-	71-55-6	2	Method A	2	160000			200	Method A	200	16,000		None	None	76,000		None	None	2,286	
Trichloroethylene (TCE)	79-01-6	0.03	Method A	0.03	40	12		5	Method A	5	4	0.54	11	Method B	30	11	0.33	Method B	0.914	0.334
Trimethylbenzene;1,2,3-	526-73-8	800	Method B		800			80	Method B		80		None	None	910		None	None	27.4	
Trimethylbenzene;1,2,4-	95-63-6	800	Method B		800			80	Method B		80		910	Method B	910		27	Method B	27.4	
Trimethylbenzene;1,3,5-	108-67-8	800	Method B		800			480	Method B		80		910	Method B	910		27	Method B	27.4	
Vinyl chloride	75-01-4	0.67	Method B		240	0.67		0.2	Method A	0.2	24	0.029	None	None	1,500	9.5	None	None	45.7	0.284
Xylenes	1330-20-7	9	Method A	9	16,000			1,000	Method A	1,000	1,600		1,500	Method B	1,500		46	Method B	45.7	
Xylene;o-	95-47-6	None	None		16,000			None	None		1,600		1,500	Method B			46	Method B	46.0	

Notes:

\# - A blank or missing value indicates that a cleanup level (CUL) has not been established by MTCA for Method A cleanups (Tables 720-1 or 740-1) or has not been established for Method B single substance cleanups and provided in Ecology's CLARC tables.

* - USGS, Background Concentrations of Metals in Soils from Selected Regions in the State of Washington, April 1995.

\+ - Washington State Department of Ecology, Natural Background Soil Metals Concentrations in Washington State, Publication No. 94-115, October, 1994.

^ - It appears that TGE is attempting to establish the Soil portective of Groundwater Vadose @ 13 degrees C provided in the CLARC tables, and that TGE has the Cr III and Cr VI values switched, and the 18 mg/kg value being used should actually be 0.018 mg/kg.

NA - Not Aplicable

None - No value proposed or no value available. No Information.

@ - TGE applied the generic attenuation value of 0.03, for near-source exterior soil vapor samples, to the lowest Method B indoor air screening level.

? - Ecology could not valadate the proposed screening value from the given source.

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Enclosure B

Basis for the Opinion

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Table 2
Hazardous Substances Present in Soil

Hazardous Substance	CAS#	Data Available in CLARC	Causes Cancer	Proposed CUL (mg/kg)	Proposed CUL Source	Included in Total Health Index Assessment
Acetone	67-64-1	**YES**	NO	72,000	Method B	YES
Anthracene	120-12-7	**YES**	NO	None		**NO**
Arsenic	7440-38-2	**YES**	**YES**	None		**NO**
Barium	7440-39-3	**YES**	NO	None		YES
Benz[a]anthracene	56-55-3	**YES**	NO	None		**NO**
Benzene	71-43-2	**YES**	**YES**	0.03	Method A	YES
Benzo(a)pyrene	50-32-8	**YES**	**YES**	None		**NO**
Benzo(b)fluoranthene	205-99-2	**YES**	NO	None		**NO**
Benzo(ghi)perylene	191-24-2	NO	NO	None		**NO**
Benzo(k)fluoranthene	207-08-9	**YES**	NO	None		**NO**
Cadmium	7440-43-9	**YES**	NO	None		**NO**
Chloroform	67-66-3	**YES**	**YES**	32	Method B	YES
Chromium	7440-47-3	**YES**	NO	None		**NO**
Chromium, Trivalent	16065-83-1	**YES**	NO	None		**NO**
Chrysene	218-01-9	**YES**	NO	None		**NO**
Dibenzo(a,h)anthracene	53-70-3	**YES**	NO	None		**NO**
Dibenzofuran	132-64-9	**YES**	NO	None		**NO**
Dibromofluoromethane	1868-53-7	NO	NO	None		**NO**
Dichlorobenzene;1,3-	541-73-1	**YES**	NO	None	None	**NO**
Dichlorobenzene;1,4-	106-46-7	**YES**	**YES**	190	Method B	YES
Dichloroethylene;1,1-	75-35-4	**YES**	NO	4,000	Method B	YES
Dichloroethylene;1,2-,cis	156-59-2	**YES**	NO	160	Method B	YES
Dichloroethylene;1,2-,trans	156-60-5	**YES**	NO	None		YES
Diesel Range Organics	None	NO	NO	None		**Not Aplicable**
Ethylbenzene	100-41-4	**YES**	NO	6	Method A	**NO**
Fluoranthene	206-44-0	**YES**	NO	None		**NO**
Fluorene	86-73-7	**YES**	NO	None		**NO**
Gasoline Range Organics	None	NO	NO	None		**Not Aplicable**
Indeno(1,2,3-cd)pyrene	193-39-5	**YES**	NO	None		**NO**
Isopropyltoluene;p-	99-87-6	NO	NO	None		**NO**
Lead	7439-92-1	**YES**	NO	None		**NO**
Lube Oil	None	NO	NO	None		**Not Aplicable**
Mercury	7439-97-6	**YES**	NO	None		**NO**
Methyl ethyl ketone	78-93-3	**YES**	NO	48,000	Method B	YES
Methyl t-butyl ether	1634-04-4	**YES**	**YES**	0.1	Method A	**NO**
Methylene Chloride	75-09-2	**YES**	**YES**	0.02	Method A	**NO**
Naphthalene	91-20-3	**YES**	NO	5	Method A	**NO**
Phenanthrene	85-01-8	NO	NO	None		**NO**
Propylbenzene;n-	103-65-1	**YES**	NO	8,000	Method B	YES
Pyrene	129-00-0	**YES**	NO	None		**NO**
Selenium	7782-49-2	**YES**	NO	None		YES
Silver	7440-22-4	**YES**	NO	None		YES
Tetrachloroethene	127-18-4	**YES**	**YES**	None		**NO**
Toluene	108-88-3	**YES**	NO	7	Method A	**NO**
Trichloroethane;1,1,1-	71-55-6	**YES**	NO	2	Method A	**NO**
Trichloroethene	79-01-6	**YES**	**YES**	None		**NO**
Trimethylbenzene;1,2,3-	526-73-8	**YES**	NO	800	Method B	YES
Trimethylbenzene;1,2,4-	95-63-6	**YES**	NO	800	Method B	YES
Trimethylbenzene;1,3,5-	108-67-8	**YES**	NO	800	Method B	YES
Vinyl Chloride	75-01-4	**YES**	**YES**	0.67	Method B	YES
Xylenes	1330-20-7	**YES**	NO	9	Method A	**NO**

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List of Documents

1. TGE Resources, Inc. (TGE), *Response to Ecology Comments*, letter, addressed to Mr. Aaren Fiedler, March 15, 2023.
2. Washington State Department of Ecology (Ecology), *Technical Assistance at the following Site*, letter, addressed to Trina Tan, December 5, 2022.
3. TGE, *Supplemental Phase II Site Assessment and Vapor Intrusion Mitigation System Testing*, May 19, 2022.
4. Ecology, *Technical Assistance and Request for Additional Information*, letter, addressed to Tammy Buyok, March 4, 2021.
5. Ecology, *Further Action at the following Site*, letter, addressed to Tammy Buyok, November 19, 2020.
6. TGE, *Remedial Investigation and Independent Remedial Action Report*, September 2020.
7. Soloveda Division II LLC, *WSEC Air Barrier Testing Report*, April 23, 2020.
8. TGE, *"Grub" Soil/Fill Material Characterization Assessment*, June 20, 2019.
9. TGE, *Soil Management Plan*, June 17, 2019.
10. TGE, *Terrestrial Ecological Evaluation*, memorandum, June 6, 2019.
11. *Supplemental Phase II Environmental Site Assessment*, April 2, 2018.
12. TGE, *Limited Phase II Environmental Site Assessment*, January 30, 2018.
13. TGE, *Phase I Environmental Site Assessment,* January 30, 2018.